

NOTICES OF FINAL RULEMAKING

The Administrative Procedure Act requires the publication of the final rules of the state's agencies. Final rules are those which have appeared in the *Register* first as proposed rules and have been through the formal rulemaking process including approval by the Governor's Regulatory Review Council. The Secretary of State shall publish the notice along with the Preamble and the full text in the next available issue of the *Arizona Administrative Register* after the final rules have been submitted for filing and publication.

NOTICE OF FINAL RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 2. DEPARTMENT OF ENVIRONMENTAL QUALITY AIR POLLUTION CONTROL

PREAMBLE

1. Sections Affected

R18-2-1001
R18-2-1003
R18-2-1004
R18-2-1005
R18-2-1006
R18-2-1007
R18-2-1008
R18-2-1009
R18-2-1010
R18-2-1011
R18-2-1012
R18-2-1013
R18-2-1014
R18-2-1015
R18-2-1031
Table 3
Table 4
Table 6

Rulemaking Action

Amend
Amend
Repealed
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2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 49-104(A)(11) and 49-542

Implementing statutes: A.R.S. §§ 49-104(A)(11), 49-541, 49-542.01, 49-542, 49-543 and 49-546.

3. The effective date of the rules:

The date filed with the Secretary of State.

4. List of all previous notices appearing in the Register addressing the final rule:

Notice of Docket Opening, 4 A.A.R. 3343, October 23, 1998.

Notice of Docket Opening, 5 A.A.R. 2564, August 6, 1999.

Notice of Proposed Rulemaking, 5 A.A.R. 2670, August 13, 1999

5. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Mark Lewandowski or Martha Seaman, Rule Development Section

Address: ADEQ, 3033 N. Central, Phoenix, AZ 85012-2809

Telephone Number: (602) 207-2230 or (602) 207-2222 (Any extension may be reached in-state by dialing 1-800-234-5677, and asking for that extension.)

Fax Number: (602) 207-2251

6. An explanation of the rule, including the agency's reasons for initiating the rule:

Summary. The Arizona Department of Environmental Quality (ADEQ) has made changes to the rules that implement the vehicle emissions testing program for area A (Phoenix metropolitan area) and area B (Tucson metropolitan area). The legal descriptions of area A and area B are contained in A.R.S. § 49-541. Contained in the changes are

requirements in Senate Bill 1427 from the 1998 legislative session, including an exemption from emissions testing for vehicles of a model year equivalent to the current calendar year and the 4 prior model years; a catalytic converter efficiency test and waiver denial for certain vehicles in area A; waiver denials for vehicles with excessive emissions; an increase of the vehicle emissions inspection program area to incorporate high-growth areas adjacent to metropolitan Phoenix; and, in area A only, the implementation of a new test procedure along with more stringent vehicle emissions testing standards for vehicles undergoing the transient loaded emissions test.

The final rule also removes the specific state-charged fee for waivers under R18-2-1008. This is to facilitate fee adjustments in accordance with A.R.S. § 49-543, which requires program fees to cover the full cost of program implementation. Deletion of this fee amount will allow timely readjustment of the fee to reflect changes in the vehicle populations to which the rule applies.

The final rules also incorporate recommendations included in a 1998 5-year rule review report. Finally, many changes were made to improve the clarity and conciseness of the regulatory language of the rule.

Note: The changes proposed by ADEQ to R18-2-1016 through R18-2-1030, have been separated from this rulemaking at ADEQ's request. It is expected that the proposed changes to R18-2-1016 through R18-2-1030 will be considered by the Governor's Regulatory Review Council (GRRC) at their January 4, 2000 meeting.

Purpose. The purpose of this rule is to reduce emissions of carbon monoxide (CO), particulate matter (PM10), and ozone forming pollutants such as nitrogen oxides (NOx) and volatile organic compounds (VOCs) from diesel and gasoline vehicles in area A and area B. The emission reductions are realized through the vehicle testing program implemented under this rule.

There are several changes to the rule, which include:

- Changes to implement statutory language enacted during the 1997 and 1998 legislative sessions;
- Modifications recommended during the 5-year review of the vehicle emissions rules, approved by the Governor's Regulatory Review Council on September 1, 1998;
- Changes to update the transient loaded emissions test (from IM240 to IM147) and emissions standards;
- Changes to update the emissions standards for the remote sensing program and to requirements for fleet emissions inspection sampling equipment; and
- Improvements to clarify the language of the rules.

ADEQ held stakeholder meetings in Phoenix and Tucson on November 7 and 8, 1998, to discuss proposed changes to the vehicle emissions and inspection programs with interested parties and modified and adjusted the proposed requirements based upon the outcome of those meetings.

Each of the changes in this rule are summarized in the following paragraphs.

Legislative Changes. Under the federal Clean Air Act Amendments of 1990, the urbanized area of Maricopa County was classified as a "moderate" nonattainment area for ozone, CO and PM10 by the Environmental Protection Agency (EPA). However, due to continuing exceedances of each of the standards, the EPA redesignated the Phoenix airshed to "serious" nonattainment area for each of these pollutants. The redesignations were effective June 10, 1996, for PM10, August 28, 1996 for CO, and February 13, 1998, for ozone (see 61 FR 21372, 61 FR 39343, 62 FR 60001, and 63 FR 7290).

In order to address the air quality problems within the Maricopa County area, Governor Fife Symington issued Executive Order (EO) 96-6 on May 24, 1996. Under EO 96-6, a Task Force was created and charged with evaluating and recommending measures that could be implemented to reduce the formation of ozone and emissions of PM10 and CO. From August through September 1996, the Task Force considered hundreds of suggestions by the general public, private businesses, and government entities. Additionally, the Task Force collected and evaluated information related to dozens of ozone control measures adopted by jurisdictions in every area of the country. Based on an evaluation of the information presented to them, on December 2, 1996, the Task Force released their report containing 35 recommended air pollution control measures, many of which were adopted by the Arizona Legislature during 1997.

Because further emission reductions were needed, Governor Jane Dee Hull issued EO 97-12 on November 13, 1997, forming a second Task Force to evaluate additional control measures that could be implemented to reduce the formation of ozone and emissions of PM10 and CO. This second Task Force convened in November 1997, and issued a report on February 20, 1998. The Task Force recommended the implementation of an additional 48 control measures, many of which were adopted during the 1998 legislative session.

This final rule incorporates recommendations in the 1996 and 1998 Task Force reports that were enacted during the 1998 legislative session, as well as improvements to the program mandated by the Legislature in 1997. The following is a summary of the relevant legislative actions:

Senate Bill 1002, signed by the Governor on July 18, 1996, included a provision for not allowing vehicles to receive more than one waiver from the emissions testing requirements.

Senate Bill 1427, signed by the Governor on May 29, 1998, contained several provisions to improve the vehicle emissions testing program, including:

- An expansion of the 1-year exemption from testing requirements for new vehicles to the current model year plus the 4 prior model years;
- A waiver prohibition for vehicles with emissions in excess of twice the standard;
- An increase in the applicable testing region (area A) to incorporate high-growth areas surrounding metropolitan Phoenix; and
- A waiver denial for vehicles with inoperable or ineffective catalytic converters.

House Bill 2189, signed by the Governor on May 18, 1998, contained technical corrections to statutes pertaining to the vehicle emissions and inspection program, including correction of typographical errors, cross references, and the incorporation of clearer and more consistent language. This rulemaking incorporates these technical corrections.

Senate Bill 1007, signed by the Governor on May 20, 1998, required ADEQ to set fees for the vehicle emissions inspection program that reflect the full cost of the program, including administration, implementation, and enforcement. As a result, fees for vehicle emissions inspections, certificates of waiver, Director's certificates, and certificates of exemption for out-of-state vehicles are scheduled for adjustment, beginning January 1, 1999. Also under this bill, ADEQ is required to charge fees to cover the cost of administering and enforcing the fleet inspection program. The fees applicable to fleet vehicle inspection permit holders are also scheduled for adjustment, beginning January 1, 1999. These rules have been updated to reflect these requirements.

The rules delete a specific fee amount charged for waivers and indicate that the fee will be determined by the state in accordance with A.R.S. §§ 49-543(A) and 49-543(G), as applicable. This will allow reevaluation of fees in a timely manner to account for changes in vehicle populations and mandated changes in program costs. All fees are subject to a public hearing before the Joint Legislative Budget Committee. Notification to the public of changes in fees will be accomplished by the distribution of informational brochures through the vehicle registration process, at Arizona Department of Transportation/Motor Vehicle Division (MVD) registration office, with reregistration mailings, and through MVD automated registration systems.

House Bill 2001, allowed to go into effect on December 28, 1998, without the Governor's signature, imposed a fee cap on the amount that could be charged for a vehicle emissions inspection test. In area A, the biennial IM240 test fee was capped at \$25.00 and the annual non-IM240 test fee was capped at \$12.50. In area B, the annual non-IM240 test fee was capped at \$10.00, effective January 1, 1999.

The rule changes related to fees take into account many factors including any future decrease in demand (decreased throughput) due to new testing methods implemented in the near-term, inflation, increases in vehicle population (due to population growth and the expansion of the testing area), loss of revenue due to the newer-model year vehicle exemptions, and decreases in the issuance of waivers.

5-Year Review. Under A.R.S. § 41-1056, agencies are required to review all their rules at least once every 5 years to determine whether the rules should be amended or appealed and submit a written report summarizing the analyses to the Governor's Regulatory Review Board (GRRRC). The analysis of the rules includes:

- An evaluation of the rule's effectiveness;
- A description of written criticisms received;
- Authorization of the rule by existing statutes;
- An evaluation of the enforcement of the rule and its consistency with respect to other rules adopted by the agency;
- A review of clarity, conciseness and understandability; and
- Review of the economic, small business and consumer impacts of the rule.

ADEQ performed the 5-year review for in 1998, and submitted the written report to GRRRC on May 21, 1998. The GRRRC approved the 5-year review at its September 1, 1998, public meeting. The 5-year review of Article 10, which pertains to the vehicle emission and inspection programs, contained several recommended modifications to improve the rule, including:

- Update of the evaporative system integrity test procedure;
- Update of the gas cap leakage standard;
- Deletion of requirements to inspect for the presence of the fuel neck restricter due to changes in technology that have rendered such a requirement obsolete (also removed by Senate Bill 1002, signed by the Governor on July 18, 1996);
- Deletion of requirements to perform the purge test;
- Addition of unsafe or unstable conditions for which a vehicle emissions inspector shall reject a vehicle from testing;
- Modernize the requirements for the low emissions tune-up;
- Update requirements for payments by vehicle grant recipients; and
- Modernize the on-road testing requirements for the remote sensing program.

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All of these recommendations are reflected in the final rule.

Testing and Standards. One of the control measures recommended by the Task Force to reduce CO and ozone was the implementation of vehicle emissions testing standards for vehicles undergoing the inspection and maintenance emissions test (IM240). Under Table 3 of the existing rule, more stringent IM240 standards (final standards) were to be effective on January 1, 1997. Adoption of the final standards was designed to increase the effectiveness of the IM240 testing program by increasing the identification of vehicles with high emissions. However, studies conducted in the Arizona emissions testing lanes during 1995 and 1996 demonstrated that, without adequate preconditioning of vehicles prior to performing the emissions test, 25% to 30% of the vehicles failing the emissions test under the final standards would be false failures (i.e., the vehicle would not actually require repair in order to meet the emissions standards). Since a false failure rate of this magnitude is unacceptable, the implementation of the final standards was postponed until research could be performed to develop an adequate preconditioning routine and appropriate final standards developed.

ADEQ contracted with Sierra Research, Inc. to evaluate a number of issues related to the IM240 standards, including:

- Development of alternative IM240 cutpoints that maximize CO benefits and result in acceptable failure rates;
- Evaluation of failure rates associated with alternative IM240 standards using existing preconditioning procedures and more sophisticated preconditioning procedures;
- Evaluation of the impact on test duration for each of the standards scenarios; and
- Evaluation of the emissions and test time impact of exempting new vehicles from the testing requirements.

The most recent IM240 transient loaded emissions test incorporates two phases. Phase I is 93 seconds in length, and phase 2 is 147 seconds, for a total of 240 seconds. In researching a test method to provide sufficient preconditioning for the final standards, two methods were compared to the existing transient loaded IM240 test:

- 2 back-to-back IM240 tests; and
- Multiple IM147 (IM240, phase II) tests, up to 3 back-to-back tests.

For failing vehicles, 2 IM240 tests would require as much as 480 seconds for the full duration. Studies indicated that 2 consecutive IM240 tests are not sufficient to properly precondition all vehicles, and some falsely failed both tests. Because the IM147 driving cycle is more aggressive than the Phase I of the IM240 driving cycle, the studies revealed that the third of 3 consecutive IM147 tests more fully preconditions vehicles. A maximum 441 seconds (full duration) for 3 consecutive IM147 tests are involved when a vehicle fails.

For both transient loaded multiple test methods, the existing standards (EPA start-up) were compared to EPA final standards and standards developed by Sierra Research that targeted maximum CO emissions benefits, moderate tightening of HC standards, and slight adjustments of NOx standards. The proposed standards developed by Sierra Research were evaluated using a limited database. In order to provide final validation of these standards and obtain full EPA approval of the revised test procedure and standards, additional data are currently being evaluated by ADEQ. The outcome of this study has necessitated future minor adjustments to individual standards to realize full emissions reduction benefits expected from the revised test and standards. This rule is being proposed at this time.

Multiple IM147 tests using the standards in this rule will increase identification of correctly failing vehicles from the previous rate of about 11% to about 16%. The majority of this increase in the failure rate will be for excessive CO emissions not identified by the previous test and standards. Using the retest algorithms to ensure vehicle preconditioning and fast-pass standards to reduce test time, the IM147 test duration is significantly less than that of the IM240. Further, with the exemption of the most current vehicle model years from testing, IM147 testing represents a 17% time savings for each vehicle tested when compared to the back-to-back IM240 test.

Successful implementation of the transient loaded test was predicated on the implementation of final standards in order to achieve necessary air quality improvement goals. The final standards will allow area A to meet CO National Ambient Air Quality Standards, and prevent federal intervention into state affairs. If the State is unable to meet its obligations under air quality plans, EPA may have to impose a federal air quality plan and withhold federal highway funds from the State. The IM147 test will enable ADEQ to adopt final standards that result in optimal identification of vehicles that emit excess pollution.

The benefits of the IM147 test using final standards are:

- increased identification rate for true failures; and
- decreased identification of true passes as failures (false failures).

Remote Sensing Program and Fleet Emissions Testing Equipment. This rule includes changes to update the remote sensing notification requirements and applicable emissions standards. Changes to notification requirements in the rule include the deletion of an obsolete requirement for a remote sensing unit to twice identify a vehicle exceeding the emissions standards before an emissions test is required at a state testing facility. As made final, the rule is consistent with the current statute and requires emissions testing at a state facility after the first time the vehicle is identified as exceeding the emissions standards.

The revisions to the remote sensing standards are identified in Table 6. The remote sensing standards were last modified in June 1996. The changes to Table 6 update the rule to reflect the current standards.

In addition, the rule changes R18-2-1019 to include requirements for new vehicle testing equipment to be required for fleet vehicle emission testing permit holders. The purpose of this revision is to require repair equipment that corresponds with new vehicle technologies.

Clarity. Numerous changes have been made throughout the rules to improve the clarity and understandability of the rules. Other changes included changing verbs to the present tense, replacing language that does not conform to the rule writing standards of the Secretary of State's Office or the GRRC's rule writing conventions, deleting obsolete or confusing language, and in general revising the rule so that it is clear, concise, and understandable.

7. A reference to any study that the agency proposes to rely on its evaluation of or justification for the final rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

Analysis of Alternate IM240 Cutpoints, Phase 2 Testing, and Exempting New Vehicle Models on Test Duration and Projected I/M Benefits, Report No. SR98-05-01, May 12, 1998, prepared by Sierra Research, Inc., Sacramento California, for ADEQ, available through ADEQ's Library.

Draft Final Report, *Determination of Emissions Credit and Average Test Times for IM147 Testing*, November 9, 1998, prepared by Sierra Research, Inc., Sacramento California, for the U.S. Environmental Protection Agency, available through ADEQ's Library.

8. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable.

9. The summary of the economic, small business, and consumer impact:

The major economic impacts of this rule will be on vehicle owners whose vehicles are registered in area A and area B. A deregulatory impact is achieved for owners of new and relatively new vehicles (those manufactured in the current model year and four prior model years) who will be exempt from emissions testing. For those not exempt from testing, alternative emissions standards (cutpoints) are introduced through a different transient loaded test protocol known as the IM147 in order to achieve the air quality goals expressed in the State Implementation Plan (SIP). The Clean Air Act Amendments of 1990 required metropolitan areas with the most serious air quality problems to implement "enhanced" inspection and maintenance (I/M) programs. Due to continuing exceedances of the National Ambient Air Quality Standards (NAAQS), the EPA redesignated the urbanized area of Maricopa County from "moderate" to "serious" for ozone, carbon monoxide (CO) and particulate matter (PM10).

Unless SIP air quality goals are met, the health of area A residents and visitors continue to be put in jeopardy. Officials of the Arizona Department of Health Services (ADHS) and other public health professionals have documented the escalating costs to the health care system in recent years of an increase in the incidence of asthma and other chronic lung diseases in Maricopa County. These diseases are either caused or aggravated by air quality problems. If air quality does not improve and area A continues to be in serious non-attainment, the state could also lose about \$400 million in federal highway funds managed by the Arizona Department of Transportation (ADOT) over the next few years. Because federal highway funds are vital to the construction and maintenance of Arizona's planned transportation infrastructure, any fund loss has the potential for negatively impacting all vehicle owners (not just local residents) who drive through the state. To address the problem, this rule puts into place several measures that will be implemented and enforced by ADEQ's Vehicle Emissions Inspection Program (VEIP). The rule contains recommendations made by the Governor's Air Quality Task Force subsequently enacted by the Arizona Legislature and implements strategies that utilize findings from air quality research studies commissioned by the EPA¹ and ADEQ.²

1. Sierra Research, Inc., *Determination of Emissions Credit and Average Test Times for IM-147 Testing*, prepared for the US Environmental Protection Agency, Sacramento, CA, November 9, 1998.

2. Sierra Research, Inc., *Analysis of Alternate IM240 Cutpoints, Phase 2 Testing, and Exempting New Vehicle Models on Test Duration and Projected I/M Benefits*, prepared for the Arizona Department of Environmental Quality, Sacramento, CA, May 12, 1998.

The principal aspects of the VEIP that the rule will change are:

- 1) the introduction of an alternative emissions test (the IM147) to replace the IM240 test;
- 2) the expansion of area A to include parts of Maricopa, Yavapai and Pinal Counties;
- 3) the exemption from testing of all vehicles manufactured in the current model year plus four;
- 4) eligibility for the repair grant assistance program will be expanded to include owners whose vehicles have received a one-time only waiver since January, 1997;
- 5) waiver denials for all vehicles that emit more than two times the standard; and
- 6) waiver denials for all vehicles with inoperable catalytic converters.

The IM147

The impetus for the introduction of an alternative emissions test (the IM147) to replace the existing IM240 test in Maricopa County came from the effort to find a more effective test that would help demonstrate attainment while reducing the number of what are known in the trade as “false-failures” for those vehicles subject to the program. ADEQ explored two options: 1) implementation of EPA final cutpoints for the IM240 that have the most stringent emissions standards; and 2) implementation of the IM147 test protocol. The objective of the Sierra Research studies was to determine what specific strategy ADEQ should adopt in order to maximize benefits.

The Department concluded from the Sierra Research findings that the IM147 transient loaded test protocol is a more effective and efficient vehicle emissions test. Effectiveness is achieved with greater emissions reductions. The research evaluated what emissions reductions would occur for carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx). A comparison of the existing IM240 and the IM147 test protocols yielded the following percent reduction in average emissions per vehicle for all testable (1981 and later model year) vehicles:

	<u>IM240</u>	<u>IM147</u>
CO	23%	32%
HC	21%	26%
NOx	9%	10%

The percentages indicated are a weighted average (not the arithmetic mean); that is, they are weighted according to the number of observations found in each of the pass/fail categories yielded by the research sample (n=336). The results show significant emissions reductions for carbon monoxide, and improvements of smaller magnitudes for HC and NOx. These emissions reductions, when combined with the reductions to be achieved by other measures in this rule, will result in higher failure rates of vehicles that truly exceed the standards. More definitive conclusions about air quality benefits will be forthcoming when a more comprehensive analysis of research results from a much larger statistical sample become available in the fall of 1999. By introducing more stringent emissions standards in the form of alternative cutpoints, this rule will maximize carbon monoxide benefits and result in failure rates that are more accurate, according to Sierra Research.

Efficiency is achieved with the IM147 on two levels: 1) the limitation of what are known as “false failures” that are inherent in the final standards for the IM240 transient loaded test; and 2) a decrease in the average test duration (resulting in shorter testing times) when multiple test protocols are carried out. False failures are caused by inadequate pre-conditioning of vehicles associated with cold starts, shutting off engines while queuing, evaporative system loading, ambient temperature and other factors. Inadequate pre-conditioning can cause high emissions due to air-fuel ratio enrichment or an inactive catalytic converter. False failures represent an inefficiency in the IM240 final standards test protocol. If ADEQ were to implement the IM240 final standards, owners of falsely failed vehicles would make unnecessary expenditures of time and money (for vehicle repairs). If the final IM240 cutpoints were to be implemented, Sierra Research stated that “... a significant portion of the [failed vehicle] fleet (i.e., 20 to 25%) would pass an IM240 test if given an immediate re-test.” Because the IM147 provides for pre-conditioning methods to be built into the test protocols, the reduction or limitation of false failures will therefore result in clearly identifiable benefits to owners of falsely failed vehicles.

The second level of efficiency achieved by the IM147 is a reduction in testing duration. Sierra Research found that the IM240 test using final standards with pre-conditioning has a weighted average test duration per vehicle of 137 seconds. On the other hand, the IM147 test with pre-conditioning and final standards has a weighted average test duration per vehicle of 107 seconds. This decrease in test duration addresses a concern that the Department had when considering policy changes to the I/M program. ADEQ considered that either an increase in testing times or administering tests that would force vehicle owners to spend inordinately long periods waiting, would be unacceptable to the motoring public.

Expansion of Area A and Exemption of Newer Vehicles

The expansion of area A mandated by SB1427 increases the Maricopa County geographical area that is to be covered by the VEIP, and encompasses portions of Yavapai and Pinal Counties for the first time. But the increase in the number of vehicles in areas where owners will have to submit their vehicles for emissions testing will be more than offset by the exemption from testing of all vehicles manufactured in the current model year and the four prior model years. Vehicles manufactured in the model years 1995 to 1999 comprised a large portion (just under 30%) of all Maricopa County vehicles registered with the ADOT Motor Vehicle Division (MVD) as of July 31, 1998. This portion of the vehicle fleet, however, is responsible for only a small fraction of identifiable excess emissions. Sierra Research has analyzed test results and observed that the 1992 and newer model year vehicles account for only about 5% of the total excess IM240 emissions attributable to 1981 and later model year vehicles in the Arizona VEIP. Since an overwhelming majority of new and newer vehicles are “clean,” their exemption from emissions testing will benefit their owners as well as enable a more efficient and productive use of the testing network.

Test Fees to Shift from Partial to Full Coverage of VEIP

As a result of changes mandated by the Arizona legislature and SB 1007, vehicle owners will pay additional fees for various aspects of the VEIP. The VEIP is a multi-faceted program that aims to reduce vehicle emissions from all non-

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exempt vehicles. Since its inception, VEIP fees collected by ADEQ have historically covered only a portion of total program costs and subsidies have been provided by legislative appropriations from the State General Fund and other sources. Effective July 1, 2000, the fee structure is shifting from partial to full coverage of VEI Program costs. Authorized by A.R.S. § 49-543, this change recognizes that vehicle owners must defray the costs of the VEIP if Arizona is to meet its SIP obligations and continue to receive federal highway funds.

The Department also made fee adjustments for vehicle emissions inspection, certificates of waiver, Director's certificates, and certificates of exemption for out-of-state vehicles for the period starting January 1, 1999, through June 30, 2000. These reduce, but do not completely eliminate, the General Fund subsidies. On July 1, 2000, the Department will commence charging full coverage fees. Actual fees to be paid by vehicle owners are still unknown because negotiations for the State Contract have not been completed. It is anticipated that by the time fees for the full cost of the program are charged, the General Fund subsidies will cease.

Air Quality Benefits -- The beneficiaries of this rule are all residents and visitors to area A and area B, who will breathe cleaner air. According to the US Environmental Protection Agency in a report prepared for the US Congress entitled The Benefits and Costs of the Clean Air Act: 1970 to 1990, October 1997, motor vehicle pollution controls adopted under the Clean Air Act nationwide have been largely responsible for a 50% reduction in carbon monoxide (CO) emissions, a 30% reduction in emissions of nitrogen oxides (NOx), a 45% reduction in emissions of volatile organic compounds (VOCs), and a near elimination of lead emissions. The report's executive summary (p. ES-5) stated that lower ambient concentrations of identified criteria pollutants ". . . yield a substantial variety of human health, welfare and ecological benefits. For a number of these benefit categories, quantitative functions are available from the scientific literature that allow estimation of the reduction in incidence of adverse effects. Examples of these categories include the human mortality [death] and morbidity [sickness] effects of a number of pollutants, the neuro-behavioral effects among children caused by exposure to lead, visibility impairments, and effects on yields for some agricultural products.

ARS § 41-1055 Requirements for an EIS

B(2) Persons Directly Affected by the Rule

a) Arizona Department of Environmental Quality -- The ADEQ Vehicle Emissions Inspection (VEI) Section will be charged with implementing and enforcing the rule.

b) Arizona Department of Transportation -- Some changes to the ADOT Motor Vehicle Division vehicle registration process have occurred as a result of the exemption of vehicles with the current model year plus four, and the expansion of area A. ADOT will also receive and administer federal highway funds earmarked for Arizona.

c) Vehicle Owners -- Motorists and vehicle owners will pay for the full costs of the VEIP.

d) Motor Vehicle Dealers and Fleet Operators -- Vehicle owners registered in area A or area B will be affected in different ways, depending mainly on the age of their vehicles, which determines exemption status. Owners of current model year plus four vehicles will be exempt.

e) Repair Shop Businesses -- Owners and operators of vehicle repair shops in area A are likely to see an increase in their business as a result of the anticipated increase in vehicle failure rates.

f) Private Sector Manufacturers and Distributors -- Makers and sellers of testing equipment and supplies, vehicle spare parts and other materials needed to repair failed vehicles and upgrade the testing network, are also likely to see a net increase in their business in the expanded area A and area B.

g) Residents, Consumers and Visitors to Area A and B -- People who reside in these two metropolitan areas will breathe cleaner air. They will be the main beneficiaries of this rule's implementation.

B(3) Cost-Benefit Analysis

I. Costs and Benefits to State Agencies

a) ADEQ -- The Vehicle Emissions Inspection (VEI) Section will implement the rule. Implementation of the rule will require several changes to existing I/M program processes. Previous legislative changes have already cut back many aspects of the VEIP, the most notable of which was the elimination of 17 FTEs from the program. This downsizing has reduced administrative costs by \$1.56 per test. Applying this figure to the 1999 projected IM240 tests, this translates to an estimated savings to taxpayers of less than one million dollars (\$906,000).

The Department is in the process of negotiating an amendment to the State VEIP contract to account for changes being implemented by statute and this rule. The negotiation and the upgrading of existing testing facilities is likely to result in an increase in fees and will change the testing/repair process. The use of the IM147 alternative emissions test will be accompanied by an increase in the number of vehicle failures. This is expected to result in more emissions reductions following vehicle repairs. Additionally, the number of vehicles tested under the program will change due to area A expansion, the current model year plus four exemptions, and to a lesser degree, the waiver prohibition for high-emitting vehicles and vehicles with inoperable catalytic converters. Fewer waivers are expected to be issued; that is, more waiver denials will be made.

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Test Fees -- As authorized by Senate Bill 1007, signed by the Governor on May 20, 1998, ADEQ will set fees for the VEIP to reflect the full cost of the program, including administration, implementation and enforcement. The previously authorized fees (\$20 per vehicle for the biennial test and \$10 for the annual test) paid for only a portion of the VEIP costs. The remainder of program costs were funded by legislative appropriations from the State General Fund and other sources.

Commencing on January 1, 1999, the biennial test fee increased to \$25 and the annual fee increased from \$10 to \$12.50 in area A, and from \$8.05 to \$10 in area B as a result of the passage of HB2001 in December 1998. These fees will be collected until June 30, 2000. Starting July 1, 2000, full coverage fees will be paid by vehicle owners. What these fees will be is unknown at this stage. It is anticipated that the General Fund subsidy of the VEIP will cease in the fiscal year ending 2000. The new fee will be collected for the term of the contract, which is scheduled to expire on December 31, 2000.

Expansion of Area A -- Motorists with vehicles that are older than the current model year plus four and registered in the expanded portions of area A in Maricopa and portions of Pinal and Yavapai Counties will be brought into the I/M program for the first time. The expansion of area A will include communities on the periphery of the Phoenix Metropolitan area such as New River, Apache Junction and portions of Goodyear. The testing of vehicles in the expanded areas of Maricopa and Yavapai Counties commenced on January 1, 1999; those in Pinal County will be tested starting January 1, 2001.

VEI staff reviewed ADOT Motor Vehicle Division (MVD) data on the number of vehicles registered in the expanded portions of area A. They examined zip code lists that reflected the new area A boundaries as defined in Senate Bill 1427. The data were then refined using Maricopa County Transportation Analysis Zone (TAZ) maps to make estimates of vehicle to population ratios in areas that were not confined to the expanded area A region. An estimated 27.6% of these vehicles will be of a newer model year, making them exempt from emissions testing. Approximately 53,910 vehicles are thus added to the emissions testing program as a result of the expansion of area A. The number of vehicles used to commute into the vehicle emissions testing area that are now required to undergo the emissions test is unknown; therefore, this number may overestimate the actual number of vehicles in the expanded portions of area A. A majority of vehicles (75.9%) that will be added to the testing program due to the expansion of area A are located in Apache Junction (Pinal County). Table 1 shows the 1998 and projected 1999 to 2002 number of vehicles that will be emissions tested in accordance with the statutory provisions of SB 1427.

	Year	Maricopa & Yavapai	Pinal	Number of Vehicles
Current	1998	12,952	40,958	12,952
Projected	1999	13,341	42,187	13,341
	2000	13,741	43,452	13,741
	2001	14,153	44,756	58,909
	2002	14,578	46,099	60,676

Table 1 shows that fewer than 15,000 additional vehicles will be tested in 1999 and 2000, but the number more than quadruples in the years 2001 and 2002 when Pinal County vehicles are added to the testing program. The projected additional vehicles to be tested are based on the assumption that the number of vehicles in area A will increase at an annual rate of 3% per annum, based on the average annual rate of increase in the number of registered vehicles projected by Sierra Research.

Exemption from Testing of Current Model Year Plus Four Vehicles -- Prior to the passage of SB 1427, new vehicles were exempt from the emissions testing program for one year. SB 1427 expanded the exemption to include those manufactured in the current year and the four prior model years. Although these vehicles are exempt, owners are given the option to have their vehicles tested if they so choose. ADEQ has estimated on the basis of past experience that about 3% of owners of exempt vehicles will choose to take the test.

Fleet Permits -- Fleet vehicles that are of the current model year plus four will be exempt from emissions testing. Many new car dealers will see a major decline in their expenditures associated with emissions testing and, in a few instances, repair. A number of car dealers have already withdrawn their fleet permits due to the exemption provision of this rule. This exemption-caused reduction in vehicles will decrease the COI fees normally collected by ADEQ for implementation of the program. Private sector (non-government) vehicle owners with fleet permits used to pay \$5 to ADEQ for a COI issued to every inspected vehicle in the fleet. COI revenues in fiscal year ending (FYE) 1998 totaled \$808,145 for 161,629 certificates. The corresponding amount for FYE 1999 is \$640,117.20 for 101,594 COIs repre-

senting a revenue decrease of 20.8%. Revenue from new car dealers comprised 73.1% of the total in FY 1998, but 65.0% in 1999. Beginning January 1, 1999, COI fees increased to \$6.60 in area A and \$11.60 in area B. The disparity in fees charged in area A and area B reflects the economies of scale achieved for area A.

Currently, there are 208 fleets permitted by the VEI Section, a decrease of 10.7% from the 233 that were permitted last year. 40 of the current permitted fleets are government-operated. Of the current 168 private sector fleets, more than half (92 or 54.7%) are new car dealers, 55 are used car dealers and 21 are diesel fleets. The number of diesel fleets dropped by 11 from last year's 32. After August 1998, 25 private fleet dealers took advantage of the exemption which caused the decline in COI sales. However, this revenue loss will be partially offset by the Department's collection of COI fees from government fleet operators, estimated to be around \$126,000 annually.

Waiver Recipients from 1997 onward will be eligible for the Repair Grant Assistance Program -- Since the beginning of the IM240 test program, owners of failed vehicles, who are also current recipients of food stamps as determined by the Arizona Department of Economic Security (ADES), have been eligible for the VEI repair grant assistance program. The number of grant recipients and the amounts disbursed for approved repairs have been relatively small. There were a total of 188 grantees from 1995 through April 1999, that involved vehicle repairs totaling \$20,001.92, or an average repair cost of \$106.39. The repair grant fund is capped at \$50,000 annually.

The demands on the State subsidy for this program could increase significantly because of a new provision of this rule enabling all waiver recipients from 1997 onward to be eligible for repair grants if their vehicles fail the emissions test. From January 1, 1997, through May, 1999, VEI Section staff have issued 10,442 waivers (an average of 360 monthly). Assuming that the average monthly number of waivers are issued between June and December, 1999, a total of 12,962 waivers will have been issued by the end of the year. It is highly conceivable that some waiver recipients since 1997 have taken steps on their own to fix their vehicles and attain compliance. It is also conceivable that the majority did not, and will therefore be eligible for repair grants. If the average repair grant per vehicle is still the going market rate (\$106.39) to repair failed vehicles, the total repair cost could be \$1.4 million. But since the grant money is capped at \$50,000 annually, only about 470 (3.6%) of eligible vehicles will be able to obtain assistance during the first year.

Waivers Denied to Gross Polluting Vehicles -- Legislation enacted in 1998 prohibited the issuance of a waiver to a vehicle failing the emission inspection at more than twice the standard. Since that provision was implemented, approximately 25% of vehicles failing the waiver inspection were denied in area A and 54% were denied in area B because their emissions were greater than twice the standard. A possible explanation could be the types of emissions tests used: the less vigorous idle and loaded tests (not the IM240 transient loaded test) are used in area B; whereas in area A, more rigorous tests are used.

Vehicle owners who apply for a waiver comprise only a small fraction (about 4% in 1998) of the total initial emissions tests conducted, since the vast majority of vehicles (84.3% in Maricopa) passed the initial test or subsequent re-tests. Vehicles that fail the initial test are then subjected to repairs and are given a free re-test. If they fail the free re-test, vehicle owners have the option to either have more repairs done and do another (paid) re-test, or apply for a waiver. Waivers are granted or denied depending on whether the eligibility requirements for A.R.S. § 49-542 are met by the vehicle owner.

The rule requires that no waiver may be granted if emissions from a failing vehicle are more than twice the standard, even if the vehicle owner has carried out all appropriate measures consistent with A.R.S. § 49-542. This means that VEI staff will issue more waiver denials (i.e., grant fewer waivers) and more vehicle owners will be required to repair their vehicles. On the basis of the limited data collected in areas A and B, and assuming that the same x failure rates apply, ADEQ staff will issue about 3,400 waiver denials for the 2x standard annually. More than two-thirds of these will be in area A and the remainder, in area B. On an annualized basis, and assuming the average cost to repair (as compiled by the State's contractor in 1998) still holds true, the incremental cost to vehicle owners or to manufacturers (if the vehicle is still under warranty) for this portion of the rule is \$401,000.

One-Time Only Waivers -- In addition to the inability of an owner to obtain a waiver for a failing vehicle if it emits more than two times the standard, the waiver may be granted only once during the vehicle's life. On January 1, 1997, ADEQ implemented the one-time only waiver according to A.R.S. § 49-542(D). Prior to that date, it was possible for multiple waivers to be issued to a specific vehicle if the eligibility requirements were met at subsequent testing dates. Between 1996 and 1997, the number of waivers granted in areas A and B declined by 118%, from 16,665 to 7,661. Area A accounted for 76% of the decline. The rule will officially eliminate multiple waivers to make the Department's rules consistent with statute. Because an owner may take advantage of a waiver only once, there could continue to be a further reduction in the number of waivers granted as a result of this requirement; however, with implementation of IM147, and a higher failure rate, waiver requests could increase.

Waiver Denials Due to Inoperable Catalytic Converters -- Finally, the number of waivers issued by the Department are bound to decrease due to test failures caused by inoperable catalytic converters. VEI staff estimate that about 40% of the vehicles that meet all other waiver requirements will be denied due to malfunctioning catalytic converters. Vehicle owners will be required to replace them, and manufacturers, repair shop owners and the general public will benefit from this rule requirement.

Remote Sensing Program -- In 1993, the Arizona Legislature amended A.R.S. § 49-542 with the addition of 49-542.01, "Random on-road testing; notification; testing requirements; contingency." This legislation mandated the

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Department to operate a random on-road testing program in area A as one of the emissions control measures. This program was first implemented in 1995. In October 1996, ADEQ implemented a carbon monoxide contingency measure by authority of A.R.S. § 49-542.01(E). This eliminated the requirement that a high-emitting vehicle be identified twice by a remote sensing unit before a vehicle owner is sent a notification requiring the vehicle to be emissions tested. Now, a high-emitting vehicle has to be identified only once for a notification to be sent. This contingency measure caused the notification rate to increase more than sevenfold from an average of 408 notifications to 2,964 notifications annually. The effect of this change has been to speed up the emissions testing and repair cycle so that more efficient emissions reduction can be achieved.

In 1998, the Legislature passed SB 1007 that required ADEQ to charge fees that would fully fund the various programs of the VEIP. As a result, all emission test fees for required non-cyclic I/M tests (i.e., those not conducted for the purpose of vehicle registration renewal) must now be paid by vehicle owners. Currently, all vehicles identified by the remote sensing program are referred to an ADEQ waiver facility for testing without any charge. However, when these vehicles are tested at an I/M contractor facility, and if the same number of notices are sent out annually, test fees payable to the Department could reach a maximum of \$50,680 annually for approximately 2,371 notifications. These non-cyclic tests constitute 80% of the estimated 2,964 notifications sent out annually by the Remote Sensing Program. 71% of the 2,371 notifications are for vehicles that are subject to the biennial transient loaded emissions test, and the remaining 29% are for vehicles subject to the annual loaded test or idle test. The fee estimate for the remote sensing program reflects the fee structure that is now in place. After July 1, 2000, the test fees will reflect whatever is charged for the appropriate emissions test, as negotiated by the Department and the State contractor.

b) ADOT Motor Vehicle Division -- The impact on the Department of Transportation MVD is slight. Their vehicle registration process has been modified to include exempted vehicles and to expand the registration list to include all non-exempt vehicles in the expansion areas of Maricopa, Yavapai and Pinal Counties.

II. Costs and Benefits to Political Subdivisions of the State

Political subdivisions of the State such as counties, school districts and municipalities are government fleet operators, and as such, their vehicles will be subjected to the same emissions testing for as long as they are registered within the boundaries of area A and area B. Because these rules apply equally to all vehicle owners, whether they are private or public entities, owners of vehicles manufactured in the current model year plus four will enjoy the same exemption. Expenditures for the testing of all non-exempt vehicles, and the repair of failed vehicles in government-operated fleets will be borne by the respective owners.

III. Costs and Benefits to Private Businesses, including Small Businesses

Automotive Technicians, Mechanics and Vehicle Repair Shop Owners -- Private sector businesses in the vehicle repair industry are likely to benefit tremendously from this rule. An increase in the vehicle failure rates is anticipated as a result of implementing the IM147 test protocol, as well as significant increases in waiver denials issued by VEIP staff. All failed vehicles will require repairs and the primary beneficiaries of this requirement are people employed in vehicle repair businesses. In the 1995 economic census, the US Bureau of the Census recorded 3,104 Arizona business establishments in the vehicle repair industry employing 21,427 people with a combined annual payroll of \$404.2 million. More than three-quarters (77.6%) of these establishments are located in Maricopa and Pima counties.

Tables 3 and 4 below project the difference in failure rates by vehicle class between the existing IM240 and the new IM147, based on data from the Sierra Research studies. As anticipated, both test protocols indicate a relatively high correlation between the age of the vehicle and emissions failure rates. But the data also show that failures from the IM-147 test are expected to be about seven percentage points higher than those from the IM-240.

Table 3.				
1998 Maricopa County IM-240 Failure Rates by Vehicle Class				
	LDV	LDT1	LDT2	ALL
1981-85	38.6%	19.8%	24.6%	32.8%
1986-89	16.6%	13.8%	14.7%	15.7%
1990-93	8.0%	7.6%	6.5%	7.8%
1994+	1.1%	1.1%	1.0%	1.1%
Total:	13.0%	9.0%	9.1%	11.6%

LDV refers to “light duty vehicles”, mainly passenger cars; and LDT1 and LDT2 refers to categories of light duty trucks.

Table 4.				
Projected IM-147 Failure Rates by Vehicle Class				
	LDV	LDT1	LDT2	ALL
1981-85	42.6%	44.2%	50.3%	43.5%
1986-89	26.0%	25.6%	23.0%	25.7%
1990-93	8.1%	7.4%	11.8%	8.2%
1994+	1.4%	1.1%	1.1%	1.3%
Total:	19.4%	16.9%	18.0%	18.6%

Based on emissions test failure statistics for calendar year 1997, vehicle owners spent more than \$27 million to repair failing vehicles, assuming all these failures were fixed at the annual repair average cost for 1997 provided by the VEIP contractor. 72% of the failures were in area A. The number of repairs carried out may be greater than the number of repaired vehicles because some vehicles are known to fail more than once. If the above failure rates are applied to 1998 MVD-registered vehicles, and adjusting for new and newer vehicle exemptions, the incremental increase in revenue for Maricopa County repair businesses is estimated at \$7.9 million. If vehicle repairs due to waivers denied for all reasons are added, the estimate increases by about \$681,000. Repairs for diesel vehicles and tampering are not included in the estimate, since failure rates data for heavy duty diesel vehicles with gross vehicle weight ratings of greater than 8,500 lbs. are not available.

Manufacturers and Distributors of Testing Equipment and Vehicle Spare Parts and Supplies -- The economic impact to the manufacturers and distributors of vehicle parts are included in the estimate of the added business that will accrue to vehicle repair shops indicated above. The rule will also increase the purchase of selected vehicle replacement parts and components. For example, VEI staff estimate that, as a result of this rule, approximately 40% of vehicles that meet all other waiver requirements (an estimated 2,100 in 1997) will have failing catalytic converters. These will require replacements to attain compliance. Currently, the average cost of catalytic converters ranges from a low of \$120 to a high of \$175. Assuming all the catalytic converter failures in 1997 were replaced, and using the midpoint of the price range, an additional \$310,000 would have been spent in area A and area B. The estimate is only for parts and does not include labor.

Private businesses will also benefit from expenditures by fleet permit holders to purchase new equipment such as scan tools, digital volt ohm meters and pressure test equipment for the Gas Integrity Test.

IV. Costs and Benefits to Residents and Consumers --

Savings in time and effort due to exemptions -- Owners of current model year plus four vehicles are exempt from emissions testing, unless failing vehicles from this group are identified by the remote sensing program. If this rule were in place in 1998, a total of 805,355 vehicles or 28.2% of those registered in Maricopa and Pima counties, would have been exempt from testing during the entire calendar year. This means that starting next year, owners of exempt vehicles may choose to forego the test and be spared the time and effort it takes to have their vehicles emissions tested. The exemption represents an increase in efficiency of the emissions testing process, since the vast majority of vehicles in this category (about 98.5%) pass the test, and therefore may be excluded from testing without adversely affecting air quality.

Air Quality Benefits -- All residents and visitors to area A will benefit from this modified VEI program because of cleaner air. Air pollution has adverse impacts on human health and welfare, principally through respiratory-related diseases and ailments. Air pollution also damages agricultural crops and has other negative effects associated with reduced visibility and ecosystem changes. Metropolitan Phoenix (area A) has been declared a serious non-attainment area by EPA. The problem is compounded by a very high population growth rate in Maricopa County relative to the growth occurring in other Arizona counties and in most states. This growth is due mainly to in-migration and increased business activity.

The inference is that there has been, and will continue to be, a corresponding growth in the vehicle fleet numbers as well as vehicle miles traveled, with the County’s transportation infrastructure barely able to keep up with the growth. To mitigate the problem, various strategies to reduce emissions from motor vehicles are being implemented by this rule. ADEQ Air Quality Assessment Section staff calculated the emissions reduction from criteria pollutants expected to occur from the various strategies contained in the rule. The reductions are expressed in metric tons per year for carbon monoxide (CO), volatile organic compounds (VOCs), nitrogen oxides (NOx), and particulate matter (PM10), with specific assumptions about vehicle failures, repairs, and vehicle miles traveled. Table 7 below shows that more than 90% of the emissions reductions are expected to occur for CO, less than 9% for VOCs, and 1% for NOx. Many pollutants, including NOx and VOCs, are precursors for the formation of ozone and particulates; thus, emissions reductions for these will yield air quality benefits beyond those directly associated with reduced concentrations of the individual pollutants themselves. The percentage reductions for PM10 are minimal. Furthermore, 78.9% of the emissions benefits will result from implementation of the IM147 test protocols.

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Table 7. Projected Emissions Reductions (in metric tons per year)					
	CO	VOC	NOx	PM10	Total
A. IM-147 Test	22,075.20	2,336.00	116.80		24,528.00
B. Area A Expansion	2,727.00	146.00	87.60	0.99	2,961.59
C. Replacing Cat. Conv.	131.80	20.60	43.70		196.10
D. One-Time Waiver	1,638.85	105.85	76.65		1,821.35
E. Waiver Denial*	166.08	59.13	1.46		226.67
F. Remote Sensing	1,336.00	0.00	0.00		1,336.00
Total:	28,074.93	2,667.58	326.21	0.99	31,069.71
Percent:	90.4%	8.6%	1.0%	0.003%	100.0%

*Gross Polluters

Reduction of Rule Impacts on Small Businesses

The legislation pertaining to this rule requires vehicle owners to pay for the full costs of implementing, administering and enforcing the VEIP. The major cost impacts will be on individual vehicle owners as well as fleet operators, private and public. The anticipated cash flows that will occur with implementation of this rule will be primarily from vehicle owners to small businesses in the vehicle repair industry. Therefore, small businesses will be the major economic beneficiaries, although the primary intent of this rule is to address public health and other concerns stemming from air pollution. Almost all (99.5%) vehicle repair business establishments in Arizona meet the statutory definition of small business. Less than one-half of one percent (0.48%) are "large" businesses, using the employment-size criterion. Positive economic impacts will also be experienced by manufacturers and distributors (and their suppliers) of spare parts and other supplies that will be needed for vehicle repair.

10. A description of the changes between the proposed rules, including supplemental notices, and final rules (if applicable):

The changes to the proposed rule are shown below with strike out (~~strike out~~) and underline. There were few substantive changes, and none that were substantial. Almost all changes to the proposed rule were made as a result of suggestions by GRRC staff to improve the clarity, conciseness, and understanding of the rules.

The changes proposed by ADEQ to R18-2-1016 through R18-2-1030, have been separated from this rulemaking at ADEQ's request. It is expected that the proposed changes to R18-2-1016 through R18-2-1030 will be considered by GRRC at their January 4, 2000 meeting.

Section

- R18-2-1001. Definitions
- R18-2-1002. Reserved
- R18-2-1003. Vehicles to be Inspected by the Mandatory Vehicle Emissions Inspection Program
- R18-2-1004. ~~Reserved~~Repealed
- R18-2-1005. Time of Inspection
- R18-2-1006. Emissions Test Procedures
- R18-2-1007. Evidence of Meeting State Inspection Requirements
- R18-2-1008. Procedure for Issuing Certificates of Waiver
- R18-2-1009. Tampering Repair Requirements
- R18-2-1010. Low Emissions Tune-up, Emissions, and Evaporative System Repair
- R18-2-1011. Vehicle Inspection Report
- R18-2-1012. Inspection Procedures and Fee
- R18-2-1013. Reinspections
- R18-2-1014. Vehicle Repair Grants
- R18-2-1015. On-road Testing; High Emissions Identifications
- R18-2-1031. Standards for Evaluating the Oxidation Efficiency of a Catalytic Converter
- TABLE 3. Emission Standards - Biennial Tests
- TABLE 4. Transient Driving Cycle
- TABLE 6. Emission Standards - Remote Sensing Identifications

ARTICLE 10. MOTOR VEHICLES; INSPECTION AND MAINTENANCE

R18-2-1001. Definitions

In this Article, unless the context otherwise requires:

1. Abbreviations and symbols ~~used herein shall be~~are as follows:
 - a. "A/F" means air/fuel.
 - b. "CID" means cubic inches displacement.
 - c. "CO" means carbon monoxide.
 - d. "CO₂" means carbon dioxide.
 - e. "EGR" means exhaust gas recirculation.
 - f. "GVWR" means gross vehicle weight rating.
 - g. "HC" means hydrocarbon.
 - h. "HP" means horsepower.
 - i. "LNG" means ~~liquefied~~liquefied natural gas.
 - j. "LPG" means liquid petroleum gas.
 - k. "LVW" means loaded vehicle weight.
 - l. "MPH" means miles per hour.
 - m. "MVD" means the Motor Vehicle Division of the Arizona Department of Transportation.
 - n. "NDIR" means nondispersive infrared.
 - o. "NO_x" means the sum of nitrogen oxide and nitrogen dioxide.
 - p. "%" means percent.
 - q. "OEM" means original equipment manufacturer.
 - r. "PROM" means programmable read only memory.
 - s. "PCV" means positive crankcase ventilation.
 - t. "PPM" means parts per million by volume.
 - u. "RPM" means revolutions per minute.
 - v. "VIN" means vehicle identification number.
 - w. "VIR" means vehicle inspection report.
2. "Annual test" means any vehicle emissions test ~~which~~that is not a biennial test.
3. "Apportioned vehicle" means a vehicle that is subject to the proportional registration provisions of A.R.S. § 28-2233.
4. "Area A" has the same meaning as in A.R.S. § 49-541.
5. "Area A vehicle" means a motor vehicle subject to emission inspection and that is:
 - a. Registered or to be registered within area A;
 - b. Owned by or leased to a person having a valid fleet permit and customarily kept in area A;
 - c. A ~~governmental~~government vehicle customarily kept in area A;
 - d. Used to commute to the driver's principal place of employment located in area A; or
 - e. Parked, will be parked, or is the subject of a parking permit application at an institution ~~which is both~~ located in area A and subject to the requirements of A.R.S. §§ 15-1444(C) or 15-1627(G).
6. "Area B" has the same meaning as in A.R.S. § 49-541.
7. "Area B vehicle" means a motor vehicle subject to emission inspection and that is:
 - a. Registered or to be registered within area B;
 - b. Owned by or leased to a person having a valid fleet permit and customarily kept in area B;
 - c. A ~~governmental~~government vehicle customarily kept in area B;
 - d. Used to commute to the driver's principal place of employment located in area B; or
 - e. Parked, will be parked, or is the subject of a parking permit application at an institution located in area B and subject to the requirements of A.R.S. §§ 15-1444(C) or 15-1627(G).
8. "Biennial test" means the transient loaded emission test and evaporative system tests required under R18-2-1006(E)(2).
9. "Calibration gas" means a gas with assigned concentrations of CO, hexane, or CO₂ that is used by a state inspector to check the accuracy of emissions analyzers.
10. "Certificate of compliance" means a serially numbered document issued by a state station at the time of a vehicle inspection indicating that the vehicle has met the emissions standards.
11. "Certificate of exemption" means a serially numbered certificate issued by the Director exempting a vehicle ~~which~~that is not available within the state for ~~the~~an inspection during the 90 days before the emissions compliance expiration date.
12. "Certificate of inspection" means a serially numbered document issued by the Director *indicating that a vehicle has been inspected under A.R.S. § 49-546 and has passed inspection.*
13. "Certificate of waiver" means a serially numbered document issued by the Department or a fleet inspector other than an auto dealer licensed to sell used motor vehicles under Title 28 of the Arizona Revised Statutes, *indicating that the requirement of passing reinspection has been waived for a vehicle under A.R.S. § 49-542.*

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14. "Conditioning mode" means either a fast idle condition or a loaded condition as defined in this Section.
15. "Constant 4-wheel drive vehicle" means any 4-wheel drive vehicle with 4 wheels ~~which~~ and that cannot be converted to 2-wheel drive except by disconnecting 1 of the vehicle's drive shafts.
16. "Constant volume sampler" means a system that dilutes engine exhaust to be sampled with ambient air so that the total combined flow rate of exhaust and dilution air mix is nearly constant for all engine operating conditions.
17. "Contractor" means a person, business, firm, partnership, or corporation with whom the Director has a contract ~~which that~~ provides for the operation of 1 or more official emissions inspection stations.
18. "Curb idle test" means an exhaust emissions test conducted with the engine of the vehicle running at the manufacturer's idle speed \pm 100 RPM but without pressure exerted on the accelerator.
19. "Curb weight" means a vehicle's unloaded weight without fuel and oil plus 300 pounds.
20. "Dealer" means a person or organization licensed by the Arizona Department of Transportation as a new motor vehicle dealer, used motor vehicle dealer, or motorcycle dealer.
21. "Department" means the Department of Environmental Quality.
22. "Director" means the Director of the Department of Environmental Quality.
23. "Director's certificate" means a serially numbered document issued by the Director in special circumstances ~~where that~~ the Director deems ~~it~~ inappropriate for the vehicle to show evidence of meeting the minimum standards for registration or reregistration under R18-2-1019 or R18-2-1022.
24. "Electrically-powered vehicle" means a vehicle that both uses electricity as the means of propulsion and does not require the combustion of fossil fuel within the confines of the vehicle in order to generate electricity.
25. "Emissions compliance expiration date" means:
 - a. Each registration expiration date for vehicles subject to annual tests; and
 - b. The registration expiration date in the 2nd year after the initial biennial test required under this Article or R18-2-1005(B) for vehicles subject to biennial tests.
26. "Emissions inspection station permit" means a certificate issued by the Director authorizing the holder to perform vehicle inspections under this Article.
27. "Exhaust emissions" means products of combustion emitted into the atmosphere from any opening downstream of the exhaust ports of a motor vehicle engine.
28. "Exhaust ~~tail pipe~~ pipe" means the ~~pipe~~ pipe that ~~attach~~ attaches to the muffler and ~~exit~~ exits the vehicle.
29. "Fast idle condition" means to operate a vehicle by running the engine at 2,500 RPM, \pm 300 RPM, for up to 30 seconds, with the transmission in neutral, to ~~ready~~ prepare the vehicle for a subsequent curb idle test.
30. "Fast pass or fast fail algorithm" means a procedure in a vehicle emission testing system that ~~can~~ logically ~~determine~~ determines whether ~~or not~~ a vehicle will pass or fail the biennial test before the test is over.
31. "Fleet emissions inspection station" or "fleet station" means any inspection facility operated under a permit issued under A.R.S. \S 49-546.
32. "Fuel" means any material that is burned within the confines of a vehicle ~~in order to be used as the means of propelling~~ propel the vehicle.
33. "Four-stroke vehicle" means a vehicle equipped with an engine that requires 2 revolutions of the crankshaft for each piston power stroke.
34. "Golf cart" means a motor vehicle that has not less than 3 wheels in contact with the ground, has an unladen weight less than 1,300 pounds, is designed to be and is operated at not more than 15 MPH, and is designed to carry golf equipment and persons.
35. "~~Governmental~~ Government vehicle" means a registered motor vehicle exempt from the payment of a registration fee, or a federally owned or leased vehicle.
36. "Gross vehicle weight rating" (GVWR) means the maximum vehicle weight that the vehicle is designed for as established by the manufacturer.
37. "Gross weight" means the sum, measured in pounds, of the empty weight of a motor vehicle combination plus the weight of the maximum load to be carried thereon at any 1 one time, except that for tow trucks, gross weight means the sum of the empty weight of the tow truck plus the weight of operational supplies and equipment.
- ~~38~~37. "Inspection" means the mandatory vehicle emissions inspection including the tampering portion ~~inspection~~.
- ~~39~~38. "Inspection sticker" means a self-adhesive, serially numbered rectangular sticker indicating a ~~governmental~~ government vehicle has met ~~the state of~~ Arizona emissions inspection requirements.
- ~~40~~39. "Loaded condition" means to condition a vehicle by running the vehicle on a chassis dynamometer at a specified speed and load for ~~up to~~ no more than 30 seconds to ~~ready~~ prepare the vehicle for a subsequent curb idle test.
- ~~41~~40. "Loaded cruise test" means an exhaust emissions test conducted on a chassis dynamometer under R18-2-1006(E)(1)(a) and (F)(2)(a).
- ~~42~~41. "Mass emission measurement" means measurement of a vehicle's exhaust in mass units such as grams.
- ~~43~~42. "Model year" means ~~either~~ the date of manufacture of the original vehicle within the annual production period of ~~such~~ the vehicle as designated by the manufacturer or, if a reconstructed vehicle, the 1st year of titling.

4443. "MOL percent" means the percent, by volume, that a particular gas occupies in a mixture of gases at a uniform temperature.
4544. "Motorcycle" means a motor vehicle, other than a tractor, having a seat or saddle for use of the rider and designed to travel on not more than 3 wheels in contact with the ground.
4645. "Motorhome" means a vehicle built on a truck or bus chassis and equipped as a self-contained traveling home.
4746. "New aftermarket catalytic converter" or "new aftermarket converter" means a catalytic converter, except for an OEM, that meets the standards under 40 CFR 86.
4847. "Official emissions inspection station" means an inspection facility, other than a fleet emissions inspection station, whether placed in a permanent structure or in a mobile unit for conveyance ~~among~~to various locations within the state, for the ~~purposes~~purpose of conducting inspections under A.R.S. § 49-542.
4948. "Opacity" means the degree of absorption of transmitted light.
5049. "Operational air pump" means an air injection system (AIS) to supply additional oxygen (air) into the exhaust system to promote further oxidation of HC and CO gases and to assist in catalytic reaction.
5150. "Person" means the federal government, state, or any federal or state agency or institution ~~thereof~~, any municipality, political subdivision, public or private corporation, individual, partnership, association, or other entity, and includes any officer or governing or managing body of any municipality, political subdivision, or public or private corporation.
5251. "Reconditioned OEM catalytic converter" or "reconditioned OEM converter" means a used OEM reconditioned equivalent or an OEM converter ~~which that~~ has had the pellets replaced with new or used OEM equivalent pellets and that also meets the standards under 40 CFR 86.
5352. "Recognized repair facility" means a ~~going concern~~business with an Arizona transaction privilege (sales) tax license whose primary purpose is vehicle repair, and having at least 1 employee with a nationally recognized certification for ~~emission-related~~emissions-related diagnosis and repair.
5453. "Reconstructed vehicle" means:
- A reconstructed special as identified by the code letters "SP" on the ~~portion~~section of the vehicle's Arizona registration card or Arizona certificate of title ~~that is~~ reserved for identification of the vehicle's style; or
 - A vehicle in which the vehicle style is not shown on the Arizona registration card or certificate of title, and the original manufacturer of the complete vehicle cannot be identified from the body.
5554. "Standard gases" means gases maintained as a primary standard for determining the composition of working gases, calibration gases, or the accuracy of emissions analyzers.
5655. "State inspector" means an employee of the Department designated to perform quality assurance or waiver functions under this Article.
5756. "State station" means an official emissions inspection station operated by a contractor.
5857. "Tampering" means removing, defeating, or altering an emissions control device ~~which was~~ installed at the time the vehicle was manufactured. For the purposes of this Article, defeating ~~shall include~~includes failure to repair any malfunctioning emission control system or device.
5958. "Two-stroke vehicle" means a vehicle equipped with an engine that requires 1 revolution of the crankshaft for each power stroke.
6059. "Unloaded fast idle test" means an exhaust emissions test conducted with the engine of the vehicle running at 2,500 RPM.
6160. "Vehicle" means any automobile, truck, truck tractor, motor bus, or self-propelled or motor-driven vehicle registered or to be registered in this state and used upon the public highways of this state for the purpose of transporting persons or property, except implements of husbandry, roadrollers, or road machinery temporarily operated upon the highway.
6261. "Vehicle emissions inspector" means an individual who ~~has been~~is licensed by the Director to perform vehicle emissions inspections ~~for this program under this Article.~~
6362. "Working gases" means gases maintained ~~by a facility~~ to perform periodic calibration of emissions analyzers.

R18-2-1003. Vehicles to be Inspected by the Mandatory Vehicle Emissions Inspection Program

- A. The following vehicles shall be inspected according to this Article at a state station or a fleet station unless exempted by subsection (B):
- ~~Each~~A vehicle to be registered or reregistered within area A or area B for highway use. For the purposes of this Article, registration or reregistration within area A or area B shall be determined by the vehicle owner's permanent and actual residence. The permanent address in the MVD database shall be presumed to be the owner's permanent and actual residence. A post office box address listed on a title or registration document under A.R.S. § 28-2051(C) ~~shall~~is not be evidence of the owner's permanent and actual residence;
 - Each vehicle delivered to retail purchasers by ~~dealers~~a dealer licensed to sell used motor vehicles for highway use under A.R.S. Title 28 and whose place of business is located in area A or area B;
 - Each vehicle registered outside area A and area B but used to commute to the driver's principal place of employment located within area A or area B;

4. Each vehicle owned by a person who is subject to A.R.S. §§ 15-1444(C) or 15-1627(G); and
 5. ~~Area~~An area A or area B ~~vehicles~~vehicle located ~~out of state~~out-of-state for more than 90 days before vehicle registration expiration shall be emissions tested at an official emissions inspection testing center in ~~that~~the area where it is located. If no official emission testing program is available in the area for ~~that~~the vehicle, the vehicle shall meet the testing requirements under this Article within 15 calendar days ~~upon~~of returning to Arizona.
- B.** The following vehicles are exempt from the inspection requirements of this Article:
1. A vehicle manufactured in or before the 1966 model year;
 2. A vehicle leased to a person residing outside area A and area B by a leasing company whose place of business is in area A or area B, except as ~~otherwise~~ provided in subsection (A)(3);
 3. A vehicle sold between motor vehicle dealers;
 4. An electrically-powered vehicle;
 5. An apportioned vehicle;
 6. A golf cart;
 7. A vehicle with an engine displacement of less than 90 cubic centimeters;
 8. A vehicle registered at the time of change of name of ownership except when:
 - a. ~~the~~The change in registration is accompanied by required fees for the year following expiration of the prior registration, or
 - b. ~~the~~The change results from the sale by a dealership whose place of business is located in area A or area B;
 9. A vehicle for which a current certificate of exemption or Director's certificate has been issued;
 10. A diesel-powered vehicle in area A applying for registration or reregistration 33 months or less after the date of initial registration as a new vehicle; and
 11. Vehicles of a model year the same as, or newer than, the current calendar year and vehicles of the prior 4 model years, except:
 - a. Reconstructed vehicles; and
 - b. Vehicles requiring emissions testing under R18-2-1015.
- C.** ~~Governmental~~Government vehicles operated in area A or area B and not exempted by this Article shall be emissions inspected according to R18-2-1017.

R18-2-1004. Repealed

R18-2-1005. Time of Inspection

- A.** ~~Area~~All area B vehicles, area A vehicles subject to an annual test, and vehicles sold or offered for sale by dealers required to be inspected under R18-2-1003, shall be inspected at the following times:
1. For vehicles not covered by a fleet station permit, within 90 days before each registration expiration date.
 2. For vehicles sold by a dealer licensed to sell used motor vehicles under A.R.S. Title 28, whose place of business is located in area A or area B, before delivery of the vehicle to the retail purchaser.
 3. For consignment vehicles offered for sale by a dealer licensed to sell used motor vehicles under A.R.S. Title 28 whose place of business is located in area A or area B, before delivery of the vehicle to the retail purchaser. Such consignment vehicles shall be inspected at a state station ~~in conformance with~~according to R18-2-1006.
 4. For ~~governmental~~government vehicles:
 - a. ~~At least once~~ For vehicles not exempt under R18-2-1003(B)(10) or (11), within 12 months following the applicable date of after acquisition by the operating entity ~~in area A or area B and annually thereafter, on or before the anniversary date of the previous inspection; and~~
 - b. For vehicles temporarily exempt under R18-2-1003(B)(10) or (11), within 90 days after the vehicle becomes subject to testing, and annually thereafter, on or before the anniversary date of the previous inspection. On or before the date of initial registration; or
 - c. On or before the date of prior inspection.
 5. For vehicles owned by or leased to a person having a valid fleet station permit, at least once within each 12-month period following any original registration or reregistration.
 6. For vehicles ~~that are being to be~~ registered in area A or area B under conditions not specified in subsections (1) through (5), within 90 days before registration.
 7. For vehicles registered outside area A and area B ~~but~~and used to commute to the driver's principal place of work located in area A or area B, upon vehicle registration or reregistration.
 8. For vehicles owned by persons subject to A.R.S. §§ 15-1444(C) or 15-1627(G), within 30 calendar days following the date of initial registration at the institution located in area A or area B and annually thereafter.
 9. For vehicles issued a certificate of exemption under R18-2-1023, within 15 calendar days after returning to Arizona, unless an official emissions inspection document from the out-of-state emissions inspection station was submitted with the request for exemption.
- B.** Area A vehicles subject to the biennial test shall be inspected at the following times:

1. For vehicles not covered by a fleet station permit, within 90 days before the vehicle's emissions compliance expiration date.
2. For ~~governmental~~government vehicles;
 - a. ~~At least once within 24 months following the applicable date of acquisition by the operating entity in area A For vehicles not exempt under R18-2-1003(B)(10) or (11), within 12 months after acquisition by the operating entity, and biennially thereafter, on or before the anniversary date of the previous inspection; and~~
 - b. ~~On or before the date of initial registration; or For vehicles temporarily exempt under R18-2-1003(B)(10) or (11), within 90 days after the vehicle becomes subject to testing, and biennially thereafter, on or before the anniversary date of the previous inspection.~~
 - c. On or before the date of prior inspection.
3. For vehicles owned by or leased to a person having a valid fleet station permit, at least once within each successive 24-month period following original registration.
4. For vehicles registered outside area A but used to commute to the driver's principal place of work located in area A, upon vehicle registration and biennially thereafter.
5. For vehicles owned by persons subject to A.R.S. §§ 15-1444(C) or 15-1627(G), within 30 days following the date of initial registration at the institution located in area A and biennially thereafter.
6. For vehicles ~~that are being to be~~ registered as area A vehicles under conditions not specified in subsections (1) through (5), upon initial registration and within 90 days before the vehicle's emissions compliance expiration date thereafter.
7. For vehicles issued a certificate of exemption under R18-2-1023, within 15 calendar days after returning to Arizona unless an official emissions inspection document indicating compliance with the emissions requirements from the out-of-state emissions inspection station is submitted with the request for exemption.
- C. Vehicles registered in the portion of area A within Pinal County ~~shall be~~ exempt from the requirements of this Article until January 1, 2001.
- D. Unless exempted by R18-2-1003(B), a used vehicle not registered as an area A or area B vehicle shall ~~require the appropriate emission test be inspected according to this Article before registration as an area A or area B vehicle.~~
- E. An area B vehicle ~~that is being registered in area A shall require~~ is subject to the appropriate annual or biennial test from area A before registration even if the emissions compliance period for area B has not yet expired.
- F. New vehicles that are temporarily exempt from emission testing under R18-2-1003(B)(11), and ~~are~~ subject to either an annual or biennial test, shall be tested before registration in ~~the~~ calendar year that exceeds the vehicle's model year by 5 years.
- G. Nothing in this Section shall be construed to waive a late registration fee because of failure to meet inspection requirements by the registration deadline, except that motor vehicles failing the initial or subsequent test shall not be subject to a penalty fee for late registration renewal if ~~both~~:
 1. ~~the original testing was~~ The initial test is accomplished before the emissions compliance expiration date, and
 2. ~~the~~ The registration renewal is received by the Arizona Department of Transportation Motor Vehicle Division within 30 days of the ~~original~~ initial test.
- H. A vehicle subject to subsection (A)(1), (A)(6), (B)(1), or (B)(6) may be submitted ~~voluntarily~~ for a voluntary inspection more than 90 days before the emissions compliance expiration date on payment of the ~~prescribed~~ inspection fee. ~~Such a~~ voluntary inspection ~~shall not be considered as~~ not compliance with the registration or reregistration testing requirement under R18-2-1003.

R18-2-1006. Emissions Test Procedures

- A. Each vehicle inspected at a state station shall be visually inspected before the emissions test for the following unsafe or unstable conditions:
 1. A fuel leak ~~which that~~ causes wetness or pooling of fuel;
 2. A continuous engine or transmission oil leak onto the floor;
 3. A continuous engine coolant leak onto the floor such that the engine overheating has ~~occurred~~ overheated or may ~~occur~~ overheat within a short time;
 4. The vehicle has a tire on a driving wheel with less than 2/32-inch tread, with metal protuberances, unmatched tire size, ~~or~~ with obviously low tire pressure, as determined by visual inspection, or any other condition that precludes a loaded test for ~~reason~~ reasons of safety to personnel, equipment, or ~~the vehicle~~ safety;
 5. An exhaust pipe that does not exit the rear or side of the vehicle to allow for safe exhaust probe insertion. An exhaust pipe on a diesel-powered vehicle that does not allow for safe exhaust probe insertion and attachment of opacity meter sensor units;
 6. Improperly operating brakes;
 7. Any vehicle modification, or mechanical condition ~~which that~~ prevents dynamometer operation; and
 8. Any other condition deemed unsafe by the inspector, ~~such as~~ including loud internal engine noise or an obvious exhaust leak.

- B. A vehicle emissions inspection shall not be performed by an official emissions inspection station on any vehicle ~~that is~~ towing a heavily loaded trailer, carrying a heavy load, loaded with explosives, or loaded with any ~~other~~ hazardous material not used as fuel for the vehicle.
- C. Any vehicle ~~found to be~~ unsafe or otherwise untestable as determined by the visual inspection shall be rejected without an emissions test. Vehicle owners or drivers shall be notified of all unsafe conditions found on rejected vehicles. A fee shall not be charged if the vehicle is rejected at a state station. The emissions test shall not be conducted on a vehicle rejected for a safety reason or any other untestable condition until the cause for rejection is repaired.
- D. When conducting the emissions test procedure required by this Section, both of the following requirements shall be met:
1. All vehicles shall be tested in ~~as received~~ the condition presented, unless rejected under subsection (A), (B), or (C). The vehicle's engine shall be operating at normal temperature. ~~The vehicle's engine shall and~~ not be overheating as indicated by a gauge, warning light, or boiling radiator, ~~and all~~ All of the vehicle's accessories shall be turned off during testing.
 2. Vehicles designed to operate with more than 1 fuel shall be tested on the fuel in use when the vehicle is presented for inspection.
- E. In area A, the inspection test procedures for all vehicles other than diesel-powered vehicles and vehicles held for resale by fleet-licensed motor vehicle dealers ~~with a fleet license~~ shall conform to the following:
1. Vehicles manufactured with a model year of 1967 through 1980, all nonexempt vehicles with a GVWR greater than 8,500 pounds, and all reconstructed vehicles, except motorcycles and constant 4-wheel drive vehicles, are required to annually take and pass ~~both~~ a loaded cruise test and a curbed idle test, ~~described~~ as follows:
 - a. Loaded cruise test. The vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1 of this Article, in drive for automatic transmission or 2nd or higher gear for manual transmission. Overdrive shall not be used for testing. All vehicles shall be driven by the inspector during testing. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. After exhaust emissions have been recorded, engine speed shall be returned to idle for a curbed idle test.
 - b. Curbed idle test. The test shall be performed with the vehicle in neutral for 1981 and newer vehicles. For 1980 and older vehicles, the test shall be performed in neutral, except that if the vehicle has an automatic transmission, drive shall be used. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading of less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired.
 2. Vehicles with a 1981 or newer model year and a GVWR of 8,500 pounds or less, except motorcycles, reconstructed vehicles, and until January 1, 2002 constant 4-wheel drive vehicles, are required to biennially take and pass a transient loaded emissions test and an evaporative system integrity test as follows:
 - a. The transient loaded emission test shall consist of 147 seconds of mass emission measurement using a constant volume sampler while the vehicle is driven by an inspector through a computer-monitored driving cycle on a dynamometer with inertial weight settings appropriate for the weight of the vehicle. The driving cycle shall include the acceleration, deceleration, and idle operating modes ~~required~~ described in Table 4. The 147 second sequence may be ended earlier using fast pass or fast fail algorithms. A retest algorithm shall be used to determine if a test failure ~~was~~ due to insufficient vehicle preconditioning. As determined by the retest algorithm, up to 2 additional tests may be performed on a failing vehicle. Drive shall be used for automatic transmissions and 1st gear shall be used to begin for manual transmissions. Exhaust emissions concentrations in grams per mile for HC, CO, NO_x and CO₂ shall be recorded continuously beginning with the 1st second. The inspector shall reject from testing vehicles with audible or ~~otherwise detectable~~ visible exhaust leaks.
 - b. The evaporative system integrity test shall consist of the following steps in sequence:
 - i. Connect the test equipment to either the fuel tank vent hose at the canister or the fuel tank filler neck. The gas cap shall be checked to ensure that it is properly tightened, and shall be tightened if necessary.
 - ii. Pressurize the system to 14 ± 0.5 inches of water without exceeding 26 inches of water system pressure.
 - iii. Close off the pressure source, seal the evaporative system, and monitor pressure decay for ~~up to no more than~~ 2 minutes.
 3. For vehicles required to take a biennial emissions test, all testing and test equipment shall conform to "IM240 & ~~Evaporative Test~~ Evap Technical Guidance", EPA-AA-RSPD-IM-98-1 EPA420-R-98-010, EPA, August 1998, except that the transient driving ~~scheduled~~ cycle in Table 4 of this Article shall be used, incorporated by reference and on file with the Department and the Secretary of State. This incorporation by reference contains no future editions or amendments. A copy of this referenced material may be obtained at EPA's National Vehicle and Fuel Emissions Laboratory, 2565 Plymouth Road, Ann Arbor, MI 48105-2498. ~~For vehicles required to take an annual emissions test, exhaust~~ Exhaust sampling for vehicles required to take an annual emissions test shall conform to comply with subsection (F)(6).

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4. All motorcycles and constant 4-wheel drive vehicles shall ~~be required only to~~ take and pass only a curb idle test according to subsection (F)(1).
 5. The emissions ~~pass/fail/pass-fail~~ determination for all vehicles tested under subsection (E) shall be made as follows:
 - a. Vehicles tested under subsection (1), ~~which that~~ do not exceed either the loaded cruise mode or curb idle mode HC and CO emissions standards listed in Table 2 ~~for the vehicle, shall be in compliance~~ comply with minimum the emissions standards ~~contained~~ in Table 2. The loaded cruise test standards ~~specified~~ in Table 2 shall apply to fleet vehicles tested with the 2,500 RPM unloaded fast idle test under R18-2-1019(A)(E).
 - b. Vehicles tested under subsection (E)(2) shall meet the standards in Table 3 and pass the evaporative system integrity test as follows:
 - i. Table 3 Standards. A vehicle shall meet either the composite standard for the whole test or the phase 2 standard for seconds 65 to 146. The Department may implement testing algorithms for fast pass, fast fail, or both, provided that the algorithms are reliable in accurately predicting the final outcome of the entire cycle. ~~The Department may adjust individual standards for a vehicle class or model year, if test data determine that a standard does not result in an optimal emissions level for correctly identifying passing or failing vehicles. The Department's determination and any adjusted standard shall be filed with the SOS (Secretary of State) office.~~ Vehicles not meeting either the composite or phase 2 standard shall fail the emissions test.
 - ii. Evaporative System Integrity. A vehicle fails the emissions test if the evaporative system cannot maintain a system pressure above 8 inches of water for ~~up to at least~~ at least 2 minutes after being pressurized to 14 ± 0.5 inches of water. Additionally, vehicles fail the evaporative test if the canister is missing or damaged, if hoses or electrical connections are missing, ~~mis-routed~~ routed incorrectly, or disconnected, according to the vehicle emissions control information label, ~~disconnected~~, or if the gas cap is missing.
 - c. Vehicles ~~operating that operate~~ on compressed natural gas shall ~~be in compliance~~ comply with HC emissions standards if the HC emissions value multiplied by 0.19 does not exceed the applicable ~~standards~~ standard in subsection (E)(5)(a) or (E)(5)(b).
 - d. Motorcycles and constant 4-wheel drive vehicles ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards listed in Table 2 on either the 1st ~~curb idle test or the 2nd curb idle test~~ shall ~~be in compliance~~ comply with the ~~minimum~~ emissions standards in Table 2.
 - e. ~~Any A~~ vehicle exceeding the applicable emissions standards for the tests described in subsections (E)(1) and (E)(2)(a) fail the emissions test and shall ~~not be reinspected until~~ have a low-emissions tune-up is performed as described in R18-2-1010 ~~before reinspection~~. ~~Any A~~ vehicle that fails the test described in subsection (E)(2)(b) shall ~~not be reinspected until~~ repaired as required in R18-2-1010(D)(1) ~~or and~~ (2), ~~as applicable, before reinspection~~.
 6. ~~Each A~~ nondiesel vehicle required to take an annual emission test in area A shall, at the time of the test, undergo a tampering inspection based on the original configuration of the vehicle as manufactured. The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide the written statement required in R18-2-1008(B). "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by the manufacturer for original entry and sale in the United States. The tampering inspection shall consist of the following:
 - a. All nondiesel vehicles emission tested, except those with non-sealing gas caps, shall have a functional test of the gas cap to determine that cap leakage does not exceed 60 cubic centimeters of air per minute at a pressure of 30 inches of water gauge. Nondiesel vehicles with non-pressurized, vented systems shall ~~have a visual inspection to determine~~ be checked for the presence of a properly fitting gas cap.
 - b. For 1975 and newer model year vehicles:
 - i. A visual inspection to determine the presence of properly installed catalytic converters;
 - ii. An examination to determine the presence of an operational air pump; and
 - iii. A visual inspection to determine the presence of an operational positive crankcase ventilation system and evaporative control system.
- F. In area B, the inspection test procedures for all vehicles other than diesel-powered vehicles shall ~~conform to~~ consist of the following:
1. Area B vehicles ~~manufactured~~ with a model year of 1967 through 1980 shall take and pass only a curb idle test. The curb idle test shall be performed with the vehicle in drive for vehicles with automatic transmissions or in neutral for vehicles with manual transmissions. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired. ~~In the event~~ If the vehicle fails the curb idle test, and if ~~requested~~ permitted by the vehicle operator, the vehicle shall be conditioned according to 1 of the following conditioning procedures:

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- a. For the fast-idle ~~conditioning procedure~~, the vehicle shall be conditioned by increasing engine speed to 2,500, ± 300 RPM, for up to 30 seconds with the transmission in neutral. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. The conditioning ~~mode procedure~~ standards in Table 2 ~~shall be~~ are for diagnostic and advisory information only. After exhaust emissions ~~have been~~ are recorded, the engine speed shall be returned to curb idle for a 2nd idle test. The fast idle conditioning ~~mode procedure~~ may be used on a vehicle at state stations ~~in place~~ instead of the loaded conditioning ~~mode procedure~~ if any of the following occurs:
 - i. The vehicle has a tire on a driving wheel with less than 2/32-inch tread, with metal protuberances, ~~or~~ with visibly low tire pressure, as determined by visual inspection, or any other condition that precludes loaded conditioning for ~~reason~~ reasons of safety to personnel, equipment, or vehicle safety;
 - ii. The vehicle is driven by a person who, because of physical incapacity, is unable to yield the driver's seat to the vehicle emissions inspector;
 - iii. The driver refuses to yield the driver's seat to the vehicle emissions inspector; or
 - iv. The vehicle ~~is unable to~~ cannot be tested according to Table 1 because of the vehicle's inability to attain the speeds specified.
 - b. For the loaded ~~conditioning procedure~~, for all vehicles other than motorcycles and constant 4-wheel drive vehicles, the vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1, in drive for automatic transmission, or 2nd or higher gear for manual transmission. All front wheel drive vehicles shall be driven by the inspector. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. The conditioning ~~mode procedure~~ standards in Table 2 ~~shall be~~ are for diagnostic and advisory information only. After exhaust emissions ~~have been~~ are recorded, engine speed shall be returned to curb idle for a 2nd idle test.
 - c. Following 1 of the conditioning procedures in subsection (a) or (b), the vehicle shall be retested according to the curb idle test procedure in subsection ~~(a)~~ (1).
2. Area B vehicles with a 1981 or newer model year, except motorcycles and constant 4-wheel drive vehicles, shall ~~be required to~~ take and pass ~~both~~ a loaded cruise test and curb idle test, ~~described~~ as follows:
- a. Loaded Cruise Test. The vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1, in drive for automatic transmission or 2nd or higher gear for manual transmission. Overdrive shall not be used. All front wheel drive vehicles shall be driven by the inspector. Exhaust emissions, HC and CO concentrations, shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. After exhaust emissions have been recorded, engine speed shall be returned to idle for a curb idle test.
 - b. The Curb Idle Test. The test shall be performed with the vehicle in neutral. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired.
3. All motorcycles and constant 4-wheel drive vehicles shall ~~be required only to~~ take and pass only a curb idle test according to subsection (1). ~~In the event~~ If the vehicle fails the curb idle test, and if ~~requested~~ permitted by the vehicle operator, the vehicle shall be conditioned according to the fast idle conditioning procedure required in subsection ~~(1)(b)(1)(a)~~. Following conditioning, the ~~engine speed~~ vehicle shall be ~~returned to idle for a 2nd~~ retested according to the curb idle test procedure in ~~according to~~ subsection (1)~~(a)~~.
4. The emissions ~~pass/fail~~ pass-fail determination shall be made as follows:
- a. Vehicles ~~manufactured~~ with a model year of 1967 through 1980, except motorcycles and constant 4-wheel drive vehicles, ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards in Table 2 on either the 1st ~~curb idle test or the 2nd curb idle test~~, ~~shall~~ shall comply with the minimum emission standards contained in Table 2.
 - b. Vehicles with a 1981 or newer model year, except motorcycles and constant 4-wheel drive vehicles, ~~which that~~ do not exceed ~~either~~ the loaded cruise mode or curb idle mode HC and CO emissions standards listed in Table 2, ~~shall~~ shall comply with the minimum emissions standards in Table 2. The loaded cruise test standards specified in Table 2 shall apply to fleet vehicles tested with the 2,500 RPM unloaded fast idle test.
 - c. Vehicles ~~operating that~~ operate on compressed natural gas shall be in compliance if the HC emissions value multiplied by 0.19 does not exceed the applicable ~~standards~~ standard in subsection ~~(F)(4)(a) or (F)(4)(b)~~.
 - d. Motorcycles and constant 4-wheel drive vehicles ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards in Table 2 on either the 1st ~~curb idle test or the 2nd curb idle test~~ ~~shall~~ shall comply with the minimum emissions standards in Table 2.
 - e. Any vehicle exceeding the appropriate emissions standards fails the emissions test and shall have a low emissions tune-up as described in R18-2-1010 before reinspection.
5. ~~An area B~~ A nondiesel vehicle required to take an ~~emissions~~ emissions test ~~under this Article in area B~~, shall at the time of the test, undergo a tampering inspection based on the original configuration of the vehicle as manufactured, ~~as fol-~~

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~~laws.~~ The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide the written statement required in R18-2-1008(B). "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by the manufacturer for original entry and sale in the United States. The tampering inspection shall consist of the following:

- a. Vehicles that have pressure holding gas caps shall have a functional test of the gas cap to determine that cap leakage does not exceed 60 cubic centimeters of air per minute at a pressure of 30 inches of water gauge. Vehicles with non-sealing gas caps shall be checked for the presence of a properly fitting gas cap.
- b. For 1975 and newer model year vehicles:
 - i. A visual inspection to determine the presence of properly installed catalytic converters; and
 - ii. An examination to determine the presence of an operational air pump.

The above items shall be checked for conformance to the original configuration at time of manufacture. "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by a manufacturer for original entry and sale in the United States. The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide a written statement required by R18-2-1008(B).

- 6. Exhaust sampling in area B shall ~~conform to~~ comply with the following:
 - a. All CO and HC emission analyzers shall have water traps incorporated in the sampling lines. Sampling probes shall be capable of taking undiluted exhaust samples from a vehicle exhaust system.
 - b. All vehicles, other than diesel-powered vehicles, shall be inspected with NDIR analyzers capable of determining concentrations of CO and HC within the ranges and tolerances specified in Table 5.
 - c. Vehicles with multiple exhaust pipes shall be inspected by collecting and averaging samples by 1 of the following methods:
 - i. ~~Collect separate samples from each exhaust pipe. The~~ and use the average concentration shall to determine the test ~~results~~ result;
 - ii. Use manifold exhaust probes to simultaneously sample approximately equal volumes from each pipe; or
 - iii. Use manifold exhaust pipe adapters to collect approximately equal volume samples from each pipe.

G. The following apply to all testing under subsections (E) or (F):

- 1. ~~All~~ A rotary piston ~~engines~~ engine shall be ~~treated in the same manner as~~ inspected as a 4-stroke ~~engines~~ engine with 4 cylinders or less;
- 2. ~~All~~ A turbine ~~engines~~ engine shall be ~~treated as~~ inspected as a 4-stroke ~~engines~~ engine having more than 4 cylinders; and
- 3. ~~All vehicles~~ A vehicle in which a diesel engine has been replaced with a gas engine shall be inspected as a gas-powered ~~vehicles~~ vehicle of the same vehicle model year. The vehicle shall not pass the ~~test~~ inspection unless each catalytic ~~converters~~ converter, air ~~pumps~~ pump, gas ~~caps~~ cap and other emissions control ~~devices~~ device applicable to the vehicle model year and the same or more recent year engine configuration ~~are~~ is properly installed and in operating condition.

H. In area A, the inspection test procedure for a diesel-powered ~~vehicles~~ vehicle is as follows:

- 1. A diesel-powered vehicle with a GVWR greater than 8,500 pounds shall be tested with a procedure that conforms to Society of Automotive Engineers standard J1667, February 1996, incorporated by reference and on file with the Department and the Secretary of State. This incorporation by reference contains no future editions or amendments. A copy of this referenced material may be obtained at: Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096-0001. The procedure shall utilize the corrections for ambient test conditions in Appendix B of J1667 for all tests. The test results shall be reported as the percentage of smoke opacity. Emissions ~~pass/fail~~ pass-fail determinations are as follows:
 - a. Vehicles powered by a 1991 or later model year diesel engine shall fail if the J1667 final test result is greater than 40%, unless the engine family is exempted from the 40% standard under subsection (e);
 - b. Vehicles powered by a pre-1991 model year diesel engine shall fail if the J1667 final test result is greater than 55%, unless the engine family is exempted from the 55% standard under subsection (e);
 - c. The engine model year is determined by the emission control label. If the emission control label is missing, illegible, or incorrect, the test standard shall be 40%, unless a correct, legible emission control label replacement is attached to the vehicle within 30 days of the inspection;
 - d. Any vehicle that exceeds the appropriate opacity standard in subsection (a) or (b) fails the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010(G);
 - e. The Director shall exempt any engine family from the standards in subsections (a) or (b) if the engine manufacturer demonstrates either of the following:
 - i. The engine family exhibits smoke opacity greater than the standard ~~if~~ when in good operating condition and

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- adjusted to the manufacturer's specifications. ~~Instead the engine family~~ The Director shall comply with any ~~identify a~~ technologically appropriate less stringent standard identified by the Director based on a review of data obtained from engines in good operating condition and adjusted to manufacturer's specifications; or
- ii. The engine family is exempted from an equivalent standard based on J1667 by the executive officer of the California Air Resources Board (CARB). ~~Instead~~ The Director shall allow the engine family ~~shall to~~ comply with any technologically appropriate less stringent standard identified by the executive officer of CARB; and
- f. A demonstration under subsection (e)(i) shall be based on data from at least 3 vehicles. Data from official inspections under subsection (H)(1) showing that vehicles in the engine family ~~pass meet the standard~~ may be used to rebut the demonstration. The Director shall implement any new standard resulting from each exemption as soon as practicable for all subsequent tests and provide notice at all affected test stations and fleets.
2. A diesel-powered vehicle with a GVWR greater than 4,000 pounds and less than or equal to 8,500 pounds shall be tested by a loaded dynamometer test by applying a single load of 30 HP, \pm 2 HP, while operated at 50 MPH. A diesel-powered vehicle with a GVWR of 4,000 pounds or less shall be tested by a loaded dynamometer test by applying a single load of between 6.4 - 8.4 HP while operated at 30 MPH. For all diesel-powered vehicles with a GVWR less than or equal to 8,500 pounds:
 - a. The emissions ~~pass/fail~~ pass-fail determination shall be made as follows:
 - i. The opacity reading for a period of 10 consecutive seconds with the engine under applicable loading shall be compared to the opacity standard ~~specified in R18-2-1030(B)~~. Vehicles ~~which that~~ do not exceed the opacity standards in R18-2-1030(B) ~~shall be in compliance~~ comply with the minimum emission standards.
 - ii. ~~Any~~ A vehicle that exceeds the appropriate standard fails the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010.
 - b. Exhaust sampling shall ~~conform to~~ comply with the following:
 - i. ~~For a diesel-powered vehicle equipped with multiple pipes, separate~~ Separate measurements shall be made on each exhaust pipe ~~on diesel vehicles equipped with multiple pipes. For vehicles equipped with more than 1 exhaust pipe, the~~ The reading taken from the exhaust pipe ~~which that~~ has the highest opacity reading shall be used for comparison with the appropriate emission standard.
 - ii. Vehicles shall be inspected with a full-flow, direct reading, continuous reading light extinction opacity meter using a collimated light source and photo-electric cell, accurate to a value within \pm 5% of filter value.
- I. In area B, ~~the~~ the inspection test procedure for ~~a diesel-powered vehicles shall be~~ vehicle is as follows:
1. A diesel-powered vehicle with a GVWR greater than 26,000 pounds or having tandem axles shall be tested according to 1 of the following methods:
 - a. The vehicle shall be tested on a chassis dynamometer beginning with no power absorption by selecting a gear ratio ~~which that~~ produces a maximum vehicle speed of 30-35 MPH at governed or maximum rated RPM. If the vehicle has a manual transmission or an automatic transmission with individual gear selection, the engine shall be operated at governed or maximum rated engine RPM, at normal operating temperature under a power absorption load applied to the dynamometer until ~~such the~~ loading reduces the engine RPM to 80% of the governed speed at wide-open throttle position. If the vehicle has an automatic transmission and automatic gear kickdown, the engine shall be loaded to a speed just above the kickdown speed or 80% of the governed speed, whichever is greater. If the chassis dynamometer does not have enough horsepower absorption capability to lug the engine down to these speeds, the vehicle's brakes may be used to assist the dynamometer.
 - b. If a chassis dynamometer is not available, the vehicle shall be tested by being lugged by its own brakes by selecting a gear ratio ~~which that~~ produces a maximum speed of 10-15 MPH at governed engine RPM or maximum rated RPM and then loading the engine by applying the brakes until the engine RPM is lugged down to 80% of the governed or maximum rated RPM at wide-open throttle position. If the vehicle does not have a tachometer, the vehicle may be loaded to 80% of governed or maximum rated speed.
 2. A diesel-powered vehicle without tandem axles and having a GVWR greater than 10,500 pounds and less than or equal to 26,000 pounds shall be tested according to 1 of the following methods:
 - a. The vehicle shall be tested on a chassis dynamometer beginning with no power absorption by selecting a gear ratio ~~which that~~ produces a maximum vehicle speed of 30-35 MPH at governed or maximum rated RPM. If the vehicle has a manual transmission or an automatic transmission with individual gear selection, the engine shall be operated at governed or maximum rated engine RPM, at normal operating temperature under a power absorption load applied to the dynamometer until such loading reduces the engine RPM to 80% of the governed speed at wide-open throttle position. If the vehicle has an automatic transmission and automatic gear kickdown, the engine shall be loaded to a speed just above the kickdown speed or 80% of governed speed, whichever is greater. If the chassis dynamometer does not have enough horsepower absorption capability to lug the engine down to these speeds, the vehicle's brakes may be used to assist the dynamometer;
 - b. The vehicle shall be tested by applying a single load of 30 HP, \pm 2 HP, while operated at 50 MPH; or

- c. The vehicle shall be tested by being lugged by its own brakes by selecting a gear ratio ~~which~~that produces a maximum speed of 10-15 MPH at governed engine RPM or maximum rated RPM and then loading the engine by applying the brakes until the engine RPM is lugged down to 80% of the governed or maximum rated RPM at wide-open throttle position. If the vehicle does not have a tachometer, the vehicle may be loaded to 80% of governed or maximum rated speed.
3. A diesel-powered vehicle with a GVWR of greater than 4,000 pounds and less than or equal to 10,500 pounds shall be tested by a loaded dynamometer test by applying a single load of 30 HP, ± 2 HP, while operated at 50 MPH.
4. A diesel-powered vehicle with a GVWR of 4,000 pounds or less shall be tested by a loaded dynamometer test by applying a single load of between 6.4 - 8.4 HP while operated at 30 MPH.
5. The emissions ~~pass/fail~~pass-fail determination shall be performed:
 - a. The opacity reading during a period of 10 consecutive seconds with the engine under applicable loading specified in ~~subsections~~subsections (1) through (4) shall be compared to the opacity ~~reading~~ standard specified in R18-2-1030(B). Vehicles ~~which~~that do not exceed the opacity standards in R18-2-1030(B) ~~shall be in compliance~~comply with the minimum emission standards.
 - b. ~~Any~~A vehicle that exceeds the standard in R18-2-1030(B) ~~shall fail~~fails the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010.
6. Exhaust sampling shall ~~conform to~~comply with the following:
 - a. ~~For a diesel-powered vehicle equipped with multiple exhaust pipes, separate~~ Separate measurements shall be made on each exhaust pipe ~~on diesel vehicles equipped with multiple exhaust pipes. For vehicles equipped with more than 1 exhaust pipe, the~~ reading taken from the exhaust pipe ~~which~~that has the highest opacity reading shall be used for comparison with the standard in R18-2-1030(B).
 - b. Vehicles shall be inspected with either a full-flow or sampling-type opacity meter. The opacity meter shall be direct reading, continuous reading light extinction-type using a collimated light source and photo-electric cell, accurate to a value within $\pm 5\%$ of filter value.
- J. ~~Diesel-powered area~~Area A or area B vehicles that are ~~diesel-fueled and~~ equipped with catalytic converters or PCV systems shall undergo a tampering inspection for those devices under ~~subsections (E) or (F)~~subsection (E)(6).
- K. ~~Diesel-powered area~~Area B vehicles that are ~~diesel-fueled and~~ equipped with catalytic converters shall undergo a tampering inspection for those devices under ~~subsections (E) or (F)~~subsection (F)(5).

R18-2-1007. Evidence of Meeting State Inspection Requirements

- A. Vehicles required to be inspected under this Article shall pass inspection before registration by meeting the requirements of R18-2-1006, unless waived under R18-2-1008.
- B. The MVD or its agent may use the MVD motor vehicles emissions database, if available, ~~may be used by the registering authority~~ as evidence that a vehicle complies with the requirements of this Article.
- C. If the MVD motor vehicles emissions database is not available, the MVD or its agent shall accept any of the following documents, when complete, unaltered and dated no more than 90 days before registration expiration date, ~~shall be accepted by the registering authority~~ as evidence that a vehicle complies with the requirements of this Article unless the ~~registering authority~~MVD or its agent has reason to believe it is ~~a false document~~. Documents accompanying a late registration may be dated subsequent to the registration expiration date:
 1. Certificate of compliance,
 2. Certificate of waiver (except from auto dealers licensed to sell used motor vehicles under A.R.S. Title 28),
 3. Certificate of exemption, or
 4. Director's certificate,
 5. The upper section of the vehicle inspection report with "PASS" in the final results block.
- D. Complete and unaltered certificates of inspection dated within 12 months of registration for annually tested vehicles and 24 months for biennially tested vehicles shall be accepted by the ~~registering authority~~MVD or its agent as evidence that a vehicle is in compliance with the requirements of this Article unless the ~~registering authority~~MVD or its agent has reason to believe it is ~~a false document~~.
- E. Documents listed in subsection (C) and originating in ~~from~~ area B are not acceptable for meeting the inspection requirements in area A.
- F. ~~Governmental~~Government vehicles for which only weight fees are paid shall be registered without evidence of inspection.

R18-2-1008. Procedure for Issuing Certificates of Waiver

- A. Unless prohibited under subsections (C), (D), or (E), a certificate of waiver shall be issued subsequent to reinspection by a state inspector at a state or Department station to a vehicle that failed the emissions inspection or the emissions and tampering inspections when it is determined by repair receipts, emissions test results, evidence of repairs performed, underhood verification, or other similar evidence that the requirements of R18-2-1009 and R18-2-1010 have been met, or ~~that~~ with respect to emissions failures only, any further repairs within the repair cost limit would be ineffective. A waiver may be denied ~~when~~if a waiver request is based upon repair estimates and the state inspector demonstrates that a recognized repair facility can repair or improve the vehicle's test readings within the repair cost limit.

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- B. A certificate of waiver may be issued to a vehicle failing the tampering inspection if the vehicle owner of the vehicle provides to the Director a written statement from an automobile parts or repair business that an emission control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply provided, and if applicable, that all requirements of R18-2-1008(A) have been met. All written statements may be subject to verification for authenticity and accuracy by the Department. The Department may deny a certificate of waiver if the state inspector has any reason to believe the written statement is a false document or a usual source of supply does not exist and the device which is necessary to repair the tampering is available. Certificates of waiver for tampered vehicles may be issued conditionally for a specified period, not to exceed 90 days, which that allows sufficient time for the procurement and installation of a proper emissions control device. Receipts or billing A receipt or bill from a vehicle repair facility or automobile parts store shall be accepted as proof of purchase. Before or at the end of the specified time period, the vehicle owner shall present to the Director proof of purchase and installation of the device to prevent cancellation of vehicle registration. The Department shall track all issued conditional certificates of waiver and if no proof of purchase and installation is received on or before the end of the specified time period, the Director shall forward to the Department of Motor Vehicles an order to cancel the vehicle's registration.
- C. The Director shall not issue a waiver to a vehicle that has failed the emissions test due to the catalytic converter system. A vehicle shall have failed the emissions test due to the catalytic converter system if:
1. theThe converter's oxidation efficiency, as measured by the Catalyst Efficiency Test Procedure underin R18-2-1031(A), is less than 75%; and
 2. there are noNo engine or fuel system malfunctions exist that would prevent the proper operation of thea catalytic converter.
- D. The Director shall not issue a waiver to a vehicle that failsfailing the emission inspection test with an HC, CO, NO_x, or opacity emission levelslevel greater than 2 times the pass/fail standardpass-fail standard in R18-2-1006, unless the vehicle is repaired to reduce so that each emission levelslevel is less than below 2 times the pass/fail standardpass-fail standard.
- E. After January 1, 1997, the Director shall not issue a certificate of waiver no to the same vehicle more than 1 time to a vehicleonce.
- F. The fee for a certificate of waiver under this Section shall be fixed by the Director according to A.R.S. § 49-543, and shall be based upon the Director's estimated costs to the state offor administering and enforcing the provisions of this Article as they apply tofor issuance of certificates of waiverswaiver under this Section. EachThe fee shall be payable directly to the Department of Environmental Quality at the time the certificate of waiver is issued.

R18-2-1009. Tampering Repair Requirements

- A. Failure to pass if a vehicle fails the visual inspection to determine the presence ofor properly installed catalytic converters, shall require replacement of the converters shall be replaced with new or reconditioned OEM converters or approved equivalent new aftermarket converters. The Department shall provide names Names of approvedacceptable aftermarket converters shall be available at the time of inspection and listed on the repair requirement list.
- B. Failure to passIf a vehicle fails the functional gas cap pressure test described in R18-2-1006(E)(6)(a) or (F)(5)(a), the gas cap shall require replacementbe replaced with a gas capone that meets those specifications. Failure to passIf a vehicle designed with a vented system fails a visual inspection for the presence of a gas cap, on vehicles designed with vented systems shall require installation of a properly fitting gas cap shall be installed on the vehicle.
- C. Failure to pass if a vehicle fails the visual check to determineinspection for the presence of an operational air pump, shall require replacement with a new, used, or reconditioned, operational properly installed and operational air pump shall be properly installed on the vehicle.
- D. Failure to pass if a vehicle fails the visual inspection for the presence or malfunction of the positive crankcase ventilation system, the system shall require the repair or replacement of the system or parts be repaired or replaced with OEM or equivalent aftermarket parts.
- E. Failure to pass if a vehicle fails the visual inspection for the presence or malfunction of the evaporative control system, the system shall require repair or replacement of the system or parts be repaired or replaced with OEM or equivalent aftermarket parts.

R18-2-1010. Low Emissions Tune-up, Emissions and Evaporative System Repair

- A. A low emissions tune-up on nondiesel-powered vehicles consists of a person performing the following procedures:
1. Emissions Failure Diagnosis. OnFor computer-controlled vehicles, the on-board-diagnostics shall be accessed and any stored trouble codes recorded. The following instruments or equipment are required to complete a low emissions tune-up: tachometer, timing light, or an engine analyzer or oscilloscope, and whereif specified by the manufacturer, a HC/CO NDIR analyzer to make final A/F adjustments. Final adjustment shall be made on the vehicle engine only after the engine is at normal operating temperature. All adjustments shall be made according to the manufacturer's specifications and procedures.
 2. Inspection of Air Cleaner, Choke, and Air Intake System. The person shall replace or repair a dirty or plugged air cleaner, a stuck choke, or a restricted air intake system shall be replaced or repaired as required.

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3. Dwell and Basic Timing Check. Dwell and basic engine timing shall be checked and adjusted, if necessary, according to manufacturer's specifications.
 4. Inspection of PCV Valve. The PCV valve shall be checked to ensure that it is the type recommended by the manufacturer and that it is correctly operating. Free flow through the PCV system passages and hoses shall be verified. Repair and/or replace as required.
 5. Inspection of Vacuum Hoses. The vacuum hoses shall be inspected for leaks, obstruction, and proper routing and connection. Repair and/or replace as required.
 6. Perform a visual inspection for leaking fuel lines or system components. Repair and/or replace as required.
 7. Idle Speed and A/F Mixture Check. The idle speed and A/F mixture shall be checked and adjusted according to manufacturer's specifications and procedures. If the vehicle is equipped with a fuel injection system or an alternate fuel (LPG or LNG), the manufacturer's recommended adjustment procedure shall be followed.
- B.** ~~A low emissions tune-up and diagnosis must be performed on each vehicle in order to qualify for a waiver if the vehicle fails reinspection.~~ A vehicle that fails reinspection does not qualify for a waiver unless a low emissions tune-up and diagnosis is performed on the vehicle.
- C.** If the maximum required repair cost in ~~subsections~~ subsection (E) and/or (F), ~~or the vehicle owner share of repair costs in R18-2-1014(E), if applicable, whichever is less,~~ is not exceeded after a low emissions tune-up described in subsection (A), then ~~a person shall perform the following and repair or replace as required~~ procedures apply:
1. If a vehicle fails the CO only, the vehicle shall be checked for proper canister purge system operation, high float setting, leaky power valve, faulty or worn needles, seats, jets or improper jet size. If applicable, ~~the person following shall check the~~ also be checked: computer, engine and computer sensors, engine solenoids, engine thermostats, engine switches, coolant switches, throttle body or port fuel injection system, fuel injectors, fuel lines; (routing and integrity), air in fuel system (for example, line, pump), fuel return system, injection pump, fuel injection timing, routing of vacuum hoses and electrical connections. Repair or replace as required.
 2. If a vehicle fails HC₂ or HC and CO, the vehicle shall be checked for faulty spark plugs and faulty, open, crossed, or disconnected plug wires, distributor module, vacuum hose routing and electrical connections; ~~and for~~ distributor component malfunctions including vacuum advance, faulty points or condenser, and distributor cap crossfire, catalytic converter efficiency, and catalytic converter air supply; ~~and for~~ vacuum leaks at intake manifold, carburetor base gasket, EGR, and vacuum-operated components. Repair or replace as required.
 3. If a vehicle fails NO_x, the vehicle shall be checked for removed, plugged, or malfunctioning EGR valve; exhaust gas ports, lines, and passages; EGR valve electrical and vacuum control circuitry, components, and computer control, as applicable; ~~and for~~ above normal engine operating temperature, proper air management, lean A/F mixture, catalytic converter efficiency and over advanced off-idle timing. Repair or replace as required.
- D.** For Evaporative System Failures, the following procedures apply:
1. If a vehicle fails ~~an~~ the evaporative system integrity (~~pressure~~) test, the vehicle shall be checked for leaking or disconnected vapor hoses, line, gas cap, and fuel tank.
 2. If a vehicle fails a visual inspection of the evaporative system, ~~check~~ the vehicle shall be checked for a missing or damaged canister, canister electrical and vacuum control circuits and components, disconnected, damaged, mis-routed or plugged hoses, and damaged or missing purge valves. Repair and/or replace as necessary.
- E.** The maximum required repair cost for ~~vehicles~~ a vehicle in area A, not including costs to repair ~~vehicles which fail~~ the vehicle for failing an evaporative system integrity test due to tampering, or other tampering repair costs, is:
1. ~~Five hundred dollars for~~ For a diesel-powered vehicle with a GVWR greater than 26,000 pounds or a diesel-powered vehicle with tandem axles, ~~\$500; or~~ and
 2. For a vehicle ~~other than~~ that is not a diesel-powered vehicle with a GVWR greater than 26,000 pounds ~~or~~ and not a diesel-powered vehicle with tandem axles:
 - a. Two hundred dollars for a vehicle manufactured in or before the 1974 model year;
 - b. Three hundred dollars for a vehicle manufactured in the 1975 through 1979 model years; and
 - c. Four hundred and fifty dollars for a vehicle manufactured in or after the 1980 model year.
 3. Subsection (E) does not prevent a vehicle owner from authorizing or performing more than the required repairs. A vehicle operator who has a vehicle reinspected shall have repair receipts available when requesting a certificate of waiver.
- F.** The maximum required repair cost for vehicles in area B, not including tampering repair costs, is:
1. ~~Three hundred dollars for~~ For a diesel-powered vehicle with a GVWR greater than 26,000 pounds or a diesel-powered vehicle with tandem axles, ~~\$300; or~~ and
 2. For a vehicle ~~other than~~ that is not a diesel-powered vehicle with a GVWR greater than 26,000 pounds ~~or~~ and not a diesel-powered vehicle with tandem axles:
 - a. Fifty dollars for a vehicle manufactured in or before the 1974 model year;
 - b. Two hundred dollars for a vehicle manufactured in the 1975 through 1979 model years; and
 - c. Three hundred dollars for a vehicle manufactured in or after the 1980 model year.

3. Subsection (F) does not prevent a vehicle owner from authorizing or performing more than the required repairs. A vehicle operator who has a vehicle reinspected shall have repair receipts available when requesting a certificate of waiver.
- G. A low emissions tune-up on a diesel-powered ~~vehicles~~ vehicle consists of a ~~person performing~~ the following procedures:
 1. ~~Inspection~~ Inspect for dirty or plugged air cleaner, or restricted air intake system; ~~repair and~~ Repair or replace as required.
 2. ~~Checking~~ Check fuel injection system timing according to manufacturer's specifications; ~~adjust~~ Adjust as required.
 3. ~~Checking~~ Check for fuel injector fouling, leaking or mismatch; ~~repair and~~ Repair or replace as required.
 4. ~~Checking~~ Check fuel pump and air-fuel ratio control according to manufacturer's specifications; ~~adjust~~ Adjust as required.
 5. If the vehicle fails the J1667 procedure, ~~checking~~ check smoke-limiting devices, if any, ~~such as including~~ the aneroid valve and puff limiter. ~~Repair and/or~~ Repair or replace as required.
- H. Any available warranty coverage for a vehicle shall be used to obtain needed repairs before ~~expenditures~~ an expenditure can be counted ~~toward~~ toward the cost limits in subsections (E) and (F). ~~The~~ If the operator of a vehicle within the age and mileage coverage of section 207(b) of the Clean Air Act ~~shall present~~ presents a written denial of warranty coverage from the manufacturer or authorized dealer ~~for this provision to be waived~~, warranty coverage is not considered available under this subsection.

R18-2-1011. Vehicle Inspection Report

- A. ~~Each~~ A vehicle inspected at a state station shall be provided a serially numbered vehicle inspection report of a design approved by the Director ~~and shall provide for that contains~~ the following information ~~as at~~ a minimum:
 1. License plate number;
 2. Vehicle identification number;
 3. Model year of vehicle;
 4. Make of vehicle;
 5. Style of vehicle;
 6. Type of fuel;
 7. Odometer reading to the nearest 1000 miles, truncated;
 8. Emissions standards for idle and loaded cruise modes, if applicable;
 9. Emissions measurements during idle and loaded cruise modes, if applicable;
 10. Opacity measurements and standards, if applicable;
 11. Emission standards and measurements for the transient loaded test, and the evaporative system integrity test, if applicable;
 12. Tampering inspection results;
 13. Repair requirements;
 14. Final test results;
 15. Repairs performed;
 16. Cost of emissions-related repairs;
 17. Cost of tampering-related repairs;
 18. Name, address, and telephone number of the business ~~firm~~ or person making repairs;
 19. Signature and ~~license or~~ certification number of person ~~certifying~~ making repairs;
 20. Date of inspection;
 21. Test results of the previous inspection if the inspection is a reinspection;
 22. Type of business making repairs;
 23. State certification number of technician making repairs, if applicable;
 24. ~~22.~~ Inspection station, lane locators; and
 25. ~~23.~~ Test number and time of test.
- B. ~~Each~~ A vehicle failing the initial inspection shall receive an inspection report supplement approved by the Department containing, at a minimum, ~~both of~~ the following:
 1. Diagnostic and tampering information including acceptable replacement units, and
 2. Applicable maximum repair costs.
- C. The inspection report shall provide a 3-inch by 5-inch tear-out section that may be used as a certificate of compliance for vehicles ~~that pass~~ passing the inspection or as a certificate of waiver ~~when, if~~ applicable.
 1. The tear-out section shall be a certificate of compliance when the word "compliance" appears in the appropriate location on the printout.
 2. The tear-out section shall be a certificate of waiver when the word "waiver" appears in the appropriate location on the printout.
 3. The tear-out section shall contain all of the following information:
 - a. License plate number;
 - b. Vehicle identification number;

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- c. Final results;
- d. Serial number of the inspection report;
- e. Date of inspection;
- f. Model year;
- g. Make;
- h. Date of initial inspection; and
- i. Inspection fee.

D. At the time of registration or reregistration, the certificate of compliance or certificate of waiver may be submitted to the Arizona Department of Transportation Motor Vehicle Division as evidence of meeting the requirements of this Article.

R18-2-1012. Inspection Procedures and Fee

- A. ~~Each~~ A vehicle that is inspected by a state station must be accompanied by a document such as a registration renewal notice, registration, certificate of title, or bill of sale ~~which that~~ which identifies the vehicle by make, model year, identification number, and license plate if applicable.
- B. If the registration renewal notice is used as ~~an entrance~~ the accompanying document, it shall be stamped by the test lane inspector. If the vehicle inspection report from the previous test is used, it shall be retained by the test lane inspector.
- C. The fees for emissions inspections at a state station shall be specified in the contract between the contractor and the state of Arizona according to A.R.S. § 49-543, and shall include the full costs of the vehicle emissions inspection program including administration, implementation, and enforcement. Each fee is payable directly to the contractor at the time and place of inspection in cash or by check approved by the contractor. ~~Money Fees~~ collected by the contractor to defray the costs of the inspection shall be retained by the contractor. ~~The fee amounts amount~~ collected to defray the costs of the administration, implementation, and enforcement of the vehicle emissions inspection program shall be remitted to the Department. Amounts collected shall be recorded and reported to the Department monthly. The contractor shall submit to the state of Arizona on a monthly basis, by the 10th day of each month, a report setting forth the number of inspections performed and the amount of fees collected.
- D. Subsequent inspections, if needed, shall be treated by the state and the contractor in the same manner as an initial inspection and reinspection, providing for ~~4~~ a free reinspection according to R18-2-1013, if needed, following ~~each~~ a paid inspection. The fee for each ~~subsequent inspection~~ paid reinspection shall be the full fee as provided for in the contract with the ~~independent~~ contractor.
- E. State station emissions inspectors shall not recommend repairs or repair facilities.

R18-2-1013. Reinspections

- A. ~~Each~~ A vehicle ~~which fails its~~ failing the initial inspection or any subsequent paid inspection is entitled to 1 reinspection at no additional charge under the following conditions:
 - 1. The vehicle is presented for inspection within 60 ~~consecutive~~ calendar days of the initial or any subsequent paid inspection, ~~provided that~~ if the vehicle operator presents the vehicle inspection report ~~for from~~ the previous inspection, indicating the itemization of the repairs performed.
 - 2. ~~Emission related~~ Emissions-related repairs or adjustments and any tampering repairs have been made.
 - 3. The vehicle is accompanied by the entire vehicle inspection report from the initial or subsequent ~~inspections~~ inspection with the following information filled in on the reverse side:
 - a. Emissions-related and tampering-related repairs ~~that have been~~ made;
 - b. Cost of emissions-related and tampering-related repairs as reflected by receipts ~~of purchase or bills~~;
 - c. Name, address, ~~phone~~ telephone number, and type of facility making repairs;
 - d. Signature of person certifying the repairs were made;
 - e. Date of repairs; and
 - f. The state certification number of the technician making repairs, ~~if so certified~~ if applicable.
- B. ~~Vehicles~~ A vehicle shall be retested after repair for any portion of the inspection ~~that is~~ the vehicle failed on the previous test to determine if the repairs were effective. To the extent that repair to correct a previous failure could ~~lead to cause~~ failure of another portion of the test, that portion shall also be retested. Evaporative system repairs shall trigger an exhaust emissions retest.
- C. A vehicle ~~that fails a~~ failing the reinspection shall be provided a vehicle inspection report and a vehicle inspection report supplement.

R18-2-1014. Vehicle Repair Grants

- A. The Department shall pay ~~for a portion~~ one-half of approved ~~emission related~~ emissions-related repairs ~~in an amount not to exceed up to~~ the maximum amount in subsection (F) ~~(E)~~ if:
 - 1. ~~Eligibility requirements for food stamp recipients is outlined~~ The vehicle owner is a food stamp recipient as described in subsection (B); or
 - 2. ~~and eligibility requirements for vehicles that have~~ The vehicle has received a ~~one time only~~ waiver ~~is outlined on~~ after January 1, 1997, and has not previously been provided a grant under this Section.

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- B. ~~Repair~~ Vehicle repair grant assistance eligibility for a ~~current~~ food stamp recipient shall be determined by the following as follows:**
1. The recipient is the owner of vehicle is an area A vehicle ~~and that~~ fails the annual, biennial, or remote sensing-triggered emission test. Ownership shall be based on current title or registration information.
 2. ~~The Confirmation that the~~ owner of the vehicle is a ~~current~~ food stamp recipient:
 - a. ~~The determination of food stamp eligibility~~ shall be made by the Department or its authorized representative based on documentation provided by the Department of Economic Security (DES) ~~which identifies~~ identifying the vehicle owner as a current food stamp recipient.
 - b. The determination of vehicle ownership shall be based on current title or registration information.
- C. Repair grant assistance eligibility for a vehicle that has received a ~~one time only~~ waiver ~~on or~~ after January 1, 1997 shall be determined by the following:**
1. The vehicle is an area A vehicle that fails the annual, biennial, or remote sensing-triggered emission test.
 2. ~~The vehicle has already received a one time only waiver as determined by accessing the vehicle inspection database maintained by the testing contractor.~~
 3. The vehicle has not previously been repaired through a grant under the ~~waiver grant assistance program~~ this Section.
 4. ~~Application~~ The application for assistance is made by the vehicle owner, based on current title or registration information.
- D. To be eligible for a grant under this Section, an ~~Each~~ owner of a vehicle eligible for repair assistance shall have:**
1. A recognized repair facility perform a low emissions tune-up and diagnosis according to R18-2-1010(A), and provide an estimate of additional repairs needed, if any, to bring the vehicle into compliance, ~~provided by a recognized repair facility.~~ The diagnosis and cost estimate shall be on a repair invoice ~~which that~~ describes the facility by name, address, and ~~phone~~ telephone number.
 2. ~~All needed repair in excess of~~ Additional repairs necessary after the low emission tune-up and diagnosis ~~performed after they are confirmed and authorized~~ approved by a Department waiver facility before being performed.
 3. The recognized repair facility certify that the vehicle owner ~~has~~ paid, or agreed to pay on terms acceptable to the facility, one-half of the approved repairs incurred after the initial failure and necessary for the correction of the emission failure. Money paid for the low emission tune-up and diagnosis under R18-2-1010(A) shall be included ~~toward the vehicle owner's portion.~~ Money paid for correcting equipment tampering shall not be ~~considered for this determination~~ included.
 4. ~~The authorized~~ Approved repairs performed by the same recognized repair facility ~~which that~~ performed the low emission tune-up and diagnosis.
 5. Repairs verified at a Department waiver facility during reinspection within 7 days of completion of the repair.
- E. The maximum grant amounts are:**
1. One hundred dollars for a 1967 through 1974 model year vehicle.
 2. One hundred fifty dollars for a 1975 through 1979 model year vehicle.
 3. Two hundred twenty-five dollars for a 1980 and newer model year vehicle.

R18-2-1015. On-road Testing; High Emissions Identifications

- A.** The Director shall operate an on-road testing program in area A as a supplement to annual, biennial, and motor vehicle dealer emissions testing. The program shall consist of mobile remote sensing units to identify high emitting vehicles under A.R.S. § 49-542.01. The Director may operate the program through 1 or more contractors.
- B. ~~An~~ For the purposes of this Section, identification of a vehicle ~~as~~ exceeding emission standards shall consist of ~~all of~~ the following:**
1. The vehicle ~~shall be~~ registered in area A on the date of the identification ~~as shown in the MVD database by~~ based upon the permanent address of the vehicle owner in the MVD database, and,
 2. The vehicle shall not have a waiver on record that allows the vehicle to exceed an emission standard for any of the pollutants identified as being exceeded.
 3. ~~2.~~ The vehicle is identified ~~as having exceeded~~ exceeding an HC or CO emission standard in Table 6 and does not have a waiver allowing the vehicle to exceed a standard for that pollutant. Each exceedance shall be linked photographically to a license plate and shall be linked to a particular vehicle by the VIN of the vehicle registered with the license plate as shown in the MVD database on the date of the identification.
 4. No conditions existed during the identification which, in the opinion of the inspector making the remote measurement, would lead to an invalid reading for the vehicle.
- C. ~~Any letter~~ Notice sent by the Department to the vehicle's registered owner requiring an emissions test ~~following a remote sensing~~ after an identification shall ~~indicate~~ state whether ~~or not~~ the required test may also be used for the purpose of complying with registration or reregistration requirements for that vehicle under A.R.S. § 49-542(C), ~~and if so,~~ The notice shall indicate the time period within which the emissions test must take place for it to be used to also comply with the registration requirements.**
- D.** An emission test ~~that is~~ required ~~following~~ after a remote sensing identification shall be performed at a state station or waiver station under R18-2-1006 and shall require payment of the applicable test fee. One reinspection shall be provided

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~~free of charge as specified in R18-2-1012(D). Failure of an emission test that is required following a remote sensing identification. A vehicle identified under this Section that fails the required emission test shall require the vehicle to be repaired and pass reinspection or to receive a waiver from any emission standards not complied with within 30 days of the initial test to avoid suspension of registration to meet the requirements of A.R.S. § 49-542(B). One reinspection shall be free as provided in R18-2-1012(D).~~

[Note: The changes proposed by ADEQ to R18-2-1016 through R18-2-1030, have been separated from this rulemaking at ADEQ's request. It is expected that the proposed changes to R18-2-1016 through R18-2-1030 will be considered by Governor's Regulatory Review Council (GRRC) at their January 4, 2000 meeting.]

R18-2-1031. Standards for Evaluating the Oxidation Efficiency of a Catalytic Converter

A. ~~Except for a vehicle requiring an Idle-Only Inspection, a~~ A gasoline-powered vehicle requiring a catalytic converter test under R18-2-1008(C) shall be tested using the following Catalyst Efficiency Test Procedure, ~~except for a vehicle which requires an Idle-Only Inspection:~~

1. Immediately after a vehicle ~~has completed~~ completes an Inspection and Maintenance (I/M) test in the waiver lane, the exhaust sampling cone shall be removed from the tailpipe. The vehicle shall ~~be left~~ remain on the dynamometer with the engine idling and the transmission in neutral. The vehicle engine must be at normal operating temperature.
2. For the catalyst test, the dynamometer and the constant volume sampler shall remain at the settings used for the vehicle's I/M test.
3. The inspector shall insert the sampling tube for the A/F analyzer into the tailpipe of the vehicle.
4. The inspector shall accelerate the vehicle to 40 ± 2.5 MPH and maintain a steady-state operating mode for the duration of the test. Once the vehicle ~~has obtained~~ obtains the test speed, the test shall ~~be initiated~~ begin.
5. Once the test ~~is initiated~~ begins, a 2-minute stabilization period shall ~~begin~~ take place. ~~During the stabilization period, during which~~ the inspector shall monitor the A/F analyzer to ~~insure that~~ ensure the A/F is 14.0 or greater. If the mean A/F is less than 14.0, the inspector shall abort the test.
6. If the A/F is 14.0 or greater, the exhaust sampling cone shall be repositioned for exhaust sampling.
7. ~~Once~~ After the stabilization period ~~has ended~~ ends, the total hydrocarbon and methane concentrations and the A/F ratio shall be continuously recorded for 2 minutes.
8. At the end of the 2-minute sampling period, the inspector shall stop the vehicle ~~shall be stopped~~, remove the exhaust sampling cone and the A/F analyzer sampling probe ~~removed~~ from the tailpipe, and remove the vehicle ~~removed~~ from the dynamometer.
9. The mean total hydrocarbon concentration shall be divided by the mean methane concentration for the recorded values of the test, to produce a ratio (R) of total hydrocarbon to methane. ~~This~~ The ratio, R, shall be applied to the formula: Catalyst Efficiency (%) = $-3 (R) + 100$.
10. A vehicle passes the test if the Catalyst Efficiency (%) is 75% or greater.
11. The test result for a non-passing vehicle with a mean A/F equal to, or less than, 14.3 shall be ~~ruled as inconclusive, and the vehicle cannot be granted a waiver until malfunction is corrected and the vehicle passes a catalyst efficiency retest.~~
12. A vehicle ~~failing~~ fails the Catalyst Efficiency Test Procedure if the A/F is greater than 14.3 and the Catalyst Efficiency (%) is less than 75%. ~~the test~~ The failing vehicle cannot be granted a waiver according to R18-2-1008(C)(1).

B. Analytical equipment required to perform the Catalyst Efficiency Test Procedure shall meet the following requirements:

1. Analyzer Specifications:
 - a. ~~Each~~ An analyzer shall meet performance specifications of ~~the~~ 40 CFR 86, subparts B, D, and N with respect to accuracy, precision, drift, interference, and noise. 40 CFR, subparts B, D, and N, adopted as of July 1, 1998, are incorporated by reference and on file with the Department and the Secretary of State. This incorporation contains no future editions or amendments. A copy of this referenced material may be obtained from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop SSOP, Washington D.C. 20402-9328.
 - b. Total hydrocarbon analysis shall be determined by a flame ionization detector. The analyzer shall be single range with a calibration curve covering at least ~~the range of~~ 0 to 300 ppm ~~Carbon~~ carbon.
 - c. Methane analysis shall be determined by a flame ionization detector equipped with a non-methane cutter capable of oxidizing 98% of the hydrocarbons (except methane) while more than 90% of the methane remains unchanged. The analyzer shall be single range with a calibration curve covering at least ~~the range of~~ 0 to 30 ppm.
 - d. Engine A/F mixture analysis shall be determined by a Universal Exhaust Gas Oxygen Sensor. The range shall be 8.0 to 25.5 A/F for gasoline with an accuracy of $\pm 2\%$ of point and a response time of less than 150 ~~millisecond~~ milliseconds.
2. Analyzer Performance Verification and Calibration:
 - a. ~~Verification of~~ The operator of an analyzer under this Section shall verify analyzer performance ~~shall be conducted in accordance with~~ according to manufacturer recommendations.

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- b. Upon initial installation, and monthly thereafter, the operator of an analyzer under this Section shall generate a 10-point calibration curve ~~shall be generated~~ for each total hydrocarbon and methane analyzer. A gas divider, employing equally spaced points may be used to generate the calibration curve.
- i. Each calibration curve generated shall fit the data within $\pm 2.0\%$ at each calibration point.
 - ii. Each calibration curve shall be verified for each analyzer with a confirming calibration standard between 15-80% of full scale that is not used for curve generation. Each confirming standard shall be measured by the curve within $\pm 2.5\%$.

TABLE 3. EMISSION STANDARDS - BIENNIAL TESTS

FINAL STANDARDS (Standards are in grams per mile)

(i) Light Duty Vehicles

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1981-1982	3.0	2.5	25.0	21.8	3.5	3.4
1983-1985	2.4	2.0	20.0	17.3	3.5	3.4
1986-1989	1.6	1.4	15.0	12.8	2.5	2.4
1990-1993	1.0	0.8	12.0	10.1	2.5	2.4
1994+	0.8	0.7	12.0	10.1	2.0	1.9

(ii) Light Duty Trucks 1 (less than 6000 pounds GVWR)

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1981-1985	4.0	3.4	40.0	35.3	5.5	5.4
1986-1989	3.0	2.5	25.0	21.8	4.5	4.4
1990-1993	2.0	1.7	20.0	17.3	4.0	3.9
1994+	1.6	1.4	20.0	17.3	3.0	2.9

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR)

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1981-1985	4.4	3.7	48.0	42.5	7.0	6.9
1986-1987	4.0	3.4	40.0	35.3	5.5	5.4
1988-1989	3.0	2.5	25.0	21.8	5.5	5.4
1990-1993	3.0	2.5	25.0	21.8	5.0	4.9
1994+	2.4	2.0	25.0	21.8	4.0	3.9

TABLE 4. TRANSIENT DRIVING CYCLE

Time second	Speed mph	Time second	Speed mph	Time second	Speed mph	Time second	Speed mph	Time second	Speed mph
0	0	30	20.7	60	26	90	51.5	120	54.9
1	0	31	21.7	61	26	91	52.2	121	55.4
2	0	32	22.4	62	25.7	92	53.2	122	55.6
3	0	33	22.5	63	26.1	93	54.1	123	56
4	0	34	22.1	64	26.5	94	54.6	124	56
5	3.3	35	21.5	65	27.3	95	54.9	125	55.8
6	6.6	36	20.9	66	30.5	96	55	126	55.2
7	9.9	37	20.4	67	33.5	97	54.9	127	54.5
8	13.2	38	19.8	68	36.2	98	54.6	128	53.6
9	16.5	39	17	69	37.3	99	54.6	129	52.5
10	19.8	40	17.1	70	39.3	100	54.8	130	51.5
11	22.2	41	15.8	71	40.5	101	55.1	131	50.8
12	24.3	42	15.8	72	42.1	102	55.5	132	48
13	25.8	43	17.7	73	43.5	103	55.7	133	44.5
14	26.4	44	19.8	74	45.1	104	56.1	134	41
15	25.7	45	21.6	75	46	105	56.3	135	37.5
16	25.1	46	22.2	76	46.8	106	56.6	136	34
17	24.7	47	24.5	77	47.5	107	56.7	137	30.5
18	25.2	48	24.7	78	47.5	108	56.7	138	27
19	25.4	49	24.8	79	47.3	109	56.3	139	23.5
20	27.2	50	24.7	80	47.2	110	56	140	20
21	26.5	51	24.6	81	47.2	111	55	141	16.5
22	24	52	24.6	82	47.4	112	53.4	142	13
23	22.7	53	25.1	83	47.9	113	51.6	143	9.5
24	19.4	54	25.6	84	48.5	114	51.8	144	6
25	17.7	55	25.7	85	49.1	115	52.1	145	2.5
26	17.2	56	25.4	86	49.5	116	52.5	146	0
27	18.1	57	24.9	87	50	117	53		
28	18.6	58	25	88	50.6	118	53.5		
29	20	59	25.4	89	51	119	54		

TABLE 6. EMISSION STANDARDS - REMOTE SENSING IDENTIFICATIONS

Vehicle Engine Type	Vehicle Model Year	Gross Vehicle Weight Rating (Pounds)	Number of Cylinders	Remote Sensing Standard CO %	Remote Sensing Standard HC ppm
<u>N/A</u>	<u>1991-9999</u>	<u>8500 or less</u>	<u>N/A</u>	<u>3.5</u>	<u>450</u>
<u>N/A</u>	<u>1983-1990</u>	<u>8500 or less</u>	<u>N/A</u>	<u>3.9</u>	<u>500</u>
<u>N/A</u>	<u>1981-1982</u>	<u>8500 or less</u>	<u>N/A</u>	<u>5.2</u>	<u>500</u>
<u>N/A</u>	<u>1991-1999</u>	<u>6000 or less</u>	<u>N/A</u>	<u>5.2</u>	<u>525</u>
<u>N/A</u>	<u>1988-1990</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1984-1987</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1981-1983</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6.8</u>	<u>875</u>
<u>N/A</u>	<u>1991-9999</u>	<u>6000-8500</u>	<u>N/A</u>	<u>5.2</u>	<u>525</u>
<u>N/A</u>	<u>1988-1990</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1984-1987</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6</u>	<u>575</u>

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<u>N/A</u>	<u>1981-1983</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6.8</u>	<u>875</u>
<u>4-Stroke</u>	<u>1980+Newer</u>	<u>8500 or less</u>	<u>All</u>	<u>3.6</u>	<u>500</u>
<u>4-Stroke</u>	<u>1979+Newer</u>	<u>Greater than 8500</u>	<u>All</u>	<u>5.5</u>	<u>575</u>
<u>4-Stroke</u>	<u>1979</u>	<u>8500 or less</u>	<u>4 cylinders or less</u>	<u>4.1</u>	<u>500</u>
<u>4-Stroke</u>	<u>1979</u>	<u>8500 or less</u>	<u>More than 4 cylinders</u>	<u>3.9</u>	<u>500</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>6000 or less</u>	<u>4 cylinders or less</u>	<u>4.1</u>	<u>550</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>6000 or less</u>	<u>More than 4 cylinders</u>	<u>3.9</u>	<u>550</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>Greater than 6000</u>	<u>All</u>	<u>5.5</u>	<u>600</u>
<u>4-Stroke</u>	<u>1972-1974</u>	<u>All</u>	<u>4 cylinders or less</u>	<u>6.7</u>	<u>650</u>
<u>4-Stroke</u>	<u>1972-1974</u>	<u>All</u>	<u>More than 4 cylinders</u>	<u>6.2</u>	<u>650</u>
<u>4-Stroke</u>	<u>1967-1971</u>	<u>All</u>	<u>4 cylinders or less</u>	<u>6.7</u>	<u>725</u>
<u>4-Stroke</u>	<u>1967-1971</u>	<u>All</u>	<u>More than 4 cylinders</u>	<u>6.2</u>	<u>675</u>
<u>4-Stroke</u>	<u>1981 and Newer, Reconstructed</u>	<u>All</u>	<u>All</u>	<u>7.8</u>	<u>875</u>
<u>4-Stroke</u>	<u>1980 and Older, Reconstructed</u>	<u>All</u>	<u>All</u>	<u>8.1</u>	<u>1225</u>

11. A summary of the principal comments and the agency responses to them:

ADEQ only received two comments on these rules. One was from an association that represents aftermarket equipment manufacturers. The other comment was a series of questions about how the testing program works. Both are responded to in this section.

The commenter representing aftermarket equipment manufacturers stated that at a number of places, language in the proposed rule could be interpreted to preclude or discourage the use of “acceptable” aftermarket parts. ADEQ believes the language in the proposed rule is neutral with respect to the use of aftermarket parts in all of the locations noted. In many cases, the proposed language specifically allows “acceptable” or “equivalent” aftermarket parts. With two minor exceptions, ADEQ did not change the language of the proposed rules because the rule language itself is neutral and unbiased. In R18-2-1009(D) and (E), the word “aftermarket” was inserted after “equivalent” to clarify “equivalent.”

ADEQ recognizes the important contributions of, and values its long standing relationship with aftermarket parts manufacturers. The fleet of vehicles that requires emissions testing in Arizona is one of the oldest (by average vehicle model year) in the nation. In many instances, these vehicles are running only because of those aftermarket parts providers.

The second commenter submitted the following questions:

Q. What process or procedure does ADEQ follow to assign HC and CO concentrations of calibration gases?

A. ADEQ does not assign concentrations to any of the calibration gases it uses. The calibration gases are purchased from commercial specialty gas suppliers, who bottle the gas and then assign the concentrations using ultra high quality gases traceable to the National Bureau of Standards.

Q. What does the acronym NDIR stand for?

A. A list of most abbreviations used in the vehicle emissions rules is contained in R18-2-1001(1). NDIR means non-dispersive infrared and is a common method for CO and HC analysis. An infrared beam of known strength and wavelengths is passed from a source to a detector through the gas being analyzed. A precise amount of the infrared energy is absorbed by each molecule of CO and HC that the beam encounters.

Q. Who certifies the NDIR emission analyzers?

A. EPA, ADEQ and analyzer owners implement a comprehensive program to ensure that the analyzers that measure official test results are accurate. Although there is no step called certification, the instrument manufacturer designs and builds the analyzer and generally warrants to users that it meets particular specifications, including those estab-

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lished by EPA and ADEQ. Generally, the user, either a fleet or the state contractor, must check calibration and perform other maintenance on the instrument according to the manufacturer's specifications. ADEQ checks each analyzer's accuracy at regular intervals using field calibration gases, and the user's calibration checks and maintenance practices are audited as well. In addition, analyzer operators are registered.

Q. How does ADEQ propose to monitor the sale, distribution, or installation of new aftermarket or re-conditioned OEM catalytic converters that do not meet State standards?

A. ADEQ is not proposing to directly monitor the use of converters that do not meet state standards. Catalytic converters approved for use by federal law, whether aftermarket or OEM, must meet the minimum efficiency standards for all installed catalysts, 70% for HC and CO and 30% for NO_x. Under the VEI program, ADEQ visually checks each vehicle for the presence of properly installed converters, while many vehicles with failed tests will undergo a converter evaluation under the new Catalyst Efficiency Test Procedure in R18-2-1031.

Q. Why should the catalyst efficiency test procedure be conducted with the vehicle accelerated to 40 + or -2.5 mph?

A. The Catalyst Efficiency Test Procedure was developed with the vehicle operating at 40 mph on a dynamometer loaded according to the I/M specifications for the vehicle. The equation to calculate catalyst efficiency ($%E = -3R + 100$) does not apply to other vehicle operating modes.

Q. If personnel are injured in administering the loaded test, who is to be responsible for his injuries, the owner of the automobile or the State?

A. The liability for any particular injury would be apportioned based on the precise facts of that case under established legal principles. However, it is unlikely the State would be liable because it has an agreement with a contractor to conduct all the testing at state stations and there is a clause that the state will not indemnify the contractor. In general, the contractor has primary responsibility for the safe administration of the loaded test.

Q. What is a dynamometer and what is its limitations as far as its role in emissions test?

A. A dynamometer is an apparatus which simulates vehicle on-road operation. Primarily, it consists of either one or two rolls connected to a controllable power absorber. When the drive wheels of a vehicle turn the rolls, the power absorber applies a load which is similar to that required to move the vehicle down a level road. The load which can be applied is limited to some maximum and speed is limited by safety. The accuracy of operating condition measurements and the response time to changing operating conditions are also limited.

Q. Why should the dynamometer and the constant volume sampler remain at the settings used for the vehicle's I/M test?

A. As discussed in the answer to a previous question, this test was developed at I/M dynamometer settings. This ensures that ADEQ can make a positive determination about whether the vehicle failed the I/M test due to the catalytic converter. In addition, since the outcome of the cat test depends only upon the relative concentrations of total hydrocarbons and methane, and dilute sample will be measured to determine catalyst efficiency, there is no reason to change the dilution rate.

Q. During the site inspection to determine administrative completeness, what will the Department look for?

A. Under R18-2-1019(A)(2), permission to conduct a site inspection is part of an administratively complete application, but the results of the site inspection do not affect completeness of the application. A fleet site inspection consists of verifying the employment of the licensed inspector, fleet agent and the proper equipment to operate as a fleet entity. Also verified during the inspection is sales records (dealer) or current fleet vehicles emissions status. The department is required to determine that the fleet is in compliance, as a requisite to issuance of a permit.

Q. Will personnel at the fleet station be required to get training or to be certified to calibrate the fleet station emission analyzer?

A. Fleet inspectors can be trained by the vendor of the emissions analyzer on the procedure of performing the monthly calibration "check". They are not expected to perform the actual calibrations, or to service the equipment. That function belongs to certified analyzer repair technicians, working for the various vendors of equipment.

Q. How was the formula of the catalyst efficiency derived? What does the factor -3 signify? Why was the passing percentage of 75% chosen instead of 60% or 90% for example? Is there any scientific justification for 75%?

A. The catalyst efficiency formula was derived empirically by measuring the actual catalyst efficiency (amount entering the catalyst and amount exiting the catalyst) of several vehicles, each vehicle with catalysts of different efficiency. Catalyst efficiency was then plotted versus the ratio of total hydrocarbon (HC) divided by methane (CH₄) measured at the tailpipe. The formula is the mathematical representation of the maximum catalyst efficiency at a given HC/CH₄ value.

The multiplier, -3, is the slope of the line which identifies the maximum catalyst efficiency at a given HC/CH₄ value. The differentiation between a good and a bad catalyst was set at 75% for two reasons: 1. it had been used previously in studies of catalyst efficiency and 2. it is a value which identifies catalysts that need to be replaced. If the passing percentage were 60%, the vehicle would have had high emissions for a considerable time before the test; if the pass-

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ing percentage were 90%, there would be little gain by replacing the catalyst. Catalysts operate at high efficiency for a relatively long period of time (and mileage), but once efficiency begins to decline, it continues to decline. This reasoning is the “scientific” justification for the 75%.

Q. What are the strengths and weaknesses of the catalyst efficiency test procedure?

A. The cat test is based on a scientifically defensible principle; the difference in oxidation potential between methane and all other hydrocarbons. Other strengths of the cat test are that it requires little time and is completely nonintrusive. On the negative side, test analyzers and equipment are expensive, and at the current cost, it is unlikely that the test would be commercially economical. The test also took considerable time and resources to develop.

Q. Is there any possibility of false failures with this test?

A. All tests involve some level of test-to-test variability and high excursions produce false failures and low excursions produce false passes. The answer to the previous question stating how the formula for catalyst efficiency was derived also states that the efficiency equation represents the maximum catalyst efficiency at a given HC/CH₄ value. Since this is the upper efficiency limit, nearly all of the test variability will result in errors of omission (replacement will not be required for some catalysts which should be replaced).

Q. What is an A/F analyzer and what role does it play in the catalyst efficiency test procedure? Why must the A/F be 14.0 or greater during the test?

A. An A/F analyzer measures the air to fuel ratio of the fuel charge entering the engine by monitoring the applicable undiluted exhaust components and back calculating the units of air per unit of fuel required for combustion to produce that particular exhaust gas mixture. Proper fueling is critical to the cat test, and the A/F reading tells the operator if the vehicles fueling system is functioning properly. If the A/F is less than 14.0, there is not enough oxygen in the exhaust for the catalyst (even a good one) to operate efficiently.

Q. Why is the total hydrocarbon and methane concentrations and the A/F ratio continuously recorded for 2 minutes, why not 5 or even 3?

A. It is only necessary to monitor the readings long enough to be sure they are all stable. Shorter time periods could produce incorrect catalyst efficiency results; longer time periods would be a waste of time.

Q. The range of the normal operating temperature for a vehicle is large. Could this have an effect on whether the vehicle passes or fails the catalyst test if it happens to be in the low or high range?

A. Normal operating temperature fluctuations, once the temperature control system is operating and the emissions control system has equilibrated, will not effect the outcome of the test. The critical element is catalyst bed temperature which must be about 650°F before the catalyst begins working. Changes in coolant temperature have little effect on exhaust gas temperature.

12. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

Not applicable

13. Incorporations by reference and their locations in the rules:

<u>Incorporation by reference</u>	<u>Location</u>
IM240 & Evap Technical Guidance,	
EPA420-R-98-010, EPA, August 1998	R18-2-1006(E)(3)
40 CFR 86, subparts B, D, and N	R18-2-1031(B)

14. Was this rule previously adopted as an emergency rule?

No.

15. The full text of the rules follows:

TITLE 18. ENVIRONMENTAL QUALITY
CHAPTER 2. DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR POLLUTION CONTROL
ARTICLE 10. MOTOR VEHICLES; INSPECTION AND MAINTENANCE

Section

R18-2-1001.	Definitions
R18-2-1003.	Vehicles to be Inspected by the Mandatory <u>Vehicle</u> Vehicle Emissions Inspection Program
R18-2-1004.	State Inspection Requirements <u>Repealed</u>
R18-2-1005.	Time of Inspection
R18-2-1006.	Emissions Test Procedures

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R18-2-1007.	Evidence of Meeting State Inspection Requirements
R18-2-1008.	Procedure for Issuing Certificates of Waiver
R18-2-1009.	Tampering Repair Requirements
R18-2-1010.	Low Emissions Tune-up, Emissions, and Evaporative System Repair
R18-2-1011.	Vehicle Inspection Report
R18-2-1012.	Inspection Procedures and Fee
R18-2-1013.	Reinspections
R18-2-1014.	Vehicle Repair Grants
R18-2-1015.	On-road Testing; High Emissions Identifications
R18-2-1031.	Standards for Evaluating <u>the Oxidation Efficiency of a Aftermarket Catalytic Converters Converter</u>
TABLE 3.	Emission Standards - Biennial Tests
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TABLE 6.	Emission Standards - Remote Sensing Identifications

ARTICLE 10. MOTOR VEHICLES; INSPECTION AND MAINTENANCE

R18-2-1001. Definitions

In this Article, unless the context otherwise requires:

1. Abbreviations and symbols ~~used herein shall be~~ are as follows:
 - a. "A/F" means air/fuel.
 - b. "CID" means cubic inches displacement.
 - c. "CO" means carbon monoxide.
 - d. "CO₂" means carbon dioxide.
 - e. "EGR" means exhaust gas recirculation.
 - f. "GVWR" means gross vehicle weight rating.
 - g. "HC" means hydrocarbon.
 - h. "HP" means horsepower.
 - i. "LNG" means ~~liquefied~~ liquefied natural gas.
 - j. "LPG" means liquid petroleum gas.
 - k. "LVW" means loaded vehicle weight.
 - l. "MPH" means miles per hour.
 - m. "MVD" means the Motor Vehicle Division of the Arizona Department of Transportation.
 - n. "NDIR" means nondispersive infrared.
 - o. "NO_x" means the sum of nitrogen oxide and nitrogen dioxide.
 - p. "%" means percent.
 - q. "OEM" means original equipment manufacturer.
 - r. "PROM" means programmable read only memory.
 - s. "PCV" means positive crankcase ventilation.
 - t. "PPM" means parts per million by volume.
 - u. "RPM" means revolutions per minute.
 - v. "VIN" means vehicle identification number.
 - w. "VIR" means vehicle inspection report.
2. "Annual test" means any vehicle emissions test ~~which~~ that is not a biennial test.
3. "Apportioned vehicle" means a vehicle that is subject to the proportional registration provisions of A.R.S. § 28-2233.
- ~~4. 3. "Area A" has the same meaning as in A.R.S. § 49-541. "Area A" means a carbon monoxide nonattainment area in a county with a population of one million two hundred thousand or more persons as determined by the most recent United States decennial census.~~
- ~~5. 4. "Area A vehicle" means a motor vehicle subject to emission inspection and that is for which ~~1 one or more of the following is true:~~~~
 - a. ~~Registered~~ It is registered or to be registered within area A- ;
 - b. ~~Owned~~ It is owned by or leased to a person having a valid fleet permit and customarily kept in area A- ;
 - c. ~~A~~ It is a governmental ~~government~~ vehicle customarily kept in area A- ;
 - d. ~~Used~~ It is used to commute to the driver's principal place of employment located in area A- ; or
 - e. ~~Parked, will be parked, It is or will be parked~~ or is the subject of a parking permit application at an institution ~~which is both~~ located in area A and subject to the requirements of A.R.S. §§ 15-1444(C) or 15-1627(G).
- ~~6. 5. "Area B" has the same meaning as in A.R.S. § 49-541. means a carbon monoxide nonattainment area in a county with a population in excess of four hundred thousand but fewer than one million two hundred thousand persons as determined by the most recent United States decennial census.~~

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7. ~~6.~~ “Area B vehicle” means a motor vehicle subject to emission inspection and that is: for which one or more of the following is true:
- a. ~~Registered~~ It is registered or to be registered within area B₂ ;
 - b. ~~Owned~~ It is owned by or leased to a person having a valid fleet permit and customarily kept in area B₂ ;
 - c. ~~A It is a governmental~~ government vehicle customarily kept in area B₂ ;
 - d. ~~Used~~ It is used to commute to the driver’s principal place of employment located in area B₂ ; ~~or~~
 - e. ~~Parked, will be parked, It is or will be parked~~ or is the subject of a parking permit application at an institution ~~which is both~~ located in area B and subject to the requirements of A.R.S. §§ 15-1444(C) or 15-1627(G).
8. ~~7.~~ “Biennial test” means the transient loaded emission test and evaporative system tests required under ~~pursuant to~~ R18-2-1006(E)(2).
9. “Calibration gas” means a gas with assigned concentrations of CO, hexane, or CO₂ that is used by a state inspector to check the accuracy of emissions analyzers.
10. ~~8.~~ “Certificate of compliance” means a serially numbered document issued by a state station at the time of a vehicle inspection indicating that the vehicle has met the emissions standards.
11. ~~9.~~ “Certificate of exemption” means a serially numbered certificate issued by the Director exempting a vehicle ~~which that~~ is not available within the state for ~~the an~~ inspection during the 90 days before ~~prior to~~ the emissions compliance expiration date.
12. ~~10.~~ “Certificate of inspection” means a serially numbered document issued , ~~as may be prescribed~~ by the Director, indicating that a vehicle has been inspected under ~~pursuant to the provisions of~~ A.R.S. § 49-546 and has passed inspection.
13. ~~11.~~ “Certificate of waiver” means a serially numbered document issued by the Department or a fleet inspector other than an auto dealer licensed to sell used motor vehicles under ~~pursuant to~~ Title 28 of the Arizona Revised Statutes, indicating that the requirement of passing reinspection has been waived for a vehicle under ~~pursuant to~~ A.R.S. § 49-542.
14. ~~12.~~ “Conditioning mode” means either a fast idle condition or a loaded condition as defined in this Section.
15. ~~13.~~ “Constant ~~4-wheel~~ four wheel drive vehicle” means any ~~4-wheel~~ four wheel drive vehicle with ~~4~~ four wheels ~~which and that~~ cannot be converted to ~~2-wheel~~ two wheel drive except by disconnecting ~~1~~ one of the vehicle’s drive shafts.
16. ~~14.~~ “Constant volume sampler” means a system that dilutes engine exhaust to be sampled with ambient air so that the total combined flow rate of exhaust and dilution air mix is nearly constant for all engine operating conditions.
17. ~~15.~~ “Contractor” means a person, business, firm, partnership, or corporation with whom the Director has a contract ~~which that~~ provides for the operation of ~~1~~ one or more official emissions inspection stations.
18. ~~16.~~ “Curb idle test” means an exhaust emissions test conducted with the engine of the vehicle running at the manufacturer’s idle speed ~~± plus or minus~~ 100 RPM but without pressure exerted on the accelerator.
19. ~~17.~~ “Curb weight” means a vehicle’s unloaded weight without fuel and oil plus 300 pounds.
20. ~~18.~~ “Dealer” means a person or organization licensed by the Arizona Department of Transportation as a new motor vehicle dealer, used motor vehicle dealer, or motorcycle dealer.
21. ~~19.~~ “Department” means the Department of Environmental Quality.
22. ~~20.~~ “Director” means the Director of the Department of Environmental Quality.
23. ~~21.~~ “Director’s certificate” means a serially numbered document issued by the Director in special circumstances ~~where that~~ the Director deems ~~it~~ inappropriate for the vehicle to show evidence of meeting the minimum standards for registration or reregistration under R18-2-1019 or pursuant to R18-2-1022 or R18-2-1023.
24. ~~22.~~ “Electrically-powered vehicle” means a vehicle that both uses electricity as the means of propulsion and does not require the combustion of fossil fuel within the confines of the vehicle in order to generate electricity.
25. ~~23.~~ “Emissions compliance expiration date” means:
- a. ~~Each~~ each registration expiration date for vehicles subject to annual tests; and
 - b. The for vehicles subject to biennial tests means the registration expiration date in the 2nd ~~second~~ year after the initial biennial test required under ~~pursuant to~~ this Article or ~~as provided in R18-2-1005(C)~~ R18-2-1005(B) for vehicles subject to biennial tests.
26. ~~24.~~ “Emissions inspection station permit” means a certificate issued by the Director authorizing the holder to perform ~~vehicle~~ vehicular inspections under ~~pursuant to~~ this Article.
27. ~~25.~~ “Exhaust emissions” means products of combustion emitted into the atmosphere from any opening downstream of the exhaust ports of a motor vehicle engine.
28. ~~26.~~ “Exhaust ~~tail pipe~~ pipe” means the ~~pipe~~ pipe that ~~attach~~ attaches to the muffler and ~~exit~~ exits the vehicle.
29. ~~27.~~ “Fast idle condition” means to operate a vehicle by running the engine at 2,500 ~~2500~~ RPM, ~~± plus or minus~~ 300 RPM, for up to 30 seconds, with the transmission in neutral, to ready ~~prepare~~ the vehicle for a subsequent curb idle test.
30. ~~28.~~ “Fast pass or fast fail algorithm” means a procedure in a vehicle emission testing system that ~~can~~ logically ~~deter-~~ minedetermines whether ~~or not~~ a vehicle will pass or fail the biennial test before the test is over.

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29. ~~“Field calibration gas” means a gas with assigned concentrations of CO, hexane, or CO₂ that is used by a state inspector to check the accuracy of emissions analyzers used by state stations, fleet stations, and vehicular repair facilities.~~
31. ~~30.~~ “Fleet emissions inspection station” or “fleet station” means any inspection facility operated under a permit issued under pursuant to A.R.S. § 49-546.
32. ~~31.~~ “Fuel” means any material that is burned within the confines of a vehicle ~~in order to be used as the means of propelling~~ propel the vehicle.
33. ~~32.~~ “Four-stroke vehicle” means a vehicle equipped with an engine that requires 2 ~~two~~ revolutions of the crankshaft for each piston power stroke.
34. ~~33.~~ “Golf cart” means a motor vehicle ~~that which~~ has not less than 3 ~~three~~ wheels in contact with the ground, has an unladen weight less than 1,300 pounds, is designed to be and is operated at not more than 15 MPH ~~miles an hour~~, and is designed to carry golf equipment and persons.
35. ~~34.~~ Governmental ~~Government~~ vehicle” means a registered motor vehicle exempt from the payment of a registration fee, or a federally owned or leased vehicle.
36. ~~35.~~ “Gross vehicle weight rating” (GVWR) means the maximum vehicle weight that the vehicle is designed for as established by the manufacturer.
36. ~~“Gross weight” means the sum, measured in pounds, of the empty weight of a motor vehicle combination plus the weight of the maximum load to be carried thereon at any one time, except that for tow trucks, gross weight means the sum of the empty weight of the tow truck plus the weight of operational supplies and equipment.~~
37. “Inspection” means the mandatory vehicle ~~vehicular~~ emissions inspection including the tampering portion ~~inspection~~.
38. “Inspection sticker” means a self-adhesive, serially numbered rectangular sticker indicating a governmental ~~govern-~~ ment vehicle has met ~~the state of~~ Arizona emissions inspection requirements.
39. “Loaded condition” means to condition a vehicle by running the vehicle on a chassis dynamometer at a specified speed and load for up to no more than 30 seconds to ready ~~prepare~~ the vehicle for a subsequent curb idle test.
40. “Loaded cruise test” means an exhaust emissions test conducted on a chassis dynamometer under ~~as prescribed in R18-2-1006(E)(1)(a) and (F)(2)(a).~~
41. “Mass emission measurement” means measurement of a vehicle’s exhaust in mass units such as grams.
42. “Model year” means ~~either~~ the date of manufacture of the original vehicle within the annual production period of ~~such~~ the vehicle as designated by the manufacturer or, if a reconstructed vehicle, the 1st ~~first~~ year of titling.
43. “MOL percent” means the percent, by volume, that a particular gas occupies in a mixture of gases at a uniform temperature.
44. “Motorcycle” means a motor vehicle, other than a tractor, having a seat or saddle for use of the rider and designed to travel on not more than 3 ~~three~~ wheels in contact with the ground.
45. “Motorhome” means a vehicle built on a truck or bus chassis and equipped as a self-contained traveling home.
46. “New aftermarket catalytic converter” or “new aftermarket converter” means a catalytic converter, except for an OEM, that meets the standards under 40 CFR 86 defined in R18-2-1031(A).
47. “New aftermarket fuel filler neck inlet restrictor” means a fuel filler neck inlet restrictor, except for an OEM, which is approved by the Department.
48. ~~“Nonattainment areas” means areas which have been designated by the Administrator of the Environmental Protection Agency, acting under pursuant to Section 107 of the Clean Air Act, 42 USC Section 7401 et seq., as exceeding national primary or secondary ambient air standards for carbon monoxide or ozone and designated as such in the State Implementation Plan submitted to the Environmental Protection Agency, except that “nonattainment area” does not include the area which the Environmental Protection Agency determined should be redesignated as an attainment area as printed in the Federal register, Volume 51, Number 149, Monday, August 4, 1986, Page 27843.~~
47. ~~49.~~ “Official emissions inspection station” means an inspection facility, other than a fleet emissions inspection station, whether placed in a permanent structure or in a mobile unit for conveyance ~~among~~ to various locations within the state, for the ~~purposes~~ purpose of conducting inspections under pursuant to A.R.S. § 49-542.
48. ~~50.~~ “Opacity” means the degree of absorption ~~obscuration~~ of transmitted light.
49. ~~51.~~ “Operational air pump” means an air injection system (AIS) to supply additional oxygen (air) into the exhaust system to promote further oxidation of HC and CO gases and to assist in catalytic reaction.
50. ~~52.~~ “Person” means the federal government, state, or any federal or state agency or institution ~~thereof~~, any municipality, political subdivision, public or private corporation, individual, partnership, association, or other entity, and includes any officer or governing or managing body of any municipality, political subdivision, or public or private corporation.
53. ~~“Prorate vehicle” means any vehicle whose licensing fee in the state is prorated by its estimated usage in the state.~~
51. ~~54.~~ “Reconditioned OEM catalytic converter” or “reconditioned OEM converter” means a used OEM reconditioned equivalent or an OEM converter ~~which that~~ has had the pellets replaced with new or used OEM equivalent pellets and that also meets the standards under 40 CFR 86 defined in R18-2-1031(B).

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- ~~52.~~ ~~55.~~ “Recognized repair facility” means a ~~going concern~~ business with an Arizona transaction privilege (sales) tax license whose primary purpose is vehicle repair, and having at least ~~1~~ one employee with a nationally recognized certification for ~~emission-related~~ emissions-related diagnosis and repair.
- ~~53.~~ ~~56.~~ “Reconstructed vehicle” means ~~either of the following:~~
- a. A reconstructed special as identified by the code letters “SP” on the ~~portion~~ section of the vehicle’s Arizona registration card or Arizona certificate of title ~~that is reserved for identification of the vehicle’s style;~~ or
 - b. A vehicle in which the vehicle style is not shown on the Arizona registration card or certificate of title, and the original manufacturer of the complete vehicle cannot be identified from the body.
- ~~54.~~ ~~57.~~ “Standard gases” means gases maintained as a primary standard for determining the composition of working gases, ~~field~~ calibration gases, or the accuracy of emissions analyzers.
- ~~55.~~ ~~58.~~ “State inspector” means an employee of the Department designated to perform quality assurance or waiver functions under pursuant to this Article.
- ~~56.~~ ~~59.~~ “State station” means an official emissions inspection station operated by a contractor.
- ~~57.~~ ~~60.~~ “Tampering” means removing, defeating, or altering an emissions control device ~~which was installed at the time the vehicle was manufactured. For the purposes of this Article, defeating shall include~~ includes failure to repair any malfunctioning emission control system or device.
- ~~58.~~ ~~61.~~ “Two-stroke vehicle” means a vehicle equipped with an engine that requires ~~1~~ one revolution of the crankshaft for each power stroke.
- ~~59.~~ ~~62.~~ “Unloaded fast idle test” means an exhaust emissions test conducted with the engine of the vehicle running at ~~2,500~~ 2500 RPM.
- ~~60.~~ ~~63.~~ “Vehicle” means any automobile, truck, truck tractor, motor bus, or self-propelled or motor-driven vehicle registered or to be registered in this state and used upon the public highways of this state for the purpose of transporting persons or property, except implements of husbandry, roadrollers, or road machinery temporarily operated upon the highway.
- ~~61.~~ ~~64.~~ “~~Vehicle~~ Vehicle emissions inspector” means an individual who ~~has been~~ is licensed by the Director to perform vehicle ~~vehicular~~ emissions inspections ~~for this program under this Article.~~
- ~~62.~~ ~~65.~~ “Working gases” means gases maintained ~~by a facility~~ to perform periodic calibration of emissions analyzers.

R18-2-1003. Vehicles to be Inspected by the Mandatory ~~Vehicle~~ Vehicle Emissions Inspection Program

- A. The following vehicles shall be inspected according to this Article at a state station or a fleet station unless exempted by subsection (B):
1. ~~Each~~ A vehicle to be registered or reregistered within area A or area B for highway use. For the purposes of this Article, registration or reregistration within area A or area B ~~a vehicle emissions control area~~ shall be determined by the vehicle owner’s permanent and actual residence. The permanent address in the MVD database shall be presumed to be the owner’s permanent and actual residence. A post office box address listed on a title or registration document under A.R.S. § 28-2051(C) ~~shall~~ is not be evidence of the owner’s permanent and actual residence;
 2. Each vehicle delivered to retail purchasers by ~~dealers~~ a dealer licensed to sell used motor vehicles for highway use under A.R.S. Title 28 and whose place of business is located in area A or area B;
 3. Each vehicle registered outside area A and area B but used to commute to the driver’s principal place of employment located within area A or area B; ~~and~~
 4. Each vehicle owned by a person who is subject to A.R.S. §§ 15-1444(C) or 15-1627(G); and
 5. An area A or area B vehicle located out-of-state for more than 90 days before vehicle registration expiration shall be emissions tested at an official emissions inspection testing center in the area where it is located. If no official emission testing program is available in the area for that vehicle, the vehicle shall meet the testing requirements under this Article within 15 calendar days of returning to Arizona.
- B. The following vehicles are exempt from the inspection requirements of this Article:
1. A vehicle manufactured in or before the 1966 model year;
 2. A vehicle leased to a person residing outside area A and area B by a leasing company whose place of business is in area A or area B, except as ~~otherwise~~ provided in subsection (A)(3);
 3. A vehicle sold between motor vehicle dealers;
 4. An electrically-powered vehicle;
 5. An apportioned vehicle;
 6. A golf cart;
 7. A vehicle with an engine displacement of less than 90 cubic centimeters; ;
 8. ~~A new vehicle originally registered at the time of initial retail sale and titling in this state under A.R.S. § 28-2153;~~
 9. ~~A~~ A vehicle registered at the time of change of name of ownership except when:
 - a. ~~the~~ The change in registration is accompanied by required fees for the year following expiration of the prior registration; or
 - b. ~~the~~ The change results from the sale by a dealership whose place of business is located in area A or area B;
 10. ~~A~~ A vehicle for which a current certificate of exemption or Director’s certificate has been issued; ~~and~~

~~10. A~~ A diesel-powered vehicle in area A applying for registration or reregistration 33 months or less after the date of initial registration as a new vehicle; ~~and~~

11. Vehicles of a model year the same as, or newer than, the current calendar year and vehicles of the prior 4 model years, except:

a. Reconstructed vehicles; and

b. Vehicles requiring emissions testing under R18-2-1015.

C. ~~Governmental~~Government vehicles operated in area A or area B and not exempted by this Article shall be emissions inspected according to R18-2-1017.

R18-2-1004. ~~State Inspection Requirements Repealed~~

~~All vehicles required to be inspected by this Article shall pass inspection by meeting the requirements of R18-2-1006 unless waived pursuant to R18-2-1008.~~

R18-2-1005. Time of Inspection

A. ~~Area~~All area B vehicles, area A vehicles subject to an annual test, and vehicles sold or offered for sale by dealers required to be inspected ~~under~~ pursuant to R18-2-1003, shall be inspected at the following times:

1. For vehicles not covered by a fleet station permit, within 90 days ~~before~~ prior to each registration expiration date.
2. For vehicles sold by a dealer licensed to sell used motor vehicles under A.R.S. pursuant to Title 28, whose place of business is located in area A or area B, before prior to delivery of the vehicle to the retail purchaser.
3. For consignment vehicles offered for sale by a dealer licensed to sell used motor vehicles under A.R.S. pursuant to Title 28 whose place of business is located in area A or area B, before prior to delivery of the vehicle to the retail purchaser. Such consignment vehicles shall be inspected at a state station ~~in conformance with~~ according to R18-2-1006.
4. For ~~governmental~~government vehicles;
 - a. ~~at least once~~ For vehicles not exempt under R18-2-1003(B)(10) or (11), within 12 months ~~following the applicable date of~~ after acquisition by the operating entity ~~in area A or area B, and annually thereafter, on or before the anniversary date of the previous inspection; and~~
 - b. ~~date of initial registration, or date of prior inspection.~~For vehicles temporarily exempt under R18-2-1003(B)(10) or (11), within 90 days after the vehicle becomes subject to testing, and annually thereafter, on or before the anniversary date of the previous inspection.
5. For vehicles owned by or leased to a person having a valid fleet station permit, at least once within each 12-month period following any original registration or reregistration.
6. For vehicles ~~that are being to be~~ registered in area A or area B under conditions not specified in ~~subsections paragraphs (1) through (5) of this subsection,~~ within 90 days ~~before~~ prior to registration.
7. For vehicles registered outside area A and area B ~~but~~and used to commute to the driver's principal place of work located in area A or area B, upon vehicle registration or reregistration.
8. For vehicles owned by persons subject to A.R.S. §§ 15-1444(C) or 15-1627(G), within 30 calendar days following the date of initial registration at the institution located in area A or area B and annually thereafter.
9. For vehicles issued a certificate of exemption under R18-2-1023, within 15 calendar days after returning to Arizona, unless an official emissions inspection document from the out-of-state emissions inspection station was submitted with the request for exemption.

B. Area A vehicles subject to the biennial test shall be inspected at the following times:

1. For vehicles not covered by a fleet station permit, within 90 days ~~before~~ prior to the vehicle's emissions compliance expiration date.
2. For ~~governmental~~government vehicles;
 - a. ~~at least once within 24 months following the applicable date of acquisition by the operating entity in area A, For vehicles not exempt under R18-2-1003(B)(10) or (11), within 12 months after acquisition by the operating entity, and biennially thereafter, on or before the anniversary date of the previous inspection; and~~
 - b. ~~date of initial registration, or the date of prior inspection.~~For vehicles temporarily exempt under R18-2-1003(B)(10) or (11), within 90 days after the vehicle becomes subject to testing, and biennially thereafter, on or before the anniversary date of the previous inspection.
3. For vehicles owned by or leased to a person having a valid fleet station permit, at least once within each successive 24-month period following original registration.
4. For vehicles registered outside area A but used to commute to the driver's principal place of work located in area A, upon vehicle registration and biennially thereafter.
5. For vehicles owned by persons subject to A.R.S. §§ 15-1444(C) or 15-1627(G), within 30 days following the date of initial registration at the institution located in area A and biennially thereafter.
6. For vehicles ~~that are being to be~~ registered as area A vehicles under conditions not specified in ~~subsections paragraphs (1) through (5) of this subsection,~~ upon initial registration and within 90 days ~~before~~ prior to the vehicle's emissions compliance expiration date thereafter.

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7. For vehicles issued a certificate of exemption under R18-2-1023, within 15 calendar days after returning to Arizona unless an official emissions inspection document indicating compliance with the emissions requirements from the out-of-state emissions inspection station is submitted with the request for exemption.
- C. Vehicles registered in the portion of area A within Pinal County are exempt from the requirements of this Article until January 1, 2001. Effective January 1, 1995, area A vehicles subject to the biennial test that have VINs ending with an even digit shall have an emission compliance expiration date set to 24 months after the most recent registration or reregistration and shall be allowed to be reregistered with the same owner without an emissions test in 1995. Said vehicles shall be required to take the biennial test prior to reregistration in 1996. Vehicles with VINs ending in an odd digit shall have the vehicle's emission compliance expiration date set to 12 months after the most recent registration or reregistration and shall be required to take the biennial test prior to reregistration in 1995.
- D. Unless exempted by R18-2-1003(B), a used vehicle not registered as an area A or area B vehicle shall require the appropriate emission test be inspected according to this Article before registration as an area A or area B vehicle.
- E. An area B vehicle that is being registered in area A shall require is subject to the appropriate annual or biennial test from area A before prior to registration even if the emissions compliance period for area B has not yet expired.
- F. New vehicles that are temporarily exempt from emission testing under R18-2-1003(B)(11) pursuant to R18-2-1003(B)(8), and are subject to either an annual or biennial test, shall be tested before registration in the calendar year that exceeds the vehicle's model year by 5 years. have an emissions compliance expiration date of 12 months after the month of original registration.
- G. Nothing in this Section shall be construed to waive a late registration fee because of failure to meet inspection requirements by the registration deadline, except that motor vehicles failing the initial or subsequent test shall not be subject to a penalty fee for late registration renewal if both:
1. the original testing was The initial test is accomplished before prior to the emissions compliance expiration date, and
2. the The registration renewal is received by the Arizona Department of Transportation Motor Vehicle Division in Pima County or the Maricopa County Assessor in Maricopa County within 30 days of the original initial test.
- H. A vehicle subject to subsection (A)(1), (A)(6), (B)(1), or (B)(6) either paragraphs (1) or (6) of subsections (A) or (B) of this Section may be submitted voluntarily for a voluntary inspection more than 90 days before the emissions compliance expiration date on payment of the prescribed inspection fee. Such A voluntary inspection shall not be considered as not compliance with the registration or reregistration testing requirement under pursuant to R18-2-1003.

R18-2-1006. Emissions Test Procedures

- A. Each vehicle inspected at a state station shall be visually inspected before the emissions test for the following unsafe or unstable conditions:
1. A fuel leak in or around the engine area, fuel tank, or lines which that causes wetness or pooling of fuel;
 2. A continuous engine or transmission oil leak onto the floor;
 3. A continuous engine coolant leak onto the floor such that the engine overheating has occurred overheated or will occur may overheat within a short time;
 4. The vehicle has a tire on a driving wheel with less than 2/32-inch tread, with metal protuberances, unmatched tire size, with obviously low tire pressure as determined by visual inspection, or any other condition that precludes a loaded test for reasons of personnel, equipment, or vehicle safety; A worn tire with less than 2/32 inch tread remaining or which has cord showing, or a bulge, delamination, lump, or separation;
 5. An exhaust pipe that does not exit the rear or side of the vehicle to allow for safe exhaust probe insertion. An exhaust pipe on a diesel-powered vehicle that does not allow for safe exhaust probe insertion and attachment of opacity meter sensor units; and
 6. Improperly operating brakes;
 7. Any vehicle modification, or mechanical condition that prevents dynamometer operation; and
 8. Any other condition deemed unsafe by the inspector, such as including loud internal engine noise or an obvious exhaust leak.
- B. A vehicle mandatory vehicular emissions inspection shall not be performed by an official emissions inspection station on any vehicle that is towing a heavily loaded trailer, carrying a heavy load, loaded with, or towing a trailer loaded with explosives, or loaded with any other hazardous material not used as fuel for the vehicle.
- C. Any vehicle found to be unsafe or otherwise untestable as determined by the visual inspection shall be rejected without an emissions test. Vehicle owners or drivers shall be notified of all unsafe conditions found on rejected vehicles. A fee shall not be charged if the vehicle is rejected at a state station. The emissions test shall not be conducted on a vehicle rejected for a safety reason or any other untestable condition until the cause for rejection is repaired.
- D. When conducting the emissions test procedure required by this Section, both of the following requirements shall be met:
1. All vehicles shall be tested in as received the condition presented, unless rejected under subsection subsections (A), or (B), or (C). The vehicle's engine shall be operating at normal temperature. The vehicle's engine shall and not be overheating as indicated by a gauge, warning light, or boiling radiator, and all All of the vehicle's accessories shall be turned off during testing.

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2. Vehicles designed to operate with more than 1 fuel shall be tested on the fuel in use when the vehicle is presented for inspection. ~~used by the vehicle at time of inspection.~~
- E. In area A, the inspection test procedures for all vehicles other than diesel-powered vehicles and vehicles held for resale by fleet-licensed motor vehicle dealers with a fleet license shall conform to the following:
1. Vehicles manufactured with a model year of 1967 through 1980, all nonexempt vehicles with a GVWR greater than 8,500 ~~8500~~ pounds, and all reconstructed vehicles, except motorcycles and constant 4-wheel drive vehicles, are required to annually take and pass ~~both~~ a loaded cruise test and a curb idle test, ~~described~~ as follows:
 - a. Loaded cruise test. The vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1 of this Article, in drive for automatic transmission or 2nd or higher gear for manual transmission. Overdrive shall not be used for testing. All vehicles shall be driven by the inspector during testing. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. After exhaust emissions have been recorded, engine speed shall be returned to idle for a curb idle test.
 - b. Curb idle test. The test shall be performed with the vehicle in neutral for 1981 and newer vehicles. For 1980 and older vehicles, the test shall be performed in neutral, except that if the vehicle has an automatic transmission, drive shall be used. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading of less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired.
 2. Vehicles with a 1981 or newer model year and a GVWR of 8,500 ~~8500~~ pounds or less, except motorcycles, reconstructed vehicles, and until January 1, 2002 constant 4-wheel drive vehicles, are required to biennially take and pass a transient loaded emissions test, ~~an evaporative system purge test~~ and an evaporative system integrity test as follows:
 - a. The transient loaded emission test shall consist of 147 ~~240~~ seconds of mass emission measurement using a constant volume sampler while the vehicle is driven by an inspector through a computer-monitored driving cycle on a dynamometer with inertial weight settings appropriate for the weight of the vehicle. The driving cycle shall include the acceleration, deceleration, and idle operating modes ~~required~~ described in Table 4. The 147 ~~240~~ second sequence may be ended earlier using fast pass or fast fail algorithms. A retest algorithm shall be used to determine if a test failure is due to insufficient vehicle preconditioning. As determined by the retest algorithm, up to 2 additional tests may be performed on a failing vehicle. Drive shall be used for automatic transmissions and 1st gear shall be used to begin for manual transmissions. ~~Overdrive shall not be used.~~ Exhaust emissions concentrations in grams per mile for HC, CO, NO_x and CO₂ shall be recorded continuously beginning with the 1st second. The inspector shall reject from testing vehicles with audible or ~~otherwise detectable~~ visible exhaust leaks.
 - b. ~~The evaporative system purge test procedure shall consist of measuring the total purge flow in standard liters occurring in the vehicle's evaporative system during the transient loaded emission test specified in subsection (a). The purge flow measurement system shall be connected to the purge portion of the evaporative system in series between the canister and the engine near the canister.~~
 - ~~b. e.~~ The evaporative system integrity test shall consist of the following steps in sequence:
 - i. Connect the test equipment to either the fuel tank vent hose at the canister or the fuel tank filler neck, ~~hose at the canister end.~~ The gas cap shall be checked to ensure that it is properly tightened, and shall be tightened if necessary.
 - ii. Pressurize the system to 14 ± 0.5 inches of water without exceeding 26 inches of water system pressure.
 - iii. Close off the pressure source, seal the evaporative system, and monitor pressure decay for ~~up to~~ no more than 2 minutes.
 3. For vehicles required to take a biennial emissions test, all testing and test equipment shall conform to "IM240 & Evap Technical Guidance", EPA420-R-98-010, EPA, August 1998, ~~except that the transient driving cycle in Table 4 of this Article shall be used, "High-Tech I/M Test Procedures, Emission Standards, Quality Control Requirements, and Equipment Specifications-Final Technical Guidance", ("High-Tech I/M Final Technical Guidance"), EPA-AA-EPSP-IM-93-1, EPA, April 1994, incorporated by reference and on file with the Department and the Secretary of State. This incorporation by reference contains no future editions or amendments. A copy of this referenced material may be obtained at EPA's National Vehicle and Fuel Emissions Laboratory, 2000 Traverwood- 2565 Plymouth Road, Ann Arbor, MI 48105-2498. For vehicles required to take an annual emissions test, exhaust~~ Exhaust sampling for vehicles required to take an annual emissions test shall conform to comply with subsection (F)(6).
 4. All motorcycles and constant 4-wheel drive vehicles shall ~~be required only to~~ take and pass only a curb idle test according to subsection (F)(1).
 5. The emissions ~~pass/fail~~ pass-fail determination for all vehicles tested under subsection (E) shall be made as follows:
 - a. Vehicles tested under subsection (1), ~~which that~~ do not exceed ~~either~~ the loaded cruise mode or curb idle mode HC and CO emissions standards listed in Table 2 for the vehicle, shall be in compliance ~~comply~~ with ~~mini-~~

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~~from~~ the emissions standards contained in Table 2. The loaded cruise test standards specified in Table 2 shall apply to fleet vehicles tested with the ~~2,500~~ 2500 RPM unloaded fast idle test under R18-2-1019(A)(E).

b. Vehicles tested under subsection ~~(E)~~(2) shall meet the standards in Table 3, and pass the evaporative system integrity test, and pass the evaporative system purge test as follows:

i. Table 3 Standards. A vehicle shall meet either the composite standard for the whole test or the phase 2 standard for seconds ~~65-94~~ to ~~146-239~~. The Department may implement testing algorithms for ~~fast pass, fast fail, fast pass, fast fail,~~ or both, provided that the algorithms ~~are equivalent to or consistent with those listed in "High Tech I/M Final Technical Guidance"~~ and are reliable in accurately predicting the final outcome of the entire cycle. Vehicles not meeting either the composite or phase 2 standard shall fail the emissions test.

ii. Evaporative System Integrity. A vehicle fails the emissions test if the evaporative system cannot maintain a system pressure above 8 inches of water for ~~up to~~ at least 2 minutes after being pressurized to 14 ± 0.5 inches of water. Additionally, vehicles fail the evaporative test if the canister is missing or damaged, if hoses or electrical connections are missing, routed incorrectly, or disconnected, according to the vehicle emissions control information label, or if the gas cap is missing.

iii. ~~Purge System Flow Test. A vehicle with a total purge system flow measuring less than 1 liter, over the course of the transient test required in subsection (E)(2), fails the evaporative system purge test.~~

c. Vehicles that operate on compressed natural gas comply with HC emissions standards if the HC emissions value multiplied by 0.19 does not exceed the applicable standard in subsection (a) or (b).

~~d. e.~~ Motorcycles and constant 4-wheel drive vehicles ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards listed in Table 2 on either the 1st curb idle test or the 2nd curb idle test ~~shall be in compliance~~ comply with the ~~minimum~~ emissions standards in Table 2.

~~e. d.~~ ~~Any~~ A vehicle exceeding the applicable emissions standards for the tests described in subsections ~~(E)~~(1) and ~~(E)~~(2)(a) fail the emissions test and shall not be reinspected until ~~have~~ a low-emissions tune-up is performed as described in R18-2-1010 ~~before reinspection~~. Any A vehicle that fails the test described in subsection either sub-sections (E)(2)(b) or (E)(2)(e) shall not be reinspected until repaired as required in R18-2-1010(D)(1) ~~or and (2); as applicable, before reinspection~~.

6. ~~Each~~ A nondiesel vehicle required to take an annual emission test in area A shall, at the time of the test, undergo a tampering inspection based on the original configuration of the vehicle as manufactured. The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide the written statement required in R18-2-1008(B). "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by the manufacturer for original entry and sale in the United States. The tampering inspection shall consist of the following:

a. All nondiesel vehicles emission tested, except those with non-sealing gas caps, shall have a functional test of the gas cap to determine that cap leakage does not exceed ~~60~~ 200 cubic centimeters of air per minute at a pressure of 30 inches of water gauge. Nondiesel vehicles with non-pressurized, vented systems shall ~~have a visual inspection to determine~~ be checked for the presence of a properly fitting gas cap.

b. For 1975 and newer model year vehicles:

i. A visual inspection to determine the presence of properly installed catalytic converters;

ii. An examination to determine the presence of an operational air pump; and

iii. A visual inspection to determine the presence ~~or malfunction~~ of an operational ~~the~~ positive crankcase ventilation system and ~~the~~ evaporative control system.

F. In area B, the inspection test procedures for all vehicles other than diesel-powered vehicles shall ~~conform to~~ consist of the following:

1. Area B vehicles ~~manufactured~~ with a model year of 1967 through 1980 shall take and pass only a curb idle test. The curb idle test shall be performed with the vehicle in drive for vehicles with automatic transmissions or in neutral for vehicles with manual transmissions. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired. ~~In the event~~ If the vehicle fails the curb idle test, and if requested permitted by the vehicle operator, the vehicle shall be conditioned according to 1 of the following conditioning procedures:

a. For the fast-idle conditioning procedure, the vehicle shall be conditioned by increasing engine speed to ~~2,500~~ 2500, ± 300 RPM, for up to 30 seconds with the transmission in neutral. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. The conditioning ~~mode~~ procedure standards in Table 2 ~~shall be~~ for diagnostic and advisory information only. After exhaust emissions ~~have been~~ recorded, the engine speed shall be returned to curb idle for a 2nd idle test. The fast idle conditioning ~~mode~~ procedure may be used on a vehicle at state stations ~~in place~~ instead of the loaded conditioning ~~mode~~ procedure if any of the following occurs:

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- i. The vehicle has a tire on a driving wheel with less than 2/32-inch tread, with metal protuberances, ~~or~~ with visibly low tire pressure; as determined by visual inspection, or any other condition that precludes loaded conditioning for ~~reason~~reasons of ~~safety~~ to personnel, equipment, or vehicle safety;
 - ii. The vehicle is driven by a person who, because of physical incapacity, is unable to yield the driver's seat to the vehicle ~~vehicular~~ emissions inspector;
 - iii. The driver refuses to yield the driver's seat to the vehicle ~~vehicular~~ emissions inspector; or
 - iv. The vehicle ~~is unable to~~cannot be tested according to Table 1 because of the vehicle's inability to attain the speeds specified.
 - b. For the loaded ~~condition~~conditioning procedure, for all vehicles other than motorcycles and constant 4-wheel drive vehicles, the vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1, in drive for automatic transmission, or 2nd or higher gear for manual transmission. All front wheel drive vehicles shall be driven by the inspector. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 30 seconds, whichever occurs first. The conditioning ~~mode~~procedure standards in Table 2 ~~shall be~~ for diagnostic and advisory information only. After exhaust emissions ~~have been~~are recorded, engine speed shall be returned to curb idle for a 2nd idle test.
 - c. Following 1 ~~one~~ of the conditioning procedures in subsection (a) or (b), the vehicle shall be retested according to the curb idle test procedure in subsection ~~(a)~~(1).
2. Area B vehicles with a 1981 or newer model year, except motorcycles and constant 4-wheel drive vehicles, shall ~~be required to~~ take and pass ~~both~~ a loaded cruise test and curb idle test, ~~described~~ as follows:
 - a. Loaded Cruise Test. The vehicle's drive wheels shall be placed on a dynamometer and the vehicle shall be operated according to Table 1, in drive for automatic transmission or 2nd or higher gear for manual transmission. Overdrive shall not be used. All front wheel drive vehicles shall be driven by the inspector. Exhaust emissions, HC and CO concentrations, shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. After exhaust emissions have been recorded, engine speed shall be returned to idle for a curb idle test.
 - b. The Curb Idle Test. The test shall be performed with the vehicle in neutral. Engine RPM shall be within ± 100 RPM of the manufacturer's specified idle RPM. HC and CO exhaust emissions concentrations shall be recorded after readings have stabilized, or at the end of 90 seconds, whichever occurs first. A CO₂ plus CO reading of 6% or greater shall be registered to establish test validity. A CO₂ plus CO reading less than 6% shall be proof of exhaust sample dilution and the vehicle shall be rejected from further emissions inspection until repaired.
3. All motorcycles and constant 4-wheel drive vehicles shall ~~be required only to~~ take and pass only a curb idle test according to subsection (1). ~~In the event~~ If the vehicle fails the curb idle test, and if ~~requested~~permitted by the vehicle operator, the vehicle shall be conditioned according to the fast idle conditioning procedure required in subsection ~~(1)(b)(1)(a)~~. Following conditioning, the ~~engine speed~~vehicle shall be ~~returned to idle for a 2nd~~retested according to the curb idle test procedure in ~~accordance with~~ subsection (1)(a).
4. The emissions ~~pass/fail~~pass-fail determination shall be made as follows:
 - a. Vehicles ~~manufactured~~ with a model year of 1967 through 1980, except motorcycles and constant 4-wheel drive vehicles, ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards in Table 2 on either the 1st curb idle test or the 2nd curb idle test, shall ~~be in compliance~~comply with the minimum emission standards contained in Table 2.
 - b. Vehicles with a 1981 or newer model year, except motorcycles and constant 4-wheel drive vehicles, ~~which that~~ do not exceed ~~either~~ the loaded cruise mode or curb idle mode HC and CO emissions standards listed in Table 2, shall ~~be in compliance~~comply with the minimum emissions standards in Table 2. The loaded cruise test standards specified in Table 2 shall apply to fleet vehicles tested with the 2,500 ~~2500~~ RPM unloaded fast idle test.
 - c. Vehicles that operate on compressed natural gas comply with HC emissions standards if the HC emissions value multiplied by 0.19 does not exceed the applicable standard in subsection (a) or (b).
 - d. ~~e.~~ Motorcycles and constant 4-wheel drive vehicles ~~which that~~ do not exceed the curb idle mode HC and CO emissions standards in Table 2 on either the 1st curb idle test or the 2nd curb idle test shall ~~be in compliance~~comply with the minimum emissions standards in Table 2.
 - e. ~~e.~~ Any vehicle exceeding the appropriate emissions standards fails the emissions test and shall have a low emissions tune-up as described in R18-2-1010 before reinspection.
5. ~~Each area B~~ nondiesel vehicle required to take an ~~emission~~emissions test ~~under this Article in area B~~, shall at the time of the test, undergo a tampering inspection based on the original configuration of the vehicle as manufactured, as follows: The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide the written statement required in R18-2-1008(B). "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by the manufacturer for original entry and sale in the United States. The tampering inspection shall consist of the following:

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- a. Vehicles that have pressure holding gas caps shall have a functional test of the gas cap to determine that cap leakage does not exceed ~~60~~ 200 cubic centimeters of air per minute at a pressure of 30 inches of water gauge. Vehicles with non-sealing gas caps shall be checked for the presence of a properly fitting gas cap.
- b. For 1975 and newer model year vehicles:
 - i. A visual inspection to determine the presence of properly installed catalytic converters; and
 - ii. An examination to determine the presence of an operational air pump.

The above items shall be checked for conformance to the original configuration at time of manufacture. "Original configuration" for foreign manufactured vehicles means the design and construction of a vehicle produced by a manufacturer for original entry and sale in the United States. The applicable emission system requirements shall be verified by the "VEHICLE EMISSION CONTROL INFORMATION" label under the hood. Vehicles that fail any portion of the tampering inspection shall be repaired according to R18-2-1009 before reinspection or shall provide a written statement required by R18-2-1008(B).
6. Exhaust sampling in area B shall ~~conform to~~ comply with the following:
 - a. All CO and HC emission analyzers shall have water traps incorporated in the sampling lines. Sampling probes shall be capable of taking undiluted exhaust samples from a vehicle exhaust system.
 - b. All vehicles, other than diesel-powered vehicles, shall be inspected with NDIR analyzers capable of determining concentrations of CO and HC within the ranges and tolerances specified in Table 5.
 - c. Vehicles with multiple exhaust pipes shall be inspected by collecting and averaging samples by 1 of the following methods:
 - i. Collect separate samples from each exhaust ~~pipe. The and use the average concentration shall to~~ determine the test ~~results~~ result;
 - ii. Use manifold exhaust probes to simultaneously sample approximately equal volumes from each pipe; or
 - iii. Use manifold exhaust pipe adapters to collect approximately equal volume samples from each pipe.
- G. The following apply to all testing under subsections (E) or (F):
 1. ~~All~~ rotary piston ~~engines~~ engine shall be ~~treated in the same manner as inspected as a~~ 4-stroke ~~engines~~ engine with 4 cylinders or less;
 2. ~~All~~ turbine ~~engines~~ engine shall be ~~treated as inspected as a~~ 4-stroke ~~engines~~ engine having more than 4 cylinders; and
 3. ~~All vehicles~~ A vehicle in which a diesel engine has been replaced with a gas engine shall be inspected as a gas-powered ~~vehicles~~ vehicle of the same vehicle model year. The vehicle shall not pass the test inspection unless each catalytic ~~converters~~ converter, air ~~pumps~~ pump, gas ~~caps~~ cap and other emissions control ~~devices~~ device applicable to the vehicle model year and the same or more recent year engine configuration ~~are~~ is properly installed and in operating condition.
- H. In area A, the inspection test procedure for a diesel-powered ~~vehicles~~ vehicle is as follows:
 1. A diesel-powered vehicle with a GVWR greater than 8,500 pounds shall be tested with a procedure that conforms to Society of Automotive Engineers standard J1667, February 1996, incorporated by reference and on file with the Department and the Secretary of State. This incorporation by reference contains no future editions or amendments. A copy of this referenced material may be obtained at: Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096-0001. The procedure shall utilize the corrections for ambient test conditions in Appendix B of J1667 for all tests. The test results shall be reported as the percentage of smoke opacity. Emissions ~~pass/fail~~ pass-fail determinations are as follows:
 - a. Vehicles powered by a 1991 or later model year diesel engine ~~shall~~ fail if the J1667 final test result is greater than 40%, unless the engine family is exempted from the 40% standard under subsection (e);
 - b. Vehicles powered by a pre-1991 model year diesel engine ~~shall~~ fail if the J1667 final test result is greater than 55%, unless the engine family is exempted from the 55% standard under subsection (e);
 - c. The engine model year is determined by the emission control label. If the emission control label is missing, illegible, or incorrect, the test standard shall be 40%, unless a correct, legible emission control label replacement is attached to the vehicle within 30 days of the inspection;
 - d. ~~Any~~ A vehicle that exceeds the appropriate opacity standard in subsection (a) or (b) fails the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010(G);
 - e. The Director shall exempt any engine family from the standards in subsections (a) or (b) if the engine manufacturer demonstrates either of the following:
 - i. The engine family exhibits smoke opacity greater than the standard ~~if when~~ in good operating condition and adjusted to the manufacturer's specifications. ~~Instead the engine family~~ The Director shall comply with any identify a technologically appropriate less stringent standard ~~identified by the Director~~ based on a review of data obtained from engines in good operating condition and adjusted to manufacturer's specifications; or
 - ii. The engine family is exempted from an equivalent standard based on J1667 by the executive officer of the California Air Resources Board (CARB). ~~Instead~~ The Director shall allow the engine family ~~shall to~~ comply with any technologically appropriate less stringent standard identified by the executive officer of CARB;

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and

- f. A demonstration under subsection (e)(i) shall be based on data from at least 3 vehicles. Data from official inspections under subsection (H)(1) showing that vehicles in the engine family ~~pass meet the standard~~ may be used to rebut the demonstration. The Director shall implement any new standard resulting from each exemption as soon as practicable for all subsequent tests and provide notice at all affected test stations and fleets.
 2. A diesel-powered vehicle with a GVWR greater than ~~4,000~~ 4000 pounds and less than or equal to 8,500 pounds shall be tested by a loaded dynamometer test by applying a single load of 30 HP, \pm 2 HP, while operated at 50 MPH. A diesel-powered vehicle with a GVWR of ~~4,000~~ 4000 pounds or less shall be tested by a loaded dynamometer test by applying a single load of between 6.4 - 8.4 HP while operated at 30 MPH. For all diesel-powered vehicles with a GVWR less than or equal to 8,500 pounds:
 - a. The emissions ~~pass/fail~~ pass-fail determination shall be made as follows:
 - i. The opacity reading for a period of 10 consecutive seconds with the engine under applicable loading shall be compared to the opacity standard ~~specified in R18-2-1030(B)~~. Vehicles ~~which that~~ do not exceed the opacity standards in R18-2-1030(B) ~~shall be in compliance~~ comply with the minimum emission standards.
 - ii. ~~Any~~ A vehicle that exceeds the appropriate standard fails the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010.
 - b. Exhaust sampling shall ~~conform to~~ comply with the following:
 - i. ~~For a diesel-powered vehicle equipped with multiple pipes, separate~~ Separate measurements shall be made on each exhaust pipe ~~on diesel vehicles equipped with multiple pipes. For vehicles equipped with more than 1 exhaust pipe, the~~ The reading taken from the exhaust pipe ~~which that~~ has the highest opacity reading shall be used for comparison with the appropriate emission standard.
 - ii. Vehicles shall be inspected with a full-flow, direct reading, continuous reading light extinction opacity meter using a collimated light source and photo-electric cell, accurate to a value within \pm 5% of filter value.
- I. In area B, the inspection test procedure for ~~a diesel-powered vehicles shall be~~ vehicle is as follows:
1. A diesel-powered vehicle with a GVWR greater than 26,000 pounds or having tandem axles shall be tested according to 1 of the following methods:
 - a. The vehicle shall be tested on a chassis dynamometer beginning with no power absorption by selecting a gear ratio ~~which that~~ produces a maximum vehicle speed of 30-35 MPH at governed or maximum rated RPM. If the vehicle has a manual transmission or an automatic transmission with individual gear selection, the engine shall be operated at governed or maximum rated engine RPM, at normal operating temperature under a power absorption load applied to the dynamometer until ~~such the~~ loading reduces the engine RPM to 80% of the governed speed at wide-open throttle position. If the vehicle has an automatic transmission and with automatic gear kickdown, the engine shall be loaded to a speed just above the kickdown speed or 80% of the governed speed, whichever is greater. If the chassis dynamometer does not have enough horsepower absorption capability to lug the engine down to these speeds, the vehicle's brakes may be used to assist the dynamometer.
 - b. If a chassis dynamometer is not available, the vehicle shall be tested by being lugged by its own brakes by selecting a gear ratio ~~which that~~ produces a maximum speed of 10-15 MPH at governed engine RPM or maximum rated RPM and then loading the engine by applying the brakes until the engine RPM is lugged down to 80% of the governed or maximum rated RPM at wide-open throttle position. If the vehicle does not have a tachometer, the vehicle may be loaded to 80% of governed or maximum rated speed.
 2. A diesel-powered vehicle without tandem axles and having a GVWR greater than 10,500 pounds and less than or equal to 26,000 pounds shall be tested according to 1 of the following methods:
 - a. The vehicle shall be tested on a chassis dynamometer beginning with no power absorption by selecting a gear ratio ~~which that~~ produces a maximum vehicle speed of 30-35 MPH at governed or maximum rated RPM. If the vehicle has a manual transmission or an automatic transmission with individual gear selection, the engine shall be operated at governed or maximum rated engine RPM, at normal operating temperature under a power absorption load applied to the dynamometer until such loading reduces the engine RPM to 80% of the governed speed at wide-open throttle position. If the vehicle has an automatic transmission and with automatic gear kickdown, the engine shall be loaded to a speed just above the kickdown speed or 80% of governed speed, whichever is greater. If the chassis dynamometer does not have enough horsepower absorption capability to lug the engine down to these speeds, the vehicle's brakes may be used to assist the dynamometer;
 - b. The vehicle shall be tested by applying a single load of 30 HP, \pm 2 HP, while operated at 50 MPH; or
 - c. The vehicle shall be tested by being lugged by its own brakes by selecting a gear ratio ~~which that~~ produces a maximum speed of 10-15 MPH at governed engine RPM or maximum rated RPM and then loading the engine by applying the brakes until the engine RPM is lugged down to 80% of the governed or maximum rated RPM at wide-open throttle position. If the vehicle does not have a tachometer, the vehicle may be loaded to 80% of governed or maximum rated speed.
 3. A diesel-powered vehicle with a GVWR of greater than ~~4,000~~ 4000 pounds and less than or equal to 10,500 pounds shall be tested by a loaded dynamometer test by applying a single load of 30 HP, \pm 2 HP, while operated at 50 MPH.

4. A diesel-powered vehicle with a GVWR of ~~4,000~~ 4000 pounds or less shall be tested by a loaded dynamometer test by applying a single load of between 6.4 - 8.4 HP while operated at 30 MPH.
 5. The emissions ~~pass/fail~~ ~~pass-fail~~ determination shall be performed:
 - a. The opacity reading during a period of 10 consecutive seconds with the engine under applicable loading specified in ~~subsections~~ subsections (1) through (4) shall be compared to the opacity reading standard specified in R18-2-1030(B). Vehicles ~~which that~~ do not exceed the opacity standards in R18-2-1030(B) ~~shall be in compliance~~ ~~and comply~~ with the minimum emission standards.
 - b. ~~Any~~ A vehicle that exceeds the standard in R18-2-1030(B) ~~shall fail~~ ~~fails~~ the emission test. Before reinspection, the vehicle shall have a low emissions tune-up as described in R18-2-1010.
 6. Exhaust sampling shall ~~conform to~~ ~~comply with~~ the following:
 - a. ~~For a diesel-powered vehicle equipped with multiple exhaust pipes, separate~~ ~~Separate~~ measurements shall be made on each exhaust pipe ~~on diesel vehicles equipped with multiple exhaust pipes. For vehicles equipped with more than 1 exhaust pipe, the~~ The reading taken from the exhaust pipe ~~which that~~ has the highest opacity reading shall be used for comparison with the standard in R18-2-1030(B).
 - b. Vehicles shall be inspected with ~~either a full-flow; or sampling-type opacity meter. The opacity meter shall be direct reading, continuous reading light extinction-type opacity meter using a collimated light source and photo-electric cell, accurate to a value within ± 5% of filter value.~~
- J.** ~~Diesel-powered area A or area B~~ Area A or area B vehicles that are ~~diesel fueled and~~ equipped with catalytic converters or PCV systems shall undergo a tampering inspection for those devices under ~~subsections (E) or (F)~~ subsection (E)(6).
- K.** Diesel-powered area B vehicles that are equipped with catalytic converters shall undergo a tampering inspection for those devices under subsection (F)(5).

R18-2-1007. Evidence of Meeting State Inspection Requirements

- A.** Vehicles required to be inspected under this Article shall pass inspection before registration by meeting the requirements of R18-2-1006, unless waived under R18-2-1008.
- B.** ~~A.~~ The MVD or its agent may use the MVD motor vehicles emissions database, if available, may be used by the registering authority as evidence that a vehicle complies is in compliance with the requirements of this Article.
- C.** ~~B.~~ If the MVD motor vehicles emissions database is not available, the MVD or its agent shall accept any of the following documents, when complete, unaltered and dated no more than 90 days before prior to registration expiration date, shall be accepted by the registering authority as evidence that a vehicle complies is in compliance with the requirements of this Article unless the registering authority MVD or its agent has reason to believe it is a false document. Documents accompanying a late registration may be dated subsequent to the registration expiration date:
1. Certificate of compliance,
 2. Certificate of waiver (except from auto dealers licensed to sell used motor vehicles under A.R.S. pursuant to Title 28),
 3. Certificate of exemption, or
 4. Director's certificate,
 5. The upper section of the vehicle inspection report with "PASS" in the final results block.
- D.** ~~C.~~ Complete and unaltered certificates of inspection dated within 12 months of registration for annually tested vehicles and 24 months for biennially tested vehicles shall be accepted by the registering authority MVD or its agent as evidence that a vehicle is in compliance with the requirements of this Article unless the registering authority MVD or its agent has reason to believe it is a false document.
- E.** ~~D.~~ Documents listed in subsection (C) and originating in from area B are not acceptable for meeting the inspection requirements in area A.
- F.** ~~E.~~ Governmental Government vehicles for which only weight fees are paid shall be registered without evidence of inspection.

R18-2-1008. Procedure for Issuing Certificates of Waiver

- A.** Unless prohibited under subsections (C), (D), or (E), a A certificate of waiver shall be issued subsequent to reinspection by a state inspector at a state or Department station to a vehicle that failed the emissions inspection or the emissions and tampering inspections; when it is determined by repair receipts, emissions test results, evidence of repairs performed, underhood verification, or other similar other evidence that the requirements of R18-2-1009 and R18-2-1010 have been met, or that with respect to for emissions failures only, any further repairs within the repair cost limit would be ineffective. A waiver may be denied if a waiver request is based upon repair estimates and the state inspector demonstrates that a recognized repair facility can repair or improve the vehicle's test readings within the repair cost limit.
- B.** A certificate of waiver may be issued to a vehicle failing the tampering inspection if the vehicle owner of the vehicle provides to the Director a written statement from an automobile parts or repair business that an emission control device ~~which~~ is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply ~~before the vehicle's current emission compliance expires provided, and if applicable, that~~ all requirements of R18-2-1008(A) have been met. All written statements ~~may be~~ are subject to verification for authenticity and accuracy by the Department. The Department may deny a certificate of waiver if the state inspector has any reason to believe the written statement is a false

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~~document~~ or a usual source of supply ~~does exist~~ exists and the device ~~which is~~ necessary to repair the tampering is available before the vehicle's current emission compliance expiration. Certificates of waiver for tampered vehicles may be issued conditionally for a specified period, not to exceed 90 days, ~~which~~ that allows sufficient time for the procurement and installation of a proper emissions control device. A receipt or bill from a vehicle repair facility or automobile parts store shall be an acceptable proof of purchase. Before ~~or at~~ the end of the specified time period, the vehicle owner shall present to the Director proof of purchase and installation of the device ~~to prevent cancellation of vehicle registration.~~ The Department shall track all issued conditional certificates of waiver and if no proof of purchase and installation is received ~~on or~~ before the end of the specified time period, the Director shall forward to the Department of Motor Vehicles an order to cancel the said vehicle's registration.

- C. If the administrator of the United States environmental protection agency finds that area A has failed to demonstrate reasonable further progress or has failed to attain the national ambient air quality standards for ozone by the applicable attainment date, ~~the~~ The Director shall not thereafter issue a waiver to a vehicle that has failed the emissions test due to the catalytic converter system. A vehicle shall ~~be deemed to have failed~~ the emissions test due to the catalytic converter system if:
1. The converter's oxidation efficiency, as measured by the Catalyst Efficiency Test Procedure in R18-2-1031(A), is less than 75%; and
 2. No engine or fuel system malfunctions exist that would prevent the proper operation of a catalytic converter, if the vehicle is within 25% of all emissions standards and a properly performed comparison of exhaust gas before and after the converter demonstrates that the converter is performing at less than half the efficiency in Table 7 in R18-2-1031.
- D. The Director shall not issue a waiver to a vehicle failing the emission test with an HC, CO, NOx, or opacity emission level greater than 2 times the pass-fail standard in R18-2-1006, unless the vehicle is repaired so that each emission level is less than 2 times the pass-fail standard.
- E. After January 1, 1997, the Director shall not issue a certificate of waiver to the same vehicle more than once.
- ~~F. D.~~ The fee for a certificate of waiver under this Section shall be fixed by the Director according to A.R.S. § 49-543, and shall be based upon the Director's estimated costs to the state for administering and enforcing the provisions of this Article for issuance of certificates of waiver under this Section. The fee shall be payable directly to the Department of Environmental Quality at the time the certificate of waiver is issued. The charge for certificates of waiver obtained from the Department is five dollars each.

R18-2-1009. Tampering Repair Requirements

- A. ~~Failure to pass a visual inspection for the presence or malfunction of the fuel filler neck inlet restrictor shall require replacement of the fuel filler neck inlet restrictor with a new OEM or new aftermarket fuel filler neck inlet restrictor. Names of approved aftermarket restrictors shall be available at time of inspection and listed on the repair requirement list.~~
- ~~A. B.~~ Failure to pass a visual inspection to determine the presence of or properly installed catalytic converters, shall require replacement of the converters shall be replaced with new or reconditioned OEM converters or approved equivalent new aftermarket converters. The Department shall provide names Names of approved acceptable aftermarket converters ~~shall be available at the~~ time of inspection and ~~listed~~ on the repair requirement list.
- ~~B. C.~~ Failure to pass a functional gas cap pressure test described in R18-2-1006(E)(6)(a) or (F)(5)(a), the gas cap shall require replacement be replaced with a gas cap one that meets those specifications. If a vehicle designed with a vented system fails a visual inspection for the presence of a gas cap, a properly fitting gas cap shall be installed on the vehicle.
- ~~C. D.~~ Failure to pass a visual ~~check to determine~~ inspection for the presence of an operational air pump, shall require replacement with a new, used, or reconditioned, operational properly installed and operational air pump shall be properly installed on the vehicle.
- ~~D. E.~~ Failure to pass a visual inspection for the presence or malfunction of the positive crankcase ventilation system, the system shall require replacement of the system or parts be repaired or replaced with OEM or equivalent aftermarket parts thereof with new or reconditioned OEM parts or approved new aftermarket parts.
- ~~E. F.~~ Failure to pass a visual inspection for the presence or malfunction of the evaporative control system, the system shall require replacement of the system or parts thereof be repaired or replaced with OEM or equivalent aftermarket parts with new or reconditioned OEM parts or approved new aftermarket parts.
- G. Reconditioned emissions control devices shall be identified and installed with respect to application category. The application category means those vehicles for which the device was the original emissions control device.

R18-2-1010. Low Emissions Tune-up, Emissions and Evaporative System Repair

- A. A low emissions tune-up on nondiesel-powered vehicles consists of a person performing the following procedures:
1. Emissions Failure Diagnosis. ~~On~~ For computer-controlled vehicles, the on-board-diagnostics shall be accessed and any stored trouble codes recorded. The following instruments or equipment are required to complete a low emissions tune-up: tachometer, timing light, or an engine analyzer or oscilloscope, and ~~whereif~~ specified by the manufacturer, a HC/CO NDIR analyzer to make final A/F adjustments. Final adjustment shall be made on the vehicle engine only

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after the engine is at normal operating temperature. All adjustments shall be made according to the manufacturer's specifications and procedures.

2. Inspection of Air Cleaner, Choke, and Air Intake System. ~~The person shall replace or repair a~~ dirty or plugged air cleaner, a stuck choke, or a restricted air intake system shall be replaced or repaired as required.
 3. Dwell and Basic Timing Check. Dwell and basic engine timing shall be checked and adjusted, if necessary, according to manufacturer's specifications.
 4. Inspection of PCV Valve. The PCV valve shall be checked to ensure that it is the type recommended by the manufacturer and ~~that it~~ is correctly operating. Free flow through the PCV system passages and hoses shall be verified. Repair ~~and~~ replace as required.
 5. Inspection of Vacuum Hoses. The vacuum hoses shall be inspected for leaks, obstruction, and proper routing and connection. Repair ~~and~~ replace as required.
 6. Perform a visual inspection for leaking fuel lines or system components. Repair or replace as required.
 7. ~~6.~~ Idle Speed and A/F Mixture Check. The idle speed and A/F mixture shall be checked and adjusted according to manufacturer's specifications and procedures. If the vehicle is equipped with a fuel injection system or an alternate fuel (LPG or LNG), the manufacturer's recommended adjustment procedure shall be followed.
- B.** ~~A low emissions tune-up must be performed on a vehicle in order to qualify for a waiver if the vehicle fails reinspection. A vehicle that fails reinspection does not qualify for a waiver unless a low emissions tune-up and diagnosis is performed on the vehicle.~~
- C.** If the maximum required repair cost in ~~subsections~~ subsection (E) and/or (F), or the vehicle owner share of repair costs in ~~R18-2-1014(E)(D)~~, if applicable, ~~whichever is less~~, is not exceeded after a low emissions tune-up described in subsection (A), then ~~a person shall perform~~ the following ~~and repair or replace as required~~ procedures apply:
1. If a vehicle fails the CO only, the vehicle shall be checked for proper canister purge system operation, high float setting, leaky power valve, faulty or worn needles, seats, jets or improper jet size. If applicable, ~~the person~~ following shall ~~check the~~ also be checked: computer, engine and computer sensors, engine solenoids, engine thermostats, engine switches, coolant switches, throttle body or port fuel injection system, fuel injectors, fuel lines; (routing and integrity), air in fuel system (for example, line, pump), fuel return system, injection pump, fuel injection timing, routing of vacuum hoses and ~~or~~ electrical connections. Repair or replace as required.
 2. If a vehicle fails HC₂ or HC and CO, the vehicle shall be checked for faulty spark plugs and faulty, open, crossed, or disconnected plug wires, distributor module, vacuum hose routing and electrical connections; ~~and for~~ distributor component malfunctions including vacuum advance, faulty points or condenser, and distributor cap crossfire, catalytic converter efficiency, and catalytic converter air supply; ~~and for~~ vacuum leaks at intake manifold, carburetor base gasket, EGR, and vacuum-operated components. Repair or replace as required.
 3. If a vehicle fails NO_x, the vehicle shall be checked for removed, plugged, or malfunctioning EGR valve; exhaust gas ports, lines, and passages; EGR valve electrical and vacuum control circuitry, components, and computer control, as applicable; ~~and for~~ above normal engine operating temperature, proper air management, lean A/F mixture, catalytic converter efficiency and over advanced off-idle timing. Repair or replace as required.
- D.** For Evaporative System Failures, the following procedures apply:
1. If a vehicle fails ~~an~~ the evaporative system integrity (~~pressure~~) test, the vehicle shall be checked for leaking or disconnected vapor hoses, line, gas cap, and fuel tank.
 2. If a vehicle fails a visual inspection of the evaporative system, the vehicle shall be checked for a missing or damaged canister, canister electrical and vacuum control circuits and components, disconnected, damaged, mis-routed or plugged hoses, and damaged or missing purge valves. Repair or replace as necessary. If a vehicle fails an evaporative system purge test, the vehicle shall be checked for missing or malfunctioning canister, canister electrical and vacuum control circuits and components.
- E.** The maximum required repair cost for ~~vehicles~~ a vehicle in area A, not including costs to repair ~~vehicles which fail the vehicle for failing an evaporative system purge or integrity test due to tampering, or other tampering~~ repair costs, is:
1. ~~Five hundred dollars for~~ For a diesel-powered vehicle with a GVWR greater than 26,000 pounds or a diesel-powered vehicle with tandem axles, \$500; ~~or and~~
 2. For a vehicle ~~other than~~ that is not a diesel-powered vehicle with a GVWR greater than 26,000 pounds ~~or and not~~ a diesel-powered vehicle with tandem axles:
 - a. Two hundred dollars for a vehicle manufactured in or before the 1974 model year;
 - b. Three hundred dollars for a vehicle manufactured in the 1975 through 1979 model years; and
 - c. Four hundred and fifty dollars for a vehicle manufactured in or after the 1980 model year.
 3. Subsection (E) does not prevent a vehicle owner from authorizing or performing more than the required repairs. A vehicle operator who has a vehicle reinspected shall have repair receipts available when requesting a certificate of waiver.
- F.** The maximum required repair cost for vehicles in area B, not including tampering repair costs, is:
1. ~~Three hundred dollars for~~ For a diesel-powered vehicle with a GVWR greater than 26,000 pounds or a diesel-powered vehicle with tandem axles, \$300; ~~or and~~

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2. For a vehicle ~~other than~~ that is not a diesel-powered vehicle with a GVWR greater than 26,000 pounds ~~or and not~~ a diesel-powered vehicle with tandem axles:
 - a. Fifty dollars for a vehicle manufactured in or before the 1974 model year;
 - b. Two hundred dollars for a vehicle manufactured in the 1975 through 1979 model years; and
 - c. Three hundred dollars for a vehicle manufactured in or after the 1980 model year.
3. Subsection (F) does not prevent a vehicle owner from authorizing or performing more than the required repairs. A vehicle operator who has a vehicle reinspected shall have repair receipts available when requesting a certificate of waiver.
- G. A low emissions tune-up on a diesel-powered vehicle ~~vehicles~~ consists of a person performing the following procedures:
 1. ~~Inspection~~ Inspect for dirty or plugged air cleaner, or restricted air intake system; ~~repair and~~ Repair or replace as required.
 2. ~~Checking~~ Check fuel injection system timing according to manufacturer's specifications; ~~adjust~~ Adjust as required.
 3. ~~Checking~~ Check for fuel injector fouling, leaking or mismatch; ~~repair and~~ Repair or replace as required.
 4. ~~Checking~~ Check fuel pump and air-fuel ratio control according to manufacturer's specifications; ~~adjust~~ Adjust as required.
 5. If the vehicle fails the J1667 procedure, ~~checking~~ check smoke-limiting devices, if any, ~~such as~~ including the aneroid valve and puff limiter. ~~Repair and~~ or replace as required.
- H. Any available warranty coverage for a vehicle shall be used to obtain needed repairs before expenditures ~~an expenditure~~ can be counted toward ~~toward~~ the cost limits in subsections (E) and (F). ~~The~~ If the operator of a vehicle within the statutory age and mileage coverage of ~~under~~ section 207(b) of the Clean Air Act ~~shall present~~ presents a written denial of warranty coverage from the manufacturer or authorized dealer ~~for this provision to be waived~~, warranty coverage is not considered available under this subsection.

R18-2-1011. Vehicle Inspection Report

- A. ~~Each~~ A vehicle inspected at a state station shall be provided a serially numbered vehicle inspection report of a design approved by the Director ~~and shall provide for~~ that contains the following information ~~as~~ at a minimum:
 1. License plate number;
 2. Vehicle identification number;
 3. Model year of vehicle;
 4. Make of vehicle;
 5. Style of vehicle;
 6. Type of fuel;
 7. Odometer reading to the nearest 1000 miles, truncated;
 8. Emissions standards for idle and loaded cruise modes, if applicable;
 9. Emissions measurements during idle and loaded cruise modes, if applicable;
 10. Opacity measurements and standards, if applicable;
 11. Emission standards and measurements for the transient loaded test, and the evaporative system integrity test ~~and purge tests~~, if applicable;
 12. Tampering inspection results;
 13. Repair requirements;
 14. Final test results;
 15. Repairs performed;
 16. Cost of emissions-related repairs;
 17. Cost of tampering-related repairs;
 18. Name, address, and telephone number of the business ~~firm~~ or person making repairs;
 19. Signature and ~~license or~~ certification number of person certifying repairs;
 20. Date of inspection;
 21. Test results of the previous inspection if the inspection is a reinspection;
 22. ~~Type of business making repairs;~~
 23. ~~State certification number of technician making repairs, if applicable;~~
 - 24 Inspection station, lane locators; and
 - 25 Test number and time of test; and
- B. ~~Each~~ A vehicle failing the initial inspection shall receive an inspection report supplement approved by the Department containing, at a minimum, ~~both~~ of the following:
 1. Diagnostic and tampering information including acceptable replacement units, and
 2. Applicable maximum repair costs.
- C. The inspection report shall provide a ~~3-inch three-inch~~ 5-inch five-inch tear-out section that may be used as a certificate of compliance for vehicles ~~that passing~~ the inspection or as a certificate of waiver ~~when~~, if applicable.
 1. The tear-out section shall be a certificate of compliance when the word "compliance" appears in the appropriate location on the printout.

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2. The tear-out section shall be a certificate of waiver when the word "waiver" appears in the appropriate location on the printout.
3. The tear-out section shall contain all of the following information:
 - a. License plate number;₂
 - b. Vehicle identification number;₂
 - c. Final results;₂
 - d. Serial number of the inspection report;₂
 - e. Date of inspection;₂
 - f. Model year;₂
 - g. Make;₂
 - h. Date of initial inspection;₂, and
 - i. Inspection fee.

D. At the time of registration or reregistration, the certificate of compliance or certificate of waiver may be submitted to the Arizona Department of Transportation Motor Vehicle Division ~~in Pima County or the Maricopa County Assessor in Maricopa County with the application for Arizona certificate of title and registration (DOT 48-0510) or an Arizona Registration Card (DOT 48-5113)~~ as evidence of meeting the requirements of this Article.

R18-2-1012. Inspection Procedures and Fee

- A.** ~~Each~~A vehicle that is inspected by a state station must be accompanied by a document such as a registration renewal notice, registration, certificate of title, or bill of sale ~~which that~~ identifies the vehicle by make, model year, identification number, and license plate if applicable.
- B.** If the registration renewal notice is used as ~~an entrance~~the accompanying document, it shall be stamped by the test lane inspector. If the vehicle inspection report from the previous test is used, it shall be retained by the test lane inspector.
- C.** The fees for emissions inspections at a state station shall be specified in the contract between the contractor and the state of Arizona according to A.R.S. § 49-543, and shall include the full costs of the vehicle emissions inspection program including administration, implementation, and enforcement. Each fee is payable directly to the contractor at the time and place of inspection in cash or by check approved by the contractor. ~~Fees Monies~~ collected by the contractor to defray the costs of the inspection shall be retained by the contractor. The fee amount collected to defray the costs of the administration, implementation, and enforcement of the vehicle emissions inspection program shall be remitted to the Department. Amounts collected shall be recorded and reported to the Department monthly. The contractor shall submit to the state of Arizona on a monthly basis, by the ~~10th tenth~~ day of each month, a report setting forth the number of inspections performed and the amount of fees collected.
- D.** Subsequent inspections, if needed, shall be treated by the state and the contractor in the same manner as an initial inspection and reinspection, providing for ~~one~~a free reinspection according to in accordance with R18-2-1013, if needed, following ~~each~~a paid inspection. The fee for each ~~subsequent inspection~~paid reinspection shall be the full fee as provided for in the contract with the ~~independent~~ contractor.
- E.** ~~All inspection fees collected by the county assessor pursuant to A.R.S. § 49-543(C) shall be transferred to the state treasurer for deposit in the emissions inspection fund upon completion of each daily closing except when daily inspection fee collections are less than \$2500. When daily inspection fee collections are less than \$2500 they shall be transferred to the state treasurer for deposit in the emissions inspection fund at such time as they are cumulatively \$2500 or more. In the event cumulative inspection fee collections are less than \$2500 for any month they shall be transferred to the state treasurer for deposit in the emissions inspection fund by the fifth working day of the following month. An accounting of all monies shall be made at the time of transfer. The accounting of monies transferred to the treasurer shall contain the number of single fees and the number of multiple fees collected and the amount forwarded. Documents such as certificates of compliance and certificates of waiver, which indicate the number of inspection fees to be collected with the registration, shall be filed in a manner that provides traceability to the associated registration document.~~
- E. F.** State station emissions inspectors shall not recommend repairs or repair facilities.

R18-2-1013. Reinspections

- A.** ~~Each~~A vehicle ~~which fails its failing~~ the initial inspection or any subsequent paid inspection is entitled to ~~1 one~~ reinspection at no additional charge under the following conditions:
 1. The vehicle is presented for inspection within 60 ~~consecutive~~ calendar days of the initial or any subsequent paid inspection, ~~provided that~~ if the vehicle operator presents the vehicle inspection report ~~for from~~ the previous inspection, indicating the itemization of the repairs performed.
 2. ~~Emission related~~Emissions-related repairs or adjustments and any tampering repairs have been made.
 3. The vehicle is accompanied by the entire vehicle inspection report from the initial or subsequent ~~inspections~~inspection with the following information filled in on the reverse side:
 - a. Emissions-related and tampering-related repairs ~~that have been~~ made;
 - b. Cost of emissions-related and tampering-related repairs as reflected by receipts ~~of purchase or bills;~~
 - c. Name, address, ~~phone~~telephone number, and type of facility making repairs;

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- d. Signature of person certifying the repairs were made;
 - e. Date of repairs; and
 - f. The state certification number of the technician making repairs, if so certified applicable.
- B.** ~~Vehicles~~ A vehicle shall be retested after repair for any portion of the inspection ~~that is~~ the vehicle failed on the previous test to determine if the repairs were effective. To the extent that repair to correct a previous failure could ~~lead to~~ cause failure of another portion of the test, that portion shall also be retested. Evaporative system repairs shall trigger an exhaust emissions retest.
- C.** A vehicle ~~that fails~~ afailing the reinspection shall be provided a vehicle inspection report and a vehicle inspection report supplement.

R18-2-1014. Vehicle Repair Grants

- ~~**A.** The Department shall pay for a portion of emission related repairs on a vehicle in an amount not to exceed the maximum amount in subsection (D) if all of the following are true:~~
- ~~1. The vehicle is an area A vehicle and fails an annual, biennial, or remote sensing triggered emission test.~~
 - ~~2. The owner of the vehicle is determined to be an assistance recipient of the food stamp program according to subsection (B).~~
 - ~~3. For model year 1975 and newer vehicles, a low emissions tune-up pursuant to R18-2-1010(A) has been performed, and a diagnosis and estimate of further repairs needed, if any, to bring the vehicle into compliance is done on the vehicle by a recognized automotive repair facility before prior to the repair or repairs to be paid for by the Department, according to subsection (C). For model year 1974 and older vehicles, the same requirement applies except that a portion of the low emissions tune-up and diagnosis may be included in the repairs to be paid for by the Department, if it is performed subsequent to the initial failure.~~
 - ~~4. The needed repair or repairs in excess of the vehicle owner's share are confirmed and authorized at the indicated amount by a Department waiver facility pursuant to the diagnosis and estimate and any state inspection. No amount shall be authorized for correcting equipment that has been recorded as failing the tampering inspection, except that if the Administrator makes the finding described in R18-2-1008(C), a n amount may be authorized for the repair or replacement of a catalytic converter system that causes the vehicle to fail as described in R18-2-1008(C) that subsection.~~
 - ~~5. The repair facility confirms that the vehicle owner has paid, or agreed to pay on terms acceptable to the facility, for repairs incurred subsequent to the initial failure and necessary for the correction of the emission failure, in an amount equal to one half of the waiver limit for the vehicle. Monies paid for the low emissions tune-up and diagnosis pursuant to R18-2-1010(A) shall be considered for this determination. Monies paid for correcting equipment that has been recorded as failing the tampering inspection shall not be considered for this determination.~~
 - ~~6. The authorized repairs are performed by a recognized repair facility and confirmed on the vehicle at a Department waiver facility during reinspection within 7 days of repair. If the repair facility does not receive payment within 30 days of repair, the repairs may be confirmed by the repair facility sending the Department a copy of the completed repair voucher provided by the Department, signed by the vehicle owner and repair facility technician performing the repairs.~~
- B.** Eligibility determination. The determination of eligibility pursuant to (A)(2) shall be made by the Department or its authorized representative. The determination may be made by directly accessing information in the department of economic security (DES) food stamp assistance database on a date after the owner's vehicle has failed, or based on documentation originating from DES and identifying the vehicle owner as a recipient. Ownership of the vehicle may be determined by a recent MVD document such as a title or by accessing information in the MVD database. Identification of the vehicle owner for food stamp recipient status shall be confirmed with the date of birth or other information on the owner's driver license. An owner who has been determined eligible under subsections (A)(1) and (2) shall be provided with evidence of that determination and the documentation necessary to obtain a repair grant at the state test station. A determination of eligibility under this subsection shall be valid for 60 days.
- ~~**C.** Low emissions tune-up, diagnosis and estimate. Authorizations of repairs shall not be made unless a low emissions tune-up, and a diagnosis and estimate have been made as follows:~~
- ~~1. The low emissions tune up shall be performed by a recognized repair facility of the owner's choice based on the class of vehicle as provided in R18-2-1010(A).~~
 - ~~2. If the repair facility believes after the low emission tune-up that the vehicle will still fail, a diagnosis and cost estimate shall be provided on a repair invoice which describes the facility by name, address and telephone number.~~
- D.** Repair categories, maximum grant amounts and vehicle owner responsibility are as outlined in the table below:

Repair Category	Maximum Grant Amounts		
	1967-74	1975-79	1980 & newer
Low emissions tune up (R18-2-1010(A))	50	0	0

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Repair of tampered items	0	0	0
Any other approved emission related repairs	\$50	\$150	\$225
(Vehicle owner share to qualify for grant)	\$50	\$150	\$225

- A.** The Department shall pay one-half of approved emissions-related repairs up to the maximum amount in subsection (E) if:
1. The vehicle owner is a food stamp recipient as described in subsection (B); or
 2. The vehicle received a waiver after January 1, 1997 and has not previously been provided a grant under this Section.
- B.** Vehicle repair grant eligibility for a food stamp recipient shall be determined as follows:
1. The recipient is the owner of an area A vehicle that fails the annual, biennial, or remote sensing-triggered emission test. Ownership shall be based on current title or registration information.
 2. Confirmation that the owner of the vehicle is a food stamp recipient shall be made by the Department or its authorized representative based on documentation provided by the Department of Economic Security (DES) identifying the vehicle owner as a current food stamp recipient.
- C.** Repair grant eligibility for a vehicle that has received a waiver after January 1, 1997 shall be determined by the following:
1. The vehicle is an area A vehicle that fails the annual, biennial, or remote sensing-triggered emission test.
 2. The vehicle has not previously been repaired through a grant under this Section.
 3. The application for assistance is made by the vehicle owner, based on current title or registration information.
- D.** To be eligible for a grant under this Section, an owner of a vehicle shall have:
1. A recognized repair facility perform a low emissions tune-up and diagnosis according to R-18-2-1010(A), and provide an estimate of additional repairs needed, if any, to bring the vehicle into compliance. The diagnosis and cost estimate shall be on a repair invoice that describes the facility by name, address, and telephone number.
 2. Additional repairs necessary after the low emission tune-up and diagnosis confirmed and approved by a Department waiver facility before being performed.
 3. The recognized repair facility certify that the vehicle owner paid, or agreed to pay on terms acceptable to the facility, one-half of the approved repairs incurred after the initial failure and necessary for the correction of the emission failure. Money paid for the low emission tune-up and diagnosis under R18-2-1010(A) shall be included. Money paid for correcting equipment tampering shall not be included.
 4. Approved repairs performed by the same recognized repair facility that performed the low emission tune-up and diagnosis.
 5. Repairs verified at a Department waiver facility during reinspection within 7 days of completion of the repair.
- E.** The maximum grant amounts are:
1. One hundred dollars for a 1967 through 1974 model year vehicle.
 2. One hundred fifty dollars for a 1975 through 1979 model year vehicle.
 3. Two hundred twenty-five dollars for a 1980 and newer model year vehicle.

R18-2-1015. On-road Testing; High Emissions Identifications

- A.** The Director shall operate an on-road testing program in area A as a supplement to annual, biennial, and motor vehicle dealer emissions testing. The program shall consist of mobile remote sensing units to identify high emitting vehicles under pursuant to A.R.S. § 49-542.01. The Director may operate the program through ~~1~~ one or more contractors.
- B.** For the purposes of this Section, identification of a vehicle as exceeding emission standards shall consist of all of the following:
1. The vehicle shall be registered in area A on the date of the identification as shown in the MVD database by based upon the permanent address of the vehicle owner in the MVD database, and-
 2. The vehicle shall not have a waiver on record that allows the vehicle to exceed an emission standard for any of the pollutants identified as being exceeded.
 3. The vehicle is identified as having exceeded exceeding an HC or CO emission standard in Table 6 and does not have a waiver allowing the vehicle to exceed a standard for that pollutant. Each exceedance shall be linked photographically to a license plate and shall be linked to a particular vehicle by the VIN of the vehicle registered with the license plate as shown in the MVD database on the date of the identification.
 4. No conditions existed during the identification which, in the opinion of the inspector making the remote measurement, would lead to an invalid reading for the vehicle.
- C.** An identification of a vehicle as having exceeded an emissions standard shall be counted as a second identification if the same vehicle exceeded the same standard in a previous identification, and a time period has elapsed between the two identifications which is greater than 30 days and less than 12 months and during which there is no record of a passed emission test for the vehicle.
- C. D.** Any letter Notice sent by the Department to the vehicle's registered owner requiring an emissions test pursuant to a remote sensing after an identification shall indicate state whether or not the required test may also be used for the purpose of complying with registration or reregistration requirements for that vehicle under pursuant to A.R.S. § 49-542(C), and if

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~~so, The notice shall indicate the time period within which the test must take place for it to be used to also comply with the for registration requirements.~~

~~**D. E.** An emission test that is required after pursuant to a remote sensing identification shall be performed at a state station or waiver station under pursuant to R18-2-1006 and shall not require payment of the applicable any test fee unless the test can be used for the purpose of complying with registration or reregistration requirements pursuant to A.R.S. § 49-542(C). One reinspection shall be provided free of charge as specified in R18-2-1012(D). To be tested without a fee pursuant to this Section, the vehicle shall be presented for testing with the letter from the Department requiring the vehicle to be tested and with evidence of any repairs or adjustments that have taken place subsequent to the last identification. Failure of an emission test that is required pursuant to a remote sensing identification A vehicle identified under this Section that fails the required emission test shall require the vehicle to be repaired and pass reinspection or to receive a waiver from any emission standards not complied with within 30 days of the initial test to avoid suspension of registration to meet the requirements of A.R.S. § 49-542(B). One reinspection shall be free as provided in R18-2-1012(D).~~

~~**F.** For 24 months after the effective date of this Section, the emission standards for each vehicle type in Table 6 may be adjusted according to the following procedures:~~

- ~~1. A standard shall be raised by 10% relative if there have been 50 or more vehicles in the vehicle type that have taken an initial emission test pursuant to a remote sensing identification using that emission standard and for which the Director has determined that no repair or adjustment has taken place since the last identification, and five percent or more of the sample passed the test.~~
- ~~2. A standard shall be lowered by 10% relative if both subparagraphs (a) and (b) are satisfied:
 - ~~a. The Director determines that the rate of vehicles in any vehicle type being identified as high emitters for the standard is less than half the failure rate for the pollutant in the last complete calendar month for the official I/M emissions test, and~~
 - ~~b. There have been 50 or more vehicles in the vehicle type that have taken an initial emission test pursuant to a remote sensing identification using that emission standard and for which the Director has determined that no repair or adjustment has taken place since the last identification and less than one percent of the sample passed the test.~~~~

R18-2-1031. Standards for Evaluating the Oxidation Efficiency of a Aftermarket Catalytic Converters~~Converter~~

~~**A.** All new aftermarket converters that are installed shall meet the following standards:~~

- ~~1. The converters require limited vehicle durability testing by the converter manufacturer on worst case vehicles in each application category and the converters shall meet the exhaust emissions control efficiency requirements listed at Table 7. The converter manufacturer shall demonstrate that the converters meet the applicable performance standards described in this subsection after 25,000 miles, which is considered half their useful lives.~~
- ~~2. Two vehicles in each application category are required to conduct the mileage accumulation and testing. The application category shall be identified by the converter manufacturer. Application category can refer to the types of vehicles and/or engines the converters are to be installed on, or the types of OEM converters the aftermarket converters are to replace. In addition, the converters must be identified as one of the following:
 - ~~a. Oxidation converter;~~
 - ~~b. Three-way converter; or~~
 - ~~c. Three-way plus oxidation converter.~~~~
- ~~3. The vehicles for which the converter is an appropriate installation shall be identified by the converter manufacturer. The converter manufacturers shall supply this information with each converter so that the installer can easily and clearly know the vehicle application.~~
- ~~4. The worst case vehicles in each application category shall be tested by the converter manufacturer. Absent any information supplied by the converter manufacturer, the worst case for each application category shall be the highest test weight/largest engine displacement within the application category. This combination is determined by selecting the largest engine displacement within the highest test weight class. Test weight is described in Title 40 Code of Federal Regulations, Section 86.129-80, which, as amended as of November 14, 1978, is hereby adopted and incorporated herein by reference and is on file with the Department and the Office of the Secretary of State.~~
- ~~5. Durability mileage accumulation shall be conducted on at least two test converters for 25,000 miles each, using the mileage cycle for track mileage accumulation in Appendix IV of Title 40 Code of Federal Regulations, part 86, which as amended as of June 28, 1977, is hereby adopted and incorporated herein by reference and is on file with the Department and the Office of the Secretary of State, or one that is typical of in-use operation and equal to that cycle for road mileage accumulation. Commercially available unleaded fuel and oils of the grade and quality specified by the manufacturers in the owner's manual shall be used. The vehicles shall be set to manufacturer's specifications, equipped with the test converters for the entire mileage accumulation and records of all vehicle and engine maintenance shall be kept. No maintenance of the converters is permitted. Different vehicles may be used for mileage accumulation and testing if they are equal with respect to emission related parameters (i.e., "slave" vehicles may be used for testing).~~

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6. As an alternative to vehicle mileage accumulation, accelerated bench testing which simulates the 25,000 miles accumulation may be used if it can be demonstrated to the state of Arizona and to the United States Environmental Protection Agency in advance that the procedures are at least as stringent as vehicle mileage accumulation.
7. At the end of the mileage accumulation, two cold start Federal Test Procedures tests (including the heat build portion of the evaporative test) described in Title 40 Code of Federal Regulations Sections 86-130-78, 131-78, 132-82, 133-78, and 135-82, which, as amended as of June 28, 1977, March 5, 1980, November 16, 1983, and December 10, 1984, respectively, are hereby adopted and incorporated herein by reference and are on file with the Department and the Office of the Secretary of State, shall be performed on each vehicle. The pair of test results shall be considered consistent if they are within 10% for HC and CO and 15% for nitrogen oxides. If the results are consistent, the results shall be averaged to obtain the with converter emissions. If the pair are not consistent, i.e., not within 10% for HC and CO and 15% for nitrogen oxides, a third test shall be run. The results of the third test may be averaged with either of the first two tests if the resulting pair is consistent, i.e., within 10% for HC and CO and 15% for nitrogen oxides. If the third test does not result in a consistent pair, then the design shall not be acceptable unless the manufacturer can demonstrate to the state of Arizona's and to the United States Environmental Protection Agency's satisfaction that the first three tests were not repeatable due to nonconverter problems (e.g., test equipment, etc.) and that there is repeatability on subsequent tests.
8. If the with converter tests produce a consistent pair, the aftermarket converter shall then be removed and replaced with an exhaust pipe which adequately simulates the exhaust backpressure characteristics of the converter. No other maintenance or modification to the vehicles is permitted between with and without converter configurations. Two more cold-start Federal Test Procedures tests shall be run on each vehicle with the converter removed. The results shall be averaged (if they meet the consistency requirements described in paragraph (A)(7) of this subsection) to obtain the without converter baseline values.
9. The converter efficiency shall be determined using the following formula:

$$\text{Efficiency} = 100 \frac{(\text{emissions without converter} - \text{emissions with converter})}{\text{emissions without converter}}$$

In order to be an acceptable converter, the converter efficiency determined above must be greater than or equal to the values shown in Table 7 for each of the 2 converters.

TABLE 7

	Minimum efficiency for (in percent)		
	HC	CO	NO _x
Oxidation converter	70	70	(*)
Three-way converter	70	70	30
Three-way-plus-oxidation	70	70	30

*No requirement

10. Converters produced after the qualification process has been successfully completed shall be identical to the qualified converters in all material respects. A listing of these characteristics and the information to be supplied to the state of Arizona and the United States Environmental Protection Agency shall include the following:
 - a. Catalyst supplier and address;
 - b. General type of converter (e.g., oxidation, reduction, three-way, etc.);
 - c. Number of each type of catalyst used per can (each individual monolith unit or "biscuit" is considered to be a separate catalyst for purposes of determining the number of catalysts per can);
 - d. Substrate (e.g., monolithic, pelleted) — configuration construction technique (e.g., extruded, laid-up, formed, Dravo disk, etc.), composition, supplier and address, and composition of active constituents in substrate (grams or troy ounces). For monolithic substrates, also specify the number of cells per square inch of frontal area and design tolerances and the nominal cell wall thickness (e.g., in mils). For pelleted substrates, also specify the pellet shape and dimensions, pellet bulk density, the type of pellet used (e.g., Rh or Pt/Pd), the geometrical distribution of pellets (if applicable), and (if this is controlled in production) the mean impregnation depth (e.g., in microns) of active materials including production tolerances;
 - e. Composition of active constituents, and total active material loading (grams or troy oz) in washcoat;
 - f. Composition of active constituents, loading of each active material (including design tolerances), and total active material loading (including design tolerances) in grams or troy oz;
 - g. Container dimensions, including volume, materials used, technique of containment and restraint, method of constructing container, canner (if different from catalyst supplier), and insulation and shielding (converter and/or vehicle);

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- h. Physical description of the converter, including dimensions (e.g., length, width, height, etc.) weight (lbs), volume (including design tolerances), active surface area (BET), and total active surface area (including design tolerances):
11. The converter manufacturer shall enclose with each converter a statement that it has been designed and manufactured to meet the United States Environmental Protection Agency emission reduction requirements for the designated type of converter and shall warrant that when the vehicle is properly maintained, the converter will meet the emission reduction requirements specified in paragraph (A)(9) of this subsection for 25,000 miles and that the converter will not constitute a safety hazard.
 12. To ensure that new aftermarket converters have adequate external durability which will make them effective alternatives to OEM converters, the converter manufacturer shall design and warrant the external converter shell, including the end pipes, to last for five years or 50,000 miles (whichever comes first) from the date of installation.
 13. The converter manufacturer shall enclose with each converter the specific vehicle applications of that converter and a warranty application card to be returned to the converter manufacturer which shall include the vehicle owner's name and address, phone number, the make, model, year and mileage of the vehicle, the date of installation, the installing dealer's name and address, and the part numbers installed. A catalytic converter manufacturer may satisfy the vehicle applications information requirement of this paragraph with an aftermarket catalytic converter catalog if the manufacturer makes such catalog readily available to installers, retail customers, and the Department. All such cards or applications must be retained by the converter manufacturer for a period of five years.
 14. New converter manufacturers selling in Arizona shall report to the state of Arizona and the United States Environmental Protection Agency semiannually, the information contained on the warranty cards received and the number of each type of converter produced during the period. The warranty card information shall consist of either a listing of the names and addresses of dealerships purchasing new converters and the number of each type of converter sold or installed by each dealer, or copies of all completed warranty cards received by the manufacturer. In either case, such information shall be submitted within 30 days of the end of each period. The reporting periods shall end on June 30 and December 31 of each year.
- B.** All reconditioned OEM converters shall meet the following standards:
1. Only used OEM converters can qualify under this subsection.
 2. The converter shall be structurally sound. There shall be no leak paths in the can, and the can shall have acceptable backpressure characteristics, i.e., not be plugged. The substrate shall be sound, shall not be melted or attrited and shall not rattle.
 3. A reconditioned converter shall be subjected to a performance test as follows: A converter originally at room temperature shall be subjected to an exhaust flow of known composition and temperature. The converter parameters of light off and stabilized efficiency shall be measured on the same test. Each converter shall be tested and the exhaust gas constituents shall be read before and after the converter. Converter efficiency values for HC and CO conversion shall be computed at 120 seconds and 200 seconds. A light off test and stabilized efficiency test shall be performed consecutively. The exhaust shall be set to the control parameters while bypassing the converter through a pipe set to a backpressure equal to the test system. At time = zero, the exhaust stream shall be switched into the converter system and a strip chart shall record exhaust gas constituents (before and after the converter) versus time. From this chart the conversion efficiency vs. time curve shall be established. Each converter shall meet all applicable requirements in Table 8.

TABLE 8. — LIGHT OFF AND STABILIZED CONVERSION
 EFFICIENCY VALUES FOR USED OEM CONVERTERS
 (In percent)

Converter Type	Minimum efficiency at 120 seconds		Minimum efficiency at 200 seconds	
	HC	CO	HC	CO
Oxidation	50	50	75	75
Three Way	50	50	75	75
Three way plus oxidation	50	50	75	75

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The control parameters for this test are:-

- a. Engine type and displacement: V 8, 350 to 360 CID.-
- b. Engine speed: 1800 ±20 RPM.-
- e. Converter inlet CO: 2% ±0.05% CO.—
- d. Converter inlet temperature: 730 ±30°F (set using engine load)-
- e. Air injection pump: 20 CID, (maximum)-
- f. Air injection drive ratio: 1.5:1 (maximum)-
- g. Converter mounting: The converter shall not be located closer than 2 feet from the location in the exhaust system where the exhaust from the 2 engine banks is joined together.-
- h. Converter pretest temperature: 90°F (Maximum normally, 100°F if room temperature makes it necessary due to outside ambient temperatures above 90°F)-

- 4. At the option of the converter remanufacturer, small size converters (less than 100 cubic inches of converter volume) may be tested using a smaller engine if the oxygen concentration at the converter inlet is five percent ± 0.5 percent, and the converter space velocity is not less than 25,000 hr⁻¹.
 - 5. The converter remanufacturer shall enclose with each reconditioned converter a statement that it has been tested according to the test procedures contained in this subsection for reconditioned converters and meets all applicable requirements at the time of testing.
 - 6. The converter remanufacturer shall enclose with each reconditioned converter the specific application of that converter.
 - 7. The converter remanufacturer shall report to the state of Arizona and to the United States Environmental Protection Agency on a semiannual basis the names and complete addresses of the persons or companies in Arizona to whom it distributes along with the number of each type of converter sold to each. This information shall be submitted within 30 days of the end of each period. The reporting periods shall end on June 30 and December 31 of each year.
 - 8. Used OEM catalytic converters that meet the performance test specified at Table 8 shall be considered used OEM reconditioned equivalent.
- C.** Labeling. The new aftermarket converter manufacturer or OEM remanufacturer shall label each new or reconditioned converter with a visible, permanent, nondestructible label or stamp, which will identify the manufacturer's code (to be issued by the United States Environmental Protection Agency when requested by letter), vehicle application code (to be supplied by the manufacturer to the state of Arizona and the United States Environmental Protection Agency), the month and year of manufacture or remanufacture, and information about whether the converter is new or reconditioned. The label information shall be in the following formats:
- 1. New converters — N/XX/YYYY/ZZZZ
 - 2. Reconditioned converters — U/XX/YYYY/ZZZZ
- N — is for a new converter designation,
U — is for a reconditioned converter designation,
XX — is the manufacturer code issued by the United States Environmental Protection Agency and provided to the state of Arizona by the converter manufacturer or remanufacturer,
YYYY — is to be a numerical designation of the vehicle application,
ZZZZ — is the month and year of manufacture (i.e., "0187" for January, 1987).
- D.** Notification of state of Arizona and United States Environmental Protection Agency by catalyst manufacturers and remanufacturers. Any converter manufacturer or remanufacturer which markets converters pursuant to these standards must notify the Department and the United States Environmental Protection Agency of its intent to do so 30 days prior to the actual introduction of each product line. New converter manufacturers must include or have submitted a summary of test results including vehicles tested, method of mileage accumulation, name and location of testing facility, test results, intended vehicle application, and the converter information specified in R18-2-1031(A)(10). Reconditioned converter remanufacturers must include a description of the test facility and its location and the intended vehicle applications of the converter. The information shall be sent to Vehicle Emissions Inspection, 600 North 40th Street, Phoenix, Arizona 85008. Manufacturers and remanufacturers shall include any other information which they deem relevant to a determination that the subject converters meet the requirements set forth in this Section.
- E.** Notification of dealers and distributors by converter manufacturers and remanufacturers. Any converter manufacturer or remanufacturer which markets under this Article shall have a system in place to notify and shall notify all of its known dealers and distributors of the proper installation requirements and restrictions which are applicable to the use of its converters. If the manufacturer or remanufacturer is notified by the United States Environmental Protection Agency or the Department that converters produced or sold by it do not meet the applicable acceptance criteria described in this Section, the manufacturer or remanufacturer shall promptly notify all of its known dealers and distributors of that fact and that the continued installation of the affected converters may be considered to be violations of the vehicle emission laws of the state of Arizona.

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- ~~F.~~ It shall be unlawful to sell, distribute, or install in the state of Arizona new aftermarket or reconditioned OEM catalytic converters that do not meet the standards set forth in this Section.
- A.** Except for a vehicle requiring an Idle-Only Inspection, a gasoline-powered vehicle requiring a catalytic converter test under R18-2-1008(C) shall be tested using the following Catalyst Efficiency Test Procedure:
1. Immediately after a vehicle completes an Inspection and Maintenance (I/M) test in the waiver lane, the exhaust sampling cone shall be removed from the tailpipe. The vehicle shall remain on the dynamometer with the engine idling and the transmission in neutral. The vehicle engine must be at normal operating temperature.
 2. For the catalyst test, the dynamometer and the constant volume sampler shall remain at the settings used for the vehicle's I/M test.
 3. The inspector shall insert the sampling tube for the A/F analyzer into the tailpipe of the vehicle.
 4. The inspector shall accelerate the vehicle to 40 ± 2.5 MPH and maintain a steady-state operating mode for the duration of the test. Once the vehicle obtains the test speed, the test shall begin.
 5. Once the test begins, a 2-minute stabilization period shall take place, during which the inspector shall monitor the A/F analyzer to ensure that the A/F is 14.0 or greater. If the mean A/F is less than 14.0, the inspector shall abort the test.
 6. If the A/F is 14.0 or greater, the exhaust sampling cone shall be repositioned for exhaust sampling.
 7. After the stabilization period ends, the total hydrocarbon and methane concentrations and the A/F ratio shall be continuously recorded for 2 minutes.
 8. At the end of the 2-minute sampling period, the inspector shall stop the vehicle, remove the exhaust sampling cone and the A/F analyzer sampling probe from the tailpipe, and remove the vehicle from the dynamometer.
 9. The mean total hydrocarbon concentration shall be divided by the mean methane concentration for the recorded values of the test, to produce a ratio (R) of total hydrocarbon to methane. The ratio, R, shall be applied to the formula: Catalyst Efficiency (%) = -3 (R) + 100.
 10. A vehicle passes the test if the Catalyst Efficiency (%) is 75% or greater.
 11. The test result for a non-passing vehicle with a mean A/F equal to, or less than, 14.3 shall be inconclusive.
 12. A vehicle fails the Catalyst Efficiency Test Procedure if the A/F is greater than 14.3 and the Catalyst Efficiency (%) is less than 75%. The failing vehicle cannot be granted a waiver according to R18-2-1008(C)(1).
- B.** Analytical equipment required to perform the Catalyst Efficiency Test Procedure shall meet the following requirements:
1. Analyzer Specifications:
 - a. An analyzer shall meet performance specifications of 40 CFR 86 subparts B, D, and N with respect to accuracy, precision, drift, interference, and noise. 40 CFR, subparts B, D, and N, adopted as of July 1, 1998, are incorporated by reference and on file with the Department and the Secretary of State. This incorporation contains no future editions or amendments. A copy of this referenced material may be obtained from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop SSOP, Washington D.C. 20402-9328.
 - b. Total hydrocarbon analysis shall be determined by a flame ionization detector. The analyzer shall be single range with a calibration curve covering at least 0 to 300 ppm carbon.
 - c. Methane analysis shall be determined by a flame ionization detector equipped with a non-methane cutter capable of oxidizing 98% of the hydrocarbons (except methane) while more than 90% of the methane remains unchanged. The analyzer shall be single range with a calibration curve covering at least 0 to 30 ppm.
 - d. Engine A/F mixture analysis shall be determined by a Universal Exhaust Gas Oxygen Sensor. The range shall be 8.0 to 25.5 A/F for gasoline with an accuracy of ±2% of point and a response time of less than 150 milliseconds.
 2. Analyzer Performance Verification and Calibration:
 - a. The operator of an analyzer under this Section shall verify analyzer performance according to manufacturer recommendations.
 - b. Upon initial installation, and monthly thereafter, the operator of an analyzer under this Section shall generate a 10-point calibration curve for each total hydrocarbon and methane analyzer. A gas divider employing equally spaced points may be used to generate the calibration curve.
 - i. Each calibration curve generated shall fit the data within ± 2.0% at each calibration point.
 - ii. Each calibration curve shall be verified for each analyzer with a confirming calibration standard between 15-80% of full scale that is not used for curve generation. Each confirming standard shall be measured by the curve within ± 2.5%.

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TABLE 3. EMISSION STANDARDS—BIENNIAL TESTS

START-UP STANDARDS (To be used during calendar years 1995 and 1996 unless adjusted pursuant to R18-2-1006(J). Standards are in grams per mile.)

(i) Light Duty Vehicles						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1991+—	1.20	0.75	20.0	16.0	2.5	(Reserved)
1983-1990	2.00	1.25	30.0	24.0	3.0	(Reserved)
1981-1982	2.00	1.25	60.0	48.0	3.0	(Reserved)
(ii) High-Altitude Light Duty Vehicles						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1983-1984	2.00	1.25	60.0	48.0	3.0	(Reserved)
1982	2.00	1.25	75.0	60.0	3.0	(Reserved)
(iii) Light Duty Trucks 1 (less than 6000 pounds GVWR)						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1991+	2.40	1.50	60.0	48.0	3.0	(Reserved)
1988-1990	3.20	2.00	80.0	64.0	3.5	(Reserved)
1984-1987	3.20	2.00	80.0	64.0	7.0	(Reserved)
1981-1983	7.50	5.00	100.0	80.0	7.0	(Reserved)
(iv) High-Altitude Light Duty Trucks 1 (less than 6000 pounds GVWR)						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1991+	3.00	2.00	70.0	56.0	3.0	(Reserved)
1988-1990	4.00	2.50	90.0	72.0	3.5	(Reserved)
1984-1987	4.00	2.50	90.0	72.0	7.0	(Reserved)
1982-1983	8.00	5.00	130.0	104.0	7.0	(Reserved)
(v) Light Duty Trucks 2 (greater than 6000 pounds GVWR)						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1991+	2.40	1.50	60.0	48.0	4.5	(Reserved)
1988-1990	3.20	2.00	80.0	64.0	5.0	(Reserved)
1984-1987	3.20	2.00	80.0	64.0	7.0	(Reserved)
1981-1983	7.50	5.00	100.0	80.0	7.0	(Reserved)
(vi) High-Altitude Light Duty Trucks 2 (greater than 6000 pounds GVWR)						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1991+	3.00	2.00	70.0	56.0	4.5	(Reserved)
1988-1990	4.00	2.50	90.0	72.0	5.0	(Reserved)
1984-1987	4.00	2.50	90.0	72.0	7.0	(Reserved)
1982-1983	8.00	5.00	130.0	104.0	7.0	(Reserved)
FINAL STANDARDS (To be used beginning January 1, 1997. Standards are in grams per mile.)						
(i) Light Duty Vehicles						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1996+	0.60	0.40	10.0	8.0	1.5	(Reserved)
1983-1995	0.80	0.50	15.0	12.0	2.0	(Reserved)
1981-1982	0.80	0.50	30.0	24.0	2.0	(Reserved)
(ii) High-Altitude Light Duty Vehicles						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1983-1984	1.20	0.75	30.0	24.0	2.0	(Reserved)
1982	1.20	0.75	45.0	36.0	2.0	(Reserved)
(iii) Light Duty Trucks 1 (less than 6000 pounds GVWR)						
Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1996+						
(≤3750 LVW)	0.60	0.40	10.0	8.0	1.5	(Reserved)
(>3750 LVW)	0.80	0.50	13.0	10.0	1.8	(Reserved)
1988-1995	1.60	1.00	40.0	32.0	2.5	(Reserved)
1984-1987	1.60	1.00	40.0	32.0	4.5	(Reserved)
1981-1983	3.40	2.00	70.0	56.0	4.5	(Reserved)
(iv) High-Altitude Light Duty Trucks 1 (less than 6000 pounds GVWR)						

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Model Years	Hydrocarbons-		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1988+	2.00	1.25	60.0	48.0	2.5	(Reserved)
1984-1987	2.00	1.25	60.0	48.0	4.5	(Reserved)
1982-1983	4.00	2.50	90.0	72.0	4.5	(Reserved)
(v) Light Duty Trucks 2 (greater than 6000 pounds GVWR)						
Model Years	Hydrocarbons-		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1996+						
(≤5750 LVW)	0.80	0.50	13.0	10.0	1.8	(Reserved)
(>5750 LVW)	0.80	0.50	15.0	12.0	2.0	(Reserved)
1988-1995	1.60	1.00	40.0	32.0	3.5	(Reserved)
1984-1987	1.60	1.00	40.0	32.0	4.5	(Reserved)
1981-1983	3.40	2.00	70.0	56.0	4.5	(Reserved)
(vi) High Altitude Light Duty Trucks 2 (greater than 6000 pounds GVWR)						
Model Years	Hydrocarbons-		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
1988+	2.00	1.25	60.0	48.0	3.5	(Reserved)
1984-1987	2.00	1.25	60.0	48.0	4.5	(Reserved)
1982-1983	4.00	2.50	90.0	72.0	4.5	(Reserved)

TABLE 3. EMISSION STANDARDS - BIENNIAL TESTS

FINAL STANDARDS (Standards are in grams per mile)

(i) Light Duty Vehicles

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
<u>1981-1982</u>	<u>3.0</u>	<u>2.5</u>	<u>25.0</u>	<u>21.8</u>	<u>3.5</u>	<u>3.4</u>
<u>1983-1985</u>	<u>2.4</u>	<u>2.0</u>	<u>20.0</u>	<u>17.3</u>	<u>3.5</u>	<u>3.4</u>
<u>1986-1989</u>	<u>1.6</u>	<u>1.4</u>	<u>15.0</u>	<u>12.8</u>	<u>2.5</u>	<u>2.4</u>
<u>1990-1993</u>	<u>1.0</u>	<u>0.8</u>	<u>12.0</u>	<u>10.1</u>	<u>2.5</u>	<u>2.4</u>
<u>1994+</u>	<u>0.8</u>	<u>0.7</u>	<u>12.0</u>	<u>10.1</u>	<u>2.0</u>	<u>1.9</u>

(ii) Light Duty Trucks 1 (less than 6000 pounds GVWR)

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
<u>1981-1985</u>	<u>4.0</u>	<u>3.4</u>	<u>40.0</u>	<u>35.3</u>	<u>5.5</u>	<u>5.4</u>
<u>1986-1989</u>	<u>3.0</u>	<u>2.5</u>	<u>25.0</u>	<u>21.8</u>	<u>4.5</u>	<u>4.4</u>
<u>1990-1993</u>	<u>2.0</u>	<u>1.7</u>	<u>20.0</u>	<u>17.3</u>	<u>4.0</u>	<u>3.9</u>
<u>1994+</u>	<u>1.6</u>	<u>1.4</u>	<u>20.0</u>	<u>17.3</u>	<u>3.0</u>	<u>2.9</u>

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR)

Model Years	Hydrocarbons		Carbon Monoxide		Oxides of Nitrogen	
	Composite	Phase 2	Composite	Phase 2	Composite	Phase 2
<u>1981-1985</u>	<u>4.4</u>	<u>3.7</u>	<u>48.0</u>	<u>42.5</u>	<u>7.0</u>	<u>6.9</u>
<u>1986-1987</u>	<u>4.0</u>	<u>3.4</u>	<u>40.0</u>	<u>35.3</u>	<u>5.5</u>	<u>5.4</u>
<u>1988-1989</u>	<u>3.0</u>	<u>2.5</u>	<u>25.0</u>	<u>21.8</u>	<u>5.5</u>	<u>5.4</u>
<u>1990-1993</u>	<u>3.0</u>	<u>2.5</u>	<u>25.0</u>	<u>21.8</u>	<u>5.0</u>	<u>4.9</u>
<u>1994+</u>	<u>2.4</u>	<u>2.0</u>	<u>25.0</u>	<u>21.8</u>	<u>4.0</u>	<u>3.9</u>

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Table 4. TRANSIENT DRIVING CYCLE

Time second	Speed mph	Time second	Speed mph	Time second	Speed mph	Time second	Speed mph	Time second	Speed mph
0	0	48	25.7	96	0	144	24.6	192	54.6
1	0	49	26.1	97	0	145	24.6	193	54.8
2	0	50	26.7	98	3.3	146	25.1	194	55.1
3	0	51	27.5	99	6.6	147	25.6	195	55.5
4	0	52	28.6	100	9.9	148	25.7	196	55.7
5	3	53	29.3	101	13.2	149	25.4	197	56.1
6	5.9	54	29.8	102	16.5	150	24.9	198	56.3
7	8.6	55	30.1	103	19.8	151	25	199	56.6
8	11.5	56	30.4	104	22.2	152	25.4	200	56.7
9	14.3	57	30.7	105	24.3	153	26	201	56.7
10	16.9	58	30.7	106	25.8	154	26	202	56.3
11	17.3	59	30.5	107	26.4	155	25.7	203	56
12	18.1	60	30.4	108	25.7	156	26.1	204	55
13	20.7	61	30.3	109	25.1	157	26.7	205	53.4
14	21.7	62	30.4	110	24.7	158	27.3	206	51.6
15	22.4	63	30.8	111	25.2	159	30.5	207	51.8
16	22.5	64	30.4	112	25.4	160	33.5	208	52.1
17	22.1	65	29.9	113	27.2	161	36.2	209	52.5
18	21.5	66	29.5	114	26.5	162	37.3	210	53
19	20.9	67	29.8	115	24	163	39.3	211	53.5
20	20.4	68	30.3	116	22.7	164	40.5	212	54
21	19.8	69	30.7	117	19.4	165	42.1	213	54.9
22	17	70	30.9	118	17.7	166	43.5	214	55.4
23	14.9	71	31	119	17.2	167	45.1	215	55.6
24	14.9	72	30.9	120	18.1	168	46	216	56
25	15.2	73	30.4	121	18.6	169	46.8	217	56
26	15.5	74	29.8	122	20	170	47.5	218	55.8
27	16	75	29.9	123	20.7	171	47.5	219	55.2
28	17.1	76	30.2	124	21.7	172	47.3	220	54.5
29	19.1	77	30.7	125	22.4	173	47.2	221	53.6
30	21.1	78	31.2	126	22.5	174	47.2	222	52.5
31	22.7	79	31.8	127	22.1	175	47.4	223	51.5
32	22.9	80	32.2	128	21.5	176	47.9	224	50.5
33	22.7	81	32.4	129	20.9	177	48.5	225	48
34	22.6	82	32.2	130	20.4	178	49.1	226	44.5
35	21.3	83	31.7	131	19.8	179	49.5	227	41
36	19	84	28.6	132	17	180	50	228	37.5
37	17.1	85	25.1	133	17.1	181	50.6	229	34
38	15.8	86	21.6	134	15.8	182	51	230	30.5
39	15.8	87	18.1	135	15.8	183	51	231	27
40	17.7	88	14.6	136	17.7	184	52.2	232	23.5
41	19.8	89	11.1	137	19.8	185	53.2	233	20
42	21.6	90	7.6	138	21.6	186	54.1	234	16.5
43	23.2	91	4.1	139	22.2	187	54.6	235	13
44	24.2	92	0.6	140	24.5	188	54.9	236	9.5
45	24.6	93	0	141	24.7	189	55	237	6
46	24.9	94	0	142	24.8	190	54.9	238	2.5
47	25	95	0	143	24.7	191	54.6	239	0

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TABLE 4. TRANSIENT DRIVING CYCLE

<u>Time second</u>	<u>Speed mph</u>	<u>Time second</u>	<u>Speed mph</u>	<u>Time second</u>	<u>Speed mph</u>	<u>Time second</u>	<u>Speed mph</u>	<u>Time second</u>	<u>Speed mph</u>
0	0	30	20.7	60	26	90	51.5	120	54.9
1	0	31	21.7	61	26	91	52.2	121	55.4
2	0	32	22.4	62	25.7	92	53.2	122	55.6
3	0	33	22.5	63	26.1	93	54.1	123	56
4	0	34	22.1	64	26.5	94	54.6	124	56
5	3.3	35	21.5	65	27.3	95	54.9	125	55.8
6	6.6	36	20.9	66	30.5	96	55	126	55.2
7	9.9	37	20.4	67	33.5	97	54.9	127	54.5
8	13.2	38	19.8	68	36.2	98	54.6	128	53.6
9	16.5	39	17	69	37.3	99	54.6	129	52.5
10	19.8	40	17.1	70	39.3	100	54.8	130	51.5
11	22.2	41	15.8	71	40.5	101	55.1	131	50.8
12	24.3	42	15.8	72	42.1	102	55.5	132	48
13	25.8	43	17.7	73	43.5	103	55.7	133	44.5
14	26.4	44	19.8	74	45.1	104	56.1	134	41
15	25.7	45	21.6	75	46	105	56.3	135	37.5
16	25.1	46	22.2	76	46.8	106	56.6	136	34
17	24.7	47	24.5	77	47.5	107	56.7	137	30.5
18	25.2	48	24.7	78	47.5	108	56.7	138	27
19	25.4	49	24.8	79	47.3	109	56.3	139	23.5
20	27.2	50	24.7	80	47.2	110	56	140	20
21	26.5	51	24.6	81	47.2	111	55	141	16.5
22	24	52	24.6	82	47.4	112	53.4	142	13
23	22.7	53	25.1	83	47.9	113	51.6	143	9.5
24	19.4	54	25.6	84	48.5	114	51.8	144	6
25	17.7	55	25.7	85	49.1	115	52.1	145	2.5
26	17.2	56	25.4	86	49.5	116	52.5	146	0
27	18.1	57	24.9	87	50	117	53		
28	18.6	58	25	88	50.6	118	53.5		
29	20	59	25.4	89	51	119	54		

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TABLE 6. EMISSION STANDARDS — REMOTE SENSING IDENTIFICATIONS

(Unless adjusted pursuant to R18-2-1015(F))

Vehicle-Engine Type	Vehicle-Model Year	Gross Vehicle Weight Rating (Pounds)	Number of Cylinders	Remote	Remote
				-CO %	Sensing Standard HC ppm
4-stroke	1981 and newer	8500 or less	All	3.30	2000
4-stroke	1980	8500 or less	All	3.30	2000
4-stroke	1979	8500 or less	4 cylinders or less	3.80	2000
4-stroke	1979	8500 or less	More than 4 cylinders	3.60	2000
4-stroke	1981 and newer	Greater than 8500	All	5.10	2000
4-stroke	1979 and 1980	Greater than 8500	All	5.10	2000
4-stroke	1975-1978	6000 or less	4 cylinders or less	3.80	2000
4-stroke	1975-1978	6000 or less	More than 4 cylinders	3.60	2000
4-stroke	1975-1978	Greater than 6000	All	5.10	2000
4-stroke	1972-1974	All	4 cylinders or less	6.30	2000
4-stroke	1972-1974	All	More than 4 cylinders	5.90	2000
4-stroke	1967-1971	All	4 cylinders, or less	6.30	2000
4-stroke	1967-1971	All	More than 4 cylinders	5.90	2000
4-stroke	Reconstructed-1981 and newer	All	All	7.40	2000
4-stroke	Reconstructed-1980 and older	All	All	7.70	2000

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TABLE 6. EMISSION STANDARDS - REMOTE SENSING IDENTIFICATIONS

<u>Vehicle Engine Type</u>	<u>Vehicle Model Year</u>	<u>Gross Vehicle Weight Rating (Pounds)</u>	<u>Number of Cylinders</u>	<u>Remote Sensing Standard CO %</u>	<u>Remote Sensing Standard HC ppm</u>
<u>N/A</u>	<u>1991-9999</u>	<u>8500 or less</u>	<u>N/A</u>	<u>3.5</u>	<u>450</u>
<u>N/A</u>	<u>1983-1990</u>	<u>8500 or less</u>	<u>N/A</u>	<u>3.9</u>	<u>500</u>
<u>N/A</u>	<u>1981-1982</u>	<u>8500 or less</u>	<u>N/A</u>	<u>5.2</u>	<u>500</u>
<u>N/A</u>	<u>1991-1999</u>	<u>6000 or less</u>	<u>N/A</u>	<u>5.2</u>	<u>525</u>
<u>N/A</u>	<u>1988-1990</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1984-1987</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1981-1983</u>	<u>6000 or less</u>	<u>N/A</u>	<u>6.8</u>	<u>875</u>
<u>N/A</u>	<u>1991-9999</u>	<u>6000-8500</u>	<u>N/A</u>	<u>5.2</u>	<u>525</u>
<u>N/A</u>	<u>1988-1990</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1984-1987</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6</u>	<u>575</u>
<u>N/A</u>	<u>1981-1983</u>	<u>6000-8500</u>	<u>N/A</u>	<u>6.8</u>	<u>875</u>
<u>4-Stroke</u>	<u>1980+Newer</u>	<u>8500 or less</u>	<u>All</u>	<u>3.6</u>	<u>500</u>
<u>4-Stroke</u>	<u>1979+Newer</u>	<u>Greater than 8500</u>	<u>All</u>	<u>5.5</u>	<u>575</u>
<u>4-Stroke</u>	<u>1979</u>	<u>8500 or less</u>	<u>4 cylinders or less</u>	<u>4.1</u>	<u>500</u>
<u>4-Stroke</u>	<u>1979</u>	<u>8500 or less</u>	<u>More than 4 cylinders</u>	<u>3.9</u>	<u>500</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>6000 or less</u>	<u>4 cylinders or less</u>	<u>4.1</u>	<u>550</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>6000 or less</u>	<u>More than 4 cylinders</u>	<u>3.9</u>	<u>550</u>
<u>4-Stroke</u>	<u>1975-1978</u>	<u>Greater than 6000</u>	<u>All</u>	<u>5.5</u>	<u>600</u>
<u>4-Stroke</u>	<u>1972-1974</u>	<u>All</u>	<u>4 cylinders or less</u>	<u>6.7</u>	<u>650</u>
<u>4-Stroke</u>	<u>1972-1974</u>	<u>All</u>	<u>More than 4 cylinders</u>	<u>6.2</u>	<u>650</u>
<u>4-Stroke</u>	<u>1967-1971</u>	<u>All</u>	<u>4 cylinders or less</u>	<u>6.7</u>	<u>725</u>
<u>4-Stroke</u>	<u>1967-1971</u>	<u>All</u>	<u>More than 4 cylinders</u>	<u>6.2</u>	<u>675</u>
<u>4-Stroke</u>	<u>1981 and Newer, Reconstructed</u>	<u>All</u>	<u>All</u>	<u>7.8</u>	<u>875</u>
<u>4-Stroke</u>	<u>1980 and Older, Reconstructed</u>	<u>All</u>	<u>All</u>	<u>8.1</u>	<u>1225</u>