

# Installation Manual

**PACBRAKE®**



## AMP AIR SUSPENSION KITS

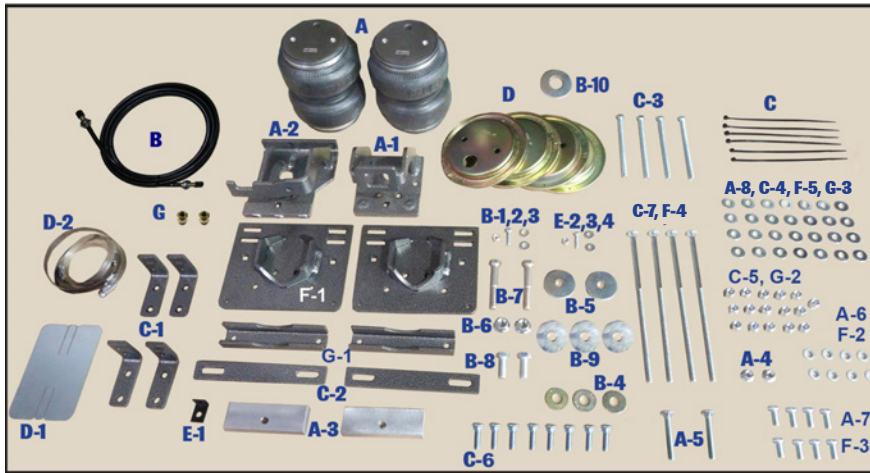


HP10193: *Ford F-250/350 4WD\**  
*Ford F-450\**

HP10194: *Ford F-250/350 2WD\**  
*Ford F-450\**

ALL KITS FOR TRUCKS INCLUDING IN-BED HITCHES;  
NOT FOR USE WITH CHASSIS CAB TRUCKS

\* See application guide for proper fitment.



**Make sure all the items shown in the photo are provided in your kit before starting the installation.**

**NOTE:** Do not apply air pressure to the air springs until advised to in Step 15.

**CAUTION:** This kit includes "push to connect OR barbed" air line fittings. They require the end of the air line to be round, square and cleanly cut to ensure the internal seal will not leak. The air line must only be cut with a sharp razor knife or a hose cutter.

**KIT CONTENTS**

**Subgroup A:**

- A-1** Upper Bracket, Passenger Side (1) HP1357
- A-2** Upper Bracket, Driver Side (1) HP1395
- A-3** Spacer (2) HP1364
- A-4** Serrated Flange Nut, 3/8"-16 (2) HP1338
- A-5** Carriage Bolt, 3/8"-16 x 2" (2) HP1447
- A-6** Lock Washer, 3/8" (4) C18007
- A-7** Hex Head Cap Screw, 3/8"-24 x 7/8" (4) HP1002
- A-8** Washer, Flat, 3/8" (4) C653

**Subgroup B:**

- B-1** Hex Head Cap Screw, 5/16"-24 (1) C10465
- B-2** Washer, Flat, 5/16" (2) C11944
- B-3** Nut, 5/16"-24 (1) C10450
- B-4** Washer, Flat, 1/2" (3) HP1368
- B-5** Washer, Thick Flat, 1/2" x 2" x 1/4" (2) HP1369
- B-6** Serrated Flange Nut, 1/2"-13 (2) HP1370
- B-7** Hex Head Cap Screw, 1/2"-13 x 3" (2) HP1324
- B-8** Hex Head Cap Screw, 1/2"-13 x 1 1/4" (2) HP1371
- B-9** Washer, Flat, 1/2" x 2" (3) HP1010
- B-10** Washer, 3/4" (1) HP1446

**Subgroup C:**

- C-1** 4-Hole Locating Bracket (4) HP1374
- C-2** Spring Clamp Bar (2) HP1373
- C-3** Hex Head Cap Screw, 3/8"-16 x 5" (4) HP1372
- C-4** Washer, Flat, 3/8" (12) C653
- C-5** Nyloc Nut, 3/8"-16 (12) HP1000
- C-6** Carriage Bolt, 3/8"-16 x 1 1/4" (8) HP1149
- C-7** Carriage Bolt, 3/8"-16 x 10" (2) HP1329

**Subgroup D:**

- D-1** Heat Shield (1) HP0012
- D-2** Hose Clamp, 4 1/2" - 6 1/2" (2) HP1377

**Subgroup E:**

- E-1** L Bracket (1) HP1379
- E-2** Hex Head Cap Screw, 1/4"-20 x 1" (1) P34637
- E-3** Nyloc Nut, 1/4"-20 (1) HP1072
- E-4** Washer, Flat, 1/4" (2) P02190

**Subgroup F:**

- F-1** Lower Bracket \*HP10193 4WD Kit\* (2) HP1353
- F-1** Lower Bracket \*HP10194 2WD Kit\* (2) HP1382
- F-2** Lock Washer, 3/8" (4) C18007
- F-3** Hex Head Cap Screw, 3/8"-24 x 7/8" (4) HP1002
- F-4** Carriage Bolt, 3/8"-16 x 10" (2) HP1329
- F-5** Washer, Flat 3/8" (4) C653

**Subgroup G:**

- G-1** Axle Strap (2) HP1383
- G-2** Nyloc Nut, 3/8"-16 (4) HP1000
- G-3** Washer, Flat, 3/8" (8) C653

**Individual Parts:**

- A** Air Spring (2) HP10000D
- B** Air Line/Valve Assembly HP1344
- C** Tie Strap (6) C11618
- D** Roll Plate (4) HP10054
- G** Air Fitting(2) HP1099

**REQUIRED TOOLS**

- 3/8", 7/16", 1/2", 9/16", 3/4" Open End or Box Wrenches
- 9/16" & 13mm Deep Well Sockets and 9/16" & 3/4" Crowsfoot Sockets
- Heavy Duty Drill
- 5/16" Drill Bit (very sharp)
- Torque Wrench
- Cut Off Wheel or Sawzall
- Thread Sealant
- Hose Cutter, Razor Blade or sharp Knife
- Air Compressor/Compressed Air Source
- Hoist or Floor Jack
- Safety Stands
- Safety Glasses
- Spray Bottle with Dish Soap/Water Solution

Thank you and congratulations on the purchase of an AMP air suspension kit. Please read the entire installation manual prior to starting the installation to ensure you can complete the installation once started.

**IMPORTANT:**

***This air suspension kit will not increase the GVWR (Gross Vehicle Weight Rating), as the GVWR is determined by the axle rating. Do not exceed the maximum capacity listed by the vehicle manufacturer.***

**NOTE:**

*Some vehicles are equipped with a rear wheel brake proportioning valve. Check with the manufacturer before installing the air spring kit, as it may affect braking performance.*

## BEFORE YOU START

1. Ensure the application information is correct for the make, model and year of the vehicle you are installing the kit on.
2. Pacbrake recommends using a good quality anti-seize on all fasteners. This will reduce the chance of corrosion on the fasteners and will help facilitate removal, if required at a later date

## 1. RAISE THE REAR AXLE

- Remove any unnecessary weight from the vehicle to attain normal ride height. This is important for correct initial air spring setup and adjustment.
- Park the vehicle on a level surface.
- Record the vehicle's 'normal ride height', which is the distance between the center of the axle and the horizontal wheel well flange. Ensure both sides are the same before raising the vehicle.
- Raise the rear axle high enough to remove both rear wheels and attain a comfortable working height.
- Place two jack stands under the axle, as shown in the photo.
- Lower the floor jack until the vehicle axle is supported by the jack stands.
- Ensure the normal ride height measurement recorded earlier is the same. Adjust if necessary before proceeding.
- Once the rear axle is raised correctly, remove the rear wheels.



**IMPORTANT NOTE:**

If vehicle has pre-existing 5th wheel hitch, other than standard factory Reese hitch purchased with the truck at new, the ½" or ¾" hardware mounting the side brackets will have to be removed to install the air spring kit.

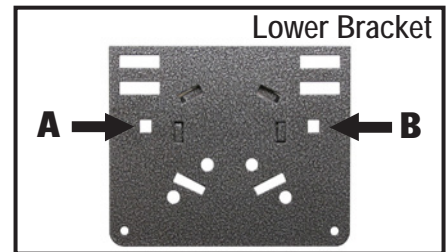
NOTE: For steps 2-3, use the parts in Subgroup F, as listed on Page 2.

## 2. ROLL PLATES

Set the roll plates on the top and bottom of the air spring, lining up the holes. (The bottom surface of the air spring is the one with only 2 holes.)

Insert one 10" carriage bolt into each lower bracket. The carriage bolt inserts into the top surface of the lower bracket through the square hole. For the driver side, insert the carriage bolt into hole (A); for the passenger side, insert the carriage bolt into hole (B).

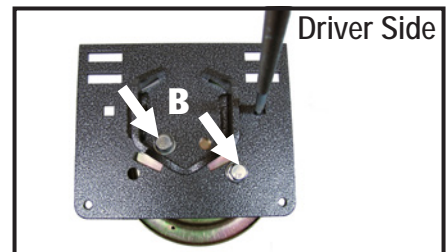
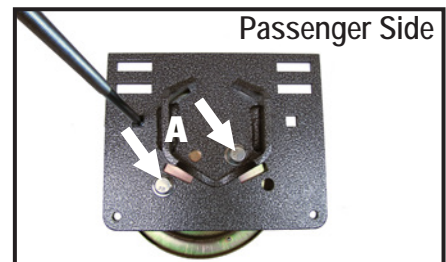
*Note: It is necessary to put the carriage bolts through the lower bracket before the air spring is attached as the air spring will block the holes they go into.*



## 3. ATTACH A LOWER BRACKET TO EACH AIR SPRING

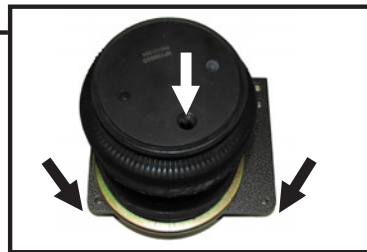
Attach a lower bracket to the air springs with two  $\frac{3}{8}$ "-24 x  $\frac{7}{8}$ " hex head cap screws, two  $\frac{3}{8}$ " lock and flat washers.

Make sure that the rounded edges of the bracket are on the same side as the large air fitting hole. The lower bracket is positioned so that the bolts are threaded into the correct holes of the lower bracket exactly as shown here



A - Passenger Side  
B - Driver Side

Torque to 20 ft-lbs, 34 N•m.

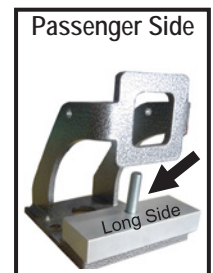
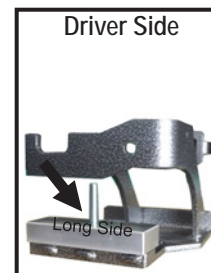
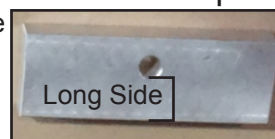


NOTE: For steps 4-7, use the parts in Subgroup A, as listed on Page 2.

## 4. ASSEMBLE A SPACER TO EACH UPPER BRACKET

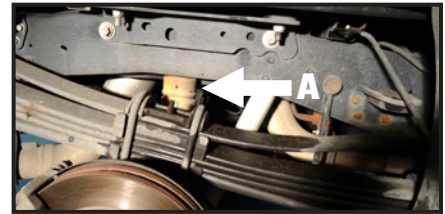
Install a spacer to the passenger side upper bracket and to the driver side upper bracket with a  $\frac{3}{8}$ "-16 x 2 $\frac{1}{2}$ " carriage bolt, with the long side facing away from the bracket as shown.

Spacer



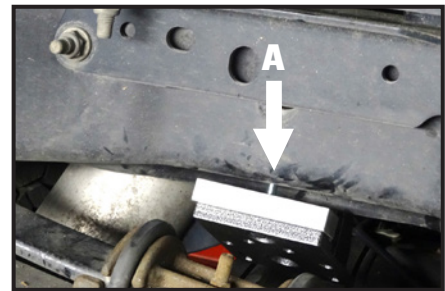
## 5. REMOVE THE JOUNCE BUMPER

Remove the jounce bumper (A) from the frame by removing the nut holding the top of the jounce bumper to the frame using a 13mm wrench or socket.



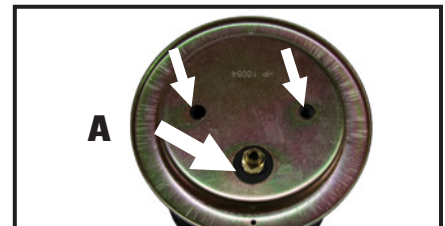
## 6. ATTACH THE UPPER BRACKET TO THE FRAME

Attach the upper bracket and spacer to the frame, by inserting the  $\frac{3}{8}$ "-16 x 2 $\frac{1}{2}$ " carriage bolt through the hole in the bottom surface of the frame where the jounce bumper was attached (A). Loosely secure with a  $\frac{3}{8}$ "-16 serrated flange nut. Do not tighten the nut as you will need to leave the bracket hanging to fit it to the top of the air spring. This nut will get tightened in Step 9.

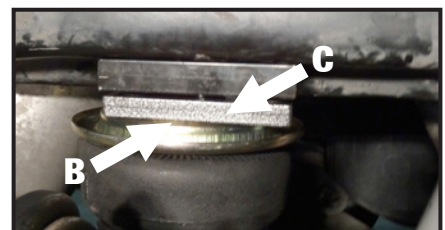


## 7. POSITION AND SECURE THE AIR SPRING ASSEMBLY TO THE UPPER BRACKET

Position a roll plate over the top surface of the air spring. Make sure that all three holes on the roll plate align with the openings on top of the air spring and install an air fitting in the large hole on the air spring using thread sealant or tape (A).



Position the air spring assembly under the bottom surface of the lower bracket so that the holes in the roll plate (B) align with the holes in the upper bracket (C).

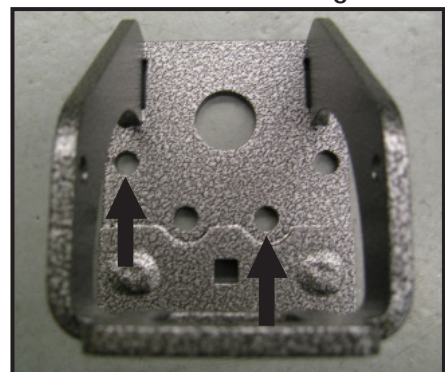


Secure the air spring assembly to the upper bracket with two  $\frac{3}{8}$ "-24 x  $\frac{7}{8}$ " hex head cap screws, two  $\frac{3}{8}$ " lock and flat washers. Make sure the upper bracket is positioned so that the bolts are screwed into the two smaller openings of the upper bracket exactly as shown. Torque to 20 ft-lbs, 34 N•m

Passenger Side

*NOTE: The bolt holes used for the passenger side upper brackets are as shown here.*

*(Driver's side hole locations shown on next page.)*

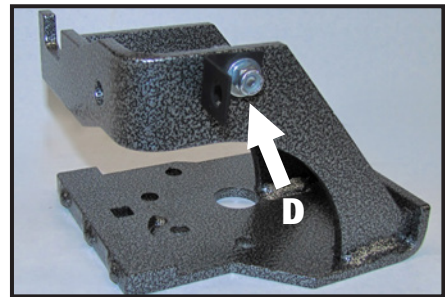
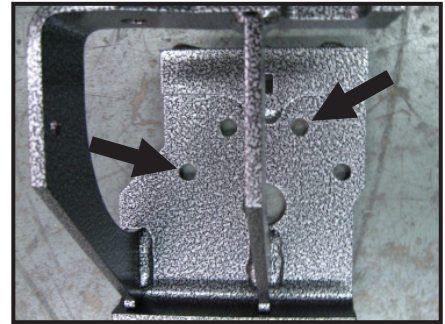


**7. POSITION AND SECURE THE AIR SPRING ASSEMBLY TO THE UPPER BRACKET (Cont...)**

*NOTE: The bolt holes used for the driver side upper brackets are as shown here.*

*NOTE: If necessary, disconnect or move any components such as a wiring harness away from the inside of the driver side frame rail to gain clearance for positioning the air spring assembly. Use Subgroup E to attach the harness clip into the upper bracket hole shown (D).*

Driver Side



**8. POSITION THE BOTTOM OF THE AIR SPRING ASSEMBLY ON THE JOUNCE BUMPER STRIKE PLATE**

Align the bottom of the air spring and lower bracket assembly so the bottom curved surface of the lower bracket fits onto the jounce bumper strike plate, as shown (A). The carriage bolts will be closest to the leaf pack on the truck.

*NOTE: For 2WD models, the lower bracket will sit on the axle.*



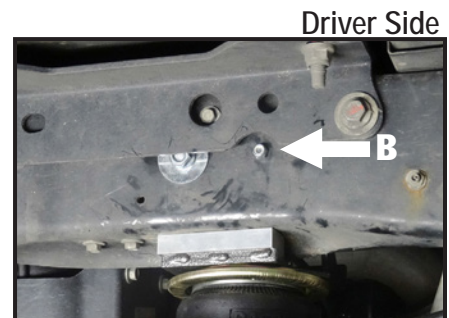
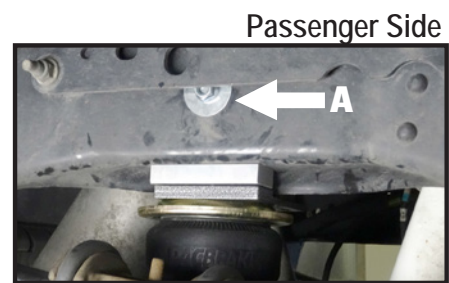
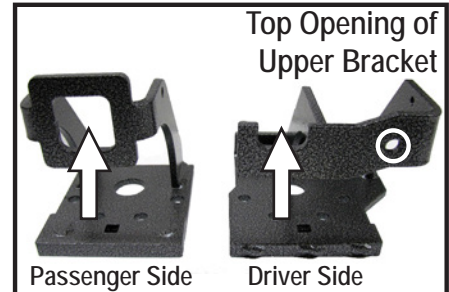
NOTE: For Step 9, use the parts in Subgroup B, as listed on Page 2.

## 9. SECURE THE TOP OF THE AIR SPRING ASSEMBLY TO THE FRAME

Torque the  $\frac{3}{8}$ " serrated flange nut on the carriage bolt, which was loosely attached to the frame in Step 6, to 16 ft lbs, 22 N•m.

Fasten the top opening of the upper bracket to the inside surface of the frame (see photo on right). Using the supplied  $\frac{1}{2}$ "-13 x  $1\frac{1}{4}$ " hex head cap screw with a  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washer to go through the upper bracket. Add another  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washer between the upper bracket and the frame and insert the rest of the screw through the frame. Cap with a  $\frac{1}{2}$ "-13 serrated flange nut and a  $\frac{1}{2}$ " x 2" thin flat washer on the outside (A). Torque to 27 ft-lbs, 37 N•m.

NOTE: For reference, the driver side is also in the photo shown on the right. The procedure for securing the air spring assembly is the same as for the passenger side, with the addition of securing the upper bracket to the inside surface of the frame with a  $\frac{5}{16}$ "-24 hex head cap screw and a  $\frac{5}{16}$ "-24 nut (B). Torque to 16 ft-lbs, 22 N•m.



### \*For trucks with a FACTORY FIFTH WHEEL HITCH:

Insert the supplied  $\frac{1}{2}$ "-13 x  $1\frac{1}{4}$ " hex head cap screw with a  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washer through the upper bracket. Add another  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washer between the upper bracket and the frame and insert the rest of the screw through the frame. Cap with a  $\frac{1}{2}$ "-13 serrated flange nut and a  $\frac{1}{2}$ " x 2" thin flat washer on the outside.

### \*For trucks with an AFTERMARKET FIFTH WHEEL HITCH WITH A BRACKET OR PLATE THAT RUNS ALONG THE SIDE OF THE FRAME AND USES THE FRAME SLOT TO SECURE ITSELF TO THE FRAME:

Use the existing hardware that is holding the plate to the frame. Add a  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washer in between the bolt and the air spring upper bracket.

### \*For trucks with an AFTERMARKET FIFTH WHEEL HITCH WITH A BRACKET OR PLATE THAT RUNS ALONG THE SIDE OF THE FRAME BUT DOESN'T HAVE ANY HARDWARE ATTACHING IT TO FRAME:

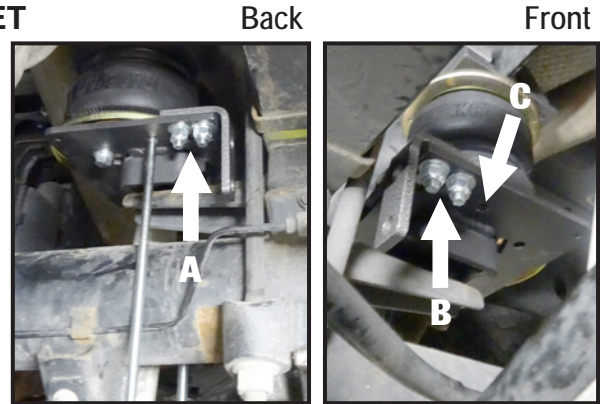
A  $\frac{1}{2}$ " hole will have to be drilled through the plate with the slot in the frame serving as a template. Use the supplied  $\frac{1}{2}$ "-13 x 3" hex head cap screws and  $\frac{1}{2}$ " x 2" x  $\frac{1}{4}$ " thick flat washers to fasten the upper bracket to the frame with the  $\frac{1}{2}$ "-13 x 3" hex head cap screw going all the way through the hole that was drilled through the fifth wheel hitch plate.

NOTE: For steps 10 & 11, use the parts in Subgroup C, as listed on Page 2.

**10. SECURE A FOUR HOLE LOCATING BRACKET TO EACH SIDE OF THE LOWER BRACKET**

Fasten two of the Four Hole locating brackets to the top side of the lower bracket closest to the leaf spring using four  $\frac{3}{8}$ "-16 x  $1\frac{1}{4}$ " carriage bolts, four  $\frac{3}{8}$ " flat washers, and a  $\frac{3}{8}$ " Nyloc nut for each bolt, as shown (A and B).  
Torque to 16 ft-lbs, 22 N•m.

Four Hole Locating Bracket



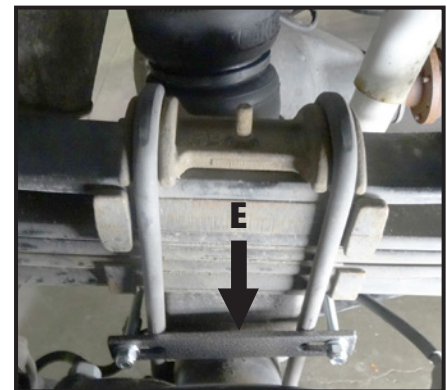
Insert a 10" carriage bolt into the unused square hole (C) from the top of the lower bracket.

**11. SECURING THE AIR SPRING ASSEMBLY TO THE LEAF SPRING**

Position a spring clamp bar on the side of the leaf spring U-bolt closest to the tire and attach it to the bottom hole of each Four Hole locating bracket with two  $\frac{3}{8}$ "-16 x 5" hex head cap screws,  $\frac{3}{8}$ " flat washers and  $\frac{3}{8}$ " Nyloc nuts (D).  
Torque to 16 ft lbs, 22 N•m.



When secured to both locating brackets, the spring clamp bar will secure the lower bracket of the air spring assembly to the leaf spring, as shown (E).



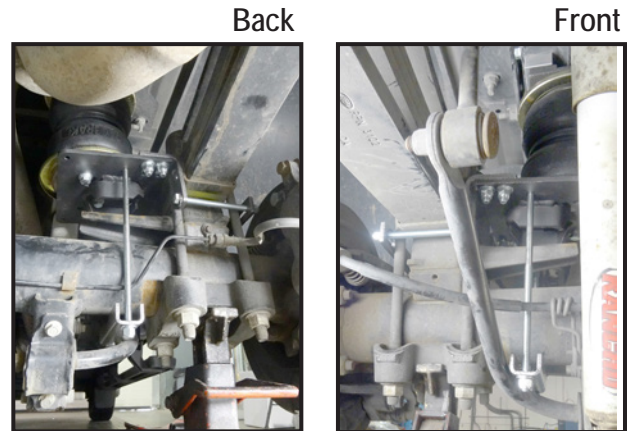


NOTE: For Step 12, use parts in Subgroup G, as listed on Page 2.

## 12. SECURE THE AIR SPRING ASSEMBLY TO THE AXLE WITH AN AXLE STRAP

Position an axle strap on to the two 10" carriage bolts (installed in Step 10), with the "U" facing UP towards the axle housing on the bottom of the axle. Attach the axle strap using two  $\frac{3}{8}$ " Nyloc nuts and  $\frac{3}{8}$ " flat washers, as shown.

Torque to 16 ft lbs, 22 N•m.

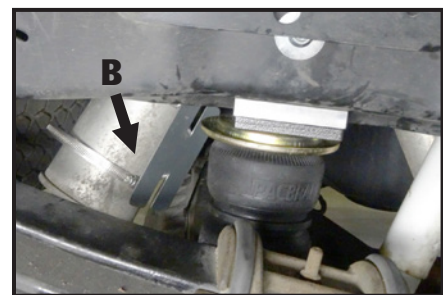
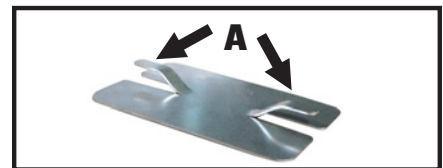


NOTE: For step 13, use the parts in Subgroup D, as listed on Page 2.

## 13. ATTACH THE HEAT SHIELD TO THE MUFFLER

Bend the tabs on the heat shield as shown (A) so there will be the necessary  $\frac{1}{2}$ " dead space between the heat shield and the muffler when the heat shield is attached.

Attach the heat shield to the muffler as shown (B) using two hose clamps. Each hose clamp holds a tab against the muffler. Make sure the heat shield is facing toward the airspring.



## 14. INSTALL THE AIR LINE

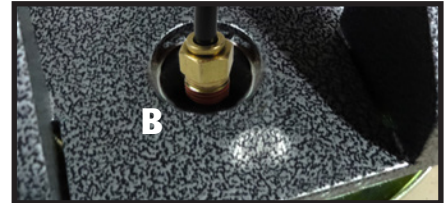
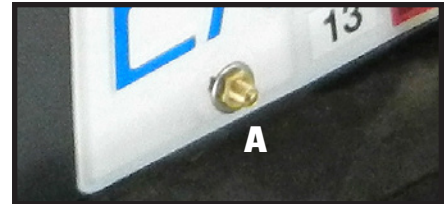
Provided in the basic air spring kit are two fill valves, the most common place to install them is to replace the license plate fasteners with the fill valves (A). Alternatively, two holes can be drilled in a convenient location. Install one airline provided, route the nylon hose to an air spring fitting, cut the hose and connect to the air spring fitting. Repeat with the other fill valve. Secure airlines with the tie-straps provided away from moving items and heat sources.

If an in cab inflation kit is being installed, follow the instructions provided with it.

NOTE: This kit contains push to connect fittings, using scissors or wire cutters to cut the nylon airline will distort the line and cause the connection to leak. **THE AIRLINE MUST BE CUT OFF SQUARELY WITH A SHARP RAZOR KNIFE.** Moisten the end of the airline prior to inserting it into the fitting and push it in until it stops.

After the air line is cut, insert one end into the air line fitting, as shown in (B), and the other into the fill valve. Moisten the end of the air line with liquid soap prior to inserting it, and then push it in until it stops.

NOTE: Repeat steps 5-14 for the other side of the vehicle.



## 15. DO A LEAK CHECK

Inflate both the air springs to 90 PSI, then use a dish soap and water mixture on all air line connections to detect any air leaks. Repair as necessary and retest.

Inflate the air springs to a predetermined value, and on the following day recheck the pressure. If one or both the air springs have lost pressure, a leak is present. The leak must be repaired, and then retested until no leaks exist.



## 16. AFTER THE INSTALLATION IS COMPLETED, PLEASE REMEMBER:

Install the wheels, torquing the fasteners to the manufacturer's specifications.

Re-torque all the fasteners after the first 500 miles of driving.

For safe and proper operation, never operate the vehicle under the minimum of 10 PSI or over the maximum of 100 PSI. Staying within the pressure limit will ensure maximum air spring life. Failure in doing so may result in a void warranty (see *Note* below).



## OPTIONAL ACCESSORIES

Pacbrake offers an optional dual needle air gauge to monitor the pressure in each air spring from the vehicle's cab. Pacbrake also offers a full line of air compressors, air tanks and solenoids to control your air spring system.

## OPERATING YOUR VEHICLE WITH PACBRAKE AIR SUSPENSION

Air springs have minimum and maximum pressure requirements. Never operate your vehicle with less than 10 PSI in the air spring and never inflate the air springs over 100 PSI, or damage to the air springs will result.

Check the air pressure in the air springs daily for the first couple of days to ensure a leak does not develop. The air springs are designed to maintain the vehicle's stock ride height with a load. Do not use the air springs as a means to lift the vehicle with no load, or a rough ride will result.

## SERVICING YOUR VEHICLE WITH PACBRAKE AIR SUSPENSION

When lifting the vehicle with a floor jack or hoist on the frame, never allow the air spring to limit the travel of the axle: try to always jack the vehicle on the axle. Suspending the axle with the air spring limiting the axle travel will damage the air spring and void the air spring warranty.