CONTENTS

DESCRIPTION

Front and rear wheels with integral drop center rims are each bolted, by means of five wheel bolts to a wheel hub, together with the brake drum. The front hubs are mounted on the steering knuckles and are each installed on two opposed tapered roller bearings which are adjustable (Fig. 312).

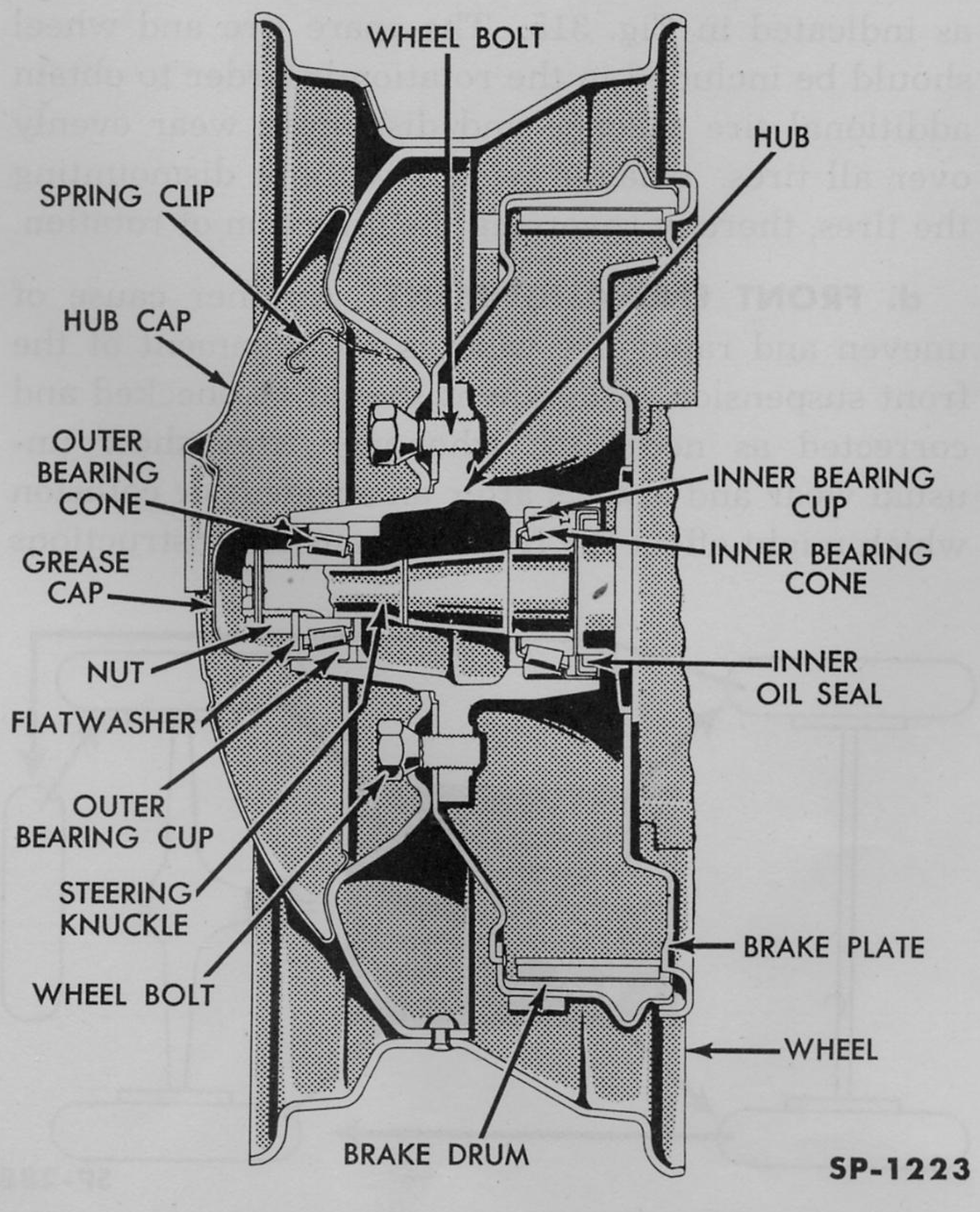

Fig. 312—Sectional View of Front Wheel and Hub Installed

Rear hubs are keyed directly onto the ends of the rear axle shafts and the axle shafts are supported in tapered roller bearings in the ends of the axle housing (Fig. 313).

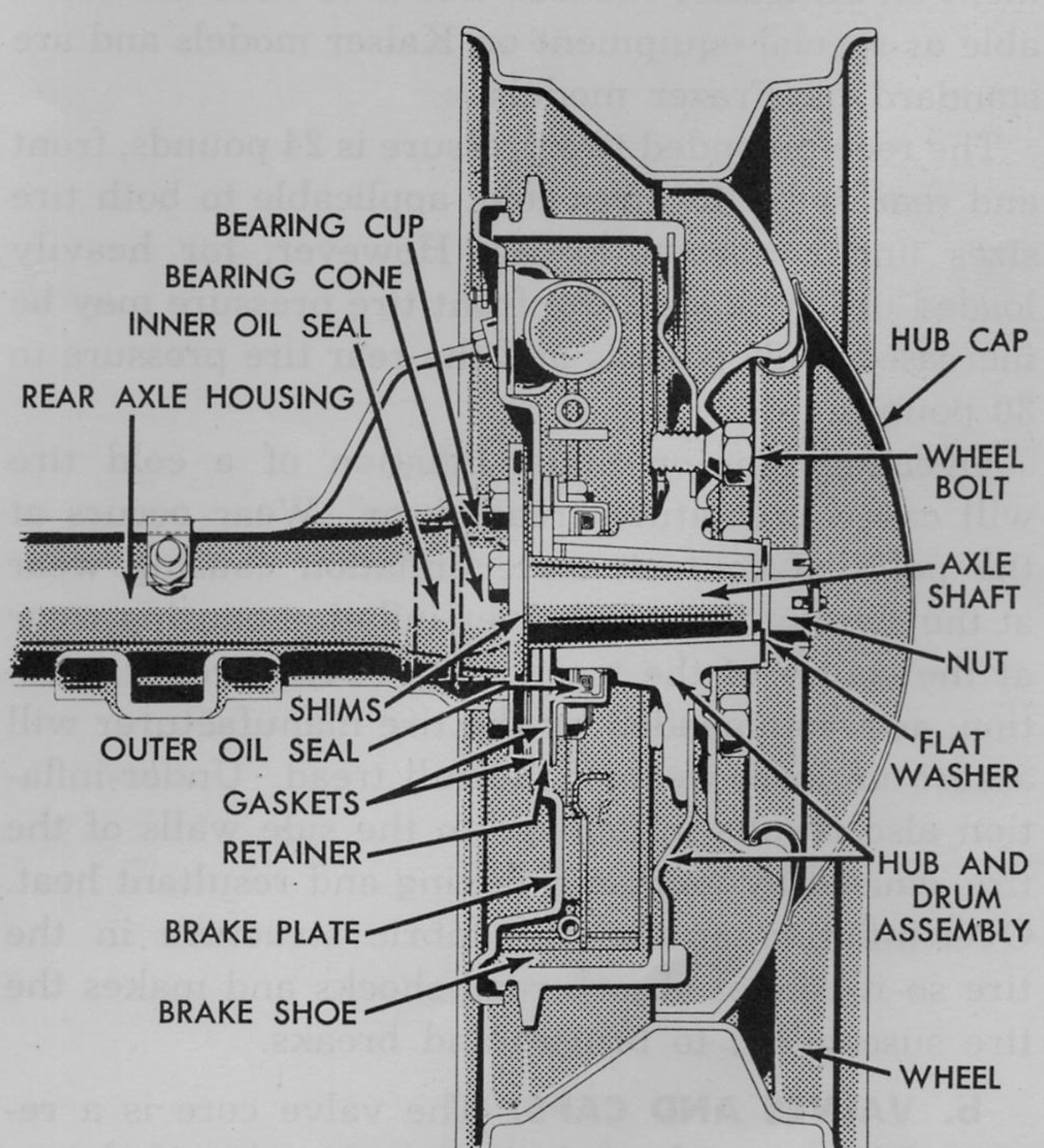

Fig. 313—Sectional View of Rear Wheel and Hub Installed

The front wheel bearings and the rear axle shaft bearings require periodic lubrication. For information on rear axle shaft bearings refer to Section 9, "Rear Axle."

In addition to service operations relative to hubs, wheels and tires, information which is essential in preventing irregular and rapid tire wear, and which will help to assure smooth riding and easy steering, is provided in this section of the manual.

TIRE MAINTENANCE

a. TIRE INFLATION. Systematic and proper tire maintenance is essential to economical and safe automobile operation. Proper tire inflation is one of the most important of the maintenance operations and yet is frequently neglected. Tires in ordinary use should be checked for proper pressure once each week.

Tire pressures vary with temperature, the pressure increasing when tires are hot. Tire pressure should be checked only when tires are cold, i.e., before operation. Tires should be inflated or deflated as necessary to obtain the proper pressure.

To assure easy operation and perfection in riding qualities, 6.70 x 15 tires are used as standard equipment on all Kaiser models; 7.10 x 15 tires are available as special equipment on Kaiser models and are standard on Frazer models.

The recommended tire pressure is 24 pounds, front and rear, with the tires cold, applicable to both tire sizes under normal loads.. However, for heavily loaded utility models the front tire pressure may be increased to 26 pounds and the rear tire pressure to 30 pounds.

Over-inflation or under-inflation of a cold tire will cause premature tread wear. Wear occurs at the point of contact, under-inflation causing wear at the sides of the tread, over-inflation causing wear at the center of the tread (Fig. 314). Proper inflation, as recommended by the tire manufacturer will assure uniform wear of the full tread. Under-inflation also results in damage to the side walls of the tire, caused by increased flexing and resultant heat. Over-inflation strains the fabric structure in the tire so it cannot absorb road shocks and makes the tire susceptible to bruises and breaks.

b. VALVES AND CAPS. The valve core is a replaceable spring loaded check valve threaded into the valve stem, permitting inflation or deflation of the tube. This valve and the valve cap are used to seal the air in the tube. When the valve cap is tightened down over the end of the valve stem a sealing washer inside the cap prevents air leakage. The check valve, or valve core, should be replaced as necessary and valve caps should be used at all times.

c. TIRE ROTATION. Inasmuch as each tire is subjected to different operation conditions, certain normal irregularities of tire wear will occur. This wear will be reduced to a minimum by periodic rotation

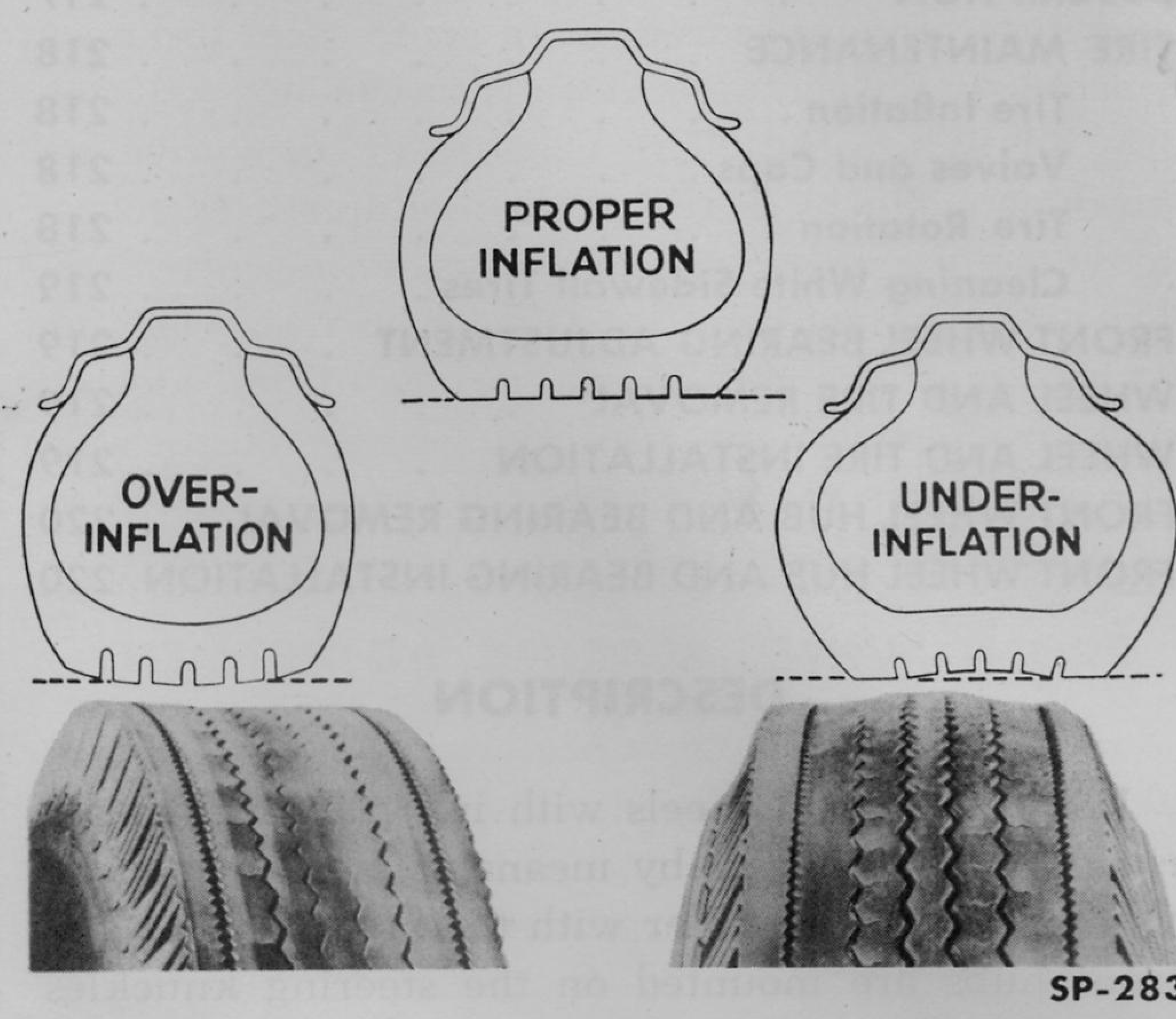

Fig. 314—Effect of Inflation on Tire Tread to Road Contact

or switching of wheels at 2,500 to 3,000 mile intervals as indicated in Fig. 315. The spare tire and wheel should be included in the rotation in order to obtain additional tire mileage and distribute wear evenly over all tires. Change wheels without dismounting the tires, thereby reversing the direction of rotation.

d. FRONT END ALIGNMENT. Another cause of uneven and rapid tire wear is misalignment of the front suspension. Alignment should be checked and corrected as necessary whenever tires show unusual wear and always after an accident or collision which might affect the front suspension. Instructions

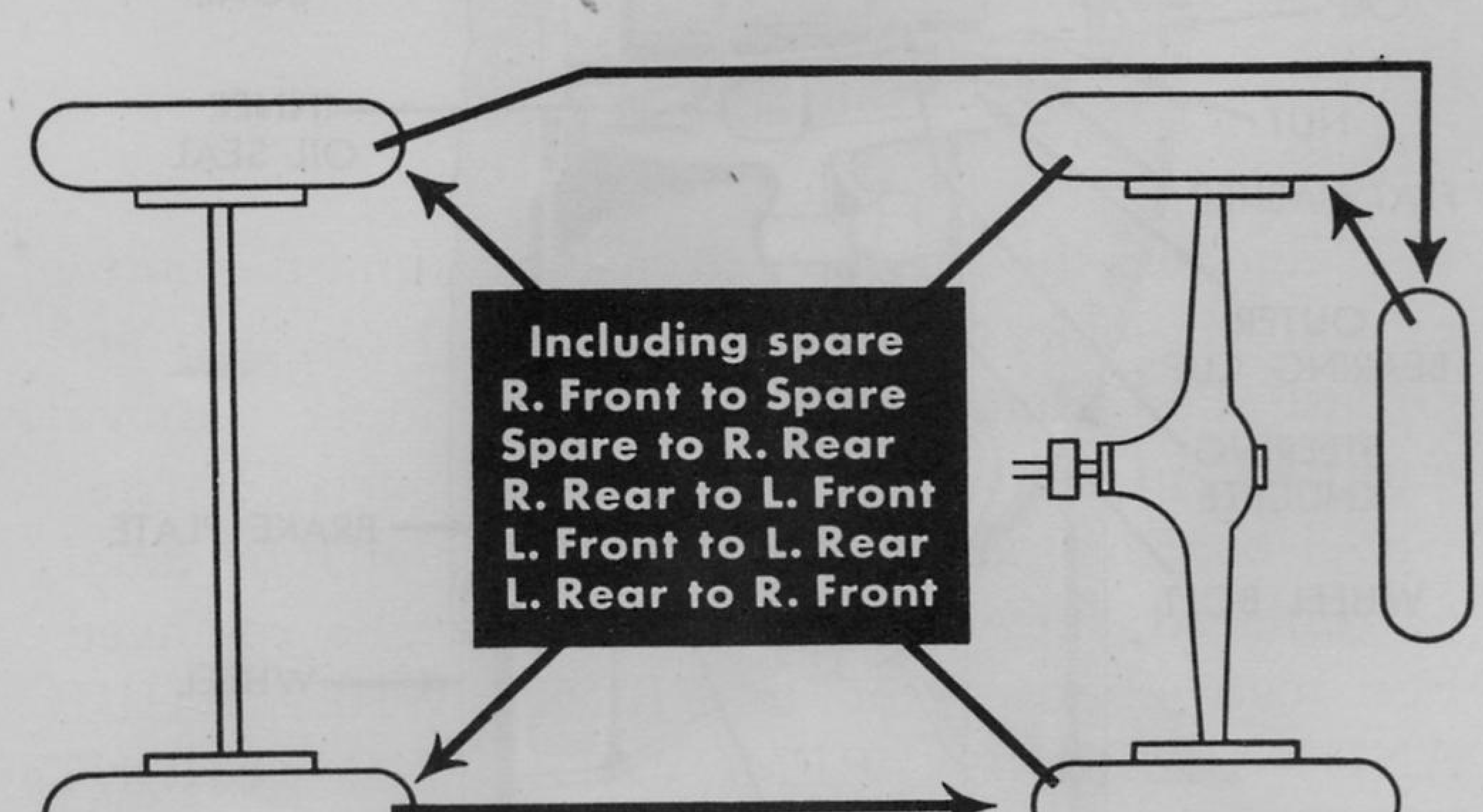

Fig. 315—Tire Rotation Diagram

for checking front end alignment are given in detail in Section 8, "Chassis Suspension."

e. CLEANING WHITE SIDEWALL TIRES. White sidewalls of tires often become scuffed and dirty and require cleaning to restore their original whiteness and decorative appearance. In some cases ordinary washing will clean the sidewalls satisfactorily. If not, use KF White Side Tire Cleaner or an equivalent product made by a reputable manufacturer to remove scuff marks, grease and other discoloration. Do not use steel wool or a tire brush for cleaning as resultant scratches in the surface of the sidewall may produce serious cracking. Use the cleaner according to the manufacturer's recommendations as printed on the container.

FRONT WHEEL BEARING ADJUSTMENT

a. GENERAL. Front wheel bearings are adjustable and, therefore, should be checked periodically and, if necessary, adjusted. Wheel bearing lubrication, required every 10,000 miles, provides a good opportunity periodically for bearing adjustment. Long bearing life depends on correct adjustment and proper lubrication.

b. CHECKING ADJUSTMENT. With front wheels jacked up and brakes released, check for end-play of the wheel on the steering knuckle by grasping the tire at the top and pushing and pulling alternately. If bearings are loose, there will be perceptible end-play or side movement of the wheel. Then, if bearings are not loose rotate the wheel to check for tightness—the wheel should turn freely without drag. If the wheel drags make sure it is not the brakes dragging instead of tight wheel bearings. If bearings are too tight, overheating will result. If bearings are too loose, it will cause pounding.

c. ADJUSTMENT PROCEDURE (Fig. 312).

1. Release the brakes and jack up the front wheels.

2. Remove the hub cap, grease cap, and the cotter pin which locks the hub nut. Use Hub Cap and Grease Cap Remover C-438 to facilitate removal and prevent denting or marring the parts. If front wheel bearings are to be inspected and lubricated, or replaced, the wheel and hub must be removed. For instructions refer to FRONT WHEEL HUB AND BEARING REMOVAL AND FRONT WHEEL HUB AND BEARING INSTALLATION elsewhere in this section.

3. Turn the hub nut up tight on the steering knuckle spindle to seat the bearings. Then back off the nut until end-play is evident and tighten again until there is no end-play. Back off the nut only enough to install the cotter pin.

4. Install the cotter pin, grease cap (do not put grease in the grease cap) and the hub cap. Use Grease Cap Installing Drift C-575 to prevent denting the grease cap. Check adjustment as described under CHECKING ADJUSTMENT above. Remove the jack.

WHEEL AND TIRE REMOVAL

a. The wheel and tire should be removed from the hub before attempting to remove the tire from the wheel. Proceed as follows:

1. Set the hand brake and jack up the wheel to be removed.

2. Remove the hub cap for access to wheel bolts. Use Hub Cap Remover C-438 to prevent denting or marring hub cap.

On all Kaiser Deluxe Models the hub cap and chrome trim ring are integral and can be removed by inserting Hub Cap Remover C-438 under rim of trim ring at the valve stem.

3. Remove the five wheel bolts attaching wheel to the hub. **NOTE: All wheel bolts have right hand threads.**

4. Lift the wheel and tire off the wheel hub.

5. Completely deflate the tire. Remove the valve core from the valve stem to do this quickly and easily.

6. It is usually necessary to break the tire beads loose from the wheel rim, for which operation Tire Removing Tool C-715 can be used effectively with tire and wheel flat on the floor, outside up. Then one bead at a time must be worked free over the side of the rim. This is best accomplished with a universal tire changer such as Modern Tire Changer C-833 but can also be done by using suitable flat steel tire irons to pry the bead over the edge of the rim.

7. Remove the tube from inside the tire.

WHEEL AND TIRE INSTALLATION

a. In general, installation of wheel and tire is accomplished by reversing the removal procedure.

Prior to installation, however, the following is recommended. When installing a synthetic tube, coat the inner diameter of the tube with a liquid vegetable oil soap. Also coat the tire beads with the same solution. This will assist the tube to shape itself during inflation without uneven stretching due to binding against tire beads and rim. Tire beads which are coated will slip over the rim much easier when installing tire and tube on the wheel. Then proceed as follows:

1. With the wheel flat on the floor, outside up, lay the tire over the wheel with the colored dot on the outside of the tire located at the valve stem hole in the rim. Tires are factory balanced to compensate for the weight of the valve stem in the tube and alignment of the dot on the tire and the valve stem will assure this balance. Press the lower tire bead over the upper edge of the rim.

2. Install the valve core in the valve stem and fit the tube into the tire, inserting the valve stem through the hole provided for it in the rim. Inflate the tube slightly to shape it to the tire. Then starting at the valve stem, force the upper bead of the tire over the upper edge of the rim.

3. With tire and tube on the rim, inflate tube slowly, at the same time watching to see that the tire beads expand evenly against the sides of the rim to avoid pinching the tube. Install the valve cap, tightening it with the fingers.

4. Place tire and wheel on the wheel hub.

5. Install the five wheel bolts, tightening them alternately and evenly to 85–90 foot pounds torque.

6. Install the hub cap on the wheel and remove the jack. Check the air pressure in the tire to be sure it is properly inflated.

FRONT WHEEL HUB AND BEARING REMOVAL

a. REMOVAL. (Fig. 312). Front wheel hubs, together with the brake drums, must be removed to inspect and lubricate wheel bearings, to replace wheel bearings and to inspect or repair the front wheel brakes. After the wheel and tire has been removed from the hub, remove the front wheel hub as follows:

1. Remove the grease cap using Grease Cap Remover C-438. Remove the cotter pin, nut and washer from the steering knuckle spindle.

2. Remove the outer bearing cone and pull the hub and brake drum off the spindle. Both bearing cups, the inner bearing cone and inner oil seal remain in the hub.

3. Remove the inner oil seal, inner bearing cone, and the inner and outer bearing cups from the hub. Pry the oil seal out with a screwdriver and after lifting out the cone, drive the cups out of the hub with a drift. These parts need to be removed only for cleaning or replacement.

b. CLEANING AND REPLACEMENT.

1. Clean bearing cups, cones and oil seal in a suitable solvent. Use a stiff brush to remove oil lubricant from bearings. Inspect oil seal carefully and if it is worn or was damaged when removed, discard it, replacing with a new oil seal. Blow bearings dry with compressed air, directing the air across the bearing. Do not "spin" the dry bearings. Inspect bearing rollers for wear, chipped edges, or other damage and replace if necessary. Check bearing cups for pits and cracks and replace if necessary.

2. Clean all old lubricant from the inside of the hub and from the spindle with solvent. Inspect parts carefully.

3. Hand pack bearings with lubricant as specified in Section 17, "Lubrication."

FRONT WHEEL HUB AND BEARING INSTALLATION

a. INSTALL BEARING AND OIL SEAL PARTS IN HUB (Fig. 312). When necessary to replace the hub and drum assembly, bearing parts, or the oil seal, new parts identical to those discarded must be used. Install parts in hub as follows:

1. Drive or press bearing cups into hub with the thick side of each cup toward the center of the hub. Cups must not be cocked and must bottom against the shoulder in hub.

2. Fit the inner bearing cone into the inner bearing cup and install the inner oil seal. With the flat side of the oil seal facing outward, press the seal into the inner end of the hub until the seal is flush with the end of the hub. Do not cock the oil seal in the hub.

Interchangeable front wheel inner bearing oil seals of two types, ¼ inch and ½ inch wide are being used in production and service. Both types of seals should have the seal lip toward the bearing or center of hub. **CAUTION: When installing seals of ¼ inch width use only one seal per hub.** Do not install two thin seals to equal the width of the thick type. This is not necessary or practical.

b. INSTALL HUB AND BRAKE DRUM ASSEMBLY.

1. Install hub and brake drum assembly on the steering knuckle spindle, being careful not to damage the oil seal.

2. Place outer bearing cone on end of spindle and push it into place in outer bearing cup.

3. Install the washer and hub nut on the threaded end of the spindle and adjust the wheel bearings as described under FRONT WHEEL BEARING ADJUSTMENT.

4. Install the wheel and tire on the hub as described under WHEEL AND TIRE ADJUSTMENT, beginning with item 4. Check the wheel bearing adjustment.

WHEEL AND TIRE BALANCING

New tires and tubes are marked for assembly so that the heavy part of the tube at the valve stem will be counterbalanced by a light portion of the tire. Then for top riding qualities and best steering performance, the tire and tube should be balanced together with the wheel, brake drum and hub after mounting the tire. A wheel assembly can lose its original balance due to uneven tread wear, tube and tire repairs, etc.; therefore, it is desirable to check the balance of any wheel assembly before installing the assembly in service. Wheel balance should be one of the first items to check if any steady disturbance, especially at high speeds, is noticed at the steering wheel and is judged to come from the front wheels.

Wheel balance is the equal distribution of the weight of the wheel, tire and tube, brake drum, and hub around the axis of rotation. The complete wheel assembly should be balanced two ways—statically and dynamically. Balancing equipment made for the purpose is required and should be used as instructed by the equipment manufacturer. Static and dynamic balancing are explained below.

a. STATIC BALANCE. Static balance (or still balance) is the equal distribution of the weight of the wheel assembly around the axis of rotation so that the assembly has no tendency to rotate by itself, regardless of its position. Any wheel assembly with a heavy side, which will rotate by itself until this part of the assembly is at the bottom, is not statically balanced.

After checking the static balance of a wheel assembly, an unbalanced condition is corrected by attaching a suitable weight to the rim of the wheel at a point diametrically opposite the heavy point of the wheel assembly.

A wheel which is not statically balanced causes an up and down hopping or pounding action. The greater the unbalanced weight or the greater the speed the more pronounced the condition becomes and steering stability is affected accordingly.

b. DYNAMIC BALANCE. Dynamic balance (or running balance) is the even distribution of the total weight of the wheel assembly around the axis of rotation (static balance) **and also in relation to the centerline of the wheel.** A wheel can be in static balance and not be balanced dynamically but a wheel in dynamic balance has to be in static balance.

A dynamically balanced wheel must run smoothly at all speeds on the axis which runs through the centerline of the wheel, with the wheel at a right angle to the axis of rotation.

If the weight of the wheel is unevenly distributed in relation to the centerline of the wheel, centrifugal force when the wheel is turning will move the wheel and the spindle on the steering knuckle king pin. The force will throw the wheel out of line first in one direction and then in the opposite as the wheel rotates 180 degrees, causing wheel shimmy or wobble. Such a wheel is not dynamically balanced.

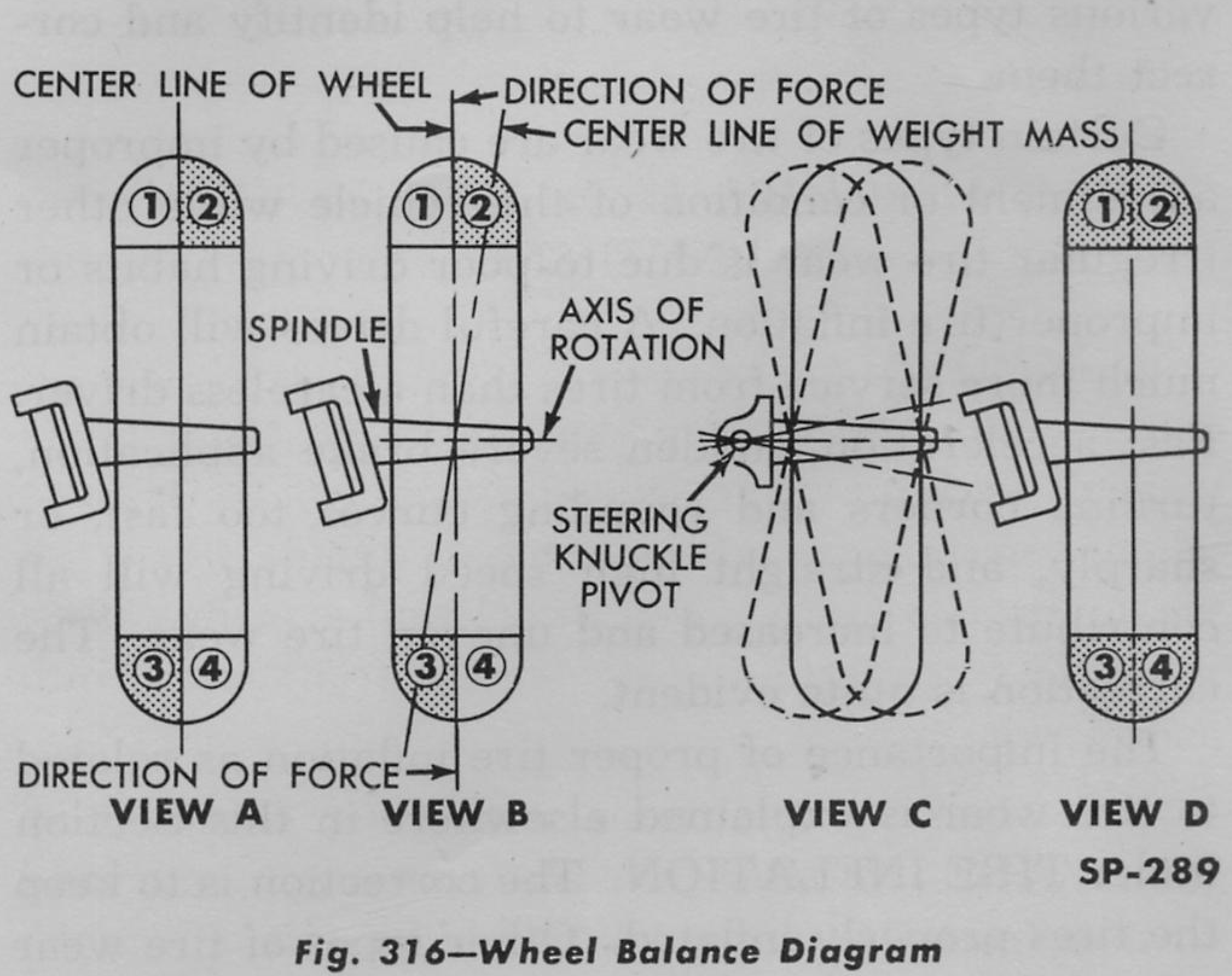

Fig. 316—Wheel Balance Diagram

To correct the condition weight must be added so that the total weight is evenly distributed in relation to both the axis of rotation and the centerline of the wheel.

This is illustrated in Fig. 316. In "View A" a wheel in static balance is shown, sections indicated by numerals 1 and 4 being equal in weight and sections 2 and 3 also being equal in weight but heavier than sections 1 and 4. This wheel is not dynamically balanced. As this wheel rotates the centerline of the weight masses 2 and 3, indicated in "View B," is pulled by centrifugal force toward a right angle to the axis of rotation, the force being directed as shown by the arrows. The force tends to move the wheel, distorting the centerline of the wheel and, at the same time, the axis of rotation.

When the wheel rotates 180 degrees the forces caused by heavy sections 2 and 3 reverse and tend to move the centerline of the wheel in the opposite direction. In other words, the wheel wobbles or shimmies as shown in "View C." To correct this condition weight must be added to sections 1 and 4 so they will be equal to the weights of sections 2 and 3. This addition of weight distributes the total weight evenly about the axis of rotation and the centerline of the wheel as shown in "View D" and the wheel is both statically and dynamically balanced.

TIRE WEAR

a. GENERAL. Irregular tire wear is due to some condition which causes certain parts of a tire to wear more rapidly than others. The only way to correct such wear is to determine the cause and correct it. Information which follows will explain various types of tire wear to help identify and correct them.

Certain types of tire wear are caused by improper adjustment or condition of the vehicle while other irregular tire wear is due to poor driving habits or improper tire inflation. A careful driver will obtain much more service from tires than a careless driver. Fast acceleration, sudden severe brake application, turning corners and rounding curves too fast, or sharply, and straight high speed driving will all contribute to increased and uneven tire wear. The correction is quite evident.

The importance of proper tire inflation as related to tire wear is explained elsewhere in this Section under TIRE INFLATION. The correction is to keep the tires properly inflated. Other types of tire wear due to improper adjustment of the front suspension or other condition of the vehicle can be corrected by checking and correcting front end alignment or other improper conditions.

In addition to the above, the amount of tire wear per mile is also affected by outside temperature, the type and contour of the road surface, the number of sharp turns and the number of grades the vehicle must go up and down.

Wear characteristics by which various types of tire wear can be identified are explained under the following headings which indicate the cause of the wear.

b. SIDE OR CAMBER WEAR (Fig. 317). There are several causes for tires wearing more rapidly on one side of the tread than on the other. Wheel camber, either positive or negative, makes the tire run at a slight angle to the road surface and if camber is excessive, due to improper adjustment, it will cause faster wear on one side of the tread.

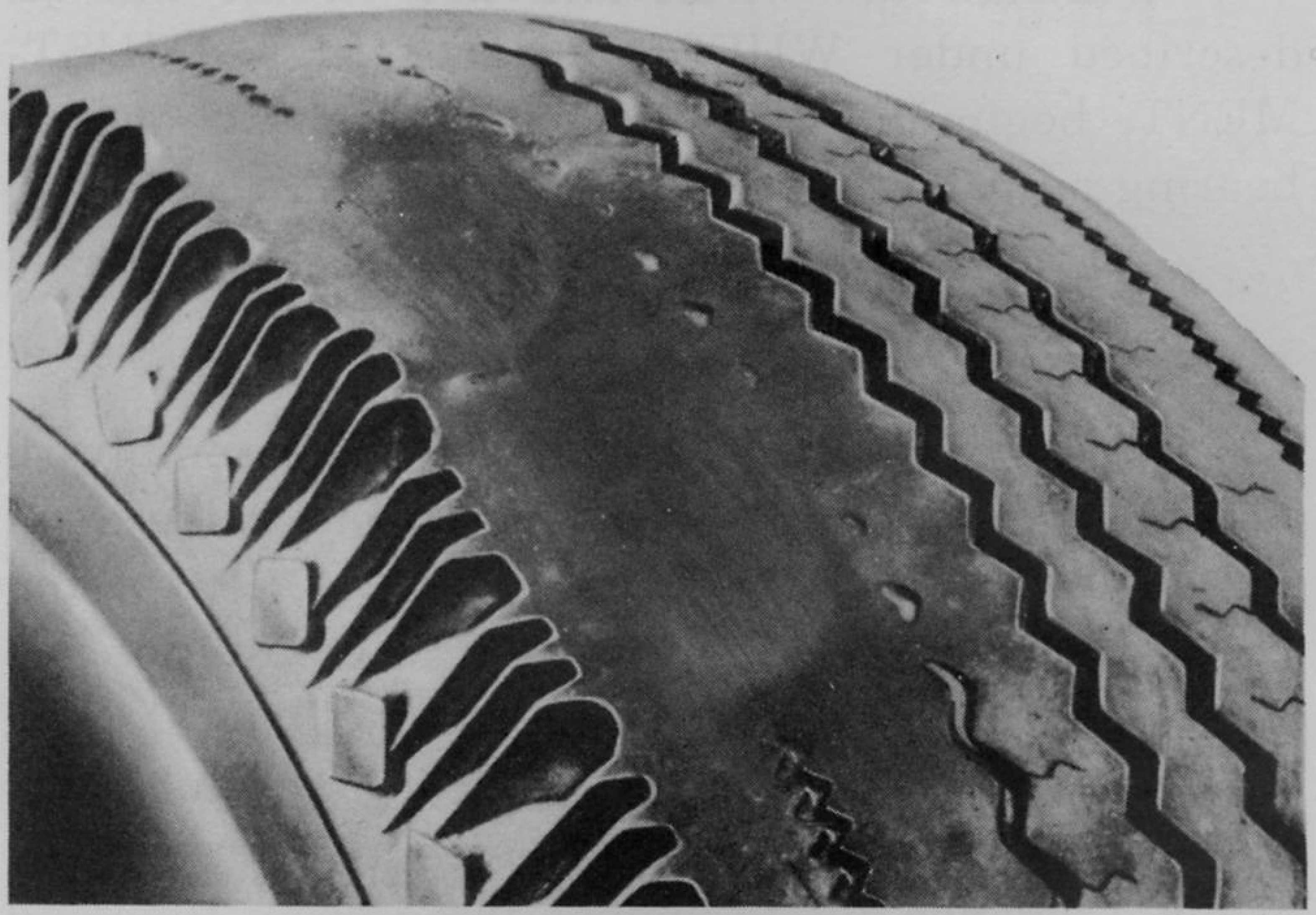

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Fig. 317—Side or Camber Wear of Tire Tread

Continual driving on high crowned roads will cause side wear on one side of the right front tire. Side thrust when turning also causes side wear. In turning left, particularly at high speeds, the outer edge of the right tire tread and the inner edge of the left tire tread will receive the load of the side thrust with resultant increased wear. Under-inflated tires will also wear on the sides of the tire tread.

Where side wear occurs the front wheel camber should be checked as described in Section 8, "Chassis Suspension."

c. HEEL AND TOE WEAR (Fig. 318). This wear results in a saw-tooth effect with one end of each tread block worn more than the other. The end which wears is that which first grips the road when the brakes are applied. High speed driving and excessive use of the brakes will cause this type of irregular tire wear and it occurs on any type of tread design.

Heel and toe wear is not so prevalent on rear tires because the driving action of the rear wheels produces a counter-action, wearing the opposite end of the tread block. These two wear forces wear the tread blocks in opposite directions. This results in wear which is more even than that on the front tires where the wear due to braking action is not opposed by driving action.

In addition to correcting driving habits, tires should be rotated as described under TIRE ROTATION to counteract heel and toe wear.

d. TOE-IN AND TOE-OUT WEAR (Fig. 319). When the front wheels toe-in or toe-out excessively, the tires drag at an angle to the direction of vehicle movement as they rotate, causing cross wear of the tire by scraping off tread rubber. This wear is usually distinguished by a feather edge of rubber on one side of the tread blocks.

If the feather edge is toward the inside of the tread on both tires, too much toe-in is indicated—toe-out is indicated when the feather edge is toward the outside of the tread on both tires.

If only one front tire shows toe-in wear and the other tire is worn to indicate toe-out, the two tires are probably not turning an equal number of de-

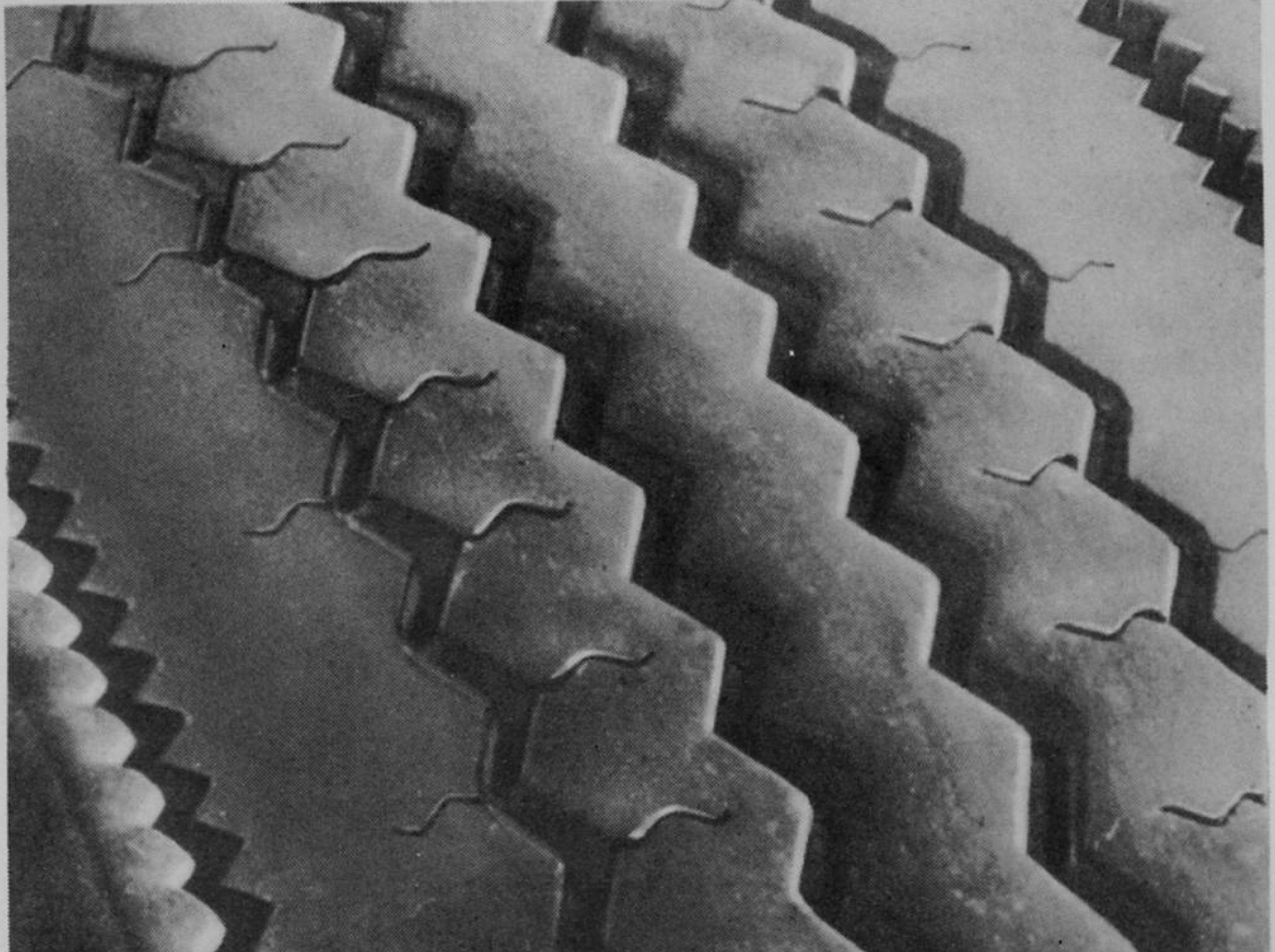

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Fig. 318—Heel and Toe Wear of Tire Tread

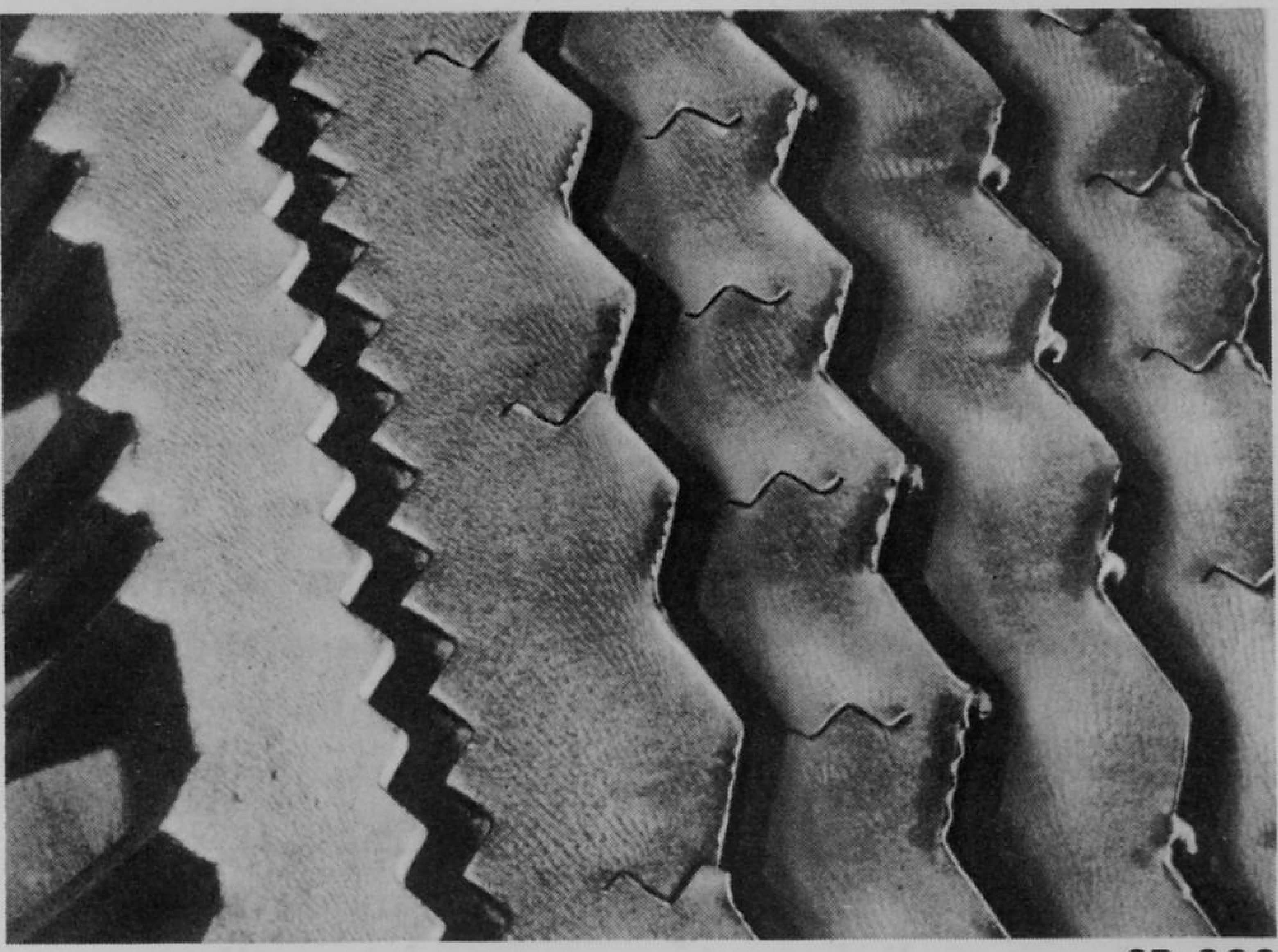

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Fig. 319—Toe-In and Toe-Out Wear of Tire Tread

grees when turning to right or left. In this case check the steering geometry on turns and correct as necessary. Otherwise, check the toe-in alignment and adjust as required in Section 8, "Chassis Suspension."

e. CORNERING WEAR (Fig. 320). This is a diagonal cross type wear caused by high speed driving on curves and turning corners where the tire slips or skips on the road. Independent suspension of present day automobiles permits turning curves at a high rate of speed with safety and this has been responsible for an increase in this type of wear.

Cornering wear may be easily mistaken for side or camber wear but can be corrected only by driving at lower speeds on curves and turns. Rounding and

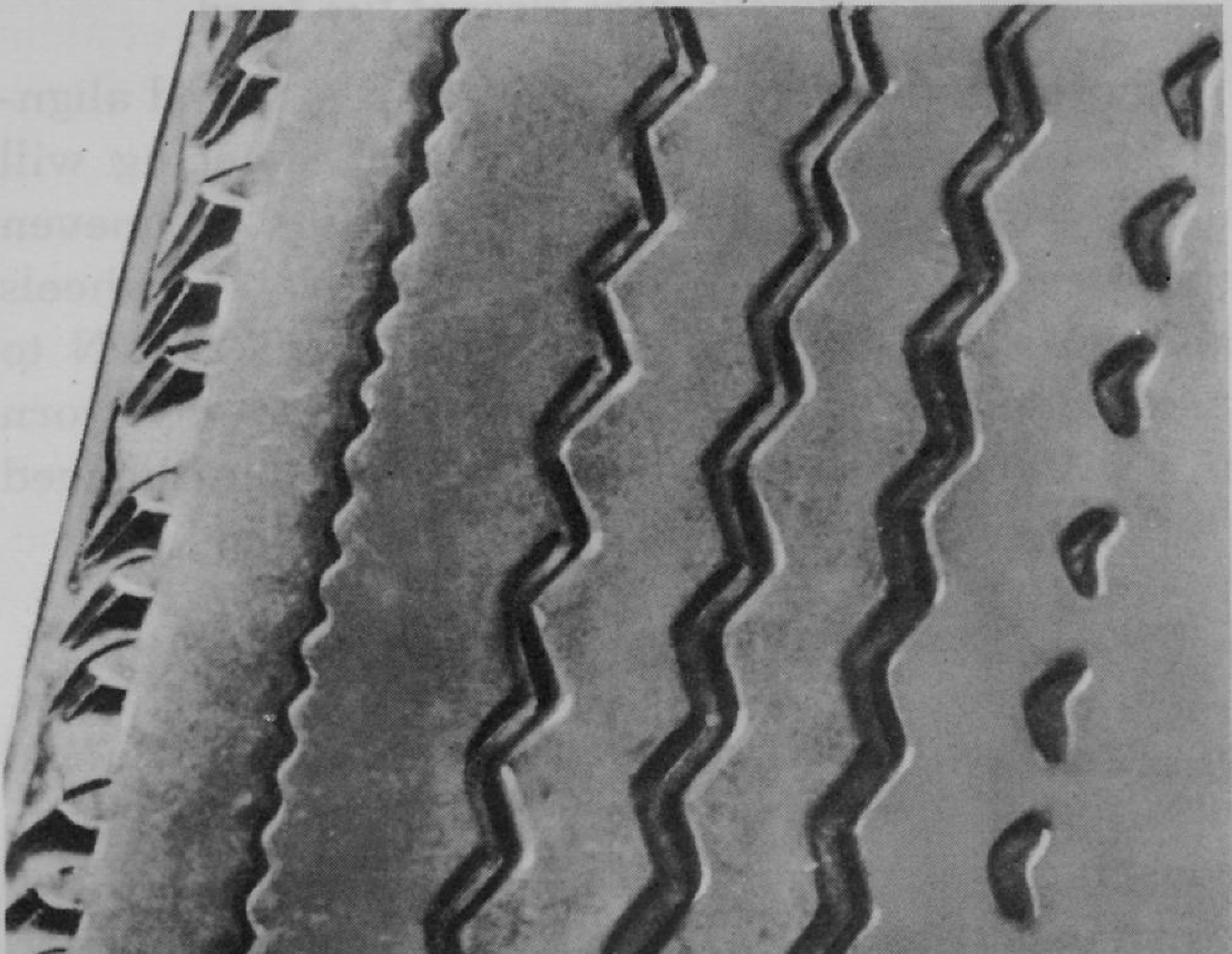

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Fig. 320—Cornering Wear of Tire Tread

roughening of the tread at the outside shoulder of the tire caused by severe abrasion usually indicates cornering wear.

f. MISCELLANEOUS WEAR (Fig. 321). Flat spots, cups, gouges and waves in the tire tread are all types of miscellaneous wear. All wear of this type may be caused by one or more of numerous factors, many of which are difficult to isolate. For example, a single flat spot may be worn in the tire tread and may be caused by an unbalanced wheel due either to wheel and tire static unbalance or an out-of-round brake drum. Looseness of front suspension parts (king pins and bushings, upper and lower suspension arm mountings, shock absorbers and steering linkage for example) will permit erratic and irregular wheel movement and cause uneven tire wear.

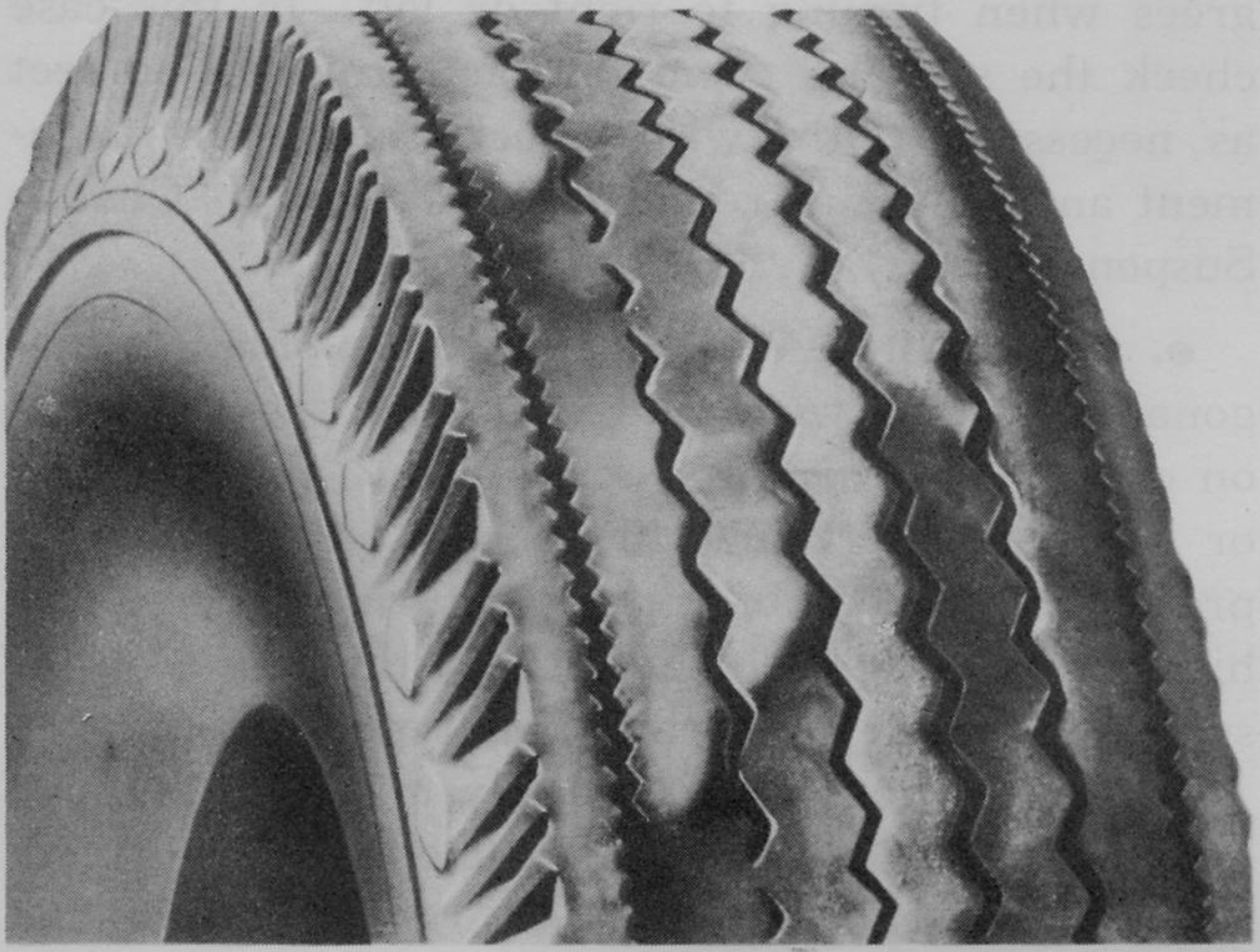

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Fig. 321—Miscellaneous Wear of Tire Tread

Thorough mechanical inspection, repair and alignment, together with wheel and tire balancing will usually disclose and correct the causes of uneven tire wear. At the time of correction, rotate wheels and tires as described under TIRE ROTATION to take advantage of the fact that the unevenly worn tire will to some extent true itself up when changed to the rear or the opposite side of the vehicle.

SPARE TIRE MOUNTING

The spare tire in Kaiser models is mounted flat in a well, located in the rear compartment floor to conserve space (Fig. 322). A cover is provided which is finished with the same material as the floor. The tire well should be inspected periodically to make sure the drain holes do not become plugged.

In Frazer models the spare wheel and tire sets into a recess in the floor of the rear compartment and is supported upright with a stud, plate and wing nut. When stowing the spare wheel and tire, always position it so the valve stem is accessible.

When checking the air pressure of tires on the vehicle be sure to check spare tire pressure and inflate, if necessary.

SERVICE DIAGNOSIS

For diagnosis of causes of irregular and uneven tire wear refer to TIRE WEAR elsewhere in this Section.

a. WHEEL NOISES. The following are all causes of various wheel noises.

1. Loose wheel bolts.
2. Wheel bearings not lubricated.
3. Loose, tight or damaged wheel bearings.
4. Brake drum, backing plate or hub cap loose.
5. Tires under-inflated.
6. Type of tread on tires.
7. Stones or foreign object imbedded in tire.
8. Rear wheel hub loose on axle shaft.
9. Brakes dragging.

b. UNUSUAL HEATING OF FRONT WHEEL HUBS. Front hubs are normally warm after vehicle has been operating for some time but may be hot due to the following causes:

1. Insufficient or improper wheel lubrication.
2. Bearings adjusted too tight or damaged.
3. Heat transfer from brake drums due to brakes dragging.
4. Bent steering knuckle spindle.
5. Hub oil seal cocked or too tight.

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Fig. 322—Spare Wheel and Tire Mounting—Kaiser