

## Determining Vehicle Fitment

Fitting a wheel and tire package is different for each vehicle, but by following these guidelines your chances for success will be much greater. In most cases you'll have to use the physical dimensions of the current wheel/tire package to determine the dimensions of the new wheel/tire package.

Items which are potential trouble spots:

- Tie Rod Ends
- A-arms or lower control arms
- Sway bars
- Brake Callipers
- Discs/ Drums
- Shocks/struts and their Mounts
- Springs
- Inner & Outer Fenders (especially front tires when turned to full lock)

## Wheel Terminology

**Hub Diameter or centre bore:** The hole at the centre of the wheel.

**Rear spacing or back spacing:** This is the distance from the backside of the wheel mounting pad to the outside of the rim flange.

**Offset:** The distance from the centreline of the wheel to the mounting surface of the wheel.

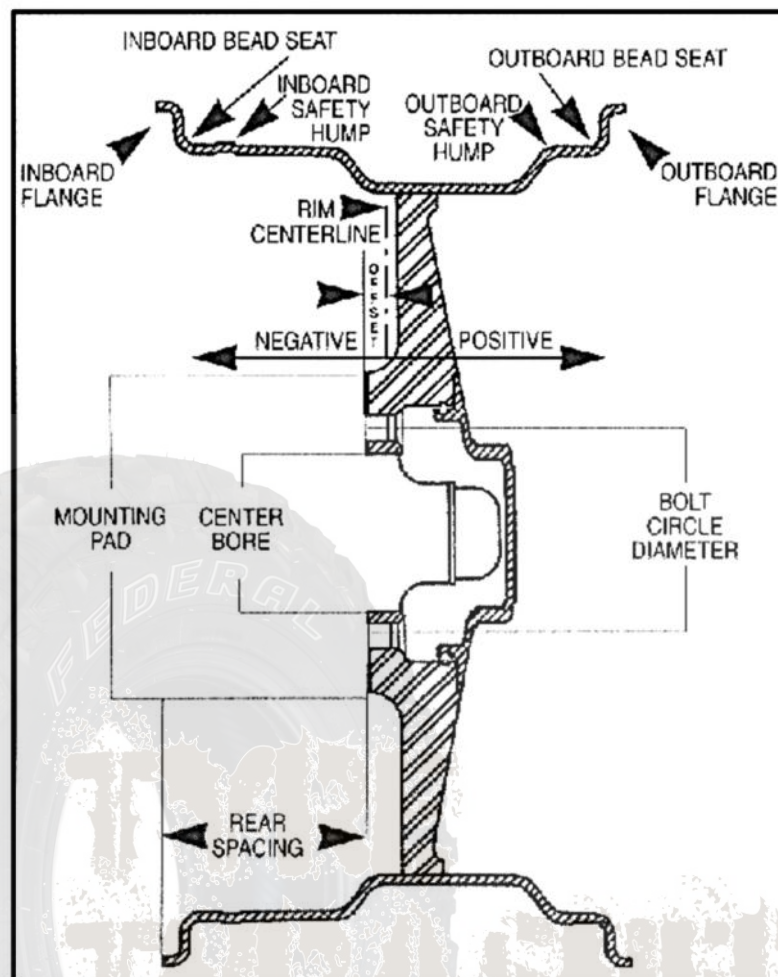
**Negative offset:** When the back of the bolt pad/mounting surface is closer to the inside of the wheel; when mounting surface is inboard of the rim centreline.

**Positive offset:** When the back of the bolt pad/mounting surface is closer to the street side of the wheel; when the mounting surface is outboard of the rim centreline.

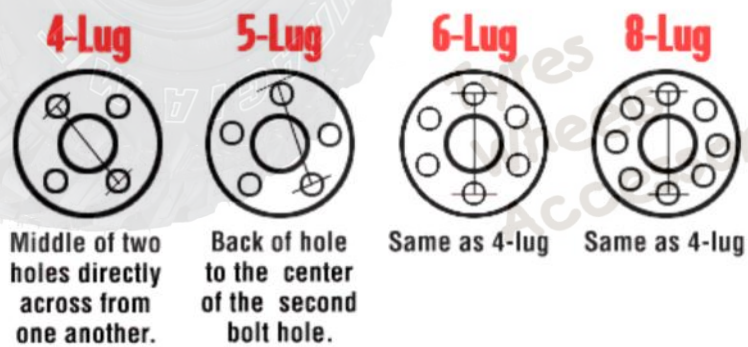
**PCD/Bolt pattern/Stud pattern:** PCD stands for pitch circle diameter and is the diameter of a circle drawn through the centre of your wheel's bolt holes or your hubs bolts. The bolt/stud pattern or PCD as it is commonly known is measured in millimetres and also indicates the number of studs or bolts the wheel will have. E.g. Toyota Land Cruiser wheels have a PCD of 6x139.7 meaning that they have 6 bolt holes drilled through the centre of a 139.7mm diameter circle(see the 2<sup>nd</sup> picture below for more information).

**Bead Lock:** A device which captures the tire bead between its flanges or itself and the wheel flange (usually secured by bolts or air pressure to keep tire bead from dismounting). Normally used in off road applications where low tire pressures are required and hitting ruts or other obstacles are common.

## Getting to know a wheel



### How to Measure the PCD/ Bolt Pattern of your wheels



A hub can be measured the same way as your wheels however instead of the holes you will be measuring from the studs.

It's hard to get this spot on but you should get very close

## How to Measure the backspacing of a wheel

### Items required for measuring the backspacing of a wheel

- Tape measure
- Straight edge or straight piece of timber, steel or plastic cut to size
- Wheel without tyre (preferred but can still be done with a tyre)

Back side of wheel



Face side of wheel

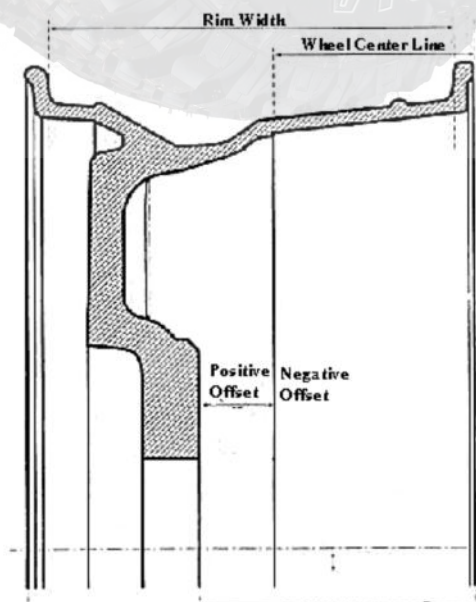
The above photo shows three wheels. one with 2 inches of backspace, one with 3 inches & one with 4 inches of backspace

The easiest way to measure backspace is to lay the wheel face down onto the ground so the backside (the side you don't see when its fitted to the car) of the wheel is facing up. Take a straight edge and lay it diagonally across the inboard flange of the wheel. Take a tape measure and measure the distance from the straight edge to the hub mounting pad of the wheel. Try and keep the tape at 90° to the straight edge, this measurement is the backspace.

If you are unsure on any of our terminology it might become clearer if you refer to the getting to know a wheel diagram and terminology on the previous pages.

### Measuring the Wheel Offset

Wheels are usually stamped with their offset using the German prefix "ET" (press depth). An example would be "ET45" for a 45mm offset.



To calculate offset you'll need the following measurements:

- Wheel backspace
- Wheel Width
- Wheel Centre line (outboard flange to inboard flange measurement divided by 2)

Subtract the wheel centre line distance from the wheel backspace to get the offset.

If the backspace is less than the wheel centreline the offset is negative

If backspace is greater than the wheel centreline the offset is positive.

### Conversions

To convert from inches to mm multiply by 25.4

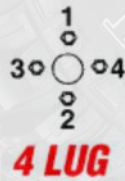
To convert from mm to inches divide by 25.4

### Backspace to Offset Conversion Chart

BACKSPACE	3.25"	3.5"	3.75"	4"	4.25"	4.5"	5"	5.25"	5.5"	5.75"	6"
WHEEL WIDTH											
5.5"	0	6	12	19	25	32	44	52	57	63	69
6"	-6.4	0	6	12	19	25	38	44	51	57	63
6.5"	-12	-6	0	6	12	19	32	38	44	51	57
7"	-19	-12	-6	0	6	12	25	32	38	44	51
8"	-32	-25	-19	-12	-6	0	12	19	25	32	38
8.5"	-38	-32	-25	-19	-12	-6	6	12	19	25	32
9"	-44	-38	-32	-25	-19	-12	0	6	12	19	25
9.5"	-51	-44	-38	-32	-25	-19	-6	0	6	12	19
10"	-57	-51	-44	-38	-32	-25	-12	-6	0	6	12
10.5"	-63	-57	-51	-44	-38	-32	-19	-12	-6	0	6
11"	-69	-63	-57	-51	-44	-38	-25	-19	-12	-6	0
12"			-69	-63	-57	-51	-38	-32	-25	-19	-6

### How to tighten lug nuts

***Tighten Lug Nuts in a Criss-Cross Pattern for Best Equal Torque Distribution.***



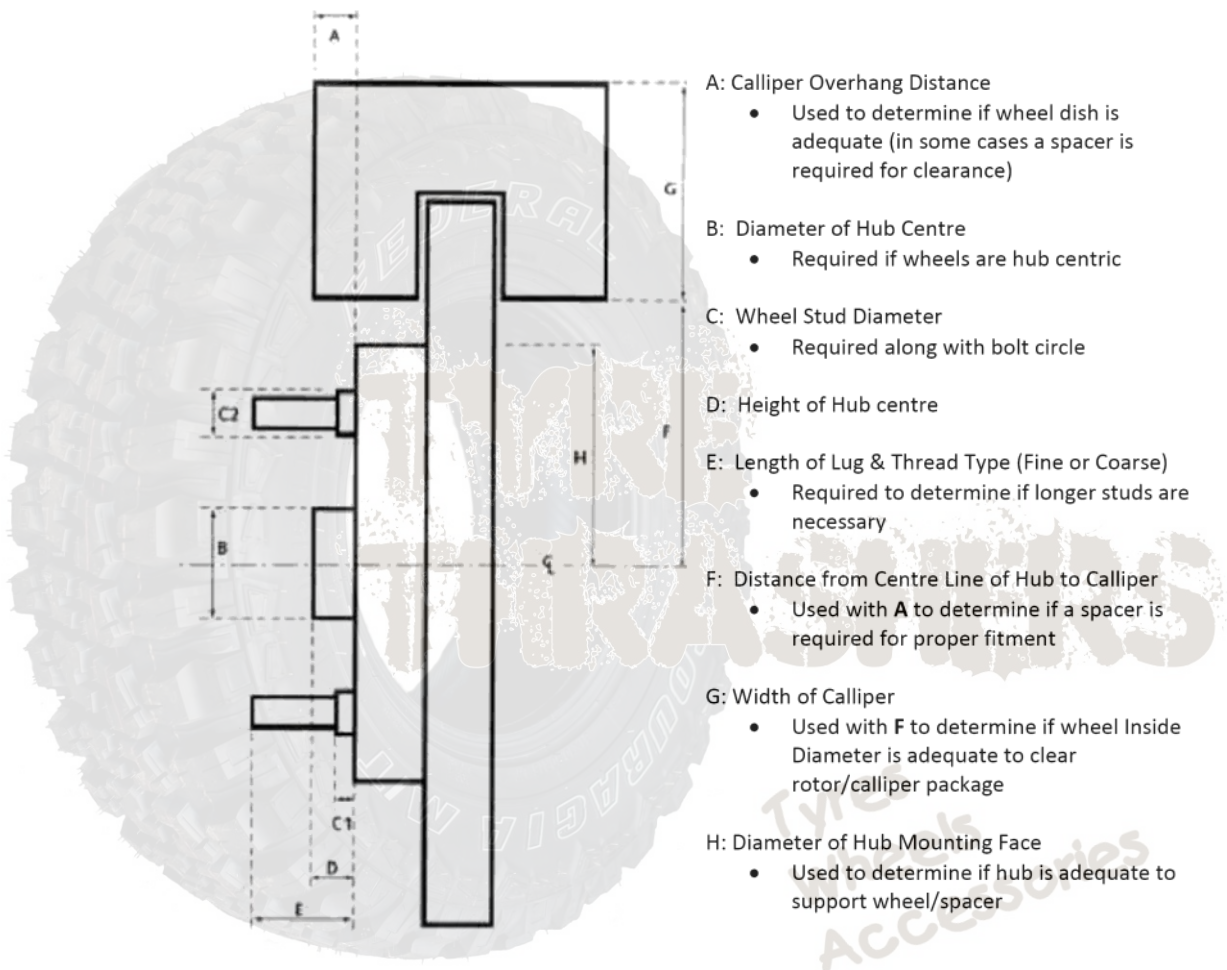
**IMPORTANT NOTICE:** As with all types of wheels re-torque lug nuts after the first 40km or so & it's good practice to check them every so often.

**Note:** Always refer to Owner's Manual for proper factory specifications that take precedence over the listed recommendations.

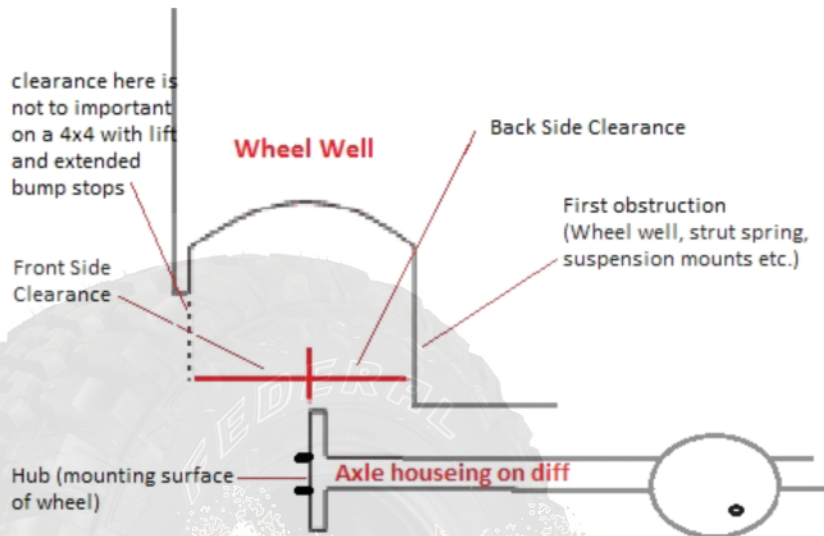
## Determine Wheel Calliper Clearance

Ensuring proper calliper clearance inside the wheel is important. The following chart should enable you to have the dimensions required.

### Calliper and Hub Diagram



## Areas to measure for clearance and offset



In the drawing above, we've made two measurements  
Front Side Clearance  
Back Side Clearance

These measurements when used with:

Tire Section Width  
Rim Width  
Rim Backspace

help determine if wheel/tire clearance is adequate for the new wheel/tire package you've selected

We won't bother going into the front as it can be a fair bit more complicated, regardless the short of it is similar to the above but the measurements also need to be done from lock to lock and sometimes even under suspension compression.