



# REAR BUMPER & TIRE CARRIER FOR JK WRANGLER

US PATENT: D642,502 ; D633,024



AEV30105AD

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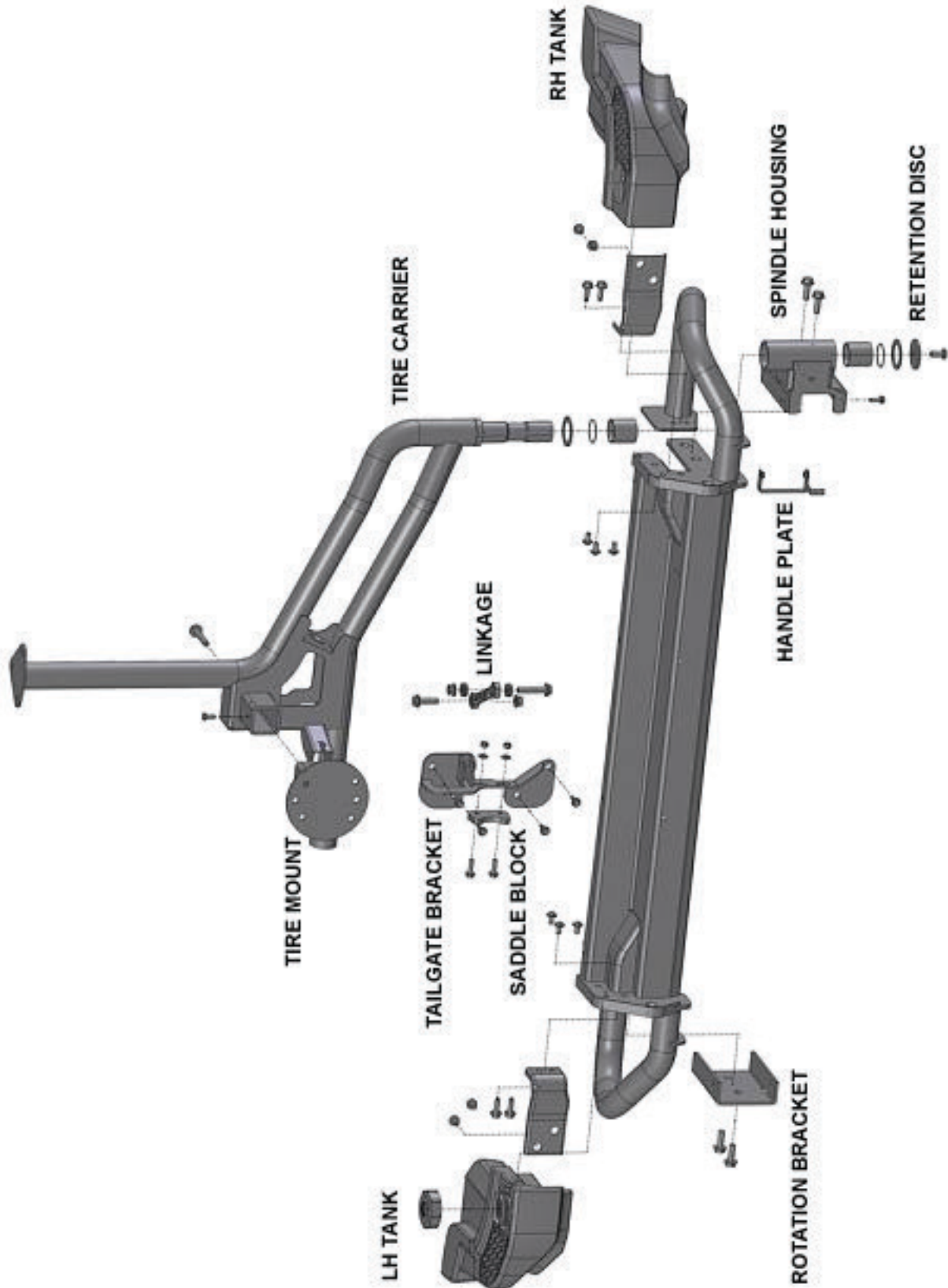
INSTALLATION GUIDE



## PLEASE READ BEFORE YOU START

To guarantee a quality installation, we recommend reading these instructions thoroughly before beginning any work. These instructions assume a certain amount of mechanical ability and are not written nor intended for someone not familiar with auto repair.

INCLUDED PARTS	QTY	REQUIRED TOOLS
REAR BUMPER KIT		
Rear Bumper	1	Common Hand Tools
Corner Tanks	2	Drill Motor
LH Tank Cap	1	3/8" Drill Bit
LH Bumper Mounting Bracket	1	2 3/4" Hole Saw
Non-Skid Tape	1	Reciprocating Air Saw or Cut-off Wheel
Hardware Pack	1	File or De-burring Tool
TIRE CARRIER KIT		SUGGESTED TOOLS
Tire Carrier	1	Ratcheting Wrench Set
Spindle Mount	1	
Tailgate Bracket	1	
Tire Mount	1	
Backing Plate	1	
Hardware Pack	1	
TIRE CARRIER DELETE KIT		
RH Bumper Mounting Bracket	1	

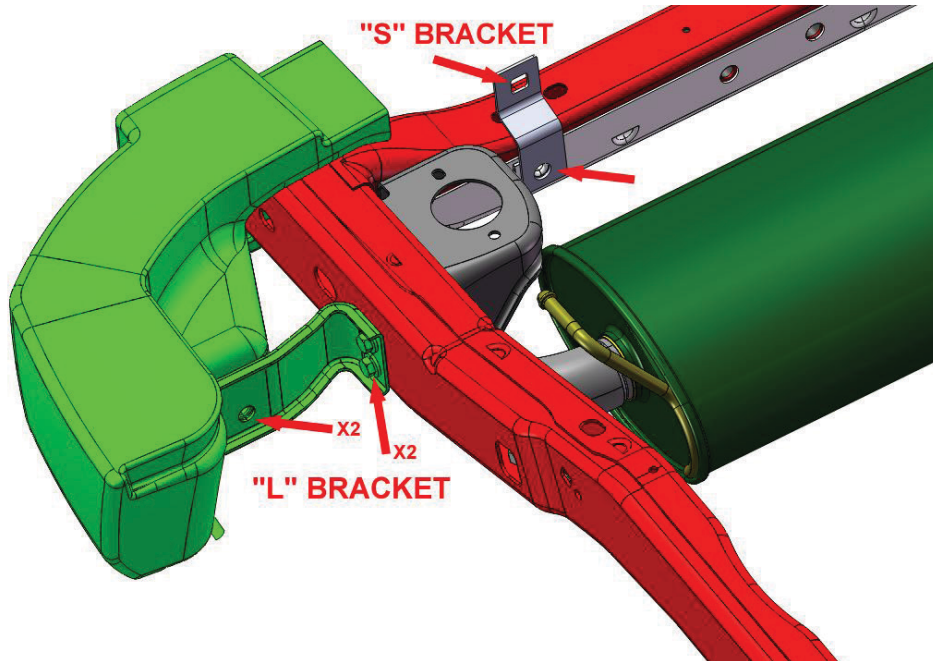




## VEHICLE PREPARATION

### A. REMOVAL OF THE FACTORY REAR BUMPER

1. Remove the four bolts that attach each of the "L" brackets to the frame and bumper. **SAVE** the "L" brackets and bolts for later use. **MARK** the "L" brackets Left and Right.
2. Remove the two bolts that attach each "S" bracket from the bumper and rear cross member. You can discard the factory rear bumper, "S" brackets, and bolts if installing the AEV JK Rear Bumper. If you are installing the AEV Tire Carrier only you'll need to save this hardware.



"L" BRACKET



"S" BRACKET



## B. REMOVAL OF THE FACTORY SPARE TIRE CARRIER

**NOTE:** If you are installing the AEV Rear Bumper ONLY you do not have to remove the factory spare tire carrier and can proceed to step I.

3. Remove the vent bezel on the inside of the tailgate to access the connector for the CHMSL (Center High Mount Stop Lamp). Use a pry tool to remove as shown.
4. Remove the eight bolts that attach the factory spare tire carrier to the tailgate. Reinstall the four bolts on the right side of the tailgate and **SAVE** the other four bolts to install the AEV Tire Carrier Bracket later.
5. Remove the rubber tire bumpers from the Tailgate.
6. If using the AEV CHMSL kit (PART#10404001AA) refer to the instructions at the end of this document.  
**NOTE: The stock CHMSL is not compatible with the AEV Tire Carrier.**





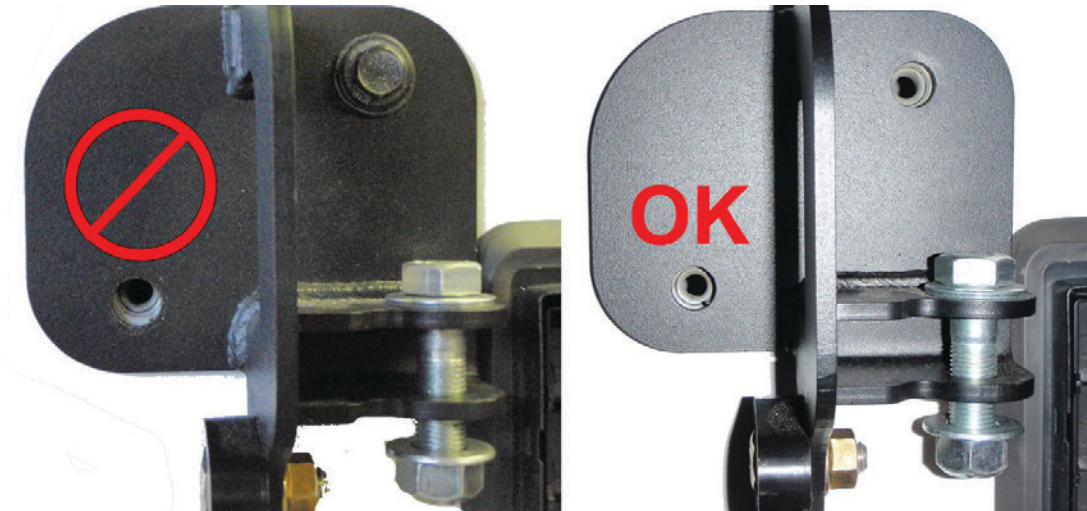


## INSTALLATION OF THE AEV TIRE CARRIER with or without the AEV Rear Bumper

(if installing aev rear bumper only proceed to section I).

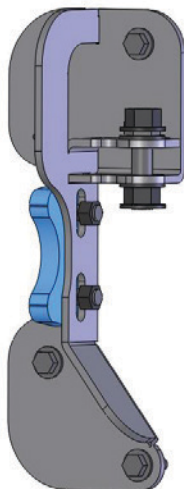
### A. INSTALL THE AEV TAILGATE BRACKET

1. Install the AEV Tailgate Bracket using the four factory bolts from the stock tire carrier. Install the bracket so that it is centered both vertically and horizontally on the bolt holes. The easiest way to do this is to install two bolts hand tight at first, adjust the bracket and install and tighten all the bolts.



### B. INSTALL THE SADDLE BLOCK

1. Install the plastic Saddle Block using the 3/8"x1" bolts with 3/8" washers under the head of each bolt. Install the bolt into the countersink on the Saddle block. Use the 3/8" Flange nuts on the inside surface of the AEV Tire Carrier Bracket.
2. Adjust the Saddle Block to its MIDDLE adjustment.
3. Using hand tools only torque the bolts down to 20 ft/lbs (27.1 N-m) max.
4. 2010+ MODELS ONLY: The exhauster on 2010s is wider than earlier models and must have the top left corner trimmed in order to fit the AEV Bracket.

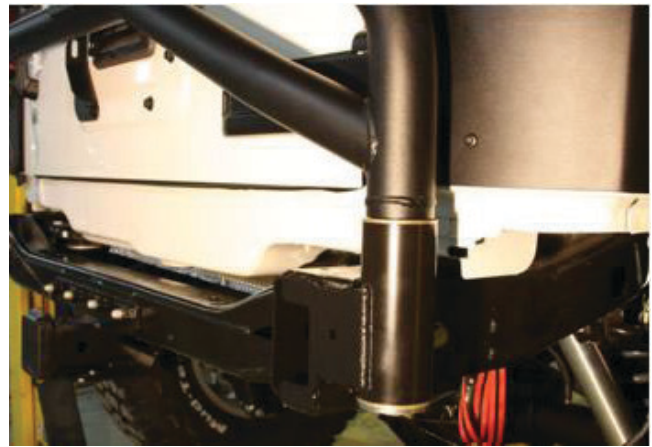
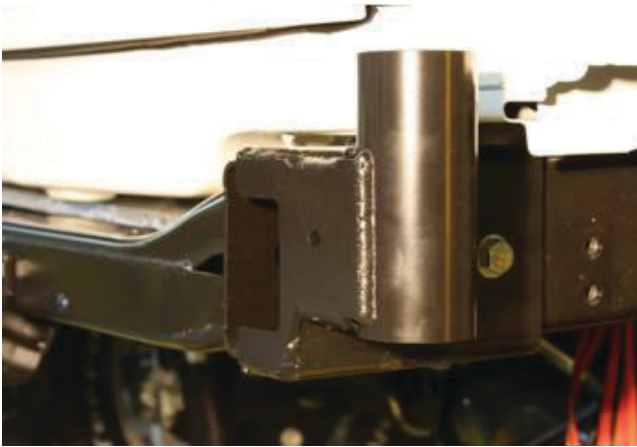




## C. INSTALL THE TIRE CARRIER SPINDLE HOUSING

NOTE: Most Jeep frames will require the use of shims between the frame and the spindle housing for proper operation.

1. Install the Zerk Fitting into the Spindle Housing so that the Zerk is facing DOWN.
2. Temporarily install the spindle mount to the right rear frame rail using the two 1/2" bolts, washers, flange nuts and backing plate provided. HAND TIGHTEN ONLY for now, making sure that everything is snug but still loose enough to adjust the Spindle Housing.
3. Install the Spiral Cut Bronze Bushings into the Spindle Housing at this time. They are designed to have a slight interference fit. Tapping them in with a block of wood is OK if necessary, BE SURE THEY ARE SEATED FULLY. NEVER USE A METAL HAMMER.
4. Install a Bronze Washer all the way onto the Tire Carrier Spindle.
5. Insert the Tire Carrier into the Spindle Housing
6. On the bottom of the Spindle install the other Bronze Washer, steel Retention Disc and use the fine thread 1/2x1" bolt and washer to firmly attach the Tire Carrier into the Spindle Housing. There is no need to add grease or to install the O-rings at this time.



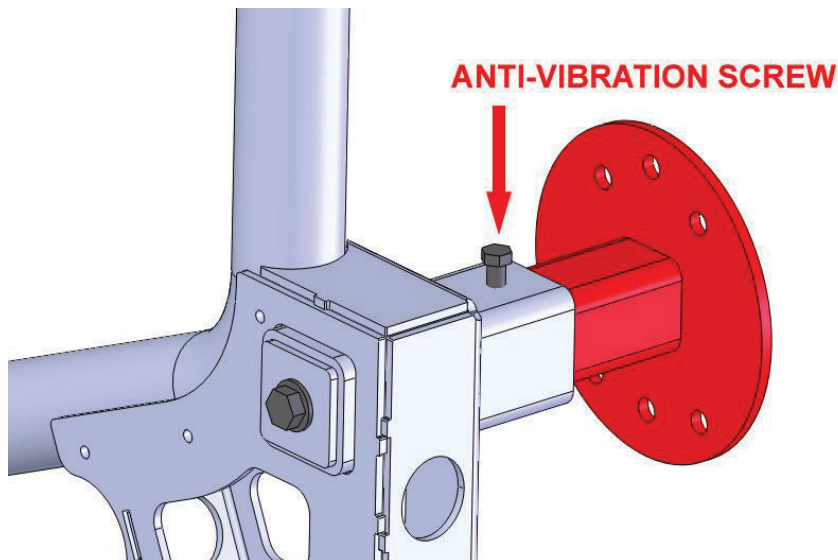
## D. INSTALL THE WHEEL MOUNT TO THE TIRE CARRIER

1. Install the wheel mount into the tire carrier.
2. Measure the distance from the wheel mounting surface in the wheel to the bulge in the tire sidewall (not wheel backspacing). Subtract 0.25" (6mm) from this measurement to get a default setting.
3. There are two 1/2" fine thread bolts included, use the 3" long bolt for backspacing ranging from 5" to 6". Use the 4" long bolt for backspacing ranging from 6" to 7". While these bolts will accept 99% of the wheel and tire combinations used on JK's, it might be necessary to source a 1/2x20 bolt of a different length for some applications.

Use Anti-Seize compound on the bolt. Thread the Tire Mount Bolt with the safety lock washer through the back of the Tire Carrier as shown with the pre bent tongue in the machined slot as shown. NOTE: It will make locking the safety washer easier later if you slightly bend up the ears prior installing the bolt.



4. When doing the final tire install, be sure to tighten the  $\frac{1}{2}$ -20 bolt so that the tubes of the TIRE CARRIER are all contacting the tire and there is about  $\frac{1}{4}$ " of "squish" in the tire sidewall making sure that the final rotated position of the bolt head aligns the flat side of the bolt parallel with the two tongues of the safety washer.
5. Temporarily install the M10 X 20 anti-vibration bolt into the Tire Carrier. Tighten it a bit to prevent the  $\frac{1}{2}$ " bolt from sliding rearward when the tire is initially installed so that it cannot damage the tailgate. Tighten this bolt fully after the tire is on for the first time and after the  $\frac{1}{2}$ " bolt has been adjusted.
6. The wheel mount has studs pressed in for a 5 on 5" bolt pattern, if custom axles are used with a 5 on 5.5" bolt pattern, the studs will need to be pressed out and pressed into the holes provided.





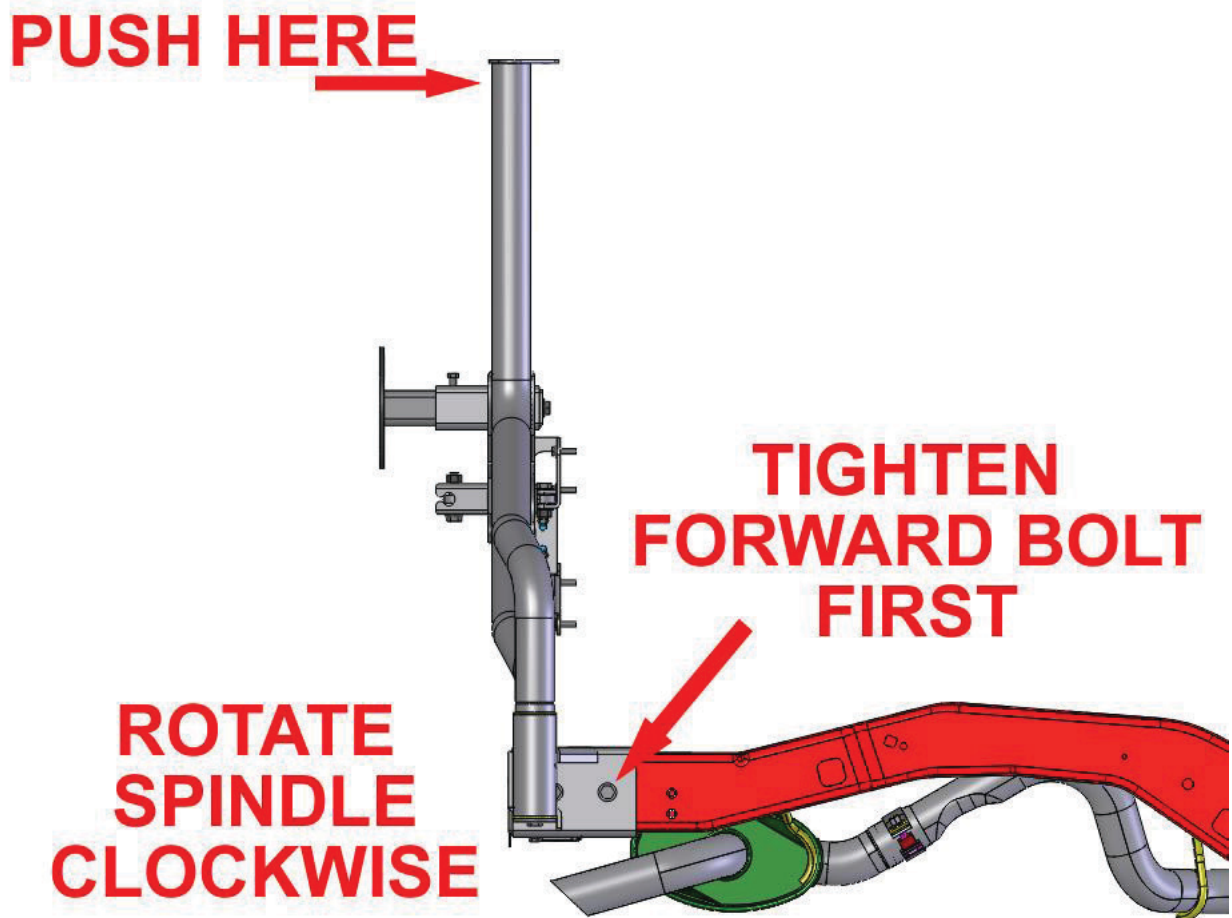


7. Once it is determined that the tire carrier has been installed correctly, use a hammer and a flat head screwdriver to bend the tongues of the safety washer against the head of the bolt.



## E. POSITION SPINDLE PROPERLY ON FRAME

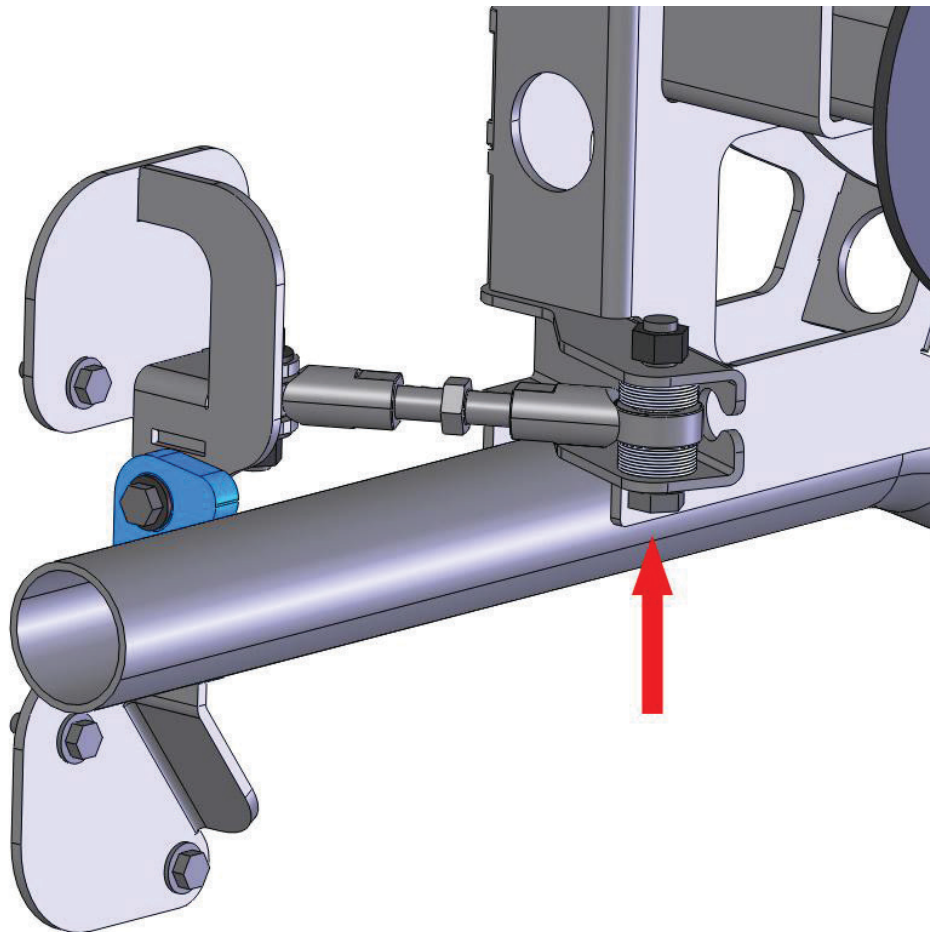
1. Close tailgate completely. Be sure Tire Carrier is seated properly into the Spindle Housing.
2. With the Spindle Housing on the frame and the  $\frac{1}{2}$ " bolts hand tight, close the Tire Carrier and with one hand pressing the Tire Carrier into the Saddle Bracket, use the other hand to press on the top of the Tire Carrier. This will seat the Spindle Housing properly on the frame. The goal is to have the Tire Carrier vertical or angled in towards the car if possible. Tighten the forward  $\frac{1}{2}$ " bolt on the Spindle Housing FIRST and then tighten the rearward  $\frac{1}{2}$ " bolt.





## F. INSTALL AND ADJUST THE TURNBUCKLE LINKAGE

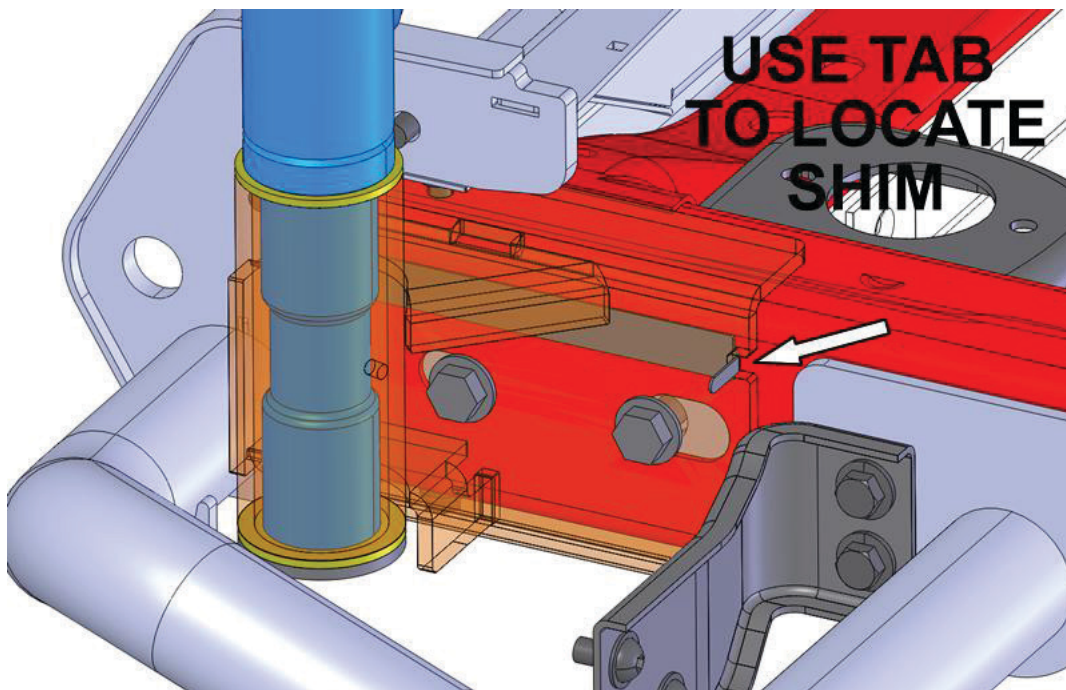
1. Set the Turnbuckle Linkage so that the ends are threaded on equally and about 6.5"-7" from center to center
2. Install the Linkage to the Tire Carrier using the  $\frac{1}{2}$  x 2.5" bolt. This bolt **MUST** pass from the bottom upward with the nut on top. Use washers under the bolt head and nut. Use an even number of washers on both sides of the linkage. Tighten this bolt to achieve a rattle free connection.
3. Install the Linkage to the Tailgate Bracket using  $\frac{1}{2}$  x 1.75" bolt. Use washers under the bolt head and the nut. Tighten this bolt to achieve a rattle free connection.
4. Close the tailgate
5. Adjust the Turnbuckle Linkage so that the horizontal tube of the tire carrier is fully seated into the Saddle Block. Once it's fully seated, tighten the linkage an additional 1.5 **FULL TURNS** for a default adjustment. You should now be able to feel tension on the tailgate about 1.5" from its fully closed position.





## G. TEST TIRE CARRIER OPERATION AND SHIM AS NECESSARY

1. Temporarily install the spare tire and wheel for the following test.
2. Test the operation of the TIRE CARRIER, it should operate smoothly and when nearly closed, the horizontal tube of the TIRE CARRIER and the SADDLE BLOCK should be within  $\frac{1}{4}$ " (vertically) of being concentric with each other.
3. Check to see if the TURNBUCKLE LINKAGE fully clears the channel when the TIRE CARRIER travels throughout its full range.
4. Many Jeep JK Frames are not square when viewed from the rear. This discrepancy can cause the TIRE CARRIER to "droop". If this is the case, it will cause the TIRE CARRIER and SADDLE BLOCK to not match up well and will cause the TURNBUCKLE LINKAGE to contact the channel when the TIRE CARRIER travels throughout its range.
5. SHIM the SPINDLE HOUSING as necessary to correct the "droop" caused by the frame build variance.
  - Three SHIMS are provided; any combination can be used to achieve the desired results.
  - The pointed end of the SHIM is designed to fit into a location tab on the SPINDLE HOUSING.
  - The handle tab is designed to bend out to make the SHIMS easier to hold on to and to lock into place in the SPINDLE HOUSING.
  - Early SPINDLE HOUSINGS do not have the location notches for the SHIMS. Place the shims in the approximate location shown.



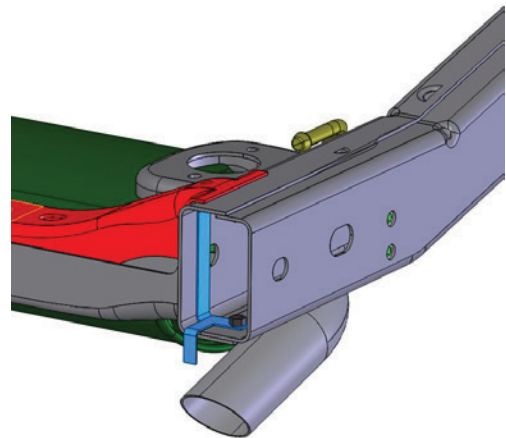


## H. DRILL THE FRAME TO LOCK THE PLACEMENT OF THE SPINDLE HOUSING

1. ONLY PROCEED once you're satisfied with the SHIM placement and the TIRE CARRIER operation throughout its full range of motion.
2. Temporarily disconnect the TURNBUCKLE LINKAGE.
3. With the Tailgate closed and the Tire Carrier in its FULL OPEN position, drill the upper and lower 3/8" holes using the Spindle Housing as a drill guide.
4. Apply touch-up paint to the 3/8" holes in the frame rail. Use MOPAR Part #82300508 or its equivalent.
5. Temporarily remove the Tire Carrier and Spindle Housing from the Jeep Frame.
6. Insert the HANDLE NUT into the frame as shown below and align it with the 3/8" holes.



*Tire Carrier in Full Open Position*



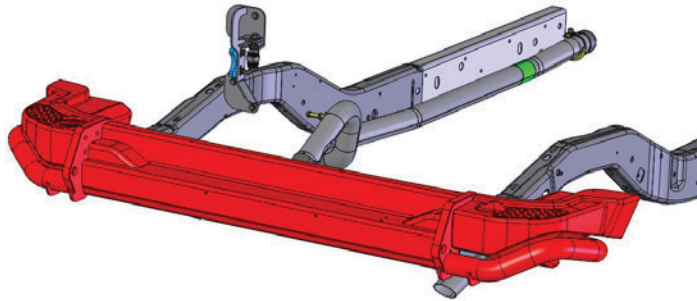
*Handle Nut Placed Inside of Frame*

7. If you are installing the AEV Rear Bumper proceed to step I (next page).
8. If you are installing the AEV Tire Carrier with the factory bumper re-install the Spindle Housing to the frame. Loosely install the 5/16" x 1 socket head allen bolts in the top and bottom of the Spindle Housing through the frame into the handle nut. Replace the SHIM pack and adjust if necessary. Install and tighten the 1/2" bolts using the backing plate on the inside of the frame, then tighten the allen bolts. Proceed to step K.

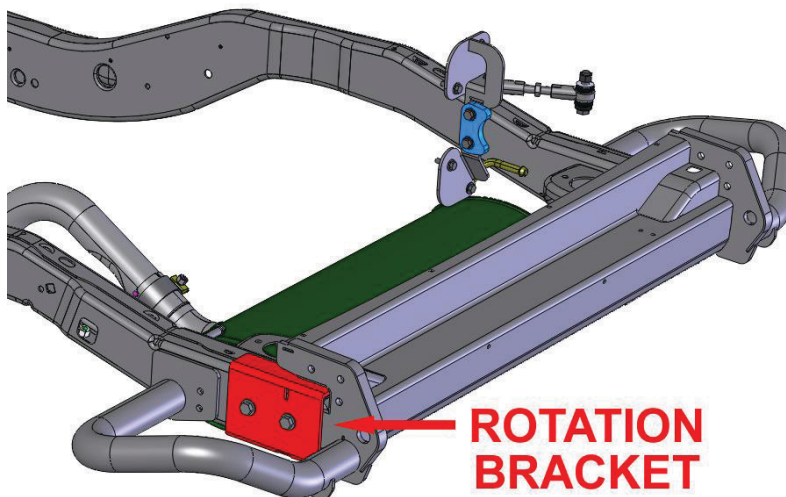




## I. PREPARE AEV JK REAR BUMPER FOR ASSEMBLY



1. Install the Corner Tank Plugs. If the optional Pump Kit is being fitted, install the 90° tube fittings into the Corner Tanks with Teflon tape to prevent leakage.
2. With two people, evenly place the Rear Bumper, Corner Tanks (loose but in place), Spindle Housing and Rotation Bracket into the rear of the Jeep frame at the same time, it's a bit awkward but easier with two people.
3. Install the Corner Tanks to the bumper using three M10x20 button head Allen bolts and small diameter washers per side. Leave loose for now, there will be adjustment required later.
4. Install the factory re-used "L" Brackets loosely to the Corner Tanks using two M10x20 hex head bolts and large diameter washers on each of the Corner Tanks.
5. Using a small amount of ANTI-SEIZE compound on each bolt, install the bolts that hold the bumper to the frame by JUST STARTING EACH BOLT. Begin with the re-used bolts attaching the "L" brackets to the Jeep frame, then the M12 bolts and washers through the Spindle Housing (on the right side) and the Rotation Bracket (on the left side), and finally use the M8x1.25 Allen bolts in the top and bottom of the Spindle Housing.





## J. TIGHTENING SEQUENCE AND ADJUSTMENT OF THE REAR BUMPER

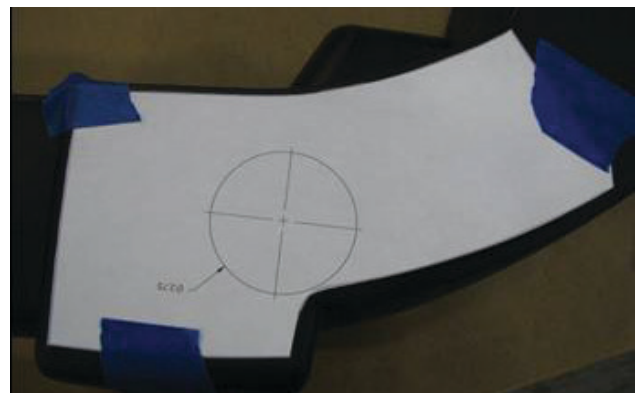
1. Once all the bolts have been started, check to see that the bumper is level from side to side, and rotate the tire carrier as shown in **STEP E**. Replace the SHIM pack and adjust if necessary, tighten the 1/2-13 bolts.
2. Next tighten the L BRACKET bolts and last the 5/16 bolts into the HANDLE NUT.

## K. PREPARE FACTORY BUMPER FOR ASSEMBLY

1. **NOTE: This step is for those who are installing the AEV Tire Carrier with the factory bumper. Proceed to step L if you are installing the AEV JK Rear Bumper and Tire Carrier.**
2. Working on the underside of the bumper, using a grey marker, markup the bumper as shown below. This is where you will cut to allow clearance for the Spindle Housing. Be careful not to cut away too much or cut through the outer surface of the bumper. You can trim later as necessary if you need more clearance. The trimming operation is best done using a small reciprocating air saw or cut off wheel.



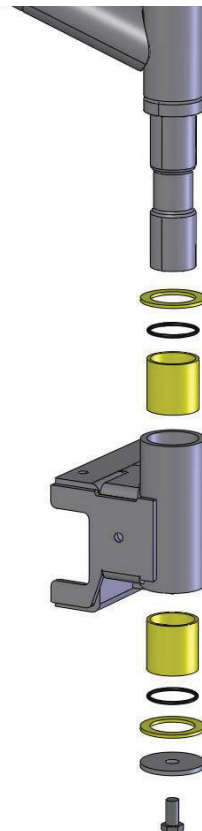
3. Cut out the Spindle Tube template provided. Turn the bumper right side up and locate the template on the top surface of the bumper. You will see a distinct parting line on the forward tangent of the bumper as indicated in the photo. Position the template along the parting line and the rearward upper tangent. Secure to the bumper with masking tape. Mark the center of the hole with a center punch and drill using a 2 3/4" hole saw.
4. Carefully clean all the cut edges with a file or de-burring tool.
5. Re-install the factory bumper using the original hardware





## L. RE-INSTALL THE TIRE CARRIER TO THE SPINDLE HOUSING

1. Install the Tire Carrier into the Spindle Housing as shown. Lubricate the O-Rings and all components thoroughly with grease during assembly.
2. Tighten the 1/2" Tire Carrier Retention bolt. Test for swing resistance on the Tire Carrier, there should be mild resistance, if there is too much, a thin washer can be placed between the Retention Disc and the Tire Carrier Spindle if necessary.
3. Be sure the Zerk fitting is pointing downward. Fully grease the system at this point. Use any conventional axle bearing grease.
4. Re-install the **TURNBUCKLE LINKAGE** to the assembly as shown in **STEP F**.





## M. INSTALLING THE TIRE AND ADJUSTMENTS

1. Install the spare wheel and tire, tighten the  $\frac{1}{2}$ " bolt until the tire touches the Tire Carrier vertical and horizontal tubes. Tighten the bolt another  $\frac{1}{4}$ " which equates to six or seven **FULL** turns.
2. Tighten the Anti-Vibration bolt to take any movement out of the backspacing adjustment. Loc-Tite is recommended on this bolt.
3. Close the Tailgate and Tire Carrier and push/pull on the tire to check for any rattles or movement, there should be virtually none. If there are any rattles or movement, adjust the turnbuckle in  $\frac{1}{4}$  **TURN** increments until the movement is gone.
4. Open the tire carrier fully and be sure the Turnbuckle Linkage fits into the channel on the Tire Carrier without interference. If the Turnbuckle Linkage hits the channel, the Spindle Housing is not seated properly and you must repeat the seating and tightening procedure outlined in sections E and G of this manual.
5. The bumper should match the fender flares and have even gaps around the Corner Tubes, adjust as necessary.
6. The Tire Carrier should swing with mild resistance, if there is too much the lower O-Ring can be removed or a thin washer can be placed between the Retention Disc and the Tire Carrier Spindle if necessary.

## N. FINISHING DETAILS

1. Install the Plastic Tube end in the horizontal tube of the Tire Carrier.
2. Install the Plastic Plugs in the tailgate where the stock rubber bumpers were removed.
3. Shovel Install – Most shovels will need to have the handle cut down slightly in order to fit properly. The most important thing is to have the blade of the shovel fit tightly against the tire in order to provide enough resistance to hold the shovel in place. Its best to leave enough of the handle in place that it sits on the outside of the tubing where the tire carrier and spindle are welded together, but not hit the corner of the vehicle when fully opened.







## O. INSTALLING ACCESSORIES

1. **AEV CHMSL** — The AEV CHMSL can be added if using any AEV wheel. NOTE, the AEV CHMSL will not work with all aftermarket wheels, please check with the wheel manufacturer before purchasing. When installing the AEV CHMSL, reuse the factory CHMSL wiring. **CONNECT THE BLACK WIRE TO THE WHITE WIRE AND WHITE WIRE TO THE BLACK WIRE.**
2. **PUMP KIT** — Please see instructions in the Pump Kit box.
3. **RECOVERY RACK** — Please see instructions in the Recovery Rack box.
4. **REAR BACK UP LAMP** — When installing the IPF Backup Lamp 8161, install per IPF Instructions, use the L1 (white/gray) circuit located in C5 (Brown), Cavity 15 underneath the TIPM for the rear backup lamp feed. Use the provided zip ties on Tire Carrier.
5. **ANTENNA** — CB or shortwave antennas can be mounted to the Tire Carrier and routed to the front of the vehicle on the right side of the vehicle. Some setups may require an additional ground strap for optimal performance. Use the provided zip ties on Tire Carrier.