A6 xEV SYSTEMS

	MAST - 1200 Hours	AST - 840 Hours	MLR - 540 Hours	CL-1919	CL-1918	CL-1930	EM-140S HY03	EM-140S GM04A	EM-200-25	EM-300-07	EV-360	MD-4000-22	MD-4000-23	MD-4000-24	MP-1918	MP-750
A. General																
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	P-1	P-1				X	X								X
2. Identify electrical/electronic system components and configurations.	P-1	P-1	P-1	X	X	X	X	X	X	X		X			X	X
3. Retrieve and record on-board diagnostics, DTCs, monitor status, and freeze frame data; clear codes and data when directed.	P-1	P-1	P-1				X	X								X
4. Perform calibration/recalibration, initialization, or relearn procedures as required.	P-1	P-1	P-1	X	X		X	X	X	X		X	X	X	X	X
5. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	P-1	P-1	P-1	X	X		X	X	X	X		X	X	X	X	X
6. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1	P-1	P-1	X	X	X	X	X		X		X	X	X	X	X
7. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1	P-1	P-1	X	X	X	X	X				X	X	X	X	
8. Describe precautions related to the use of test lights.	P-3	P-3	P-3	X	X		X	X							X	
9. Use fused jumper wires to check operation of electrical circuits per service information.	P-1	P-1	P-2	X	X		X	X	X			X	X	X	X	X
10. Use wiring diagrams during the diagnosis of electrical/electronic circuit problems.	P-1	P-1	P-2	X	X	X	X	X							X	X
11. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1	P-1	P-2	X	X		X	X				X	X		X	X
12. Inspect and test fusible links, circuit breakers, and fuses; determine needed action	P-1	P-1	P-2				X	X								
13. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1	P-2		X			X	X	X	X		X	X	X	X	X
14. Test and measure circuit using an oscilloscope and/or graphing multimeter (GMM); interpret results; determine needed action.	P-1	P-2		X	X	X	X	X	X			X	X	X	X	X
B. Batteries (Low Voltage)																
1. Perform battery state-of-charge test; determine needed action.	P-1	P-1	P-1				X	X								
2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test as recommended by manufacturer; determine needed action.	P-1	P-1	P-1				X	X								
3. Maintain or restore electronic memory functions as recommended by manufacturer.	P-2	P-2	P-2													X
4. Inspect and clean battery; check battery cables, connectors, clamps, and hold-downs.	P-1	P-1	P-1				X	X								
5. Perform battery charging according to manufacturer's recommendations.	P-1	P-1	P-1				X	X								
7. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.	P-2	P-2	P-2				X	X							X	X
C. Starting System (Low Voltage)																
1. Perform starter current draw test; determine needed action.	P-1	P-1	P-1				X	X								
2. Perform starter circuit voltage drop tests; determine needed action.	P-1	P-1	P-1				X	X								
3. Inspect and test starter relays and solenoids; determine needed action.	P-2	P-2	P-2				X	X								
5. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.	P-1	P-1	P-2	X			X	X								
6. Demonstrate knowledge of automatic idle-stop/start-stop system that uses a low-voltage starter to restart the engine.	P-1	P-1	P-2					X								
7. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-1	P-2					X	X								
8. Diagnose a no-crank condition using a wiring diagram and test equipment; determine needed action.	P-1	P-2					X	X								

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D. Charging System (Low Voltage)																
1. Perform charging system output test; determine needed action.	P-1	P-1	P-1				X	X								
2. Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment; determine needed action.	P-1	P-1	P-1				X	X								
4. Perform charging circuit voltage drop tests; determine needed action.	P-1	P-1	P-2				X	X								
5. Diagnose charging system for causes of undercharge, no-charge, or overcharge conditions; determine needed action.	P-1	P-1					X	X				X				
E. Lighting Systems																
1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); determine needed action.	P-1	P-1	P-1	X	X							X			X	X
2. Aim headlights.	P-2	P-2	P-2													X
3. Diagnose the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1	P-1		X	X							X			X	X
F. Instrument Cluster and Driver Information Systems																
1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.	P-1	P-1	P-1				X	X							X	X
2. Inspect and test gauges and gauge sensors/sending units for causes of abnormal readings; determine needed action.	P-1	P-2					X	X							X	X
3. Diagnose the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-1	P-2					X	X				X				X
G. Body Electrical Systems																
1. Diagnose vehicle comfort, convenience, access, safety, and related systems operation; determine needed action	P-2	P-2	P-3									X		X		
2. Remove and reinstall door panel.	P-1	P-1	P-2													X
3. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed action.	P-1	P-2	P-3													X
4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.	P-1	P-1	P-2							X						X
5. Verify windshield wiper and washer operation; replace wiper blades.	P-1	P-1	P-1													
6. Diagnose operation of entertainment/infotainment systems and related circuits (such as: radio, DVD, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed action.	P-2	P-2						X								X
7. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, and washers; determine needed action.	P-1	P-2								X						
8. Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-1	P-2														X
9. Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-1	P-2					X	X								X
10. Demonstrate knowledge of advanced driver assistance systems (ADAS) and related circuits (such as: speed control/collision avoidance, heads-up display, parking assist, and back-up camera)	P-2										X					
11. Recalibrate a vehicle's advanced driver assistance system (ADAS).	P-2															