

### Wheel Alignment Check

Excerpt Dave Breggins CD on Hummer Maintenance  
(available for purchase at [www.bluehummer.com](http://www.bluehummer.com))  
This article was posted in Azimuth Feb 2004

#### Fasteners

Fastener	Wrench Size	Loctite	Torque	Notes / Special Tools
Tie Rod Clamp Bolts	5/8" & 11/16"	-		Position critical in front
Cam-type Caster/Camber	1-1/8"	-	300 lb ft	'97-1/2 and later

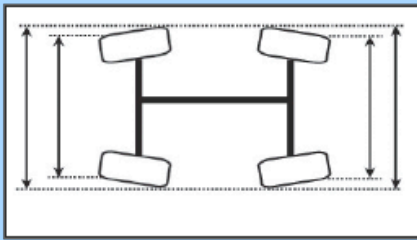


Figure 1 - Toe-in

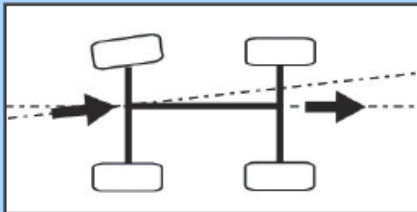


Figure 2 - Thrust Angle

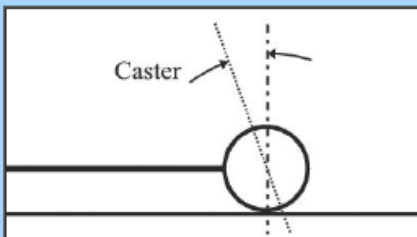


Figure 3 - Caster

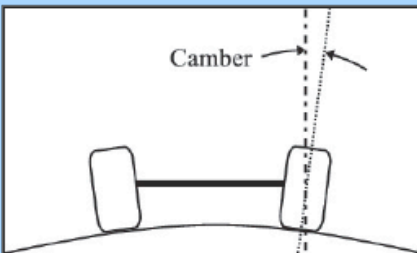


Figure 4 - Camber

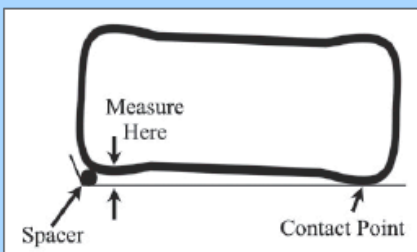


Figure 5 - Thrust Measurement

**Description**

The Wheel Alignment Check is performed as part of the "B" service. The Wheel Alignment Check should be performed any time uneven or unusual tire wear is observed. The Wheel Alignment Check should be performed after replacing Tie Rod Ends, Idler Arm, or Pitman Arm.

**Related Tasks**

If checking is being performed as part of a regular service, it should be done before any of the wheels are raised.

**Tools and Supplies**

Tape Measure  
Special Tools  
String or heavy thread,  
about 50 feet long  
Two small clamps or clothespins  
Golf pencil or similar spacer (refer to text)

**Notes / Special Instructions**

- Wheel Alignment must be measured with the truck suspension in normal driving position. If one or more of the wheels has been raised (e.g. by jacking), the suspension must be re-settled. This is most easily done by driving the vehicle forward about one truck-length. Typically, the truck is backed out of the service area, and then driven back into place.
- The truck must be on a flat, nearly level surface.
- The truck must not noticeably lean to one side or the other.
- The String method of measuring Thrust Angle can also be used to adjust the toe-in, but only if the front and rear track width (width of wheels) is nearly identical.
- Adjustment of Caster and Camber are beyond the scope of this manual. This is better left to experienced personnel with the appropriate equipment. Specifications for these are included in this section, as are many other tips that may be helpful for shops unfamiliar with the HUMMER.
- All alignment work should be performed with the vehicle at typical weight (e.g. normal cargo), and with the tires at the correct pressure for hard surfaces.
- The torque specification in this manual for the cam-type Caster/Camber adjustment is higher than the AMG recommendation. This is required to reliably maintain the adjustment.

**Overview**

This will provide a summary of the terminology used in describing wheel alignment.

\*Note: All diagrams are greatly exaggerated for clarity.

**Toe-in**

Toe-in is the measure of the distance between the fronts and the rears of the tires on a particular axle. (Figure 1) This difference can be measured as a distance, or as an angle. On the HUMMER, the front tires are closer together at the front than at the rear, and the rear tires farther apart at the front than at the rear.

**Thrust Angle**

When the Toe-in is set, both tires on an axle should have the same angle with respect to the vehicle. Any deviation from this may cause handling problems and increased tire wear. The Thrust Angle for an axle is the average of the angles of the two tires (with respect to the vehicle). If the rear is misaligned, the rear of the truck tends not to follow the front (Figure 2). If the front is misaligned, the steering wheel must be held at an angle for the truck to drive in a straight line. On the HUMMER, the thrust angles should always be zero.

**Caster**

On steering axles (front on most vehicles), there is an axis of rotation of the tires as they steer. The angle between this axis and vertical is known as the Caster. (Figure 3) On the HUMMER, only the front tires steer, so only the front tires should have the Caster set. Since the rear suspension is almost exactly

