

## Denfeld Auto Block 2 Auto Basics: Transmissions and Suspensions

### Syllabus with Task Sequence

40% Classroom Lecture and 60% Supervised Lab Time

### ASE 0: Foundation Studies (Block 2, Weeks 1-9, Grade Period 1)

- A. General Safety
- B. Personal Safety
- C. Tool Safety
- D. Vehicle Protection and Jack and Lift Safety
- E. Vehicle, Customer, and Service Information
- F. SRS and ABS Safety

During Weeks 1-3, SP2 Online Safety Course to be completed

CDX Tasksheet Number	NATEF Tasksheet Title	MLR NATEF Reference number; Priority Level	Grade Period 1 Block 2 Week #	NATEF Supplemental Task?
<u>Task Sheet Group Title Page</u>	<b>A. General Safety</b>			
<u>C451</u>	Identify general shop safety rules and procedures.	0A1; P-1	4	Y
<u>C456</u>	Identify marked safety areas.	0A6; P-1	4	Y
<u>C458</u>	Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	0A7; P-1	4	Y

<a href="#"><u>C459</u></a>	Identify the location and use of eye wash stations.	0A8; P-1	5	Y
<a href="#"><u>C460</u></a>	Identify the location of posted evacuation routes.	0A9; P-1	5	Y
<a href="#"><u>C465</u></a>	Locate and demonstrate knowledge of material safety data sheets (MSDS).	0A15; P-1	5	Y
<a href="#"><u>NN00</u></a>	Shop Diagram	N/A	6	NO
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>B. General Safety: Personal Safety</b>			
<a href="#"><u>C461</u></a>	Comply with the required safe use of safety glasses, ear protection, gloves, and shoes, during lab/shop activities.	0A10; P-1	6	Y
<a href="#"><u>C462</u></a>	Identify and wear appropriate clothing for lab/shop activities.	0A11; P-1	6	Y
<a href="#"><u>C463</u></a>	Secure hair and jewelry for lab/shop activities.	0A12; P-1	6	Y
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>C. General Safety: Tool Safety</b>			
<a href="#"><u>C466</u></a>	Identify tools and their usage in automotive applications.	0B1; P-1	6	Y
<a href="#"><u>C467</u></a>	Identify standard and metric designation.	0B2; P-1	6	Y
<a href="#"><u>C452</u></a>	Utilize safe procedures for handling of tools and equipment.	0A2; P-1	7	Y
<a href="#"><u>C468</u></a>	Demonstrate safe handling and use of appropriate tools.	0B3; P-1	7	Y
<a href="#"><u>C469</u></a>	Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	0B4; P-1	7	Y

<u>C896</u>	Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper).	0B5; P-1	7	Y
<u>Task Sheet Group Title Page</u>	<b>D. General Safety: Vehicle Protection and Jack and Lift Safety</b>			
<u>C473</u>	Identify purpose and demonstrate proper use of fender covers, mats.	0C2; P-1	7	Y
<u>C455</u>	Utilize proper ventilation procedures for working within the lab/shop area.	0A5; P-1	7	Y
<u>C453</u>	Identify and use proper placement of floor jacks and jack stands.	0A3; P-1	7	Y
<u>C454</u>	Identify and use proper procedures for safe lift operation.	0A4; P-1	7	Y
<u>C476</u>	Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover etc).	0D1; P-1	8	Y
<u>Task Sheet Group Title Page</u>	<b>E. General Safety: Vehicle, Customer, and Service Information</b>			
<u>C471</u>	Proper vehicle identification information, Define the use and purpose of the VIN, engine numbers and data code, Locate VIN, Apply knowledge of VIN information.	N/A	8	NO
<u>C472</u>	Identify information needed and the service requested on a repair order.	0C1; P-1	8	Y
<u>C474</u>	Demonstrate use of 3 C's (concern, cause and correction).	0C3; P-1	8	Y
<u>C475</u>	Review vehicle service history.	0C4; P-1	8	Y

<u>Task Sheet Group Title Page</u>	<b>F. General Safety: SRS and ABS Safety</b>			
<u>C464</u>	Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	0A13; P-1	9	Y
<u>C895</u>	Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignitions systems, injection systems, etc.).	0A14; P-1	9	Y
<u>C590</u>	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	0C5; P-1	9	Y

## ASE 4: Suspension and Steering –

(Block 2, Grade Period 2 & Weeks 1-5 of Grade Period 3)

- [A. Vehicle, Customer, and Service information](#)
- [B. Wheel and Tire Maintenance](#)
- [C. Wheel and Tire Diagnosis](#)
- [D. Power Steering Pump Maintenance and Service](#)
- [E. Steering Gear Service](#)
- [F. Steering Linkage Service](#)
- [G. Steering Gear Diagnosis](#)
- [H. Steering Column Service](#)
- [I. Front Suspension Service-Long and Short Arm](#)
- [J. Front Suspension Service-Strut and Torsion Bar](#)
- [K. Front-Suspension Diagnosis](#)
- [L. Rear Suspension Service](#)
- [M. Electronically Controlled Steering and Suspension Service](#)
- [N. Wheel Alignment Diagnosis, Adjustment, and Repair](#)

CDX Tasksheet Number	NATEF Tasksheet Title	MLR NATEF Reference number; Priority Level	Grade Period 2 Block 2 Week #	
<a href="#">Task Sheet Group Title Page</a>	<b>A. Suspension and Steering Systems: Vehicle, Customer, and Service Information</b>			
<a href="#">C166/A4001</a>	Research applicable vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	4A1; P-1	10	
ID 2/A4003	Identify suspension and steering system components and configurations.	4A3; P-1	10	
<a href="#">Task Sheet Group Title Page</a>	<b>B. Suspension and Steering Systems: Wheel and Tire Maintenance</b>			

<a href="#"><u>C619/A4029</u></a>	Inspect tire condition; identify tire wear patterns; check for correct tire size and application (load and speed ratings), and air pressure as listed on the tire information placard/label.	4D1; P-1	10	
<a href="#"><u>C222/A4030</u></a>	Rotate tires according to manufacturer's recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).	4D2; P-1	10	
<a href="#"><u>C620/A4031</u></a>	Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.	4D3; P-1	11	
<a href="#"><u>C936/A4036</u></a>	Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure.	4D8; P-1	11	
<a href="#"><u>C621/A4032</u></a>	Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.	4D4; P-1	12	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>C. Suspension and Steering Systems: Wheel and Tire Diagnosis</b>			
<a href="#"><u>C580/A4033</u></a>	Inspect tire and wheel assembly for air loss; perform necessary action.	4D5; P-1	13	
<a href="#"><u>C552/A4034</u></a>	Repair tire following vehicle manufacturer approved procedure.	4D6; P-1	13	
<a href="#"><u>C935/A4035</u></a>	Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate system; verify operation of instrument panel lamps.	4D7; P-1	13	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>D. Suspension and Steering Systems: Power Steering Pump Maintenance and Service</b>			
<a href="#"><u>C177/A4005</u></a>	Inspect power steering fluid level and condition.	4B2; P-1	14	

<a href="#">C182</a>	Replace power steering pump filter(s).	N/A		
<a href="#">C178/A4006</a>	Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.	4B3; P-2	14	
<a href="#">C180/A4008</a>	Remove, inspect, replace, and/or adjust power steering pump drive belt.	4B5; P-1	14	
<a href="#">C179/A4007</a>	Inspect for power steering fluid leakage.	4B4; P-1	14-15	
<a href="#">C183/A4009</a>	Inspect and replace power steering hoses and fittings.	4B6; P-2	14-15	
<a href="#">Task Sheet Group Title Page</a>	<b>E. Suspension and Steering Systems: Steering Gear Service</b>			
<a href="#">C933/A4004</a>	Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.	4B1; P-1	16	
<a href="#">Task Sheet Group Title Page</a>	<b>F. Suspension and Steering Systems: Steering Linkage Service</b>			
<a href="#">C918/A4010</a>	Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper.	4B7; P-1	16	
<a href="#">C916/A4011</a>	Inspect tie rod ends (sockets), tie rod sleeves, and clamps	4B8; P-1	16	
<a href="#">Task Sheet Group Title Page</a>	<b>G. Suspension and Steering Systems: Steering Gear Diagnosis</b>			
<a href="#">Task Sheet Group Title Page</a>	<b>H. Suspension and Steering Systems: Steering Column Service</b>			
<a href="#">C168/A4002</a>	Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.	4A2; P-1	17	
<a href="#">Task Sheet Group Title Page</a>	<b>I. Suspension and Steering Systems: Front Suspension Service-Long and Short Arm</b>			

<a href="#"><u>C925/A4018</u></a>	Inspect and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	4B15; P-1	18	
<a href="#"><u>C923/A4016</u></a>	Inspect suspension system coil springs and spring insulators (silencers).	4B13; P-1	18	
<a href="#"><u>C920/A4012</u></a>	Inspect upper and lower control arms, bushings, and shafts.	4B9; P-1	18	
<a href="#"><u>C919/A4013</u></a>	Inspect and replace rebound bumpers.	4B10; P-1	18	
<a href="#"><u>C922/A4015</u></a>	Inspect upper and lower ball joints (with or without wear indicators).	4B12; P-1	18	
<a href="#"><u>Task Sheet Group Title Page</u></a>	J. Suspension and Steering Systems: Front Suspension Service-Strut and Torsion Bar			
<a href="#"><u>C926/A4019</u></a>	Inspect, remove, and/or replace strut cartridge or assembly; inspect mounts and bushings.	4B16; P-2	19	
<a href="#"><u>C927/A4020</u></a>	Inspect front strut bearing and mount.	4B17; P-1	19	
<a href="#"><u>C921/A4014</u></a>	Inspect track bar, strut rods/radius arms, and related mounts and bushings.	4B11; P-1	19	
<a href="#"><u>C924/A4017</u></a>	Inspect suspension system torsion bars and mounts.	4B14; P-1	19	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>K. Suspension and Steering Systems: Front-Suspension Diagnosis</b>			
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>L. Suspension and Steering Systems: Rear Suspension Service</b>			
<a href="#"><u>C202/A4023</u></a>	Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	4B20; P-1	20	
<a href="#"><u>C928/A4021</u></a>	Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms.	4B18; P-1	21	



<a href="#"><u>C929/A4022</u></a>	Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.	4B19; P-1	21	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>M. Suspension and Steering Systems: Electronically Controlled Steering and Suspension Service</b>			
<a href="#"><u>C700/A4024</u></a>	Inspect electric power steering assist system.	4B21; P-2	22	
<a href="#"><u>C931</u></a>	Describe the function of the power steering pressure switch.		23	
<a href="#"><u>C551/A4025</u></a>	Identify hybrid vehicle power steering system electrical circuits and safety precautions.	4B22; P-2	23	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>N. Suspension and Steering Systems: Wheel Alignment Diagnosis, Adjustment, and Repair</b>			
<a href="#"><u>C939/A4027</u></a>	Perform pre-alignment inspection and measure vehicle ride height.	4C1; P-1	23	

## ASE 2: Automatic Transmission and Transaxle

(Block 2, Weeks 24-27, Grade Period 3)

- A. Vehicle, Customer, and Service information
- B. Inspection and Testing
- C. Diagnosis
- D. Maintenance and Repair
- E. Transmission Removal and Replacement
- F. Assemble Transmission

CDX Tasksheet Number	NATEF Tasksheet Title	MLR NATEF Reference number; Priority Level	Grade Period 3 Block 2 Week #	
<u>Task Sheet Group Title Page</u>	<b>A. Automatic transmission and Transaxle: Vehicle, Customer, and Service information</b>			
<u>C681/A2001</u>	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	2A1; P-1	24	
<u>C902/A2002</u>	Check fluid level in a transmission or a transaxle equipped with a dip-stick.	2A2; P-1	24	
<u>C903/A2003</u>	Check fluid level in a transmission or a transaxle not equipped with a dip-stick.	2A3; P-1	24	
<u>C904/A2004</u>	Check transmission fluid condition; check for leaks.	2A4; P-2	24	
<u>C907/A2009</u>	Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	2B4; P-1	25	
<u>C606/A2010</u>	Describe the operational characteristics of a continuously variable transmission (CVT)	2C1; P-3	25	

<a href="#"><u>C607/A2011</u></a>	Describe the operational characteristics of a hybrid vehicle drive train.	2C2; P-3	26	
<a href="#"><u>NN02</u></a>	Demonstrate the use of the 3 Cs (concern, cause, and correction).	N/A	26	
ID 3/A2005	Identify drive train components and configuration.	2A5; P-1	26	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>C. Automatic Transmission and Transaxle: Diagnosis</b>			
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>D. Automatic Transmission and Transaxle: Maintenance and Repair</b>			
<a href="#"><u>C683/A2006</u></a>	Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.	2B1; P-2	26	
<a href="#"><u>C905/A2007</u></a>	Inspect for leakage at external seals, gaskets, and bushings	2B2; P-2	27	
<a href="#"><u>C602/A2008</u></a>	Inspect, replace and/or align powertrain mounts.	2B3; P-2	27	
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>E. Automatic Transmission and Transaxle: Transmission Removal and Replacement</b>			
<a href="#"><u>Task Sheet Group Title Page</u></a>	<b>F. Automatic Transmission and Transaxle: Assemble Transmission</b>			

## ASE 3: Manual Drive Train & Axles – (Block 2, Grade Period 4)

- A. Vehicle, Customer, and Service Information
- B. Transmission/Transaxle Maintenance
- C. Clutch Maintenance
- D. Clutch Diagnosis and Repair
- E. Transmission/ Transaxle Diagnosis
- F. Transmission/ Transaxle Repair
- G. Drive Shaft, Half Shaft, Universal, and Constant-Velocity Joint Diagnosis and Repair
- H. Drive Axle Diagnosis and Repair
- I. Limited Slip Differential
- J. Drive Axle Shaft
- K. Four-Wheel Drive/ All-Wheel Drive Component Diagnosis and Repair

CDX Tasksheet Number	NATEF Tasksheet Title	MLR NATEF Reference number; Priority Level	Grade Period 4 Block 2 Week #	
<u>Task Sheet Group Title Page</u>	<b>A. Manual Drive Train and Axles: Vehicle, Customer, and Service Information</b>			
<u>C102/A3001</u>	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	3A1; P-1	28	
<u>C611/A3007</u>	Describe the operational characteristics of an electronically controlled manual transmission/transaxle.	3C1; P-3	28	
<u>NN03</u>	Demonstrate use of 3 Cs (concern, cause, and correction).	N/A	28	
ID 4/A3004	Identify manual drive train and axle components and configuration.	3A4; P-1	28	
<u>Task Sheet Group Title Page</u>	<b>B. Manual Drive Train and Axles: Transmission/Transaxle Maintenance</b>			
<u>C901/A3003</u>	Check fluid condition; check for leaks.	3A3; P-2	28	

<a href="#">C105/A3002</a>	Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.	3A2; P-1	29	
<a href="#">Task Sheet Group Title Page</a>	<b>C. Manual Drive Train and Axles: Clutch Maintenance</b>			
<a href="#">C908/A3005</a>	Check and adjust clutch master cylinder fluid level; use proper fluid type per manufacturer specification.	3B1; P-1	29	
<a href="#">C909/A3006</a>	Check for hydraulic system leaks.	3B2; P-1	29	
<a href="#">Task Sheet Group Title Page</a>	<b>E. Manual Drive Train and Axles: Transmission/Transaxle Diagnosis</b>			
<a href="#">Task Sheet Group Title Page</a>	<b>F. Manual Drive Train and Axles: Transmission/Transaxle Repair</b>			
<a href="#">Task Sheet Group Title Page</a>	<b>G. Manual Drive Train and Axles: Drive Shaft, Half Shaft, Universal, and Constant-Velocity Joint Diagnosis and Repair</b>			
<a href="#">C849/A3009</a>	Inspect, service, and/or replace shafts, yokes, boots, and universal/CV joints.	3D2; P-2	30	
<a href="#">C134/A3008</a>	Inspect, remove and/or replace bearings, hubs, and seals.	3D1; P-2	31	
<a href="#">C911/A3013</a>	Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.	3E2; P-1	32	
<a href="#">C912/A3014</a>	Drain and refill differential housing.	3E3; P-1	32	
<a href="#">C785/A3012</a>	Clean and inspect differential case; check for leaks; inspect housing vent.	3E1; P-2	33	
<a href="#">Task Sheet Group Title Page</a>	<b>I. Manual Drive Train and Axles: Limited Slip Differential</b>			

<u>Task Sheet Group Title Page</u>	<b>J. Manual Drive Train and Axles: Drive Axle Shaft</b>			
<u>C154/A3015</u>	Inspect and replace drive axle wheel studs.	3E4:1; P-2	34	
<u>Task Sheet Group Title Page</u>	<b>K. Manual Drive Train and Axles: Four-Wheel Drive/ All-Wheel Drive Component Diagnosis and Repair</b>			
<u>C913/A3010</u>	Inspect locking hubs	3F1: P-3	35	
<u>C914/C914</u>	Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.	3F2; P-2	36	

**Final Exam Follows Week 36**