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Task Analysis of Non-Emergency Flat Tire Changing Procedure
Rev 1
19 April 2020

BEFORE YOU BEGIN:

Caution: If this is an emergency or a particularly dangerous situation, take appropriate safety steps, not detailed in this procedure, before attempting to change a flat tire. Dangerous tire changing situations may include:

- Pulling a trailer
- Parking on a hill
- Parking on a blind road curve
- Traffic
- Storms
- Unlighted or dark areas at night
- Unfamiliar areas that may pose a higher risk of crime
- Other physical risks

Be observant for unexpected hazards. Changing tires has accidentally killed many people for many surprising reasons. Not all risks are immediately obvious. Be careful.

If possible, **remove the vehicle from a hazardous area, before changing a tire**, even if it means driving on the flat tire's wheel rim at a low speed for a short distance, to get to a place of relative safety.

Familiarize yourself with this non-emergency procedure, before attempting to change a tire. If you do not properly change a tire, you or others might accidentally:

- Damage your vehicle
- Damage property
- Get badly hurt
- Get killed

Familiarize yourself with your vehicle owner's manual to determine if you have the parts needed to change a tire. Make sure that your tire changing parts are in good working order.

Parts Needed to Change a Tire include a(n):

- Inflated spare tire
- Vehicle jack (to lift the vehicle)
- Tire iron
- Wheel chocks, if provided or otherwise available (Chocks are blocks to place against your good tires, to prevent them from accidentally rolling)
- You may also need a hubcap key, to remove the hubcap.

Note that many newer vehicles no longer include a spare tire or a jack to lift your vehicle. Instead, many vehicle manufacturers now include an emergency aerosol can, sometimes called "Fix a Flat®", with a tube attachment to your tire, to temporarily reinflate the flat tire and seal small punctures at the same time. Older tire repair aerosol cans contained butane, propane, or possibly other explosive gases. Be sure to inform the tire repair shop, if you have used one of these aerosol cans to fix a flat tire**.**

Your vehicle will also need a solid frame that has not rusted, in order to support the vehicle's weight that is placed on the jack.

TO CHANGE A TIRE:

A. Park and inspect the situation:

1. Park your vehicle on a level surface, away from traffic or other hazards.
2. Put on the parking brake.
3. Shut off the engine.
4. Identify the flat tire.
5. Check for other, obvious, possible damage to the vehicle, to make sure there is nothing else to fix.

B. Prepare to lift the vehicle:

6. Get everyone out of the vehicle. Also remove excess weight as much as possible from the passenger compartment and the trunk, etc.
7. Locate the jack, tire iron, and spare tire. These are usually in the trunk, underneath some thin carpet or cardboard, if the vehicle is a regular passenger car.
8. Remove the jack, tire iron, and spare tire from their secure storage location.
9. Verify that the spare tire is firmly inflated and is not damaged or otherwise unsafe.
10. If you have chocks, (usually little triangular blocks) put them against the good tires, to keep your vehicle from accidentally rolling.
11. Position the jack under the vehicle's frame support point. Check your owner's manual, if unsure of the exact location.

C. Lift the vehicle with the jack; loosen and remove the lug nuts:

12. Put your tire iron into the jack to lift. (Use rotation or up and down – check your owner's manual, if unsure how to operate the jack. You might typically find a scissors jack or a ratchet jack.)
13. Using the jack, slowly lift the vehicle.
14. Confirm that the vehicle does not roll anywhere or shift, as you lift it.
15. Confirm that the jack and vehicle are otherwise stable. Lower the jack and reposition it, if needed, and slowly lift the vehicle, again. Do not put any part of your body under the vehicle, or near it in a way that you could be pinched or crushed, while lifting it.
16. With the tire just barely touching the ground, so that the wheel does not freely spin, remove the hub cap or other coverings over the wheel lug nuts. Check with the vehicle owner's manual, if unsure about what lug nuts are, or where they are located.

17. Partially loosen each nut, following a “star pattern” of opposite nuts, going around the circle of the wheel. You may need to kick the tire iron with your heel, to loosen particularly seized lug nuts. Use caution when kicking, to avoid injury.
18. With the lug nuts partially loosened, slowly lift the vehicle, until the wheel is just free from the ground.
19. Continue to loosen each lug nut with the tire iron, following the star pattern, until you can fully remove each of them by hand.

D. Switch tires, reattach lug nuts and lug cover, and lower the vehicle

20. Slide the wheel off of the hub.
21. Inspect the wheel, brakes, cables, wheel well, etc. for any obvious, potential damage, such as leaky brake lines, cracked brake pads, or damaged rotors (the metal discs that the brake pads squeeze, if your vehicle uses disc brakes).
22. Roll the wheel with the damaged tire over to the trunk area.
23. Roll the spare wheel with the good tire into place. Note that the spare may be smaller than a regular tire.
24. Slide the wheel with the good tire over the lug studs (they look like big screws).
25. Partially screw by hand each lug nut onto each lug stud, in an alternating, star pattern. Continue to screw the lug nuts in the alternating star pattern, a little at a time, around the wheel with the tire iron, until the lug nuts are tight. Use enough force to be sure that the lug nuts are tight, but not so tight that they might break the lug studs.
26. Look and verify that the wheel is perpendicularly mounted with respect to the ground; not seated sideways, such that the wheel would wobble, when turning.
27. Reapply the lug nut cover or hub cap.
28. Slowly lower the vehicle to the ground.
29. Remove the jack from under the vehicle.
30. Remove the wheel chocks, if they are present.
31. Put the damaged tire in the trunk, and secure it with the jack and tire iron. Follow the owner’s manual for any further specific instructions regarding proper storage of the tire, jack, and tire iron.
32. Put everything and everyone back into the car.
33. Start the car.
34. Disengage the parking brake.
35. Drive away. **Drive under 50 mph if the spare tire is smaller than a regular tire.** You may notice some vibration, if the spare tire is not properly balanced.
36. Find a shop to fix the flat tire as soon as possible, especially if the spare tire is smaller than the original tires. Be particularly careful when driving, if the spare tire is used on the front of the car, as a small spare tire can seriously impact safe steering.