TECHNICAL PROCEDURE

TRAILER SUSPENSION SYSTEMS

SUBJECT: SURELOK® Operator's Manual
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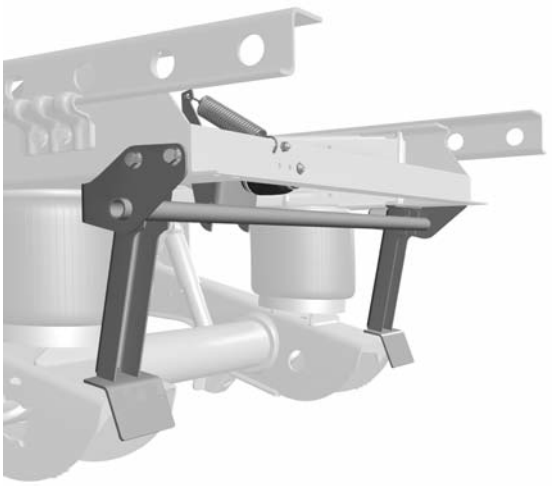

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INTRODUCTION

SURELOK® is a pneumatically-controlled trailer-support system designed to hold the trailer at a constant height and minimize the amount of trailer movement that can occur with air suspensions during loading and unloading.

SURELOK works in conjunction with the trailer parking brakes to limit both vertical ("trailer drop") and horizontal ("trailer walk") movement.

When the trailer parking brakes are applied, mechanical spring tension automatically pulls the SURELOK support arms into the engaged position above the trailer rear suspension beams (figure 1).

In some air control configurations, when the parking brakes are applied and SURELOK is initially engaged, a small gap will exist between the bottom of the SURELOK support arms and the top of the rear suspension beams as shown in figure 1. Load changes (such as a lift truck driving in and out of the trailer) cause the height control valve (HCV) to respond and attempt to maintain the trailer at a constant height. In doing so, air will exhaust through the HCV, thus lowering the trailer and incrementally closing the gap, eventually causing the SURELOK support arms to rest on top of the suspension beams. With the support arms on the suspension beams, trailer height remains constant, helping to limit both "drop" and "walk." In air control configurations where the air suspension is automatically exhausted when the parking brakes are applied and SURELOK is engaged, there will be no gap.

When loading is complete and the trailer parking brakes are released, an air actuator automatically retracts the SURELOK support arms to the disengaged position (figure 1). When the air suspension reinflates (if exhausted), the trailer can be safely transported.

Trailers can be equipped with SURELOK in one of three pneumatic configurations:

- **Typical** — SURELOK will engage automatically when the parking brake is applied and will disengage automatically when the parking brake is released. In this configuration, no provision is made to bypass SURELOK (there is no SURELOK bypass valve), and the trailer is not equipped with air suspension exhaust capability (there is no air suspension exhaust valve).
- **Manual Bypass** — A SURELOK bypass valve is required when SURELOK is used on trailers equipped with a manual air suspension exhaust valve. The SURELOK bypass valve has two operating positions: NORMAL / ON HIGHWAY and BYPASS / BY RAIL.

  The NORMAL / ON HIGHWAY position allows you to use SURELOK in the normal or typical manner (automatically with the parking brakes, as previously described in the Typical configuration).

  The BYPASS / BY RAIL position allows you to bypass SURELOK. When the valve is in the BYPASS / BY RAIL position, SURELOK is constantly

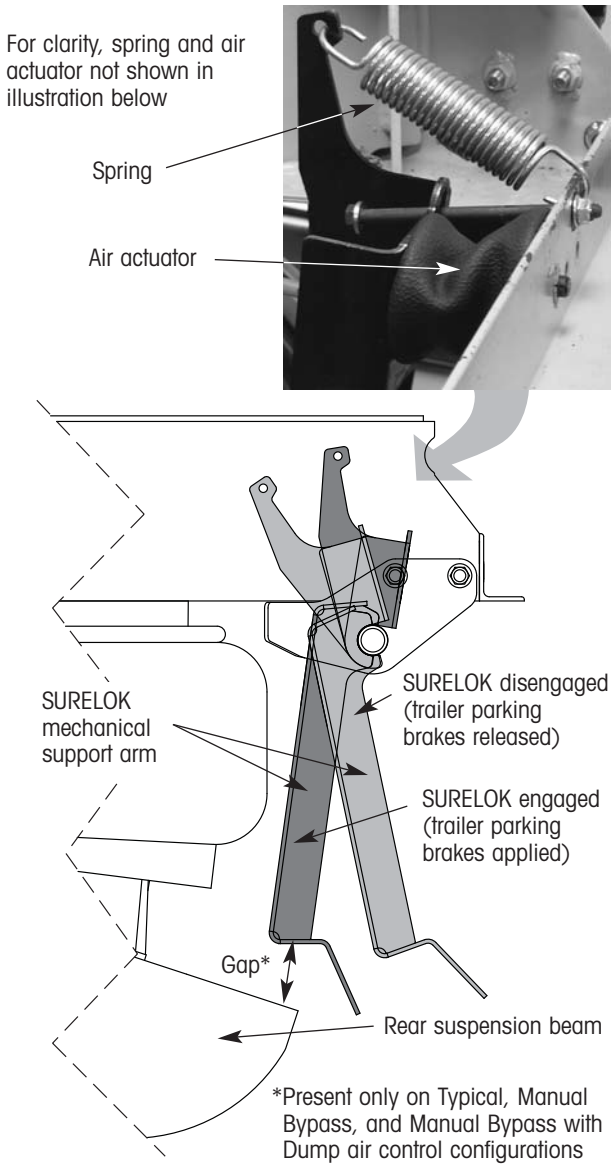

Figure 1. Position of SURELOK mechanical support arms when trailer parking brakes are applied and released

disengaged and nonfunctional, regardless of the state of the trailer parking brakes. With SURELOK® bypassed, the trailer air suspension can be exhausted onto the air-spring bumpers using a remote, separate or previously-installed manual air suspension dump valve. Exhausting the trailer air suspension is mandatory whenever the trailer will be transported via railway or by any other intermodal means.

- **Manual Bypass With Dump** — This configuration is similar to the Manual Bypass configuration except it integrates the bypass feature and air suspension exhaust capability into one convenient step. This is accomplished by combining an air pilot valve and a two-way check valve with the SURELOK bypass valve. The SURELOK bypass valve has two operating positions: NORMAL / ON HIGHWAY and BYPASS & DUMP / BY RAIL.

  The NORMAL / ON HIGHWAY position allows you to use SURELOK in the normal or typical manner (automatically with the parking brakes, as previously described in the Typical configuration).

  The BYPASS & DUMP / BY RAIL position bypasses SURELOK, disengages the SURELOK support arms and exhausts the trailer air suspension onto the air spring bumpers in one simple step. When the valve is in the BYPASS & DUMP / BY RAIL position, SURELOK is constantly disengaged and nonfunctional, regardless of the state of the trailer parking brakes. Exhausting the trailer air suspension is mandatory whenever the trailer will be transported via railway or by any other intermodal means.

NOTE: Along with the operating instructions described in this document, drivers should adhere to local, state and federal regulations when docking a trailer. For example, if dock restraint systems are not used, trailers must be properly chocked to prevent movement as required in OSHA standards 29 CFR 1910.178(k)(1) and 29 CFR 1910.178(m)(7).

The rest of this document describes operating instructions for each SURELOK pneumatic configuration.

SURELOK AIR CONTROL KIT	TRAILER		SURELOK® SUPPORT ARMS			SUSPENSION AIR SPRINGS					SURELOK ACTUATOR	
	PARKING BRAKE STATUS	SURELOK BYPASS VALVE POSITION	ENGAGED INITIALLY WITH GAP	ENGAGED WITHOUT GAP	DISENGAGED	REMAIN INFLATED	MUST BE MANUALLY EXHAUSTED	MUST BE MANUALLY INFLATED	ARE AUTOMATICALLY EXHAUSTED	ARE AUTOMATICALLY INFLATED	AIR APPLIED	AIR EXHAUSTED
Typical	Applied	n/a	✔[1]	✔[1]		✔						✔
	Released	n/a			✔	✔					✔	
Manual Bypass	Applied	Normal / On Highway	✔[1]	✔[1]		✔[4]						✔
		Bypass / By Rail			✔	✔[4]	✔[2]				✔	
	Released	Normal / On Highway			✔	✔[4]		✔[5]			✔	
		Bypass / By Rail			✔	✔[4]					✔	
Manual Bypass with Dump	Applied	Normal / On Highway	✔[1]	✔[1]		✔[4]						✔
		Bypass & Dump / By Rail			✔				✔[3]		✔	
	Released	Normal / On Highway			✔	✔[4]				✔[6]	✔	
		Bypass & Dump / By Rail			✔						✔	

Table 1. SURELOK air control configuration comparison

[1] When the parking brakes are applied and SURELOK is initially engaged, a small gap will exist between the bottom of the SURELOK support arms and the top of the rear suspension beams as shown in figure 1. Load changes (such as a lift truck driving in and out of the trailer) will cause the height control valve (HCV) to respond and attempt to maintain the trailer at a constant height. In doing so, air will exhaust through the HCV, thus incrementally lowering the trailer and closing the gap, eventually causing the SURELOK support arms to rest on the suspension beams and fully support the suspension. This is the reason why the SURELOK support arms are shown in the table above as both "engaged initially with gap" and "engaged without gap" for the Typical, Manual Bypass, and Manual Bypass with Dump air control configurations.

[2] In a two step process, the operator uses the SURELOK bypass valve to bypass SURELOK (step 1), then uses a separate, remote or previously-installed manual air suspension dump valve (not included in the Manual Bypass air control kit) to manually exhaust the suspension air springs (step 2).

[3] In a single step, the operator uses the SURELOK bypass valve to simultaneously bypass SURELOK and exhaust the suspension air springs.

[4] The suspension air springs will remain inflated unless the trailer air system is exhausted by the operator.

[5] In a two step process, the operator closes the manual air suspension dump valve to allow the suspension air springs to reinflate (step 1), then turns the SURELOK bypass valve to NORMAL / ON HIGHWAY to return SURELOK to typical operation (step 2).

[6] In a single step, the operator turns the SURELOK bypass valve to NORMAL / ON HIGHWAY to simultaneously allow the suspension air springs to reinflate and to return SURELOK to typical operation.

TYPICAL CONFIGURATION

SURELOK® engages and disengages automatically with the trailer parking brakes.

ENGAGING SURELOK

1. Apply the trailer parking brakes and chock the trailer wheels. SURELOK will automatically engage when the trailer parking brakes are applied.

2. Visually check to ensure that both SURELOK arms are in the engaged position (i.e., the SURELOK arms must be positioned directly above the rear suspension beams as shown in figure 2).

NOTE: A gap will remain between the bottom of the SURELOK support arms and the top of the suspension beams until the trailer load is increased enough to lower the support arms onto the beams.

NOTE: If SURELOK will not engage, refer to the TROUBLESHOOTING section of this manual.

⚠**WARNING: STAY CLEAR OF THE TRAILER WHEN SURELOK IS IN OPERATION. MOVEMENT OF SUSPENSION PARTS MAY RESULT IN PERSONAL INJURY.**

⚠**CAUTION Never operate a trailer with SURELOK engaged. Damage to the suspension, trailer, and / or cargo may occur.**

When fully engaged, SURELOK will maintain the trailer at a constant height, allowing safe and confident loading and unloading.

DISENGAGING SURELOK

1. Remove the trailer wheel chocks and release the trailer parking brakes. SURELOK will automatically disengage when the trailer parking brakes are released.

2. Visually check to ensure that both SURELOK arms are in the disengaged position (i.e., the SURELOK arms must be retracted from and clear of the rear suspension beams as shown in figure 3).

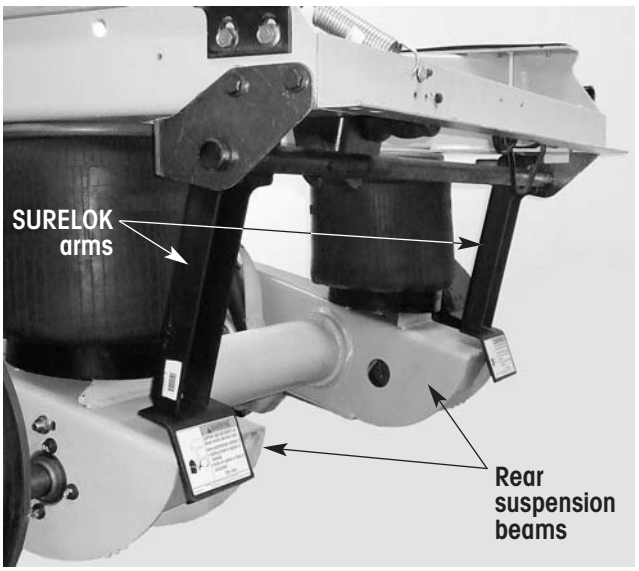

Figure 2. SURELOK engaged

⚠**WARNING: NEVER WORK ON SURELOK WHILE IT IS IN THE DISENGAGED POSITION. SUDDEN OR ACCIDENTAL ENGAGEMENT MAY RESULT IN PERSONAL INJURY.**

NOTE: If SURELOK will not disengage, refer to the TROUBLESHOOTING section of this manual.

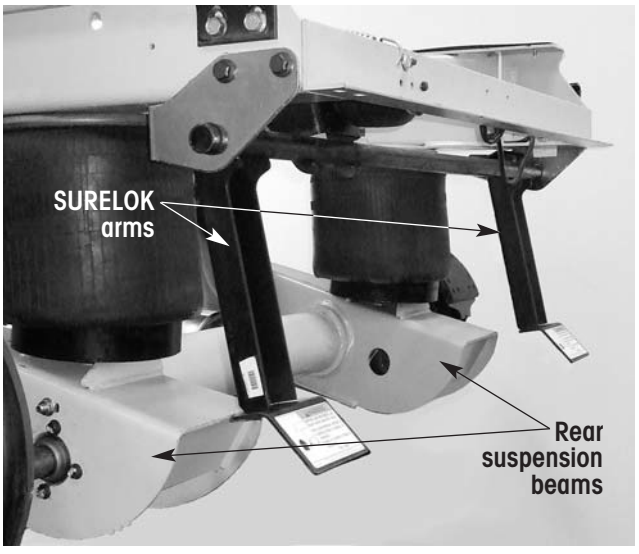

Figure 3. SURELOK disengaged

MANUAL BYPASS CONFIGURATION

On trailers that have manual air suspension exhaust capability, SURELOK® must be bypassed before the trailer air suspension is exhausted. This is accomplished with the SURELOK bypass valve (figure 4).

The SURELOK bypass valve has two operating positions: NORMAL / ON HIGHWAY and BYPASS / BY RAIL.

When the SURELOK bypass valve is in the NORMAL / ON HIGHWAY position, SURELOK engages and disengages automatically with the trailer parking brakes as normally intended for loading dock use.

When the valve is in the BYPASS / BY RAIL position, SURELOK is disengaged and nonfunctional (essentially bypassed). With SURELOK bypassed, the trailer air suspension can be exhausted by opening a separate, remote or previously-installed manual air suspension dump valve.

TYPICAL SURELOK OPERATION (SURELOK BYPASS VALVE IN NORMAL / ON HIGHWAY POSITION)

ENGAGING SURELOK

1. Apply the trailer parking brakes and chock the trailer wheels. SURELOK will automatically engage when the trailer parking brakes are applied.

2. Visually check to ensure that both SURELOK arms are in the engaged position (i.e., the SURELOK arms must be positioned directly above the rear suspension beams as shown in figure 2).

NOTE: A gap will remain between the bottom of the SURELOK support arms and the top of the suspension beams until the trailer load is increased enough to lower the support arms onto the beams.

NOTE: If SURELOK will not engage, refer to the TROUBLESHOOTING section of this manual.

⚠**WARNING: STAY CLEAR OF THE TRAILER WHEN SURELOK IS IN OPERATION. MOVEMENT OF SUSPENSION PARTS MAY RESULT IN PERSONAL INJURY.**

⚠**CAUTION Never operate a trailer with SURELOK engaged. Damage to the suspension, trailer and / or cargo may occur.**

When fully engaged, SURELOK will maintain the trailer at a constant height, allowing safe and confident loading and unloading.

DISENGAGING SURELOK

1. Remove the trailer wheel chocks and release the trailer parking brakes. SURELOK will automatically disengage when the trailer parking brakes are released.

2. Visually check to ensure that both SURELOK arms are in the disengaged position (i.e., the SURELOK arms must be retracted from and clear of the rear suspension beams as shown in figure 3).

⚠**WARNING: NEVER WORK ON SURELOK WHILE IT IS IN THE DISENGAGED POSITION. SUDDEN OR ACCIDENTAL ENGAGEMENT MAY RESULT IN PERSONAL INJURY.**

NOTE: If SURELOK will not disengage, refer to the TROUBLESHOOTING section of this manual.

BYPASSING SURELOK (SURELOK BYPASS VALVE IN BYPASS / BY RAIL POSITION)

Whenever the trailer will be transported via railway or by any other intermodal means, SURELOK must be bypassed and the trailer air suspension exhausted. Failure to do so may result in damage to the suspension, trailer and / or cargo. Follow this procedure to exhaust a SURELOK-equipped trailer air suspension using a separate, remote or previously-installed manual air suspension dump valve:

BYPASSING SURELOK

1. Apply the trailer parking brakes and chock the trailer wheels. SURELOK will automatically engage when the trailer parking brakes are applied.

2. Turn the SURELOK bypass valve to the BYPASS / BY RAIL position (figure 4). SURELOK disengages and becomes nonfunctional.

3. Visually check to ensure that both SURELOK arms are in the disengaged position (i.e., the

Figure 4. Bypassing SURELOK, prior to exhausting air suspension

SURELOK® arms must be retracted from and clear of the rear suspension beams as shown in figure 3).

EXHAUSTING THE AIR SUSPENSION

With SURELOK bypassed, the trailer air suspension can be exhausted by opening a separate, remote or previously-installed manual air suspension dump valve.

IMPORTANT: Exhausting the trailer air suspension is mandatory whenever the trailer will be transported via railway or by any other intermodal means.

INFLATING THE AIR SUSPENSION

After completing the task that required the trailer air suspension to be exhausted, close the manual air suspension dump valve (not included with SURELOK) so the air suspension can be reinflated.

RETURNING SURELOK TO NORMAL OPERATION

1. Turn the SURELOK bypass valve to the NORMAL / ON HIGHWAY position (figure 5). SURELOK engages and resumes automatic operation in tandem with the trailer parking brakes (SURELOK will disengage when the trailer parking brakes are released).

2. Remove the trailer wheel chocks.

Figure 5. Returning SURELOK to normal operation

MANUAL BYPASS WITH DUMP CONFIGURATION

Whenever the trailer will be transported via railway or by any other intermodal means, SURELOK must be bypassed, the SURELOK support arms must be disengaged, and the trailer air suspension must be exhausted. Failure to do so may result in damage to the suspension, trailer and/or cargo. The combination manual bypass with dump configuration allows you to simultaneously bypass SURELOK, disengage the SURELOK support arms and exhaust the air suspension in one convenient step.

TYPICAL SURELOK OPERATION (SURELOK BYPASS VALVE IN NORMAL / ON HIGHWAY POSITION)

ENGAGING SURELOK

1. Apply the trailer parking brakes and chock the trailer wheels. SURELOK will automatically engage when the trailer parking brakes are applied.

2. Visually check to ensure that both SURELOK arms are in the engaged position (i.e., the SURELOK arms must be positioned directly above the rear suspension beams as shown in figure 2).

NOTE: A gap will remain between the bottom of the SURELOK support arms and the top of the suspension beams until the trailer load is increased enough to lower the support arms onto the beams.

NOTE: If SURELOK will not engage, refer to the TROUBLESHOOTING section of this manual.

⚠WARNING: STAY CLEAR OF THE TRAILER WHEN SURELOK IS IN OPERATION. MOVEMENT OF SUSPENSION PARTS MAY RESULT IN PERSONAL INJURY.

⚠CAUTION Never operate a trailer with SURELOK engaged. Damage to the suspension, trailer and/or cargo may occur.

When fully engaged, SURELOK will maintain the trailer at a constant height, allowing safe and confident loading and unloading.

DISENGAGING SURELOK®

1. Remove the trailer wheel chocks and release the trailer parking brakes. SURELOK will automatically disengage when the trailer parking brakes are released.

2. Visually check to ensure that both SURELOK arms are in the disengaged position (i.e., the SURELOK arms must be retracted from and clear of the rear suspension beams as shown in figure 3).

   WARNING: NEVER WORK ON SURELOK WHILE IT IS IN THE DISENGAGED POSITION. SUDDEN OR ACCIDENTAL ENGAGEMENT MAY RESULT IN PERSONAL INJURY.

NOTE: If SURELOK will not disengage, refer to the TROUBLESHOOTING section of this manual.

BYPASSING SURELOK AND EXHAUSTING THE SUSPENSION (SURELOK BYPASS VALVE IN BYPASS & DUMP / BY RAIL POSITION)

Whenever the trailer will be transported via railway or by any other intermodal means, SURELOK must be bypassed and the trailer air suspension exhausted. Failure to do so may result in damage to the suspension, trailer and / or cargo. Follow this procedure to exhaust a SURELOK-equipped trailer air suspension using the SURELOK bypass valve:

BYPASSING SURELOK AND EXHAUSTING THE AIR SUSPENSION

1. Chock the trailer wheels and apply the trailer parking brakes. SURELOK will automatically engage when the trailer parking brakes are applied.

2. Turn the SURELOK bypass valve to the BYPASS & DUMP / BY RAIL position (figure 6). The trailer air suspension will exhaust while SURELOK simultaneously disengages and becomes nonfunctional.

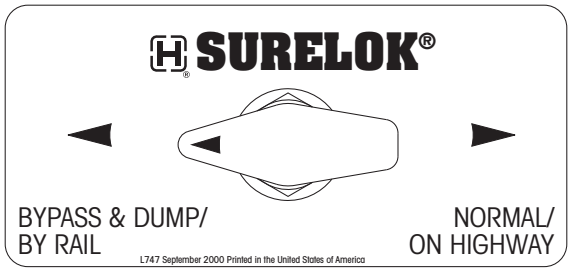

Figure 6. Bypassing SURELOK and exhausting the air suspension

3. Visually check to ensure that both SURELOK arms are in the disengaged position (i.e., the SURELOK arms must be retracted from and clear of the rear suspension beams as shown in figure 3). If SURELOK does not disengage, continue with step 4.

4. Return the ball valve to the NORMAL / ON HIGHWAY position (figure 7) and release the trailer parking brakes. This will inflate the trailer air suspension, which relieves the weight on the SURELOK support arms and allows SURELOK to disengage. With SURELOK disengaged, repeat steps 1 through 3.

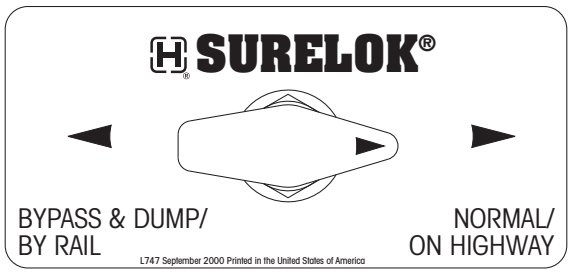

Figure 7. Reinflating the suspension

INFLATING THE AIR SUSPENSION AND RETURNING SURELOK TO NORMAL OPERATION

1. Turn the ball valve to the NORMAL / ON HIGHWAY position (figure 7). The trailer air suspension automatically inflates and SURELOK engages and resumes automatic operation in tandem with the trailer parking brakes (SURELOK will disengage when the trailer parking brakes are released).

2. Remove trailer wheel chocks.

TROUBLESHOOTING

⚠WARNING: APPLY THE TRAILER PARKING BRAKES AND CHOCK THE TRAILER WHEELS PRIOR TO ATTEMPTING ANY CORRECTIVE ACTIONS.

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
SURELOK® does not engage	Bypass valve in the BYPASS / BY RAIL position or ball valve in the BYPASS & DUMP / BY RAIL position	Turn the bypass or ball valve to the NORMAL / ON HIGHWAY position
	Return spring is broken	Inspect and replace the return spring
	Ride height is set too low	Adjust to the proper ride height[1]
	Debris (mud, ice, snow, etc.) on rear suspension beam or SURELOK arm	Remove debris[2]
	SURELOK arms bent or broken	Replace SURELOK assembly
	Cargo load too heavy	Move or transfer cargo load
	Manual air suspension dump valve (if equipped) is open	Close manual air suspension dump valve[3] (if equipped)
SURELOK does not retract	Parking brakes not released	Release parking brakes
	Air line flow restricted	Replace air line
	Cargo load too heavy	Move or transfer cargo load
	Air spring actuator leaking or defective	Replace air spring actuator
	SURELOK installed incorrectly	Correctly reinstall SURELOK
	SURELOK arms bent or broken	Replace SURELOK assembly
	Bolt and nut used to limit air spring actuator travel too tight	Loosen the flanged nut so that only two threads of the bolt are visible beyond the nut

[1] Refer to Hendrickson Trailer Suspension Systems publication L388, *Ride Height Settings* and L459, *Checking Trailer Ride Height* for proper ride height settings and adjustment procedure.

[2] Cycle parking brakes or manually remove the debris using proper safety procedures.

[3] SURELOK must be disengaged whenever a manual air suspension dump valve is used to lower the overall height of the trailer. Improper use of a manual air suspension dump valve may cause damage to suspension parts.

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