

## AER 0399 - Automotive Manual Transmissions and Transaxles

2013 NATEF JOB TASKS COMPLETION REQUIREMENT: **P1 - 95% P2 - 80% P3 - 50%**

**Student Name:** \_\_\_\_\_

### DETAILED COURSE CONTENT

MANUAL DRIVETRAIN AND AXLES TECHNICIAN

#### DEMONSTRATE PROFICIENCY IN GENERAL: DRIVE TRAIN DIAGNOSIS –

The student will be able to:

		P1	P2	P3	Level	Date	Textbook Ch CDX Task
III-A-1	Identify and interpret drive train concern; determine necessary action.						24: C101
III-A-2	Research applicable vehicle and service information, fluid type, vehicle service history, service precautions, and technical service bulletins.						24: C102
III-A-3	Check fluid condition; check for leaks; determine necessary action.						24: C901
III-A-4	Drain and refill manual transmission/transaxle and final drive unit.						24: C105

#### DEMONSTRATE PROFICIENCY IN AXLES CLUTCH DIAGNOSIS AND REPAIR -

The student will be able to:

III-B-1	Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action.						23: C106
III-B-2	Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs, perform necessary action.						23: C107
III-B-3	Inspect and replace clutch pressure plate assembly, clutch disc, release (throw-out) bearing and linkage, and pilot bearing/bushing (as applicable).						23: C608
III-B-4	Bleed clutch hydraulic system.						23: C111
III-B-5	Check and adjust clutch master cylinder fluid level; check for leaks						31: C908
III-B-6	Inspect flywheel and ring gear for wear and cracks, determine necessary action.						23: C847
III-B-7	Measure flywheel runout and crankshaft end play; determine necessary action.						23: C848

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### DEMONSTRATE PROFICIENCY IN TRANSMISSION/TRANSAXLE DIAGNOSIS

AND REPAIR - The student will be able to:

		P1	P2	P3	Level	Date	Textbook Ch CDX Task
III-C-1	Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers.						25: C768
III-C-2	Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.						24 : C611

### DEMONSTRATE PROFICIENCY IN DRIVE SHAFT AND HALF SHAFT, UNIVERSAL AND CONSTANT-VELOCITY (CV) JOINT DIAGNOSIS AND REPAIR -

The student will be able to:

III-D-1	Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action.						26: C132
III-D-2	Diagnose universal joint noise and vibration concerns; perform necessary action.						26: C133
III-D-3	Inspect, remove, and replace front-wheel-drive (FWD) bearings, hubs, and seals.						26 C134
III-D-4	Inspect, service, and replace shafts, yokes, boots, universal/CV-joints.						26: C849
III-D-5	Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.						26: C779

### DEMONSTRATE PROFICIENCY IN RING AND PINION GEARS, AND DIFFERENTIAL CASE ASSEMBLY – The student will be able to:

III-E-1-1	Clean and inspect differential housing, check for leaks; inspect housing vent.						26: C785
III-E-1-2	Check and adjust differential housing fluid level.						26: C911
III-E-1-3	Drain and refill differential housing.						26: C912
III-E-1-4	Inspect and replace companion flange and pinion seal; measure companion flange runout.						26: C889

### DEMONSTRATE PROFICIENCY IN DRIVE AXLES -

The student will be able to:

		P1	P2	P3	Level	Date	Textbook Ch CDX Task
III-E-3-1	Inspect and replace drive axle shaft wheel studs.						26, 32: C154
III-E-3-2	Remove and replace drive axle shafts.						26: C155

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		P1	P2	P3	Level	Date	Textbook Ch CDX Task
III-E-3-3	Inspect and replace drive axle shaft seals, bearings, and retainers.						26: C156
III-E-3-4	Measure drive axle flange runout and shaft end play; determine necessary action.						26: C850

### DEMONSTRATE PROFICIENCY IN FOUR-WHEEL-DRIVE/ALL-WHEEL DRIVE

COMPONENT DIAGNOSIS AND REPAIR - The student will be able to:

		P1	P2	P3	Level	Date	Textbook Ch CDX Task
III-F-1	Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.						26: C788
III-F-2	Inspect front-wheel bearings and locking hubs; perform necessary action(s).						26: C913
III-F-3	Check for leaks at drive assembly seals; check vents; check lube level.						26: C914
III-F-4	Identify concerns related to variations in tire circumference and/or final drive ratios.						26: C613

	P1	P2	P3
Tasks Completed	0	0	0
Total Tasks	17	8	5
% of Total Tasks	0	0	0