Auto Repair Guide

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How to Tell When You Need an Alignment

How to Diagnose an Alignment Problem

Expert Reviewed

Uh oh. Wasn't there a deceptively deep pothole you hit the other day? Is your car now tending to pull or drift to the left or right? Or maybe there's too much "play" in the steering? By diagnosing any tire problems, the camber and caster of your front-end alignment, and taking it for a road test, any questions can be easily answered. And then you can move onto How to Fix the Alignment on a Car!

Steps

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1 **Eliminate tire problems.** Before attempting to diagnose a front end alignment problem, you need to be sure your tires are not causing steering problems you may be experiencing.

- Check the air pressure on all four tires, making sure to inflate them to the recommended pressure. You should find the manufacturer's recommended inflation pressure on the label attached to the driver's side door.
- Check to see that the tread (or tire pattern) and tire size are the same on both front wheels. You do not want to have a *mud and snow* tire on one side and a normal highway tire on the other side. This, or any combination of different tire types or sizes, can cause the car to pull one way or the other.
- Check to see if the tires are showing unusual wear or are damaged. Look over the tire completely. Does it look symmetrical, round? Are there chunks missing from the tread? Carefully feel around the tire with your hand to see if there are deformities or bulges, indicating the tread is trying to separate from the steel belts.

2 **Examine your front-end alignment.** There are different aspects to front end alignments for rear wheel drive vehicles. You may observe serious alignment problems with a tape measure and a two foot level by checking them. These are:

- Toe-in. The front of each tire, when driving straight, points slightly to the centerline of the vehicle. This gives an advantage when cornering so each tire has equal traction (bite), but if it is angled inward (positive) too much, the OUTSIDE of the tire's tread wears more quickly. Measuring the front and rear distances between the centerline of the tires will give you an idea of how much toe-in your vehicle has.
- Caster. This is the vertices angle of the centerline of the tire from front to back. This angle is best checked with an automotive shop's front end equipment, but unless the ball joints, control arm bushings, or king pins are seriously worn, the caster doesn't vary too much.
- Camber. This is the vertical angle of the centerline of the tire perpendicular to the cross-section of your car. You can park your car on a level surface, and using a 2x4 attached to the a builder's level, check to see if they are plumb. Make sure you are measuring from the rim and not the tire itself, as it can be affected by tire bulge.

3 **Road test your vehicle.** Drive on a flat, level, smooth highway and do the following tests:

- Let your grip on the steering wheel loosen enough to let the car proceed on its own while driving down a fairly straight road on a day when the weather is dry and the wind calm. You may need an alignment if the car pulls to the left or right.
- Check the sounds from the front end of the car. Driving slowly, listen for scraping, whining, or grinding sounds. These may indicate excessive friction as the tire tread rubs against the road, or other problems.
- Have someone follow you at a moderate speed to observe the front to back wheel alignment. If the front wheels are not tracking in the same *groove* as the back, you may have a bent frame. This is applicable to a vehicle with a solid axel in the rear.
- Drive the car in a weaving pattern in an empty parking lot while someone observes the wheels. They may notice unusual leaning in the tires, or hear wheel bearings making noises, indicating problems.

4 **Check for abnormal wear on the tires.** You may have an alignment problem if the inside or outside of the front tires are worn. Other causes of uneven or unusual wear may include the following conditions:

- Worn struts or shock absorbers can cause tires to *bounce* while driving, creating *dishing* in the tread.
- Worn out or loose wheel bearings can cause the tire to lean, since the bearings are what keeps the wheel assembly in position on the vehicle's spindle.
- Worn or damaged tie-rod ends, ball joints, upper and lower control arm bushings (or kingpins, depending on the vehicle), and other steering components.
- A worn or damaged steering gear box or pit man arm.
- Poor driving habits like hard cornering, braking, or swerving can also cause tire damage or unusual wear over the life of a set of tires.

5 Have your front end checked and realigned and repeat the tests to make sure it has been done correctly.

Tips

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- A good time to check for abnormal tire wear would be when you check your tire's inflation and when you rotate your tires.
- Alignment problems are not uncommon and do not take a great deal of mechanical knowledge to confirm. Yet, it is important that you take your vehicle to a professional alignment shop. Professional mechanics use the right tools and equipment to put your vehicle back to the preferred alignment settings.
- Keep your vehicle equally loaded. Heavy loads on one side of the car puts additional strain on the suspension, and may even cause handling problems unrelated to the steering system.
- If the steering wheel is not straight after hitting a road hazard, there is a likely chance something got bent. A lot of modern cars (mainly with ESP) will have a steering angle sensor and will probably trigger an ABS/ ESP light to turn on when the steering wheel isn't straight.

Warnings

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- Be careful when running your hand around the edge of the tire. If the tire is trying to separate, wire from the steel belt could be poking through and rip your hand open.
- Maintain complete control of your vehicle while testing for the steering to pull to the left or right.
- If you're going to make a toe adjustment, make sure the steering wheel is centered and that the wheel is locked straight before turning any tie rods.

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