Plus Wheel Sizes and Bearing Wear

2005-2011 Dodge Charger and Other Vehicles

DYK12-102MHB

MOOG STEERING & SUSPENSION

NASCAR PERFORMANCE

DID YOU KNOW?

ADVICE FOR THE PROFESSIONAL

Overview

Installing larger diameter/wider wheels and tires (Plus Sizing) is a popular upgrade. In many cases, however, larger than OE spec wheels can result in added wheel bearing wear and premature failure.

When the width of the rim is increased, the **backspacing or offset** of the wheel has to remain close to that of the original wheel to prevent problems with clearance and improper loading of the wheel bearings.

As you increase the wheel diameter from a standard 17 inches to, say, 20 or 22 inches, you increase offset and also increase the related loads on the bearings.

Backspacing is measured from the hub-mounting surface to the outside lip of the rim. This means that the increase in width must be offset in a positive direction to the outside of the vehicle. (This is referred to as "**Positive Offset**.") Backspacing also determines the centerline of the tire's scrub radius. Tire scrub radius is an important aspect of tire wear.

See the comparisons in the chart below.

Wheel Size	Offset	Back-spacing	Rec. Tire Size	Weight
17"	10mm	4.88"	215/65-17	30 lbs.
20"	+18mm	5.51"	245/45-20	39.9 lbs.
22"	+20mm	6.06"	265/30-22	42.8 lbs.

Chart 1

17" Wheels/Tires (standard)

22" Wheels/Tires (Plus Sized)

Situation

Positive Offset
Positive offset can affect handling, ride comfort and tire wear. It can have another effect on the suspension.

It can also change the loading on the wheel bearings. (The offset moves the loading from the inner bearing to the outer bearing.) It increases the torsional load on the bearing as well. Thus, a large change in offset can cause a bearing failure. This is true for both front- and rear-wheel applications.

Weight
A large diameter, cast-aluminum wheel can weigh more than the stamped steel wheel that it is replacing. The tire can also weigh more, especially as it increases in size. In Chart 1, you can see the difference between a 17" OE wheel and 20" upgrade. This extra weight creates more stress on the hub and bearing unit.

Aspect Ratio
OEMs tune tires, wheels and suspensions as one system. Oversized rims normally lead to a lower aspect ratio – a reduction of sidewall on the "new" tires. The reduced sidewall means less flex and the inability of the tire to absorb impact. Since the impact is no longer being absorbed by the tire's sidewall, it is being transferred to the wheel bearings and other wheel end components.

Installation Procedure

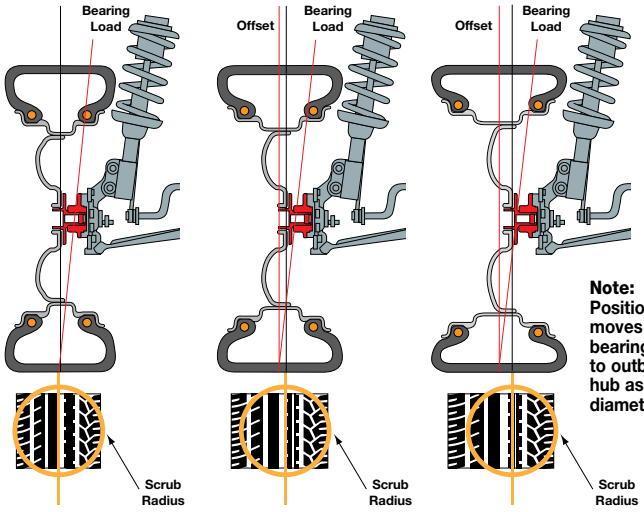
To ensure long life on applications where oversized and non-original equipment tires and wheels are present, be sure to install MOOG® Hub Assemblies.

MOOG Hub Assemblies feature:

- **Superior Oil Seal**
- **Integral Raceway**
- **OEM Approved Bearing Design**
- **OEM ABS Sensor and Plug**

513224 MOOG Hub Assembly
2005-2011 Dodge Charger (FRONT)

512301 MOOG Hub Assembly
2005-2011 Dodge Charger (REAR)



17 x 7.5 Wheel
215/65 x 17 Tire

20 x 8.5 Wheel
245/45 x 20 Tire

22 x 9.5 Wheel
265/30 x 22 Tire

Note:
Position of bearing load moves from inboard bearing of hub assembly to outboard bearing of hub assembly as wheel diameter increases.

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