



559-734-7451 800-367-5480 FAX 559-734-7460

INSTALLATION INSTRUCTIONS

6090 Air Suspension Kit (pat. pending)

1999-2006 Tahoe, Suburban, Avalanche, Yukon

Thank you for purchasing a quality Hellwig Product.

**PLEASE READ THIS INSTRUCTION SHEET COMPLETELY BEFORE STARTING
YOUR INSTALLATION**

IMPORTANT NOTES

**IF EQUIPPED WITH FACTORY PREMIUM RIDE OR
AUTOLEVEL SUSPENSION, CONTACT HELLWIG
PRODUCTS CO. FOR FURTHER INSTRUCTIONS.**

***DO NOT INFLATE ANY AIR SPRING ASSEMBLY UNLESS IT HAS BEEN
PROPERLY INSTALLED ON VEHICLE.***

DO NOT INFLATE AIR SPRINGS OVER 100 PSI

**A MINIMUM OF 5-10 PSI MUST BE MAINTAINED IN AIR SPRINGS
AFTER INSTALLATION FOR WARRANTY TO BE VALID. FAILURE TO
KEEP MINIMUM PRESSURE IN AIR SPRINGS WILL VOID WARRANTY.**

**THIS UNIT IS DESIGNED TO INCREASE THE LEVEL LOAD CARRYING
CAPACITY OF YOUR VEHICLE. NEVER LOAD THE VEHICLE THIS
UNIT IS INSTALLED ON BEYOND THE MANUFACTURER'S MAXIMUM
GROSS VEHICLE WEIGHT RATING.**

**OVERINFLATION AND IMPROPER USE MAY RESULT IN PERSONAL
INJURY AND/OR DAMAGE TO YOUR VEHICLE AND PROPERTY.**



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BEFORE STARTING YOUR PROJECT

WHEN LIFTING A VEHICLE WITH A JACK, BE SURE TO SET THE PARKING BRAKE AND USE SAFETY STANDS.

ENSURE THAT THE INSTALLATION OF COMPONENTS WILL NOT CRUSH OR DAMAGE FUEL AND BRAKE LINES OR ELECTRICAL HARNESSES.

BEFORE DRILLING ANY HOLES, ENSURE THAT ALL ELECTRICAL WIRES, FUEL LINES, BRAKE LINES, BRAKE HOSES AND ANY OTHER COMPONENTS ARE MOVED OR PROTECTED TO AVOID DAMAGE FROM DRILLING ANY HOLES .

DO NOT ATTEMPT ANY MODIFICATIONS TO THE VEHICLE OTHER THAN THOSE OUTLINED IN THIS INSTRUCTION SHEET. IF ANY INTERFERENCE WITH THE GAS TANK, FUEL LINES, BRAKE LINES, EXHAUST PIPE, ETC. EXISTS, STOP YOUR INSTALLATION AND CALL HELLWIG PRODUCTS FOR TECHNICAL HELP.

IF WHEELS ARE REMOVED FOR INSTALLATION OF KIT, CHECK MANUFACTURERS SPECIFICATIONS FOR PROPER LUG NUT TORQUE BEFORE REINSTALLING WHEELS.

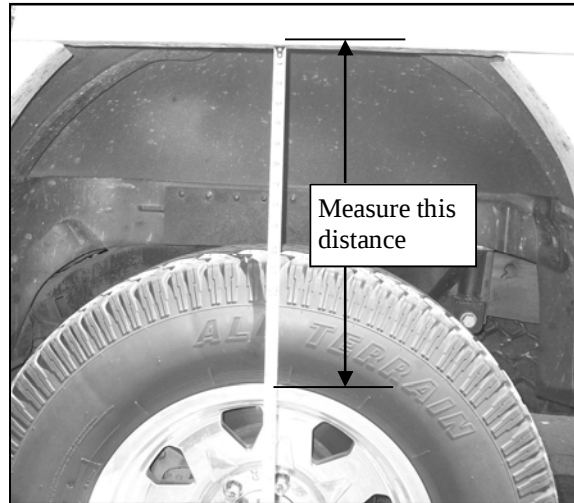
WHEN CUTTING AIR BRAKE TUBING, A SQUARE CUT IS REQUIRED AND THE HOSE END MUST NOT BE DEFORMED OR LEAKAGE MAY RESULT. IF DEFORMATION OF THE HOSE END OCCURS, THE HOSE END MUST BE REWORKED SO THAT IT IS ROUND.

ENGAGEMENT OF THE SEALING O-RING WILL BE FELT WHEN THE AIR LINE HAS BEEN INSERTED PROPERLY INTO THE FITTING. FITTINGS MAY BE DISCONNECTED IF REQUIRED BY PUSHING DOWN ON THE OUTER RING WHILE PULLING FIRMLY ON THE AIR LINE.

ROUTE AIR LINES AWAY FROM EXHAUST PIPES OR ANY OTHER SOURCES OF HEAT AND ENSURE THAT THE AIR LINES ARE PROTECTED FROM SHARP EDGES.



Part A Air Spring Installation

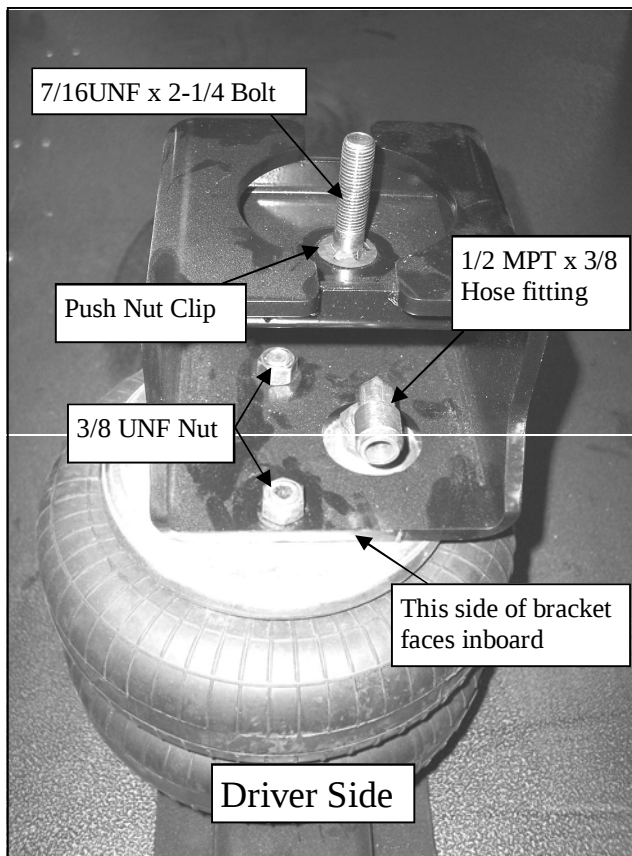


1. Prepare vehicle for installation by chocking front tires and setting emergency brake. Before starting installation, measure the distance from the top of rear wheel to fender lip as shown. This is the original ride height of the vehicle. Write this measurement down as this will be used to set the height of the air springs later in the installation.

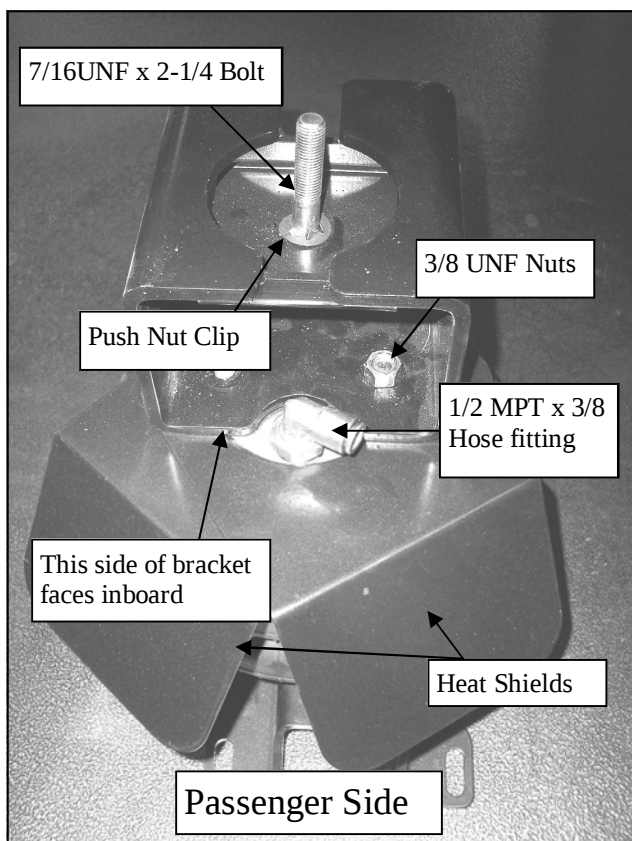


2. For ease of installation, position the rear wheels on automotive ramps. Ensure vehicle is secure and disconnect shock absorbers from rear axle. Raise vehicle frame until coil springs are unloaded. Support frame with jack stands and remove coil springs and insulators from vehicle. Do not remove bump stops from frame.

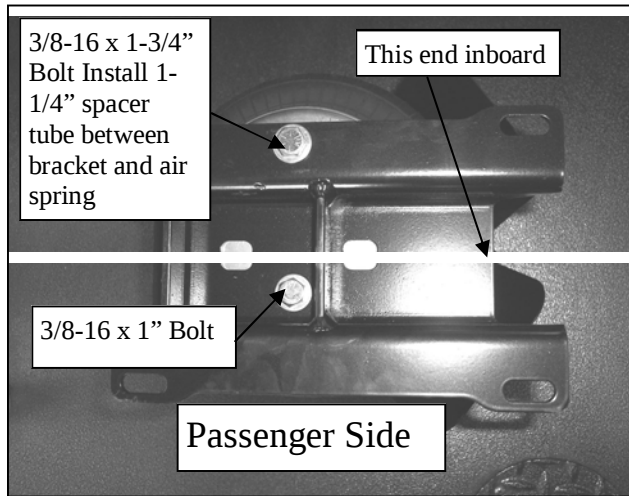
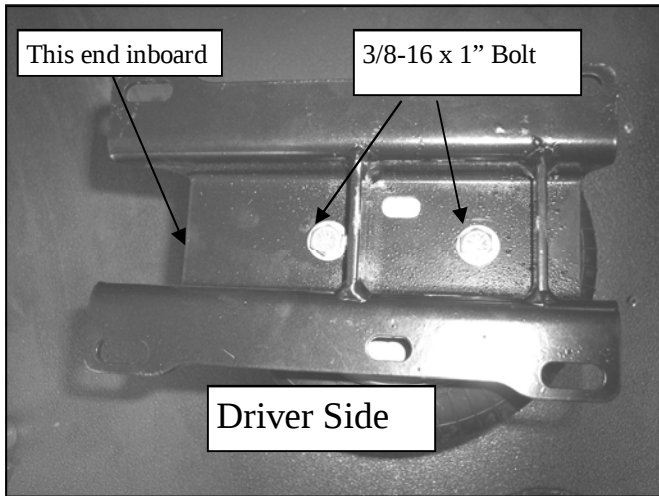




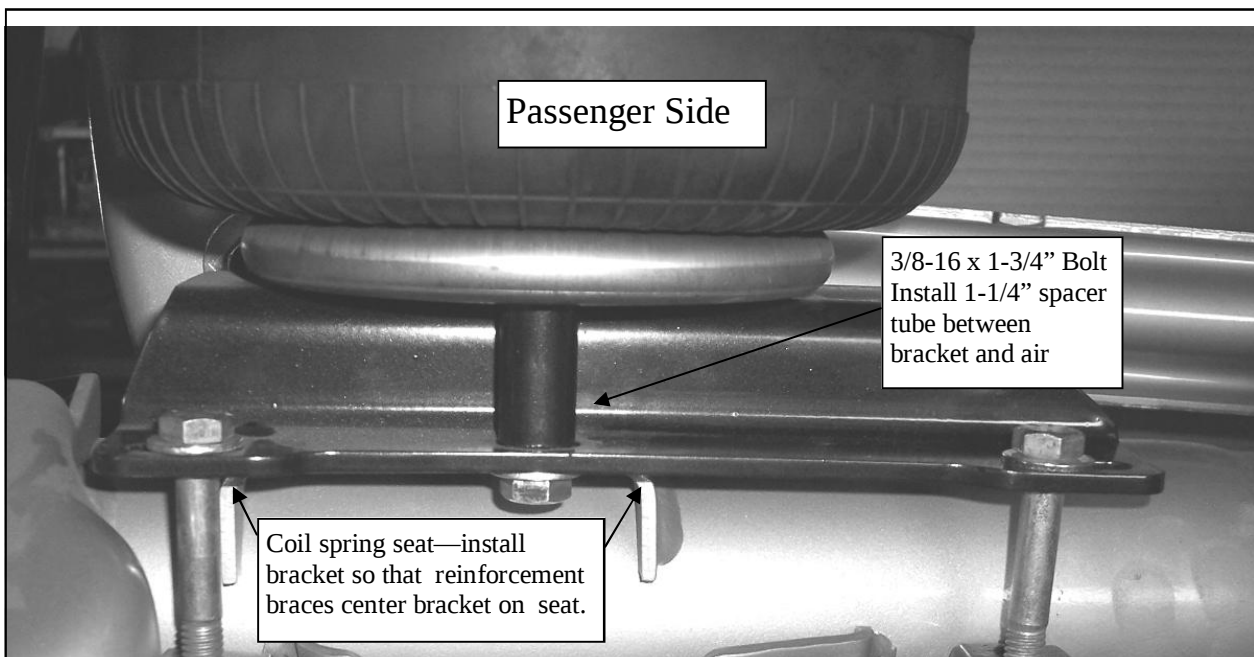
3. Prepare driver side air spring assembly by installing 1/2" MPT x 3/8 push to connect fitting into air spring. Torque to 25-30 ft-lb. The driver side frame bracket has a full circle cut out for the air fitting instead of a cut-out on the edge. Attach frame bracket to air spring with 3/8" UNF nuts. Torque to 20 ft-lb. Place 7/16-20x2-1/4" bolt through hole in frame bracket and retain with push nut clip. Push nut can be installed on bolt by pushing on clip with a deep well socket while holding head of bolt in place.

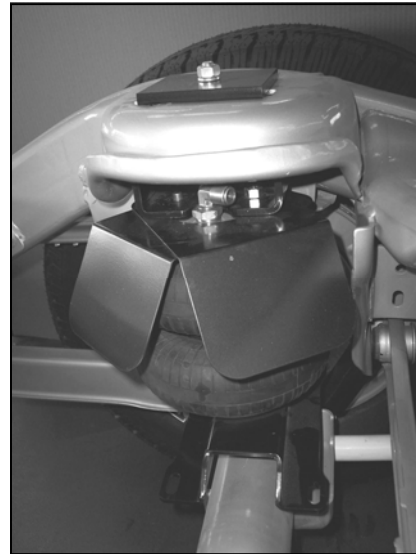
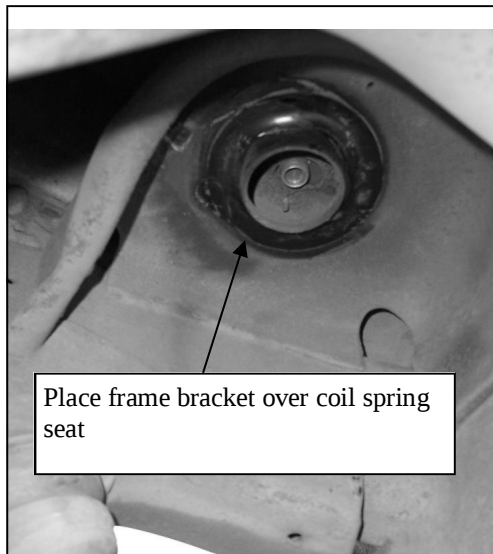


4. Prepare passenger side air spring assembly by installing 1/2" MPT x 3/8 push to connect fitting into air spring. Torque to 25-30 ft-lb. The passenger side frame bracket has a cut-out on the edge of the bracket for the air fitting. Place two (2) heat shields on top of air spring as shown and attach frame bracket to air spring with 3/8" UNF nuts. Torque to 20 ft-lb. Place 7/16-20x2-1/4" bolt through hole in frame bracket and retain with push nut clip. Push nut can be installed on bolt by pushing on clip with a deep well socket while holding head of bolt in place.

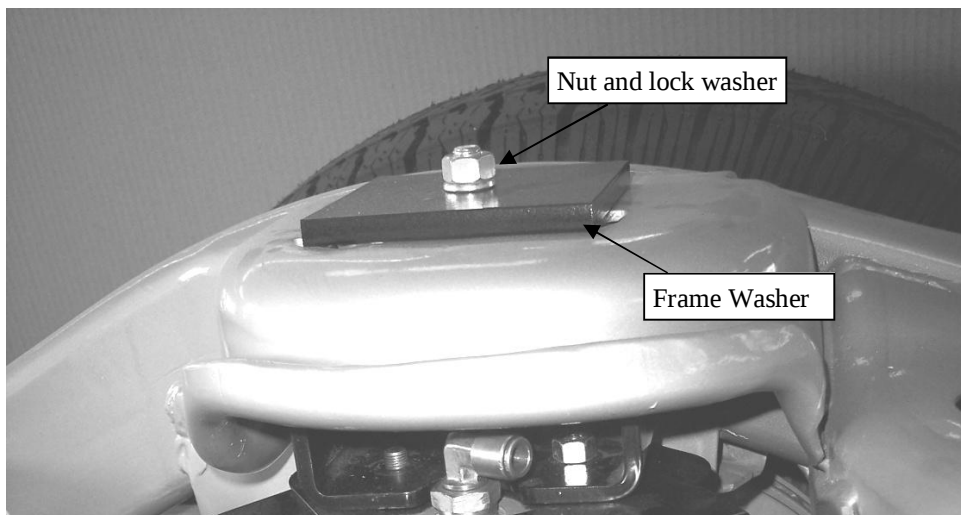


5. Attach axle bracket to air spring as shown. The reinforcement braces are to be installed over the coil seat on the axle. Note that the bracket is installed so that the braces are under the air spring. The section of the axle bracket without braces will be installed so that it faces inboard toward the center of the axle. There are differences in how the brackets attach to the air spring for the driver and passenger assemblies. On the passenger side assembly attach the 3/8-16 x 1-3/4" bolt and 1-1/4" spacer to air spring and axle bracket as shown. Then attach 3/8-16 x 1" bolt to air spring through middle hole of axle bracket as shown. Snug bolts but do not tighten to allow for adjustment. On the driver side assembly attach the axle bracket to the air spring using the slotted holes as shown using 3/8-16 x 1" bolts. Snug bolts but do not tighten to allow for adjustment.

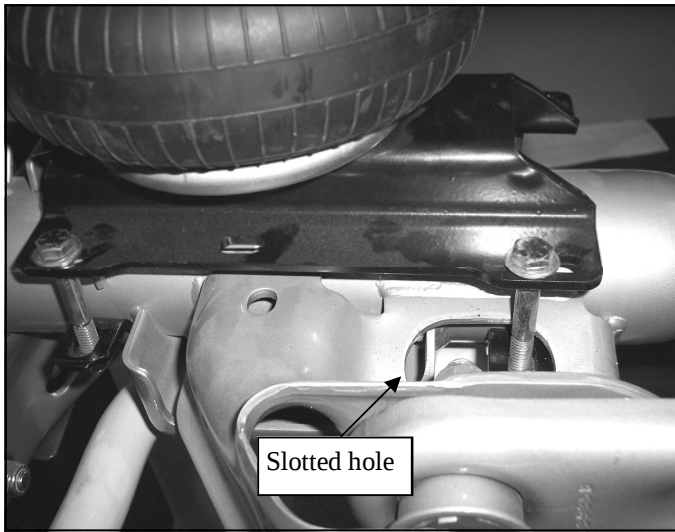




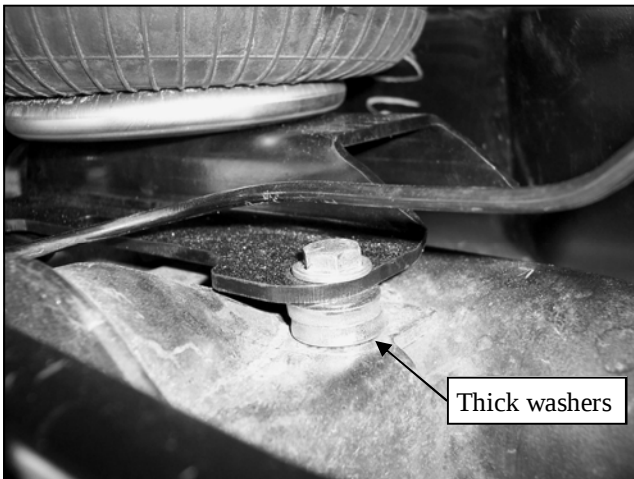
6. Compress air spring assembly and install between axle and frame. Place brackets over coil spring seats so that the cut-out in the frame bracket and the reinforcements in the axle bracket fit over the raised lip of the seat. Adjust axle brackets so that air springs sit square and tighten bolts to 20 ft-lb. Heat shields may need to be bent slightly to clear exhaust pipe.



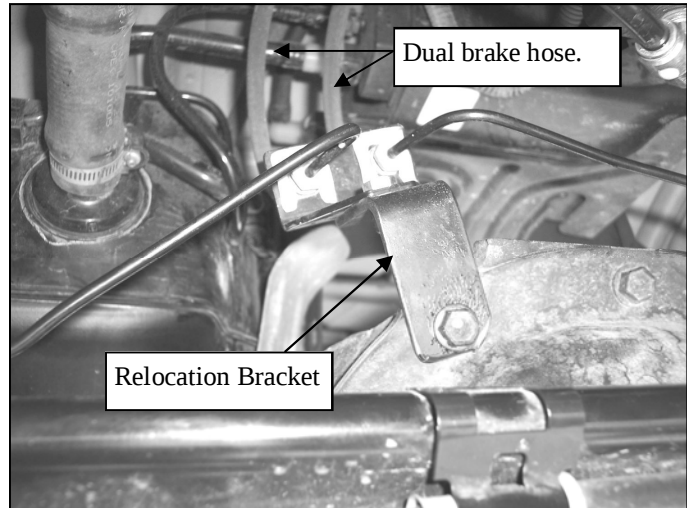
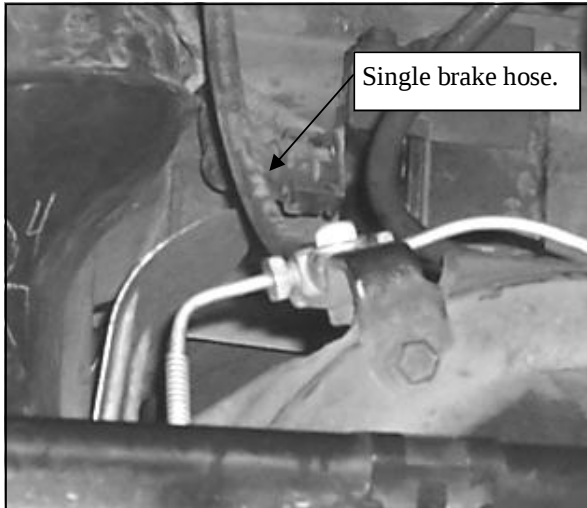
7. To aid assembly of brackets to frame, lower frame of vehicle slightly so that the air spring assembly holds itself in place between the axle and frame. While lowering frame, DO NOT get under vehicle or place hands between axle and frame. Place frame on jack stands before continuing work. Attach frame bracket by placing frame bracket over coil spring seat so that the cut-out in the frame bracket fits over the raised lip of the seat. Place frame washer over bolt and attach bracket with 7/16" nut and lock washer. Tighten 7/16" bolt to 35-40 ft-lb. Due to the close quarters of the body and frame it is advised to hold the nut in place with a wrench and tighten the bolt head. To gain additional clearance to tighten the nut, the plastic inner fender wells can be unbolted.



8a. 1999– early 2006 models—Driver side panhard axle bracket has a large slotted hole to insert bolt through as shown. Place 3/8-16x2-3/4” bolts through slotted holes in axle bracket as shown and attach qty 2 axle straps per side to axle using washers and 3/8” locknuts. Tighten nuts until legs of axle straps bend slightly. Relocate brake lines so that they do not interfere with axle brackets, bolts, straps and air springs.



8b. Late 2006 models - Driver side panhard axle bracket does not have a large slotted hole. Place 3/8-16x2-3/4” bolts through slotted holes in axle bracket as shown and attach qty 2 axle straps to passenger side axle bracket using washers and 3/8” locknuts. Attach 1 axle strap to outboard side of axle bracket only as shown for early models. Place qty (2) 1/4” thick washers between axle bracket and panhard axle bracket as shown. Shim axle bracket with additional flat washers until bracket is parallel with axle. Insert 3/8-16 x 1-1/2 bolt and tighten locknut to 20 ft-lb. Tighten nuts on axle straps until legs of axle straps bend slightly. Relocate brake lines so that they do not interfere with axle brackets, bolts, straps and air springs.



9. If vehicle has a single brake hose go to step 10. If the vehicle has two brake hoses as shown, remove factory bracket and install brake relocation bracket using 5/16" bolt and nut to attach brake hoses to bracket. Failure to properly install bracket will result in contact between the brake lines and leveling valve.

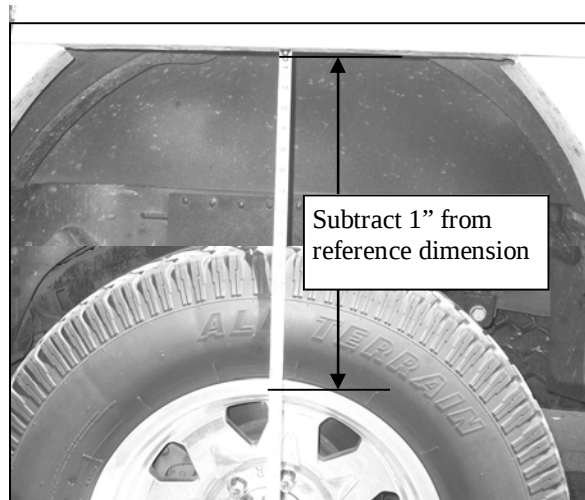


10. Recheck all fasteners for proper torque and ensure adequate clearance to all vehicle components – exhaust, brake hoses, brake lines, shocks, differential, etc. Make sure that passenger side panhard bolt will not contact air spring during use. A minimum of 1/2" clearance is required. If necessary, remove and re-install panhard bolt with bolt head facing air spring to provide clearance.

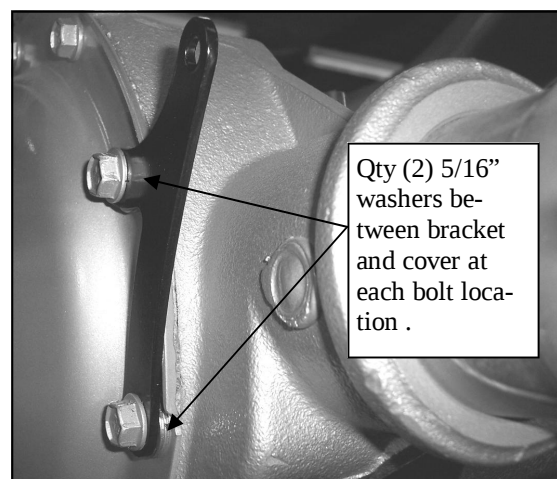
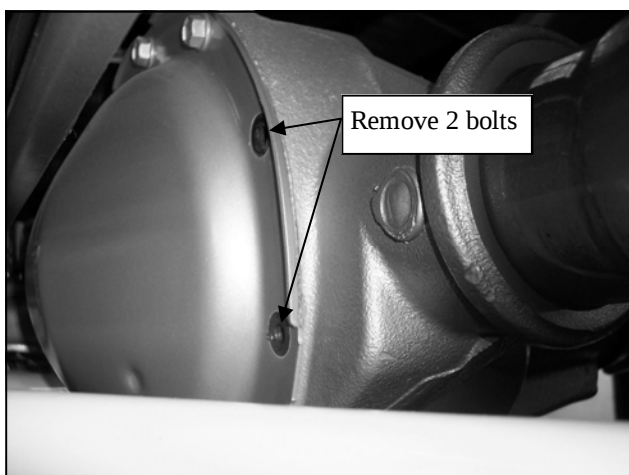


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Part B Leveling Valve Installation



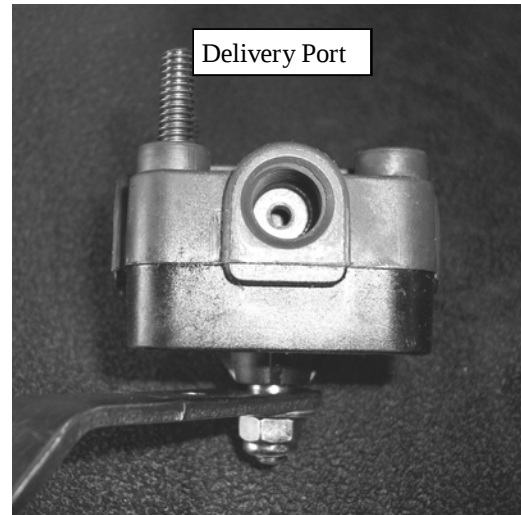
11. Reference the ride height from step (1) and subtract 1" from this measurement. Adjust frame height to the new measurement and place frame on jack stands. This will allow the vehicle to have a level attitude as GM built in rake to accommodate compression of the coil spring under load. The air suspension will hold ride height regardless of load. **IMPORTANT-** You must reduce the rear ride height 1" to prevent the leveling valve linkage from contacting the floorpan.



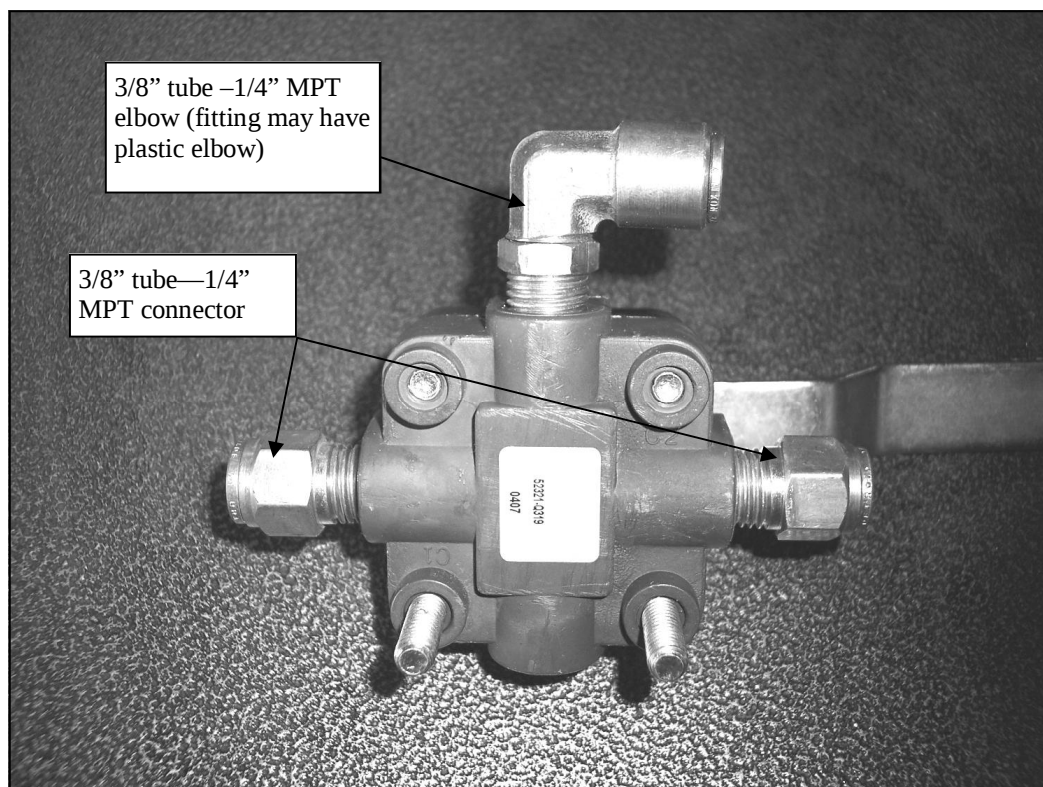
12. Remove 2 bolts from differential cover as shown. Re-use bolts to attach leveling valve axle bracket as shown. Place qty (2) 5/16" washers between differential cover and bracket at each bolt location to make bracket sit square. Torque to 10-12 ft-lb.



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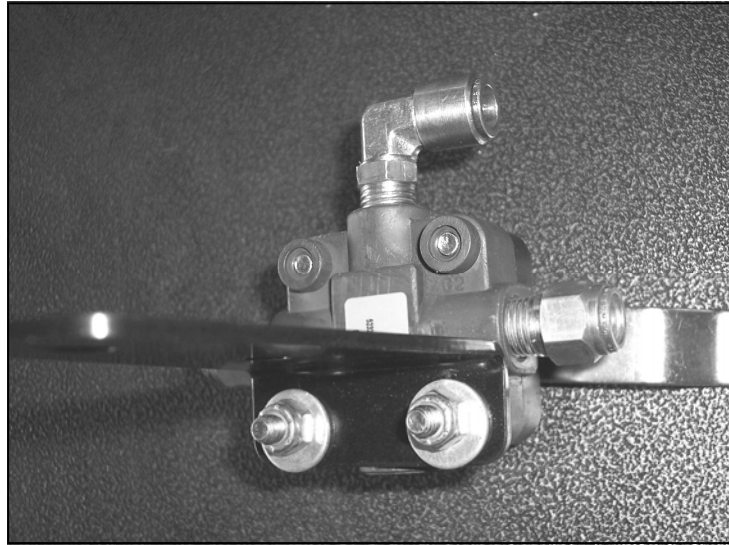


13. Prepare leveling valve for installation. The inlet and exhaust ports have a screen across the base of the port while the delivery ports to the air springs have a hole. See photos. Attach fittings to leveling valve as shown below. Torque fittings to 7-8 ft-lb. Do not overtighten.

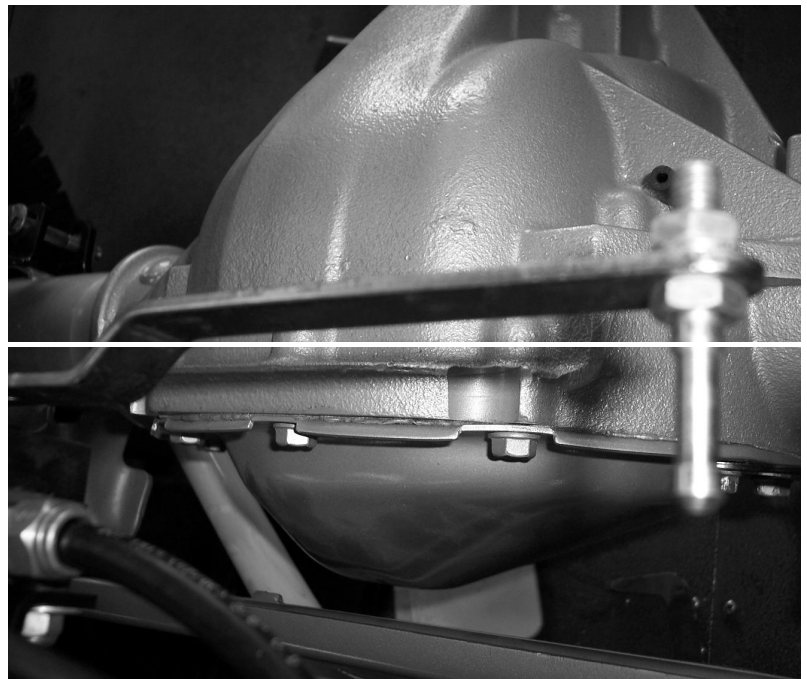
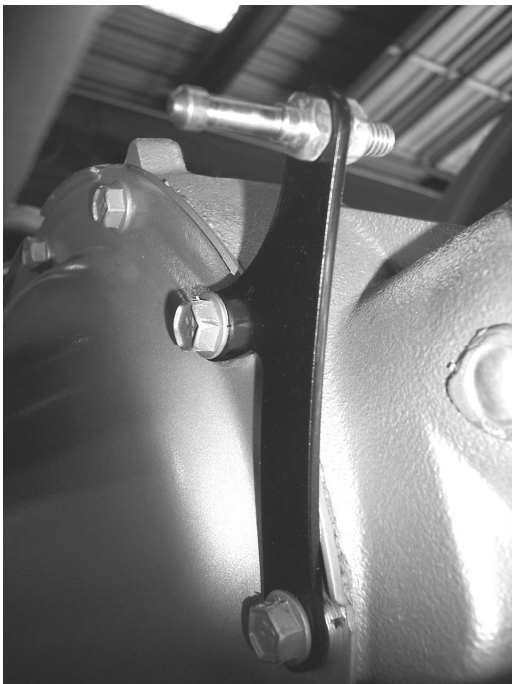




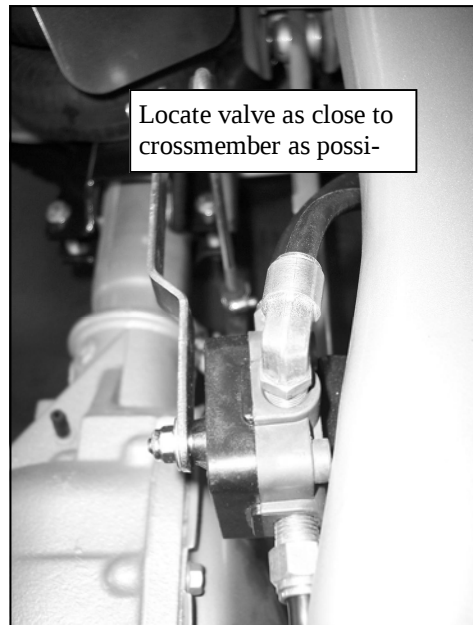
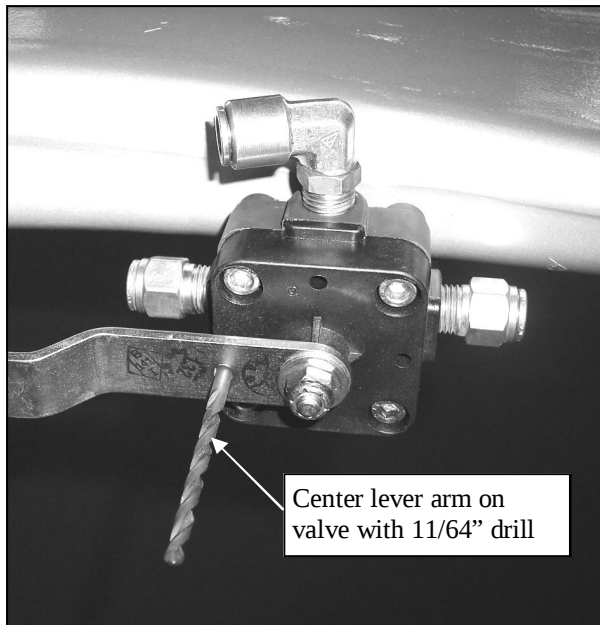
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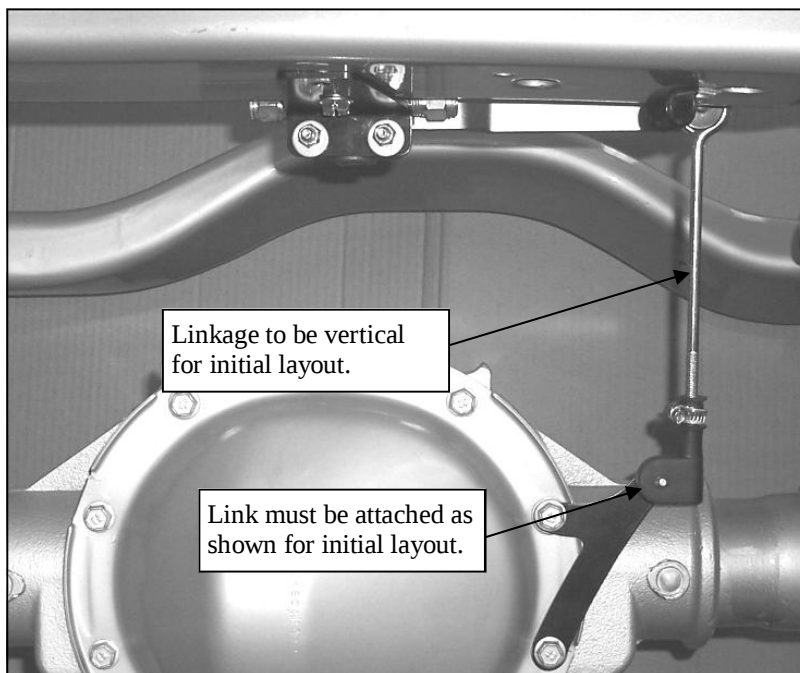
14. Attach leveling valve bracket to valve as shown using 1/4" nylon locknuts and washers. Tighten to 7 ft-lb.

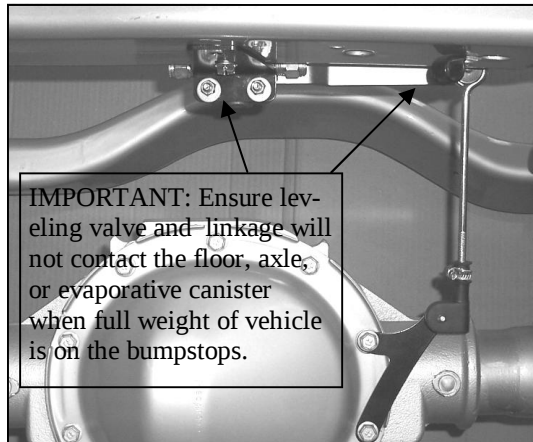
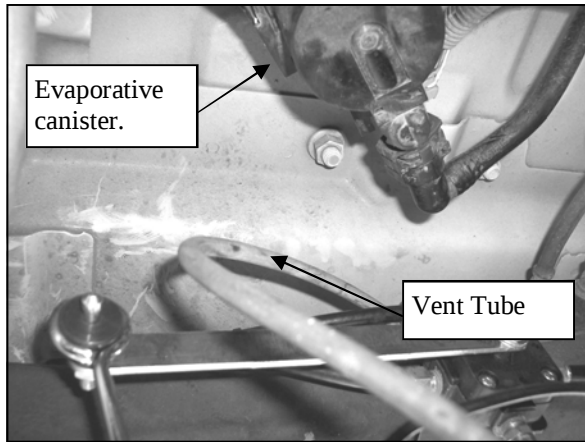


15. Attach leveling valve linkage pins to valve and axle bracket in orientation shown. Make sure that the axle bracket and linkage pin will not interfere with brake lines. Relocate brake lines as required. Tighten nuts to 8-10 ft-lb.

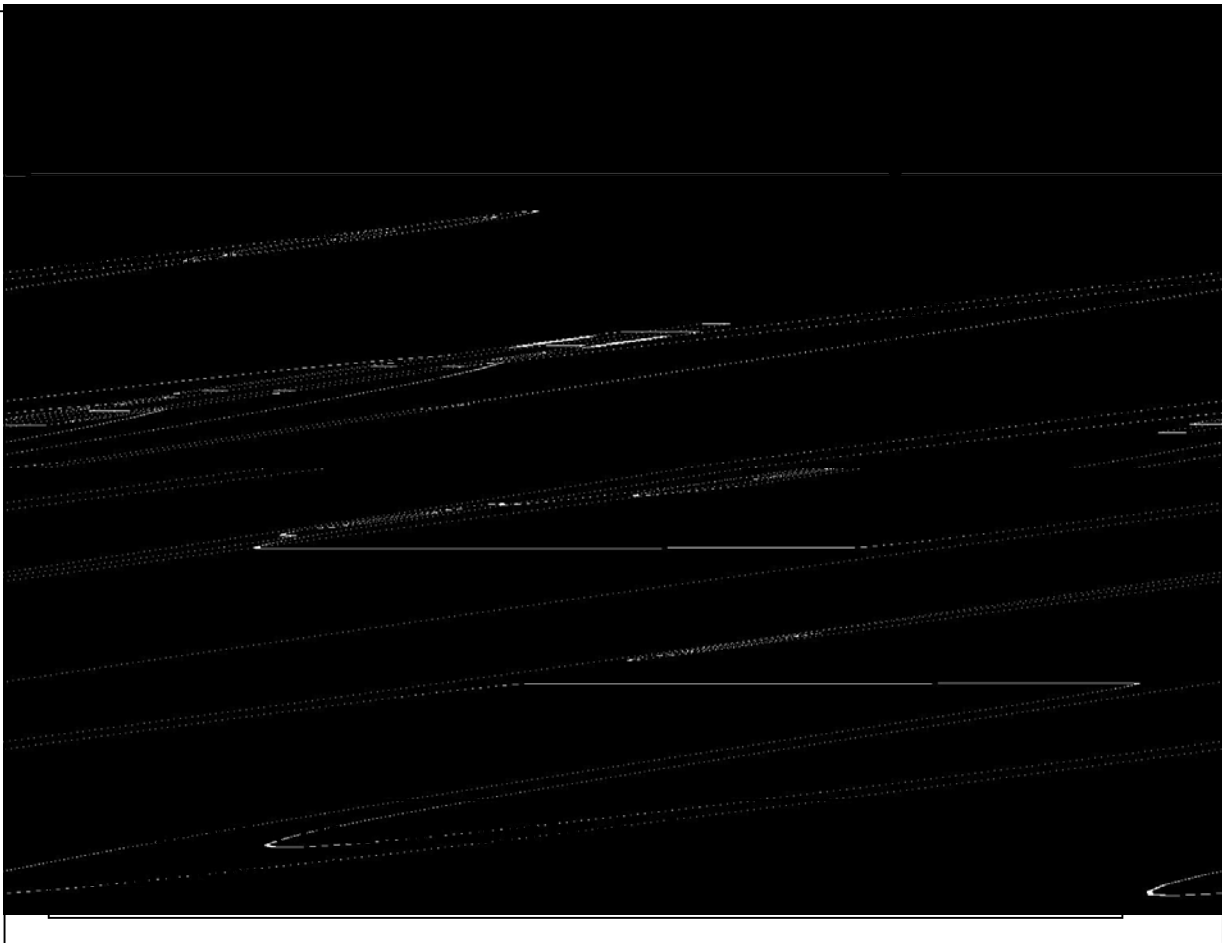


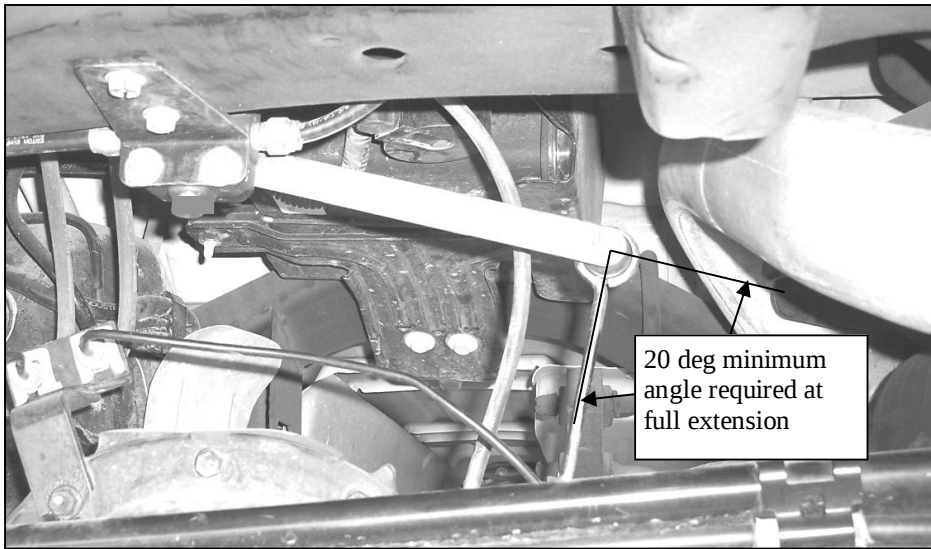
16. Assemble linkage as shown in photos and clamp leveling valve bracket to frame crossmember in location shown so that linkage geometry matches photo. Make sure leveling valve is as close to crossmember as possible to provide axle clearance when suspension compresses. DO NOT drill mounting holes at this time. Center leveling valve by inserting a 11/64" drill bit through hole in arm and body of leveling valve. When satisfied with linkage geometry, REMOVE drill bit.



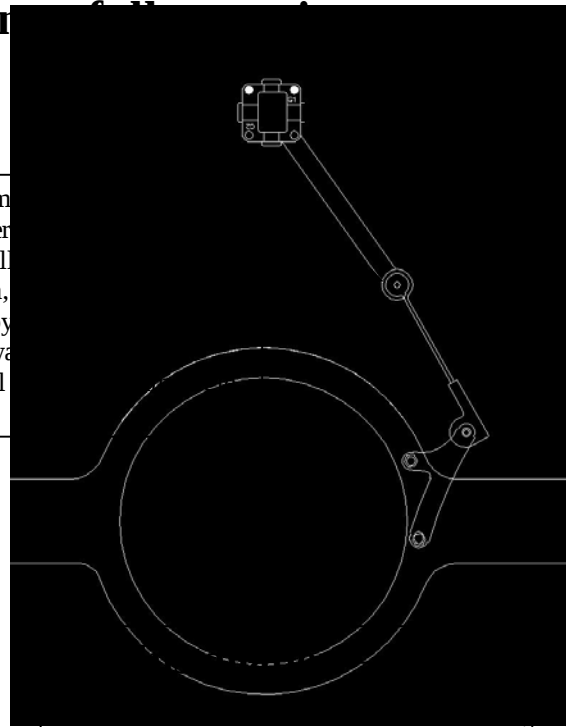
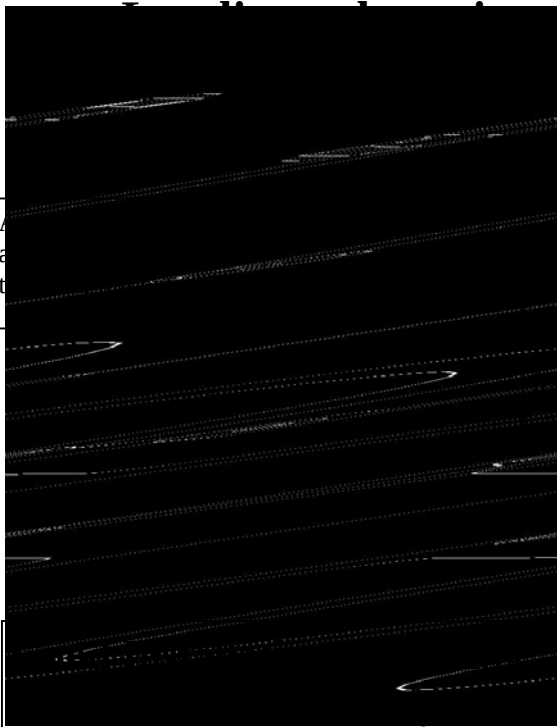


17. IMPORTANT— BEFORE DRILLING ANY MOUNTING HOLES IN CROSS-MEMBER, remove jack stands and lower frame so that the weight of the vehicle is on the bumpstops. CHECK POSITION OF LEVELING VALVE SO THAT IT CLEARS AXLE ASSEMBLY AND BRAKE LINES. It will be a close fit but there should be at least 1/2" of clearance. Relocate brake lines if required. Also check that the leveling valve arm will not contact the floor of the vehicle or any other components— evaporative canister, vent tube, exhaust pipe, etc. After verifying clearances proceed to step 18—Do not drill holes at this time.





18. Reconnect shock absorbers to axle brackets and torque bolts to 60-70 ft-lb. **IMPORTANT**— Raise vehicle frame until the wheels come off the ground and support frame on jack stands. Note orientation of leveling valve linkage. The leveling valve arm and link must NOT be in line when the suspension is at full extension or the valve will not operate properly. Ensure there is at least a 20 degree angle between the lever arm and linkage at full extension. The leveling valve can be moved toward the passenger side frame rail to increase this angle. The leveling valve **MUST** be **RECHECKED** at compression and nominal ride height if the leveling valve is moved to ensure that the arm and linkage will not contact the vehicle or any of its components.

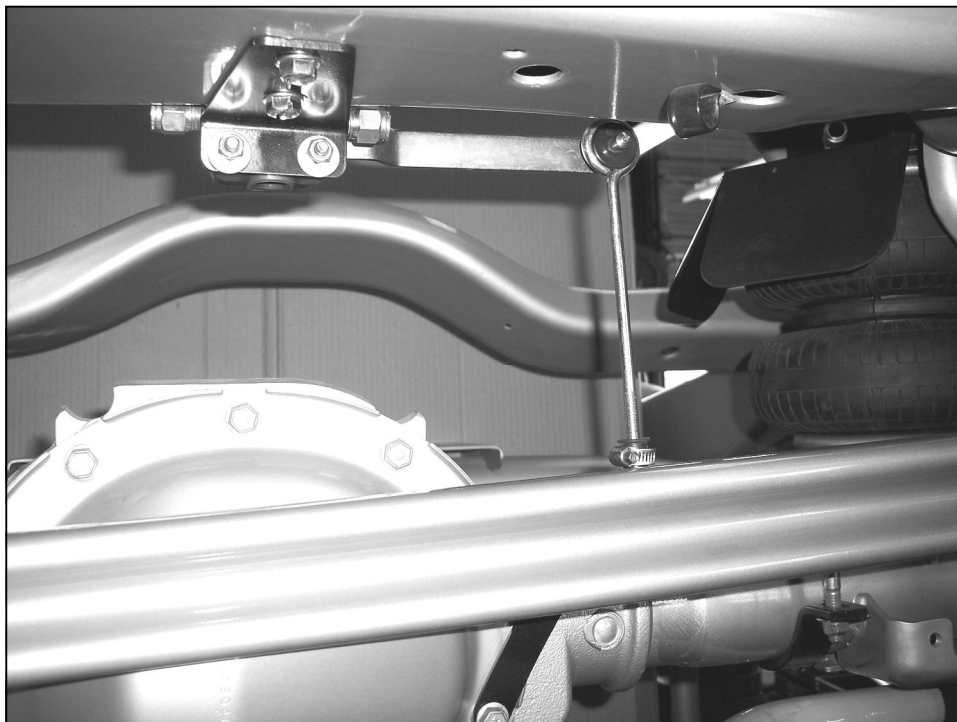




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19. When satisfied with position of leveling valve and linkage has been checked for proper operation and clearance, mark hole location to attach leveling valve bracket to crossmember. Drill (2) 1/4" holes and install (2) 5/16" self tapping bolts to attach bracket to crossmember. Torque bolts to 10 ft-lb



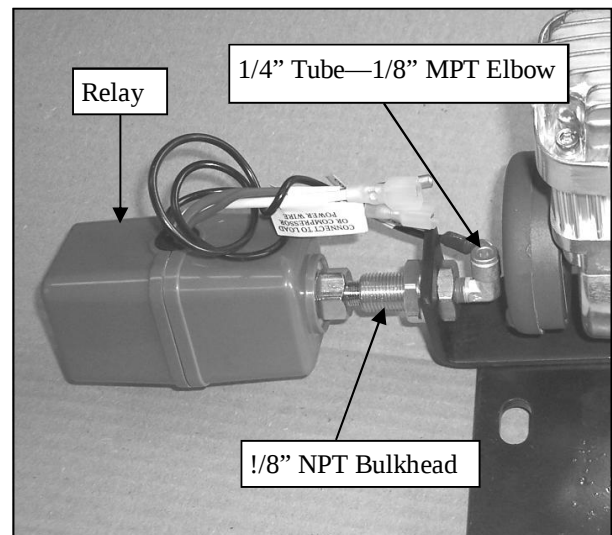
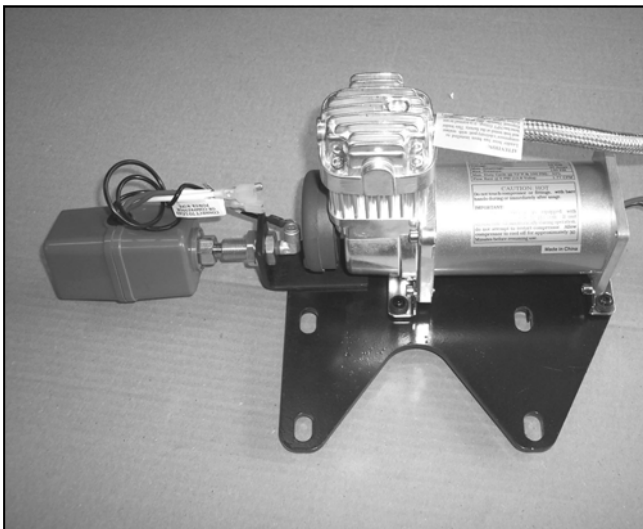


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Part C Compressor Installation



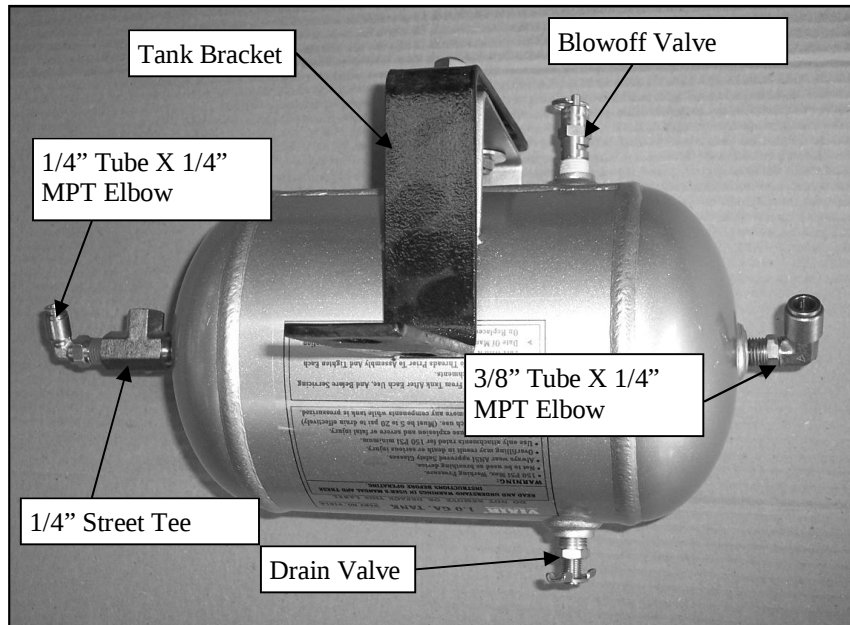
20. Prepare the compressor for mounting by **HAND-TIGHTENING** the air filter into the port on the compressor. If necessary, adapters are provided with the compressor to connect nylon hose from the tank to the compressor hose. Do not remove the braided hose or check valve from the compressor. **If the vehicle will be operated in a manner where the compressor may draw in water, the air filter should be remotely mounted with components included with compressor.**



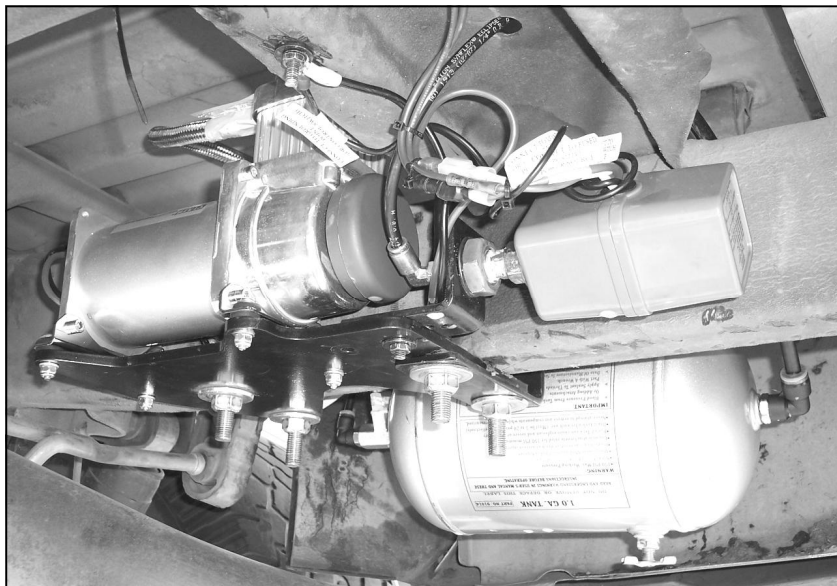
21. Attach 1/8" NPT bulkhead to relay bracket and fasten to mounting plate using 1/4" hardware. Attach 1/4"x 1/8" MPT elbow to bulkhead. Attach relay to opposite end of bulkhead as shown. Use pipe sealant or Teflon tape (provided) on all connections. Attach compressor to mounting plate as shown using hardware provided.



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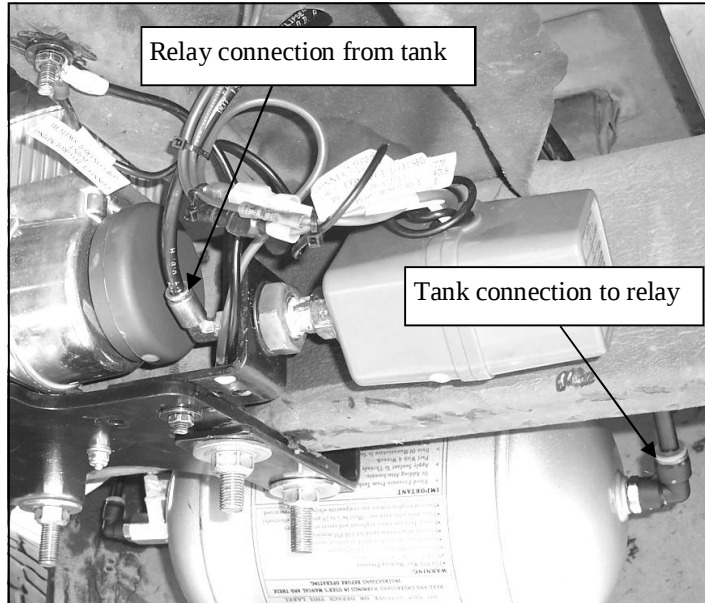
22. Prepare air tank as shown. Apply pipe sealant or Teflon tape to all fittings. Attach tank to tank bracket with 3/8-16 x 1" bolts, washers and locknuts.



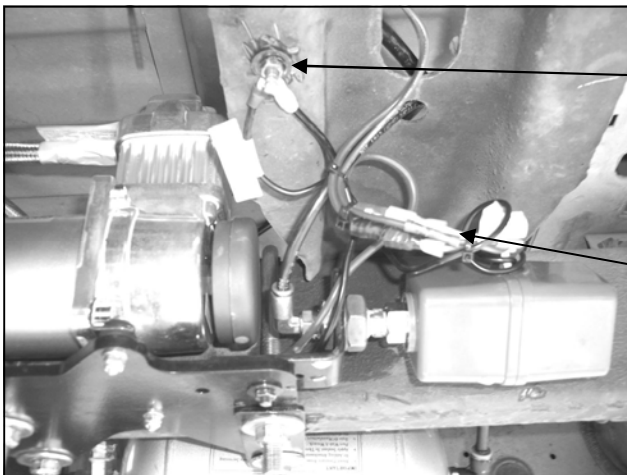
23. Remove spare tire and install U-bolts on passenger side frame rail in location shown in photo. Attach compressor mounting plate with compressor located on inboard side of frame rail using U-bolt, 7/16" locknuts and washers. Attach tank to outboard side of frame rail by attaching tank mounting bracket to U-bolt as shown.



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24. Connect elbow fitting on relay bulkhead to 1/4" fitting on tank using 1/4" nylon tubing as shown. Make sure hose will not be damaged by rubbing on any frame mounted components.



Use existing hole in crossmember to ground compressor and relay. Remove coating to provide ground contact.

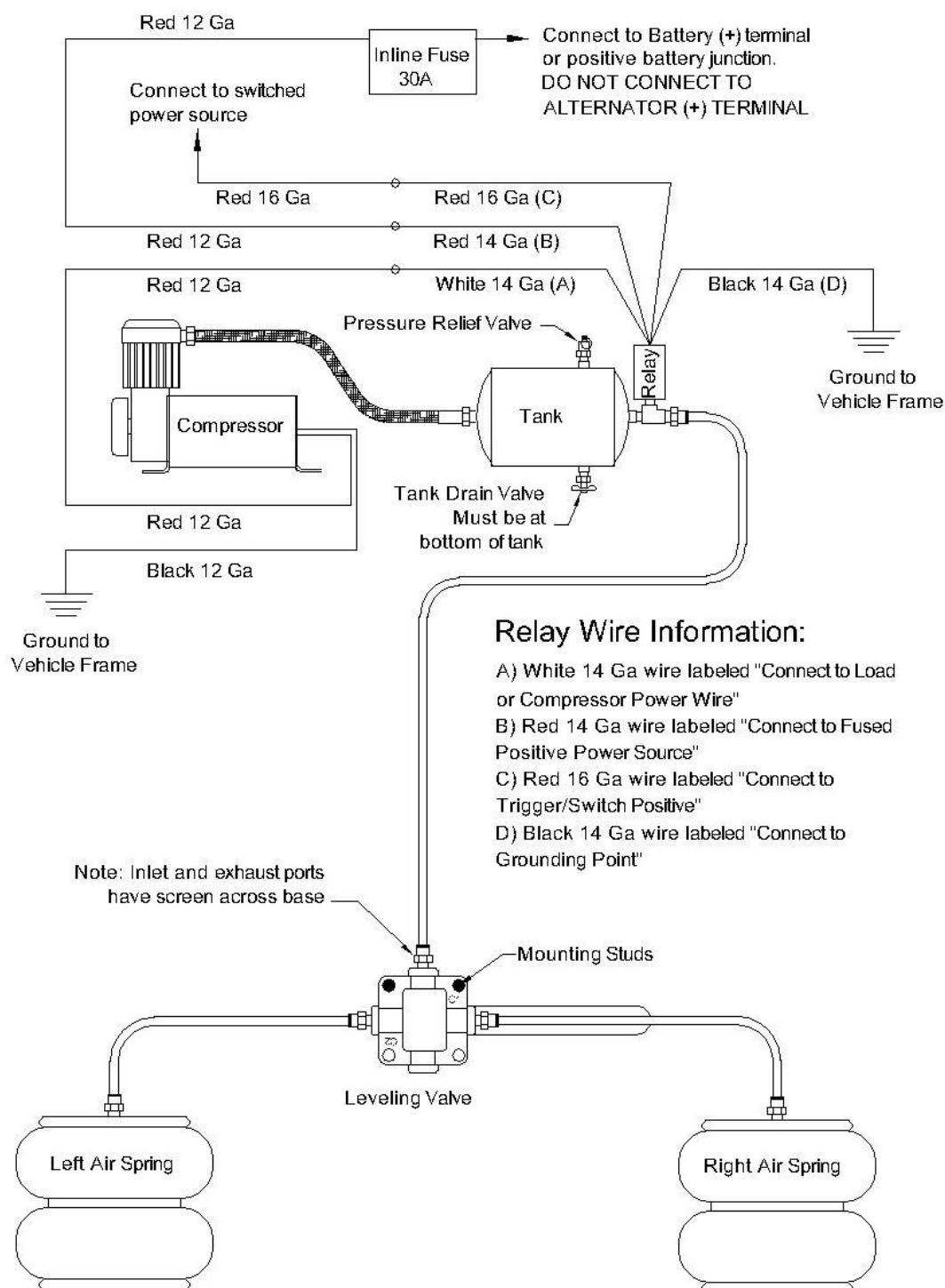
Relay connections—see next page for schematic.

25. Route 12 ga and 16 ga electrical wires from compressor to engine compartment along driver's side frame rail. Make sure to fasten wires securely to existing wire harness. Follow plumbing and wiring diagram for connection of leveling valve, compressor, and relay. Take care when routing air and electrical lines that they will not be crimped or chafed during installation or use. Deviation from the electrical diagram and failure to use an inline fuse holder (supplied) will void warranty. DO NOT install fuse in inline fuse holder until all connections and circuits are verified to be completed correctly.



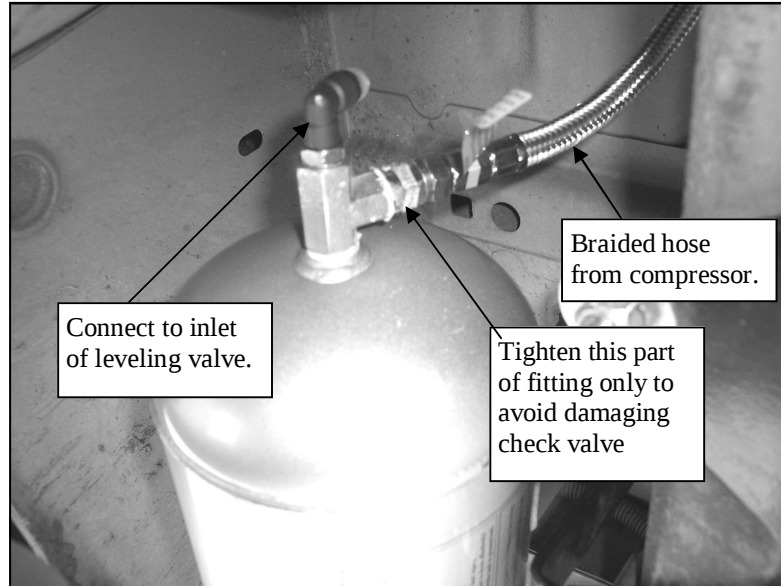
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Plumbing and Wiring Diagram





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26. Connect compressor hose to tank fitting as shown above. Take care to tighten only the specified fitting to avoid damaging check valve. Connect 3/8" tube elbow to inlet of leveling valve with 3/8" nylon hose supplied. Route tubing to avoid chafing or damaging tubing.



27. Connect air springs to leveling valve as shown. Loop passenger side hose over crossmember as shown to avoid contact with exhaust pipe. Tie strap hoses as required to avoid contact with exhaust and chafing on frame. (picture shown is for hose routing information only as vehicle shown has 6" lift installed.)



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28. After all connections have been verified, install fuse in inline fuse holder, apply park brake and start engine with shifter in park or neutral. Due to the amperage draw of the compressor, failure to turn engine on during initial startup may drain the battery enough to require a jump start.

29. Test system by adding air to air springs. Disconnect linkage from arm and rotate arm up to fill air springs. Check all connections with soapy water for leaks. After the integrity of the system is verified, reconnect linkage to valve. A MINIMUM OF 5-10 PSI MUST BE MAINTAINED IN AIR SPRINGS AFTER INSTALLATION FOR WARRANTY TO BE VALID. FAILURE TO KEEP MINIMUM PRESSURE IN AIR SPRINGS WILL VOID WARRANTY.

30. Recheck all components and test drive vehicle. Re-check all components for mounting and proper torque. Check clearance to all vehicle components including suspension components, exhaust pipe, brake lines, fuel lines, hoses, etc. Re-check installation on a regular basis afterward. The air tank MUST be drained at least every couple of weeks to prevent condensation buildup, FAILURE TO REGULARLY DRAIN AIR TANK WILL VOID WARRANTY.

For Best Performance

This suspension system is designed to work with the factory supplied shocks and suspension components, however, for increased performance, Hellwig Products recommends the following suspension upgrades:

Monroe Reflex Shock Absorber p/n 911178 front* / 911166 rear*

Hellwig p/n 7633 1-5/16" front sway bar

Hellwig p/n 7650 1-1/4" rear sway bar

*confirm part number to application as part number may change