



PSI licensure:certification

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Department of Consumer Affairs
Bureau of Automotive Repair
Smog Check Technician
Licensing Examinations



CANDIDATE INFORMATION BULLETIN

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Please refer to our website to check for the most updated information at www.psiexams.com.

SECTION 1: INTRODUCTION

PURPOSE

The California Department of Consumer Affairs, Bureau of Automotive Repair (BAR) developed this handbook to help you prepare for the Smog Check Technician Licensing Examination. The purpose of the examination is to determine the basic qualifications of the applicant. We strongly recommend that you study every section carefully, well in advance of the examination date.

The Smog Check Technician licensing examination is used only to initially obtain a license. Smog Check Technicians renewing a license must complete an update course at a BAR-certified institution, and submit a license renewal application to BAR.

Licensed Smog Check Technicians may conduct both initial and after-repair certification tests on vehicles included in the Smog Check Program. They may also perform vehicle emission control system adjustments, diagnoses and repairs to failed vehicles at licensed Test and Repair stations.

This handbook will not give you all the knowledge that you need. It is intended to help you decide what training and/or skills you may need to pass the exam, and provide an idea of what the actual test is like.

The handbook gives recommendations for studying, information on the format of the examination, a general description of the examination and examples of the kinds of test items you will encounter.

SECTION II: PREPARING FOR THE EXAMINATION

WHERE TO BEGIN

The BAR Smog Check Technician Licensing Examination evaluates a candidate's knowledge of Smog Check Program inspection requirements, as well as diagnosis, repair and retest of failed vehicles. Examination questions are based on the Examination Plans in Section V. Review this outline carefully and plan an appropriate schedule of study or review.

HOW THE EXAMINATIONS ARE DEVELOPED

The examinations are developed by licensed Smog Check Technicians who work within guidelines established by DCA/BAR for the licensing of many regulated trades and professions. Every attempt is made to assure that the questions fairly and reasonably measure the competencies listed in the Examination Plans in Section V.

First, the questions are written in a structured setting by technicians, and are edited and reviewed by several groups of technicians. This assures that the questions are job-related and written in terms used by practicing technicians. This process provides for an impartial review of the questions to verify their accuracy and technical quality.

A series of computer-generated statistics is compiled on each question. These statistics assist BAR in determining if a question is a fair measure of knowledge.

Then, the passing score is determined by another group of licensed technicians, who evaluate the difficulty of each question, as it relates to entry-level practice. These evaluations are analyzed, and the passing score is determined, with an acceptable level of confidence that the examination separates the qualified candidates from the non-qualified candidates. Different forms of the examination may have different passing scores.

LICENSE CLASSES

All applicants for a Smog Check Technician license must use the most current application form (Form #T-6, REV. 10/99).

Regulations establish three classes of licenses: Intern, Basic, and Advanced. Detailed descriptions and requirements are contained in the charts on Pages 4 to 6 of this handbook.

Technicians employed to perform inspections, repairs and certifications at stations in the Enhanced Program areas must possess an Advanced Emission Technician License. Technicians may consult BAR's Web site at www.smogcheck.ca.gov to determine if the station where they are/wish to be employed is in a Basic or Enhanced area.

Technicians employed in a Basic area may choose the Basic Area Technician or Advanced Emission Technician license at the time of initial application. Advanced licensees may perform inspections and repairs (depending on station type) to failed vehicles at all licensed stations in California.

TRADE EXPERIENCE

Significant portions of the examination relate directly to actual situations. Therefore, experience you acquire performing tune-up, emission control, and related diagnostic and repair work increases the likelihood that you will answer these questions correctly.

TRAINING

Smog Check Technicians shall have the option to do hands-on work in lieu of written work in order to successfully complete the department certified training and retraining courses or may complete comparable military training as documented by submission of Verification of Military Experience and Training (V-MET) records in lieu of meeting any other training-related requirements.



REVIEW COURSES AND PUBLICATIONS

Some persons may offer review or preparation courses or publications. We have no information to indicate that applicants who use these sources have a higher pass rate than those who do not. Courses other than BAR-certified Clean Air Car (or citation) courses are **not** associated with BAR. No publishers or course sponsors have legal access to BAR's examination materials. We make every effort to ensure that the contents of our examinations remain confidential and that the questions are changed frequently.

RESOURCES

A. INFORMATION ON PERFORMING INSPECTIONS

Review of BAR training materials is helpful. They include the Student Materials Packet for the BAR-certified Clean Air Car Course, the current edition of the Smog Check Inspection Manual, the BAR "Write It Right" booklet and videos, as well as current Laws and Regulations Relating to Licensed Smog Check Stations.

Some of these materials may be purchased by mail from **BAR**. The Student Materials Packet is available only by mail. See the Reference List on the following page.

B. INFORMATION ON DIAGNOSIS AND REPAIR

A number of commercial publications (as well as training classes) offer detailed diagnostic and repair information. They may be obtained from public and college libraries, bookstores, test equipment manufacturers' courses (including diagrams and illustrations), parts manufacturers' courses, independent schools, and vehicle manufacturers' schools.

REFERENCE MATERIALS

Below is a list of the reference materials that were used when the subject matter experts wrote examination questions. These references may be of use to you when preparing to take the examination. BAR does not endorse these publications other than to disclose that they were used in the examination development process.

(Available at libraries or from publishers)

Listed below are reference materials used by licensed Smog Check Technicians when writing questions for the Basic Area Technician and Advanced Emission Technician licensing examinations. These books are available at some public libraries, some community college libraries and bookstores, or can be ordered by any bookstore. When available, a telephone number for the publisher is included.

Also used as references when developing the examination are standard emission control diagnostic and repair manuals, as each licensed Smog Check Test and Repair Station is required to maintain.

Chek-Chart [Scan Tool and Lab Scope Guide](#).

Chek-Chart Publications, www.chekchart.com, 800.662.6277

Duffy, James E. [Auto Electricity, Electronics, Computers](#). South Holland, Illinois; Goodheart-Willcox Co., Inc. 1989; 708.333.7200

ISBN# 0-87006-694-3

Duffy, James E., and Smith, Howard Bud [Auto Fuel and Emission Control Systems](#). South Holland, Illinois; Goodheart-Willcox Co., Inc. 1992; 708.333.7200

ISBN# 0-87006-932-2

Escalambre, Rick [Advanced Automotive Emissions Systems](#). Delmar Publishers, 3 Columbia Circle, Box 15015 Albany, New York 12212-5015; 800.347.7707

ISBN# 0-8273-7154-3

Halderman, James [Advanced Engine Performance Diagnosis](#). Prentice-Hall, Inc., Upper Saddle River, New Jersey 07458 800.223.1360

ISBN# 0-13-576570-6

Layne, Ken [Automobile Electronics and Basic Electrical Systems, Volume 1](#): Text. New York; John Wiley & Sons. 1990; 800.223.1360

ISBN# 0-471-61763-6

Layne, Ken [Automobile Electronics and Basic Electrical Systems, Volume 2: Practice Manual](#). New York; John Wiley & Sons. 1990; 800.223.1360

ISBN# 0-471-61762-8

Layne, Ken [Automotive Engine Performance. Second Edition, Tuneup, Testing, and Service. Volume 1](#): Text. Englewood Cliffs, New Jersey; Regents/Prentice Hall; 800.223.1360

ISBN# 0-413-059775-9

Layne, Ken [Automotive Engine Performance. Second Edition, Tuneup, Testing, and Service. Volume 2: Practice Manual](#). Englewood Cliffs, New Jersey; Regents/Prentice Hall, 800.223.1360

ISBN# 0-413-059775-9

Probst, Charles O. [Bosch Fuel Injection & Engine Management](#). Cambridge, Massachusetts; Robert Bentley, Inc. 1989, 800.423.4595

ISBN# 0-8736-0300-5

Jendham [OBD II Diagnosis & Repairs](#). Jendham Inc. 13230 Evening Creek Drive South, Suite 202, San Diego, CA 92128-4104, 858.486.8525

King, Dick [Computerized Engine Controls, Fifth Edition](#). Delmar Publishers Inc., 2 Computer Drive West, Box 15-015 Albany, NY 12212-5015

ISBN# 0-8273-5263-8

(Available for purchase from BAR)

The following BAR publications have been used as references when writing questions for the Basic Area Technician and Advanced Emission Technician licensing examinations. They are available from the Bureau of Automotive Repair as a student set, known as the *Clean Air Car Course Student Materials Set*, for \$12. The individual prices are listed with each item.

[Smog Check Inspection Manual](#). Bureau of Automotive Repair, \$12.

[Write It Right Booklet](#). Bureau of Automotive Repair, first copy free.

[Laws and Regulations Relating to Automotive Repair Dealers and Smog Check Stations](#). Bureau of Automotive Repair, first copy free.

To purchase the *Clean Air Car Course Student Materials Set*, send a check or money order for \$12 (includes tax and shipping charges) to:

BAR Mail Room
10240 Systems Parkway
Sacramento, CA 95827-3006

An order blank is available from the Smog Check Web site.



DESCRIPTION OF CLEAN AIR CAR COURSES

The **Basic** course is a minimum of 68 hours in length and covers:

- Operation of BAR97 EIS (Emission Inspection System)
- BAR rules & regulations
- Vehicle emission testing procedures for the Basic Smog Check Program
- On Board Diagnostics (OBD II)

Students entering the course(s) must have one year experience/education in the automotive engine performance area. The instructor will determine if the student has the required automotive knowledge to enter the course.

Completion of the Basic course is required to take the Basic exam.

The **Advanced** course is a minimum of 28 hours in length and covers:

- NOx emissions diagnostic and repair procedures
- Setup and operation of a Digital Storage Oscilloscope (DSO), and oxygen sensor waveform analysis
- Loaded mode emissions baselining techniques, and application of BAR's diagnostic flowchart
- Catalytic converter theory, operation and efficiency testing procedures
- Vehicle emissions testing procedures using the BAR97 EIS for the Enhanced Smog Check Program

Completion of the Basic and Advanced courses are required to take the Advanced examination.

INTERN TECHNICIAN LICENSE REQUIREMENTS

THIS LICENSE DOES NOT REQUIRE AN EXAMINATION

Use/Expiration	Duties
<p>The license is valid for all areas of the state.</p> <p>The license expires in two years, can only be issued once and is nonrenewable.</p>	<p>The license allows an individual, under the direction of a supervising licensed test and repair technician, to perform repairs, or adjustments to the emission control systems on vehicles subject to the Smog Check Program.</p>
<p>Education/Experience</p> <p>To qualify for the Intern Technician license, the applicant must have one year experience and/or education in the engine performance area, and have completed the Bureau of Automotive Repair's Basic Clean Air Car Course within the last 12 months.</p>	

BASIC AREA TECHNICIAN LICENSE REQUIREMENTS

THIS LICENSE REQUIRES AN EXAMINATION

Use	Duties	Required Certifications
<p>The license is valid in the Basic or Change of Ownership Program areas of the state.</p>	<p>Depending on station type, the license allows an individual to inspect, diagnose, adjust, repair and certify the emissions control systems on vehicles subject to the Smog Check Program at Smog Check stations in areas of the state designated as Basic Smog Check Program areas.</p>	<p>The following BAR-certified courses satisfy the certification requirements for licensure. The course completion is valid for five years.</p> <ul style="list-style-type: none"> ▪ Electrical/Electronic Systems (20-hour minimum) ▪ Engine Performance (24-hour minimum) ▪ Advanced Engine Performance/Emission Systems (28-hour minimum) <p>Note: Unexpired ASE certifications in the areas of A6, A8 and L1, respectively, are acceptable in place of the above courses.</p>
<p>Education/Experience</p> <p>To qualify to take the examination, the applicant must meet one of the following requirements:</p> <ol style="list-style-type: none"> 1. Possess a valid unexpired Intern Technician license and have one year experience as an Intern Technician; OR 2. Have one year of automotive experience and/or education in the engine performance area, and have completed the Bureau's Basic Clean Air Car Course within the last 12 months; OR 3. Possess an Associate of Arts, Associate of Science, or higher degree in Automotive Technology from a state-accredited or recognized college, public school, or trade school AND have successfully completed the Bureau of Automotive Repair's Basic Clean Air Car Course within the last 12 months; OR 4. Possess a certificate in Automotive Technology from a state-accredited or recognized college, public school, or trade school with a minimum of 360 hours of coursework in the engine performance area, AND have successfully completed the Bureau of Automotive Repair's Basic Clean Air Car Course within the last 12 months. 		
<p>Locating Providers of Alternative & Update Training</p> <p>Information regarding alternative courses and update training courses is available through BAR's toll-free number, 800.952.5210, or BAR's Web site at www.smogcheck.ca.gov.</p>		

ADVANCED EMISSION TECHNICIAN LICENSE REQUIREMENTS

THIS LICENSE REQUIRES AN EXAMINATION

Use	Duties	Required Certifications
<p>The license is valid for all areas within the state.</p>	<p>Depending on station type, the license allows an individual to inspect, diagnose, adjust, repair and certify the emission control systems on vehicles subject to the Smog Check Program in all parts of California.</p>	<p>The following BAR-certified courses satisfy the certification requirements for licensure. The course completion is valid for five years.</p> <ul style="list-style-type: none"> ▪ Electrical/Electronic Systems (20-hour minimum) ▪ Engine Performance (24-hour minimum) ▪ Advanced Engine Performance/Emission Systems (28-hour minimum). <p>Note: Unexpired ASE certifications in the areas of A6, A8, & L1, respectively, are acceptable in place of the above courses.</p>
<p>Education/Experience</p> <p>To qualify to take the examination, the applicant must meet one of the following requirements:</p> <ol style="list-style-type: none"> 1. Possess a valid unexpired Basic Area Smog Check Technician license, AND have completed the Bureau of Automotive Repair's Advanced Clean Air Car Course within the last 12 months; OR 2. Possess a valid unexpired Intern Technician license, have one year experience as an Intern Technician, AND have completed the Bureau of Automotive Repair's Advanced Clean Air Car Course within the last 12 months; OR 3. Have one year of automotive experience and/or education in the engine performance area, and have completed the Bureau of Automotive Repair's Basic and Advanced Clean Air Car Courses within the last 12 months; OR 4. Possess an Associate of Arts, Associate of Science, or higher degree in Automotive Technology from a state-accredited or recognized college, public school, or trade school AND have successfully completed the Bureau of Automotive Repair's Basic and Advanced Clean Air Car Courses within the last 12 months; OR 5. Possess a certificate in Automotive Technology from a state-accredited or recognized college, public school or trade school with a minimum of 360 hours of coursework in the engine performance area, AND have successfully completed the Bureau of Automotive Repair's Basic and Advanced Clean Air Car Courses within the last 12 months. 		
<p>Locating Providers of Alternative & Training Classes</p> <p>Information regarding alternative, update and transition training courses is available through BAR's toll-free number, 800.952.5210, or BAR's Web site at www.smogcheck.ca.gov.</p>		

SECTION III: APPLICATION PROCEDURES

HOW TO APPLY

Applications must be complete and accurate, and be submitted with a \$20 application fee to BAR's Licensing Unit. Incomplete applications will be rejected, delaying the review process.

Current policy allows two test attempts before applicants are required to submit another application.

Applicants who falsify applications or supporting documents may have their licenses denied, revoked or suspended.

The examination fee will be collected separately by the examination administration contractor, PSI licensure:certification (PSI).

SPECIAL ACCOMMODATIONS AVAILABLE

If you need special accommodations to take the exam, mark the box on the application indicating that you may need assistance during the written examination. BAR will mail you a Request for Special Accommodations form, which must be completed and returned. The appropriate licensed health care provider (or licensed counselor) must write a letter answering all the questions on the special accommodations form, confirming the disability and justifying the need for special accommodations using the criteria in the request form.

NOTE: English as a second language is NOT a disability, and special accommodations are not granted.

CANDIDATE ELIGIBILITY

Once a candidate is determined to be eligible, BAR will notify PSI. PSI will mail an eligibility notice indicating how the candidate may register for and schedule an exam. An examination appointment date is usually available to each candidate within two weeks.

To be eligible to take the examination, the applicant must not have any unpaid BAR citations. Pending enforcement actions will not prohibit you from taking the examination, but may prevent issuance of a license.

In addition, the law requires the Department to check a list of individuals who have not paid their family support obligations. A professional license cannot be issued or renewed for an individual who has been identified by a California District Attorney as not meeting their family support obligations. However, a temporary license (valid for 150 days) may be issued to permit resolution of the family support hold. An existing license can be suspended after notice is given to the licensee.

APPLICATION AND EXAMINATION FEES

A \$20 application fee must accompany your initial licensing application. Your approved application allows you to take the examination a second time if you fail the first attempt. However, there must be at least 14 days between test attempts. If you fail the second attempt, you must submit another application, and \$20 application fee, to the BAR Licensing Unit. See the flowchart on Page 32 for details.

A separate \$45 examination fee must be paid to PSI for each examination attempt. If you cancel or don't show up without following PSI's guidelines, the examination fee is forfeited. See "Rescheduling" for further details.

SECTION IV: DESCRIPTION OF THE EXAMINATIONS

Listed below are the nine major sections of both the Basic Area Technician and the Advanced Emission Technician examinations, as well as the number of examination questions devoted to that section in each examination.

Examination Sections	Percentage of Questions	
	Basic Area Technician	Advanced Emission Technician
Calibrating, Maintaining and Servicing the Analyzer	6%	7%
Discharging Obligations to Consumers	16%	15%
Diagnosing Test Failures	15%	13%
Performing Functional Tests	8%	8%
Preparing for and Safely Conducting Emissions Tests	13%	16%
Performing and Verifying Repairs	14%	14%
Inspecting the Vehicle to be Tested for Safety	2%	3%
Identifying the Vehicle to be Tested	11%	10%
Performing Visual Inspections as Prompted by Analyzer	15%	14%
Total: 100%		

The examination for the Basic Area (EB) Technician License has a total number of 99 questions with 67 the minimum passing score. A candidate is allowed 2 1/2 hours to take the examination.

The examination for the advanced (EA) Emission Technician License has a total number of 100 questions with 69 the minimum passing score. A candidate is allowed 2 1/2 hours to take the examination.

BASIC AREA TECHNICIAN EXAMINATION PLAN

The following is the examination plan for the Basic Area Technician examination, which is the detailed information used by subject matter experts to write examination questions.

I. CALIBRATING, MAINTAINING AND SERVICING THE ANALYZER, (6% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to interpret and respond to analyzer prompts, to identify and troubleshoot routine system malfunctions and to perform required analyzer service procedures.
BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Respond to analyzer maintenance prompts, e.g., a prompt for calibration. ➤ Perform a 3-day gas calibration on a BAR 97 analyzer. ➤ Visually inspect analyzer devices, e.g., check for broken flex probe, kinked or deteriorated sample hose, dirty filters, plugged water trap drain. ➤ Repair or replace defective components, e.g., hoses, flex probe, tach leads, filters, as needed. ➤ Respond to failure prompts, e.g., purge HC hangups, correct analyzer lock-ups. ➤ Troubleshoot a printer failure that occurs without failure prompt; i.e., check and correct paper jams. ➤ Identify and troubleshoot system malfunctions, e.g., low flow through the sample hose, sample dilution, failure of a dynamometer or fuel cap tester to communicate with the analyzer. 	<ul style="list-style-type: none"> ➤ Ability to interpret and respond to analyzer maintenance prompts. ➤ Knowledge of how to perform a gas calibration on a BAR 97 analyzer. ➤ Ability to determine whether analyzer devices—e.g., probe tips, sample hose, filters, water trap drain—are functioning correctly. ➤ Knowledge of how to check the operation of the fuel cap tester. ➤ Ability to repair or replace defective external components of an analyzer. ➤ Ability to respond effectively to an analyzer's failure prompts, e.g., HC hang-ups, low flow, analyzer lock-ups. ➤ Ability to troubleshoot an analyzer's printer problems, e.g., paper jams, exhausted ink cartridges. ➤ Ability to troubleshoot minor analyzer system malfunctions, e.g., low flow, sample dilution, failure of the fuel cap tester or dynamometer to communicate with the analyzer. ➤ Knowledge of the causes of analyzer lock-outs and how to restore normal operation. ➤ Knowledge of how and when to reset and refresh an analyzer. ➤ Knowledge of how and when to obtain parts and supplies to maintain an analyzer. ➤ Knowledge of when and how to add or delete a technician access code through BAR.
II. DISCHARGING OBLIGATIONS TO CONSUMERS, (16% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to communicate current laws and regulations regarding emissions tests to consumers, such that consumers will understand what is required, why it is required, and what their options are.
BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Determine what type of smog check a consumer needs, e.g., biennial, change of ownership, after-repair, initial registration, out-of-state vehicle. ➤ Educate a customer regarding the need or lack of need to test a vehicle, e.g., point out that it must be tested before it can be sold, that it is too old or too new to require testing. ➤ Determine whether a customer's vehicle must be tested at a test-only station, explain the need if necessary, and provide the BAR 800 number or a list of stations near by. ➤ Explain to a customer why a test-only station does not perform repairs. ➤ Determine whether a vehicle must be tested at a referee station, explain the need if necessary, and refer the vehicle. ➤ Explain "gross polluter" to a customer. ➤ Explain to a customer why a vehicle must be tested at a station authorized to certify gross-polluter vehicles. 	<ul style="list-style-type: none"> ➤ Knowledge of the laws and regulations requiring vehicles to undergo emissions tests, e.g. ➤ Knowledge that some vehicles require no testing, that a change of ownership requires certification for which the seller is responsible. ➤ Knowledge of the test-only program, of how vehicles are chosen to participate, and of why particular vehicles are chosen. ➤ Knowledge that a technician may provide a list of near-by stations of the type that a customer needs to visit but may not recommend one. ➤ Knowledge of why a test-only station does not perform repairs. ➤ Knowledge of the conditions that require or allow a vehicle to be sent to a referee station and, especially, when not to send a vehicle to a referee station. ➤ Ability to judge whether an emissions pretest is advisable and to explain its advisability to the customer.
<ul style="list-style-type: none"> ➤ Explain smog check failures due to tampering and tampering's possible effects on emissions and driveability. ➤ Obtain a customer's authorization to perform a smog check. ➤ Inform a customer of incidental findings concerning a vehicle's need for repair, e.g., report problems that affect safety. ➤ Explain the value of a pretest when a pretest is appropriate. ➤ Inform a customer of a repair needed to make the vehicle safe to test and, if appropriate, provide a cost estimate. ➤ Inform a customer of unintentional tampering that would cause the vehicle to fail. 	<ul style="list-style-type: none"> ➤ Ability to determine from a pretest whether a particular vehicle would fail its emissions test as a gross polluter. ➤ Knowledge that a gross polluter must be tested at a station authorized to certify it. ➤ Knowledge of the circumstances in which no cost minimum applies to repairs needed to make a failed vehicle legally usable. ➤ Knowledge of myths about emissions control equipment that prevail among consumers and of why they are myths. ➤ Knowledge of tampering, of its effects on emissions, and of the laws, regulations, and BAR policies concerning it.

Continued on next page

<ul style="list-style-type: none"> ➤ After emissions testing print out two copies of the VIR, sign and date them, file one, and give one to the customer. ➤ Obtain authorization for diagnostic testing and provide the customer with a cost estimate. ➤ Determine what repairs within the cost minimum will bring about the greatest reduction in emissions. ➤ Obtain authorization for repairs needed to bring a failed vehicle into compliance and provide the customer with a cost estimate. ➤ Obtain customer authorization when a repair changes and the original estimate requires revision. ➤ Obtain customer authorization to replace components near the end of their useful life when significant other repairs are being made. ➤ Inform a customer of the legal \$450 repair cost minimum and the circumstances in which it applies. ➤ Inform a customer of possible warranty coverage for repairs. ➤ Explain to the customer the importance of after-repairs testing. ➤ Fully disclose to the customer the costs of all recommended procedures, e.g., test, repair, retest. ➤ Provide the customer with a detailed invoice concerning diagnoses and repairs. ➤ As needed, explain the differences between smog checks in basic and enhanced areas. ➤ Create repair records when appropriate. 	<ul style="list-style-type: none"> ➤ Knowledge that warning a customer about potential vehicle systems failures is both professional behavior and good business. ➤ Ability to determine whether a repair is needed before emissions testing. ➤ Ability to prepare lawful estimates for the costs of diagnoses and repairs or to provide information for such estimates to service writers. ➤ Ability to explain to a customer why diagnostic tests are needed. ➤ Knowledge of the legal \$450 repair cost minimum and of how it applies to correcting vehicle failures. ➤ Knowledge of diagnoses and repairs that optimize value to customers, e.g., that bring about the best reductions in emissions possible within the \$450 repair cost minimum. ➤ Knowledge of alternate routes to qualifying vehicles for use, e.g., knowledge of the circumstances in which a customer and vehicle qualify for a waiver or help from the state with repair costs. ➤ Knowledge of vehicle warranties required by State and Federal law and of how to find warranties for particular vehicles. ➤ Knowledge of the relationships between controlling CO or HC emissions and making NOx emissions worse. ➤ Ability to explain to a customer why verifying the effectiveness of repairs is necessary. ➤ Ability to provide a customer with lawful, detailed invoices concerning diagnoses and repairs or to furnish the necessary information for such invoices to service writers. ➤ Knowledge of how to locate hard-to-find repair parts and how to guide a customer through a proper sequence—local stores, manufacturers, wrecking yards, parts locators—for finding them.
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III. DIAGNOSING TEST FAILURES, (15% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to check emissions and non emission-related vehicle components in order to determine the cause of a vehicle's failure to pass the emissions test.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Check the VIR for causes of failure which may be related to the visual inspections, functional tests or emissions tests. ➤ Determine whether a system failure is due to tampering, e.g., check whether emission control components have been tampered with in ways hidden from visual inspection. ➤ Determine which emissions are out of range (if any) and decide which system or systems may be at fault. ➤ Following manufacturer's procedures, check for trouble codes that implicate particular systems. ➤ Check input sensors to determine whether they function properly. ➤ Check computer outputs to determine whether any are abnormal. ➤ Check for mechanical failures that affect emissions, e.g., a faulty valve train, leaking head gaskets, worn rings or pistons. ➤ Check for EVAP system failures. ➤ Using a laboratory oscilloscope, verify O2 sensor operation and check its output for fuel control. ➤ Make checks as needed if excessive HC emissions were the cause of failure. ➤ Make checks as needed if excessive CO emissions were the cause of failure. ➤ Make checks as needed if CO2 or O2 emissions were out of range. ➤ Check the maintenance of systems that need periodic maintenance, e.g., ignition systems, systems that require filters. ➤ Using a DVOM's minimum, maximum, and average readings, determine whether a vehicle is running in closed loop. ➤ Resolve conflicts among diagnostic readings, especially those that suggest one component failure is causing other systems to indicate failures that may not be real. ➤ Check appropriate references for information that will aid in diagnosis. ➤ Pretest a vehicle that failed its smog check at another shop to establish a baseline. 	<ul style="list-style-type: none"> ➤ Knowledge of how a four-stroke engine produces its various emissions. ➤ Knowledge of basic diagnostic principles, as set forth in the Clean Air Car Course, i.e., knowledge of how to interpret diagnostic checks and tests. ➤ Knowledge of the theory underlying each component of emission control systems, i.e., of what the component does and how and why it does it. ➤ Knowledge of diagnostic approaches to vehicles that lack OBD equipment. ➤ Ability to use all senses in diagnosis, e.g., to realize from the appearance and odor of a car's exhaust that it has a blown head gasket, that a particular engine sound implies that the engine is about to throw a connecting rod. ➤ Knowledge that a vehicle test failure may be related to visual inspection, functional tests, or emissions, as indicated by the VIR. ➤ Knowledge of how missing, modified, disconnected, damaged, plugged, deteriorated, or corroded components affect the functioning of the systems of which they are parts, e.g., of how emissions are affected by the components' flaws. ➤ Knowledge of whether particular kinds of tampering do or do not affect the MIL of a computer control system. ➤ Ability to detect covert tampering with emissions-control or emissions-related components. ➤ Ability to use the pattern of a failed vehicle's emissions readings as a guide to the vehicular system or systems that are probably at fault. ➤ Ability to use a scan tool to check input sensor functioning and to obtain diagnostic trouble codes. ➤ Knowledge of when to use particular diagnostic equipment. ➤ Knowledge of approved sources of help in interpreting trouble codes and in detecting false codes. ➤ Ability to use a lab scope to check the basic input/output functioning of a vehicle's sensors and computer. ➤ Knowledge that checking and interpreting the condition of the engine oil is basic to understanding emissions-related failures, e.g., diluted with gasoline.

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- ✎ Knowledge that checking and interpreting engine timing is basic to understanding emissions-related failures.
- ✎ Knowledge that understanding ignition systems is basic to understanding emissions failures.
- ✎ Knowledge of innovations, e.g., of distributorless ignition systems, of electrically driven air injection systems, of how they operate, and of how they fail.
- ✎ Knowledge of normal emissions readings for a vehicle in good condition.
- ✎ Knowledge of the diagnostic checks needed if a vehicle fails for excessive HC emissions.
- ✎ Knowledge of the diagnostic checks needed if a vehicle fails for excessive CO emissions.
- ✎ Knowledge of the systems that may be implicated if O2 and CO2 emissions readings are out of range and of the diagnostic checks that should be made.
- ✎ Ability to judge from a test drive what may be causing a vehicle to fail, i.e., ability to identify sounds, odors, or vibrations that implicate particular systems.
- ✎ Knowledge of how to locate and use diagnostic aids, e.g., emissions pattern charts, trouble trees, vacuum diagrams, wiring diagrams, cross-references that relate voltages to temperatures.
- ✎ Ability to identify the causes of wiring defects, e.g., excessive heat, vibration, or dampness, gnawing by rodents.
- ✎ Knowledge of how to use automotive manuals and CD-based, DVD-based, or on-line references in diagnosing smog check failures.
- ✎ Knowledge of how neglecting preventive maintenance causes problems, such as arcing plug wires or clogged filters, that affect emissions.
- ✎ Knowledge of frequent causes of failure, e.g., clogged EGR passages, faulty temperature sensors that cause EGR valves to open or close when they shouldn't, defective O2 sensors, defective AIS diverter valves.
- ✎ Ability to test whether sensors are working properly, i.e., ability to use DVOMs and DSOs to assess their functioning.
- ✎ Ability to use basic diagnostic equipment, e.g., oscilloscopes, timing lights and scan tools, and specialized equipment, e.g., mirrors for locating multiple O2 sensors.
- ✎ Knowledge of the causes of engine misfires, e.g., knowledge that any source of unmetered outside air, such as leaking vacuum brake boosters, may cause lean misfires.
- ✎ Ability to use an oscilloscope to identify the causes of misfires, e.g., faulty coils, modules, or reluctors.
- ✎ Knowledge that in pre-OBD-II cars, MAP and mass airflow sensors may not set trouble codes under out of specification conditions.
- ✎ Knowledge of how to adjust electronic carburetors.
- ✎ Knowledge of where AIS-controlled air should go and of what proportions are normal for different destinations.
- ✎ Ability to use the propane enrichment procedure to locate vacuum leaks, e.g., those that cause lean misfires.
- ✎ Ability to use a lab scope for sensor testing or to monitor an O2 sensor's function.
- ✎ Knowledge that misfires can lead to catalytic-converter failure.
- ✎ Knowledge of tests of catalytic-converter function, e.g., the oxygen absorption test, the cranking CO test, the intrusive test, and the infrared pyrometer test, and of how to perform them.
- ✎ Ability to use a pyrometer to determine which converter in a multiple-converter system is faulty.
- ✎ Knowledge of, or ability to determine, how much resistance is required in a secondary ignition system.
- ✎ Ability to perform a "cylinder balance (rpm drop)" test to determine whether a cylinder is functional.
- ✎ Ability to perform compression and leak-down tests.
- ✎ Knowledge of the possible causes of a "dead" cylinder—one that fails to ignite during engine operation.
- ✎ Knowledge of how abnormal fuel pressures affect emissions.
- ✎ Knowledge that a restricted fuel return line increases injection pressure and affects emissions.
- ✎ Knowledge of sequential or cascading failures, e.g., that a faulty ground may cause multiple sensor failures.
- ✎ Ability to perform "voltage drop" tests to locate a wiring defect.
- ✎ Knowledge that O2 emissions readings are critical to lean-mixture diagnoses.

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	<ul style="list-style-type: none"> ➤ Knowledge that an excessively rich mixture may be due to a faulty O2 sensor. ➤ Knowledge that the switch rate of the O2 sensor during closed-loop operation will reveal whether the computer is controlling fuel delivery. ➤ Ability to use a scan tool, lab scope, DVOM, or voltmeter as needed to determine why fuel control is defective. ➤ Ability to perform and interpret engine computer systems tests. ➤ Ability to use a charging-systems tester in diagnosis. ➤ Ability to determine actual engine temperatures and to correct unacceptable temperatures. ➤ Knowledge that components that appear to require replacement should be tested before a replacement is made. ➤ Knowledge that simply replacing a catalytic converter instead of diagnosing the true cause(s) of excessive emissions will mask the cause(s) and lead to early converter failure. ➤ Knowledge of, or ability to find, correct procedures for repairing older vehicles, e.g., the procedure for repairing the mechanical advance in the distributor of a vehicle so equipped.
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IV. PERFORMING FUNCTIONAL TESTS, (8% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to use correct procedures for testing the functional operation of emissions-related components.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Check whether the malfunction indicator light (MIL/Check Engine light) (a) functions properly and (b) has or has not come on during the emissions test. ➤ Obtain the trouble codes that caused the MIL to come on. ➤ Interpret the trouble codes. ➤ Check whether the maintenance-required light functions properly. ➤ Inspect the fuel cap for proper fit and ability to hold pressure, following the prompts of the BAR analyzer. ➤ As needed, test the gasoline fill-pipe restrictor with a dowel to verify that it will not accept a leaded-gasoline nozzle. ➤ As prompted, check the ignition timing. ➤ As prompted by the analyzer, check the integrity and functioning of the exhaust gas recirculation (EGR) system. 	<ul style="list-style-type: none"> ➤ Ability to check that vehicular warning lights, e.g., the MIL, function properly. ➤ Ability to obtain diagnostic trouble codes, e.g., when the MIL comes on. ➤ Ability to interpret diagnostic trouble codes and respond appropriately. ➤ Ability to choose the correct adapter and run the functional pressure test on a vehicle's fuel cap when prompted by the analyzer. ➤ Knowledge of the purpose of a fill-pipe restrictor and of the dowel test. ➤ Knowledge of where to obtain correct engine timing specifications, if necessary, for a vehicle undergoing a smog check. ➤ Ability to determine whether the timing of a particular vehicle is adjustable. ➤ Ability to check engine timing if the analyzer requires the check, i.e., ability to use a timing light correctly. ➤ Ability to correct engine timing as needed, if the timing is adjustable. ➤ Knowledge of the older and newer types of EGR, e.g., knowledge that OBD-II vehicles usually have digital electronic EGRs. ➤ Knowledge of where to obtain correct EGR specifications, if necessary, for a vehicle undergoing a smog check, i.e., knowledge of the data available from the under-hood label and from other BAR-approved sources. ➤ Knowledge of how EGRs operate, e.g., that some operate only if the vehicle is operating at speed, and that it may be necessary to test drive such a vehicle and use a gauge to record the EGR's vacuum signal. ➤ Knowledge of the various procedures—e.g., manipulating the valve, applying vacuum, overriding the computer—for checking a vehicle's EGR system. ➤ Ability to interpret functional-test failures and report them correctly to the analyzer.

V. PREPARING FOR AND SAFELY CONDUCTING EMISSIONS TESTS, (13% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to inspect the vehicle to be tested, the testing area and the testing equipment in order to ensure and maintain a safe working environment.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Ensure the testing area is safe, e.g., clear the area of loose tools, wipe up spills, exclude nonessential staff and customers. ➤ Take precautions for personal and staff safety during the tests, e.g., run them from inside the vehicle, allow no one to work on the vehicle, avoid releasing pressurized fluids. ➤ Follow the safety procedures recommended by vehicle and equipment manufacturers. ➤ Start the vehicle and bring its engine to operating temperature. 	<ul style="list-style-type: none"> ➤ Knowledge of BAR 97 testing, i.e., of the information the analyzer requires and of how to supply it and respond to the analyzer's prompts. ➤ Knowledge of personal-safety precautions during emissions testing. ➤ Knowledge of precautions that prevent damage to costly equipment, e.g., keeping vehicle fluids out of a dynamometer, removing the tailpipe probe and tachometer lead before moving a vehicle after testing.

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<ul style="list-style-type: none"> ➤ As needed, pretest the vehicle, checking the fuel cap, timing, and EGR valve as well as the emissions. ➤ Enter vehicle information and inspection results as required by the BAR 97 analyzer, i.e., identify yourself by license number and access code; scan the BAR code on the renewal form or identify the vehicle as prompted; enter the gross vehicle weight rating as prompted; and respond to prompts regarding engine and emission controls. ➤ As prompted, insert the tailpipe probe into the vehicle's exhaust system and attach the tachometer leads. ➤ Following the prompts of the BAR 97 analyzer, run the high-rpm test. ➤ Following the prompts of the BAR 97 analyzer, run the idle rpm test. ➤ If sample dilution occurs, locate and correct the cause, if possible, e.g., move the probe. ➤ Abort a smog check when necessary. ➤ Detach the tachometer leads and remove the tailpipe probe from the exhaust system before moving the vehicle out of the testing area. 	<ul style="list-style-type: none"> ➤ Knowledge that chocking is appropriate even for BAR 97 testing because an old vehicle may slip into gear. ➤ Knowledge of appropriate operating temperatures for a vehicle and its emission control components. ➤ Knowledge of pretesting a vehicle so as to determine any need for repairs. ➤ Ability to judge whether required maintenance, if indicated, will affect the vehicle's emissions. ➤ Knowledge of when to abort problematic tests, e.g., when warning lights come on, when a substantial fluid leak occurs, when the engine pings or knocks, when the vehicle overheats or smokes. ➤ Knowledge of where to insert the probe if sample dilution occurs.
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VI. PERFORMING AND VERIFYING REPAIRS, (14% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to repair and/or replace faulty vehicle components, and to bring vehicle components within correct operating specifications.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Use references to estimate repair costs. ➤ Use references to guide repairs, e.g., use vacuum diagrams, wiring diagrams, component locators, emission parts locators. ➤ Research whether a repair, such as a manufacturer's recall, is available for a vehicle. ➤ Replace a faulty computer-input sensor, e.g., an O2 sensor, a MAP sensor, a mass airflow sensor. ➤ Clean and repair or replace electrical wiring that has deteriorated or has been disconnected by vibration, burned, or chewed by rodents. ➤ Repair wiring problems that affect the vehicle's computer or OBD-II system, e.g., faulty grounds to sensors. ➤ Repair vacuum lines that have deteriorated or split, e.g., under thermal stress. ➤ Repair ignition system, e.g., replace spark plugs, reconnect plug wires, correct secondary ignition problems. ➤ Correct a timing belt malfunction, i.e., adjust, repair, or replace the belt. ➤ Eliminate "voltage drop" problems from electrical systems. ➤ Repair a malfunctioning EGR system, e.g., clear clogged passages, replace a faulty EGR valve or faulty EGR control system. ➤ Repair an intake manifold leak. ➤ Repair the AIS, e.g., replace faulty air-switching valves or faulty check valves. ➤ Correct a cooling system problem, e.g., clear or replace a plugged radiator, replace a faulty thermostat, replace the fan belt, repair coolant leaks, replace a water pump. ➤ Correct a fuel system problem, e.g., overhaul a carburetor, clean or replace fuel injectors, replace a restricted fuel line, replace a faulty pressure regulator. ➤ Reroute vacuum hoses that have been installed incorrectly and repair or replace hoses that have been damaged. ➤ Perform a cylinder balance test. ➤ Clean the throttle plate and any auxiliary speed control device. ➤ Verify that repaired components operate properly. ➤ Retest a vehicle with repaired components to verify the success of the repairs. 	<ul style="list-style-type: none"> ➤ Knowledge of the use of tools and equipment mandated for use in emissions control repairs, e.g., timing lights, fuel cap testers. ➤ Knowledge of how a system that requires repair functions, i.e., of how and why it works when in good repair. ➤ Ability to recognize or otherwise identify a defective component in need of cleaning, repair, or replacement, e.g., to recognize that the wrong type of spark plug has been installed. ➤ Knowledge of disassembly procedures needed to perform emissions-related repairs. ➤ Knowledge that common emissions control repairs involve: O2 sensors; mass airflow sensors; air injection systems; catalytic converters; EGR systems; spark plugs or ignition system wiring; other electrical-circuit components; timing components; exhaust systems; fuel pressure regulators; fuel caps. ➤ Knowledge of how to use references—printed manuals, CD-based, DVD-based, and on-line databases—to obtain repair instructions. ➤ Ability to interpret and follow the repair instructions in standard repair references, e.g., to use wiring diagrams, vacuum routing diagrams. ➤ Knowledge of how to replace a failed sensor and reset the vehicle's computer to accommodate the new sensor. ➤ Knowledge that cleaning EGR passages and ports may be routinely required for some failed vehicles, e.g., high-mileage vehicles, older cars with rotary engines. ➤ Ability to repair an EGR system, e.g., to clear its passages and ports, to replace a defective EGR valve. ➤ Ability to repair or replace a leaking intake or exhaust manifold. ➤ Ability to repair cooling systems, e.g., to replace a faulty thermostat, to clear or replace a plugged radiator, to replace a failed coolant sensor. ➤ Ability to repair fuel systems, e.g., to repair or replace a faulty fuel pump, to replace a faulty fuel injector, to overhaul a carburetor, to recognize and replace a faulty fuel cap. ➤ Ability to repair an AIS, e.g., to ensure that the diverter valve switches properly and routes air correctly. ➤ Ability to replace catalytic converters, e.g., to choose the correct converter for the repair, to orient particular types of converter correctly, to prevent exhaust leaks at the converter. ➤ Ability to replace deteriorated vacuum hoses and to route and connect the new hoses correctly. ➤ Ability to repair electrical circuitry, e.g., to route wires correctly, to make correct connections with wire of the correct gauge, to follow color codes as needed. ➤ Ability to perform valve train repairs, e.g., to replace valves, valve lifters, or valve springs as needed, to regrind valve seats. ➤ Knowledge that technicians should avoid prolonged cylinder balance tests, which overheat catalytic converters. ➤ Knowledge of how to clean away corrosion without causing further damage to automotive components. ➤ Knowledge of procedures for verifying that the thermostatic air cleaner operates properly.

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	<ul style="list-style-type: none"> ➤ Ability to use diagnostic equipment—scan tool, oscilloscopes, hand vacuum pump, vacuum gauge, compression gauge, fuel-pressure gauge, propane enrichment equipment, an exhaust analyzer, and the like—to verify the success of a repair. ➤ Knowledge of the value of multiple tests that produce mutually confirming results concerning the success of repairs, ➤ Knowledge that an emissions test will verify the success of a catalytic converter replacement. ➤ Knowledge that manual-mode emissions testing allows a technician to observe the effectiveness of repairs.
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VII. INSPECTING THE VEHICLE TO BE TESTED FOR SAFETY, (2% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to identify and determine whether the vehicle presented for testing has any conditions that would render any emissions testing problematic and/or unsafe.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Visually check a vehicle presented for testing, looking for fluid leaks, excessive tire wear, frayed fan belts, weakened radiator hoses, or other conditions that may render it unsafe to test. ➤ Safety-check a vehicle presented for testing, checking for indicator lights, exhaust smoke or vapor, and sounds, odors, vibrations, or other conditions, such as a slipping clutch or faulty brakes, that indicate need for repairs before testing. ➤ With customer authorization, correct quickly correctable conditions—e.g., underinflated tires; insufficient oil, coolant, transmission fluid, or brake fluid—that should be corrected before testing. 	<ul style="list-style-type: none"> ➤ Ability to determine whether a vehicle's fluid levels will permit safe testing and to correct them if correcting them is feasible. ➤ Knowledge of vehicle conditions that would render any emissions testing problematic or unsafe. ➤ Ability to determine from inspection or a test drive whether a vehicle can be tested safely.

VIII. IDENTIFYING THE VEHICLE TO BE TESTED, (11% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to verify that the vehicle presented for testing is the vehicle identified in the owner, vehicle and registration information, as well as to identify and verify that the vehicle is equipped with all required and/or authorized emissions, engine, power train, etc. equipment.
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BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Verify the presence or absence of a VIN label and its accuracy, if present. ➤ Determine whether a DMV notice correctly identifies the vehicle; e.g., determine that DMV made no errors in its ID number or license number. ➤ Verify that the vehicle's VIN and odometer mileage match their counterparts in the DMV renewal notice, service writer's work order, or other documentation concerning the prospective test. ➤ Check the owner's zip code to verify that the vehicle has been presented for testing in an appropriate testing area. ➤ Check that the year, make, and model of the vehicle to be tested match its description in the documents concerning it. ➤ Check the engine, power train, and other equipment of the vehicle to determine its identity and check that these components are original equipment or permitted substitutes. ➤ Determine the presence or absence of vehicle emission labels and their accuracy. ➤ Verify that the under-hood emissions label and any BAR label (a) belong on the vehicle to be tested and (b) help confirm its identity. ➤ Determine from the under-hood label whether a vehicle was built for use in California, the other 49 states, Canada, or elsewhere outside the United States; i.e., whether it was intended to meet California emissions specifications. ➤ Use the under-hood emissions label, a manufacturer's manual, or an applications manual to determine a vehicle's required emission control components. 	<ul style="list-style-type: none"> ➤ Ability to determine from the owner's zip code whether a vehicle is being presented for testing in an appropriate testing area. ➤ Knowledge of the information about a vehicle that its VIN contains. ➤ Knowledge that DMV renewal notices, repair orders, or other documentation may contain errors in VINs or license plate numbers; i.e., that the vehicle itself is the first source for identification. ➤ Knowledge, for both common and specialized vehicles, of where to find standard labels related to smog checks, of how to access and interpret the information they contain, and of how to use them, if necessary, to confirm the vehicle's identity. ➤ Knowledge that a vehicle may have a replacement hood or radiator support bearing a label issued to a different vehicle. ➤ Ability to use a manufacturer's manual or ECS applications guide to identify required emissions control equipment in the absence of a correct, legible label, or to determine that a vehicle was not built to meet California emissions control requirements. ➤ Knowledge that vehicles not equipped to meet California or federal emissions standards must be sent to a referee station for testing. ➤ Knowledge of the information to use—e.g., year, make, model, state or province of licensure, odometer mileage, engine configuration, type of drive train, type of computer, emissions control equipment—in confirming the identity given by VIN, license plate, labels, and documents concerning the vehicle. ➤ Ability to use references that supply information about how particular vehicles are configured and equipped, e.g., to use an electronic reference to obtain a printout concerning a vehicle's required emission control equipment. ➤ Knowledge of gray-market vehicles, of how to identify them from their VINs and emissions control equipment, and of how to respond when they are presented for testing.

IX. PERFORMING VISUAL INSPECTIONS AS PROMPTED BY ANALYZER, (15% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to locate, identify and check emissions components for proper condition and operation.
BASIC TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Visually inspect the PCV system, checking valve, vacuum hose, and clean-air hose to the air cleaner. ➤ Visually inspect the TAC system for vacuum line connection and installation of the pre-heat hose and heat stove. ➤ Visually inspect the AIS, i.e., on a pulse air system, check the control valve, hoses, and plumbing; on a pump system, check the belt, pump, check valves, and controls. ➤ Visually inspect the EVAP system, checking vapor canister, purge solenoids, vacuum hoses, and fuel lines. ➤ Visually inspect the EGR system, checking valve, controls, and vacuum hoses (if used in the system). ➤ Visually inspect the catalytic converter(s), i.e., check that any required converter is present and check it for damage. ➤ Visually inspect input sensors, i.e., check that each sensor is present and that its connecting wires are intact. ➤ Visually inspect other computer components, checking actuator, spark controls, and output wiring. ➤ Visually inspect vacuum hoses, i.e., check their condition, routing, and connections. ➤ Visually inspect the fuel injection system, checking pressure regulator, injectors, wiring, and leaks. ➤ Visually inspect other emissions-related equipment, e.g., EFE, heat risers, anti-dieseling solenoids, choke controls, deceleration controls. ➤ Verify whether a vehicle's required emission control components are present, unmodified, free of tampering, and properly connected. ➤ Verify that a vehicle's emission control components are appropriate to its year, make, and model or are permitted substitutes for original equipment. 	<ul style="list-style-type: none"> ➤ Ability to check the PCV system, system operation, and related components and recognize component failures. ➤ Ability to check air cleaner installation, condition, and operation and recognize component failures. ➤ Knowledge of TAC function and correct TAC operation. ➤ Ability to check the vacuum controls of a TAC. ➤ Knowledge of how an AIS operates, where and when air injection occurs, and how to recognize system failures. ➤ Knowledge of how to locate EVAP components and how to recognize component failures. ➤ Ability to locate and identify a vehicle's EGR valve. ➤ Knowledge of EGR system components and of how to recognize component failures. ➤ Ability to locate a vehicle's catalytic converter(s), identify different types of converter, and recognize damage. ➤ Ability to locate, identify, and evaluate the condition of computer input sensors, connectors, and wiring, using references as needed. ➤ Ability to locate and evaluate computer output devices, connectors, and wiring. ➤ Ability to locate and use vacuum hose routing diagrams to check hose routing and installation as well as to check hose condition. ➤ Ability to identify approved, emissions-related changes and replacements, e.g., intake and exhaust manifolds, injection systems, and thermal reactors; carburetor dash pots, EFEs, throttle position sensors, and choke systems. ➤ Knowledge of fuel injection systems, of their components, and of how to recognize faulty components. ➤ Knowledge of tampering, i.e., of what components or systems are likely to be altered or disabled and of how to recognize overt tampering when it is present. ➤ Ability to determine whether any component of a vehicle's required emission control or related equipment is missing, modified, disconnected, or tampered with. ➤ Ability to detect covert engine changes and other hidden modifications that prevent correct emissions testing.

ADVANCED EMISSION TECHNICIAN EXAMINATION PLAN

The following is the examination plan for the Advanced Emission Technician examination, which is the detailed information used by subject matter experts to write examination questions.

I. CALIBRATING, MAINTAINING AND SERVICING THE ANALYZER, (7% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to interpret and respond to analyzer prompts, to identify and troubleshoot routine system malfunctions and to perform required analyzer service procedures.
ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Respond to analyzer maintenance prompts, e.g., a prompt for calibration. ➤ Perform a 3-day gas calibration on a BAR 97 analyzer and inspect and calibrate the dynamometer. ➤ Visually inspect analyzer devices, e.g., check for broken flex probe, kinked or deteriorated sample hose, dirty filters, plugged water trap drain. ➤ Repair or replace defective components, e.g., hoses, flex probe, tach leads, filters, as needed. ➤ Respond to failure prompts, e.g., purge HC hang-ups, correct analyzer lock-ups. 	<ul style="list-style-type: none"> ➤ Ability to interpret and respond to analyzer maintenance prompts. ➤ Knowledge of how to perform a gas calibration on a BAR 97 analyzer and of how to calibrate the dynamometer. ➤ Ability to determine whether analyzer devices—e.g., probe tips, sample hose, filters, water trap drain—are functioning correctly. ➤ Knowledge of how to check the operation of the fuel cap tester. ➤ Ability to repair or replace defective external components of an analyzer. ➤ Ability to respond effectively to an analyzer's failure prompts, e.g., HC hang-ups, low flow, analyzer lock-ups. ➤ Ability to troubleshoot an analyzer's printer problems, e.g., paper jams, exhausted ink cartridges.

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<ul style="list-style-type: none"> ➤ Determine whether analyzer failures are caused by computer lock-outs and take corrective action. ➤ Troubleshoot a printer failure that occurs without failure prompt; i.e., check and correct paper jams. ➤ Identify and troubleshoot system malfunctions, e.g., low flow through the sample hose, sample dilution, failure of a dynamometer or fuel cap tester to communicate with the analyzer. ➤ Call the manufacturer's representative to make internal analyzer repairs. 	<ul style="list-style-type: none"> ➤ Ability to troubleshoot minor analyzer system malfunctions, e.g., low flow, sample dilution, failure of the fuel cap tester or dynamometer to communicate with the analyzer. ➤ Knowledge of the causes of analyzer lock-outs and how to restore normal operation. ➤ Knowledge of how and when to reset and refresh an analyzer. ➤ Knowledge of how and when to obtain parts and supplies to maintain an analyzer. ➤ Knowledge of when and how to add or delete a technician access code through BAR.
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II. DISCHARGING OBLIGATIONS TO CONSUMERS, (15% OF THE EXAMINATION)	This area assesses the candidate's ability to communicate current laws and regulations regarding emissions tests to consumers, such that consumers will understand what is required, why it is required, and what their options are.
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ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Determine what type of smog check a consumer needs, e.g., biennial, change of ownership, after-repair, initial registration, out-of-state vehicle. ➤ Educate a customer regarding the need or lack of need to test a vehicle, e.g., point out that it must be tested before it can be sold, that it is too old or too new to require testing. ➤ Determine whether a customer's vehicle must be tested at a test-only station, explain the need if necessary, and provide the BAR 800 number or a list of stations near by. ➤ Explain to a customer why a test-only station does not perform repairs. ➤ Determine whether a vehicle must be tested at a referee station, explain the need if necessary, and refer the vehicle. ➤ Explain "gross polluter" to a customer. ➤ Explain to a customer why a vehicle must be tested at a station authorized to certify gross-polluter vehicles. ➤ Explain smog check failures due to tampering and tampering's possible effects on emissions and driveability. ➤ Obtain a customer's authorization to perform a smog ➤ Inform a customer of incidental findings concerning a vehicle's need for repair, e.g., report problems that affect safety. ➤ Explain the value of a pretest when a pretest is appropriate. ➤ Inform a customer of a repair needed to make the vehicle safe to test and, if appropriate, provide a cost estimate. ➤ Inform a customer of unintentional tampering that would cause the vehicle to fail. ➤ After emissions testing print out two copies of the VIR, sign and date them, file one, and give one to the customer. ➤ Obtain authorization for diagnostic testing and provide the customer with a cost estimate. ➤ Determine what repairs within the cost minimum will bring about the greatest reduction in emissions. ➤ Obtain authorization for repairs needed to bring a failed vehicle into compliance and provide the customer with a cost estimate. ➤ Obtain customer authorization when a repair changes and the original estimate requires revision. ➤ Obtain customer authorization to replace components near the end of their useful life when significant other repairs are being made. ➤ Inform a consumer of the legal \$450 repair cost minimum and of the circumstances in which it applies. ➤ Inform a customer of possible warranty coverage for ➤ Explain to the customer the importance of after-repairs Fully disclose to the customer the costs of all recommended procedures, e.g., test, repair, retest. ➤ Provide the customer with a detailed invoice concerning diagnoses and repairs. ➤ Create repair records when appropriate. 	<ul style="list-style-type: none"> ➤ Knowledge of the laws and regulations requiring vehicles to undergo emissions tests, e.g., ➤ Knowledge that some vehicles require no testing, that a change of ownership requires certification for which the seller is responsible. ➤ Knowledge of the test-only program, of how vehicles are chosen to participate, and of why particular vehicles are chosen. ➤ Knowledge that a technician may provide a list of near-by stations of the type that a customer needs to visit but may not recommend one. ➤ Knowledge of why a test-only station does not perform repairs. ➤ Knowledge of the conditions that require or allow a vehicle to be sent to a referee station and, especially, when not to send a vehicle to a referee station. ➤ Ability to judge whether an emissions pretest is advisable and to explain its advisability to the customer. ➤ Ability to determine from a pretest whether a particular vehicle would fail its emissions test as a gross polluter. ➤ Knowledge that a gross polluter must be tested at a station authorized to certify it. ➤ Knowledge of the circumstances in which no cost minimum applies to repairs needed to make a failed vehicle legally usable. ➤ Knowledge of myths about emissions control equipment that prevail among consumers and of why they are myths. ➤ Knowledge of tampering, of its effects on emissions, and of the laws, regulations, and BAR policies concerning it. ➤ Knowledge that warning a customer about potential vehicle systems failures is both professional behavior and good business. ➤ Ability to determine whether a repair is needed before emissions testing. ➤ Ability to prepare lawful estimates for the costs of diagnoses and repairs or to provide information for such estimates to service writers. ➤ Ability to explain to a customer why diagnostic tests are needed. ➤ Knowledge of the legal \$450 repair cost minimum and of how it applies to correcting vehicle failures. ➤ Knowledge of diagnoses and repairs that optimize value to customers, e.g., that bring about the best reductions in emissions possible within the \$450 repair cost minimum. ➤ Knowledge of alternate routes to qualifying vehicles for use, e.g., knowledge of the circumstances in which a customer and vehicle qualify for a waiver or help from the state with repair costs. ➤ Knowledge of vehicle warranties required by State and Federal law and of how to find warranties for particular vehicles. ➤ Knowledge of the relationships between controlling CO or HC emissions and making NOx emissions worse. ➤ Ability to explain to a customer why verifying the effectiveness of repairs is necessary. ➤ Ability to provide a customer with lawful, detailed invoices concerning diagnoses and repairs or to furnish the necessary information for such invoices to service writers. ➤ Knowledge of how to locate hard-to-find repair parts and how to guide a customer through a proper sequence—local stores, manufacturers, wrecking yards, parts locators—for finding them.

III. DIAGNOSING TEST FAILURES, (13% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to check emissions and non emission-related vehicle components in order to determine the cause of a vehicle's failure to pass the emissions test.
ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Check the VIR for causes of failure which may be related to the visual inspections, functional tests or emissions tests. ➤ Using the VIR, determine in which part of the test (e.g., high rpm, idle or 50/15, 25/25) the emissions were too high and use the finding in diagnosis. ➤ Determine whether a system failure is due to tampering, e.g., check whether emission control components have been tampered with in ways hidden from visual inspection. ➤ Determine which emissions are out of range (if any) and decide which system or systems may be at fault. ➤ Following manufacturer's procedures, check for trouble codes that implicate particular systems. ➤ Check input sensors to determine whether they function properly. ➤ Check computer outputs to determine whether any are abnormal. ➤ Check for mechanical failures that affect emissions, e.g., a faulty valve train, leaking head gaskets, worn rings or pistons. ➤ Check for EVAP system failures. ➤ Using a laboratory oscilloscope, verify O2 sensor operation and check its output for fuel control. ➤ Make checks as needed if excessive NOx emissions were the cause of failure. ➤ Make checks as needed if excessive HC emissions were the cause of failure. ➤ Make checks as needed if excessive CO emissions were the cause of failure. ➤ Make checks as needed if CO2 or O2 emissions were out of range. ➤ Check the maintenance of systems that need periodic maintenance, e.g., ignition systems, systems that require filters. ➤ Using a DVOM's minimum, maximum, and average readings, determine whether a vehicle is running in closed loop. ➤ Resolve conflicts among diagnostic readings, especially those that suggest one component failure is causing other systems to indicate failures that may not be real. ➤ Check appropriate references for information that will aid in diagnosis. ➤ Pretest a vehicle that failed its smog check at another shop to establish a baseline. 	<ul style="list-style-type: none"> ➤ Knowledge of how a four-stroke engine produces its various emissions. ➤ Knowledge of basic diagnostic principles, as set forth in the Clean Air Car Course, i.e., ➤ Knowledge of how to interpret diagnostic checks and tests. ➤ Knowledge of the theory underlying each component of emission control systems, i.e., of what the component does and how and why it does it. ➤ Knowledge of diagnostic approaches to vehicles that lack OBD equipment. ➤ Ability to use all senses in diagnosis, e.g., to realize from the appearance and odor of a car's exhaust that it has a blown head gasket, that a particular engine sound implies that the engine is about to throw a connecting rod. ➤ Knowledge that a vehicle test failure may be related to visual inspection, functional tests, or emissions, as indicated by the VIR. ➤ Knowledge of how missing, modified, disconnected, damaged, plugged, deteriorated, or corroded components affect the functioning of the systems of which they are parts, e.g., of how emissions are affected by the components' flaws. ➤ Knowledge of whether particular kinds of tampering do or do not affect the MIL of a computer control system. ➤ Ability to detect covert tampering with emissions-control or emissions-related components. ➤ Ability to use the pattern of a failed vehicle's emissions readings as a guide to the vehicular system or systems that are probably at fault. ➤ Ability to use a scan tool to check input sensor functioning and to obtain diagnostic trouble codes. ➤ Knowledge of when to use particular diagnostic equipment. ➤ Knowledge of approved sources of help in interpreting trouble codes and in detecting false codes. ➤ Ability to use a lab scope to check the basic input/output functioning of a vehicle's sensors and computer. ➤ Knowledge that checking and interpreting the condition of the engine oil is basic to understanding emissions-related failures, e.g., diluted with gasoline. ➤ Knowledge that checking and interpreting engine timing is basic to understanding emissions-related failures. ➤ Knowledge that understanding ignition systems is basic to understanding emissions failures. ➤ Knowledge of innovations, e.g., of distributorless ignition systems, of electrically driven air injection systems, of how they operate, and of how they fail. ➤ Knowledge of normal emissions readings for a vehicle in good condition. ➤ Knowledge of the diagnostic checks needed if a vehicle fails for excessive NOx emissions. ➤ Knowledge of the diagnostic checks needed if a vehicle fails for excessive HC emissions. ➤ Knowledge of the diagnostic checks needed if a vehicle fails for excessive CO emissions. ➤ Knowledge of the systems that may be implicated if O2 and CO2 emissions readings are out of range and of the diagnostic checks that should be made. ➤ Ability to judge from a test drive what may be causing a vehicle to fail, i.e., ability to identify sounds, odors, or vibrations that implicate particular systems. ➤ Knowledge of how to locate and use diagnostic aids, e.g., emissions pattern charts, trouble trees, vacuum diagrams, wiring diagrams, cross-references that relate voltages to temperatures. ➤ Ability to identify the causes of wiring defects, e.g., excessive heat, vibration, or dampness, gnawing by rodents. ➤ Knowledge of how to use automotive manuals and CD-based, DVD-based, or on-line references in diagnosing smog check failures.

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	<ul style="list-style-type: none"> ✎ Knowledge of how neglecting preventive maintenance causes problems, such as arcing plug wires or clogged filters, that affect emissions. ✎ Knowledge of frequent causes of failure, e.g., clogged EGR passages, faulty temperature sensors that cause EGR valves to open or close when they shouldn't, defective O2 sensors, defective AIS diverter valves. ✎ Ability to test whether sensors are working properly, i.e., ability to use DVOMs and DSOs to assess their functioning. ✎ Ability to use basic diagnostic equipment, e.g., oscilloscopes, timing lights and scan tools, and specialized equipment, e.g., mirrors for locating multiple O2 sensors. ✎ Knowledge that emissions readings may mislead—e.g., a vehicle failed for HC emissions may show 14% CO2 and less than 1% O2, which indicate no misfire, but with the engine under load misfires may be heard or felt. ✎ Knowledge of the causes of engine misfires, e.g., knowledge that any source of unmetered outside air, such as leaking vacuum brake boosters, may cause lean misfires. ✎ Ability to use an oscilloscope to identify the causes of misfires, e.g., faulty coils, modules, or reluctors. ✎ Knowledge that in pre-OBD-II cars, MAP and mass airflow sensors may not set trouble codes under out of specification conditions. ✎ Knowledge of how to adjust electronic carburetors. ✎ Knowledge of where AIS-controlled air should go and of what proportions are normal for different destinations. ✎ Ability to use the propane enrichment procedure to locate vacuum leaks, e.g., those that cause lean misfires. ✎ Ability to use a lab scope for sensor testing or to monitor an O2 sensor's function. ✎ Knowledge of catalytic converter theory and test procedures. ✎ Knowledge that misfires can lead to catalytic-converter failure. ✎ Knowledge of tests of catalytic-converter function, e.g., the oxygen absorption test, the cranking CO test, the intrusive test, and the infrared pyrometer test, and of how to perform them. ✎ Ability to use a pyrometer to determine which converter in a multiple-converter system is faulty. ✎ Knowledge of, or ability to determine, how much resistance is required in a secondary ignition system. ✎ Ability to perform a "cylinder balance (rpm drop)" test to determine whether a cylinder is functional. ✎ Ability to perform compression and leak-down tests. ✎ Knowledge of the possible causes of a "dead" cylinder—one that fails to ignite during engine operation. ✎ Knowledge of how abnormal fuel pressures affect emissions. ✎ Knowledge that a restricted fuel return line increases injection pressure and affects emissions. ✎ Knowledge of sequential or cascading failures, e.g., that a faulty ground may cause multiple sensor failures. ✎ Ability to perform "voltage drop" tests to locate a wiring defect. ✎ Knowledge that O2 emissions readings are critical to lean-mixture diagnoses. ✎ Knowledge that an excessively rich mixture may be due to a faulty O2 sensor. ✎ Ability to use a scan tool, lab scope, DVOM, or voltmeter as needed to determine why fuel control is defective. ✎ Knowledge of the circuits that come into play when a carbureted vehicle undergoes BAR 97 emissions tests and what the circuits should be doing. ✎ Ability to perform and interpret engine computer systems tests. ✎ Ability to use a charging-systems tester in diagnosis. ✎ Ability to determine actual engine temperatures and to correct unacceptable temperatures. ✎ Knowledge that components that appear to require replacement should be tested before a replacement is made. ✎ Knowledge that simply replacing a catalytic converter instead of diagnosing the true cause(s) of excessive emissions will mask the cause(s) and lead to early converter failure.
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IV. PERFORMING FUNCTIONAL TESTS, (8% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate’s ability to use correct procedures for testing the functional operation of emissions-related components.
ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Check whether the malfunction indicator light (MIL/Check Engine light) (a) functions properly and (b) has or has not come on during the emissions test. ➤ Obtain the trouble codes that caused the MIL to come on. ➤ Interpret the trouble codes. ➤ Check whether the maintenance-required light functions properly. ➤ Inspect the fuel cap for proper fit and ability to hold pressure, following the prompts of the BAR analyzer. ➤ As needed, test the gasoline fill-pipe restrictor with a dowel to verify that it will not accept a leaded-gasoline nozzle. ➤ As prompted, check the ignition timing. ➤ As prompted by the analyzer, check the integrity and functioning of the exhaust gas recirculation (EGR) system. 	<ul style="list-style-type: none"> ➤ Ability to check that vehicular warning lights, e.g., the MIL, function properly. ➤ Ability to obtain diagnostic trouble codes, e.g., when the MIL comes on. ➤ Ability to interpret diagnostic trouble codes and respond appropriately. ➤ Ability to choose the correct adapter and run the functional pressure test on a vehicle’s fuel cap when prompted by the analyzer. ➤ Knowledge of the purpose of a fill-pipe restrictor and of the dowel test. ➤ Knowledge of where to obtain correct engine timing specifications, if necessary, for a vehicle undergoing a smog check. ➤ Ability to determine whether the timing of a particular vehicle is adjustable. ➤ Ability to check engine timing if the analyzer requires the check, i.e., ability to use a timing light correctly. ➤ Ability to correct engine timing as needed, if the timing is adjustable. ➤ Knowledge of the older and newer types of EGR, e.g., knowledge that OBD-II vehicles usually have digital electronic EGRs. ➤ Knowledge of where to obtain correct EGR specifications, if necessary, for a vehicle undergoing a smog check, i.e., knowledge of the data available from the under-hood label and from other BAR-approved sources. ➤ Knowledge of how EGRs operate, e.g., that some operate only if the vehicle is operating at speed, and that it may be necessary to test drive such a vehicle and use a gauge to record the EGR’s vacuum signal. ➤ Knowledge of the various procedures—e.g., manipulating the valve, applying vacuum, overriding the computer—for checking a vehicle’s EGR system. ➤ Ability to interpret functional-test failures and report them correctly to the analyzer.

V. PREPARING FOR AND SAFELY CONDUCTING EMISSIONS TESTS, (16% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate’s ability to inspect the vehicle to be tested, the testing area and the testing equipment in order to ensure and maintain a safe working environment.
ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Ensure the testing area is safe, e.g., clear the area of loose tools, wipe up spills, exclude nonessential staff and customers. ➤ Take precautions for personal and staff safety during the tests, e.g., run them from inside the vehicle, allow no one to work on the vehicle, avoid releasing pressurized fluids. ➤ Follow the safety procedures recommended by vehicle and equipment manufacturers. ➤ Start the vehicle and bring its engine to operating temperature. ➤ As needed, pretest the vehicle, checking the fuel cap, timing, and EGR valve as well as the emissions. ➤ Enter vehicle information and inspection results as required by the BAR 97 analyzer, i.e., identify yourself by license number and access code; scan the BAR code on the renewal form or identify the vehicle as prompted; enter the gross vehicle weight rating as prompted; and respond to prompts regarding engine and emission controls. ➤ For BAR 97 testing, follow the prompts to disengage the traction control and/or all-wheel drive, if present. ➤ Ensure that the vehicle is properly positioned over the lift plates for weighing. ➤ For BAR 97 testing, weigh the vehicle so the BAR analyzer can calculate the horsepower load required for loaded-mode testing. ➤ For BAR 97 testing, chock or ratchet-clamp the wheels of the non-driven axle and properly place the side restraints. ➤ As prompted, position, plug in to the analyzer, and start a cooling fan to assist a vehicle’s fan during BAR 97 testing. 	<ul style="list-style-type: none"> ➤ Knowledge of BAR 97 testing, i.e., of the information the analyzer requires and of how to supply it and respond to the analyzer’s prompts. ➤ Knowledge of personal-safety precautions during emissions testing. ➤ Knowledge of precautions that prevent damage to costly equipment, e.g., ➤ keeping vehicle fluids out of a dynamometer, removing the tailpipe probe and tachometer lead before moving a vehicle after testing. ➤ Knowledge of when and how to use a vehicle’s computer to disengage its traction control. ➤ Knowledge of suitable restraints for all vehicles tested. ➤ Knowledge of how to chock or ratchet-clamp non-driven wheels for emissions testing. ➤ Knowledge that chocking is appropriate even for two speed idle testing because an old vehicle may slip into gear. ➤ Knowledge of how test procedures differ between two speed idle and enhanced testing. ➤ Knowledge of appropriate operating temperatures for a vehicle and its emission control components. ➤ Ability to attach tachometer leads, properly place the tailpipe probe, and, for dual-exhaust vehicles, use the correct two-probe adapter. ➤ Ability to distinguish dual-exhaust vehicles from those with two tailpipes after the muffler. ➤ Knowledge of pretesting a vehicle so as to determine any need for repairs.

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<ul style="list-style-type: none"> ➤ As prompted, insert the tailpipe probe into the vehicle's exhaust system and attach the tachometer leads. ➤ For BAR 97 testing, select a gear range that will help establish proper rpm and load. ➤ Following the prompts of the BAR 97 analyzer, run the 15-mph emissions test. ➤ Following the prompts of the BAR 97 analyzer, run the 25-mph emissions test. ➤ Following the prompts of the BAR 97 analyzer, run the high-rpm test. ➤ Following the prompts of the BAR 97 analyzer, run the idle rpm test. ➤ If sample dilution occurs, locate and correct the cause, if possible, e.g., move the probe. ➤ Abort a smog check when necessary. ➤ Detach the tachometer leads and remove the tailpipe probe from the exhaust system before moving the vehicle out of the testing area. 	<ul style="list-style-type: none"> ➤ Ability to judge whether required maintenance, if indicated, will affect the vehicle's emissions. ➤ Knowledge of how to help a BAR 97 analyzer determine vehicle weight for loaded-mode testing, i.e., knowledge that both axles of a vehicle may have to be weighed. ➤ Knowledge that trying to steer a vehicle on dynamometer rollers may worsen its tendency to drift, that it will settle in at slow speed or after a shift to neutral. ➤ Knowledge that testing must be done in the proper gear, e.g., that small-displacement cars (1.2 liters or less) should be tested in second gear with standard tires. ➤ Knowledge of the need to avoid over-accelerating the engine when changing from 15 to 25 mph, i.e., knowledge that over-speeding and dropping back too much may cause the analyzer to abort the test. ➤ Knowledge of when to abort problematic tests, e.g., when warning lights come on, when a substantial fluid leak occurs, when the engine pings or knocks, when the vehicle overheats or smokes. ➤ Knowledge of where to insert the probe if sample dilution occurs. ➤ Knowledge of checks to make if an engine fails to maintain proper rpm under a dynamometer load, e.g., of the need to check the transmission fluid level, the clutch, the tire sizes and tire condition.
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VI. PERFORMING AND VERIFYING REPAIRS, (14% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to repair and/or replace faulty vehicle components, and to bring vehicle components within correct operating specifications.
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ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Use references to estimate repair costs. ➤ Use references to guide repairs, e.g., use vacuum diagrams, wiring diagrams, component locators, emission parts locators. ➤ Research whether a repair, such as a manufacturer's recall, is available for a vehicle. ➤ Attempt repairs on a gross-polluter vehicle that will bring it nearer emissions specifications and make it eligible for a waiver. ➤ Replace a failed catalytic converter. ➤ Replace a faulty computer-input sensor, e.g., an O2 sensor, a MAP sensor, a mass airflow sensor. ➤ Clean and repair or replace electrical wiring that has deteriorated or has been disconnected by vibration, burned, or chewed by rodents. ➤ Repair wiring problems that affect the vehicle's computer or OBD-II system, e.g., faulty grounds to sensors. ➤ Repair vacuum lines that have deteriorated or split, e.g., under thermal stress. ➤ Repair ignition system, e.g., replace spark plugs, reconnect plug wires, correct secondary ignition problems. ➤ Correct a timing belt malfunction, i.e., adjust, repair, or replace the belt. ➤ Eliminate "voltage drop" problems from electrical systems. ➤ Repair a malfunctioning EGR system, e.g., clear clogged passages, replace a faulty EGR valve or faulty EGR control system. ➤ Repair an intake manifold leak. ➤ Repair the AIS, e.g., replace faulty air-switching valves or faulty check valves. ➤ Correct a cooling system problem, e.g., clear or replace a plugged radiator, replace a faulty thermostat, replace the fan belt, repair coolant leaks, replace a water pump. ➤ Correct a fuel system problem, e.g., overhaul a carburetor, clean or replace fuel injectors, replace a restricted fuel line, replace a faulty pressure regulator. ➤ Reroute vacuum hoses that have been installed incorrectly and repair or replace hoses that have been damaged. ➤ Perform a cylinder balance test. ➤ Clean the throttle plate and any auxiliary speed control device. ➤ Following manufacturers' procedures, remove excessive carbon from the engine. ➤ Verify that repaired components operate properly. ➤ Retest a vehicle with repaired components to verify the success of the repairs 	<ul style="list-style-type: none"> ➤ Knowledge of the use of tools and equipment mandated for use in emissions control repairs, e.g., timing lights, fuel cap testers. ➤ Knowledge of how a system that requires repair functions, i.e., of how and why it works when in good repair. ➤ Ability to recognize or otherwise identify a defective component in need of cleaning, repair, or replacement, e.g., to recognize that the wrong type of spark plug has been installed. ➤ Knowledge of disassembly procedures needed to perform emissions-related repairs. ➤ Knowledge that common emissions control repairs involve: O2 sensors; mass airflow sensors; air injection systems; catalytic converters; EGR systems; spark plugs or ignition system wiring; other electrical-circuit components; timing components; exhaust systems; fuel pressure regulators; fuel caps. ➤ Knowledge of how to use references—printed manuals, CD-based, DVD-based, and on-line databases—to obtain repair instructions. ➤ Ability to interpret and follow the repair instructions in standard repair references, e.g., to use wiring diagrams, vacuum routing diagrams. ➤ Knowledge of how to replace a failed sensor and reset the vehicle's computer to accommodate the new sensor. ➤ Knowledge that cleaning EGR passages and ports may be routinely required for some failed vehicles, e.g., high-mileage vehicles, older cars with rotary engines. ➤ Ability to repair an EGR system, e.g., to clear its passages and ports, to replace a defective EGR valve. ➤ Knowledge of, or ability to find, correct procedures for repairing older vehicles, e.g., the procedure for repairing the mechanical advance in the distributor of a vehicle so equipped. ➤ Ability to repair or replace a leaking intake or exhaust manifold. ➤ Ability to repair cooling systems, e.g., to replace a faulty thermostat, to clear or replace a plugged radiator, to replace a failed coolant sensor. ➤ Ability to repair fuel systems, e.g., to repair or replace a faulty fuel pump, to replace a faulty fuel injector, to overhaul a carburetor, to recognize and replace a faulty fuel cap. ➤ Ability to repair an AIS, e.g., to ensure that the diverter valve switches properly and routes air correctly. ➤ Ability to replace catalytic converters, e.g., to choose the correct converter for the repair, to orient particular types of converter correctly, to prevent exhaust leaks at the converter. ➤ Ability to replace deteriorated vacuum hoses and to route and connect the new hoses correctly. ➤ Ability to repair electrical circuitry, e.g., to route wires correctly, to make correct connections with wire of the correct gauge, to follow color codes as needed.

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	<ul style="list-style-type: none"> ➤ Ability to perform valve train repairs, e.g., to replace valves, valve lifters, or valve springs as needed, to regrind valve seats. ➤ Knowledge that technicians should avoid prolonged cylinder balance tests, which overheat catalytic converters. ➤ Knowledge of how to clean away corrosion without causing further damage to automotive components. ➤ Knowledge of procedures for verifying that the thermostatic air cleaner operates properly. ➤ Ability to use diagnostic equipment—scan tool, oscilloscopes, hand vacuum pump, vacuum gauge, compression gauge, fuel-pressure gauge, propane enrichment equipment, an exhaust analyzer, and the like—to verify the success of a repair. ➤ Knowledge of the value of multiple tests that produce mutually confirming results concerning the success of repairs, ➤ Knowledge that an emissions test will verify the success of a catalytic converter replacement. ➤ Knowledge that manual-mode emissions testing allows a technician to observe the effectiveness of repairs.
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VII. INSPECTING THE VEHICLE TO BE TESTED FOR SAFETY, (3% OF THE EXAMINATION)	This area assesses the candidate's ability to identify and determine whether the vehicle presented for testing has any conditions that would render any emissions testing problematic and/or unsafe.
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ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Visually check a vehicle presented for testing, looking for fluid leaks, excessive tire wear, frayed fan belts, weakened radiator hoses, or other conditions that may render it unsafe to test. ➤ Safety-check a vehicle presented for testing, checking for indicator lights, exhaust smoke or vapor, sounds, odors, vibrations, or other conditions, such as a slipping clutch or faulty brakes, that indicate need for repairs before testing. ➤ With customer authorization, correct quickly correctable conditions—e.g., underinflated tires; insufficient oil, coolant, transmission fluid, or brake fluid—that should be corrected before testing. ➤ If a vehicle requires BAR 97 testing determine whether the traction control, if present, can be disengaged and how to disengage it, and determine whether all-wheel drive, if present, can be disengaged and how to disengage it. ➤ Verify that a vehicle prepared for dynamometer testing has been properly positioned and secured. 	<ul style="list-style-type: none"> ➤ Knowledge of references that detail what engines and power trains are appropriate to a vehicle of a particular year, make, and model. ➤ Knowledge of references that detail what emission control components are required or permitted on a vehicle of a particular year, make, and model. ➤ Knowledge that systems approved for a vehicle of a particular make may not be approved for a vehicle of a different make, even though the two systems are very similar or identical. ➤ Ability to determine whether any component of a vehicle's required emission control or related equipment is missing, modified, disconnected, or tampered with. ➤ Ability to detect covert engine changes and other hidden modifications that prevent correct emissions testing. ➤ Ability to determine whether a vehicle's fluid levels will permit safe testing and to correct them if correcting them is feasible. ➤ Knowledge of vehicle conditions that would render BAR 97 emissions testing problematic or unsafe. ➤ Knowledge of vehicle conditions that would render any emissions testing problematic or unsafe. ➤ Ability to determine from inspection or a test drive whether a vehicle can be tested safely.

VIII. IDENTIFYING THE VEHICLE TO BE TESTED, (10% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to verify that the vehicle presented for testing is the vehicle identified in the owner, vehicle and registration information, as well as to identify and verify that the vehicle is equipped with all required and/or authorized emissions, engine, power train, etc. equipment.
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ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Verify the presence or absence of a VIN label and its accuracy, if present. ➤ Determine whether a DMV notice correctly identifies the vehicle; e.g., determine that DMV made no errors in its ID number or license number. ➤ Verify that the vehicle's VIN and odometer mileage match their counter-parts in the DMV renewal notice, service writer's work order, or other documentation concerning the prospective test. ➤ Check the owner's zip code to verify that the vehicle has been presented for testing in an appropriate testing area. ➤ Check that the year, make, and model of the vehicle to be tested match its description in the documents concerning it. ➤ Check the engine, power train, and other equipment of the vehicle to determine its identity and check that these components are original equipment or permitted substitutes. 	<ul style="list-style-type: none"> ➤ Ability to determine from the owner's zip code whether a vehicle is being presented for testing in an appropriate testing area. ➤ Knowledge of the information about a vehicle that its VIN contains. ➤ Knowledge that DMV renewal notices, repair orders, or other documentation may contain errors in VINs or license plate numbers; i.e., that the vehicle itself is the first source for identification. ➤ Knowledge, for both common and specialized vehicles, of where to find standard labels related to smog checks, of how to access and interpret the information they contain, and of how to use them, if necessary, to confirm the vehicle's identity. ➤ Knowledge that a vehicle may have a replacement hood or radiator support bearing a label issued to a different vehicle. ➤ Ability to use a manufacturer's manual or ECS applications guide to identify required emissions control equipment in the absence of a correct, legible label, or to determine that a vehicle was not built to meet California emissions control requirements.

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<ul style="list-style-type: none"> ➤ Determine the presence or absence of vehicle emission labels and their accuracy. ➤ Verify that the under-hood emissions label and any BAR label (a) belong on the vehicle to be tested and (b) help confirm its identity. ➤ Determine from the under-hood label whether a vehicle was built for use in California, the other 49 states, Canada, or elsewhere outside the United States; i.e., whether it was intended to meet California emissions specifications. ➤ Refer a specially constructed vehicle, a vehicle with an engine change, or any other vehicle that must go elsewhere for testing. Obtain the gross vehicle weight rating of the vehicle to be tested and determine what emissions test is appropriate. ➤ Use the under-hood emissions label, a manufacturer's manual, or an applications manual to determine a vehicle's required emission control components. 	<ul style="list-style-type: none"> ➤ Knowledge that vehicles not equipped to meet California or federal emissions standards must be sent to a referee station for testing. ➤ Knowledge of the information to use—e.g., year, make, model, state or province of licensure, odometer mileage, engine configuration, type of drive train, type of computer, emissions control equipment—in confirming the identity given by VIN, license plate, labels, and documents concerning the vehicle. ➤ Ability to use references that supply information about how particular vehicles are configured and equipped, e.g., to use an electronic reference to obtain a printout concerning a vehicle's required emission control equipment. ➤ Knowledge of gray-market vehicles, of how to identify them from their VINs and emissions control equipment, and of how to respond when they are presented for testing. ➤ Knowledge that specially constructed vehicles need a BAR referee label.
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IX. PERFORMING VISUAL INSPECTIONS AS PROMPTED BY ANALYZER, (14% OF THE EXAMINATION QUESTIONS)	This area assesses the candidate's ability to locate, identify and check emissions components for proper condition and operation.
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ADVANCED TASKS	ASSOCIATED KNOWLEDGE
<ul style="list-style-type: none"> ➤ Visually inspect the PCV system, checking valve, vacuum hose, and clean-air hose to the air cleaner. ➤ Visually inspect the TAC system for vacuum line connection and installation of the pre-heat hose and heat stove. ➤ Visually inspect the AIS, i.e., on a pulse air system, check the control valve, hoses, and plumbing; on a pump system, check the belt, pump, check valves, and controls. ➤ Visually inspect the EVAP system, checking vapor canister, purge solenoids, vacuum hoses, and fuel lines. ➤ Visually inspect the EGR system, checking valve, controls, and vacuum hoses (if used in the system). ➤ Visually inspect the catalytic converter(s), i.e., check that any required converter is present and check it for damage. ➤ Visually inspect input sensors, i.e., check that each sensor is present and that its connecting wires are intact. ➤ Visually inspect other computer components, checking actuator, spark controls, and output wiring. ➤ Visually inspect vacuum hoses, i.e., check their condition, routing, and connections. ➤ Visually inspect the fuel injection system, checking pressure regulator, injectors, wiring, and leaks. ➤ Visually inspect other emissions-related equipment, e.g., EFE, heat risers, anti-dieseling solenoids, choke controls, deceleration controls. ➤ Verify whether a vehicle's required emission control components are present, unmodified, free of tampering, and properly connected. ➤ Verify that a vehicle's emission control components are appropriate to its year, make, and model or are permitted substitutes for original equipment. 	<ul style="list-style-type: none"> ➤ Ability to check the PCV system, system operation, and related components and recognize component failures. ➤ Ability to check air cleaner installation, condition, and operation and recognize component failures. ➤ Knowledge of TAC function and correct TAC operation. ➤ Ability to check the vacuum controls of a TAC. ➤ Knowledge of how an AIS operates, where and when air injection occurs, and how to recognize system failures. ➤ Knowledge of how to locate EVAP components and how to recognize component failures. ➤ Ability to locate and identify a vehicle's EGR valve. ➤ Knowledge of EGR system components and of how to recognize component failures. ➤ Ability to locate a vehicle's catalytic converter(s), identify different types of converter, and recognize damage. ➤ Ability to locate, identify, and evaluate the condition of computer input sensors, connectors, and wiring, using references as needed. ➤ Ability to locate and evaluate computer output devices, connectors, and wiring. ➤ Ability to locate and use vacuum hose routing diagrams to check hose routing and installation as well as to check hose condition. ➤ Ability to identify approved, emissions-related changes and replacements, e.g., intake and exhaust manifolds, injection systems, and thermal reactors; carburetor dash pots, EFES, throttle position sensors, and choke systems. ➤ Knowledge of fuel injection systems, of their components, and of how to recognize faulty components. ➤ Knowledge of tampering, i.e., of what components or systems are likely to be altered or disabled and of how to recognize overt tampering when it is present.

SECTION V: THE EXAMINATION PROCESS

EXAMINATION REGISTRATION PAYMENT AND SCHEDULING PROCEDURES

Once you have been approved by BAR, you are responsible for contacting PSI to register, pay, and schedule an appointment to take the examination. You may do so via the Internet at www.psiexams.com, or schedule over the telephone at (877) 392-6422.

Current policy allows two test attempts before candidates are required to submit another application to the BAR Licensing Unit. You must wait 14 days between the two test attempts.

EXAMINATION FEE

Examination Fee \$45

NOTE: REGISTRATION FEES ARE NOT REFUNDABLE OR TRANSFERABLE. The fee is for each registration, whether you are taking the examination for the first time or repeating.

In most California testing centers, testing does not take place on the following major holidays:

Memorial Day	Closed May 26, 2008
Independence Day	Closed July 4, 2008
Labor Day	Closed September 1, 2008
Thanksgiving	Closed November 27-28, 2008
Christmas	Closed December 25, 2008

INTERNET SCHEDULING

You may schedule for your test by completing the online Test Registration Form. The Test Registration Form is available at PSI's website, www.psiexams.com. You may schedule for a test via the Internet 24 hours a day.

1. Complete the registration form online and submit your information to PSI via the Internet.
2. Upon completion of the online registration form, you will be given the available dates for scheduling your test.
3. You will need to choose a date to complete your registration.
4. Upon successful registration, you will receive a traceable confirmation number.

TELEPHONE REGISTRATION AND SCHEDULING

The second fastest method of scheduling is via the telephone with PSI's Interactive Voice Response system (IVR) during non-business hours, or through live registrars during business hours. For telephone registration, you will need a valid VISA or MasterCard.

1. Complete the Examination Registration Form, including your credit card number and expiration date, so that you will be prepared with all of the information needed to register by telephone.

Call (877) 392-6422, 24 hours a day and register using the Automated Registration System. Otherwise, PSI registrars are available Monday through Friday, between 4:30 am and 7:00 pm and Saturday, between 8:00 am and 2:00 pm, Pacific Time, to receive the information listed on your Examination Registration Form and schedule your appointment for the examination.

FAX REGISTRATION AND SCHEDULING

For Fax registration, you will need a valid VISA or MasterCard.

Complete the Examination Registration Form, including your credit card number and expiration date.

1. Fax the completed form to PSI (702) 932-2666. Fax registrations are accepted 24 hours a day.
2. If your information is incomplete or incorrect, it will be returned for correction.

Please allow 4 business days to process your Registration. After 4 business days, you may schedule your examination using a touch-tone phone, by calling PSI 24 hours a day at (877) 392-6422. between 4:30 am and 7:00 pm and Saturday, between 8:00 am and 2:00 pm, Pacific Time. You may also schedule online by accessing PSI's registration website at www.psiexams.com.

STANDARD MAIL REGISTRATION AND SCHEDULING

For those desiring to make payment for their examination using cashier's checks or money orders, or for those that simply do not wish to provide credit card information over the phone or Internet, you must use the Standard Mail Registration. In order to register, please follow the steps below.

1. Complete the PSI Examination Registration Form (found at the end of the bulletin), and appropriate examination fee to PSI. Payment of fees can be made by money order or cashier's check. Money orders or cashier's checks should be made payable to PSI. Print your ID number on your cashier's check or money order to ensure that your fees are properly assigned. **CASH, COMPANY CHECKS, PERSONAL CHECKS ARE NOT ACCEPTED.**

Mail the completed Registration Form to:

PSI licensure:certification
ATTN: Examination Registration CA BAR
3210 E Tropicana
Las Vegas, NV 89121
(877) 392-6422 • Fax (702) 932-2666

Please allow 2 weeks to process your Registration. After 2 weeks you may schedule your examination using a touch-tone



phone, by calling PSI 24 hours a day at (877) 392-6422. To schedule with a PSI registrar, call Monday through Friday, between 4:30 am and 7:00 pm and Saturday, between 8:00 am and 2:00 pm, Pacific Time. You may also schedule online by accessing PSI's registration website at www.psiexams.com.

CANCELING AN EXAMINATION APPOINTMENT

You may cancel and reschedule an examination appointment without forfeiting your fee *if your cancellation notice is received 2 days prior to the scheduled examination date*. For example, for a Monday appointment, the cancellation notice would need to be received on the previous Saturday. You may call PSI at (877) 392-6422. Please note that you may also use the automated system, using a touch-tone phone, 24 hours a day in order to cancel and reschedule your appointment.

Note: A voice mail message is not an acceptable form of cancellation. Please use the internet, automated telephone system, or call PSI and speak to a Customer Service Representative.

MISSED APPOINTMENT OR LATE CANCELLATION

If you miss your appointment, you will not be able to take the examination as scheduled, further you will forfeit your examination fee, if:

- You do not cancel your appointment 2 days before the scheduled examination date;
- You do not appear for your examination appointment;
- You arrive after examination start time;
- You do not present proper identification when you arrive for the examination.

EXAMINATION SITE CLOSING FOR AN EMERGENCY

In the event that severe weather or another emergency forces the closure of an examination site on a scheduled examination date, your examination will be rescheduled. PSI personnel will attempt to contact you in this situation. However, you may check the status of your examination schedule by calling (877) 392-6422. Every effort will be made to reschedule your examination at a convenient time as soon as possible. You will not be penalized. You will be rescheduled at no additional charge.

EXAMINATION SITE LOCATIONS

The California examinations are administered at the PSI examination centers in California as listed below:

ANAHEIM

2301 W. LINCOLN AVE, SUITE 252

ANAHEIM, CA 92801

(714) 254-1453

TAKE I-5 SOUTH TO SANTA ANA. EXIT ON BROOKHURST ST. AND MAKE A RIGHT GOING SOUTH. TURN RIGHT (WEST) ON LINCOLN AVE. RIGHT AFTER MONTEREY LN. GO HALF A BLOCK AND ENTER ON THE FIRST OR SECOND DRIVEWAY ON 2301 LINCOLN. SUITE 252 IS LOCATED ON THE SECOND FLOOR.

ATASCADERO

7305 MORRO RD, SUITE 201A

ATASCADERO, CA 93422

(805) 462-8983

FROM US-101 N, TAKE THE CA-41 EXIT- EXIT 219-TOWARD MORRO RD. TURN LEFT ONTO EL CAMINO REAL. Turn LEFT onto CA-41/MORRO RD.

FROM US-101 S, TAKE THE MORRO RD/CA-41 EXIT- EXIT 219, TURN RIGHT ONTO CA-41/MORRO RD.

BAKERSFIELD

5405 STOCKDALE HIGHWAY, SUITE 206

BAKERSFIELD, CA 93309

(661) 398-9354

FROM I-5 S, TAKE THE STOCKDALE HWY EXIT (253). TURN LEFT ONTO STOCKDALE HWY.

FROM I-5 N TOWARD BAKERSFIELD, KEEP LEFT TO TAKE CA-99 N VIA EXIT (221) TOWARD BAKERSFIELD/FRESNO. TAKE THE CA-58 E EXIT TOWARD TEHACHAPI/MOJAVE. TAKE THE EXIT ON THE LEFT TOWARD CAL STATE UNIV/STOCKDALE HWY/BRUNDAGE LANE. TURN LEFT ONTO WIBLE RD. TURN SLIGHT LEFT ONTO STOCKDALE HWY.

CARSON

17420 S. AVALON BLVD, SUITE 205

CARSON, CA 90746

(310) 217-1066

FROM CA-91 E/GARDENA FWY TAKE THE AVALON EXIT. OFF RAMP WILL LEAD YOU ONTO ALBERTONI ST. MAKE A RIGHT ONTO AVALON BLVD AND WE ARE LOCATED ON THE RIGHT HANDSIDE (SAME PARKING LOT AS CARL'S JR).

FROM CA-91 W TAKE THE AVALON EXIT. MAKE A LEFT ONTO AVALON BLVD. MAKE A U-TURN ON AVALON BLVD AND ALBERTONI ST. WE ARE LOCATED ON THE RIGHT HAND SIDE. (SAME PARKING LOT AS CARL'S JR).

EL MONTE

9420 TELSTAR, SUITE 138

EL MONTE, CA 91731

(626) 442-4112

FROM I-10 E TOWARD SAN BERNARDINO, MERGE ONTO ROSEMEAD/CA 19 S TOWARD LONG BEACH. TURN LEFT ONTO E. TELSTAR AVE.

FROM I-10 W TOWARD LOS ANGELES, TAKE THE ROSEMEAD BLVD/CA-19 EXIT TOWARD PASADENA. TAKE THE ROSEMEAD BLVD RAMP TOWARD LONG BEACH. MERGE ONTO ROSEMEAD BLVD/CA-19 S. TAKE A LEFT ONTO E. TELSTAR AVE.

FRESNO

351 E. BARSTOW, SUITE 101

FRESNO, CA 93710

(559) 221-9006

FROM CA-41 S, TAKE THE BULLARD AVE EXIT. TURN LEFT ONTO E BULLARD AVE. TURN RIGHT ONTO N FRESNO ST. PASS THROUGH THE INTERSECTION OF FRESNO AND BASTOW AVE. TAKE THE FIRST DRIVEWAY ON THE RIGHT HAND SIDE.

FROM CA-41 N, TAKE THE SHAW AVE EXIT TOWARD CLOVIS. TURN RIGHT ONTO E SHAW AVE. TURN LEFT ONTO N FRESNO ST. TURN LEFT INTO THE LAST DRIVEWAY BEFORE BARSTOW AVE.

TESTING CENTER IS IN THE OFFICE COMPLEX ON THE SW CORNER OF BARSTOW AND FRESNO ST.

HAYWARD

24301 SOUTHLAND DRIVE, SUITE B-1

HAYWARD, CA 94545

(510) 784-1114

FROM I-880 N TOWARD OAKLAND, TAKE THE WINTON AVENUE EXIT. MERGE ONTO W WINTON AVE TOWARD HEALD COLLEGE. TURN LEFT ONTO SOUTHLAND DR.



FROM I-880 S TOWARD SAN JOSE/SAN MATEO BR, TAKE THE WINTON AVE WEST EXIT TOWARD HEALD COLLEGE. MERGE ONTO W WINTON AVE. TURN LEFT ONTO SOUTHLAND DR.

REDDING

2861 CHURN CREEK, UNIT C
REDDING, CA 96002

(530) 221-0945

ON 299 FROM EAST TAKE RAMP ONTO I-5 S. TAKE EXIT #677/REDDING/CYPRESS AVE. TURN LEFT ON E CYPRESS AVE. TURN RIGHT ON CHURN CREEK RD.

ON 299 FROM WEST TURN RIGHT ON MARKET ST (CA-273 S). TURN LEFT ON TEHEMA ST (CA-299 E). CONTINUE TO FOLLOW CA-299 E. TAKE EXIT #2A/RED BLUFF/SACRAMENTO ONTO I-5 S. TAKE EXIT #677/REDDING/CYPRESS AVE. TURN LEFT ON E CYPRESS AVE. TURN RIGHT ON CHURN CREEK RD.

ON I-5 FROM NORTH TAKE EXIT #677/ REDDING/CYPRESS AVE. TURN LEFT ON E CYPRESS AVE. TURN RIGHT ON CHURN CREEK RD
ON I-5 FROM SOUTH TAKE EXIT #677/ REDDING/CYPRESS AVE. TURN RIGHT ON E CYPRESS AVE. TURN RIGHT ON CHURN CREEK RD

ON HWY 44 FROM EAST TAKE RAMP TOWARD VICTOR AVE. TURN LEFT ON VICTOR AVE. TURN RIGHT ON E CYPRESS AVE. TURN LEFT ON CHURN CREEK RD.

FROM ALL DIRECTIONS, FRONT BUILDING IS 2881 CHURN CREEK, DRIVEWAY INTO COMPLEX IS DIRECTLY ACROSS FROM MAJOR MUFFLER ON EAST SIDE OF CHURN CREEK. 2861 IS FIRST BUILDING ON THE LEFT.

RIVERSIDE

RIVERSIDE TECHNOLOGY BUSINESS PARK
1660 CHICAGO AVE, SUITE M-15

RIVERSIDE, CA 92507

(951) 680-9720

FROM I-215 N TOWARD RIVERSIDE/SAN BERNARDINO, TAKE THE COLUMBIA AVENUE EXIT. TURN RIGHT ONTO E LA CADENA DR. TURN LEFT ONTO COLUMBIA AVE. TURN RIGHT ONTO CHICAGO AVE. TURN LEFT ONTO MARLBOROUGH AVE AND END AT 1660 CHICAGO AVENUE.

FROM I-215 S TOWARD SAN BERNARDINO/RIVERSIDE, TAKE THE EXIT TOWARD COLUMBIA AVENUE. TURN SLIGHT RIGHT ONTO INTERCHANGE DR. TURN LEFT ONTO PRIMER ST. TURN LEFT ONTO COLUMBIA AVE. TURN RIGHT ONTO CHICAGO AVE. TURN LEFT ONTO MARLBOROUGH AVE AND END AT 1660 CHICAGO AVENUE.

SACRAMENTO

9719 LINCOLN VILLAGE DR.
BUILDING 100, SUITE 100
SACRAMENTO, CA 95827

(916) 363-6455

FROM SAN FRANCISCO/VALLEJO ON I-80 E, TAKE US-50 E TOWARD SACRAMENTO/SOUTH LAKE TAHOE. TAKE BRADSHAW ROAD, EXIT 13, TURN RIGHT ONTO BRADSHAW ROAD. TURN IMMEDIATE LEFT ONTO LINCOLN VILLAGE DR.

SAN DIEGO

5440 MOREHOUSE DRIVE, SUITE 3300
SAN DIEGO, CA 92121

(858) 658-0786

FROM I-805 S, TAKE THE SORRENTO VALLEY RD/MIRA MESA BLVD EXIT. TURN LEFT ONTO MIRA MESA BLVD, TURN LEFT ONTO SCRANTON ROAD. TURN RIGHT ONTO MOREHOUSE DRIVE.

FROM I-805 N TOWARD LOS ANGELES, TAKE THE MIRA MESA BLVD/VISTA SORRENTO PKWY EXIT. TURN RIGHT ONTO MIRA MESA BLVD. TURN LEFT ONTO SCRANTON RD. TURN RIGHT ONTO MOREHOUSE DR.

ADDITIONAL PARKING CAN BE FOUND (on top of the AT&T building) BY CONTINUING ON MOREHOUSE PAST OUR BUILDING AND TURNING LEFT AT THE NEXT DRIVEWAY UP THE HILL

SANTA ROSA

160 WIKIUP DRIVE, SUITE 105
SANTA ROSA, CA 95403

(707) 544-6723

FROM US-101 N, MERGE ONTO FULTON RD. TURN RIGHT ONTO AIRPORT BLVD. TURN RIGHT ONTO OLD REDWOOD HWY. TURN LEFT ONTO WIKIUP DR.

FROM US-101 S, TAKE THE AIRPORT BLVD EXIT. TAKE THE RAMP TOWARD MARK WEST AREA/LARKFIELD WIKIUP. TURN LEFT ONTO AIRPORT BLVD. TURN RIGHT ONTO OLD REDWOOD HWY. TURN LEFT ONTO WIKIUP DR.

SANTA CLARA

2936 SCOTT BLVD
SANTA CLARA, CA 95054

(408) 844-0004

FROM US-101 N, TAKE THE SAN TOMAS EXPWY/MONTAGUE EXPWY EXIT- EXIT 392. TAKE THE SAN TOMAS EXPWY RAMP. MERGE ONTO SAN TOMAS EXPY/CR-G4. TURN LEFT ONTO SCOTT BLVD.

FROM I-880 S TOWARD SAN JOSE, TAKE THE MONTAGUE EXPWY EXIT (7). TAKE THE MONTAGUE EXPWY WEST RAMP. MERGE ONTO MONTAGUE EXPY/CR-G4 E. TURN LEFT ONTO E TRIMBLE RD. E TRIMBLE RD BECOMES DE LA CRUZ BLVD. TURN SLIGHT RIGHT ONTO CENTRAL EXPY/CR-G6 W. TURN SLIGHT RIGHT ONTO SCOTT BLVD.

REPORTING TO THE EXAMINATION SITE

On the day of the examination, you must arrive at least 30 minutes prior to your scheduled appointment time. This allows time for check-in and identification verification and provides time to familiarize yourself with the examination process. If you arrive late, you may not be admitted to the examination site and you may forfeit your examination registration fee. Even though candidates will be thumb printed, you are still required to comply with any identification requirements established by the appropriate regulatory entity.

REQUIRED IDENTIFICATION AT EXAMINATION SITE

You must provide one of the following valid forms of government-issued identification before you may examine:

- An unexpired California Driver License with a photo.
- An unexpired California Department of Motor Vehicles Identification Card with a photo.
- A current U.S. military-issued (active duty) identification card

The second ID must have your signature and preprinted legal name. All identification provided must match the name on the license application submitted to BAR.

CALIFORNIA EXAMINATION SECURITY LAW

Section 123 of the California Business and Professions Code states: "It is a misdemeanor for any person to engage in any conduct which subverts or attempts to subvert any licensing examination or the administration of an examination, including, but not limited to:

- Conduct which violates the security of the examination materials;
- Removing from the examination room any examination materials without authorization;



- The unauthorized reproduction by any means of any portion of the actual licensing examination;
- Aiding by any means the unauthorized reproduction of any portion of the licensing examination;
- Paying or using professional or paid examination-takers for the purpose of reconstructing any portion of the licensing examination;
- Obtaining examination questions or other examination material, except by specific authorization either before, during, or after an examination; or
- Selling, distributing, buying, receiving, or having unauthorized possession of any portion of a future, current, or previously administered licensing examination.
- Communicating with any other examinee during the administration of a licensing examination.
- Copying answers from another examinee or permitting one's answers to be copied by another examinee.
- Having in one's possession during the administration of the licensing examination any books, equipment, notes, written or printed materials, or data of any kind, other than the examination materials distributed, or otherwise authorized to be in one's possession during the examination.
- Impersonating any examinee or having an impersonator take the licensing examination on one's behalf.

Nothing in this section shall preclude prosecution under authority provided for in any other provision of law. In addition to any other penalties, a person found guilty of violating this section, shall be liable for the actual damages sustained by the agency administering the examination not to exceed ten thousand dollars (\$10,000) and the costs of litigation."

IMPORTANT INFORMATION ABOUT TAKING AN EXAMINATION

1. All candidates will have their thumbprint taken during examination check-in and re-entry into the testing room after an approved absence. If a candidate passes the examination, the thumbprint record will be destroyed. If a candidate abandons his or her application for licensure, as determined by the appropriate regulatory authority, the thumbprint will also be destroyed. If a candidate is unsuccessful, the thumbprint record will be retained by PSI to ensure proper identification on any subsequent examination attempts. If the thumbprint doesn't match upon exit and re-entry, the candidate shall be disqualified from the examination, his or her test results invalidated and the appropriate regulatory entity will be notified of the occurrence. The taking of the thumbprint is an additional measure to enhance examination security. The Department's Office of Examination Resources shall ensure that the appropriate safeguards for the storage and destruction of the thumbprint records are in place.
2. The temperature in the testing room is maintained at a moderate level. Candidates are advised to layer clothing. Acceptable layered clothing includes lightweight shirts, sweaters, and pullovers without pockets. These items must be worn upon check-in, while you wait to enter the testing room and during your initial seating for the examination.

3. There are timing mechanisms available at the test site and on the computer console to help candidates keep track of time during the test administration time. Watches or other timekeeping devices are not permitted in the examination rooms.
4. Only one candidate will be allowed to take a restroom break at a time. Candidates are required to sign out when you leave the room and when you return. If a candidate's restroom break takes longer than 5 (five) minutes, a proctor will check on the candidate and will notify the applicable regulatory entity of the occurrence, which will take appropriate action.
5. The following items are not permitted in the examination rooms:
 - Cellular telephones, personal digital assistants (PDAs), recording devices, pagers, purses, notebooks, notebook computers, reference or readings material, music players, radios, electronic games, calculators or briefcases.
 - Personal items including watches, backpacks, wallets, pens, pencils, or other writing devices, food, drinks (unless medically required) and good-luck items.
 - Hats, baseball caps, or visors (with the exception of religious apparel), coats, shawls, hooded clothing, heavy jackets or overcoats.
 - During the check-in process, all candidates will be asked if they possess any of the prohibited items and all candidates will be asked to empty their pockets. If prohibited items are found during check-in, candidates shall return these items to their vehicle or other place of safekeeping. Neither PSI nor the Department of Consumer Affairs shall be responsible for the items. Any candidate possessing the prohibited items in the examination room shall have his or her test results invalidated, and PSI shall notify the appropriate regulatory entity of the occurrence.
6. Copying or communicating examination content is a violation of PSI security policy and existing law. Either one shall result in the disqualification or invalidation of examination results, the denial of your license, and may subject the candidate to criminal prosecution.

SPECIAL TESTING CONSIDERATIONS

AMERICANS WITH DISABILITIES ACT (ADA)

Candidates with a physical or mental impairment that substantially limits a major life activity may be eligible for accommodation in the testing process to assure you that the examination accurately reflects knowledge, skills or abilities.



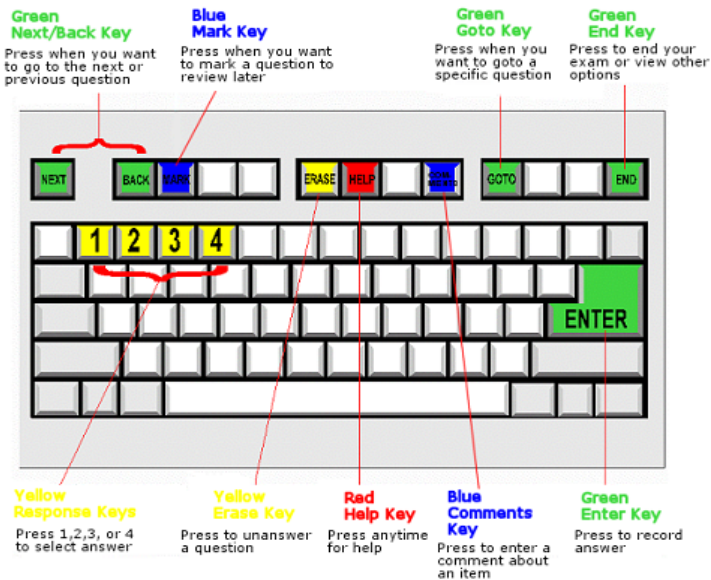
BAR and PSI are fully compliant with ADA guidelines and will provide reasonable accommodations. Scheduling services are also available via our Telecommunications Device for the Deaf (TDD) by calling 800-790-3926.

ACCOMMODATION PROCEDURES

Candidates requiring special testing arrangements due to a physical or mental impairment must submit a request to BAR for such arrangements at the time of application. Please see Page 8 for details.

TAKING THE EXAMINATION BY COMPUTER

Taking the PSI examination by computer is simple. You do not need any computer experience or typing skills. You will use fewer keys than you use on a touch-tone telephone. All response keys are colored and have prominent characters. An illustration of the special keyboard is shown here.



IDENTIFICATION SCREEN

You will be directed to a semiprivate testing station to take the examination. When you are seated at the testing station, you will be prompted to confirm your name, identification number, and the examination for which you are registered.

TUTORIAL

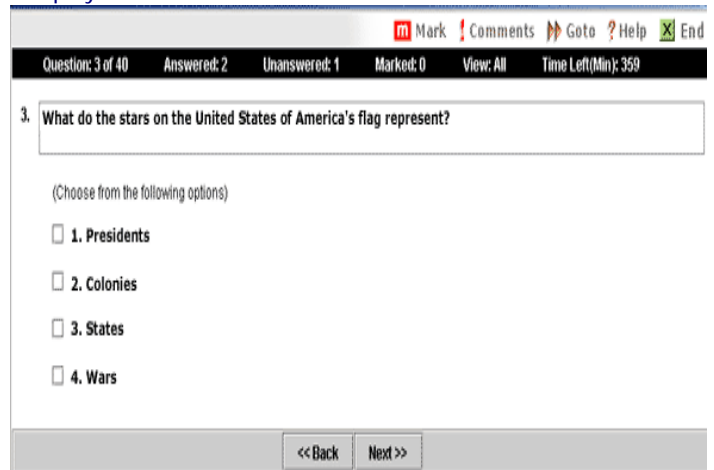
Before you start your examination, an introductory tutorial to the computer and keyboard is provided on the computer

screen. The time you spend on this tutorial, up to 15 minutes, DOES NOT count as part of your examination time. Sample questions are included as part of the tutorial so that you may practice using the keys, answering questions, and reviewing your answers.

One question appears on the screen at a time. During the examination, minutes remaining will be displayed at the top of the screen and updated as you record your answers.

EXAMINATION QUESTION EXAMPLE

During the examination, you should press 1, 2, 3, or 4 to select your answer. You should then press "ENTER" to record your answer and move on to the next question. A sample question display follows:



TIPS FOR PREPARING FOR YOUR EXAMINATION

The following suggestions will help you prepare for your examination.

- Planned preparation increases your likelihood of passing.
- Start with a current copy of this Candidate Information Bulletin and use the examination content outline as the basis of your study.
- Read study materials that cover all the topics in the content outline.
- Take notes on what you study. Putting information in writing helps you commit it to memory and it is also an excellent business practice. Underline or highlight key ideas that will help with a later review.
- Discuss new terms or concepts as frequently as you can with colleagues. This will test your understanding and reinforce ideas.
- Your studies will be most effective if you study frequently, for periods of about 45 to 60 minutes. Concentration tends to wander when you study for longer periods of time.

SECTION VI: THE LICENSING EXAMINATION

THE LICENSING EXAMINATION

Examination	Length of Time	# of Items	Minimum Passing Score
Basic Area Tech	2.5 Hours	99	67
Advanced Emission Specialist Tech	2.5 Hours	100	69

Actual number of questions and passing score may vary, depending on the actual exam version. Check the latest BAR publications for the latest information.

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are used throughout the examination. These are questions in which four answers are provided, only one of which is correct.

Examination candidates should carefully read the following:

1. For each multiple-choice question, you may select only one answer.
2. There is no penalty for guessing. Scores are based on the number of overall correct answers. **It is to your advantage to answer as many questions as you can.**
3. Some questions will require you to use provided reference materials to find the correct answer.
4. Suggestions for taking multiple-choice examinations:
 - a. Your first answer is often your best answer. Don't spend too much time on any one question.
 - b. If more than one answer seems to be correct, choose the answer that seems correct most often.

SAMPLE EXAMINATION QUESTIONS

1. While performing a visual inspection, a technician observes there is no EGR amplifier, even though one is shown on the underhood emission label. The EGR valve is connected to ported vacuum. What TAS entry should be made?
 - A. Missing
 - B. Disconnected
 - C. Pass
 - D. Defective

2. Which of the following actions should be taken if a vehicle's timing reads 5 degrees BTDC and the specification for the vehicle is 8 degrees BTDC?
 - A. Adjust timing to specification and perform an after-repairs test.
 - B. Enter "fail" into the TAS for ignition timing because it is out of specification range.
 - C. Enter "pass" into the TAS for ignition timing and 5 degrees BTDC for the timing reading.
 - D. Enter "not applicable" for the ignition timing and specification.

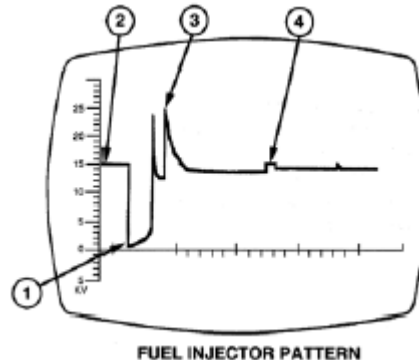
3. What is the primary mission of the Smog Check Referee?
 - A. Perform initial smog inspections.
 - B. Analyze data from TAS analyzers.
 - C. Perform dispute resolutions.
 - D. Perform smog-related repairs.

4. What action should be taken when a 22-month-old car with 25,200 miles on its odometer fails an emissions inspection because of a failed emission component?
 - A. Send the vehicle to a Referee as a pattern failure.
 - B. Have the customer go to a dealer for the repair.
 - C. Retest and issue a certification and exemption.
 - D. Issue a certificate of non-compliance.

5. If a vehicle equipped with a contact point ignition system fails the ignition timing specification, what step should be performed **FIRST**?
 - A. Check coil saturation.
 - B. Check the dwell angle.
 - C. Check condenser output.
 - D. Adjust the timing to manufacturer's specifications.

6. Which of the following statements describes the difference between a three-wire oxygen sensor and a single-wire oxygen sensor?
 - A. A three-wire is more accurate.
 - B. A single-wire is more durable.
 - C. A single-wire sends information slower.
 - D. A three-wire allows earlier closed-loop operation.

7. Use the following exhibit to answer this question.



At what point in this scope pattern would the fuel injector be open?

- A. 1
- B. 2
- C. 3
- D. 4

(Correct answers to these questions can be found on the next page.)

SECTION VII: AFTER THE EXAMINATION IS OVER

EXAMINATION RESULTS

At the end of your test, you will receive a printed Score Report. The report indicates the number of questions answered correctly, and whether you passed or failed.

To pass the examination, you must correctly answer a predetermined minimum number of questions for the entire examination. Your total score, the minimum passing score, and the scores for each of the sections of the examination will be identified on your score report. The scores for each of the sections are provided to give you more details about your performance on the examination. You may refer to the examination plans in Section V of this handbook for the specific knowledge, skills and abilities needed for each section. Only correctly answered questions count toward your examination score.

CONFIDENTIALITY OF EXAMINATION RESULTS

Examination results are the property of the person who took the examination, and will not be released to anyone else without the written permission of the candidate.

DUPLICATE SCORE REPORTS

You can write to PSI to request a duplicate of your score report. Please include your name, candidate identification number, and date of the test.

RETAKING AN EXAMINATION

Once you have received your Examination Eligibility Notice, you will be allowed two attempts to pass the examination. If you do not pass your first examination, you may schedule a second examination appointment. BAR requires 14 days between examination attempts.

It is not possible to make a new examination appointment on the same day you have taken an examination; this is due to processing and reporting scores. A candidate who tests unsuccessfully on a Wednesday can call the next day, Thursday, to schedule another test. In order to retest, you must re-register following the steps for registration and scheduling as outlined earlier. You may re-register over the Internet, telephone, fax or by mail. Once registered, you can schedule for your re-examination.

If you do not pass the examination in two attempts, you must submit a new application, with a \$20.00 application fee, to:

Department of Consumer Affairs
Bureau of Automotive Repair
Licensing Unit
P.O. Box 989001
West Sacramento, CA 95798-9001

If you wish to send your application and fees by an express carrier, send to:

Department of Consumer Affairs
Bureau of Automotive Repair
Licensing Unit
10240 Systems Parkway
Sacramento, CA 95827-3006

You must wait at least 14 days between examination attempts. You will be charged a fee of \$45 each time you take the examination.

Answers to sample examination questions
1:A; 2:C; 3:C; 4:B; 5:B; 6:D; 7:A



SECTION VIII: OBTAINING A LICENSE

After passing the examination, your record is sent back to BAR to review for enforcement actions, as well as family support actions before a license may be issued. If there are no administrative or family support holds on your license, your results will be updated into the BAR Vehicle Information Database (VID) within five business days of your examination. You must perform a Data File Refresh on your analyzer to update it with the new license expiration date.

No additional fees are collected before the license is issued.

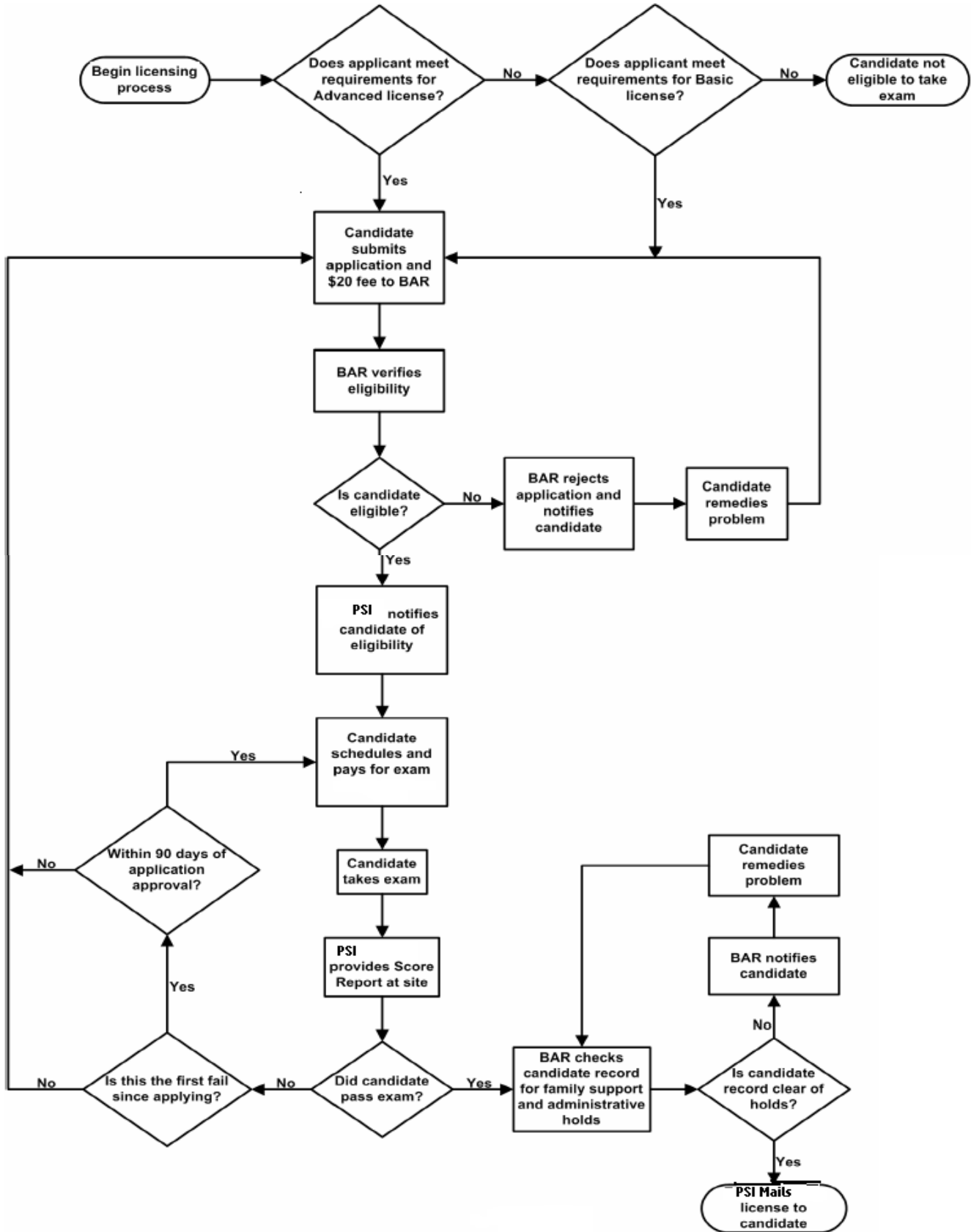
A person may not perform the duties of a licensed technician without a current license. The license expiration dates are adjusted so that the licenses expire in the month of the technician's birthday. Therefore, initial licenses are valid for 18 to 30 months, depending upon the technician's birth month and month in which the technician passes the licensing examination. This process is fully explained in California Code of Regulations, Title 16, Section 3340.29 (e).

Before BAR can issue a technician's license to you, BAR must have information required by Sections 44014 and 44031.5 of the Health and Safety Code. The Chief of the bureau is responsible for maintaining the information you provide. The information may be transferred to other government agencies if the agencies need it to perform their legal duties. You have a right to review the records maintained on you by this bureau, unless the records are identified as confidential information and exempted in Section 1798.3 of the Information Practices Act.

Disclosure of your Social Security number to BAR is mandatory.

Section 30 of the Business and Professions Code and Pub. L. 94-455 [42 w. 405(c)(2)(C)] authorizes collection of your Social Security number. Your Social Security number will be used exclusively for tax enforcement purposes and for purposes of compliance with any judgment or order for family support in accordance with section 11350.6 of the Welfare and Institutions Code. If you fail to provide your Social Security number, you will be reported to the Franchise Tax Board, which may assess a \$100 penalty against you.

INITIAL LICENSING FLOWCHART



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Sacramento, CA 95827-3006

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