Brake Monitoring System (BMS)
L31250W  Rev. 5-15

Patent Numbers
8,108,118 B2 - US
2,680,569 - Canada
2009217438 - Australia

www.haldex.com
**Important Notice**

The products described within this literature, including without limitation, product features, specifications, designs, availability and pricing are subject to change by Haldex and its subsidiaries at any time without notice.

This document and other information from Haldex, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system, in the current literature or catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through their own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements are met.
IMPORTANT NOTICE

This installation manual describe the correct installation procedure for the Haldex Brake Monitoring System (BMS).

The information contained in this installation manual was current at the time of printing and is subject to change without notice or liability.

Safety First!

You must follow your “Company Safety Procedure” when you install this equipment. Be sure you understand all procedures and instruction before you begin.

Installing the Haldex Brake Monitoring System (BMS) is not complex, but care must be taken during the installation in order to ensure the Brake Monitoring System is installed correctly.

IMPORTANT NOTICE

The data listed herein is correct to the best of Haldex's knowledge and belief, having been compiled from reliable and official sources of information.

However, HALDEX CAN NOT ASSUME ANY RESPONSIBILITY for possible error or misapplication of the product. Final determination of the suitability of the products for the use contemplated by the Buyer is the sole responsibility of the Buyer. Haldex shall have no responsibility in connection with this suitability.

IMPORTANT NOTICE

The description and specifications contained in this Installation/Service Manual are current at the time of printing. Haldex Brake Products Corp. reserves the right to discontinue or modify its models and/or procedure and to change specifications at any time without notice.

All Rights Reserved

Material may only be reproduced with the written permission of Haldex.
If you have any questions on this product or any of these Innovative Products offered by Haldex, contact your local distributor for complete details. **Technical Service or Troubleshooting help can be obtained by calling Haldex at 800-643-2374 and asking for ABS Technical Support.**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important Notices</td>
<td>1</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>2</td>
</tr>
<tr>
<td>Brake Monitoring System (BMS) General Information</td>
<td>3</td>
</tr>
<tr>
<td>BMS Operation</td>
<td>4</td>
</tr>
<tr>
<td>BMS Component Overview</td>
<td>5</td>
</tr>
<tr>
<td>BMS Mounting Orientation</td>
<td>6</td>
</tr>
<tr>
<td>BMS Installation - FFABS Valve/2 Port Valve</td>
<td>7</td>
</tr>
<tr>
<td>Trailer Schematic (FFABS Valve)</td>
<td>8</td>
</tr>
<tr>
<td>Trailer Schematic (2-Port ABS Relay Valve)</td>
<td>9</td>
</tr>
<tr>
<td>Dolly Schematic (2-Port ABS Relay Valve)</td>
<td>10</td>
</tr>
<tr>
<td>BMS Lid Assembly Replacement Kit</td>
<td>11</td>
</tr>
<tr>
<td>BMS End of Line or PM Test</td>
<td>12</td>
</tr>
<tr>
<td>BMS Troubleshooting</td>
<td>13 - 14</td>
</tr>
<tr>
<td>BMS GPS/Tire Inflation Connection</td>
<td>15</td>
</tr>
<tr>
<td>BMS Door Switch Connection</td>
<td>16</td>
</tr>
</tbody>
</table>
The Haldex Brake Monitoring System (BMS) is the newest platform in safety products offered by Haldex. The Brake Monitoring System notifies the driver of a Spring Brake Pressure and/or a Service Brake Pressure loss.

The Haldex Brake Monitoring System (BMS) uses a Warning Alarm and a flashing Trailer In-Cab Warning Lamp. BMS is capable of supplying a 12VDC signal to a GPS, monitoring the Tire Inflation System and notifying the driver of an open trailer door.

The Haldex Brake Monitoring System (BMS) can be used on Single, Tandem, or Multi-Axle Trailers and Single or Tandem Axle Dollies with Service Chambers only or Spring Brake Chambers.

Haldex Brake Monitoring System (BMS) features:

- Monitors Service Brake Pressure
- Monitors Spring Brake Pressure
- Monitors Stop Light Power
- Monitors Wheel Speeds on Power Line Communication (PLC)
- Monitors Air System for incorrect air connections on Trailers/Dollies
- Mounted Alarm
- Monitors the Tire Inflation System
- Monitors Door Ajar
- Supplies a 12VDC Signal to the GPS

Haldex Brake Monitoring System (BMS) benefits:

- Warns Driver of Potential Brake Drag (Service and/or Spring Brake)
- Warns Driver of Air System Leaks on Service or Emergency Line
- Warns Driver of Incorrect Gladhand Connections
- Warns Driver of False Charging of Trailer and Dolly
- Warns Driver of Closed Shut Off Valves
- Warns Driver of False Service Brake Application from the Tractor
- Warns Driver of Tire Inflation System Problems
- Warns Driver of Trailer Door Open
The Haldex Brake Monitoring System (BMS) prevents the driver from initially driving away with the alarm (ON) because of inadequate air pressure to the Trailer or Dolly air system. The driver is required to check the air system for proper gladhand locations and shut-off valve positions on each vehicle.

If an air system problem is present and the alarm remains (ON) when static after powering up the towed vehicle(s), verify there is sufficient emergency air to the system.

Verify the towed vehicles have gladhand shut off valves open with the exception of the rear trailer, the rear trailer requires these gladhand shut off valves to be closed. Verify there is no delivery air to the system without stoplight power from the tractor.

If an air system problem is present and the alarm remains (ON) while the vehicle is in motion, the In-Cab warning lamp will flash to warn the driver there is an air system problem. The driver should find a safe place to pull off the road and verify sufficient emergency air to each towed vehicle as well as verify no delivery air is present to the system without stoplight power from the tractor.

If an air system problem is present and the alarm remains (ON) while the vehicle is in motion, the in-cab warning lamp will flash to warn the driver there is an air system problem. If the problem is ignored, in an additional 10 minutes a signal will notify the GPS system to warn the fleet the problem is being ignored.

If the tire inflation is on for 5 minutes continuous while the vehicle is in motion, the In-Cab Lamp will begin to flash to warn the driver there is a problem. If the problem is ignored, in an additional 5 minutes a signal will notify the GPS system to warn the fleet the problem is being ignored.

If the optional door switch is used and the door is open after power is applied to the trailer, the alarm will remain (ON). If the vehicle is in motion for 30 seconds with the door open, a signal will notify the GPS system to warn the fleet the problem is being ignored.
Brake Monitoring System (BMS)
Component Overview

Note: Add dielectric grease to both ABS power connectors. Secure a tie strap around the locking tab of ABS power cable connections. Use tie straps to secure excess cable lengths.

Use 5/16” bolts, washers, and lock nuts. Torque 5 lb-ft (2 Places).

7.41” inches 188 mm

34” inches 864 mm long cables

Note: Mask off the alarm before undercoating or painting. Remove masking after painting.
The Haldex Brake Monitoring System (BMS) has two trailer/dolly approved methods of mounting. Vertical or Horizontal. See example below.

**Front of Trailer**

**Trailer Deck Floor**

**Vertical Mounting**

(Recommended)

**Horizontal Mounting**

**Note:** Mounting bracket or hardware is not included with Brake Monitoring System (BMS)

**Note:** for vertical mounting, **Do Not** mount unit upside down or with the alarm facing toward the front of trailer as shown below.
Brake Monitoring System (BMS)
Installation - FFABS Valve/2 Port Valve

Application - Trailer

FFABS Valve

Brake Monitoring System (BMS)

To Service Delivery Port
To Spring Brake Emergency Port

Application - Dolly

2-Port ABS Relay Valve

Brake Monitoring System (BMS)

To Service Delivery Port
To Emergency/Supply (In) Red Gladhand
Brake Monitoring System (BMS)
Installation - 2-Port ABS Relay Valve (Trailer)

Application - Trailer (2S/1M)
Brake Monitoring System (BMS) Installation - 2-Port ABS Relay Valve (Dolly)

2-Port ABS Relay Valve

Brake Monitoring System (BMS)

Application - Dolly (2S/1M)

Curb Side

Blue (Out) 
Blue (In)

Red (Out) 
Red (In)

Road Side
Brake Monitoring System (BMS)
Lid Assembly Replacement Kit

Step 1. Use a 3/8” wrench or socket to remove cover screws (2) from box.

Step 2. Use a 3/8” wrench or socket to remove all nuts, washers, and wire terminals from pressure switches. Re-attach wire terminals, washers, and nuts to the pressure switches of the new lid assembly. Apply dielectric grease on pressure switches terminals.

Step 3. Install lid assembly onto box and insert 3/8” cover screws and torque to (30-40 lb-in.)

Verifying no wires are pinched and clear during assembly. Follow End of Line or PM test procedures outlines in this manual to verify the system is functioning properly.
Stationary Testing the Brake Monitoring System (BMS) Device for proper Functionality.

**Step 1.** Apply 12 volts to the Blue ABS Pin #7 on the 7-Way and verify the external mounted trailer ABS warning lamp goes **ON/OFF**. The ABS system is **OK** (No ABS Faults). If the ABS lamp stays **ON** solid, an ABS fault is present. Reference the ABS Installation/Service Manual L30041.

**Step 2.** Wait 15 seconds after Blue ABS power is applied.

**Step 3.** The BMS will turn **ON** the alarm with NO Emergency air applied. If (90-120 psi) emergency air pressure is present, the alarm should turn on for 2.5 seconds and turn off telling you the system is functioning properly.

**Step 4.** Charge the Emergency gladhand to (90-120 psi) and verify the alarm shuts-off. If the (BMS) does not shut off refer to troubleshooting section.

**Step 5.** While **BLUE** ABS power is still applied, apply 12 volts to the **RED** stoplight power Pin #4 on the 7-Way connector. With **NO** service air applied to the Blue Service (IN) Gladhand, wait 60 seconds to verify that the alarm turns **ON**. If the alarm does NOT turn **ON**, refer to the troubleshooting section.

**Step 6.** Charge the Service (IN) Gladhand to (90-120 psi) and verify that the alarm shuts **OFF**. If the alarm does not shut **OFF**, refer to troubleshooting section.

**NOTE.** If the alarm continues to sound go to Troubleshooting Brake Monitoring System (BMS) Pressure Switches and Electronic Control Module Instructions.
If the alarm turns **ON**, and the Trailer In-Cab Warning Lamp starts **FLASHING** while the vehicle is moving, first verify the hand brake control valve or foot brake are not slightly on as this can cause the In-Cab Warning Lamp to flash and the alarm to come on. If this is not the cause then pull off the road and STOP.

The alarm and the Trailer In-Cab Warning Lamp will turn **OFF**. If this occurs, re-apply power to the Trailer/Dolly with the tractor parked and release the Trailer/Dolly parking brakes, wait 15 seconds and the alarm should turn **ON/OFF**.

If the alarm remains **ON**, follow the steps below:

**Step 1.** Verify Emergency/Spring Brake Pressure:
- Check gladhand for proper connections and system air leaks.
- Check gladhand shut-off valves are open except rear most trailer.
- Allow sufficient time for the system to fully charge.
- Apply Emergency/Supply air and verify the BMS has 90 psi or greater.
- Check emergency and service air lines are connected to the correct (1/4” PTC) fittings on the BMS.
- Check the system for air leaks.

**Step 2.** Verify Service Brake Pressure:
- Apply Service Brakes and check for air at the rear most trailer service gladhand.
- Check if trailer brake lamps are on.
- With no Service Brakes applied, remove lead trailer service gladhand and check for leakage from the tractor Service gladhand (If using a tractor for this test).
- Apply Service Brakes and verify the BMS has 50 psi or greater.
- Check emergency and service air lines are connected to the correct (1/4” PTC) fittings on the BMS.
- Check the system for air leaks

**Step 3.** Verify Stoplight Power:
- Apply Service Brakes and check brake lamps turn **ON** at the rear most Trailer/Dolly.
- Remove Service Brakes and verify brake lamps turn **OFF**.

*Troubleshooting Continued on Following Page*
If all the previous steps have been verified and the alarm is still ON, testing of the pressure switches is required. This requires removing the two 3/8” hex head screws on the lid.

Test Pressure Switches:

**Step 1.** Test Emergency Pressure Switch (Red) with the lid removed and 1/4” Red Air Line still connected:
- Disconnect the Service Gladhand.
- Remove the Red wires from the Red Pressure Switch.
- Apply 90 psi or greater to the Emergency Gladhand to verify correct pressure switch operation.
- Use an Ohm Meter or Test Light to verify the Emergency Pressure Switch circuit is an **Open Circuit** and there is **No Continuity**. If **Open Circuit** proceed to **Step 2**.
- If the switch has a **Closed Circuit** and **Full Continuity**, replace the lid assembly.

**Step 2.** Test Service Pressure Switch (Black) with the lid removed and 1/4” Blue Air Line still connected:
- Continue to keep 90 psi or greater to the Emergency Gladhand.
- Remove the Blue wires from the Black Pressure Switch.
- Apply 90 psi or greater to the Service Gladhand to verify correct pressure switch operation.
- Use an Ohm Meter or Test Light to verify the Service Pressure Switch circuit is a **Closed Circuit** and there is **Full Continuity**. If **Closed Circuit** proceed to **Test ECM**.
- If the switch has an **Open Circuit** and **No Continuity**, replace the lid assembly.

Test ECM (Electronic Control Module) with both pressure switches disconnected:

**Step 1.** Verify both Red wire Terminals and both Blue wire Terminals are not touching each other or any other wires.

**Step 2.** Apply 12VDC power to the blue ABS pin #7, wait for 15 seconds. If the alarm turns **ON** for 2.5 seconds and then turns **OFF**, proceed to Step 3. If the alarm stays **ON**, replace Brake Monitoring System Unit (BMS).

**Step 3.** Jumper together the Red Pressure Switch wires. If the alarm turns **ON**, proceed to **Step 4**. If the alarm does not turn **ON**, replace Brake Monitoring System Unit (BMS).

**Step 4.** Disconnect the Jumper used on the Red Pressure Switch wires in **Step 3** to turn off the alarm. Apply stoplight power. After 60 seconds if the alarm turns **ON** proceed to **Step 5**. If the alarm does not turn **ON**, replace Brake Monitoring System Unit (BMS).

**Step 5.** Jumper together the Blue Pressure Switch wires and verify the alarm turns **OFF**. If the alarm does not turn **OFF**, replace Brake Monitoring System Unit (BMS).
Brake Monitoring System (BMS)
GPS/Tire Inflation Connection

If INPUT 1 detects 12Vdc for > 10 minutes while the vehicle is moving, OUTPUT 1 sends a 12Vdc signal to a warning device such as a GPS input.

The GPS/Tire Inflation Cable is connected to the GPS signal wire and the Tire Inflation signal wire located in the 7-Way Nose Box on the Trailer.

Signal wires are located in the Junction Box on the Dolly.

Note. GPS/Tire Inflation cable is not included with the Brake Monitoring System (BMS).
The Brake Monitoring System (BMS) door switch cable is connected to a door switch.

**Note.** The switch **must be** in the normally closed (N.C.) position when the door of the trailer is open to function correctly.

**Note.** Door switch cable is **not included** with the Brake Monitoring System (BMS).

If INPUT 2 switch is closed while the vehicle is moving, the BMS alarm will sound and an in-cab lamp will warn the driver. OUTPUT 1 provides a 12Vdc signal to a warning device such as a warning lamp or GPS input.

### Examples of IN 1/OUT 1 Functions:

<table>
<thead>
<tr>
<th>IN 2</th>
<th>OUT 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Switch</td>
<td>Alarm, Lamp, GPS</td>
</tr>
<tr>
<td>Tail Fin Failure</td>
<td>Alarm, Lamp, GPS</td>
</tr>
<tr>
<td>Power Spring</td>
<td>Alarm, Lamp, GPS</td>
</tr>
<tr>
<td>Brake Stroke</td>
<td>Alarm, Lamp, GPS</td>
</tr>
<tr>
<td>Reverse Detect</td>
<td>Steer/Lift Axle</td>
</tr>
<tr>
<td>Suspension Dump</td>
<td>Alarm, Lamp</td>
</tr>
</tbody>
</table>

Brake Monitoring System (BMS)

The Brake Monitoring System (BMS) door switch cable is connected to a door switch.
Haldex develops and provides reliable and innovative solutions with focus on brake and air suspension products to the global commercial vehicle industry.

Listed on the Stockholm Stock Exchange, Haldex has annual sales of approximately 3.9 billion SEK and employs about 2,200 people.

Disclaimer: The products described within this literature, including without limitation, product features, specifications, designs, availability and pricing are subject to change by Haldex and its subsidiaries at any time without notice.

This document and other information from Haldex, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system, in the current literature or catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through their own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements are met.

©2014, Haldex AB - This material may contain Haldex trademarks and third party trademarks, trade names, corporate logos, graphics and emblems which are the property of their respective companies. The contents of this document may not be copied, distributed, adapted or displayed for commercial purposes or otherwise without prior written consent from Haldex.