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Tri-Face Operators Manual
Version 7.0

July 2008 Revision

Tri-Face signs are intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or applicable local codes. This equipment requires proper grounding and bonding of the sign.

AdTech™
Innovators In Advertising Signage.

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July, 2008

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Tri-Face Operator's Manual

Introduction

A Multi-Image sign is a heavy-duty machine with intermittent rotating parts. Extreme caution needs to be taken when operating or servicing this equipment. Before installing, operating or servicing a Tri-Faced Multi-Image sign, **read this manual**. This equipment contains high voltages, rotating parts, motors and mechanical drives that can cause serious or fatal injury. Only qualified personnel, familiar with this manual, should install or service this equipment.

Safety Warnings

Do not work on this equipment without disconnecting it from the primary electrical service. The motor circuit may have high voltage present whenever AC power is applied, even when the motor is not rotating.

Do not apply AC power before making sure the system is grounded. This equipment must be properly grounded. Use extreme caution. Do not touch any circuit board, power device or electrical connection without ensuring that high voltage is not present.

The mechanical system cannot be manually stopped and can cause serious or fatal injury.

The sign is very quiet and does not produce any warning noise or light signal before starting its rotation cycle.

This equipment has an automatic restart feature that can start the motor without warning.

Improper control operation may cause violent motion of the motor shaft and drive mechanisms.

Peak torque, several times the rated motor torque can occur during a control failure.

In the event of a drive system lockup, the motor (even with the power off) applies pressure to the system. Be careful. Correcting a system lockup may cause the drive system to pop or jump.

All signs have an external On/Off switch that is typically located on top of the control box. Locate this switch before working on the sign.

Changeable louver faces need to be installed properly before operating the sign. Inspect louver faces for uneven application prior to starting sign. Louver faces not installed properly can collide jamming the sign or dislodging from the louver core. A dislodged louver face can cause personal injury or harm.

For proper operation and service of a Tri-Face sign, the installation guidelines and start up procedures must be followed. Service access must be provided and the preventive maintenance schedule must be followed. Improper or no preventive maintenance will cause premature failure of system components.

This product has its highest malfunction rate during the first month of operation, usually due to improper installation or improper start up procedures. After installation, the sign must run continually (15 second or less dwell time) for a period of 30 days. At the end of this 30 day break-in period, a preventive maintenance inspection of the equipment must be performed.

Tri-Face signs require 120V 5 amp single-phase power per motor. Tri-Face signs have been tested by ETL and carry an ETL label certifying compliance with UL and CSA electrical Standards.

Factors to Consider Before You Order

Serviceability - Tri-Face signs require service access to the drive train unit, the side beam where the motor and controller are located, and the top channel to access the louver pivot. Before manufacturing begins, you must decide on the following: front or rear service access; left or right drives; vertical or horizontal louvers; and controller locations.

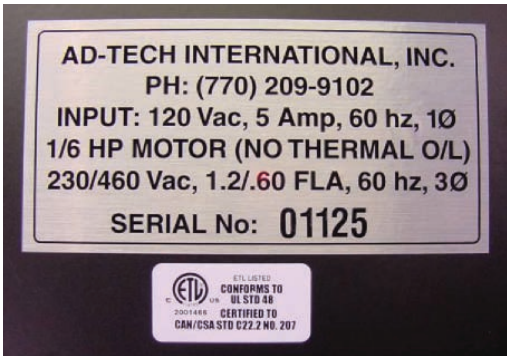
Back Panel - A Tri-Face sign requires a Back Panel. The Back Panel prevents sunlight from shining through gaps in the louvers, which can make it difficult to read the sign, and reduces wind load on the louvers. Tri-Face signs over 6' tall must have a Back Panel. Typical Tri-Face installations use rotary lock sections on the existing billboard face, often painted solid black, as the Back Panel. On smaller Tri-Face signs without Back Panel, the sign should not be rotated unless all three changeable faces are in place. Wind blowing through the back of the sign can dislodge changeable louver faces unless all three faces are in place.

Electrical - A typical Tri-Face sign requires single phase 120 VAC at 5 Amps electrical service with a proper electrical ground. If the sign has a remote control box do not run the high voltage wires in the same conduit as the control wire, and do not coil up access wire. Either causes electronic noise and the sign may not operate properly.

Frame Components - The upper and lower frame components require a support within 4' of the ends and no more that 8' between supports. Other configurations are possible. Consult Formetco for any structural modification that may be required.

The mounting structure needs to support the steel "C" channel in the back of the drive train. For installation of a rear service sign, the support structure must hold up the steel "C" channel located at the front of the sign.

Structure Preparation - Ad-Tech does not design support structures or provide structural engineering. It is the responsibility of the buyer to ensure a properly engineered support structure is installed, which meets



required weight and wind loads of each sign. We recommend that a structural engineer review and approve the structure and mounting method.

Lifting Method - Typical Tri-Face signs are long and narrow. Any piece or section over 20' in length must be lifted using a spreader bar. A Tri-Face sign should not be lifted with the louvers installed. When lifted assembled, the sign should be lifted from the bottom of the drive train or by the Hanger Bracket Clips.

Long signs (over 18'), especially those with horizontal louvers, require a spreader bar for lifting. Signs can be assembled on the ground and lifted into place. Large signs should be installed without the louvers in place.

The Tri-Face sign mounting system and the structure to which it mounts must be approved by a local structural engineer. This Manual provides recommendations, which may not necessarily be suitable for your specific structure or geographical location. The following are general recommendations that may not necessarily be suitable for your specific structure or geographic location.

Installation Guidelines

The sign must be mounted on a straight level surface without front or back tilt. The mount cannot sag from the weight of the sign. The closer the support structure is to level-perfect, the better the sign will operate. A drive train mounted with front or back tilt will cause excessive louver pivot base friction at the bottom of the louver and will not be covered by warranty. The drive train support structure should hold a ¼" per 48′ deviation from level-perfect.

Step 1

Bolt the Upper Vertical side beams to the short vertical beams mounted to the drive train.

Step 2

Bolt the top channel to the vertical side beams.

Step 3

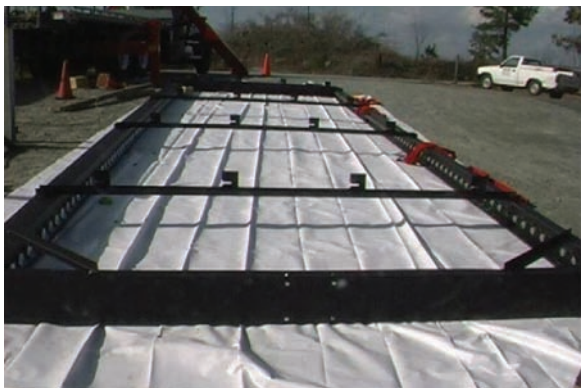
All signs must be square for proper operation.
A measurement of the cross-distance from adjacent corners must be taken before the connecting bolts are tightened. This helps assure that the sign is square.

Step 4

We typically provide intermittent vertical supports and diagonal corner braces depending upon the size of the sign and how it will be installed. All supports are predrilled for bolting in place.

Step 5 Hanger Bracket Clips System

Clips are welded onto vertical Hanger Bracket supports to match the spacing of the horizontal stringers that support the bulletin sections. The Hanger Bracket Supports are bolted onto the back of the Tri-Face frame. At the location of the vertical Hanger Bracket the bulletin sections are split apart 2" and the Hanger Bracket is spaced along the back of the Tri-Face frame lined up with gaps in the bulletin sections. The frame



is assembled on the ground. Often the Stringers or the Stringer support clips need to be modified. Consult your structure manufacture or a structural engineer for recommendations. New structures can be ordered Tri-Face-ready from most structure manufacturers.

Step 6 Support Arm Mounting

Horizontal Support Arms are either welded or bolted onto the existing vertical support structure below and above the Tri-Face frame. Consult your

structure manufacture or a structural engineer for recommendations regarding the size of the Support Arms.

Step 7 Electrical

Typically a Tri-Face sign requires 120V 5 Amp electrical service. Primary electrical power is run to the control box. In the bottom of the control box is a knockout for the electrical contractor to install the power supply conduit and wiring per applicable Codes and Standards. Inside the control box is a terminal strip for the primary power connection. The terminals are labeled. The sign is turned off before connecting the primary power. If the sign is on, it will start the rotating sequence creating a risk of personal injury, property damage, or both. See the wiring diagrams in the drawing section.

Installation Methods

There is a wide range of installation methods used for a variety of Tri-Face applications. Unique applications or installation requirements can be accommodated. The following is an overview of some common installation methods.

Pylon Installation
Tri-Face signs require support within 4' of the cabinet end and at least every 8' between supports.

Billboard Installation
Generally two different methods are used: Hanger Bracket Clips or Support Arms Mounting.

Wall Installation
Tri-Face signs are easily mounted on walls using the Hanger Bracket Clip system or a direct wall mount. The lower Tri-Face support needs to be at least 8" wide to properly support the Tri-Face drive train.

Installation Tools & Torque Specifications

3/32", 3/16" and 1/4" Allen wrenches
Pliers or Channel Locks
Torque socket wrench
9/16" socket or 9/16" open end wrench
5/16" square head or 3/8" 12 point socket
7/16" socket or 7/16" open end wrench
1/2" socket or 1/2" open end wrench
5/16" open end wrench
Locktite or similar threadlocker
Light weight rubber mallet wrapped with a white cloth

Top Louver Pivots - 1/4" Allen wrench, pliers or Channel Locks for the lower bolt and 9/16" socket or open end wrench for the top bolt. Lock-Tite or similar threadlocker.

Louver Pivot Base - 5/16" Square Head or 3/8" 12 point socket, 5'16" open end wrench. Torque bolts to 205 Inch Pounds or 17 Foot Pounds.

Gears - 5/16" Square Head or 3/8" 12 point socket, 5'16" open end wrench. Torque bolts to 205 Inch Pounds or 17 Foot Pounds.

Louver Pivot Bearing Assembly - 7/16" socket or open end wrench.

Louver Pivot Splice - Pivots require 5/16" Square Head or 3/8" 12 point socket, 5'16" open end wrench. Torque bolts to 205 Inch Pounds or 17 Foot Pounds. Bearing set screws require a 3/32 Allen wrench.

Drive Shaft Couplers and Motor Couplers - 3/16" Allen wrench.

Frame Bolts - 7/16" sockets or 7/16" open end wrenches.

Motors - 1/3 HP requires 1/2" sockets or 1/2" open end wrenches; motors under 1/3 HP require 7/16" sockets or 7/16" open end wrenches.

Changeable PVC Faces - Lightweight rubber mallet wrapped with a white cloth to avoid marking up the graphics.

Installation Steps

Step 1

Before beginning installation, read the Manual, including the Safety Notices, Pre-Installation Considerations, and Installation Guidelines. Have the structure and attachment system reviewed and approved by a structural engineer.

A. Unloading and Installing Slide-In Louver Faces

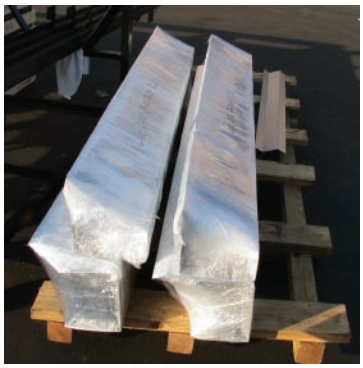
Step 2

Receiving and Unloading - Inspect the load for damage and shortages before signing Bill of Lading. In the package shipped with every sign are an Operators Manual, Shop Drawing, Electrical Schematic, Inverter Parameter Sheet and a Shipping Pack Slip. On the truck will be the following:

A. Drive Trains - Drive trains over 40' long are typically spliced into two sections. Drive trains less than 40' are typically shipped in one section. If a sign is shipped with a splice the service access door at the splice location can be found attached to the adjacent service access door.

B. Top Frames - Top frames over 40' long typically are spliced into two sections. Top frames less than 40' are typically shipped in one section.

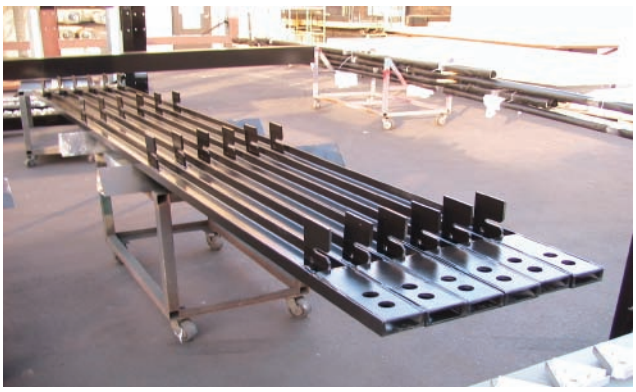
C. Side Frames - Signs over 10'6" tall have the Side Frames shipped labeled "Motor End" and "Far End." Signs 10'6" and shorter have the Side Frames shipped attached to the Top Frames. Lower Side Frames are attached to the Drive Train.



D. Top Corner Diagonals - These are two flat bars with pre-drilled holes used to square up the sign. They are to be attached to the upper left and right corners of the sign. On signs over 10'6" tall they are packaged with the Side Frames when the Side Frames are shipped separate from the tops. On signs 10'6" and under they are pre-installed at the factory.

E. Vertical Support Angles **-** These come with signs that do not use the Vertical Mounting Channels. They are pre-drilled and bolted to the back of the sign. They are used as spacers to equalize the distance from the top frame and drive train.

F. Vertical Mounting Channels **-** These are optional larger 4" channels with clips to attach to the horizontal stringers and replace the Vertical Support Angles. The measurement of the actual stringer spacing with the clip locations on the Vertical Mounting Channels should be double checked before lifting the sign.



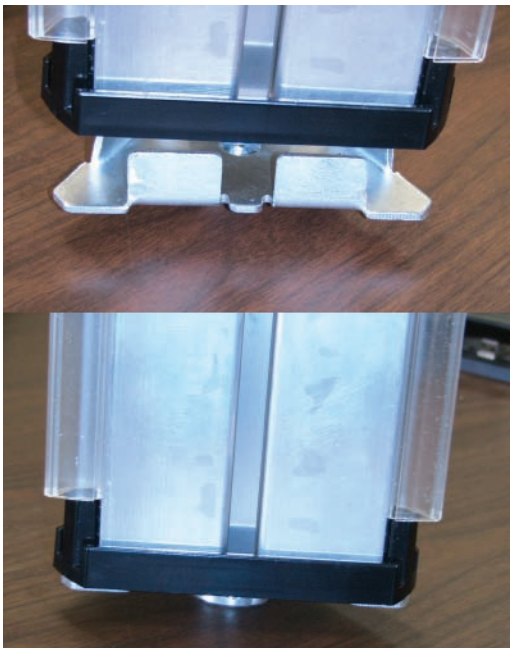
G. Frame Bolt Kit **-** One per sign has all of the bolts and screws necessary to assemble the sign.

H. Controller Cabinet and Cables **-** Typically a single sign comes with the controller (as packaged below left) located just above the motor mounted inside the Side Frame just above the motor. Controller boxes (lower right) typically run two signs from one box and have the cables coiled up in the packaging.

I. Louvers and Acrylic Clips **-** The louvers are crated with the Acrylic Clips installed. Extra Acrylic Clips are packaged with one of the louvers.
Parts are labeled. Side frames and tops are specific to the drive train for best fit.

Step 3 Louver Installation and Acrylic Clips

Care needs to be taken in handling the louvers to avoid cracking or breaking the Acrylic Clips. Extra Acrylic Clips are shipped with each sign in case an Acrylic Clip is broken during installation. Cracked or broken Acrylic Clips should be replaced to keep the slide-in graphics material in place. Please store unused replacement Acrylic Clips for future use.

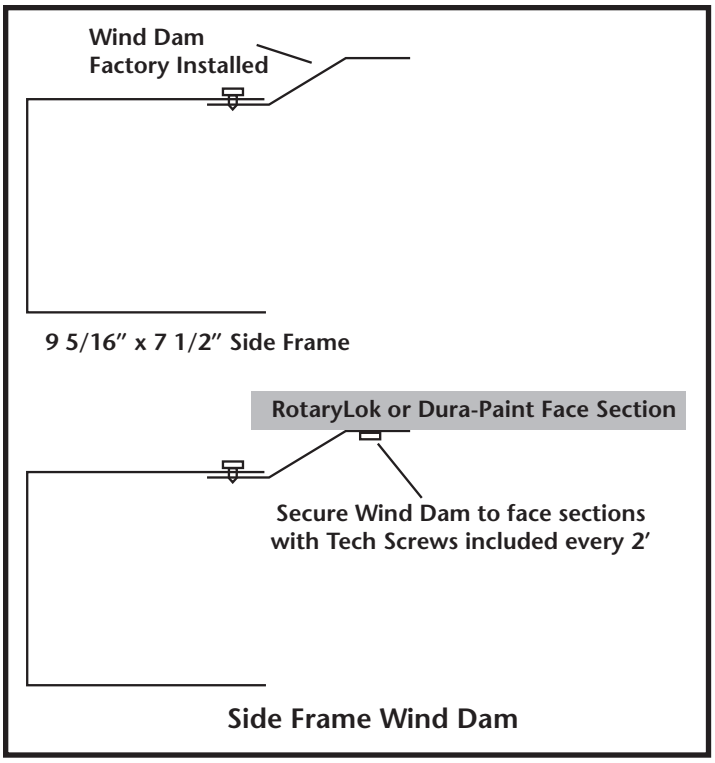


Step 4 Slide-In Graphics Production Requirements

Slide-in graphics must be printed on material strong enough to hold within the acrylic clips, typically 20 mils thick. Material must not be wider than 5 7/16", or narrower than 5 6/16", with a recommended length of 13'11½".

Step 5 Install Wind Dams

Fabricated metal side wind dams and assorted screws and washers are provided with the sign. Wind dams are necessary for the slide-in graphics system to work properly. The sign must have a full back without open areas. If there are gaps in the back of the sign they must be filled in for the sign to operate properly. See the illustration below:



B. Configuring and Calibrating the Contoller

Step 6 Controller Card Operation and Face Calibration

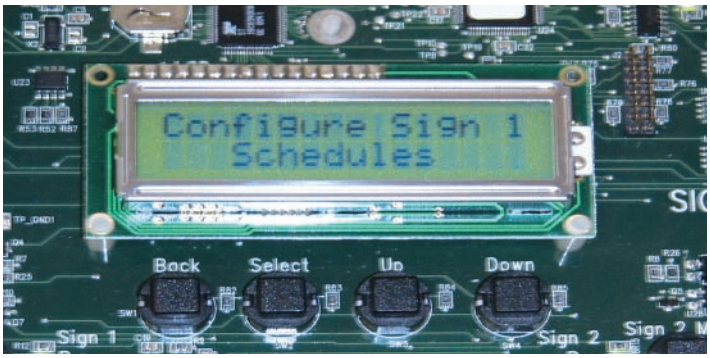
The sign face is set flat at the factory but most signs are not run at the factory with the aluminum in place. Often after the sign runs with the aluminum installed, it will need to have the face set flat by Calibrating Face A. Face A is the face with all of the set screws facing out.

To get into the programming mode of the controller card, place the sign in Maintenance mode. Review the following sections on Maintenance Mode and Calibrating Face A.

1. Maintenance Mode

Once you have become familiar with the Controller main screens, you are ready to begin configuration.

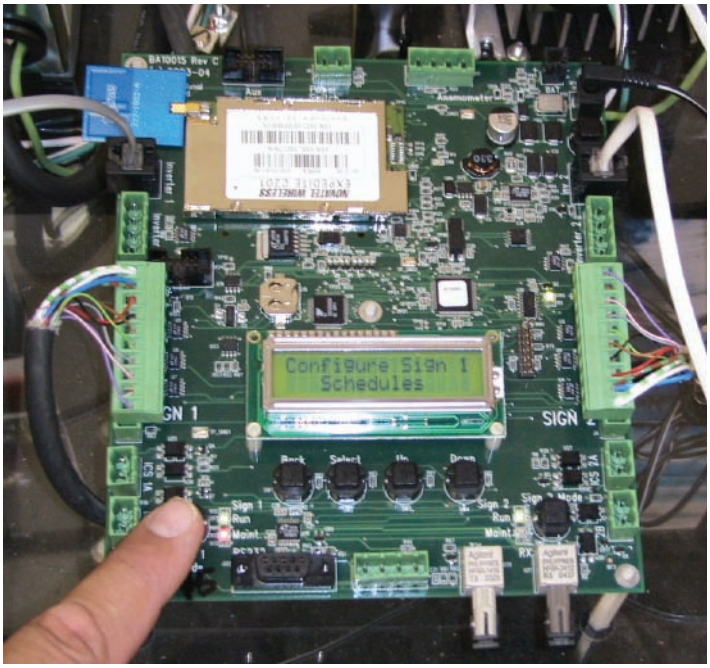
Each properly operating sign will be in one of two Modes – **Run Mode** or **Maintenance Mode**. For Sign 1, the Mode buttons and LED indicators are in the lower left hand corner of the Controller. For Sign 2, the indicators are in the lower right hand corner.



When a sign is in **Run Mode** and the inverter and encoder are properly connected, the green **Run** LED for that sign should be lighted. When a sign is in **Maintenance Mode**, both the green **Run** LED and the red **Maintenance** LED for that sign should be lit. A sign can ***only*** be configured when in **Maintenance Mode**.

To change a sign from **Run Mode** into **Maintenance Mode**, press the **Mode** button once. The red Maintenance LED will illuminate while the **Run** LED remains illuminated. To return to **Run Mode**, press the Mode button again. This will turn off the **Maintenance** LED and return the sign to **Run Mode.**

IMPORTANT NOTICE: After setup or maintenance is complete and before leaving the sign, make sure that the sign has been returned to **Run Mode**. Once a sign is placed in **Maintenance Mode**, the only way to return that sign to **Run Mode** is to press the **Mode** button again. Powering the sign on and off will not return the sign to **Run Mode**. Also, a sign with POP features cannot be returned to **Run Mode** using the modem. This feature



is designed to help ensure the safety of sign maintenance personnel. If a sign is left in **Maintenance Mode** after maintenance is completed, a return trip to the sign will be required to place the sign back into **Run Mode.**

When Sign 1 is first placed into **Maintenance Mode**, the display will read:

```
Configure Sign 1
   Schedules
```

If Sign 2 is being configured, the same message will be displayed but with "Sign 2" indicated instead of "Sign 1". Note, only one sign can be in **Maintenance Mode** at one time.

If the sign being configured is currently in motion, it will complete its rotation normally and then stop rotating until the sign is returned to **Run Mode**.

Once in **Maintenance Mode**, the sign can be configured.

Safety Warning
DO NOT return the sign to **Run Mode** until all personnel are clear of the sign drive train and louvers. **FAILURE TO ADHERE TO THIS PROCEDURE MAY RESULT IN INJURY OR DEATH!**

2. Calibration
Before the sign will present faces A, B, and C accurately, the sign must first be calibrated to stop "flat" on Side A. Use the calibration menu to do this. From the main menu, find the Calibration menu shown below:

```
Configure Sign 1
   Calibration
```

3. Seek to Face
At the screen shown above, press the **Select** button to enter the **Calibration Menu**. The first option of the **Calibration Menu** is the **Seek to Face** menu shown below:

```
   Calibration
Seek to Face
```

Press the **Select** button to enter the **Seek to Face** menu. The Seek to Face A option should appear as shown below:

```
Seek to Face
      A
```

Press the **Select** button. The sign will move to the position currently calibrated as Face A. This position may or may not be the proper position for Face A. When the sign has finished moving to the currently calibrated position for Face A, it will momentarily display the "**Save Succeeded**" message shown below:

```
Save Succeeded
```

4. Calibrate Face A
Once the sign has moved to its current Face A position, press the **Select** button to return to the **Calibration Menu**. Use the **Up** or **Down** button to move to the **Calibrate Face A** selection shown below:

```
   Calibration
Calibrate Face A
```

Press the **Select** button and the following screen will appear: (the sign position number shown below is an example – the actual number may be any number between 1 and 4,000). The word STOP indicates that the sign is not currently moving.

```
Calibrate  Face  A
     STOP  1037
```

If the sign needs to be moved slightly forward, press the **Up** button. The sign will move forward slowly. The display will appear as shown below, with the sign position number to the right rapidly increasing:

```
Calibrate  Face  A
  <FORWARD  ----
```

When the sign has reached a position where it is actually flat on Face A, press the **Down** button. This will cause the sign to stop in the new position, displaying the new sign position number. An example is shown below:

```
Calibrate  Face  A
     STOP  1843
```

If you "overshoot" the flat position and need to move the sign backward slightly, press the **Down** button again. This will cause the sign to move slowly in the reverse direction, with the display appearing as shown below:

```
Calibrate  Face  A
  <REVERSE  ----
```

Pressing the **Up** button will cause the sign to stop, displaying the new sign position value. An example is shown below:

```
Calibrate  Face  A
     STOP  1792
```

Review

- If the sign is stopped, pressing the **Up** button will cause the sign to slowly move forward and adjust the Face A position.
- While the sign is moving forward, pressing the **Down** button will cause it to stop.
- If the sign is stopped, pressing the **Down** button will cause the sign to slowly move in reverse and adjust the Face A position.
- While the sign is moving in reverse, pressing the **Up** button will cause it to stop.

Once the sign is in the proper position to make Face A flat, press the **Select** button. This will save the calibrated sign position and momentarily display the "Save Succeeded" message shown below:

Step 7

Each sign needs to be entered into the POP-System for Wireless control and monitoring. We need to verify the signs MIN # and Devise ID #. This information can be verified using the button on the Right below the LCD screen on the Controller when the sign is not in Maintenance Mode. Push the **Select** button through a series of screens until you see the screen showing both the MIN # and Devise ID #. This information along with the location of the sign, the sign ID #, the advertising faces on the sign, and special instructions need to be

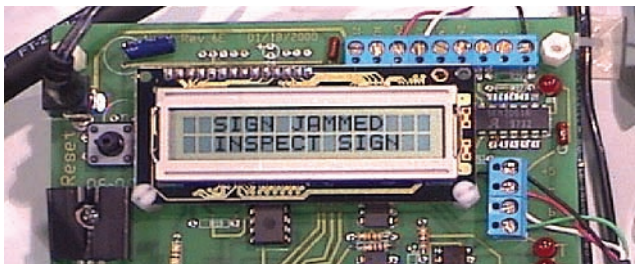
```
Save  Suceeded
 FWD  or  RVS
```

entered into the POP-System. Contact Cindy Peters at 770-476-7000 or Service at 770-209-9102, ext. 213 to enter this information in to the POP-System.

Step 8

For assistance or additional information, contact Ad-Tech Service at 770-209-9102, ext. 213, or Cindy Peters at 770-476-7000.

Tri-Face Sign Safety System - If the sign jams or does not find the next face during a rotation, after 15 seconds the sign will stop. The sign will then reverse back to the previous face, trying to dislodge anything that might be jamming the rotation of the sign. If it finds the previous face within 10 seconds it will stop on that face and then start rotating forward. If it does not find the previous face the controller will go into "**Sign Jammed Mode.**" The sign will stop until an operator inspects the sign and resets the controller.

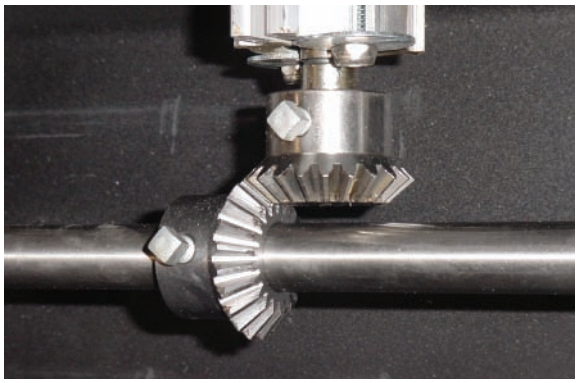


How-To Guide

How to read the Inverter
Every Ad-Tech Inverter has an LCD or LED display. If you see anything but the following information on the display, please note the info and look up the Error Code in the Inverter Manual. A Delta Inverter should display "18.5".

How to replace the Inverter
Although our replacement Inverter may come from a different manufacturer, the replacement inverter will be pre-programmed and with colored lead wires that match the existing wires. Remove the existing Inverter. New mounting holes may have to be drilled for the new Inverter. We typically mount replacement Inverters with self taping screws. Connect the wires on the Inverter wire for wire. Remove one lead wire from the new Inverter and replace it with the permanent wire.

How to install Louvers
Either end of the Solid Aluminum Louvers may be installed at the top or bottom of the sign. Universal Louvers, on the other hand, have a three foot section of the tracks removed, which is the bottom of the louver. The top of the louver slides over the Louver Top Pivot. Often this is a snug fit and the louver may have to be wiggled some to fit over the pivot. The bottom of the louver fits over the three vertical legs of the Louver Base Pivot. The face of the louver will be flat with the front of the sign. If the corner of the louver points towards the front of the sign the louver is installed incorrectly. All louvers are inspected prior to shipment. Extra louvers are shipped with the sign. The Extra louvers may be used to replace louvers damaged or bent in shipping or installation.



How to adjust the Gear Backlash
Louvers should rotate approximately ¼" at the end of the louver with the face on it. If it rotates more, there is too much gear backlash. If it rotates less, the gears are too tight. Do not adjust the gears too tight. Some backlash is needed. Gear backlash is adjusted by loosening the set screw on the gear on the drive shaft with a 5/16" Square Socket or 4 point socket, 3/8" 12 point socket, or a 5/16" open end wrench. Move the gear along the shaft to obtain the required gear backlash. Tighten the set screw to 205 Inch Pounds or 17 Foot Pounds. Check to see where the gears meet to make sure the two gears have not become offset. If the face of the gears do not line up, both gears will need to be re-adjusted.

How to change a Top Louver Pivot
Remove the louver by pulling it up and out of the Louver Base Pivot (Note: some signs have the louver

bolted into the base pivot.) On top of the frame you will need a 9/16" socket, open ended wrench or Channel Locks. Under the frame you will need a ¼" Allen wrench, pliers or Channel Locks. Turn the 9/16" bolt counter-clockwise while holding the shaft of the base pivot with the Allen wrench or pliers or Channel Locks. The Top Louver Pivot unbolts similarly.

How to change a Louver Pivot Assembly

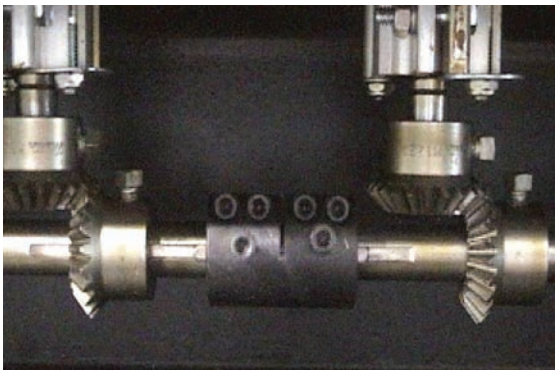
Stop the sign on face "A". Remove the service access doors from the Drive Train. Remove the Louver Pivot Base from the assembly. Remove the two screws on each side of the assembly and the assembly will come loose. We recommend changing the Louver Pivot Seal at the same time. (See the section on How to change a Louver Pivot Seal, below.) If you are just replacing the bearing in the aluminum housing, loosen the screw on the aluminum housing and remove the existing bearing, noting which end of the shaft (long or short) attaches to the Louver Pivot Base. That needs to be in the up position when the assembly is reinstalled. Remove the gear off the bearing shaft. Install the new bearing in the aluminum housing and tighten (but do not overtighten) the set screw. Test the tightness by rotating the bearing shaft. It should rotate smoothly. If it binds during rotation, the set screw is too tight. Reinstall the assembly making sure the two bearing support washers are reinstalled. Reinstall the gear making sure the set screw is facing in the same direction as the adjacent gear.

How to change a Louver Pivot Seal

Remove the Louver Pivot Base. If the seal has come loose, use a screw driver to move it up off the shaft. Clean out any contaminates. Pack with Bearing Grease. Push the new Louver Pivot Seal down the shaft. With a hammer, gently press the Seal into position with about a 1/8" lip showing above the base frame.

How to change the Drive Shaft Coupler

Stop the sign on face "A". Depending upon the condition of the coupler it might be easier to cut off the exiting coupler and replace with a two piece coupler. Loosen the set screws. The four adjacent gears are loosened and moved out of the way. The Drive Shaft Coupler can then be slid to the right or left, which ever direction has more room. On the side to which the Drive Shaft Coupler has been moved, the adjacent



Pillow Block Bearing(s) will need to be loosened completely, which will allow enough flexibility in the drive shaft for the Drive Shaft Coupler to slide off. Replace the new Drive Shaft Coupler, tighten the Pillow Block Bearing(s), tighten the set screws making sure the keys are set in place and the key locking screws are tightened. Replace the gears, tighten to specification, and adjust the louver for flatness. If the Drive Shaft Coupler will not loosen, using a cut off wheel grinder cut along the back side breaking the existing coupler into two pieces. Replace with a new two piece coupler (Granger part 3ZN69, 2 piece coupler with keyway ¾" bore). Setscrews should be tight and the coupler halves joined snuggly.

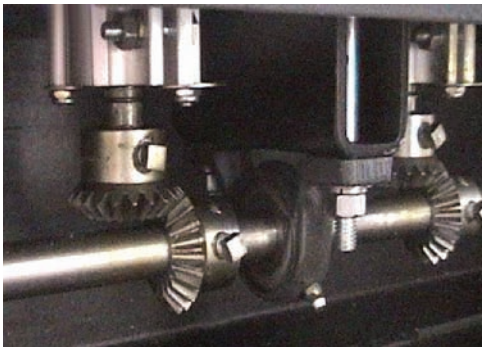
How to change the Flexible Motor Coupler

Stop the sign on face "A". Using a ¼" Allen wrench loosen both sides of the motor coupler and slide both sides back on the shaft. Once the two half's are slid back, there is a gap in the drive shaft through which the pieces can be slid out. Visually check the star piece between the two couplers for wear. Replace if noticeable

wear is present. Replace the new Flexible Motor Coupler by reversing this process.

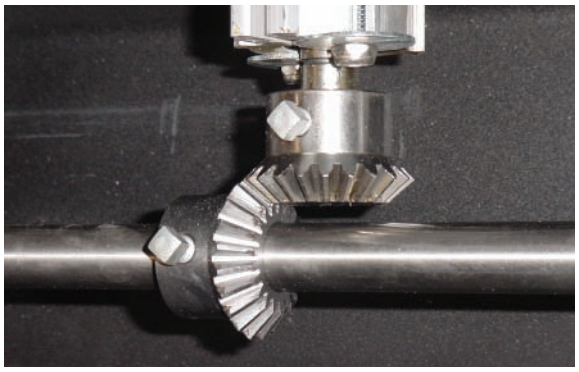
How to change a Pillow Block Bearing

Stop the sign on face "A". Remove the two support bolts. Loosen the Pillow Block assembly. Loosen the two set screws on the Pillow Block Bearing on the drive shaft. Find the closest Drive Shaft Coupler. Remove that Drive Shaft Coupler. Remove all of the Gears and other Pillow Block Bearing between the location of the Drive Shaft Coupler and the Pillow Block Bearing to be replaced. Gently slide the gears and Pillow Block Bearing off the drive shaft. The set screws may slightly mar the drive shaft. The mar mark should be smoothed out with Emory cloth. Once removed, reinstall Gears and Pillow Block Bearings in the same order. Tighten to specification.



How to change a Gear

Stop the sign on face "A". Locate and remove the closest Drive Shaft Coupler. Remove all of the Gears and other Pillow Block Bearings between the location of the Drive Shaft Coupler and the gear that needs to be replaced. Gently slide the gears on the drive shaft. The set screw may slightly mar the drive shaft. The mar mark will have to be smoothed out with Emery cloth. Once the old gear is removed, install the new Gear and replace in the same order. Tighten to specification.

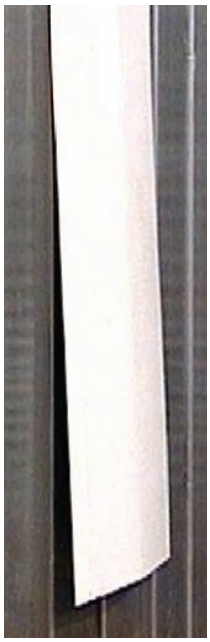


How to adjust one Louver for flatness

A typical Tri-Face sign will have the louvers aligned flat as shown in the adjacent photo. If one louver is out of alignment, stop the sign on face "A". All of the Louver Base Pivots set screws are accessible from face "A". Loosen the set screw on the Louver Base Pivot with a 5/16" Square Head Socket, 3/8" 12 point socket, or 5'16" open-ended wrench. Adjust the louver in the flat position. Tighten the Screw to 205 Inch Pounds or 17 Foot Pounds.

How to install and remove a Changeable PVC Face

Care needs to be taken in handling the changeable PVC faces. A damaged PVC face needs to be replaced. Do not reinstall damaged PVC faces. Doing so will cause operating problems. Changeable PVC face pieces must be installed from the bottom up, leaving a gap of at least 1/16" to 1/8" between the changeable PVC face and the Louver Base Pivot. The Changeable PVC faces are snapped into the louver core from the bottom up. The top of the Changeable PVC face may need to be tucked into the top frame before the bottom is snapped into place. The Changeable PVC face needs to be snapped in one direction and fully snapped into the louver core

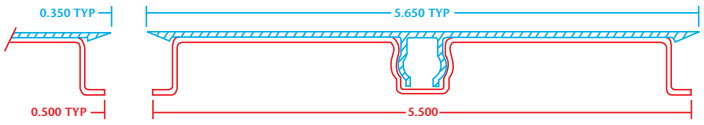


without any humps or gaps. Gaps or humps will cause louver interference and can cause the Changeable PVC Face to dislodge from the louver core and fall out of the sign. The two photos on page 15, bottom right, show unacceptable Changeable PVC Face installations.

Removing the Changeable PVC Face from the louver core or graphics application fixture requires a screwdriver (a modified screwdriver with a 90 degree bend 1" from the tip is helpful) to be placed in the middle pulling the face out of the louver core. (See photos below.) Pulling on the side of the louver face will damage the material. Improper handling can cause the face to crack or split apart.

How to set up and use the graphics application jig extrusions

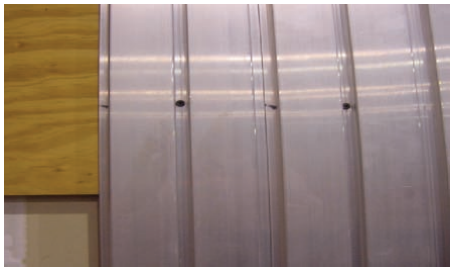
The extrusions are based upon the drawing below. The cross-marked area at the top is the Changeable PVC Face in the jig extrusion.



The louvers are installed on 6" center-to-center spacing. The Changeable faces are 5.650" wide +/- .1". The jig extrusion is 5.950" wide. Extrusions vary with width.

The jig extrusions can be installed on a wall or mounted on plywood and laid flat on supports on the floor. The photos on the right show a 20' by 50' jig installed on a wall.

Jig extrusions are attached with Tech screws in the middle of the center of the extrusion as shown in the photo on the right.



A right angle metal piece should be mounted along the bottom of the jig extrusion to help with vertical louver alignment.

Measure the center-to-center distance of every few louvers to ensure consistent 6" spacing. Measure from jig extrusion #1 across the total distance of the jig to ensure proper spacing.

Preventive Maintenance

Periodic inspections are required for the safe operation of the equipment, to comply with warranty requirements, and to ensure years of continued operation. A preventive maintenance inspection is required after the 30 day break-in period and annually thereafter. After the expiration of the warranty period, Preventative Maintenance is required to ensure safe operation of the sign.

Preventive Maintenance Procedures

1. Review Operators manual and safety notices (page 1).

2. Remove all service access doors on the drive train and control box(es).

3. Stop the sign on face "A". All set screws should be accessible on face "A".

4. Check the tightness on all drive shaft couplers.

5. Check the tightness of the flexible motor coupler and the spider gear bushing.

6. Check the tightness of set screws on the Pillow Block Bearings and mounting bolts.

7. Adjust gear lash on all gears.

8. Check all louver faces to make sure they line up flat.

9. Torque all gear set screws on the drive shaft to specification (205 Inch Pounds or 17 Foot Pounds).

10. Torque all gear set screws on each louver pivot assembly to specification (205 Inch Pounds or 17 Foot Pounds).

11. Torque each Louver Base Pivot to specification (205 Inch Pounds or 17 Foot Pounds).

12. Inspect control box and sensor board for loose components.

13. Check tightness of top louver pivots.

14. Tighten all loose connections and fittings.

15. Turn on the sign.

16. Adjust the dwell time on the controller to 1 second dwell per face for greasing the gears.

17. Grease the gears using bearing grease available at auto parts or hardware stores. While the sign is running apply a liberal amount of grease to the gear face. Reset the dwell time after the grease application is complete.

18. Adjust face alignment for each face by adjusting the sensor magnet assembly. Check tightness of sensor magnet assembly set screw.

19. On signs with spliced sections, each louver pivot assembly needs to be inspected and the set screws on the lower and upper pivot torqued to specification.

20. Horizontal louver signs need to have the louver inspected at the top and bottom louver pivot for proper fit. Louvers should fit tightly at both the top and bottom louver pivot.

21. Replace cabinet and control box service access doors.

22. Inspect for rust or corrosion on the support structure and safety equipment. The drive system is very quiet. The motor makes a slight winding sound. You should not hear anything except the slight winding sound of the motor. Any other noise when the sign is turning may be an indication of a problem.

Tri-Face Sign Parts List

Louvers Cores

Solid Type	10′6″	EXT00011295-126
Solid Type	14′	EXT00011295-168
Solid Type	20′	EXT00011295-240
Universal 6″	10′6″	EXT00011311-126
Universal 6″	14′	EXT00011311-168
Universal 6″	20′	EXT00011311-240
Replaceable 4″	10′6″	EXT00010802-126
Replaceable 4″	14′	EXT00010802-168

Changeable Louver Faces

PVC 6″	10′6″	EXT00011068-126
PVC 6″	10′6″	EXT00011068-126
PVC 6″	14′	EXT00011068-168
PVC 4″	10′6″	EXT00010801-126
PVC 4″	14″	EXT00010801-168
Alumin. 6″	10′6″	EXT00011067-126
Alumin. 6″	14′	EXT00011067-168

Changeable Face Removal Tool
Changeable Aluminum Face Cleaning Tool
Changeable PVC Face Installation Mallet
Custom size use the longer length plus 10% cutting charge
Requires a shipping crate priced depending upon the size of the shipment

Graphics Application Extrusion

14′ Long Pieces	EXT00011294

PVC Clips for Changeable Aluminum Faces
Requires a shipping crate; priced depending upon the size of the shipment

Control System

Control Card Windows	PCB00011146
Control Card Console	PCB00011362
Sensor Card	PCB00011058
Inverter Delta	INV00011
Fuse	FUS000

Rotary Encoder Assembly

Motor 1/3 HP	MTR000
Motor & Gearbox 1/6 HP	
Motor & Gearbox 1/12 HP	
Large Motor Gearbox	

Drive Parts

Top Louver Pivot Assembly 6″
Top Louver Pivot Assembly 4″ 7/8″ Bore
Top Louver Pivot Assembly 4″ 1″ Bore
Louver Pivot Base 6″ Solid Louver
Louver Pivot Base 6″ Universal Louver
Louver Pivot Base 6″ Horizontal Bolt in Type
Louver Pivot Base 4″ Replaceable Louver

Louver Pivot Assembly - Includes bearing, bearing housing, bolts, and seal
Standard Ad-Tech sign
Action upgrade sign
Pillow Block Bearing
Gear set with set screws
Drive Train Splice 6″ Louver Sign
Drive Train Splice 4″ Louver Sign
Motor Coupler Assembly
Motor Coupler Brass Star piece only
Drive Train Service Access Door - Black

Multi-Sign Controller

Console includes Console and requires a console compatible controller card for each sign.

Windows® software with RS-485 Interface Box uses our standard card version and above
Fiber optic modems per sign
Fiber optic data broadcaster (required for more than one direction of cable run)

Spare Parts Kit (Recommended)
Inverter
Control Card
Sensor Card
3 Fuses
3 Louver Pivot Assembles
3 Gear Sets
3 Top Louver Pivot Assemblies
Pillow Block Bearing
Motor Coupler Brass Stars
Tube of Grease

Tool Kit
Torque wrench 5/16 4 point socket, 12" extension
Allen wrench set
Screw driver straight and Allen
Wire stripers
Crescent wrench
Allen head socket or standard Allen wrenches - couplers and motor coupler 3/16", pillow block 3/32", set screws, top louver pivot ¼
5/16" 4 point socket
12" extension
9/16" wrench
4 in 1 screw driver
7/16" wrench
Bearing grease
PVC removal tool
Aluminum louver cleaning tool
Small 1/8" blade interment screw driver

Replacement Parts

In an effort to provide our customers with the lowest possible long-term maintenance costs, Ad-Tech uses only high quality, standard, off-the-shelf, heavy-duty industrial components. Use of high quality standard components assures long term, readily available, multiple supply sources for replacement parts at competitive prices.

Replacement parts can be obtained directly from **Ad-Tech International, Inc.,** by phone 770-209-9102, ext. 213; online at www.adtechintl.com; or almost any industrial supply distributor or from the following companies:

Grainger

Over 350 locations worldwide	1-800-CALL-WWG
Canada	1-800-633-8487
Mexico	01-800-718-2666
Puerto Rico	1-800-842-9107
Caribbean	305 591-2512
Central and South America	305 591-2512
Europe, Middle East, Africa, India, and Bermuda	847-965-7662
Asia and the Pacific	510-638-0955

www.grainger.com

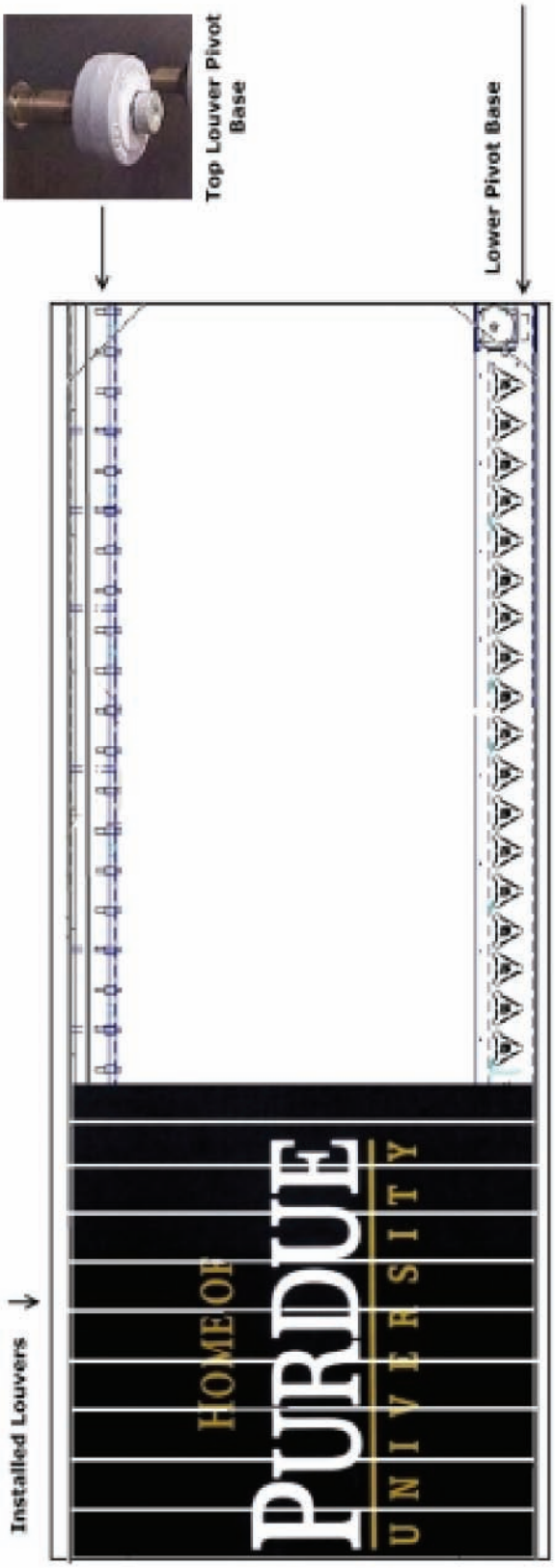
McMaster-Carr Supply Company

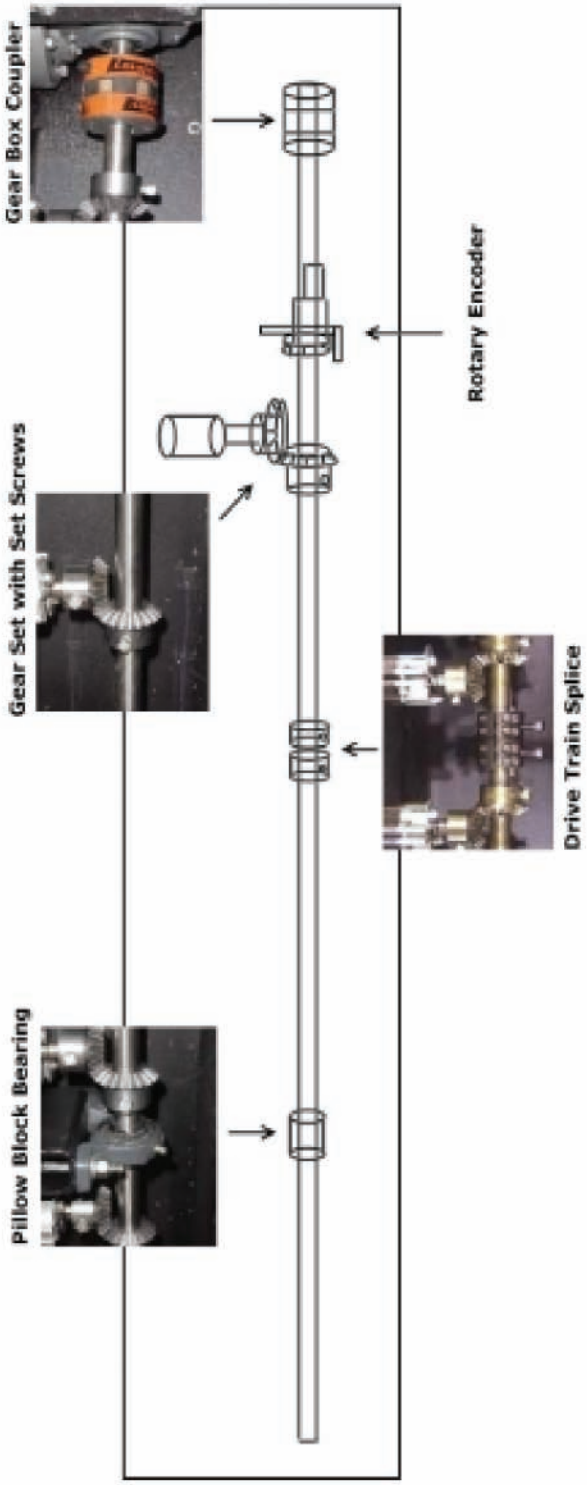
Atlanta, Georgia	404-346-7000
Chicago, Illinois	630-833-0300
Cleveland, Ohio	330-995-5500
Los Angeles, California	562-692-5911
New York/Philadelphia	737-329-3200

www.mcmaster.com

Motion Industries, Inc.
US & International Inquires 1-800-526-9328
Local distribution in 43 states
www.motion-ind.com

Applied Industrial Technologies
US & International Inquires 1-877-279-2799
Local distribution in 47 states
www.appliedindustrial.com


Installed Louvers
Top Louver Pivot Base
Lower Pivot Base
HOME OF
PURDUE
UNIVERSITY


Pillow Block Bearing
Gear Set with Set Screws
Gear Box Coupler
Rotary Encoder
Drive Train Splice

FORMETCO®
Excellence is our standard.

Tri-Face Sign Inspection Report

Sign Serial Number: _____

Sign Location: _____

Inspection Date: _____ , 20_____

Inspector's Name: _____

- ☐ Review Operators Manual and Safety Notices

- ☐ Inspect and Check Tightness to Specifications on the following:
  - ☐ Drive Shaft Couplers
  - ☐ Flexible Motor Coupler
  - ☐ Pillow Block Bearings
  - ☐ Set Screws on Gears
  - ☐ Set Screws on Louver Pivot Assembly
  - ☐ Set Screws on Upper and Lower Splice Assembly
  - ☐ Top Louver Pivots

Comments: _____

_____

_____

General Inspection Notes

- ☐ Sign rotates quietly with only motor winding sound
- ☐ Sign rotates smoothly and without clicking sounds
- ☐ Louvers fixed and tight into top and bottom pivots
- ☐ Horizontal louver signs louvers fixed and tight into pivots
- ☐ Sign frame is straight and level
- ☐ Check for rust and corrosion
- ☐ Inspect support structure
- ☐ Safety equipment present and in working order

Comments: _____

_____

_____

Formetco Tri-Face Display Limited Warranty and Limitation Of Liability

Upon receipt by Formetco, Inc. ("Formetco") of full payment for the Tri-Face Display, Formetco warrants to the Buyer that the Tri-Face Display will be free from defects in materials and workmanship for a period of five years from the date of shipment from Formetco's facility. However, if a proper wind blocking back is not installed on the Tri-Face Display, the warranty period is one year from the date of shipment from Formetco's facility. Within this time period, Formetco will repair or replace the Tri-Face Display returned to Formetco's authorized repair center (shipping prepaid by Buyer) without charge for parts or labor. Formetco may, at its option, provide warranty service on-site.

A "defect" in the Tri-Face Display means a material variance from the design specifications that prohibits the parts or equipment or both from operating as intended. Formetco is not responsible for local site communication interference caused in whole or in part by defects or damage to wire, fiber optic cable, conduit, or wireless signals serving the Tri-Face Display installation site.

Buyer must obtain the approval from Formetco for the return of the Tri-Face Display or any of its components in advance of shipment to Formetco, which will allow Formetco to determine whether to provide warranty service on site or at its repair center. Formetco reserves the right to refuse to pay for return shipping on any unapproved returns. Formetco will ship the repaired or replaced Display or parts at its cost via the same freight shipment means used by the Buyer in shipping the Tri-Face Display or it parts to Formetco. Formetco will provide warranty service in a reasonable period of time, performing such work during its normal working hours.

Replacement parts may be new or used, and will be comparable in function and performance to the original. Replacement parts will carry the original warranty, which will expire at the end of the original warranty period. The provision of additional parts to the Tri-Face Display will not extend the original warranty period.

THIS LIMITED WARRANTY APPLIES ONLY TO THE TRI-FACE DISPLAY AND REPLACES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO ORAL OR WRITTEN INFORMATION GIVEN BY FORMETCO, OTHER THAN THIS LIMITED WARRANTY, SHALL CREATE A WARRANTY OR INCREASE THE SCOPE OF THIS LIMITED WARRANTY.

This Limited Warranty may be transferred by only with the written consent of Formetco.

Damages not covered

This Limited Warranty does not cover the following:
A. Damage that occurs during shipment except as otherwise agreed in writing by Formetco.
B. Damage caused by faulty installation, improper or lack of maintenance, or failure to perform required annual preventive maintenance.
C. Damage caused by the unauthorized adjustment, repair, or service of the Tri-Face Display, including all components thereof.
D. Damage caused by an electrical power surge, electrical power failure, neglect, abuse, or misuse.
E. Damage caused by flood, fire, earthquake, wind, water, lightning, natural disaster, war, terrorism, riot, civil disturbance, or other cause beyond Formetco's reasonable control.
F. Damage to or deterioration of PVC vinyl material, acrylic clips attached to louvers used in graphics changes, and lamps or lighting.

Limitation of Liability

Formetco's liability is limited to the purchase price paid by the Buyer for the Formetco Tri-Face Display. In no event shall Formetco be liable for any special, consequential, incidental, punitive or exemplary damages arising out of or in any way connected to the installation, use, or dismantling of the Formetco Tri-Face Display including, but not limited to, damages for lost profits, lost revenues, cost of substitute or replacement components, down time, data loss, injury to property, or amounts paid to one or more third parties relating to the Tri-Face Display.

Governing Law

The rights and obligations of the parties under this Warranty shall be governed, interpreted, and enforced under the laws of the State of Georgia, without regard to conflict of law principles.

[3/2008]

System Start-Up Checklist

Prior to powering up the sign please check the following:

- ☐ The straightness of the drive train over the length of the unit meets specifications.
- ☐ The drive train is level front to back.
- ☐ If the louvers are installed, check for obstructions.
- ☐ Make sure lifting hardware and any eye bolts are removed.
- ☐ If Changeable Louver faces are installed, check for bending, bowing or improper attachment of the louver faces.
- ☐ Inspect the drive train and insure that all tools and other potential obstructions are removed.
- ☐ If the sign has a splice, make sure the coupler and keys are installed and the adjacent gears tightened. The gears at the splice are shipped loose. Make sure the set screws on the gears are tightened.
- ☐ Inspect the gaps between louvers. The gap should be about 3/8" wide. A smaller gap indicates that a louver may be bent or misaligned. Bent louvers must be replaced.
- ☐ The Tri-Face Controller is located in the control box. It comes preset from the factory with an 8 second dwell time for faces "A", "B", "C".
- ☐ Turn the sign on from a position where the operator can quickly turn it off if a problem occurs. The on/off switch is typically located on top of the control box.
- ☐ When the sign is turned on it will rotate until it finds face "A". It will stop on face "A" and hold for 8 seconds until the controller signals the sign to advance to face "B", then to face "C" at the preset 8 second dwell time.
- ☐ When the sign is running, listen for unusual noises, specifically louver interference. A quick turn gear sign should turn with only a slight winding noise. A wave turn cam sign has a clicking noise when each louver turns. Any other noise needs to be investigated and corrected for proper operation of the sign.
- ☐ **Monitoring** - Each Tri-Face sign controlled by the Proof of Performance Wireless System is assigned a MIN # and a Device #. Locate these numbers by pressing the button on the right below the LCD screen on the Controller when the sign is not in sign maintenance mode. Press the button through a series of screens until the screen that shows the MIN # and Devise ID #. The location of the sign, the sign ID #, the advertising faces, and special instructions need to be entered into the System. Contact Cindy Peters at 770-476-7000 or Service at 770-209-9102, ext. 213 for assistance.