

TECHNICAL INFORMATION

TRAILER SUSPENSION SYSTEMS DOCK SOLUTIONS

SUBJECT: Trailer Loading Dock Terms
And Solutions

LIT NO: L816

DATE: November 2017

REVISION: D

TRAILER LOADING DOCK TERMS AND ISSUES

It is important to understand dock operation issues facing the industry today. Not all trailer / dock solutions provide the same benefits. Understanding the terms, issues and solutions will help you make the right choice for your needs.

Three trailer movements must be addressed when discussing loading dock issues:

Trailer Deck Height Change

Any change of the trailer's deck height relative to the dock when the trailer is being positioned at the dock. Air suspension trailers equipped with a dump valve will lower 2.5 to 3.5 inches at the rear sill when dumped, allowing the trailer to contact and rest on its internal air spring bumpers.

Trailer Drop

A downward trailer movement that results when the forklift enters the trailer during loading and unloading.

Trailer drop does not include the trailer deck height change that occurs due to an air dump during the trailer positioning at the dock. Trailer drop can prevent a smooth transition when the forklift enters and exits the trailer.

Tire deflection will also contribute to the total vertical change as the load increases on the trailer. Tire deflection will vary depending on the type of tires. Typical tire deflection may range from 1 to 1.5 inches.

Trailers equipped with mechanical spring suspensions may drop up to 1.75 inches at the axle due to spring deflection. Air-suspension equipped trailer drop will vary depending on the suspension and option configuration. Some air-suspension equipped trailers without dump valves or deck height locking devices can drop more than 3.5 inches at the axle.

In addition to tire deflection and suspension movement, the actual downward movement measured at the rear sill of the trailer may be up to 1.4 times greater than at the axle, depending on the fore-aft position of the suspension on the trailer.

Total Vertical Change at Sill		HENDRICKSON SOLUTIONS		COMPETITOR	
		SURELOK®	Dump Valves	A with Dump valve	B
NOTE: All values are in inches	Spring Suspension				
Deck Height Change Before Loading	0	0	2.5–3.5	2.5–3.5	0
Trailer Drop During Loading	1.75	0.5–1.4	0	0	2.5–3.5
Tire Deflection	1.0–1.5	1.0–1.5	1.0–1.5	1.0–1.5	1.0–1.5
Total Vertical Change	2.75–3.25	1.5–2.9	3.5–5.0	3.5–5.0	3.5–5.0

Trailer Walk

A series of horizontal trailer movements away from the dock caused by the forklift entering the trailer during repeated loading and unloading. Trailer walk can move the trailer away from the dock, creating a gap between the trailer and the dock. Even a spring equipped trailer can exhibit walk when a heavily loaded forklift repeatedly enters the trailer with speed, stopping abruptly near the front. The abrupt stop will move the trailer away from the dock.



HENDRICKSON LOADING DOCK SOLUTIONS

Hendrickson offers solutions to meet virtually every loading dock operation. The following descriptions should help you specify the correct option for the application.

LOADING DOCK NEED #1:

Maintain the trailer deck height and minimize drop and walk during loading and unloading.

SOLUTION: SURELOK®

Features supporting legs that automatically rotate and lock into place over the suspension trailing arms when the trailer parking brakes are engaged. When the parking brakes are released, SURELOK's support legs automatically return to a neutral position.

SURELOK:

- Maintains trailer **deck height**.
- Minimizes trailer **drop** from the suspension to approximately 1 inch at the axle (trailer drop at the rear sill may be as much as 1.4 inches plus tire deflection).
- Trailer **drop** is similar to a spring suspension.
- Minimizes trailer **walk**.

SURELOK NOTES

- SURELOK adds approximately 40 pounds to the overall weight of the trailer.
- Trailer **drop** distances may be greater if the suspension ride height is not properly adjusted.
- May, in some unique loading situations, allow **walk** to occur.

LOADING DOCK NEED #2:

Trailer **walk** is an issue during loading and unloading, but maintaining **deck height** is not.

SOLUTIONS: MANUAL DUMP, AUTOMATIC DUMP OR DST®

The trailer's **deck height** will lower approximately 2.5 inches at the axle. The **deck height change** at the rear sill may be as much as 3.5 inches. Dump valves are intended to lower the trailer onto the internal air spring bumpers, limiting trailer **drop** and **walk**. If your application requires the trailer to maintain deck height, you should use SURELOK.

Manual Dump Valve

The air springs are exhausted by the driver operating a manual or electric valve.

- Does not maintain trailer **deck height** (trailer will lower 2.5 to 3.5 inches at the sill or it may experience a one-time drop up to the same amount as the forklift enters the trailer the first time).
- During loading and unloading, trailer **drop** is limited to tire deflection.
- During loading and unloading, trailer **walk** is minimized.
- Requires driver intervention.

Automatic Dump Valve

The air springs are automatically exhausted when the trailer parking brakes are set.

- Does not maintain trailer **deck height** (trailer will lower 2.5 to 3.5 inches at the sill, or it may experience a one-time drop of the same amount as the forklift enters the trailer for the first time).
- During loading and unloading, trailer **drop** is limited to tire deflection.
- During loading and unloading, trailer **walk** is minimized, but a one time horizontal move away from the dock may occur.
- Does not require driver intervention.



DST®

A patented integral HCV / Dump Valve that rapidly dumps the air springs when the trailer parking brakes are engaged. DST dumps over twice as fast as conventional automatic dump valves, and in most cases, allows the trailer to rest on the internal air spring bumpers before the trailer parking brakes are fully engaged.

- Does not maintain trailer **deck height** (trailer will lower 2.5 to 3.5 inches at the sill).
- During loading and unloading, trailer **drop** is limited to tire deflection.
- During loading and unloading, trailer **walk** is minimized.
- Does not require driver intervention.

To optimize the trailer’s loading dock performance, please refer to Hendrickson’s recommended loading dock approach procedure for trailers equipped with an automatic air suspension dump valve (Hendrickson literature number B109, available at www.Hendrickson-intl.com/TrailerLit). This B109 procedure will also ensure optimal performance on trailers equipped with DST.

If the yard truck or tractor’s service or parking brakes are already applied when the trailer parking brakes are engaged, the air-suspension trailer **deck height** will **not** lower the full 2.5 to 3.5 inches and typically **not** rest on the internal air spring bumpers. As a result, the air-suspension trailer will experience **a one-time drop and one-time horizontal move** as the forklift enters the trailer the first time.

When a trailer is properly positioned at the dock, some vertical trailer movement will exist to a varying extent no matter whether the trailer suspension is spring or air suspension equipped.

Please refer to the following chart to assist you when specifying Hendrickson dock operation options:

LOADING DOCK OPERATION BENEFITS		SURELOK®		DST®	AUTO DUMP VALVE	MANUAL DUMP VALVE
		Without Manual Dump	With Manual Bypass Dump			
Maintains deck height to within 1.5"		✓				
Allows trailer deck to lower 2.5" - 3.2" during air dump			✓	✓	✓	✓
Trailer Drop	Virtually eliminates			✓		
	Minimizes	✓	✓		✓	✓
Trailer Walk	Virtually eliminates			✓		
	Minimizes	✓	✓		✓	✓
Up to 40 pounds less weight than SURELOK				✓	✓	✓
Superior dock stability — equivalent to spring				✓		
System simplification — no driver intervention required		✓		✓	✓	

For any questions, please contact **Hendrickson Trailer Technical Services**, in the United States and Canada at 866-RIDEAIR (743-3247) or e-mail HTTS@Hendrickson-intl.com.

Call Hendrickson at **866.RIDEAIR (743.3247)** for additional information.



TRAILER COMMERCIAL VEHICLE SYSTEMS

2070 Industrial Place SE
Canton, OH 44707-2641 USA
866.RIDEAIR (743.3247)
330.489.0045 • Fax 800.696.4416

Hendrickson Canada

250 Chrysler Drive, Unit #3
Brampton, ON Canada L6S 6B6
800.668.5360
905.789.1030 • Fax 905.789.1033

Hendrickson Mexicana

Circuito El Marqués Sur #29
Parque Industrial El Marqués
Pob. El Colorado, Municipio El Marqués,
Querétaro, México C.P. 76246
+52 (442) 296.3600 • Fax +52 (442) 296.3601