EMF Rebuildable Upper & Lower Ball Joints

US PATENT 8,764,336, CANADA PATENT 2,784,185 & US PATENT PENDING 62/561,434

CAUTION: Proper service and repair procedures are essential for safe and reliable installation of chassis parts, and require experience and tools specially designed for the purpose. These parts **MUST** be installed by a qualified mechanic, otherwise an unsafe vehicle and/or personal injury could result. **EMF IS NOT RESPONSIBLE FOR ANY IMPROPER CUSTOMER INSTALLED COMPONENTS!! A PROPER BALL JOINT PRESS TOOL SHOULD BE USED TO INSTALL BALL JOINTS ON A VEHICLE – NOT A HAMMER!!**

WARNING: Before attempting to remove the stud from the steering knuckle, make sure the stud of the old ball joint was firmly seated in the tapered hole of the steering knuckle. If the ball joint was loose in the steering knuckle, or if any
out-of-roundness, deformation, or damage is observed, the **STEERING KNUCKLE MUST BE REPLACED.** Failure to replace a damaged or worn steering knuckle may cause loss of steering ability since the ball joint **STUD MAY BREAK** and cause the wheel to separate from the vehicle.

NOTICE: This ball joint was designed to be **TIGHTENED** when needed by backing out the set screw on the side and tightening the cap using the proper Spanner Wrench and then replacing the set screw in the side when it is tight. It was also designed to be **REBUILT** and not replaced. Contact EMF for a rebuild kit when the time comes to replace just the pin and inner race.

INSTALLATION INSTRUCTIONS

1. Raise and support the vehicle. Remove the wheel and tire assembly.
2. Remove the disc brake caliper mounting pins from the caliper adapter, and remove caliper assembly and secure out of the way.
NOTE: DO NOT allow caliper to hang by flex hose. Remove caliper adapter mounting bolts and remove caliper adapter from the steering knuckle.
3. Remove cotter pin and hub nut from the axle shaft.
4. Disconnect the ABS wheel speed sensor wire from under the hood. Remove the sensor wire from the frame and steering knuckle if
equipped.
5. Back off the hub/bearing mounting bolts 1/4 inch each. Then tap the bolts with a hammer to loosen the hub/bearing from the steering knuckle. Remove the hub/bearing mounting bolts and remove the hub bearing.
6. Remove the rotor assembly, brake shield and spacer from the steering knuckle.
7. Remove half shaft from vehicle.
8. Using a suitable tool, separate the outer tie rod from the steering knuckle.
9. Remove the stud nuts from both the upper and lower ball joints.
10. Using a suitable press tool, remove the upper ball joint from the knuckle assembly. Examine ball joint contact area of the knuckle and make sure it is clean and free of cracks.
WARNING: If any cracks are found **KNUCKLE MUST BE REPLACED.** Failure to replace a cracked or damaged knuckle may cause loss of steering ability because the **KNUCKLE MAY BREAK** and cause the wheel to separate from the vehicle.
12. Clean steering knuckle taper. Insert new ball joint stud into steering knuckle by hand and check fit of stud taper to the knuckle. Stud should seat firmly without any rocking. Only the threads of the stud should extend through the steering knuckle. If the parts do not meet these requirements either the steering knuckle is worn and needs replacement or incorrect parts are being used.

IMPORTANT NOTE: 7460-4007 Upper Ball Joint Installation Tool is required if your ball joint press kit is not equipped with a die with an ID minimum of 1.93" and a minimum depth of 0.86". The EMF-K7460 joint can be pressed into place by a die resting on the cap, however it risks damaging the cap threads, leading to the possibility of not being able to rebuild or tighten the joint. This is your call if you want to purchase the tool or not and EMF is not responsible for damage to the cap that may occur during install without this tool.

13.. Using a suitable ball joint press tool, install upper ball joint into knuckle squarely until shoulder of the ball joint meets the knuckle. **NEVER EXERT PRESS FORCE ON COVER PLATE.** *If using the EMF 7460-4007 Upper Ball Joint Installation tool, please place the tool over top of the cap and press the ball joint into the knuckle using a ball joint press tool.* ***DO NOT USE A HAMMER TO INSTALL BALL JOINTS!!!*** *Remove the tool after the joint is pressed in and set aside. This tool is used to prevent damage to the top cap when installing the joint into the knuckle using a ball joint press tool.*
14. Thoroughly clean the tapered holes of the steering knuckle before assembly of the studs with the knuckle.

Step 15 – Torque & Greasing Procedures

1. *Position the steering knuckle on the ball studs.*
2. *Install and tighten lower ball stud nut (non nylock) to 47 N·m (35 ft. lbs.) torque.*
3. *Install and tighten upper ball stud nut (non nylock) to 94 N·m (70 ft. lbs.) torque.*
4. *Retorque lower ball stud nut (non nylock) to 190–217 N·m (140–160 ft. lbs.) torque.*

5.Remove the upper install nut (non nylock) with a wrench or ratchet. An impact will break the seated pin loose from the knuckle allowing it to spin.
6. Install and torque the upper nylock nut supplied to the previous to 94 N·m (70 ft. lbs.) torque Using a wrench or ratchet. Again do not use an impact as it will break the seated pin loose while tightening the nylock nut.
7. Remove the Lower install nut (non nylock) with a wrench or ratchet. An impact will break the seated pin loose from the knuckle allowing it to spin.
8. .Install and torque the Lower nylock nut supplied to the previous to 190–217 N·m (140–160 ft. lbs.) torque. Using a wrench or ratchet. Again, do not use an impact as it will break the seated pin loose while tightening the nylock nut.
9.move the knuckle back and forth to ensure there is no binding. It should move freely. If the knuckle binds up on 2009 and up trucks, look for contact points between the knuckle and ball joint faces. As trucks get older and ball joints are changed the tapered holes in the knuckles wear, allowing the knuckles to sit higher on the pins changing clearances. Sometimes boots need to be modified. Also, we've found spindle knuckles on the driver side, mainly in 2006 models but up to 2008, have misaligned upper tapered holes. You'll notice this instantly as the knuckle will be stiff to rotate side to side. These knuckles need to be replaced.

IMPORTANT GREASING PROCEDURES

10. Grease the LOWER Ball Joint First until the grease gun starts to become firm (You should get about 6-8 pumps of grease in there). Then Grease the Upper Ball Joints until the grease gun becomes firm. Then Grease the LOWER ball Joint a couple more pumps.

11. Rotate the knuckle side to side to distribute the grease inside the ball joints. The knuckle should go from stiff and hard to move, to easier to move side to side freely.
Now you want to repeat step 10 again and grease the lower ball joint first as many pumps as you can get (you might only get 2-3 in this time)then grease the uppers if you can get any more in, then cycle the knuckle back and forth until it frees up and grease is evenly distributed within the joint..
12. If everything feels good proceed with re-assembly of the axle.

16. Install Grease Fitting on the top of the cap using an 8mm wrench. Lubricate with a good grade of chassis grease.
17. Reinstall the outer tie rod end and tighten nut to 55ft. lbs. (75Nm).
18. Reinstall the half shaft.
19. Insert the two rearmost, top and bottom rotor hub/bearing bolts in the steering knuckle. Insert the bolts through the back side of the knuckle so they extend out the front face.
20. Position the hub spacer and brake shield on the bolts just installed in the knuckle.
NOTE: If the vehicle is equipped with a wheel speed sensor the brake shield must be positioned on the hub bearing.
21. Align the rotor hub with the drive shaft and start the shaft into the rotor hub splines.
NOTE: Position wheel speed sensor wire at the top of the knuckle if equipped.
22. Align the bolt holes in the hub bearing flange with the bolts installed in the knuckle. Then thread the bolts into the bearing flange far enough to hold the assembly in place.
23. Install the remaining bolts. Tighten the hub/bearing bolts to 149 ft.lbs. (202 Nm).
24. Install the washer and axle nut and tighten to a beginning torque of 132 ft.lbs. (179 Nm).
25. Rotate the axle 5 to 10 times to seat the hub bearing.
26. Tighten axle nut to a final torque of 263 ft.lbs. (356 Nm). Continue to tighten the axle nut to the next available slot and install a new cotter pin. **Never back off the axle nut to achieve alignment with the hole in the shaft.**
27. Reinstall the caliper adapter to the steering knuckle. Tighten caliper adapter bolts to 130 ft.lbs. (176 Nm).
28. Reinstall the caliper and mounting pins to the caliper adapter. Tighten caliper pins to 24 ft.lbs. (32 Nm).
29. Reinstall the ABS wheel speed sensor wire.
30. Install the wheel and torque to O.E. specifications and lower the vehicle to the floor.
31. Align the front end of the vehicle to specifications. A check of the wheel balance is recommended.
NOTE: The parts in this kit are designed to replace the worn or non-functioning original equipment parts in the vehicle as produced by the car factory. These parts are not designed for installation on vehicles where the suspension and/or steering systems have been modified for racing, competition, or any other purpose.

SPECIAL NOTICE
STEERING KNUCKLE WEAR CAN CAUSE BALL JOINT STUD BREAKAGE

THE STEERING KNUCKLE MUST BE REPLACED IN ANY AND ALL CASES OF BALL JOINT STUD BREAKAGE.
THE STEERING KNUCKLE MUST BE REPLACED IF ANY TEST INDICATES AN "OUT-OF-ROUND" OR "FRETTED" TAPER.

TROUBLESHOOTING GUIDE

If you are having trouble seating upper pin, make sure the tapered hole and pin are clean, torque non-nylock nut up to 120 ft/lb for install (if pin won't seat) and remove with a ratchet. (Do not use an impact). Then install nylock with a ratchet (Do not use impact) and torque nylock to 70 ft lbs.

We do not have a hex on the end of the pin because it would increase the cost of the product significantly.

Thank you for purchasing a set of EMF Rebuildable Ball Joints. If there are any questions, concerns or comments please feel free to contact us 24/7 via TEXT to the TECH SUPPORT LINE at 403-999-0592

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