

SECTION 4

STEERING, SUSPENSION, WHEEL AND TIRE

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TROUBLESHOOTING

Troubleshooting of steering, suspension, wheels or tires are related to other systems, therefore consideration of others is essential. Firstly road test shall be accomplished.

As a preliminary inspection, followings shall be checked.

1. Inspect pressure level, abnormal friction and wear of tire.
2. After lifting up car, check looseness and damage of front and rear suspension or steering systems.
3. Rotate front wheels. Check for deformation and balance of tires, looseness and wear of wheel bearings and worn condition.

Condition	Probable Cause	Correction
Dragging tire (Feeling of braking during driving)	<ul style="list-style-type: none"> • Unbalanced or uneven tires • Improper tire pressure • Broken or weakened spring • Radial tire lateral free • Disturbed wheel alignment • Unbalanced brake • Loose, distorted or broken suspension parts 	<ul style="list-style-type: none"> • Replace tires • Adjust tire pressure • Replace spring • Replace tire • Check and adjust wheel alignment • Inspect and repair brake • Tighten or replace suspension parts

Condition	Probable Cause	Correction
Abnormal or excessively worn tire	<ul style="list-style-type: none"> • Broken spring • Unbalanced wheel • Disturbed wheel alignment • Broken shock absorber • Hard driving • Overloaded car • Worn and loose wheel bearing • Unbalanced rotation • Improper tire pressure 	<ul style="list-style-type: none"> • Replace spring • Adjust balance or replace tire • Check and adjust wheel alignment • Replace shock absorber • Replace tire • Replace tire • Replace wheel bearing • Replace wheel rim or tire • Adjust tire pressure
Wheel tramp	<ul style="list-style-type: none"> • Uneven tire inflation • Improper shock absorber action 	<ul style="list-style-type: none"> • Replace tire • Replace shock absorber
Vibration or shake	<ul style="list-style-type: none"> • Unbalanced tire or wheel • Broken wheel bearing • Worn tie rod end • Worn lower ball joint • Excessive tire run out • Partial tire deformation • Excessive radial run out of tire wheel assembly • Abnormal front wheel alignment • Loose or worn steering link mechanism • Loose steering gear case bolt 	<ul style="list-style-type: none"> • Adjust wheel balance or replace tire • Replace wheel bearing • Replace tie rod end • Replace tie rod end • Replace front suspension control arm • Replace wheel or tire • Replace wheel or tire • Adjust front wheel alignment • Retighten or replace steering mechanism • Tighten case bolt
Hard steering	<ul style="list-style-type: none"> • Bind or poor operation and lubrication of tie rod end ball stud or lower ball joint • Abnormal front wheel alignment • Steering gear box adjustment • Improper tire pressure • Binding or insufficient lubrication of steering column 	<ul style="list-style-type: none"> • Replace tie rod end or front suspension control arm • Adjust front wheel alignment • Check, adjust, repair or replace steering gear box • Adjust to proper value • Repair
Too much play of steering wheel	<ul style="list-style-type: none"> • Worn wheel bearing • Improper rack and pinion adjustment • Worn steering shaft joint • Worn tie rod end ball joint • Worn lower ball joint 	<ul style="list-style-type: none"> • Replace wheel bearing • Check and adjust rack and pinion • Replace joint • Replace tie rod end • Replace front suspension control arm
Poor returnability	<ul style="list-style-type: none"> • Binding of tie rod end ball stud • Binding of ball joint 	<ul style="list-style-type: none"> • Replace tie rod end • Replace ball joint

Condition	Probable Cause	Correction
Poor returnability	<ul style="list-style-type: none"> • Binding of steering column • Abnormal front wheel alignment • Improper tire pressure 	<ul style="list-style-type: none"> • Repair or replace • Adjust front wheel alignment • Adjust to proper value
Steering noise	<ul style="list-style-type: none"> • Loose bolt and nut • Broken wheel bearing • Wear or binding of tie rod end 	<ul style="list-style-type: none"> • Retighten • Replace • Replace
Abnormal noise	<ul style="list-style-type: none"> • Wear, binding or looseness in tie rod end, lower ball joint, tie rod or drive shaft joint • Damaged shock absorber strut or mount • Worn control arm bush • Loose stabilizer bar • Loose wheel nut • Loose suspension bolt or nut • Broken or damaged wheel bearing • Broken suspension spring • Insufficient lubrication or wear in strut bearing 	<ul style="list-style-type: none"> • Replace tie rod end, control arm, tie rod or drive shaft • Replace or repair • Replace • Tighten bolt or replace bush • Tighten • Tighten suspension bolt or nut • Replace wheel bearing • Replace spring • Lubricate or replace strut bearing
Vibration or instability of steering	<ul style="list-style-type: none"> • Unbalanced or uneven tire • Loose ball joint • Poor shock absorber, strut or mounting • Loose stabilizer bar • Broken or deformed spring • Poor adjusted steering gear box • Abnormal wheel alignment 	<ul style="list-style-type: none"> • Inflate tire properly or replace • Replace suspension control arm or tie rod end • Replace shock absorber, strut or mount • Tighten or replace stabilizer bush • Replace spring • Check and adjust tightening torque for steering gear box • Check and adjust wheel alignment
Erratic steering when braking	<ul style="list-style-type: none"> • Worn wheel bearing • Broken or distorted spring • Oil leak from wheel cylinder or caliper • Distorted disc • Biased wear of brake lining • Poor drum roundness • Uneven tire inflation • Poor wheel cylinder • Abnormal front wheel alignment 	<ul style="list-style-type: none"> • Replace wheel bearing • Replace bearing • Repair or replace wheel cylinder or caliper • Replace disc • Replace brake lining • Replace brake drum • Adjust to proper pressure • Replace wheel cylinder • Check and adjust front wheel alignment

Condition	Probable Cause	Correction
Uneven fender height	<ul style="list-style-type: none">• Broken or distorted spring• Overloaded• Improper spring	<ul style="list-style-type: none">• Replace spring• Check loading• Replace spring
Too soft suspension	<ul style="list-style-type: none">• Poor shock absorber or strut	<ul style="list-style-type: none">• Replace shock absorber or strut
Suspension bottoms	<ul style="list-style-type: none">• Overloaded• Poor shock absorber or strut• Improper, broken or loose spring	<ul style="list-style-type: none">• Check loading• Replace shock absorber or strut• Replace spring
Roll or yaw in corners	<ul style="list-style-type: none">• Loose stabilizer• Poor shock absorber, strut or mounting• Broken or loose spring• Overloaded	<ul style="list-style-type: none">• Tighten bolts or replace bush• Replace shock absorber or strut or tighten mounting• Replace spring• Check loading
Early wear tire	<ul style="list-style-type: none">• Poor strut• Worn or broken wheel bearing• Excessive vibration of tire wheel• Worn ball joint• Unbalanced wheel	<ul style="list-style-type: none">• Replace strut• Replace wheel bearing• Replace tire or wheel• Replace front suspension control arm• Check and adjust wheel balance

CHECKING TIRE

ABNORMAL OR EARLY WEAR

Possible causes of abnormal or early wear are various. Those include improper tire pressure, poor tire rotation, poor driving habit, unbalanced wheel, etc.

In following cases, check shall be carried out:

1. Worn patterns of front wheels are different from those of rear wheels.
2. Worn pattern of tire tread traverse surface is uneven.
3. Worn patterns of left and right front tires are different from each other.
4. Worn patterns of left and right rear tires are different from each other.
5. Excessive wear.

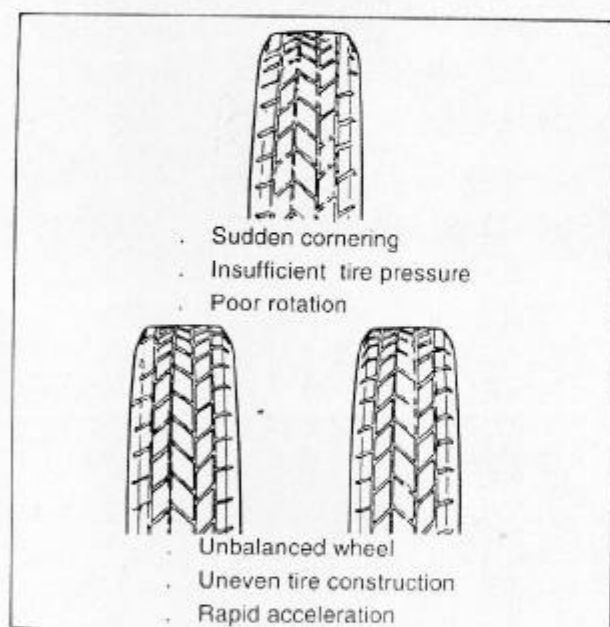


FIG. 4 — 1 TIRE WEAR CHECK

In Following Cases, Wheel Balance Shall be Checked.

1. Wears on left and right front tires are different from each other.
2. Wear on traverse surface of front tire is uneven.
3. Excessive wear on tread or pattern.

TIRE INDICATOR

New tire includes tire indicator showing that tire shall be replaced. This indicator shows band of 12mm width when the depth of tread reaches 1.6mm. When 3 and more indicators of 6 are shown, tire shall be replaced.

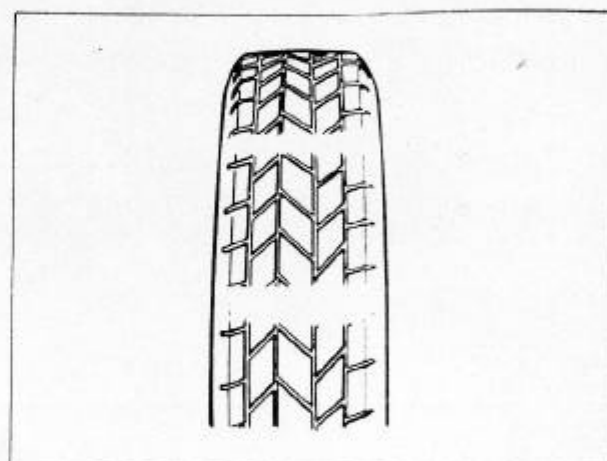


FIG. 4 — 2 TIRE INDICATOR