

## INSTALLATION MANUAL – TRAILER

(Form No. 5050)

### e•STROKE® System & Installation Overview

The MGM Brakes e•STROKE® system (**Fig. 1**) allows an instant brake stroke status check to be taken without having to crawl underneath the trailer.

The e•STROKE® system converts air brake actuator shaft travel into an electronic signal. This output signal is monitored by a Chassis Communications Module (CCM) (**Fig. 2**). The CCM's Brake Chamber LEDs signal wheel specific brake stroke statuses.



**Fig. 1**

#### COMPONENTS KEY

|   |                                 |
|---|---------------------------------|
| a - e•STROKE® Spring Brake Chamber(s)   | f - Strain Relief Brackets      |
| b - e•STROKE® Service Chamber(s)        | g - Power Cable                 |
| c - Sensor Harnesses                    | h - T-Breakout                  |
| d - Sensor Assemblies                   | i - Mounting Bracket / Hardware |
| e - Chassis Communications Module (CCM) |                                 |

#### e•STROKE® Installation:

- STEP 1:** Installation of e•STROKE® Brake Chambers & Sensor Assemblies
- STEP 2:** Installation of Chassis Communications Module (CCM)
- STEP 3:** Installation of Power Cable
- STEP 4:** Installation of Sensor Harnesses
- STEP 5:** e•STROKE® Brake Stroke Status Check Procedure



**Fig. 2**

### STEP 1: Installation of e•STROKE® Brake Chambers & Sensor Assemblies – Trailer

#### General Recommendations

It is very important to verify that all automatic slack adjusters are working properly. Measure the stroke of each actuator before installation to determine if adjusted correctly. If these are within specifications then the automatic slack adjusters should be functioning properly.

Follow MGM Brakes recommended installation procedures to replace all brake chambers with new MGM Brakes e•STROKE® chambers. Refer to the following *MGM Brakes Service Manuals* for standard installation procedures:

- Form #5011 - *TR Service Manual*
- Form #5042 - *LTR Service Manual*
- Form #5044 - *Magnum Performance Plus Service Manual*

**NOTE:** A copy of the appropriate *Service Manual* should have been included with your e•STROKE® kit. If you need a *Service Manual*, it can be downloaded or a 'hard copy' can be requested by visiting the MGM Brakes website (<http://www.mgmbrakes.com>), or contact your MGM Brakes representative for assistance.



Fig. 3

**IMPORTANT** – Be aware that proper installation and warranty coverage of e•STROKE® equipped brake chambers require that several important, unique steps be taken in addition to those found in the standard *MGM Brakes Service Manuals*. See following section: **SPECIAL e•STROKE® INSTALLATION INSTRUCTIONS**

### SPECIAL e•STROKE® INSTALLATION INSTRUCTIONS

#### Strain Relief Bracket

When installing each e•STROKE® brake chamber, a Strain Relief Bracket (included) **MUST** be installed under the top mounting nut to ensure the Sensor Assembly is anchored properly. This will prevent Sensor Assembly damage due to vibration.

**NOTE:** It is recommended that a lift or pit be used during procedure below.

- (a) Install brake chamber (following standard *Service Manual* procedures), but make sure to position a Strain Relief Bracket on the top mounting bolt (with bracket facing inward toward centerline of trailer) (**Fig. 3**), before tightening nut.



Fig. 4

**IMPORTANT** – Mount brake chamber so ‘Sensor Assembly Receptacle’ is on side closest to centerline of trailer (**Fig. 4**)—be aware that there are right- and left-hand actuators.

- (b) Once chamber is installed, connect air-lines.
- (c) Remove dust plug from Stone Shield ‘Sensor Assembly Receptacle’ on bottom of brake chamber.
- (d) Firmly grip Sensor Assembly by the lower ‘ears’ with thumb and forefinger, then insert into ‘Sensor Assembly Receptacle’ (**Fig. 5**) by pushing straight in until it locks into place with ‘ears’ resting against receptacle.

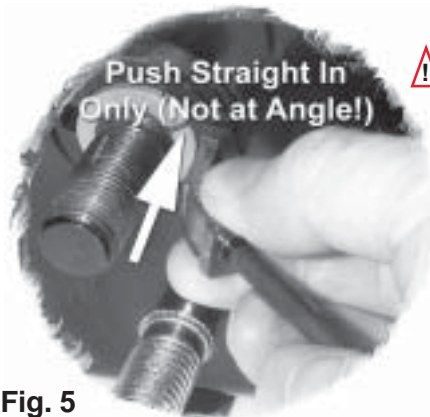


Fig. 5

**WARNING** – Be very careful when installing Sensor Assembly! Grip by lower ‘ears’ and **PUSH STRAIGHT INTO RECEPTACLE ONLY; DO NOT PUSH AT AN ANGLE** or damage may occur, thereby voiding the Sensor Assembly’s warranty. After installation, ensure adequate slack is present in Sensor Assembly cable to allow for push-rod movement.

- (e) Secure Sensor Assembly by tie-wrapping to Strain Relief Bracket (**Fig. 6**) and along air-lines approximately every 12-18 inches, making sure cables have enough slack to allow for movement of any slider axle(s).

**NOTE:** Use provided black UV (ultraviolet)-resistant ties **ONLY** (or equivalent).

## STEP 2: Installation of Chassis Communications Module (CCM) – Trailer

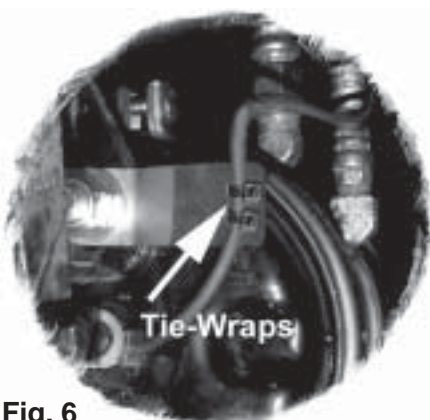


Fig. 6

Use care when selecting a location for the CCM, choosing one that minimizes exposure to moisture and road debris. Make sure the CCM can be easily viewed when necessary. See recommended mounting locations (**Fig. 7**).

- (a) Install MGM Brakes Mounting Bracket (**Fig. 8**). Choose a driver’s side location under the trailer, approximately 6 ft. ahead of the rear wheels. Use included hex head bolts and tighten hex nuts to 60-85 Lbs.-In. (5-7 Lbs.-Ft.) of torque.

**NOTE:** Verify your Power Cable (see Step 3) is long enough to connect the power source to the CCM’s Power Lead. Be certain that all Sensor Harnesses (see Step 4) are long enough to connect Sensor Assemblies on all e•STROKE® brake chambers to the appropriate CCM leads.

- (b) Secure the CCM to the Mounting Bracket with included self-tapping screws and tighten to no more than 90-100 Lbs.-In. (7.5-8.5 Lbs.-Ft.) of torque.

**NOTE:** If you choose NOT to use the Mounting Bracket, drill 13/64" mounting holes into the mounting location using the CCM as a template. Mount the CCM using #10 x 1-1/2" (or metric equivalent) machine screws with self-locking nuts; instead of drilling holes you may use self-tapping metal screws.

### Step 3: Installation of Power Cable – Trailer

Use only MGM Brakes supplied e•STROKE® Power Cable (included in kit) (**Fig. 9**). Connect Power Cable to CCM Power Lead and route to electrical system connection location (see Typical & Alternate Connection to Electrical System below). Leave enough slack in cable to allow for minor movement, and tie-wrap to trailer approximately every 12-18 inches.

**NOTE:** Use provided black UV (ultraviolet)-resistant ties ONLY (or equivalent).

#### Typical Connection to Electrical System (ABS-Equipped Trailers)

Trailers equipped with an Anti-Lock Braking System (ABS) Electronic Control Unit (ECU) require an MGM Brakes 'T-Breakout' connector (**Fig. 10**) and Power Cable. This provides for a quick, simple connection to the trailer's power, ground and stoplight circuits. All new truck tractors sold within the North American market are now wired "full-time, ignition hot" to provide for the electrical power requirements of trailer ABS. See System Wiring Diagram (included in kit) when making connections below.

- (a) Disconnect round 5-pin Weather Pack connector from ABS ECU and make an inline installation of T-Breakout connector.
- (b) Connect 4-pin Metri-Pack connector of Power Cable to 4-pin connector on T-Breakout.

#### Alternate Connection to Electrical System

The MGM Brakes e•STROKE® system requires that power, ground and stop light circuits provide input to the CCM. The trailer's 12 VDC (ignition-switch) Auxiliary Circuit is a good source for electrical power. This connection can be made at trailer's 7-pin connector (or at any other convenient access point on trailer's 7-wire harness). If Power Cable is too long, it may be cut to desired length before hard-wiring into trailer's electrical system. See System Wiring Diagram (included in kit) when making connections.



Fig. 7

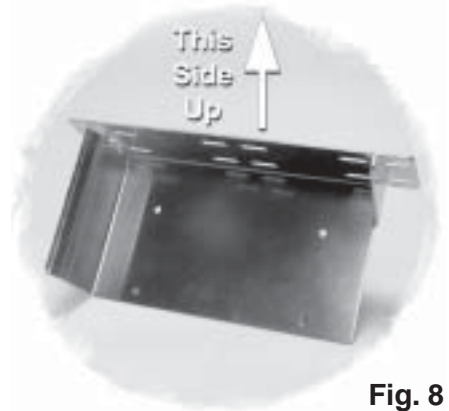


Fig. 8

### Step 4: Installation of Sensor Harnesses – Trailer

The e•STROKE® system displays wheel-specific readings. Therefore, CCM leads are pre-labeled and MUST be connected to properly corresponding brake chambers with Sensor Harnesses (**Fig. 11**).

- (a) Label both ends of each Sensor Harness for easy reconnection if ever disconnected. When doing this, duplicate the ID codes (i.e., LR, RR, etc.) from the pre-labeled CCM leads (write-on labels included in kit).
- (b) Connect required length Sensor Harness to Sensor Assembly on each e•STROKE® brake chamber.
- (c) Route each Sensor Harness along the trailer's air-lines\* (or existing wiring harness) to the CCM. Tie-wrap Sensor Harnesses every 12-18 inches to either the trailer's air-lines or existing wiring harness (if present).

**NOTE:** Use provided black UV (ultraviolet)-resistant ties ONLY (or equivalent).



Fig. 9



**\*WARNING – On trailers with SLIDER AXLES, ALL Sensor Harnesses MUST be tie-wrapped to the air-lines which are suspended by springs and can handle slider axle movement.**

- (d) Connect Sensor Harnesses to appropriate CCM leads.



Fig. 10

**NOTE:** Double check that all e•STROKE® cables are securely tied-wrapped to trailer’s air-lines and/or existing wire harnesses. It is also a good idea to seal wiring connections in an appropriate manner to prevent corrosion. Make sure wires at all connections are NOT unduly stressed.

*The installation is now complete.*



Fig. 11

**STEP 5: e•STROKE® Brake Stroke Status Check Procedure - Trailer**

Now that you’ve completed the installation of your MGM Brakes e•STROKE® system, you can conduct a quick, accurate and safe brake stroke status check on your trailer—anytime, anywhere, in any weather. Simply follow the recommended procedure listed below to conduct a test. During the test, the wheel-specific Brake Chamber LEDs on the CCM will display meaningful blink code information (detailed below, as well as printed on the CCM label) which will enable you to easily determine your trailer’s brake stroke status.

Following is the recommended procedure for determining your trailer’s brake stroke status with the MGM Brakes e•STROKE® system:

- (a) Chock the vehicle’s wheels.
- (b) Release parking brake (typically, push dash-mounted yellow knob).
- (c) Start engine and build system air pressure to 100-110 psi.
- (d) Apply service brake foot pedal one time ONLY to 90-100 psi (for at least 2 seconds), then release foot pedal (wait at least 6 seconds).

**IMPORTANT – Upon first brake application after power up, CCM will hold LED fault codes for 5 minutes; immediately upon second brake application, LED fault codes are displayed in ‘real time’.**

- (e) View System Status LED and Brake Chamber LEDs on trailer CCM.  
**NOTE:** If tractor also has a CCM, you may check it at this time as well. Please consult *e•STROKE® Installation Manual – Truck/Tractor (Form No. 5049)* for specific procedure and more information. Visit our website (<http://www.mgmbreaks.com>) to download a copy, or consult our online Sales Rep Map listings to contact a representative for assistance.

Solid GREEN System Status LED is mandatory; Solid GREEN Brake Chamber LEDs are desirable—

**System Status LED:**

- Solid GREEN - Operating Properly
- Blinking RED or unlit - Low Voltage (accompanied by unlit brake chamber LEDs)

**Brake Chamber LEDs:**

- Unlit - Low Voltage (accompanied by Blinking RED System Status LED)
- Solid GREEN - Normal Stroke
- Slow RED Blink - Dragging Brake\*
- Rapid RED Blink - Overstroke
- Alternating RED/GREEN - Non-Functioning Brake Actuator
- Blinking ORANGE - Sensor Cable or Connector Cable Fault
- GREEN Blink (or unlit) - see Trouble-Shooting Guide

**\*IMPORTANT – Does not detect overtightened slack adjusters.**

**NOTE:** If a brake actuator is experiencing BOTH an overstroke condition and a dragging brake condition, the dragging brake code will be displayed.

**Having problems with your e•STROKE® System? Please visit the MGM Brakes website (<http://www.mgmbreaks.com>) to download our *e•STROKE® Trouble-Shooting Guide (Form No. 5056)*. If you still require assistance after using the guide, please call MGM Brakes at 1-800-849-0108, ext. 300.**

**WARNING:** Installation, maintenance and replacement of MGM Brakes e•STROKE® chambers and related system components require a high degree of skill and experience. Improper installation, maintenance or replacement can result in brake failure and resulting loss of control of the vehicle and possible injury or death. MGM Brakes, a division of Indian Head Industries, Inc. (IHI), does not authorize anyone other than highly skilled and experienced persons to attempt to utilize the instructions contained in this Installation Manual. MGM Brakes and IHI shall have no liability of any kind for damages arising out of any other use of the information contained within this Installation Manual.