Drivelines and Universal Joints

Universal Joint Maintenance

• Most factory-installed universal joints are sealed and don’t require periodic lubrication
• After-market replacement joints are equipped with a grease fitting and must be greased periodically

Drive Shaft Problem Diagnosis

• Road testing
  – Vehicle should be driven while accelerating and decelerating as well as at various steady speeds
  – Vibrations caused by worn U-joints usually occur while accelerating

Types and Causes of Vibrations

• High speed vibrations
  – Usually caused by driveshaft imbalance
• Vibrations during acceleration
  – Usually caused by worn double Cardan joint ball and socket
• Low speed vibrations
  – Usually caused by improper operating angles

Noise Diagnosis

• Clunking noise while accelerating from a dead stop
  – Usually caused by worn or damaged U-joint
  – Can be caused by problems including excessive clearance between slip joint and extension housing
• Squeaking noise
  – Often caused by worn or poorly lubricated U-joint

Reasons for Universal Joint Failure

• Lack of lubrication
• Pushing another car
• Towing a trailer
• Changing gears abruptly
• Carrying heavy loads

Steps in Lubricating U-Joints

1. Wipe off the nozzle of the fitting
2. Attach the hose of the grease gun to the fitting
3. Pump grease slowly into the fitting
4. Stop pumping when grease appears at the bearing cups

Inspecting the Drive Shaft

• Check for fluid leaks
• Check the U-joints for signs of rust or leakage
• Check for movement in the joint while trying to turn the yoke and the shaft in opposite directions
• Check the drive shaft for dents, missing weights, and undercoating or dirt
Tips for Removing and Installing a Drive Shaft
- Always mark the pinion flange and the end yoke before disassembly
- Use a plug on the transmission extension housing to prevent fluid loss
- Line up all index marks
- Torque bolts to manufacturer’s specifications

Tips for Disassembling a U-Joint
- Index the joint’s components before disassembly
- Remove all retaining rings before pressing on the spider
- Use a U-joint tool kit, socket and vise, c-clamp, or press to press the spider from the yoke

Tips for Assembling a U-Joint
- Clean all components before assembly
- Turn the spider while tightening to ensure the trunions move freely on the bearings
- Take care not to tear the bearing seal during assembly
- Fill new joint with grease (if equipped with a fitting)

Servicing Double Cardan Joints
- Index all parts before disassembly
- Follow the specified sequence for removing the bearing caps
- Only remove the centering ball if it is to be replaced
- If installing a new ball, make sure it is fully seated
- Follow the recommended assembly sequence

Causes of Drive Shaft Imbalance
- Damage from rocks and debris
- Balance weights fallen off
- Dirt or mud stuck on drive shaft
- Undercoating sprayed on drive shaft

Steps for Checking Imbalance
1. Set up vehicle to be run on a lift
2. While vehicle is running, use chalk to mark the high spot on the shaft
3. Stop vehicle and install two large hose clamps to the shaft with the screw assembly opposite the chalk mark
4. Run engine to the desired speed again

Steps for Checking Imbalance (Cont’d)
5. If the vibration is gone, road test the vehicle
6. If the vibration is still felt, rotate the clamps away from each other in equal amounts and repeat test
7. Repeat the procedure until no vibration is felt
Measuring Drive Shaft Runout

- Use a dial indicator
- Measure at the center and at both ends of shaft
- Refer to manufacturer’s specifications for acceptable runout
- Replace the shaft if runout is greater than allowed

Measuring Operating Angle

- Make sure the vehicle is empty and the gas tank is full
- Use inclinometer to measure U-joint angles
- Follow the service manual procedures
- Compare front and rear angles
- The difference between the two angles is the operating angle