WHEELS AND TIRES

CONTENTS OF THIS SECTION

GENERAL DESCRIPTION

Drop center rim, steel wheels, secured by left-hand thread nuts on left side of car and right-hand thread nuts on right side of car are used on all models. The rim width is 5½" and wheel diameter 15". Low pressure 7:10-15, 4 ply tubeless tires (Fig. 10-1) are standard equipment on all models except the station wagon where 7:60-15, 4 ply tubeless tires are used and the heavy duty chassis which uses 7:60-15, 6 ply rating tubeless tires. 7:60-15, 4 ply tubeless tires are optional on all models except the station wagon.

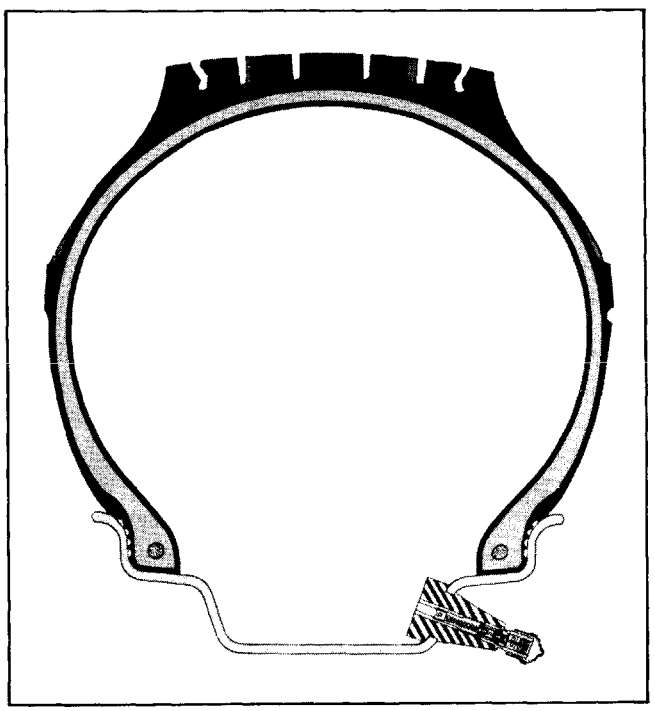

Fig. 10-1 Cross Section of Typical Tubeless Tire

Owners who want to use 6 ply rating tires usually do so with the idea of securing longer tire life. Six ply rating tires should not be used unless extraordinarily heavy loads are to be carried and then, to obtain longer life from these tires, it is necessary to carry higher inflation pressures. When this is done the owner sacrifices the easy riding qualities afforded by 4 ply tires with lower air pressure.

Six ply rating tires are, therefore, not recommended except on the heavy duty chassis or on other models used to carry heavy loads, such as heavy samples in the case of a traveling man, or when pulling a trailer which imposes a heavy load on the rear of the car. Wheels having heavier rims are used with 6 ply rating tires.

PERIODIC SERVICE

INFLATION OF TIRES

Maintenance of correct inflation pressure is one of the most important elements of tire care. The inflation pressure recommended for any model of car is carefully worked out as the best pressure to give a correct balance of those factors in good car performance which are affected by inflation pressure. Some of these factors are: satisfactory ride, stability, acceptable steering, even tread wear, tire carcass cord life and resistance to stone bruises.

Common opinion is that inflating a tire above the manufacturer's recommended pressure will give increased life. This, however, is in error as overinflation can be as bad as underinflation, since it not only results in wear at the center of the tread but also makes the tire more subject to casing breaks,

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Tires should be checked once a month and if necessary inflated to the recommended pressures.

Wherever possible, tire pressure should be checked with tires at atmospheric temperature and corrected if necessary. It is normal for air pressure to increase in a tire due to driving conditions. This fact has been considered in recommending the pressure for cold tires.

When impossible to check air pressure at atmospheric temperature, it may be checked with tires warm, using pressure recommended for city and highway driving given in specifications. It must be recognized that this method is not as accurate as checking pressure at atmospheric temperature since one driver's tires may get warmer than another driver's due to differences in speed, acceleration, and braking.

Tire valve caps should always be reinstalled on the valve and tightened finger tight as they assist in keeping air in the tire in case of a valve leak, and keep dust and water out of the valve.

IMPORTANT: Always check tires as recommended above and with an accurate gauge.

Higher inflation pressure than recommended will give:

1. A harder riding car.

2. A tire carcass more susceptible to bruising or carcass damage directly under the tread.

3. Poorer traction at rear wheels resulting in uneven wear.

4. Fast tread wear at center.

Lower inflation pressures than recommended will give:

1. Rapid and uneven wear on the edges of tire tread.

2. A tire more susceptible to rim bruises and various types of rupture.

3. Increased cord fatigue or broken tire cords.

4. Harder steering.

5. Higher tire temperatures.

6. Increased tramp and shimmy troubles.

7. Increased car roll when turning a corner or making a sharp swerve in traffic.

8. Increased tire squeal on turns.

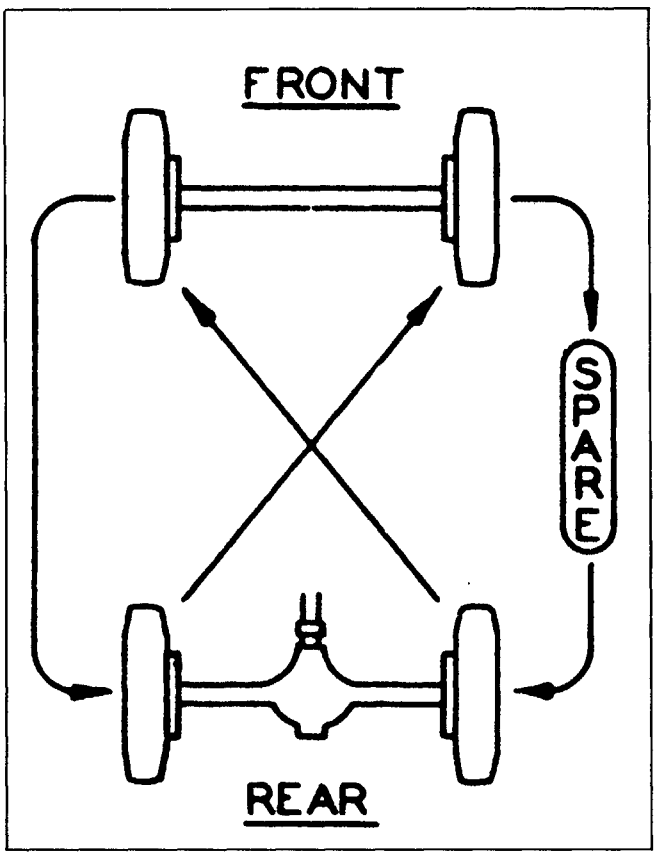

Fig. 10-2 Diagram for Switching Tires

TIRE SWITCHING

Uneven tire wear is frequently the cause of tire noises which are attributed to rear axle gears, bearings, wheels, etc., and at times unnecessary work has been done on rear axle assemblies in an endeavor to correct this noise.

To minimize the possibility of tire noise and equalize wear, it is recommended that tires be interchanged, as shown in Fig. 10-2, at regular intervals of approximately 4000 miles and more frequently in the case of an owner that gives his tires extremely hard wear. This will effectively prevent undue wear on any particular tires which might cause excessive noise. More important from the owner's viewpoint, will be equalization of wear on all tires and the savings made through getting some use from the spare tire which all too often is allowed to remain as a spare until the other tires are worn out. When this occurs, the spare tire, while appearing to be new, will actually have deteriorated through disuse. Note that if the interchanging of tires is followed each 4000 miles in accordance with Fig. 10-2, all tires will have had the same number of miles in each wheel position at the end of the fourth change or when ready to

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interchange tires for the fifth time. The car will have been driven 20,000 miles but each tire will have only 16,000 miles of use.

When tires are switched they should be inspected for signs of abnormal wear, bulging, etc., and all stones, nails, glass, etc., removed before reinstalling tire and wheel on car.

MINOR REPAIRS

TIRE MOUNTING AND DISMOUNTING INSTRUCTIONS

Removing or installing tires on drop center rims is not difficult if the instructions given below are followed. Ordinarily two 16″ tire tools are all that are required. If tools larger than 16″ appear necessary, it is evident that the method of applying the tires is incorrect and instructions should be reviewed.

TO TEST FOR LEAKS

1. Use soapy water to check valve area for leaks. In many cases air loss can be corrected by simply tightening the valve core.

2. If the reason for air loss is not immediately discernible, submerge the complete wheel assembly in a tank of water.

3. Mark the tire and rim at the point where air is escaping.

TO REMOVE TIRE FROM WHEEL

1. Remove valve cap and valve core. Let out all the air.

2. Break beads away from rim. If possible use a breaker tool, either mechanical or manual type. Otherwise the usual hand-tool method may be used.

3. Remove the first bead, using the machine method if available, otherwise the hand-tool method.

4. During the entire operation of breaking beads away from the rim and removing tire from rim, special care should be taken not to damage the rubber "rim-seal" ridges which are molded to the outside of the tire along the beads.

PUNCTURE REPAIRS

Puncture repairs may be quickly and permanently performed using one of several kits available through tire manufacturers' dealer outlets.

WHEEL LEAKS

Examine rim flanges for sharp dents. Any dent visible to the eye should be straightened. The rim flanges should be thoroughly cleaned with No. 3 coarse steel wool thereby removing all oxidized rubber, soap solution, etc. If the flange is rusted, it can be cleaned with a wire brush or in extreme cases of pitted rims a file can be used.

In isolated cases loss of air may result from loose rivets. If the leak is minute and the rivet is not perceptibly loose, the leak can be sealed with a cement available from tire manufacturers for this purpose. If the rivet is noticeably loose or the air leak is large replace the wheel.

CAUTION: Under no condition should loose rivets or wheels be brazed, welded or peened.

TO INSTALL TIRE ON WHEEL

PREPARATION OF RIM

Check these points to prevent air loss . . .

1. Using a small piece of steel wool or emery cloth, clean all particles of foreign matter from rim ledges and flanges.

2. Straighten the rim if it is bent or damaged.

MOUNTING AND INFLATING THE TIRE

The general procedure for inflating tubeless tires is to mount the casing on the rim so that the beads are resting uniformly on the bead ledge and quickly apply a large volume of air. This forces the bead over the bead seat and against the flanges where the air seal for the tire is obtained. A thin vegetable oil soap solution may be used for bead lubrication.

1. Mount the tire on the wheel using either the machine method or the hand-tool method.

2. Remove valve core from stem to increase flow of air during inflation.

3. Inflate with wheel in vertical position until beads are completely forced against rim flanges.

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4. Seating the Beads: Snap beads out against rims, using either of these three methods:

(a) Bounce tire at various points around its circumference.

(b) Rubber Mallet . . . strike center tread area of tire around tire's circumference.

(c) Bead Expander.

5. Once the beads are seated against the rim flanges, the air can be released from the valve, the valve core inserted and inflation completed in a normal fashion.

6. General precautions in mounting tubeless tires:

(a) Use tire irons free of "burrs".

(b) Pry bead over rim flange so that the section nearest the valve stem will be applied last.

(c) Take small bites with tire iron to avoid damaging the rim seal ledges.

TIRE INSPECTION

A careful inspection of tires will often indicate car defects or poor driving practice such as improper wheel alignment, grabbing brakes, fast cornering, etc., which should be given attention. Below are listed several common types of irregular tire wear and possible causes:

UNDERINFLATION

The result of underinflation is shown in Fig. 10-3. Car weight distorts the normal contour of the tire body and the tire bulges or "bellies out" with an extreme flexing action. This wears the tread at the edges more than the center and generates excessive internal heat weakening the cords and resulting in bruises, broken cords or ply separation. Underinflation also leads to rim bruises as insufficient resistance is provided to prevent the tire from being jammed against the rim and crushed or cut when the tire strikes a curb, rock, or rut.

OVERINFLATION

The result of overinflation is shown in Fig. 10-4. When a tire is overinflated, increased tension caused by excessive pressure prevents proper deflection of the sidewalls. This results in wear in the center of the tread and the tire also loses its ability to absorb road shocks. Under this increased strain, cords in the tread area eventually snap under impact, causing either a characteristic X-break or diagonal break.

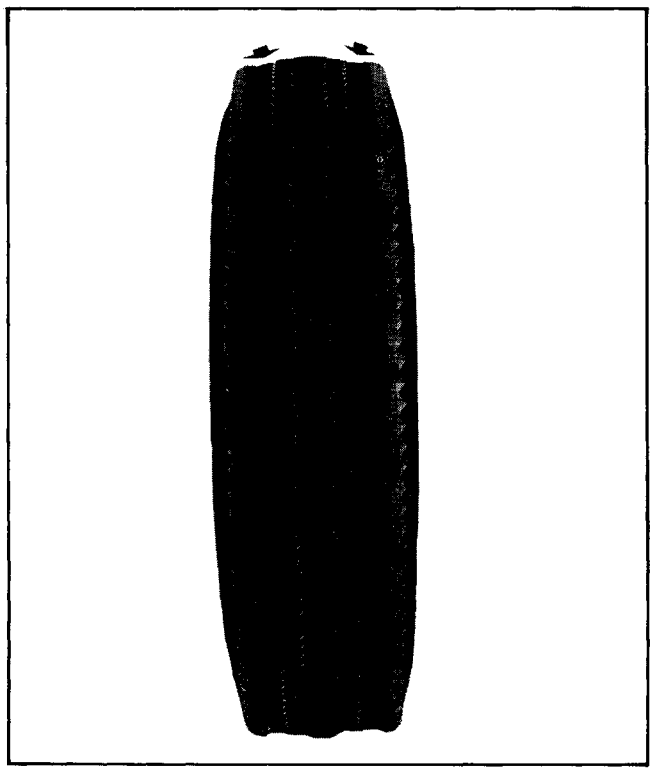

Fig. 10-3 Wear from Underinflation

Fig. 10-4 Wear from Overinflation

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SIDE WEAR (CAMBERING OR CORNERING WEAR)

There are three reasons why tires wear more rapidly on one side of the tread than on the other.

1. Wheel camber causes the tires to run at a certain angle from the perpendicular, resulting in side wear.

2. Side thrust when rounding turns causes wear on the side of the treads. In making a turn to the left, especially at high speeds, the outside shoulder of the right tire and the inside shoulder of the left tire take most of the wear. When making a right-hand turn, the opposite shoulders of the tires are worn.

3. High cambered roads cause increased wear on the side of the right front tire. This is particularly true when there is too much toe-in on front wheels or when positive camber of right front wheel is greater than the left.

Cornering wear can usually be differentiated from camber wear because cornering wear affects both sides of the tire giving it a very round appearance (Fig. 10-5). When camber is incorrect it will cause excessive wear only on one side of the tire tread. Camber wear does not leave the tread rounded as cornering wear does.

When cornering wear is encountered, the owner should be shown, by the rough tire surface and rounded shoulders, that he is severely abrading his tires by fast or sharp turns, and told that he could greatly prolong the useful life of his tires by taking the turns a little slower. The tires and wheels should be switched (Fig. 10-2) and continued in service the same as with normal camber wear.

TOE-IN OR TOE-OUT MISALIGNMENT WEAR

Front wheels should be straight ahead or toe-in slightly. When there is excessive toe-in or toe-out, tires will revolve with a side motion and scrape the tread rubber off. If the misalignment is severe, the rubber on both tires will be scraped off, but if the misalignment is slight, the rubber on only one tire will be scuffed off.

In general, if front right tire shows most wear, toe-in or right camber is excessive. If front left shows most wear, toe-out or left wheel camber is excessive.

The scraping action against the face of the tire causes a small feather edge of rubber to appear on one side of the tread design. This feather edge is the evidence of irregularity, as shown in Fig. 10-6.

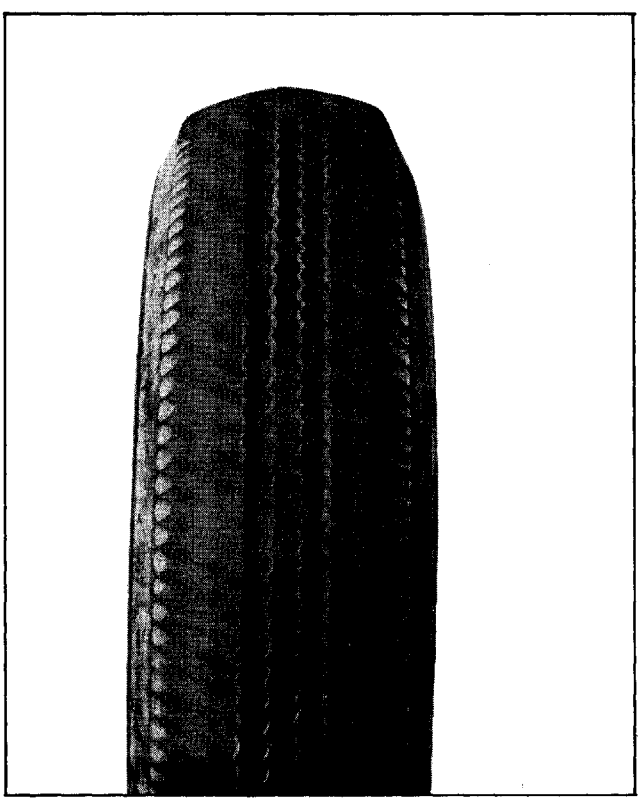

Fig. 10-5 Cornering Wear

Fig. 10-6 Toe-in or Toe-out Misalignment Wear

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UNEVEN TIRE WEAR

Other types of uneven tread wear such as a single spot or series of cuppings around the tire circumference (Fig. 10-7) may also be noted on some tires. Such uneven wear may be due to excess toe-in or toe-out with underinflation, uneven camber, or such irregularities as bent suspension, wobbly wheels, out of round brake drums, and unequally adjusted brakes.

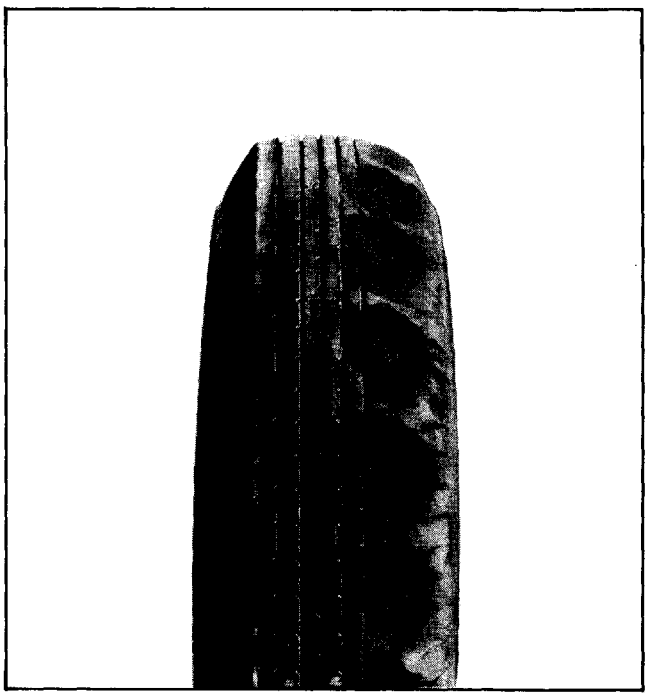

Fig. 10-7 Spot Wear

TIRE TROUBLE DIAGNOSIS AND TESTING

Interpretation of various types of tire conditions as revealed by detailed inspection has been covered under "Tire Inspection", page 10–4. There are other considerations in diagnosing tire troubles on tire wear, shimmy, etc., which should be kept in mind.

TREAD WEAR

While tread wear is affected by wheel alignment cornering, inflation pressure, etc., as mentioned previously, there are several other factors which must be considered in analyzing tread wear.

A careful driver may obtain many times the mileage from his tires as would be obtained by a severe driver. Also, tires wear much faster in some localities depending on the type of road (some of which are more abrasive than others), whether the road is wet (rain or snow), the number of sharp turns, hills or mountains the car must go up or down, and the prevailing temperature. Fast driving, quick starting, and hard stopping are generally recognized as a definite cause of rapid tread wear. Temperature is often not considered to be as great a factor in tire life as it actually is. By actual test an increase of 40°F in temperature reduces tread mileage by 33%.

TIRE BALANCING

Many tires are marked at the factory with a red mark on the sidewall near the bead. This mark denotes the light point of the tire and should be mounted at the valve stem. If no red mark is found on the casing the tire has been balanced by the manufacturer and no special mounting is needed.

Factory specifications call for wheel and tire assemblies to be in balance within 25 inch ounces maximum. When outside this maximum, balance weights are applied to the inside rim flange to bring the balance within production limits. Since a sensitive wheel balancer will indicate out of balance less than the production limit of 25 inch ounces, wheels on a new car, if checked on such equipment, may indicate an unbalanced condition when the wheels are within acceptable production limits.

Tramp or shimmy may be caused by radial run-out or eccentricity of the tire and wheel assembly as well as out of balance. This will be seen as a variation in the radius of the tire and wheel assembly when revolving the wheel with the car jacked up. Radial run-out may be caused by a variation in tire tread surface caused by skidding, a bent or distorted wheel, or an improperly mounted tire.

TESTING FOR TIRE NOISES

The determination of whether tires are causing the noise complained of, can be determined by the following procedure:

Check car to see if snow tires are being used. These tires have a characteristic noise which the owner will have to ignore or overlook. If not equipped with snow tires, drive the car at various speeds and note the effect of throttle opening, sudden acceleration, and deceleration on the noise. Axle and exhaust noise show definite variations under these conditions while tire noise will remain constant. Tire noise generally is most pronounced on smooth black top roads at speeds between 15 and 40 miles per hour.

Carefully inspect the tire making the noise for bulges, irregular wear, low air pressure, toe and heel

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(saw tooth) wear, and unusual tread design (ribbed tread gives less noise than some all weather treads; mud and snow treads are very noisy). Checking wheel alignment and interchanging tires will usually cure tire noises unless caused by tire tread design, heavy irregular tread wear, or tire bulges.

Tire thump is the periodic noise at wheel speed and is prominent only on smooth black top pavement that is free of surface irregularities. Tire thump may be checked by driving the car over smooth black top pavement with the tires at normal pressure, and again over the same stretch of road with the tires inflated to 50 lbs. and dropping the pressure in one tire at a time to normal. CAUTION: *Be careful not to strike any obstructions or rocks in road with tires at 50 lbs. pressure as this will lead to a rupture in the casing. Operate car with higher inflation only while testing.* Do not operate car over 50 MPH with high tire pressure.

If the noise is caused by tires, it will noticeably decrease when tire pressure is increased. By lowering tire pressure one wheel at a time the noise can be traced to the tire or tires with which it reappears as tire pressure is lowered.

SPECIFICATIONS

SUBJECT	ALL MODELS
Wheels	Steel Disc
Type	Drop Center
Diameter	15"
Width	5½"

TIRES

TIRE SIZE		Starting Pressure (after car has been standing for three hours)	City Pressure (after driving car three miles or more below 40 MPH)	Highway Pressure (after driving car three miles or more above 40 MPH)
7.10-15 (4-ply)	Front	24 lbs.	27 lbs.	29 lbs.
	Rear	24 lbs.	27 lbs.	29 lbs.
7.60-15 (4-ply)	Front	22 lbs.	25 lbs.	27 lbs.
	Rear	20 lbs.	23 lbs.	25 lbs.
With Air Conditioning	Front	24 lbs.	27 lbs.	29 lbs.
	Rear	20 lbs.	23 lbs.	25 lbs.
Station Wagon 7.60-15 (4-ply)	Front	26 lbs.	29 lbs.	31 lbs.
	Rear	26 lbs.	29 lbs.	31 lbs.
With Air Conditioning	Front	26 lbs.	29 lbs.	31 lbs.
	Rear	26 lbs.	29 lbs.	31 lbs.

IT IS NORMAL FOR AIR PRESSURE TO BUILD UP IN A TIRE DUE TO DRIVING CONDITIONS: THEREFORE, DO NOT LET AIR OUT OF TIRES TO REDUCE THIS INCREASE IN PRESSURE.

SERVICE CRAFTSMAN NEWS REFERENCE

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