Steering: Testing and Inspection

General Diagnosis

GENERAL DIAGNOSIS

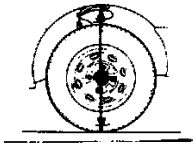
Since the problems in steering, suspension, wheels and tires involve several systems, they must all be considered when diagnosing a complaint. To avoid using the wrong symptom, always road test the vehicle first. Proceed with the following preliminary inspection and correct any defects which are found.

1. Inspect tires for proper pressure and uneven wear.
2. Raise vehicle on a hoist and inspect front and rear suspension and rack and pinion for loose or damaged parts.
3. Spin front wheels. Inspect for out-of-round tires, out-of-balance tires, bent rims, loosen and/or rough wheel bearings.

Condition	Possible Cause	Correction
Vehicle Pulls (Leads)	• Mismatched or uneven tires. • Tires not adequately inflated. • Broken or sagging springs. • Radial tire lateral force. • Disturbed front end alignment. • Disturbed rear wheel alignment. • Brake dragging in one road wheel. • Loose, bent or broken front or rear suspension parts.	Replace tire. Adjust tire pressure. Replace spring. Replace tire. Check and adjust front end alignment. Check and adjust rear wheel alignment. Repair front brake. Tighten or replace suspension parts.
Abnormal or Excessive Tire Wear	• Sagging or broken spring. • Tire out of balance. • Disturbed front or rear end alignment. • Faulty strut (shock absorber). • Hard driving. • Overloaded vehicle. • Not rotating tire. • Worn or loose road wheel bearing. • Wobbly wheel or tire. • Tires not adequately inflated.	Replace spring. Adjust balance or replace tire. Check and adjust front end alignment. Replace strut. Replace tire. Replace tire. Replace or rotate tire. Replace wheel bearing. Replace wheel or tire. Adjust tire pressure.
Wheel Tramp	• Blister or bump on tire. • Improper strut (shock absorber) action.	Replace tire. Replace strut.

Condition	Possible Cause	Correction
Shimmy, Shake or Vibration	• Tire or wheel out of balance.	Balance wheels or replace tire and/or wheel.
	• Loosen wheel bearings.	Replace wheel bearing.
	• Worn tie rod ends.	Replace tie rod end.
	• Worn lower ball joints.	Replace front suspension arm.
	• Excessive wheel runout.	Repair or replace wheel and/or tire.
	• Blister or bump on tire.	Replace tire.
	• Excessively loaded radial runout of tire/wheel assembly.	Replace tire or wheel.
	• Disturbed front end alignment.	Check and adjust front end alignment.
	• Loose or worn steering linkage.	Tighten or replace steering linkage.
	• Loose steering gear case bolts.	Tighten case bolts.
Hard Steering	• Tire not adequately inflated.	Inflate tires to proper pressure.
	• Low fluid level, loosen drive belt or malfunction of power steering system. (Power steering only.)	Check and correct.
	• Bind in tie rod end ball studs or lower ball joints.	Replace tie rod end or front suspension arm.
	• Disturbed front end alignment.	Check and adjust front end alignment.
	• Rack and pinion adjustment. (Manual steering only.)	Check and adjust rack & pinion torque.
	• Bind in steering column.	Repair or replace.
Too Much Play in Steering	• Wheel bearings worn.	Replace.
	• Loose steering gear case bolts.	Tighten.
	• Rack and pinion adjustments. (Manual steering only)	Check and adjust rack & pinion torque.
	• Worn steering shaft joints.	Replace joint.
	• Worn tie rod ends or tie rod inside ball joints.	Replace tie rod end or tie rod.
	• Worn lower ball joints.	Replace front suspension control arm.
Poor Returnability	• Bind in tie rod end ball studs.	Replace tie rod end.
	• Bind in ball joints.	Replace.
	• Bind in steering column.	Repair or replace.
	• Poorly lubricated rack and pinion.	Check, repair or lubricate rack & pinion.
	• Disturbed front end alignment.	Check and adjust front end alignment.
	• Rack and pinion adjustment. (Manual steering only.)	Check and adjust rack & pinion torque.
	• Tires not adequately inflated.	Adjust tire pressure.

Condition	Possible Cause	Correction
Rack and Pinion Noise (Rattle or Chuckle)	• Loose steering gear case bolts. • Worn rack bush. • Rack and pinion adjustment. (Manual steering only.)	Tighten. Replace. Check and adjust rack & pinion torque.
Abnormal Noise, Front End	• Worn, sticky or loose tie rod ends, lower ball joints, tie rod inside ball joints or drive shaft joints. • Damaged struts or mountings. • Worn suspension arm bushings. • Loose stabilizer bar. • Loose wheel nuts. • Loose suspension bolts or nuts. • Broken or otherwise damaged wheel bearings. • Broken suspension springs. • Poorly lubricated or worn strut bearings. • Worn or sticky stabilizer joints.	Replace tie rod end, suspension arm, tie rod or drive shaft joint. Repair or replace. Replace. Tighten bolts or nuts, replace bushes. Tighten wheel nuts. Tighten suspension bolts or nuts. Replace. Replace. Replace strut bearing. Replace.
Wander or Poor Steering Stability	• Mismatched or uneven tires. • Loosen ball joints and tie rod ends. • Faulty struts or mounting. • Loose stabilizer bar. • Broken or sagging springs. • Rack and pinion adjustment. (Manual steering only.) • Front end alignment. • Loose stabilizer joints.	Replace or inflate tires to proper pressure. Replace suspension arm or tie rod end. Replace strut or repair mounting. Tighten or replace stabilizer bar or bush. Replace spring. Check and adjust rack and pinion torque. Check and adjust front end alignment. Replace joint.
Erratic Steering When Braking	• Worn wheel bearings. • Broken or sagging springs. • Wheel tires are inflated unequally. • Disturbed front end alignment. • Brakes not working in unison.	Replace. Replace coil spring. Inflate tires to proper pressure. Check and adjust front end alignment. Refer to Brakes and Traction Control.

Condition	Possible Cause	Correction
Low or Uneven Trim Height Right-to-left trim height (H) difference should be within 15 mm (0.6 in) with curb weight.  *Same with rear side.	• Broken or sagging springs. • Over loaded. • Incorrect springs.	Replace. Check loading. Replace.
Ride Too Soft	• Faulty struts (shock absorber).	Replace strut.
Suspension Bottoms	• Overloaded. • Faulty struts (shock absorber). • Incorrect broken or sagging springs.	Check loading. Replace strut. Replace.
Body Leans or Sways in Corners	• Loose stabilizer bar. • Faulty struts (shock absorbers) or mounting. • Broken or sagging springs. • Overloaded.	Tighten stabilizer bar bolts or nuts, or replace bushes or joint. Replace strut or tighten mounting. Replace. Check loading.
Cupped Tires	• Front struts defective. • Worn wheel bearings. • Excessive tire or wheel run-out. • Worn ball joints. • Tire out of balance.	Replace. Replace. Replace tire or wheel disc. Replace front suspension arm. Adjust tire balance.

GENERAL DIAGNOSIS TABLE