TIRES

Their selection and care

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A Consumer's Guide from the National Bureau of Standards
NBS CIS 2

TIRES

Their Selection and Care

by F. C. BRENNER

INFORMATION TO HELP YOU GET THE MAXIMUM SAFETY, WEAR AND PERFORMANCE FROM YOUR TIRES.

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A Consumer's GUIDE

FROM THE NATIONAL BUREAU OF STANDARDS
U.S. DEPARTMENT OF COMMERCE

U.S. DEPARTMENT OF COMMERCE
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FOREWORD

Technology is changing not only the products you buy, but the marketplace as well. Unfortunately, this is not an unmixed blessing.

Products are constantly being improved, but designs are complicated, quality is variable, and good advice is hard to get. Modern stores and merchandising bring you a wide variety of products; but the large number of choices and the lack of dependable information often make shopping a confusing and frustrating experience.

A generation ago the merchant was likely to be a friend of the family. Products were out in the open where they could be seen, touched, smelled or tasted, and decisions about quality were comparatively easy to make. Today, stores are more impersonal; most of the items are pre-packaged, or made of unfamilar materials, or so complicated only an expert can understand how they work.

If you are like most consumers you need more information—accurate, understandable, believable information which will help you make wise choices, and get more use and satisfaction from what you buy.

Your principal source of such information will be from manufacturers and vendors themselves. But the technical work at NBS brings our experts in contact with many subjects of potential interest to the citizen, who supports our work with his taxes. The Consumer Information Series is designed to share this knowledge and experience with you. The National Bureau of Standards does not test or recommend products, but our research on measurement and standards produces information in many areas which can be of practical value to you.

At the request of the President and the Secretary of Commerce,we are pleased to make this information available.

Lewis M. Branscomb, Director

CONTENTS

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INTRODUCTION

Your automobile has become an essential part of your daily life. It is your link to work, to school, to shopping, to recreation. It can also be a threat to your safety and that of your family if you misuse it or fail to maintain it properly. Each day, traffic accidents kill over 150 Americans, injure over 5,400 others.

Sometimes the cause is worn out or defective tires, or the lack of tire care. Bald tires, tires with deep cuts, or blisters, or tread separation; tires that are out of balance, out of round; under-inflated tires, over-loaded tires—all are potential killers. At the very least, they can be a cause of inconvenience and delay.

They also cost you money. Tires that are not properly selected and cared for wear faster. They can reduce gasoline mileage, and make your car handle poorly on the road. They are an invitation to trouble.

But properly selected tires, properly cared for are another story. Today's tires are built to give you much better service than those in the past. They can improve the safety and performance of your car, increase your pleasure in driving, and save you money. But to get that service, you have to match the tires to the car, the load, the use, and to your driving habits and expectations. And you have to give them proper care. This booklet will help you provide the care necessary for maximum safety, tire life and performance, and help you select replacement tires to suit your particular needs when your present tires are no longer adequate.

The information was developed by the Department of Commerce through the Institute for Applied Technology in the National Bureau of Standards, under the sponsorship of the Department of Transportation's National Highway Safety Bureau. The studies were carried out by the Institute's Office of Vehicle Systems Research.

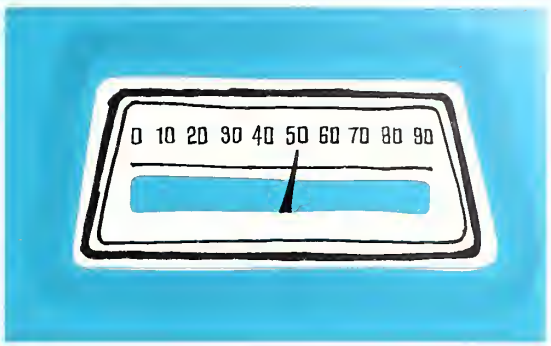
The program is being funded under the provisions of the National Traffic and Motor Vehicle Safety Act of 1966.

Care of Your Tires

The minutes per month spent in giving your tires the care they need will not only save you money and increase your driving pleasure; they may save your life. Tires are designed to run at a certain pressure, a certain angle to the road, a certain angle to the line of travel, and under certain maximum loads. If you respect these requirements, most modern tires will serve you well. If you do not, you are inviting trouble.

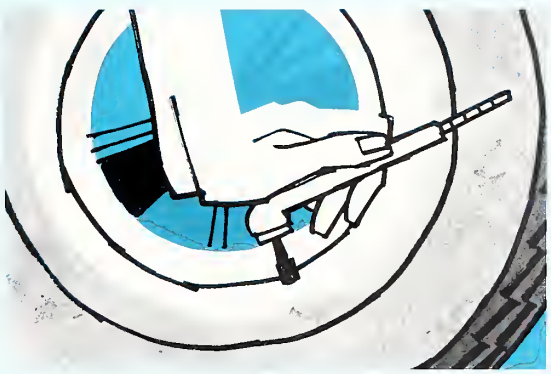
Break-in

Tires need a break-in period. To avoid possible damage to your tires, keep your speed below 60 miles per hour for the first 50 miles. This will give the various parts of the tires a chance to "seat in".

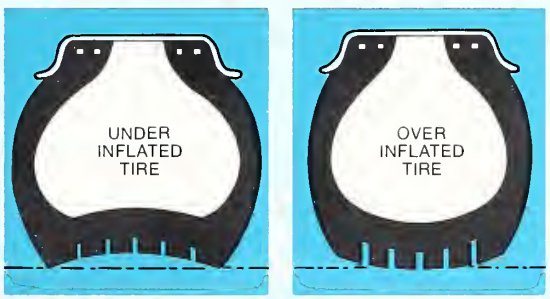


Pressure

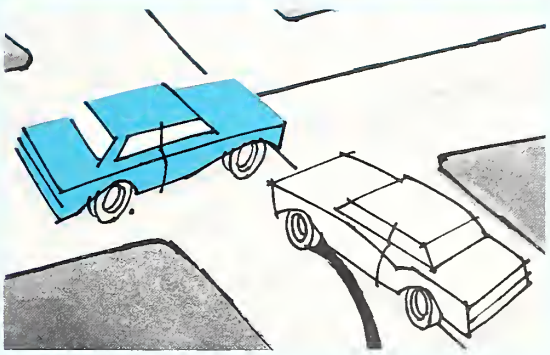
The air pressure recommendation is one of the most important figures in your Car Owner's Manual. At the correct pressure your tires will carry the specified weight; they will provide maximum traction in a curve or corner; they will resist damage from rocks and potholes; and they will "squirm" less and run cooler than at lower pressures.



Tires run at **below** recommended pressure flex more, therefore they run hotter, and tend to wear faster on the edges of the tread pattern. Tires with **excessive** air pressure wear faster at the center of the tread. Either too much or too little pressure may reduce traction and cause loss of control.



Unequal pressure, particularly in the front tires, can cause uneven braking—another possible cause of accidents.

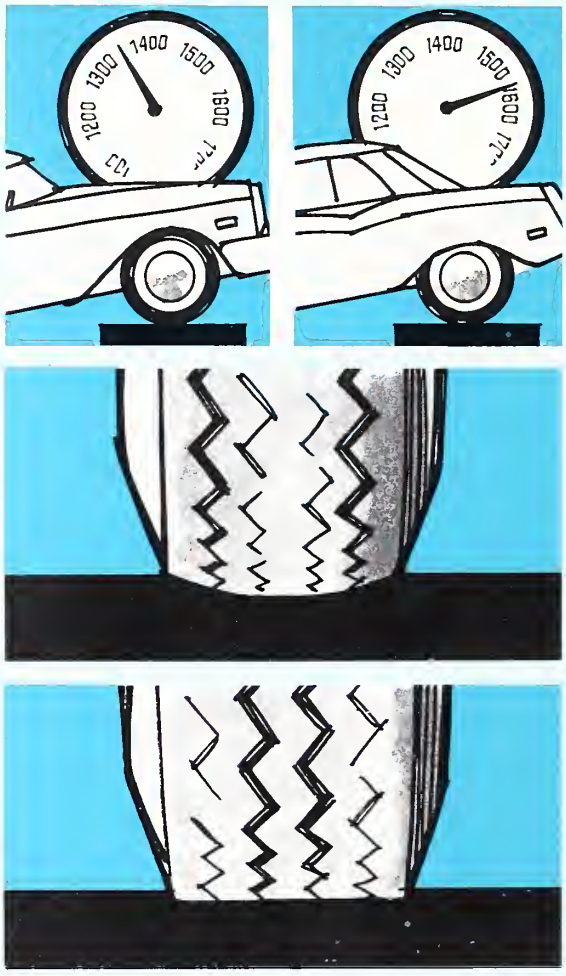


Remember that recommended pressures are **cool** tire pressures. Check your tires before you drive or after your tires have had a chance to cool at the end of a trip.

In many cars the weight is not evenly divided between front and rear. Follow the advice in your Car Owner's Manual for air pressure in front and rear tires. The manual may also advise higher pressure for turnpike driving.

If you plan to carry unusually heavy loads you may need even higher pressures. Check the Load Range Table on Page 24, or ask for advice at your automobile dealer, tire store, service station or garage.

Do not exceed the maximum pressure rating on the sidewall of your tires.

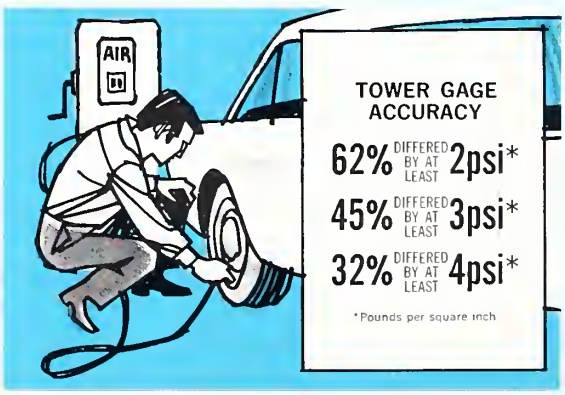


If you habitually drive with air pressures far from normal, your tires will give you warning, as follows:

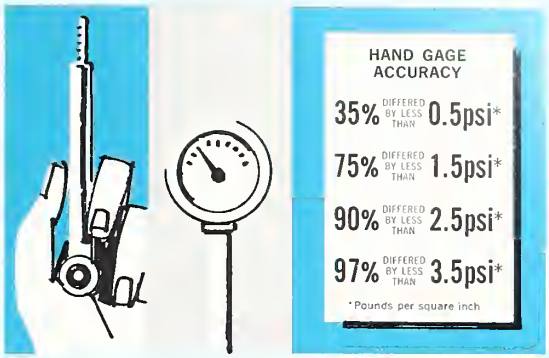
- Excessive wear on the center of the tread and a "hard" ride indicate too much pressure; and
- Excessive wear on the outside of the tread, a "mushy" ride, and a tendency for tires to "squeal" on corners indicate too little pressure.

Gages

A particular problem is finding an accurate air tower or pocket gage to determine the actual pressure you are carrying. Tests by the National Bureau of Standards reveal that approximately one out of three air tower gages is wrong by four pounds per square inch or more, and three out of five are wrong by two pounds or more.



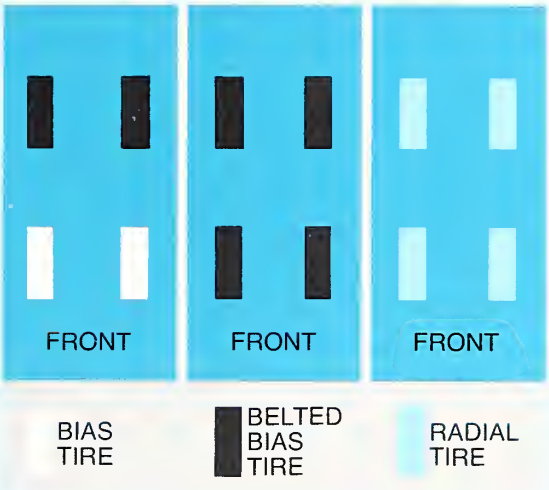
Pocket gages are more accurate. Only one in ten was found to be wrong by two pounds per square inch or more. To be sure that you are maintaining the correct, safe pressure in your tires, buy a good pocket gage at an auto supply store and see that it is used to check your tires at least once a month.



Mixing Tire Types

If you mix bias tires (See "Types of Tires" Page15) with belted bias, do not use two different types on either front or rear. For better handling mount the bias tires on the front, and the belted bias on the rear.

Do not mix radials with other tires unless the tire manufacturer specifically recommends it. For optimum handling, use tires of the same type all around.



Alignment

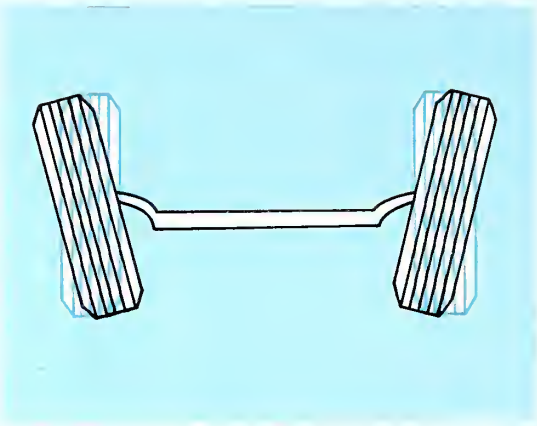
This is the angle of the wheel in relation to the direction of travel—just like your feet in relation to the direction you are walking.

TOE-IN - TOE-OUT Too much toe-in produces a feathered edge on the **inside** of the tread design; too much toe-out produces a feathered edge on the **outside** of the tread design.

CAMBER

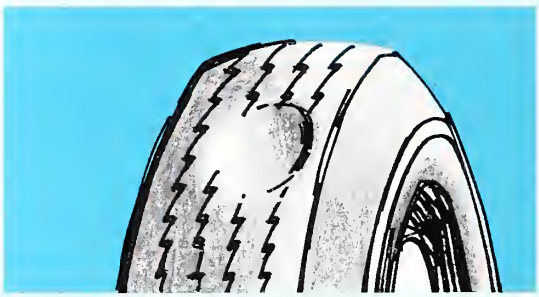
This is the angle the wheel makes with the surface of the road. The wrong camber angle causes excessive **even** wear on one or the other side of the tread, depending on the way the wheel leans.

The backward tilt of the axle structure can also cause trouble. Too little tilt can result in poor handling and spotty wear. Unequal tilt can cause one tire to pull, resulting in uneven wear on one tire.



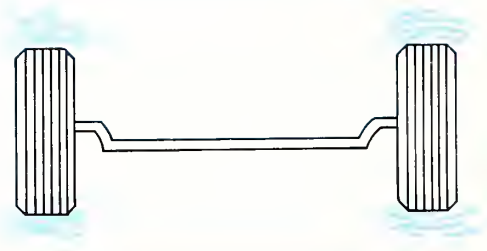
Badly Adjusted or "Grabby" Brakes

Poorly adjusted brakes cause tires to wear unevenly; out-of-round brake drums can be the cause of excessive wear in a single spot.

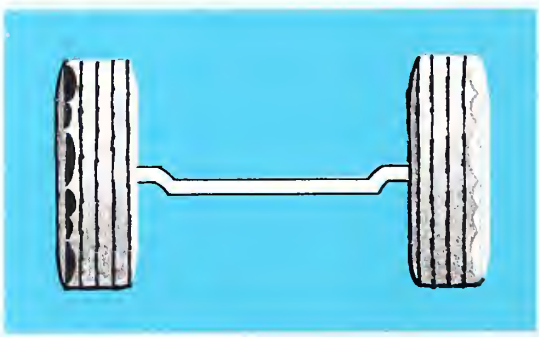


Out of Balance

If tires are not balanced properly the wheels vibrate, and tire wear is increased. Balance all four tires, particularly if your car has an independently sprung suspension. If in doubt, seek expert advice.



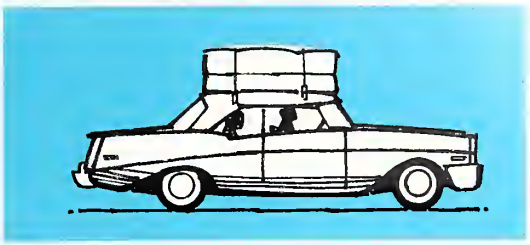
Worn wheel bearings, worn shock absorbers, loose tie rods or wobbly wheels cause vibration and various types of uneven and excessive wear.

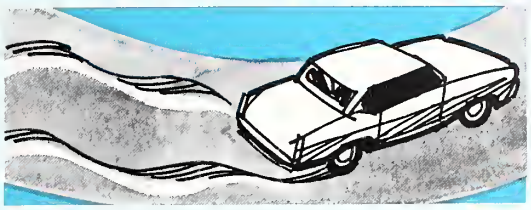


When you notice uneven or excessive wear on one or more tires, take the car in for inspection. The chances are it is in need of service.

Loading

Overloading can cause serious trouble not only for springs and shock absorbers, but particularly for tires. Excessive loads can cause cord breaks. Heat buildup is increased because of abnormal flexing. The combination is an invitation to tread separation and hidden tire damage which can lead to trouble, sometimes long after the damage occurred. Overloading also makes a car harder to control. To determine your maximum safe load, read your Car Owner's Manual.

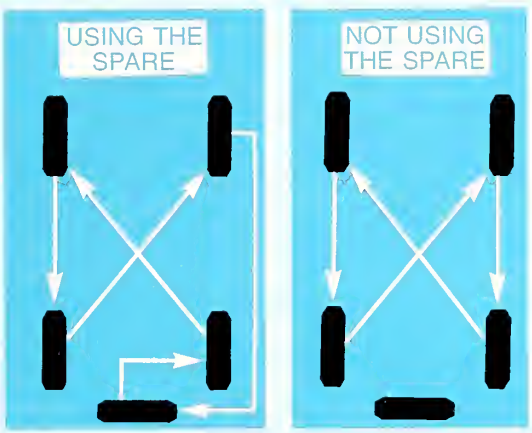




Rotation

In normal city driving, cornering tends to wear the front tires more than the back; in turnpike driving, the rear tires tend to wear more. Frontwheel drive cars, of course, show more wear on the front tires in turnpike driving. Rotation distributes the wear more evenly.

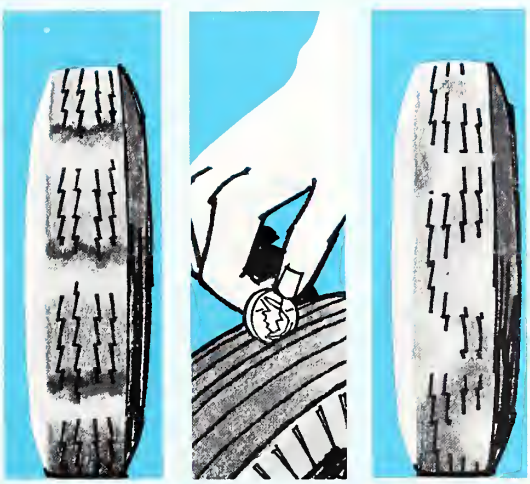
Five tire rotation, including the spare, at 5,000 mile intervals is good economics, as well as good safety practice.



Tread Depth

Modern tires have built-in wear indicators which appear as smooth narrow bands across the face of the tire when the tread depth gets down to 1/16th inch. Beyond this point the tire may be extremely dangerous, particularly on wet roads.

If a tire wears unevenly so that **any considerable portion** of the tread is below the 1/16th inch minimum, the tire should be replaced, and the cause of the uneven wear corrected.



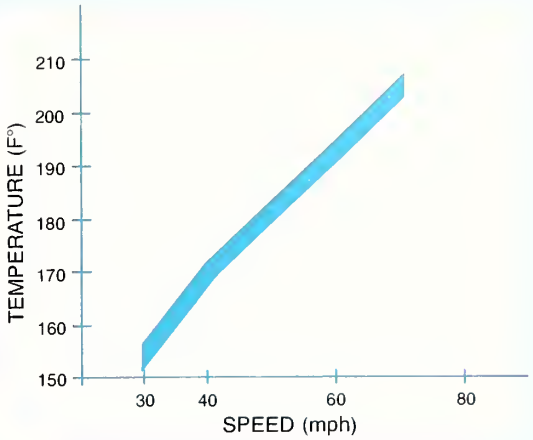
Driving Habits

As tire characteristics and care affect the performance of your car, so driving habits affect the performance of your tires. By following these simple rules you can help your tires do a better job for you.

Speed and Wear

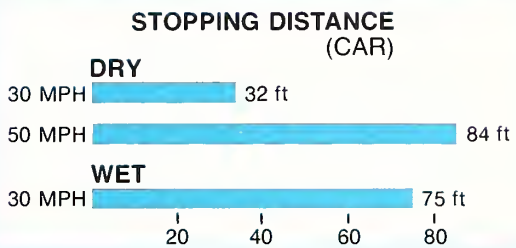
High speed generates heat, and heat increases the rate of wear. If you want long tire life:

- Keep your speed down
- Accelerate slowly
- Avoid "squealing" your tires on corners and curves.



Speed and Wet Roads

Water acts as a lubricant between your tires and the road surface, and seriously reduces traction even if your tires are new. Particularly dangerous is a light drizzle, falling on a road surface which has been dry for a considerable period of time. The drizzle, mingling with dust and traffic film, can produce a road surface which is as slick as ice and extremely hazardous. Even on clean, wet pavement a stop may take up to 4 times the distance that would be required on dry pavement.



Another hazard is "hydroplaning." Above 40 or 50 miles per hour the water may build up in the tread grooves and literally lift the tire off the road, reducing or even eliminating traction, causing loss of control. This effect occurs at lower speeds if the tire tread is thin.

In the rain, slow down!

Speed and Rough Roads

The force of impact between tires and stones or potholes increases sharply with speed. Modern tires are built to "take it," but there is a limit to what rubber and fabric will endure. If you want to avoid cuts, bruises and blow-outs, slow down on bad roads.

Give your tires a chance!

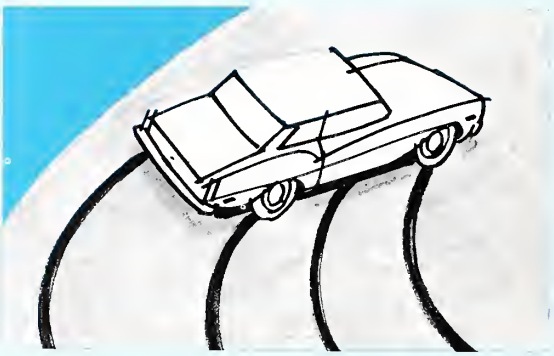
Braking

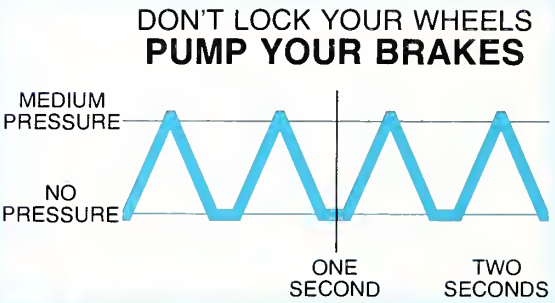
You may be using your brakes more than necessary, thereby increasing tire wear. Use the engine compression to decelerate; slow down **before** you reach a corner. If you have to make a sudden stop, avoid locking the wheels. A locked wheel panic stop not only wears tires severely, it can also reduce your stopping ability and may cause you to lose control of your car.

Brakes do their work by creating friction between drum and lining, or between pad and disc, converting momentum into heat. This friction, plus the friction of the tire on the pavement, brings you to a halt. In the quickest stop, the tires slip a little but continue to roll.

On a wet, snowy, or icy road, if you feel the tires beginning to skid in a stop, don't freeze on the brake; pump it rapidly and lightly. This will give you the quickest stop, and will tend to prevent a skid and loss of control.

If a skid starts, release the gas and brake pedals and turn the wheels in the direction of the skid. When you regain control, brake gently to a lower, safer speed.





Selecting New Tires

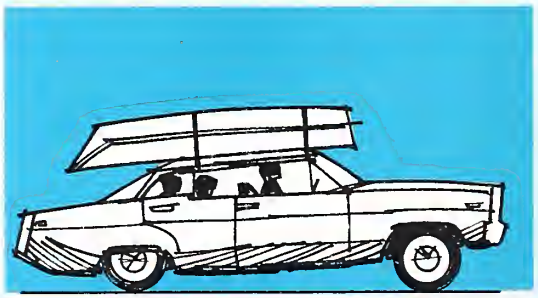
When your tires are worn down to a tread of 1/16th inch, it is time to replace them. Bald tires endanger not only you and your family, but every motorist you pass on the road. The selection of your new tires may be one of the most important decisions of your life. You may not need the most expensive tires, or the ones with the most advertised gimmicks; but you do need a tire designed for your car and your driving habits.

You will probably need help from your tire dealer, but before you talk with him you should learn as much as you can about your options. Here are four basic principles and a few basic facts which will help you ask the right questions.

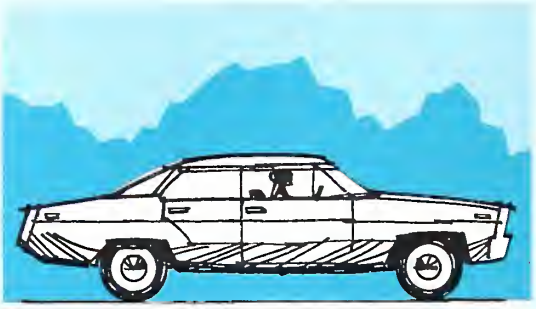
Principles of Tire Selection

When you are driving at 60 miles per hour over ordinary roads, your tires take a pounding. Stones, potholes or uneven joints in the pavement slam into a tire with a terrific impact. Some tires spend most of their life on punishing rural roads; others are used on rocky terrain, or on highly abrasive surfaces.

In many family automobiles, the load on tires varies widely. At one time it is just the weight of the car and the driver. At another, the family sedan may be converted into a bus to carry a load of kids to the beach. At still another, the whole family may go on a cross country trip with a trunk full of heavy vacation luggage or camping gear.

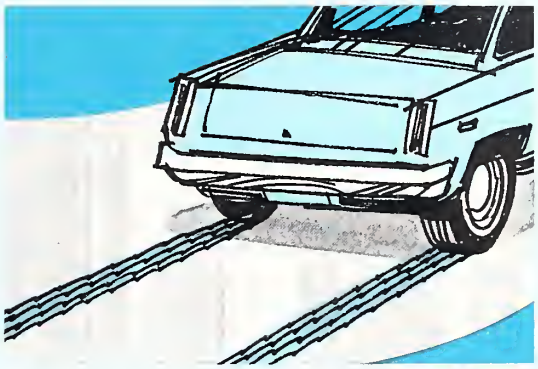


Choose a tire strong enough to stand up under the maximum loads you intend to carry, over the roads you intend to use.



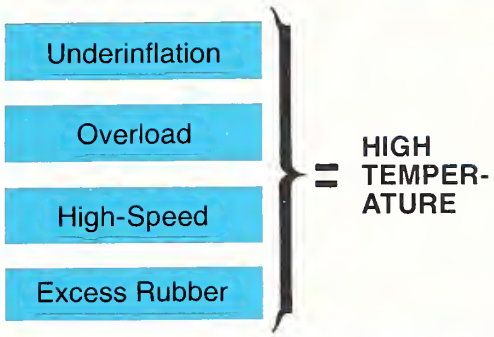
Your control over your car depends upon the small areas of contact your tires make with the road surface as they roll. These "footprints" are only five or six inches wide, and about eight inches long—a total for all four tires of less than one and a third square feet! Yet these small contact areas must control the weight of your car at the speeds you drive on all kinds of roads in all kinds of weather.

When you go around a curve, or take a sharp corner, the mass of the car tends to continue in a straight line, and only the ability of the tires to maintain their footing makes your car obey the steering wheel.



Choose a tire designed to hold its footing and keep its footprint flat and stable through curves and corners at the maximum speeds you intend to drive.

Do you expect to take any long trips at turnpike speeds while these tires are on your car? Or will most of your driving be around town or at moderate road speeds? Remember that high speed increases flexing, and thereby generates heat which can be dangerous unless the tire is built to withstand it.



Will much of your driving be in deep snow or slush? Hard packed snow or ice? Intermittent snow interspersed with rain or dry weather? A snow tire that is good for loose, fluffy snow may not be good for packed snow or ice; it may wear excessively on dry roads, or handle poorly in the rain.

Choose tires designed to give the best performance under the combination of circumstances you expect to encounter while they are on the car.

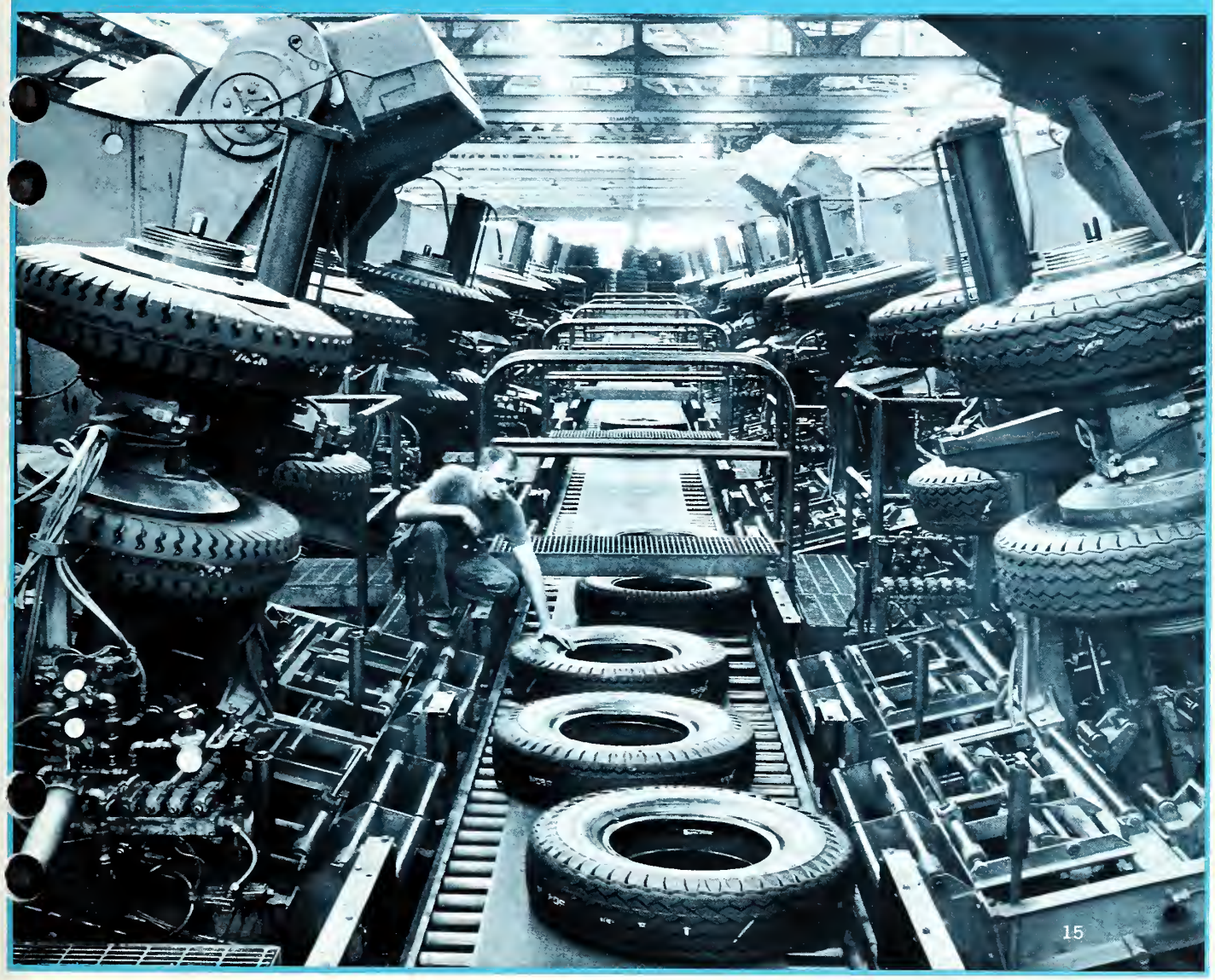
The economics of buying tires are not very well understood by many people. Too many tires are bought on the basis of price alone, without taking into account the factors of safety, convenience, and performance, or the potentially disastrous economic cost of tire failure. Saving money on tires can be an expensive and dangerous mistake.

On the other hand, you may be buying a more expensive tire than is necessary to satisfy your particular driving needs. If you never drive above 60 miles per hour, you do not need a tire built for road racing. If you have a light car, you do not need a tire designed to carry the weight of a station wagon. If you live in a mild climate where snow is a rarity, a set of light chains will carry you through an occasional emergency.

Choose tires to fit your particular needs even if they cost a little more or a little less than you expected to pay.

With these principles in mind, let us look at the various types of tires that are available for passenger cars. There are three basic types: bias, belted bias, and radial; and there are many combinations of materials and design. A clearer understanding of the differences between tire types will help you make a better choice.

Types of Tires



Bias Ply Tire

The "bias" tire is the conventional tire which has been with us since the 1920's. The cords in the plies, or layers, which make up the body of the bias tire criss-cross at an angle called the "bias angle," usually about 30-40° to the center line. Cords may be arranged in two or more (even number) plies, depending in general on the strength desired in the finished tire. This design provides rigidity in both the sidewall and tread, but bias tires squirm more and tend to run hotter than belted bias or radial.

Belted Bias Tire

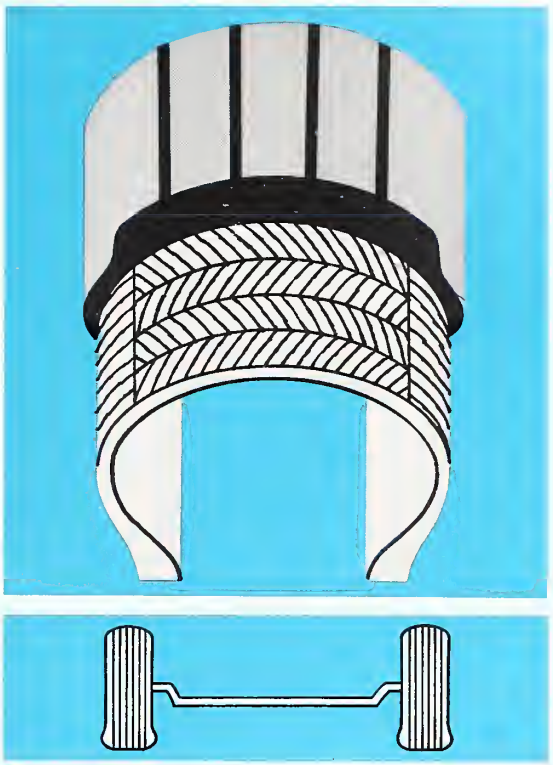
In a belted bias tire the cords in the body are also arranged in a criss-cross pattern; but, in addition, it has two or more layers of fabric or "belts" under the tread. The cords in the belt also run at an angle, about 25° to the center line. This construction provides a sidewall stiffness similar to the bias tire, with increased strength and stiffness in the tread. Body cords are made of rayon, nylon, or polyester; belt cords are made of fiber glass, rayon or steel. The belted bias tire squirms less than the bias tire, runs cooler, and gives more mileage.

Radial Tires

The radial tire carries a lettered number which has an "R" in it such as "ER78-14." The cords in the body run at right angles to the centerline, and may be arranged in one to three plies. Over this radial section is added a belt, made of up to four plies, whose cords run at an angle of about 15° to the centerline.

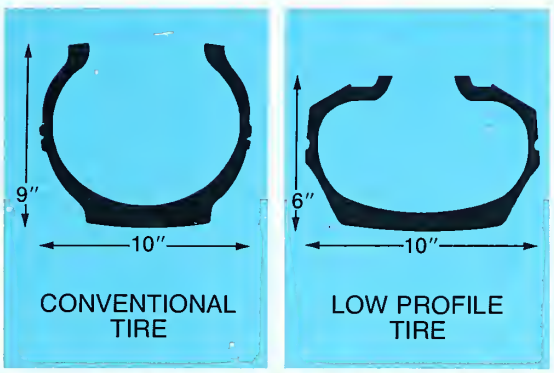
The result is a tire with flexible sidewalls—even when fully inflated it looks as though it needs air—but with great stiffness and strength in the tread area.

In some radials the belts are made of steel; in others, fiberglass or rayon. The radial tire, like the belted bias, has minimum squirm, runs cool, and provides long wear.

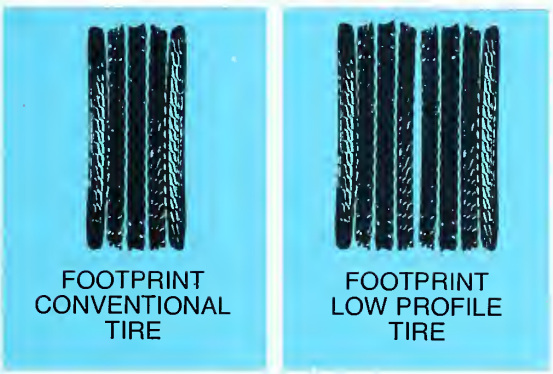


Tire Profile

The trend in passenger car tires has been from a high, narrow cross-sectional profile to a low, wide profile. Today, some passenger car tire cross-sections are almost twice as wide as they are high.

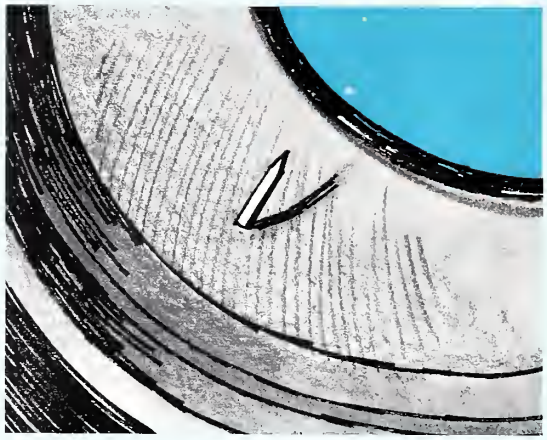


Wide tires provide a wider "footprint" and better cornering, but the very wide tires may present problems. They may not fit your rims; they are harder to steer on cars without power steering; they take up a great deal of room in the trunk; and the ride may be hard. If you have an older car, and are thinking of buying the broader tires, have your dealer check to see if your fender wells are wide enough to permit turns without rubbing.



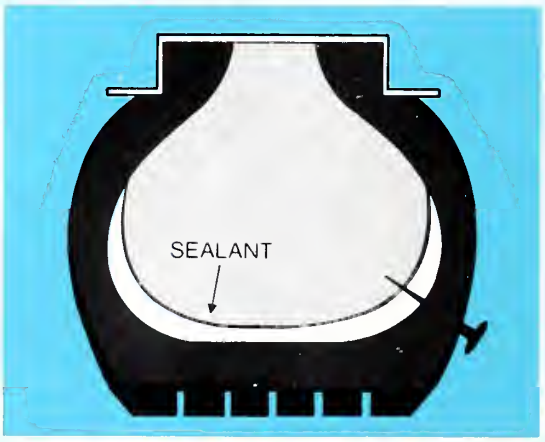
Blow-out or Puncture-resistant Tires

In a puncture, an object penetrates the tire and permits the air to escape, usually without doing extensive damage to the body of the tire. If the tire is run while flat, however, it may be destroyed. Even a piece of wire or a sliver of glass can produce a slow leak which eventually will cause a flat. Such a leak should be repaired at once.



In a blow-out, the cord gives way and the tire deflates suddenly. After a blow-out a tire may not be reusable. Blow-outs may be caused by a slow weakening of the cord as a result of flexing, or by impacts with such things as rocks, pot holes or curbs. Blow-outs can be especially dangerous if they occur at high speed, or on a curve. A blow-out on a front tire produces a hard, steady pull; on the rear, a dangerous weaving motion.

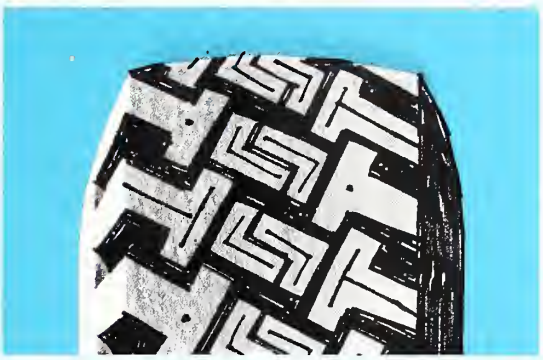
Various types of blow-out-and puncture-resistant tires are on the market. Some have a steel safety belt underneath the tread. Some have an inner tire separated from the main body of the tire by an air space. Some use a sealant to prevent the escape of air if a tire is punctured. Some such feature is frequently a selling point in the "Premium Tire." In some tires of this type there is a tendency to increased heat buildup. Some others are difficult to balance satisfactorily.



Snow Tires

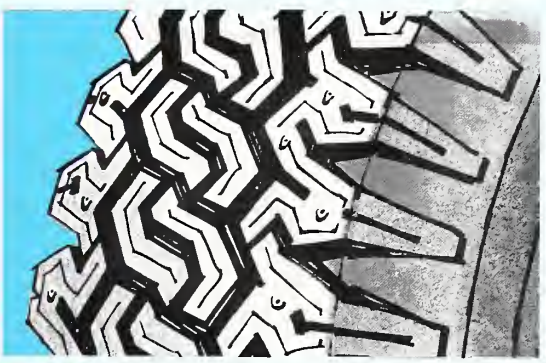
In general, snow tires have an open tread pattern with deep grooves which dig into the snow and provide traction, very much like the lugs in a tractor tire. The pattern is designed to be self-cleaning to a maximum degree so that snow will not pack in the grooves and reduce traction. As with conventional tires, it is essential to select snow tires which fit your particular driving needs.

Tires designed for intermittent snow and dry roads have a tread design in between that of the deep snow tire and the conventional tire. A deep, open design may look safe and rugged, but if the design is too open it may wear with disappointing rapidity on dry roads.



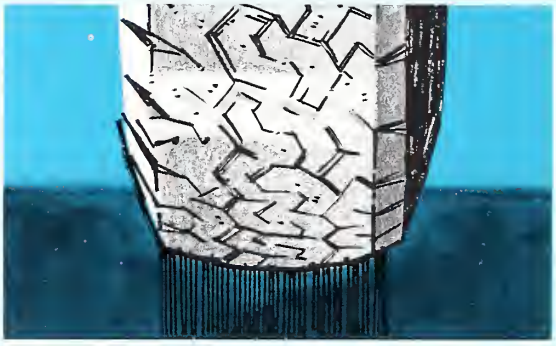
If you expect to be driving in the rain part of the time, select a tread design which has an open channel, or channels, along the circumference of the tire to minimize water buildup. Otherwise, you may find that the tire will 'hydroplane" and lose traction even at comparatively low speeds on a wet road surface.

For driving on ice or packed snow, most snow tires permit the use of small metal studs inserted in the tread. They dig into ice or packed snow and improve traction. Studs wear rapidly on dry pavement, however, and it is becoming increasingly clear that they damage road surfaces. Studs are most useful in climates where you frequently encounter packed snow and ice.



If studs are used, 100 studs per tire will probably be enough to do the job, and 150 studs per tire should be the maximum. A greater number will decrease traction on wet and dry pavements, exactly the opposite result from what you intended. You need enough rubber to grip dry pavement, and "sweep" a path through the water film on wet pavement.

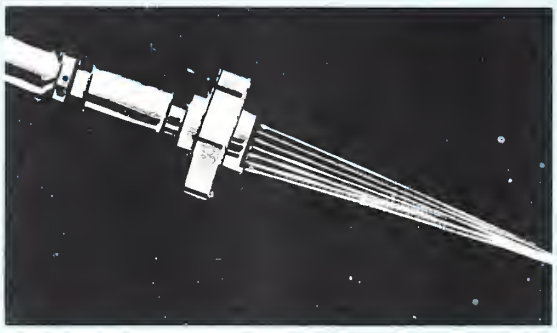
Snow tires of all types wear more rapidly than conventional tires on dry pavement, and some types are not recommended for high-speed driving. Your dealer can help you choose a tire suited to your local driving conditions.



If regular radials are used on the front, you should mount radial snow tires on the rear. Otherwise, your car will not handle properly.

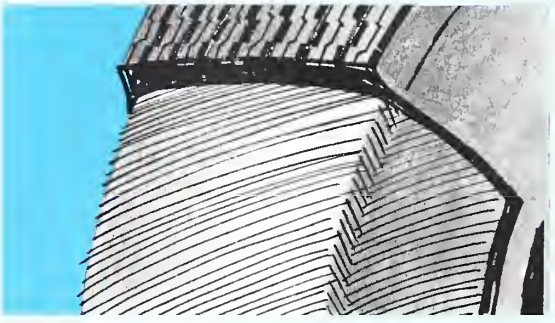
Types of Cord

Cords in the sidewall of the tire are usually made of the artificial fibers nylon, rayon or polyester.



- Polyester has good strength, it is insensitive to water, and it does not flat spot. It is gaining wide use.

- Nylon is resilient, and is resistant to heat and water. It is used in racing tires, aircraft tires, and off-the-road tires as well as automobile tires. It has one fault: nylon cord tires tend to "flat spot" when they stand overnight, and cause a bumpy ride for a few miles; but flat spotting is not a safety problem.



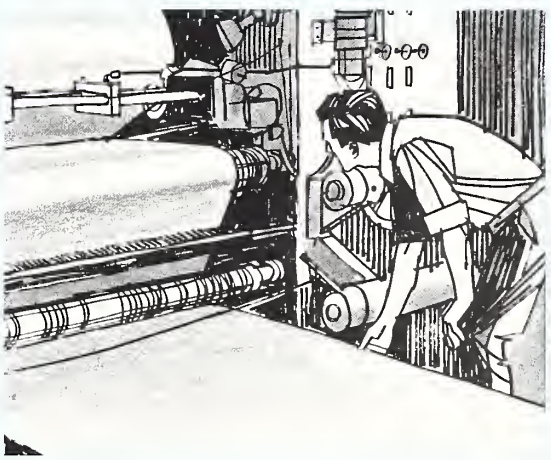
■ Rayon is the oldest of the manmade fibers. It has good strength, dimensional stability, and abrasion resistance, but it tends to degenerate if it is continually exposed to water. This could cause trouble in a tire if a cut exposed the fabric to the weather. This could be particularly troublesome if a cut went undetected in a wet season. Rayon does not flat spot.

Cords used in the belts of belted bias or radial tires must provide maximum stiffness and resistance to deformation. The main purpose of the belted bias and radial designs is to reduce or eliminate "squirm" and maintain a flat footprint, providing maximum traction and wear. For this purpose, three types of cord have proved successful.

■ Steel wire makes very strong belts. Because they stubbornly resist distortion, steel belted tires tend to maintain a flat tread pattern, and run comparatively cool. They provide excellent traction and give maximum wear for a given thickness of tread. The principal use of steel belts is in radials.

■ Glass fibers have excellent tensile strength, good dimensional stability, and resist flexing; hence a tire with fiber glass belts tends to run cool and provide long wear.

■ Rayon is the only textile fiber used in both belt and carcass plies. Rayon has the stiffness and insensitivity to temperature changes necessary for use in belts, as well as the ability to stand up under the flexing to which carcass fibers are subjected. Rayon belts are competitive with glass.



Tire Specifications

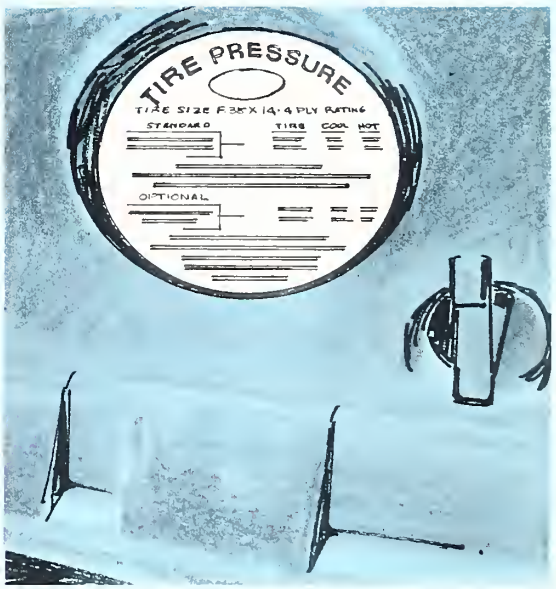
Manufacturers are required by law to provide certain information essential to the selection and maintenance of tires for your car. Data permanently molded into the sidewall of the tire itself include:

- Size
- Maximum permissible inflation pressure
- Brand name and manufacturer's code number
- Composition of the cord
- Number of plies (sidewall and tread)
- "Tubeless" or "tube" type
- "Radial" if tire is a radial tire

Department of Transportation symbol "DOT" indicates that the tire conforms to Federal Motor Vehicle Safety Standards.

Certain information must also be affixed to the glove compartment door, or an equally accessible location:

- Vehicle weight
- Seating capacity
- Recommended cold tire inflation pressure for the vehicle's maximum loaded weight
- Recommended tire size



Load Range Table

If you have decided to buy tires which are wider and lower than those you have been using, or if you want to shift from bias to belted bias, or from belted bias to radials, the table below will help you select sizes which will fit your car.

To use the table, check your old tires to determine their size and type (for example, "E78-14"). Then locate the horizontal row in which that number appears. All of the tires in that row probably will fit your car. However, if you choose a tire which is wider than your original tires, be sure that it will fit your rim, and clear your fender well without scraping when you make a turn. Proper clearance is essential. In the belted bias and radial rows, the "78" series are 78 percent as high as they are wide; the "70" series tires are 70 percent as high as they are wide. Some of the newer tires are in the "60" series—a very low, wide profile.

Air Pressure and Load

If you are planning to carry much heavier loads than you have in the past, you can use the Load Range Table to help choose sturdier tires. First, check your Car Owner's Manual for the normal weight of your car, add the additional weight you expect to carry, and divide by four. This will give you a rough approximation of the weight per tire. Ask your tire dealer to check your figures; then consult the Table.

In the row where your tire size designation appears (for example, "E78-14") look under the "Load Range" section for the maximum load-per-tire you expect to carry. The figure at the head of that column is the correct air pressure for *that* tire carrying *that load*. Buy a tire whose maximum permissible air pressure is at least as high or higher than that figure.

Thus, if the pressure reading is 32 pounds or under, you need a Load Range B tire. If it is in the 34 to 36 pound range, you need a Load Range C tire. If it is in the 38 to 40 pound range, you need a Load Range D tire.

If you find the Load Range designations confusing, just remember that "Load Range B" is equivalent to the old 4-ply rating; "Load Range C" is equivalent to the 6-ply rating; and "Load Range D" is equivalent to the 8-ply rating. The principle is: the higher the ply rating and the higher the safe maximum pressure, the higher the load carrying capability.

If you plan to carry extra heavy loads, check with your automobile dealer, tire store, service station or garage. You may need helper springs or heavy-duty shock absorbers in addition to stronger tires.

LOAD RANGE TABLE

LOAD LIMITS (LBS. PER TIRE) FOR TIRES USED ON PASSENGER CARS, STATION WAGONS AND MULTI-PURPOSE PASSENGER VEHICLES*

Tire Size or Designation

Bias		Bias and Belted Bias			Radial		
1965-On	Pre-1965	'78 Series'	'70 Series'	'60 Series'	Metric	'78 Series'	'70 Series'
6.00-13					165 R 13		
		A78-13	A70-13			AR 78-13	AR 70-13
6.50-13		B78-13	B70-13		175 R 13	BR 78-13	BR 70-13
		C78-13	C70-13			CR 78-13	CR 70-13
7.00-13					185 R 13		
			D70-13			DR 78-13	DR 70-13
			E70-13		195 R 13	ER 78-13	ER 70-13
			A70-14		155 R 14		AR 70-14
6.45-14	6.00-14				165 R 14		
		B78-14	B70-14			BR 78-14	BR 70-14
6.95-14	6.50-14	C78-14	C70-14		175 R 14	CR 78-14	CR 70-14
		D78-14	D70-14			DR 78-14	DR 70-14
7.35-14	7.00-14				185 R 14		
		E78-14	E70-14			ER 78-14	ER 70-14
7.75-14	7.50-14				195 R 14		
		F78-14	F70-14			FR 78-14	FR 70-14
8.25-14	8.00-14				205 R 14		
		G78-14	G70-14			GR 78-14	GR 70-14
8.55-14	8.50-14				215 R 14		
		H78-14	H70-14			HR 78-14	HR 70-14
8.85-14	9.00-14				225 R 14		
		J78-14	J70-14			JR 78-14	JR 70
			K70-14				KR 70
	9.50-14						
			L70-14				LR 70-14
					165 R 15		
	6.00-15					BR 78-15	
6.85-15			C70-15		175 R 15	CR 78-15	CR 70-15
	6.50-15	C78-15					
		D78-15	D70-15			DR 78-15	DR 70-15
7.35-15					185 R 15		
		E78-15	E70-15	E60-15		ER 78-15	ER 70-15
7.75-15	6.70-15				195 R 15		
		F78-15	F70-15	F60-15		FR 78-15	FR 70-15
	7.10-15				205 R 15		
		G78-15	G70-15	G60-15		GR 78-15	GR 70-15
8.25-15							
	7.60-15				215 R 15		
		H78-15	H70-15			HR 78-15	HR 70-15
8.55-15							
8.85-15	8.00-15				225 R 15		
		J78-15	J70-15			JR 78-15	JR 70-15
9.00-15	8.20-15						
			K70-15				KR 70-15
9.15-15					235 R 15		
		L78-15	L70-15			LR 78-15	LR 7
		M78-15					
		N78-15					
8.90-15							
6.00-16							
6.50-16							
7.00-15							
7.00-16							

*Reprinted from CONSUMER TIRE GUIDE, The Industry Safety Council.

Load Range B (4-ply rating) →
Load Range C (6-ply rating) →
Load Range D (8-ply rating) →

COLD INFLATION PRESSURES—POUNDS PER SQUARE INCH										
20	22	24	26	28	30	32	34	36	38	40
770	820	860	900	930	970	1010	1040	1080	1110	1140
810	860	900	940	980	1020	1060	1090	1130	1160	1200
890	930	980	1030	1070	1110	1150	1190	1230	1270	1300
950	1000	1050	1100	1140	1190	1230	1270	1320	1360	1390
980	1030	1080	1130	1180	1230	1270	1310	1360	1400	1440
1010	1070	1120	1170	1220	1270	1320	1360	1410	1450	1490
1060	1110	1170	1220	1280	1320	1370				
1070	1130	1190	1240	1300	1350	1400	1440	1490	1540	1580
780	820	860	900	940	970	1010				
810	860	900	940	980	1020	1060	1090	1130	1160	1200
860	910	960	1000	1040	1080	1120	1160	1200	1240	1270
840	900	930	980	1020	1060	1100	1130	1170	1210	1240
890	930	980	1030	1070	1110	1150	1190	1230	1270	1300
950	1000	1050	1100	1140	1190	1230	1270	1310	1350	1390
950	1000	1050	1100	1140	1190	1230	1270	1320	1360	1400
930	990	1030	1080	1130	1170	1210	1250	1300	1330	1370
1010	1070	1120	1170	1220	1270	1320	1360	1410	1450	1490
1040	1100	1160	1210	1260	1310	1360	1400	1450	1490	1540
1030	1100	1140	1190	1240	1290	1340	1380	1430	1470	1520
1070	1130	1190	1240	1300	1350	1400	1440	1490	1540	1580
1150	1210	1270	1330	1390	1440	1500	1550	1600	1650	1690
1150	1230	1280	1340	1390	1450	1500	1550	1600	1650	1700
1160	1220	1280	1340	1400	1450	1500	1550	1610	1650	1700
1250	1310	1380	1440	1500	1560	1620	1670	1730	1780	1830
1240	1320	1380	1440	1500	1560	1620	1670	1730	1780	1830
1250	1310	1380	1440	1500	1560	1620	1680	1730	1780	1830
[illegible]	1430	1510	1580	1640	1710	1770	1830	1890	1950	2000
[illegible]	1420	1480	1550	1610	1670	1740	1790	1850	1910	1960
1360	1440	1510	1580	1650	1710	1770	1830	1890	1950	2010
1430	1510	1580	1660	1730	1790	1860	1920	1990	2050	2100
[illegible]	1500	1580	1650	1720	1790	1860	1920	1980	2040	2100
[illegible]	1540	1620	1690	1770	1830	1900	1970	2030	2090	2150
1540	1640	1700	1780	1850	1930	2000	2060	2130	2200	2260
1520	1600	1680	1750	1830	1900	1970	2040	2100	2170	2230
870	910	960	1000	1050	1090	1130				
890	930	980	1030	1070	1110	1150				
890	940	980	1030	1070	1110	1150	1190	1230	1270	1300
950	1000	1050	1100	1140	1190	1230	1270	1320	1360	1390
950	1000	1050	1100	1140	1190	1230	1270	1320	1360	1400
980	1040	1080	1130	1180	1230	1270	1320	1360	1400	1440
1010	1070	1120	1170	1220	1270	1320	1360	1410	1450	1490
1070	1130	1180	1240	1290	1340	1390	1440	1480	1530	1570
1070	1130	1190	1240	1300	1350	1400	1440	1490	1540	1580
1150	1210	1270	1330	1380	1440	1490	1540	1590	1640	1690
1110	1190	1230	1290	1340	1400	1450	1500	1550	1590	1640
1160	1220	1280	1340	1400	1450	1500	1550	1610	1650	1700
1240	1300	1370	1430	1490	1550	1610	1660	1720	1770	1820
1190	1270	1320	1380	1440	1500	1550	1600	1660	1710	1760
1250	1310	1380	1440	1500	1560	1620	1680	1730	1780	1830
1250	1310	1380	1440	1500	1560	1620	1670	1730	1780	1830
1340	1410	1480	1550	1620	1680	1740	1800	1860	1920	1970
1310	1400	1450	1520	1580	1640	1710	1760	1820	1880	1930
1360	1440	1510	1580	1650	1710	1770	1830	1890	1950	2010
1360	1430	1510	1580	1640	1710	1770	1830	1890	1950	2000
1430	1510	1580	1650	1720	1790	1860	1920	1980	2040	2100
1380	1470	1530	1600	1670	1730	1800	1860	1920	1980	2040
1430	1500	1580	1650	1720	1790	1860	1920	1980	2040	2100
1460	1540	1620	1690	1760	1830	1900	1970	2030	2090	2150
1470	1570	1630	1710	1780	1850	1920	1980	2050	2110	2170
1460	1540	1620	1690	1770	1830	1900	1970	2030	2090	2150
1510	1600	1680	1750	1830	1900	1970	2030	2100	2160	2230
[illegible]	1600	1680	1750	1830	1900	1970	2040	2100	2170	2230
[illegible]	1700	1780	1860	1940	2020	2090	2160	2230	2300	2370
1700	1790	1880	1970	2050	2130	2210	2280	2360	2430	2500
1700	1810	1880	1970	2050	2130	2210	2290	2360	2430	2500
[illegible]	1135	1195	1250	1300	1350	1400	1450	1500		
[illegible]	1280	1345	1405	1465	1525	1580	1635	1690		
1310	1380	1450	1515	1580	1640	1700	1760	1820		
1365	1440	1515	1585	1650	1715	1780	1840	1900		

Summary

Before you buy a tire, take an inventory of your driving habits and your particular needs.

1. If you drive primarily between home and work, school and shoping you don't have to worry too much about heat buildup, and you don't need heavy duty construction. You do need long mileage, and protection against everyday hazards. For your purposes a bias tire with a medium to heavy tread will probably give you adequate service, though a belted bias or radial would give you longer wear.

2. If you do a lot of cross-country driving at turnpike speeds, you need a tire strong enough to withstand road shocks, but with a medium depth of rubber in the tread to avoid heat buildup. The thicker the tread, the higher the heat buildup at high speeds. For your purposes a high quality bias tire is acceptable, but you would get better traction, less heat buildup, and longer mileage from a belted bias or radial tire.

3. If you are a sports car buff, or want optimum performance and handling, the belted bias or radial tire will give you the most satisfaction. It offers superior cornering and greater safety at sustained turnpike speeds. Of the two, the radial probably has a slight edge in precise handling, though it gives a somewhat harder ride. You may also want to consider a lower, wider profile tire. Generally speaking, the wider the tread the better the grip on the road.

4. If you plan to carry heavy loads or drive on rough or rocky roads, you will want a tire with a heavier tread and a sturdy construction. Ask about heavy duty tires when you make your purchase.

5. If you live in a cold country where there is much snow, you will want snow tires which provide traction in deep, loose snow. But if you live in a more temperate climate where snow is intermittent, mixed with rain and dry weather, you will want a tire that provides good traction in snow, but handles well on wet roads, and stands up to driving on dry roads. If you have radials tires on the front, for good handling you must have radial snow tires on the rear.

When you have decided on the kind of tire you want to buy, the next step is to decide on the size, profile, and load range.

1. Check your old tires, your Car Owner's Manual and the placard inside your glove compartment door to determine the size and type of tire which came as original equipment on your car. Check the appropriate column in the Load Range Table to find the tire sizes and types which will fit your car. Check your conclusions with your tire dealer.

2. Make up your mind about bias, belted bias, or radial tires, and decide on the width of tire you want to buy. Check with your automobile dealer, tire store, service station or garage to see if your choice is practical for your rims and fender wells.

3. Estimate the maximum weight you will be carrying, and divide by four to get the load per tire. Choose a tire which has a maximum permissible air pressure (as shown on the tire sidewall) equal to or higher than the one called for by the Load Range Table for that load.

4. Do not buy a tire which is smaller than the original equipment tires on your car. The smaller tire will not have the load carrying capacity you need. Remember that overloading means heat, and heat shortens tire life.

5. Buy the tire which your car, your load, your roads, your climate and your driving habits call for—not the cheapest, not the most expensive, not the one with the most "extra features."

If one tire salesman is unwilling to answer your questions and work with you in making a rational choice, go elsewhere.

Your comfort and safety are at stake.

Tire Quality

At the present time there is no reliable system which grades tires in terms of quality. The Federal Trade Commission described the problems in these words in 1966: "There exists today no industry-wide, Government, or other accepted system of quality standards or grading of (tire) industry products. Within the industry, however, a variety of trade terminology has developed which, when used in conjunction with consumer transactions, has the tendency to suggest that a system of quality standards or grading does in fact exist. Typical of such terminology are such expressions as "line," "level," and "premium." The exact meaning of such terminology may vary from one industry member to another. Therefore, the "1st line" or "100 level" or "premium" tire of one industry member may not be equivalent to the "1st line" or "100 level" or "premium" tire of another member since, in the absence of an accepted system of grading or quality standards, each manufacturer can determine what "line" or "100 level" or "premium" classification to attach to a tire.

The Office of Vehicle Systems Research is now carrying out for the Department of Transportation a program of research leading to the development of a "Uniform Quality Grading System" for tires. When a system is implemented, it will provide clear and practical guidelines for selecting the level of quality necessary to suit your needs.

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