

# Hub Conversion Kit Install

**Before Starting! Check all parts and tools!**

## Notes:

These instructions will cover the EMS Offroad Hub conversion kits:

- 94-99 Dodge 2500/3500 (HC-94D-xx)
- 00+ Dodge 2500/3500 (HC-00D-SRW)(HC-00D-DRW)
- 99-04 Ford Super Duty (HC-SD)

DRW = Dual Rear Wheel

SRW = Single Rear Wheel

1. Read all instructions before starting. Do not attempt the install unless you are an equipped and experienced mechanic.
2. When working with tools and chemicals, always wear the required safety equipment and glasses.
3. Check the parts list (for your kit) on the last page and Contact EMS Offroad about any shortages.
4. If there are any questions during the install, contact EMS Offroad. **Do not modify** any of the parts (UNLESS INSTRUCTED TO DO SO).
5. The Dodge 3500 DRW kits do not reuse the Wheel Adapter! There is a different new wheel hub for these trucks. **DO NOT ATTEMPT TO BORE THE INSIDE DIAMETER OF THE OEM WHEEL ADAPTER!**
6. The Super Duty DRW Kit will reuse the Wheel Adapter. Before installing the kit, check to make sure the wheel adapter will fit over the new wheel hub. Due to differences in the OEM casting you may have to bore or grind the inside diameter of the wheel adapter to fit over the new wheel hub and lock out. **DO NOT REMOVE MORE THEN 1/16" of material!!!**

7. ABS equipped trucks must have a tone ring on the back of the hub, or the ABS will not work!
8. Table below notes kit specific steps thru out the instructions. If there is no note, it applies to all applications.

94-99 Dodge 2500/3500	<b>94DOD</b>
00-08 Dodge 2500/3500	<b>00DOD</b>
98-04 Super Duty	<b>98SD</b>

9. These kits do not increase your GVW (gross vehicle weight rating) or GAWR (gross axle weight rating).
10. **94DOD & 00DOD** – The center cap of the wheels will need to have a hole cut into them, to be able to engage the lockout.
11. The new locking hubs will require the lockout to be manually engaged for the 4 wheel drive to work. **98SD** – the auto lock will no longer work.
12. Inspect all parts. If any parts appears to be damaged or does not fit/function contact EMS Offroad. There are no returns on modified, abused, neglected, altered or improperly installed parts.
13. The new wheel hubs may have rust inhibitor inside of them. This grease based, and does not need to be removed.

**\*\*\*Improper tool use may result in injury or death!**

Tools required:

- 12mm Allen Wrench
- 22mm (or 7/8”) Wrench and Socket
- 4 point 1 ton hub Spanner Socket (most auto parts stores will carry this, or can be purchased from EMS Offroad LTD).
- Die Grinder w/flap wheel (or equivalent). Emery cloth will work.
- Common Air/hand Tools

**When working with tools and chemicals, always wear the required safety equipment and glasses.**

## Installing the EMS Offroad Hub Conversion Kit:

1. Make all required modifications to your Center caps (**94DOD, 00DOD**), and Wheel adapters (**98SD DRW**).
2. Clean and inspect all parts. Note with all new parts you may find it helpful to de-bur the machined parts with fine emery cloth.
3. Lift and support front axle with jack stands of vehicle. Block rear tires.
4. Remove OEM outers
  - 4.1. Remove wheels
  - 4.2. Remove calipers and hang from vehicle frame (do not disconnect brake hose)
  - 4.3. Remove DRW adapters (**DRW trucks Only**)
  - 4.4. Remove OEM rotor (**00DOD, 98SD**)
  - 4.5. Remove ABS sensor (**ABS Only Trucks**).
    - 4.5.1. **98SD, 00DOD** – One bolt on top of unit bearing. The Sensor will pull straight out. Take care not to hurt the sensor.
    - 4.5.2. **94DOD** – bolts in back of steering knuckle.



- 4.6. **98SD Only**
  - 4.6.1. Remove OEM Lockout
  - 4.6.2. Remove the snap ring and washers behind the OEM lockout
  - 4.6.3. Remove and plug vacuum line from steering knuckle
  - 4.6.4. Remove and plug vacuum line fitting from knuckle
- 4.7. Remove the OEM bolts retaining the factory unit bearing
  - 4.7.1. **94DOD, 00DOD** – (4) 14mm 12 pt bolts
  - 4.7.2. **98SD** – (4) 19mm nuts
- 4.8. Remove the OEM unit bearing. Depending on where the truck is from, this may be the hardest part of install (salt, rust, ect)
  - 4.8.1. **94DOD, 00DOD**– The axle shaft will come out with the bearing.
  - 4.8.2. **98SD** – The axle shaft will stay in the housing.
- 4.9. **94DOD, 00DOD**– Remove the cotter pin and retaining nut from the end of axle shaft.



- 4.9.1. Remove OEM unit bearing from stub axle.
- 4.10. Remove OEM stub axle from inner axle (**skip this step if upgrading to the inner axle kit**)
- 5. Install the new stub axles onto the OEM inners (**or on the new inners if upgrading to the inner axle kit**) **EMS Offroad stocks Spicer u-joints and 4340 u-joints if required.**
  - 5.1. **00DOD** – Install U-joint shims between the clip and ear of the new stub axle.

5.2. Install the dust shields, spacers, and seals onto the outer axle as shown in the following pictures:



6. Install wheel bearings into new wheel hubs.

- 6.1. Install wheel bearing races (if needed)
- 6.2. Pack wheel bearings with a High Temp Disc Brake Wheel Grease.
- 6.3. Install Rear wheel bearing into back of new wheel hub.
- 6.4. Pack the inside of the hub with grease, the more the merrier.
- 6.5. Pack more grease in the hub between the bearings. (yes this is listed twice)
- 6.6. Install Wheel Seal into the back of the hub.



7. Install wheel Studs

- 7.1. **98SD** – Your kit has been supplied with 2 sets of wheel studs, use the set that matches your existing ones.
- 7.2. **DRW 00DOD** – Bolt the OEM rotor to the back of the new wheel hub with the 5/8 – 11 bolts provided.



- 7.3. **SRW 00DOD** – Studs are installed into the wheel for you.
  - 7.4. **94DOD** – Remove rotor from unit bearing. Reuse your rotor onto new wheel hub. Press the new wheel studs into the new wheel hub.
8. Clean the OEM steering knuckle where the new spindle will bolt in/on
- 8.1. Depending on rust build up, you may need to use a die grinder with flap wheel to clean out the hole. And also the face of the knuckle. You must clean all scale rust that may have built up under your unit bearing.



9. If installing the inner axle kit – do so at this time
10. Attach new stub axle to inner axle. (Disregard section 10 if installing the inner axle upgrade)
  - 10.1. **98SD & 94-02 Dodge** – Press OEM Outer axle off the U-Joint, Press new outer axle onto the U-joint.
  - 10.2. **03+ Dodge** – Press OEM Outer axle off the U-Joint, Install one (1) shim over each cap of the u-joint. Press new outer axle onto u-joint. Make sure the shim is between the ear of the axle shaft and the snap ring. See below.



11. Apply a liberal amount of grease to the seal area and splines of the inner axle shafts.
12. Slide Axles into housing; make sure not to push dirt, mud, and rust into the center section.
13. Lube the outer axles and seals with grease.
14. Apply Anti-seize to the spindle hole and mating surface.



15. Install the spindle over the axle and install the 4 - 14mm Socket head cap bolts (Red thread locker recommended.) The 2 tapped holes will need to be aligned to the 12 o'clock position. Tighten to 135 ft lbs. Make sure you install the dust shield before the spindle.
  - 15.1. It is recommended that the head of the 14 mm Socket Head Cap Screw be on the inside of the knuckle. You may be required to flip the bolts around later.
  - 15.2. Apply a light coat of grease to the spindle
16. **ABS ONLY** – Install the ABS sensor holder onto the spindle, using the 2 - 1/4 x 1" flat head bolts (Blue thread locker recommended.) Use the sensor as a guide. You will need to install the ABS holder so the sensor wire is pointing up and towards the ball joints.
  - 16.1. Install the ABS sensor into the sensor holder w/OEM bolt (Blue Thread locker recommended)
  - 16.2. On some models you may have to clearance the OEM dust shield



17. Install the hub or hub rotor assembly onto spindle. **Take care not to damage the seal while installing.**
  - 17.1. The bearings will slide onto the spindle. If they get jammed, pull the hub back off and try again.
  - 17.2. Install the inner jam nut with the pin facing out.
  - 17.3. Make sure the bolts that hold the spindle fast the knuckle are not contacting the wheel hub. If they are you can either flip the bolts, or trim them.
  - 17.4. Using spanner locknut wrench while rotating the front disc brake hub and rotor back and forth, tighten the inner locknut to 68 Nm (50 lb ft) to seat the bearing.
  - 17.5. Back off the locknut 90 degrees.
  - 17.6. Re-tighten the nut to 15-20 ft. lbs.
  - 17.7. Install the lock washer so the key is positioned in the groove of the spindle. The pin, of the inner locknut **must be aligned** with the washer. NOTE: The hole pattern of lock washer is offset with keyway to provide half-position settings by flipping washer over to obtain closest hole. It may be necessary to rotate the inner lock nut in order to align the pin with a hole of the washer.
  - 17.8. Install the outer locknut and tighten to 217-278 Nm (160-205 lb ft)
  - 17.9. Check the final end play of the front wheel spindle. It should be 0.00-0.11mm (0.000-0.004 in).
  - 17.10. Torque required to rotate the front disc brake hub and rotor is not to exceed 2.3 Nm (20 lb in)
  - 17.11. If you are in doubt of your install, error on the side of loose. You can tighten the wheel bearings up if needed. If you over tighten them you may burn up the bearings and damage the spindle.
18. Install the Warn Hub Locks per instructions in the hub lock box.

18.1. **Do not pack the lock outs with grease! A light coating of lithium grease is all they need.**

18.2. The body of the lockout goes in first, retained by the large retaining ring.

18.3. Warn includes 2 different retaining rings for the stub axle. The Snap ring is for 30 spline applications, the spiral ring is for 35 spline.

19. **00DOD SRW , 98SD** – Install the rotor over the studs.

**NOTE: Make sure the ABS sensor wire is attached and away from all rotating parts!**

19.1. Tighten two lug nuts to hold the rotor on the new wheel hub.

20. Install the caliper

21. **98SD DRW** – Install the wheel adapter

22. Install the wheels and torque the lug nuts per factory specs.

23. Double check all bolts and nuts.

24. Test Drive and re-check wheel bearing torque/play, adjust as needed.

25. Re-check all bolts and nuts after 50 miles and again at 500

## **Use of your new Lockout hubs:**

To engage 4wd:

- Turn the lockout to the lock/engaged position
- Engage the truck into 4wd via the shifter lever or push button

You can drive with the hubs locked in if you are expecting to use 4wd: ie you are driving in bad weather (snow). This will allow you to engage and disengage your transfer case on the fly.

If you wish to get the full benefits of the locking hubs, you should only have them in the lock position when you are in 4wd. This will remove the stress and wear from the front axles, u-joints, gears, driveshaft and transfer case.

To Disengage 4wd: (these steps may be performed in either order)

- Shift the Transfer Case into 2wd
- Turn the lockout to the free or disengaged position

A nice added bonus is you can now also have 2wd Low Range. This you may find handy while backing a trailer into a tight spot.

To use 2wd Low:

- Make sure the lockouts are in the Free position
- Engage the transfer case into 4wd Low