

# Dakota County Technical College

## ABCT 2212: Unibody/Frame/Wheel Alignment II

### A. COURSE DESCRIPTION

Credits: 6

Lecture Hours/Week: 1

Lab Hours/Week: 5

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course is a continuation of ABCT2108 with additional technical information and procedures. Students will be using frame repair equipment, various measuring equipment to include universal measuring, centerline gauges, and lazer measuring and applying all previous training on damaged vehicle repairs.

Prerequisites: ABCT1111, ABCT1212 or BSEP1301, ABCT1120, ABCT2108, and ABCT2106.

**B. COURSE EFFECTIVE DATES:** 08/19/2002 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

**D. LEARNING OUTCOMES (General)**

1. Perform suitable measuring
2. Perform frame rail cutting
3. Perform safe frame repair practices
4. Perform heat control methods
5. Perform repair remeasure
6. Perform method of measuring recording process
7. Perform new rail preparation techniques
8. Perform repair or replace method of decision
9. Perform vehicle anchoring techniques
10. Perform frame damage quick checks
11. Perform initial frame damage examination
12. Perform vehicle frame rack mounting procedures
13. Perform vehicle lift contact points procedures
14. Perform frame repair parts identification
15. Perform frame repair parts removal
16. Perform frame repair set up
17. Perform frame damage estimates
18. Perform repair process plan
19. Perform proper internal corrosion protection techniques
20. Perform work area cleanup
21. Perform total time of repair statement
22. Perform completed vehicle cleanup procedure
23. Perform refinishing process
24. Perform new part refinish preparation process
25. Perform part fitup inspection
26. Perform parts reinstallation
27. Perform frame rail measuring for cutting methods
28. Perform total body verification measuring
29. Perform new rail corrosion protection techniques
30. Perform frame rail metal finishing techniques
31. Perform frame rail remeasure
32. Perform frame rail pulling
33. Perform pulling clamp hookup
34. Perform final measuring inspection
35. Perform weld nugget cleanup
36. Perform weld joint inspection
37. Perform welding
38. Perform welding procedure setup
39. Perform frame rail welding setup
40. Perform vehicle frame rack removal
41. Identify suspension system fasteners that should not be reused HP-G
42. Inspect and replace rack and pinion steering gear, tie rod ends, and bellows boots HP-G
43. Inspect alignment, adjust tension, and replace power steering pump belts HP-G
44. Remove and replace power steering pump, pulleys; inspect pump mounts HP-G

45. Inspect and replace power steering hoses and fittings HP-G
46. Remove and replace power steering gear (non-rack and pinion type) HP-G
47. Remove and replace power rack and pinion steering gear; inspect and replace mounting bushings and brackets; ensure proper mounting location HP-G
48. Inspect and adjust (where applicable) steering linkage geometry (attitude/parallelism) HP-G
49. Inspect and replace pitman arm HP-G
50. Inspect and replace relay (center link/intermediate) rod - HP-G
51. Inspect, remove and replace idler arm and mountings HP-G
52. Inspect, remove and replace tie rod sleeves, clamps, and tie rod ends HP-G
53. Inspect, remove and replace steering linkage damper HP-G
54. Inspect, remove and replace upper and lower control arms HP-G
55. Inspect, remove and replace upper and lower ball joints HP-G
56. Inspect, remove and replace steering knuckle/spindle/hub assemblies (including bearings, races, seals, etc) HP-G
57. Inspect, remove and replace front suspension system coil springs and spring insulators (silencers) HP-G
58. Inspect, remove, and replace stabilizer bar bushings, brackets, and links HP-G
59. Inspect, remove and replace MacPherson strut cartridge or assemble, upper bearing, and mount HP-G
60. Inspect, remove, and replace rear suspension system transverse links, control arms, stabilizer bars, bushings, and mounts HP-G
61. Inspect, remove, and replace suspension system leaf spring(s), leaf spring insulators (silencers), shackles, brackets, bushings, and mounts HP-G
62. Inspect axle assembly for damage and misalignment HP-G
63. Inspect, remove and replace shock absorbers HP-G
64. Inspect, remove and replace air shock absorbers, load-leveling devices, air springs, and associated lines and fittings HP-G
65. Diagnose, inspect, adjust, repair or replace components of electronically controlled suspension systems HP-G
66. Measure vehicle ride height; determine needed repairs HP-I
67. Inspect, remove, replace, and align front and rear frame (cradles/stub) HP-G
68. Diagnose steering column damage, looseness, and binding problems (including tilt mechanisms); determine needed repairs HP-G
69. Inspect, remove and replace steering shaft U-joint(s), flexible coupling(s), collapsible columns, and steering wheels HP-G
70. Diagnose manual and power steering gear (non-rack and pinion type) noises, binding, uneven turning effort, looseness, hard steering and fluid leakage problems; determine needed repairs HP-G
71. Diagnose power rack and pinion steering gear noises, vibration, looseness, hard steering, and fluid leakage problems, ensure proper mounting location; determine needed repairs HP-G
72. Diagnose non-MacPherson front and rear suspension system noises and body sway problems; determine needed repairs HP-G
73. Diagnose MacPherson strut suspension system noises and body sway problems; determine needed repairs HP-G
74. Diagnose vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine needed repairs HP-G
75. Adjust front and rear wheel camber on suspension systems with camber adjustments HP-I
76. Check front and rear wheel camber on adjustable and non-adjustable suspension systems; determine needed repairs HP-I
77. Check caster on adjustable and non-adjustable suspension systems; determine needed repairs HP-I

78. Check and adjust wheel toe; determine needed adjustment or repair HP-I
79. Center steering wheel HP-I
80. Identify tow-out-on-turns (turning radius) related problems; determine needed repairs HP-I
81. Identify SAI (steering axis inclination)/KPI (king pin inclination) related problems; determine needed repairs HP-I
82. Identify thrust angle related problems; determine needed repairs HP-I
83. Check for front wheel setback; determine needed repairs HP-I
84. Diagnose tire wear patterns; determine needed repairs HP-I
85. Inspect tires, identify direction of rotation, and location; check and adjust air pressure HP-I
86. Diagnose wheel/tire vibration, shimmy, and tramp (wheel hop) problems; determine needed repairs HP-G
87. Measure wheel, tire, axle, and hub runout; determine needed repairs HP-I
88. Diagnose tire pull (lead) problems; determine corrective actions HP-G
89. Reinstall wheels and torque lug nuts according to manufacturer's specifications HP-I
90. Inspect, remove, replace, and adjust suspension system torsion bars, and inspect mounts HP-G
91. Adjust caster on suspension systems with caster adjustments HP-I
92. Exhibit professionalism

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted