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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.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important Notices</td>
<td>2</td>
</tr>
<tr>
<td>Safety</td>
<td>2</td>
</tr>
<tr>
<td>Background Information</td>
<td>3</td>
</tr>
<tr>
<td>Theory of Operation</td>
<td>4</td>
</tr>
<tr>
<td>Automatic Control of Lift Axle</td>
<td>5</td>
</tr>
<tr>
<td>Load Based Control of the Lift Axle</td>
<td>5</td>
</tr>
<tr>
<td>Calculation of the Lower and Raise Percentage Loads using the Laden and Unladen Air Bag Pressures</td>
<td>7</td>
</tr>
<tr>
<td>Examples</td>
<td>7</td>
</tr>
<tr>
<td>Speed Control of the Lift Axle – Raise with Speed</td>
<td>8</td>
</tr>
<tr>
<td>Speed Control of the Lift Axle – Raise with Speed and Drop with Speed</td>
<td>9</td>
</tr>
<tr>
<td>Manual Control of Lift Axle</td>
<td>10</td>
</tr>
<tr>
<td>Traction Control of the Lift Axle – Enabling and Disabling</td>
<td>10</td>
</tr>
<tr>
<td>Hardware Setup</td>
<td>12</td>
</tr>
<tr>
<td>Plumbing Into the Trailer’s Air System</td>
<td>13</td>
</tr>
<tr>
<td>Connecting the ILAS-E to the ITCM ECU</td>
<td>14</td>
</tr>
<tr>
<td>Connecting the Load Sensor (Pressure Transducer) to the ITCM ECU</td>
<td>16</td>
</tr>
<tr>
<td>Software Setup</td>
<td>17</td>
</tr>
<tr>
<td>Setting the Auxiliary Devices</td>
<td>17</td>
</tr>
<tr>
<td>Setting the Drop and Raise Percentage Loads</td>
<td>18</td>
</tr>
<tr>
<td>Setting the Laden and Unladen Suspension Pressures</td>
<td>19</td>
</tr>
<tr>
<td>Installation End of Line Test (EOLT)</td>
<td>20</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>22</td>
</tr>
</tbody>
</table>

### Additional Information

Installation and Troubleshooting Guides available on the Haldex website.

- L31286W Intelligent Trailer Control Module (ITCM) Installation/Service Manual (web only)
- L31287W DIAG+ Diagnostic Software Users Guide (web only)
- L31295W External Pressure Transducer Installation/Service Manual (web only)

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Important Notices

Safety First

The customer’s company safety procedures must be followed when installing or servicing this equipment. Be sure that all instructions are understood before beginning the procedures.

⚠️ WARNING

Remove electrical power and drain the air reservoir(s) before beginning work on the trailer's air brake system.

The information provided by this manual is correct to the best of Haldex's knowledge and belief, having been compiled from reliable and official sources of information. However, Haldex cannot assume any liability or responsibility for possible errors or misapplication of the product. Final determination of the suitability of the product for the use contemplated by the buyer is the sole responsibility of the buyer.

The descriptions and specifications contained within this document are current at the time of publication. Haldex Brake Products, Inc. reserves the right to discontinue or modify its products and/or procedures and specifications at any time without notice.

⚠️ WARNING

The lift axle will raise or lower automatically when the change-over pressure is reached or when the voltage is switched on or off, respectively.

Keep away from the hazardous area.

Questions?

If you have any questions on this product or any of the innovative products offered by Haldex, contact your local distributor for complete details. Technical Service or Troubleshooting help can be obtained by calling Haldex Technical Services Department at 800-643-2374, Press 2.
Background Information

This manual instructs the customer how to install, set up, and test the Haldex ILAS-E (Integrated Lift Axle System – Electronic) lift axle valve when used in combination with the Haldex ITCM (Intelligent Trailer Control Module).

The Haldex ILAS-E/ITCM lift control system can automatically raise or lower the lift axle based upon the load on the trailer, the speed of the vehicle, or both. The automatic operation may be overridden by the traction control feature either once or every time during the power-up session.

This integrated lift axle system provides the customer with such benefits as:

- Increased fuel mileage
- Reduced highway tolls
- Reduced tire wear
- Improved traction in snow and ice
- Improved trailer ABS stability
Theory of Operation

The ILAS-E lift axle valve controls airflow to inflate or deflate the lift axle bellows in order to either raise or lower the lift axle. When raising, the ILAS-E valve isolates and exhausts the air suspension of the lift axle; enabling the raising of the lift axle. When lowering, the ILAS-E exhausts the lift bellows, inflates the lift axle suspension, and makes it common with the non-lifting axle(s) air suspension via the trailer-leveling valve. In the ILAS-E unpowered condition, the lift axle is lowered by default.

Application of 12-Volt DC power will operate an electronic solenoid and direct reservoir air to move the internal ILAS-E components, causing the ILAS-E to raise the lift axle. The ILAS-E valve will not raise the lift axle if 12-Volt DC electric power is not applied or if reservoir air pressure is not at a minimum of 100 PSI.

The ITCM ABS ECU uses the vehicle’s speed and the vehicle’s suspension pressure as inputs to the lift axle control algorithm. The output of the ITCM lift axle control is the 12-Volt DC electric power to drive the ILAS-E’s activation solenoid. The vehicle’s load state, speed, and the user-configured software parameter settings determine whether the lift axle is raised or lowered.

For load-based lift axle control, the air pressure reading in the suspension of the non-lifting axle(s) determines whether to raise or lower the axle. The system operates as follows (assuming a raised lift axle to start):

1. As goods are loaded onto the unladen (empty) trailer, the air pressure in the air suspension rises until the preconfigured lift axle drop suspension pressure threshold is reached.

2. At this point the lift axle will lower and take up its share of the trailer load.

3. The lift remains on the ground until the goods are off-loaded from the trailer.

4. As goods are off-loaded from the trailer, the common air suspension pressure decreases.

5. When the suspension air pressure is decreased below the raise suspension pressure threshold, the lift axle raises, transferring the trailer load onto the non-lifting axle(s).

Vehicle speed-based control of the lift axle is used to improve the maneuverability of the trailer at low speeds. The speed control is used to override the load-based lift axle control to prevent the lift axle from otherwise raising. For front lift axles, keeping the lift on the ground improves the trailer’s maneuverability in tight turns at low speeds.

Manual lift axle control or traction control is enabled through an external switch input to the ITCM. With traction control the lift may be raised, if dropped, to load shift the trailer’s weight onto the tractor’s drive axles to provide more traction on snowy and icy roads at low speeds. Limits on maximum trailer load and speed provide safeguards to prevent damage to the trailer when traction control is used.
Theory of Operation (cont’d)

Automatic Control of Lift Axle

Load Based Control of the Lift Axle

Load based control of the lift axle is based upon the suspension air pressure of the non-lifting axle(s). This pressure is measured with an electronic Pressure Transducer connected as an auxiliary device to the ITCM.

NOTE

If the Haldex Stability Module is installed on the trailer, the trailer load is measured by the Stability Module, and the external Pressure Transducer is not necessary.

The measured load pressure signal is numerically processed to eliminate the effect of pressure spikes and rapid suspension pressure changes due to vehicle cornering, sudden or hard stops, or bumps in the roadway. The resultant signal is a long-term average of the vehicle’s suspension pressure.

The ITCM lift axle control software is programmed with four pre-set parameters:

1. The suspension air pressure of the vehicle, assuming the lift is raised, of the unladen or unloaded trailer.
2. The suspension air pressure of the fully laden or loaded trailer with the lift axle lowered.
3. The percentage of load on the trailer to raise the lift axle.
4. The percentage of load on the trailer to lower the lift axle.

Default valves of these parameters are set in the ITCM’s memory. Changes to these values are made to align performance of the lift axle with the trailer’s axle configuration, weight, and customers’ expectations. Changes to these software parameters are made with the Haldex DIAG+ Diagnostic Software. For details on how to install and use the DIAG+ Software, refer to the DIAG+ Software Users Guide (L31287W), available as a free download on Haldex.com.

Figure 1 (on the following page) illustrates the performance of the lift axle system in response to the semi-trailer’s suspension air pressure. Figure 1 is a plot of the non-lifting axle(s) air bag pressure over time as the trailer is loaded and unloaded and the lift axle lowered then raised. Time is on the horizontal axis; Trailer Load is on the vertical axis. Referring to Figure 1, initially the trailer is unladen or empty and the lift axle is in the raised position. As indicated on Figure 1, load is subsequently added over time to the semi-trailer and the suspension air pressure rises accordingly. When the load on the trailer increases to a point the suspension air pressure crosses the drop pressure threshold, the lift axle lowers and takes up its share of the load. The suspension pressure decreases because now the load is being shared between the non-lifting axles and the lift axle. As the trailer is further loaded the suspension pressure increases until the trailer is fully loaded and at the laden air suspension pressure value.
As load is taken off the trailer, the suspension air pressure drops accordingly. Note however that the lift axle remains on the ground until the suspension pressure crosses the raise pressure threshold, then the lift axle raises and no longer supports the load on the trailer. As the lift raises, the suspension pressure of the non-lifting axle also raises as the load is now supported just by the non-lifting axles. As more load is taken off the trailer, the suspension pressure continues to decrease until the trailer is empty or unladen and the suspension pressure is at the unladen air pressure.

The lower and raise threshold pressures are shown as horizontal dotted lines on Figure 1. As long as the suspension air pressure remains in between the two threshold pressures, the lift axle will not change its current state of being either raised or lowered. If the suspension pressure rises above the drop threshold, the lift will lower, if raised. If the suspension pressure drops below the lift threshold, the lift will raise, if lowered. Note that as the lift changes state then the resultant air bag pressure will also change as the lift axle shares the trailer load or transfers the load to the non-lifting axles.

Successful operation of the lift axle requires that the raise and lower threshold pressures be set correctly for that trailer’s axle rating and axle configuration.

In setting the raise and lower thresholds one must consider the number of non-lifting axle(s) on the tractor and the trailer plus the number of lift axles on both the tractor and trailer, the maximum load rating of each axle and of the air bags supporting the load. The load on the trailer is shared by the trailer’s axles plus the tractor’s axles but not equally.
Furthermore, the distribution of the load on the semi-trailer affects how much of the load is supported by the tractor and how much is supported by the semi-trailer. Loads placed forward on the semi-trailer are supported more by the tractor than the rear axles of the semi-trailer. For example, a 10,000 lb. load on the semi-trailer will produce a different air bag pressure if this load is placed towards the nose of semi-trailer than a position at the rear of the semi-trailer. The lift axle system responds to load distribution it measures at the rear axles of the semi-trailer.

To find the corresponding suspension air pressures at the raise and drop load points, the customer must contact the trailer’s suspension and/or axle manufacturer. Determination of these load point pressures are beyond the scope of this document.

Calculation of the Lower and Raise Percentage Loads using the Laden and Unladen Air Bag Pressures

The ITCM requires the raise and lower thresholds be expressed as percentage loads. Once the desired lift and drop suspension air pressures are determined, it is necessary to convert the suspension pressures to percentage loads. Percentage loads are expressed as a percentage of the range of air pressure in the suspension air bags between a fully laden trailer and a fully unladen trailer.

An unladen trailer may be thought of as being 0% loaded; however, the air pressure in the air bags is not zero. An empty or unladen trailer has a non-zero suspension pressure due to the weight of the trailer frame, decking, and body. Likewise, a fully laden semi-trailer would have a higher suspension pressure due to the weight of the product plus all of the other trailer components just mentioned on the semi-trailer. A fully laden semi-trailer may be thought of as 100% laden. Assuming the air bag pressure is linear with load, it then becomes a matter of doing the math to convert the raise and lower suspension pressures to percentage loads.

Examples

To illustrate the procedure, two example calculations are given. For the two examples below, the default values for the load percentages set for an ILAS-E are 90% lower and 50% raise thresholds. The default unladen suspension pressure is 1 bar; the default laden suspension pressure is 5.5 bar. It is useful to know that 1 bar is equal to 14.5 PSI. In PSI the unladen suspension pressure is 14.5 PSI, the laden suspension pressure is 79.75 PSI.

Example 1:

Given the default laden and unladen suspension pressures, it is required to change the lower and raise threshold pressures to 50 and 18 PSI respectively. What are these pressures expressed as a percentage load of the lower and raise thresholds?

Solution:

The suspension pressure varies from 14.5 PSI to 79.75 PSI as the trailer is loaded from 0% load to 100% load. Expressed another way the suspension pressure rises $79.75 - 14.5 = 65.25$ PSI from empty to fully loaded.

A drop pressure threshold of 50 PSI includes the suspension pressure due to the weight of the trailer by itself plus the pressure due to the load on the trailer. Therefore, 50 – 14.5, or 35.5 PSI is due to the load on the trailer.
Theory of Operation (cont’d)

Expressed as a percentage: 35.5/65.25 x 100 = 54% load for the drop threshold.

The raise threshold of 18 PSI has 18 – 14.5, or 3.5 PSI due to the load on the trailer.

Expressed as a percentage: 3.5/65.25 x 100 = 5% load for the raise threshold.

Example 2:

It has been determined that the unladen suspension pressure of 1 bar (14.5 PSI) is too low a pressure for the trailer and that the real value is 20 PSI. Convert 20 PSI, the unladen suspension pressure, to what value expressed in units of bar. Given the new unladen suspension pressure of 20 PSI, what are the new values of the raise and drop thresholds of 50% and 90% in PSI?

Solution:

Since 14.5 PSI is 1 bar, then 20 PSI is 20/14.5 or 1.4 bar.

Because the laden pressure is unchanged, the 100% to 0% range is 79.75 – 20 or 59.75 PSI.

90% drop threshold is (59.75 x 0.9) + 20 = 73.8 PSI

The 50% raise threshold is: (59.75 x 0.5) + 20 = 49.9 PSI

Speed Control of the Lift Axle – Raise with Speed

The ILAS-E Front auxiliary has an additional layer of lift axle control based upon the vehicle’s speed. It is possible to override the lift axle load based control if the vehicle is going slower or faster than a programmed speed. This layer of control is not available on the ILAS-E Rear auxiliary, however load control is still available on ILAS-E Rear.

If the load on the trailer is small enough such that the lift axle would be raised based upon load control alone, it is possible to configure a speed threshold such that the lift axle will not lift if the trailer is traveling slower than the speed threshold. Once the trailer is moving faster than the programmed speed threshold, the lift will raise as it would based upon load control alone.

The speed adjustments are made using the DIAG+ Software in the ITCM configuration mode. Figures 2 and 3 show the specific screens in DIAG+ where these adjustments are made. Refer to the DIAG+ Diagnostic Software Users Guide (L31287W) and “Software Setup” section later in this guide. The Raise with Speed function is enabled by checking the appropriate check box as shown in Figure 2.

![Figure 2: Raise with Speed selection](image-url)
Theory of Operation (cont’d)

Simply put, if the lift axle is raised based upon load control and if the raise with speed option is checked, then the lift axle will not raise until the trailer is going faster than the speed parameter. This option is useful for situations where it is desired to maintain the short wheelbase of the trailer for improved maneuverability at slow speeds. This option only makes sense for front lift axles. Lift axles positioned at the rear of the trailer do not improve maneuverability if kept down at slow speed. The speed parameters are entered through the “Extra Lift Axle Data” screen as shown in Figure 3.

![Figure 3: Extra Lift Axle Data screen](image)

**Speed Control of the Lift Axle – Raise with Speed and Drop with Speed**

*Drop with Speed* is another speed parameter that can be programmed if *Raise with Speed* is selected. This option allows the user to program a separate speed limit to drop an otherwise raised lift axle while the vehicle is slowing down. As with Raise with Speed, this option is intended to improve maneuverability of semi-trailers equipped with front lift axles. A separate speed for raising and dropping helps prevent the lift axle from oscillating, providing the two speed thresholds are set far enough apart such that it is unlikely each will be frequently crossed during normal driving conditions.

The *Drop with Speed* function is enabled only if the Raise with Speed option is selected first. The function is selected by checking the *Drop with Speed* check box as shown in Figure 4.

![Figure 4: Raise with Speed, Drop with Speed selection](image)
Theory of Operation (cont’d)

Manual Control of Lift Axle

Traction Control of the Lift Axle – Enabling and Disabling

Traction control is available to lift an otherwise lowered, due to load, lift axle. This option is available to load-shift a portion of the semi-trailer’s load onto the tractor’s drive axles. Doing so in icy or snowy road conditions improves traction of the vehicle. Since the trailer is in a laden state traction control is only active at low speeds. Exceeding a programmable speed parameter cancels traction control and the lift axle lowers. Another safety condition is an upper load threshold. If upon lifting due to traction control, the load rises above an upper load threshold, the lift immediately drops and cancels traction control.

Traction control is enabled by operating an external SPDT switch connected to the ITCM on an auxiliary input port. Either auxiliary port #4 or port #5 may be used. The auxiliary port must be configured as a General-Purpose Input device (GPI). Using an unterminated auxiliary cable, the yellow wire is connected to either the red or black wire through the switch. The choice of which wire to use is dependent upon how the General-Purpose Input device is configured in software. An example of wiring of a switch is shown in Figure 5 and software GPI configuration in Figure 6.

Figure 5: External SPDT switch wiring
The switch must be a toggle switch and not a momentary contact switch. The difference is in the amount of time the switch is closed. Closing the switch for less than five seconds enables a single instance of traction control. Closing the switch for longer than five seconds enables traction control continuously during the power up cycle for the semi-trailer. Refer to Figure 3 for the Extra Lift Axle Data screen.

Checking the box “Disable Lift Axle” will disable the lift axle from lifting during the power up cycle once the switch is closed for more than five seconds. Refer to Figure 3 for the Extra Lift Axle Data screen.
Hardware Setup

Mount the ILAS-E valve in a location on the semi-trailer close enough to the ITCM ECU to connect each together with the two-meter long interface cable. Mount the ILAS-E in a location high enough on the semi-trailer under carriage to be protected from road debris and road spray. Provide enough clearance on the top and bottom of the valve so that the exhaust ports are not blocked or the airflow restricted. Mount the ILAS-E valve with the solenoid on top facing upwards with enough clearance to attach the interface cable.

Figure 7 shows the bolt pattern, port identification, and dimensions for the ILAS-E valve.

![ILAS-E Valve Diagram](image)

Figure 7: Bolt pattern, port identification, and dimensions in inches
Hardware Setup (cont’d)

Plumbing Into the Trailer’s Air System

1. Plumb the ILAS-E according to Figure 8. Use nylon hose to plumb the ILAS-E valve.
2. Connect port #1 (Figure 7) to the reservoir through a pressure protection valve and in-line debris filter (recommended).
3. Connect port #22 to the lift bellows.
4. Connect port #11 to the output of the trailer-leveling valve. Alternately, port #11 can be connected to the air suspension circuit of the non-lifting axle.
5. Connect port #21 to the air suspension of the lift axle.
6. Route the ILAS-E air lines carefully, protect the tubing from chafe at points where the tubing touches or rubs on frame edges or hard surfaces with split loom. Secure the air lines to the vehicle appropriately; do not allow the air lines to hang where they could be snagged or pulled loose.
7. The body of the solenoid may be turned to better position the cable attachment. Do not use cable ties to secure the interface cable to rubber delivery hoses. Use split loom to protect the interface cable from chafing at points where the cable touches or rubs on frame edges or hard surfaces.

![Figure 8: Plumbing the ILAS-E into the Trailer Air System](image-url)
Hardware Setup (cont’d)

Connecting the ILAS-E to the ITCM ECU

1. Attach the control cable from the ILAS-E to either auxiliary port #1 or #2 or #3 of the ITCM. Figure 9 illustrates the auxiliary port locations on the ITCM ECU.

2. Remove the sealing blanking plug from auxiliary port #1, #2, OR #3 to prepare for the connection from the ILAS-E. Figure 10 illustrates the plug in place in section view. Press on the locking lever, engaging the hole while simultaneously pulling the plug out.

May configure up to one of each: an ILAS-E Front and/or ILAS-E Rear

Figure 9: Auxiliary port locations on the ITCM

Figure 10: Removing the blanking plug from the ITCM auxiliary port
Hardware Setup (cont’d)

3. Attach the control cable from the ILAS-E to either auxiliary port #1 or #2 or #3 of the ITCM as shown in Figure 11.

![Figure 11: ILAS-E connection to ITCM auxiliary port #1, #2, or #3](image)

Connect the interface cable such that the locking lever tab engages the access hole of the auxiliary port. Press the cable firmly into the auxiliary port receptacle such that the locking lever engages with an audible click. Figure 12 illustrates the cable insertion into auxiliary port #3.

![Figure 12: ILAS-E cable insertion into auxiliary port #3](image)

Connect the other end to the solenoid connector on the ILAS-E. This connection is keyed; turn the connector until the keys line up and twist the locking ring to secure the connection.

**NOTE**

Remember which auxiliary port of the ITCM is used. This port will need to be configured with the DIAG+ Software later.
Hardware Setup (cont’d)

**NOTE**

If the Haldex Stability Module is installed the load sensor is not required. Steps 6 and 7 may be skipped in “Setting the Auxiliary Devices” on page 17.

Connecting the Load Sensor (Pressure Transducer) to the ITCM ECU

1. Plumb the load sensor in the air suspension circuit of the non-lifting axle as shown in Figure 13. Figure 13 shows the Pressure Transducer plumbed into an air bag with a tee fitting.

![Figure 13: Load sensor plumbed into the air bag suspension of the non-lifting axle(s)](image)

2. Remove the sealing blanking plug from either auxiliary port #4 or auxiliary port #5 as shown in Figure 9.

3. Connect the pressure sensor cable to the load sensor.

4. Route the sensor cable to ITCM auxiliary port #4 or auxiliary port #5.

5. Connect the pressure sensor cable into the selected auxiliary port #4 or #5, in the same way as the ILAS-E cable was inserted as shown in Figure 12.

![Figure 14: Pressure Transducer cable plugged into auxiliary port #4 or #5](image)
Software Setup

Setting the Auxiliary Devices

Once the hardware installation is complete the ITCM must be configured for auxiliary devices. Refer to the DIAG+ User Guide.

1. Connect the DIAG+ USB to CAN diagnostic cables to the ITCM, power up the ITCM, and start the DIAG+ Software.

2. When the DIAG+ Software indicates it is connected to the ITCM, open the configuration menu.

3. Select the external auxiliaries’ configuration as shown in Figure 15.

4. Select devices on specific channels by using the **down arrow** adjacent to an auxiliary channel.

5. Select the specific auxiliary port the ILAS-E is connected to and select either ILAS-E Front or ILAS-E Rear. For example, in Figure 15 the ILAS-E Front is connected to auxiliary port #3.

6. If the external Pressure Transducer is used, it must be connected to either auxiliary port #4 or auxiliary port #5. In Figure 15 the Pressure Transducer is configured as being connected to auxiliary port #4.

7. Select **Pressure Transducer** as the auxiliary device for the specific auxiliary port the Transducer is connected to. Click **Modify**, then select **Local Suspension Pressure**.

![External Auxiliaries Configuration screen](image)
Software Setup (cont’d)

Setting the Drop and Raise Percentage Loads

1. To configure the percentage loads for the drop and raise of the lift, click **Modify** as shown in Figure 15 for the specific auxiliary port the ILAS-E is connected to.

2. The ILAS-E Front window opens as shown in Figure 2. The figure shows the default values for the Drop and Raise percentage loads.

3. Click on the field to change the default values for the Drop and Raise percentages. For details and examples on how to calculate percentage loads refer to the *Calculation of the Lower and Raise Percentage Loads using the Laden and Unladen Air Bag Pressures* section on page 7 of this document.

4. If speed sensors are fitted to the lift axle, determine which sensor pair is fitted and select the fitted pair in the **Sensor Configuration** box in Figure 2 on page 8.

5. If **Raise with Speed** or **Raise and Drop with Speed** are desired, check the appropriate box as shown in Figure 2 and Figure 4 (pages 8 and 9).

6. Click the green check button to close the window.

7. To write the new values into the ITCM ECU refer to the DIAG+ Diagnostic Software Users Guide (L31287W).

**NOTE**

*Raise with Speed* must be checked before *Drop with Speed* can be selected.

The default values of the Drop and Raise percentage loads are 90% and 50% respectively. If the parameters need to be changed to different values, refer to the discussion in *Load Based Control of the Lift Axle* on page 5.

For further assistance refer to the Haldex Technical Support contact information on Page 2.
Software Setup (cont’d)

Setting the Laden and Unladen Suspension Pressures

Extra heavy and extra light semi-trailers can be accommodated through the setting of the air suspension pressure when the vehicle is both unladen and fully laden.

This is accomplished with the DIAG+ Software using the trailer configuration menu.

1. From the ECU Setup menu click **Setup Load Plate Configuration**.

2. A new window will open as in Figure 16.

3. Change the Unladen and Laden air bag pressures to the actual values.

4. The air pressure is expressed in units of bar, where 1 bar is 14.5 PSI.

5. Click the green check button to close the menu.

6. To write the new values into the ITCM ECU, refer to the DIAG+ Diagnostic Software Users Guide (L31287W).
Software Setup (cont’d)

Installation End of Line Test (EOLT)

To verify the installation of the ILAS-E, run the End of Line Test (EOLT) section in DIAG+. This is accomplished with the DIAG+ Software using the Trailer Configuration menu.

1. Charge the air system of the trailer and power the trailer with 12 Volts DC.
2. As shown in Figure 17, click the EOLT button to initiate the EOLT.
3. Select the Lamp and Auxiliaries test shown in Figure 18.

![Figure 17: Selecting and running EOLT](image1)

![Figure 18: Selecting Lamp and Auxiliaries to test](image2)
Software Setup (cont’d)

4. Verify the suspension air bags are inflated.

As the test sequences through the auxiliary devices, the ILAS-E solenoid should cycle ON then OFF. At the conclusion of this test the ON and OFF buttons will become active, allowing manual activation of the ILAS-E to raise and lower the lift axle. If there is an issue with the ILAS-E plumbing or electrical connection, then this test will show it. Figure 19 displays a successful EOLT test of the ILAS-E and Pressure Transducer.

![Figure 19. End of Line Test – Lamp and Auxiliaries screen](image)

The Transducer should show the pressure value in PSI of the air suspension on the DIAG+ main screen. This numerical value can be verified with a pressure gauge.

5. If any issues are found see Troubleshooting section before continuing.

6. Disconnect all diagnostic cables from the PC to the ITCM ECU.
Troubleshooting

Problem: The lift axle does not raise.

1. Verify that the pneumatic connections are correct as shown in Figure 8 (Page 13), and that there are no air leaks.

2. Verify the interface cable is secured to the ILAS-E valve and correctly connected to the ITCM ECU, as shown in Figures 11 and 12 (Page 15).

3. Verify the Pressure Transducer is plumbed into the non-lifting axle’s air suspension as shown in Figure 13 (Page 16) or connected to the output of the leveling valve with no air leaks.

4. Verify the Pressure Transducer interface cable is securely connected to the Transducer and is correctly connected to the ITCM ECU as in Figure 14 (Page 16).

5. Use the DIAG+ Diagnostic Software to read the configuration from the ITCM ECU and verify the software configuration is correct with respect to the physical auxiliary ports on the ITCM ECU.

6. Verify the reservoir is charged to at least 100 PSI.

7. Verify the ITCM ECU is powered to 12 Volts DC with a power source that has sufficient wattage to drive the ILAS-E.

8. With the air system fully charged, run the EOLT with DIAG+ Lamp and Auxiliaries. At the conclusion of the test, use the manual ON and OFF buttons to verify the lift will raise and drop as shown in Figure 19 (Page 21).

9. Check that the air bag suspension Pressure Transducer is plumbed into the non-lifting axle air suspension and not the air reservoir.

10. Verify that the air pressure in the non-lifting axle air suspension, as read by the Pressure Transducer, is correct.

11. With DIAG+, verify that the Pressure Transducer is correctly configured in the ITCM software.
Troubleshooting (cont’d)

Problem: The lift axle does not lower.

1. Verify that the pneumatic connections are correct as shown in Figure 8 (Page 13), and that there are no air leaks.

2. Verify the interface cable is secured to the ILAS-E valve and correctly connected to the ITCM ECU, as shown in Figures 11 and 12 (Page 15).

3. Verify the Pressure Transducer is plumbed into the non-lifting axle’s air suspension as shown in Figure 13, or connected to the output of the leveling valve with no air leaks.

4. Verify the Pressure Transducer interface cable is securely connected to the Transducer and is correctly connected to the ITCM ECU as in Figure 14 (Page 16).

5. Use the DIAG+ Diagnostic Software to read the configuration from the ITCM ECU and verify the software configuration is correct with respect to the physical auxiliary ports on the ITCM ECU.

6. Verify the ITCM ECU is powered to 12 Volts DC with a power source that has sufficient wattage to drive the ILAS-E solenoid.

7. With the air system fully charged, run the EOLT with DIAG+ Lamp and Auxiliaries. At the conclusion of the test, use the manual ON and OFF buttons to verify the lift axle will raise and lower.

8. If the lift axle does not lower, disconnect the valve cable from the ILAS-E.

9. Set the trailer’s parking brake, disconnect the red gladhand, and drain the reservoir.

10. If the lift axle has not lowered, check the air lines for signs of contamination and/or debris.

11. Verify that the air bag suspension Pressure Transducer is plumbed into the non-lifting axle air suspension and not the air reservoir.

12. Verify that the air pressure in the non-lifting axle air suspension, as read by the Pressure Transducer, is correct.

13. With DIAG+, verify that the Pressure Transducer is correctly configured in the ITCM software.
Troubleshooting (cont’d)

Problem: The lift axle raises and drops erratically.

Possible causes:

1. Intermittent or insufficient permanent 12-Volt DC power. Verify sufficient power when the ILAS-E lifts.

2. The ITCM to ILAS-E cable is not secured at the ILAS-E. Verify a final 1/8 turn to lock the cable onto the ILAS-E.

3. Contamination in the trailer’s air system or debris in ILAS-E. Verify that the airlines and reservoir are clear and clean.

4. Possible misconfiguration of the software parameters of the ILAS-E auxiliary.

5. Incorrect plumbing of the air bag suspension system. Verify the Pressure Transducer is correctly plumbed into the suspension system and is not reading reservoir pressure.

6. Verify the software parameters of the Pressure Transducer auxiliary are correctly configured in the ITCM.

Problem: ABS speed sensor pair fitted to the lift axle produces dynamic speed sensor DTCs:

With the DIAG+ Diagnostic Software, read the configuration from the ITCM ECU and verify:

- The software configuration is correct with respect to there being speed sensors fitted to the lift axle, and

- The software configuration is correct as to which pair of speed sensors are fitted to the lift axle.

NOTE

Extra heavy and extra light semi-trailers can be accommodated through the setting of the air suspension pressure when the semi-trailer is unladen, and then fully laden. This is done by the use of the Haldex program DIAG+ Diagnostic Software version 6.19.
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.

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