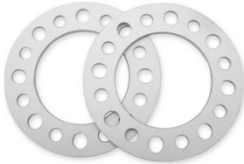


Spacers, Adapters, and Wobble Bolts/Nuts QRG

Purpose and Overview

This document is designed to give you a basic definition of the different types of spacers, adapters, and wobble bolts/nuts you may come across.

	Type	Description	Example
Spacer and Adapter Variations	Both wheel spacers and wheel adapters come in two variations: lug-centric and hub-centric		
	Lug-Centric	Lug-centric wheel spacers and adapters are centered by the lugs of a wheel. These are typically cheaper but can lead to vibration issues.	
	Hub-Centric	Hub-centric spacers and adapters are centered by the hub like a wheel. These are typically purpose built and higher quality.	
Wheel Spacers	There are three types of spacers: slip on, bolt on and press on. These can provide more clearance for the wheel but reduces the lug thread engagement that is possible.		
	Slip On Spacers	- Slip on spacers are typically thinner and will slide over the studs on the hub to push the wheel out. - Slip on spacers must be hub-centric	
	Bolt On Spacers	Bolt on spacers are typically thicker. They bolt onto the vehicle's existing studs and include another set of studs to mount the assembly to.	
	Press On Spacers	These press on to the wheels mounting pad through a precision friction fit via the center bore. Not very common but sometimes used on higher end aftermarket wheels.	

	Type	Description	Example
	Wheel Adapters	- These allow an assembly to be installed on a vehicle it was not designed to fit. - This is done by changing the bolt pattern on the hub of the vehicle. For example: 4 to 5 lug, or 5x112 to 5x127. - The wheel adapters function similarly to the bolt on wheel spacers and are bolted to the vehicle first, then the assembly is bolted onto the adapter.	
	Stud Adapters	- Stud adapters convert a hub that uses lug bolts to use studs and lug nuts. - These are typically European vehicles such as Mercedes, BMW, and VW.	
	PCD Variation (Wobble) Lugs and Bolts	- These lug nuts and bolts allow a wheel to be installed on a vehicle they were not designed to fit. - These are essentially lug nuts (or bolts) with a moving taper washer and can allow for small corrections in bolt patterns. - For example, this will allow a 4x100 wheel to fit on a vehicle with a 4x98 bolt pattern. - If a European vehicle (such as Mercedes, BMW, and VW) come in with a spare, check the bolts. They typically use a shorter lug bolt for the spare.	