



Tire Maintenance Guide

Tips on how effectively maintain your tires

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Tire Maintenance Guide



– Tips on How to Effectively Maintain Your Tire

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1.1 Importance of Tire Maintenance

Tire maintenance is an often overlooked aspect of car safety as people often focus on various exterior aspects and functionality of the car such as waxing and grooming, car engine & radiator system etc.

The importance of properly maintaining your car tires cannot be overemphasized as tires are the only contact between your car and the ground surface. Any damage done to the tires could result in unstable handling and potentially dangerous especially when the vehicle is going at high speed.

In general, tires that are properly maintained will have the following advantages:

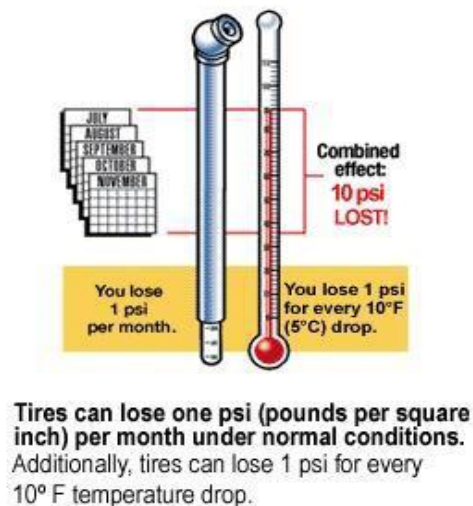
- A proper tire pressure will guard against avoidable crashes or breakdowns.
- Reduce frictional losses and therefore increase tire life.
- Enhance fuel efficiency, and lastly,
- Optimal vehicle handling

2.0 Reasons for Tires to Lose Pressure

In general, there are a few reasons that tire loses pressure and they are as follows:

- Sudden impact such as when the vehicle hit a hard object like a curb or going pass a high hump.
- Tire can lose air pressure quite suddenly if it comes into contact with sharp pointed road hazard.
- **Effect of Time:** Most if not all tires basically lose air as time passes - this is via natural leakage and permeation of air through the tire body. The estimated rate of lost in pressure is about 1psi a month.

Picture 1.1 Effects of time and temperature change on tire pressure



- **Effect of drop in environmental temperature:** In general, the vehicle's tire loses 1 psi for every 5°C drop in temperature.

3.1 How to know what Tire Pressure is suitable for your vehicle?

Many vehicle manufacturer will provide the recommended tire pressure and vehicle load limit on the tire information placard and in the vehicle owner's manual. Tire placards are permanent labels attached to the vehicle door edge (doorjamb) , glove-box door, or inside of the trunk lid (engine compartment area). Once you located this information, check your tire pressure against the information and make sure your vehicle is not overloaded - especially when you are planning for a vacation.

3.2 Determination of Tire Pressure

For most radial tires, unless for trained eyes or when we have reference to compare to, most of us will not be about to determine the extend of tire pressure lost using visual judgment. See the picture below for better understanding.



Picture 3.1 Visual comparison of 100% (left) and 50% pressure:

Difference is observable but not obvious unless one pays attention

A tire can be as much as 50% under inflated before it is visibly noticeable. Not only are under inflated tires more prone to damage and failure, but they can lead to higher fuel costs.

Because tires may naturally lose air over time, it is important to check your tire pressure at least once a month. For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, pump station and other retail outlets. Do note that the tire inflation number that vehicle manufacturers provide refers to the pressure when a tire is cold. To get an accurate tire pressure reading, measure tire pressure when the car has been unused for at least three hours.

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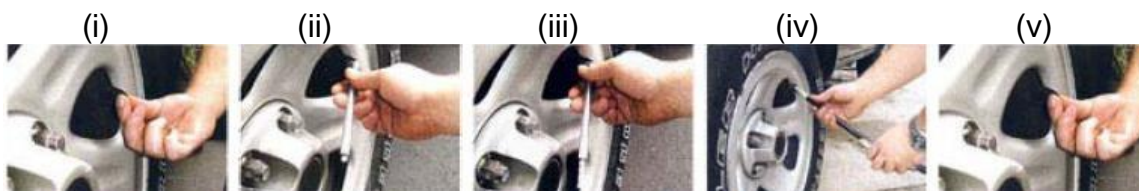
4.1 Three Important Aspects of Tires Maintenance – Inflate, Rotate and Tire Tread

4.2 Tire Inflation

Maintaining a proper tire inflation is important for safe driving as well as increasing the life span of your tires. Inflating the tires to the manufacturers' recommended pressure level and proper balance of pressure levels among the four tires is important for the car's safety.

Over and Under Inflation: Both over and under inflation are no good to the car. Over inflated tires will wear out faster at the centre of the tire whereas under inflated tires will wear out faster at the edge of the car. Also, under inflated tire create extra unnecessary traction and causes the tire to wear out sooner that it should, and reduce the fuel economy of the car which is something you do not want to happen.

Checking: The recommended interval of checking the car tire is minimum once a month and when the tires are cold.



Picture 4.1 Steps in Checking Tire Pressure

- i. Remove tire valve cap
- ii. Place the end of the tire gauge over the tire valve
- iii. Press the tire gauge to read the pressure reading
- iv. Pump air into to tire if needed. Recheck pressure with gauge if necessary.
- v. Replace Tire Valve Cap

Always inflate the tires to the manufacturers' recommended tire pressure level. Any suspicion of leakage should be attended to immediately as a safety precaution. Again, note that checking should be done when the tire is not used and cooled down to ensure accurate readings are taken.

Other inflation tips: i) Inflate for maximum load that your tire must carry. ii) Avoid introducing moisture into your tire

4.3 Tire Rotation

The main reason for the rotation is to have a more even out wear and tear for all the four tires.

Tire rotation is important as it ensure even wear and tear of the tires, and thus extending the tires useful lifespan. For best results, it is recommended that you rotate your tires every 5,000 to 6,000 miles interval.

Appended below are the correct rotation patterns for directional tread, front wheel drive as well as rear and four wheel drive vehicles.



Picture 4.2-1 Correct Tire Rotation Pattern for Directional Tread

Front



Picture 4.2-2 Tire Rotation Pattern for Front Wheel Drive Vehicle

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Picture 4.2-3 Tire Rotation Pattern for Rear and Four Wheel Drive Vehicle

How to rotate? Your role as the vehicle is to be aware of the fact that tires need to be rotated and to approach your vehicle mechanics to do the rotation. Your mechanic will know the right way of rotation for the type and make of your car. Some owner's manual provides information on how the tires are to be rotated and the interval (6,000 miles or 10,000 km for general usage or earlier) required to do so. While the above is a general guide on how the rotation can be done, the rotation pattern may vary, depending on the type and make of the car, as well as the tire.

4.4 Tire Tread

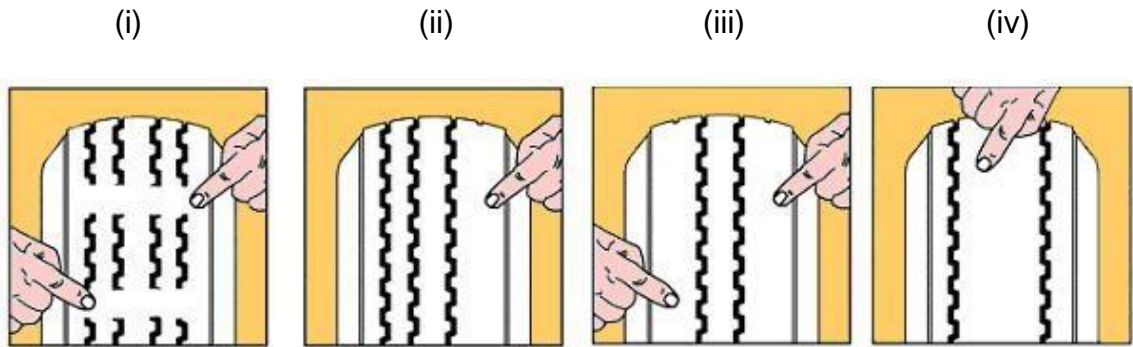
Tire Tread

Proper tire tread is important as it provide the necessary gripping action to the ground where your vehicle is in contact, and is especially important in wet conditions. Generally, when the tread is worn down to about 1/16 of an inch, it means that the tire is rather worn out and is time for you to change to new tires.

Checking a tire's treads periodically ensure the safety and effectiveness of your tires and ensure that your car's tires are safe. Excessive wear can result in a loss of traction, especially on wet and slippery roads. Tires are regular wear items and staying on top of their condition not only ensures your safety, but also gives you the opportunity to plan ahead and budget for inevitable tire replacement.

Types of Tire Wear

The pictures below show some of the possible types of tire wear.



Picture 4.3 Types of Tire Wear

- i) Exposed tread bar (replace tire)
- ii) Irregular shoulder wear (send your car for inspection by professional technician)
- iii) Pattern of tire wear due to under inflation } Send for
- iv) Pattern of tire wear due to over inflation } Inspection

Checking Tire Tread: How?

There are two popular ways for checking to see if there is enough tread on your tires.

Method 1

Most commercial tires have tread wear indicator bars molded into the tread. Tire wear bars are good as a hands-off visual indication that a tire needs replacement. These bars are located at the bottoms of the tread grooves in a few locations around the tire, and when the tire is worn to the point where any of them become visibly flush with the adjacent tread ribs, it is an indication that it is time to replace the tire.

Method 2



Picture 4.3 Using coin to determine if there is enough tread

There is another easy and popular way to check if the tire has enough tread and that is to use a penny. Place the Lincoln's head upside down and insert into the tread – when the top of Lincoln's head is seen (which means the tread is shallow), it is time to replace the tires.

Tire Replacement:

In general, it is best to replace all four tires with brand new tires when replacing your tires, as this practice minimizes and prevents problems that can appear with poor alignment and poor balance.

Do not let lower prices tempt you to purchase used tires instead of new ones and be careful when purchasing used tires. Make sure that you check the conditions of the used tires and ask intelligent questions. Watch out for tires that are being re-grooved, a malpractice called "grooving," which compromises the condition of the tire and therefore your personal safety.

If your tires contain embedded steel treads, and when one can see the metal showing through the rubber material, it is a severe tire problem and the tires must be replaced immediately as continual driving on tires with visible steel treads is a major safety risk.

Choose tires carefully. Some drivers buy a tire based on initial price or appearance. For optimum performance in wet conditions, select a tire with tread design and rubber compounds that provide enhanced wet weather driving capabilities.

Should you observe unequal or abnormal wear, it is recommended that you approach a trained mechanics to identify the root cause for the problem. If your car needs alignment work, it is best that it is done before a new set of tires are installed.

4.5 Tire Balancing

Unbalanced tires cause vibration, which can lead to driver fatigue, premature / irregular tire wear, and unnecessary wear to your vehicle's suspension. Your tires should be balanced when they are mounted on wheels for the first time or when they are remounted after repair. Tire balance should be checked at the first sign of a vibration for safety reasons.

5.0 Tire Valve and Valve Stem Caps

The combination of tire valve stem and the associated valve stem cap is an important component of your tire set. The valve stem allows air to be pumped into the tire and stays where it should be whereas the valve stem cap help to keep out dirt and moisture. A properly designed and manufactured valve stem cap also help to keep the pressure within the tire should the tire valve starts to fail.

The tire valve is essentially a component that is pre-fixed with the tire by the tire manufacturer. The tire's valve main function is to contain the inflation of air in the tires. These valves can either be made of rubber or metal material.

The rubber type valve can and will deteriorate as time passes, and should be replaced as new tires are purchased. While the vehicle owner has less control on the quality of the valve he received, he can take some proactive measures with regard to the valve stem cap. The primary function of the valve stem cap is keeping out moisture and dirt/dust particles, as these external factors can interfere with the proper operation and therefore the integrity of the tire valve.

The valve stem cap is an important item as high quality valve stem cap also double up as “pressure leak stopper”, and it is therefore wise to get good quality valve stem caps that has the right air tight seal built-into the valve stem cap. The air tight seal will help to contain the air pressure in the event that the valve of the tire break down.

There are primarily four types of Valve Stem Cap in the market:

- Plastic material – these are the basic valve stem cap that usually comes together with the tire.
- Metal decorative type – these types of valve stem cap has better visual appearance than the plastic materials. Many of these are chrome plated material or are made of steel that has high durability and appealing shinny appearance.
- Built-In pressure gauge – This type of valve stem caps has built-in pressure gauge and call tell the pressure of your car tire any time you wish. However, they can be quite eyes catchy and can be easily removed by anyone.
- Anti-theft tire valve stem caps – The anti theft tire valve stem cap ensure that the valve caps remained at where they should be and thereby ensure that your valves and valve stems are protected from dust and dirt at all times. They serves to protect the valve and the valve stem and therefore help to ensure that the car tire pressure is maintained at consistent level.

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6.1 Conclusion

Followings are the pointers with regards to properly maintaining your tires:

- Regular check of tire pressure, all tires including the spare.
- Recommended interval: about once a month (when tire is in its 'cold ' state) and under normal weather conditions (i.e. no major temperature fluctuation as it will affect tire pressure). Important to also check before going for a long distance driving.
- Check the tire tread to make sure that the tires are not worn either by visually checking the marks provided by the tire manufacturer or by using a coin.
- Make sure that the tire wears evenly and no abnormal wear and tear. Consult professional if unsure.
- Inspect the tires regularly to ensure that there are no foreign objects such as stone, glasses embedded into the tire.
- Minimize hitting the curbs or sharp objects will help to prolong the life of the tires.
- Ensure that your tires stem valves have good valves stem caps

Indirect Tips (on Safe Driving):

- Focus driving – pay attention to the weather and road conditions.
- Maintain a safe distance from the car in front.
- Drive smoothly when accelerating, deceleration, braking or turning. Avoid jerking or abrupt movements whenever possible.
- Avoid exceeding the maximum load of the vehicle.
- Try to do day trips instead of night trips for better visibility, attention span as well as availability of possible needed technical assistance.
- The driver and all passengers should use safety belts, both lap and shoulder straps. Pull them snug to ensure they work properly.

Enjoy a safe journey!

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