

Appendix G – TEST PROCEDURES

EXHAUST EMISSION TEST PROCEDURES

The on-site test inspection of motor vehicles uses a computerized Emission Analyzer which will require minimal time to complete the inspection procedure.

I. GENERAL TEST PROCEDURES

1. If the inspection technician observes a vehicle having coolant, oil, excess smoke or fuel leaks or any other such defect that is unsafe to allow the emission test to be conducted the vehicle shall be rejected from the testing area. The inspection technician is prohibited from conducting the emissions test until the defects are corrected.
2. The vehicle transmission is to be placed in neutral gear if equipped with a manual transmission, or in park position if equipped with an automatic transmission. The hand or parking brake is to be engaged. If the parking brake is found to be defective, then wheel chocks are to be placed in front and/or behind the vehicle's tires.
3. The inspection technician advises the owner to turn off all vehicle accessories.
4. The inspection technician enters the vehicle registration number (tag) or the vehicle identification number into the emissions analyzer computerized system. This information is electronically transmitted to the Division of Motor Vehicle's database.
5. If the vehicle registration number is in the database, the following information will be transmitted to and verified by the inspection technician:
 - a. Vehicle make
 - b. Vehicle Year
 - c. Vehicle Model
 - d. Vehicle Body Style
 - e. Vehicle fuel type and
 - f. other related information
6. The inspection technician shall verify this information and verify the last five characters of the Vehicle Identification Number (VIN) prior to beginning the emission test.
7. If the vehicle's identification number is not on the database, the R.L. Polk VIN Package shall be automatically accessed. This VIN package will return the following information to the inspection technician who, in turn will verify the returned information:
 - a. Vehicle make
 - b. Vehicle Year
 - c. Vehicle Model
 - d. Vehicle Body Style
 - e. Vehicle fuel type
8. The DMV System shall identify and require an emission inspection on all eligible vehicles meeting the State's criteria for an emission inspection. Once the vehicle information has been verified and accepted, the system will prompt the inspection technician to place the analyzer test probe into the tailpipe. The technician connects the tachometer lead to the vehicle's spark plug and verifies that the idle RPM is within the specified range. If the RPM exceeds the allowed range the

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vehicle is rejected and not tested. The technician will insert the probe at least 10 inches into the exhaust pipe. Genuine dual exhaust vehicles will be tested with a dual exhaust probe. Once the probe has been placed into the exhaust pipe the test will begin. The test process is completely automatic, including the pass/fail decision.

9. If the vehicle has been identified as requiring a completed Vehicle Inspection Repair (VIRR) Report Form prior to re-inspection, the inspection technician will review the form for completeness and, if applicable, record into the system the Certified Emission Repair Technician's (CERT) number or Certified Manufacturer's Repair Technician (CMRT) number before the retest.

II. SINGLE SPEED IDLE TEST PROCEDURES

1. IDLE TEST

(a). General requirements.

- (1) Exhaust gas sampling algorithm. The analysis of exhaust gas concentrations shall begin 10 seconds after the applicable test mode begins. Exhaust gas concentrations shall be analyzed at a minimum rate of two times per second. The measured value for pass/fail determinations shall be a simple running average of the measurements taken over five seconds.
- (2) Pass/fail determination. A pass or fail determination shall be made for each applicable test mode based on a comparison of the short test standards contained in Table 1.1, and the measured value for HC and CO as described in paragraph (I)(a)(1) of this appendix. A vehicle shall pass the test mode if any pair of simultaneous measured values for HC and CO are below or equal to the applicable short test standards. A vehicle shall fail the test mode if the values for either HC or CO, or both, in all simultaneous pairs of values are above the applicable standards.

Table 1.1 Short Test Standards for Light-Duty Vehicles and Trucks	Hydrocarbons:	Carbon monoxide:
<p><i>Short Test Standards for 1981 and Later Model Year Light-Duty Vehicles.</i></p> <p>For 1981 and later model year light-duty vehicles for which any of the test procedures described in appendix B to this subpart are utilized to establish Emissions Performance Warranty eligibility (<i>i.e.</i> , 1981 and later model year light-duty vehicles at low altitude and 1982 and later model year vehicles at high altitude to which high altitude certification standards of 1.5 gpm HC and 15 gpm CO or less apply), short test emissions for all tests and test modes shall not exceed:</p>	220 ppm as hexane.	1.2%.
<p><i>Short Test Standards for 1981 and Later Model Year Light-Duty Trucks.</i></p> <p>For 1981 and later model year light-duty trucks for which any of the test procedures described in appendix B to this subpart are utilized to establish Emissions Performance Warranty eligibility (<i>i.e.</i> , 1981 and later model year light-duty trucks at low altitude and 1982 and later model year trucks at high altitude to which high altitude certification standards of 2.0 gpm HC and 26 gpm CO or less apply), short test emissions for all tests and test modes shall not exceed:</p>	220 ppm as hexane	1.2%.

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- (3) Void test conditions. The test shall immediately end and any exhaust gas measurements shall be voided if the measured concentration of CO plus CO₂ falls below six percent or the vehicle's engine stalls at any time during the test sequence.
 - (4) Multiple exhaust pipes. Exhaust gas concentrations from vehicle engines equipped with multiple exhaust pipes shall be sampled simultaneously.
 - (5) The test shall be immediately terminated upon reaching the overall maximum test time.
- (b) Test sequence.
- (1) The test sequence shall consist of a first-chance test and a second-chance test as follows:
 - (i) The first-chance test, as described under paragraph (c) of this section, shall consist of an idle mode.
 - (ii) The second-chance test as described under paragraph (l)(d) of this appendix shall be performed only if the vehicle fails the first-chance test.
 - (2) The test sequence shall begin only after the following requirements are met:
 - (i) The vehicle shall be tested in as received condition with the transmission in neutral or park and all accessories turned off. The engine shall be at normal operating temperature (as indicated by a temperature gauge, temperature lamp, touch test on the radiator hose, or other visual observation for overheating).
 - (ii) The tachometer shall be attached to the vehicle in accordance with the analyzer manufacturer's instructions.
 - (iii) The sample probe shall be inserted into the vehicle's tailpipe to a minimum depth of 10 inches. If the vehicle's exhaust system prevents insertion to this depth, a tailpipe extension shall be used.
 - (iv) The measured concentration of CO plus CO₂ shall be greater than or equal to six percent.

(c) First-chance test.

The test timer shall start ($tt=0$) when the conditions specified in paragraph (l)(b)(2) of this appendix are met. The first-chance test shall have an overall maximum test time of 145 seconds ($tt=145$). The first-chance test shall consist of an idle mode only.

- (1) The mode timer shall start ($mt=0$) when the vehicle engine speed is between 350 and 1100 rpm. If engine speed exceeds 1100 rpm or falls below 350 rpm, the mode timer shall reset to zero and resume timing. The minimum mode length shall be determined as described under paragraph (l)(c)(2) of this appendix. The maximum mode length shall be 90 seconds elapsed time ($mt=90$).

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- (2) The pass/fail analysis shall begin after an elapsed time of 10 seconds ($mt=10$). A pass or fail determination shall be made for the vehicle and the mode shall be terminated as follows:
- (i) The vehicle shall pass the idle mode and the test shall be immediately terminated if, prior to an elapsed time of 30 seconds ($mt=30$), measured values are less than or equal to 100 ppm HC and 0.5 percent CO.
 - (ii) The vehicle shall pass the idle mode and the test shall be terminated at the end of an elapsed time of 30 seconds ($mt=30$), if prior to that time the criteria of paragraph (I)(c)(2)(i) of this appendix are not satisfied and the measured values are less than or equal to the applicable short test standards as described in paragraph (I)(a)(2) of this appendix.
 - (iii) The vehicle shall pass the idle mode and the test shall be immediately terminated if, at any point between an elapsed time of 30 seconds ($mt=30$) and 90 seconds ($mt=90$), the measured values are less than or equal to the applicable short test standards as described in paragraph (I)(a)(2) of this appendix.
 - (iv) The vehicle shall fail the idle mode and the test shall be terminated if none of the provisions of paragraphs (I)(c)(2)(i), (ii) and (iii) of this appendix is satisfied by an elapsed time of 90 seconds ($mt=90$). Alternatively, the vehicle may be failed if the provisions of paragraphs (I)(c)(2)(i) and (ii) of this appendix are not met within an elapsed time of 30 seconds.

Optional. The vehicle may fail the first-chance test and the second-chance test shall be omitted if no exhaust gas concentration lower than 1800 ppm HC is found by an elapsed time of 30 seconds ($mt=30$).

(d) Second-chance test.

If the vehicle fails the first-chance test, the test timer shall reset to zero ($tt=0$) and a second-chance test shall be performed. The second-chance test shall have an overall maximum test time of 425 seconds ($tt=425$). The test shall consist of a preconditioning mode followed immediately by an idle mode.

(1) Preconditioning mode. The mode timer shall start ($mt=0$) when the engine speed is between 2200 and 2800 rpm. The mode shall continue for an elapsed time of 180 seconds ($mt=180$). If engine speed falls below 2200 rpm or exceeds 2800 rpm for more than five seconds in any one excursion, or 15 seconds over all excursions, the mode timer shall reset to zero and resume timing.

(2) Idle mode.

- (i) Ford Motor Company and Honda vehicles. The engines of 1981-1987 Ford Motor Company vehicles and 1984-1985 Honda Preludes shall be shut off for not more than 10 seconds and restarted. This procedure may also be used for 1988-1989 Ford Motor Company vehicles but should not be used for other vehicles. The probe may be removed from the tailpipe or the sample pump turned off if necessary to reduce analyzer fouling during the restart procedure.

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- (ii) The mode timer shall start (mt=0) when the vehicle engine speed is between 350 and 1100 rpm. If engine speed exceeds 1100 rpm or falls below 350 rpm, the mode timer shall reset to zero and resume timing. The minimum idle mode length shall be determined as described in paragraph (I)(d)(2)(iii) of this appendix. The maximum idle mode length shall be 90 seconds elapsed time (mt=90).
- (iii) The pass/fail analysis shall begin after an elapsed time of 10 seconds (mt=10). A pass or fail determination shall be made for the vehicle and the idle mode shall be terminated as follows:
 - (A) The vehicle shall pass the idle mode and the test shall be immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), measured values are less than or equal to 100 ppm HC and 0.5 percent CO.
 - (B) The vehicle shall pass the idle mode and the test shall be terminated at the end of an elapsed time of 30 seconds (mt=30), if prior to that time the criteria of paragraph (I)(d)(2)(iii)(A) of this appendix are not satisfied and the measured values are less than or equal to the applicable short test standards as described in paragraph (I)(a)(2) of this appendix.
 - (C) The vehicle shall pass the idle mode and the test shall be immediately terminated if, at any point between an elapsed time of 30 seconds (mt=30) and 90 seconds (mt=90), measured values are less than or equal to the applicable short test standards described in paragraph (I)(a)(2) of this appendix.
 - (D) The vehicle shall fail the idle mode and the test shall be terminated if none of the provisions of paragraphs (I)(d)(2)(iii)(A), (d)(2)(iii)(B), and (d)(2)(iii)(C) of this appendix
 - (E) Are satisfied by an elapsed time of 90 seconds (mt=90).

2.. TWO SPEED IDLE TEST PROCEDURES

- (a). Exhaust gas sampling algorithm.

The analysis of exhaust gas concentrations will begin 10 seconds after the applicable test mode begins. Exhaust gas concentrations will be analyzed at a rate of two times per second. The measured value for pass/fail determinations will be a simple running average of the measurements taken over five seconds.

- (b). Pass/fail determinations.

A pass or fail determination will be made for each applicable test mode based on a comparison of the applicable standards listed in Table 4-1 of 7 De Admin Code 1131 and the measured value for HC and CO. A vehicle will pass the test mode if any pair of simultaneous values for HC and CO are below or equal to the applicable standards. A vehicle will fail the test mode if the values for either HC or CO, or both, in all simultaneous pairs of values are above the applicable standards.

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- (c). Void test conditions. The test will immediately end and any exhaust gas measurements will be voided if the measured concentration of CO plus CO₂ (CO+ CO₂) falls below six percent of the total concentration of CO plus CO₂ or the vehicle's engine stalls at any time during the test sequence.
- (d). Multiple exhaust pipes. Exhaust gas concentrations from vehicle engines equipped with dual exhaust systems will be sampled accordingly.
- (e). The test will be immediately terminated upon reaching the overall maximum test time.
- (f). Test sequence.

- (i) The test sequence will consist of a first-chance test and a second-chance test as follows:

- (A) The first-chance test will consist of an idle mode followed by a high-speed mode.

- (B) The second-chance high-speed mode, as described will immediately follow the first-chance high-speed mode. It will be performed only if the vehicle fails the first-chance test. The second-chance idle will follow the second-chance high speed mode and be performed only if the vehicle fails the idle mode of the first-chance test.

- (ii) The test sequence will begin only after the following requirements are met:

- (A) The vehicle will be tested in as-received condition with the transmission in neutral or park, the parking brake actuated (or chocked) and all accessories turned off. The engine shall appear to and is assumed to be at normal operating temperature.

- (B) The tachometer will be attached to the vehicle in accordance with the analyzer manufacturer's instructions.

- (C) The sample probe(s) will be inserted into the vehicle's tailpipe to a minimum depth of 10 inches. If the vehicle's exhaust system prevents insertion to this depth, a tailpipe extension will be used.

- (D) The measured concentration of CO plus CO₂ (CO + CO₂) will be greater than or equal to 6% of the total concentration.

- (iii) First-chance test and second-chance high-speed mode.

The test timer will start (tt=0) when the conditions specified above are met. The first-chance test and second-chance high-speed mode will have an overall maximum test time of 390 seconds (tt=390). The first-chance test will consist of an idle mode following immediately by a high-speed mode. This is followed immediately by an additional second-chance high-speed mode, if necessary.

- (iv) First-chance idle mode.

The mode timer will start (mt=0) when the vehicle engine speed is between 550 and 1300 rpm. If engine speed exceeds 1300 rpm or falls below 550 rpm, the mode timer will reset to zero and resume timing. The maximum idle mode length will be 30 seconds (mt=30)

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elapsed time. The pass/ fail analysis will begin after an elapsed time of 10 seconds (mt=10). A pass or fail determination will be made for the vehicle and the mode terminated as follows:

- (A) The vehicle will pass the idle mode and the mode will be immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), measured values are less or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131
 - (B) The vehicle will fail the idle mode and the mode will be terminated if the provisions of d (i) are not satisfied within an elapsed time of 30 seconds (mt=30).
 - (C) The vehicle may fail the first-chance and second-chance test will be omitted if no exhaust gas concentration less than 1800 ppm HC is found by an elapsed time of 30 seconds (mt=30).
- (v) First-chance and second-chance high-speed modes.

This mode includes both the first-chance and second-chance high-speed modes, and follows immediately upon termination of the first-chance idle mode. The mode timer will reset (mt=0) when the vehicle engine speed is between 2200 and 2800 rpm. If engine speed falls below 2200 rpm or exceeds 2800 rpm for more than two seconds in one excursion, or more than six seconds over all excursions within 30 seconds of the final measured value used in the pass/fail determination, the measured value will be invalidated and the mode continued. If any excursion lasts for more than ten seconds, the mode timer will reset to zero (mt=0) and timing resumed. The minimum high-speed mode length will be determined as described under paragraphs (e) (i) and (ii) below. The maximum high-speed mode length will be 180 seconds (mt=180) elapsed time.

(A) Ford Motor Company and Honda vehicles. For 1981-1987 model year Ford Motor Company vehicles and 1984-1985 model year Honda Preludes, the pass/fail analysis will begin after an elapsed time of 10 seconds (mt=10) using the following procedure.

(A) A pass or fail determination, as described below, will be used, for vehicles that passed the idle mode, to determine whether the high-speed test should be terminated prior to or at the end of an elapsed time of 180 seconds (mt=180).

(I) The vehicle will pass the high-speed mode and the test will be immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), the measured values are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131

(II) If at an elapsed time of 30 seconds (mt=30) the measured values are greater than the applicable standards listed in Table 1 of this regulation, the vehicle's engine will be shut off for not more than 10 seconds after returning to idle and then will be restarted. The probe may be removed from the tailpipe or the sample pump turned off if necessary to reduce analyzer fouling during the restart procedure. The mode timer will stop upon engine shut off (mt=30) and resume upon engine restart. The pass/fail determination will resume as follows after 40 seconds have elapsed (mt=40).

(III) The vehicle will pass the high-speed mode and the test will be immediately terminated if, at any point between an elapsed time of 40 seconds (mt=40) and

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60 seconds (mt=60), the measured values are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131.

- (IV) The vehicle will pass the high-speed mode and the test will be immediately terminated if, at a point between an elapsed time of 60 seconds (mt=60) and 180 seconds (mt=180) both HC and CO emissions continue to decrease and measured values are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131.
 - (V) The vehicle will fail the high-speed mode and the test will be terminated if neither paragraphs (e) (i) (A) (III) or (e) (i) (A) (IV), above, are not satisfied by an elapsed time of 180 seconds (mt=180).
- (B) A pass or fail determination will be made for vehicles that failed the idle mode and the high-speed mode terminated at the end of an elapsed time of 180 seconds (mt=180) as follows:
- (I) The vehicle will pass the high-speed mode and the mode will be terminated at an elapsed time of 30 seconds (mt=30) if any measured values of HC and CO exhaust gas concentrations during the high-speed mode are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131.
 - (II) Restart. If at an elapsed time of 30 seconds (mt=30) the measured values of HC and CO exhaust gas concentrations during the high-speed mode are greater than the applicable short test standards as described in Table 4-1 of 7 De Admin Code 1131, the vehicle's engine will be shut off for not more than 10 seconds after returning to idle and then will be restarted. The probe may be removed from the tailpipe or the sample pump turned off if necessary to reduce analyzer fouling during the restart procedure. The mode timer will stop upon engine shut off (mt=30) and resume upon engine restart. The pass/fail determination will resume as follows after 40 seconds (mt=40) have elapsed.
 - (III) The vehicle will pass the high-speed mode and the mode will be terminated at an elapsed time of 60 seconds (mt=60) if any measured values of HC and CO exhaust gas concentrations during the high-speed mode are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131.
 - (IV) The vehicle will pass the high-speed mode and the test will be immediately terminated if, at a point between an elapsed time of 60 seconds (mt=60) and 180 seconds (mt=180) both HC and CO emissions continue to decrease and measured values are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131.
 - (V) The vehicle will fail the high-speed mode and the test will be terminated if neither paragraphs (e) (i) (B) (I), (e) (i) (B) (III) or e (i) (B) (IV), above, is satisfied by an elapsed time of 180 seconds (mt=180).
- (ii) All other light-duty vehicles. The pass/fail analysis for vehicles not specified in paragraph (e) (i), above, will begin after an elapsed time of 10 seconds (mt=10) using the following procedure.

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- (A) A pass or fail determination will be used for 1981 and newer model year vehicles that passed the idle mode, to determine whether the high-speed mode should be terminated prior to or at the end of an elapsed time of 180 seconds (mt=180). For pre-1981 model year vehicles, no high speed idle mode test will be performed.
- (I) The vehicle will pass the high-speed mode and the test will be immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), the measured values are less than or equal to the applicable standards listed in Table 1 of this regulation.
- (II) The vehicle will pass the high-speed mode and the test will be immediately terminated if emissions continue to decrease after an elapsed time of 30 seconds (mt=30) and if, at any point between an elapsed time of 30 seconds (mt=30) and 180 seconds (mt=180), the measured values are less than or equal to the applicable standards listed in Table 1 of this regulation.
- (III) The vehicle will fail the high-speed mode and the test will be terminated if neither the provisions of paragraphs (e) (ii)(A)(I) or (e) (ii)(A)(II), above, is satisfied.
- (B) A pass or fail determination will be made for 1981 and newer model year vehicles that failed the idle mode and the high-speed mode terminated prior to or at the end of an elapsed time of 180 seconds (mt=180). For pre-1981 model year vehicles, the duration of the high speed idle mode will be 30 seconds and no pass or fail determination will be used at the high speed idle mode.
- (I) The vehicle will pass the high-speed mode and the mode will be terminated at an elapsed time of 30 seconds (mt=30) if any measured values are less than or equal to the applicable standards listed Table 4-1 of 7 De Admin Code 1131.
- (II) The vehicle will pass the high-speed mode and the test will be immediately terminated if emissions continue to decrease after an elapsed time of 30 seconds (mt=30) and if, at any point between an elapsed time of 30 seconds (mt=30) and 180 seconds (mt=180), the measured values are less than or equal to the applicable standards listed in Table 4-1 of 7 De Admin Code 1131..
- (III) The vehicle will fail the high speed mode and test will be terminated if neither the provisions of paragraphs (e) (ii)(B)(I) or (e) (ii)(B)(II) is satisfied.
- (f) Second-chance idle mode. If the vehicle fails the first-chance idle mode and passes the high-speed mode, the mode timer will reset to zero (mt=0) and a second-chance idle mode will commence. The second-chance idle mode will have an overall maximum mode time of 30 seconds (mt=30). The test will consist on an idle mode only.

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- (i) The engines of 1981-1987 Ford Motor Company vehicles and 1984-1985 Honda Preludes will be shut off for not more than 10 seconds and restarted. The probe may be removed from the tailpipe or the sample pump turned off if necessary to reduce analyzer fouling during the restart procedure.
- (ii) The mode timer will start (mt=0) when the vehicle engine speed is between 550 and 1300 rpm. If the engine speed exceeds 1300 rpm or falls below 550 rpm the mode timer will reset to zero and resume timing. The minimum second-chance idle mode length will be determined as described in paragraph (f) (iii) below. The maximum second-chance idle mode length will be 30 seconds (mt=30) elapsed time.
- (iii) The pass/fail analysis will begin after an elapsed time of 10 seconds (mt=10). A pass or fail determination will be made for the vehicle and the second-chance mode will be terminated as follows:
 - (A) The vehicle will pass the second-chance idle mode and the test will be immediately terminated if, prior to an elapsed time of 30 seconds (mt=30), any measured values are less than or equal to 100 ppm HC and 0.5 percent CO.
 - (B) The vehicle will pass the second-chance idle mode and the test will be terminated at the end of an elapsed time of 30 seconds (mt=30) if, prior to that time, the criteria of paragraph (f)(iii)(A), above, are not satisfied and the measured values during the time period between 25 and 30 seconds (mt=25-30) are less than or equal to the applicable short test standards listed Table 4-1 of 7 De Admin Code 1131.
 - (C) The vehicle will fail the second-chance idle mode and the test will be terminated if neither of the provisions of paragraphs (f) (iii)(A) or (f)(iii)(B), above are satisfied by an elapsed time of 30 seconds (mt=30).

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EVAPORATIVE SYSTEM INTEGRITY (PRESSURE) TEST

ESP Alternative Pressure Test

The EPA has defined an evaporative pressure test that involves removing hoses from the charcoal canister. An alternative, less intrusive test technique has been developed by ESP. The EPA pressure test is performed by removing the gas tank fuel vapor vent line from the charcoal canister and pressurizing the gas tank through this line with nitrogen gas. The pressure in the gas tank is then monitored for two minutes and if the pressure drops below a specified level, the vehicle is failed. The canister is often difficult to access and the vent hoses difficult to remove and replace. The alternative test consists of pressurizing the gas tank from the gas tank filler neck instead of the canister. The gas cap is removed and replaced by a gas cap adapter through which the fuel tank is filled with nitrogen gas. The vent hose is clamped at the canister, the gas tank is pressurized and the pressure in the tank monitored for two minutes. Clamping the hose rather than removing it is less likely to lead to breakage or hoses left disconnected, reducing the liability arising from the test procedure. The gas cap is tested on a test rig where the gas cap can be pressurized on its own. Removing the gas cap and pressurizing the tank from the filler neck has the following advantages:

Half of the leaks in the gas tank occur in the gas cap. On those vehicles where the canister and vent lines are inaccessible, 50% of the emissions reduction available from the evaporative system integrity check can be achieved by just testing the gas cap.

Testing the gas cap separately allows leaking gas caps to be identified. The customer can be recommended to replace the gas cap rather than pay to have a repair station isolate the cause of the leak.

The test is less intrusive as the vapor line to the charcoal canister is clamped off rather than removed. On some vehicles the vapor line can be reached even when the canister, itself is inaccessible. The gas tank can be more rapidly pressurized through the large filler neck opening than from the canister as the vapor line to the tank typically has a narrow orifice in the line. This is particularly important when pressurizing the large vapor space in nearly empty gas tanks. The more rapid pressure test potentially increases the throughput of the lane. The ESP method will result in a 50% time saving in the fill time or approximately 30 seconds. The 30 second time saving in the multi-position lane will result in a lane throughput increase of one to two vehicles per hour.

The ESP Alternative Pressure Test is a more accurate test because it compensates for the volume of vapor space. During the development of this technique, ESP discovered that differences in fuel level in the gas tank can result in an order of magnitude change in test results. ESP's alternative approach is designed to compensate for the pressure drop change of the vapor space condition. Without the ESP method of testing, it is expected that errors of omission and commission will result. The variability of the test results derived from the EPA prescribed method will result in problems such as, customer complaints for "Ping-Pong" effects and general public dissatisfaction with the program. To further reduce the problem of ping-ponging, ESP has developed a pressure drop table for repair stations, that will enable the repair technicians to perform the pressure test with a much higher degree of correlation to the centralized test.

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ON-BOARD DIAGNOSTIC TEST PROCEDURE”

Introduction

The Delaware Analyzer System (DAS) shall include the hardware and software necessary to access the onboard computer systems on 1996 and newer vehicles, determine OBDII readiness, and recover stored fault codes using the SAE standardized link. The analyzer shall be designed to guide the inspector-mechanic through the OBDII inspection sequence for a particular vehicle, and record the results.

(a) OBD Inspection Sequences: The following subparagraphs describe the OBDII inspection. The display monitor will guide the inspector through the required steps.

(1) The vehicle’s front occupants will be asked to step out of the vehicle or moved to one of the other passenger seats. The analyzer will prompt the inspector to perform the OBDII check on all passenger vehicles and light-duty trucks model years covered in 2.0 of 7 De Admin Code 1131–“ Applicability and General Provisions”

(2) The inspector will initiate an official test by scanning or manually inputting the required vehicle and owner information into the station manager.

(3) The inspector will visually examine the instrument panel to determine if the MIL illuminates when the ignition key is turned to the “key on, engine off” (KOEO) position. This portion of the test procedure is also known as the “bulb check.” Enter this information into the station manager.

(4) The inspector will locate the vehicle’s data link connector (DLC) and, with the key in the off position, plug a scan tool into the connector.

(5) The inspector will start the vehicle’s engine and visually check MIL illumination under the “key on, engine running” (KOER) condition. The inspector will perform the scan of the vehicle’s on-board diagnostics system.

(6) Scan will determine:

(i) Vehicles readiness status

(ii) MIL status (whether commanded on or off) , and

(iii) Diagnostic Trouble Codes (DTCs) for those vehicles with MILs commanded on.

(b) Inspection results will be automatically recorded.

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(1) Failed vehicles: vehicle owners will get a detailed inspection report from the inspector that will indicate the diagnostic trouble codes that have been set leading to the inspection failure in the vehicle's on-board computer. (Criteria for a failure of the OBD II test is given in 4.4 of_7 De Admin Code 1131.)

(2) Vehicles with unset readiness: owners with vehicles with more than two unset readiness codes for model years 1996-2000 or one unset readiness code for model years 2001 and newer will be given a failure with a not ready for testing result on their printed vehicle inspection report. Owners will be required to return to the inspection facility for a retest as soon as the readiness codes requirements of 4.4 of_7 De Admin Code 1131 are met. The vehicle owners will be given information concerning the readiness codes in their vehicle's on-board computer and advised accordingly before the vehicle is retested.

(3) An exception from the readiness codes requirements of 4.4 of_7 De Admin Code 1131 may be given for vehicles who have been given an initial test and are being retested after repairs have been performed. A repair receipt including evidence of a diagnostic scan and dated either on the same date as the initial test or some date thereafter will be considered adequate for establishing proof of repair for retests purposes only. The retest procedure for OBD will be performed according to the provisions in this appendix.

(4) An exception from the readiness codes requirements of 4.4 of_7 De Admin Code 1131 may be given for the following vehicles by model and year. This list may be updated as warranted by new information provided the USEPA. The vehicles are, but not limited, to the following:

- (i) 1996 Chrysler vehicles - Vehicles may clear readiness at key-off. Vehicles should be tested normally. If vehicles are found to be "Not Ready," they should be referred to a qualified service provider so the OBD software can be updated.
- (ii) 1996 - 1998 Mitsubishi vehicles - These vehicles may have a high degree of "Not Ready" for catalyst monitor due to a "trip based" design. Mitsubishi has provided driving cycles in its service information to allow monitors to operate. These vehicles should be scanned for MIL illumination without regard to readiness status.
- (iii) 1996 Nissan vehicles and 1997 Nissan 2.0 liter 200SX - These vehicles may have a high degree of "Not Ready" for catalyst and evaporative monitors due to a "trip based" design. Nissan has provided driving cycles in its service information to allow monitors to operate. These vehicles should be treated as other non-problematic vehicles. Nissan Technical Service Bulletin #NTB98-018, February 18, 1998.
- (iv) 1996-98 Saab vehicles - These vehicles may have a high degree of "Not Ready" for catalyst and evaporative monitors due to a "trip based" design. Saab has provided driving cycles in its service information to allow

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monitors to operate. These vehicles should be treated as other non-problematic vehicles.

- (v) 1996 Subaru vehicles - Vehicles will clear readiness at key-off. There is no reprogramming available for this line of vehicles. These vehicles should be scanned for MIL illumination without regard to readiness status. Subaru Technical Service Bulletin #11-49-97R.
- (vi) 1997 Toyota Tercel and Paseo - Vehicles will never clear the evaporative monitor to "Ready." At this time no fix is available. Vehicles should be scanned using remaining readiness monitors as described for non-problematic vehicles.
- (vii) 1996 Volvo 850 Turbo - Vehicles will clear readiness at key-off. There is no reprogramming available for this line of vehicles. These vehicles should be scanned for MIL illumination without regard to readiness status. Volvo Technical Service Bulletin #SB 2-23-0056.
- (viii) 1996-98 Volvo vehicles (excluding 850 Turbo) - These vehicles may have a high degree of "Not Ready" for catalyst and evaporative monitors due to a "trip based" design. Volvo has provided driving cycles in its service information to allow monitors to operate. These vehicles should be treated as other non-problematic vehicles. Volvo Technical Service Bulletin #SB 2-23-0056.