of burden hours relating to: (a) The Certification of Corrective Action, and (b) the Review and Signature of Driver Vehicle Inspection Reports. These differences, in aggregate, total 24,294,988 burden hours.

We particularly request comments on: Whether the collection of information is necessary for FMCSA to meet its goal of reducing truck crashes and its usefulness to this goal; the accuracy of the estimate of the burden of the information collection; ways to enhance the quality, utility and clarity of the information collected; and ways to minimize the burden of the collection of information on respondents, including using automated collection techniques or other forms of information technology.

Issued on: February 9, 2006.

Annette M. Sandberg,

Administrator.

[FR Doc. E6–2169 Filed 2–14–06; 8:45 am]

BILLING CODE 4910–EX–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA–2005–23470]

Model Specifications for Breath Alcohol Ignition Interlock Devices (BAIIDs)

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Request for comments.

SUMMARY: This notice seeks comments about what revisions are needed for the Model Specifications for Breath Alcohol Ignition Interlock Devices (Model Specifications) published by the National Highway Traffic Safety Administration (NHTSA) in the **Federal Register** on April 7, 1992 (57 FR 11772). Model specifications are guidelines for the performance and testing of breath alcohol ignition interlock devices (BAIIDs). These devices are designed to prevent a driver from starting a motor vehicle when the driver's breath alcohol content (BrAC) is at or above a set alcohol level. Because changes may be necessary after more than 13 years of experience with this technology, NHTSA is seeking comments regarding the need for revisions to the model specifications.

DATES: Written comments may be submitted to this agency and must be received by April 17, 2006.

ADDRESSES: Comments should refer to the docket number and be submitted (preferably in two copies) to: Docket Management, Room PL–401, 400 Seventh St., SW., Washington, DC 20590. Alternatively, you may submit your comments electronically by logging onto the Docket Management System (DMS) Web site at *http://dms.dot.gov.* Click on ''Help & Information'' or ''Help/Info'' to view instructions for filing your comments electronically. Regardless of how you submit your comments, you should mention the Docket number of this document. You may call the docket at (202) 366–9324. Docket hours are 9:30 a.m. to 4 p.m., Monday through Friday.

FOR FURTHER INFORMATION CONTACT: Dr. James F. Frank, Office of Research & Technology (NTS–131), National Highway Traffic Safety Administration, 400 Seventh St., SW., Washington, DC 20590. Telephone: (202) 366–5593.

SUPPLEMENTARY INFORMATION: On April 24, 1991 (56 FR 18857), NHTSA issued a notice and request for comments on proposed Model Specifications for Breath Alcohol Ignition Interlock Devices. BAIIDs are breath alcohol test instruments designed to allow a driver to start a motor vehicle when his/her BrAC is below a set alcohol level; conversely, the devices are designed to prevent a driver from starting a motor vehicle when his/her BrAC is at or above the set alcohol level.

As explained in the April 1991 notice, a number of States passed laws authorizing the use of ''certified'' BAIIDs, giving those States the responsibility for developing certification standards and test procedures. Consequently, a number of States and manufacturers of these ignition interlock devices requested that the Federal government develop and issue certification standards for BAIIDs. After receiving and considering comments, NHTSA adopted and published model specifications for BAIIDs in the **Federal Register** on April 7, 1992 (57 FR 11772).

Since publication, many States have incorporated these model specifications, or some variation of them, into their State certification requirements, thereby serving the purpose for which they were originally intended. Forty-three States allow the use of BAIIDs, and they are currently being used in connection with sanctions for Driving While Intoxicated (DWI). Persons required to use BAIIDs are either under the supervision of a responsible state agency (*e.g.*, a Motor Vehicle Administration) and/or under direct court supervision.

The experience of the last 13 years has shown that the issuance of model specifications and test procedures for BAIIDs has served to encourage a degree of consistency among the States while at the same time providing sufficient flexibility for States to address their individual needs or legislative requirements. The model specifications and test procedures were drafted in such a way to enable States to adopt them with minimal effort. However, the ignition interlock industry has matured, the technology has changed, and the technical and social environments have changed in the past 13 years. Therefore, it is NHTSA's view that revisions to the model specifications are appropriate.

NHTSA has not prepared a proposal for revised model specifications for BAIIDs at this time. Rather, NHTSA invites all interested parties to submit comments on what revisions are needed to update the model specifications. NHTSA is especially interested in obtaining comments from interested parties about the areas listed below. This notice also invites all interested parties to offer additional remarks, suggestions and commentary above and beyond the areas highlighted below:

(1) *Accuracy and precision requirements.* Are the current specifications for 90% accuracy at 0.01% w/v above the set point in the unstressed testing conditions, and 90% accuracy at 0.02% w/v above the set point in the stressed testing condition appropriate? Should the new model specifications change the set point from 0.025% w/v?

(2) *Sensor technology.* Should the model specifications limit sensor technology to alcohol-specific sensors? The model specifications currently include performance requirements but do not address what technology should be used to satisfy those performance requirements. In other words, the model specifications allow semi-conductor sensors, which were widely used during the early years after devices were first introduced into the marketplace. Alcohol-specific, fuel cell sensors appear to be more common today, but it is not clear whether the model specifications should limit devices to an alcohol-specific technology. NHTSA seeks comments regarding the advantages and disadvantages of limiting the model specifications to an alcohol-specific (fuel cell) technology, or other emerging technologies versus relying on performance requirements only.

(3) *Sample size requirements.* The model specifications set the minimum breath sampling size at 1.5 liters. Informal comments received over the years have indicated that this requirement may be too high. NHTSA will consider lowering the breath

sampling requirement, and/or including a requirement for both a minimum sample size and minimum back pressure at the input (mouthpiece) of the device. NHTSA requests comments regarding such a change.

(4) *Temperature extreme testing.* The model specifications call for testing at −40 °C, −20 °C, +70 °C and +85 °C, but allow for the removability of alcohol sensing unit so it may be kept warm (cool) when the vehicle is expected to be subject to extremely cold (hot) temperatures. NHTSA seeks comments about whether this approach to temperature extreme testing is sufficient, or whether more stringent demands should be made on equipment.

(5) *Radio Frequency Interference (RFI) or Electromagnetic Interference (EMI) testing.* The RFI testing protocol in the model specifications, however incomplete, uses power sources that are no longer commonly in use. New power sources (e.g., cell phones) that have output power commensurate with equipment in use today need to be identified. NHTSA welcomes comments suggesting appropriate levels of power for use in this RFI testing.

(6) *Circumvention testing.* The model specifications offer a number of procedures for evaluating whether existing devices can be easily circumvented. NHTSA seeks comments about whether these test procedures have proven adequate, or whether new or modified tests should be incorporated into the model specifications.

(7) *The Vehicle-Interlock Interface.* Anecdotal reports from ignition interlock manufacturers have suggested that it is sometimes difficult to install existing interlock systems in some of the newer electronic ignition systems. NHTSA seeks comments from all interested parties about whether NHTSA should establish any guidelines regarding the vehicle-interlock interface. More specifically, NHTSA invites comments regarding the feasibility and likelihood of incorporating generic hardware into vehicles to which commercially-available ignition interlocks could be connected.

(8) *Calibration stability.* NHTSA invites comments regarding whether the calibration stability testing is sufficient in length and/or whether ignition interlocks should be required to hold their calibration for longer periods of time, thereby requiring less frequent calibration checks.

(9) *Ready-to-use Times.* NHTSA seeks comments about whether it should establish a ''ready-to-use'' time period for extreme cold temperatures, such that devices must operate within a given period of time under extreme cold conditions.

(10) *NHTSA testing.* NHTSA seeks comments about whether it should undertake the responsibility for testing of ignition interlocks against its model specifications and subsequently publish a Conforming Products List (CPL) of devices meeting those NHTSA guidelines.

(11) *International Harmonization.* NHTSA seeks comments about the importance of the harmonization of the ignition interlock model specifications with standards in other parts of the world, such as the European Union, Canada, and Australia.

(12) *Specifications for Ignition Interlock Programs.* NHTSA seeks comments about whether the current ignition interlock community (users, manufacturers, states, etc.) favors NHTSA developing model specifications for ignition interlock programs, in addition to model specifications for devices.

(13) *Acceptance Testing.* NHTSA understands that its current model specifications involve ''type-testing'' of various models of BAIIDs. NHTSA seeks comments about establishing standardized acceptance-testing procedures, in addition to the current type-testing guidelines. It is not clear what testing might be included in such model specifications, or who would conduct the testing.

(14) NHTSA seeks comments from interested parties on any additional areas they believe will enhance the revision of the model specifications. This request for comments need not be limited to the 13 areas identified above.

In order to assist readers in preparing comments, the current model specifications are reprinted as an Appendix to this document.

Issued on: February 10, 2006.

Marilena Amoni,

Associate Administrator for Program Development and Delivery.

Appendix—Reprint From 57 FR 11774–11787 (April 7, 1992)

Model Specifications for Breath Alcohol Ignition Interlock Devices

Purpose and Scope

The purpose of these specifications is to establish performance criteria and methods of testing for breath alcohol ignition interlock devices (BAIID). BAIIDs are breath alcohol sensing instruments designed to be mounted in an automobile and connected to the ignition key switching system in a way that prevents the vehicle from starting unless the driver first provides a breath sample. These devices contain an instrument to measure the alcohol content of a deep lung breath sample. If the measured breath alcohol concentration (BrAC) is at or above a set level the ignition is locked and the vehicle will not start. These devices are currently being used as a court sanction. Drivers convicted of Driving While Intoxicated (DWI) may be required to use these devices on their car under court supervision. These specifications are intended for use in certification testing of BAIID's used under court supervision.

Definitions

D1 Alcohol

Ethanol; ethyl alcohol: (C_2H_5OH).

D2 BrAC

Breath Alcohol Concentration (BrAC) is expressed in percent weight by volume (% w/v) based upon grams of alcohol per 210 liters of breath in accordance with the Traffic Laws Annotated, Section 11–902.1(a) (Supp. 1983). A BrAC of 0.10% w/v means 0.10 grams of alcohol per 210 liters of breath (similarly, the Blood Alcohol Concentration or BAC associated with a BrAC of .10% w/v means .10 grams of alcohol per 100 milliliters of blood; except for the difference in the referenced volume measure—210 liters of breath vs. 100 ml of blood—the referenced grams of ethanol are identical). Alcohol concentrations in either breath or in air mixtures can be expressed in milligrams of alcohol per liter of air (mg/l); to convert mg/l to units of percent weight by volume, multiply by 0.21.

D3 BAIID (Breath Alcohol Ignition Interlock Devices)

These interlock devices are designed to allow a vehicle ignition switch to start the engine when the BrAC test result is below the alcohol setpoint, while locking the ignition when the breath test result is at or above the alcohol setpoint.

D4 Alcohol Setpoint

The Alcohol Setpoint is the Breath Alcohol Concentration at which the BAIID is set to lock the ignition. It should be noted that the alcohol setpoint is the nominal lockpoint at which the BAIID is set at the time of calibration.

Ideally, there should be no occasions when a person with zero BAC is blocked from starting a vehicle engine due to the interlock. Therefore, to help protect against the response of the alcohol sensor to vapors other than ethyl alcohol, such as tobacco smoke or mouthwash, and the natural production of gases by human subjects, some leeway is necessary at the low end. At the other extreme, a BAC of 0.05% w/v has been shown to produce evidence of behavioral impairment in some individuals, and in some parts of the country (e.g., Colorado and the District of Columbia) 0.05% w/v can be presumptive evidence of impairment and grounds for legal action. The setpoint must be between the limits of .00% and .05%.

With some known exceptions, use of a 0.025% w/v alcohol setpoint should minimize the possibility that users who have not recently ingested alcohol will have trouble starting their engines. A discussion of the rationale for selecting 0.025% can be found in section 4.1. State interlock program developers requiring use of these BAIIDs should be aware that even at BrACs which are lower than many states' mandated ''legal limit,'' some drivers will already have their driving ability impaired.

D5 Breath Sample

The breath sample is normal expired human breath containing primarily alveolar air from the deep lung. See section 4.2 for a more detailed discussion.

D6 Fail-Safe

When the BAIID device cannot operate properly due to some condition (e.g., improper voltage, temperature exceeding operating range, dead sensor etc.) the BAIID will not permit the vehicle to be started.

D7 Tampering and Circumvention

D7.1 Tampering

An overt, conscious attempt to physically disable or otherwise disconnect the BAIID from its power source and thereby allow a person with a BrAC above the setpoint to start the engine.

D7.2 Circumvention

An overt, conscious attempt to bypass the BAIID whether by providing samples other than the natural unfiltered breath of the driver, or by starting the car without using the ignition switch, or any other act intended to start the vehicle without first taking and passing a breath test, and thus permitting a driver with a BrAC in excess of the alcohol setpoint to start the vehicle.

D8 Safety and Utility

D8.1 Safety Feature

Any specification related to insuring that the BAIID will prevent a driver with a BrAC above the alcohol setpoint from driving.

D8.2 Utility Feature

Any specification related to insuring that the BAIID will function reliably and not interfere with driving by operators whose BrAC's are below the alcohol setpoint.

D8.3 Optional Feature

Any specification that is not specifically recommended at this time but may be necessary to include at some future issuance of certification specifications. Non-inclusion at this time is due to lack of evidence that failure to include constitutes a significant problem. Also the optional feature may, if implemented, cause the cost and complexity of the interlock device to rise substantially.

D9 Certification Tests

Tests performed to check the compliance of a product with these specifications.

D10 Stress Tests

Any testing protocol which imposes on the BAIID an environmental or use-related challenge, such as extreme temperatures, voltages, vibrations, or frequent usage.

D11 Filtered Air Samples

Any human breath sample that has intentionally been altered so as to remove alcohol from it.

D12 Device

A breath alcohol ignition interlock device (BAIID).

D13 False Negative

A breath alcohol concentration determination that incorrectly permits a vehicle to be started when the driver's BrAC is at or above the setpoint.

D14 False Positive

A breath alcohol concentration determination that incorrectly prevents the vehicle from being started when the driver's BrAC is below the setpoint.

Model Specifications and Test Requirements

1.0.S/T Safety Specifications (S) and Safety Tests (T)

1.1.S Dual Accuracy and Precision Limits (High End)

The accuracy and precision shall be determined as described in paragraphs 1.1.1.S to 1.1.4.S when tested in accordance with section 1.1.T.

The accuracy specifications for the BAIID will be different depending on the test interventions. Two conditions are recognized: unstressed and stressed.

1.1.1.S Baseline Accuracy in the Unstressed Condition

Following a calibration, and when tested at neutral ambient air temperature (10–30 °C), all BAIIDs shall lock the vehicle ignition 90% of the time when the true alcohol content of the breath sample is 0.01% w/v BrAC (0.01g ETOH/210 liters air) or more above the alcohol setpoint.

1.1.2.S Accuracy After One or More Stress Tests

Following any one or more Stress Tests in which the BAIID is subjected to conditions as specified in Definition D10, the BAIIDs shall lock the vehicle ignition 90% of the time when the true alcohol content of the breath sample is 0.02% w/v BrAC (0.02g ETOH/210 liters air) or more above the alcohol setpoint.

1.1.3.S Standard Deviation (Precision)

The accuracy requirement as specified in 1.1.1.S is equivalent to distributions of test results with a mean equal to the alcohol setpoint (e.g., 0.025% w/v), and a standard deviation equal to 0.0078% w/v BrAC. The accuracy requirement specified in 1.1.2.S is equivalent to a distribution of test results with a mean equal to the alcohol setpoint (e.g., 0.025% w/v) and a standard deviation equal to 0.0156%.

Accordingly, under 1.1.1.S, 0.01% w/v BrAC above the alcohol setpoint (90% criterion) is equal to approx. +1.28 standard deviations. Similarly, under 1.1.2.S 0.02% w/v BrAc above the alcohol setpoint (90%) criterion is equal to approx. +1.28 standard deviations. This value of standard deviation, derived from a table of cumulative normal probabilities can be regarded as equivalent to a one-tailed test of significance, and represent the *maximum allowable imprecision under conditions of perfect accuracy.* When there is analytic inaccuracy in addition to imprecision, the allowable standard deviation will be lower.

The stable criterion for all test purposes is set as 90% correct test outcomes at .01% w/v above the setpoint for Section 1.1.1.S and 90% correct outcomes for .02% w/v above the setpoint for Section 1.1.2.S.

1.1.4.S Proportions

The *safety* requirement must specify the proportion of tests at BrACs of .01% w/v or .02% w/v above the alcohol setpoint at which the ignition must be locked. The table below shows the 90% criterion for unstressed and post-stress testing.

TABLE 1.—TEST BRAC LEVEL AT WHICH THE IGNITION MUST BE LOCKED AT LEAST 90% OF THE TIME DEPENDING ON WHETHER TEST IS UNSTRESSED OR STRESSED

Alcohol setpoint	Test BrAC level (% w/v)	
	Unstressed	Stressed
0.025% w/v*	0.035	0.045

* Recommended.

Because the values referenced for allowable error (e.g., 90% criterion) are derived from a standard table of probabilities, values could also be specified for any point along the hypothetical normal distribution with mean equal to the setpoint. For example, testing a 99.5% lock criterion (2.57 standard deviations) for the unstressed and stressed tests (by using 0.045% and 0.055% w/v solutions respectively) would have no practical value because a real test of the criterion would require at least 200 repetitions in order to reliably detect 1 failure. Therefore all testing as specified in 1.1.T is referenced to a 90% lock certainty, requiring, as will be noted below, 20 test repetitions for which there may be no more than 2 failures.

A matrix of safety test requirements as specified in Appendix A shall be required for full certification of an interlock device. Accuracy of thermometers used to monitor simulator temperature and the purity of alcohol used shall be traceable to the National Institute of Standards and Technology (formerly National Bureau of Standards). All test reports must clearly specify the equipment used, the manufacturer, model number and calibration dates.

A qualified testing laboratory, chosen by a state to conduct these certification tests, shall be capable of establishing their own procedures. For reference, however, Appendix B contains the list of equipment, setup procedures for testing, and a protocol for mixing alcohol test solutions.

1.1.T Accuracy/Precision Tests (High End)

Two sets of criteria apply to the test outcome, depending on whether the BAIID had recently been subjected to a stress test. Paragraph 1.1.1.T specifies the criteria for the unstressed tests, paragraph 1.1.2.T specifies the criteria for the stress tests.

All tests shall be conducted on two different BAIIDs. These will be referred to subsequently as Device A and Device B.

The testing shall be repeated 20 times on device A, and 20 times on device B. Two types of results shall be recorded: pass/fail, and a digital readout. The pass/fail information can be read from the user display on the front of the interlock unit. A three decimal place digital readout of the vapor alcohol concentration sensed can be read from the BAIID display, if available, otherwise it shall be taken from an externally connected laboratory test instrument that monitors the BAIID's evaluation of the alcohol concentration of the introduced sample.

1.1.1.T Unstressed Accuracy/Precision Test Specifications (High End)

The baseline accuracy testing is conducted as a measure of the BAIID's ability to hold to or exceed a 90% accuracy criterion when a test solution is .01% w/v above the alcohol setpoint. Accuracy testing with this criterion shall be conducted at room temperature and initially precede all others to ensure that the fundamental operation of the BAIID is initially adequate under no-stress conditions.

If either BAIID fails to lock on more than two occasions in those twenty trials with an alcohol concentration of 0.01% w/v above the setpoint specification, then it has failed the no-stress accuracy test criterion of 90%.

1.1.2.T Stress Accuracy/Precision Test Specifications (High End)

This accuracy testing is conducted in conjunction with all subsequent Stress Tests to be specified in following paragraphs. This test protocol is a measure of the BAIID's ability to hold to or exceed a 90% accuracy criterion when a test solution is .02% w/v above the alcohol setpoint. This test shall be conducted at whatever temperature is called for by the test protocol utilizing the test criterion.

If either BAIID fails to lock on more than two occasions in those twenty trials with an alcohol concentration of 0.02% w/v above the setpoint specification, then it has failed the post-stress accuracy test criterion of 90%.

1.2.S Breath Sampling Requirement

All BAIIDs must require that a minimum of 1.5 liters of breath be introduced through the mouthpiece and run through the instrument before the alcohol content is measured. Compliance with this requirement can be determined by testing in accordance with paragraph 1.2.T.

1.2.T Breath Sampling Requirement Tests

The specification stipulates at least 1.5 liters of air be introduced before sampling the alcohol concentration. To determine that the interlock device is sampling alveolar air, spirometric measurement shall be made on both devices A and B at both the minimum acceptable and maximum acceptable delivery pressures as specified by the manufacturer.

If the sampling head of the interlock device is incapable of being fitted with a spirometer at the outlet to collect and measure all of the vented sample, then this test may be conducted in an air tight laboratory box with a transparent viewing window. In such a case, place the interlock in the box (fitted with a power outlet as needed), connect the output of the simulator to the inlet of the interlock via an air-tight feed line, and install a fitting on the vent port in the wall of the box. Connect the spirometer to the vent port. Measure the volume of air escaping from the vent port as an index of the volume of air introduced into the interlock. Record the volume of air when the sample is accepted by the interlock device.

Alternatively, a plastic bag suitably outfitted may be used in place of the box. The suitability of this alternative shall be verified by using a large (one to three liter) calibration syringe to demonstrate that collected volume equals input volume.

Begin Stress Testing Protocols

1.3.S Calibration Stability

All BAIIDs must meet the accuracy requirements set in paragraph 1.1.2.S when tested in accordance with paragraph 1.1.2.T after having been operated according to paragraph 1.3.T for 7 days longer than the period of time specified by the manufacturer in their application for certification. Thus, if the manufacturer intends to require their BAIID be brought in for maintenance and calibration every 30 days, 45 days, or 60 days, this period of time plus 7 more days (or 37, 52, or 67 days respectively), would be used to determine whether the BAIID met the calibration stability requirement.

1.3.1.S Lockout After 7 Days Beyond Service Interval

A BAIID must prevent engine ignition if it has not been recalibrated for a period in excess of 7 days beyond the manufacturer's recommended service interval. A warning must precede lockout when the manufacturer's recommended interval has passed.

1.3.T Calibration Stability Test

After completing all other tests required under section 1, the BAIIDs shall be recalibrated and remain in a fixed location in the testing laboratory for the period of time specified by the manufacturer for regular maintenance and calibration, plus 7 days. The calibration stability testing should proceed under two conditions: alcohol-free and with alcohol present. For nine out of ten test days, the BAIIDs shall be run through 10 test cycles per day using a human breath sample known to contain no alcohol. On the tenth test day, ten tests shall be performed with a known concentration of 0.10% w/v ethanol delivered from a simulator.

The calibration stability regimen shall be repeated five days a week during this interval. For example, if a manufacturer's recommended calibration interval is 60 days, this will require approximately 10 weeks (60+7=67 days) of testing, a total of 500 calibration stability tests. At least 50 of those tests then would be conducted with alcohol. Practically this would involve testing with alcohol once every two weeks.

Before continuing to the next phase of stability testing, the protocol described in Section 1.3.1.T should be evaluated.

Following the calibration stability regimen, the BAIIDs shall be retested according to the high end accuracy criteria as set forth in 1.1.2.S and the test procedures as set forth in 1.1.2.T. In addition, however, if the BAIIDs pass the accuracy/precision tests according to the criterion of 1.1.2.S (90% accuracy with a test solution .02% w/v above the setpoint), then the devices must then be recalibrated and be able to pass according to the criterion of 1.1.1.S (90% accuracy with a test solution .01% w/v above the setpoint).

1.3.1.T Evaluation of Lockout for Expiration of Service Interval

In the course of conducting the calibration stability regimen, the BAIID must be shown to prevent ignition if it has not been serviced. Determine that the warning signal alerts the user when the service interval expires. Determine that lockout ensues in 7 days.

Return to l.3.T to continue with the recalibration phase of testing.

1.4.S Power

If the BAIID device is designed to be operated from a 12 Volt DC vehicle battery, then it shall meet the accuracy requirements specified in paragraphs 1.1.1.S to 1.1.4.S when operated within the normal range of automotive voltages of 11 to 16 Volts DC, when tested in accordance with paragraph 1.4.T.

1.4.T Power Test

If the submitted BAIID draws its power from the vehicle battery, then the device shall be subjected to accuracy testing at both the high and low voltages according to the following protocol.

Devices A and B shall be selected and supplied with 11 Volts DC power and then subjected to the test protocol as set forth in section 1.1.2.T for accuracy testing.

Devices A and B shall be selected and supplied with 16 Volts DC power and then subjected to the test protocol as set forth in section 1.1.2.T for accuracy testing.

1.5.S Temperature

1.5.1.S Operating Range

All BAIIDs shall meet the accuracy specifications in paragraphs 1.1.1.S to 1.1.4.S when operated within a temperature range of +85 °C to −40 °C (+185 °F to −40 °F) and when tested in accordance with paragraph 1.5.T for their ability to operate properly at low and at high temperatures.

1.5.2.S Note on Extreme Operating Range

The BAIID manufacturer may chose to meet the specifications for temperature extremes (−40 °C and +85 °C) by having the alcohol sensing unit be removable (e.g., so that it may be kept warm (cool) when the vehicle is expected to be subject to extremely cold (hot) temperatures).

If the removable alcohol test unit is not removed, and as a result is exposed to temperatures outside the manufacturer's recommended operating range, then the BAIID shall fail-safe or the ignition be rendered inoperable.

1.5.T Temperature Tests

The following tests cover both the challenging and extremely challenging operating ranges. See section 2.3.T for warm-up utility tests that can be conducted in tandem with these temperature stress tests.

1.5.1.1.T −40 °C

Devices A and B shall be temperature stabilized for a period of 1 hr. in an environmental chamber set at −40 °C. After the period of temperature stability elapses, the BAIIDs shall be subjected to an accuracy regimen as specified in section 1.1.2 T.

1.5.1.2.T −20 °C

Devices A and B shall be temperature stabilized for a period of 1 hr. in an environmental chamber set at −20 °C. After the period of temperature stability elapses, the BAIIDs shall be subjected to an accuracy regimen as specified in section 1.1.2 T.

1.5.1.3.T +70 °C

Devices A and B shall be temperature stabilized for a period of 1 hr. in an environmental chamber set at +70 °C. After the period of temperature stability elapses, the BAIIDs shall be subjected to an accuracy regimen as specified in section 1.1.2 T.

1.5.1.4.T +85 °C

Devices A and B shall be temperature stabilized for a period of 1 hr. in an environmental chamber set at +85 °C. After the period of temperature stability elapses, the BAIIDs shall be subjected to an accuracy regimen as specified in section 1.1.2 T.

1.5.2.T Extreme Conditions Beyond Manufacturers Claimed Accuracy

If the BAIID manufacturer has chosen to meet the specifications for temperature extremes (−40 °C and +85 °C) by having the alcohol sensing unit be removable (e.g., so that it may be kept warm (cool) when the vehicle is expected to be subject to extremely cold (hot) temperatures), then the fixed or permanently installed portion of the BAIID only shall be exposed to the extreme temperature specification. Then, when the sampling head is reconnected to the device, the BAIID must meet the accuracy requirements as specified in paragraphs 1.1.1.S to 1.1.4.S when tested in accordance with paragraph 1.5.T. This testing shall be conducted promptly following reconnect so as not to allow the sensor to become equilibrated to the chamber temperature. Warming of the sensor is acceptable between trials if necessary to meet the specification.

If the sampling head is not removable and the temperature range within which the BAIID is claimed to operate properly is narrower than that provided for in paragraph 1.5.1.S, then at the extreme temperatures outside the range specified by the manufacturer, the BAIID shall fail-safe.

1.6.S Vibration

All BAIIDs shall meet the accuracy requirements specified in paragraphs 1.1.1.S to 1.1.4.S after they have been subjected to the vibration tests in accordance with paragraph 1.6.T.

1.6.T Vibration Stability Test

These tests are performed to determine BAIID fitness for the automotive environment. If the BAIID consists of more than one module, it will be necessary to shake each module separately. Before testing, inspect housing thoroughly for cracks.

1.6.1.T Test 1

Subject device A to simple harmonic motion having an amplitude of .38 mm (0.015 in.) [total excursion of 0.76 mm (0.030 in.)] applied initially at a frequency of 10 Hz and increased at a uniform rate to 30 Hz in 2.5 minutes, then decreased at a uniform rate to 10 Hz in 2.5 minutes.

1.6.2.T Test 2

Subject device B to simple harmonic motion having an amplitude of 0.19 mm (0.0075 in.) [total excursion of 0.38 mm (0.015 in)] applied initially at a frequency of 30 Hz and increased at a uniform rate to 60 Hz in 2.5 minutes, then decreased at a uniform rate to 30 Hz in 2.5 minutes.

1.6.3.T Variations

Perform the vibration tests as described in paragraphs 1.6.1.T and 1.6.2.T in each of three directions, namely in the directions parallel to both axes of the base and perpendicular to the plane of the base.

1.6.4.T

Repeat the test protocol for accuracy as specified in 1.1.2.T for both BAIIDs. The BAIID shall meet the accuracy requirements as specified in section 1.1.2.S.

1.6.5.T

After the vibration regimen, inspect both BAIIDs to identify any cracks in the exterior casing and failures in the tamper-proof points of interface with the automotive environment. If cracks or failures are identified, then the test unit fails. The manufacturer shall be allowed to submit subsequent devices for this test phase, but no more than 1 of 6 shall be allowed to fail this phase.

1.7.S Radio Frequency (Electromagnetic) Interference (RFI)

Radio frequencies generated inside the vehicle have the potential to interrupt signal processing, or sample evaluation at the BAIID.

The BAIID shall be accurate according to the specifications set forth in Section 1.1.2.S. and tested according to Section 1.1.2.T when exposed to radio frequencies generated by common in-vehicle appliances, such as CB radios or cellular telephones.

It should be noted that full characterization of RFI susceptibility of BAIID is beyond the scope of this effort. The following protocol shall be implemented as a limited test for whether intentionally generated RFI interferes with BAIID performance.

1.7.T RFI Testing Protocol

In an actual vehicle in which a BAIID is installed, the sampling head of the BAIID shall be connected to the alcohol-air delivery tube in preparation for testing according to the specifications as set forth in Section 1.1.2.T. The sampling head of the BAIID shall be positioned so that it is adjacent to (within 2 cm), but not touching, any BAIID electronics processing unit which is mounted inside the vehicle on or under the dashboard.

The antenna of a transportable cellular telephone with an output power of not less than 3 watts shall be placed within 5 cm of the sampling head/box of the BAIID. A telephone number shall have been keyed into the cellular telephone. The alcohol sample shall be introduced into the BAIID concurrent with the issuance of a ''send'' signal to the telephone.

During each cycle while the BAIID is evaluating the alcohol sample, and while the telephone continues to transmit, the antenna of the telephone shall be positioned in one of three orthogonal (i.e. 90°) orientations in relation to the BAIID. All three orthogonal orientations shall be tested.

In order to ensure the safety of the individual conducting the tests, these tests shall not be run more than six (6) minutes in any given one hour period (see American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz, approved by the American National Standards Institute on July 30, 1982). Additionally, it is an appropriate rule of thumb for the test lab personnel to make sure their eyes (as well as the rest of their bodies) are kept at a distance of at least 30 cms. from the transmitting antenna during the tests.

The performance of the BAIID shall be evaluated according to the criteria of 1.1.2.T. The performance of the data recorder shall be determined to accurately reflect the test results found on the user display of the BAIID.

1.8.S Tampering and Circumvention

The BAIID must provide a method to detect two classes of misuse, tampering and circumvention.

1.8.1.S Tampering

The BAIID must provide a secure method to detect and store the time and date of tampering attempts made by the following means:

1.8.1.1.S—interrupting the power source of the interlock device causing it to fail, or to fail to record ignition activity,

1.8.1.2.S—vehicle engine starts *not* preceded by a passed interlock test, except during the free restart interval as provided for in 1.9.S.

Information about unauthorized starts that are stored internally shall not be lost when the interlock device is disconnected from the vehicle battery.

1.8.2.S Circumvention

The BAIID must be able to detect, or protect against, illegitimate air samples introduced to the sampling head. Illegitimate samples may be delivered from the following sources:

1.8.2.1.S—non-human delivery sources of air samples such as balloons or compressed air containers,

1.8.2.2.S—human sources of air samples that are altered through filtration or other means after leaving the mouth,

1.8.2.3.S—human sources of air samples provided by anyone other than the driver of the vehicle. This specification does not imply the BAIID be able to detect a unique breath signature, but to preclude curbside assistance to an impaired driver, the BAIID shall require that a second breath test be required once a vehicle has been underway for at least 5 minutes but not more than 30 minutes.

The BAIID must detect or minimize these types of circumvention in accordance with the criteria as specified in paragraph 1.8.T.

1.8.T Tampering and Circumvention Tests

1.8.1.T Tampering

1.8.1.1.T Power Loss

The BAIID shall be able to register any external (non-sealed) loss of power. Any attempt to disconnect the BAIID from the vehicle in which it is installed shall be recorded electronically. To conduct this test disconnect external 12 Volt DC power source to the Device A or B and determine that there is a record of power loss noted by the interlock device. This may be noted on a memory chip, or by another indicator which can be detected by the service technician.

1.8.1.2.T Circuit Tampering

The BAIID shall be able to register any engine start (whether or not the ignition switch is turned ON) which occurs without passing the BrAC test. This test will require use of an installed BAIID. To conduct this test, it will be necessary to ''hotwire'' the engine. The procedure for doing this will vary with the type of engine. One example is to attach one end of a wire to the primary side of the ignition coil (coming from the distributor) and the other end to the vehicle battery's positive pole. Then short the appropriate terminals on the starter relay or starter motor to determine if the vehicle is able to be started. If the vehicle starts, shut it off and then repeat this test 3 times on either Device A or B.

An interlock device ought to be capable of either preventing a vehicle from being successfully hotwired, or be capable of registering all such successfully completed bypasses of the interlock device. If the installed device fails to achieve either of these criteria and permits circuit tampering, then it fails this test phase.

1.8.2.T Circumvention

1.8.2.1.T Non-Human Samples

The BAIID shall be capable of detecting or failing 80% of the non-human breath samples introduced through one of the following:

- Mylar balloon
- Rubber (toy) balloon
- Compressed air (aerosol can or other source)

The balloons must be large enough to deliver the minimum volume requirement, 1.5 liters. The non-human circumvention test battery shall be conducted in accordance with section 1.1.T, except the sample introduced shall be alcohol-free air introduced through the three air sources identified above. These sources are exemplary and not necessarily the best or only sources suitable for this class of circumvention.

The devices A and B shall each be subjected to this circumvention testing. The criterion of failure in this case is more than two passed tests out of a series of 10. This is not a test of accuracy of alcohol detection, but a test of how well the BAIID can detect air samples that deviate from a normal breath sample.

1.8.2.2.T Filtered Samples

BAIIDs shall be capable of detecting or failing 80% of the filtered samples when filtered by either dry or wet filtering systems such as the following:

- Commercial cat litter, silica gel
- Heated water
- Approx. 4 ft. or 1.5 meter long Tygon tube (3⁄8″ i.d.)

The filtered sample circumvention test battery shall be conducted on both devices A and B in accordance with section 1.1.2.T. In this case all elements of the testing procedure as specified in 1.1.2.T shall be identical except that the sample shall be filtered by interposing two different filtering systems, in separate tests, between the sample simulator and the interlock device. The dry filter can be composed of any tube packed with a suitable absorbent material, such as those identified above, but in doing so, the technician must keep in mind the constraints of absorbent capacity and the relationship between packing and blowability. For example, a 2½ inch piece of cardboard tubing (¾ inch diameter) might be used. It might be packed with 12 ounces of commercial cat litter, each end of the tube being stopped with cotton wadding. The wet filter shall ideally consist of water heated to 34 °C in a capped cup fitted with inlet and outlet hoses. The filter device shall be made of common materials that are widely available. For example, a 6 oz. styrofoam coffee cup might be used with ¼ inch rubber or Tygon tubing used for inlet and outlet hoses. In the case of use of the 4 ft. long Tygon tubing as a filter, the tube shall be chilled to 0 °C and attached securely to the BAIID mouthpiece before attempting to provide a sample.

1.8.2.3.T Rolling Retest To Thwart Curbside Assistance

After passing the test allowing the engine to start, the BAIID shall require a second test within a randomly variable interval ranging from 5 to 30 minutes. During the rolling retest, the retest setpoint shall be .02% w/v higher than the startup setpoint to preclude a false positive test result.

In order to alert the driver that a retest is to be required, a 3 minute warning light and/or tone shall come on. The driver would then have 3 minutes to retest. If the engine is intentionally or accidentally shutdown after the 3 min. warning but before retesting, the retest clock shall not be reset. Retesting takes priority over free restarts (see Sect. 1.9). Test that the free restart is not operative when the BAIID is awaiting a rolling retest sample.

The consequences of a failure to take the retest, shall be threefold. First, the refusal to perform a rolling retest shall be flagged and recorded on the data recorder. Second, the BAIID shall warn the driver by a unique auditory or visual cue that the vehicle ignition will enter a lockout condition within a period of 5 days, and that the assignee shall report to the BAIID program monitor promptly. Third, the lockout shall proceed within 5 days.

A retest that is taken as required and subsequently failed shall result in an alert condition that is flagged on the data recorder. The BAIID assignee shall be signalled that the BAIID program monitor must be notified promptly of the violation, the automatic lockout shall proceed.

The test protocol shall determine that both devices A and B are capable of performing according to this specification.

1.9.S Sample-Free Restart

After a stall, a sample-free restart shall be possible for 2 minutes. This free restart does not apply, however, if the BAIID was awaiting a rolling retest that was not delivered.

1.9.T Sample Free Restart Test

The BAIID shall permit a free restart (no breath sample required) for 2 ± .25 min. Conduct six tests with an alcohol-free sample from either a human or non-human source. Three tests at 1.5 min, three at 2.5 min. Use devices A and B. The BAIIDs shall allow a start without requiring a sample for all of the first three tests, and fail to start without a sample on the subsequent three tests.

1.10.S Data Recording

An active monitoring program will require vehicle use information. A BAIID shall have the capability to record the nature of such use and the test outcomes during the stipulated period. The following kinds of information shall be recorded by the BAIID:

- Efforts to disable the unit
- Date of vehicle use
- Time of vehicle use
- Pass/fail records
- BrAC levels
- Starting and stopping of vehicle engine
- Service reminders issued (date)
- Date service performed

1.10.T Data Recording Test

Perform test according to manufacturer's instructions. Determine whether readout is satisfactory and understandable. Test to be certain that the BAIID memory remains intact for multiple printouts if desired, or until the service technician chooses to reset/erase the memory.

2.0.S/T Utility Specifications (S) and Utility Tests (T)

2.1.S Dual Accuracy and Precision Limits (Low End)

The accuracy and precision for the utility specification shall be determined in a manner parallel to that described in paragraphs 1.1.1.S to 1.1.4.S except for the test solution of alcohol to be used in the simulator. In the case of the utility specification, as with the safety specification, there is a dual criterion depending on the existence of stress test protocols. No stress test protocols are specifically provided for here in conjunction with *utility* specifications, since these are not strictly highway safety question. Certifying authorities wishing to conduct stress-involved protocols for the utility specification could conduct them in a parallel fashion to those provided for and beginning in Section 1.3. Nonetheless, a parallel dual set of specifications is proposed here for States wishing to conduct such testing.

2.1.1.S Baseline Accuracy in the Unstressed Condition

All BAIIDs shall allow the ignition to remain locked no more than 10% of the time when the true alcohol content of the breath sample is 0.01% or more below the alcohol setpoint and testing is being conducted under ambient temperatures in the range of 10–30 °C in a newly recalibrated BAIID.

2.1.2.S Accuracy Under Stress Conditions

Under conditions of stress testing, the BAIIDs shall allow the ignition to remain locked no more than 10% of the time when the true alcohol content of the breath sample is 0.02% w/v or more below the alcohol setpoint.

2.1.3.S Standard Deviation (Precision)

Precision guidelines shall be parallel to those described in Section 1.1.3.S.

2.1.4.S Proportions

This is to specify the proportion of tests at BrACs of .01% w/v and .02% w/v below the alcohol setpoint at which the ignition must be unlocked. The table below shows the 90% criteria of accuracy for unstressed and post-stress testing.

TABLE 2.—TEST BRAC LEVEL AT WHICH THE IGNITION MUST BE UNLOCKED AT LEAST 90% OF THE TIME DEPENDING ON WHETHER TEST IS UNSTRESSED OR STRESSED

Alcohol setpoint	Test BrAC level (% w/v)	
	Unstressed	Stressed
0.025% w/v*	0.015	0.005

* Recommended.

2.1.T Testing of Utility Specification (Dual Criteria)

All utility tests shall be conducted on the two BAIIDs, devices A and B. Two sets of specifications can apply, but only one of these specifications, the baseline or unstressed protocol (2.1.1.T) is specifically utilized.

2.1.1.T Utility Accuracy Testing of Unstressed BAIID

The accuracy testing is conducted as a measure of the BAIID's ability to hold to or exceed a 90% accuracy criterion when a test solution is .01% w/v below the alcohol setpoint. This test shall be conducted at room temperature and precede all other utility tests to ensure that the fundamental operation of the BAIID is adequate under no-stress conditions after recent recalibration.

The test shall be repeated 20 times on device A, and 20 times of device B. Two types of results shall be recorded, pass/fail, and a digital readout representing the BAIID's evaluation of the alcohol concentration of the introduced sample.

If either BAIID locks more than twice in those twenty trials then it has failed the no-stress accuracy utility test criterion of 90%.

A failure to meet the accuracy criterion shall disqualify the BAIID.

2.1.2.T Utility Accuracy Testing of Stressed BAIIDs

If the certifying authority chooses to conduct tests of the utility specification for stressed BAIIDs, it is recommended that a protocol be followed that parallels those proposed for Stressed BAIIDs beginning in Section 1.3, and that the criteria for evaluation be .02% w/v below the setpoint for 90% unlocked accuracy.

2.2.S Clearance Rates

The BAIID shall permit a test within 3 minutes of a previous test at a BrAC < .05% w/v.

2.2.T Clearance Rate Test

The BAIID shall reset to zero and be ready for a retest within 3 minutes of a previous test at BrAC = .05% w/v.

Test adherence to this criterion by introducing a .05% w/v sample into devices A and B, activate a timer upon receipt of the test result, record the test result. Record the elapsed time before the BAIID indicates a ''ready'' condition. Repeat this three times for each BAIID.

2.3.S Warm Up

The BAIID shall be ready for operation within 5 minutes of being turned on at −20 °C (−4 °F).

2.3.T Warm Up Test

The warm up period during which the BAIID heats the sensing head shall require no more than 5 min at −20 °C (−4 °F).

This test can be conducted as part of the environmental chamber tests specified in section 1.5. After stabilization in the environmental chamber at −20 °C for 4 hr. activate timer concurrent with activation of the BAIID. Record the time required before receiving a ''ready'' condition.

2.4.S User's Display

The BAIID shall provide certain types of informational feedback to the driver. These messages include: BAIID readiness for sample, test outcome, and warning messages.

2.4.T User Display Tests

2.4.1.T Operational Modes

Indicators must be plainly visible or clearly audible to the user denoting the following:

- Unit is ON
- Unit is READY FOR TEST
- Unit has RECEIVED ACCEPTABLE SAMPLE

2.4.2.T Outcome

Unit must plainly indicate the test results with a minimum message of:

- PASS or FAIL

2.4.3.T Warnings

- UNIT must be SERVICED and CALIBRATED SOON

2.5.S Temperature Package

To reach conformance with temperatures below −20 °C or above +70 °C, the manufacturer may make available a mechanism or procedure that can achieve the warm-up (cool-down) needs. This can be accomplished via removal of the sampling head from the vehicle for bringing inside the home, or via provision of a heating jacket, or other procedures.

2.5.T Low Temperature Package Tests

Evaluate manufacturers' proposed procedure for temperatures as low as −40 °C.

2.6.S Altitude

The manufacturer shall place a notice in the BAIID manual and on the device noting that the alcohol sensing unit is more sensitive to ethanol at higher altitudes, and that attempts to start at altitudes higher than that for which the BAIID is calibrated could result in a lockout even when the BrAC is lower than the alcohol setpoint.

2.6.T Altitude Test

The BAIID must provide some written notice to the user of the possibility of a lockout at higher altitudes if it is unable to maintain accuracy at ground elevations up to 2.5 km.

3.0.S/T Optional Features Specifications (S) and Optional Features Tests (T)

3.1.S Optional BrAC Display

Knowledge of the relation between drinking and BrAC can be a useful educational tool for motivated users. Therefore it is suggested that states give consideration to whether a BAIID give a BrAC readout to the user—in addition to a mere pass/fail indication—after a test.

3.1.T Optional BrAC display

Evaluate the adequacy of the display indicator which informs the user of the BrAC test result.

3.2.S Optional Sample Acceptability Criteria at Inlet

To improve circumvention protection, sample evaluation criteria as specified in 3.2.1.S and/or 3.2.2.S may be required. These criteria are noted as optional at this time, but may be necessary in order to eliminate the most commonly identified methods of circumvention. Further discussion can be found in Sec. 6.2.

3.2.1.S Optional Temperature Window of Sample

Imposing a criterion requiring the sample to fall in a range between 32–48 °C will improve rejection of bogus samples at neutral ambient temperatures. Other criteria may need to apply, however, when air temperatures fall outside the neutral range.

3.2.2.S Optional Minimal Pressure of Sample

Filtered samples may suffer pressure losses. A minimal pressure requirement of 12 inches of water will help screen out filtered samples.

3.2.T Optional Sample Acceptability Criteria Test

These optional features, if adopted, will have been tested in tandem with the circumvention test protocols in paragraphs 1.8.2.T. If the acceptability criteria are incorporated into the design of the BAIID, it is expected that fewer bogus air samples will have resulted in a pass condition.

3.3.S Optional Smoke Protection

Tobacco smoke is known to produce false positive results on semiconductor type interlock devices. Smoke from burning fields, a common seasonal event in some rural areas, may similarly be a source of error. Protection of the sampling head from ambient smoke conditions may be necessary under some conditions.

3.3.T Optional Smoke Protection Test

To evaluate the potential of air borne smoke to interfere with the accurate sensing of alcohol, perform testing according to paragraph 1.1.T and/or 2.1.T (depending on the testing authority's interest in safety or utility concerns), in a chamber filled with smoke from burning vegetal substances or similar conditions.

3.4.S Optional Dust Protection

Fine dust can cause problems with electronic equipment by forming conductive bridges. However, of even greater concern with the interlock device is the ability of fine dust to absorb vapors. This is a specification that may be of concern in arid regions, or where there will be BAIIDs installed in construction vehicles. States subject to dust conditions may want to require some kind of a housing that protects the BAIID sampling head from exposure to powdery dust. Dust protection is incorporated in the Australian Standard for BAIIDs.

3.4.T Optional Dust Protection Test

If a test for dust protection is required by a state, the certification authority may want to follow the clearly specified test procedure in the Society of Automotive Engineers Recommended Environmental Practices For Electronic Equipment Design—J1211, page 20.122, Sect. 4.5.

3.5.S Optional CB Radio Alert Condition

Under conditions of a failure to take the required rolling retest, or a failure to pass a rolling retest (as provided for in paragraph 1.8.2.3.T), a signal could be transmitted over a restricted CB channel that can be monitored by the police which alerts nearby cruisers that an impaired driver is operating a motor vehicle. This optional feature can be regarded as support for the anti-circumvention feature as described in paragraphs 1.8.2.3.S and 1.8.2.3.T.

3.5.T Optional Alert Conditions Test

No test protocol is proposed.

4.0 Commentary on Safety Specifications

These specifications have been divided into safety and utility specifications. This distinction has been made in the Definitions Section D8. Safety issues are by far the more important and the majority of the testing is devoted to insuring that BAIIDs perform as expected under conditions of normal field use. It is expected that normal field use will involve a wide range of driving and outdoor conditions, as well as having a minimum of 5% of users trying to circumvent or tamper with the BAIID in order to drive while impaired.

The ethanol sensing technology that has been adapted to the automotive environment for BAIID devices is mostly based on the Tagucci semiconductor device. The semiconductor devices are not as specific or stable as evidential field use breath testers. However, the purpose of the BAIID is not to accurately measure in mg/ml the BAC of a driver, but to prevent the person with a high BAC from operating a motor vehicle. For this reason, the specification has allowed greater leeway in the accuracy test criteria, but has also included a protocol for circumvention protection. In the associated technical report strong recommendations are made for a central authority within each State to maintain authoritative programmatic control of the BAIID option.

4.1 Accuracy

With respect to accuracy, these specifications establish a range of acceptable performance, especially under so-called ''stress'' conditions such as temperature extremes, vibration, power variability, etc. For this reason a ''double standard'' is proposed which is conditional on the recent stress exposure of a test unit. The reasoning for this is as follows.

First, a newly recalibrated BAIID that is not subjected to stress tests ought to be held to a higher standard than one which has been so subjected. Field experience with the installed units using semiconductor technology has shown that there is considerable average error (in the range up to 0.015% w/v) following 60 days of routine field use of a BAIID.

These specifications do not provide for accuracy testing under compound stresses, such as low temperature with low power at high altitude. Rather than proposing tests for compound stresses to accuracy here, the requirement for such tests should rest with the certifying authorities of the States who can best determine their unique situation evaluation requirements. Clearly, northern Rocky Mountain States would be more interested in combined high altitude and low temperature tests than would States in the southeast. Similarly, many questions have not been researched which may prove significant. For example, would a BAIID calibrated for use at high elevation be able to meet the accuracy specification when tested at the coldest temperatures at sea level? These questions are too specific for inclusion in national guidelines, but may be important regionally.

When measuring accuracy and precision of any instrument it should be understood that all measuring devices have a certain natural amount of dispersion of scores around a mean (average) true value. Because of this fluctuation, the setpoint of the interlock device needs to be clearly specified in a way that accommodates this natural variability. In this specification, the worst acceptable deviation under conditions of perfect accuracy have been identified. This allows for inaccuracy and imprecision to trade-off as long as the overall probability of error is lower than the constant specified.

The proposed specifications for interlock devices ostensibly acknowledge three lock points:

- The alcohol setpoint (the nominal lock),
- The virtual lock (90% certainty),
- The near absolute lock (99.5% certainty).

The alcohol setpoint is defined as the interlock device-measured BrAC value at which the ignition will lock.[1] That is, the alcohol setpoint is the BrAC value at which the interlock is set. Due to the inherent variability in these measuring devices, this nominal lockpoint will be the mean of a distribution of true blood or breath alcohol concentration values as determined by evidentiary BrAC equipment. Interlock imprecision is the deviation from that value. The higher the precision of the interlock, the smaller will be the dispersion of true BrAC values around the stipulated alcohol setpoint.

The virtual lock point will be the actual, or true BrAC above which the vehicle must fail to start 90% of the time. The difference between the setpoint and virtual lock values will be a gray area which reflects both imprecision and inaccuracy. The guideline specifies that there should be a maximum permissible standard deviation from the setpoint equal to 0.0078% w/v BrAC under conditions of no-stress. Following stress protocols, the maximum permissible standard deviation under conditions of perfect accuracy is equal to .0156% w/v.

The third type of lockpoint is the near absolute lock point and is of theoretical interest only because many hundreds of repetitions would be needed to test it. The

[1] This standard recommends that .025% w/v be chosen as the setpoint.

near absolute lockpoint is equivalent to +2.57 standard deviations in a normally distributed sample of trials where 99.5%, practically all, start attempts must fail. In the unstressed condition, this would be .02% w/v above the setpoint and .04% w/v above the setpoint in the stressed conditions. The implication of this is that for devices which are tested against the specification (even with its most lax accuracy standard), a person with a BAC equal to .065% w/v—still well below the legal limit of most States—would almost certainly be locked out.

Since the condition of virtual lock is defined operationally as 1.28 standard deviations above the alcohol setpoint, and the absolute lockpoint is 2.57 standard deviations above the setpoint, a brief explanation of standard deviation (sd) is relevant.

Standard Deviation—The standard deviation is a statistical measure of dispersion of a group of scores, it is also referred to as ''sd,'' or ''s.'' The standard deviation is the most common way to express fluctuation around a mean value. For example, repeated measurements with precise instruments result in a much smaller standard deviation than do repeated measures done on imprecise instruments. In the extreme case, if a BrAC measuring device correctly reads .020% w/v for all samples evaluated from a .020% test solution, the mean of the sample is .020%, and the standard deviation is zero.

The standard deviation is the square root of the average deviation of all scores from the mean. Most scientific, financial and programmable calculators have a key dedicated to the calculation of the standard deviation. However, it can be hand calculated from the following formula.

$$\sqrt{\frac{\sum x^2 - \frac{\left(\sum X\right)^2}{n}}{n-1}}$$

The symbol **Σ** means to sum up.

That is, square all the raw values (x) and sum up those squares (e.g., $\boldsymbol{\Sigma} x^2$). Second, sum up all of the raw values and then square that number (e.g., $(\boldsymbol{\Sigma} x)^2$), and then divide that result by n. Then subtract the second value from the first value. Divide the answer by n − 1. The result is the variance. To calculate the standard deviation, take the square root of the variance.

Example—The following 10 raw BrAC values have a mean of 0.0224, and a standard deviation of 0.0016.

.023	.022
.024	.025
.020	.020
.022	.023
.022	.023

If the nominal lock is set at .025% w/v, on average 9 of 10 times a vehicle ought to be able to start when the true BrAC is .015%, and fail to start when true BrAC is .035%. Because of the instrument limitations, and because there is little evidence that drivers with a BrAC under .01% increase the risk of highway accidents, a nominal ignition lock less than .02% w/v is not warranted.

The State of California has allowed for a lockpoint at 0.03% w/v, the State of New York has specified a lockpoint of 0.02% w/v. The nominal setpoint in this specification is 0.025% w/v. The value 0.025% w/v is midway between 0 and 0.05% w/v, values which are arguably the extremes under which a vehicle always ought to start and never start, respectively. The true performance of the interlock devices will be somewhere between those extremes. However, because the first generation of BAIIDs are not up to the evidential standards for BrAC testing it would be unwise to demand feats of great precision and accuracy from them. The most important consideration in a successful interlock program is the ability of the BAIID to prevent a high BAC person from operating a vehicle, and minimize problems with lawful use of the vehicle, by the offender or family members. There are many reasons why such a wide band of acceptable performance should be adopted at this time. Among these reasons are the following:

- The BAIID will operate in environments with extreme variations, many which will be hostile to electronic sensing equipment,
- The BAIID will not be inspected or calibrated for up to two months even though receiving multiple daily usage,
- BAIID certification studies under controlled laboratory conditions have identified errors in excess of 0.015% under modest stress conditions,
- BAIID semiconductor devices are non-specific detectors of ethanol and can respond to cigarette smoke, various mouthwashes, some endogenously produced human compounds, and probably many things that haven't been identified as yet.

Having provided for a lenient specification with this first issuance of model specifications, it is expected that as the technology improves, the specifications will be made more rigorous. It should again be emphasized that precision and accuracy, while important, are less important than circumvention and tampering protection.

4.2 Breath or Blood Alcohol Estimation and Sample Requirements

The acronym BAC often refers to both *blood* alcohol concentration and *breath* alcohol concentration. In this document, breath alcohol concentration is designated as BrAC. Because alcohol (specifically ethanol: C_2H_5OH) possesses a high degree of solubility, it is capable of passing readily through biological membranes—such as the cells lining the blood capillaries and lungs—either as a liquid or as a vapor. The first concern in sampling the breath as a way to draw inferences about the blood concentration of alcohol is to be sure that the air sample is drawn from a region of the lungs where the alcohol vapor is in equilibrium with the blood concentration. This requires that the air come from deep within the lungs, so-called alveolar air, or deep lung air. Air from the upper lungs such as the bronchi contains less alcohol than deep, alveolar air.

Virtually all evidential BrAC measurement devices have blowing pressure and/or duration requirements intended to insure a deep lung sample. The purpose of this is to assure that the breath sample is in equilibrium with the circulating blood. Because of the gradual absorption of alcohol and the mixing action of the blood, the ethanol is equally distributed through the bloodstream.

The average vital capacity (exhalable air volume) of healthy adult male human lungs is approximately 4.5 liters of air, and approximately 0.5 liters is exchanged with each breath. The average woman's capacity and normal breath volumes are slightly lower, but the range of human vital capacities varies from 1.8 to 6 liters of air. To insure that the breath sample is alveolar air, the interlock device must require that a minimum of 1.5 liters of air be exhaled before sampling the air for alcohol content. This quantity is selected as a compromise.

4.3 Calibration Stability

The stability specification is added to assure that the performance criteria as noted in the accuracy specification (sec. 1.1.S) can be maintained during the normal duration that the interlock devices will be in use. Some types of breath sensing devices are inherently more stable than others and the stipulated period of stability will help to assure that a user's BAIID will not deviate from the specification during the inter-service interval. This is deemed necessary because considerable drift is possible in the current generation of BAIIDs after repeated use over time.

4.4 Power

The power specification was added to insure that BAIIDs are not prone to allowing a higher proportion of passed tests when the DC power to the BAIID varies within the normal automotive starting systems's range of weak or undercharged to overcharged battery voltage conditions. The range stipulated in the specification (sec. 1.4.S) is based on the Society of Automotive Engineer Recommended Practice, Report of the Electronics Systems Committee, definition of the normal range of supply voltages in the automotive environment.

4.5 Temperature

The use of the electronic devices in extreme temperatures can pose a challenge to the capability of an instrument to hold to specifications of accuracy. Therefore, ambient temperatures that are apt to be encountered during a visit to any part of the U.S. should ideally be tested. For example, a resident of a warm southern state may have occasion to travel north in the winter, so when state authorities specify standards they should take into account environmental extremes not encountered inside their own state borders. In extreme temperature situations, the automobile can become a survival tool, so it is important that the interlock be capable of allowing a start under conditions of severe heat and cold when a driver has a permissible BrAC.

One special recommendation is noted in the guidelines for low temperatures. Some cities in Alaska and the north central states (especially MN, ND, MI, and MT) have *normal* January low temperature equal to or below the −20 °C (−4 °F) specification, record cold mornings have been as low as −40 °C/F. Appropriately many northern states, and the Province of Alberta, have set −40 °C as the lower test limit, while other states have set −20 °C as the minimum test specification.

Given the reality of such cold temperatures, the specification as proposed here is −40 °C, but the difference between −20° and −40° can place extreme demands on any electronic device, particularly one designed to sample alcohol vapor concentrations. For this reason, Section 1.5.2.S stipulates that manufacturers may make available some kind of provision, such as a prewarming device, that allows the interlock to be brought up to a warmer temperature before the driver attempts to use the BAIID. Manufacturers may also consider providing for a removable sensor head that can be stored in a warmer environment overnight. It is recommended that colder states *insist* on the manufacturers making some provision for cold weather. It should be noted that the SAE Recommended Practices for Electronic Equipment states that ''thermal factors are probably the most pervasive environmental hazard to automotive electronic equipment.'' It identifies the normal vehicle interior heat range as −40 °C–+85 °C. This specification adopts the SAE range as the recommended range, while offering alternative strategies for compensating for these temperature extremes. Both real world use and testing should also accommodate the physical difficulties of measuring a vapor under such extreme conditions.

An interesting compromise solution to this trade-off between temperature and accuracy was rendered by Alberta which stipulated that if a BAIID was unable to meet the accuracy requirement at 40 °C below zero when the samples tested ranged from .01 to .05% w/v ethanol, then the BAIID must be able to lockout 100% of 30 further trials when an ethanol sample concentration is increased to .08% for retest. This embodies an approach to interlock specifications similar to the one outlined here. That is, the specific accuracy of the BAIID, while important, is less critical than the ability of the BAIID to prevent the severely impaired person (*e.g.* above .08% BrAC) from operating a motor vehicle.

The specific design of the low temperature *fail-safe* mechanism can be left to the discretion of manufacturer. One example, however, is a temperature-sensitive switch that cuts out the ignition circuit when the sampling head temperature is below the operating range of the BAIID.

4.6 Vibration

Vibration is common in all automobiles, and the BAIID ought to be capable of performing after specifiable vibrational exposure. The standard specification for evidentiary breath testers is repeated here as a minimum vibration specification.

4.7 Radio Frequency and Electromagnetic Interference

The proliferation of electronic gadgetry installed inside vehicles in recent years is large and some may have the potential to emit electrical fields which could alter interlock signal processing. This potential problem was identified in 1982 when a few older evidential field breath test units operating in the vicinity of police communications equipment were found to have been disrupted.

The environment of the police cruiser, with its communications equipment, may be an atypical one for the vast majority of interlock users. However, the possibility remains that electromagnetic fields associated with typical cellular telephones or CB radios may contribute to error or malfunction of the BAIID.

The test procedures identified here are designed to assess whether the most commonly used in-vehicle appliances are going to alter the operation of the interlocks.

4.8 Tampering and Circumvention

At the current state of development of interlock devices, tampering and circumvention protection is not fully developed. Much of the protection is based more on ensuring the inconvenience of tampering and circumvention rather than the impossibility of it. The highly motivated user generally can, with preplanning, override the standard protection schemes.

4.8.1 Tampering

The tampering protection is designed to prevent easy entry and alteration of the interlock devices, hot-wiring of vehicles, or other non-standard start efforts that seek to preclude a breath test as part of the ordinary startup.

The largest BAIID manufacturer uses a tamper seal on sensitive parts of the BAIID. This tamper seal is a type of sealing tape which apparently cannot be removed without destroying it or making it evident to the service person that entry was attempted. It may be, however, that such tape could be duplicated and find its way onto an underground market. Conceivably there would be some value to producing a unique tape that could not be easily reproduced. There is really no evidence that such a thing occurs now, and therefore it is premature to propose it in the specifications. Nonetheless, it may be of interest at some point.

4.8.2 Circumvention

The requirements for circumvention protection must acknowledge trade-offs between allowing unimpaired drivers to start their vehicles and preventing impaired drivers from doing so. Given the infancy of the technology, a balance of false negatives and false positives [2] needs to be struck that realistically accomplishes the intended purpose of the interlock devices for the majority of users. With that stipulation, the specifications note that 80% of the major known means of circumvention be locked out.

Human breath has an exit temperature close to 34 °C (93 °F), and is completely saturated with water. The range of pressures of exhaled air ranges up to about 30 inches of water. These and other characteristics of exhaled breath might at some point be usefully applied as restrictions placed on a sample to require that it fall within some range of acceptable elements of a breath signature so as to minimize circumvention from non-human sources. The specification as currently written is not ideal and should be made more stringent as the industry and the technology mature. The optional features as specified in 3.2.S, and discussed in 6.2 address this problem.

Filtration systems are capable of removing alcohol vapors from breath samples. Most filtering systems, however, also remove water vapor, change the temperature or pressure or otherwise change the human breath signature. These changes could be recorded as indices of attempts to use a filter to circumvent the BAIIDs.

The requirement of a rolling retest is directed toward preventing two types of offenses:

- Allowing a pedestrian, or other non-occupant of the moving vehicle, to give the initial breath sample to start the vehicle
- Preventing vehicle use by someone whose BrAC is still in an ascending phase

In this specification, the rolling retest setpoint criterion is recommended to be .02% w/v higher than the startup setpoint. This is done to reduce the basis for a measurement error claim because of the likely gravity of the consequent sanctions for a failed rolling retest, such as loss of driving privileges for an extended period of time.

It needs to be emphasized again, however, that when a rolling retest is failed there are no immediate sanctions proposed such as flashing lights or horns or other distractions. And therefore there are no threats to the safety of the driver of other motorists resulting from this test protocol. The consequence of failing or failing to take a required rolling retest are all delayed and only involve an auditory or visual cue to the driver. This cue signals the requirement that the user report immediately (within days) to the BAIID program manager and the service technician. The requirement of actually taking a rolling retest would be no more disruptive than routine in-car driving activities such as adjusting an air conditioner or tuning a radio dial. The drivers eyes need not be taken from the roadway.

For a further discussion of rolling retest see paragraph 6.5.

4.9 Free Restarts

The re-test limits were necessary in order to make provisions for mechanical or BrAC-related failures. When vehicles stall, particularly in traffic, or because of faulty mechanical or electrical systems, a quick restart should be available. A driver should not be penalized for having a malfunctioning vehicle. The grace period for restarts should be limited to 2 minutes—adequate time for a restart.

4.10 Data Recorder

A record of vehicle use and interlock test results are believed to be critical to accurate monitoring programs. When such monitoring

[2] It should be noted that a false negative test is one which incorrectly allows the driver to start the car when the BAC equals or exceeds the setpoint. Conversely, a false positive test is one which prevents an engine start when a driver's BAC is legitimately below the alcohol setpoint.

programs are in place, and when they depend upon the durability and accuracy of a vehicle-use report such as one that can be provided from a memory chip internal to the interlock device, then provisions should be made for preserving the integrity of the data record upon loss of vehicle battery power. To achieve this result may require that the memory chip be provided with continuous internal power from a small battery, one not accessible without breaking a sealed compartment. In this way, a severely non-compliant user would be unable to erase all evidence of misuse from the data record in exchange for what could easily be interpreted as an honest power loss due to a dead battery (in devices that draw power from the vehicle battery). Without some sealed power circuit to the memory, the record would be lost. This is not necessarily the best solution, just one approach.

4.10.1 Recording Efforts To Disable Unit

Interlock units should alert the service technician to tampering attempts through some mechanism that is immediately detectable at the calibration check. Once a tampering attempt is discovered, the technician should examine the unit and all the critical wiring junctions. The attempt, and other pertinent evidence of tampering, should be submitted to court personnel on the appropriate forms.

4.10.2 Recording Vehicle Use

In order for court personnel to effectively monitor the appropriate use of the interlock, a hard-copy report generated by the unit at the time of calibration should contain items of information as noted in the specification.

4.10.2.1 Date

A record of the date demonstrates that the unit is being used by the client. Reports that show a consecutive number of days with no test taken should signal court personnel of an irregularity. The concern to be addressed is the possibility of a client driving a non-interlock equipped vehicle.

4.10.2.2 Time of Day

A record of the time of day along with the date shows the total number of tests taken on any given day and how many tests were taken in a row. This information is useful for evaluating client compliance. For example, a few failed tests with high BrAC followed within a few minutes by a pass could be evidence of circumvention. It is important for program monitors to have some kind of procedure, such as an algorithm that can read the data record, or simply to have BAIID recorders that can flag such occurrences. In the event that multiple tests are taken within a short period of time, the probation officer may need to question the client.

4.10.2.3 Pass Fail

A record of pass and fail attempts can provide a relatively accurate record of alcohol use and compliance. A record with no or few fail attempts could have several meanings, but a test with many fail attempts should be of concern to court personnel. If a client is expected to abstain from drinking, then the test results may be used as a confrontation tool.

4.10.2.4 BrAC Level

BrAC level documentation may be of interest to the probation officer or the alcohol counselor for examining the consumption pattern of the driver. A significant number of failed attempts combined with elevated BrACs demonstrates that the client is not meeting program goals. Many DWI programs for offenders require abstinence, so this information may be used in conjunction with self-reports, and may possibly be used as a means of confronting the client with their behavior.

4.10.2.5 Start and Stop

A record of start and stop times, and perhaps a record of miles traveled would allow for court personnel to observe if the vehicle had actually been driven when a test was successfully completed. Thus, if a client stopped at a bar to drink and left the vehicle idling, a lengthy trip with no miles driven would be recorded. Such a situation should ''flag'' court personnel to a possible circumvention attempt.

4.10.2.6 Service Reminder

It is recommended that the unit itself have the capability to warn the client of an upcoming calibration check. Such a provision has been stated previously in paragraph 2.4.3.T. A combination of a warning light and/or audible sound during the power-up sequence would be sufficient.

5.0 Commentary on Utility Specifications

5.1 Accuracy

The accuracy specification for utility specifications is important for the convenient operation of the interlock device. In all likelihood, a BAIID that easily passes the accuracy safety specification (high end) will also pass without difficulty the accuracy utility specification (low end). Nevertheless, the acceptability of an interlock program may be damaged if too many legitimate users with legal BACs are prevented from driving. Similarly there are certain climatic or personal safety occasions when any lockout of a zero BrAC driver would be unacceptable. Therefore, this may be of concern to the certifying authority.

Several of the States and/or Provinces have included in their standards a requirement to test for the contaminating influence of things such as mouthwash, coffee, tobacco breath, unburned hydrocarbons, and breath mints. Some of these items are mentioned as complaints among users of the interlock devices in the California Pilot Program, also some of the State and Provincial testing programs have identified false positives particularly with mouthwashes, and tobacco smoke. The possible influence of these substances should not be regarded as a significant concern, however, when minor precautions are taken. While the influence of such substances on BrAC can be real when introduced in a concentrated, atypical fashion, their influence under normal use conditions should not be a serious concern. Since it is the driver who is inconvenienced by use of such interfering substances, it is in the driver's interest to avoid situations which give rise unnecessarily to false positives.

The type of alcohol-sensing technology used in a BAIID will influence the specificity of measurement. A passive fuel-cell device held in an engine exhaust stream measures about .01% w/v. The semiconductor technology is less specific, and may read higher. The ability of BAIIDs to correctly detect and reject non-ethanol contaminants is adequate but not perfect. It is for these reasons that the alcohol setpoint recommended for adoption not be set below .025% w/v.

On another matter, acetone, an exhalable product of starvation, diabetic ketosis, and a few other medical conditions, has a history of being cited as a source of false positive readings on breath-test devices for alcohol. These too, however, are well-known by forensic specialists as unlikely sources of error for fuel cell and infrared technologies.

5.2 Clearance Rates

The interlock devices should be promptly clear of residual breath alcohol after a failed start attempt. The BAIID should reset to zero and be ready for a retest within 3 minutes providing the BrAC from the previous test was less than or equal to 0.05% w/v. This stipulation is added because a very high reading due to either high true BrAC, or high mouth alcohol, would place an unreasonable burden on the BAIID possibly requiring the addition of a more costly purge blower. The added time that might be required to re-test a person with a BrAC in excess of .05% w/v ranks low in priority of concerns.

5.3 Warm-Up

The breath sample must be evaluated in a fairly constant environment, therefore some time must be allowed for the sampling head to stabilize.

5.4 User Display

As with all electronic devices that must interface with a human, the thoughtful presentation of information can mean the difference between nervous confusion and easy acceptance. In the case of the interlock device, certain pieces of information must be made crystal-clear to the user. As noted in the utility specification, these are: When to blow, when to wait, when to start the vehicle, when an extended lockout condition occurs, when to seek service. These basic functions should be clearly evident to a minimally-trained user.

5.5 Temperature Package

The specification of acceptable temperature extremes is a case where some compromises need to be made. The specification stipulates −40 °C to +85 °C. The range is regarded as the normative range for automobile exposure by the SAE, but forty degrees below zero is not conducive to vapor measurement, and there has been concern expressed that uncommonly high temperatures would require inclusion of costly circuit protections. These extremes are special conditions but they are also apt to occur.

Certification evaluation procedures should be designed around not only device compliance to the specification, but also the possibility of device's exposure to different problems, such as power and/or physical damage through mishandling. For example, at the low end, if a manufacturer allows a sampling head to be brought inside on chilly nights, there ought to be some provision made to ensure that it is safe from impact damage should it be dropped or mishandled.

The vehicle battery could conceivably be used as a source of power for a heating appliance, but this may impose extreme current demands upon batteries that must turn an engine at temperatures below −20 °C. An external portable power source of some kind might be a solution to this problem.

5.6 Altitude

In 1974 it was demonstrated that when a fixed volume of breath is obtained and analyzed at some ambient pressure, alcohol concentration is independent of barometric pressure. However, most of the current BAIIDs make use of a semiconductor sensor where the sensitivity to alcohol is a function of the oxygen concentration, and oxygen *does* decrease as altitude increases. As a result, as altitude goes up (and oxygen concentration goes down), measured BrAC increases.

Failure to meet a utility specification, however, is not a safety-related problem, but for residents of much of the non-coastal western U.S. it could be a source of some inconvenience. Two alternatives may be worthy of consideration.

On one hand, the manufacturer could conceivably adjust the basal sensitivity of the BAIID so that residents of cities above 5,000 feet, such as Salt Lake City, Denver, Flagstaff, Santa Fe etc. are able to start their vehicles without problems. Alternatively, states with high country may want to consider adopting an alcohol setpoint less restrictive than the minimal, such as .03% w/v, so that false positive problems are minimized from the beginning.

6.0 Commentary on Optional Features

6.1 BrAC Display

The manufacturer or the state's own information provided to the user ought to instruct the user on the meaning of BrAC values and the likely relation between quantity of alcohol consumed, BrAC, and the average decay time for a BrAC curve.

Inclusion of such information may well provide an educational service to the user/offender about the relationship between drinks consumed, time since drinking and BrAC.

6.2 Sample Acceptability Criteria

In a NHTSA Technical Report (DOT HS 807 333) issued November 1988, three BAIID manufacturers had their products evaluated at the Transportation Systems Center in Cambridge, MA. In general it was found that the device which requires a temperature criterion be met was most successful in preventing a pass condition following the introduction of air samples from non-human sources; the device which required a minimum pressure requirement be met was most successful in preventing a pass condition following the introduction of filtered samples.

An ideal unit might require a unique breath signature from each stipulated user, however, the costs of such technology could be prohibitive at this time. Nevertheless, a standard which provides for the breath physical characteristics, or other aspects of the stipulated users, could greatly reduce the attractiveness of circumvention strategies which are now generally quite easy to employ.

Protection from tampering and circumvention is the most challenging and potentially the most costly aspect of an interlock device.

6.3 Smoke

Tobacco smoke, or some constituents of tobacco smoke, increase the proportion of false positives detected by semiconductor type alcohol measuring devices. Other sources of smoke may well do likewise, and in the presence of high smoke environments, programs may be affected by this interference. States which have seasonal smoke from burning fields may want to adopt this element of certification testing.

6.4 Dust

Dust is a theoretical source of false negatives, the kind of error that might allow an elevated BrAC to go undetected due to absorption of the alcohol by the dust. Dust is incorporated in the Australian Standard and the certification tests there for in-vehicle alcohol devices require 5 hrs. exposure to dust. States which are prone to dust devils or dust storms may want to consider inclusion of a dust testing protocol in their standards.

6.5 Alert Conditions

The rolling retest has been adopted as a countermeasure for two different types of circumvention as described in paragraph 3.8.2.

A subject of long discussion has been the proper consequences for a failure under conditions of a failed rolling retest. If an impaired driver is identified during a rolling retest there are few safe alternatives that would remove the driver from the road. These alternatives fall into the following general categories * * *

- Alert the police and other drivers sharing the road via a conspicuous signal (lights, horns *etc.*) This alternative was considered and rejected as a safety hazard.
- Alert the police via covert transmitted signal. This alternative is good from a safety perspective, but might at this time be difficult from a cost or programmatic perspective.
- Merely warn the driver at the time of the infraction with a unique auditory or visual cue, but upon failure, prevent further use of the vehicle after a safe period (*e.g.*, 5 days) has passed. This is the only practical alternative at this time.

Most efforts to warn the public at the time of a failed test using installed equipment such as lights and/or horns would add new safety hazards. The wiring of an additional less alarming signal (*e.g.*, a single light source with a unique characteristic) that would be specific to a failed interlock test may be desirable but would add to costs to the BAIID and require public education costs as well.

If this class of circumvention were deemed prevalent enough to warrant the expense of a surveillance system, it may be that a low cost CB transmitter signal could be designed that would serve an alerting function. A specific signal, possibly one that sweeps across several frequencies, could alert nearby police cruisers or truckers. Alternatively, citizens could provide location and direction to police which, if capable of responding, could investigate.

One of the pervasive problems faced by interlock manufacturers is to design a device that finds a compromise between sophistication and affordability. The main problem of program evaluators is to honestly evaluate a BAIID program as it exists, not a program that may someday exist.

At this early phase in the development of BAIID technology, if the marriage of the device and the program to monitor the device is not thoughtfully conceived and controlled, the future of the technology may be forestalled, and the possibility of a technical monitoring approach to alcohol-involved highway safety risks abruptly ended. The specification will need to evolve to a more ideal state if the BAIID devices and monitoring programs of today can be shown to warrant such additional development.

APPENDIX A—CERTIFICATION TEST SUMMARY

Section	Test description	BAIID	Comment/purpose
1.1.1.T	Accuracy Tests for Safety Specification—Unstressed.	A, B	Unstressed criterion is 90% accuracy at .01% w/v above setpoint; 20 tests, ≥18 must lock.
1.1.2.T	Accuracy Tests for Safety Specification—Stressed.	A, B	Stressed criterion is 90% accuracy at .02% w/v above setpoint; 20 tests, ≥18 must lock.
1.2.T	Breath Sampling	A, B	Minimum sample of 1.5 L
1.3.T	Calibration Stability	A, B	Shall be last test in the series, use daily for duration up to 10 weeks. Test according to ¶ 1.1.2.T at end, then recalibrate and test with ¶ 1.1.1.T.
1.3.1.T	Lockout Evaluation	A, B	BAIID must lockout if not serviced by 7 days after recommended service interval.
1.4.T	Power	A, B	11 and 16 VDC test followed by ¶ 1.1.2.T
1.5.1.T	Temperature Ranges	A, B	Test according to ¶ 1.1.2.T at −40 °C, −20 °C, +70 °C, +85 °C

APPENDIX A—CERTIFICATION TEST SUMMARY—Continued

Section	Test description	BAIID	Comment/purpose
1.5.2.T	Temperature Extremes, −40 °C and +85 °C.	A, B	Test for manufacturer recommended exceptions to meeting the specification inextreme conditions.
1.6.1.T	Vibration 1	A	10 to 30 to 10 Hz, 5 min., .76mm displacement.
1.6.2.T	Vibration 2	B	30 to 60 to 30 Hz, 5 min., .38mm displacement.
1.6.3.T	Vibration 3	A, B	As above, 3 directions.
1.6.4.T	Vibration 4	A, B	Test by ¶ 1.1.2.T.
1.6.5.T	Post shake inspection	A, B	Search for damage.
1.7.T	RFI/EMI	A, B	5 cm from in-vehicle appliance, test with ¶ 1.1.2.T.
1.8.1.1.T	Tampering/Power loss	A, B	Test for interrupt detection.
1.8.1.2.T	Tampering/Circuit	A or B	Test for hotwire or push start detection ability on an installed device.
1.8.2.1.T	Circumvention/Non-human sample	A, B	80% correct criterion, test with ¶ 1.1.2.T.
1.8.2.2.T	Circumvention/Filtered samples	A, B	80% correct criterion, test with ¶ 1.1.2.T.
1.8.2.3.T	Circumvention/Rolling Retest	A or B	Test to determine retest conditions fulfill criteria of (1) retest interval, (2) failed lockout in 5 days.
1.9.T	Sample free restart	A, B	Test internal timer.
1.10.T	Data recorder	A, B	Evaluate output.
2.1.1.T	Accuracy/Precision for Utility Specification—Unstressed.	A, B	Basic criterion is 90% correct pass for .01% w/v below setpoint; 20 tests, 18 or more must not lock.
2.1.2.T	Stressed Utility Tests	N/A	No tests proposed, if needed recommend .02% below setpoint at 90% accuracy criterion.
2.2.T	Clearance Rate Test	A, B	Reset time after .05% w/v.
2.3.T	Warm Up Test	A, B	Time to ready at −20 °C, also see test ¶ 1.5.1.T.
2.4.1.T	Display readability	A/B	Note.
2.4.2.T	Display user feedback	A/B	Note.
2.4.3.T	Display warnings	A/B	Note.
2.5.T	Low temperature provisions	A/B	Determine that a provision is made for extremes if criteria of ¶ 1.1.T not met −40 °C.
2.6.T	Altitude	A/B	Warn user.
3.1.T	BrAC readout	A/B	Optional.
3.2.T	Sample acceptability	A, B	Optional.
3.3.T	Smoke	A, B	Optional.
3.4.T	Dust	A, B	Optional.
3.5.T	Alert Conditions	A, B	Optional.

Appendix B—Equipment List

1. *Simulators,* such as National Draeger Mark IIA or comparable, must be used with care to avoid problems due to condensation in transfer lines and to prevent overpressure effects. They shall not be exposed to temperatures below about 20 °C or above 34 °C except for momentary use. Guidelines for preparation of alcohol solutions are available from the National Safety Council's Committee on Alcohol and Other Drugs. 444 North Michigan Avenue, Chicago, Illinois 60611.

2. *Thermometers* must be traceable to the National Institute of Standards and Technology (NIST). The thermometer used for checking the simulator shall be readable to 0.1 °C.

3. *Alcohol,* ethanol, shall be U.S.P. reagent quality absolute or NIST Standard Reference Material.

4. *Temperature Chamber,* such as Thermotron FM35 CHM, may be walk-in type or bench top type.

5. *Shake Table* must be capable of vibrating load of about 4.5 kg (10 lb) through the specified schedule. It shall be programmable.

6. *DC power supply,* such as Hewlett Packard 6023 A or comparable, must be able to deliver the range of automotive voltages specified.

7. *Air syringes,* one 1L and one 3L for one class of spirometric measures.

8. *Spirometer,* approximately 9L capacity.

9. *Leak-tight box,* for collecting vented air, shall be large enough to accommodate BAIID and be fitted with suitable connections for spirometer, mouthpiece, and power to BAIID. Similarly outfitted plastic bag may be used if satisfactory seal and operation can be demonstrated using the air syringe and spirometer.

10. *Evidential breath tester,* such as CMI Intoxilyzer (infrared) and Lion Alcometer SD–2 (fuel cell). Both types may be desirable since the peak accuracy ranges differ.

11. *Hoses,* flexible, various diameters.

12. *Glassware,* class A volumetric for preparation of alcohol solutions.

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BILLING CODE 4910–59–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA–2003–16334; Notice 2]

Decision That Nonconforming 2000 Audi A8 and S8 Passenger Cars Are Eligible for Importation

AGENCY: National Highway Traffic Safety Administration, DOT.

ACTION: Notice of decision by National Highway Traffic Safety Administration that nonconforming 2000 Audi A8 and S8 passenger cars are eligible for importation.

SUMMARY: This document announces a decision by the National Highway Traffic Safety Administration (NHTSA) that certain 2000 Audi A8 and S8 passenger cars that were not originally manufactured to comply with all applicable Federal motor vehicle safety standards (FMVSS) are eligible for importation into the United States because they are substantially similar to vehicles originally manufactured for importation into and sale in the United States and that were certified by their manufacturer as complying with the safety standards (the U.S. certified version of the 2000 Audi A8 and S8 passenger cars), and they are capable of being readily altered to conform to the standards.

DATES: This decision was effective January 6, 2004. The agency notified the petitioner at that time that the subject vehicles are eligible for importation. This document provides public notice of the eligibility decision.

FOR FURTHER INFORMATION CONTACT: Coleman Sachs, Office of Vehicle Safety Compliance, NHTSA (202–366–3151).

SUPPLEMENTARY INFORMATION: