Important Notices

Product Options

This manual has been designed to assist personnel in satisfactory installation of Haldex ITCM Stability Module onto semi and full trailers. The intention has been to illustrate various aspects of the installation. It is expected that this manual will be in possession of the appropriate person throughout their training and experience and that the manual will be used as:

A) A teaching aid following supervision of a Haldex engineer.
B) A reminder of the correct procedure of Haldex ITCM Stability.

Safety First

This manual describes the correct installation process for the Haldex ITCM Stability Module. Care must be taken during each phase of the installation in order to ensure the system is installed and working properly.

Please follow your company’s safety procedures at all times when installing this equipment. Be sure that you understand all instructions before you begin.

Remove all air pressure and electrical power from the brake system before beginning work.

Replacement Parts

Use appropriate spare parts documentation when obtaining spare parts. Only use Genuine Haldex replacement parts in repairs.

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.

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.
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## Additional Information

Installation and Troubleshooting Guides available on the Haldex website.

- **Anti-Lock Braking Systems (ABS)**
  - Installation/Service Manual (L30041)

- **Intelligent Trailer Control Module (ITCM)**
  - Installation/Service Manual (L31286W)

- **Brake Monitoring System (BMS-1)**
  - Installation/Service Manual (L31250W)

- **Brake Monitoring System (BMS)**
  - Installation/Service Manual (L31290W)

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Introduction

System Overview

The Stability Module is a plug-in extension for the trailer ITCM ABS ECU which provides rollover control or other active braking applications (by combination with additional ABS software and hardware).

The Stability Module for ITCM is plumbed in series between the Control/Signal/Blue gladhand and the control input or Port #4 on the ABS valve. The Stability Module communicates with the ITCM ECU over the Haldex CAN bus for rollover control or other active braking applications.

The Stability Module contains sensors to monitor the Control/Signal/Blue line air pressure, as well as, the suspension air pressure if equipped with an air bag suspension. The trailer’s movements are monitored by an internal accelerometer and communicated to the ITCM ECU. If a threshold value of acceleration is reached the ITCM will command the Stability Module to apply a series of brief test pulses of control air to the ABS valve. The test pulses are just large enough to brake a freely spinning wheel but not a loaded wheel end. If the tested wheel end responds to the test pulse confirming the pending rollover a large brake application is initiated to slow and stabilize the trailer.
ITCM 1M System Components

“See Haldex Trailer ABS Service Components Catalog (L20243) for additional information on Haldex ABS Brake Products”

Required Items

- FFABS Valve (2-port or 4-port)
- ABS Relay Valve (6-port)
- ABS Relay Valve (2-port)
- Trailer Brake Control Valve (TBCV) shown or (RT4 Valve)
- Haldex CAN Diagnostic Tools
  - DIAG+ PC Diagnostics Kit
  - Software (PC Not Included)
  - Diagnostic Interface Cables - PC to ITCM
- Info Center 2

ITCM 1M Valves with ITCM ECU (use one)

Additional Recommended Installation Aids

- Tie Straps
- Sensor Cable Connection Clip
- Sensor Cable To Hose Clip
ITCM 2M, 3M System Components

“See Haldex Trailer ABS Service Components Catalog (L20243) for additional information on Haldex ABS Brake Products”

Required Items

- FFABS Valve (2- or 4-port)
- ABS Relay Valve (6-port)
- ABS Relay Valve (2-port)
- CAN Cable
- Remote Valve Cable
- Trailer Brake Control Valve (TBCV) shown or (RT4 Valve)
- Stability Module
- Sensor Block Clip
- ABS Light
- 90° Sensor Cable
- ITCM 2M, 3M Valves with ITCM ECU (use one)

Haldex CAN Diagnostic Tools

- DIAG+ PC Diagnostics Kit
- Software (PC Not Included)
- Diagnostic Interface Cables - PC to ITCM
- Info Center 2

Additional Recommended Installation Aids

- Tie Straps
- Sensor Cable Connection Clip
- Sensor Cable To Hose Clip
ITCM Stability Module

Dimensions and Port Identification

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>PORTS</th>
<th>VOLTAGE</th>
<th>TRAILER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>364619001</td>
<td>Imperial</td>
<td>12 V</td>
<td>Air Suspension/Spring Suspension</td>
</tr>
</tbody>
</table>

**Dimensions**
- 5.79" (147 mm)
- 3.86" (98 mm)
- 4.05" (103 mm)
- 5.20" (132 mm)
- 1.93" (49 mm)

**Port Callout Description and Notes**

<table>
<thead>
<tr>
<th>PORT CALLOUT</th>
<th>DESCRIPTION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply port (emergency “red” line)</td>
<td>3/8” NTP</td>
</tr>
<tr>
<td>2</td>
<td>Delivery</td>
<td>3/8” NTP</td>
</tr>
<tr>
<td>2-1</td>
<td>Reservoir</td>
<td>1/2” NTP*</td>
</tr>
<tr>
<td>4</td>
<td>Control port (service “blue” line)</td>
<td>3/8” NTP</td>
</tr>
<tr>
<td>41</td>
<td>Air suspension port (only used with Air Ride Suspension, plug for use with Spring Suspension)</td>
<td>3/8” NTP</td>
</tr>
</tbody>
</table>

* Torque the Port 2-1 fittings to a value of 55-70 ft.-lbf.
DO NOT use teflon tape.
Installation of the Stability Module

Orientation of the Stability Module

The Stability Module may either be frame mounted to the trailer chassis or reservoir mounted. The following guidelines apply to either method of installation, tank or frame.

Regardless of the attachment method the orientation of the Stability module must be made known to the ITCM ECU for correct operation. The orientation may be configured with the DIAG+ Software or learned during the first trip of the trailer.

If the orientation is to be learned then the trailer must have at least two maneuvers performed. A straight-line stop of at least 30 mph at 30 PSI and a left or right turn. It does not matter if the turn is performed first or second.

Until the orientation is successfully learned or programmed, the ABS warning lamp will slowly flash while the vehicle is in motion.
Installation of the Stability Module (cont’d)

Position of ITCM Stability Module Assembly

If the Stability Module is oriented forwards or rearwards follow the guidelines on this page.

The following orientation parameters are required in the ITCM Stability Module Assembly for correct operation.

Roll angle : ± 3 ° (1:20)

Yaw angle : ± 5 °

The ITCM Stability Module Assembly must be mounted within distance X & Y from the centerline of the rear axle group / bogie (includes lift axles).

<table>
<thead>
<tr>
<th>Trailer</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi</td>
<td>59” (1.5 m)</td>
<td>59” (1.5 m)</td>
</tr>
<tr>
<td>Center Axle</td>
<td>59” (1.5 m)</td>
<td>59” (1.5 m)</td>
</tr>
</tbody>
</table>

Haldex recommended position for maximum stability performance. Installation of the ITCM Stability Module outside of this area may affect the performance of the unit.

The ITCM Stability Module Assembly must be installed with the main left hand (LH) and right hand (RH) chassis members of the vehicle.

For any other installations contact the Haldex Technical Services Department at 1-800-643-2374, Press #2.
Installation of the Stability Module (cont’d)

Position of ITCM Stability Module Assembly

If the Stability Module is oriented to the road or curb side of the trailer follow the guidelines on this page.

The following orientation parameters are required in the ITCM Stability Module Assembly for correct operation.

Roll angle : ± 3 ° (1:20)

Yaw angle : ± 5 °

The ITCM Stability Module Assembly must be mounted within distance X & Y from the centerline of the rear axle group / bogie (includes lift axles).

<table>
<thead>
<tr>
<th>Trailer</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi</td>
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Haldex recommended position for maximum stability performance. Installation of the ITCM Stability Module outside of this area may affect the performance of the unit.

The ITCM Stability Module Assembly must be installed with the main left hand (LH) and right hand (RH) chassis members of the vehicle.

For any other installations contact the Haldex Technical Services Department at 1-800-643-2374, Press #2.
Installation of the Stability Module (cont’d)

Position of ITCM Stability Module Assembly

If the Stability Module is to be frame mounted follow these guidelines:

The ITCM Stability Module Assembly must be mounted vertically.

Position the Assembly as high as possible in the chassis to provide protection from direct spray and other road debris. This will also protect the Assembly against high pressure cleaning and allow acceptable hose routing.

The hose connection between the reservoir and the Stability Module Port 2-1 should be as short as possible. Use nylon tubing no smaller than 1/2” in diameter and no longer than 13 feet (4 m) in length.

Torque the Port 2-1 fittings to a value of 55-70 ft.-lbs. DO NOT use teflon tape.

If the Stability Module is to be mounted to a bracket, follow these guidelines:

Additional bracket design should be as rigid as possible.

The mounting must provide an electrical connection between the ITCM Stability Module ECU and the vehicle chassis.

The mounting bracket flatness must not deviate more than .020 in (0.5 mm) from its true plane. The surface must lie between two parallel planes .020 in (0.5 mm) apart.

Secure the ITCM Stability Module using bolts, flat washers and non-corrosive self-locking nuts.

The recommended fixing screw bolt size is 5/16-18 in (M8 x 1.25) with a 13/16 in (20.5 mm) washer. Fixed with a minimum torque of 25 - 24 ft-lb (35 - 32 nm).

The ITCM Stability Module mounting bolts, washers, locking nuts, etc. must be protected from corrosion to give 200 hours salt spray resistance.

Check continuity between ITCM Stability Module mounting and the vehicle frame. Resistance (R) should be less than 5 ohms (0 < R < 5 ohms).
Connecting/Disconnecting
ITCM Stability Module to
ITCM Connection Cable.

Connect the ITCM ECU to the Stability Module with the
Haldex 4 conductor CAN Cable as shown.

Locate the locking tab “O” position.

Using a flat bladed screwdriver “P”, insert and
press in the locking tab of the plug. While
depressed, pull the plug out from the housing.

Identify Orientation

>Black body connector.

>Ensure contact pins and seal are kept clean and
free of any contamination prior to installation.
Insert fully home.
Handling Excess Cable

Excess cable must not be allowed to hang free, but must be attached to the chassis to prevent damage due to vibration and abrasion.

Cable lengths less than 40” (1 m) should be coiled into loops of 4”- 6” (100-150 mm) diameter.

Excess length which will not form a complete loop may be left to hang in partial loops having a cable bend radius of 2” (50 mm) minimum.

Cable lengths greater than 40” (1 m) should be coiled and then flattened in the center ‘B’ to produce a ‘dog bone’ shape.

The resulting loops at the end must have a minimum bend radius of 2” (50 mm). Use cable ties to fix the cable in the flattened loop shape.

Looped cables must be staggered, do not loop cables in the same place.
Plumbing Requirements

General Plumbing Information

› Actual hose sizes need to be optimized for individual trailer response time requirements
› Some hoses have defined minimum diameters and maximum lengths as defined in subsequent plumbing schematics
› All hoses to comply to recognized international standards
› Nylon tube to SAE J844, rubber hose to SAE 1402
› The referenced sizes are defined as guidelines only
› For optimum performance all hose lengths should be as short as possible

Hose Fittings

Avoid elbows as much as possible. If essential, use swept type elbow.

Inside diameter of fitting should be the same as the inside pipe diameter it is serving.

Note:
NEVER USE tape (PTFE) during the installation of the ITCM Stability Module. Warranty claims will not be accepted from tape induced faults.
Bottom View Shown. Haldex FFABS is shown, a two- or six-port ABS Relay Valve may also be used.

The Stability Module and ABS valves are plumbed into the reservoir.

The air line between Port 2 of the Stability Module and Port 4 of the ABS valve should be no longer than 80” (2 m) in total length for a 3/8” inch tube.

CAN connection and speed sensors not shown in plumbing schematics.
Plumbing Schematic
2M Stability Module Application

Bottom View of Reservoir and Valves

1 Valve is plumbed into reservoir.
2 This line should be no longer than 6.6 ft (2 m) for a 3/8" tube.
3 Installed view.

Bottom View Shown. Haldex FFABS is shown, a two- or six-port ABS Relay Valve may also be used.

The Stability Module and ABS valves are plumbed into the reservoir.

The air line between Port 2 of the Stability Module and Port 4 of the ABS valves should be no longer than 80" (2 m) in total length for a 3/8 inch tube.

The ABS configuration may be either 2S/2M Side-By-Side, 4S/2M Side-By-Side (Recommended) or 4S/2M Axle-By-Axle (Not Recommended).

CAN connection and speed sensors not shown in plumbing schematics.
Bottom View Shown. Haldex FFABS is shown, a two- or six-port ABS Relay Valve may also be used.

The Stability Module and ABS valves are plumbed into the reservoir.

The air line between Port 2 of the Stability Module and Port 4 of the ABS valves should be no longer than 80” (2 m) in total length for a 3/8” inch tube.

The ABS configuration must be 2S/1M lead axle with the 23 valve channel, 2S/2M, 21 and 22 valve channel plumbed Side-By-Side on the trailing axle.

CAN connection and speed sensors not shown in plumbing schematics.
2S/1M ABS Configuration with Stability Module (Single or Multi-Axle Trailers)

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A) should be installed on Road Side. Sensor (S1B) should be installed on Curb Side.

Make sure sensors are pushed firmly against the exciter ring.

**Note:** For dollies and single axle trailers, Haldex recommends “A8 ECU Configuration”.

**Note:** Any non-sensed axle can be utilized as a lift axle.

*Note:* The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 13 for details on the pneumatic connections of the Stability Module.

**Legend**

Air Hose Line: 

Modulator Valve:  

Stability Module:  

Speed Sensors: S1A, S1B
2S/2M ABS Side-By-Side Configuration with Stability Module (Multi-Axle Trailers)

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S2A) should be installed on Road Side.
Sensor (S2B) should be installed on Curb Side.
Modulator Valve 21 is plumbed to Road Side.
Modulator Valve 22 is plumbed to Curb Side.

Make sure sensors are pushed firmly against the exciter ring.

**Note:** Any non-sensed axle can be utilized as a lift axle.

*Note:* The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 14 for details on the pneumatic connections of the Stability Module.

**Legend**

- Air Hose Line: — — — — —
- Modulator Valve:  21  22
- Stability Module: SM
- Speed Sensors: S2A, S2B
4S/2M ABS Side-By-Side Configuration with Stability Module (Multi-Axle Trailers)

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A, S2A) should be installed on Road Side.
Sensor (S1B, S2B) should be installed on Curb Side.
Modulator Valve 21 is plumbed to Road Side.
Modulator Valve 22 is plumbed to Curb Side.

Make sure sensors are pushed firmly against the exciter ring.

**Note:** Without lift axles.

*Note:* The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 14 for details on the pneumatic connections of the Stability Module.

**Legend**

- Air Hose Line: 
- Modulator Valve: 21 22
- Stability Module: SM
- Speed Sensors: S1A, S2A, S1B, S2B

---

**STABILITY MODULE INSTALLATION/SERVICE GUIDE (L31288W)**
Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A, S2A) should be installed on Road Side. Sensor (S1B, S2B) should be installed on Curb Side. Modulator Valve 21 is plumbed to Road Side. Modulator Valve 22 is plumbed to Curb Side.

Make sure sensors are pushed firmly against the exciter ring.

Any non-sensed axle can be lifted. One sensed axle can be used as a lift axle, but not both.

**Note:** At least one axle with speed sensors has to be a non-lifting axle.

*Note:* The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 14 for details on the pneumatic connections of the Stability Module.

**Legend**

- Air Hose Line: 
- Modulator Valve: 21 22
- Stability Module: S
- Speed Sensors: S1A, S2A, S1B, S2B
4S/2M Axle-By-Axle Configuration with Stability Module (Multi-Axle Trailers)

This is a recommended configuration for spread axle applications. For Axle-By-Axle ABS configurations and Stability Module, ITCM must be configured for this application with the DIAG+ Software.

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A, S1B) should be installed on Road Side.
Sensor (S2A, S2B) should be installed on Curb Side.

Modulator Valve 21 is plumbed to the trailing axle(s).
Modulator Valve 22 is plumbed closest to the King Pin.

Make sure sensors are pushed firmly against the exciter ring.

**Note:** The A Sensors must go with the 21 Modulator Valve and the B Sensors must go with the 22 Modulator Valve.

*Note:* The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 14 for details on the pneumatic connections of the Stability Module.

---

Legend

- Air Hose Line: ———— ———— ———— ———— ———— ———— ———— ————
- Modulator Valves: 21 22
- Stability Module: SM
- Speed Sensors: S1A, S2A, S1B, S2B

---

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4S/2M Axle-By-Axle Configuration with Stability Module [Multi-Axle Trailers with Lift Axle(s)]

This is a recommended configuration for spread axle applications. For Axle-By-Axle ABS configurations and Stability Module; ITCM must be configured for this application with the DIAG+ Software.

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A, S1B) should be installed on Road Side.
Sensor (S2A, S2B) should be installed on Curb Side.
Modulator Valve 21 is plumbed to the trailing axle(s).
Modulator Valve 22 is plumbed on axles closest to the King Pin.

Make sure sensors are pushed firmly against the exciter ring.

Any non-sensed axle can be lifted. For a sensed axle lift S1B and S2B must be used.

**Note:** The A Sensors must go with the Modulator Valve and the B Sensors must go with the Modulator Valve.

**Note:** At least one axle with speed sensors has to be on a non-lift axle.

**Note:** The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 14 for details on the pneumatic connections of the Stability Module.

**Legend**

Air Hose Line: 
Modulator Valves: 21 22
Stability Module: SM
Speed Sensors: S1A, S2A, S1B, S2B
4S/3M Configuration with Stability (Full and Semi-Trailers)

This is a recommended configuration for spread axle applications. For 3M valve applications the 23-valve Control Port 4 is plumbed upstream of the Stability Module Port 4. That is the 23-valve control signal is taken off before the Stability Module.

Recommended speed sensor wheel locations are shown in the figures below.

Sensor (S1A, S2A) should be installed on Road Side. Sensor (S1B, S2B) should be installed on Curb Side.

Make sure sensors are pushed firmly against the exciter ring.

*Note: The pneumatic tube between Stability Module Port 2 and the ABS Control Port 4 for the 21 and 22 valve channels should be no longer than 80” (2 m) in total length for a 3/8-inch diameter tube. Refer to Page 15 for details on the pneumatic connections of a 3M system configuration. The 23 valve is not controlled by the Stability Module.

Legend

Air Hose Line: – – – – – –

Modulator Valves: 21, 22, 23

Stability Module: SM

Speed Sensors: S1A, S2A, S1B, S2B
Stability Module
Painting Requirements

Masked Areas

In the event of paint or coating work all unused connections, pneumatic ports and exhausts must be protected. These are indicated by the yellow shaded areas as shown. Adequate protection should be used to avoid penetration of the paint or coating. Install connectors / blanking plugs on all electrical ports. Also mask exhaust ports and connectors / locking areas before painting.

Painting recommendations: water based, baking for 1 hour @ 100°C.

Haldex recommends the ITCM Stability Module be installed on the trailer after electro-static painting.
Stability Module Programming and Diagnostics

**DIAG+ Software**

The ITCM Stability Module can be programmed using DIAG+ Software Version 6 or later. Refer to DIAG+ Software Installation/Service Manual L31287W.

Available for download at haldex.com

**Connecting ITCM Stability Module to DIAG+ Software and Infocenter Simultaneously**

A Y-splitter and extension cables are required when connecting the ITCM Stability Module to the DIAG+ Software and Infocenter simultaneously.

*Note: Some cabling details have been omitted for clarity.*
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.