

IRON ROCK OFF ROAD

Death Wobble Checklist

There is seldom single cause for Death Wobble. There are many things that contribute to it. This checklist will help you determine what is contributing to your Death Wobble.

Death Wobble is also known as steering shimmy or speed wobble. It is a violent shaking of the vehicle caused by the front tires turning side to side repeatedly until you slow down. It usually occurs after hitting a bump or pothole at various speeds above 30MPH. If you experience death wobble just **remain calm, you still have steering and braking control**. Gently apply the brakes and slow down until the wobble disappears. Be aware of other vehicles on the road as you slow down.







Safety Warning: Some of these adjustments will reduce death wobble, but also reduce steering stability and steering responsiveness. Test drive carefully after any adjustment/modification. If you feel any modification is unsafe do not proceed. Keeping your vehicle safe to drive is the responsibility of the person making the adjustments and the driver. The driver must notice any unsafe actions of the vehicle and correct the problem immediately (wandering or unresponsive steering). Iron Rock Off Road promotes driver and vehicle safety above all else. We highly recommend working with an experienced alignment shop that has the ability, knowledge, and experience to keep your vehicle safe to drive at highway speeds.

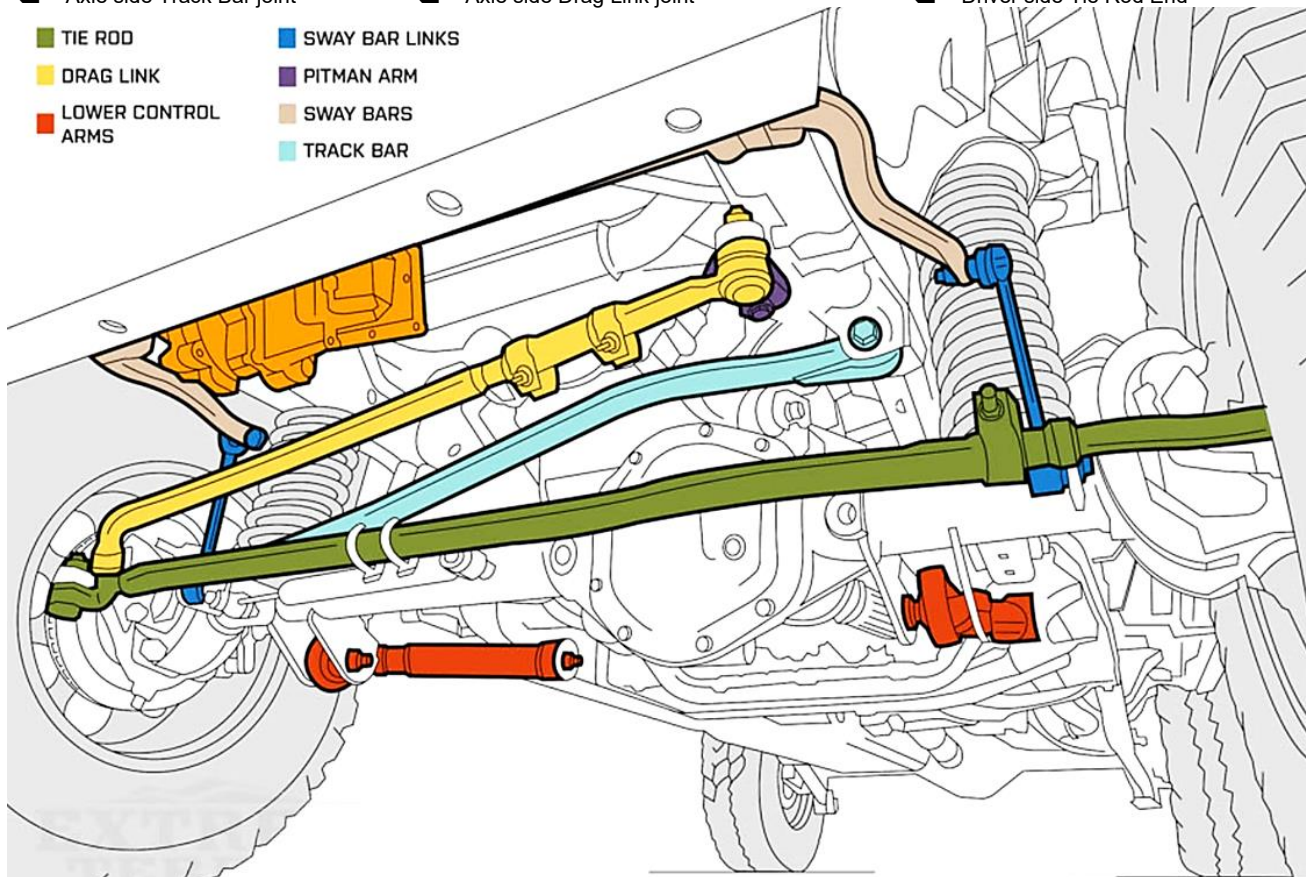
Before you begin: Go through the entire checklist before adjusting or replacing any parts. This will help you identify every contributing source of death wobble. We recommend fixing as many items at once as possible.

A. **Check for loose and worn-out parts: Perform the Steering Shimmy test:**

1. Park your Jeep on a high traction surface like a parking lot.
2. With the engine off, have a friend sit in the driver's seat and quickly turn the steering wheel left and right from the 11 o'clock position to the 1 o'clock position.
3. While a friend is turning the steering wheel, lay under the front of the Jeep and look closely at each steering and suspension joint. Pay careful attention to the end bushings and the bracket that the bushing is mounted in. There should be no movement side-to-side between the bushing and its mount.
4. Touch each end joint of the track bar, drag link, and tie rod. If you feel or hear any clicking or looseness the joint is bad. Use a check mark ✓ for a good joint or an X for a bad joint on the list below.
5. After checking all the steering and suspension joints check each mounting bolt/nut to ensure they are tight, then perform the test again.
6. It is helpful to trade positions with your friend and let them check each steering and suspension joint to confirm what you found.

- | | | |
|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Frame side Track Bar joint | <input type="checkbox"/> Frame side Drag Link joint | <input type="checkbox"/> Passenger side Tie Rod End |
| <input type="checkbox"/> Axle side Track Bar joint | <input type="checkbox"/> Axle side Drag Link joint | <input type="checkbox"/> Driver side Tie Rod End |

- | | |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|  TIE ROD |  SWAY BAR LINKS |
|  DRAG LINK |  PITMAN ARM |
|  LOWER CONTROL ARMS |  SWAY BARS |
| |  TRACK BAR |



A. Check for loose and worn-out parts continued: Use a check mark ✓ for good parts or an X for bad.

- Lift the front of vehicle by the axle and support the axle with jack stands. Ensure that the vehicle is safely supported.
- Check the ball joints and wheel bearings for wear by lifting or tilting the tire up and down, then turning left and right slightly. Have a friend watch each ball joint for movement. Touch each joint to feel for clicking or looseness. Mark any parts that show signs of wear with an X on the list below:
 Passenger side upper ball joint Driver side upper ball joint
 Passenger side lower ball joint Driver side lower ball joint
 Passenger side wheel bearing Driver side wheel bearing
- With the Jeep safely supported, use a flashlight to inspect all control arm rubber bushings. Any rubber bushing with cracks, or where the rubber is separating from the steel casing mark with an X on the list below. Finish the checklist before replacing any parts.
 Passenger side upper control arm bushings Driver side upper control arm bushings
 Passenger side lower control arm bushings Driver side lower control arm bushings
- Check the steering stabilizer. Remove the stabilizer then extend and collapse it. It should require a significant amount of force to move it in and out. Pay close attention to the point where you switch from extending to collapsing, there should be no "free play" as it changes direction. Mark any problem areas with an X on the list below. Finish the checklist before replacing any parts.
 Stabilizer free play Stabilizer damage Stabilizer bushings
- Check steering gearbox for wear, side-to-side movement in the output shaft, and free play seen at the steering wheel. Mark any problem areas with an X on the list below. Finish the checklist before adjusting or replacing any parts.
 Steering Gearbox wear Steering Gearbox output shaft Steering Gearbox free play
- Check steering gearbox mounting bolts are tight and there are no cracks on either side of the frame.
 Steering Gearbox bolts tight All Steering Gearbox bolts installed Frame cracks near Steering Gearbox

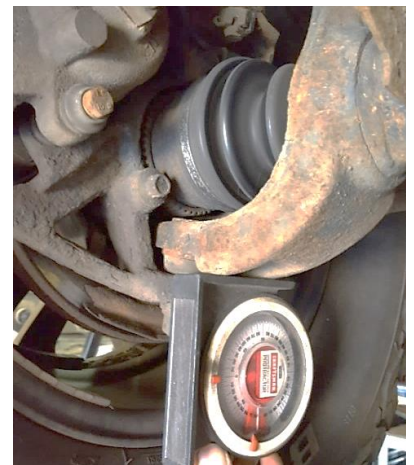


B. Check Tires:

- Check the air pressure of all tires. Typically, tires are over-inflated, do not use the tire pressure printed on the sidewall of the tire, this is the maximum pressure for that specific tire. In our experience, over-inflated tires contribute to death wobble due to smaller contact area. Tire pressure should be in the 27-33psi range. Write down the measured pressure for each tire below. Over inflated tires mark with an X on the list below.
 Passenger side front tire pressure: _____ psi Driver side front tire pressure: _____ psi
 Passenger side rear tire pressure: _____ psi Driver side rear tire pressure: _____ psi
- Check tire wear pattern. Each tire should have an even and uniform tread depth across the contact area. Uneven tread wear can be found by running the palm of your hand across the contact surface of the tire. Tires with uneven wear or under 3/32" tread depth mark with an X.
 Passenger side front tire wear Driver side front tire wear
 Passenger side rear tire wear Driver side rear tire wear
- Check tires for signs of dry rot. Look for small cracks between the tread. This is known as weather cracking or weather checking. Tires with cracking is a sign that they should be replaced soon. Tires with weather cracking mark with an X.
 Passenger side front tire cracking Driver side front tire cracking
 Passenger side rear tire cracking Driver side rear tire cracking
- Check tire balance. Do not use balance beads. Tires MUST be dynamically balanced, meaning they must have wheel weights on both the inner and outer flanges as directed by the balancing machine. Look inside each wheel and along the edge of each wheel for missing wheel weights. If a wheel weight has come loose and fallen off, the balance of the tire is compromised and should be re-balanced at a reputable tire shop. Take note of any wheel that has more weight applied than the others. Wheels with more than 6oz of weight shouldn't be used on the front axle. Wheels with excessive weight or missing weights mark with an X on the list below.
 Passenger side front wheel weight: _____ oz Driver side front wheel weight: _____ oz
 Passenger side rear wheel weight: _____ oz Driver side rear wheel weight: _____ oz
- Check tire date code. Tires older than 6 years are unsafe and should not be used on the street. Tires older than 6 years mark with an X.
 Passenger side front tire date code: _____ Driver side front tire date code: _____
 Passenger side rear tire date code: _____ Driver side rear tire date code: _____
- Rotate tires. The tires with the most even tread wear and with the least weight applied should be placed on the front axle. Finish the checklist before rotating the tires.

C. Check Alignment:

- Check the caster. You don't need to go to an alignment shop to get an idea of what your caster is. With your Jeep parked on a level flat surface, place an angle finder under the axle "C" (or on top of the upper ball joint). Ensure the angle finder is parallel to the Jeep front to rear. This is very close to your caster angle. Adjust the caster to 3.0 to 5.5 degrees (more caster will improve stability; **less** caster will **reduce** death wobble). See safety warning at the beginning of the checklist. Caster above 5.5 degrees mark with an X. Finish the check list before adjusting.
 Caster before: _____ Caster after: _____



2. Check the toe. Adjust toe to exactly zero. Note: a slight toe-in is preferred for stability, slight toe out will reduce death wobble. See safety warning at the top of this sheet. The easiest way we have found to measure Toe is using the Iron Rock Off Road Wheel Alignment Tools, Item number 13382. Toe other than zero mark with an **X**. Finish the check list before adjusting.

Toe before: _____

Toe after: _____



D. Conclusion:

Look back over all the categories and note all the **Xs** and problem areas. Hopefully this helps you understand that Death Wobble has many contributing factors and is usually not one single problem. Now that you have a good idea of all the problem areas it is best to adjust or replace as many items at once as possible. Often times people will find a single bad part, replace it, and still have death wobble. The part was certainly bad, and was more than likely contributing to death wobble, BUT if there are enough other contributing items that are overlooked then death wobble can still be a problem.

