



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

AST 2210A Automatic Transmission
4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Apply transmission and transaxle diagnosis techniques.
 - a. Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action. (P-1)
 - b. Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. (P-1)
 - c. Diagnose fluid loss and condition concerns; determine needed action. (P-1)
 - d. Check fluid level in a transmission or a transaxle equipped with a dip-stick. (P-1)
 - e. Check fluid level in a transmission or a transaxle not equipped with a dip-stick. (P-1)
 - f. Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine needed action. (P-1)
 - g. Diagnose noise and vibration concerns; determine needed action. (P-2)
 - h. Perform stall test; determine needed action. (P-2)
 - i. Perform lock-up converter system tests; determine needed action. (P-3)
 - j. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles. (P-1)
 - k. Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information. (P-1)
 - l. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law). (P-2)

2. Apply in-vehicle transmission/transaxle maintenance and repair.
 - a. Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch. (P-1)
 - b. Inspect for leakage; replace external seals, gaskets, and bushings. (P-2)

- c. Inspect, test, adjust, repair and/or replace electrical/electronic components and circuits including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses; demonstrate understanding of the relearn procedures. (P-1)
 - d. Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification. (P-1)
 - e. Inspect, replace and align powertrain mounts. (P-2)
3. Apply off-vehicle transmission and transaxle repair.
- a. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mounting surfaces. (P-2)
 - b. Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings. (P-1)
 - c. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore. (P-2)
 - d. Describe the operational characteristics of a continuously variable transmission (CVT). (P-3)
 - e. Describe the operational characteristics of a hybrid vehicle drive train. (P-3)
 - f. Disassemble, clean, and inspect transmission/transaxle. (P-1)
 - g. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, switches, solenoids, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets). (P-2)
 - h. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine needed action. (P-2)
 - i. Assemble transmission/transaxle. (P-1)
 - j. Inspect, measure, and reseal oil pump assembly and components. (P-2)
 - k. Measure transmission/transaxle end play and/or preload; determine needed action. (P-1)
 - l. Inspect, measure, and/or replace thrust washers and bearings. (P-2)
 - m. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls. (P-2)
 - n. Inspect bushings; determine needed action. (P-2)
 - o. Inspect and measure planetary gear assembly components; determine needed action. (P-2)
 - p. Inspect case bores, passages, bushings, vents, and mating surfaces; determine needed action. (P-2)
 - q. Diagnose and inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform needed action. (P-2)
 - r. Inspect measure, repair, adjust or replace transaxle final drive components. (P-2)

- s. Inspect clutch drum, piston, check-balls, springs, retainers, seals, friction plates, pressure plates, and bands; determine needed action. (P-2)
- t. Measure clutch pack clearance; determine needed action. (P-1)
- u. Air test operation of clutch and servo assemblies. (P-1)
- v. Inspect one-way clutches, races, rollers, sprags, springs, cages, retainers; determine needed action. (P-2)

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

These SLOs are not approved for experiential credit.

Effective: Fall 2018