

BRAKE SPECIFICATIONS

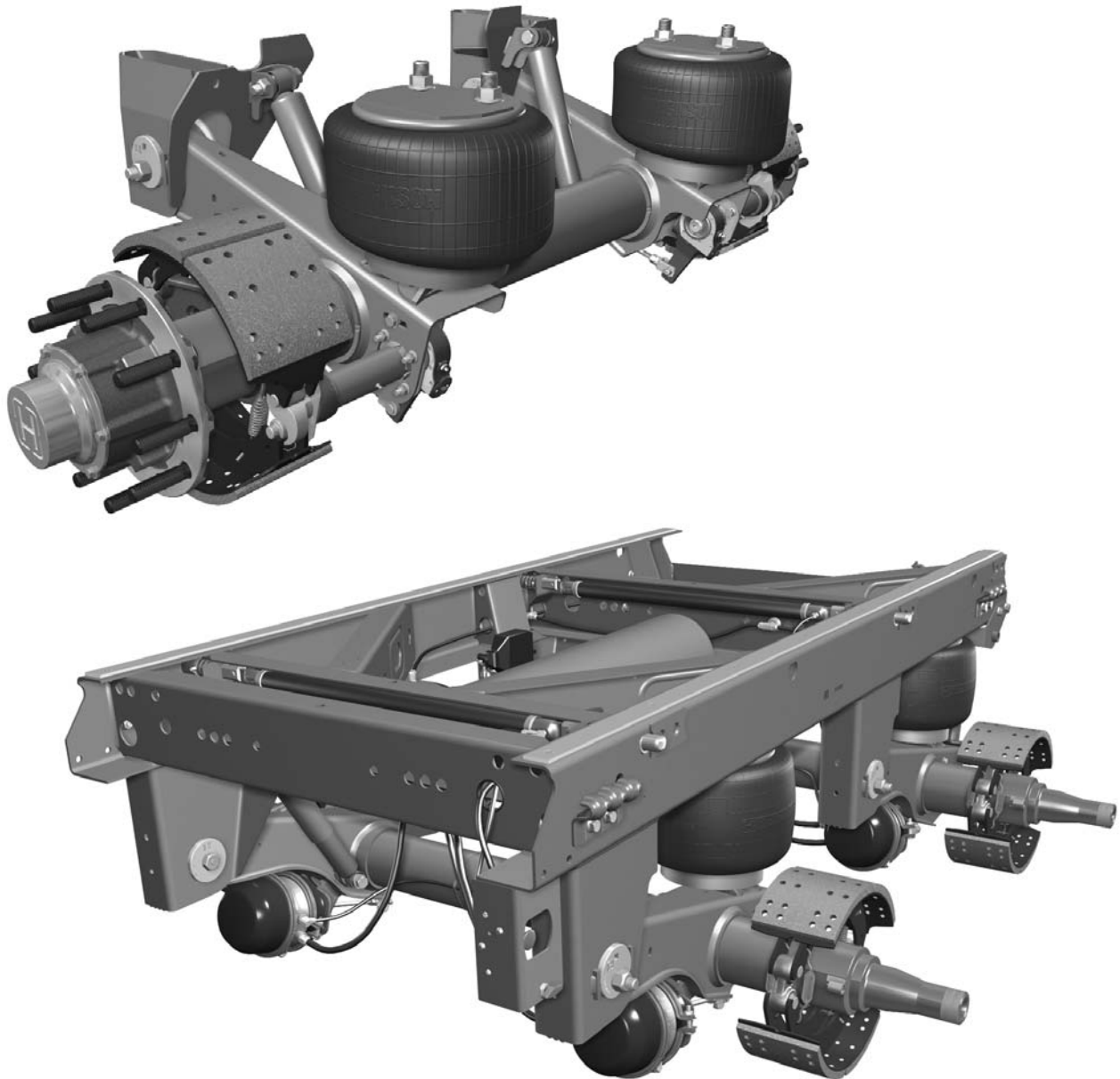
SUBJECT: Consolidated Certificate of
Compliance for Air Actuated Brakes

LIT NO: L809

DATE: May 2007

REVISION: B

Hendrickson Consolidated Certificate of Compliance for Air Actuated Brakes used on Hendrickson INTRAAX® and VANTRAAX® suspension systems in North America.





Notes Regarding Brake Certifications

Federal Motor Vehicle Standards specify that the original equipment manufacturer (OEM) is responsible for compliance to Federal Motor Vehicle Safety Standard (FMVSS)-121 for air actuated brakes. In the United States, OEMs are self-certifying to the standard. In Canada, test data must be submitted to Transport Canada either directly or indirectly through the Canadian Transport Equipment Association's (CTEA) brake database (Note - CTEA database is available to CTEA members only).

As a service to our customers, Hendrickson Trailer Suspension Systems provides this **Consolidated Certificate of Compliance** for use with Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake systems. For every entry in the table, Hendrickson has data showing compliance to FMVSS-121 requirements. As an additional service to Canadian customers who must provide parking test compliance data to Transport Canada, FMVSS/CMVSS-121 parking data is also available upon request for every table entry. This data is a part of the CTEA database. **For certifications other than those listed in these tables, please contact Hendrickson brake engineering for an application specific approval.**

Reading the tables:

BRAKE MODEL	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
<p>Entries in this column indicate the brake model, size (drum diameter x shoe width) and identifies the Friction Materials Standards Institute (FMSI) code for the brake.</p>	<p>Entries in this column indicate the lining manufacturer's name and lining formula designation.</p>	<p>Entries in this column indicate the lowest and highest Gross Axle Weight Rating (GAWR) in pounds for the given lining certification.</p> <p>The given certification is valid at any GAWR at or between the two stated values.</p>	<p>Entries in this column indicate size of the air chamber required to meet the certification for the given lining certification.</p> <p>The first number is the service chamber area (in.²).</p> <p>The second number is the Parking Chamber area # (in.²).</p> <p>Rated stroke is listed in [brackets].</p>	<p>Entries in this column indicate length of the slack adjuster in inches required to meet the certification for the given lining certification.</p> <p>Note that there may be splits between a given GAWR and the slack length necessary to meet the certification.</p>	<p>Entries in this column indicate lowest and highest static loaded radius (SLR) for the tires in inches for the given lining certification.</p> <p>Note that there may be splits between a given GAWR and the tire SLR range necessary to meet the certification.</p>

Example: (Always read across the table for valid combinations)

BRAKE MODEL	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
<p>Hendrickson 16.5" x 7" HXS® (F.M.S.I. 4707)</p>	<p>Abex 931-162</p>	17,000 - 22,000	<p>30/30 [2.5" stroke]</p>	5.5" or 6.0"	<p>17" - 20.8"</p>
		22,000 - 23,000		6.0"	

Example interpretations of the table entries:

- 16.5" x 7" HXS using Abex 931-162 at 17,000 GAWR with 30/30 chamber, 5.5" slack and 20.8" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at 20,000 GAWR with 30/30 chamber, 5.5" slack and 19.3" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at 22,000 GAWR with 30/30 chamber, 5.5" slack and 17.0" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at 22,000 GAWR with 30/30 chamber, 6.0" slack and 17.0" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at 17,000 GAWR with 30/30 chamber, 6.0" slack and 17.0" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at 23,000 GAWR with 30/30 chamber, 6.0" slack and 20.8" SLR is valid.
- 16.5" x 7" HXS using Abex 931-162 at **23,000** GAWR with 30/30 chamber, **5.5"** slack and 17.0" SLR is **invalid**.
- 16.5" x 7" HXS using Abex 931-162 at **23,000** GAWR with 30/30 chamber, **5.5"** slack and 20.8" SLR is **invalid**.



16.5" x 7" Standard Model Brake Certificate of Compliance

This table certifies that the Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake system described below complies with the current revision of DOT 49 CFR 571.121 and Canadian Motor Vehicle Safety Standards, Service Brakes, Paragraph S5.4, and Parking Brakes, Pararagraph 5.6.1, when equipped as noted. For certifications other than those listed below, please contact Hendrickson brake engineering for an application specific approval. All tests were performed on 112-pound cast drums.

BRAKE MODEL	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
Hendrickson 16.5" x 7" Standard (F.M.S.I. 4515)	Abex 3030-197	17,000 - 20,000	30/30 [2.5" stroke]	5.5" or 6.0"	17" - 20.3"
	Abex 931-162	17,000 - 22,000		5.5" or 6.0"	17" - 20.8"
		22,000 - 23,000		6.0"	
	Carlisle MB-21	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"
	Brake Pro CM18	17,000 - 22,500		5.5" or 6.0"	17" - 20.3"
				6.0"	20.3" - 20.8"
	Haldex 2015-2	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"
Haldex 2020-1	17,000 - 23,000	5.5" or 6.0"	17" - 20.8"		



16.5" x 7" HXS® Brake Certificate of Compliance

This table certifies that the Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake system described below complies with the current revision of DOT 49 CFR 571.121 and Canadian Motor Vehicle Safety Standards, Service Brakes, Paragraph S5.4, and Parking Brakes, Paragraph 5.6.1, when equipped as noted. For certifications other than those listed below, please contact Hendrickson brake engineering for an application specific approval. All test were performed on 112-pound cast drums. Heavy-duty drums are recommended for 25,000-pound applications.

BRAKE MODEL	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
Hendrickson 16.5" x 7" HXS® (F.M.S.I. 4707)	Abex 3030-197	17,000 - 20,000	30/30 [2.5" stroke]	5.5" or 6.0"	17" - 20.3"
	Abex 931-162	17,000 - 22,000		5.5" or 6.0"	17" - 20.8"
		22,000 - 23,000		6.0"	
	Hendrickson ULTRAA20™	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"
	Carlisle MB-21	17,000 - 20,000		5.5" or 6.0"	17" - 20.0"
				6.0"	20.0" - 20.3"
	Carlisle CF2000	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"
	Carlisle MB-23	20,000 - 23,000		5.5" or 6.0"	17" - 20.8"
		20,000 - 25,000		30/30 [3.0" stroke]	
	Haldex 3015	17,000 - 20,000		30/30 [2.5" stroke]	5.5" or 6.0"
Haldex 2020-1	17,000 - 23,000	30/30 [2.5" stroke]	5.5" or 6.0"	17" - 20.8"	



16.5" x 8.625" HXS® Brake Certificate of Compliance

This table certifies that the Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake system described below complies with the current revision of DOT 49 CFR 571.121 and Canadian Motor Vehicle Safety Standards, Service Brakes, Paragraph S5.4, and Parking Brakes, Paragraph 5.6.1, when equipped as noted. For certifications other than those listed below, please contact Hendrickson brake engineering for an application specific approval. All tests were performed on 123-pound cast drums.

BRAKE MODEL	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
Hendrickson 16.5" x 8.625" HXS® (F.M.S.I. 4711)	Abex 3030-197	17,000 - 20,000	30/30 [2.5" stroke]	5.5" or 6.0"	17" - 20.3"
		20,000 - 22,500		6.0"	
	Abex 931-162	17,000 - 20,000		5.5"	17" - 20.3"
		20,000 - 23,000		5.5" or 6.0"	17" - 20.8"
		23,000 - 24,000		6.0"	17" - 20.3"
		24,000 - 25,000			30/36 [2.5" stroke]
	Hendrickson ULTRAA20™	17,000 - 23,000	30/30 [2.5" stroke]	5.5" or 6.0"	17" - 20.8"
	Carlisle MB-21	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"
		20,000 - 22,500		6.0"	17" - 20.0"
	Carlisle CF2000	17,000 - 20,000		6.0"	20" - 20.3"
				5.5" or 6.0"	17" - 20.8"
	Carlisle MB-23	20,000 - 23,000		5.5" or 6.0"	17" - 20.8"
		23,000 - 25,000		6.0"	
	Haldex 3015	17,000 - 20,000		5.5" or 6.0"	17" - 20.3"



15.0" x 8.625" HXS® Brake Certificate of Compliance

This table certifies that the Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake system described below complies with the current revision of DOT 49 CFR 571.121 and Canadian Motor Vehicle Safety Standards, Service Brakes, Paragraph S5.4, and Parking Brakes, Paragraph 5.6.1, when equipped as noted. For certifications other than those listed below, please contact Hendrickson brake engineering for an application specific approval. All tests were performed using 103-pound cast drum.

BRAKE MODEL ¹	LINING	BRAKE RATING	WHEN USED WITH:		
			CHAMBER SIZE	SLACK LENGTH	TIRE SLR
Hendrickson 15.0" x 8-5/8" HXS® (F.M.S.I. 4710)	Abex 3030 - 197	13,700 - 17,000	24/24 ² [2.5" stroke]	5.5" or 6.0"	14.9" - 17.3"
		13,700 - 18,750	or 24/30 ² [2.5" stroke]	6.0"	14.9" - 17.3"
		17,000 - 20,000	30/30 [2.5" stroke]	5.5" or 6.0"	14.9" - 17.3"

1. 15" brakes are usually used with 19.5" wheel equipment. Users should review tractor brake configurations to assure correct brake balance.
2. Do not use older Type 24 service chambers rated at 1.75" stroke.



Air Disc Brake Certificate of Compliance

This table certifies that the Hendrickson INTRAAX® and VANTRAAX® suspension / axle / brake system described below complies with the current revision of DOT 49 CFR 571.121 and Canadian Motor Vehicle Safety Standards, Service Brakes, Par. S5.4 and Parking Brakes, Par. 5.6.1 when equipped as noted. For certifications other than those listed below, please contact Hendrickson brake engineering for an application specific approval.

BRAKE MODEL	BRAKE ROTOR	LINING	BRAKE RATING	WHEN USED WITH:	
				CHAMBER SIZE	TIRE SLR
Haldex DB22 Caliper	Gunite 430mm Rotor	Haldex HX-65	17,000 - 24,000	24/30	17" - 20.8"
Bendix Spicer (Knorr) ADB22X Caliper	Knorr 430mm Rotor	Jurid 539-29	17,000 - 23,000	18/24	17" - 20.8"

Important Air Disc Application Information	
1. Wheel and Valve Stem Packaging	Great care must be taken in selecting combinations of wheel and valve stem product that are compatible with air disc brakes. OEM Customers will need to review wheel-end and valve stem packaging with the selected disc brake manufacturer to confirm adequate running clearances. Hendrickson Engineering will assist customers in discussions with the disc brake manufacturer.
2. ABS Sensors	Hendrickson fully dressed air disc brake suspensions require straight ABS sensors. Depending on caliper model, ABS sensing may be via hub-mounted tone rings or rotor-mounted tone rings.
3. Air Chamber Selection and Vehicle Balance	Default air chamber selection is based on the choice of caliper brand and lining. Additional sizes are available if necessary. Trailer OEM customers are encouraged to work with end customers to review mating tractor brake specifications and determine if combined vehicle brake balance is correct for the application. Hendrickson Engineering will assist customers in discussions with the disc brake manufacturer.

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