PRACTICE EXAM 5: L1 SIMULATION — ADVANCED ENGINE PERFORMANCE SPECIALIST

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1. The proper specification for upstream oxygen sensor switching activity at idle is approximately:

A. Apply maximum activity available

B. Replace the sensor as a precaution

C. Switching between approximately 0.1V and 0.9V approximately 1-2 times per second

D. Visually inspect for visible damage only

2. The proper procedure for measuring oxygen sensor switching speed is to:

A. Use a scan tool to monitor activity, evaluate switching frequency, compare to spec

B. Apply compressed air to the sensor

C. Replace the sensor as a precaution

D. Visually inspect for visible damage only

3. A vehicle's oxygen sensor switches less than 0.5 times per second. The MOST likely cause is:

A. Apply compressed air to the sensor

B. Replace the sensor as a precaution

C. Replace the PCM as a precaution

D. Aged oxygen sensor with reduced response time

4. The proper specification for catalyst monitor enabling RPM range is typically:

A. Apply compressed air to the system

B. Approximately 1,500-2,500 RPM (varies by manufacturer)

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

5. The proper specification for catalyst monitor enabling load range is typically:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Replace the PCM as a precaution

D. Approximately 20-50% load (varies by manufacturer)

6. The proper specification for catalyst monitor enabling ECT temperature is:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Above approximately 160°F (varies by manufacturer)

D. Visually inspect for visible damage only

7. The proper specification for catalyst monitor enabling test duration is:

A. Approximately 30-60 seconds of stable conditions

B. Apply compressed air to the system

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

8. The proper procedure for verifying catalyst monitor enabling criteria is to:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Replace the PCM as a precaution

D. Reference manufacturer specifications, monitor scan data, verify all criteria are met

9. The proper specification for OBD-II Mode 6 catalyst test parameters is:

A. Apply compressed air to the system

B. Test value compared to test limit, evaluating efficiency vs threshold

C. Replace the catalyst as a precaution

D. Visually inspect for visible damage only

10. The proper procedure for interpreting Mode 6 catalyst data is to:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Read test value, compare to test limit, evaluate efficiency

D. Visually inspect for visible damage only

11. A vehicle's Mode 6 catalyst test value is at 95% of the test limit. The MOST likely indication is:

A. Catalyst approaching failure threshold but not yet failed

B. Apply compressed air to the system

C. Replace the catalyst as a precaution

D. Replace the PCM as a precaution

12. The proper procedure for using Mode 6 catalyst data preemptively is to:

A. Apply compressed air to the system

B. Replace the catalyst as a precaution

C. Replace the PCM as a precaution

D. Identify approaching-limit data, perform additional testing, address as needed

13. The proper specification for fuel trim values within normal operating range is:

A. Apply compressed air to the system

B. Approximately ±10% for both short-term and long-term fuel trim

C. Replace the affected components as a precaution

D. Visually inspect for visible damage only

14. The proper procedure for evaluating fuel trim values is to:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Read short-term and long-term values, evaluate at varied conditions, compare to spec

D. Visually inspect for visible damage only

15. A vehicle's fuel trim values exceed +20%. The MOST likely indication is:

A. Significant lean condition requiring immediate attention

B. Apply compressed air to the system

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

16. The proper specification for upstream oxygen sensor maximum voltage is:

A. Apply compressed air to the sensor

B. Approximately 0.9V (rich limit)

C. Replace the sensor as a precaution

D. Visually inspect for visible damage only

17. The proper specification for upstream oxygen sensor minimum voltage is:

A. Apply compressed air to the sensor

B. Replace the sensor as a precaution

C. Replace the PCM as a precaution

D. Approximately 0.1V (lean limit)

18. The proper procedure for testing oxygen sensor voltage range is to:

A. Apply compressed air to the sensor

B. Replace the sensor as a precaution

C. Monitor scan data, observe minimum and maximum voltage, compare to spec

D. Visually inspect for visible damage only

19. The proper specification for fuel pressure on a typical port-injected engine is:

A. Approximately 35-65 psi (varies by application)

B. Apply compressed air to the system

C. Replace the fuel pump as a precaution

D. Visually inspect for visible damage only

20. The proper procedure for measuring fuel pressure is to:

A. Apply compressed air to the system

B. Connect fuel pressure gauge, run engine, monitor pressure at idle and varied conditions

C. Replace the fuel pump as a precaution

D. Visually inspect for visible damage only

21. The proper specification for GDI high-pressure fuel rail pressure is typically:

A. Apply compressed air to the system

B. Replace the high-pressure pump as a precaution

C. Replace the PCM as a precaution

D. Approximately 1,000-3,000 psi (varies by application)

22. The proper procedure for measuring GDI fuel rail pressure is to:

A. Apply compressed air to the system

B. Replace the high-pressure pump as a precaution

C. Use scan tool to monitor rail pressure, compare to spec

D. Visually inspect for visible damage only

23. The proper specification for compression test minimum is typically:

A. Approximately 100-150 psi (varies by application), with no more than 10-15% variation between cylinders

B. Apply compressed air to the cylinder

C. Replace the engine as a precaution

D. Visually inspect for visible damage only

24. The proper specification for compression test cylinder variance is:

A. Apply compressed air to the cylinder

B. Replace the engine as a precaution

C. Replace the brake fluid as the only step

D. Approximately 10-15% maximum variance between cylinders

25. The proper specification for cylinder leakdown test maximum is typically:

A. Apply compressed air to the cylinder

B. Approximately 10-20% leakdown maximum (varies by application)

C. Replace the engine as a precaution

D. Visually inspect for visible damage only

26. The proper procedure for performing a cylinder leakdown test is to:

A. Apply compressed air to the cylinder

B. Replace the engine as a precaution

C. Position cylinder at TDC, apply regulated air, measure leakage percentage

D. Visually inspect for visible damage only

27. The proper specification for ignition firing voltage on typical port-injected engine is:

A. Approximately 6-15 kV (varies by application and load)

B. Apply compressed air to the system

C. Replace the ignition coil as a precaution

D. Visually inspect for visible damage only

28. The proper procedure for measuring ignition firing voltage is to:

A. Apply compressed air to the system

B. Replace the ignition coil as a precaution

C. Replace the spark plugs as a precaution

D. Use ignition oscilloscope, observe firing voltage, compare to spec

29. The proper specification for spark plug gap is typically:

A. Apply compressed air to the spark plug

B. Approximately 0.030-0.060 inch (varies by application)

C. Replace the spark plug as a precaution

D. Visually inspect for visible damage only

30. The proper procedure for measuring spark plug gap is to:

A. Apply compressed air to the spark plug

B. Replace the spark plug as a precaution

C. Use a feeler gauge, measure gap, compare to spec

D. Visually inspect for visible damage only

31. The proper specification for MAF sensor reading at idle is typically:

A. Apply compressed air to the sensor

B. Replace the MAF as a precaution

C. Replace the PCM as a precaution

D. Approximately 2-8 grams per second (varies by application)

32. The proper procedure for verifying MAF sensor accuracy at idle is to:

A. Compare reading to specification, evaluate at varied conditions, identify accuracy issue

B. Apply compressed air to the sensor

C. Replace the MAF as a precaution

D. Visually inspect for visible damage only

33. The proper specification for MAP sensor reading at idle is typically:

A. Apply compressed air to the sensor

B. Approximately 25-40 kPa (varies by application)

C. Replace the MAP as a precaution

D. Visually inspect for visible damage only

34. The proper procedure for verifying MAP sensor accuracy is to:

A. Apply compressed air to the sensor

B. Replace the MAP as a precaution

C. Compare reading to specification at varied vacuum, identify accuracy issue

D. Visually inspect for visible damage only

35. The proper specification for ECT sensor at engine operating temperature is typically:

A. Apply compressed air to the sensor

B. Replace the sensor as a precaution

C. Replace the PCM as a precaution

D. Approximately 195-205°F (90-95°C, varies by application)

36. The proper procedure for verifying ECT sensor accuracy is to:

A. Compare reading to actual coolant temperature, monitor at varied temperatures, identify accuracy issue

B. Apply compressed air to the sensor

C. Replace the sensor as a precaution

D. Visually inspect for visible damage only

37. The proper specification for IAT sensor at ambient temperature is typically:

A. Apply compressed air to the sensor

B. Within approximately 5°F of actual ambient temperature

C. Replace the sensor as a precaution

D. Visually inspect for visible damage only

38. The proper procedure for verifying IAT sensor accuracy is to:

A. Apply compressed air to the sensor

B. Replace the sensor as a precaution

C. Compare reading to actual ambient temperature, identify accuracy issue

D. Visually inspect for visible damage only

39. The proper specification for TPS reading at idle is typically:

A. Apply compressed air to the sensor

B. Approximately 0-10% (varies by application)

C. Replace the TPS as a precaution

D. Visually inspect for visible damage only

40. The proper procedure for verifying TPS accuracy is to:

A. Monitor reading through full throttle range, verify smooth signal, compare to spec

B. Apply compressed air to the sensor

C. Replace the TPS as a precaution

D. Visually inspect for visible damage only

41. The proper specification for evaporative emissions vacuum during smoke testing is:

A. Apply compressed air to the system

B. Replace the EVAP system as a precaution

C. Replace the PCM as a precaution

D. Approximately 0.5-2 inches of water (varies by manufacturer)

42. The proper procedure for performing evaporative system smoke test is to:

A. Apply compressed air to the system

B. Connect smoke machine to service port, introduce smoke, observe leak points

C. Replace the EVAP system as a precaution

D. Visually inspect for visible damage only

43. The proper specification for engine vacuum at idle is typically:

A. Apply compressed air to the system

B. Replace the engine as a precaution

C. Approximately 18-22 inches of mercury (varies by application)

D. Visually inspect for visible damage only

44. The proper procedure for measuring engine vacuum is to:

A. Connect vacuum gauge to intake manifold, run engine, observe reading at idle and varied RPM

B. Apply compressed air to the system

C. Replace the engine as a precaution

D. Visually inspect for visible damage only

45. The proper specification for exhaust backpressure at idle is typically:

A. Apply compressed air to the exhaust

B. Replace the exhaust as a precaution

C. Replace the catalyst as a precaution

D. Less than 1.5 psi (varies by application)

46. The proper procedure for measuring exhaust backpressure is to:

A. Apply compressed air to the system

B. Connect backpressure gauge, run engine, observe at idle and varied RPM

C. Replace the exhaust as a precaution

D. Visually inspect for visible damage only

47. The proper specification for fuel injector duty cycle at idle is typically:

A. Apply compressed air to the injectors

B. Replace the injectors as a precaution

C. Replace the PCM as a precaution

D. Approximately 1-3% (varies by application)

48. The proper procedure for monitoring fuel injector duty cycle is to:

A. Apply compressed air to the injectors

B. Replace the injectors as a precaution

C. Use scan tool, monitor duty cycle, compare to spec at varied conditions

D. Visually inspect for visible damage only

49. The proper specification for proper drive cycle for OBD-II monitor completion is typically:

A. Approximately 20-40 minutes of varied driving (varies by manufacturer)

B. Apply compressed air to the system

C. Replace the affected components as a precaution

D. Visually inspect for visible damage only

50. The proper procedure for performing OBD-II drive cycle is to:

A. Apply compressed air to the system

B. Follow manufacturer-specified drive cycle procedure, allow all monitors to complete

C. Replace the affected components as a precaution

D. Visually inspect for visible damage only

PRACTICE EXAM 5: L1 SIMULATION — ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

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1. C — Switching between approximately 0.1V and 0.9V approximately 1-2 times per second. Normal oxygen sensor switching is the diagnostic signature of proper closed-loop fuel control. The voltage range and frequency are critical specifications. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

2. A — Use a scan tool to monitor activity, evaluate switching frequency, compare to spec. Oxygen sensor measurement requires scan tool integration. The frequency reveals proper sensor function. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

3. D — Aged oxygen sensor with reduced response time. Slow switching is the diagnostic signature of aged oxygen sensor. The sensor's response time degrades with age. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

4. B — Approximately 1,500-2,500 RPM (varies by manufacturer). Catalyst monitor enabling RPM is manufacturer-specific. Most fall within this range. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

5. D — Approximately 20-50% load (varies by manufacturer). Catalyst monitor enabling load is manufacturer-specific. Each manufacturer has specific criteria. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

6. C — Above approximately 160°F (varies by manufacturer). Catalyst monitor enabling ECT requires the engine to be at operating temperature. Cold engines cannot complete catalyst monitor. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

7. A — Approximately 30-60 seconds of stable conditions. Catalyst monitor enabling duration requires sustained conditions. The monitor needs time to evaluate the catalyst. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

8. D — Reference manufacturer specifications, monitor scan data, verify all criteria are met. Catalyst monitor verification requires manufacturer specifications. Each criterion must be met. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

9. B — Test value compared to test limit, evaluating efficiency vs threshold. Mode 6 catalyst data shows the relationship between test value and limit. The relationship reveals catalyst condition. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

10. C — Read test value, compare to test limit, evaluate efficiency. Mode 6 catalyst interpretation requires understanding the value-to-limit relationship. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

11. A — Catalyst approaching failure threshold but not yet failed. Test value at 95% of limit indicates aging catalyst. The catalyst is functional but degraded. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

12. D — Identify approaching-limit data, perform additional testing, address as needed. Preemptive Mode 6 use requires identification of marginal data and additional testing. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

13. B — Approximately ±10% for both short-term and long-term fuel trim. Normal fuel trim values fall within this range. Values outside indicate compensation issues. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

14. C — Read short-term and long-term values, evaluate at varied conditions, compare to spec. Fuel trim evaluation requires varied conditions and specification comparison. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

15. A — Significant lean condition requiring immediate attention. Fuel trim above +20% indicates significant lean condition. The PCM is making large corrections. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

16. B — Approximately 0.9V (rich limit). Maximum O2 sensor voltage indicates rich mixture. The voltage saturates at approximately 0.9V at rich. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

17. D — Approximately 0.1V (lean limit). Minimum O2 sensor voltage indicates lean mixture. The voltage saturates at approximately 0.1V at lean. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

18. C — Monitor scan data, observe minimum and maximum voltage, compare to spec. Voltage range testing requires observation of both extremes. Each extreme reveals different aspects. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

19. A — Approximately 35-65 psi (varies by application). Port-injected fuel pressure typically falls in this range. Manufacturer specifications apply. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

20. B — Connect fuel pressure gauge, run engine, monitor pressure at idle and varied conditions. Fuel pressure measurement requires gauge connection and operational testing. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

21. D — Approximately 1,000-3,000 psi (varies by application). GDI rail pressures are much higher than port injection. The high pressure enables direct injection. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

22. C — Use scan tool to monitor rail pressure, compare to spec. GDI rail pressure measurement requires scan tool integration. Direct measurement is dangerous due to high pressure. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

23. A — Approximately 100-150 psi (varies by application), with no more than 10-15% variation between cylinders. Compression specifications include both minimum value and variance limits. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

24. D — Approximately 10-15% maximum variance between cylinders. Compression variance specification ensures uniform engine operation. Excessive variance indicates issues. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

25. B — Approximately 10-20% leakdown maximum (varies by application). Cylinder leakdown specifications indicate maximum acceptable leakage. Higher leakage indicates sealing issues. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

26. C — Position cylinder at TDC, apply regulated air, measure leakage percentage. Leakdown testing requires specific cylinder position and air application. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

27. A — Approximately 6-15 kV (varies by application and load). Firing voltage specifications vary with operating conditions. Higher load produces higher firing voltage. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

28. D — Use ignition oscilloscope, observe firing voltage, compare to spec. Firing voltage measurement requires ignition oscilloscope. The pattern reveals system condition. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

29. B — Approximately 0.030-0.060 inch (varies by application). Spark plug gap specifications vary by application. The gap affects firing voltage and combustion. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

30. C — Use a feeler gauge, measure gap, compare to spec. Spark plug gap measurement requires proper feeler gauge. The gap must match specification. *ASE Task Reference: L1 Domain C — Ignition System Diagnosis. Review subsection L.3.*

31. D — Approximately 2-8 grams per second (varies by application). MAF idle reading varies by engine size and design. Specification comparison reveals sensor accuracy. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

32. A — Compare reading to specification, evaluate at varied conditions, identify accuracy issue. MAF accuracy verification requires comparison to specifications. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

33. B — Approximately 25-40 kPa (varies by application). MAP idle reading reflects manifold vacuum. Lower vacuum produces higher MAP reading. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

34. C — Compare reading to specification at varied vacuum, identify accuracy issue. MAP accuracy verification requires varied vacuum testing. Each condition has expected values. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

35. D — Approximately 195-205°F (90-95°C, varies by application). ECT at operating temperature reflects normal coolant temperature. Manufacturer specifications apply. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

36. A — Compare reading to actual coolant temperature, monitor at varied temperatures, identify accuracy issue. ECT accuracy verification requires comparison to actual temperature. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

37. B — Within approximately 5°F of actual ambient temperature. IAT accuracy specification ensures proper fuel calculations. Excessive deviation indicates sensor issue. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

38. C — Compare reading to actual ambient temperature, identify accuracy issue. IAT accuracy verification requires direct temperature comparison. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

39. B — Approximately 0-10% (varies by application). TPS idle reading varies by application. Specification comparison reveals sensor calibration. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

40. A — Monitor reading through full throttle range, verify smooth signal, compare to spec. TPS accuracy verification requires full-range monitoring. Smooth signal reveals proper sensor function. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

41. D — Approximately 0.5-2 inches of water (varies by manufacturer). EVAP smoke test pressure specifications vary by manufacturer. Each manufacturer has specific values. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

42. B — Connect smoke machine to service port, introduce smoke, observe leak points. EVAP smoke testing requires proper connection and observation. *ASE Task Reference: L1 Domain E — Emissions Control Systems Diagnosis. Review subsection L.5.*

43. C — Approximately 18-22 inches of mercury (varies by application). Engine vacuum at idle reflects engine condition. Lower vacuum indicates issues. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

44. A — Connect vacuum gauge to intake manifold, run engine, observe reading at idle and varied RPM. Vacuum measurement requires gauge connection and operational testing. *ASE Task Reference: L1 Domain A — General Powertrain Diagnosis. Review subsection L.1.*

45. D — Less than 1.5 psi (varies by application). Exhaust backpressure at idle should be minimal. Higher pressure indicates restriction. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

46. B — Connect backpressure gauge, run engine, observe at idle and varied RPM. Backpressure measurement requires gauge connection and operational testing. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

47. D — Approximately 1-3% (varies by application). Fuel injector duty cycle at idle is minimal. Higher duty cycle indicates increased fuel demand. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

48. C — Use scan tool, monitor duty cycle, compare to spec at varied conditions. Duty cycle monitoring requires scan tool integration. Each condition has expected values. *ASE Task Reference: L1 Domain D — Fuel Systems and Air Induction Diagnosis. Review subsection L.4.*

49. A — Approximately 20-40 minutes of varied driving (varies by manufacturer). Drive cycle duration is manufacturer-specific. Each manufacturer specifies different requirements. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*

50. B — Follow manufacturer-specified drive cycle procedure, allow all monitors to complete. Drive cycle execution requires following manufacturer's procedure. *ASE Task Reference: L1 Domain B — Computerized Powertrain Controls Diagnosis. Review subsection L.2.*