

**MECHANIC STUDY GUIDE**  
**Manual Transmission, Front & Rear Drive Axles**  
Automobile & Light Truck Repair

Listed below are a number of items and subjects which make up the mechanic certification test identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items.

**Component R & R - 10%**

Cluster gear remove & replace  
Extension housing seal remove & replace  
Synchronizer replacement

**Transmission/Transaxle Diagnosis - 32%**

Fluid diagnosis  
Hard shifting complaints  
Transmission v.s. transaxle comparison  
Cluster gear end-play  
Transaxle gear recognition from picture  
Synchronizer problems & operation  
3, 4 & 5 speed diagnosis from picture  
(4 questions)  
Overdrive operation  
Extension housing bushing wear  
Noise diagnosis  
Defective output shaft

**Final Drive - 30%**

Ring gear run-out  
Noise diagnosis  
Differential diagnosis  
Differential pinion nose angle  
Ring & pinion gear sets  
Ring & pinion backlash  
Pinion bearing preload  
Final drive ratio  
Pinion seal remove & replace  
Limited slip diagnosis  
Differential bearing preload  
Lubricant Types

**Axle Shaft/C.V. Repair - 10%**

CV boot installation  
Drive axle noise diagnosis (2 questions)  
CV joint operation  
Vibration Diagnosis

**Clutch Diagnosis & Repair - 10%**

Clutch disc operation  
Noise diagnosis  
Chatter diagnosis  
Shifting problem diagnosis

**Miscellaneous - 12%**

Bearing removal and installation procedures  
Drive train noise diagnosis  
Gear recognition  
Trans interlock function  
Understanding how direct drive & gear reduction is accomplished

**SAMPLE QUESTION:**

The main reason for making a rear end gear tooth contact pattern is to check:

- A. Carrier end-play.
- B. Carrier bearing preload.
- C. Axle gear clearance.
- D. Pinion depth.

**ANSWER: D**