

How to Change a Flat Tire: A Guide for New Drivers

Most teenagers think they are invincible once they pass the driver's test and obtain their driver's license. The drivers course may have taught teens how to master the inside of the vehicle and cruise safely down the roads, but nothing about the test prepares them for what to do about a flat tire. Teens often drive on flats without realizing the damage they can do to their vehicle. Driving on a flat can permanently bend the tire rims and impair the alignment of the car's axle. These are two very expensive and often unfixable damages that are easily avoidable with a simple tire change. Being able to change one's own flat tire makes them one step closer to being truly independent on the road and this instruction set will teach how to do just that in 15 simple steps!

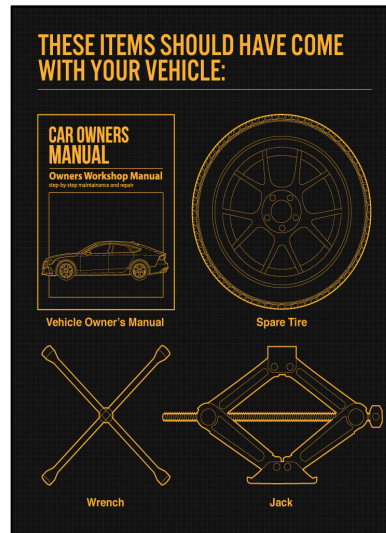
Situation: a flat tire can happen anytime, anyplace, and often with unknown cause; so, it is best to be prepared at all times.

Time required: 15-30 minutes

Required Tools: consult your *car owner's manual* for where to find these items in your vehicle.

1. Car owner's manual
2. Spare tire
3. Lug wrench
4. Car Jack
5. Wheel Wedges

- **Tips:** pieces of 2x4 wood work very well as wedges



**** Note:** if you do not have any of these items, you will not be able to change you tire and you must call for help. (911 or AAA).



Safety Steps:
(prior to changing tire)



1. Find area off major roadways with level ground.

- **Tips:** rest stops or gas stations are great places to change a tire.
- **Caution:** never attempt to change a tire on a narrow shoulder or sharp bend to avoid being hit by other cars.

2. Put car in park and apply emergency parking brake.

- Minimizes the risk of your car rolling.

3. Turn on the Emergency Hazard Lights in your car.

- (see figure 1)

Figure 1

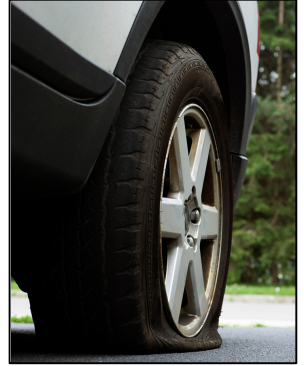


Identification and Preparation:

1. Identify the visibly flat tire.

- See figure 2 for visual of a flat tire.
- **Tips:** if you are unsure if it is flat, push two fingers into the tire and if you are able to depress the tire without much force, then it is flat.

Figure 2



2. Apply wheel wedges.

- **Caution:** Never be directly behind the tire, always apply wheel wedges when facing the side of the vehicle and the tire.
- Place wheel wedges on either side of all tires (front and back) that are not flat. – (see figure 3)
- Wheel wedges further minimize the risk of the car rolling.

Figure 3



3. Take out spare tire and car jack.

- Spare tires are usually found either underneath the trunk on the inside or outside of the car.
 - **WARNING:** Never go underneath a vehicle without the vehicle in park and wheel wedges in place
 - **Tips:** if you can't find your spare tire, consult your *owner's manual* for directions.
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How to Change the Flat Tire:

1. Place the jack underneath the vehicle's side frame.

- Place jack on flat tire side of vehicle. – (see figure 4)
 - i. Flat-**BACK**-tire = place jack just in front of flat tire
 - ii. Flat-**FRONT**-tire = place jack on back side of flat *tire*
- **Tips:** there are often notches carved into the car frame that are designed for car jacks supporting the vehicle. These can be located by consulting your *owner's manual*.

Figure 4



2. Raise the jack slightly.

- Crank the handle *clockwise* until it is supporting but not lifting the car off the ground. – (see figure 5)
- The jack should be firmly against the underside of the vehicle and perpendicular to the ground.

Figure 5



3. Remove Hubcap to reveal lug-nuts.

- If your lug nuts are already exposed you can skip this step. – (see figure 6)
- **Tips:** there are several ways of removing the hub cap (from prying open to unscrewing with a special tool), so please refer to your *owner's manual* which will tell you the specific way the hub cap is removed on your vehicle.

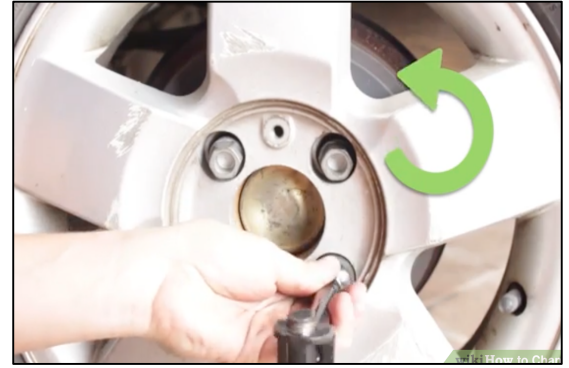
Figure 6



4. Loosen lug nuts with lug wrench.

- Turn lug wrench *counter-clockwise* to loosen nuts. – (see figure 7)
- Do not remove lug nuts completely yet, but get them loose enough that you can unscrew them by hand.
- **Tips:**
 - i. Lug wrench's often have different size lug nut openings – find the one that fits your lug-nuts. A correctly sized opening will fit snugly over the lug-nut and will not wiggle.
 - ii. You will often need to use excessive force to loosen you lug-nuts.

Figure 7



5. Raise the jack by cranking the handle *clockwise* until the tire is about 2-3 inches off the ground.

- **WARNING:** Never put any body part under the vehicle during or after the car is jacked-up off the ground.
- **CAUTION:** if there is any instability of the vehicle – lower the jack stabilize the jack/car before fully lifting the car again.
- The wheel must be raised high enough so that the flat tire can be removed and the spare can be replaced. – (see figure 8)

Figure 8



6. Completely remove lug nuts by hand or with lug wrench.

- Turn nuts *counter-clockwise*. – (see figure 9)
- **CAUTION:** Do not misplace or lose the lug nuts.
- The tire should look like the picture on the right when this step is complete.

Figure 9



7. Remove the flat tire.

- Grab the tire treads on either side of the tire and pull *towards* you until the tire slides off the hub – this may require some force.
- Lay the tire flat on its side or place in trunk so it does not roll away.
- When this task is completed you should see something similar to what is pictured in figure 10.

- **Tips:** car shop mechanics can fix dysfunctional tires – take it to your mechanic!

Figure 10



8. Place spare tire over the hub and match up the lug nut holes.

- The lug bolts will penetrate the spare when proper alignment is made. – (see figure 11)
- Take special care in not putting the tire on backwards.
 - i. Make sure lug bolts penetrate holes in spare.
 - ii. The *air valve* on the tire should face outward from the vehicle.
- **Tips:** this is the exact opposite of what you did the previous step (#8).

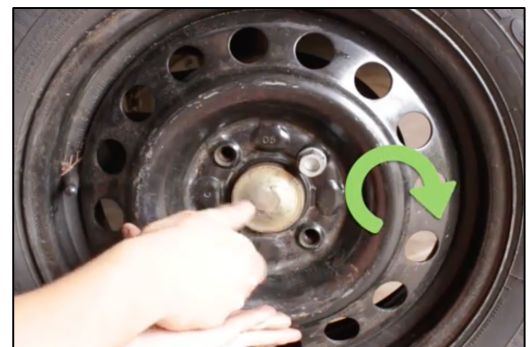
Figure 11



9. Screw lug nuts on by hand until they are snug.

- Turn lug nuts *clockwise* until you can no longer tighten them by hand.
- **Tips:**
 - i. Use the star pattern: Screw in the upper right lug nut first, then screw in bottom left, then upper left, then bottom right.
 - ii. This ensures the tire is stable and balanced when being secured.

Figure 12



10. Lower the vehicle until it is on the ground, but the tire is not supporting the full weight of the car.

- Crank the jack handle *counter-clockwise* to lower jack. – (see figure 13)

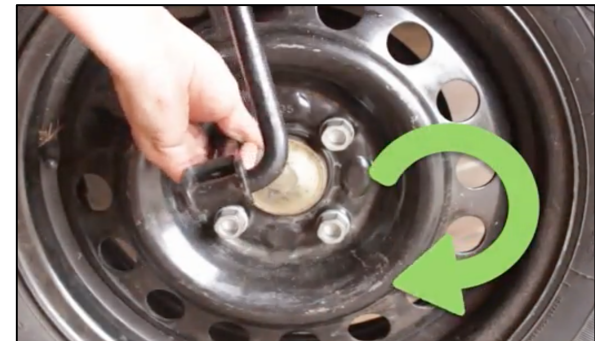
Figure 13



11. Tighten lug nuts as much as possible with lug wrench.

- The wrench must be turned *clockwise* to tighten lug nuts. – (see figure 14)

Figure 14



12. Lower vehicle completely.

- Crank jack handle *counter-clockwise* to lower the car to the ground. - (see figure 13 in step #10)
- Tires should support full weight of car now.

13. Tighten lug nuts again to ensure they are as tight as possible.

- Use the lug wrench and turn lug-nuts *clockwise* to tighten. - (see figure 14 in step #11)

14. Replace Hub cap.

- **Tips:**
 - i. The hub cap might not fit on your spare tire, so keep it until your flat tire gets fixed.
 - ii. There is often a special tool that comes the vehicle to remove the hub cap – this is often the same tool used to replace the hub cap. – Consult *owner's manual*.

15. Remove wheel wedges and restore all required tools to where they belong.

- **Caution:** Never be directly behind the tire, always remove wheel wedges when facing the side of the vehicle and the tire.
- You have now successfully changed your flat tire and your car should be ready to drive to the mechanic!

Audience Adaption:

The intended audience for this instructional set was new driver's that just passed their drivers test, but do not know how to change a tire yet. I approached the creation of this instruction set with idea that the audience had never seen nor had any experience with a flat tire. In the introduction, I explained why It is important be able to change a flat and the dangers behind leaving a flat unattended to. I expected my audience to have mastered the inside of their vehicle such as: the basic layout of in the interior, how to put the car in park, how to apply the emergency brake, and how to put on the emergency flashers because these are skills required by the driver's test. I did not expect the audience to know: what a flat tire looked like, the tools that were needed to change the tire, or where these tools could be located. However, I did expect my audience to have the tools necessary to change the tire because they usually come with the vehicle. I provided labeled images for the required tools and also listed them. I also provided images of what a flat tire looked like and for the most confusing steps about changing the tire. These images include arrows that indicate direction as well as brief explanations listed to the left of the image with italicized important words or terms to draw the reader's attention. I included warnings and cautions in the instructional set because the biggest risk for error or injury comes during the first time a task is undertaken. This is also why I covered the safety and preparation steps before the crux of the instructional set appeared. These warnings and cautions were bolded and in colored font to draw the reader's attention. Trouble shooting tips were included (bolded in green) where they were needed to either address potential questions the audience would have or to suggest helpful information that would relate to the given step or overall process. I used a very serious and straight-forward tone throughout the instruction set because the reader could get seriously injured if the steps are not preformed properly and in order. At the end of the introduction, I approached the reader with a different tone. I concluded the introduction with an encouraging tone. I explained that passing the driver's test doesn't make someone independent on the road, but one way they could be a step closer toward full road independence is to learn the simple task of changing the tire.

Picture resources:

<http://www.instructables.com/id/How-to-Change-a-Flat-Tire-1/> - emergency flasher

<https://www.bridgestonetire.com/tread-and-trend/drivers-ed/how-to-change-a-flat-tire> - images of required tools

<https://www.safewise.com/blog/properly-change-flat-tire/> - image of flat tire

<https://www.wikihow.com/Change-a-Tire> - all images in how to change a tire steps

https://www.google.com/search?q=safety&source=lnms&tbm=isch&sa=X&ved=0ahUKEwif18-U4pnaAhWLY98KHTacBXoQ_AUICigB&biw=1259&bih=653#imgrc=u8GKsdBSAIHgoM: - safety sign picture