



# 2022-2023

## Technical Skills Assessment

### Automotive Maintenance and Light Repair

## Results by Standard

Legend (%)		
0-50%	51-75%	76-100%

<b>Assessment:</b> Automotive Maintenance and Light Repair	<b>% Correct</b>	<b>% Correct</b>	<b>% Correct</b>
<b>Number tested:</b> 288	<b>20-21</b>	<b>21-22</b>	<b>22-23</b>
<b>Content Standard 1.0: Identify and utilize safety procedures and proper tools</b>	74.28%	74.82%	75.31%
<b>Performance Standard 1.1: Demonstrate general lab safety rules and procedures</b>	76.66%	77.19%	77.38%
1.1.1 Describe general shop safety rules and procedures	90.19%	90.49%	89.46%
1.1.2 Utilize safe procedures for handling of tools and equipment	23.46%	26.06%	23.00%
1.1.3 Identify and use proper placement of floor jacks and jack standards	80.77%	81.69%	82.11%
1.1.4 Identify and use proper procedures for safe vehicle life operation	87.69%	85.21%	83.87%
1.1.5 Utilize proper ventilation procedures for working within the lab/shop area	64.42%	66.73%	68.37%
1.1.6 Identify marked safety areas	91.54%	91.55%	91.37%
1.1.7 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 safety equipment	76.15%	76.06%	75.72%
1.1.8 Identify the location and use of eye wash stations	81.92%	84.15%	83.07%
1.1.9 Identify the location of the posted evacuation routes	69.04%	73.06%	77.00%
1.1.10 Comply with the required use of safety glasses, ear protection, gloves and shoes during lab/shop activities	61.92%	55.99%	63.58%
1.1.11 Identify and wear appropriate clothing for lab/shop activities	88.08%	86.62%	86.58%
1.1.12 Secure hair and jewelry for lab/shop activities	--	--	--
1.1.13 Identify safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits	63.08%	73.24%	70.93%
1.1.14 Identify safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.)	87.31%	82.75%	79.55%
1.1.16 Handle and dispose of hazardous waste and materials	89.81%	88.73%	88.50%
<b>Performance Standard 1.2: Identify and utilize proper tools</b>	59.23%	59.86%	62.19%
1.2.3 Demonstrate safe handling and use of appropriate tools	96.54%	96.13%	94.25%

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1.2.5 Demonstrate proper use of precision measuring tools (e.g., micrometer, dial-indicate, dial-caliper)	40.58%	41.73%	46.17%
<b>Content Standard 2.0: Perform basic vehicle service</b>	83.59%	85.80%	85.52%
<b>Performance Standard 2.1: Identify and utilize vehicle service information</b>	77.31%	82.39%	74.12%
2.1.2 Locate and utilize Technical Service Bulletins (TSBs)	77.31%	82.39%	74.12%
<b>Performance Standard 2.2: Prepare a vehicle for the customer</b>	86.73%	87.50%	91.21%
2.2.2 Verify vehicle repair	86.73%	87.50%	91.21%
<b>Content Standard 3.0: Apply concepts of engine repair (A1)</b>	55.38%	57.04%	58.21%
<b>Performance Standard 3.1: Demonstrate general engine service techniques</b>	52.50%	52.99%	58.47%
3.1.3 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action	52.50%	52.99%	58.47%
<b>Performance Standard 3.3: Perform lubrication and cooling systems service and repair</b>	57.31%	59.74%	58.04%
3.3.3 Inspect and test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required	79.23%	82.04%	84.35%
3.3.4 Perform oil and filter change	46.35%	48.59%	44.89%
<b>Content Standard 4.0: Analyze automatic transmission/transaxle for service (A2)</b>	71.79%	73.30%	74.60%
<b>Performance Standard 4.1: Perform general transmission/transaxle service</b>	70.46%	73.17%	73.93%
4.1.1 Research applicable vehicle and service information, fluid type, vehicle service history, service precautions, and technical service bulletins	64.74%	69.60%	68.37%
4.1.2 Check fluid level in a transmission, or a transaxle equipped with a dip-stick	92.69%	92.25%	94.57%
4.1.4 Check transmission fluid condition; check for leaks	65.38%	64.79%	69.97%
<b>Performance Standard 4.2: Perform in-vehicle transmission/transaxle service and repair</b>	78.46%	73.94%	77.96%
4.2.4 Drain and replace fluid and filter(s)	78.46%	73.94%	77.96%
<b>Content Standard 5.0: Analyze manual drivetrain and axles for service (A3)</b>	57.69%	61.97%	58.04%
<b>Performance Standard 5.1: Perform general drive train service</b>	68.08%	73.59%	66.77%
5.1.2 Drain and refill manual transmission/transaxle and final drive unit	68.08%	73.59%	66.77%
<b>Performance Standard 5.3: Perform drive shaft and half shaft, universal and constant velocity (CV) joint service and repair</b>	29.23%	32.04%	25.24%
5.3.2 Diagnose, inspect, service and replace shafts, yokes, boots, and universal/CV joints	29.23%	32.04%	25.24%
<b>Performance Standard 5.4: Assess differential case assembly for service</b>	75.77%	80.28%	82.11%
5.4.2 Clean and inspect differential housing; check for leaks; inspect housing vent	75.77%	80.28%	82.11%
<b>Content Standard 6.0: Perform suspension and steering service and repair (A4)</b>	63.61%	65.74%	66.13%

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<b>Performance Standard 6.1: Prepare vehicle for general suspension and steering systems service</b>	75.77%	80.28%	78.75%
6.1.2 Disable and enable supplemental restraint system (SRS)	75.77%	80.28%	78.75%
<b>Performance Standard 6.2: Perform steering systems service and repair</b>	77.69%	76.06%	82.75%
6.2.4 Identify and inspect various suspension system components	77.69%	76.06%	82.75%
<b>Performance Standard 6.3: Investigate wheel alignment conditions</b>	50.38%	51.76%	53.67%
6.3.2 Perform prealignment inspection and measure vehicle ride height, perform necessary action	50.38%	51.76%	53.67%
<b>Performance Standard 6.4: Perform wheel and tire service and repair</b>	60.51%	61.91%	64.54%
6.4.1 Inspect tire condition; identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action	66.79%	68.19%	71.67%
6.4.3 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic)	--	--	--
6.4.4 Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor	65.38%	62.68%	60.70%
6.4.5 Balance wheel and tire assembly.	51.15%	57.75%	61.98%
6.4.6 Repair tire according to industry standards	--	--	--
6.4.8 Determine necessary action to remedy tire air loss.	46.15%	46.48%	49.52%
<b>Performance Standard 6.5: Related Suspension and Steering Service</b>	63.13%	65.57%	64.72%
6.5.1 Inspect rack and pinon steering gear inner tie rod ends (sockets) and bellows boots.	73.85%	75.00%	75.72%
6.5.2 Inspect power steering fluid level and condition.	72.31%	76.41%	67.73%
6.5.4 Identify proper fluid type per manufacturer specification.	80.77%	83.57%	83.07%
6.5.6 Remove, inspect, replace, and/or adjust power steering pump drive belt.	58.08%	59.86%	59.42%
6.5.8 Inspect pitman arm, relay (center link/intermediate) rod, idler arm, mountings, and steering linkage damper.	45.19%	46.92%	46.33%
6.5.10 Inspect upper and lower control arms, bushings, and shafts.	73.46%	77.82%	74.12%
6.5.13 Inspect upper and lower ball joints (with or without wear indicators).	65.19%	66.55%	70.61%
6.5.18 Inspect front strut bearing and mount.	52.69%	57.39%	53.35%
<b>Content Standard 7.0: Analyze brake systems for service and repair (A5)</b>	68.42%	69.44%	69.88%
<b>Performance Standard 7.1: Demonstrate knowledge of general brake systems</b>	55.51%	56.92%	55.38%
7.1.2 Describe procedure for performing a road test to check brake system operation, including the anti-lock brake system (ABS)	43.08%	54.93%	48.56%
7.1.3 Demonstrate knowledge of basic hydraulic principles	61.73%	57.92%	58.79%
<b>Performance Standard 7.2: Perform hydraulic system service and repair</b>	73.08%	77.82%	73.48%

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7.2.6 Bleed and/or flush brake system	73.08%	77.82%	73.48%
<b>Performance Standard 7.3: Perform drum brake service and repair</b>	75.85%	76.55%	75.59%
7.3.1 Remove, clean, inspect, and measure brake drum diameter; determine necessary action	85.77%	84.86%	81.15%
7.3.4 Inspect wheel cylinders for leaks and proper operation; remove and replace as needed	74.23%	72.18%	71.88%
7.3.5 Preadjust brake shoes and parking brake; install brake drums or drum/hub assemblies, wheel bearings; make final checks and adjustments	39.23%	44.37%	42.81%
7.3.6 Install wheel and torque lug nuts to proper specifications	90.00%	90.67%	91.05%
<b>Performance Standard 7.4: Perform disc brake service and repair</b>	72.31%	72.99%	75.45%
7.4.1 Remove and clean caliper assembly; inspect for leaks and damage/wear to caliper housing; determine necessary action	69.23%	71.48%	67.73%
7.4.2 Clean, inspect and lubricate clipper mounting and slides/pins for proper operation wear, and damage; determine necessary action	80.96%	81.51%	80.83%
7.4.4 Lubricate and reinstall caliper, pads, and related hardware; seat pads and inspect for leaks	--	--	--
7.4.5 Clean and inspect rotor, measure rotor thickness, thickness variation, and lateral runout; determine necessary action	--	--	--
7.4.7 Lubricate and reinstall caliper, brake	86.15%	84.86%	89.14%
7.4.9 Clean and inspect rotor and mounting surface,	54.04%	58.80%	70.13%
7.4.10 Check brake pad wear indicator; determine necessary action	--	--	--
7.4.15 Check brake pad wear indicator.	80.77%	73.94%	69.33%
<b>Performance Standard 7.6: Perform miscellaneous service and repair (wheel bearings, parking brakes, electrical, etc.)</b>	53.27%	53.87%	56.07%
7.6.1 Remove, clean, inspect, repack, and install wheel bearings, races, seals; install hub and adjust bearings	42.69%	45.07%	45.37%
7.6.2 Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust or replace as needed	63.85%	62.68%	66.77%
<b>Content Standard 8.0: Analyze electrical/electronic system (A6)</b>	52.49%	54.06%	54.31%
<b>Performance Standard 8.1: Perform general electronic systems service</b>	51.19%	53.14%	52.02%
8.1.1 Research applicable vehicle and service information vehicle service history, service precautions, and technical service bulletins	33.46%	34.15%	33.55%
8.1.2 Demonstrate knowledge of electrical/electronic series, parallel and series-parallel circuits using principles of electricity (Ohm's and Watt's Law)	49.36%	49.18%	55.17%
8.1.3 Use and interpret wiring diagrams to trace electrical/electronic circuits	75.00%	75.18%	73.00%
8.1.4 Demonstrate proper use of digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance	39.23%	45.07%	42.49%

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8.1.5 Research the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits	37.12%	39.26%	38.66%
8.1.6 Check operations of electrical circuits with a test light	59.04%	64.44%	53.67%
<b>Performance Standard 8.2: Perform battery service</b>	65.38%	69.89%	69.17%
8.2.4 Inspect and clean battery; fill battery cells, clean battery cables, connectors, clamps, and hold-downs	--	--	--
8.2.5 Inspect and lean battery; fill battery cells, check battery cables, connectors, clamps, and hold-downs.	73.85%	75.70%	81.15%
8.2.7 Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions	--	--	--
8.2.8 Identify safety precautions for high voltage systems on electric, hybrid-electric, and diesel vehicles.	56.92%	64.08%	57.19%
<b>Performance Standard 8.6: Perform accessories service and repair</b>	46.73%	43.31%	52.08%
8.6.1 Disable and enable the airbag system for vehicle service; verify indicator lamp operation	46.73%	43.31%	52.08%
<b>10) Content Standard 10.0: Analyze engine performance (A8)</b>	54.04%	58.89%	62.54%
<b>Performance Standard 10.2: Analyze computerized engine controls</b>	39.42%	46.65%	52.40%
10.2.1 Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable	49.62%	53.87%	62.30%
10.2.2 Describe the importance of operating all OBDII monitors for repair verification	29.23%	39.44%	42.49%
<b>Performance Standard 10.3: Perform fuel, air induction, and exhaust systems service and repair</b>	69.62%	69.72%	70.93%
10.3.2 Inspect, service, or replace air filters, filter housing and intake duct work	69.62%	69.72%	70.93%
<b>Performance Standard 10.4: Perform emissions control systems service and repair</b>	67.69%	72.54%	74.44%
10.4.1 Demonstrate knowledge of basic emission control components	67.69%	72.54%	74.44%