

Proper tire maintenance is no laughing matter

Tires are the Rodney Dangerfields of vehicles. They are often abused, frequently overlooked and don't get the respect they deserve.

But tires, like other parts of an automobile, need attention if they are to perform at their best. The key, experts agree, is to prevent problems before they occur, particularly with the hot weather and extra travel associated with the summer months.

Fortunately, tire care is simple and inexpensive, and requires a little time as a few minutes every month.

"In addition to enhancing safety and economy, proper tire maintenance promotes traction, smoothness and a quieter ride," says Russell Chick, manager, consumer products and advertising for Yokohama Tire Corporation, which supplies several original equipment and replacement tires for the U.S. market.

"A little maintenance can go a long way toward ensuring a safe, confident and rewarding driving experience."

Tire maintenance is comprised of five main elements: air pressure checks, visual inspections, rotation, alignment and balancing.

The single greatest cause of tire damage is improper inflation pressure. Improperly inflated tires, which cause

irregular treadwear and poor gas mileage, will sometimes "squeal" around corners at normal speeds, or feel mushy during turns.

Yokohama's Chick recommends checking air pressure at least once a month with an accurate gauge when the tires are cold. Recommended air pressures can be found in owner's manuals, or on the driver's side door jam of some vehicles.

A tire is considered seriously under-inflated if it is four or more psi (pounds per square inch) below the recommended level. Generally, tires lose about one psi each month. Warmer temperatures will cause a rise in pressure of about one psi for every 10 degrees.

Visual inspections are important because they reveal irregular treadwear (one side may be more worn than the other), punctures or other outside damage, in addition to the amount of tread remaining on a tire.

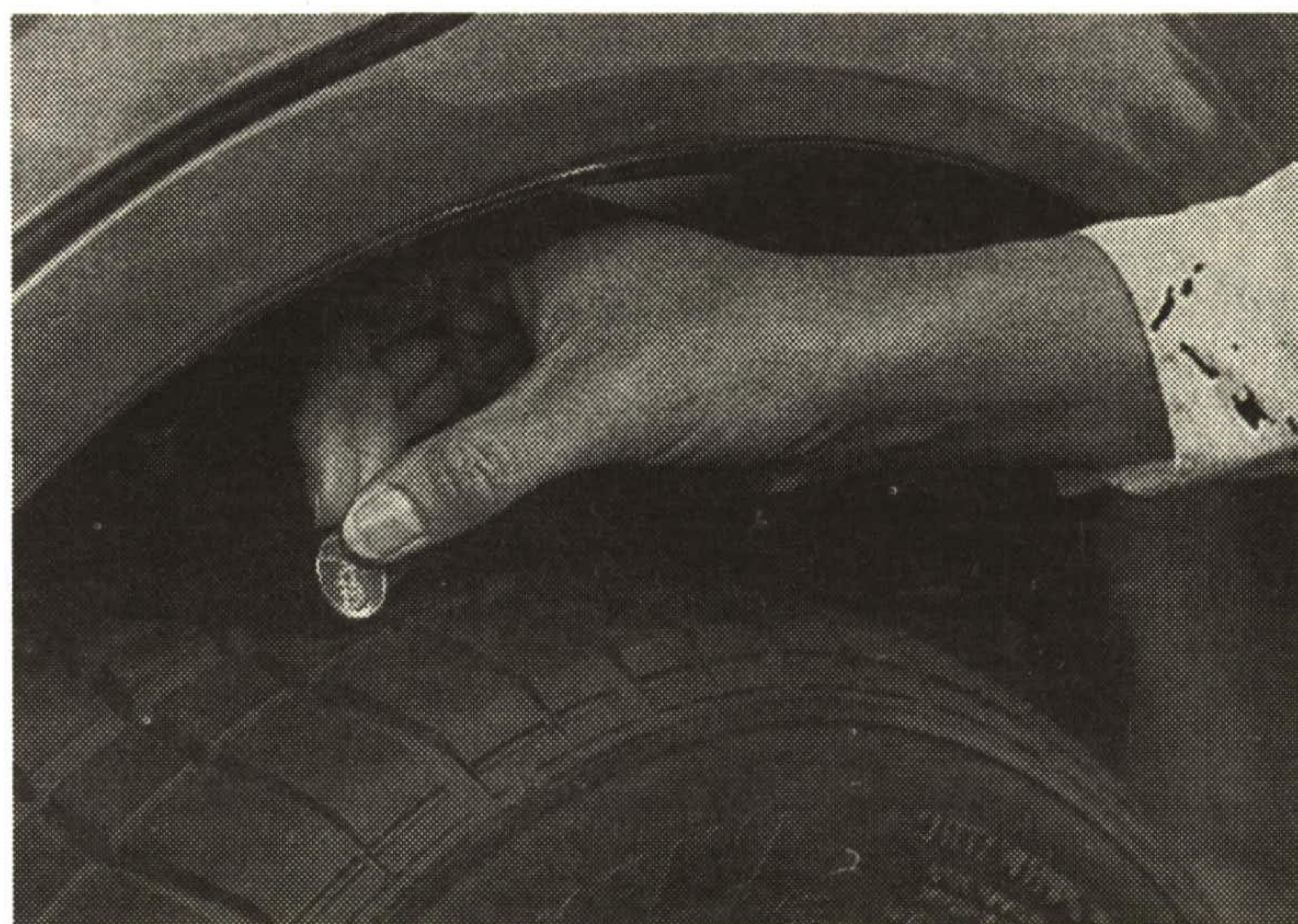
Today's tires have small raised points of rubber in the tire's grooves that indicate when the tread depth is beyond the safe — or legal — limit, which is $\frac{1}{2}$ of an inch. Another effective method is to place the top of a penny in the groove, and replace the tire if Lincoln's head is fully visible.

Tire rotation extends a tire's life by balancing out the wear variances. Treadwear can be more pronounced at wheel positions that carry more of the vehicle's weight. Tires should be rotated every 5,000-8,000 miles, with city driving requiring the most frequent attention.

Proper wheel alignment also ensures even treadwear, and may prevent suspension damage that could occur if neglected. When a car is out of alignment — often caused by driving over potholes and on rough roads — it slightly alters the position of the tires, causing one part of the tire to wear more quickly than the other areas.

Uneven wear also can occur if the wheel and tires are out of balance. The latter is detected by a vibrating steering wheel, which usually becomes more pronounced at highway speeds.

Yokohama's Chick recommends having a vehicle aligned and balanced by a professional once a year.



USING YOUR HEAD — Tires, like other parts of an automobile, require frequent maintenance in order to perform at their best. Yokohama Tire Corporation suggests regular visual tire inspections to check for irregular treadwear, punctures or other outside damage, in addition to the amount of tread remaining on a tire. One effective method for checking treadwear is to place the top of a penny in the groove, and replace the tire if Lincoln's head is fully visible. Other maintenance tips include air pressure checks, tire rotation, alignment and balancing.

SPRING AUTO GUIDE

Reduce vacation expenses by eliminating costly auto repairs

This summer, a motoring vacation for a family of four will cost nearly \$200 per day for lodging, meals and routine car expenses such as gas, oil and tires.

It could be even higher, however, if the routine car expenses turn into a stranded auto, disabled by a blown radiator hose, or a damaged engine, caused by a failed drive belt.

One way to reduce unexpected car costs, says The Gates Rubber Company, is to have the vehicle checked and serviced before it ever gets packed.

The cooling system, in particular, needs a pre-vacation inspection because of the strains of extra weight, highway speeds, and possibly some stop-and-go or mountainous driving.

Here's what to look for:

Check the coolant

Because today's engines run at temperatures high enough to melt metal, they require a heat-reducing liquid coolant that is 50 percent water and 50 percent antifreeze. Always use, or insist that your mechanic install, a good quality, brand name antifreeze.

Some engines and radiators, such as those made of aluminum, require a special blend of antifreeze. Your owner's manual should have specific recommendations.

The coolant level should be checked once a month during the summer months. Most cars have a coolant recovery system, located near the engine, which will help maintain the correct level. If the fluid level in the recovery tank is below the full line, add coolant directly to the tank.

Check the hoses

Of the four or five cooling system hoses found on most cars, the two most important are the curved bypass and the upper radiator hoses.

The bypass and upper radiator hoses carry hot coolant from the engine to the radiator, while the bottom radiator hose delivers the cooled liquid back to the

engine. Since these hoses are so vital to safe engine operation, they should be checked at least every six months.

The best way to inspect a hose is to squeeze it firmly along its entire length. If the hose feels spongy, lifeless and has bulges, or if it feels hard, brittle and if cracks appear, replace the hose immediately.

But don't be fooled if the exterior of the hose appears to be in good shape.

Gates engineers assert that most hose failures are due to an electrochemical reaction in the cooling system. This cracks the hose tube, allows liquid coolant to weaken the reinforcement, and eventually results in a burst hose or a pinhole leak.

Because there is no visible, early warning sign of this failure, Gates recommends replacing these hoses every four years.

This also is a good time to install new hose clamps, tightening them properly to avoid leaks at the connection to the radiator and the engine.

Check the belts

While the traditional V-shaped belt has been the mainstay of the automotive cooling system drive, new cars, since the early 1980s, have increasingly been designed with a V-ribbed belt. Today, more than 40 million vehicles use this multi-ribbed belt.

Vacationers — and all motorists — need to know that when this belt fails, the vehicle may lose power to a number of important accessories. These could include the alternator, the power steering pump, the air conditioning compressor, the water pump and, in some instances, the booster for the braking system.

To continue any amount of driving with a failed V-ribbed belt may lead to unsafe operation of the vehicle, and potential engine damage.

Follow the recommendations in your owner's manual for maintenance and parts replacement.

When a cooling system fails, the engine overheats. And when a car overheats for very long, metal engine parts can be seriously damaged and require expensive repair.

Overheating can result when the coolant level is too low or when there is a leak in the system. Sometimes just driving in stop-and-go traffic on a hot summer day with the air conditioner running is enough to overheat the engine.

Coolant loss

A low coolant level, explain Gates Rubber Company engineers, leads to overheating because there isn't enough fluid in the system to absorb engine heat. The air in the system that is absorbing these high temperatures is a poor heat conductor and won't do an effective job of transferring the heat to the radiator.

Cars with coolant recovery tanks have markings on the white plastic tank indicating where coolant levels should be when the car is running and when it's not. If the coolant level is low after repeated fillings, you probably have a leak in the system.

Coolant hose leaks

Hoses are the most likely source of leaks because they are structurally the weakest components of the cooling system. Hoses must be flexible to absorb vibration, so they are made of rubber compounds. Rubber, unfortunately, is not as durable as metal.

According to Gates, intense engine heat can harden and crack even the best rubber; oil can soften and swell it; the simple passage of time can break down its internal bonding; and electrochemical degradation can crack the tube.

In many instances, hose leaks occur at faulty connections to the inlet and

To avoid overheating problems, check cooling system and engine for leaks

outlet pipes. Make certain the hose clamps are secure.

When replacing a hose, it's also a good idea to replace the clamps. Traditional worm-drive clamps or the new constant tension clamps are best.

To extend the service life of a hose, keep it away from damaging external elements such as hot manifolds, oil-leaking parts and sharp edges. In these situations, protect the hose with a sleeve.

You should also avoid using the soluble oils found in some coolants, under the assumption they lubricate the water pump. Most modern antifreeze solutions contain all the lubricants a water pump needs. Soluble oil only serves to destroy a hose before its time.

All cooling system hoses should be inspected every six months. Most often, the upper radiator hose and the curved bypass hose will fail without warning. But, eventually they all will need to be replaced.

Gates recommends replacing the cooling system hoses roughly every four years.

Water pump leaks

It is common to find an occasional drop of coolant under the water pump. Excessive leaking, however, indicates a problem. Housing bolts on the pump should be tight. If they are, and leaking persists, the pump's inner seal is probably damaged and the pump must be replaced.

Radiator leaks

Radiator leaks are often just the result of a loose petcock or plug. Simple tightening should correct this.

The inner seal on the radiator cap should be checked periodically. If the seal is cracked, or the metal parts are rusted, coolant will escape and the cap

will fail to pressurize the remaining coolant adequately.

White stains on the radiator point to a more serious problem. These stains result from coolant reacting with the metal parts. Pouring a liquid sealant in the radiator might solve the problem, but chances are good that the radiator needs to be repaired or replaced. This is frequently the case with many of today's aluminum radiators.

Heater leaks

Leaks can occur in the heater control valve or in the heater core. A liquid sealant can sometimes help but, more often than not, the heating system units will have to be replaced.

Engine leaks

Leaks can occur on the engine block wherever there is a bolted housing, such as at the thermostat or water pump housing.

You should also inspect the block's drain plugs and core plugs (also known as freeze plugs). Core plugs are holes left in the engine when it is cast and later covered by metal discs. If these discs loosen or corrode, coolant can escape from the block.

If leaking continues after you've checked all the hoses, clamp connections and metal components of the cooling system, the leak is probably internal, advises Gates.

This situation can be confirmed by the presence of engine oil in the coolant, in the exhaust system, or transmission fluid. A visually inspected sample of the coolant will reveal the presence of oil. In both the latter situations, however, sophisticated test instruments will help make this determination.



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