GUIDANCE MANUAL

USING UNMARKED VEHICLES IN DECENTRALIZED I/M PROGRAMS

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SUBMITTED TO:

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ES ENGINEERING-SCIENCE

GUIDANCE MANUAL

Using Unmarked Vehicles in Decentralized I/M Programs

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EXECUTIVE SUMMARY

The problems of quality assurance in a decentralized I/M program are well-known. As a result, every current decentralized I/M program does some formal periodic audit of licensed stations. However, formal auditing cannot detect certain quality assurance problems. Specifically, while formal auditing can certainly test what station personnel may know, it does not necessarily test what is actually done during inspections and repair.

Covert auditing allows I/M program managers to determine what is actually happening in a program. "Undercover" cars have historically been used in safety programs to gather evidence on stations which may have been flagrantly violating the rules of the program. To be sure, covert auditing may serve this role for I/M as well, but it also serves to encourage comprehensive inspections and proper repairs. In addition, it may be used to gather data on program operations.

It is the purpose of this manual to present program approaches and techniques for covert auditing. Issues in both enforcement-related and data-related covert auditing are described. Results of existing covert auditing programs are discussed. Finally, some of the practical issues in program development are investigated, and two model programs (an initial program and a mature program) are presented.

DISCLAIMER

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CHAPTER 1

THE ROLE OF UNMARKED VEHICLES IN DECENTRALIZED I/M PROGRAMS

INTRODUCTION

Decentralized motor vehicle emissions inspection/maintenance I/M programs* have long been favored by many State and local governments because of the convenience they offer to motor vehicle owners. In addition, in places where decentralized safety programs were already in place, legislatures and agencies establishing I/M programs generally implemented decentralized I/M programs to avoid any inconvenience and administrative duplication which would possibly result from parallel but separate inspection systems. Despite the obvious advantages of a decentralized system, at the same time the quality assurance (QA) problems inherent in decentralized programs have always posed a challenge to program managers.

QA in a decentralized program involves four distinct steps:

- o specification of the data and other information to be collected;
- o design and development of a surveillance system to determine whether procedural regulations are met;
- o collection, reporting, and analysis of information; and
- o modifying the system and/or the program on the basis of analysis of results.

The key to developing an effective I/M QA approach, therefore, is to identify what to monitor and what to control. Early assessments of QA issues in I/M tended to focus on the ability of individual mechanics to perform proper repairs (USEPA, 1974). The need for oversight of licensed stations became more clear as decentralized I/M was analyzed as a specific program option (USEPA, 1978a and USEPA, 1978b). The essence of quality control is to take actions which ensure that program implementation is as consistent as possible with program design. In the case of I/M, it is more difficult to match program design with a decentralized program than with

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* For the purposes of this document, a decentralized I/M program is any program which, at least in part, licenses privately owned stations to inspect vehicles with respect to certain mandatory emissions-related requirements, and to issue official certificates or stickers as a proof of complying with those requirements.

a centralized program. Simply stated, there are generally fewer stations and inspectors who must be monitored in a centralized program; in addition, inspectors in a centralized program, either by contract or employment, are directly responsible to the implementing agency.

I/M QA can be directed both at auditing proper inspections and at auditing proper maintenance. Generally, I/M QA has been oriented towards periodic visits to licensed stations, checking records, reviewing compliance with administrative requirements, and auditing the performance of emission analyzers, with a calibration gas of known concentration (USEPA, 1982; and Pienta, et al, 1985). Virtually all States with inspection programs have some sort of periodic surveillance. Program elements usually include not only periodic surveillance, but also referee stations for vehicle owners who wish an independent check on test results (see for example Wallauch, 1983).

There is a limit though to what structured, overt program elements can accomplish (Carhart, 1985). Periodic overt field auditing can do much to gather information which can indicate the direction of an I/M program; it can also serve to bolster enforcement activities run by other parts of the implementing agency. However, as indicated in Table 1-1, formal periodic auditing cannot test inspectors' and mechanics' normal everyday operations and practices directly. If, for instance, inspectors have the knowledge and background to check for tampering of a certain emission control component, they will almost certainly be able to demonstrate that capability to an auditor if requested. However, in a routine workday, inspectors and mechanics may not be as thorough as when they know they are being tested by program auditors. They may even circumvent the requirements of the program, such as passing cars that should be failing or passing vehicles that are not inspected at all.

COMPREHENSIVE QA IN A DECENTRALIZED I/M PROGRAM

Discrepancies in decentralized I/M program operation have become more evident in recent years (Cabaniss, 1984; and USGAO, 1985). In particular, failure rates in several programs are well under expectations, especially when compared to centralized programs with similar cutpoints and requirements. This phenomenon has developed despite the existence of periodic field auditing. As a result, questions have been raised regarding the ability of formal periodic auditing to assure that vehicles fail when they should, the ability of stations to record program data properly, and the ability of decentralized I/M as a whole to be effective in reducing emissions.

Failure rates may be affected by many factors. Program phenomena which may affect overall failure rates include "false fails" (vehicle which fail but should pass), false passes (vehicles which pass, but should fail) and "pre-repair" (vehicles which fail and are repaired but are reported as initially passing). Program failure rates are only one example of how a program parameter may need specific indepth investigation and analysis in order to reveal what is going on in an I/M program. Auditing station operations enables program managers and others to obtain information which would allow this and other kinds of program analysis.

TABLE 1.1

CAPABILITIES AND LIMITATIONS OF FORMAL PERIODIC FIELD AUDITING IN DECENTRALIZED I/M PROGRAMS

Capabilities	Limitations
o Can review an inspector's ability to work with the analyzer on-site.	o Cannot confirm the station's usual method of testing vehicles.
o Can determine knowledge of test procedures and record keeping procedures.	o Cannot verify or disprove by itself fraudulent repair practices.
o Can analyze basic approach to check for emission control components.	o Cannot verify or disprove by itself inadequate knowledge or implementation of program procedures by inspectors and mechanics.
o Can identify discrepancies in repairs if repair orders are available.	
o Can verify accountability of inspection certificates.	

However, as explained above, formal periodic field auditing can go only so far in identifying discrepancies in program operation. There is, therefore, a need to obtain information in a way which will not affect the everyday operations that the auditor may wish to observe. This need can be met by covert auditing.

COVERT AUDITING - THE ROLE OF UNMARKED VEHICLES

In any decentralized inspection system, there is always a need for at least a "last resort" mechanism to remove "problem" stations from the system. Because administrative requirements generally require a reason for license suspension or revocation, explicit evidence of violation of program requirements is usually needed. Frequently the only way to obtain first hand evidence is for the implementing agency to obtain that information through an undercover vehicle.

Covert auditing is a generic designation for information-gathering activities in an I/M program when the auditors do not identify themselves as anything other than ordinary citizens. Generally the term "covert auditing" has been used in the same way as the term "undercover vehicles," with the implication that such vehicles are engaged only in uncovering consumer fraud and enforcing program regulations. To be sure, unmarked vehicles can and have been used for such purposes, not only for decentralized I/M programs, but also historically for safety programs and consumer protection investigations. It is a mistake though to believe that unmarked vehicles may only serve to support enforcement. As indicated above in the previous section, the essential purpose of covert auditing is to find out what is happening in an I/M program, while identifying where program implementation is failing to track program design. Covert auditing programs for decentralized I/M programs should, therefore, be developed with a clear goal of what information is to be gathered, and how the information will be used beyond just enforcement of program regulations. There are many ways this information can be used to improve program performance. Details on specific data to be gathered and how to gather it are presented in Chapters 2 - 3.

OUTLINE OF A COVERT AUDITING PROGRAM: AN INTRODUCTION TO PROGRAM PLANNING

Once the specific data to be gathered is established, the basic structure of the audits themselves must be evaluated. Two basic issues which need to be decided early are whether the covert vehicles themselves should be set to pass or fail, and how to establish incontrovertibly the results of the investigations.

Setting Up Vehicles to Fail or Pass

Historically there has been concern that decentralized inspection systems, though they offer substantial convenience to the vehicle owner, also open the way to consumer fraud. Specifically, there is an inherent conflict-of-interest in a decentralized inspection program, where a station stands to gain financially from failing a vehicle which is being tested; as a result, a station mechanic may have an obvious motivation to

fail cars that should be passing. False fails would therefore have to be investigated using vehicles set to pass. To a certain extent, computerized analyzers (generally those which meet BAR84 or similar specifications) make such fraud more difficult to perpetrate. The pass/fail decision on the vehicle is made by the analyzer, and in many analyzer systems, integrated automatic data collection systems allow the tracking of issuance of compliance certificates.

It appears though, that as of 1986, a more significant problem in decentralized I/M systems is stations that incorrectly pass vehicles which should fail ("false passes"). It may not be stated categorically that this situation exists in all decentralized I/M programs, but rather this practice is well enough established that investigating the phenomenon should be considered in the establishment or modification of a covert auditing program. Some programs have noted that when an inspection fee is high enough, a significant portion of stations and/or inspectors will purposely pass cars in order to capture fees in as short a time as possible. To test the false pass phenomenon discussed above, clearly vehicles must be set to fail. Vehicles must also be set to fail to investigate the pre-repair phenomenon.

Observation of Inspections: Documentation of Results

Actual observation of inspections may or may not be necessary to be able to document the results of covert investigations. How auditors are to conduct themselves and what data they are to collect will depend in large part on program regulations. It also may depend in part on how much practically can be seen during an investigation. Frequently customers are not allowed in service bays. In such cases, auditors may be forced to wait outside, and first hand observation of certain parts of a test (such as an EGR functional test) could be impossible.

Other Issues

Observation of inspections is directly related to other structural elements of an auditing program. For example, direct observations of inspections may not be necessary if the program has a well-equipped shop which can thoroughly document a vehicle before and after an inspection. Similarly, if the question of interest is whether a failing vehicle will be passed, the documentation of the vehicle can probably be accomplished by agency shop facility personnel. An auditor needs little training to simply take a vehicle to a licensed station and bring back to the shop results of the inspection. An approach of this sort may be an aid to an implementing agency in terms of personnel; fewer requirements for qualifications makes hiring auditors easier. Details of these and other issues are discussed in Chapter 5.

Table 1-2 presents two alternative approaches to developing a covert auditing program and how the issues discussed above may be addressed in different ways. There are of course advantages to each alternative, and other alternative approaches could easily be generated. However, any covert auditing program must address the issues presented here, as well as many other considerations which are presented in detail in the following chapters.

TABLE 1.2

CONCEPTS OF COVERT AUDITING

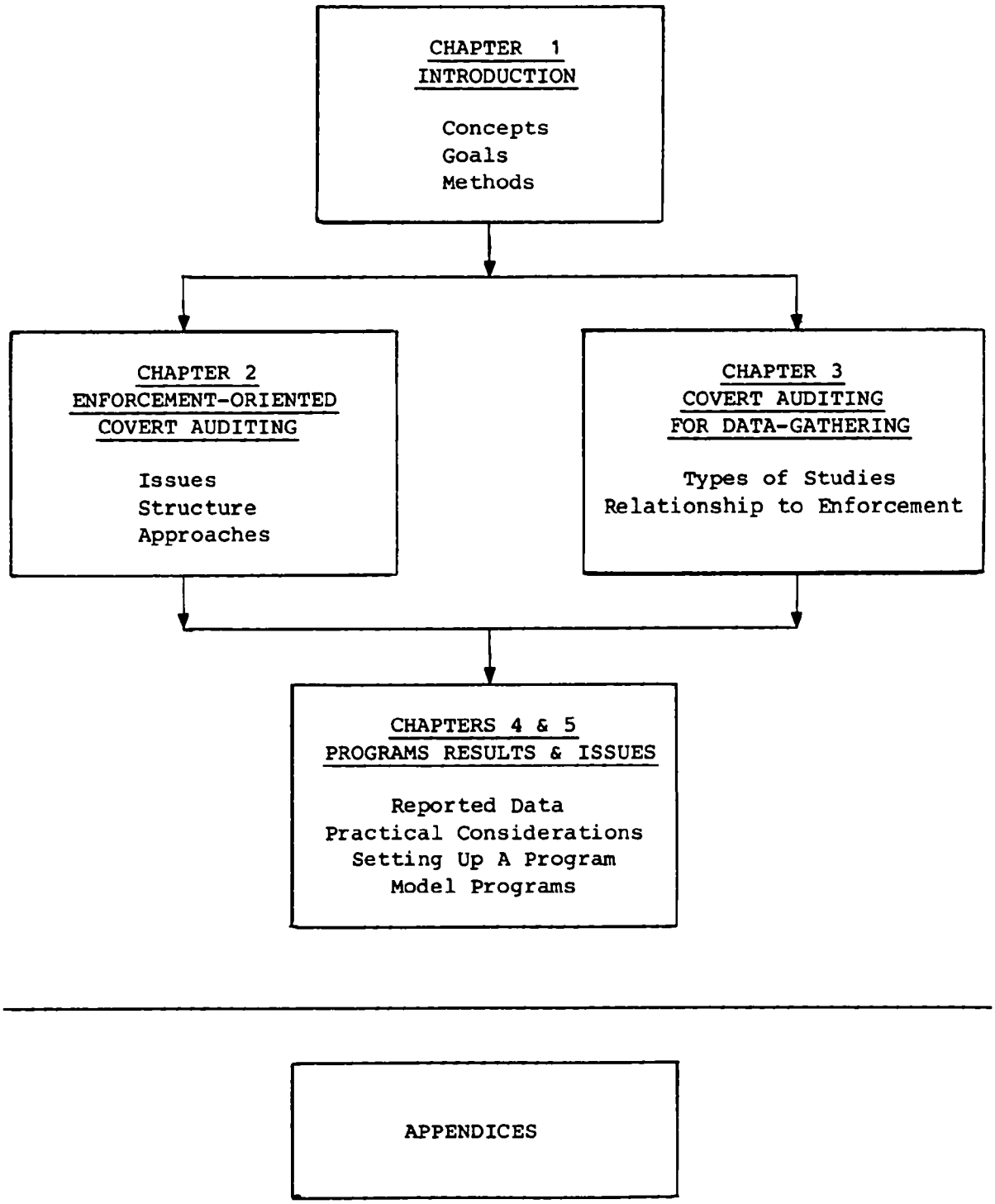
	Alternative 1	Alternative 2
Observations of Inspections by Auditors	Direct; must actually observe conduct of inspection	Only direct observations necessary may be for specific tampering checks, e.g., fuel filler inlet restrictors
Necessary Training of Auditors	Thorough knowledge of regulations; automotive background helpful	Automotive training optional; opens up auditor jobs to general public which may help to maintain cover of operations
Vehicles Set-Up to Fail/Pass	Pass	Fail
Shop Facilities	Generally not necessary except for service facility with analyzer which is periodically audited and calibrated	May range from minimal to extensive depending on the range of investigation areas and the sophistication of the set-up
Method of Documentation of Results	Auditor makes a report and will testify in enforcement hearings	Documentation, though supplemented by auditor, performed primarily by shop personnel

STRUCTURE OF THIS MANUAL

The purpose of this chapter has been to describe QA in decentralized I/M programs, and the conceptual role of unmarked vehicles in enhancing I/M QA. Chapters 2 and 3 describes specific issues involving enforcement oriented and data collection covert auditing programs. Chapter 4 presents results available from existing programs. Chapter 5 then discusses programmatic issues for setting up or expanding covert auditing programs plus suggestions for two specific model programs. Appendices are provided in the areas of shop guidance and background materials from State programs. Figure 1.1 presents the overall structure of the manual.

FIGURE 1.1

STRUCTURE OF THE MANUAL



CHAPTER 2

ENFORCEMENT OF PROGRAM REGULATIONS

Every I/M program is different, and as a result the regulations which must be enforced will be different as well. There are basic questions that can be asked though, about almost any program (see Table 2-1). The initial focus of covert auditing activities then should be to identify information which can answer these questions.

FOCUS OF ENFORCEMENT ACTIVITIES

In order to structure an enforcement-oriented covert auditing program, management must be clear on not only the overall program goals which must be addressed (Table 2-1), but also how those goals could be compromised. Figure 2-1 presents a way of analyzing this process. Working from the goals of the program, it is possible to identify the discrepancies which could compromise those goals; working from these discrepancies, it is possible to identify program practices, or indicators, which can cause these discrepancies. It is these indicators, or program practices, which should be the focus of an enforcement-oriented covert auditing program. Generally, these program practices will not be detected through formal periodic auditing.

Omission of Test

Probably one of the more serious problems in a decentralized program is the issuance of a compliance certificate or sticker without a test. This program abuse will clearly lead to false passes; it also has the potential for undermining the credibility of the program. Formal periodic auditing cannot document this practice; it can only uncover suspicious data totals (e.g., an extraordinarily low failure rate). Even covert auditing may not be able to uncover this abuse when it is performed privately for customers that station personnel know well; however, well-planned visits with a solid cover (see Chapter 5), can still uncover a lot. Because a station may omit a test on any vehicle, theoretically either passing or failing vehicles may be introduced into a station. However, if passing vehicles are introduced into a station, auditors must be with the vehicle so they can provide first hand information that certain parts of the test were not performed. If failing vehicles are introduced, and their condition before and after a test can be verified, auditors do not have to observe the test. In many State and local programs, passing a

TABLE 2.1

SUGGESTED CHECKLIST FOR DETERMINING OVERALL COMPLIANCE
WITH DECENTRALIZED I/M PROGRAM REGULATIONS

1. Are vehicles being tested according to established test procedures?

2. Are all tampering/fuel switching checks performed correctly?

3. If inspections are not being carried out completely or correctly, what parts of the inspection pose the biggest problem?

4. Are results of the inspections recorded properly?

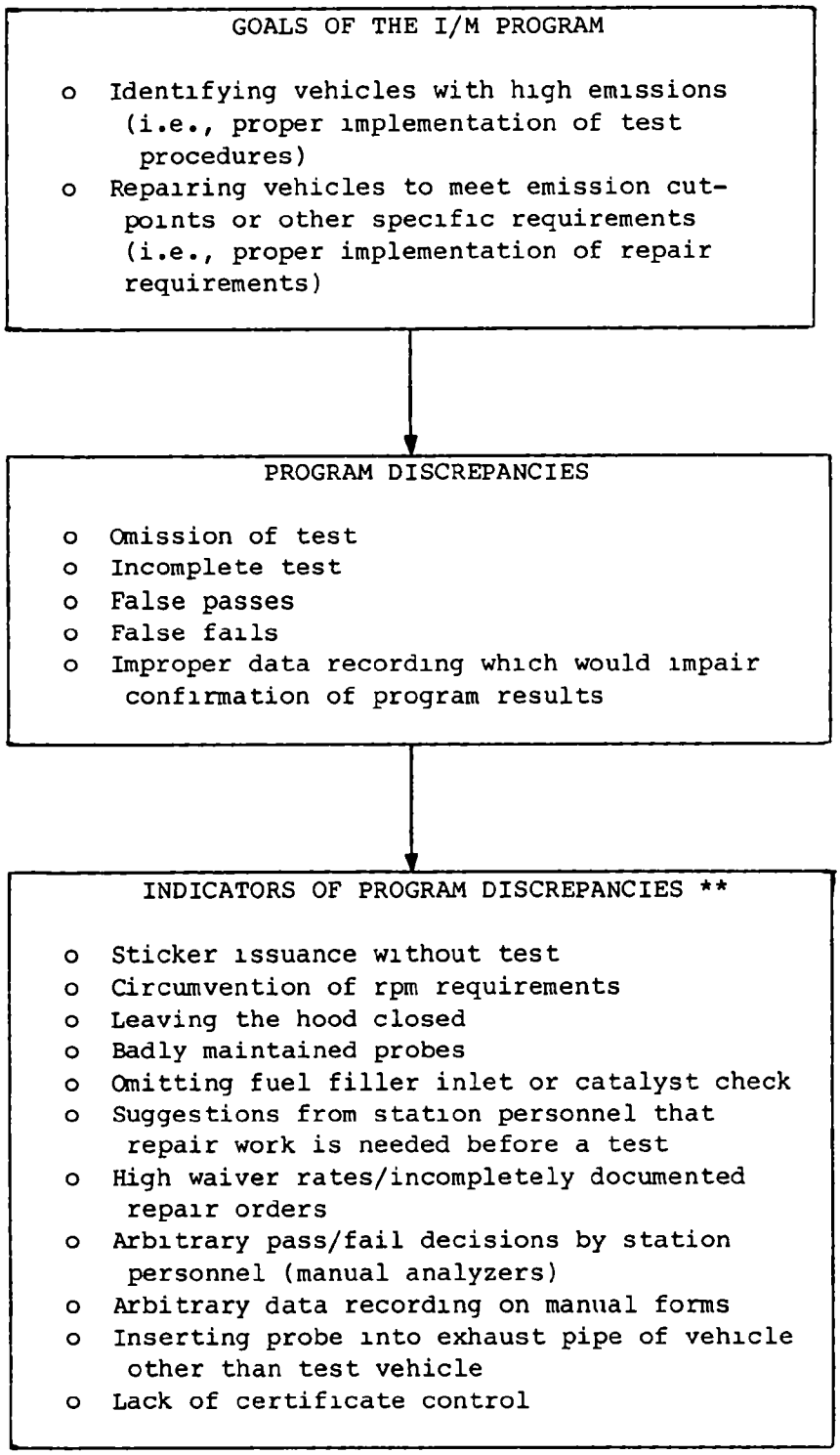
5. Are official tests being run only after adjustments are made?

6. Are the requirements for cost waivers being carried out correctly?

7. Are inspection certificates being issued properly?

FIGURE 2.1

DEVELOPMENT OF ENFORCEMENT-ORIENTED COVERT AUDITING



** NOTE - Depends on type of program.

vehicle which does not meet emission-related requirements constitutes a violation of program regulations.

Incomplete Test

Incomplete tests may also lead to false passes. When there are underhood tampering checks, if station personnel leave the hood of a vehicle closed, this part of the inspection could not have been done. Similarly, if the gas cap is not removed, or if the inspector does not look under the car, fuel filler inlet and catalyst checks could not have been performed. Rpm requirements may be circumvented by omitting use of a tachometer connection. Such an omission is, of course, easier with a manual analyzer or an automated analyzer which does not lock out improper rpm levels out of an official I/M test. Incomplete tests can be determined with either passing or failing vehicles. However, as with investigating test omissions, there are advantages to using failing vehicles, i.e., direct observation of the inspection is probably not necessary.

Other False Passes

False passes may also be caused by inadequate understanding of cost waiver procedures. (Obviously if no cost waivers are possible under a particular program's regulations, this situation will not be a problem.) Cost waivers usually require a minimum amount of work to be done on the vehicle, and the program management would therefore have to devise ways to demonstrate that required work was not performed. Failing vehicles would have to be introduced in order to simulate a cost waiver situation.

"Pre-repair" of failing vehicles may also generate a false pass. Vehicles which fail may be adjusted by station personnel and then be recorded as passing. This situation may even occur in programs with automated analyzers. In these programs, the analyzer normally has a computerized "master menu," which allows a station inspector to choose either a formal I/M test test mode or a manual emission test mode. If station inspectors wish to check a vehicle's emissions prior to an official test, they may choose the manual mode to see if the vehicle passes or fails. If they find that the vehicle fails, they may simply perform the adjustments the vehicle needs to pass, and then initiate the official test.

Badly maintained probes may leak, thereby diluting the sample and causing a false pass. Automatic leak checks and flow checks, especially on automated instruments, may minimize this phenomenon. However, to the extent that leaky probes contribute to a dilution of a sample, additional false passes will decrease the real failure rate.*

Manual analyzers exacerbate QA problems in a decentralized program, because the pass/fail decision is left up to the individual inspector/mechanic. This situation could lead to either a false pass or a false fail decision (see below). There are no comprehensive studies or reports

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* Badly maintained probes may of course also be identified through formal periodic QA audits as well.

available on the actual motivations of mechanics who purposely pass or fail vehicles falsely. However, anecdotal information from current State and local programs suggest that licensed stations do believe that their return from an I/M program is maximized by test volume, and that test volume is maximized by minimizing time associated with each test.

False Fails

False fails, either purposeful or accidental, are the subject of substantial concern.* When a station purposely fails a car which it should pass, it is generally considered consumer fraud. A false fail can be generated either by incorrect reporting of the result on the data form in a program with manual analyzers, or by probing the exhaust pipe of a car known to fail emission standards in a program with automated analyzers. Deliberate disablements such as secretly disconnecting spark plug wires, or misrepresenting the status of emission control components (for programs with tampering checks) are other ways to create false fails. It should be pointed out that there is no data available to date which suggests that false fails are a concern on a program-wide basis; rather it only appears to be a problem on a station-by-station basis.

Based on historical experience with safety inspection programs, some covert auditing programs have started by focusing on false fails. Colorado, for example, initiated its program by investigating for false fails, and found very few. The Colorado program has since changed its emphasis and is now investigating false passes. As mentioned above, reports from other programs also support the concept that false passes are more of a problem in I/M programs than false fails. If it is determined that false fails are a real concern, then cars must be set up to pass in order to investigate stations of concern.

Improper Data Recording

Improper data recording, while in and of itself is not a program discrepancy, may prevent an accurate representation of program operations from the data collected and analyzed. In programs with manual analyzers, this problem is exacerbated by the fact that the inspector must accurately read and record the data manually. Illegible and ambiguous markings of inspection data forms may be discovered either through central office review of records or through formal periodic field auditing. However, some of the practices described above in this section overlap the area of improper data recording and may become confused with them. For instance, it may be important to know how much of a low failure rate is due to prerepairs versus false passes due to emission tests being omitted. The

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* A false fail should not be confused with an error of commission, which in a testing context means a vehicle which would pass an FTP but fails a short test.

first is a data recording problem and does not necessarily indicate that program effectiveness is being compromised. The second is a program abuse.

PRIORITIZING STATIONS: AN AID TOWARDS DOCUMENTATION AND DETERRENCE

There are many ways of prioritizing stations, but they can generally be classified into periodic random auditing, probable cause auditing, and "problem station" auditing. For the purposes of this document, these classifications can be defined as follows:

Periodic/Random Auditing - Auditing with a formal or informal schedule to visit all stations in program within a specified time period (i.e., strictly speaking, no prioritization).

Probable Cause Auditing - Auditing which targets particular stations on the basis of the frequency of complaints, discrepancies on data records, etc.

"Problem Station" Auditing - Auditing which uses covert investigations only to obtain evidence against a station for the purposes of suspending or revoking that station's license.

Depending on the program, these systems could be combined into a hybrid approach.

Currently, there are programs that utilize each of these approaches. Colorado utilizes a combination of periodic auditing and probable cause auditing. The Department of Revenue, the administering agency in Colorado, visits each licensed station once a year. They also keep an informal list of "target" stations, which are visited as convenient. New York is a good example of a State which utilizes probable cause to target stations. Though the Regional DMV offices do receive computer printouts of station records, complaints and tips from periodic inspectors are the main factors used to prioritize stations for covert visits. As a result, the State visits from 10-25% of the stations per year. In some ways, "problem station" audits really are a subset of "probable cause" audits. In a program with a "problem station" approach, fewer audits are conducted, because the primary reason for performing an audit is to gather evidence against a station which is almost certainly committing serious violations of the program regulations. As an example of how one State decides to perform covert visits, a summary of reasons for covert audits in California is presented in Table 2-2.

Ultimately, the choice of an auditing prioritization scheme depends on the goals of a covert auditing program, i.e., documenting and deterring the practices which lead to program discrepancies (Figure 2-1). To be sure, if stations know that covert auditing is not conducted except in rare cases, stations' standard operating practices for I/M will probably not change much. While periodic covert visits to every station may not be possible due to limited agency funding, having covert audits on a regular basis clearly increases the chance for documenting and deterring detrimental program practices. Therefore, the need for efficient prioritization of stations is clear, and prioritization, even with relatively few visits, can still lead to deterrence (see Figure 2-2).

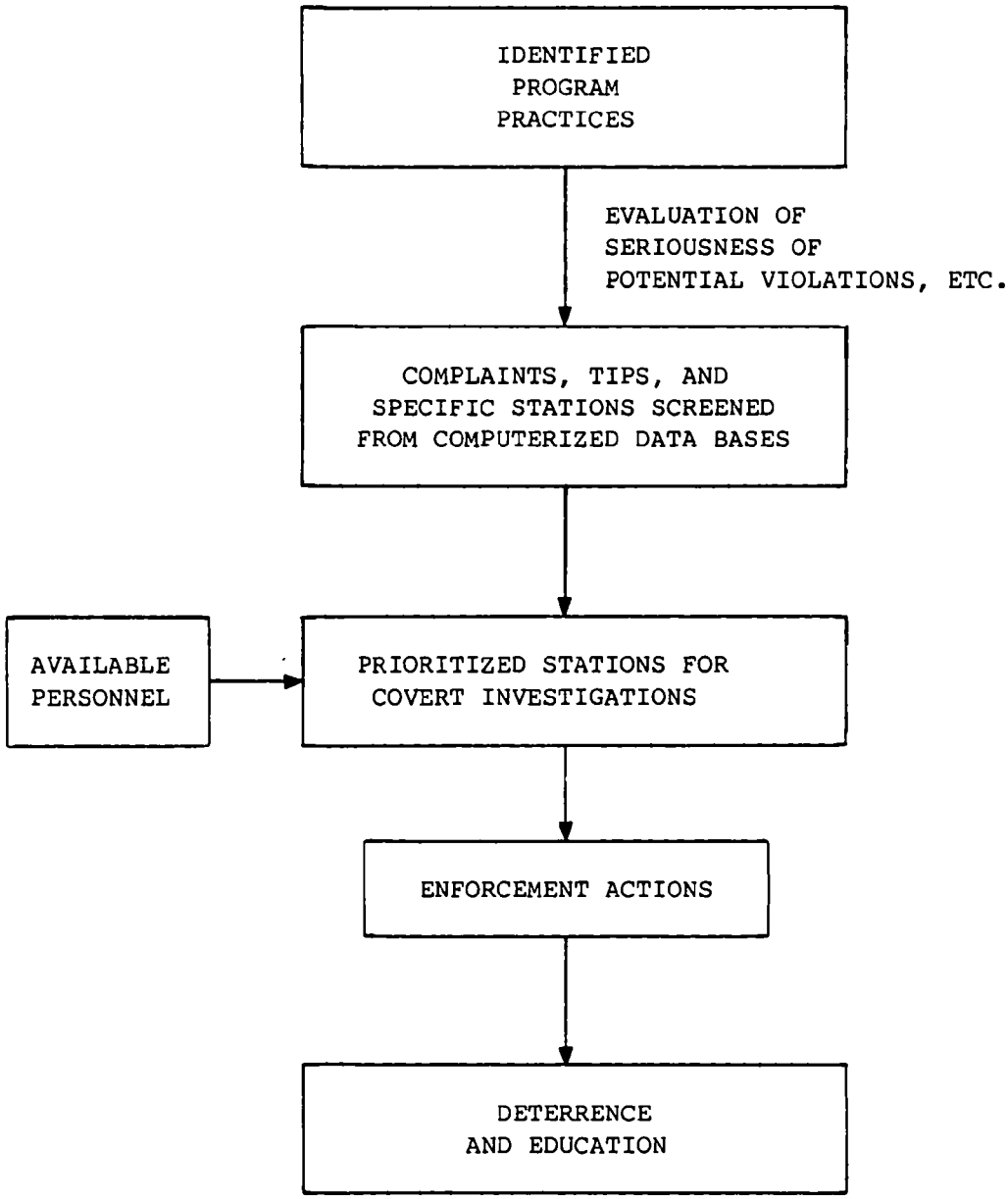
TABLE 2.2

REASON FOR PRIORITIZING STATIONS FOR
COVERT AUDIT BY STATION TYPE IN CALIFORNIA
(JULY 1984 - JUNE 1985)

	New Car Dealers	Used Car Dealers	Independent Shops	Service Stations	Total
Random Check	20	16	363	230	629
Complaints from the Public	5	4	92	84	185
Suspiciously high certificate issuance	0	0	7	4	11
Informant tips	2	5	34	28	69
Tips from QA contractors (formal auditors)	0	0	1	2	3
Referee actions	0	1	5	1	7
Follow-up visits	2	10	110	115	237
Other	0	1	10	11	22
Total	29	37	622	475	1163

FIGURE 2.2

CONCEPTUAL QA FRAMEWORK FOR ENFORCEMENT-ORIENTED COVERT AUDITS



Because of the increasing computerization of I/M data, with and without computerized analyzers, station performance is much more subject to scrutiny than it was in the late 1970's. However, few, if any, State and local agencies actively use computerized summaries currently to prioritize their undercover activities. One state, which is just starting an effort in this direction, is the State of California. A copy of the California station performance summary report is provided as Figure 2-3. Note that this form is only a sample and that many other comparisons may also be generated from similar data bases. However, several categories will depend on data generated and recorded by an automated analyzer. For example, "No. and % with fast repairs," depends on an analyzer with a clock or timer, so that "fast repairs" may be defined for a screening of a computerized data base. (See Appendix B for a full explanation of the California summary report).

As discussed above, other ways of prioritizing stations include methods that have traditionally been used by safety programs with probable cause covert auditing, including:

- o complaints by vehicle owners;
- o tips from QA auditors;
- o reputation of a shop's activities from other sources (police, etc.).

When combined with computerized data results, a list of target stations can rapidly be developed. Each State or local program should have its own criteria to determine what stations should receive priority for covert visits. Among the questions that could be asked are:

How serious are the violations to be investigated?
How prevalent do these violations appear to be?
How do the violations to be investigated obstruct the proper implementation of the program?
How will covert visits to these stations help to deter detrimental practices both at this station and the program as a whole?

The last question is addressed below under "Penalties, Publicity, and the Durability of Deterrence."

The question of how to prioritize stations then revolves around what program practices need investigation. As shown in Table 2-3, observation of the inspection is frequently not necessary if all that must be established is that a station is passing cars that should fail. Direct observation or the equivalent is usually necessary to document what specific practice is occurring (see Table 2-3, Note 2); however, in many instances introducing a failing car can still allow the identification of a false pass, though the exact reason may not be identified.

Therefore, depending on what program practices are of interest, certain data can be screened in computerized data bases. This information then can be used in addition to information from the more traditional, informal channels, (such as tips from the QA auditors), to prioritize stations.

Figure 2-3
California Station/Mechanic Summary

DEPARTMENT OF CONSUMER AFFAIRS
BUREAU OF AUTOMOTIVE REPAIR

STATION / MECHANIC EVALUATION REPORT
DATA COLLECTED 2ND QUARTER 1985

PAGE 1

STATION NAME

FIELD OFFICE SE

( )(X)( )(X)(X)( )
(X)( )(X)( )( )( )
( )( )(X)( )( )( )

PHONE: (415)

	TOTAL TESTS	FRONT FAIL	(% DEV FROM DISTRICT AVERAGE) FAIL RATE			TOTAL TESTS	FRONT FAIL	(% DEV FROM DISTRICT AVERAGE) FAIL RATE		
	A TEST STATISTICS					B TEST STATISTICS				
STA #	141	23	7 BELOW	-26	-20	5	60	30 ABOVE	-23	-17
MEC #	141	23	7 BELOW	-26	-20	5	60	30 ABOVE	-23	-17

	# CERTS BY INACCURATE PREV EMIS	% DEV FROM STATEWIDE DILUTION AVERAGE	IDLE SPEED DEVIATION I TO A TEST		NUMBER OF RETESTS ADJ CO TO	PERCENT TESTS W/IN 113 RPM OF	NO. AND % A TESTS WITH NO MATCHING	
	ISI BESLIS		% ECS & DEV		INBESHCLD	INTERSHOLD	I TEST	
STA #	2	0.2	74	35.0	0	23.5	1	19.9
MEC #	2	0.2	74	35.0	0	23.5	1	19.9

	PERCENTAGE UNDERHOOD INACCURACY		ERRONEOUS ENTRIES ON FUNCT. CK.	NO. AND % WITH FAST RESPONSE	% A TEST WITH NO RESPONSE	% MULTIPLE TESTS		NO. AND % OF FAILED TESTS WITH CHECK
						-I-	-A-	
STA #	16	79	0	3 74.9	0.0	4.9	0.0	3 9.3
MEC #	16	80	0	3 74.9	0.0	4.9	0.0	3 9.3

103 27 5 4

NOTE- See Appendix B-4 for descriptions of headings in this table.

TABLE 2.3

SUMMARY OF POTENTIAL EVIDENCE FOR SPECIFIC REPAIR PRACTICES

Program Practices	Potential Evidence	Passing/Failing Vehicles for Covert Audits	Direct Observation Needed
Sticker/certificate without a test,[1] or without regard to the results of a test.	High passing rates, fast tests.	Passing Failing	Yes No
Circumvention of rpm requirements.[1]	Discrepancies in rpm and idle speed records.[1]	Passing Failing	Yes Sometimes[2]
Badly maintained probes.[1]	Discrepancies in dilution records.[3]	Both	Yes[3]
Leaving the hood closed.[1]	High passing rates (tampering inspections).	Passing Failing	Yes Sometimes[2]
Omitting fuel filler inlet or catalyst check.[1]	High passing rates (fuel filler inlet/catalyst checks).	Passing Failing	Yes Sometimes[2]
Suggestions from station personnel that repair work is needed before a test.	High failing rates, high repair costs (possibly).	Both	No
Fraudulent fails (general).	High failures, especially for specific emission control components and HC.	Passing	No

TABLE 2.3 (continued)

SUMMARY OF POTENTIAL EVIDENCE FOR SPECIFIC REPAIR PRACTICES

Program Practices	Potential Evidence	Passing/Failing Vehicles for Covert Audits	Direct Observation Needed
Inaccurate waiver processing.	High waiver rates; short time periods betweeen initial and second tests.[4]	Failing	No
Arbitrary pass/fail decisions.	High passing or high failing rates.[5]	Both	No[5]
Arbitrary data recording on manual forms.	High passing or high failing rates.[5]	Both	No[5]
Inserting exhaust pipe into vehicle other than a test vehicle.[1]	Small standard deviation of test scores.	Failing	Yes
Waivers to 1981 and later vehicles which are serviced by untrained personnel.	High waiver rates for 1981 and later vehicles; short time periods between initial and second tests; high incidence of specific, unanticipated repairs for late model vehicles, carburetor repairs on 1981 and later vehicles and fuel-injected vehicles.	Failing	No

TABLE 2-3 (Continued)

Notes to Table 2-3

1. High passing rates may indicate a combination of phenomema occurring simultaneously; those phenomena which may contribute are noted with a "1".

2. Direct observation is needed to demonstrate a specific practice. A vehicle may still be a failing vehicle and the station could be cited for passing a failing car. If it is desired to determine whether a specific station is, for example, adjusting engine parameters in a pre-repair phase, then a program must develop a way to document the status of those parameters before and after the test. See Chapter 5 under "Shop Issues."

3. Badly maintained probes may be checked through formal periodic auditing as well.

4. Data probably available only from certain automated analyzers.

5. Generally, only with manual analyzers. Direct observation is not necessary if passing or failing status of the car can be demonstrated before and after the test.

THE ISSUE OF ENTRAPMENT

Based on surveys of operating programs in 1985, covert auditors specifically do not ask inspectors or mechanics to perform work contrary to program regulations. To do so would constitute entrapment,* i.e., inducing station personnel to commit a program violation. Instead, auditors simply ask for an inspection.

Among the specific concerns voiced by State and local programs are that:

- introducing a car that has altered or missing emission control devices, or a car known to fail emission standards, may constitute entrapment;
- altering emission control devices on vehicles, even in the interest of air quality improvement, may be a violation of Federal or State law;
- driving a vehicle on public roads with altered emission control devices may be a violation of State law.

A review of other states may be helpful to understand these and other entrapment issues. To be sure, entrapment is a matter of law, and if challenged, a State or local program might have to defend itself in court. However, as a practical matter for the States that do use failing and altered cars, entrapment has not been a major issue. Generally, presenting a failing vehicle (even with altered emission control devices) has not been considered entrapment, because stations are not being induced into doing anything that is contrary to program regulations; all the station has to do is to fail the vehicle. For state air pollution control laws, obviously the State air pollution control agency should be consulted. It should be noted that with respect to Federal laws and regulations, the U.S. Environmental Protection Agency has allowed emission control modifications for this purpose on a case-by-case basis.

PENALTIES, PUBLICITY, AND THE DURABILITY OF DETERRENCE

Figure 2-2 indicates that the "bottom line" of an enforcement-based covert auditing program is deterrence and education. The reason for this dual goal is that deterrence from detrimental program practices and education towards implementation of the program as it is designed are both im-

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* Black's Law Dictionary defines entrapment as "the act of officers or agents of the government in inducing a person to commit a crime not contemplated by him, for the purpose of instituting a criminal prosecution against him" (emphasis added).

- misunderstanding or ignorance of the program;
- partial or total disregard of the program;
- fraudulent implementation of the program requirements.

For station personnel who do not really know I/M program requirements, education and retraining is essential. However, some state's experience (e.g., Colorado) indicates that continuing conferences for some stations seems to perform no useful function; at this point, stations who continue to perform inspections or repairs incorrectly must be considered as risks for correct implementation of the program. Nevertheless, some stations do manage to revise their procedures.

Several State and local programs interviewed mentioned that the swiftness, sureness, and severity of penalties were the key to successful deterrence from a covert auditing program. The quality of deterrence may be debatable (see below), but qualitatively there seems to be some merits to this argument. Swiftness of penalties may be aided by fining authority ("ticketing") by the regulatory agency. As of January 1986, California was granted this authority, and determining the impact of this approach may be possible.

The deterrence effect of publicity must also be considered. First, however, who publicity will reach must be assessed. Among the method I/M programs have tried are:

- trade association newsletters;
- press releases;
- courses through vocational educational institutions and service station organizations.

All of these options are to be encouraged, but realistically programs must ask first who will be reached by specific publicity. A trade association newsletter, for instance, is always a meaningful approach of outreach to the service industry, but in and of itself, it may not be sufficient. The Regional Office of New York DMV, for instance, reports that only 25% of licensed stations belong to a professional trade organization (e.g., the Long Island Service Station Association). In other words, outreach and general publicity to maximize the impact of limited covert auditing must be looked at as a total package.

CHAPTER 3

COLLECTION OF DATA ON PROGRAM OPERATIONS

Covert auditing presents opportunities to I/M program management to collect information on what is happening in the program without affecting inspectors' and mechanics' behavior. This advantage, though, is not and should not be focused on enforcement activities alone. Information gathering about the program in general can be enhanced by having people in the field watching what happens.

Similar to enforcement-oriented auditing, auditing for the purpose of data collection must be well-planned from the beginning. It is important to know what information to look for, plan a system to gather that information, and analyze the information in a systematic way.

Among these areas which could be the subject of investigations are:

- o Failure rates
- o I/M effectiveness
- o Repair cost
- o Station's approach to I/M
- o Types of repairs
- o Warranties

Table 3-1 presents sample topics which could be explored within some of these areas.

COORDINATION WITH ENFORCEMENT-ORIENTED COVERT AUDITING

Not every program can do a special study, and setting up methods for collecting special data on a routine basis often takes time. Collecting data to characterize program operations may be a valuable first step in setting up an enforcement-oriented covert auditing program.

As discussed in Chapter 2, the goals of an I/M program ultimately can be compromised by detrimental program practices (e.g., fraudulent fails, false passes, etc). With limited resources for covert auditing, it is more cost effective to focus the potential deterrent effect of a covert auditing program on the practices which hurt the effectiveness and/or credibility of the program the most. To be able to determine what practices to highlight, program management must know how prevalent different practices are.

TABLE 3.1

POTENTIAL AREAS OF DATA-GATHERING INVESTIGATION
FOR COVERT VEHICLES*

Subject	Sample Topics for Investigaton
I. Failure Rates	Are stations repairing or adjusting vehicles and not reporting failures? How are these actions affecting the reported failure rate in the program?
II. *Repair Cost	Are some stations charging a maximum amount (i.e., equivalent to a cost waiver expense) for simple adjustments? Are simple adjustments being performed for free? Is there a difference in repair cost in terms of the type of service outlet?
III. Warranties	How responsive are dealerships to warranty claims?
IV. Stations' Approach to I/M	Why do station personnel make programmatic mistakes? Fraud? Laziness? Ignorance?

* I/M effectiveness and repair type investigations may be somewhat more difficult to develop, based on the number of vehicles that would be required to develop a good data base.

What may be needed is a baseline, i.e., a quantitative description of ongoing successes and flaws at a point in time. In other words, gathering data in many cases provides an opportunity to determine how a program is improving as a result of a covert auditing program. The issue of baseline development is discussed in more detail in Chapter 5.

Managers of many I/M programs feel fortunate to have enough resources for the basic activities of program operation; extra data collection and analysis may be considered to be a beneficial but expendable part of a program. While at times special studies can be resource-intensive, in many cases they can be integrated into existing operations (see Chapter 5). Regardless, probing into the operations of an I/M program can give insights into not only what is happening, but why. Without reliable, accurate information on what is really happening in I/M programs, managers cannot really manage. If, for example, real failure rates are low and emission reduction effectiveness is less than the effectiveness planned in the program design, finding out why is the first step toward correcting the problem.

SPECIFIC TYPES OF STUDIES

Gathering information about the operations of an I/M program can either be through a special study or on a continuous basis. In any event, studies must be organized. The following discussion presents a brief description of how to approach the four subjects presented in Table 3-1. Table 3-2 presents some potential comparisons that can be generated as a result of focused data collection analysis.

Failure Rates

Investigations of failure rates have been discussed in some detail in Chapters 1 and 2. If false fails and false passes are being investigated, passing vehicles and failing vehicles are usually needed. Special documentation/verification may be needed if the adjustment (or non-adjustment) of certain engine parameters is to be studied. Failure rates are of interest for all of the subgroups listed in Table 3-2 (different types of analyzers, service outputs, etc.) particularly if a program wants to identify where (if anyplace) low failure rates are concentrated.

Repair Cost

As with I/M effectiveness studies, repair cost studies need data on the types of maladjustments and poor maintenance found in an area. Model year groupings and types of service outlets are key groups to investigate. For 1981 and later vehicles, vehicle preparation is critical.

Warranties

Warranty studies will of course be focused on dealerships, and will involve only late model vehicles. Again, information on the sorts of failures that dealerships actually face is useful.

TABLE 3.2

POTENTIAL COMPARISONS TO BE USED IN CHARACTERIZING I/M OPERATIONS*

	Failure Rates	Repair Costs	Warranties	Stations' Approach
Analyzers by Manufacturer	X			
Type of Service Outlet	X	X	X	X
Vehicle Model-Year Groupings	X	X		X
Physical Location of Stations	X	X		X

* NOTE: Warranty investigations will be oriented primarily towards individual stations and possibly individual manufacturers.

Station's Approach to I/M

Investigating in some detail what stations do in an I/M program (how much diagnostics are performed, what a "typical" inspection is like) may be one of the more difficult areas to investigate. However, to the extent that the reasons for inadequacies in inspections or repairs are determined, remedies (e.g., retraining of inspectors) are much easier to develop.

Other Potential Areas of Investigation

I/M effectiveness studies may be difficult because FTP testing is generally needed to demonstrate mass emission rate reductions. As an alternative, idle emission reductions are frequently used as substitutes for summary reports to legislatures, the public, etc. Special vehicles, set-ups, and documentation are generally not needed. However, it is helpful to have a breakdown of typical maladjustments so that the repair industry may be tested with a set of vehicles which reflect the vehicle population as a whole. Types of service outlets, vehicle model year groupings, and vehicle makes are of particular interest in I/M effectiveness studies. For 1981 and later vehicles, vehicle preparation is critical (see Chapter 5 and Appendix B).

Activities in Current Programs

Data collection and analysis studies are either in progress or planned in several areas. For example, the Salt Lake City/County Health Department is considering a permanent group of stations for data-gathering purposes. The Colorado Department of Revenue, in conjunction with the Colorado Department of Health, is investigating responsiveness to warranty claims by dealerships in the Denver metropolitan area. An I/M effectiveness study is being performed by the California Air Resources Board (CARB) in Southern California; utilizing the CARB laboratory in El Monte, California, full transient driving cycle emission tests are being conducted.

CHAPTER 4

EXAMPLES OF RESULTS FROM CURRENT AUDITING PROGRAMS

As discussed above, the goal of an enforcement-oriented QA covert auditing program is to deter and document program practices detrimental to the I/M program. Education is an essential part of that deterrence. It is difficult though to define what constitutes effectiveness of a covert auditing program quantitatively.

Ultimately a covert auditing program is effective if it reduces the incidence of detrimental program practices. Data on the prevalence of different types of program problems in decentralized programs is generally not available. It is, therefore, impossible to present an analysis of the effect of different types of covert auditing programs. One measure of effectiveness that some programs use in percentage of hits:

$$H = \frac{h}{I} \quad 100$$

Where:

H is the percentage of hits;
h is the number of investigations where investigators found what they were expecting to find; and
I is the total number of investigations.

In some programs, H approaches 100%. Percentage of hits as a measure of effectiveness though can be rather misleading. First, it may be based on both safety and I/M requirements in combined programs. If a safety program requires very detailed test procedures and the covert auditors are very strict, then it is relatively easy to find that the station is not carrying out a full test procedure. Second, to the degree that auditors perform audits on a "problem station" basis, they maximize the chance that H will be 100%. Third, as programs start to use measures which are only indicators of possible problems, H may be expected to decrease. There are, therefore, many potential factors which affect the percentage of hits, and it is useful to investigate other ways to determine the effectiveness of I/M programs.

PREVALENCE OF DETRIMENTAL PRACTICES

The first step to defining how effective a covert auditing program is, is to define the prevalence of the practices the auditing is designed to control. Table 4-1 provides summary data from the Colorado program.

TABLE 4.1

SUMMARY OF COVERT INVESTIGATIONS IN THE COLORADO I/M PROGRAM
(January 1 - November 22, 1985)*

	Improper Issuance of a Sticker	Improper Visual Inspection	Other
Visual Failures (total attempts = 535)	7.5%	4.9%	6.3%
Emission Failures (total attempts = 381)	3.7%	0.8%**	5.9%
Total (total attempts = 891)	6.8%	3.2%	7.2%

NOTE - Percentages do not total, as multiple violations may occur from one audit. These totals also do not reflect violations which were addressed in an office conference only.

* Includes only those investigations which have gone to formal hearings by 11/22/85.

** Excludes one vehicle which had both emission and visual failures; n = 356.

In Colorado at least, it appears that inspectors are less likely to ignore an exceedance of the I/M cutpoints than they are a missing or modified fuel filler inlet restrictor or catalyst.

As discussed above, there is very little data available which indicates over time what covert auditing approaches have worked in terms of deterring detrimental program practices. Therefore, it is helpful to characterize program operation so that a covert auditing approach can either be developed or modified to focus on specific areas of a program. Development of a data baseline may be a useful first step towards this goal.

DETERRENCE THROUGH PUBLICITY

An example of what can be done in terms of publicity for covert auditing activities occurred in California in the summer of 1985. The California Bureau of Automotive Repair (BAR) had been receiving complaints from buyers of used cars that cars were being sold with altered or missing emission control devices. Because California runs a periodic I/M program, which includes includes numerous tampering checks, purchasers of vehicles falsely certified for sale would then be faced with paying for modifications of the vehicles to be able to pass I/M requirements. To substantiate the complaints, BAR bought several sample vehicles which had missing or altered components and removed the vehicles to the BAR shop to verify and document their condition. Then, in a coordinated media approach, with the aid of the California Highway Patrol, the car lots which sold the cars were cited for violation of specific state laws and regulations. There was substantial press coverage, not only in Sacramento, but in other parts of the State as well. Informal feedback indicated that prospective vehicle purchasers had heard of the state's operation on the car lots, and were now asking questions of the car lots before buying a vehicle. The owners of the car lots now appear to be aware of the fact that the state could still occasionally buy a car off a lot.

Of course, this example presents one incident that could affect one portion of an I/M program. There is no indication of how long the deterrence generated by this operation will last, no matter how good it was initially. However, this incident does underscore the concept that publicity about ongoing operations is a useful part of an overall strategy to encourage both deterrence and education. It also raises the possibility of using consumer awareness to help in that process.

DEVELOPMENT AND DISPOSITION OF CASES

As described above, California does prioritize its audits and as a result does try to target stations which are most likely to be performing inadequate inspections or repairs. Table 4.2 presents a summary of over 1400 audits performed in California. As presented in the table, a substantial portion of the audits (61.3%) resulted in a documented violation

TABLE 4.2

ADMINISTRATIVE SUMMARY
COVERT AUDITS IN CALIFORNIA*

	#	%
Results of the Investigation (Total = 1404)		
No violations	412	29.3
Aborted	87	6.2
Violation	861	61.3
Other (Please specify)	44	3.1
Disposition of Case (Total = 1317)		
Office conference	390	29.6
Submitted for disciplinary action	119	9.0
Submitted for administrative action	58	4.4
NOV issued	283	33.8
Closed no action	445	33.8
Pending	22	1.7
Type of Station (Total - 1173)		
Dealer (new)	29	2.5
Dealer (used)	37	3.2
Independent	628	53.5
Service station	479	40.8

* Approximately 50% random and 50% targeted audits.

(but not close to the nearly 100% "hit" percentage reported by some programs). However, California (like New York) does attempt to minimize the time taken per case, and reserves administrative and disciplinary actions. Out of over 1400 audits, actions of this sort accounted for just over 13% of the total. Office conferences, a much less time consuming action, were held for more than twice as many cases.

CHAPTER 5

PROGRAM ISSUES

Chapters 1, 2, and 3 have discussed why covert auditing is important and how it can be focused towards both enforcement and data collection. Chapter 4 discussed results to date of several current auditing programs. The purpose of this chapter is to describe specific program elements, and to discuss how different model programs can be assembled.

PROGRAM ELEMENTS

Among the decisions programs will have to make will be:

- how to maintain the cover of auditors
- whether to orient the covert program to passing or failing cars
- what kind of people to hire as auditors and how to organize a team
- what kinds of vehicles to procure and where to procure them
- how to set up vehicles physically for covert work and how to document audit results
- what kind of shop facilities are necessary
- how to approach administrative, civil, and criminal enforcement actions
- how to publicize auditors' activities
- how to use the results to improve or manage the program.

Each is discussed below.

Maintaining Cover

Maintaining cover is critical for the effective operation of the covert audit. If cover is compromised, at the very least station personnel may play along with the situation and attempt to perform in accordance with what they believe the requirements of the program are. In this situation, the covert audit may in fact be collecting information which does not reflect ongoing practices in the program.

Many programs, including several with long experience with covert investigations for safety programs, emphasize how stations frequently ignore obvious tip-offs to an ongoing covert audit. Even when cars and auditors are generally known, auditors are frequently able to perform an

effective covert audit. (One state even reported effective audits using a State vehicle with a State seal on the vehicle's door.) However maintaining cover must not be taken lightly. Even if some audits can proceed, two problems can surface if a station detects an audit and "plays along":

- o the deterrent effect of being caught in a covert audit will only be felt by those who fail to pick up the clues.

- o information gathered by auditors will not be representative of program operation, and neither the auditors nor the program management will know it.

Accordingly, good planning is essential to maintaining cover, and program managers must therefore consider how an auditor's cover could be lost. Among the clues to stations which should be considered are:

- o the auditors themselves
- o auditors' dress
- o the vehicles themselves
- o the combinations of auditors and vehicles
- o the auditor's story (is it plausible?)

To the extent the vehicles and auditors are known, an auditor's cover is suspect. A combination of people, vehicles, etc., is desirable. In addition, auditors must develop a routine for themselves and managers of auditors must review every part of an investigation package (the combination of auditor/dress/vehicle/story) to make sure that suspicions are not aroused. Periodic review of results in the field is helpful to adjust the overall program to eliminate potential problems.

A checklist of questions is provided here as Table 5-1 which can be used to assess the reasonableness of the audit approach.

Passing or Failing Cars

This issue has been discussed at some length in previous chapters, and what makes sense may vary from program to program. Ideally, a program should initiate a data gathering study to see what practices are occurring in the field. A selection of vehicles aid in characterizing program operations (see Chapter 3). In the absence of any data about the practices occurring in a specific problem, using failing cars at least in part is a good starting point. Given the false pass phenomenon and the ability in many cases to avoid the need for direct observation of the inspection, failing cars may provide an information baseline to build on. In addition, even if there are doubts in a particular jurisdiction about the legality of using failing cars in a specific case, using cars in a data collection effort can never be considered entrapment.

Personnel

Position descriptions for auditors, and in some cases, supervisory auditors are presented in Appendix B-3. It should be noted that the California position description provided is for a Bureau representative who works with licensed stations and auditors.

TABLE 5.1

CHECKLIST OF QUESTIONS FOR ENSURING THAT COVER IS MAINTAINED DURING A COVERT INVESTIGATION

o If the auditor has to leave a phone number, is the number local?
o If the vehicle must be left, is there someone at that phone number to answer and maintain the cover of the investigation?
o Is the combination of the auditor (including the way the auditor is dressed) and the vehicle reasonable for the type of clientele and business normally performed by the station under investigation?
o Is the service the auditor asks for consistent with service requests a station expects?

There are of course many ways that State and local governments can organize their teams, and there are many constraints to work with. One interesting approach to this issue has been in California where the auditors themselves have minimal responsibilities, and basically only introduce the vehicle into the target station with a plausible story. The pre- and post-audit documentation by the shape of the vehicle allows the verification of what happened during the audit. As a result, the auditors themselves may be anyone who is able to maintain a reasonable cover. California uses former State employees, other retirees, local law students, and a variety of other people on a pay-as-you-go basis. This approach avoids having to hire new employees.

Other programs have initiated similar approaches; employees of the implementing agency or sister agencies, have been used with similar success. Working with a limited number of employee-auditors can work also, but then program management needs to be more aware of potential factors which could compromise the auditors' cover. A group of diverse auditors, plus a group of diverse vehicles (see below) eliminates this problem.

Organization of Personnel

The two basic approaches used by programs to date (other than the California approach described above) are to:

- use dedicated covert auditors; or
- split the time of auditors between covert and formal auditing.

There is no consensus on the better approach. Dedicated covert auditors may have a very well-developed sense of their program responsibilities, which may aid them in developing a commitment to their task. Splitting the time of auditors on the other hand, may give auditors a better sense of the program as a whole, and gives more variety to an auditor's day.

Colorado uses a team approach where one one auditor does covert audits in another auditor's formal auditing territory and vice versa; this approach may allow for trading of information about particular stations.

Vehicles

The variety of vehicles, like the variety of auditors, is a plus for the program because it helps to maintain a program's cover. Programs have used many different types of vehicles. Vehicles have been borrowed from employees, and purchased outright. New York has had success in procuring vehicles from police impound lots.

The type of vehicles chosen will depend on the sort of audits planned. For example, it is difficult to try to introduce an inexpensive compact audit car into a luxury car dealership! At the very least, unexpected station/audit car combinations can make station personnel wonder what is happening. Borrowing cars on an as-needed basis, and having a designated fund to pay for their use, is one method around this problem.

Similarly, if a program plans to investigate stations' work on 1981 and later vehicles, then late model vehicles must obviously be utilized. (This approach is important for testing late model maintenance practices and tampering/fuel switching checks.) Setting up 1981 and later vehicles to fail is difficult, and may involve modifications which would prevent borrowing such vehicles.

Setting up Vehicles for Audits

How a vehicle should be set up again depends on what the audit will be testing. There are only two requirements: that the vehicle clearly be what it is supposed to be (i.e., a failing test car does in fact fail), and that the program can prove it. The amount of proof necessary will vary from state to state and area to area.

Setting up vehicles to pass still requires access to an emission analyzer which is regularly calibrated. However, scrutiny of the analyzer and of the emission levels of audit vehicles themselves can be expected to increase as the use of failing vehicles increases and stations are cited for passing failing cars. More than anything else, emission levels and particularly the pass/fail condition of vehicles must be repeatable. Work undertaken by the Colorado Department of Health has shown that this is particularly difficult for 1981 and later vehicles.* (It is worth noting that if a hollowed out catalyst is used on an audit car, the engine sound from the car may seem slightly abnormal.)

Setting up pre-1981 vehicles either to pass or fail is easier because they are more adjustable. However, if a program wishes to check what was done to a vehicle, then there must be very carefully documented verifications of the vehicle's condition. California performs such verifications, not only for I/M, but also as a part of its covert audits to enforce consumer protection laws on vehicle repairs. In California, a vehicle's condition is thoroughly documented before it is sent to a station. For example, to check whether spark plugs are actually charged, new plugs will be gapped, photographed, aged, and installed prior to a covert investigation. After the covert visit, the documentation process is repeated. It should be noted this approach is not necessarily the model for all covert programs; the degree of documentation necessary is dependent on what is being investigated and what is needed for successful disposition of cases and actions resulting from audits.

Shop Facilities and Tools

Shops for vehicle preparation can be quite simple. The basic requirement is an enclosed space where work may be performed on cars, preferably with room for a few tools and an emission analyzer. Some of the more specialized tools for working on 1981 and later vehicles are shown in Figure A-1 of Appendix A.

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* See Schroeer, John, "Covert Vehicle Modification," Colorado Department of Health, Denver, Colorado, 1985.

Enforcement

Enforcement may take many forms. The typical hierarchy in current inspection programs include:

- o warning letters
- o office conferences
- o administrative hearings
- o license suspension and/or revocation

Criminal actions sometimes are not pursued by programs because they believe that enforcement purposes are frequently served adequately by the results of administrative actions. Sometimes actions against stations may not even reach the administrative hearing stage. New York, for instance, utilizes a plea bargaining approach which substantially reduces their hearing load. Some programs are able to suspend stations without hearings, but many programs are bound by administrative procedure statutes to follow a specified legal protocol before a station can be removed from the system.

With limited resources, covert audit programs must avoid resource intensive, time consuming actions whenever possible. Hearings and even criminal action will occasionally be required, but they should be kept to a minimum. To the extent that enforcement and, for that matter, retraining can be accomplished by letters and office conferences, resources will be saved for other activities.

However, any plan to minimize case or hearing loads need to be reviewed carefully prior to implementation. On the basis of observations and experience of existing programs, swift and meaningful penalties are necessary. Fines may be useful if they are large enough to deter program abuses but small enough to ensure that they are administered and paid routinely.

Publicity

Part of deterrence for station personnel is the knowledge that they could be inspecting a covert vehicle at any time. Stations have contacts with three main groups and organizations as a result of an I/M program.

- o implementing agency personnel
- o other stations and their trade associations
- o the public

A review of experience with current auditing programs indicates that having each of these groups involved is helpful. The implementing agency can stress during training, certification, and formal audits that covert auditors are actively checking stations. Trade associations can be enlisted to work for the credibility and reputation of the program and their members. The public may be educated by the mass media on specific abuses that they can look for during inspections and repairs.

TWO MODEL PROGRAMS

Table 5-2 presents an outline of two model programs. The first, Alternative 1, is for a program which is just starting or modifying its covert auditing program. It assumes very limited resources, and is oriented towards integrating covert auditing into an existing auditing program. The second, Alternative 2, is for a more mature auditing program, and may be used as a model either by an Alternative 1 program, or by other auditing programs with a degree of existing covert experience. These two alternative programs are directed towards attaining the basic goals of a covert auditing program in a cost effective manner.

TABLE 5.2

TWO MODEL PROGRAMS

Program Element	ALTERNATIVE 1	ALTERNATIVE 2
Prioritization of Stations	Work off of complaints and the highest passing rates.	Develop a computerized data system which allows screening of unusual data.
Maintaining Auditors' Cover	Start with formal auditors working adjacent territories; experiment with drivers outside the program.	Analyze situations which may expose an audit; minimize visibility of particular vehicles and auditors.
Passing/Failing Cars	See comments below; use both passing and failing pre-1981 vehicles to start; if only one vehicle may be procured, use a failing pre-1981 vehicle.	Develop audit vehicles which are directed towards detrimental program practices found to be prevalent in the program; experiment with 1981 and later failures.
Personnel	Use existing formal auditors and start recruiting outside people as possible.	Use a mix of employees and non-employees; determine an optimum balance based on costs, maintaining auditors' cover, and flexibilty in planning audits.
Team Organization	Start with splitting the time of formal auditors between covert audits and formal audits.	Maximize the number of people which can be called on to be auditors (office personnel, formal auditors, etc.)
Kinds of Vehicles	Emphasize pre-1981 vehicles of a common make.	On the basis of data collection about program operations, emphasize vehicles which are involved in program discrepancies; use some 1981 and later vehicles.
Vehicle Procurement	Obtain at least one program vehicle but plan for transition to a different vehicle.	Prepare a list of all possible vehicle sources (including private vehicle owners); try a variety of approaches.

TABLE 5.2--Continued

Program Element	Alternative 1	Alternative 2
Vehicle Set-up	Minimize vehicle set up, except to make sure that failing vehicles really fail.	Set up at least one 1981 and later vehicle to fail; other vehicles should be set up to test for particular program practices.
Audit Documentation/Verification	Document only that information necessary to support the enforcement actions contemplated.	Document all data relevant both to potential enforcement actions and to the program practices investigated.
Shop Facilites	Use any enclosed space with basic tools and an emission analyzer.	Develop a shop which supports the set-ups chosen; equip the shop so that 1981 and later vehicles may be adjusted or modified.
Enforcement System	Utilize office conferences as much as possible, rather than extensive hearings and prosecutions.	Depending on available legal authority, experiment with different approaches to determine what methods provide the most deterrence.
Publicity	Use any means possible (especially training and formal audits) to remind stations that covert auditors are in the field. Do not divulge under any circumstances the size of the operation.	Along with the suggestions of Alternative 1, identify and publicize areas in which vehicle owners can play a part.
Data Collection and Program Assessment	At the beginning of a program, start the development of baseline data. Send out at least some failing vehicles in audits which will not lead to enforcement actions to determine if false passes are a problem.	Develop baseline data and then track the progress of the program.

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Wallauch, John R., "The California Approach to Vehicle Inspection/Maintenance," Paper No. 831213, Society of Automotive Engineers, Warrendale, PA, 1983.

APPENDIX A

SHOP GUIDANCE

Facilities

A beginning shop should be large enough to house at least one vehicle so that all work may be done inside. In addition, the shop should be equipped with mechanics' tools (see below), an emission analyzer, supplies, a roll-around tool box, a workbench and reference material. Space for an office and a storage area is also desirable.

The shop should ideally have two bays, but a one-bay shop can still be sufficient. A car hoist is useful, but if there is no hoist, the shop should be equipped with a floor jack and car stands. An air compressor can be located either outside or inside the shop area.

Tools

See Table A-1 and Figure A-1 for suggested tools for a basic shop.

TABLE A-1

SUGGESTED TOOLS FOR A BASIC SHOP

Basic Tools

Standard: open end; box end; hand wrenches 3/8" - 1"
Metric: open end; box end; hand wrenches 9 mm - 23 mm
Standard: closed sockets 1/4" - 3/8" - 1/2" drive
Metric: closed sockets 1/4" - 3/8" - 1/2" drive
socket drivers 1/4" - 3/8" - 1/2" drive
Standard tip screw drivers
Philips tip screw drivers
Hammers
Files
Hack saw
Air operated socket drivers
3/8" hand held
1/2" impact driver

Special Tools

For Pre-1981 Vehicles:

Timing light with advance control
Tach and Dwell Meter
Vacuum-Pressure Tester
Vaccum Pump
Volt Meter
OHM Meter
Distributor Wrenches
Exhaust Gas Analyzer
Engine Analyzer (scope) (all of the above can be incorporated in enginer analyzer)

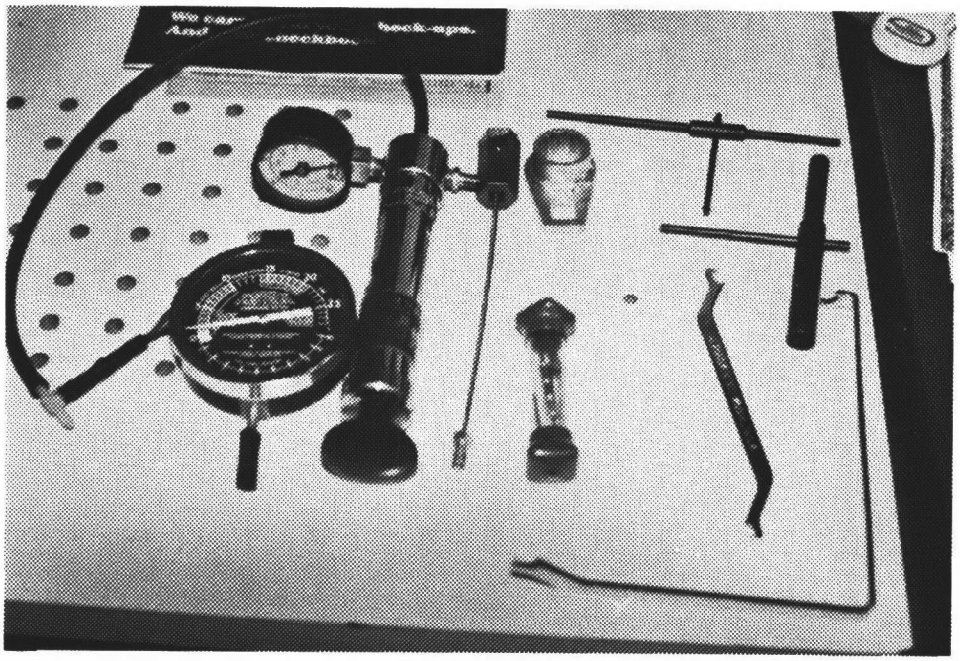
For 1981 and later vehicles:

All of the above plus -

Computer Scanner
Digital OHM Meter
Needle type OHM Meter

Figure A.1 Sample Tools for an Audit Set-Up Shop

GM computer scanner and volt/ohm tester



Hand-operated vacuum pump, vacuum-pressure tester, various GM computerized carburetor adjusting tools, and a distributor hold-down wrench

APPENDIX B

BACKGROUND MATERIAL FROM ONGOING I/M PROGRAMS

1. Covert vehicle investigation report forms
2. Covert vehicle investigation procedures
3. Auditor position descriptions
4. Background information of station performance report (Figure 2-3, California Bureau of Automative Repair)

APPENDIX B-1

COVERT VEHICLE INVESTIGATION REPORT FORMS
(COLORADO AND NEW YORK)

Note - New York and Colorado also require a narrative along with these forms where appropriate.

DR 1362 (3/84)
42-16-410

INVESTIGATOR/A&E _____

COVERT VEHICLE REPORT

DATE _____ TIME _____

AIR PROGRAM REPORT NO. _____

INSPECTION OBSERVED YES ☐ NO ☐ STICKER NO. _____

MECHANIC NO. _____

STATION SIGN POSTED YES ☐ NO ☐

EMISSIONS STANDARDS VISIBLE YES ☐ NO ☐ IN CUSTOMER AREA ☐ SHOP ☐

HOW WAS VEHICLE YEAR VERIFIED REGISTRATION ☐ VIN ☐ EMISSION DECAL ☐ OTHER ☐

STATION STARTED INSPECTION FORM YES ☐ NO ☐

CHECKED EMISSIONS LABEL FOR DEVICES YES ☐ NO ☐ N/A ☐

INSPECT CATALYTIC CONVERTER YES ☐ NO ☐ N/A ☐

INSPECT AIR SYSTEM YES ☐ NO ☐ N/A ☐

INSPECT FUEL RESTRICTOR YES ☐ NO ☐ N/A ☐

WHAT VISUAL ITEM MUST BE REPAIRED/REPLACED CATALYST ☐ AIR ☐ RESTRICTOR ☐

MAXIMUM TIME ALLOCATED BY STATION FOR REPAIR 60 DAYS ☐ OTHER ☐

HOW WAS ENGINE TEMPERATURE VERIFIED GUAGE ☐ RADIATOR ☐ CUSTOMER ☐

ZERO & ELECTRICALLY SPAN ANALYZER YES ☐ NO ☐

PROBE INSERTION/ADAPTER USAGE YES ☐ NO ☐

ACCELERATE ENGINE TO DEACTIVATE OVERRIDE DEVICES (1980 & OLDER) YES ☐ NO ☐ N/A ☐

METER READINGS 1ST HC _____ CO _____

2500 HC _____ CO _____

2ND HC _____ CO _____

WAS TWO SPEED TEST PERFORMED W/TACH. YES ☐ NO ☐ N/A ☐

WAS DRIVER INFORMED OF FIRST EMISSIONS TEST FAILURE YES ☐ NO ☐ N/A ☐

VERBALLY INFORMED OF 207(B) WARRANTY STATUS YES ☐ NO ☐ N/A ☐

HOW WERE ENGINE SPECIFICATIONS DETERMINED BOOK ☐ DECAL ☐ OTHER ☐

TACHOMETER HOOKED UP YES ☐ NO ☐ N/A ☐

PROPANE ENRICHMENT USED YES ☐ NO ☐ N/A ☐

CARBURETOR ADJUSTMENT METHOD LO CO ☐ LEAN BEST ☐ PROPANE ENRICHMENT ☐ OTHER ☐

AFFIXED EMISSIONS CERTIFICATE ADJUST ☐ PASS ☐ STICKER CERTIFICATE NO _____

AFFIXED TEMPORARY CERTIFICATE YES ☐ NO ☐ N/A ☐

CORRECT STANDARDS USED YES ☐ NO ☐

COMMENTS/RECOMMENDATIONS _____

MOTOR VEHICLE DIVISION
"AIR" PROGRAM
COVERT VEHICLE EMISSIONS CERTIFICATION

Date:_____ Time_____ Investigator_____

Vehicle Make:	Year	License	VIN Number
_____	_____	_____	_____

VISUAL INSPECTION

Air Injection System	Catalytic Converter	Fuel Restrictor
_____	_____	_____
_____	_____	_____

EMISSIONS STANDARDS

Vehicle CO Standards _____%

Vehicle HC Standards _____ppm

EMISSIONS READINGS

CO %_____ Idle HC PPM_____

_____ 2500 _____

I CERTIFY THAT I HAVE INSPECTED THE ABOVE-DESCRIBED VEHICLE IN ACCORDANCE WITH THE RULES AND REGULATIONS GOVERNING COLORADO AUTOMOBILE INSPECTION AND READJUSTMENT PROGRAM. THE ABOVE-LISTED EMISSIONS READINGS ARE CORRECT FOR THE VEHICLE, OR THE VEHICLE FAILS THE VISUAL INSPECTION OF EMISSIONS EQUIPMENT AS NOTED, AT THE TIME AND DATE LISTED.

_____	_____	_____
Signature	Title	Date

Subscribed and sworn to before me this _____ day of_____,19____

My Commission Expires:_____

_____
Notary Public

State of New York - Department of Motor Vehicles

INVESTIGATION REPORT

Case No
Facility No
CSR No (C O Use Only)

☐ CONCEALED IDENTITY ☐ COMPLAINT

Please Print or Type All Entries and Use Black Ink

Name of Complainant		Name of Facility	
Address - Number and Street		D/b/a (if applicable)	
State	Zip Code	Address - Number and Street	
Telephone No (including area code)		City State	Zip Code
Vehicle Year, Make, Model	Cyl	Telephone No (including area code)	Facility Expiration Date
V I N	Plate No	Name and Ident No of Certified Inspector	
Date of Transaction	Odometer Reading at Time of Transaction	Date of C I /Complaint Investigation	Odometer Reading at Time of Investigation

Pursuant to N. Y Vehicle and Traffic Law, Section: (Central Office Use Only)

Recommendation	Insp Station	Cert Inspector	Repair/Body Shop	Dealer	Dismantler	Other Junk & Salvage Facilities*
☐ No Action	☐	☐	☐	☐	☐	☐
☐ N O I	☐	☐	☐	☐	☐	☐
☐ Susp Pend Hrg	☐	☐	☐	☐	☐	☐
☐ Hearing	☐	☐	☐	☐	☐	☐
☐ Inspection Waiver	☐	☐				
☐ Other	☐	☐	☐	☐	☐	☐

"Other Junk and Salvage Facilities", specify here _____

☐ Unregistered Repair Shop ☐ Jt Complaint Case No (s) ☐ Refund to Consumer $ _____

☐ Restitution Case _____ ☐ Rework at No Charge

☐ Special Instruction(s) _____ ☐ Insurance Claim No _____

☐ Subpoena

☐ Hearing Notice to

Inspector's Signature _____ Date _____ AFI/BRI No _____

Supervisory Signature _____ Date _____ Region _____

VS-35 1 (7/84)

APPENDIX B-2

COVERT VEHICLE INVESTIGATION PROCEDURES (CALIFORNIA AND NEW YORK)

Documented Vehicle Procedures - Outline

1. Receive job order from District Office.
2. Review job order and assign to shop technician.
3. Perform documentation to vehicle as per job order.
4. Run I/M test on T.A.S. and obtain 2 printouts.
5. Enter documentation performed and 1 TAS printout into documentation log book.
6. Complete a "BEFORE" VEHICLE DATA sheet on the vehicle.
7. Staple remaining T.A.S. printout to back of job order.
8. Release vehicle to Field Representative.
   a. See Attachment, Program Representative's Duties
9. Enter release information into mileage log (Date, Time, Mileage)
10. Receive (returned) vehicle, test report, invoice, and CofC (if issued).
11. Enter the information into mileage log. (Date, Time, Mileage and PR's signature)
12. Reinspect and retest vehicle on T.A.S. to document its as returned condition and obtain 2 printouts.
13. Complete a "AFTER" VEHICLE DATA sheet on the vehicle.
14. Finish completing the as returned information on the job order.
15. Write Declaration if requested by Field Representative.
16. Complete a Cost Sheet if requested by Field Representative.
17. Complete Documented Run statistics.

Documented Vehicle File

Assemble a file for Field Representative

O = Original Document C = Copy of Document

Contents in file:

Repair Facility Invoice	O
Repair Facility Test Report	O
Certificate of Compliance (if issued)	O
Job Order	C
AFTER VEHICLE DATA Sheet	O
B.A.R. As Returned Printout	O
BEFORE VEHICLE DATA Sheet	O

Assembly a file for shop records

Contents in file:

Job Order	O
B.A.R. "BEFORE" Printout	O
BEFORE VEHICLE DATA Sheet	C
Repair Facility Invoice	C
B.A.R. As Returned Printout	O
AFTER VEHICLE DATA Sheet	C

BUREAU OF AUTOMOTIVE REPAIR

SOURCE
- ☐ Random
- ☐ Follow-Up
- ☐ Referee
- ☐ Tip
- ☐ Complaint
- ☐ Cert. Sale
- ☐ Q A
- ☐ Other

DOCUMENTED VEHICLE JOB ORDER

VEHICLE	YEAR
MILEAGE IN	MILEAGE OUT

DATE IN ________ 19 ____

DATE OUT ________ 19 ____

RESULTS
- ☐ Negative
- ☐ Positive

RELATED JOB ORDER

1. Detail Task Code is inserted in the first column under Detail Task and Operation Code heading with the Operation Code beginning in the third column.
2. If more space is needed for comments use a number 1. 2. etc. under comments and use the same number on reverse side under remarks and follow with comment.

DETAIL TASK AND OPER. CODE	COMMENTS	TECHNICIAN	TIME

CASE NO.

FIELD REPRESENTATIVE

PHONE	NOTIFIED
TIME NEEDED	RELIEF NUMBER

REPAIRS

IMMEDIATE	DELAYED
☐	☐

DOCUMENTATION

IMMEDIATE	DELAYED
☐	☐

SERVICE	EMPLOYEE NUMBER	ACT. TIME 1/10
LUBRICATION		
OIL CHANGE (ENGINE ☐ DIFF ☐ GEAR BOX ☐)		
OIL FILTER		
AIR FILTER		
WASH RACK		
ANTI FREEZE		
LABOR		
MATERIAL		

CHECKED

BRAKES ☐	CLUTCH ☐	HORN ☐
LIGHTS ☐	WIPERS ☐	TIRES ☐

COMPRESSION

1.	2.	3.	4.
5.	6.	7.	8

CYLINDER BALANCE

1.	2.	3.	4.
5.	6.	7.	8

SIGNATURE DATE

Form 77I-24 (11-74)

OPERATION CODE

FRONT END	1 STEERING BOX	49 PUMP OR CYLINDER	97
	2 TIE-RODS AND ENDS	50 WHEELS OR ALIGNMENT	98 WHEEL BRGS–SHAFTS–SEALS
	3 KING PINS OR BALL JOINTS	51 SHOCKS	99 SPRINGS AND SHACKLES
	4 TIRES	52 DRAG LINK PITMAN ARM	100
BRAKES	5 SERVICE BRAKE	53 EMERGENCY BRAKE SYSTEM	101 HOSES VALVES AND LINES
	6 WHEEL AND MASTER CYS.	54 AIR COMPRESSOR	102 PARKING BRAKE
	7 DRUMS/DISCS	55 CALIPERS	103 RETURN SPRINGS
COOLING	8 WATER PUMP	56 AIR CONDITIONER	104 HOSES
	9 RADIATOR OR SHROUD	57 HEATER	105 THERMOSTAT
	10 RADIATOR CAP	58 HEATER HOSE	106 CORE
ENGINE	11 VALVES, ROCKERS OR HEADS	59 SHORT BLOCK	107 CONTROLS
	12 PISTONS OR RINGS	60 GASKET LEAK	108 TUNE
	13 CRANKCASE CONTROL	61 CAMSHAFT OR LIFTERS	109 CRANKSHAFT OR BEARING
	14 HEATER HOSE	62 MAIN / ROD BEARING	110 OIL PUMP
FUEL	15 CARBURETOR OR MANIFOLD	63 TANK OR LINES	111 BLOWER
	16 FUEL PUMPS	64 FUEL FILTERS	112 FUEL INJECTORS
	17 EVAP. SYS.	65 A. I. R.	113 IDLE & TRANS. CON.
ELECTRICAL	18 PLUGS OR WIRES	66 DISTRIBUTOR OR MAGNETO	114 INSTRUMENTS OR SWITCHES
	19 COIL	67 REGULATOR OR ALTERNATOR	115 LIGHTS OR HORN
	20 BATTERY	68 STARTER	116 WIRING OR CONNECTORS
	21 DISTR.CAP	69 ROTOR	117 POINTS & COND.
CLUTCH TRANS.	22 CLUTCH	70 TRANSFER CASE	118 TORQUE CONVERTOR
	23 AUTOMATIC TRANSMISSION	71 DRIVE LINE	119 U-JOINTS
	24 MANUAL TRANSMISSION	72 GOVERNOR	120 COOLING LINES
EXHAUST	25 SPARKARREST-OR OR MUFFLER	73 MANIFOLD GASKETS	121 MANIFOLD
	26 EMISSION CONTROL	74 HEADER/TAIL PIPES	122 EXHAUST SYST. BRACKETS
REAR AXLE	27 AXLE SHAFTS	75 BEARING OR SEALS	123 WHEEL CYLINDER
	28 SHOCKS	76 DIFFERENTIAL	124 ALIGN OR WHEELS
	29 SPRINGS OR SHACKLES	77 TIE-RODS AND ENDS	125 PINS OR JOINTS
	30 TIRES	78 TORSION BARS	126
CAB BODY FRAME	31 DOOR	79 GLASS OR REGULATORS	127 METAL
	32 MIRRORS	80 W S WIPERS	128 UPHOLSTERY
	33 HITCH OR JACK	81	129 FRAME
	34 RESERVOIR BODY OR HOPPER	82 LADDER OR STEP	130 PAINT
	35	83	131
HYDRAULIC	36 PUMPS	84 MOTORS	132 CYLINDERS
	37 VALVES	85 HOSES OR LINES	133 FILTERS OR RESERVOIR
	38	86	134

Cylinder Wall Taper	1)	2)	3)	4)
	5)	6)	7)	8)
Crankshaft Rod Throws	1)	2)	3)	4)
	5)	6)	7)	8)
Crankshaft Mains	1)	2)	3)	4)
	5)	6)	7)	8)

Drum/Disc. Measurement	FRONT		REAR	

REMARKS

DETAIL TASK CODE

	1 MARK & ADJUST	2 MARK & REPAIR	3 MARK & REPLACE
	4 MEASURE	5 INSTALL	6 TORQUE

NEW YORK STATE
DEPARTMENT OF MOTOR VEHICLES
DIVISION OF VEHICLE SAFETY SERVICES

REGIONAL OFFICE PROCEDURE FOR CONCEALED IDENTITY INSPECTION OF INSPECTION STATIONS

Material Received:

1. Written or oral instruction from Sr. Automotive Facilities Inspector to perform a concealed identity inspection of a specified inspection station.

OR

2. For downstate regional offices, printout of inspection stations from the Technical Services Bureau. Printout will indicate information such as:

   a. excessive inspections conducted daily and monthly;

   b. excessive passes;

   c. excessive failures;

   d. excessive adjustments or repairs on certain items, etc.

Operations:

1. Preparation for inspection.

   a. Obtain and sign for cash from CI fund to cover the cost of the inspection and any minor repairs that may be necessary.

   b. Obtain a vehicle, registration plates, integrated windshield stickers, and inspection sticker from Regional Office to use during the inspection.

   c. Check vehicle to be used.

      1. Registration must correspond with plates.

      2. Inspection sticker should indicate expiration or near-expiration.

      3. Be sure that the vehicle is in good repair.

d. Wear appropriate attire (work, hunting, or fishing clothes) to assume the identity of an ordinary motorist.

e. If possible, carry lunch box, local newspaper, packages, fishing rods, tools, etc. in vehicle to strengthen impression that you are an ordinary motorist.

f. Tune radio to local station.

g. When necessary, telephone inspection station in an attempt to have the vehicle inspected. This will ensure that you do not waste too much time waiting around.

h. Visit the inspection station in an attempt to have the vehicle inspected. If the inspection station says they are busy, ask for an appointment.

2. Inspection

NOTE: When presenting the vehicle for inspection, be careful not to say anyting that might be considered entrapment. A single statement such as "I need a state inspection", or "Can I please get my car inspected" is all that is necessary.

a. Keep the vehicle under observation at all times. Some suggestions:

1. Strike up conversation with the inspector, express curiosity about the inspection, etc.

2. If the inspector asks, participate in the inspection by applying the brakes, operating lights and directional signals

3. Ask to check exhaust system for leaks, etc. when the vehicle is jacked up, or tell the inspector you're getting a rattle fror the tail pipe.

b. Do not, under any circumstances, attempt to hurry the inspectior.

c. If the inspector advises that adjustments or repairs are necessary, use the following guide in making a decision on whether to have them made at the station.

1. If the concealed identity inspection was conducted because a routine inspection revealed many adjustments on a certain item, or as a result of complaints concerning unnecessary repairs, adjustments can be expected. In these cases the repairs or adjustments should be made.

2. If the inspection was completed in a satisfactory manner, adjustments should not be made (except in cases of unnecessary repairs, as indicated in item 1 above).

3. If repairs are recommended by the station, do not authorize them, except in situations where the Regional Director has

given pre-approval. In all other cases, request a written estimate on the station's invoice.

d. After paying for services, obtain a receipt for the inspection and any repairs made. If no invoice is given, attach a signed statement to the report indicating the amount paid.

NOTE: If the AFI is told to wait in an area where he will be unable to properly observe the inspection, he should wait until the vehicle is brought in and then identify himself and request that the inspection be performed in his presence. This eliminates the waste of time and money associated with an unobserved inspection.

3. Post-Inspection

a. Evaluate inspection and complete Inspection Checklist (Form VS-89.1) as soon as possible.

b. Remove inspection sticker from vehicle and cover adhesive side with a transparent material.

c. If it is the policy of the Regional Office to return to the station shortly after the CI has been completed:

- Show identification and review inspection with inspector and/or owner.
- For safety inspections only, obtain VS-1074 as proof of CI and give station a receipt for it.
- For a safety/emissions inspection only, if no analyzer receipt was obtained after the inspection, inform your Senior AFI who will assign an AFI to perform a program audit and obtain the receipt.
- Perform program audit on records and equipment.

d. Always complete the Investigation Report (Form VS-35.1). Attach your written report, removed inspection sticker, invoice, and any other pertinent information to the VS-35.1.

e. If an improper inspection hs been completed, complete CI Inspection Notification Letter (Form VS-89) in triplicate. Mail one copy to the station, one copy to the certified inspector, and attache one copy to your completed report.

Disposition of Materials:

1. Forward completed report and attachments to Sr. AFI.

2. Forward copy of VS-35.1 and original receipt or statement of payment to person responsible for replacement of CI funds.

APPENDIX B-3

AUDITOR POSITION DESCRIPTION

COLORADO DEPARTMENT OF PERSONNEL

A7180A
A7182A

MOTOR VEHICLE EMISSIONS COMPLIANCE OFFICER

NATURE OF WORK

This is a multiple-range class describing the responsibility for conducting field inspections, field compliance and quality review of licensed automobile emissions stations and mechanics.

An employee in this class uses the required techniques to license emission inspection stations, instruct emission mechanics and emission station owners/managers in the proper emission inspection procedures for compliance with the Automobile Inspection and Readjustment air statutes, rules and regulations.

Distinguishing Factors: Positions in the next higher level class are distinguished from positions in this class by having supervisory responsibilities over employees in this class.

Range A

This range is characterized by the training/developmental nature of assignments which utilize a wide range of technical skills and abilities and also requires the application of specific knowledges of the statutes, rules and regulations for the Automobile Emissions Program. Work includes considerable public contact wherein judgment is exercised in executing departmental policies. Initially, work is performed under close supervision, but as training progresses, work is performed under general supervision.

Range B

This is the full operating Emissions Compliance Officer level. At this level, employees are expected to perform the full range of compliance, instructing and enforcement duties for the Automobile Emissions Program. Employees' work is subject to only occasional review for technical accuracy, adequacy of technical judgment and results. Employees receive instructions in very general terms; detailed instructions in work process or procedure are rarely needed, except to deal with the most unusual or sensitive problems.

SOME EXAMPLES OF WORK

Performs compliance inspections of licensed motor vehicle emissions stations and mechanics on a monthly basis. This requires the demonstrated technical skills in the evaluation and calibration of sophisticated electronic testing equipment. An example is performing a gas span test on the Emission Analyzer every 30 days.

Conducts field technical assistance and training as necessary to update licensed emission mechanics and station owners/managers on changes in rules, regulations and procedures.

Examines station records to insure report forms are accounted for and properly filed; examines New Car Logs at dealerships for proper issuance on Emissions Certificates and their accountability.

Does necessary follow-up due to supervision of emission mechanic/station licenses or reinstatements.

Resolves consumer complaints concerning emissions related issues.

Prepares monthly contact forms for stations contacted; prepares investigative reports on violation of the "AIR" program.

Periodically conducts covert investigations on licensed emissions stations and mechanics.

Attends and testifies in the informal hearings conducted by a Motor Vehicle Emissions Compliance Supervisor and/or the formal hearings held in the Motor Vehicle Hearings Section.

Performs related work as assigned or required.

KNOWLEDGES, SKILLS AND ABILITIES

Thorough knowledge of basic tune up procedures, and ability to use tune up equipment.

Considerable knowledge of "AIR" program statues, rules and regulations.

Considerable knowledge of relevant state and department rules, regulations, policies and procedures.

Considerable knowledge of the functions involved in the control of harmful pollutants from internal combustion engines.

Considerable knowledge of ignition systems, fuel systems, emission systems and internal combustion engines.

Knowledge of the principles underlying the operation, use, calibration and maintenance of scientific electronic instruments used in the testing of motor vehicle emissions.

Knowledge of the purpose, function and effect of emission related parts of an automobile.

Ability to perform all parts of an emission inspection and test.

Ability to use a gas span, use and calibrate an infrared analyzer.

Ability to read, comprehend, interpret and translate highly technical emission data.

Ability to interpret and apply laws and regulations uniformly.

Ability to maintain effective working relationships with other employees, emissions station/dealer personnel and mechanics.

Ability to communicate effectively, both orally and in writing.

MINIMUM PREPARATION FOR WORK

Education and Experience

Three years of progressively responsible experience in automotive mechanics which included motor vehicle tune ups and repair and diagnosis of emissions systems.

Substitution

Technical work in a motor vehicle emissions program will substitute for the experience requirement on a year-for-year basis.

Full time teaching courses in tune up, emissions system diagnosis and repair will substitute for the experience requirement on a year-for-year basis.

An Associate Degree from an accredited college with major coursework in auto mechanics with the emphasis in tune up, emissions system diagnosis and repair will substitute for two years of the required experience.

College, university or non-correspondence technical school course work in auto mechanics including tune ups, emissions system diagnosis and repair will substitute on a year-for-year basis for two years of the required experience.

Necessary Special Requirement

Possession of a valid State of Colorado driver's license. A valid Air Program Mechanic Certificate issued by the Health Department, State of Colorado must be obtained prior to and/or during the probationary period.

NOTE

Positions are to be assigned to one of the ranges in this class based on agency evaluation of the employee functioning level relative to the range descriptions identified in the class specification.

APPENDIX B-4

BACKGROUND INFORMATION OF STATION
PERFORMANCE REPORT
(FIGURE 2.3, CALIFORNIA BUREAU OF AUTOMOTIVE REPAIR)

INSTRUCTIONS FOR THE STATION - MECHANIC EVALUATION REPORT

The Station / Mechanic Evaluation Report has been developed to assist the field offices in monitoring and enforcing the requirements of the California Smog Check Program. By collecting and analyzing the TAS data the report can be a valuable tool to provide a clearer picture of how a particular station or mechanic is performing in the field.

The various areas of information on the report will be explained as to their purpose and the methods used to arrive at the results.

The report is detailed by station number and mechanic number.

Group 1:
Column:

1. Total Tests
   Lists the number of I (initial) or B (before repair) tests performed.

2. Prcnt Fail
   Indicates the percentage of these I or B tests that failed.

3. % Dev from District Average Fail Rate
   The percentage above or below the District average fail rate for I tests.

4. % Dev from District Average HC
   The purpose of this field is to reveal chronic problems due to analyzers with excessive drift or air bleeds during testing.
   The district average HC for each standards category are determined and a baseline is established. The average HC emission for each station and mechanic is determined for each standards category. These averages are divided by the district averages for each category that the sta/mec performed tests in. This factor is summed and then divided by the number of categories in which tests were performed. The result is multiplied by 100 to get the percentage deviation.

5. % Dev from District Average CO
   Same as number 4 for CO.

6. Total Tests
   Lists the number of A (after repair) tests performed.

7. Prcnt Fail
   Indicates the percentage of these A tests that failed.

8. % Dev from District Average Fail Rate (A Tests)
   The percentage above or below the District average fail rate for A tests.

9. % Dev from District Average HC Reduction
   Similar to number 4 above except this calculates the average emission reduction for HC. The first I test and the last A test for all vehicles with multiple tests are used to determine the HC reduction. The figure listed on the report is listed as a positive or negative (-) percent deviation from the district average HC reduction.

10. % Dev from District Average CO Reduction
    Same as number 9 for CO.

Group 2:
Column:

1. # Certs by Innacurate Prev Emis Tst Reslts
   Indicates the number of certificates issued where the A test emission results do not indicate a reduction of emissions when compared with the I or B test. This is calculated by comparing the actual emission readings of the first test for a vehicle, to the last test emission readings for the same vehicle. If they do not show a reduction and a certificate was issued the count is incremented by one.

2. % Dev from Statewide Dilution Average
   This field is used to determine if a mechanic is diluting the exhaust sample by partially removing the probe from the exhaust pipe or inducing leaks elsewhere. A baseline dilution average for the district is determined by averaging the sum of the CO and CO2 readings. The station and mechanic dilution average is also calculated in the same manner.
   The sta / mec dilution average is divided by the district average and a percent deviation is calculated.

3. Idle Speed Deviation I to A Test (% pos) (% dev)
   The purpose is to see if mechanics are increasing idle speeds close to thresholds instead of factory specifications to gain emissions reductions. The idle speed of the first test for a vehicle is compared to the idle speed of the next sequential test for the same vehicle. The percent they deviate from each other is calculated. The first figure in this column lists the percent of tests that had an increase in idle speed. The second figure shows the percent those tests deviated from the first test.

4. Number of Retests Adj CO to Threshold
   The purpose is to indicate if mechanics are adjusting carburetor mixture close to the CO threshold instead of factory specifications.
   The first and next sequential test for a vehicle are compared to each other. If the vehicle failed for CO emissions, the second test is checked to see how close the idle CO adjustment brought the CO emission result to the CO threshold. If the CO emission was brought to within .5 of the CO threshold a counter is increased by one. The number on the report is the total of that counter.

5. Percent Tests W/In 113 RPM of Threshold
   The idle speed is checked for each test to see if it comes within 113 RPM of the threshold for the specific emission standards category that the vehicle falls into. The total number of tests that fit this pattern are divided by the total number of tests and a percent is calculated and listed in this column.

6. Number A Tests With No Matching I Tests
   This is to see if mechanics are performing A tests without an I or B test This could indicate the previous emission readings may be ficticous.
   Each A test is checked to see if it has a corresponding I or B test. If no matching test can be found a counter is incremented. The figure in this column represents the number of times this was the case.

Group 3:
Column:

1. Percent Underhood Accuracy
   The purpose of this field is to compare the underhood inspection information specified in the emission control systems application manual to the actual underhood data entered by the mechanic. The vehicle make, year, number of cylinders and engine size indicated on the test are compared to a table for the corresponding vehicle make, year, number of cylinders and engine size. If the table and the actual underhood data differ the mechanic will be given an incorrect response. The number of incorrect responses are divided by the total number of vehicles tested and a percentage of accuracy is listed.

2. Erroneous Entries on Functional Check
   This is used to see if the mechanics are performing the functional checks in districts where the functional check is not required or are not performing the functional checks in districts where they are required to do so. When this is the case a counter is added to and the total of that counter is listed on the report.

3. No. and % With Fast Repairs
   This field is to indicate the percentage of time the A test begins in less than 15 minutes following the completion of the corresponding I or B test. The first number in this column represents the number of times this occured. The second number represents the percent of times this occured.

4. % A Test With No Repairs
   This is used to see if mechanics are performing A tests without indicating the repair action taken.
   The A tests are checked in the repair action field. If no action was indicated a counter is incremented. The total of this counter is divided by the total number of A tests and that percentage is listed.

5. % Multiple Tests
   This is used to see if multiple tests of the same type for the same vehicle are being done. Multiple tests for a vehicle are checked to see if the test type (I or A) is the same as the previous type. Where multiple test of the same type for the same vehicle are done the percent is calculated and listed in the appropriate column.

6. Number of Failed Tests With Certs
   The purpose of this field is to determine if the mechanics are abusing the emission reducton and exceeding cost limit to issue a certificate. The number of times a certificate is issued due to a vehicle achieving a reduction of emission and an exceed the cost amount is added to a counter. This number can be converted to a percent and compared with the district average.