DTU

DISCOUNT TIRE UNIVERSITY

FITMENT BASICS

PARTICIPANT REFERENCE GUIDE

FITMENT BASICS

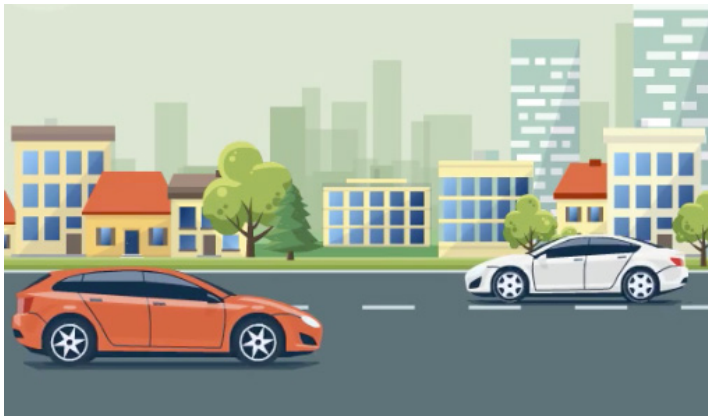
INTRODUCTION

In today's vehicle service industry, tire fitment has never been more important.

The compatibility of tires to vehicles is crucial in achieving desired performance without unintended consequences.

Simply put, proper tire fitment means the tires:

- Meet the load requirements of the vehicle
- Fit the wheel properly
- Fit the vehicle



Proper tire fitment results in Happy Customers and helps achieve proper vehicle performance.

FITMENT BASICS

OBJECTIVES

As a Crew Chief, you are the last line of defense in identifying an improper tire fitment situation before a vehicle leaves our store.

This requires you to master a few basic concepts in tire and wheel fitment:

- Identifying the correct vehicle Year, Make, Model and Trim.
- The factors that go into replacing OE tires.
- The additional factors related to installing aftermarket wheels and how to perform a test fit.

As each customer enters our customer experience, their vehicle and the tires they purchase go through a fitment validation in our Fitment Guide.

The Fitment Guide uses calculations based on the OE placard tire information to identify OE replacement tires and appropriate aftermarket options.

Not all vehicles we service have tires and wheels that were purchased from Discount Tire, so it is important to verify the fitment during each service.

Additionally, it is your job as a Crew Chief to perform a pre-service vehicle inspection before each service to look for tell-tale signs of improper fitments.

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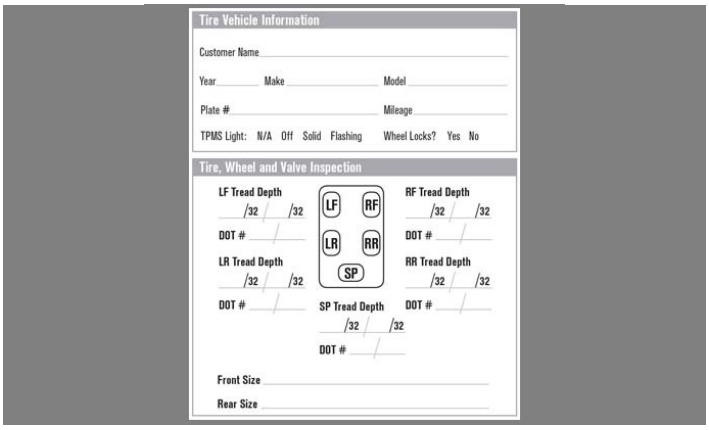
VEHICLE SPECIFIC

VTV Data Collection

During the fitment validation process, a Salesperson uses the data they collected during the Visit the Vehicle to ensure they select the correct tire and/or wheel fitment for the customer's vehicle.



Workorder vs Vehicle

Upon pulling the vehicle in, it will be your responsibility to confirm that the vehicle matches the information on the work order. This means verifying the Year, Make, Model, and Trim of the vehicle. While Make and Model are pretty easy to identify due to manufacturer badges, Year and Trim require a closer inspection.

```
2012  VW                    Location: SPOT B
GTI VI                      Color:    WHITE
18"BASE   2/4-DOOR
```

VEHICLE SPECIFIC *(continued)*

Vehicle Identification Number

Year, or Model Year, is clearly identified by the 10th digit of the vehicle identification number (VIN). This number can typically be found at the bottom of the driver side windshield and on the vehicle placard located on the driver side door or door frame.

The 10th digit can be a number or a letter that represents a given year. Model Year is important because it represents when a vehicle truly changed specifications in production, not the date the vehicle was built.

3GDA03E4135038704

VIN Reference

Let's look at an example of a vehicle's year by referencing the VIN with this chart.

Code	Year	Code	Year	Code	Year	Code	Year
A	1980	L	1990	Y	2000	A	2010
B	1981	M	1991	1	2001	B	2011
C	1982	N	1992	2	2002	C	2012
D	1983	P	1993	3	2003	D	2013
E	1984	R	1994	4	2004	E	2014
F	1985	S	1995	5	2005	F	2015
G	1986	T	1996	6	2006	G	2016
H	1987	V	1997	7	2007	H	2017
J	1988	W	1998	8	2008	J	2018
K	1989	X	1999	9	2009	K	2019

VEHICLE SPECIFIC *(continued)*

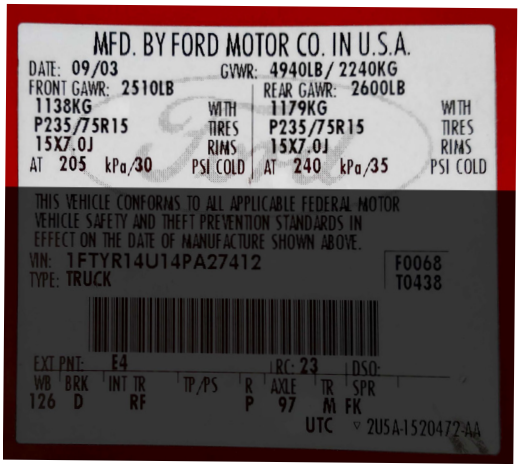
Trim

Trim is usually identifiable by emblems on the body of the vehicle. Occasionally, the distinguishing features are visual or physical in nature, like truck cab style (Regular, Extended, Crew, etc.) or vehicle type (Coupe, Sedan, Convertible, Hatchback, etc.).

VEHICLE SPECIFIC *(continued)*

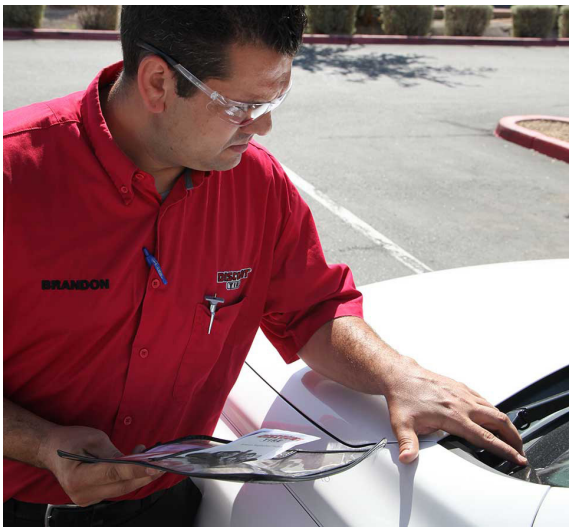
Verifying the Trim

Most of the differences in Trim packages are obvious. However, it cannot always be identified. When this happens, you can always reference the vehicle's door placard which contains much of the critical information needed to determine a proper fitment. If you see something different or funny, notify the Salesperson before beginning service.



Wrap up

During a visit to the vehicle, it is the responsibility of the Salesperson to collect the right information then enter the information into the Fitment Guide. As a Crew Chief you are the last line of defense. The concepts and techniques presented in this section are here to guide you in case you notice something is off. Proper fitment begins with identifying the specific vehicle Year, Make, Model, and Trim. You play a role in ensuring the vehicle serviced matches the vehicle on the work order.



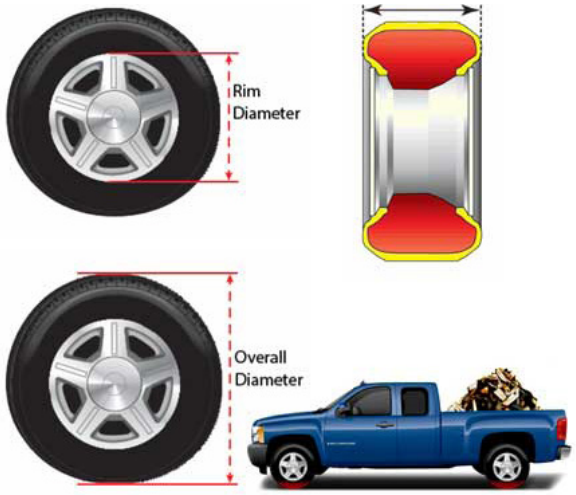
FACTORS OF OE REPLACEMENT

Four Factors

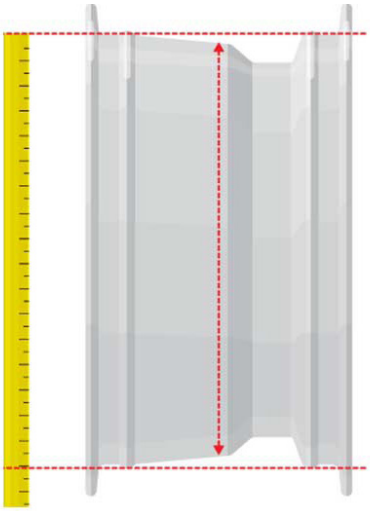
Most customers replace their tires with new ones that are intended to fit their vehicle and perform closely to their original tires.

In these cases, there are four factors to take into consideration:

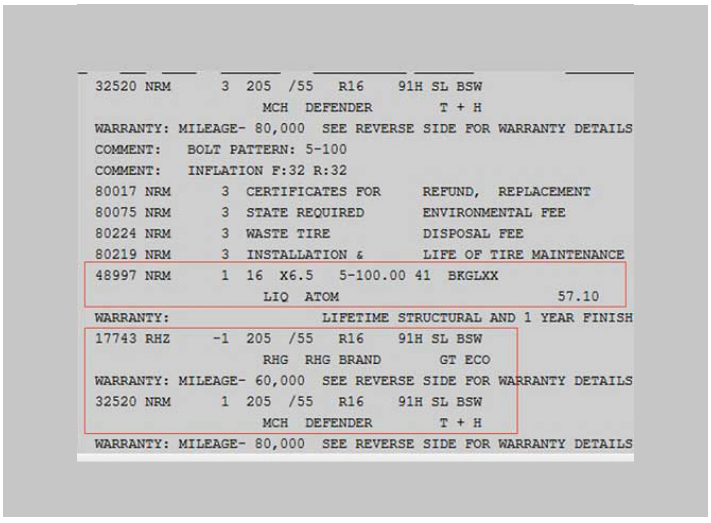
1. Rim diameter
2. Overall diameter
3. Section width vs. rim width
4. Load



Rim Diameter



In Wheel Basics we learned about how tires and wheels of different diameters are not compatible and could result in bead failure during inflation. The diameter of the tires and wheels must match exactly!



```
32520 NRM      3  205  /55   R16    91H SL BSW
                  MCH  DEFENDER        T + H
WARRANTY: MILEAGE- 80,000  SEE REVERSE SIDE FOR WARRANTY DETAILS
COMMENT:   BOLT PATTERN: 5-100
COMMENT:   INFLATION F:32 R:32
80017 NRM      3  CERTIFICATES FOR     REFUND,  REPLACEMENT
80075 NRM      3  STATE REQUIRED       ENVIRONMENTAL FEE
80224 NRM      3  WASTE TIRE           DISPOSAL FEE
80219 NRM      3  INSTALLATION &       LIFE OF TIRE MAINTENANCE
48997 NRM      1  16  X6.5   5-100.00 41  BKGLXX
                  LIQ  ATOM                              57.10
WARRANTY:                 LIFETIME STRUCTURAL AND 1 YEAR FINISH
17743 RHZ     -1  205  /55   R16    91H SL BSW
                  RHG  RHG BRAND       GT ECO
WARRANTY: MILEAGE- 60,000  SEE REVERSE SIDE FOR WARRANTY DETAILS
32520 NRM      1  205  /55   R16    91H SL BSW
                  MCH  DEFENDER        T + H
WARRANTY: MILEAGE- 80,000  SEE REVERSE SIDE FOR WARRANTY DETAILS
```

During a pre-service vehicle inspection, make sure the tire's rim diameter matches the wheel's diameter. If they do not match, notify the Salesperson immediately.

FACTORS OF OE REPLACEMENT *(continued)*

Overall Diameter

Then you change the overall diameter of the tire, either larger or smaller, you are also changing the displayed speed on the vehicle's speedometer. This is also a key sign that the recommended pressure may be different than OE, or that the rim width or load capacity may be in question.

While performing a pre-service vehicle inspection, pay attention to see if the tires look larger or smaller than the original equipment tires for that vehicle. If the tires appear larger or smaller than the OE tire size, reference the vehicle's placard to verify the OE size. If you see something out of place, notify the Salesperson.

Section Width

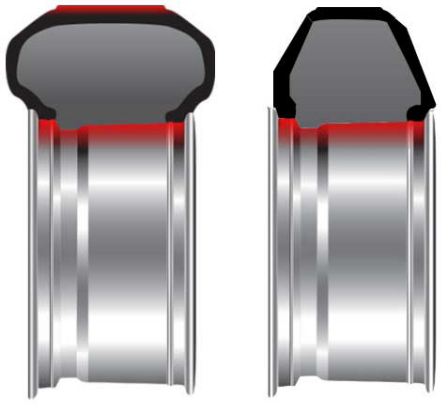
Similar to diameter, the section width of a tire must be compatible with the width of the wheel.

FACTORS OF OE REPLACEMENT *(continued)*

Section Width *(continued)*

When stretched or pinched too much, the tire may not correctly flex, which may weaken the tire.

During a pre-service vehicle inspection, look to see if the tires have a big sidewall bulge or if they look stretched. If something does not look right, reference the vehicle's placard to verify the OE tire and wheel size. If you see something, notify the Salesperson.



Load

The fourth and final factor of OE replacement is the most important: **load!**

If you are going to replace any tire on a vehicle, the new tire must carry the load, PERIOD!

This includes the vehicle and its maximum allowable weight in cargo and passengers.

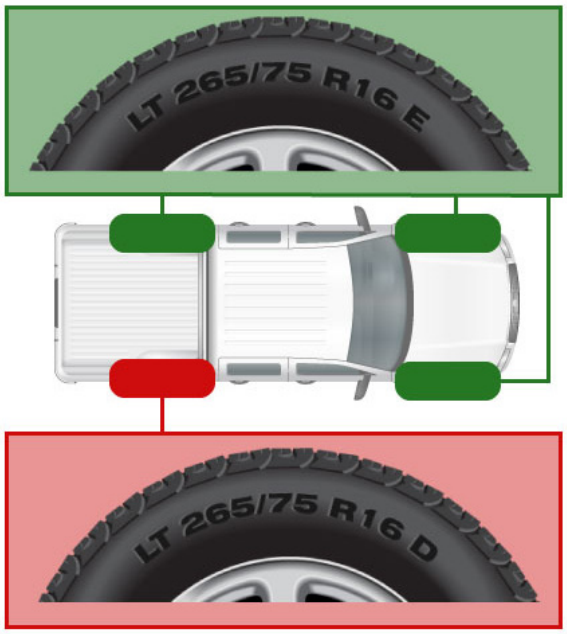
The load index of the replacement tire must meet or exceed the Reserve Load for the vehicle. The Reserve Load is defined by the load carrying capacity of the OE tire load index at the OE cold inflation pressure.

Reserve Load =
OE Tire Load Index at
OE Cold Inflation

FACTORS OF OE REPLACEMENT *(continued)*

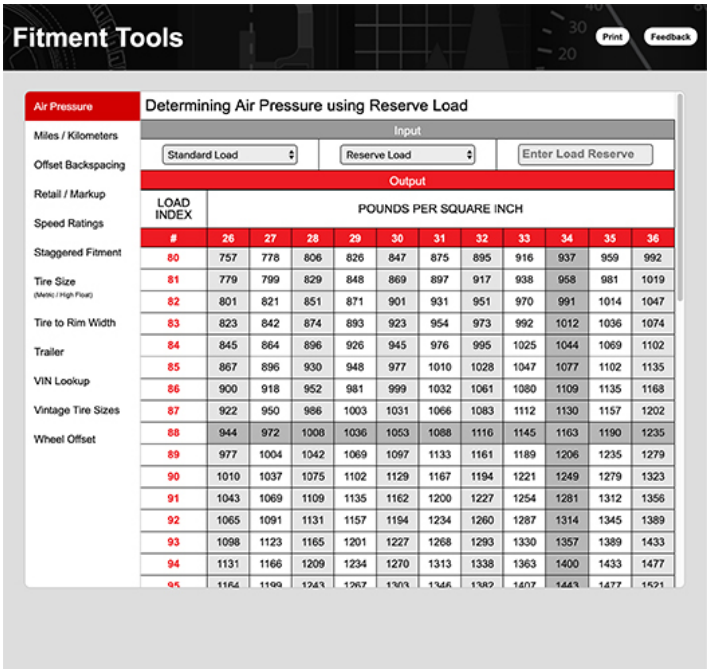
Load *(continued)*

While performing a pre-service vehicle inspection, check to make sure the tires have the appropriate load index and load range for the vehicle. For truck tires that have a Load Range, confirm that all Load Ranges match. If something does not look right, reference the vehicle's placard to verify the OE tire load index, Load Range, and placard pressure. If you see something, notify the Salesperson.



A great tool for identifying the Reserve Load is the Air Pressure Tool on the KC.

This easily provides you with the load capability for each tire type, load index, and air pressure. We will revisit this later in Fitment Tools.



#	26	27	28	29	30	31	32	33	34	35	36
80	757	778	806	826	847	875	895	916	937	959	992
81	779	799	829	848	869	897	917	938	958	981	1019
82	801	821	851	871	901	931	951	970	991	1014	1047
83	823	842	874	893	923	954	973	992	1012	1036	1074
84	845	864	896	926	945	976	995	1025	1044	1069	1102
85	867	896	930	948	977	1010	1028	1047	1077	1102	1135
86	900	918	952	981	999	1032	1061	1080	1109	1135	1168
87	922	950	986	1003	1031	1066	1083	1112	1130	1157	1202
88	944	972	1008	1036	1053	1088	1116	1145	1163	1190	1235
89	977	1004	1042	1069	1097	1133	1161	1189	1206	1235	1279
90	1010	1037	1075	1102	1129	1167	1194	1221	1249	1279	1323
91	1043	1069	1109	1135	1162	1200	1227	1254	1281	1312	1356
92	1065	1091	1131	1157	1194	1234	1260	1287	1314	1345	1389
93	1098	1123	1165	1201	1227	1268	1293	1330	1357	1389	1433
94	1131	1166	1209	1234	1270	1313	1338	1363	1400	1433	1477

FACTORS OF OE REPLACEMENT *(continued)*

See Something, Say Something

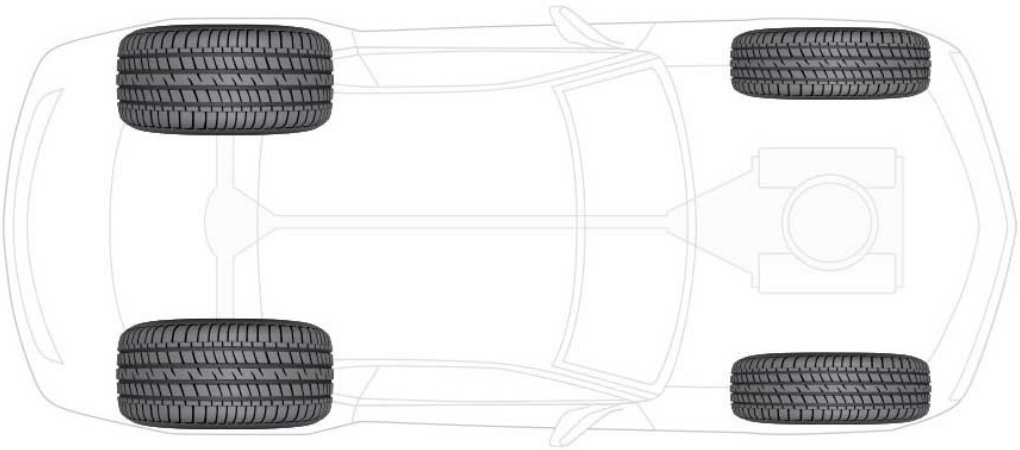
Most fitment situations will be obvious and quick to identify. The goal is to identify these situations before the vehicle is serviced.

SPECIAL FACTORS

When servicing some vehicles, or installing less than four new tires, there are some other factors to take into consideration.

Staggered

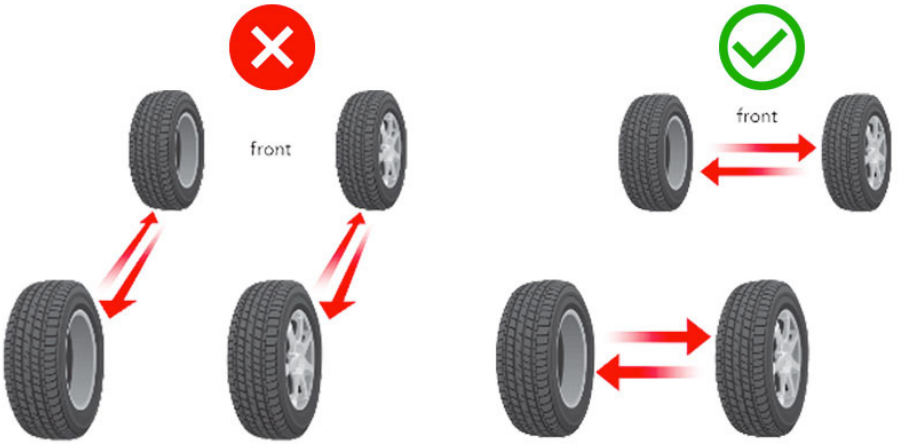
Staggered fitment vehicles have a different tire and/or wheel size used on the front of the vehicle versus the rear.



In most cases, this is done to improve the vehicle's performance by providing more grip at the rear.

While servicing these types of vehicles, the wheels and tires should not be moved from their original axle. The rear wheels and tires often interfere with large front brake calipers or rub against the suspension or bodywork.

During the pre-service vehicle inspection, pay special attention to the size of the tires on the front versus the rear.



If you find the service instructions on the work order do not meet the requirements of a staggered vehicle (ex: front to back rotation), notify the Salesperson before beginning service.

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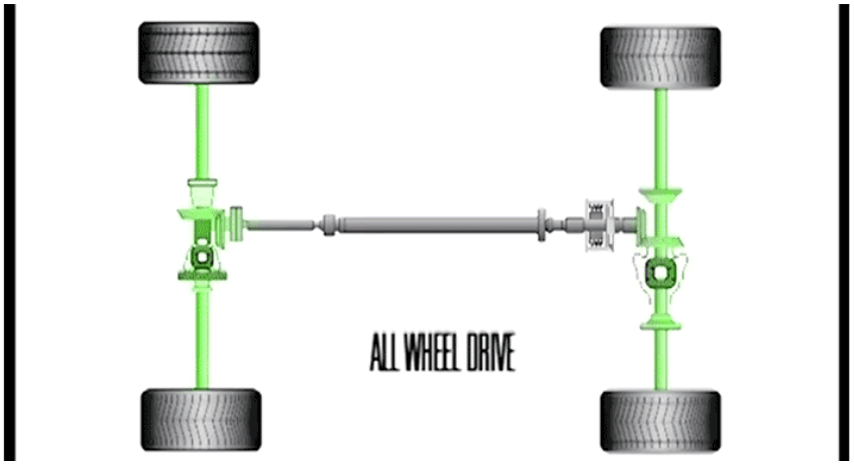
SPECIAL FACTORS *(continued)*

AWD or 4WD Vehicles



All-Wheel Drive and Four-Wheel Drive vehicles are capable of powering all four tires at the same time and are all connected mechanically to each other.

In order to maintain proper operation for All-Wheel Drive and Four-Wheel Drive systems, all tires should be of the same size, Model, and tread depth.

When any of these factors do not match, ensure the work order notes that the customer authorized the work to be done. Otherwise, stop and inform the Salesperson.

All 4WD and AWD vehicles can be identified from the vehicle information on the work order and, most times, from badges on the vehicle.

If you find the service instructions on the work order do not follow the service guidelines for AWD/4WD vehicles, notify the Salesperson before beginning service.

SPECIAL FACTORS *(continued)*

Dual Wheel Fitment

Dual wheel fitments exist when an axle on a truck or trailer has two tires and wheels mounted on each end.

The special factor for dual wheels is ensuring proper spacing between the two adjacent tires when loaded.

Tire sidewalls bulge slightly more where they meet the road. At this point, dual wheel tires must not come into contact with each other, as this rubbing may cause damage to both tires. This is usually the sign of a section width versus rim width issue.

During your pre-service vehicle inspection, look to see if the tires appear to touch or are close enough they will likely touch when the truck is loaded. If you find that the tires are touching, stop and inform the Salesperson.

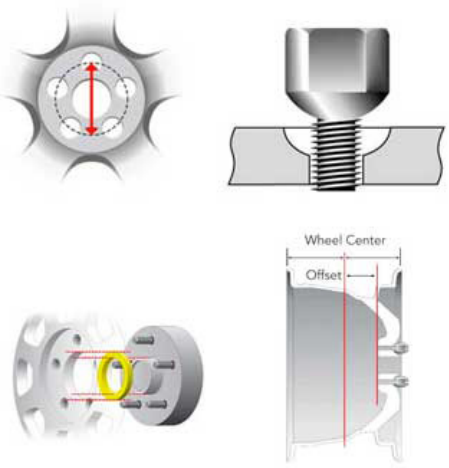
Wrap up

Each vehicle we service presents its own set of challenges and situations, but these can be quickly identified with a thorough pre-service vehicle inspection.

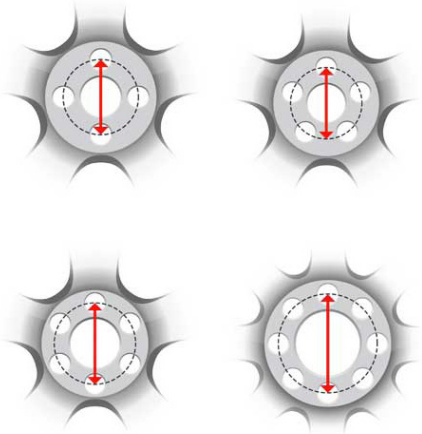
INSTALLING AND SERVICING AFTERMARKET WHEELS

Four Factors of Installing and Servicing Aftermarket Products

In addition to the four factors in replacing OE tires, there are four additional factors to consider when a customer has purchased or previously installed aftermarket wheels.



Wheel Bolt Pattern



The bolt pattern of the replacement wheels must match that of the vehicle. The bolt pattern is often stamped on the wheel or the wheel box.

If the customer brings in their own wheels to install outside of a box, a bolt pattern gauge can be used to measure it.

While we do NOT sell or endorse the use of adaptors or wobble bolts, if they preexist, the wheel must match the adaptor's bolt pattern or the wobble bolts must thread freely through the wheel into the hub. In situations where you do not feel comfortable with the setup, notify the Salesperson.

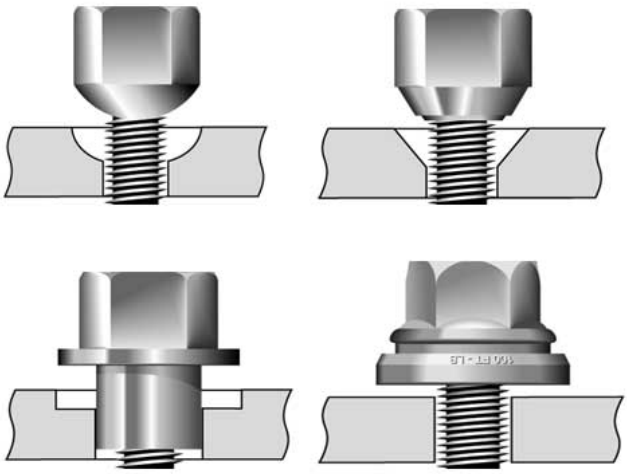
INSTALLING AND SERVICING AFTERMARKET WHEELS *(continued)*

Lug Size, Seat, and Thread Engagement

For lug nuts, there are three critical factors:

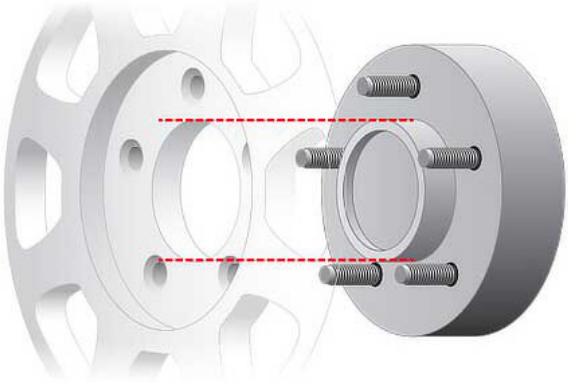
The lug nut size must match the stud of the vehicle, the seat must match the seat of the wheel, and the lug nuts or bolts must be able to achieve seven or more turns of engagement when torqued.

Pay special attention to the style and sizing information before installing aftermarket wheels and accessories. If any of these three factors do not match, do not install the wheel or lug nuts/bolts and notify the Salesperson.



Wheel Bore and Hub Rings

Proper mounting and centering of the wheel to the vehicle is extremely important. For a wheel to fit correctly, it must slide over the hub pilot and sit flat against the mounting pad.



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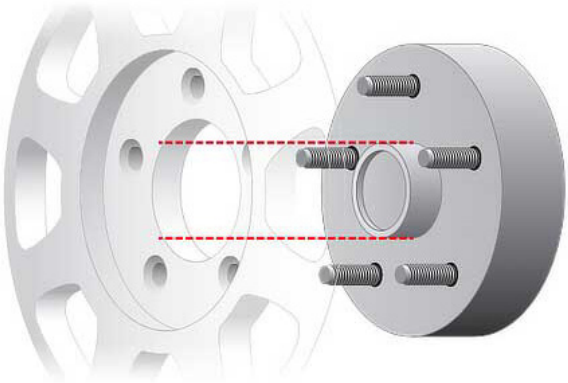
INSTALLING AND SERVICING AFTERMARKET WHEELS *(continued)*

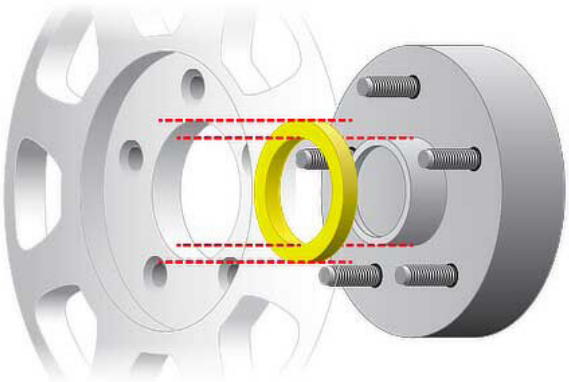
Wheel Bore and Hub Rings *(continued)*

The wheel bore should match identically to the hub of the vehicle to center the assembly when installed. An off-center assembly will cause vibration, even when it has been perfectly balanced.



Since aftermarket wheels are made for a variety of applications, they may require hub rings to allow for a centered installation.

If hub rings are present, make sure the ring sits flush inside the wheel and on the hub pilot of the vehicle.

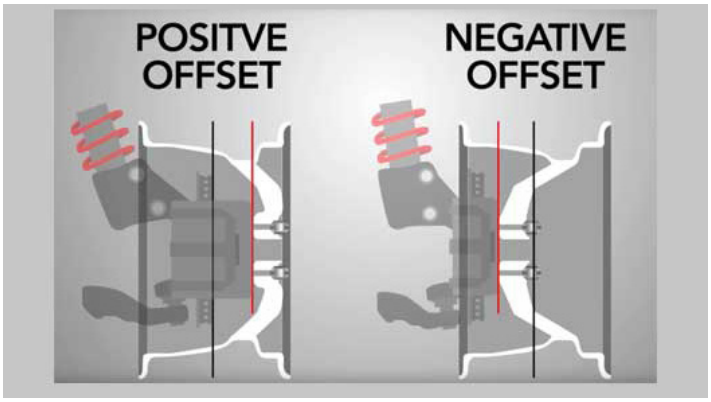


INSTALLING AND SERVICING AFTERMARKET WHEELS *(continued)*

Wheel Offset

The offset of the wheels plays a significant role in how the wheel and tire fit in the wheel well. The more a replacement wheel offset differs from the OE, the more important it becomes to test fit the assembly, checking for interference points.

With all four factors laid out, let's walk through a standard test fit!



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INSTALLING AND SERVICING AFTERMARKET WHEELS *(continued)*

Test Fitting New Wheels

When a customer purchases new tires, wheels, and accessories, it is your job as a Crew Chief to perform a test fit before any Service Techs begin service.

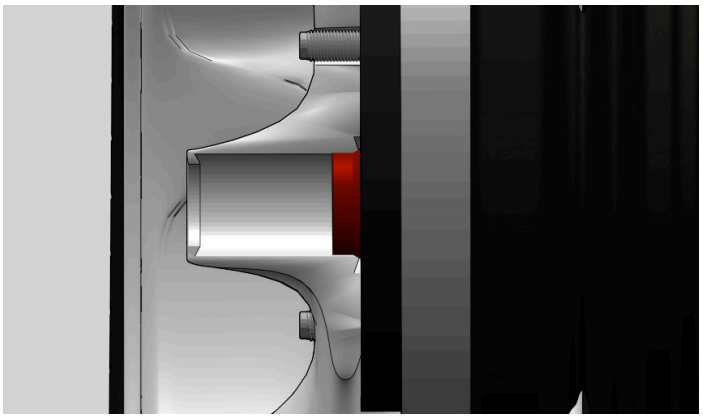
First, raise the vehicle with a lift and remove a front assembly.

Be sure to clean the wheel and hub before proceeding with the test fit.

INSTALLING AND SERVICING AFTERMARKET PRODUCTS *(continued)*

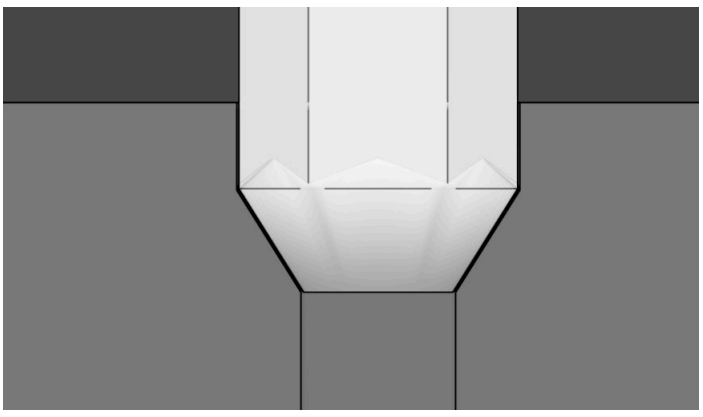
Test Fitting New Product *(continued)*

If a hub ring is needed, test the hub ring to make sure it fits both the wheel and front hub of the vehicle so that the assembly will sit flush against the hub.



Place a bare wheel on the hub and check for interference against the brake calipers, hub, or suspension components. If the wheel sits flush against the hub, it should be turned by hand 360˚to ensure no low spots make contact. Never turn or spin a wheel by handling the spokes or inner barrel of the wheel.

Next come the lug nuts. This involves verifying the thread engagement and lug seat. Make sure the seat of the wheel and the lug nut match.



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INSTALLING AND SERVICING AFTERMARKET PRODUCTS *(continued)*

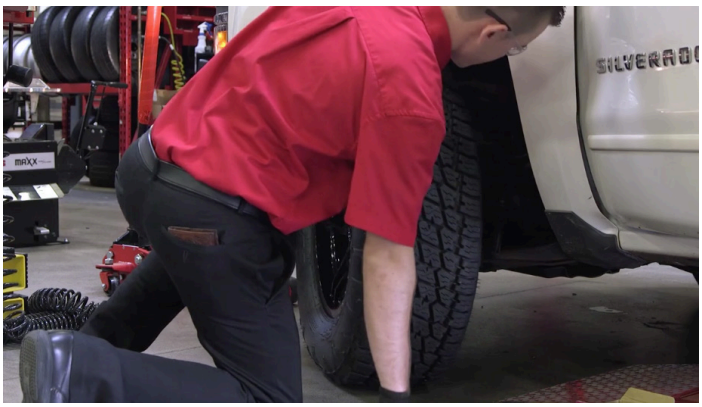
Test Fitting New Product *(continued)*

Next, turn the lug nut on the stud to confirm at least seven turns of thread engagement will be achieved when torqued.

Following the bare wheel and lug nut checks, mount the tire on one wheel and install the assembly on the vehicle.

Proceed with dropping the vehicle to the floor and turning the steering wheel lock to lock in order to check for interference with the body, fender well, suspension, or frame.

If you find no signs of interference, proceed with the mounting of all four tires and wheels.



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FITMENT BASICS

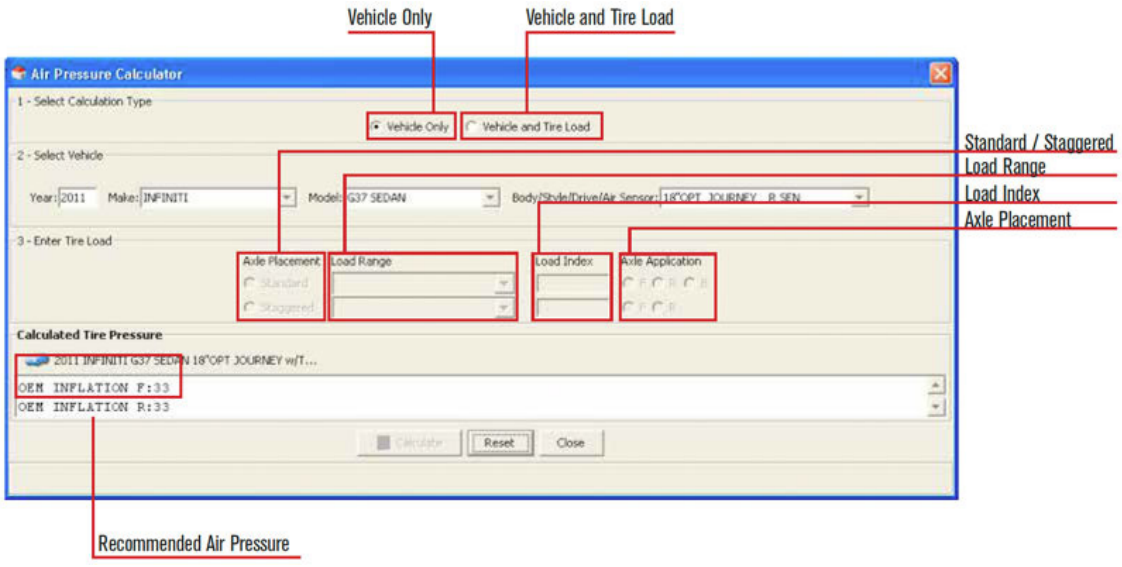
USING THE FITMENT TOOLS

When customers purchase their tires from Discount Tire, all products are filtered through the fitment validation process. But when customers bring in their own products to install, we must validate the fitment manually using our fitment calculators.

While this validation is done by the Salesperson before the sale, we will introduce some of them now so you can become familiar with them.

Air Pressure Calculator on POS/CSL

When a tire with a different load index or tire construction than the original equipment tire is being inflated, it is likely the required air pressure will differ from the vehicle placard in order to maintain the Reserve Load. The Air Pressure Calculator easily determines the appropriate pressure by entering the vehicle and new tire load index and construction.



USING THE FITMENT TOOLS *(continued)*

Fitment Tools: Air Pressure Tools

An additional tool to use for adjusting air pressure or calculating load requirements is the Air Pressure Tool on the KC.

Using the information from the tool, you will be able to accomplish two things:

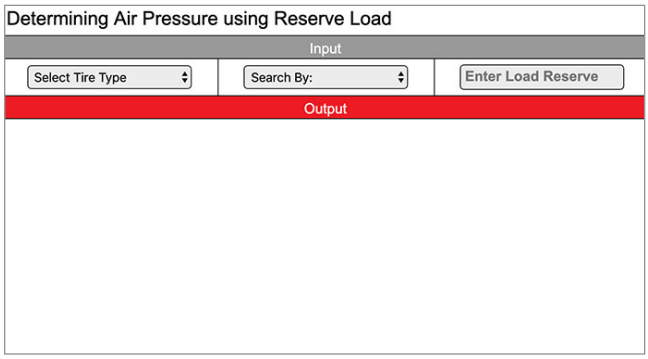
Using this number, you'll be able to accomplish two things:

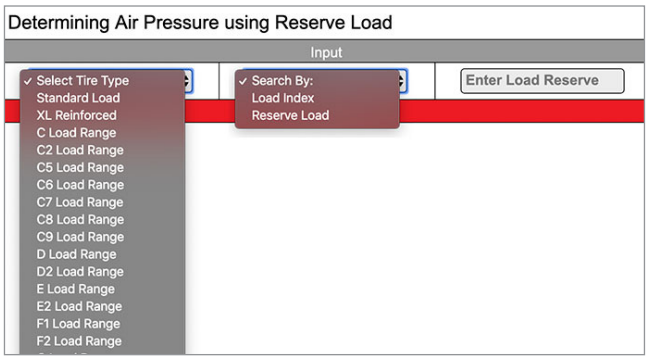
1. Alternate inflation pressure when changing tire sizes and load ranges.
2. Verify that the replacement tire meets the load requirement of the vehicle.

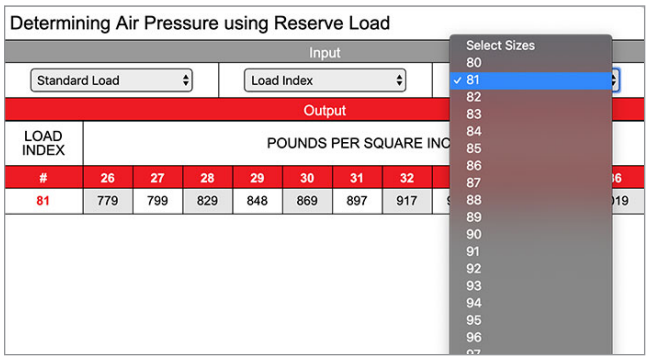
To use the Air Pressure Calculator, you will select the tire type from the dropdown (Standard, XL, C, D, E, etc.) then select if you want to search by Load Index or Reserve Load.

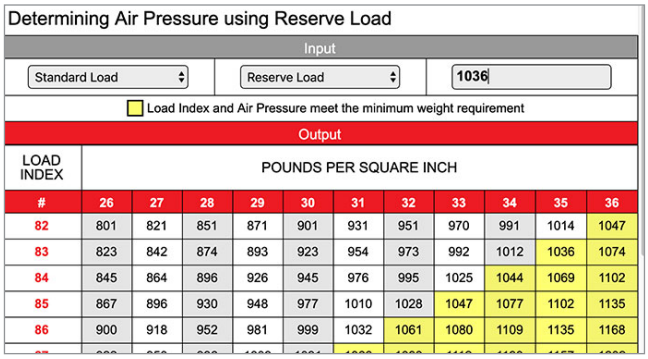
When searching by the Load Index, use the dropdown to select the tires load index to see carrying capacity at each inflation pressure.

If you know the Reserve Load (not the Gross Axle Weight Rating), enter that into the tool and it will highlight the load index and air pressures that meet the Reserve Load requirements.







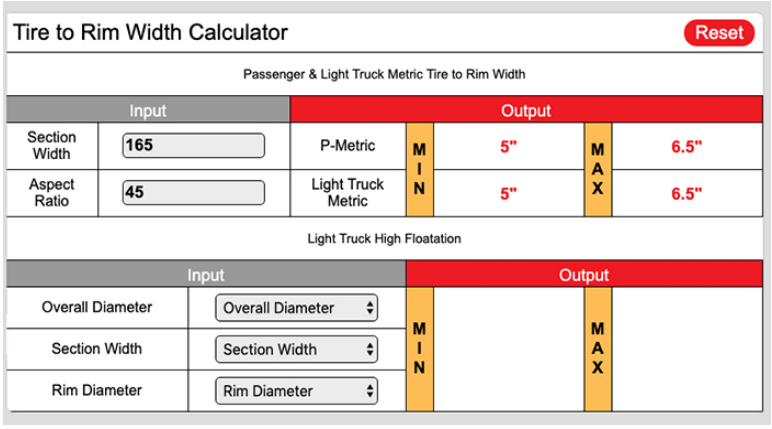


USING THE FITMENT TOOLS *(continued)*

Tire to Rim Width Calculator

Rim width ranges for each tire size and construction can be found in the Tire to Rim Width Calculator on the KC.

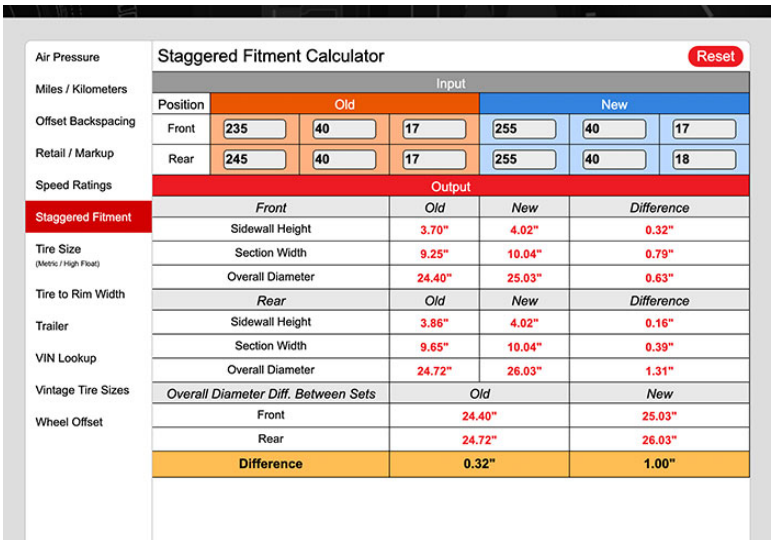
To use this calculator, simply enter the tire information in the appropriate input section and the calculator will provide you with the minimum and maximum rim width you can safely install the tire on.



Additional Fitment Tools

Additional Fitment Tools to explore on the KC include:

- Tire Size (Metric / High Floatation) Calculator
- Staggered Fitment Calculator
- Trailer Calculator
- Offset Backspacing Calculator
- Wheel Offset Calculator
- Vintage Tire Converter
- Speed Ratings



Wrap up

Each of these tools serves a purpose: to keep Our Customers safe. However, the Salesperson in the showroom plays the biggest role in providing Our Customers with products that are appropriate for their vehicles. As a Crew Chief, you are the last line of defense in the backroom.

If you See Something, Say Something.

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