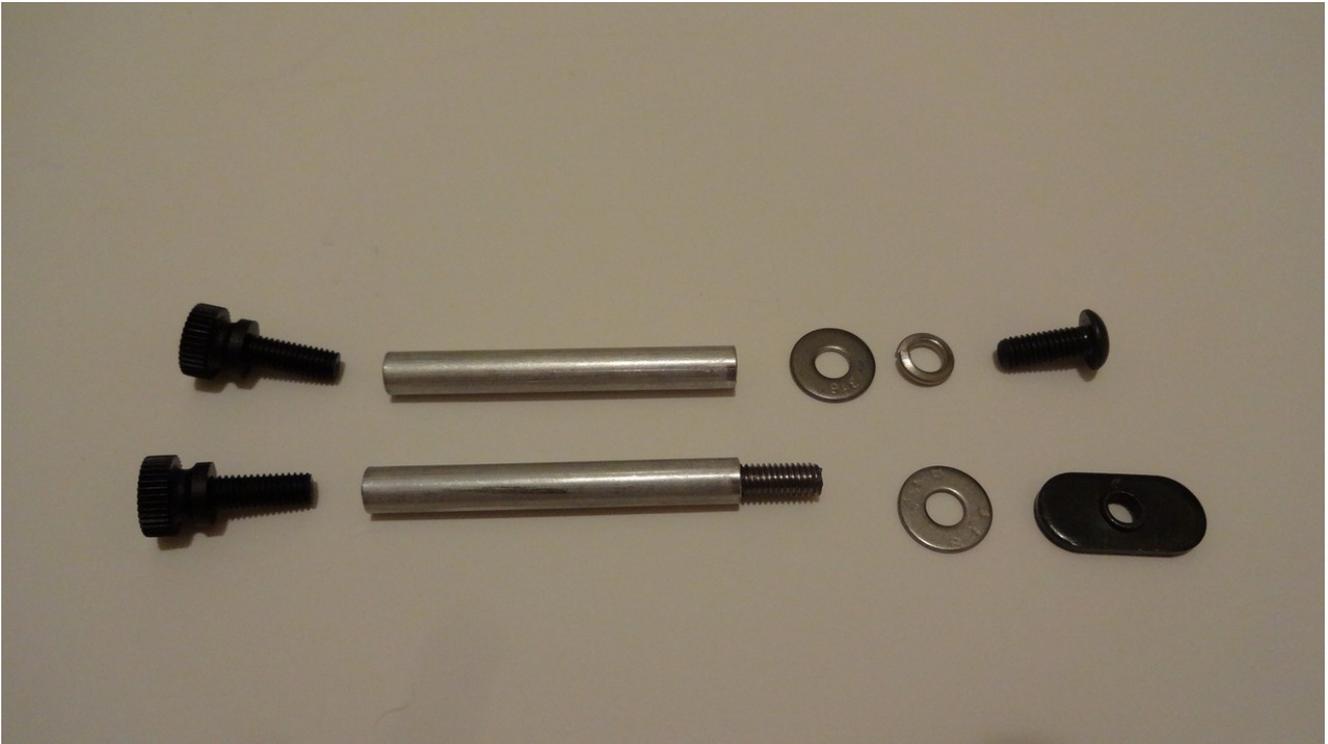


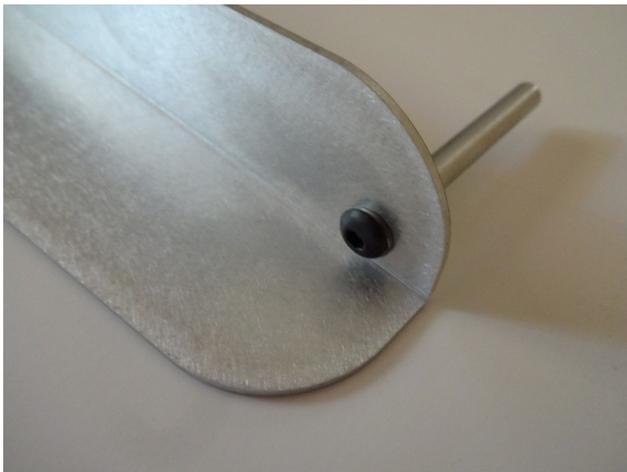
Camber Gauge Assembly Instructions

Included hardware: 2 plastic ends, 1 button head bolt, 2 flat washers, 1 lock washer, 1 threaded backing plate, 1 plain shaft, 1 shaft with a stud.



Step 1: Bolt on the lower contact point.

Using the lock washer, bolt the plain shaft to the hole in the camber gauge frame, placing one of the flat washers between the shaft and the frame. Now included is a philips head bolt, which allows the bolt to be tightened with a screwdriver



NOTE: There will be two holes at the bottom of your frame (not pictured). This is because this product's frame was upgraded to the thicker frame used by our hands free gauge. Use the lower hole to bolt the stand-off to the frame

Step 2: Bolt on the upper contact point. One washer sits between the chassis of the gauge and the standoff. The small backing plate threads on the backside . To adjust the position of the contact point only the threaded shaft needs to be turned, the chassis of the gauge will prevent the backing plate from turning.



Step 3: Screw on the plastic ends.
Thread the plastic ends into the threaded shafts.



Your gauge should now be assembled

If you have any questions or issues, please contact us at info@TenhulzenAutomotive.com

Tenhulzen Automotive Caster Instructions

There are two methods that can be used to measure caster. The first method measures the actual caster value. The second method does not find the actual caster value but provides a side-to-side comparison. This is useful for example, to quickly investigate if caster is to blame for a vehicle pulling to one side (if caster is not equal the vehicle will pull to one side, but there are also many other reasons for why a vehicle may be pulling).

Method 1: True Value Caster Measurement

Step 1: Create Reference Line

Straighten the steering wheel. To measure caster a straight object at least 2 feet long is required. A box, broomstick, jack handle, or metal or wood scrap are some items that can be used.

Adjust the upper contact point of the camber gauge to fit the wheel rim. Holding the gauge sideways on the wheel, orientate the object of choice so the angle and distance of the object approximately aligns with the edge of the camber gauge, when viewed from straight down.



Step 2: Turn the wheel being measured inwards

Turn the steering wheel so the front of the wheel being measured is pointing inwards. Hold the camber gauge to the wheel, with the top pointing towards the rear of the vehicle. Use the top angle of the gauge's frame to check the angle of the wheel. Adjust the angle of the wheel as needed until the edge of the camber gauge is parallel to the reference plate.



Step 3: Zero the digital readout

When the angle has been set, hold the camber gauge to the wheel in the camber measuring orientation, then power on the digital readout and zero it. Do not turn off the digital readout.



Step 4: Turn the wheel being measured outwards

Turn the steering wheel so the front of the wheel being measured is pointing outwards. Hold the camber gauge to the wheel, with the top pointing towards the front of the vehicle. Use the top angle of the gauge's frame to check the angle of the wheel. Adjust the angle of the wheel as needed until the edge of the camber gauge is parallel to the reference plate.



Step 5: Calculate Caster

Place the camber gauge on the wheel as you would to measure camber, and note the value. To calculate caster multiply the camber value displayed by 2. The result is the caster measurement.

Below the digital readout is displaying 4.25, so the caster is $4.25 * 2 = 8.5$ degrees



Repeat the process on the other side of the vehicle.

Method 2: Caster Comparison

Step 1:

Turn the steering wheel 1/2 turn from center. Place the camber gauge on the wheel as you would to measure camber and zero the digital readout.

Step 2:

Turn the steering wheel 1/2 turn from center the opposite direction. Place the the camber gauge on the wheel and note the value displayed on the digital readout. Repeat on the other front wheel.

Step 3:

Compare the two measurements. Again this is not the real caster reading itself, but an easy way to compare the side to side caster values. The two values should be approximately equal.

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Tenhulzen Automotive Camber Measurement Instructions

Calibration

The digital readout auto-levels when it is powered on. If the surface you are working on is not level the readout can be calibrated.

If it is desired to add a certain amount of camber, the gauge can be also calibrated on the wheel itself. For example if you are out at the track and decide you want to add 1 degree more negative camber, the gauge can be placed on the wheel and zeroed. Now the camber can be adjusted until the gauge reads 1 degrees negative camber.

IMPORTANT!!!: The digital readout must always face the same direction it was facing when calibrated. If the readout is forward (toward the front of the car) when it is calibrated the readout should be facing forward when camber is measured on both sides of the vehicle. This will keep the calibration.

Step 1: Calibration (if necessary)

Place the gauge chassis and digital readout on the ground as shown in the picture below and press the zero button on the gauge. Beware that if the surface is very wavy the calibration may still not be perfect. Alternatively a long, straight piece of metal or similar can be laid down and used to calibrate the digital readout.



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Step 2: Measure Camber

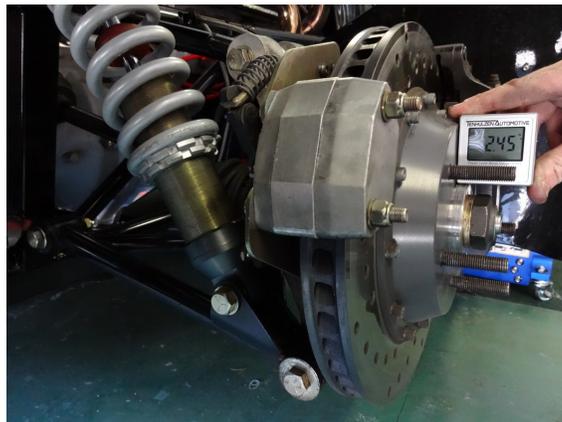
Adjust the upper contact point so that both contact points touch the wheel rim. The camber value will instantly be displayed on the digital readout. Remember that the readout must always face the same direction it was facing when calibrated.



NOTE: The digital readout is very sensitive, so sensitive that you may make yourself crazy trying to adjust to the exact desired value. Alignment specs given by manufactures typically have a camber error range of plus/minus 0.5 degrees, meaning if the camber is within 0.5 degrees of the desired value the car is considered to be within spec. Keep this in mind while adjusting camber, if camber is a couple tenths off the exact desired value, there will be no perceivable difference in handling or tire wear.

Tip: If the suspension the vehicle must be disassembled to adjust camber (threaded ball-joints, rod ends, etc.), it is possible to speed up the process using the digital readout on the wheel hub.

First measure the camber as normal, and determine how much you want to add or subtract. Then after jacking up the vehicle use the digital readout on the hub. This will NOT provide an accurate camber measurement because the suspension is unloaded, but it can provide an accurate camber CHANGE measurement. Meaning if you change the angle of the hub by one degree, the camber should also change by about 1 degree. This will eliminate having to repeatedly disassemble/reassemble the suspension to guess and check.



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