



## BMW E36/E46 Driveshaft Removal & Installation

A driveshaft is essentially just a spinning shaft which sends torque from the engine to the differential. The drive flange on the transmission side of the driveshaft is mated to the transmission output flange through the use of a Giubo. The Giubo, or Flex Disc, allows the driveshaft to move as necessary while it acts as a vibration damper. In the middle of an OEM BMW driveshaft, you have the Center Support Bearing (CSB) which mounts the middle of the driveshaft to the underside of the vehicle, while the built in rubber isolator helps to dampen additional vibrations. There are two universal joints in the driveshaft, one is located in the center of the driveshaft near the support bearing, while the other is located near the rear drive flange. These universal joints (U-joint) allow the two halves of the driveshaft to move as needed without binding, but they are not serviceable on OEM BMW driveshafts. It is worth noting that certain models utilize a CV (Constant Velocity) joint at the rear of the driveshaft, this style of joint also allows the two halves of the driveshaft to move as needed without binding, but it can offer a longer lifespan due to its internal design.

Maintaining your existing driveshaft, or switching to a lightweight alternative can increase throttle response and keep your BMW putting every bit of horsepower to the ground that it should. Servicing your driveshaft is incredibly easy (with the exception of the U-joint).

These instructions should help to guide you through the removal, inspection, and installation procedures on your BMW E36/E46. Please be sure to read these instructions completely **before** starting on this repair. Also, please note the different styles of rear drive flanges found on E36 vs E46 vehicles shown in the photos below.

**E36 Driveshaft:**



**E46 Driveshaft:**

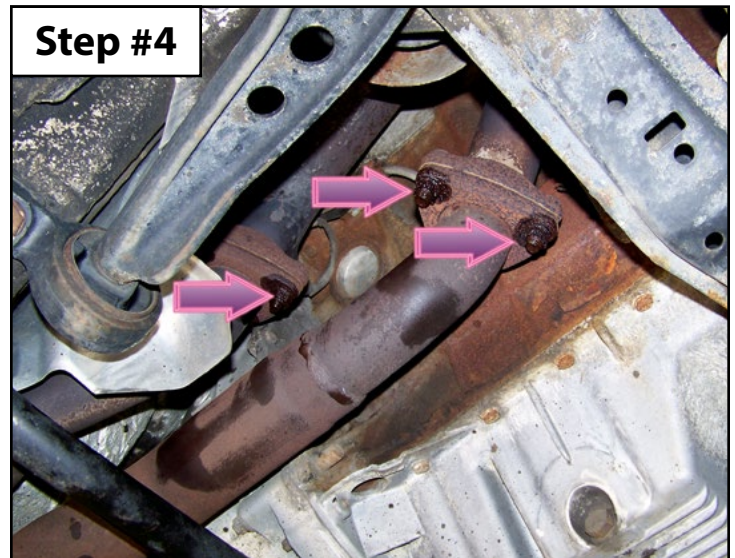
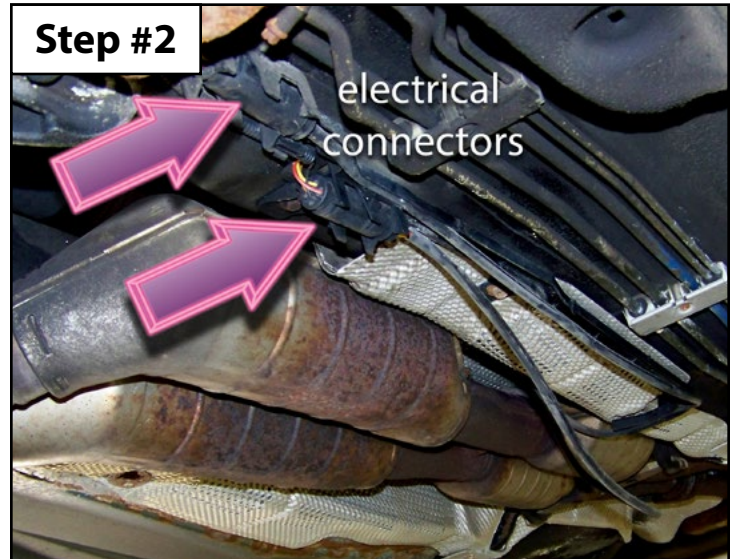
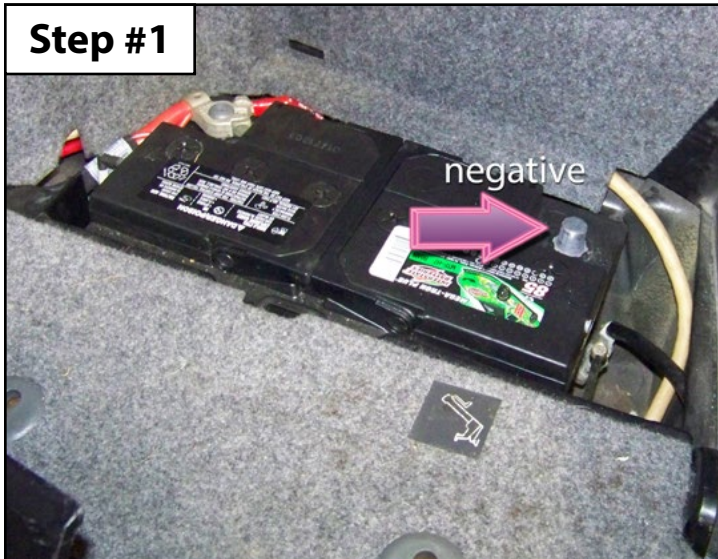


### Torque Values:

- Driveshaft center support to body
  - 22 Nm (16 ft-lb)
- Flex coupler bolt/nut 21 Nm (16 ft-lb)
  - M10 (8.8) 48 Nm (35 ft-lb)
  - M10 (10.9) 64 Nm (47 ft-lb)
  - M12 (8.8) 81 Nm (60 ft-lb)
  - M12 (10.9) 100 Nm (74 ft-lb)

## Section 1: Driveshaft Removal

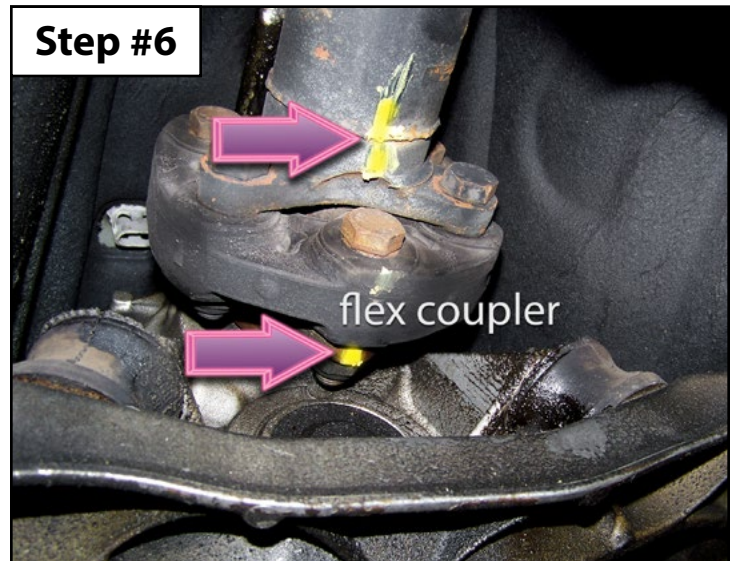
- Step #1**
- Disconnect the negative battery cable.
- Step #2**
- Raise and safely support the car.
  - Disconnect the two round electrical plugs for the downstream oxygen sensors (arrows).
  - Release the black protective cover on the channel that shields the sensor wires against the chassis.
    - Let the disconnected wires hang for now.
- Step #3**
- Disconnect and remove the exhaust (highlighted), we'll remove the main center section between the exhaust manifold and rear muffler.
    - It is possible to remove the entire exhaust (from exhaust manifold to tailpipe), although the entire exhaust is much heavier and harder to handle than the center section.
- Step #4**
- If you live in the rust belt where roads are salted heavily in winter, bring your can of rust penetrant to soak all exhaust studs and nuts.
    - We ended up heating the nuts on the manifold studs to remove them without breaking something.





## Section 1: Driveshaft Removal

- Step #5**
- Remove the aluminum heat shield to expose the driveshaft.
- Step #6**
- Before unbolting the flex coupler, use a paint stick or other marker that won't wipe off easily to match mark the driveshaft and the drive flange at the rear of the transmission.
    - We'll use these marks to realign the shaft and flange to prevent driveline imbalance and vibration.
- Step #7**
- Use a long-handled wrench to counter-hold the flex coupler nuts while you loosen the bolts.
    - Expect these to be tight.



## Section 1: Driveshaft Removal

### Step #8

#### E36 vehicles only:

- Note the locations of the mounting studs on the rear drive flange shown in the **Step #8 - E36** photo.
- Before unbolting the rear drive flange, use a paint stick or other marker that won't wipe off easily to match mark the rear of the driveshaft and the drive flange at the rear diff.
- Unbolt the rear drive flange from the rear diff.

#### E46 vehicles only:

- Note the mounting bolt holes on the rear drive flange shown in the **Step #8 - E46** photo.
- Before unbolting the rear drive flange, use a paint stick or other marker that won't wipe off easily to match mark the rear of the driveshaft and the drive flange at the rear diff.
- Unbolt the rear drive flange from the rear diff.

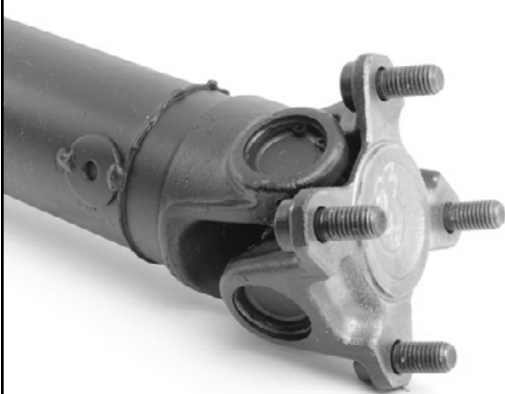
### Step #9

- Loosen and remove the two nuts from the center bearing support bracket studs (arrows).

### Step #10

- Remove the driveshaft from the vehicle.

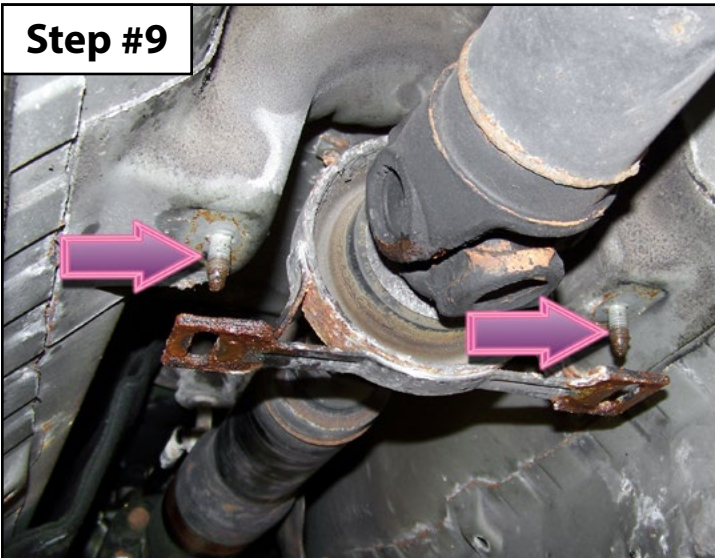
**Step #8 - E36**



**Step #8 - E46**



**Step #9**



**Step #10**





## Section 2: Inspection & Reassembly

- Step #1**
- Inspect the flex coupler for signs of wear or damage.
    - Our flex coupler (photo right) is original, and has developed large cracks (arrow). This needed to be replaced immediately.
  - Make sure the center support bearing spins freely on the driveshaft, without noise or sticking.
  - Check the rubber donut surrounding the center support bearing for tears or cracks.
- Step #2**
- Inspect your transmission mounts for signs of wear or damage (including sagging, cracking, or complete failure).
- Step #3**
- Reinstall the driveshaft and slide the flex coupler and the rear drive flange into place.
  - Torque the fasteners to spec.
    - Use the chart on page 1 to find the correct torque, based on bolt diameter and hardness.
- Step #4**
- Bolt up the driveshaft center support bearing to the chassis, torque the nuts to 22Nm (16 ft-lb).

