



Air Lift

# User's Manual

*"The Choice of the Professional Installer"*

## Frequently Asked Questions

### **Q. How much will adding air springs increase the Weight Ratings of a vehicle?**

- A. Adding air springs will not change the Weight Ratings (GAWR, GCWR, and or GVWR) of a vehicle. Doing so is dangerous and voids the Air Lift air spring warranty.

### **Q. Is it necessary to keep air in the air springs all the time and how much pressure will they need?**

- A. The manufacturer's recommended minimum air pressure in the air springs should always be maintained. The minimum air pressure keeps the air spring in shape so that it will move throughout its travel without rubbing or wearing on itself.

### **Q. Is it necessary to add a compressor system to the air springs?**

- A. No. Air pressure can be adjusted with just about any type of compressor, as long as it can produce sufficient pressure to service the springs. A bicycle tire pump can even be used, but it's a lot of work.

### **Q. How long should air springs last?**

- A. If the air springs were properly installed and the owner maintains the air springs, they can last indefinitely. Maintaining the air springs is quite simple. All that is necessary for air spring maintenance is to check the air pressure on a weekly basis. If one of the Load Controller II or SmartAir compressor systems is installed along with Air Lift air springs, then the compressor system automatically adds air if the pressure falls below the unloaded vehicle minimum pressure.

### **Q. What is the warranty on the air springs and compressors?**

- A. Air Lift air springs and compressor systems come with a manufacturer's limited one-year warranty, against defects in materials or workmanship. The purchase of a Load Controller I, Load Controller II, or SmartAir Automatic Leveling System with a Super Duty, Ride Control, or Air Lift 1000 extends the air springs' warranty from one year to a Lifetime Limited warranty to the original purchaser.

### **Q. Is it possible get replacement parts?**

- A. Yes. Replacement parts are available through Air Lift retailers and directly from the factory.

Air Lift helper springs are designed to help correct a number

### **Q. If the vehicle rides rough, is it helpful to add air springs to make the ride smoother?**

- A. It depends on what is causing the rough ride. If the rough ride is caused by weak or overloaded springs, then the answer is yes. Vehicles with weak or overloaded springs can bottom out, causing some very harsh ride problems. Reading this user's manual will provide a good understanding of the use of Air Lift products and the problems these products help correct.

### **Q. How much will air springs raise or lower the vehicle?**

- A. Air springs do not take the place of a lifting or lowering kit. However, air springs will cause the normal ride height to ride slightly higher, if that is what is desired. By adjusting the air pressure, a slight lift can be created, but it is typically only an inch or two.

### **Q. Should the air be added before adding the load?**

- A. Air Lift 1000 requires adding air first. Ride Control and Super Duty do not.

### **Q. Can the air lines be connected together?**

- A. Yes they can, but roll control is lost because of air transfer and the ability to level left to right.

### **Q. What is the minimum and maximum pressure recommended for the air spring kit?**

- A. Minimum and maximum pressures are dependent upon the kit type and the load. Most of our kits require a minimum of 5-10 p.s.i. Kits for motorhomes and heavy duty vehicles usually require more air pressure to prevent problems such as bottoming out. Refer to Table 1 on page 8 for further detail.

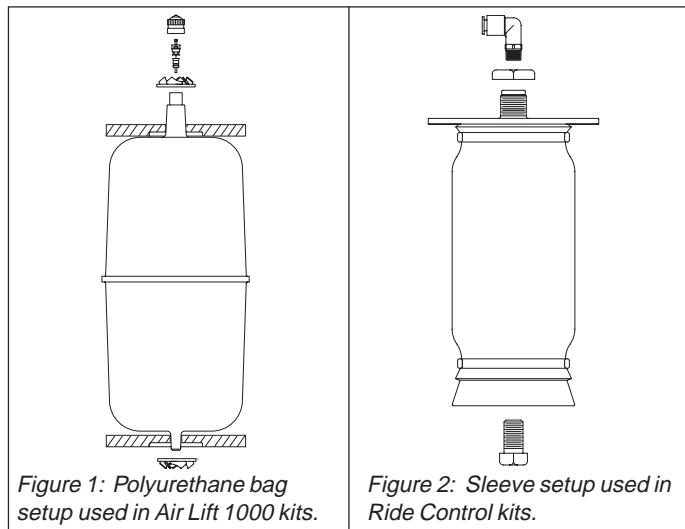
### **Q. Will raising the vehicle on a hoist for service work damage the Air Lift air spring kit?**

- A. No. The vehicle can be lifted on a hoist for short-term service work (ex. tire rotation, oil change, etc.). However, if the vehicle will be on the hoist for a prolonged period of time, support the axle with jack stands to take the tension off of the air springs.

## Product Outline

of different problems encountered as a result of carrying heavy loads on your vehicle. Different kinds of loads magnify different kinds of problems. Also, with a wide variety of vehicles, there is a need for various load assist products which are specifically designed for each individual vehicle. Due to different load conditions and different types of vehicle suspensions, we have created an array of products to suit specific vehicle needs. The following is a description of our main products.

### Air Lift 1000



Air Lift 1000 (Figure 1) is made from a very durable polyurethane material and is inserted into the vehicle's stock coil springs. When filled with air, it increases the spring rate and ability to support a load. Because of their design, Air Lift 1000 products are best categorized as load support products, rather than lifting products. Air Lift 1000 kits will provide up to 1000 pounds of load support at maximum pressure. The minimum and maximum pressures are listed in the installation manual and on the included inflation decal supplied with the kit. Air Lift 1000 kits are used in many different types of vehicles from motorhomes to passenger cars, provided that there is an open coil spring for the bag.

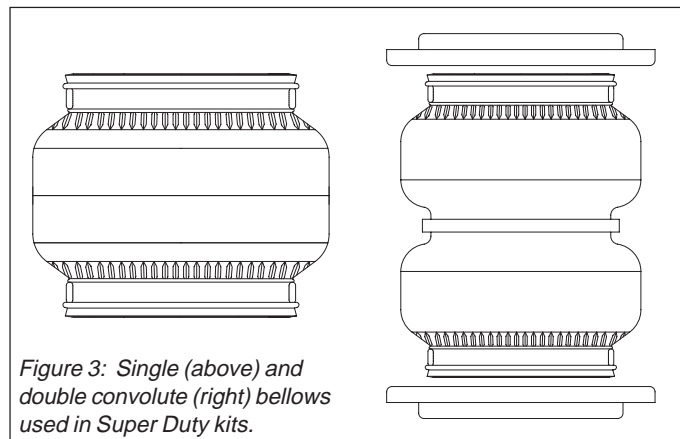
### Ride Control

The air springs used in these kits are designed and manufactured much like a tire. They have layers of rubber and cords that control the bag's growth and funnel it into one direction. They don't require a coil spring to control them. Ride Control kits utilize a sleeve style air bag (Figure 2) that provides up to 2,000 pounds of load. Each sleeve is rated at a maximum of 100 p.s.i. Ride Control kits are recommended for all light duty, leaf spring vehicles such as  $\frac{1}{2}$  ton pickups, SUVs, mini-trucks, and minivans. Ride Control kits are also used in some front applications on leaf spring  $\frac{3}{4}$  ton and 1 ton pickups.

### Load Controller II

### Super Duty

Super Duty utilizes sturdy, reinforced, commercial grade single or double, depending on the kit, convolute bellows (Figure 3). Like the sleeves used for the Ride Control kits, these bellows are manufactured much like a tire with layers of rubber and cords that control growth. Super Duty kits provide up to 5,000 pounds of load leveling support. These kits provide air adjustability from 5 – 100 p.s.i. Super Duty kits are recommended for most all  $\frac{3}{4}$  and 1 ton pickups and SUVs with leaf springs. Super Duty is also used in motorhome rear kits and some motorhome fronts where leaf springs are used.



### Load Controller I

Load Controller I is Air Lift's heavy and/or frequent user (including all rear motorhome applications) onboard compressor system. It offers twice the flow of the lighter duty Load Controller II and more control in the dual gauge version. Within the Load Controller I product category, two different types of kits are offered: 1) the single gauge kit, which provides equal air pressure to each bag; 2) the dual gauge kit, which provides independent control to each of the two air bags. The single gauge kit is recommended for all heavy duty and frequent use applications, and centered loads, such as heavy horse trailers, race car haulers, and contractor vehicles. The dual gauge version is recommended for all motorhome rear kits, heavy pickup campers, and contractor vehicles where bias loads and frequent use is common. The dual gauge system is designed to be fully independent in order to allow for individual changes to help correct problems, including changing wind conditions while driving. Campsite leveling is also a benefit of the independent control. Corrections for as much as 3 – 4" side to side can be made instead of adding another board under the tires.

## Product Outline

This is Air Lift's most economical fully adjustable system. The compressor has an output of about .5 CFM and works very well for the occasional and light duty users. Because Load Controller II users are typically part time users, automatic minimum pressure maintenance is built into the system to assure that the minimum unloaded vehicle pressure is maintained at all times. A Low Pressure Sensor (LPS) is used to monitor the pressure and turn the compressor on automatically when the system falls below the recommended minimum unloaded pressure. The LPS also serves as an early warning device if a small leak develops, thus preventing a premature failure.

As with the Load Controller I product category, Load Controller II also includes a single and dual gauge version. The single version is recommended for all passenger cars, SUVs, mini vans, and most pickup truck applications when the load is centered and only occasional use is required. The dual gauge version is recommended for all pickups with campers and full size vans or on any light vehicle when left/right leveling correction is desired.

### SmartAir Automatic Leveling

This system cuts down on maintenance with a self-controlled rear air spring leveling system that does not require users to monitor any in-cabin gauges or switches. When faced with varying loads, SmartAir's algorithm sensor electronically picks up the change in level ride height and automatically adds or releases air pressure to balance the load. Vehicles towing heavy loads and RVs benefit greatly from the installation of a SmartAir system by relieving stress on the vehicle while insuring a safe and comfortable ride.

SmartAir is designed to work with Super Duty, Ride Control and Air Lift 1000 products. A dual kit is recommended for some special RV applications. Coupling SmartAir with another Air Lift system extends the product's warranty to limited lifetime as it applies to the original owner of the vehicle.

Proper setup and inspection of the Air Lift air spring kit will help ensure optimum performance and a long product life.

### Special Considerations

Although not recommended, it is possible to tee the air bags together to simplify the pressure adjustment. Before deciding to tee the bags together, it is important to remember that many applications require separating the air bags because of either air transfer from one bag to the other, roll control, or inability to correct a bias load.

Air Lift products will work with stock four-wheel drive vehicles, but caution should be exercised if suspension travel is at the extreme. Air Lift makes every effort to design our kits to allow full travel of the suspension, but the need to make compromises to allow for an appropriate fit of an Air Lift kit frequently arises. Before engaging four-wheel drive, it is important that the air bags are closely examined for allowable travel in relationship to the suspension's full travel. It may be necessary to fit the vehicle with suspension limiters, such as limiting straps or jounce bumper spacers, to make sure that the air bag is not the suspension limiter. During extreme four-wheel drive conditions, it may be necessary to remove the air bags first if full suspension travel is desired and the air bags are the limiter. When using Ride Control, it is best to add extra pressure so that the air bags remain in the proper shape throughout the bags' travel. Operating the vehicle in four-wheel drive with the pressure adjusted to the minimum will cause the air bags to collapse when they are extended.

## Product Use

### Using Air Lift 1000 Kits:

1. When airing the bag for the first time, the vehicle must be jacked up with the suspension hanging down and unsupported. Applying the air will cause the bag to stretch out and fill the voids evenly. Apply the maximum pressure recommended for the specific kit at this time.

Note: With motorhome front ends, it is permissible to add air to achieve the ride that is desired without jacking up the vehicle before adding air. Front end alignment is recommended after determining the optimum operating pressure resulting from angle changes caused by lifting the front end.

2. With the maximum pressure still in the bags, lower the vehicle and apply the load. Decrease the pressure until the vehicle is at the desired ride height. After removing the load, let the pressure down to the desired unloaded pressure. Never deflate the bags below the minimum recommended pressure.

### Using Super Duty, SlamAir, and Ride Control Kits:

1. Add the load to the vehicle.

Note: Never drive the vehicle without air pressure. Never drive the loaded vehicle with low pressure. Both can cause damage to the air bags.

2. Add air to the air bags until the vehicle is at least level front to back. Adjust the pressure to level the vehicle left to right if necessary. Add more if a possible danger of the suspension bottoming out exists. Do not exceed the maximum pressure. If the vehicle did not sag below level, add at least 25 p.s.i.
3. If the load is a trailer, see the section on Trailers and Weight Distribution Bars on page 10.

### Tuning the Air Pressure

All Air Lift air spring kits come with a minimum pressure rating that must be adhered to at all times, even when the vehicle is unloaded (Table 1). This minimum pressure takes into account that the vehicle is in "Like New" condition and the vehicle is being used on the road in standard, noncommercial practices. Minimum pressures will have to be increased for vehicle spring fatigue, unusual driving conditions, and other uses. Remember that the single biggest cause of air spring failure is low pressure, which is not covered by warranty. When in doubt, add air.

Kit	Min	Max
<b>Air Lift 1000 vehicles</b>		
Light Trucks, Vans, and Class "B" Motorhomes	5 p.s.i.	–
Minivans and SUVs	5 p.s.i.	–
Passenger Cars	5 p.s.i.	–
Class "C" Motorhomes	40 p.s.i.	–
<b>Ride Control vehicles</b>		
Light Trucks and Vans	10 p.s.i.	100 p.s.i.
Minivans and SUVs	10 p.s.i.	100 p.s.i.
<b>Super Duty vehicles</b>		
Light Trucks and Vans	5 p.s.i.	100 p.s.i.
Class "A", "B", and "C" Motorhomes	20 p.s.i.	100 p.s.i.

Table 1: Minimum and maximum air pressures. NOTE: Refer to instruction manual for the specific application.

With the air bags adjusted according to the initial setup, test the ride and handling of the vehicle. If the minimum and maximum pressures are adhered to, the driver and passengers can determine the proper pressure. Pressure determination comes down to three things: 1) Level Vehicle, 2) Ride Comfort, and 3) Stability.

### Level Vehicle

Level vehicle is the easiest of the three concepts to explain. If the headlights are shining into the trees, then the vehicle is not level (Figure 4). If the vehicle is leaning to one side, then it is not level. In order to correct either of these problems, raise the pressure until the headlights are where they are supposed to be and the vehicle is not leaning to one side.

### Ride Comfort

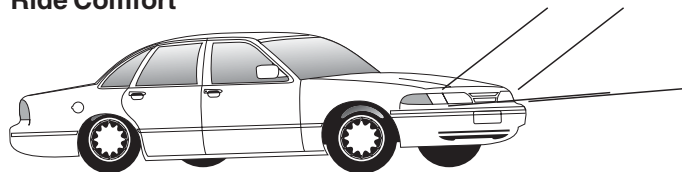


Figure 4: Misaligned headlights may mean that the vehicle is not level.

## Product Use

If the vehicle has a rough and harsh ride, the air pressure may need to be adjusted. Adjusting the pressure up or down will change the ride of the vehicle. However, determining which way to adjust the pressure can be difficult. Some characteristics, such as a harsh ride, can be the result of either too much pressure or not enough pressure. Try different pressures to determine the best ride comfort.

When dealing with a pickup truck fitted with contact overload springs, the overload springs may be the source of a harsh ride when a bump is hit because of the overload's quickly building spring rate. Increasing pressure will make the vehicle ride more on air and less on the overloads, thus improving the ride quality. However, if the vehicle is not equipped with overloads and the ride is still stiff, then it could have either too much air in the springs, or it could be the result of having flattened leaf springs.

### Stability

Stability translates into safety and should be the priority, which means the driver might need to sacrifice a perfectly level and comfortable ride. Stability is usually all about roll control, bounce, diving in a brake, and sponginess (Figure 5). Tuning out these problems is always about adjusting the air pressure and usually requires an increase in pressure.

### The rules of thumb for adding air:

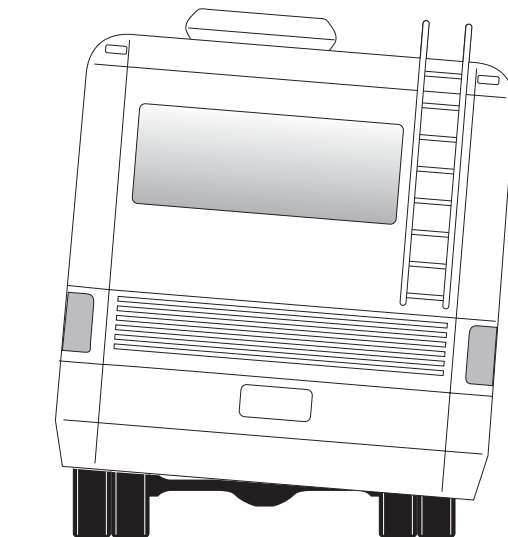


Figure 5: Swaying or rolling of a vehicle translates into poor stability.

1. Start with the vehicle level or slightly above.
2. When in doubt, always add air.
3. For motorhomes, start with 90 – 100 p.s.i. in the rear, because it can be safely assumed that it is heavily loaded.
4. If the front of the vehicle dives while breaking, then increase the pressure in the front air bags.
5. If it is ever suspected that the air bags have bottomed out, increase the pressure (Figure 6).

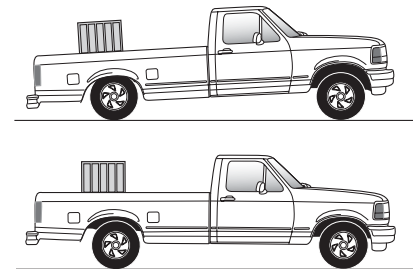


Figure 6: Top truck is unlevel and is bottoming out. Increase air pressure to prevent bottoming out, as in bottom truck.

6. Adjust the pressure up and down to find the best ride.
7. If the vehicle rocks and rolls, increase the pressure.
8. It may be necessary to maintain different pressures in one side than in the other. Loads such as water, fuel, and appliances will cause the vehicle to be heavier on one side (Figure 7). As much as a 50 p.s.i. difference is not uncommon.

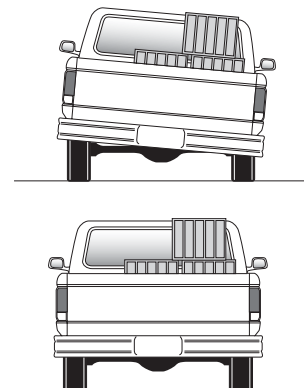


Figure 7: The top truck is unlevel. Increase air pressure on the unlevel side to even out the truck. The pressure in one side may be different from the other side.



## Vehicle Weight Ratings

Air Lift air springs are just one component of a vehicle's ability to carry a load and they alone do not increase a vehicle's Gross Vehicle Weight Ratings. Other items such as brakes, wheel bearings, tires, engine, transmission, differential gear ratios, and cooling are major components of a vehicle's weight ratings that are not changed by adding any type of springs to help support a load. Exceeding a vehicle's weight ratings with air springs is dangerous and voids the Air Lift air spring warranty. It is crucial that vehicle weight ratings are understood and adhered to. Weight ratings are typically posted on the vehicle. If the weight ratings can't be found, contact the dealer where the vehicle was purchased.

When using pickup campers, remember that the posted weight on the camper does not represent the total load on the truck. It is recommended to weigh the truck's axles and camper as loaded, and then compare those actual weights against the truck's GVWR and GAWR rear and front. Many air spring problems handled by Air Lift's Technical Support group are a result of overloaded pickup campers. Keep the camper and its load inside of the truck's Payload capacity.

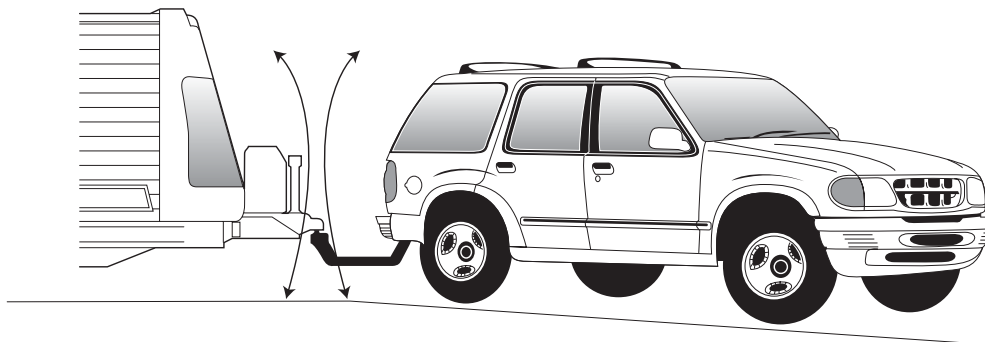
Understanding a vehicle's weight ratings is the first step to assuring compliance. The second and usually more difficult step is understanding the actual weight of an RV. The Recreational Vehicle Industry Association (RVIA) is working hard to standardize these posted RV weights. Unfortunately, until all of the manufacturer's comply with RVIA's standard, it is safe to assume that the weights posted do not necessarily reflect an RV as equipped. Aside from equipment, many RV enthusiasts like to travel with all of the conveniences from home and tend to load the RV without much consideration for the weight that is being added. Before taking a new RV out for the first time, spend some time understanding its base curb weight and its GVWR. It is crucial to know the RV's payload capacity and load it within those limits.

## Trailers and Weight Distribution Bars

The downward force of heavy trailer tongue weight causes the front of a vehicle to lighten up and rise as the vehicle pivots over the rear axle. This causes the vehicle's weight to be unbalanced and steering traction to be lost. This is a dangerous situation because it causes a lack of control and fishtailing of the trailer. Using weight distribution bars along with Air Lift air springs provides maximum stability and control of the vehicle and trailer. Air Lift air springs provide the load assist for a sagging vehicle and the weight distribution bars redistribute the load and balance the vehicle.

To find the proper pressure, start by selecting the correct distribution bars. The bars must be rated for the tongue weight of the trailer (for example, 500 lbs bars for a 500 lbs tongue weight). With the vehicle unloaded, take reference measurements from the front and back of the vehicle to the ground. Then connect the trailer and start loading the bars

one chain link at a time, keeping the links equal on both sides. As the load on each bar increases, the rear of the vehicle will come up and the front will come down. When the front and rear of the vehicle are as close to the reference measurement as possible (within  $\frac{1}{2}$ " at the front), the bars are tensioned correctly. When the bars cannot be adjusted tight enough to achieve similar or identical vehicle-height reduction, then add air to bring the vehicle back to the correct height and balance. When adding cargo to the vehicle or trailer, do not compensate for inadequate suspension by using higher rated bars, or readjusting the bars, as this will cause for an unbalanced vehicle. Use additional air pressure to bring the vehicle back to the correct height. Fine tuning the ride and control can be accomplished by adjusting the air pressure in 5 p.s.i. increments until the desired feel is achieved. Adding air may require readjustment of the bars.



## Maintenance

Aside from checking the air pressure weekly, Air Lift air spring and compressor systems require very little maintenance. A periodic inspection of the air springs for any abnormalities such as rub marks, misalignment, or other obvious problems will detect most air spring problems in their early stage. Also, inspect the air lines to make sure that they are not wearing against a sharp edge or melting near the exhaust system. Most importantly, check for clearance issues. A minimum of  $\frac{1}{2}$ " around the air bag is an absolute must. The following is a list of maintenance requirements that, when adhered to, will prolong the life of the air springs:

1. Always maintain Normal Ride Height.
2. For safety reasons and to prevent possible damage to the vehicle, *do not exceed maximum Gross Vehicle Weight Rating (GVWR), as indicated by the vehicle manufacturer.* Although the air springs are rated at a maximum inflation pressure of 100 p.s.i., the air pressure actually needed is dependant upon the load and GVWR, which may be less than 100 p.s.i. Check the vehicle owner's manual and do not exceed the maximum load listed for the vehicle.
3. Never inflate beyond 100 p.s.i. in the air springs. Failure to do so can result in a damaged air spring.
4. Do not use the Air Lift air springs as substitution for weight distribution or sway bars.
5. Do not exceed the recommended extension or compression of the air spring. Failure to do so may result in damage to the air spring.
6. Always add air to springs in small quantities, checking the pressure frequently. Sleeves require less air volume than a tire and inflate quickly.
7. Should it become necessary to raise the vehicle by the frame, make sure the system is at minimum pressure (10 p.s.i.) to reduce the tension on the suspension/brake components. Use of onboard leveling systems do not require deflation or disconnection.
8. Failure to maintain correct minimum pressure (or pressure proportional to load), bottoming out, overextension, or rubbing against another component will void the warranty.
9. Follow the torque specifications listed for the fasteners and air fittings:

	Bellows	Sleeves
Lower Mounting Fasteners	20 ft-lbs	15 ft-lbs
Upper Mounting Fasteners	20 ft-lbs	4 ft-lbs
Air Fittings	Hand tight + 1½ turns	Hand tight + 1½ turns

Table 2: Air spring torque specifications.

## Leak Checking

If the air system loses more than 5 p.s.i. in a 24 hour period, a leak in the system is present. If a leak is suspected, a solution of 1 tablespoon dish soap to 1 quart of water in a spray bottle can be used to find the source of the leak. To search for a leak, inflate the air springs to 30 p.s.i. and spray all fittings, connections, air lines, inflation valves, and air bags with a soapy water solution. Leaks can be spotted by looking for bubbles in the soapy water solution. On occasion, the leak may be very difficult to find. Isolating the leak to one component, such as the gauge or air bag, can be done by using a leak checking gauge, which can be purchased from Air Lift (part number 26124).

Common leak areas include the swivel air fitting to the air spring or to the inflation valve. If there is a problem with the swivel fitting:

- Check the air line connection by deflating the spring and removing the line by pulling the collar against the fitting and pulling firmly on the air line. Trim 1" off the end of the air line. Be sure the cut is clean and square. Reinsert the air line into the push-to-connect fitting.

- Check the threaded connection by tightening the swivel fitting another  $\frac{1}{2}$  turn. If it still leaks, deflate the air spring, remove the fitting, and re-coat the threads with thread sealant. Reinstall by hand tightening as much as possible, then use a wrench for an additional two turns.

Or if the leak is at the inflation valve, then:

- Check the valve core by tightening it with a valve core tool.
- Check the air line connection by removing the air line from the barbed type fitting. **CAUTION: Do not cut it off. As this will usually nick the barb and render the fitting useless.** Cut air line off a few inches in front of the fitting and use a pair of pliers or vise-grips to pull/twist the air line off the fitting.



## Troubleshooting

Problem	Cause	Action
Vehicle leans to one side.	Air not adjusted properly.	Add air to low side.
Vehicle sags in the rear.	Air pressure too low.	Add air.
Vehicle bounces in deep, slow cycles.	Air pressure too low.	Add air.
Front of vehicle dives when braking.	Front air pressure too low, or needs front air bags.	Add air or bags.
Vehicle rolls Left to Right.	Air pressure too low.	Add air.
	Air bags are connected together allowing air to transfer from one side to the other.	Separate air bags.
Vehicle bangs in back when hitting small bumps or expansion joints.	Air bags are bottoming out.	Add air. For motorhomes, adjust to 100 psi and then reduce if ride is too stiff.
When towing a trailer, steering feels light and unresponsive.	Trailer tongue weight is improperly distributed to the front tires.	Adjust weight distribution bars or adjust air pressure. See trailer dealer for more information or assistance.
Trailer sways or fishtails.	Inadequate sway control.	Adjust or add sway control. See trailer dealer for more information.
Vehicle rides stiff or rough when loaded.	Incorrect pressure.	Adjust air pressure up or down accordingly. When in doubt, add air.
Pickup with camper porpoises (front to back rocking motion).	Camper not attached properly.	See camper dealer for more information and assistance. Tighten tie-downs.
	May need front camper struts.	See camper dealer for more information and assistance.
Pickup with camper rolls from Left to Right.	Camper is not attached properly.	See camper dealer for more information and assistance. Tighten tie-downs.
	Air bags are connected together allowing air transfer from one side to the other.	Separate air bags.
Vehicle seems to sway Left to Right slightly. Steering feels mushy. Adjustments are ineffective.	Tires, tire pressure, and/or shock absorbers are inadequate. Under-inflated or inadequate tire weight ratings can cause tires to roll, making an unsafe situation. Shock absorbers may be worn or broken.	Examine tires for weight and pressure ratings. Check against load of vehicle. See local tire and shock dealer for more information and assistance.
Vehicle rides stiff/rough when loaded.	Incorrect pressure.	Adjust air pressure up or down accordingly. When in doubt, add air.
Vehicle rides stiff/rough when empty.	Pressure is above minimum required.	Adjust air pressure down, but never below the minimum recommended.
	Adding helper springs, air or steel, will increase the spring rate of a suspension. Air allows adjustability for road and load conditions. Expect some increase in spring rate, or stiffer ride when empty. Shorter wheel base vehicles will increase the effect.	