

Dakota County Technical College

ASEP 2209: Driveline and Four-Wheel Drive

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 1

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course covers the disassembly, operation, reconditioning, assembly, and adjustments of General Motors front and rear axles, driveaxles, and driveshafts. Prerequisites: None

B. COURSE EFFECTIVE DATES: 03/16/1998 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

D. LEARNING OUTCOMES (General)

1. Bleed clutch hydraulic system
2. Check drive assembly seals and vents; check lube level
3. Check ring and pinion tooth contact patterns; perform necessary action
4. Check shaft balance; measure shaft run out; measure and adjust driveline angles
5. Comply with personal and environmental safety practices
6. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action
7. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action
8. Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine necessary action
9. Diagnose fluid leakage concerns; determine necessary action
10. Diagnose fluid usage, level, and condition concerns; determine necessary action
11. Diagnose noise and vibration concerns; determine necessary action
12. Diagnose noise, hard shifting, jumping out of gear, and fluid leakage concerns; determine necessary action
13. Diagnose noise, slippage, and chatter concerns; determine necessary action
14. Diagnose noise, vibration, and unusual steering concerns; determine necessary action
15. Diagnose test, adjust, and replace electrical/electronic components of four-wheel drive systems
16. Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action
17. Diagnose universal joint noise and vibration concerns; perform necessary action
18. Disassemble, clean, and reassemble transmission/transaxle components
19. Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case
20. Disassemble, service, and reassemble transfer case and components
21. Drain and fill manual transmission/transaxle and final drive unit
22. Identify and interpret drive train concern; determine necessary action
23. Inspect and flush differential housing; refill with correct lubricant
24. Inspect and reinstall clutch (cone or plate) components
25. Inspect and reinstall powertrain mounts
26. Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers
27. Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings
28. Inspect and replace clutch pressure plate assembly and clutch disc
29. Inspect and replace companion flange and pinion seal; measure companion flange run out
30. Inspect and replace drive axle shaft seals, bearings, and retainers
31. Inspect and replace drive axle shaft wheel studs
32. Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces
33. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform necessary action
34. Inspect engine block, clutch (bell) housing, transmission/transaxle case mating surfaces, and alignment dowels; determine necessary action
35. Inspect flywheel and ring gear for wear and cracks, determine necessary action
36. Inspect front-wheel bearings and locking hubs; perform necessary action
37. Inspect hydraulic clutch slave and master cylinders, lines, and hoses; determine necessary action
38. Inspect lubrication devices (oil pump or slingers); perform necessary action
39. Inspect release (throw-out) bearing, lever, and pivot; determine necessary action
40. Inspect ring gear and measure run out; determine necessary action
41. Inspect transmission/transaxle case, extension housing, case mating surfaces

41. Inspect transmission/transaxle case, extension housing, case mating surfaces
42. Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs
43. Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers
44. Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets
45. Inspect, remove or replace pilot bearing or bushing (as applicable)
46. Inspect, service, and replace shafts, yokes, boots, and CV joints
47. Inspect, test, and replace transmission/transaxle sensors and switches
48. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals)
49. Measure and adjust drive pinion bearing preload
50. Measure and adjust drive pinion depth
51. Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types)
52. Measure drive axle flange run out and shaft endplay; determine necessary action
53. Measure endplay or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action
54. Measure flywheel run out and crankshaft endplay; determine necessary action
55. Measure rotating torque; determine necessary action
56. Reassemble and reinstall differential case assembly; measure run out; determine necessary action
57. Remove and reinstall transfer case
58. Remove and reinstall transmission/transaxle
59. Remove and replace drive axle shafts
60. Remove and replace transaxle final drive
61. Remove, inspect, and reinstall drive pinion and ring gear, spacers, sleeves, and bearings
62. Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly
63. Replace front wheel drive (FWD) front wheel bearing
64. Research applicable vehicle and service information such as drive train system operation, vehicle service history, service precautions, and technical service bulletins

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted