

MANUAL STEERING GEAR TROUBLE SHOOTING

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
<p>Rattle or Chucking Noise in Rack and Pinion.</p> <ul style="list-style-type: none"> ● Rack and pinion attachment loose. ● Lack of lubricant, or incorrect lubricant in rack and pinion assembly. ● Pitman arm loose on shaft, or steering gear mounting bolts loose. ● Improper gear adjustment. ● Loose or worn steering shaft bearing. <p>Excessive Play or Looseness</p> <ul style="list-style-type: none"> ● Front wheel bearing improperly adjusted. ● Loose or worn steering linkage, ball joints or steering gear shaft. ● Steering arm loose on steering gear shaft. ● Incorrect front wheel alignment. ● Steering gear housing attachment bolts loose, or steering gear adjustment too loose. ● Steering arms loose at knuckles. ● Grease, oil or fluid on brake linings. ● Rack and pinion mounting loose or out of adjustment. ● Tie rod end loose. ● Steering wheel loose. ● Excessive Pitman shaft-to-ball nut lash. <p>Hard Steering</p> <ul style="list-style-type: none"> ● Incorrect tire pressure. ● Lack of lubrication in steering linkage. ● Steering gear or knuckle ball studs tight. ● Front springs sagging. ● Steering knuckle bent. ● Frozen column bearings. ● Worn steering gear or tie rod ends. ● Lower coupling flange rubbing against steering shaft. ● Bent or broken frame. 	<p>Poor Returnability</p> <ul style="list-style-type: none"> ● Lack of lubricant in ball joints, steering gear or linkage. ● Binding in linkage or ball joints. ● Improper front end alignment, steering gear adjustment or tire pressure. ● Binding in steering linkage, ball joints, or front axle spindles. ● Column misaligned. <p>Wheel Tramp (Excessive Vertical Motion)</p> <ul style="list-style-type: none"> ● Improper tire pressure. ● Improper balance of wheels, tires or brake rotors. ● Worn or faulty shock absorbers. ● Loose tie rod ends or steering connections. ● Improper wheel alignment. ● Loose or worn wheel bearings. <p>Steering Pulls to One Side</p> <ul style="list-style-type: none"> ● Improper tire pressure, or mismatch of front tires. ● Wheel bearings not adjusted properly. ● Bent suspension components, or broken or sagging springs. ● Improper wheel alignment. ● Brakes dragging. ● Steering gear mounting loose or not centered. ● Loose wheel lug nuts. <p>Instability</p> <ul style="list-style-type: none"> ● Low or uneven tire pressure. ● Loose or worn wheel bearings, idler arm bushing or strut bushings. ● Incorrect front wheel alignment. ● Steering gear not centered. ● Broken rear springs or inoperative shock absorbers. ● Improper steering cross shaft adjustment. ● Bent linkage. ● Frozen ball joints or suspension pivots.

POWER STEERING TROUBLE SHOOTING

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
<p>Power Steering Noise Diagnosis</p> <p>Rattle or Chucking in Steering Gear</p> <ul style="list-style-type: none"> ● Pressure hoses touching engine parts. ● Loose Pitman shaft over center adjustment. ● Tie rod ends, or Pitman arm loose. ● Rack and pinion attachment loose. ● Free play in worm and piston assembly. ● Loose sector shaft or thrust bearing adjustment. ● Free play in pot coupling, or worn shaft serrations. ● Steering gear loose on frame. ● Linkage loose. <p>Growl in Steering Pump</p> <ul style="list-style-type: none"> ● Excessive back pressure in hoses or steering gear because of restrictions. ● Scored pressure plates, thrust plates or rotor. ● Extreme wear of cam ring. 	<p>Rattle in Steering Pump</p> <ul style="list-style-type: none"> ● Vanes not installed properly, or vanes sticking in rotor slots. <p>Swish Noise in Steering Pump</p> <ul style="list-style-type: none"> ● Defective flow control valve. <p>Groan in Steering Pump</p> <ul style="list-style-type: none"> ● Air in fluid, or poor pressure hose connections. ● Low fluid level. <p>Squawk Noise When Turning</p> <ul style="list-style-type: none"> ● Damper "O" ring on valve spool cut.

POWER STEERING TROUBLE SHOOTING (Cont.)

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
<p>Power Steering Noise Diagnosis (Cont.)</p> <p>Moan or Whine in Steering Pump</p> <ul style="list-style-type: none"> ● Pump shaft bearing scored. ● Air in fluid, or low fluid level. ● Hose or column grounded. ● Valve cover "O" ring missing or damaged. ● Valve cover baffle missing or damaged. ● Interference of components in pumping elements. ● Loose or poor bracket alignment. <p>Hissing Noise When Parking</p> <ul style="list-style-type: none"> ● Internal leakage in steering gear. Check valve assembly first. <p>Chirp Noise in Steering Pump</p> <ul style="list-style-type: none"> ● Loose or worn power steering pump belt. <p>Buzzing Noise When Not Steering</p> <ul style="list-style-type: none"> ● Noisy pump. ● Free play in steering shaft upper bearing or bearing loose on shaft serrations. <p>Clicking Noise in Pump</p> <ul style="list-style-type: none"> ● Noise probably caused by pump slippers being too long, broken slipper springs, excessive wear, nicked rotors or damaged cam contour. <p>Power Steering Handling Diagnosis</p> <p>Poor Return of Steering Wheel to Center</p> <ul style="list-style-type: none"> ● Steering wheel rubbing against turn signal housing. ● Lower coupling flange rubbing against steering gear adjuster plug. ● Tight or frozen steering shaft bearings. ● Steering gear adjustment over specifications. ● Sticking or plugged spool valve. ● Improper front end alignment. ● Wheel bearings worn or loose. ● Tie rods or ball joints binding. ● Intermediate shaft joints binding. ● Kinked pressure hoses. ● Loose housing head spanner nut. ● Damaged valve lever. ● Sector shaft or worm thrust bearing adjustment too tight. ● Reaction ring sticking in cylinder or housing head, or seal worn. ● Steering pump internal leakage. ● Steering gear-to-column misalignment. ● Lack of lubrication in steering linkage or ball joints. ● Incorrect tire pressure. ● Steering linkage or ball joints binding. ● Steering shaft poppet valve installed incorrectly. 	<p>Momentary Increase in Effort When Turning Left or Right Fast</p> <ul style="list-style-type: none"> ● High internal pump leakage. ● Power steering pump belt slipping. ● Low fluid level. ● Engine idle speed too low. ● Air in pump fluid system. ● Pump output low. ● Steering gear malfunctioning. <p>Steering Wheel Surges or Jerks When Turning</p> <ul style="list-style-type: none"> ● Low fluid level or loose pump belt. ● Insufficient pump pressure. ● Sticky flow control valve. ● Steering linkage hitting engine oil pan at full turn. <p>Excessive Wheel Kick Back or Free Play</p> <ul style="list-style-type: none"> ● Air in pump fluid system. ● Worn poppet valve in steering gear. ● Excessive over center lash. ● Loose thrust bearing preload adjustment in steering gear. ● Free play in pot coupling. ● Steering gear flexible coupling loose on shaft, or rubber disc mounting nuts loose. ● Coupling loose on worm shaft serrations. ● Improper sector shaft adjustment. ● Excessive worm piston side play. ● Damaged valve lever. ● Universal joint loose. ● Defective rotary valve. ● Ball studs or wheel bearings loose. ● Steering gear loose on frame. <p>Lack of Power Assist When Parking</p> <ul style="list-style-type: none"> ● Sticking flow control valve. ● Insufficient pump pressure output. ● Excessive internal pump leakage. ● Excessive internal gear leakage. ● Lower coupling flange rubbing against steering gear adjuster plug. ● Loose pump belt or low fluid level. ● Engine idle speed too low. ● Steering gear-to-column misalignment. <p>Lack of Power Assist in Left Turns</p> <ul style="list-style-type: none"> ● Left turn reaction seal "O" ring worn, damaged or missing. ● Cylinder head "O" ring damaged. <p>Lack of Power Assist in Right Turns</p> <ul style="list-style-type: none"> ● Column pot coupling bottomed. ● Right turn reaction seal worn, missing or damaged. ● Excessive internal leakage through piston end plug and/or side plugs.

POWER STEERING TROUBLE SHOOTING (Cont.)

CONDITION & POSSIBLE CAUSE	CONDITION & POSSIBLE CAUSE
<p>Power Steering Handling Diagnosis (Cont.)</p> <p>Lack of Effort in Turning</p> <ul style="list-style-type: none"> ● Left or right reaction seal worn or damaged. ● Left or right reaction oil passageway not drilled in housing or cylinder head. ● Left or right reaction seal ring sticking in housing head. <p>Car Wanders to One Side</p> <ul style="list-style-type: none"> ● Front end alignment incorrect. ● Unbalanced steering gear valve. ● Incorrect tire pressure. ● Steering linkage not level. ● Ball joints loose. ● Oversize or omitted sector cover bushing. ● Steering shaft rubbing shift tube. ● Insufficient thrust bearing preload. 	<p>Low Pressure Due to Steering Pump</p> <ul style="list-style-type: none"> ● Flow control valve stuck or inoperative. ● Pressure plate not flat against cam ring. ● Extreme wear of cam ring. ● Scored pressure plate, thrust plate or rotor. ● Vanes not installed properly, or vanes sticking in rotor slots. ● Cracked or broken thrust or pressure plate. <p>Low Pressure Due to Steering Gear</p> <ul style="list-style-type: none"> ● Pressure loss in cylinder due to worn piston ring or scored housing bore. ● Leakage at valve rings, or at valve body-to-worm seal connection. <p>Foaming, Milky Power Steering Fluid, Low Fluid Level or Low Pressure</p> <ul style="list-style-type: none"> ● Air trapped in fluid, and loss of fluid due to internal pump leakage which creates fluid overflow.