Instructional Framework

Medium/Heavy Vehicle and Truck Technology

47.0613.00

This Instructional Framework identifies, explains, and expands the content of the standards/measurement criteria, and, as well, guides the development of multiple-choice items for the Technical Skills Assessment. This document corresponds with the Technical Standards endorsed on July 12, 2026.

Domain 1: Electrical and Electronics **Instructional Time: 30 - 35%**	
STANDARD 13.0 PERFORM GENERAL ELECTRICAL/ELECTRONIC SYSTEM DIAGNOSIS AND REPAIR	
13.1 Research vehicle service information, including service history, service precautions, and technical service bulletins	• Work orders • Required customer information • Vehicle information online resources
13.2 Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (e.g., Ohm's Law)	• Circuit types
13.3 Demonstrate operation and proper use of digital multimeters and other test equipment when measuring source voltage, voltage drop (including grounds), current flow, continuity, and resistance	• Open circuit voltage • Ammeter

13.4 Demonstrate the causes and effects of shorts, grounds, opens, and resistance problems in electrical/electronic circuits	• Effect on circuit caused by
	  ○ Open
	  ○ Short to ground
	  ○ Short to voltage
	  ○ Excessive resistance
	  ○ Low resistance

13.5 Use wiring diagrams to trace electrical/electronic circuits	• Identify diagram types • Power condition • Always-on voltage • Switched voltage ○ Power side switching

	○ Ground side switching
13.6 Measure parasitic (key-off) battery drain	● Determine maximum parasitic draw
13.7 Demonstrate the function, operation, and testing of fusible links, circuit breakers, relays, solenoids, actuators, diodes, and fuses	● Circuit overcurrent hazards
13.8 Inspect, repair (including solder repair, mechanical crimp repair, and sealed heat shrink), and/or replace connectors, seals, terminal ends, and wiring and verify proper routing and securement	● Moisture intrusion ● Connection
13.9 Use appropriate electronic service tool(s) and procedures to diagnose problems; check and record diagnostic codes; and interpret digital multimeter (DMM) readings	● Scan tool usage ● Digital multimeter (DMM) usage ● Instrument cluster
13.10 Check for malfunctions caused by faults in the data bus communications network	● Scan tool ● Oscilloscope
13.11 Identify electrical/electronic system components and configuration	● Switches ● Relays ● Modules ● Actuators
13.12 Check gauge and warning indicator operation	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
13.13 Explain sensor/sending units, gauges, switches, relays, bulbs/LEDs, wires, terminals, connectors, sockets, printed circuits, and control components/modules of the instrument cluster, driver information system, and warning systems	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
13.14 Check operation of horn(s), wiper/washer, and occupant restraint systems	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

STANDARD 14.0 PERFORM BATTERY DIAGNOSIS AND REPAIR (LOW VOLTAGE)	
14.1 Identify battery type and system configuration	• Series • Parallel • Maintenance-free batteries
14.2 Confirm proper battery capacity for application; perform battery state-of-charge test; perform battery capacity test and determine needed action	• Open circuit voltage test • Load test
14.3 Inspect and clean battery, battery cables, connectors, battery boxes, mounts, and hold-downs and determine needed action	• Connections • Corrosion • Security
14.4 Charge battery using appropriate method for battery type	• Fast charge • Slow charge • Charge amperage
14.5 Jump-start vehicle using a booster battery and jumper cables or using an appropriate auxiliary power supply	• Jump start safety • Jumper cable procedure • Jump pack procedure
14.6 Identify low voltage disconnect (LVD) systems	• Battery isolator • Low voltage switches and relays
STANDARD 15.0 PERFORM STARTING SYSTEM DIAGNOSIS AND REPAIR	
15.1 Explain starter system operation	• Cranking circuit • Solenoid • Motor • Pinion • Ring gear • Over-running clutch
15.2 Perform starter circuit cranking voltage and voltage drop tests	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
15.3 Inspect starter control circuit switches, relays, connectors,	• Ignition/start switches

terminals, wires, and harnesses (including over-crank protection)	• Solenoid • Over-crank thermal breaker
STANDARD 16.0 PERFORM CHARGING SYSTEM DIAGNOSIS AND REPAIR	
16.1 Explain the operation of the alternator	• Induction principle • Rectification • Voltage regulator
16.2 Check instrument panel mounted gauges and/or indicator lamps	• Voltmeters • Check lamps
16.3 Inspect alternator drive belt condition; check pulleys and tensioners for wear; check fans and mounting brackets; and verify proper belt alignment	• Belt type • Types of belt wear • Bearing
16.4 Inspect cables, wires, and connectors in the charging circuit, including remote sense circuit	• Corrosion • Insulation • Connections • Check resistance
16.5 Perform charging system voltage and amperage output tests; perform AC ripple test	• Current output test • Determine needed action
STANDARD 17.0 PERFORM LIGHTING SYSTEM DIAGNOSIS AND REPAIR	
17.1 Inspect for brighter-than-normal, intermittent, dim, or no-light operation and determine needed action	• Lighting system inspection
17.2 Test, replace, and aim headlights	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
17.3 Inspect cables, wires, and connectors in the lighting systems	• Connection • Cuts • Abrasion • Moisture intrusion

17.4 Inspect tractor-to-trailer multi-wire connectors, cables, and holders	• Connection • Cuts • Abrasions • Moisture intrusion • Proper mounting
STANDARD 18.0 PERFORM ELECTRIFIED VEHICLE HIGH VOLTAGE SAFETY	
18.1 Explain hazards related to high voltage system/electric vehicles, including electrocution, fire, explosion, arc flash, gases and fumes, hazardous chemicals, and EMF, and how to properly respond to emergency situations	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
18.2 Explain high voltage system and component coloring, warning labels, lights, signage, and lockout/tagout (LOTO) procedures	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
18.3 Identify which components and circuits contain high voltage	• Dealer specific
18.4 Explain steps needed to assess possible hazards prior to servicing a high voltage/electric vehicle, including awareness of automatic systems that may operate while the key switch/ignition is off	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
18.5 Identify systems, components, and circuits of a high voltage/electric vehicle a technician can safely service based on their training and the vehicle manufacturer's service guidelines and warranty	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

Domain 2: Inspections
Instructional Time: 25 - 30%

STANDARD 2.0 PERFORM PRE-TRIP INSPECTION	
2.1 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins	• Work orders • Required customer information • Vehicle information online resources

2.2 Inspect level and condition of fuel, oil, diesel exhaust fluid (DEF), and coolant	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
2.3 Inspect engine assembly for fuel, oil, coolant, air, and other leaks	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
2.4 Check engine operation (starting and running), including noise, vibration, smoke, etc.	• Idle/governor speed • Abnormal noise • Check vibration damper • Black/white/blue smoke
2.5 Use appropriate electronic service tool(s) to check and record diagnostic codes; check and record trip/operational data; reset maintenance monitor if applicable	• Scan tool usage • Digital multimeter (DMM) usage • Instrument cluster
2.6 Identify system components, configurations, and types [e.g., cylinder head(s), valve train, engine block, engine lubrication, engine cooling, air induction, exhaust, fuel, and engine braking]	• Engine configurations • Cylinder head configurations • Turbocharger configurations • Engine brake configurations • Intercooler identification • Exhaust after-treatment system
2.7 Inspect external electronic wiring harness and brackets for wear, bending, cracks, and proper securement	• Corrosion
STANDARD 3.0 PERFORM LUBRICATION SYSTEM PERFORMANCE MAINTENANCE (PM)	
3.1 Test engine oil pressure and check the operation of pressure sensor, gauge, and/or sending unit; test engine oil temperature and check operation of temperature sensor	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
3.2 Check engine oil level, condition, and consumption and take engine oil sample	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
3.3 Determine proper lubricant and perform oil and filter service	• Oil and filter service and inspection • Lubricant identification

STANDARD 4.0 PERFORM COOLING SYSTEM PERFORMANCE MAINTENANCE (PM)	
4.1 Check engine coolant type, level, condition, and test coolant for freeze protection and additive package concentration	• pH strips • Refractometer
4.2 Verify coolant temperature and check operation of temperature and level sensors, gauge, and/or sending unit	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
4.3 Inspect and reinstall/replace pulleys, tensioners and drive belts and adjust drive belts and check alignment	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
4.4 Recover coolant, flush, and refill with recommended coolant/additive package and bleed cooling system	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
4.5 Inspect coolant conditioner/filter assembly for leaks; inspect valves, lines, and fittings; replace as needed	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
4.6 Inspect water pumps, hoses, and clamps	• Visual inspection for leaks
4.7 Inspect and pressure test cooling systems; pressure test cap, tanks, and recovery systems; and radiator and mountings	• Visually inspect radiator mounts
4.8 Inspect thermostatic cooling fan system (e.g., hydraulic, pneumatic, and electronic) and fan shroud	• Inspect fan shroud for cracks and function
4.9 Identify engine block heater(s)	• Verify the location of the block heater on the engine (if present)
STANDARD 5.0 PERFORM AIR INDUCTION AND EXHAUST SYSTEM PERFORMANCE MAINTENANCE (PM)	

5.1 Inspect turbochargers, wastegates, and piping systems	• Leaks
	  ○ Exhaust
	  ○ Intake air
	  ○ Piping
	  ○ Lubrication
	• Proper operation

5.2 Check air induction system including cooler assembly, piping, hoses, clamps, and mountings and replace air filter as needed; reset restriction indicator if applicable	• Intake air filter • Check air restriction
5.3 Inspect manifold intake, gaskets, and connections	• Leaks • Abrasions • Cuts
5.4 Inspect engine exhaust system, exhaust gas recirculation (EGR) system, and exhaust aftertreatment system for leaks, mounting, proper routing, and damaged or missing components	• Diesel Exhaust Fluid (DEF) • Selective Catalyst Reduction (SCR) • Diesel Particulate Filter (DPF) • Seventh injector
5.5 Explain the exhaust gas recirculation (EGR) system operation including EGR valve, cooler, piping, electronic sensors, controls, and wiring	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
5.6 Explain the exhaust aftertreatment system components and controls including diesel oxidation catalyst (DOC), selective catalytic reduction (SCR), diesel exhaust fluid (DEF), diesel particulate filter (DPF), and sensors and regeneration system operation	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
5.7 Inspect engine compression and/or exhaust brake operation	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
STANDARD 6.0 PERFORM FUEL SYSTEM PERFORMANCE MAINTENANCE (PM)	
6.1 Check fuel level and condition	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
6.2 Inspect fuel tanks, vents, caps, mounts, valves, screens, crossover system, hoses, lines, and fittings	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
6.3 Inspect low pressure fuel system components (e.g., fuel pump, pump drives, screens, fuel/water separators/indicators, hoses, lines, filters, heaters, coolers, ECM cooling plates, check valves, pressure	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

regulator valves, restrictive fittings, and mounting hardware)	
6.4 Replace fuel filter and prime and bleed fuel system	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
6.5 Inspect high pressure fuel system components (e.g., fuel pump, pump drives, hoses, injection lines, filters, hold-downs, fittings, seals, and mounting hardware)	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
STANDARD 7.0 PERFORM DRIVE TRAIN PERFORMANCE MAINTENANCE (PM)	
7.1 Research vehicle service information, including fluid type, vehicle service history, service precautions/service mode, and technical service bulletins	• Work orders • Required customer information • Vehicle information online resources
7.2 Identify drive train components, transmission type, and configuration	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.3 Use appropriate electronic service tools and procedures to check and record diagnostic codes	• Dealer software
7.4 Inspect and adjust clutch, clutch brake, linkage, cables, levers, brackets, bushings, pivots, springs, and clutch safety switch, including push-type and pull-type and check pedal height and travel	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.5 Inspect clutch primary (master) cylinder fluid level and condition and check clutch primary (master) cylinder, secondary (slave) cylinder, lines, and hoses for leaks and damage	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.6 Inspect transmission shifter and linkage and inspect transmission mounts, insulators, and mounting bolts	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.7 Inspect transmission for leakage	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

7.8 Check transmission cover plates, gaskets, seals, and cap bolts and inspect seal surfaces and vents	• Identify Power Takeoff (PTO) components
7.9 Check transmission fluid level and condition	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.10 Inspect transmission oil filters, coolers, and related components	• Locate and inspect transmission breather
7.11 Inspect speedometer components	• Gauge/digital display • Speed sensor
7.12 Inspect and test function of reverse light	• Neutral start switch • Warning device circuits
7.13 Inspect and service, if applicable, driveshafts, slip joints, yokes, drive flanges, support bearings, universal joints, boots, seals, and retaining/mounting hardware and check phasing of all shafts	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.14 Check for fluid leaks and inspect drive axle housing assembly, cover plates, gaskets, seals, vent/breather, and magnetic plugs	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.15 Check drive axle fluid level and condition and check drive axle filter	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.16 Inspect air-operated power divider (interaxle differential) assembly	• Diagrams • Seals • Springs • Yokes • Pins • Lines • Hoses • Fittings • Controls
7.17 Inspect drive axle shafts	• Dents

	• Missing weights and hardware
7.18 Remove and replace wheel assembly and check rear wheel seal and axle flange for leaks	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
7.19 Inspect for drive axle wheel bearing noise, check for wheel bearing damage, and replace wheel seal	• Wheel seal leaking
STANDARD 12.0 PERFORM FRAME AND FIFTH WHEEL PERFORMANCE MAINTENANCE (PM)	
12.1 Inspect, service, and/or adjust fifth wheel, pivot pins, bushings, locking mechanisms, mounting hardware, air lines, and fittings	• Locking jaws
12.2 Inspect frame and frame members for cracks, breaks, corrosion, distortion, elongated holes, looseness, and damage	• Welds
12.3 Inspect frame hangers, brackets, and cross members	• Mounting • Security • Cracks
12.4 Check pintle hook and mounting (if applicable)	• Free of corrosion or debris (if applicable) • Verify the pintle hook moves freely (if applicable)

Domain 3: Brakes **Instructional Time: 15 - 25%**	
STANDARD 8.0 PERFORM AIR BRAKE SYSTEM PERFORMANCE MAINTENANCE (PM)	
8.1 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins	• Work orders • Required customer information • Vehicle information online resources
8.2 Identify brake system components and configurations (including air and hydraulic systems, parking brake, power assist, and vehicle dynamic brake systems)	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

8.3 Identify brake performance problems caused by the mechanical/foundation brake system (air and hydraulic)	• Run-out condition (rotors and drums) • Uneven friction surface wear • Springs • Caliper piston • Drum brake cylinder
8.4 Use appropriate electronic service tools and procedures, and check and record diagnostic codes	• Dealer software
8.5 Inspect air supply system components such as compressor, governor, air drier, tanks, and lines and inspect service system components such as lines, fittings, mountings, and valves (hand brake/trailer control, brake relay, quick release, tractor protection, emergency/spring brake control/modulator, and pressure relief/safety)	• Gladhand Couplings
8.6 Verify proper gauge operation and readings, verify low pressure warning alarm operation, perform air supply system tests such as pressure build-up, governor settings, and leakage, and drain air tanks and check for contamination	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.7 Inspect service brake chambers, diaphragms, clamps, springs, pushrods, clevises, and mounting brackets and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.8 Identify slack adjuster/brake adjuster type, check free stroke and applied stroke, inspect and lubricate slack adjusters/brake adjusters, and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.9 Inspect and lubricate camshafts (S-cams), tubes, rollers, bushings, seals, spacers, retainers, brake spiders, shields, anchor pins, and springs and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.10 Inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.11 Inspect, clean, and adjust air disc brake caliper assemblies;	*The teacher committee reviewed the measurement criterion and*

inspect and measure disc brake pads; inspect mounting hardware; and determine needed action	*determined that no additional clarification is required.*
8.12 Remove brake drum; clean and inspect brake drum and mounting surface; measure brake drum diameter; measure brake lining thickness; inspect brake lining condition; and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.13 Inspect and check parking (spring) brake chamber for leaks and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.14 Inspect and test parking (spring) brake check valves, lines, hoses, and fittings and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.15 Inspect and test parking (spring) brake application and release valve and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
8.16 Manually release (cage) and reset (uncage) parking (spring) brakes	• Safety • Identify and use proper caging bolt
STANDARD 9.0 PERFORM HYDRAULIC BRAKE SYSTEM PERFORMANCE MAINTENANCE (PM)	
9.1 Check primary (master) cylinder fluid level and condition; determine proper fluid type for application	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.2 Inspect hydraulic brake system components for leaks and damage	• Master cylinder • Hydraulic lines • Calipers • Wheel cylinders • Hoses • Valves
9.3 Check hydraulic brake system operation including pedal travel, pedal effort, and pedal feel	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.4 Inspect rotor and mounting surface; measure rotor thickness,	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

thickness variation, and lateral runout; and determine needed action	
9.5 Inspect and clean disc brake caliper assemblies; inspect and measure disc brake pads; inspect mounting hardware and slides; and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.6 Remove brake drum; clean and inspect brake drum and mounting surface; measure brake drum diameter; measure brake lining thickness; inspect brake lining condition; inspect wheel cylinders; and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.7 Check parking brake operation; inspect parking brake application and holding devices	• Mounting • Brackets • Cable
9.8 Check brake assist/booster system (vacuum or hydraulic) hoses, pump, switches, and control valves and check fluid level and condition (if applicable)	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.9 Check operation of emergency (backup/reserve) brake assist system	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.10 Observe antilock brake system (ABS) warning light operation including trailer and dash mounted trailer ABS warning light	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
9.11 Observe automatic traction control (ATC) and electronic stability control (ESC) warning light operation	• Identify steering angle calibration
STANDARD 10.0 PERFORM SUSPENSION AND STEERING SYSTEMS PERFORMANCE MAINTENANCE (PM)	
10.1 Research vehicle service information, including fluid type, vehicle service history, service precautions, technical service bulletins, and special service message(s)	• Work orders • Required customer information • Vehicle information online resources
10.2 Disable and enable supplemental restraint system (SRS) and	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

verify indicator lamp operation	
10.3 Identify suspension and steering system components and configurations	● Suspension system ○ Leaf spring ○ Air bags ○ Independent ● Steering system ○ Three-piece steering linkage ○ Rack and pinion
10.4 Use appropriate electronic service tool(s) and procedures to diagnose problems, check and record diagnostic codes, and interpret digital multimeter (DMM) readings	● Dealer software
10.5 Check the steering wheel for free play, binding, and proper centering; inspect and service steering shaft U-joint(s), slip joint(s), bearings, bushings, and seals; and phase steering shaft	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.6 Check operation of tilt and telescoping steering column	● Inspect intermediate shaft ● Lubricate
10.7 Check cab mounts, suspension, and ride height	● Bolts ● Brackets ● Bushings ● Air bags
10.8 Check power steering pump and gear operation, mountings, lines, and hoses; check fluid level and condition; service filter; and inspect system for leaks	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.9 Flush and refill power steering system and purge air from system	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.10 Inspect and lubricate tie rod ends, ball joints, kingpins, pitman arms, idler arms, and other steering linkage components	● Lubricate moving joints (if applicable)

10.11 Inspect shock absorbers, bushings, brackets, and mounts and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.12 Inspect leaf springs, center bolts, clips, pins, bushings, shackles, U-bolts, insulators, brackets, and mounts and determine needed action	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.13 Inspect axle and axle aligning devices such as radius rods, track bars, stabilizer bars, and torque arms and inspect related bushings, mounts, and shims	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.14 Inspect tandem suspension equalizer components	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.15 Inspect air springs, mounting plates, springs, suspension arms, and bushings	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.16 Inspect and test air suspension pressure regulator and height control valves, lines, hoses, dump valves, and fittings	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
10.17 Measure and record ride height	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
STANDARD 11.0 PERFORM TIRE AND WHEEL PERFORMANCE MAINTENANCE (PM)	
11.1 Explain alignment angles and their influence on tire wear and vehicle tracking	● Toe ● Caster (if applicable per truck class) ● Camber ● Steering Axis Inclination (SAI)
11.2 Inspect tire condition; identify tire wear patterns; measure tread depth; verify tire matching (diameter and tread); inspect valve stem and cap; set tire pressure; and verify tire pressure monitoring system (TPMS) operation (if applicable)	● Measure tread depth at lowest point of the tire per Department of Transportation (DOT) regulations ● Inflate/deflate to proper pressure
11.3 Explain causes for wheel/tire vibration, shimmy, pounding, and	*The teacher committee reviewed the measurement criterion and*

hop (tramp) problems	*determined that no additional clarification is required.*
11.4 Check wheel mounting hardware; check wheel condition and runout; remove and install wheel/tire assemblies (steering and drive axle); and torque fasteners to manufacturer's specification using torque wrench	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
11.5 Explain Department of Transportation (DOT) tire identification numbers/markings for new and retread/recap tires, inspect tire and wheel for proper application (size, load range, position, and tread design), and determine needed action	• Tread depth at the lowest point of the tire

Domain 4: Safety **Instructional Time: 15 - 20%**	
STANDARD 1.0 PERFORM AUTOMOTIVE SHOP AND SAFETY TASKS	

1.1 Identify general shop safety rules and procedures	• Types of hazards
	  ○ Horseplay
	  ○ Slips/trips/falls protection

1.2 Utilize safe procedures for handling tools and equipment	• Hand tools • Electrical power tools • Precision measurement tools • Pneumatics
1.3 Identify and use proper placement of floor jacks and jack stands	• Identify jack designs • Safe procedures for jacks • Wheel chocks • Proper use of jack stands
1.4 Identify and use proper procedures for safe lift operation	• Vehicle placement/weight distribution • Safe lift • Safety locks

1.5 Utilize proper ventilation procedures for working within the lab/shop area	• Carbon monoxide (CO)/exhaust hazards • Ventilation fan/system switch location
1.6 Identify marked safety areas	• OSHA color codes • Lockout/tagout (LOTO)
1.7 Identify location and types of fire extinguishers and other fire safety equipment	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.8 Identify procedures for using fire extinguishers and other fire safety equipment	• Pull, Aim, Squeeze, Sweep (PASS) technique • Classes of fire
1.9 Identify the location and use of eye wash stations	• Buddy system
1.10 Identify the location of the posted evacuation routes	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.11 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.12 Identify and wear appropriate clothing for lab/shop activities	• Shirts • Pants
1.13 Secure hair and jewelry for lab/shop activities	• No jewelry
1.14 Explain the safety aspects of vehicle systems that can operate automatically when the vehicle is off [e.g., supplemental restraint systems (SRS), electronic brake control systems, and electrified vehicle systems]	• Hybrid high voltage systems • High voltage protection
1.15 Explain the safety aspects of high voltage circuits [i.e., high intensity discharge (HID) lamps, ignition systems, injection systems, electrified vehicle powertrain, etc.]	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*

1.16 Locate and demonstrate knowledge of safety data sheets (SDS)	● Right to Know ○ Employer responsibilities ○ Employee responsibilities
1.17 Identify tools and their usage in medium/heavy truck applications	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.18 Identify standard and metric designation	● Convert between standard and metric
1.19 Demonstrate safe handling and use of appropriate tools	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.20 Demonstrate proper cleaning, storage, and maintenance of tools and equipment	● Air tools ● Power tools
1.21 Demonstrate proper use of precision measuring tools (i.e., micrometer, dial-indicator, dial-caliper, torque wrench, etc.)	*The teacher committee reviewed the measurement criterion and determined that no additional clarification is required.*
1.22 Identify necessary information and the service requested on a repair order	● Service requests ● Information on repair ● Vehicle Identification Number (VIN) ● Mileage/hours ● Complaint/Cause/Corrective action
1.23 Identify and report damaged tools that need repair or replacement	● Report to the foreman