

MANUAL DRIVETRAIN AND AXLES SPECIALIST PROFILE OF TRAINING MASTERY

Instructor _____

Date _____

Program _____	
Grade _____	School _____
Name _____ Soc. Sec. No. _____	
Address _____ Phone _____	
In Case of Emergency, Contact _____	
Address _____ Phone _____	
Allergies/Disabilities that might require special accommodation for training (please specify) _____	
<p>The above information can be used for school records and/or to ensure safety of students. This confidential information is not to be released to employers or the general public.</p>	

Date of Enrollment ____ - ____ - ____ Total Class Hours _____ Total Hours Absent _____

Date of Withdrawal ____ - ____ - ____ Total On-the-Job Training Hours _____ Total Hours Tardy _____

Date of Completion ____ - ____ - ____ Total Lab Hours _____

ON-THE-JOB TRAINING/WORK EXPERIENCE

_____	_____	_____
Duration of Employment	Job Title	Supervisor's Name
_____		_____
Address of Employer		Phone
_____	_____	_____
Duration of Employment	Job Title	Supervisor's Name
_____		_____
Address of Employer		Phone

Use of This Document

This document can be used to record information about the student and skills mastered. This information is useful in documenting student progress during training and in providing information about the student's qualifications to potential employers and/or for entry into advanced training programs. Instructors using these materials are authorized to reproduce this document as required for use in their training programs.



SPECIFIC JOB COMPETENCIES

Instructor: As each competency is mastered, place your initials and the date in the blank on the left. This will verify that the student can perform the skill with a minimum of supervision.

Date/Initials	Date/Initials
<p>UNIT 1 — SERVICE DRIVELINES</p> <p>_____ 1. Label the components of a rear-wheel drivetrain.</p> <p>_____ 2. Match the function of rear-wheel drivetrain components with the name of the component.</p> <p>_____ 3. Label the components of a driveline.</p> <p>_____ 4. Match the names of driveline components to phrases describing the components or giving their functions.</p> <p>_____ 5. Match the names of the two types of drivelines to illustrations or written descriptions of each.</p> <p>_____ 6. List methods of controlling driveline vibration.</p> <p>_____ 7. List methods of eliminating driveline speed fluctuations.</p> <p>_____ 8. Identify the major types of driveline joints and their parts.</p> <p>_____ 9. Diagnose driveline noise and performance problems. (Assignment Sheet)</p> <p>_____ 10. Measure and adjust universal joint angles. (Job Sheet 1)</p> <p>_____ 11. Check driveshaft runout and adjust minor driveshaft imbalance. (Job Sheet 2)</p> <p>_____ 12. Remove and replace the driveline. (Job Sheet 3)</p> <p>_____ 13. Inspect, remove, and replace a simple universal joint. (Job Sheet 4)</p> <p>_____ 14. Inspect, remove, and replace other driveline joints. (Job Sheet 5)</p> <p>_____ 15. Check companion flange runout. (Job Sheet 6)</p> <p>_____ 16. Inspect, remove, and replace a center support bearing. (Job Sheet 7)</p> <p>_____ 17. _____</p> <p>Pretest Score (%) _____</p> <p>Post Test Score (%) _____</p> <p>Modified Gains Score (%) _____</p> <p>UNIT 2 — SERVICE DIFFERENTIALS AND REAR DRIVE AXLES</p> <p>_____ 1. Match the names of the parts of a gear and a gear tooth to illustrations.</p> <p>_____ 2. Match the names of common gear types with illustrations of the gears.</p> <p>_____ 3. Identify the two types of rear axle housings from an illustration.</p> <p>_____ 4. Label the parts of antifriction bearings.</p> <p>_____ 5. Label the parts of rear drive axles.</p> <p>_____ 6. Write the four functions of a differential.</p> <p>_____ 7. Match the names of the parts of a conventional differential to an illustration.</p> <p>_____ 8. Use ring gear tooth contact patterns to determine needed differential adjustments. (Assignment Sheet 1)</p> <p>_____ 9. Distinguish between the functional operation of a conventional and a limited-slip differential.</p> <p>_____ 10. Label the parts of the categories of limited-slip differentials.</p> <p>_____ 11. Figure ring to drive pinion gear ratios. (Assignment Sheet 2)</p> <p>_____ 12. Diagnose differential and rear axle leak, noise, and performance problems. (Assignment Sheet 3)</p> <p>_____ 13. Inspect the rear axle housing and flush and refill the rear axle lubricant. (Job Sheet 1)</p> <p>_____ 14. Remove rear axle shafts. (Job Sheet 2)</p> <p>_____ 15. Measure ring gear runout. (Job Sheet 3)</p> <p>_____ 16. Check ring gear tooth contact patterns. (Job Sheet 4)</p> <p>_____ 17. Measure and adjust side bearing preload and ring to pinion gear backlash. (Job Sheet 5)</p> <p>_____ 18. Remove, inspect, and replace a companion flange and pinion seal. (Job Sheet 6)</p> <p>_____ 19. Remove the differential case assembly and clean and inspect the differential housing. (Job Sheet 7)</p> <p>_____ 20. Remove, inspect, and replace a ring gear. (Job Sheet 8)</p> <p>_____ 21. Measure differential case runout. (Job Sheet 9)</p> <p>_____ 22. Remove, inspect, and replace differential side bearings. (Job Sheet 10)</p> <p>_____ 23. Remove, inspect, measure, adjust, and replace the parts of a conventional differential case assembly. (Job Sheet 11)</p> <p>_____ 24. Remove, inspect, measure, adjust, and replace limited slip differential components. (Job Sheet 12)</p> <p>_____ 25. Remove and inspect a drive pinion gear assembly. (Job Sheet 13)</p> <p>_____ 26. Measure and adjust drive pinion depth. (Job Sheet 14)</p> <p>_____ 27. Replace drive pinion gear assembly components and measure and adjust drive pinion bearing preload. (Job Sheet 15)</p>	<p>_____ 28. Replace and adjust the differential case assembly. (Job Sheet 16)</p> <p>_____ 29. Inspect and replace rear axle shaft wheel studs. (Job Sheet 17)</p> <p>_____ 30. Remove, inspect, and replace rear axle shaft seals and bearings. (Job Sheet 18)</p> <p>_____ 31. Remove and replace axle shaft pressed-on bearings and retainers. (Job Sheet 19)</p> <p>_____ 32. Replace rear axle shafts. (Job Sheet 20)</p> <p>_____ 33. Measure rear axle and axle flange runout and shaft end play and complete differential and rear drive axle service. (Job Sheet 21)</p> <p>_____ 34. _____</p> <p>Pretest Score (%) _____</p> <p>Post Test Score (%) _____</p> <p>Modified Gains Score (%) _____</p> <p>UNIT 3 — SERVICE CLUTCHES</p> <p>_____ 1. Label the major components of the clutch system on an illustration.</p> <p>_____ 2. Match the names of clutch components to phrases describing their functions.</p> <p>_____ 3. Identify the operating condition of the major clutch components in both the engaged and the disengaged positions.</p> <p>_____ 4. Match the names of the parts of a flywheel to an illustration.</p> <p>_____ 5. Match the names of parts of pressure plate assemblies to illustrations.</p> <p>_____ 6. Match the names of the parts of a clutch disc to illustrations.</p> <p>_____ 7. Match the names of the parts of clutch linkages to illustrations.</p> <p>_____ 8. Label the parts involved in the clutch release mechanism on an illustration.</p> <p>_____ 9. Diagnose clutch noise and performance problems. (Assignment Sheet)</p> <p>_____ 10. Inspect, adjust, and replace rod and lever type clutch linkage components. (Job Sheet 1)</p> <p>_____ 11. Inspect, adjust, and replace cable type clutch linkage components. (Job Sheet 2)</p> <p>_____ 12. Inspect, adjust, repair, and replace hydraulic clutch components. (Job Sheet 3)</p> <p>_____ 13. Remove the transmission and clutch housing. (Job Sheet 4)</p> <p>_____ 14. Remove, inspect, adjust, and replace the release bearing, release fork, and pivot. (Job Sheet 5)</p> <p>_____ 15. Remove, inspect, and replace the pressure plate assembly and clutch disc. (Job Sheet 6)</p> <p>_____ 16. Remove, inspect, and replace the pilot bushing or bearing. (Job Sheet 7)</p> <p>_____ 17. Inspect, remove, repair, service, and replace the flywheel and ring gear. (Job Sheet 8)</p> <p>_____ 18. Measure crankshaft end play and flywheel runout. (Job Sheet 9)</p> <p>_____ 19. Inspect the engine block, clutch housing, and transmission housing mating surfaces. (Job Sheet 10)</p> <p>_____ 20. Measure clutch housing face runout and clutch housing bore runout. (Job Sheet 11)</p> <p>_____ 21. Replace the clutch housing and transmission. (Job Sheet 12)</p> <p>_____ 22. _____</p> <p>Pretest Score (%) _____</p> <p>Post Test Score (%) _____</p> <p>Modified Gains Score (%) _____</p> <p>UNIT 4 — SERVICE MANUAL TRANSMISSIONS AND FRONT DRIVE AXLES</p> <p>_____ 1. Identify driving situations which require greater or less torque.</p> <p>_____ 2. Label the basic parts of a transmission on an illustration.</p> <p>_____ 3. Match the names of the basic parts of a transmission to a description of their functions.</p> <p>_____ 4. Match the names of the parts of a transmission housing to an illustration.</p> <p>_____ 5. Label the parts of an input shaft assembly on an illustration.</p> <p>_____ 6. Match the names of the parts of a countershaft assembly to an illustration.</p> <p>_____ 7. Match the names of the parts of an output shaft to an illustration.</p> <p>_____ 8. Label the parts of a speed gear on an illustration.</p>

Student ratings on specific competencies evaluated during the course are available upon student's written request and/or by calling the instructor. Parent's or guardian's signature is necessary if student is under 18 years of age.

Date/Initial

UNIT 4 — SERVICE MANUAL TRANSMISSIONS AND FRONT DRIVE AXLES (CONTINUED)

- _____ 9. Label the parts of two types of synchronizer assemblies on illustrations.
 - _____ 10. Label the parts of a reverse idler gear assembly on an illustration.
 - _____ 11. Match the names of the basic parts of transmission shift linkages to illustrations.
 - _____ 12. Figure transmission torque multiplication factors. (Assignment Sheet 1)
 - _____ 13. Diagnose manual transmission noise and performance problems. (Assignment Sheet 2)
 - _____ 14. Inspect, replace, and adjust the external shift linkage parts located outside the transmission housing. (Job Sheet 1)
 - _____ 15. Inspect and replace transmission mounts. (Job Sheet 2)
 - _____ 16. Disassemble a transmission. (Job Sheet 3)
 - _____ 17. Remove, inspect, and replace external shift assembly components located inside the transmission housing. (Job Sheet 4)
 - _____ 18. Remove, inspect, and replace internal shift assembly components. (Job Sheet 5)
 - _____ 19. Remove, inspect, and replace input shaft assembly components. (Job Sheet 6)
 - _____ 20. Remove, inspect and replace output shaft assembly components. (Job Sheet 7)
 - _____ 21. Remove, inspect, and replace synchronizer assembly components. (Job Sheet 8)
 - _____ 22. Remove, inspect, and replace countershaft assembly components. (Job Sheet 9)
 - _____ 23. Remove, inspect, and replace reverse idler gear assembly components. (Job Sheet 10)
 - _____ 24. Check and adjust end play in transmission shafts. (Job Sheet 11)
 - _____ 25. Clean and inspect the transmission housing and transmission housing components. (Job Sheet 12)
 - _____ 26. Assemble the transmission and complete transmission service. (Job Sheet 13)
 - _____ 27. _____
- Pretest Score (%) _____
- Post Test Score (%) _____
- Modified Gains Score (%) _____

UNIT 5 — SERVICE MANUAL TRANSAXLES

- _____ 1. Label the components of a front-wheel power train on an illustration.
- _____ 2. Label the major sections and parts of a manual transaxle on an illustration.
- _____ 3. Match the names of the parts of a front drive axle to an illustration.
- _____ 4. Match the names of the parts of drive axle joints to illustrations.
- _____ 5. Diagnose manual transaxle and front drive axle noise and performance problems. (Assignment Sheet)
- _____ 6. Inspect, adjust, and replace transaxle shift linkage components located outside the transaxle housing. (Job Sheet 1)
- _____ 7. Remove and replace front drive axles. (Job Sheet 2)
- _____ 8. Inspect, remove, and replace front drive axle boots. (Job Sheet 3)
- _____ 9. Remove, inspect, and replace front drive axle joints. (Job Sheet 4)
- _____ 10. Inspect, remove, and replace transaxle power train mounts. (Job Sheet 5)
- _____ 11. Remove a transaxle assembly. (Job Sheet 6)
- _____ 12. Remove, inspect, and replace transaxle shift assembly components located inside the transaxle housing. (Job Sheet 7)
- _____ 13. Remove, inspect, and replace input shaft assembly components. (Job Sheet 8)
- _____ 14. Remove, inspect, and replace output shaft assembly components. (Job Sheet 9)
- _____ 15. Remove, inspect, and replace reverse idler gear assembly components. (Job Sheet 10)
- _____ 16. Measure and adjust end play and preload on transaxle shafts. (Job Sheet 11)

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- _____ 17. Remove, inspect, adjust, and replace the transaxle differential section. (Job Sheet 12)
 - _____ 18. Remove, inspect, and replace the speedometer drive assembly. (Job Sheet 13)
 - _____ 19. Clean and inspect the transaxle housing and transaxle housing components. (Job Sheet 14)
 - _____ 20. Assemble a transaxle. (Job Sheet 15)
 - _____ 21. Install a transaxle and complete transaxle service. (Job Sheet 16)
 - _____ 22. _____
- Pretest Score (%) _____
- Post Test Score (%) _____
- Modified Gains Score (%) _____

UNIT 6 — SERVICE FOUR-WHEEL DRIVE

- _____ 1. Match the names of the components of a four-wheel drivetrain to an illustration.
 - _____ 2. Match the names of the parts of types of transfer cases to illustrations.
 - _____ 3. Match the names of the parts of a planetary gear assembly to illustrations.
 - _____ 4. List three ways the front drive axles can be disconnected in four-wheel drive vehicle.
 - _____ 5. Label the parts of front drive axles used on four-wheel drive vehicles on illustrations.
 - _____ 6. Diagnose four-wheel drive assembly noise and performance problems. (Assignment Sheet)
 - _____ 7. Inspect, adjust, and repair transfer case shifting components. (Job Sheet 1)
 - _____ 8. Remove an independent four-wheel drive transfer case. (Job Sheet 2)
 - _____ 9. Remove, inspect, service, and replace transfer case components. (Job Sheet 3)
 - _____ 10. Remove and inspect front steering knuckles and drive axle assemblies. (Job Sheet 4)
 - _____ 11. Inspect, service, and replace front wheel bearings and locking hubs. (Job Sheet 5)
 - _____ 12. Service and replace front steering knuckles and drive axle assemblies. (Job Sheet 6)
 - _____ 13. Replace an independent four-wheel drive transfer case and complete service. (Job Sheet 7)
 - _____ 14. _____
- Pretest Score (%) _____
- Post Test Score (%) _____
- Modified Gains Score (%) _____