Service and Install Ball Joints

Updated April 12, 2008

I just invested in a brand new set of Cepek 17" Aluminum wheels with Goodyear MT/R's. While my truck is driving nice and straight I figured I'd get the alignment checked just to make sure I get maximum tire wear. Not following my own advice I drove all the way to the shop only to find that I have bad front and rear upper right ball joints. No alignment today! I checked my records and found that 2 of the ball joints have around 55,000 miles and the other 6 over 60,000. I ordered out all 8 front and rear joints.

Pictured on the left is an upper ball joint and a lower ball joint.

Older Hummer Ball Joint History

Over the years AMG has made design changes in the ball joints. Note that sometime after the 1993 model year AMG made changes that required larger fasteners that secure the ball joints to the control arms. You will

need to drill out the holes in the 'A' arms, replace the bolts, the washers, and the locknuts to use a new ball joint on an older truck.

You also should have 4 upper A arm reinforcement rings. These rings add 'meat' to the upper A arm where the ball joint gets bolted. The rings fit under the A arm and sandwich the end of the A arm when tightened. These parts don't come with the ball joint. Unfortunatly, AMG doesn't sell the rings, nuts, bolts and washers anymore. If you want to make one you can download this template. The rings are 1/4" thick steel.

Each New

Upper Joint uses:

- 4 - 3/8 - 24 fine1-1/2" grade-8 bolts
- 8 - 3/8" grade 8 washers OD 0.7"
- 4 - 3/8 - 24 Top lock Grade C nuts.

Each New Lower Joint uses:

- 4 - 7/16 - 20 fine1-1/2" grade-8 bolts
- 8 - 7/16" grade 8 washers
- 4 - 7/16 - 20 Top lock Grade C nuts.

If you can't find the fine thread fastners you can use 3/8 - 16 and 7/16 - 14.

A "top lock" style locknut has a slightly elliptical hole. You can get the above bolts at any industrial fastner supply. You will have to make the reinforcement rings.

One of the problems with the original ball joints was the they did not have grease fittings. Greasing with a needle on the grease gun does not get to the bottom of the ball joint no matter how much grease you pump in (the proof was clear once I took the old one apart). Since the middle of 1995 all ball joints sold by AMG have grease fittings. If you some how get one without a fitting don't use it.

Maintenance: It is recommended by AM General that you grease all joints every 3,000 miles. In addition I would grease it after every major outing, or after you have been running in deep water. When greasing the lower ball joints you can jack up the lower "A" arm to remove the load from the ball joint in order to get the grease into the base of the ball joint. Pump grease into the joint until you see the old grease squirting out of the rubber boot.

It took me 6 hours to do all 4 front ball joints. I thought doing the rears would go faster but they ended up about the same. I had one lower ball joint nut that needed a torch to get loose.

This is a new style upper ball joint. Unlike the older ones this one has grooves on the ball so grease can work it's way to all surfaces of the ball. These ball joints all have grease fittings and can last over 100,000 miles. The one pictured had 58,000 on it.

Checking the Ball Joints

You can do a quick and dirty check of the ball joints by jacking the truck up on the frame so the A arms are hanging. Grab the tire at the top and bottom and shake the tire in and out while watching the upper and lower joints for movement. If you see any movement in the ball joints replace them. On a truck with good ball joints there will be no movement at all. I had a slightly loose upper right rear ball joint. My rear camber on the right was .2 degrees. The camber on the left was right on at .5. Replacing the ball joint should bring me back into spec.

The shop manual has a procedure that uses a pry bar that is much better. With the truck on the ground place the tip of a pry bar between the top of the geared hub and the upper ball joint boot. Pry upward against the upper control arm. You want to see if there is any free play between the upper control arm and the geared hub. If the ball joint moves more then 1/16" replace it.

For the lower ball joint jack the truck up by the lower control arm. Put a pry bar between the lower arm at the ball joint and the geared hub. Move the pry bar down. The free play shouldn't be more then 1/8".

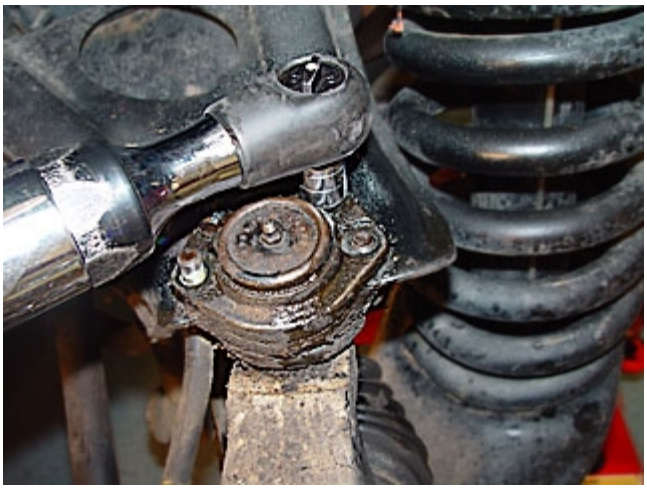
In my opinion if the joints have any movement replace them.

The first thing I like to do is to power wash the mud and grease off the area I'm going to be working on getting all the dirt out of the threads. When you're working on the floor without a lift having big clumps of mud and grease drop on your face and in your eyes isn't pleasant. Next spray all the nuts and bolts with WD-40 or PB Blaster and let it soak in. This will save you a bunch of work trying to remove stuck bolts. Once you remove the nuts, bolts and washers clean off the threads and wipe all the crud off the washers.

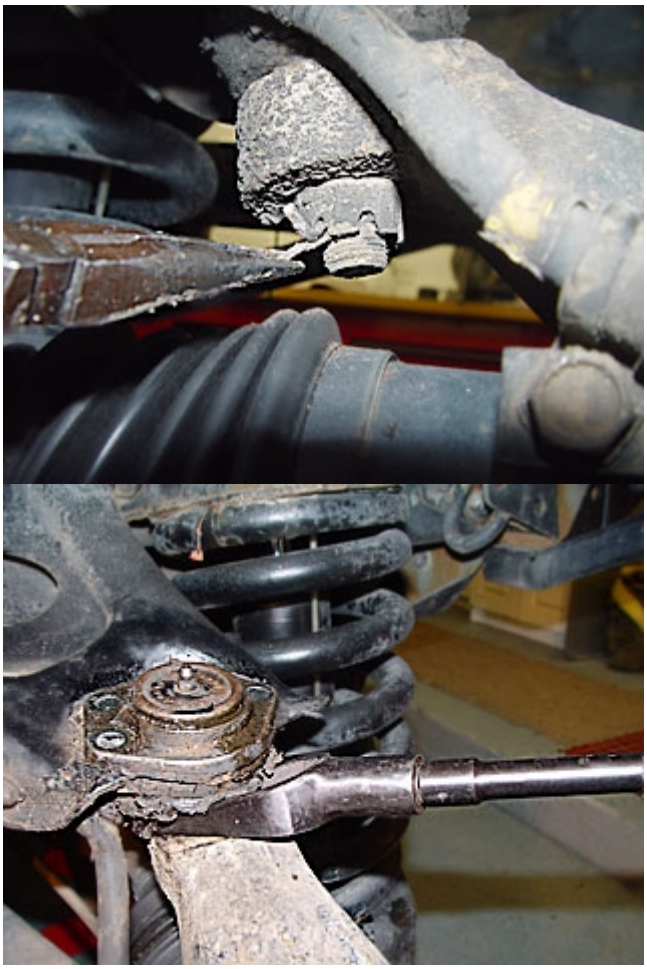
I am replacing all 4 front ball joints so I jacked up the front end and supported it with 2 heavy duty 6 ton jack stands. Use at least a 3 ton jack. You will be getting under the truck while doing this so don't take any chances with your safety. The front of the truck weighs close to 4000 pounds and can easily crush you.

Remove the wheels.

Remove Upper Ball Joints



Using a 9/16" socket and wrench remove the 4 top bolts. and pull out the ball joint. Yea right! If you never did one of these before you're in for a surprise. The ball joints are all tightly seated in tapered holes. You will need a ball joint separator otherwise called a pickle fork to get the uppers off. You can bang the lowers up and out with a heavy hammer but the half shaft is in the way of using a hammer on the uppers. If you're stuck in the field without a pickle fork remove the half shaft. Don't waste your time screwing around with a pry bar, get the right tools.



Remove the cotter pin and slotted nut (15/16" socket) from the lower bolt and toss out the old pin. Take a 15/16" ball joint separator (pickle fork) and whack it with a heavy hammer until the ball joint pops up out of the tapered hole. The geared hub will drop down out of the way supported by the lower ball joint.

You can now pull the old ball joint up and out of the upper control arm.

Install Upper Ball Joints

Clean all debris around the hole in the hub and the upper control arm. Drop the new ball joint into the hole in the upper control arm. Make sure that the rubber boot does not get pinched in the control arm hole. Push it down clear through.

Bolt the Ball joint to the hub first and then to the A arm.

Put a small jack under the geared hub and raise it until the new ball joint bolt is through the upper geared hub hole. Hand tighten the slotted nut.

Line up the new ball joint and drop the 4 bolts and washers into the holes. Tighten the bolts to 37 ft-lbs. Tighten the 15/16" bolt to 73 ft-lbs while lining up the slot in the nut with the hole in the bolt. Tighten the nut to line it up; never loosen. Insert a new cotter pin.

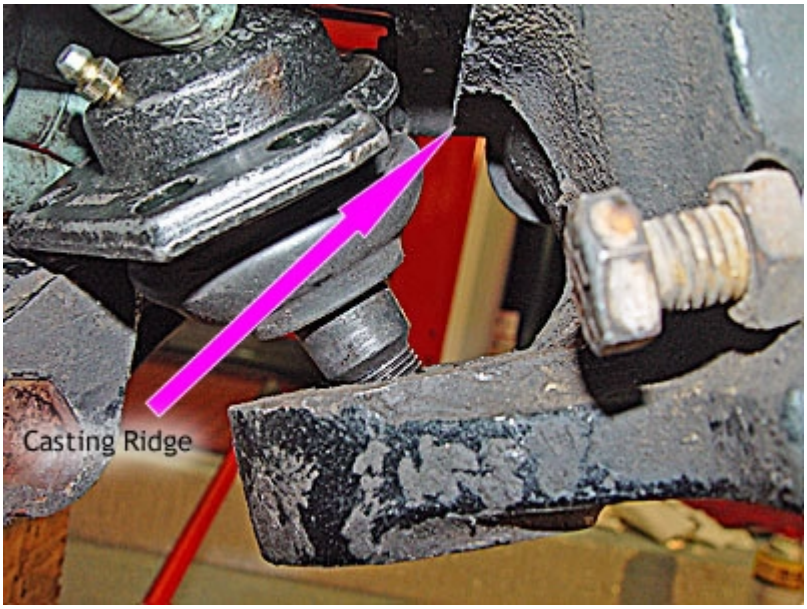
Removing the Lower Ball Joint

Notice that the bolts on the front lower ball joint are not all facing the same direction. The outside bolts have their heads facing up. On the rear the nuts are all facing up. The lower ball joint bolts are a different size then the upper bolts. The bolt heads take a 5/8" and the nuts take an 11/16" wrench. Remove the 4 bolts that hold the lower ball joint to the lower control arm. The 2 bolts on the ends are the hardest ones to remove. It's very difficult to get a wrench on the bolt underneath the ball joint because the control arm wraps around it. I used a thick Craftsman open end wrench pushed on the hex vertically. You may be able to get enough of a socket on the head but it won't go on square. One of the nuts was so tight I had to heat it up with a propane torch. Remove the cotter pin from the slotted nut and unscrew the nut using a 15/16" socket.

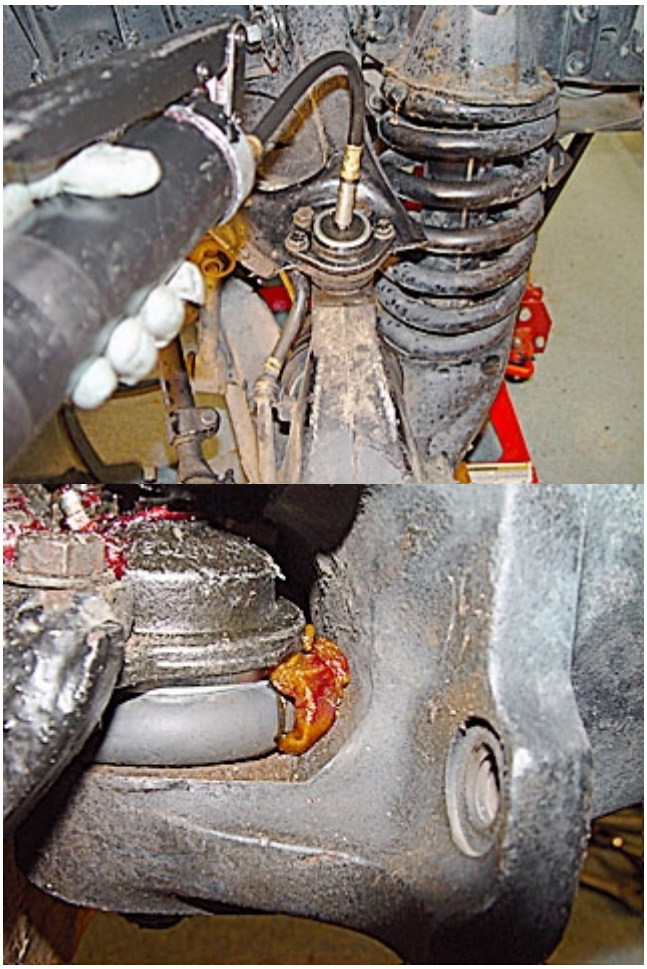
Raise the lower control arm up fairly high (not the geared hub) with a jack and hammer the ball joint till it breaks loose. Jack the arm up a little more and pull the bottom of the geared hub away from the control arm while pulling and rotating the ball joint up and out sideways.

Installing the Lower Ball Joint

Bend the new joint all the way over to the side. Twist the joint about 90 degrees and it will drop into the hole in the lower geared hub. The first time I tried to put one in I tried to get it in straight and it got caught up and jammed on a small ridge which is part of the geared hub casting. The lower joint goes under the lower control arm.



Start the slotted nut on the bottom ball joint. Slip the ball joint under the the lower control arm, line up the holes and replace the 4 nuts, bolts and 8 washers. Torque these to 65 ft-lbs. Remember that the outside 2 bolts are heads up on the front. Tighten the 15/16" slotted nut to 73 ft-lbs while lining up the slot in the nut with the hole in the bolt.



Grease all the ball joints until grease oozes out of the seal. Install your wheels, lower the jacks and you're ready to go. You might want to get your alignment checked.