

H[®] TECHNICAL PROCEDURE

HLK SERIES

SUBJECT: HLK Installation Procedure

LIT NO: H605

DATE: June 2001

REVISION: A

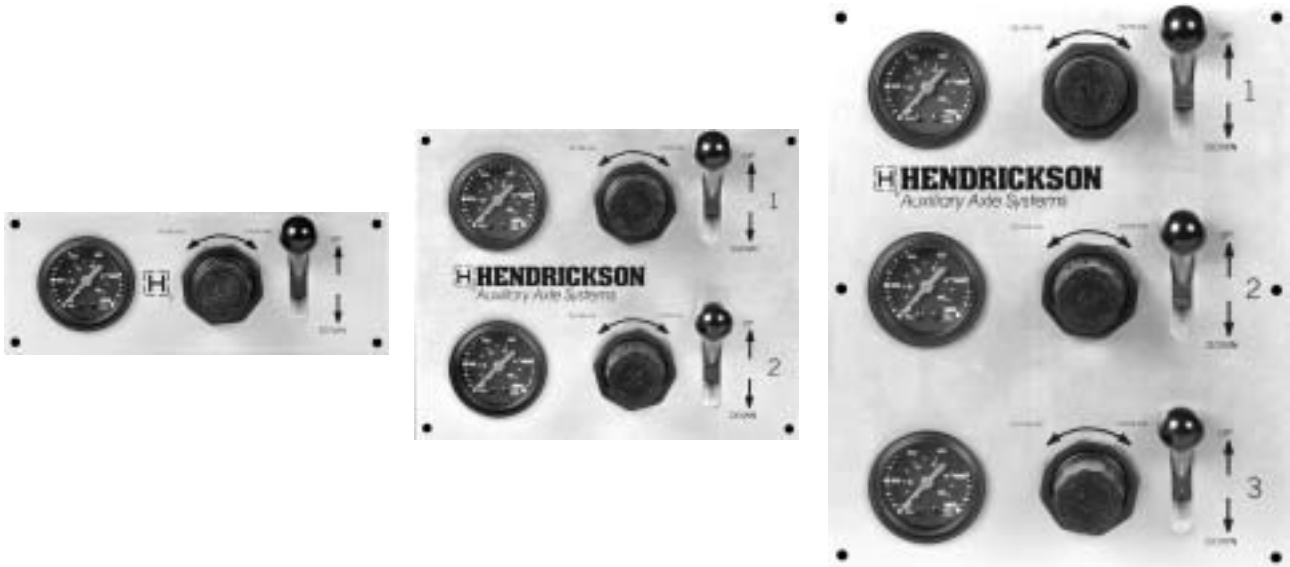


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AIR KIT PURPOSE/FUNCTION

(Italicized words may be referenced in the glossary)

Many types of vehicles use Hendrickson *auxiliary axles*: dump trucks, cement mixers, over-the-road tractors, and trailers. Auxiliary axles are required by federal and state regulations to distribute a vehicle's load over a large span of the road, in an effort to prolong the life of the road surface.

In order to control the position of the auxiliary axle, an air kit is required. An air kit allows the auxiliary axle to be lifted into the "UP" position, as well as lowered in the "DOWN" position and controlled based on the load you are hauling.

Hendrickson air kits are used world-wide, in all facets of the trucking industry. At Hendrickson, we have developed and refined our new generation air kit product offering to provide the operation you expect and the quality you deserve. The versatility of the new generation air kit allows you the customer, to purchase an air kit that is suited to your individual applications, for your individual needs.

HOW DOES A HENDRICKSON AIR KIT WORK?

Most of the vehicles using auxiliary axles, utilize an air brake system. Hendrickson air kits utilize the air normally maintained in the vehicle's air brake system, to lift and lower the auxiliary axle when you desire.

THE LIFT MODE

When you are operating your vehicle without a load, a steerable or non-steerable auxiliary axle needs to be lifted into the "UP" position. When you flip the toggle switch into the lift position, the Hendrickson air kit will lift the auxiliary axle with direct line pressure (normally 120 psi). This is accomplished through the toggle valve delivering of line pressure through the *control panel* and into the auxiliary *lift springs*. Utilizing direct line pressure ensures that the suspension is maintained in the "UP" position, even in rough terrain.

Steerable suspensions have an additional air kit requirement. Due to the positive caster angle built into Hendrickson steerable auxiliary axles, our air kits designed for steerable applications will automatically lift the auxiliary axle while you drive in reverse, unless a reverse locking option is specified. When utilizing reverse locking option, the air kit will automatically engage the locking feature when the vehicle is operated in reverse gear. Additionally, if a reverse castering suspension is employed, the air kit will automatically change caster orientation as the vehicle alternates between forward and reverse gears.

THE RIDE MODE

Hendrickson air kits also allow you to direct regulated pressure (0-120 psi) through the control panel and into the auxiliary axle *ride springs*. Since suspension capacity, load distribution and bridge laws command the flexibility in distributing load, the versatility of the air *regulator* allows you to meet the needs of your application, while also meeting the load distribution laws in your area of operation.



TYPES OF AIR KITS AVAILABLE FROM HENDRICKSON

Since your auxiliary axles have individual lifting requirements, you need an air kit that caters to your needs. Hendrickson’s new generation air kits have been engineered to provide the response that you need, for your application. Below are the air kit model numbers which correspond to the Hendrickson suspension you are using:

BASIC AIR KITS FOR STEERABLE SUSPENSIONS

HAUX MODEL AXLE	BASIC AIR KIT MODEL NUMBER			
	INSIDE MOUNT			OUTSIDE MOUNT
	SINGLE	DUAL	TRIPLE	SINGLE
HLP/HLPS/ HLUH-2/HLUS-2	HLK-SSI	HLK-SDI	HLK-STI	HLK-SSO
HLP/HLPS/ HLUH-2/HLUS-2 w/locking option	HLK-RSI	HLK-RDI	HLK-RTI	HLK-RSO
HLUR-2	HLK-ASI	HLK-ADI	HLK-ATI	HLK-ASO

BASIC AIR KITS FOR NON-STEERABLE SUSPENSIONS

HAUX MODEL AXLE	BASIC AIR KIT MODEL NUMBER		
	INSIDE MOUNT		OUTSIDE MOUNT
	SINGLE	DUAL	SINGLE
HLM/HLN/ HLQ/HLR	HLK-NSI	HLK-NDI	HLK-NSO

OPTIONAL AVAILABLE COMPONENTS

The Hendrickson air kits listed above will allow you to lift and lower your suspension as desired. Each comes complete with two *quick release valves* for rapid ride spring exhausting and a *pressure protection valve* to protect your air brake system.

In addition to the BASIC Hendrickson air kits listed above, the following options will facilitate or enhance the installation and the operation of your air kit:

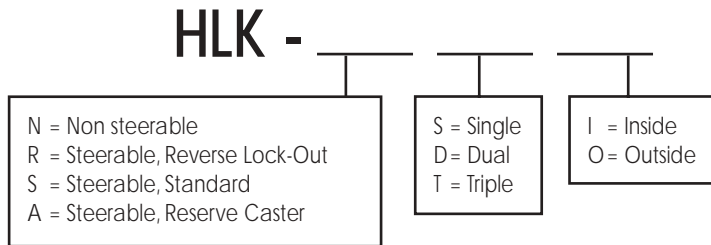
brake deactivation valve A pilot valve used to allow auxiliary axle brakes to normally apply when the suspension is in the “DOWN” position. However, when the auxiliary axle is in the “UP” position, the brakes are released to eliminate hang-ups during high centering, as well as conserve system air pressure.

console box A console box designed to accompany the single, dual, triple and quad inside mount air kits. These boxes are made of steel and contain the tapped holes to mate with the control panel. They are 20” deep for between the seat installation placement, and can be trimmed to any height for convenient operation.



The following grid will allow you to select the BASIC air kit you need for your application. Additional air kit items are listed to the right and may be ordered as separate line items.

AIR KIT PART NO. GUIDE



BASIC AIR KIT MODEL NUMBER

(Basic air kit models include two 004348 quick release valves and an A-1128 pressure protection valve.)

STEERABLE VERSIONS

Inside-the-cab

HLK-SSI	Single - Standard
HLK-SDI	Dual - Standard
HLK-STI	Triple - Standard
HLK-RSI	Single - Reverse Locking
HLK-RDI	Dual - Reverse Locking
HLK-RTI	Triple - Reverse Locking
HLK-ASI	Single - Reverse Caster
HLK-ADI	Dual - Reverse Caster
HLK-ATI	Triple - Reverse Caster

Outside-the-cab

HLK-SSO	Single - Standard contained in a box
HLK-RSO	Single - Reverse locking contained in a box
HLK-ASO	Single - Reverse Caster contained in a box

NONSTEERABLE VERSIONS

Inside-the-cab

HLK-NSI	Single - Standard
HLK-NDI	Dual - Standard

Outside-the-cab

HLK-NSO	Single - Standard contained in a box
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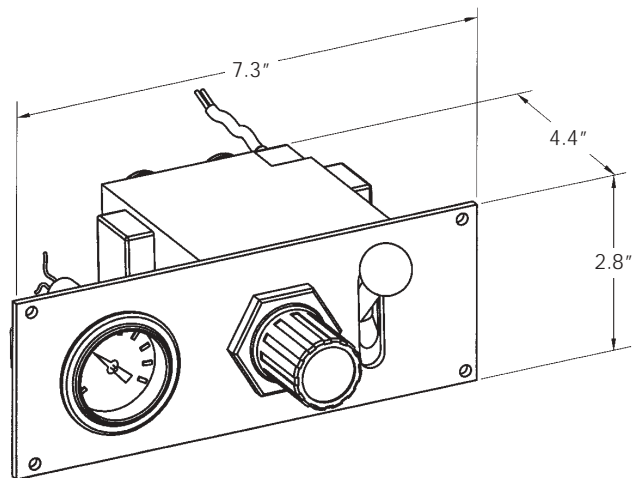
OPTIONAL AIR KIT COMPONENTS

CENTER MOUNTING CONSOLE BOXES

Single Control	004349
Dual Control	004350
Triple Control	004351
Quad Control (used w/ 2 dual panels)	004352

BRAKE DEACTIVATION VALVE

Standard Pilot Valve	001994
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INSTALLATION INSTRUCTIONS


1. Follow installation diagram for the air control you have.
2. Connect the gage light red wire to a power source that turns on with the running lights circuit.
3. Connect the gage light black wire to a good vehicle ground.
4. Connect solenoid white wire to a power source that is on only with the backup lights.
5. Connect solenoid brown wire to a good vehicle ground.
 - Blue fittings connect to the lift springs
 - Red fittings connect to the ride springs.
 - Yellow fittings connect to the exhaust ports.
 - Green fittings connect to the supply tank.
 - Violet fittings connect the auxiliary components.


INSTALLATION TIPS

1. Use only air brake tubes that conform to S.A.E. J844.
2. Ensure all tubes are free from kinks.
3. Ensure that the minimum bend radii are achieved on all tubes prior to assembly.
Recommended minimum radii:
 - 1/4" Tube – 1,000 inches
 - 3/8" Tube – 1,500 inches
4. Use only dedicated tube cutters when preparing tube ends for insertion into push-in fittings.
5. Ensure tube ends are square, free from all damage and clean.
6. Ensure tube is fully inserted into fittings (tube ends are pushed past both the grip ring and sealing O-ring).
7. Ensure that when panels are fitted, there is enough free length of tube to ensure the tube in the fittings is not under any tension.
8. Crimp wires for all electrical connections into the spade terminal provided using an appropriate crimp tool.
9. Ensure there is sufficient free electrical cable to prevent wires and connections from being under tension.

FREQUENTLY ASKED QUESTIONS

1. HOW DO I PLUMB MY HENDRICKSON AIR KIT?

 The pages that follow contain the recommended plumbing for Hendrickson Auxiliary Axle Systems' air kits. If you have any questions regarding optional plumbing methods, please contact our technical service department at (800) 660-2843.

 Please note that all brake plumbing installations must adhere to FMVSS-121 regulations. Modification to a vehicle's pneumatic system may alter its compliance to FMVSS-121 regulations.

2. WHERE DO I INSTALL MY HENDRICKSON AIR KIT CONTROL PANEL?

The Hendrickson air kit product line is available for inside-the-cab and outside-the-cab mounting. Your particular application will be dictated by regulations in your state(s) of operation.

3. CAN I PLUMB MY AIR KIT IN-LINE WITH MY RIDE HEIGHT CONTROL VALVE?

This type of plumbing is not recommended for auxiliary axle applications due to differences in load variation requirements, suspension geometry and air spring characteristics.

4. WHAT PRESSURE SHOULD THE REGULATOR BE SET AT?

All new suspension and air control installations should be verified at a certified scale to determine correct air pressures for a particular vehicle loading. An average performance chart for each suspension is in the owners manual (H642).

 Improper vehicle loading can cause handling irregularities.



INSTRUCTIONS FOR SUSPENSION OPERATION

USING INSIDE OR OUTSIDE MOUNTED HLK AIR CONTROL KITS

Raising Your Lift Axle

1. If vehicle is already running, please proceed to #6.
2. Set parking brake of truck.
3. Turn your vehicle ignition to on position.
4. Press start switch and release when engine is started.
5. Allow truck to idle until the air pressure has reached compressor cut-out pressure (usually 120 psi).
6. If controls are inside mounted, move the Hendrickson air control panel's lever to the up position.

⚠ WARNING! Do not raise or lower your lift axle if truck is moving in excess of 15 mph. Assure area surrounding lift axle is clear of any obstructions.

7. If controls are **outside mounted**, assure vehicle is stopped and parking brake is set. Exit vehicle, go to air control enclosure and open it. Move the control valve's lever to the up position.
8. Visually confirm that the axle is lifting.

⚠ NOTE: Air pressure may drop during suspension lifting process.

9. Axle should be completely lifted when truck's air pressure returns to the air compressor cut-out point (usually 120 psi).
10. Be sure to raise the lift axle when not in use.

Lowering Your Lift Axle

1. If vehicle is already running, please proceed to #6.
2. Set parking brake of truck.
3. Turn your vehicle ignition to on position.
4. Press start switch and release when engine has started.
5. Allow truck to idle until the air pressure has reached compressor cut-out (usually 120 psi).
6. If controls are inside mounted, move the control valve's lever to DOWN position.

⚠ WARNING! Do not raise or lower your lift axle if truck is moving in excess of 15 mph. Assure area surrounding lift axle is clear of any obstructions.

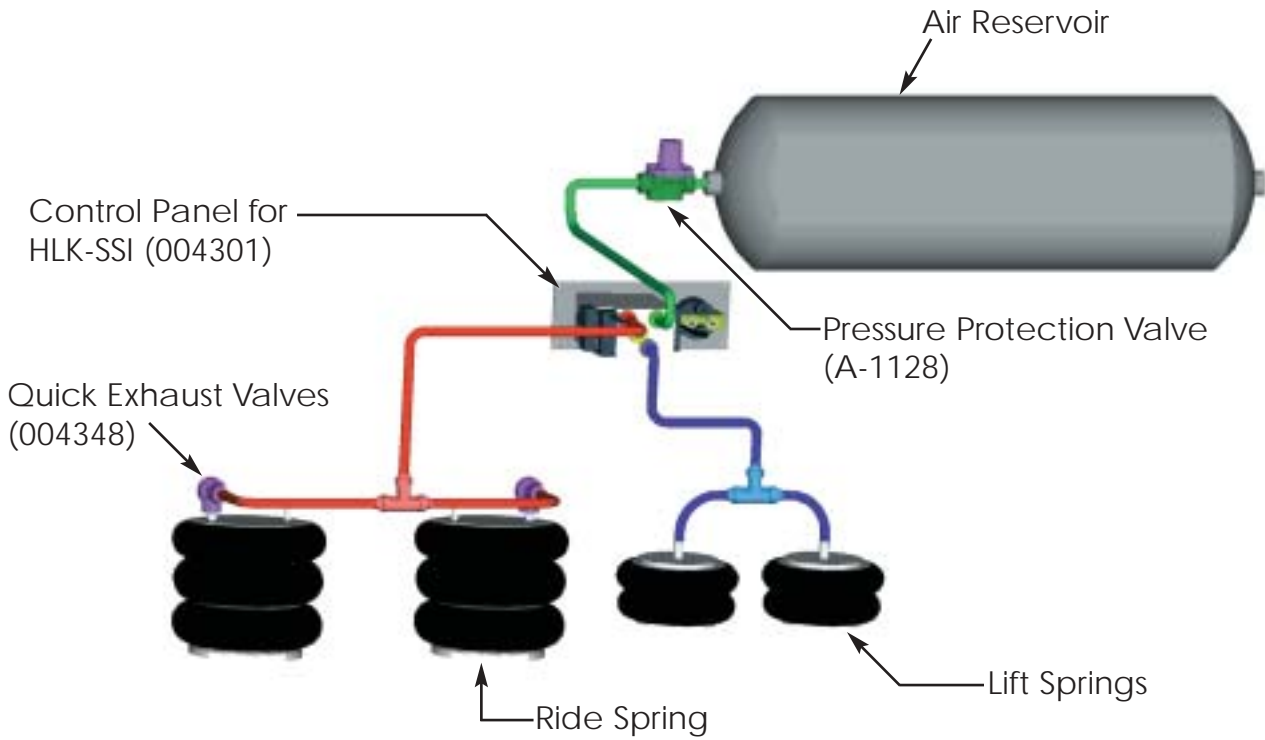
7. If controls are **outside mounted**, assure vehicle is stopped and parking brake is set. Exit vehicle, go to air control enclosure and open it. Move the control valve's lever to the down position.

8. Using the regulator, adjust air pressure on gauge to appropriate air pressure for vehicle load conditions. See performance charts in the owners manual (H 642).

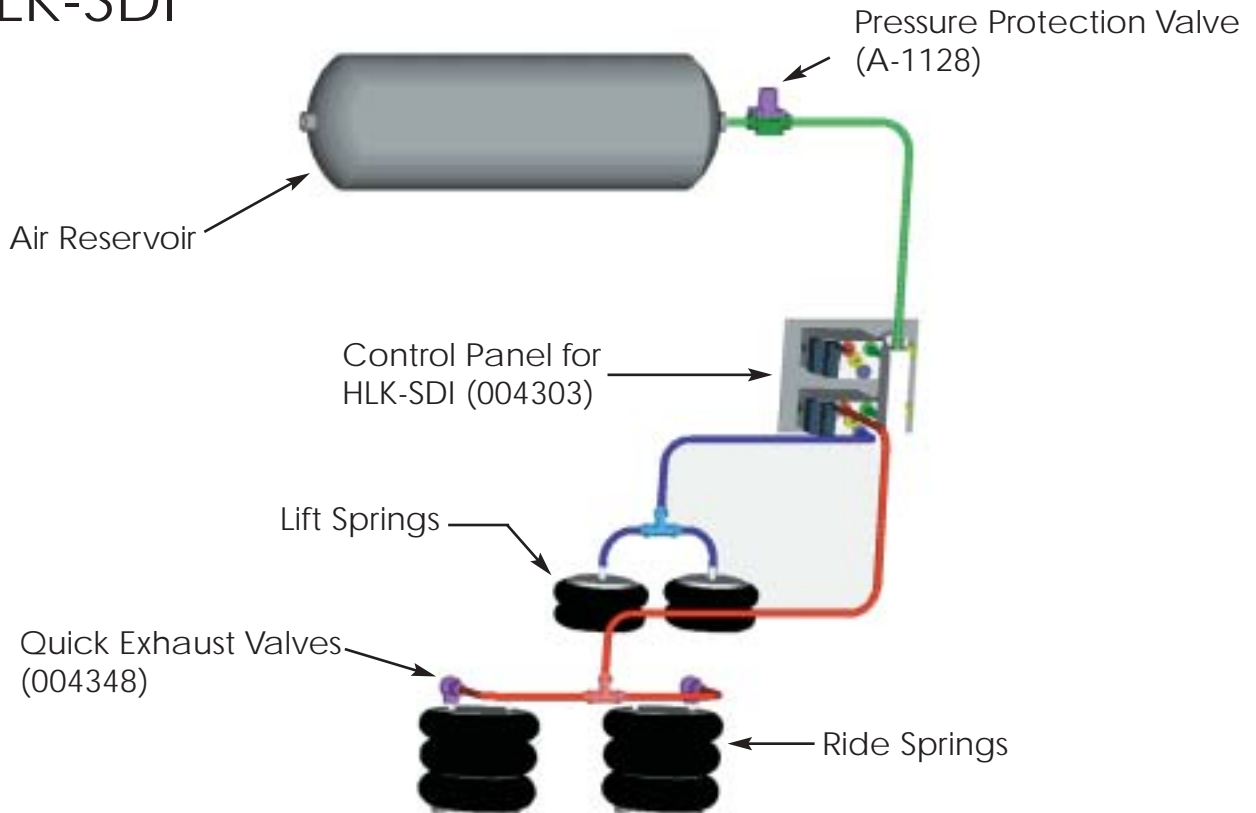
⚠ NOTE: Air system pressure may drop during suspension lowering process.

9. Axle should be completely lowered and supporting pre-determined load when system air compressor cut-out point is reached (usually at 120 psi).

HLK-SSI



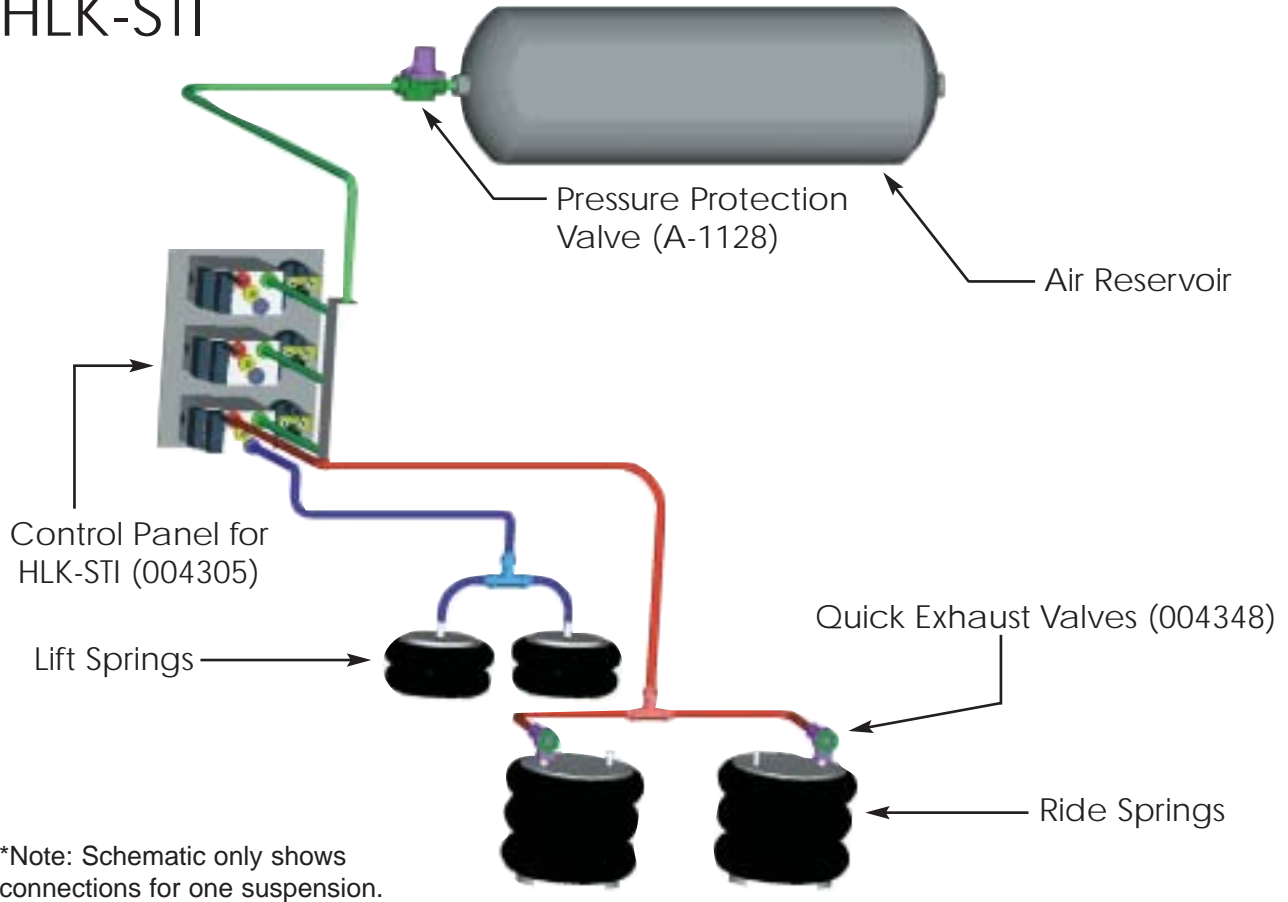
HLK-SDI



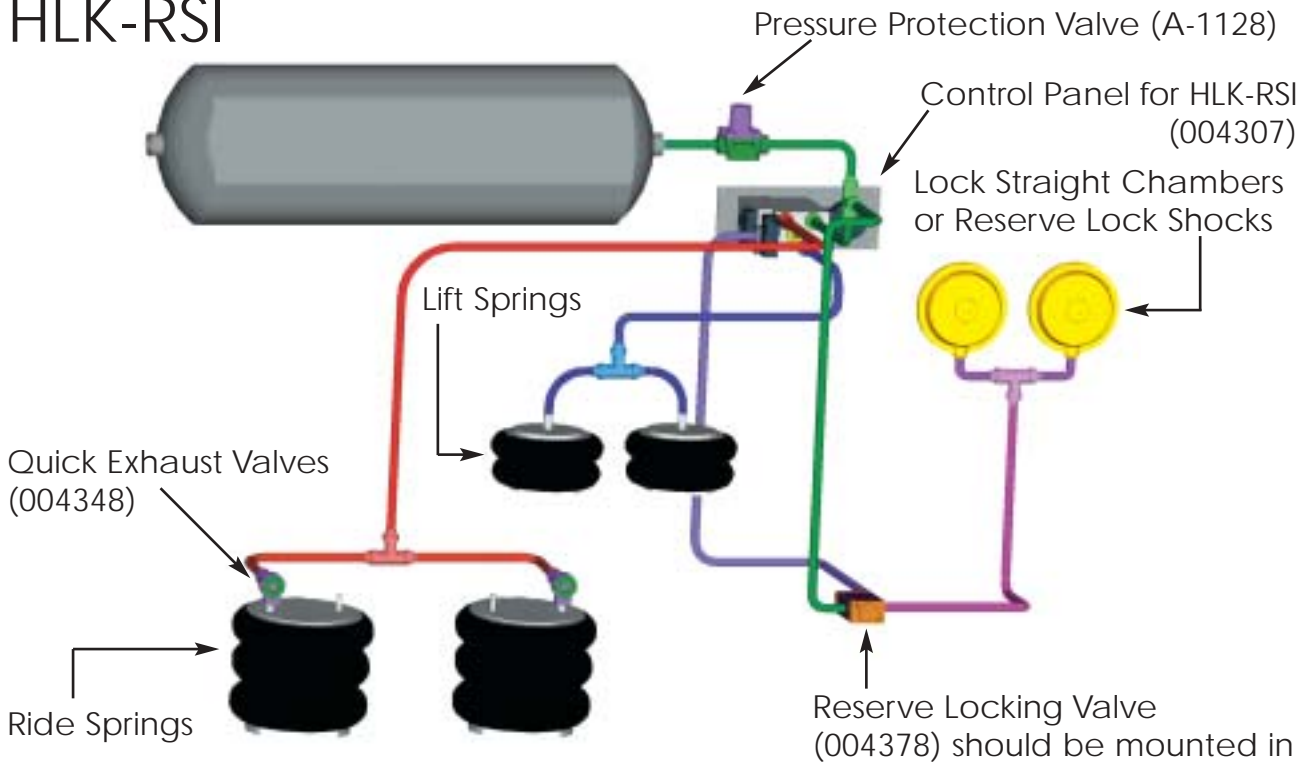
*Note: Schematic only shows connections for one suspension.



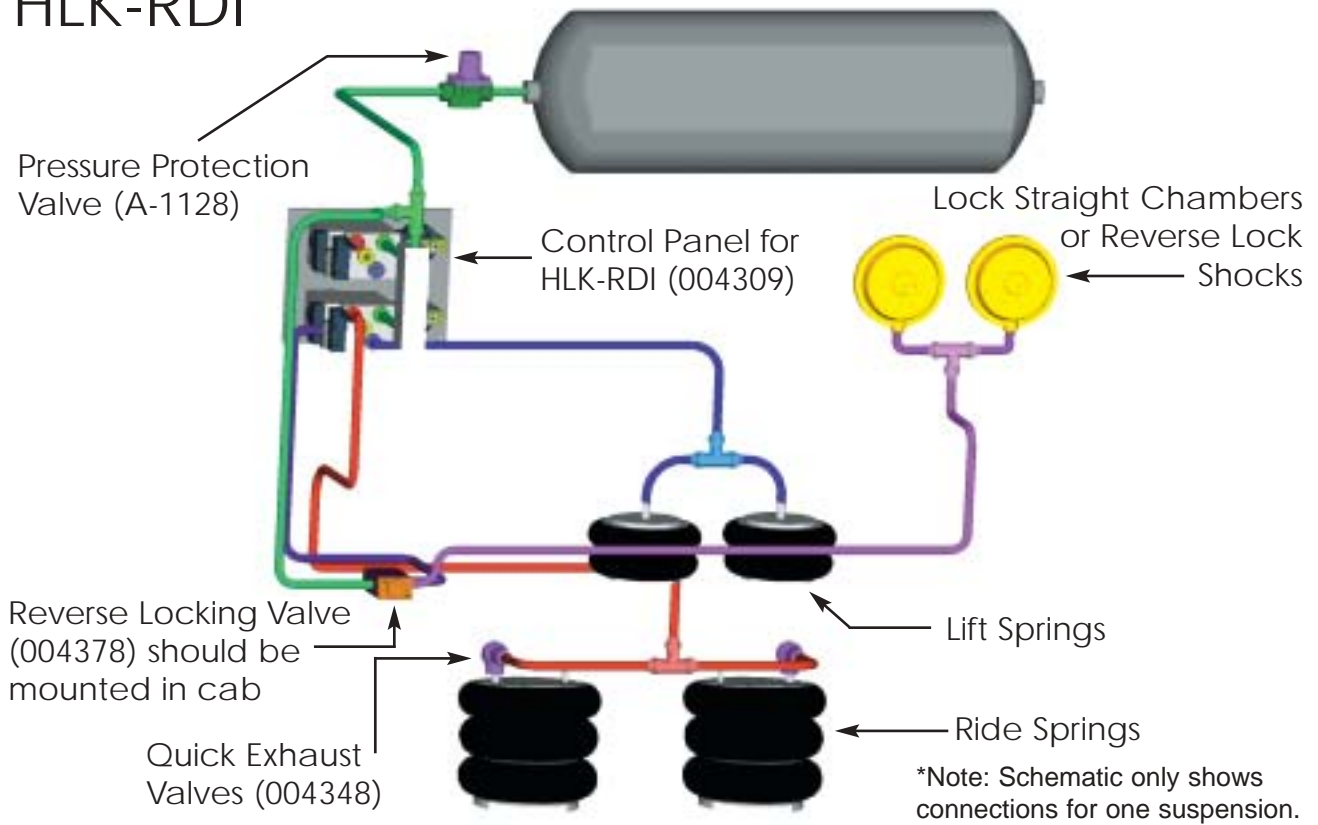
HLK-STI



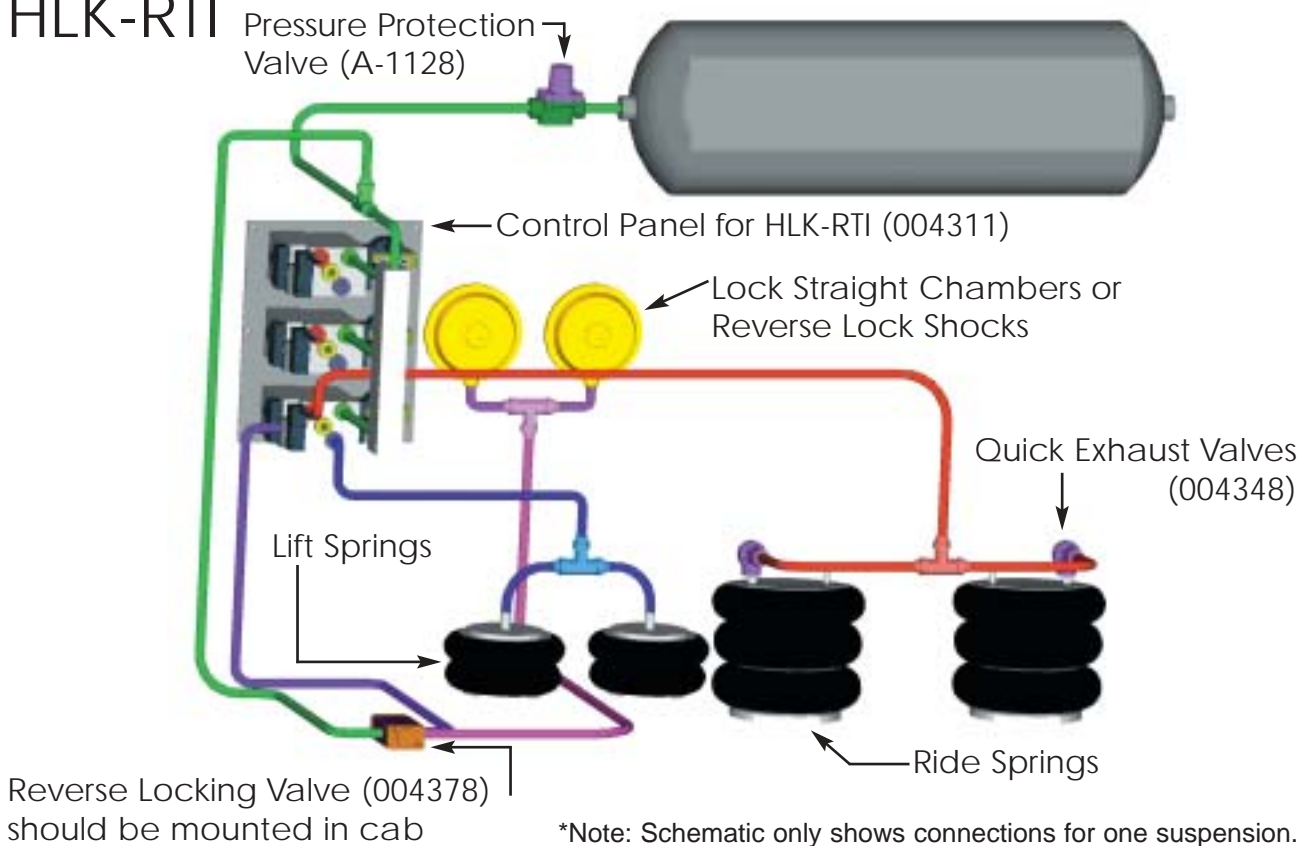
HLK-RSI



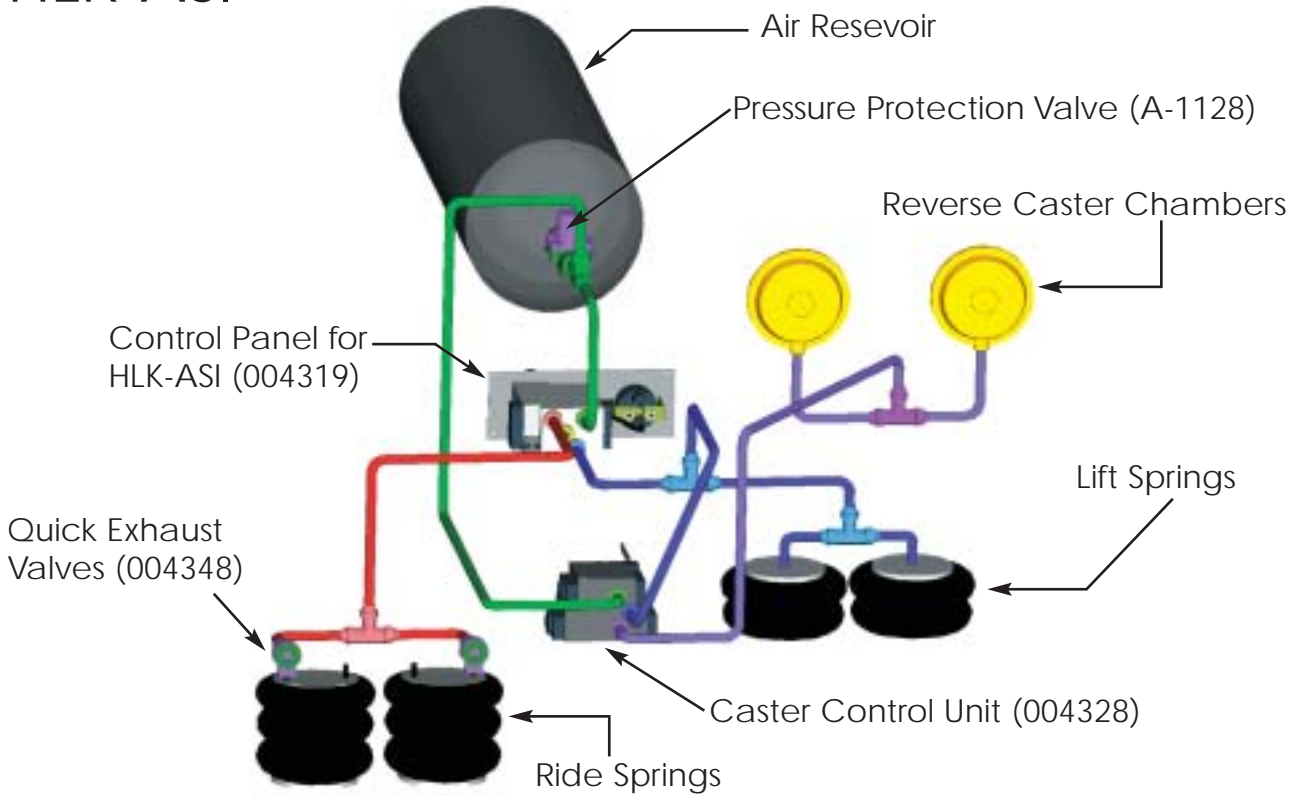
HLK-RDI



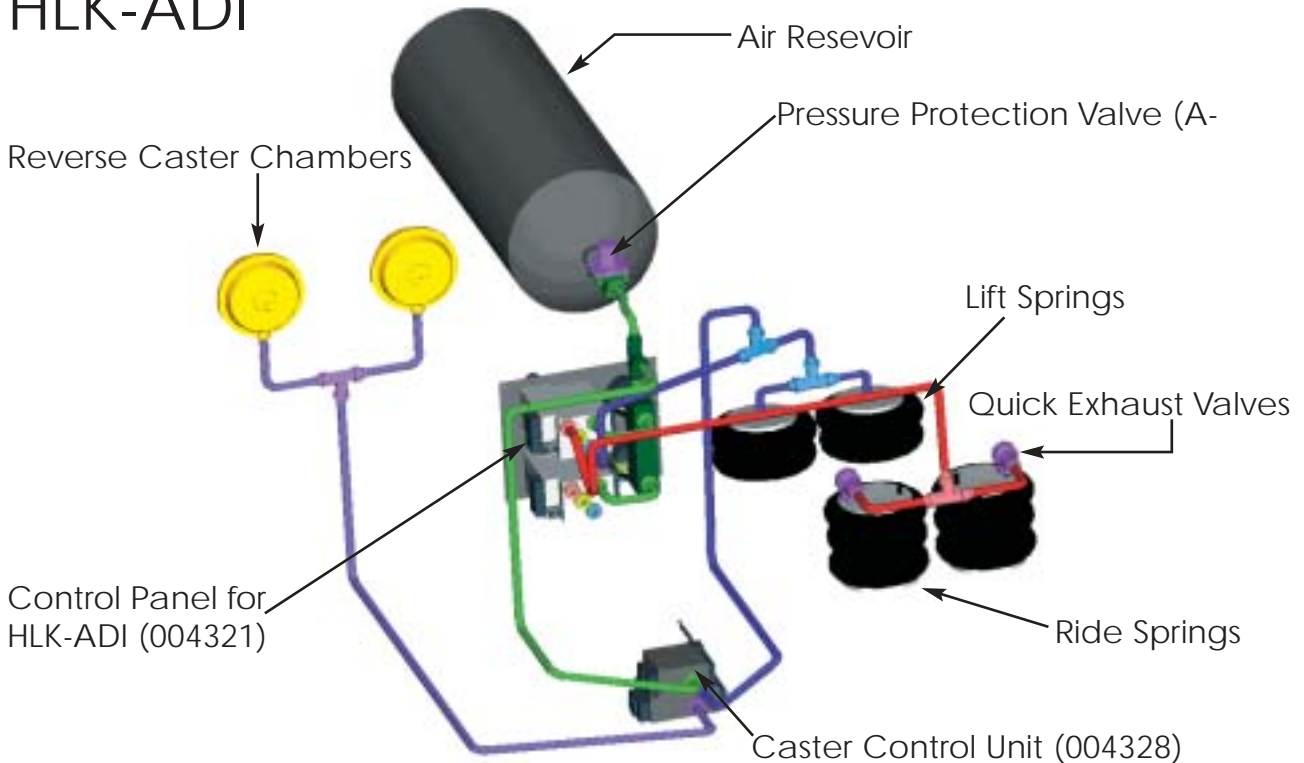
HLK-RTI



HLK-ASI

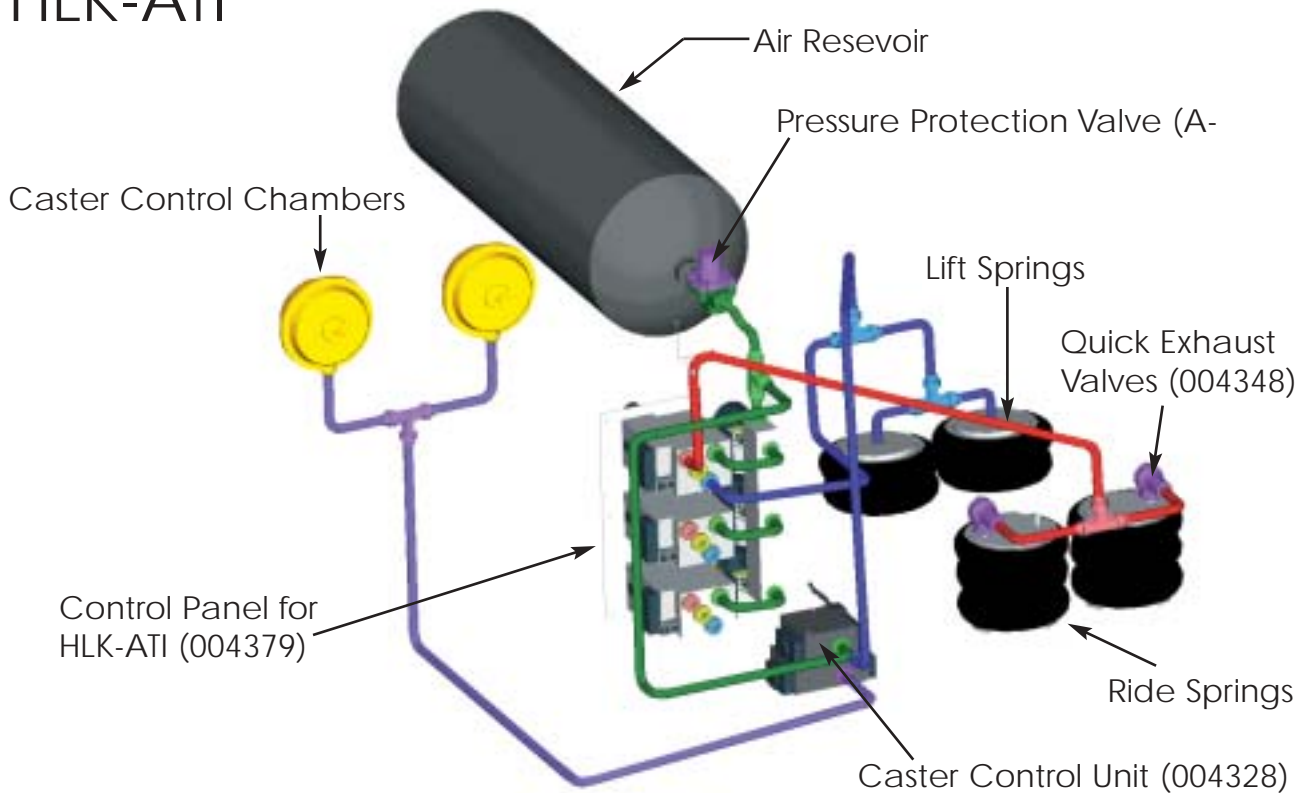


HLK-ADI



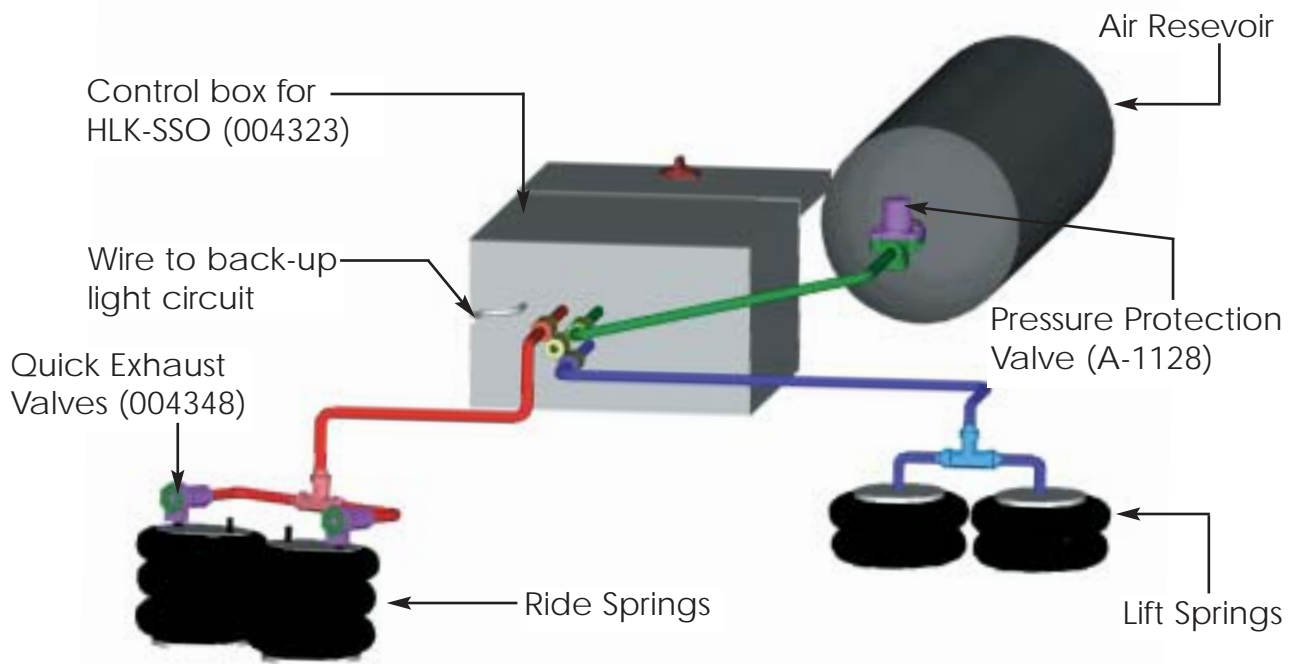
*Note: Schematic only shows connections for one suspension.

HLK-ATI



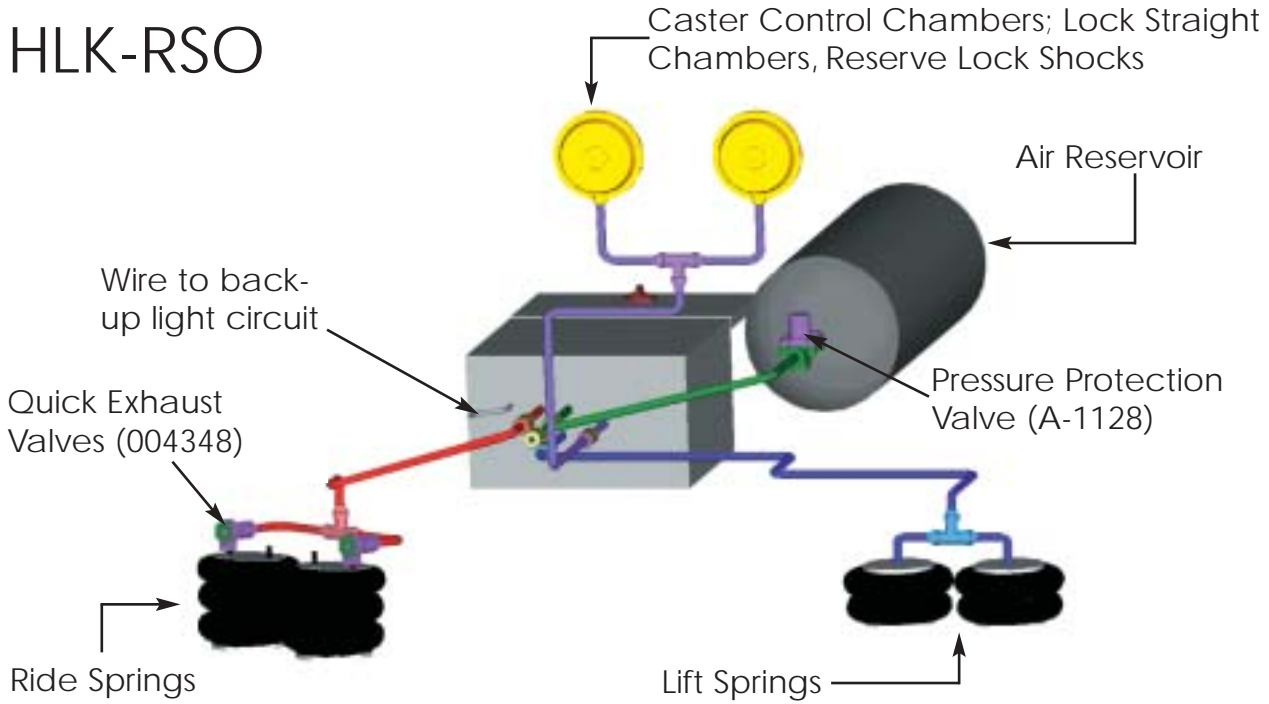
*Note: Schematic only shows connections for one suspension.

HLK-SSO

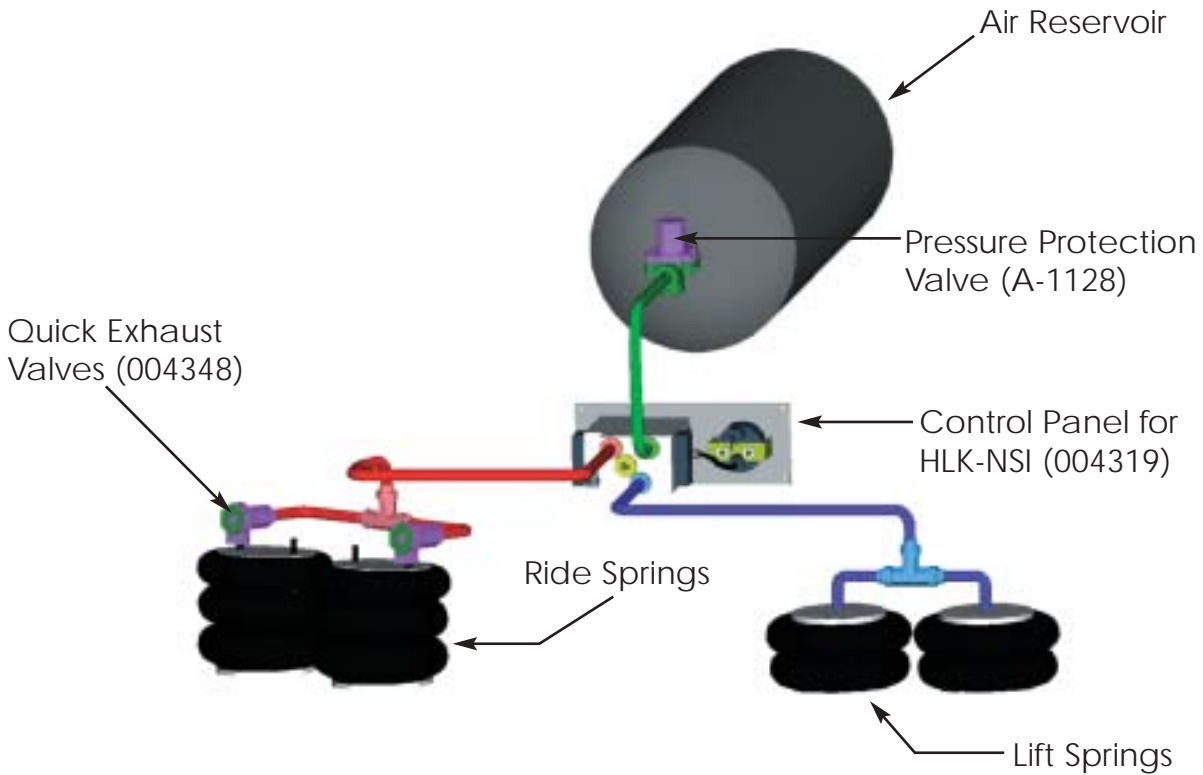




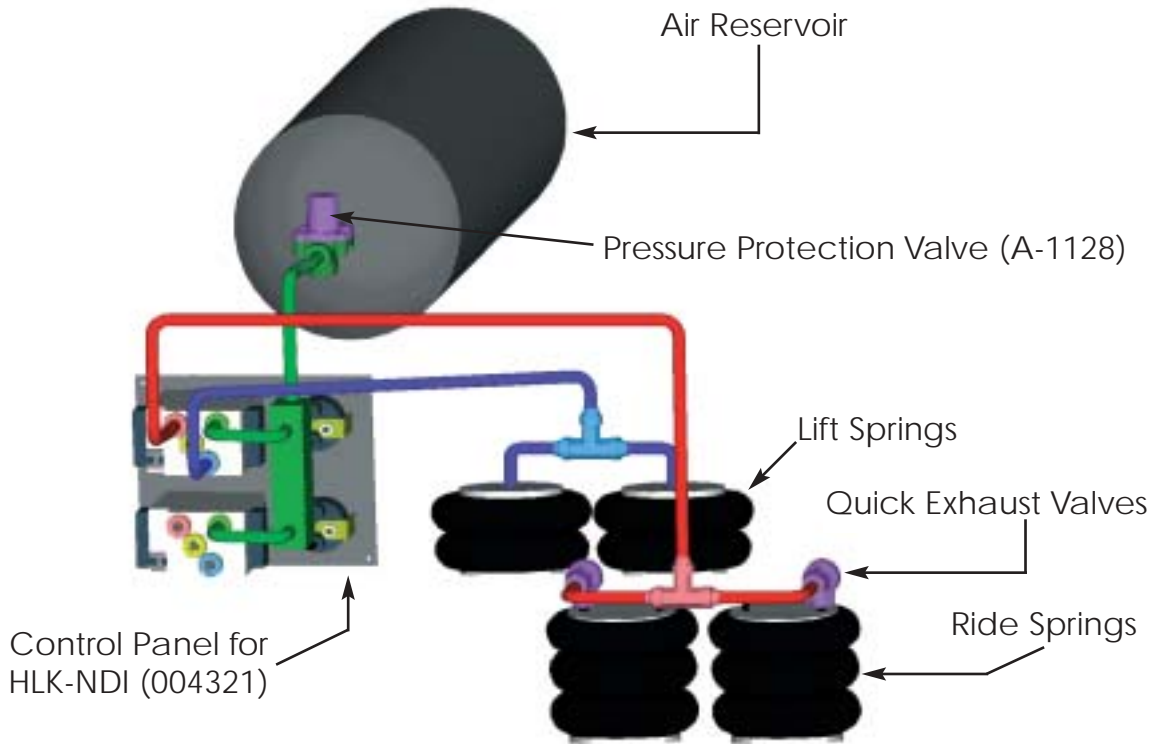
HLK-ASO & HLK-RSO



HLK-NSI

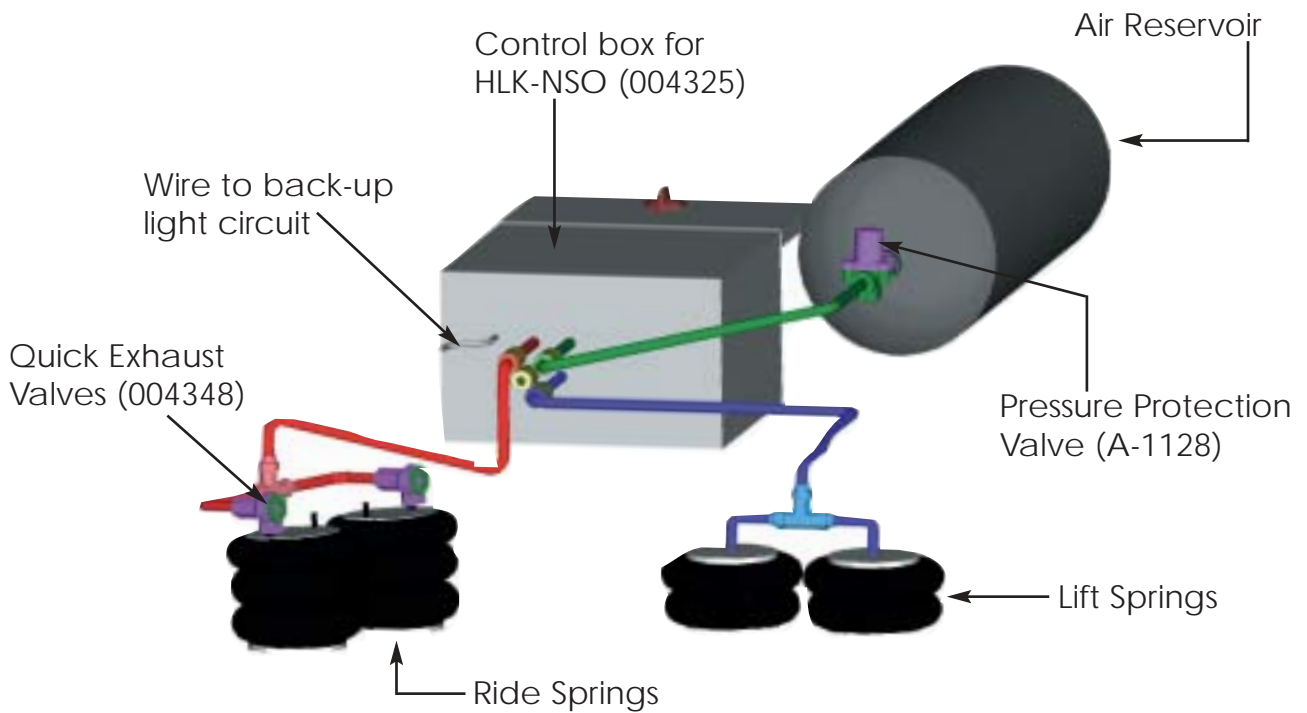


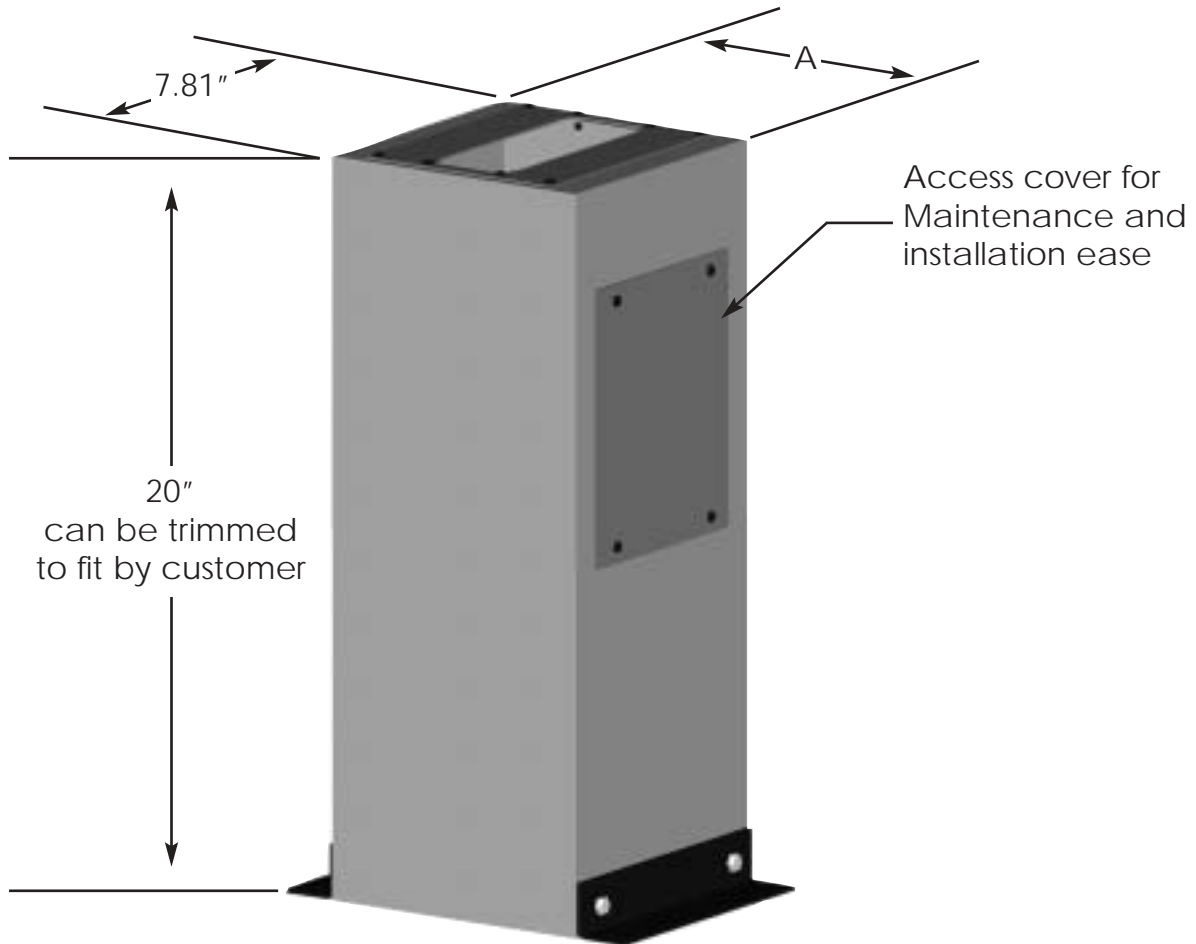
HLK-NDI



*Note: Schematic only shows connections for one suspension.

HLK-NSO





Part Number	Description	Dimension A
004349	Single Panel control box	7 3/4"
004350	Dual Panel control box	7 3/4"
004351	Triple Panel control box	10 15/18"
004352	Quad Panel control box	13 7/16"



TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REMEDY
Automatic Lift Does Not Function	Solenoid on air kit control panel is not being energized	Connect white wire to vehicle ground and brown wire to backup light power wire
	Kinked, pinched, or broken air line between air kit control panel and lift springs	Replace pinched, kinked or broken air lines
	Kinked, pinched, or broken air line between air kit control panel and supply tank	Replace pinched, kinked or broken air lines
	Supply air pressure insufficient to operate lift mechanism	Verify that you are receiving 90 psi minimum at the lift axle control panel. Using calibrated gage at supply line inlet
	Defective quick exhaust valve on ride springs	Replace defective quick exhaust valve
	Exhaust port on back of air kit control panel plugged	Remove obstruction to exhaust port on back of air control panel
	Air kit control panel not properly plumbed	Confirm that the air kit control panel is plumbed per the appropriate diagram in this book
	Defective air kit control panel	Call Hendrickson warranty department @ 1-800-660-2829
Won't lift with lever on air kit control panel	Kinked or broken air line between air kit control panel and air springs	Replace pinched, kinked or broken air lines
	Kinked or broken air line between air kit control panel and supply tank	Replace pinched, kinked or broken air lines
	Supply air pressure insufficient to operate lift mechanism	Verify that you are receiving 90 psi minimum at the lift axle control panel. Using calibrated gage at supply line inlet
	Defective quick exhaust valves between ride springs	Replace defective quick exhaust valve
	Exhaust port on back of air kit control panel plugged	Remove obstruction to exhaust line on back of air control panel
	Air kit control panel not properly plumbed	Confirm that the air kit control panel is plumbed per diagram in this book
	Defective air kit control panel	Call Hendrickson warranty department @ 1-800-660-2829
Won't lower with lever on air kit control panel	Regulator turned down too low	Increase air pressure at regulator until desired load is carried at wheels
	Truck in reverse gear	Place transmission in forward gear or neutral



TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REMEDY
Won't lower with lever on air kit control panel	Solenoid valve on back of air kit control panel energized	Connect white wire to vehicle ground and brown wire to backup light power wire
	Kinked, pinched, or broken air line between air kit control panel and ride springs	Replace pinched, kinked or broken air lines
	Kinked, pinched, or broken air line between air kit control panel and supply tank	Replace pinched, kinked or broken air lines
	Supply air pressure insufficient to operate lower mechanism	Verify that you are receiving 90 psi minimum at the lift axle control panel. Using calibrated gage at supply line inlet
	Exhaust port on back of air kit control panel plugged	Remove obstruction to exhaust port on back of air control panel
	Air kit control panel not properly plumbed	Confirm that the air kit control panel is plumbed per diagram in this book
	Defective air kit control panel	Call Hendrickson warranty department @ 1-800-660-2829
Slow lift or lower times	Insufficient air flow or volume being delivered to air kit control panel	Increase incoming air line size or Increase air reservoir capacity
	Insufficient air flow or volume being delivered to the air springs	Increase air line size going to air springs
Gage light does not function	No power to light bulb	Attach black wire to vehicle ground, Attach red wire to running light circuit
	Defective light bulb	Replace light bulb
Suspension does not carry rated load	Insufficient air pressure in ride springs	Increase pressure in ride springs by increasing regulator setting. Check pressure in ride springs at air spring inlet
	Supply air pressure insufficient to carry rated load	Verify that you are receiving 100 psi minimum at the lift axle control panel. Using calibrated gage at supply line inlet
	Kinked, pinched or broken hose between air kit control panel and ride springs	Replace pinched, kinked or broken air lines
	Kinked, pinched or broken hose between air kit control panel and supply tank	Replace pinched, kinked or broken air lines
	Defective air kit control panel	Call Hendrickson warranty department @ 1-800-660-2829



REPLACEMENT PARTS

DESCRIPTION	PART NO.
Pressure Protection Valve	A-1128
Quick Exhaust Valve	004348
Caster Control Unit	004328
Enclosure	004372
Regulator Nut	004353
Toggle Switch Lever	004329
Toggle Switch Knob	004330
Gage	004331
Replacement Bulb for Gage	004332
Single Control Panel Plate	004334
Dual Control Panel Plate	004335
Triple Control Panel Plate	004336

REPLACEMENT CONTROL PANEL CROSS REFERENCE

AIRKIT	CROSS REFERENCE
HLK-SSI-01	004301
HLK-SDI-01	004303
HLK-STI-01	004305
HLK-RSI-01	004307
HLK-RDI-01	004309
HLK-RTI-01	004311
HLK-ASI-01	004313
HLK-ADI-01	004315
HLK-ATI-01	004317
HLK-NSI-01	004319
HLK-NDI-01	004321
HLK-SSO-02	004323
HLK-NSO-02	004325
HLK-ASO-01	004327



GLOSSARY

<i>auxiliary axle</i>	A liftable suspension and axle combination with remote air control, used to distribute the load of a vehicle over a larger road surface.
<i>bridge laws</i>	The formula used to limit the weight on groups of axles in order to reduce the risk of damage to highway bridges.
<i>control panel</i>	The Hendrickson Auxiliary Axle Systems main control unit consisting of a toggle switch, a pressure gage and a regulator.
<i>FMVSS121</i>	Federal Motor Vehicle Safety Standard section 121
<i>lift springs</i>	An inflatable rubber bellow used to lift the auxiliary axle into the "UP" position. Uses system pressure to lift the axle and hold axle in the "UP" position.
<i>locking option</i>	The air kit automatically engages the locking feature when the vehicle operates in reverse gear.
<i>pilot valve</i>	An inversion valve used to allow auxiliary axle brakes to apply only when the suspension is in the "DOWN" position. When the auxiliary axle is in the "UP" position, the brakes are released to eliminate hang-ups during high centering as well as conserve air pressure.
<i>pressure protection valve</i>	A one way shut-off valve used to conserve vehicle air brake pressure in the event that an air spring leak or failure becomes excessive. The valve allows air that exceeds 80 psi to travel to the air kit, and will cease delivery to the air kit if air drops below 70-79 psi.
<i>regulator</i>	A valve which controls the pressure delivered to the ride springs of an auxiliary axle, thus enabling the load carrying capability of the suspension to be adjusted.
<i>reverse caster</i>	The self-steering lift axle which has a caster changing mechanism that enables the suspension to steer in both forward and reverse.
<i>ride springs</i>	An inflatable rubber bellow used as the main load support member on an auxiliary axle in the "DOWN" position. Normal operation pressure range is between 0 - system pressure.
<i>quick release valve</i>	A valve consists of a two-piece body and a diaphragm. The valve allows air to exhaust from the air springs immediately by releasing near the point of entry, and eliminating the amount or time required for the air to travel to the control panel to exhaust.



Auxiliary Lifiable Suspensions

3 YEAR/300,000 MILE WARRANTY

Hendrickson Auxiliary Axle warrants its Auxiliary Lifiable Air Suspensions manufactured by it, when properly installed and assembled, to be free from defects in material and workmanship in normal use and service, subject to the limitations herein provided. Hendrickson Auxiliary Axle shall repair or replace any component which is returned to Hendrickson Auxiliary Axle within the warranty coverage period, with transportation charges prepaid and which, upon inspection by Hendrickson Auxiliary Axle, is determined to be defective in material or workmanship. Hendrickson Auxiliary Axle will provide the replacement parts or material - freight prepaid - and will reimburse for freight charges on returned parts which are covered under this warranty policy. Hendrickson Auxiliary Axle is not responsible for additional costs incurred when replacement parts or materials are not acquired through Hendrickson Auxiliary Axle, unless pre-approved by the Hendrickson Auxiliary Warranty Department.

Hendrickson Auxiliary Axle will pay a specified labor allowance amount for repair or replacement of any defective major component as determined by the Hendrickson Auxiliary Axle Warranty Department. HENDRICKSON AUXILIARY AXLE WARRANTY DEPARTMENT MUST AUTHORIZE REPAIRS OR SERVICES **BEFORE** THEY ARE PERFORMED. Costs and procedures will be determined at that time (see labor allowance chart for a listing of typical repairs.) Failure to obtain such prior authorization may result in partial or complete loss of warranty coverage or warranty labor allowance.

COVERAGE PROVISIONS

ITEM	MONTHS or MILEAGE whichever comes first		COVERAGE
Major Structural Components	Up to 12	Up to 100,000	Parts & Labor Allowance
	12 - 36	100,000 - 300,000	Parts Only
Tri-Functional Pivot Bushing	Up to 12	Up to 100,000	Parts & Labor Allowance
	12 - 36	100,000 - 300,000	Parts Only
Air Controls (Purchased after 7-1-01)	Up to 12	Up to 100,000	Parts & Labor Allowance
	12 - 36	100,000 - 300,000	Parts Only
Air Springs	Up to 12	Up to 100,000	Parts & Labor Allowance
	12 - 24	100,000 - 200,000	Parts Only
Hendrickson Manufactured Axle Components	Up to 12	Up to 100,000	Parts & Labor Allowance
	12 - 36	100,000 - 300,000	Parts Only
Other Suspension and Brake Components	Warranty as provided by the original equipment manufacturer.		

THE FOREGOING IS HENDRICKSON AUXILIARY AXLE'S ONLY WARRANTY, AND ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.

This warranty does not apply to failures resulting from improper installation, neglect, accident, misuse, or operation beyond the rated capability of the model or the vehicle to which it is attached, nor to any parts which have been altered or repaired without the written consent of Hendrickson Auxiliary Axle. In no event shall Hendrickson Auxiliary Axle be liable for any expense, loss or damage (direct, incidental, consequential or exemplary—including, but not limited to, towing expenses, downtime expenses, cargo damage, incidental charges or any other losses arising in connection with the sale, use or inability to use the suspension system) resulting from the warranty-covered part found to be defective.

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