Modern Automotive Technology
Chapter 60

Drive Shaft & Transfer Case Diagnosis, Service & Repair
Learning Objectives

- Troubleshoot common drive shaft problems.
- Check universal joint wear.
- Measure drive shaft runout.
- Remove and replace a drive shaft assembly.
- Replace universal joints.
- Perform basic service operations on a transfer case.
- Cite and practice good safety procedures.
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1. Because a Transfer Case is heavy, use a transmission jack when removing.

2. Before disassembling a Universal Joint, scribe/mark each component.
Transfer Case Removal

Use a hoist and transmission jack
Transfer Case Oil

Check the oil condition and level first. Replace dirty or contaminated oil
Drive Shaft Removal

Scribe marks on the yokes and universal joints to assist in reassembly
Universal Joint Disassembly

Remove retainers from the caps or yokes
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3. Some universal joint caps are secured by a special Plastic Resin injected into/around the universal joint cap.

4. A Worn Universal Joint can cause squeaking, grinding, clunking, or clicking sounds.
Drive Shaft Problems

- Slip yoke wobble or clunk
- Worn extension bushing
- Transmission rear seal leaking
- Dry universal joint
- Leaks
- Noises
- Bent drive shaft
- Companion flange not true
- Vibration
- Worn universal joint
Universal Joint Disassembly

Use a vise and two sockets
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5. When balancing a drive shaft, if needed, install two Screw or Worm-Type hose clamps.

6. A Grease Gun can be used to lubricate universal joints that have fittings.
Balancing a Drive Shaft

Place the vehicle on a twin post lift so that the rear axle housing is supported.
Balancing a Driveshaft

Mark the drive shaft
Install hose clamps
Adjust the clamps
Greasing a Universal Joint

Narrow clearance may require a special long stem or needle.
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7. One way to check drive shaft angle is to use a Bubble Gauge.

8. Drive Shaft Vibration can be caused by any problem that affects drive shaft balance, runout, and angle.
Measuring Driveline Angle

Adjusted by placing shims under the rear axle housing or transmission mount
Drive Shaft Vibration

- Caused by problems that affect drive shaft balance, runout, and angle
- Vibration is more rapid than that caused by wheel or tire imbalance
- Because the drive shaft turns at engine speed in high gear, vibration frequency matches that of a clutch or engine vibration
9. A dial indicator is normally used to measure Drive Shaft Runout.

10. Grinding & Squeaking from the drive shaft is frequently caused by worn universal joints.
Measuring Runout

Turn the drive shaft slowly, noting indicator movement
Drive Shaft Noise

- Grinding and squeaking are often caused by worn universal joints.
- Clunking is often caused by slip yoke wear, or extension housing bushing wear allowing the yoke to flop up and down as torque changes.
- Whining may be caused by a dry, worn center support bearing.
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