

**MGM Brakes**

A Division of Indian Head Industries, Inc.

# TECHNICAL BULLETIN

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**SUBJECT: EB 08-013 e-DT Diagnostic Tool Users Guide**

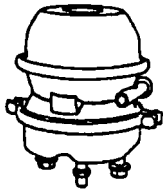
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**MGM P/N 9090110 – e-DT Diagnostic Kit**



## Manual Index

1. Introduction
2. e-DT Display & Harness Connections
3. Display Functions & Screens
4. Display Communication Failure Screen
5. Vehicle Speed & Brake Application Pressure Page
6. Displaying Current Active Faults
7. Displaying Inactive Stored Faults
8. Contrast & Back Light Adjustment
9. Display Configuration Settings
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#### 1. Introduction:

The e-Stroke e-DT is a hand held diagnostic tool which works with MGM Brakes e-Stroke systems to continuously monitor the brake status of the vehicle. As brake faults occur, the e-Stroke system sends fault codes over the vehicles SAE J1939 network for diagnostic use.

The e-DT can be easily connected to the vehicles 9-pin diagnostic (OBD) connector with the supplied harnesses. The e-DT will automatically turn ON and establish communication with the e-Stroke System using vehicle power.

The e-DT displays real time e-Stroke system status and active brake faults. In addition the brake fault history can be acquired from the e-Stroke ECU. Vehicle speed and brake application pressure are also available for diagnostic purposes.

#### 2. e-DT Display & Harness Connections

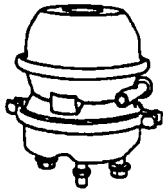
The e-Stroke e-DT Display Diagnostic Kit (P/N 9090110) consists of the following components:

- MGM P/N: 8290240 - e-DT Display
- MGM P/N: 8290302 - Display Harness
- MGM P/N: 8290239 – SAE J1939, New Flyer Adapter
- MGM P/N: 8290299 – SAE J1939 500kbit/s (Green Connector) Adapter
- MGM P/N: 8090091 - e-Stroke Diagnostic Software USB Flash Drive
- MGM P/N: 8290561 – Storage Case

The P/N 8290302 diagnostic harness connects between the P/N 8290240 e-DT display to the vehicles standard 9-pin OBD connector. The display will receive power from the vehicle and automatically turn ON.

Use the supplied P/N 8290299 “Green Connector” adapter for e-Stroke systems which are connected to an SAE J1939 500kbit/s network. Consult the vehicle OEM for specific J1939 network connections.

NOTE: 2009 and newer New Flyer buses and some NABI buses will require the P/N 8290239 Adapter for connection to the 9 pin OBD connector. If the display shows “No Communication”, then 8290239 adapter maybe required.



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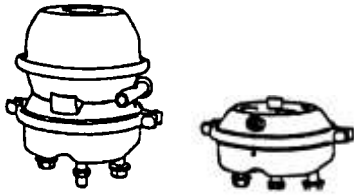
### 3. Display Functions & Screens

#### Startup Display Screen:

When the e-DT is plugged in it will show an MGM Brakes splash screen while the unit conducts a self-test. When the self-test is complete, the baud rate selection screen will be displayed. Here, the user must select from either 250 kbit/s or 500 kbit/s. This screen (See Figure 1) will always present itself during startup as long as the auto prompt setting is selected in the settings menu (see Section 9).

**Figure 1: e-DT Display, Baud Rate Selection Screen**





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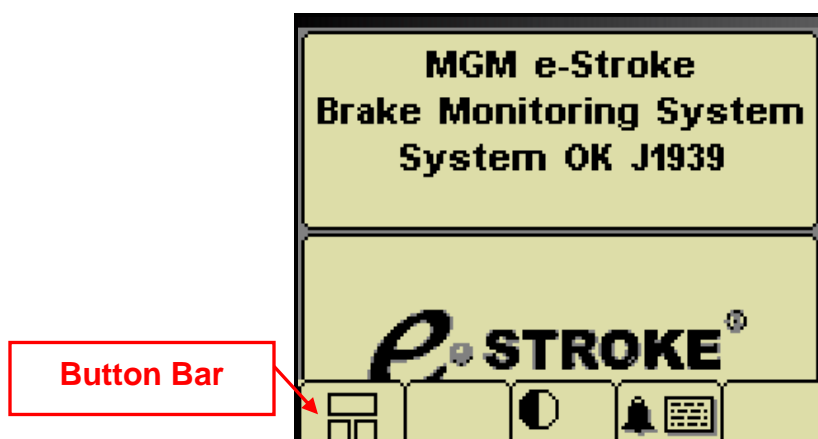
After a baud rate has been selected, the home screen displays system status, as well as the active diagnostic circuit being used. See Figure 2 below.

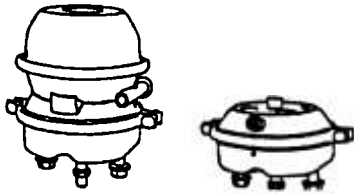
**Figure 2: e-DT Display, Home Screen, and Buttons**



The e-DT can be navigated using the 5 soft keys on the front of the display. A button bar graphic will appear after a soft key is pressed indicating the menu options available. With the button bar displayed the appropriate soft key below the icon can then be pressed selecting the option that is desired. The button actions will vary depending on the options displayed on the button bar. See Figure 3 below.

**Figure 3: Button Bar**





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### Button Bar Icon Definitions



Vehicle Speed & Brake Application Pressure Diagnostic Page



Contrast & Back Light Adjustment



Active Alarm Acknowledgement



Active & In-active Fault Table



Screen Exit



Scroll Up



Scroll Down



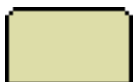
Select to View More Options



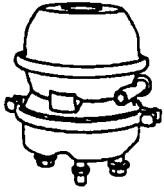
Return



Clears Stored Faults from CCM (Press for 5 Seconds)



Inactive Soft Key (Blank)



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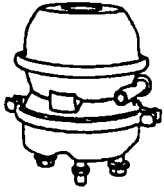
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### 4. Display Communication Failure Screen

The e-DT display requires connection to the vehicles J1939 network to retrieve data from the e-Stroke system. If communication is not present then the icon shown below in Figure 4 will appear. When communication is restored the icon will disappear and the active data network will be displayed on the home screen (Figure 2).

**Figure 4: Display Communication Failure Screen**





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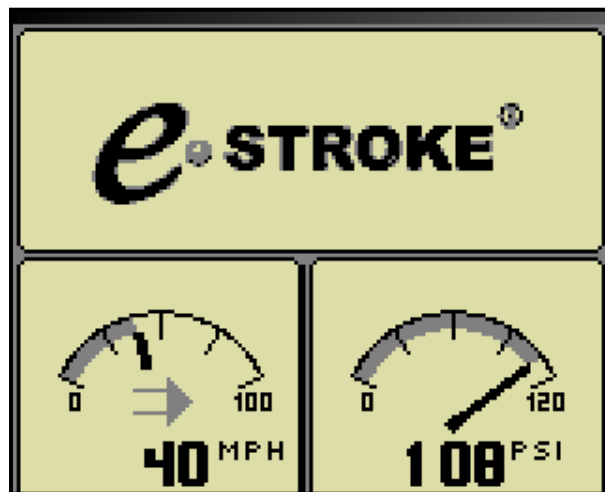
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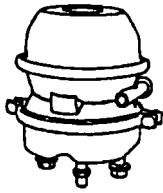
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### 5. Vehicle Speed & Brake Application Pressure Diagnostic Page

This page displays real time vehicle speed and brake application pressure. This data can be used to aid in the diagnosis of a reported brake fault. See Figure 5 below.

**Figure 5: Vehicle Speed & Brake Application Pressure Page**





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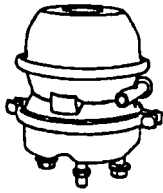
## 6. Displaying Active Faults:

An e-Stroke fault is considered active while the fault is occurring. Active faults are displayed using a flashing pop up alarm window on the display. This alarm window appears overlaid on the current screen in use, showing details of the fault which is occurring. See Figure 6 below.

**Figure 6: Active Fault Alarm Pop Up Window**







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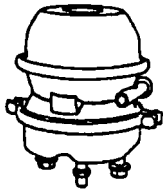
Pressing any key will acknowledge the fault and display the active alarm (fault) page. This page shows the list of active faults occurring with the e-Stroke system. The button bar icons show the navigation and functions option available on this page. See Figure 7 below.

#### Key Functions:

- The arrow keys 1 & 2 can be used to scroll through the active faults.
- An active alarm can be acknowledged by pressing key 3.
- The inactive stored fault table can be accessed by pressing key 4 for 5 seconds.

Figure 7: Active Fault Table

SRC	DESCRIPTION	FAIL MODE
1.	Brake Lining Remaining 10% - Axle 1 Left SPN : 1099	FMI : 1B



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The active alarms must be acknowledged by pressing key 3 before this page can be exited.

#### Key Functions:

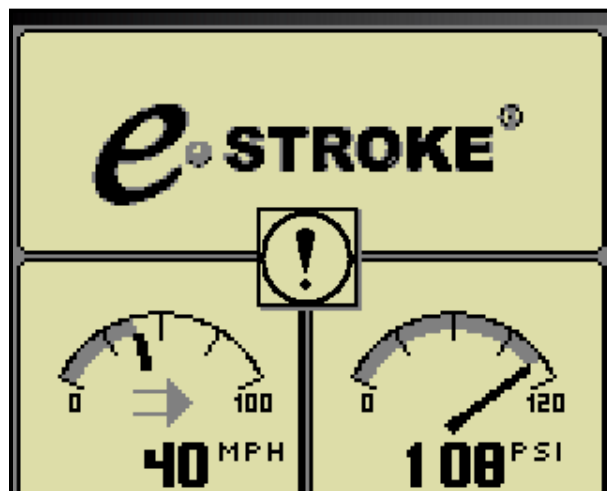
- The inactive stored fault table can be exited by pressing key 5.

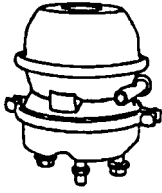
**Figure 8: Active Fault Table with Alarm Acknowledged**

SRC	DESCRIPTION	FAIL MODE
1.	Brake Lining Remaining 10% - Axle 1 Left SPN : 1099	FMI : 1B

If the active fault table page is exited while there is still an active alarm present a caution icon will appear indicating that an active alarm is still present. The active fault must be repaired before the caution icon will go away. See Figure 9 below.

**Figure 9: Caution Icon Indicating Active Fault is Present after Acknowledgement**





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#### 7. Displaying Inactive Faults:

Faults which occur during operation of the e-Stroke GEN 3 system will be stored in the ECU memory, up to 126 counts, per fault, per wheel. The fault count will increment once per fault occurrence, regardless of the duration of the active fault.

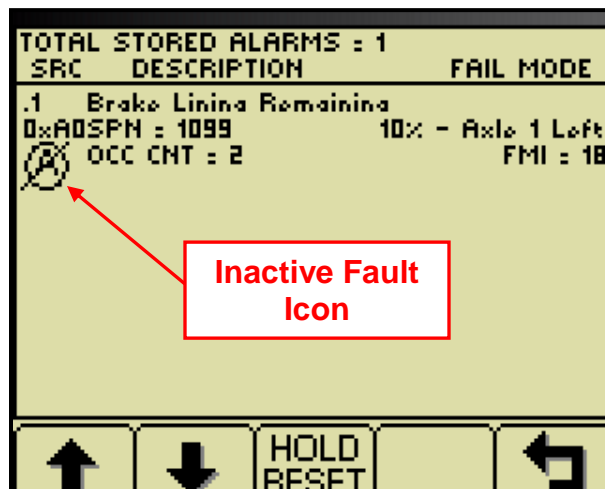
The stored fault alarms can be accessed from the ECU memory by accessing the active & inactive fault table. The fault table can be accessed from the home page by pressing the active & inactive fault table key. The active fault table will then be displayed. The active & inactive fault table key must then be pressed again for 5 seconds to display the stored faults from the ECU memory.

Inactive faults are marked with an inactive icon. See Figure 10 below.

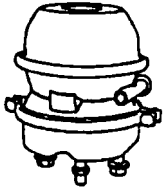
#### Key Functions:

- The arrow keys 1 & 2 can be used to scroll through the inactive faults.
- Press the "HOLD RESET" Key 3 for 5 seconds to clear the ECUs fault history.
- The inactive stored fault table is exited by pressing the return key 5. This will return to the inactive fault table where the key 5 can then be pressed to exit to the home screen.

Figure 10: Inactive Fault Table



Note: Stored inactive faults can only be accessed from the GEN 3 ECU through the J1939 circuit. GEN 2 Systems & J1708 does not support the ECU fault history retrieval or brake application pressure.



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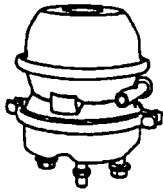
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### 8. Display Contrast & Back Light Adjustment:

The contrast and back light of the display screen can be adjusted. Access the contrast adjustment screen by pressing the contrast & back light adjustment key from the home page. Follow the button bar icons to adjust as required. See Figure 11 below.

**Figure 11: Contrast & Back Light Adjustment Page**





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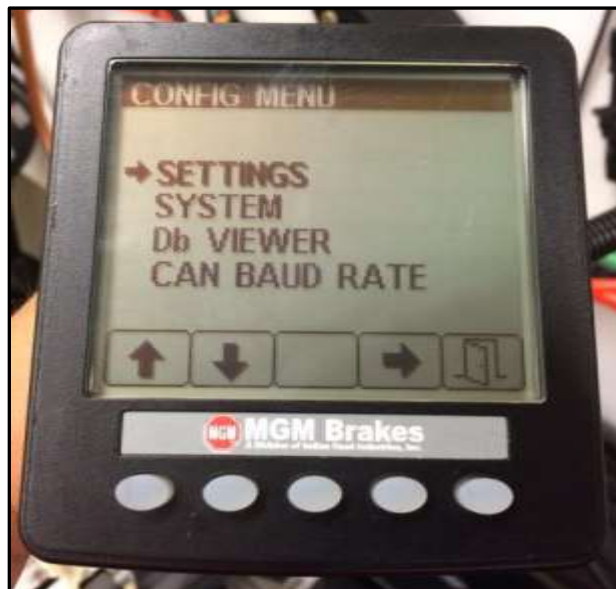
### 9. Display Configuration Settings:

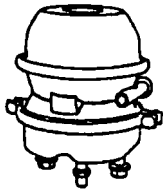
The display configuration menus can be accessed from the home page. With the button bar not visible on the screen, press key 5 for 5 seconds to display the configuration menu. See Figure 12 below. Select settings or system to continue.

#### Key Functions:

- The arrow keys 1 & 2 can be used to scroll through the configuration options.
- Arrow key 4 will select the option indicated by the arrow.
- Key 5 will exit the configuration menu page returning to the home page.

**Figure 12: Configuration Menu Page**





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The following display settings can be adjusted to meet the application requirements:

#### **Display Settings Menu (See Figure 13):**

- Units – Units can be adjusted between English and Metric.
- Language – The language can be changed by selecting one of the displayed options from the settings / language menu.
- Bleep – The audible key bleep can be turned ON or OFF.
- Backlight – Backlight mode and level can be adjusted.

#### **System Menu (See Figure 14):**

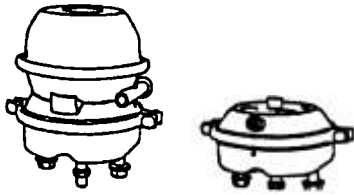
- Demo – Three demo options are available to illustrate the features of the display. Select 0 to shut the demo option OFF.
- Restore Defaults – This will reset the display back to factory settings.
- COM Viewer – Displays real time data traffic on the J1708 & J1939 circuits.
- Data link Settings – Allows adjustment of J1939 & J1587 data link settings.
- About – Displays display unit information.

#### **CAN Baud Rate (See Figure 15):**

- Three selectable options for SAE J1939 speed configuration.
- 250 kbit/s allows the e-DT to operate with SAE J1939 250 kbit/s network.
- 500 kbit/s allows the e-DT to operate with SAE J1939 500 kbit/s network.
- Prompt will ask the user to select a speed every time the unit is powered ON.
- If 250kbit/s or 500kbit/s is selected, this speed selection is saved until the user enters this menu again and changes it to one of the other three options.

#### **Key Functions:**

- The arrow keys 1 & 2 can be used to scroll through the display options.
- Arrow key 4 will select the option indicated by the arrow.
- Key 5 will return to the previous page.



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Figure 13: Settings Menu Page

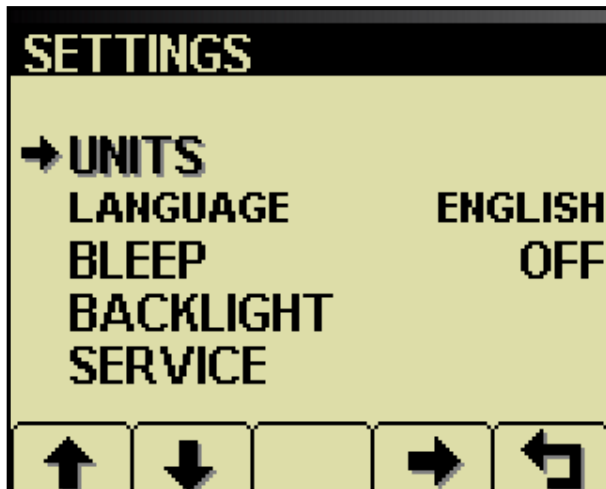


Figure 14: System Menu Page

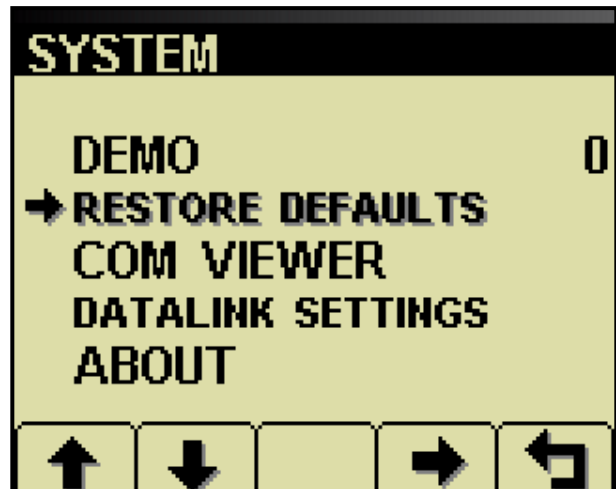
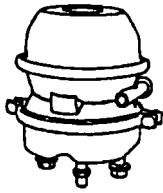


Figure 15: Baud Rate Menu Page





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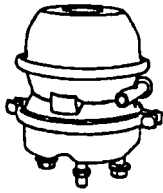
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## 10. Trouble Shooting Guide

<b>e-DT Trouble Shooting Guide</b>	
<b>Problem</b>	<b>Recommended Action</b>
Unit does not power up or fails to display any data	Check for correct connections Check for power (10 to 30 volts) Check for CCM J1939 or J1708 convention.
Display is blank or black	Check lighting and contrast settings Operating temperature is -25C to + 75 C
Unit beeps at startup and does not show home page	Unit has failed self-test, reset power.
Unit fails to display parameters / unable to select parameters	-Ensure e-DT is communicating with CCM (J1939 or J1708)
Active alarm messages are not displayed	-A diamond caution icon with arrow will appear when both J1708 and J1939 communication are not present.
Stored alarm messages are not displayed	-Ensure proper J1939 speed configuration selected (Figure 15).
Display does not respond to key input and shows "Key" icon when pressed. Display keys have been locked.	Press and hold all 5 soft keys on the display to lock and unlock keys.





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#### 11. Display Connector Information

Display Connector Receptacle: Deutsch DT0412PA

Deutsch Mating Connector Parts:

Connector Body: DT0612PA

Wedglock: W12S (One per Connector)

Pin Sockets: 0462-201-1631 (One per Connection)

Seal Plugs: 114017 (One per unused cavity)

#### Display Connector Pin Function

Pin #	Function	Pin #	Function
1	Power -	7	CAN LO
2	Power +	8	CAN HI
3	RS232 TX+	9	RS485A
4	RS232 TX-	10	RS485B
5	RS232 RX-	11	External alarm
6	RS232 RX+	12	No connection

#### 12. Glossary of Terms

ECU	Electronic Control Unit (formerly referred to as CCM)
e-DT	e-Stroke Diagnostic Display (MGM P/N 8290240)
CAN	Controller Area Network (CAN bus)
FMI	Failure Mode Identifier
J1939	SAE data bus protocol (CAN)
J1708/J1587	Electronic Data Interchange between Microcomputer Systems in Heavy Duty Vehicle applications.
KBIT/S	Kilobit per second – SAE J1939 communication speed units
LCD	Liquid Crystal Display
PID	Parameter Identifier
RS-232	Standard electrical interface for serial communications
SAE	Society of Automotive Engineers
SID	Subsystem Identifier
Soft Keys	Push Button keys that change function with use
SPN	Suspect Parameter Number: J1939 specific fault code ID number