

SECTION 7-B TROUBLE DIAGNOSIS—CHASSIS SUSPENSION

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7-3 CAR ROUGHNESS OR VIBRATION

Car roughness or vibration may be caused by road surface conditions as some types of road set up unusual vibrations in cars at various speeds. Testing the car on a different type of road will show whether the road is causing the vibration.

Some types of tire treads, and tire construction other than those chosen for production may cause abnormal vibration or roughness. If car is equipped with tires other than those which have been selected for production equipment, it is advisable to test the car with standard tire equipment before deciding that a mechanical condition is the cause of roughness.

The following procedure should be used to determine cause of roughness or vibration in car operation at various speeds, which may be due to an unbalanced condition of wheels, tires, brake drums, propeller shaft, or engine.

1. Jack up all wheels, having jack support rear end of car at center of rear axle housing.

2. Check runout of front and rear wheels and tires. Runout should not exceed .107" at side of tire.

3. With transmission in third speed or Drive run engine at various car speeds to note speeds at which vibration or roughness occurs.

4. Remove rear wheels and run engine again at the critical speeds noted in Step 3. If roughness is gone the condition is caused by unbalanced rear wheel and tire assemblies (par. 7-6).

5. If roughness still exists with rear wheels removed, remove rear brake drums and repeat the running test. Elimination of the roughness indicates out of balance brake drums (par. 7-6).

6. If roughness still exists with brake drums removed, run engine with transmission in Neutral. Elimination of the roughness indicates that propeller shaft is out of balance or not running true. Continued roughness with engine running alone indicates an out of balance condition of engine.

7-4 IMPROPER STEERING ACTION

Steering action is dependent upon the chassis suspension members as well as the steering gear assembly and tie rods. Improper steering actions which are most likely to be caused by chassis suspension are covered in this paragraph, while conditions most likely to be caused by the steering gear assembly or tie rods are covered in paragraph 8-3.

a. Car Pulls or Leads to One Side

1. High crowned roads.
2. Low or uneven tire pressure (par. 1-3).
3. Front tires of unequal diameter due to wear.
4. Brakes dragging on one side (par. 9-8).
5. Incorrect caster, camber, or toe of front wheels (par. 7-15).
6. Suspension components bent or broken.

b. Steering Affected by Application of Brakes

1. Low or uneven tire pressure (par. 1-3).
2. Type of road surface.
3. Low or uneven tire pressure (par. 1-3).
4. Wheels toe out in straight ahead position (par. 7-15).

5. Incorrect or uneven caster or camber (par. 7-15).

6. Steering gear or tie rods adjusted too loose or worn, or adjusted too tight (par. 8-4).

7. No lubrication in ball joints or upper ball joint worn (par. 7-9).

8. Loose suspension components.

c. Road Shocks Transmitted to Steering Wheel

1. Low or high tire pressure (par. 1-3).

2. Wrong type or size of tires used (par. 7-6).

3. Uneven tire wear (especially shoulder or concerning wear) (par. 7-6).

4. Steering gear or tie rods incorrectly adjusted. Broken tie rod spring (par. 8-4).

5. Shock absorbers inoperative or leaking (pars. 7-11 and 7-18).

6. Improper caster or bent steering knuckle (par. 7-15).

7. Steering knuckle upper ball joint worn (par. 7-9).

d. Front Wheel Shimmy (Low Speed)

Low speed shimmy is a rapid series of oscillations of the front wheel and tire assembly as the wheels attempt to point alternately to the right and left. This movement is often transmitted through the steering linkage

to the steering gear. Low speed shimmy usually occurs below 30 MPH.

1. Uneven or low tire pressure (par. 1-3).

2. One or both wheel and tire assemblies out of balance (par. 7-6).

3. Front wheel bearings loose or worn (par. 7-8).

4. Incorrect alignment of front wheels (par. 7-15).

5. Steering knuckle upper ball joint worn (par. 7-9).

6. Steering gear or tie rods incorrectly adjusted or worn (par. 8-4).

7-5 WHEEL TRAMP

Wheel tramp, sometimes called high speed shimmy, is a rapid up and down movement of a wheel and tire assembly, as though the tire were decidedly eccentric. In severe cases the tire actually hops clear of the road surface. Wheel tramp may develop in either front or rear wheels, and occurs at speeds above 35 MPH.

1. Wheel tire or brake drum out of balance (par. 7-6).

2. Shock absorber inoperative (pars. 7-11, 7-18).

3. Item 1 or 2 in combination with one or more items listed under Front Wheel Shimmy (subpar. d, above).