



# SERVICE BULLETIN

Classification: ST08-001f	Reference: NTB08-097f	Date: November 21, 2011
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## DIAGNOSIS OF VEHICLE PULL (DRIFT) AND STEERING WHEEL OFF CENTER

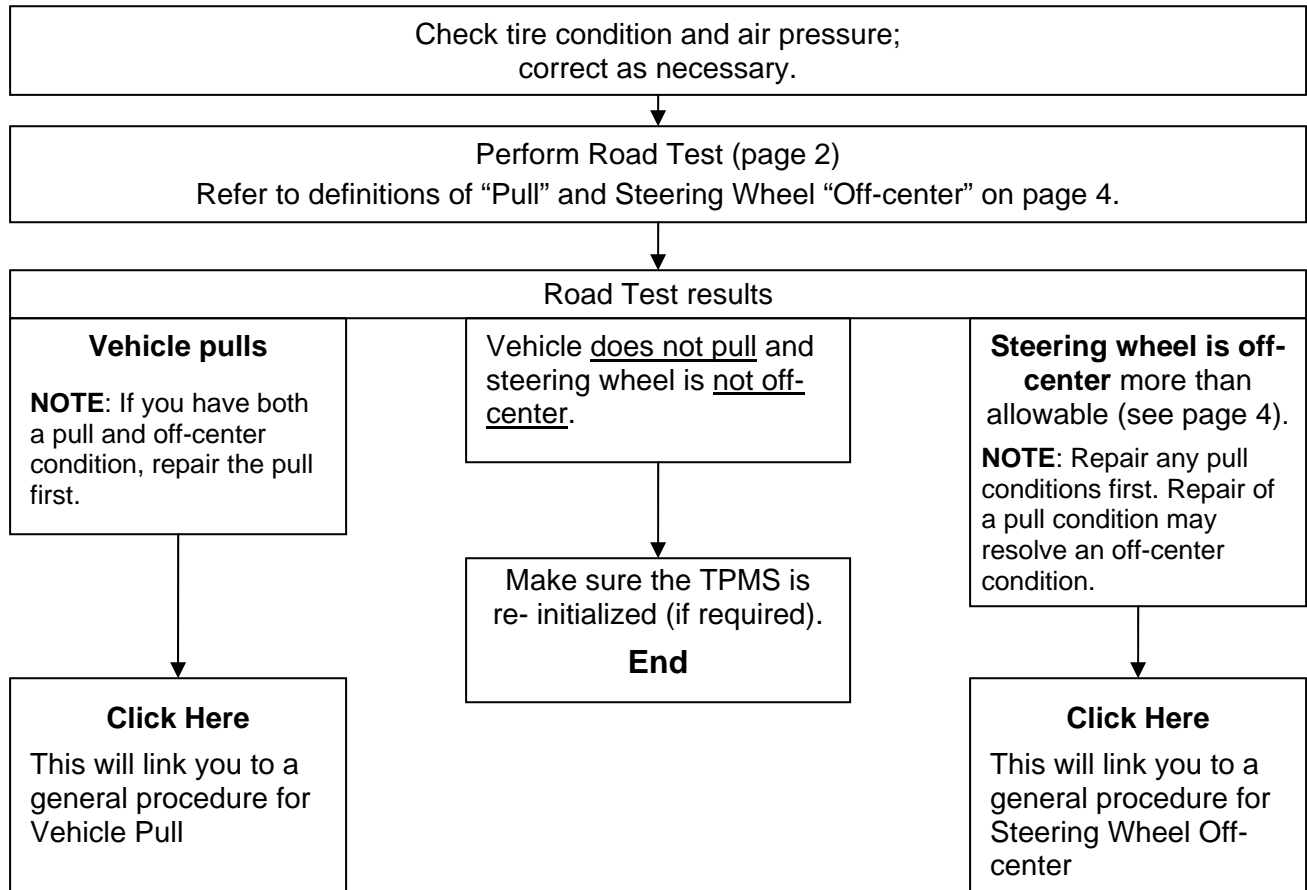
The linked General Procedures in this bulletin have been amended. Please discard previous versions of these General Procedures.

**APPLIED VEHICLES:** All Nissan - except GT-R

### SERVICE INFORMATION

If a customer reports their "vehicle pulls" or the "steering wheel is off-center," use the Diagnostic Flow Chart below and the other information in this bulletin to diagnose and correct the issue

### Diagnostic Flow Chart



## Road Test

Determine if the vehicle has a pull or steering wheel off-center issue that requires repair.

### IMPORTANT:

- If the vehicle has any tire issues, such as:
  - Tires that are different sizes (except when specified from the factory)
  - Significant difference in the amount of wear between any of the tires
  - Any other tire irregularity or damage to any tire

Replace the tire(s) or use known good tires from another vehicle for all road tests and diagnostics in this bulletin.

- Make sure tire pressure is set to the correct specification.

1. Install the following measuring tools on the vehicle:

- Steering Wheel Offset Gauge
- Road Crown Gauge

**NOTE:** See pages 5 and 6 for a description of these tools and an explanation of their use.

2. Obtain a watch with a second hand (preferably a stopwatch) to use during the road test.

3. Take the vehicle for a road test and confirm the customer's concern.

- Select a flat road where the vehicle can be driven in a straight line at a preferred speed of 60 mph.
- During the road test make sure the vehicle is pointing straight. Don't worry about steering wheel position during the road test.

### NOTE:

- If you adjusted the tire pressure or changed the tires before the road test, the issue may have been resolved.
- If there are cross winds strong enough to affect the vehicle's straight line movement, then diagnosis cannot be performed.

4. Determine the vehicle's issue – refer to the definitions of "Pull" and Steering Wheel "Off-center" on page 4.

5. When the road test is completed, remove the Road Crown Gauge, leave the Steering Wheel Off-Set Gauge in place until the Service Procedure is complete.

6. Refer to the Flow Chart on page 1 for the next step.

## Other Service Information

Customers may report that their vehicle's steering wheel is "off-center" because the steering wheel spokes are tilted to the left or right when the vehicle continues straight ahead on a straight flat road (see example in Figure 1).

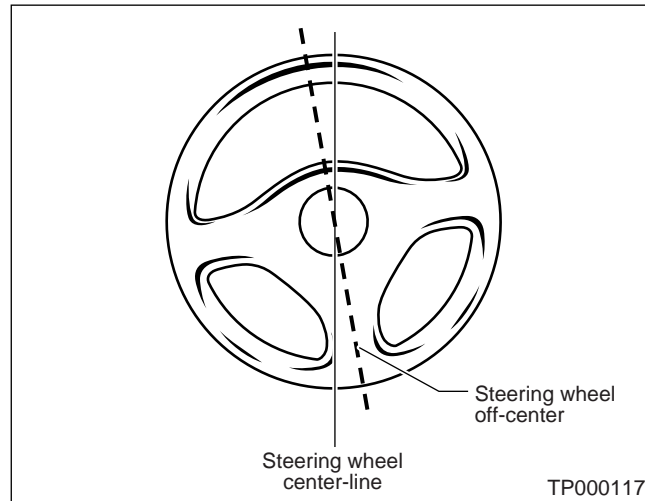


Figure 1

If a vehicle's steering wheel spokes are slightly off center while driving straight, it may be the normal result of road crown. Most roads in the United States are built with a "crown" to help rain water drain from the road surface. The slope of the road crown varies from place to place.

Vehicles have a natural tendency to drift to the low side of the crown. The greater the slope of the crown, the faster the vehicle will drift in that direction.

Tires and vehicles are designed to counteract the effect of typical road crown, but may not fully counteract the effect of a highly crowned road.

Some freeways slope to both the left and right from the center. When driving on a freeway that slopes in both directions, a vehicle may exhibit a small amount of drift to the left when driving in the left lane and a small amount of drift to the right when driving in the right lane.

**This bulletin does not address road crown issues because they are not vehicle related,** although the customer may incorrectly perceive them to be.

## **Description/Definition of Steering Wheel “Off-center” Condition**

The steering wheel spokes are tilted to the left or right more than allowable (see example in Figure 2) when driving straight ahead on a straight flat road.

### **Allowable specification for steering wheel off-center**

- All Nissan (except NV1500, 2500, and 3500): 2 mm or less.
- NV1500, 2500, and 3500: 4 mm or less.

When driving straight on a highly crowned road, the steering wheel may be turned (off-center) to counteract the affect of the road crown. When road testing for an off-center condition, the vehicle should be driven on a straight flat road.

Although the vehicle does not pull in either direction, the customer may perceive that the vehicle pulls because it will respond if he or she tries to bring the steering wheel back to center. This condition can occur if the tie rod length is uneven (not adjusted correctly) from side to side.

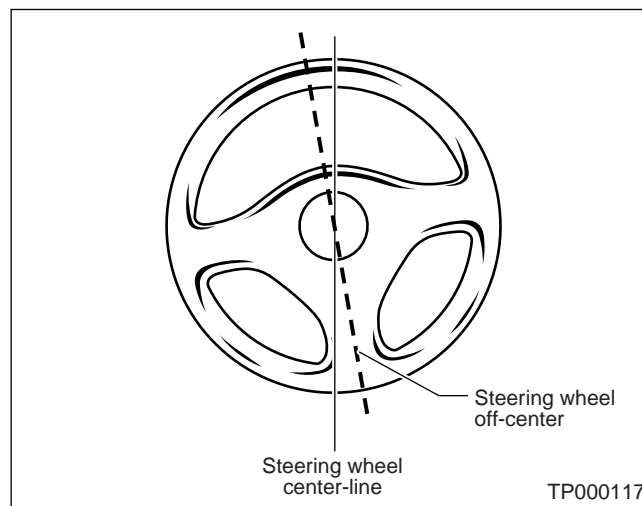


Figure 2

## **Description/Definition of a Vehicle “Pull” Condition**

The vehicle consistently drifts to one side while driving at a constant speed on a straight, flat road.

- A vehicle is said to “pull” if it completes a lane change in less than 7 seconds (with no steering correction from the driver) when driving at 60 MPH on a road with less than 2 degrees of road crown slope. All four wheels must pass into the other lane during this time (7 seconds).

## SPECIAL TOOLS

### Steering Wheel Offset Gauge (Stickers) – Tool # J-49286-3

The Steering Wheel Offset Gauge is a set of one-time use stickers that are attached to the steering wheel and the steering column cover.

#### Tool Use

Turn / adjust the steering wheel to the straight position (spokes of steering wheel are straight across).

Attach the sticker with numbers on the steering column cover.

Attach the arrow sticker on the steering wheel. Make sure the arrow lines up with the 0 (zero) mark.

When you road test the vehicle you can read how many millimeters the steering wheel is off-center.

**NOTE:** If stickers are not available, use a piece of masking tape on the steering wheel and on the steering column. Mark where the steering wheel is centered.

- **Additional tools can be ordered from TECH-MATE at 1-800-662-2001.**

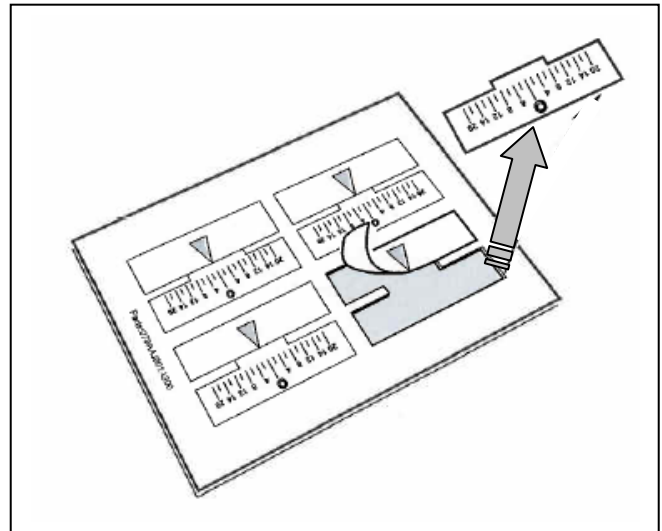


Figure 3



Figure 4



Figure 5

## Road Crown Gauge – Tool # J-49286-2

The Road Crown Gauge measures the amount of road crown in degrees.

The suction cup is used to attach the Road Crown Gauge to a secure spot on the vehicle dash.

### Tool Use

Before the road test, calibrate the gauge:

**NOTE:** The gauge must be calibrated with the same weight in the vehicle as there will be during the road test. For example, if you plan to have an assistant in the vehicle during the road test, calibrate the gauge while both of you are sitting in the vehicle.

There are two ways to calibrate the gauge:

- Preferred method: Park the vehicle on a level surface, such as an alignment rack and calibrate the gauge by moving the gauge until the ball is on the zero mark.
- If you do not have a perfectly flat level surface:
  - a. Park the vehicle on a reasonable flat level surface and note the gauge reading.
  - b. Turn the vehicle 180 degrees so the vehicle is in the same spot but facing the opposite direction and note the gauge reading.
  - c. Move / calibrate the gauge so it reads half the difference between the two readings.

For example; if the first reading is -1 and the second reading (after moving the vehicle) is +3, half way between is +1.

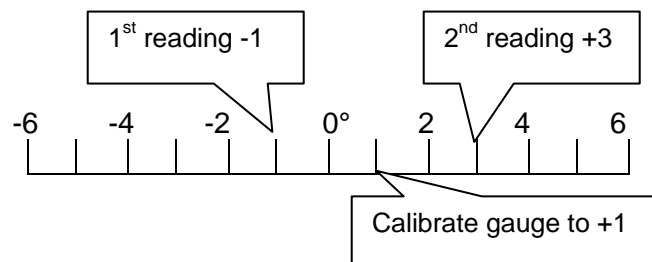


Figure 6



Figure 7