EPA -

IN-USE COMPLIANCE TESTING PROGRAM FOR LIGHT-DUTY VEHICLES

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ABSTRACT

A comprehensive exhaust emission test program on properly maintained and used 1972 through 1974 model-year vehicles was performed on 31 classes of vehicles in the St. Louis, Missouri metropolitan area and on 22 classes of 1972 and 1973 model-year vehicles in the Los Angeles metropolitan area to determine if vehicles "in-use" continued to meet applicable exhaust emission standards. This study was conducted and data forwarded to the United States Environmental Protection Agency (EPA), Office of Mobile Source Air Pollution Control, for use by the Administrator of the Environmental Protection Agency in order that the Administrator may fulfill his obligations as defined in Section 207(c)(1) of the 1970 Clean Air Amendments.

Vehicles were randomly selected; inspection and restorative maintenance were performed; and emission tests were conducted in accordance with EPA certification test procedures.

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1. INTRODUCTION

The Clean Air Amendments of 1970, which became law on December 31, 1970, required all automobile manufacturers to warrant the maximum emission levels of their vehicles beginning with the 1972 model year. The emission levels of the vehicles are not to exceed the established emission standards for 50,000 miles or five years, whichever occurs first. Furthermore, the Clean Air Amendments established the mechanism requiring manufacturers to rectify those classes of in-use vehicles that do not conform to air pollution requirements. Referencing Section 207(c)(1) of the Clean Air Amendment: "If the Administrator determines that a substantial number of any class or category of vehicles or engines, although properly maintained and used, do not conform to the regulations prescribed under Section 202, when in actual use throughout their useful life (as determined under Section 202(d), he shall immediately notify the manufacturer thereof of such non-conformity, and he shall require the manufacturer to submit a plan for remedying the non-conformity."

The purpose of this program was to measure the emission levels from a statistically valid sample of 1972, 1973 and 1974 properly maintained and properly used light-duty vehicles. Testing was conducted in five metropolitan cities across the United States. AESi performed testing in St. Louis, Missouri, and Los Angeles, California. Olson Research Laboratories, Inc. conducted testing in Detroit, Michigan; Philadelphia, Pennsylvania; and Atlanta, Georgia. Thirty-one vehicle engine classes were tested; two 1972, twenty-one 1973, and eight 1974 model-year engine classes comprised the vehicles that were tested under this program. The 1972 and 1973 model-year engine classes received restorative maintenance based upon inspection of each vehicle's engine and emission control devices. The 1974 model-year vehicles were inspected but less extensive restorative maintenance was performed. The emission data generated from this program along with supporting documentation have been provided to the United States Environmental Protection Agency, Office of Mobile Source Air Pollution Control, for use by the

Administrator of the Environmental Protection Agency in order that the Administrator may fulfill his obligations as defined in Section 207(c)(1) of the Clean Air Amendments of 1970.

This report is a narrative summary by vehicle engine class and test site of the Vehicle Sampling, Inspection and Maintenance, and Exhaust Emission Testing performed in this program.

Figure 1.1-1 lists the engine classes tested by make, engine displacement, and number of carburetor venturis. The three-digit class number used throughout this report consists of one digit for the model year with the engine class appended (e.g., IUCP Class 227 means engine class 27 of the 1972 model year).

FIGURE 1.1-1

ENGINE CLASSES TESTED

Model Year	Engine Class	Make	CID	No. of Venturis
2	27	Toyota	097	2
2	28	Chevrolet	140	2
3	01	Chevrolet	350-400	2
3	02	Chrylser	318-360	2
3	03	Ford	302	2
3	04	Chevrolet	307	2
3	05	Ford	400	2
3	07	Ford	351C	2
3	09*	Chrysler	198-225	1
3	10	Ford	122	2
3	12	Ford	429-460	4
3	13	Chevrolet	350	4
3	24	Chevrolet	250	1
3	26	Chevrolet	140	2
3	27	American	232-258	1
3	31	Buick	350	4
3	38	Datsun	097	2
3	41	Datsun	108	2
3	42	Mazda	35x2	4
3	49	Pontiac	350-400	2
3	51	Volkswagen	102	FI
3	55	Audi	114	2
3	56	Ford	351C	4
4	01*	Chevrolet	350-400	2
4	02*	Chrysler	318-360	2
4	12*	Ford	351C	2
4	13*	Chevrolet	140	2
4	14*	Ford	351W	2
4	15*	Volkswagen	097	1
4	16*	Cadillac	472-500	4
4	19*	Oldsmobile	455	4

* Not tested in California

2. TECHNICAL DISCUSSION

2.1 PROGRAM OBJECTIVE

The overall objective of "FY73 In-Use Compliance Testing Program for Light-Duty Vehicles" was to procure properly maintained and used 1972, 1973 and 1974 vehicles, to perform restorative maintenance, and to emission test these vehicles in accordance with certification testing procedures. The statistical data developed under this program along with supporting documentation was provided to the United States Environmental Protection Agency, Office of Mobile Source Air Pollution Control, for the Administrator of the Environmental Protection Agency in order that he may fulfill his obligations as defined in Section 207(c)(1) of the Clean Air Amendments of 1970.

2.2 VEHICLE PROCUREMENT

The objective of this activity was to procure randomly selected consumer-owned 1972, 1973 and 1974 automobiles of the appropriate vehicle class to determine their eligibility for emission testing and to make all necessary arrangements with the vehicle owners enhancing their participation. To ensure comparable emission data among all contractors for the In-Use Compliance Testing Program, the Environmental Protection Agency (EPA), Office of Mobile Source Air Pollution Control, established vehicle procurement guidelines. The overall management, determination of vehicle eligibility, documentation of participation, disposition of test vehicles, and award of owner incentives were performed according to the following procedures.

2.2.1 Test Vehicle Selection

Magnetic tapes containing the names of candidate test vehicle owners were provided by EPA for the St. Louis, Missouri, and Los Angeles, California, test sites. These tapes contained a random list of admissible motor vehicles by vehicle engine class. For the 1972 and 1973 model-year vehicles, one tape was provided for St. Louis and one tape for Los Angeles. For the 1974 model-year engine classes, the tapes were provided twice for six of the eight classes and once for the other two. The 1974 model-year vehicles and Class 309 (engine class 09, model year 1973) were not tested in Los Angeles, California. Table 2.2-1 lists the engine classes and the number of vehicles that were tested at each test site.

To ensure that vehicle sampling was as random as possible, vehicles were procured in the order listed on the tapes. That is, for the first vehicle contained on the list every effort was made to contact the vehicle owner, determine vehicle eligibility, and schedule an appropriate time with the vehicle owner for emission testing the vehicle. If the vehicle was rejected for any reason, then the next vehicle owner on the list became eligible to participate. In other words, if the first 20 vehicle owners on the list were contacted and only one of the 20 participated, then the next 19 names on the list became eligible to participate in the program.

TABLE 2.2-1

ENGINE CLASSES AND NUMBER OF VEHICLES TUNED

Class No. / Test Site	1972 Model Yr		1973 Model Year																					1974 Model Year								Totals
	227	228	301	302	303	304	305	307	309	310	312	313	324	326	327	331	338	341	342	349	351	355	356	401	402	412	413	414	415	416	419	
Los Angeles																																
No. Required	20	20	20	20	20	20	20	20	--	20	20	20	20	20	20	20	20	20	20	20	20	20	20	--	--	--	--	--	--	--	--	440
No. Tested	17	14	14	18	16	16	16	12	--	15	16	18	17	15	19	16	4	16	16	19	17	7	8	--	--	--	--	--	--	--	--	326
St. Louis																																
No Required	20	20	20	20	20	20	20	20	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	25	25	25	25	25	25	25	25	665
No. Tested	14	4	17	18	16	16	19	14	16	16	19	15	10	15	19	13	0	16	3	0	5	8	12	25	19	8	19	17	17	16	17	423
Total																																
No. Required	40	40	40	40	40	40	40	40	25	40	40	40	40	40	40	40	40	40	40	40	40	40	40	25	25	25	25	25	25	25	25	1105
No Tested	31	18	31	36	32	32	35	26	16	31	35	33	27	30	38	29	4	32	19	19	22	15	20	25	19	8	19	17	17	16	17	749

Figure 2.2-1 is an example of a working vehicle registration list used by AESi in the performance of this contract.

2.2.2 Contact with Vehicle Owners in Sample

A letter from AESi and an EPA cover letter were sent by certified mail to registered vehicle owners in the order they appeared on the magnetic tape printout. The AESi letter and EPA cover letter are shown in Figures 2.2-2 and 2.2-3. Letters were mailed in stages by vehicle class in order to minimize the time between the mailings and the initial telephone or personal contact. After a mailing was completed, vehicle procurement technicians obtained telephone numbers, when listed, for the subsequent follow-up telephone contacts to determine their willingness and eligibility for participation in the program. When telephone numbers were available, a minimum of four attempts were made to contact the vehicle owner. The calls were spaced at various times of the day, evening, and weekend. If four telephone attempts were not productive in making contact with the vehicle owner, then four personal contacts were attempted. For vehicle owners with unlisted telephones, a maximum of four personal contacts were made. Often certified mail was returned to AESi as undeliverable or refused by the party to whom addressed. In these cases, a second mailing was made to the vehicle owner by first-class mail in a second attempt to contact the vehicle owner.

In Los Angeles, California, 33.1 percent of the vehicle owners had unlisted telephones. In St. Louis, Missouri, 12.7 percent had unlisted telephones. During the latter stages of the program, the number of personal contacts which were needed approached a staggering magnitude. While the EPA cover letter asked vehicle owners with unlisted telephones to call the contractor, this message was almost always overlooked. To increase the rate of vehicle owner contacts, AESi included a one-page attachment to the introductory letter and EPA cover letter asking vehicle owners to please call AESi collect. A copy of this supplemental letter is shown in Figure

FIGURE 2.2-1

✓10	00015	FORD X	UNDERWRITERS AUTO LEASING 8621 WILSHIRE RD 3R12X106475	504GNB	1973	PO BX 1226 933615 BEVERLY HILLS CA 90713 Sold
✓10	00027	FORD X	GALPIN MOTORS INC LEASE DIV 302 W QUEEN APT 10 306 3R12X103867	737GNU	1973	C/O E J MCKAJIAN INGLEWOOD CA 90301 Sold
✓10	00055	FORD X	SICKLES THEODORE GEORGE 375 S MEADOWS AV 3R12X105302	029GMB	1973	OR BEAULORE CHERYL MANHATTAN BC CA 90266 Disq.
✓10	00085	FORD X	BARBIER VIRGINIA ELEANORE 3R11X128484	523GWR	1973	7110 LEMOC ST NORTHRIDGE CA 91324 Refused
✓10	00092	FORD X	ADAMS OSCAR MILTON 3X12X106924	232FKW	1973	920 PACIFIC COAST HWY SANTA MONICA CA 90403 Moved
✓10	00102	FORD X	BUDGET AIRPORT ASSN 3R11X106262	601GIF	1973	9725 AIRPORT BL LOS ANGELES CA 90045 Sold
✓10	00109	FORD X	HARRIS GEORGE DANA JR 4115 W 185TH ST. 3R11X102564	797GJC	1973	4108 W 185TH ST TORRANCE CA 90504 Refused
✓10	00115	FORD X	HERTZ CORP 3R11X108857	505GNI	1973	5300 W CENTURY BL LOS ANGELES CA 90045 Sold
✓10	00127	FORD X	BROWN SUSAN MARIE 3R11X104508	054GPV	1973	4540 VAN NUYS BL SHERMAN OAKS CA 91403 Moved
✓10	00127	FORD X	ANTERO FELIX JOVEN 23013 MEYLER ST 3R12X121556	871GMP	1973	OR JUNE ELEANOR TORRANCE CA 90502 Tested
✓10	00186	FORD X	LLOYD IDRIS BOWLES 3R12X133669	958GYY	1973	4726 BERRYMAN AVE CULVER CITY CA 90230 Disq
✓10	00187	FORD X	HERTZ CORP 3R11X108856	517GNI	1973	5300 W CENTURY BL LOS ANGELES CA 90045 Sold
✓10	00249	FORD X	MORRIS JAMES JOSEPH 3314 SHEFFIELD 3R12X125697	176HGR	1973	OR CONSTANCE MARY LOS ANGELES CA 90032 Tested
✓10	00278	FORD X	BUDGET AIRPORT ASSN 3R11X106261	450GID	1973	9725 AIRPORT BL LOS ANGELES CA 90045 Sold

AESi

AUTOMOTIVE ENVIRONMENTAL SYSTEMS INC. ■ 7300 BOLSA AVENUE WESTMINSTER CALIFORNIA 92683 ■ 714 897 0331

Air pollution and its consequences continue to be a critical problem in many major urban areas in the United States To investigate and combat this problem, a number of programs are under way at all levels of government and industry

The automobile continues to be a major contributor to urban air pollution, and the United States government has since 1968, required new cars to meet increasingly stringent air pollution emission standards. As required by the Clean Air Act of 1970, vehicles now being manufactured must meet certain emission standards during their defined life of 50,000 miles If these automobiles fail to meet the standards, when properly maintained and operated, auto manufacturers may be required to recall these vehicles to correct their emission control systems

The Environmental Protection Agency of the United States government has been authorized to conduct a testing program to determine if 1972, 1973, and 1974 model vehicles are meeting these standards. About 4,500 vehicles will be tested at five sites across the nation. Automotive Environmental Systems, Inc (AESi) is responsible for securing and testing vehicles for the Environmental Protection Agency in this area

A 1973 automobile registered in your name has been randomly selected for testing If you are the original owner of this vehicle, please check the vehicle identification information next to your name and address to make sure that our records are correct If your vehicle meets certain eligibility requirements, we are anxious for you to provide your car for testing Your vehicle will be operated under normal driving conditions as simulated on a dynamometer, and your vehicle's exhaust emissions will be measured and analyzed. Normally, we will need to keep your car for about two and one-half days

Vehicles eligible for testing must meet the following requirements, which are intended to provide a sample of "typical" 1973 automobiles

1 The vehicle has accumulated less than 50,000 miles

2 The vehicle has had oil and oil filter changes at the intervals specified in the owner's manual

3 The vehicle has been operated on unpaved roads less than 50% of the time

4 The vehicle has not been entered in competitive speed events

5 The vehicle has not been used to transport heavy loads for which it was not designed

FIGURE 2 2-2

6 The vehicle has not been otherwise improperly maintained and/or used

7 The vehicle has not been involved in an accident which damaged the engine, frame, or gas tank

8 The vehicle or engine has not been altered by the installation of exhaust headers, performance carburetor components, a performance camshaft, performance ignition equipment, or modified exhaust system components

9 The engine or carburetor has not been disassembled or serviced internally

While your vehicle is in our custody, it will be fully covered by our collision, liability, and comprehensive insurance In addition a new loan car will be provided for your use, and a number of incentives will be awarded if your car goes through the complete test cycle These incentives include

1 A $50 U S Savings Bond

2 An engine tune-up, if required

3 A new set of spark plugs

4 A full tank of gas

5 A mechanical inspection report on the overall condition of your vehicle

6 A certificate of participation

If, for some reason, your car is transferred to our custody, but is determined unacceptable for testing, you will receive incentives for partial participation These incentives are a $10 cash award, use of a loan car while we have your car, and a mechanical inspection report detailing the reason(s) why your vehicle was not accepted for testing

A member of our staff will telephone you within the next few weeks to answer any questions you may have about the test program, and to determine if you will allow your vehicle to be tested, if it is eligible. If you are concerned about the treatment your car will receive during testing, we will be happy to give you a tour of our test facility

We at AESi consider this testing program to be a crucial part of controlling air pollution The problem of air pollution cannot be solved without the support and participation of concerned citizens. We sincerely hope that you will be willing to let your vehicle be tested, and we will greatly appreciate your contribution to the success of our program

Sincerely,

Robert Rederer
Procurement Supervisor

FIGURE 2.2-3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C 20460

A Message to the Car Owner

The U.S. Environmental Protection Agency, in carrying out the Clean Air Act, has contracted with competent testing organizations to make emission tests of certain specific 1973 model automobiles. The purpose of these tests is to determine whether such vehicles, as a class or category, meet Federal emission standards in actual use. The emission test results from any individual car will be used by the EPA only in combination with the test results from all other similar cars; the outcome of the test on any individual car can not result in any enforcement action against the owner of the car.

The enclosed letter to you, from one of these testing organizations, explains this project in detail, and asks to test your car. The purpose of this message is to urge that if at all possible you allow your 1973 model car to be tested in this program.

To assure valid results from this testing program, complete statistical methods are used to select without bias from state registration records the specific cars that will comprise the sample to be tested. Your car has been tentatively selected in that process. Your participation in the test will represent a real and significant contribution to the cause of Clean Air.

Please read the enclosed letter. You will note that it says that a follow-up will be made by phone. Should you have an unlisted telephone number, or if for any other reason it may be difficult for the testing organization to reach you by phone, please call the number given in the enclosed letter to arrange for your participation.

Sincerely yours,

Eric O. Stork
Deputy Assistant Administrator
for Mobile Source Air Pollution Control

Enclosure

2.2-4. This added note proved very successful and reduced the number of personal contacts substantially. When vehicle owners were asked if they read the message in the EPA cover letter about contacting the contractor, they usually replied that they had not bothered to read the last paragraph. To summarize the overall procurement activity, Table 2.2-2 lists the results for the total program and by test site. Individual summaries by test site and class are shown in Appendix A.

During contact with the vehicle owner, a vehicle procurement specialist asked the vehicle owner a number of detailed questions. The objective of the telephone call was to determine vehicle eligibility and to reject unqualified vehicles by telephone rather than in the field or at the laboratory. The list of eligibility requirements used to question vehicle owners (and recorded on the telephone contact control sheet shown as Figure 2.2-5) for the 1972 and 1973 model-year vehicles contained the following items:

1. The vehicle was a 1972 or 1973 model year and one of the specified engine classes.

2. The vehicle had not accumulated more than 50,000 miles and would not accumulate more than 50,000 miles by the time the vehicle was brought in for testing.

3. The vehicle owner was the original owner.

4. The vehicle had the oil and oil filter changed as specified in the owner's manual.

5. If the answer to Item No. 4 was yes but the vehicle owner did not have proof, would he sign an affidavit?

6. The vehicle had been operated on unpaved roads less than 50 percent of the time.

7. The vehicle had not been used to transport heavy loads for which it was not designed.

8. The vehicle had not been entered in competitive speed events.

TABLE 2.2-2

VEHICLE SAMPLING

Description	Test Site		
	Both Test Sites	St. Louis	Los Angeles
a. Total number of introductory letters mailed	5934	2889	3045
b. Total number of telephone calls	4537	3104	1433
c. Total number of personal contacts	1182	367	815
d. Total number of vehicles rejected	1093	822	271
e. Total number of vehicles tested	749	423	326
f. Percent breakdown of vehicle owners with no or unlisted telephones	23.1	12.7	33.1
g. Percent breakdown of vehicles which are leased or non-privately owned	23.2	17.5	28.6

FIGURE 2.2-4

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC. ■ 7300 BOLSA AVENUE, WESTMINSTER, CALIFORNIA 92683 ■ 714 897-0331

DEAR VEHICLE OWNER:

While the enclosed introductory letter states that AESi personnel will be calling your shortly, this will not be possible if you have an unlisted telephone number. Our past experience shows that about 70 percent of the telephones in Los Angeles County are not listed.

If you have an unlisted telephone number, we would very much appreciate your calling us COLLECT at (714) 897-0331. Our contractual requirements with the Environmental Protection Agency make it necessary that we contact all vehicle owners who receive letters asking for their cooperation in participating in this important program.

Very truly yours,
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

Dottie Pike

Dottie Pike
Procurement Department

P.S.: Although we hope that you will decide to participate, your calling us about this program will NOT, of course, obligate you in any way.

OWNER CONTACT CONTROL SHEET FIGURE 2.2-5

(1972 or 1973 Models)

Owner's Name	Phone Number (Home)	Will Owner Participate? ☐ Yes ☐ No
Owner's Address	Phone Number (Office)	☐ Pick up vehicle ☐ Owner will deliver
Vehicle Year, Make, and Model	Vehicle I.D. Number (VIN)	Date of Pick-up/Delivery
Owner/Car Data OK? ☐ Yes ☐ No	If No, What Changes?	Time of Pick-up/Delivery
Date of Letter	Did Owner Get Letter? ☐ Yes ☐ No / Best Time to Call	Current Mileage

OWNER CONTACT RECORD

	Type	Date	Time	Comments
1.				
2.				
3.				
4.				

VEHICLE ELIGIBILITY RECORD (Comment on back, if necessary.)	Yes	No
1. Is owner the original owner of vehicle?		
2. Has car had oil and oil filter changes as required?		
3. Does owner have proof of oil and oil filter changes?		
4. If "no" to Q.3, will owner sign affidavit?		
5. Has car been driven on unpaved roads more than 50% of time?		
6. Has car been entered in competitive speed events?		
7. Has car been used to haul loads for which it was not designed?		
8. Has car's engine been modified by installation of headers, etc.?		
9. Has vehicle been involved in an accident which damaged the frame, engine, or gas tank?		
10. Has the carburetor ever been removed, replaced, rebuilt, or otherwise disassembled?		
11. Have the internal workings of the engine ever undergone repairs or replacement?		
12. Are the tires, other than snow tires, of a size not offered as standard or optional equipment on your car?		

Does Owner Want Tour?	Date & Time of Tour	Suggested Pick-up/Delivery Dates & Times
☐ Yes ☐ No		

9. The vehicle's engine, exhaust system, fuel tank and suspension had not been modified.

10. The vehicle had not been involved in an accident which damaged the frame, engine or gas tank.

11. The carburetor had not been removed, replaced or rebuilt.

12. The vehicle's engine had not received major maintenance (rings, valves, etc.).

13. The VIN on AESi's magnetic printout list agreed with the VIN on his vehicle.

During a personal contact, the above items were also asked and recorded on the telephone contact control sheet.

When the initial telephone or personal contact was made in procuring the 1974 model-year vehicles, the following questions were asked and recorded on the telephone contact control sheet (Figure 2.2-6):

1. The vehicle was a 1974 model-year and one of the specified vehicle engine classes.

2. The vehicle had not accumulated more than 12,000 miles and would not accumulate more than 12,000 miles before the vehicle was brought into the laboratory for testing.

3. The vehicle owner was the original owner.

4. The car had been maintained in accordance with vehicle manufacturer's specifications.

5. If the answer to Item No. 4 was yes but the owner did not have proof, would he sign an affidavit?

6. The vehicle had been operated on unpaved roads less than 50 percent of the time.

7. The vehicle had not been used to transport heavy loads for which it was not designed.

8. The vehicle had not been entered in competitive speed events.

9. The vehicle's engine, exhaust system, fuel tank and suspension had not been modified.

OWNER CONTACT CONTROL SHEET

FIGURE 2.2-6

(1974 Models)

Owner's Name	Phone Number (Home)	Will Owner Participate? ☐ Yes ☐ No
Owner's Address	Phone Number (Office)	☐ Pick up vehicle ☐ Owner will deliver
Vehicle Year, Make and Model	Vehicle I.D. Number (VIN)	Date of Pick-up/Delivery
Owner/Car Data OK? ☐ Yes ☐ No	If No, What Changes?	Time of Pick-up/Delivery
Date of Letter	Did Owner Get Letter ☐ Yes ☐ No	Best Time to Call	Current Mileage

OWNER CONTACT RECORD

	Type	Date	Time	Comments
1.				
2.				
3.				
4.				

VEHICLE ELIGIBILITY RECORD (Comment on back, if necessary	Yes	No
1. Is owner the original owner of vehicle?		
2. Has car been maintained according to manufacturers recommendations?		
3. Does owner have proof that the vehicle was maintained in accordance with the manufacturer's recommendations?		
4. If "no" to Q.3, will owner sign affidavit?		
5. Has car been driven on unpaved roads more than 50% of time?		
6. Has car been entered in competitive speed events?		
7. Has vehicle been used to haul loads for which it was not designed?		
8. Has car's engine been modified by installation of headers, etc.?		
9. Has vehicle been involved in an accident which damaged frame, engine, or gas tank?		
10. Has the carburetor ever been removed, replaced, rebuilt, or otherwise disassembled?		
11. Have the internal workings of the engine ever undergone repairs or replacement?		
12. Are the tires, other than snow tires, of a size not offered as standard or optional equipment on your car?		

Does owner want tour? ☐ Yes ☐ No	Date & Time of Tour	Suggested Pick-up/Delivery Dates & Times

10. The vehicle had not been involved in an accident which damaged the frame, engine or gas tank.

11. The carburetor had not been removed, replaced or rebuilt.

12. The vehicle's engine had not received major maintenance (rings, valves, etc.).

13. The VIN on AESi's magnetic printout list agreed with the VIN on his vehicle.

There were many instances where the registered owner of the candidate vehicle was listed as a company, leasing firm, or car rental agency. In these cases, the agent of the registered owner was contacted and asked for permission to test the vehicle(s) in question. If the response was negative, the vehicle was rejected. If the response was affirmative, the owner was asked to provide a list of the vehicles with the "custodians'" names and addresses. The list of "custodians" was then used to update the computer list. In the case of rented vehicles, the agency may have been located within the sample area while the car itself was outside of the area. If the car was not expected to return within a reasonable period, it was rejected. Overall, for both test sites, 23.2 percent of the vehicles were leased or non-privately owned.

2.2.3 Vehicle Pickup and Initial Inspection

During the telephone contact, a definite time was established to inspect the vehicle in the owner's presence to further establish program eligibility. The list of items inspected during vehicle pickup was the following:

1. Inspect vehicle for damage to engine, frame or fuel tank.

2. Examine exhaust system for damage or corrosion.

3. Check vehicle for trailer hitches, non-standard tires, tire condition and suspension system.

4. Check that the VIN was the same as on computer printout.

5. Check for high performance modifications.
6. Check for removal of emission control systems.
7. Check oil level and oil filter cartridge appearance.
8. Check that all drive belts are present.

If the vehicle passed this initial inspection, the owner questionnaire was completed and the affidavit signed if maintenance records or oil and oil filter maintenance proof were missing. Test vehicle and loan car forms were then completed and the test vehicle was brought to the laboratory for inclusion in the program.

2.2.4 Vehicle Rejection

Appendix A summarizes vehicle procurement activities by test site and vehicle engine class. The following discussion highlights common causes for vehicle rejection. Item "e" of Appendix A (total number of vehicles tested) includes only those tests accepted by EPA.

2.2.4.1 Owners Not Available to Contact: Contacting vehicle owners in Los Angeles, California, was far more difficult than in St. Louis, Missouri, for two reasons: (1) the greater number of unlisted telephones and (2) the residents in the area being more transient. The initial mailing to vehicle owners was by certified mail. When this letter was returned to AESi because the vehicle owner refused to pick up the letter, a second letter was sent by first-class mail. If a letter was returned to AESi because the owner had moved and left no forwarding address, the vehicle was rejected. If a second letter was not returned, and the vehicle owner did not have a listed telephone number, a personal contact was made. In Los Angeles, personal contacts were frequently not productive since people who answered the door were very hesitant to even listen to the program details. However, in St. Louis when personal contacts were made and a resident was found at home,

about half of these contacts resulted in procurement of the vehicle for testing. In general, personal contacts were non-productive in both cities.

2.4.4.2 Owners Unwilling to Participate: When telephone or personal contacts were made, the following are reasons for unwillingness to participate:

1. Could "care less" about the program.
2. Thought the program was a waste of the taxpayer's money.
3. The program would not do anything to clean the air.
4. Did not have the time.
5. Would not let car out of their possession.
6. Would not let another mechanic work on their car.
7. Rental and leased car agencies did not want to be bothered with searching through their files to locate consigned owner.
8. Company-owned cars would create a schedule problem if in the program.

2.4.4.3 Sold Vehicles: Vehicles sold by the original owner were a common cause for rejecting vehicles. Leased vehicles, rental vehicles and company-owned cars contributed the greatest percentage of these vehicles. This was especially prevalent in St. Louis, Missouri, during the latter stages of the program for the 1974 model-year vehicles.

2.2.4.4 "No Show" Vehicles: Very few vehicle owners failed to participate in the program because they changed their minds or failed to remember the scheduled appointment. Vehicle owners were telephoned one or two days in advance, or immediately before the scheduled time, to remind them of the appointment.

2.2.4.5 Vehicles Rejected in Field: The screening of vehicles during the telephone contact reduced the number of field disqualifications to very few. Vega Class 228 was a problem since vehicle owners usually did not know if their car had a one- or two-barrel carburetor. The two-barrel carburetor was a requirement for program participation. In St. Louis, the largest single cause of vehicle rejection was the wrong engine type. Ford vehicles manufactured with the 351 CID W (Windsor) engine or the 351 CID C (Cleveland) engine caused a problem, since the vehicle identification number (VIN) could not be used to determine the engine with which the vehicle was equipped. The vehicle owner also seldom knew the difference between the two engine types. As a result, a personal visit to the vehicle owner's home was necessary for a visual inspection of the engine. The 351 C engine was difficult to find.

2.2.4.6 Vehicles Rejected in Laboratory: Evidence of vehicle tampering was the main reason for rejection of vehicles in the laboratory. Evidence of tampering was more prevalent in Los Angeles than in St. Louis. Vehicles equipped with EGR and Ford engine classes were most often tampered with. Vacuum line rerouting, plugged vacuum lines, and distributor centrifugal advance springs of a lesser tension were common modifications found.

2.2.4.7 Vehicles Exceeding Mileage: In St. Louis, Missouri, about 75 percent of the 1974 model-year vehicles rejected were due to the

vehicles exceeding 12,000 miles. The 1972 and 1973 model-year vehicles that were non-privately owned often exceeded 50,000 miles. Rejection of privately owned 1972 and 1973 model-year vehicles for this reason seldom occurred.

2.2.5 Vehicle Classes Difficult to Procure:

Vehicle classes in Los Angeles, California, difficult to procure and reasons for this difficulty were as follows:

1. Class 228 - Chevrolet Vega. Many of these vehicles were sold by original owner or the vehicle was not equipped with the required 2-barrel carburetor.

2. Class 355 - Audi. This class required the vehicle to be equipped with a manual transmission, and most vehicles on the list were equipped with automatic transmissions. Only manual transmission vehicles were equipped with the exhaust emission control system EPA desired to test.

3. Class 338 - Datsun. The list of registered vehicle owners was a mix of 1972 and 1973 model-year vehicles. Only the 1973 model-year vehicles were to be tested. Vehicles owners sometimes did not know that they had a 1972 model-year vehicle until they were contacted by AESi. The vehicle was often sold to the owner as a 1973 model-year vehicle.

4. Class 331 - Buick. Buicks were difficult to procure due to the owners' resistance in allowing their cars to be tested.

5. Class 351 - VW. Vehicle owners were resistant to participate and required extra convincing before they would allow their cars to be tested.

6. Class 356 - Ford. The owners were very resistant.

Vehicle classes in St. Louis, Missouri, difficult to procure were as follows:

1. Class 228 - Chevrolet Vega. Many of these vehicles were sold by the original owner or the vehicle was not equipped with the required 2-barrel carburetor.

2. Class 307 - Ford. This required separating the 351 W from 351 C engines. The VIN on the tape printout did not make this distinction.

3. Class 338 - Datsun. All vehicles on the list were 1972 model year. The program required testing of 1973 model-year vehicles.

4. Class 349 - Pontiac. Because of the exhaust emission control system that EPA desired to test, the vehicle had to be a 350 CID, manual transmission type. No vehicles meeting these requirements were found.

5. Class 356 - Ford. Vehicle owners were resistant to participating.

6. Class 412 and 414 - Ford. These classes required separating the 351 W and 351 C engines. Class 412 vehicles were nearly impossible to find. Also, many of these vehicles were leased and had been sold.

7. Class 416 - Cadillac. Vehicle owners were very resistant to allowing their vehicles out of their possession.

Additional procurement difficulties were due to "short" vehicle classes; that is, insufficient numbers of registered vehicle owners to contact. Table 2.2-3 itemizes by test site and vehicle engine class the number of vehicles required for testing, the number of registered vehicle owners on the list, and the number of vehicles actually tested. Unfortunately several of the "short" classes were difficult to procure for other reasons (see above).

TABLE 2.2-3

SHORT VEHICLE CLASSES

Test Site & Class No.	No. Required to Test	No. Vehicles on List(s)	No. Vehicles Tested	Comments
St. Louis				
Class 338	20	92	0	All 1972 model-year vehicles
Class 342	20	6	3	--
Class 349	20	2593	0	No 350 CID manual transmissions on list
Class 351	20	14	5	--
Class 355	20	100	8	Manual transmission only
Class 356	20	56	12	Owners resistant
Class 412	25	3940	8	351 CID Cleveland engine only
Los Angeles				
Class 338	20	1836	4	Only 142 are 1973 model-year
Class 355	20	210	7	Manual transmission only
Class 356	20	49	8	--

2.3 VEHICLE INSPECTION AND MAINTENANCE

2.3.1 1972 and 1973 Model-Year Vehicles

Each vehicle's engine and emission control device were inspected to determine component condition. The inspection of components was based on the vehicle's current mileage and time since the vehicle was purchased by the vehicle owner. Repair or replacement of a component system was based solely on a competent mechanic's judgement of the condition of a component/system (with the exception of filters and evaporative emission canisters). If a component/system to be inspected was determined to not be within the manufacturer's specifications, it was adjusted, repaired, or replaced. In addition, a list of items to be inspected and restored regardless of the manufacturer's recommended maintenance interval included:

1. Ignition point dwell
2. Ignition points and condenser
3. Initial timing
4. Idle air/fuel mixture
5. Distributor cap and rotor
6. Ignition wires
7. Curb idle RPM
8. Exhaust control valve
9. Thermal reactors
10. Throttle and choke linkage
11. Tubes, hoses, fittings, and electrical connectors
12. Air cleaner element
13. Crankcase emission filter element
14. Spark plugs (mandatory)
15. Exhaust system
16. Radiator core
17. Air conditioner condensor core
18. Engine coolant level
19. Engine coolant specific gravity
20. Radiator pressure cap
21. Vacuum advance diaphragm (if leaking)
22. Mechanical advance adjustment (if specified by manufacturer)
23. Engine drive belts
24. Fast idle RPM (if specification given)

Appendix B summarizes by test site and vehicle engine class the frequency of parts repair, replacement or adjustment. Table 2.3-1 summarizes by test site and vehicle engine class vehicles which showed cylinder leakages of greater than 15 percent after oil had been introduced into the cylinder to seal the leakage past the piston rings.

TABLE 2.3-1

WET CYLINDER LEAKAGE GREATER THAN 15%

Class / Test Site	1972 Model Yr		1973 Model Year																				
	227	228	301	302	303	304	305	307	309	310	312	313	324	326	327	331	338	341	342	349	351	355	356
St. Louis																							
No. of Vehicles	6	4	4	3	6	0	8	7	1	12	3	1	1	8	4	2	-	4	0	-	0	0	2
No. Tested	14	4	17	18	16	16	19	14	16	16	19	15	10	15	19	13	0	16	3	0	5	8	12
Los Angeles																							
No. of Vehicles	5	5	0	9	4	1	4	6	-	11	7	0	2	3	10	6	2	4	0	9	0	1	3
No. Tested	17	14	14	18	16	16	16	12	-	15	16	18	17	15	19	16	4	16	16	19	17	7	8

2.3.2 1974 Model-Year Vehicles

The emission control components of the 1974 model-year vehicles were inspected based on each vehicle's current mileage. However, no restorative maintenance or mechanical adjustments were performed except as noted below:

1. Spark plugs (always replaced)
2. Exhaust system
3. Radiator core
4. Air conditioner condenser core
5. Engine drive belts
6. Engine collant level
7. Engine collant specific gravity
8. Radiator pressure cap

Appendix C summarizes by engine class the state of mechanical tune the vehicles were in when emission tested. Table 2.3-2 summarizes the number of vehicles that had "wet" cylinder leak-down tests that exceeded 15 percent.

2.3.3 Parts Maintenance Rates

Appendix B deals with 1972-1973 model-year vehicles and lists by test site and vehicle class the frequency of parts and emission-related systems that required maintenance and the type of maintenance performed. For the 1972-1973 model-year vehicles, the frequency of parts failure rates in descending order were: air cleaner element, fuel filter, crankcase inlet air cleaner, ignition points, condenser, PCV valve and system, fuel vapor inlet filter, ignition wires, distributor rotor, EGR system, radiator pressure cap, distributor cap, A.I.R. system, carburetor choke and accelerator linkage, and idle stop solenoid. For the 1973 model-year vehicles, the frequency of maintenance required in descending order were: idle RPM, timing, idle CO, vacuum advance, point dwell, centrifugal advance, points, radiator pressure cap, exhaust gas recirculation system, coolant level, and coolant strength. Appendix C lists the state of tune parameters, parts and condition of emission-related systems for the 1974 model-year vehicles (on which restorative maintenance was not performed).

TABLE 2.3-2

WET CYLINDER LEAKAGE GREATER THAN 15%

Class / Test Site	1974 Model Year							
	401	402	412	413	414	415	416	419
St. Louis Only								
No. of Vehicles	0	6	2	8	5	0	3	1
No. Tested	25	19	8	19	17	17	16	17

2.3.4 Original Equipment Parts Difficult to Obtain

Original equipment parts (OEM) were not difficult to obtain. All parts were readily available and did not result in any program delay. On one occasion, AESi did encounter difficulty obtaining a distributor vacuum advance diaphragm for a Class 351 Volkswagen.

2.3.5 Vehicles Difficult to Perform Inspection and Maintenance

Vehicle classes difficult to perform inspection and maintenance on were:

1. Class 349
2. Class 351
3. All Ford engine classes

Items 1 and 2 listed above were difficult to perform I&M on because of engine and body configurations. This difficulty existed because of the lack of adequate working space around the engine to perform engine diagnostics. In general, all Ford Motor Company vehicles required additional time due to (1) the nature of the emission control systems and (2) the frequency of production changes forced the mechanics to spend a great deal of time looking up calibration codes. Ford vehicles frequently showed no evidence of tampering, but the engine configuration did not match the specified calibration number. Also, AESi frequently encountered calibration codes for which data was not immediately available.

2.4 VEHICLE EMISSION TESTING

Exhaust emission tests were performed in accordance with test procedures for gasoline-fueled light-duty vehicles in 37 Federal Register 221, November 15, 1972, Part II, as corrected by Advisory Circular 1-2, and as amended by 38 Federal Register 124, June 28, 1973. The process through which each vehicle was tested is shown in Figure 2.4-1.

2.4.1 Preconditioning

Following inspection and maintenance procedures by AESi's mechanics, the test vehicles were preconditioned over a 1-hour road course in the immediate vicinity of the test laboratory. Figures 2.4-2 and 2.4-3 are maps of the preconditioning road courses for Los Angeles, California, and St. Louis, Missouri. These road courses were selected to allow vehicle operation at 55 mph, 45 mph, and residential speeds of 25 mph. Preconditioning was scheduled to avoid peak traffic congestion and better ensure that the 32-mile road course would be completed in about one hour.

Immediately upon completion of mileage accumulation, the fuel tank was drained and the fuel system pressure checked. The fuel tank line at the fuel pump was disconnected and plugged, and pressure was applied to the evaporative emission line from the fuel system to the vapor storage canister. The fuel system was pressurized with dry nitrogen to fourteen inches of water pressure. The fuel system was considered acceptable if the pressure loss was less than or equal to 2 inches water pressure in five minutes. Fuel system leaks were uncommon during the performance of testing in this program. On several occasions fuel caps were found to leak. However, test vehicle fuel caps were not used during testing, and were replaced with properly functioning ones.

FIGURE 2.4-1

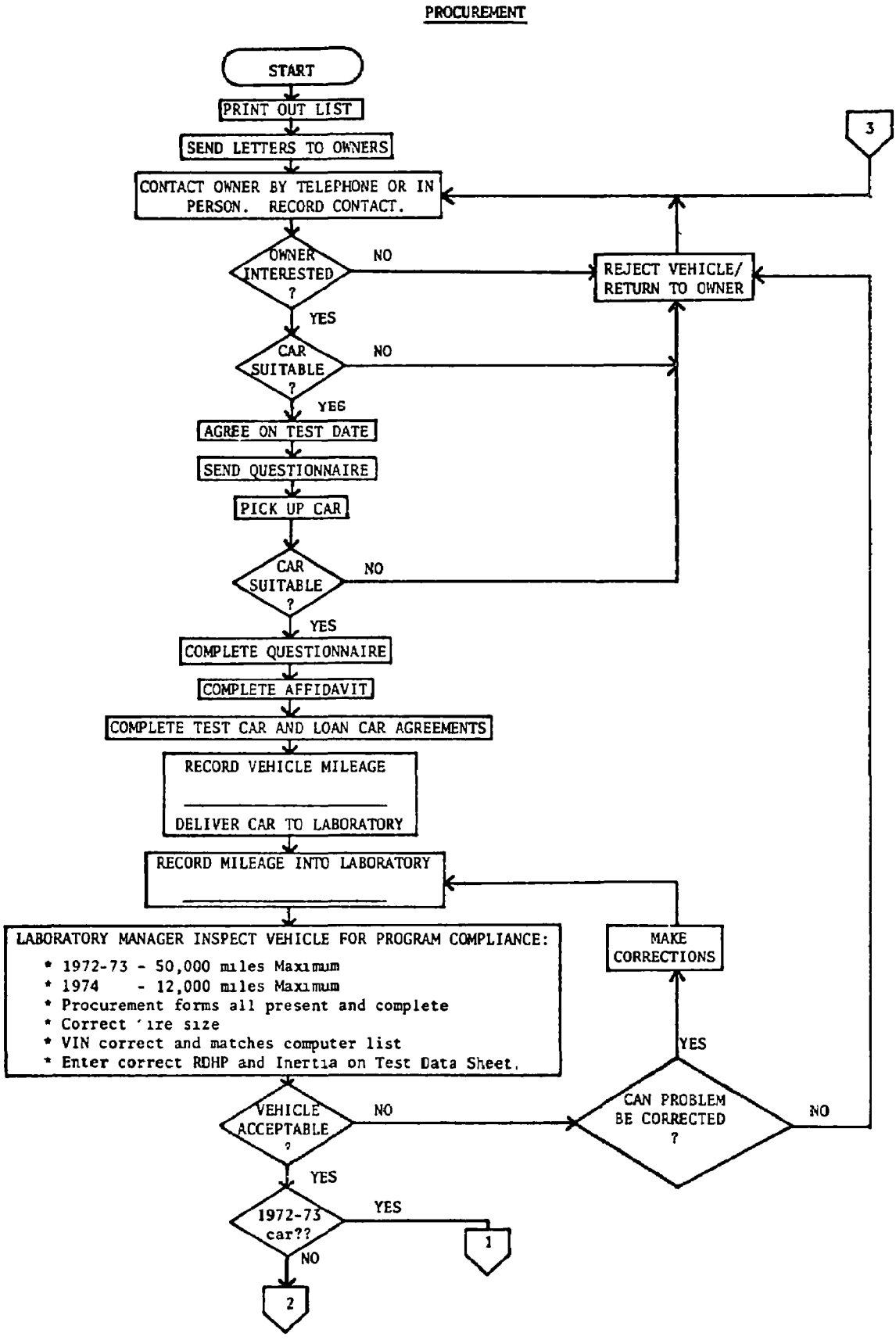

PROCUREMENT
START
PRINT OUT LIST
SEND LETTERS TO OWNERS
CONTACT OWNER BY TELEPHONE OR IN PERSON. RECORD CONTACT.
OWNER INTERESTED ?
NO
YES
REJECT VEHICLE/ RETURN TO OWNER
3
CAR SUITABLE ?
NO
YES
AGREE ON TEST DATE
SEND QUESTIONNAIRE
PICK UP CAR
CAR SUITABLE ?
NO
YES
COMPLETE QUESTIONNAIRE
COMPLETE AFFIDAVIT
COMPLETE TEST CAR AND LOAN CAR AGREEMENTS
RECORD VEHICLE MILEAGE
DELIVER CAR TO LABORATORY
RECORD MILEAGE INTO LABORATORY
LABORATORY MANAGER INSPECT VEHICLE FOR PROGRAM COMPLIANCE:
* 1972-73 - 50,000 miles Maximum
* 1974 - 12,000 miles Maximum
* Procurement forms all present and complete
* Correct tire size
* VIN correct and matches computer list
* Enter correct RDHP and Inertia on Test Data Sheet.
MAKE CORRECTIONS
YES
CAN PROBLEM BE CORRECTED ?
NO
VEHICLE ACCEPTABLE ?
NO
YES
1972-73 car??
YES
1
NO
2

FIGURE 2.4-1
(continued)

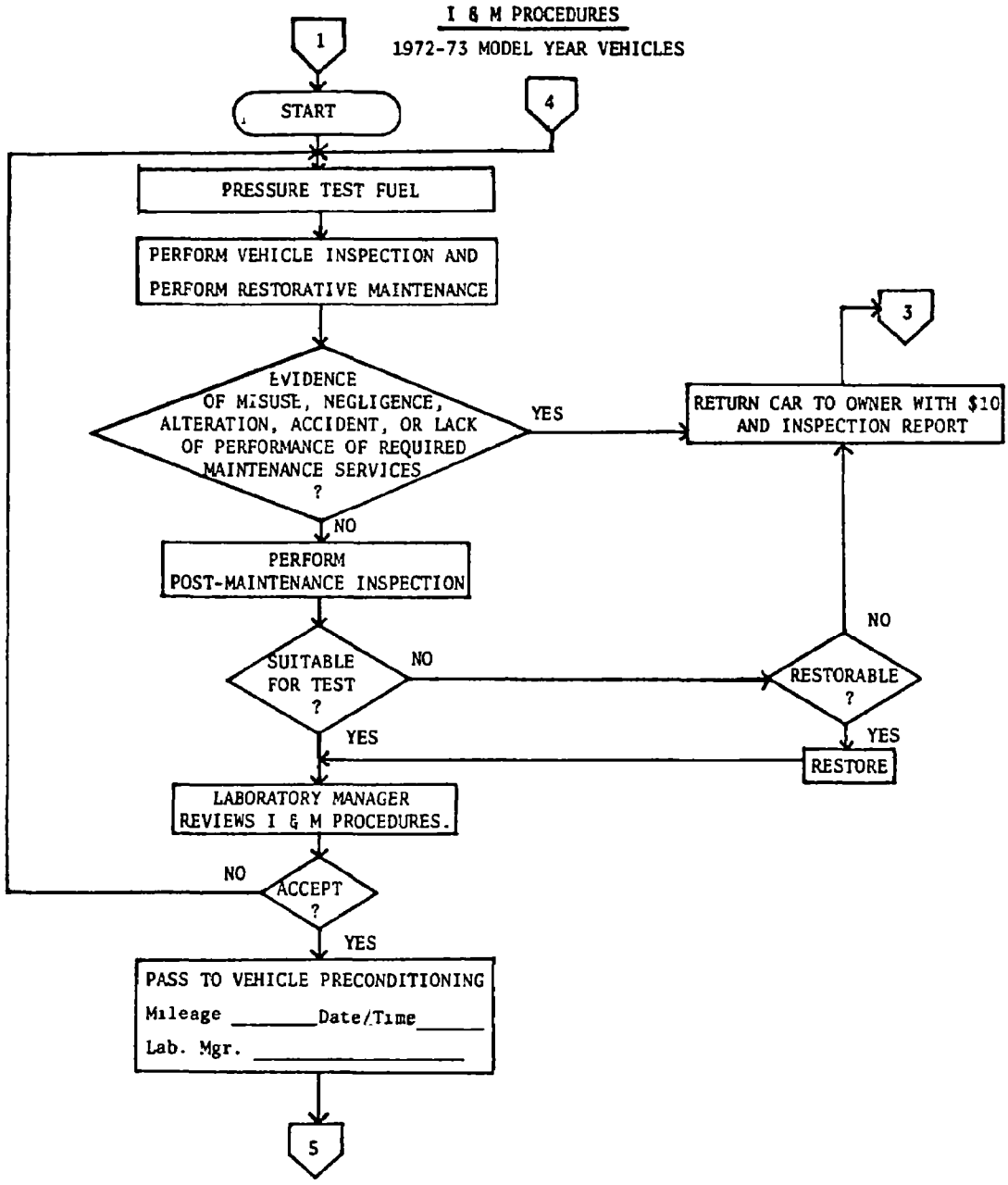


FIGURE 2.4-1
(continued)

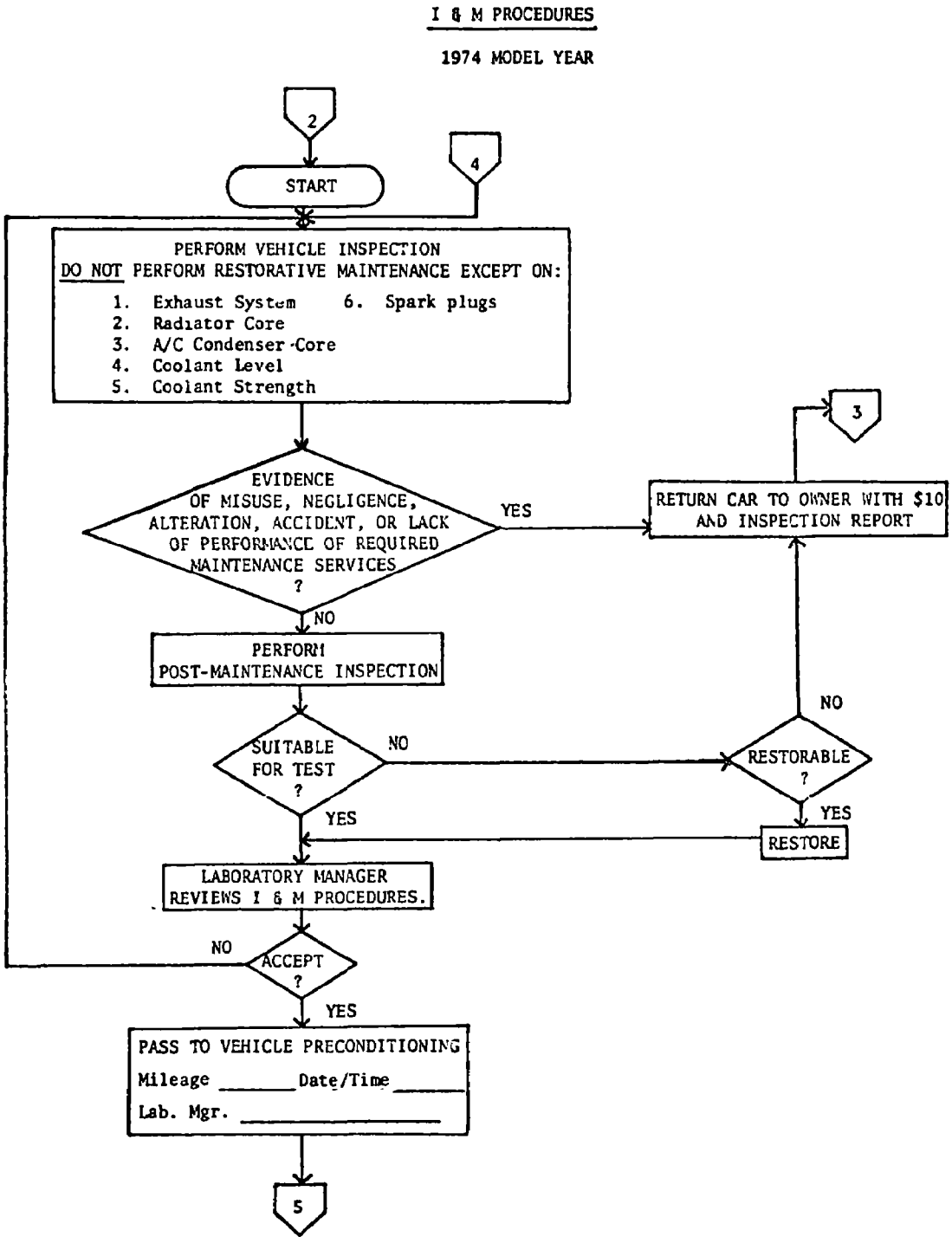


FIGURE 2.4-1
(continued)

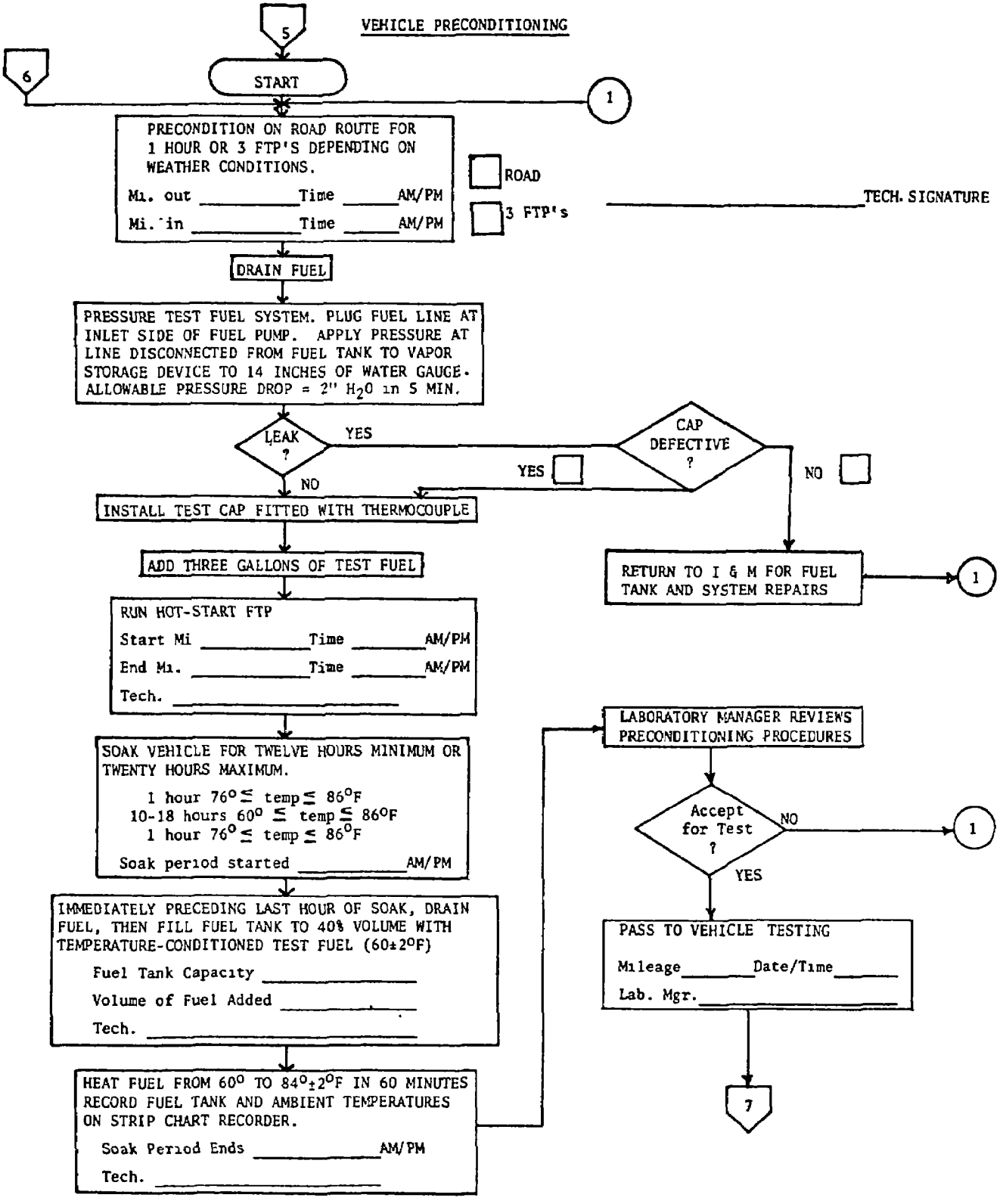


FIGURE 2.4-1
(continued)

EMISSIONS TESTING PROCEDURES

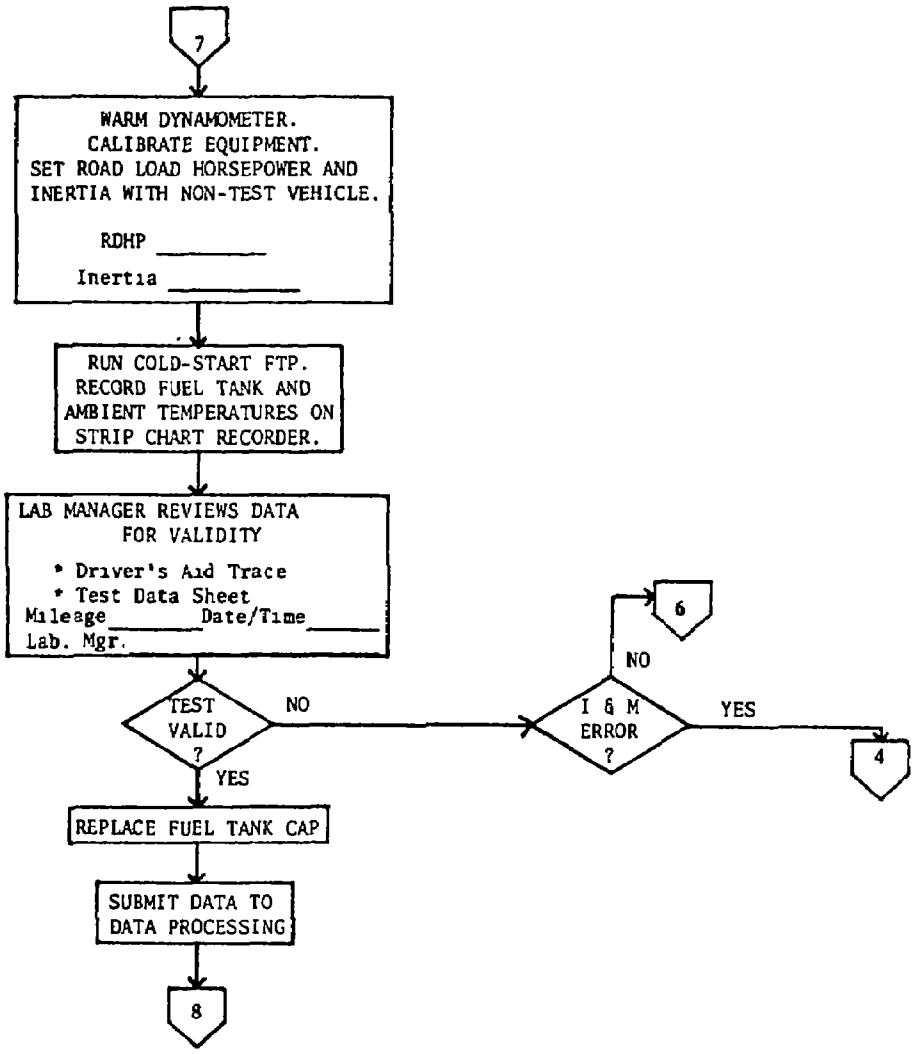
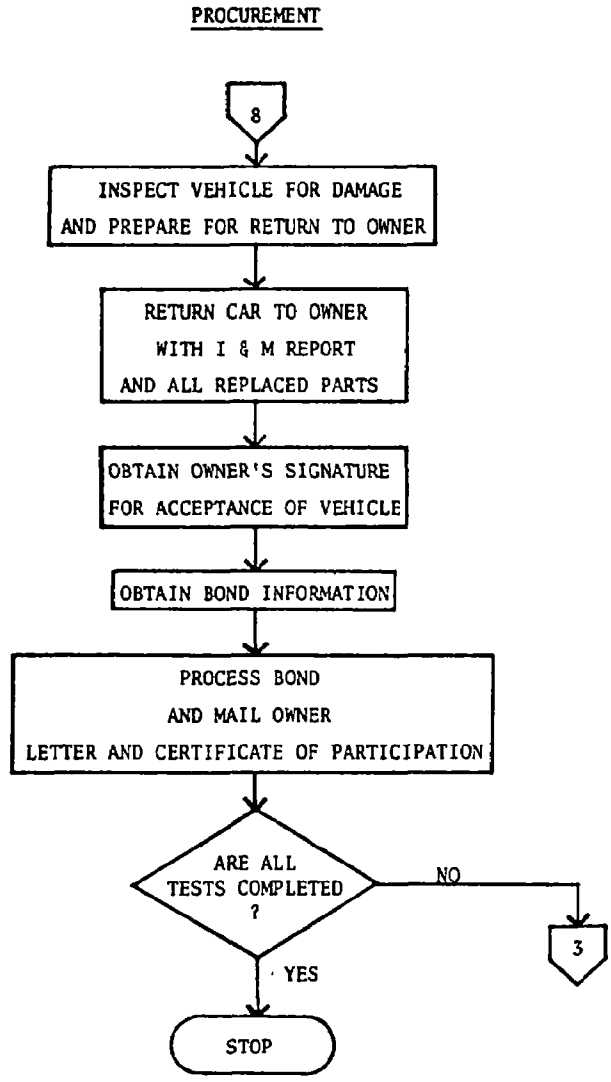


FIGURE 2.4-1
(continued)



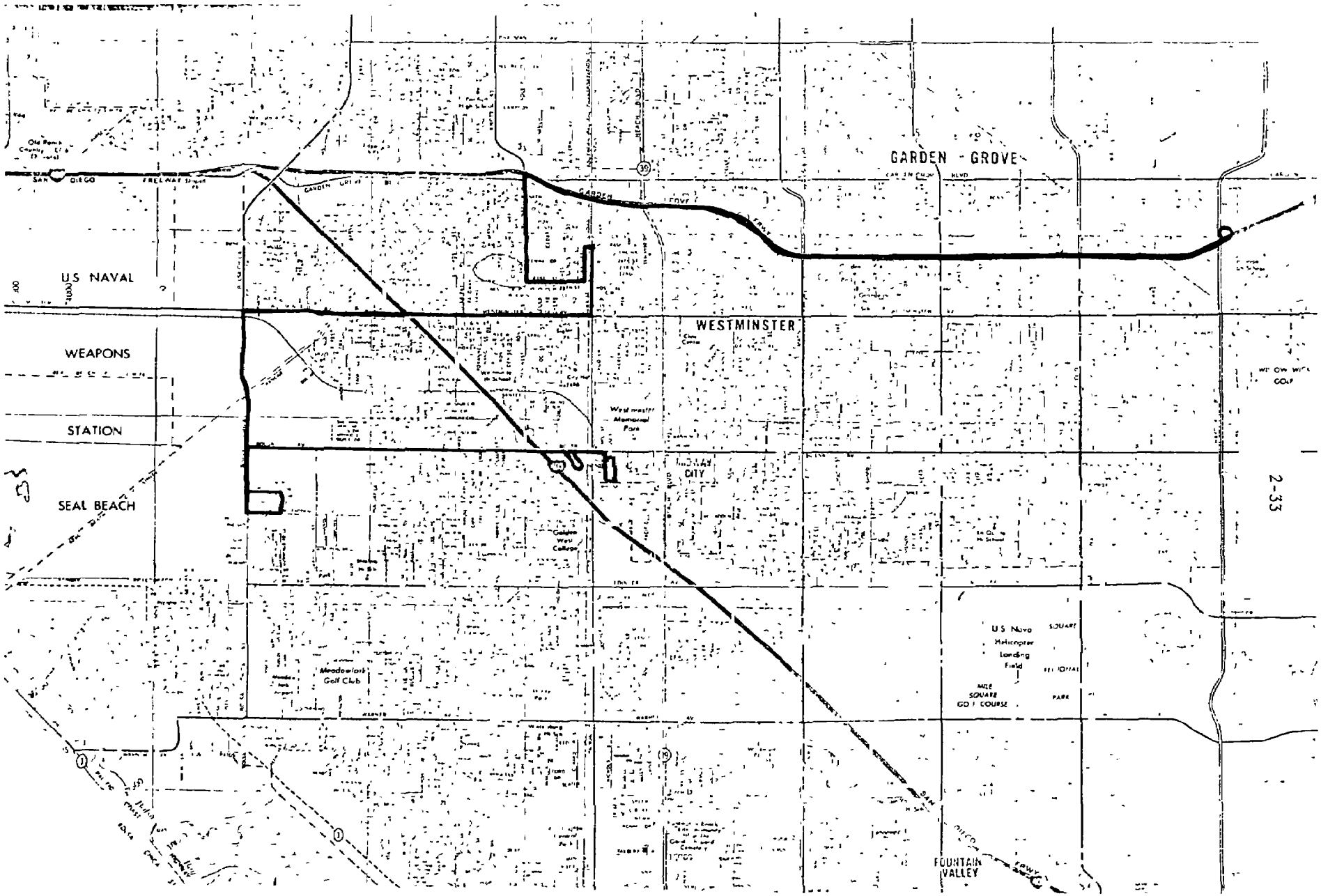


FIGURE 2.4-2
LOS ANGELES PRECONDITIONING ROUTE (32 Miles)

FIGURE 2.4-2
(Continued)

LOS ANGELES PRECONDITIONING ROUTE

East in lane,
Left on Golden West Circle - north,
Left on Bolsa - west (45 MPH),
Left on Bolsa Chica - south (50 MPH),
Left on McFadden - east (40 MPH),
Left on Cambay - north (20 MPH),
Left on Tasman - west (20 MPH),
Right on Bolsa Chica -north (20 MPH)
Change to 45 MPH,
Right on Westminster - east (45 MPH),
Change to 40 MPH,
Change to 35 MPH,
Change to 30 MPH,
Left on Hoover - north (35 MPH),
Left on Trask - west (35 MPH),
Left on Iowa - south (20 MPH),
Right on 21st - west (20 MPH),
Right on Golden West - north (50 MPH),
Right on Garden Grove Freeway - east (55 MPH),
Get off at Harbor - south
Left on Harbor, to Garden Grove Freeway - west (55 MPH)
Get off at Golden Grove - left, south (30 MPH),
Left on 21st - east (20 MPH),
Left on Iowa - north (20 MPH),
Right on Trask - east (35 MPH),
Right on Hoover - south (30 MPH),
Right on Westminster - west (30 MPH),
Change to 35 MPH,
Change to 40 MPH,
Change to 45 MPH,

FIGURE 2.4-2
(Continued)

Left on Bolsa Chica - south (45 MPH),
Left on Tasman - east (20 MPH),
Right on Combay - south (20 MPH),
Right on McFadden - west (20 MPH),
Right on Bolsa Chica - north (50 MPH),
Right on Bolsa - east (45 MPH),
Right on Temple - south (15 MPH),
Left on Colgate - east (15 MPH),
Left on Syracuse - north (15 MPH),
Left on Lehigh - west (15 MPH),
Right on Temple - north (15 MPH),
Left on Bolsa (45 MPH),
Left on Golden West Circle, and around circle to shop.
(Circle speed 20 MPH)

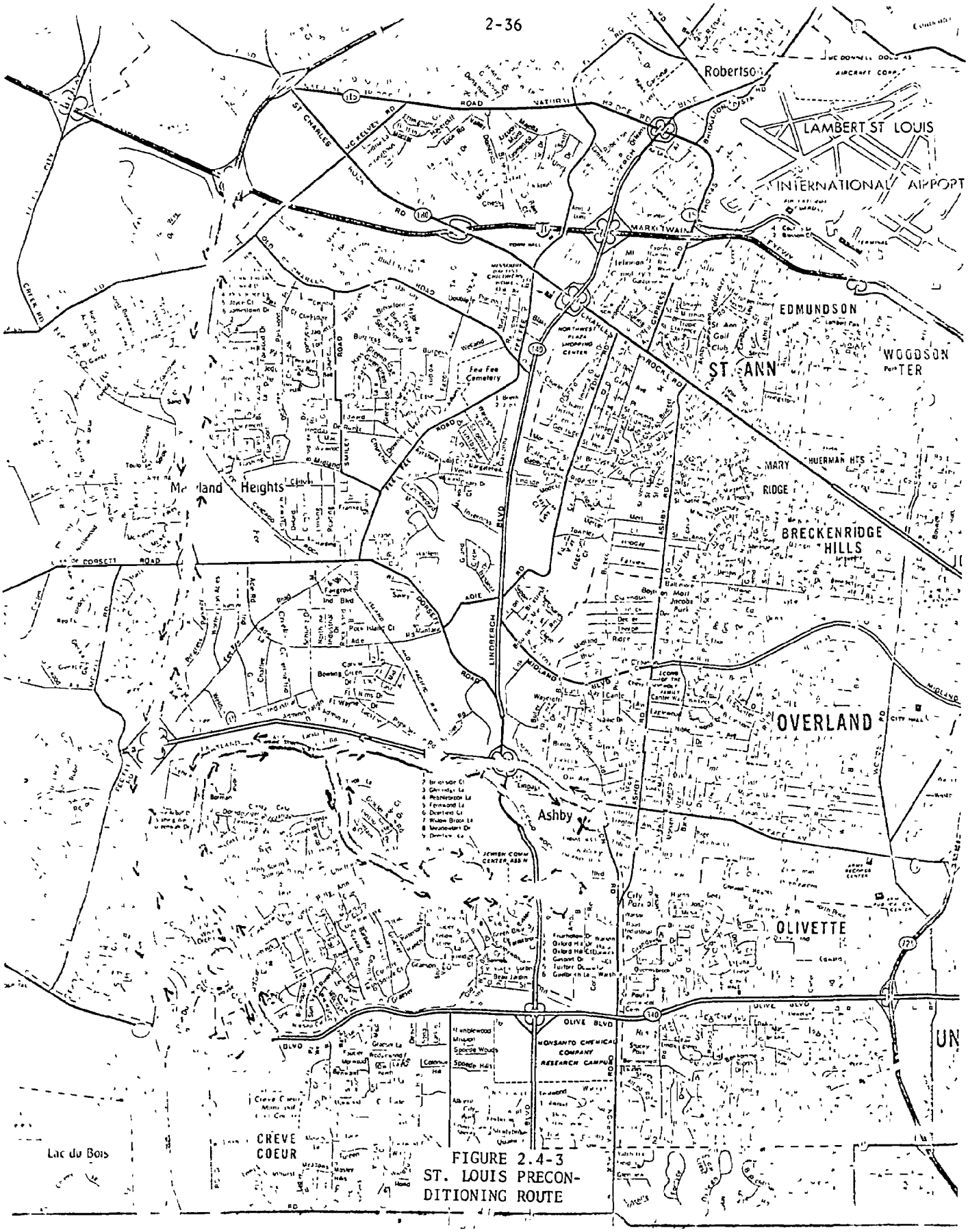


FIGURE 2.4-3
ST. LOUIS PRECONDITIONING ROUTE

FIGURE 2.4-3
(Continued)

ST. LOUIS PRECONDITIONING ROUTE

North on Warson and West on Page,
West on Lackland and proceed West on Lackland;
Left on Schuetz - southbound,
Left on Prince Albert Drive
Left on Queensway, turns into Cricket Hill,
Drive left on Queensway, Right on Willow Brook,
Left on Schuetz Road, Right on Andes,
Left on Ambassador, Left on Research,
Left on Baur which changes to Schuetz,
Follow Schuetz and Left on Lackland,
Left on Craig,
Right on Debonnaire, Right on Vivacite,
Right on Craig, Right on Olive Blvd.,
North on 244, Turn around point, 1/2 mark,
Exit K.C. West, Back 244 South Kirkwood Exit
Exit 244 at Olive Street,
Left on Olive, Left on Craig,
Left on Debonnaire, Right on Bonheur, which changes to Vivacite,
Left on Debonnaire, Left on Craig,
Right on Lackland, Right on Schuetz,
Left on Price Albert, Left on Queensway,
Turn to Cricket Hill, Left on Queensway,
Right on Willow Brook, Right on Schuetz,
Right on Lackland, Right on Page,
Right on Warson, Back to Lab

Following pressure testing of the fuel system, three gallons of test fuel were added and the vehicle was driven on the emission dynamometer for one Federal Test Procedure driving schedule. The vehicle was then pushed to the soak area for 12 to 20 hours of cold soaking.

During the last hour of soaking the vehicle's fuel tank was drained and refilled with temperature-conditioned test fuel to 40 percent of the manufacturer's published tank capacity. Ambient and tank fuel temperature was continuously monitored from this time until the end of the emission test. The temperature of conditioned fuel in the vehicle's tank was elevated from 60 $\pm$ 2°F to 84 $\pm$ 2°oF in 60 $\pm$ 10 minutes. AESi did experience operating difficulties with ambient temperatures during this phase of testing. Spurious temperature fluctuations from laboratory personnel opening a door, or an eddy of warm air from the emission dynamometer caused the ambient temperature recorded to exceed the 76-86°F temperature limits. This, of course, resulted in a sizable number of voided emission tests.

2.4.2 Exhaust Emission Test

The dynamometer was previously warmed up for 15 minutes at 30 mph with a non-test vehicle if the dynamometer had not been used during the previous two hours. Dynamometer loading and inertia were set with a non-test vehicle immediately before the test vehicle was pushed on the dynamometer. Difficulties AESi experienced with exhaust emission test procedures were with temperature recording during the emission test. At the beginning of the program the recording thermocouple quite often reacted to warm air currents from the vehicle engine, thereby exceeding the 86°F maximum. This resulted in void tests until the problem was solved by shielding the fan to keep stray air currents as far away as possible.

The vehicle was started from a cold start in accordance with the vehicle owner's manual. Table 2.4-1 lists the cold start procedures that were followed.

TABLE 2.4-1

COLD START PROCEDURES
FOR IN-USE COMPLIANCE PROGRAM VEHICLES

General Motors: (Classes 01, 04, 13, 16, 19, 24, 26, 28, 31 for 1972 through 1974 model years)

1. Fully depress accelerator pedal and release slowly.

2. Start engine by turning ignition key to start position. If engine fails to start, repeat step No. 1.

3. Do not "kick-down" accelerator (not required).

Ford: (Classes 03, 05, 07, 10, 12, 14 for 1973 through 1974 model years)

1. Turn key to "on".

2. Fully depress accelerator pedal and release pedal slowly.

3. Start engine by turning ignition key to start position. If engine fails to start, repeat step No. 1.

4. Do not "kick-down" accelerator (not required).

Chrysler: (Classes 02, 09 for 1973 through 1974 model years)

1. Do not turn key to "on" until ready to start.

2. Fully depress accelerator pedal and release pedal slowly.

3. Start engine by turning igntion key to start positon. If engine fails to start, repeat step No. 1

4. Three to five seconds after engine starts, for automatic transmission depress accelerator slowly and then release completely. Place vehicle in gear 15 seconds after engine starts. No "kick-down' for manual transmission.

American Motors: (Class 27 for 1973 model year)

1. Place transmission in neutral for automatic transmission, or depress clutch for manual transmission.

2. Depress accelerator pedal one half or more and release slowly.

3. Start engine by turning ignition key to start position. If engine fails to start, repeat step No. 2.

TABLE 2.4-1 (continued)

4. Do not "kick-down" accelerator (not required).

5. Manual transmission shift points are 18 and 30 mph.

Toyota: (Class 27 for 1972 model year)

1. Fully depress accelerator pedal and release slowly.

2. Start engine by turning ignition key to start position. If engine fails to start, repeat step No. 1.

3. Do not "kick-down" accelerator (not required).

Audi: (Class 55 for 1973 model year)

1. Fully depress accelerator pedal and release slowly.

2. Start engine by turning ignition key to start positon. If engine fails to start, repeat step No. 1.

3. Do not "kick-down" accelerator (not required).

Datsun: (Class 38, 41 for 1973 model year)

1. Fully depress accelerator pedal and release slowly.

2. Start engine by turning ignition key to start position. If engine fails to start, repeat step No. 1.

3. Do not "kick-down" accelerator (not required).

Mazda: (Class 42 for 1973 model year)

1. Pull choke control to full-out position. Do not depress accelerator pedal.

2. Start engine by turning ignition key to start position.

3. When engine starts, push in choke control until engine runs at 1800+ RPM.

4. Run engine at this condition (step No. 3) for:
   a. Automatic transmission - 2 minutes (120 seconds)
   b. Manual transmission - 3 minutes (180 seconds)
   Then push choke control knob to full-in position.

TABLE 2.4-1 (continued)

Volkswagen: (Class 51 for 1973 model year)

1. Do not depress accelerator.

2. Start engine by turning ignition key to start position 3. If engine fails to start, repeat step No. 2.

3. Do not "kick-down" accelerator.

Volkswagen: (Class 15 for 1974 model year)

1. Fully depress accelerator pedal and release slowly.

2. Start engine by turning ignition key to start position. If engine fails to start, repeat step number 1.

3. Do not "kick-down" accelerator.

2.4.3 Vehicle Driveability

The following vehicle classes had poor vehicle driveability characteristics during the cold portions of the Federal Test Procedure:

1. Class 228
2. Class 310

The small engine displacement combined with the cold engine made following the driver's trace on the first acceleration very difficult. After engine warmup, these two classes were no more difficult to drive than any other vehicle engine class.

2.5 FACILITIES AND EQUIPMENT

2.5.1 Test Locations

Test facilities were located in the metropolitan areas of Los Angeles and St. Louis. In accordance with contractual requirements, both test facilities were located within ten miles of the metropolitan areas. The address and elevation above mean sea level of each facility is as follows:

Los Angeles
7300 Bolsa Avenue
Westminster, California 92683
50 feet

St. Louis
10723 Indianhead Boulevard
St. Louis, Missouri 63132
400 feet

2.5.2 Constant Volume Sampler

The equipment described in this section was designed and built in accordance with requirements stipulated in pertinent issues of the Federal Register for performing vehicle emission tests in accordance with the 1972 through 1975 Federal Test Procedures. An AESi-designed and fabricated constant volume sampler was utilized in each city. Each of these constant volume samplers featured a gas-to-water heat exchanger and temperature control circuit allowing for precise control of the sample temperature. Inlet pressure depression was adjusted by a precision butterfly valve enabling inlet pressure adjustments to within plus or minus 0.05 inches of water. Blower speed was maintained at a constant 1,125 revolutions per minute by the use of a constant speed motor. Blower revolutions were counted by the use of a magnetic pickup and an electronic counter. All function controls are pushbutton operated giving a confirming visual indication when each particular function is being performed. Table 2.5-1 lists the

TABLE 2.5-1

CONSTANT VOLUME SAMPLER - PERFORMANCE SPECIFICATIONS

Specification	CVS Performance
1. Must have two particulate filters plus one charcoal filter with a total pressure drop of less than 1" H_2O.	0.3"-0.4" H_2O
2. Tailpipe pressure within ±1" H_2O during driving cycle with CVS and without CVS.	+0.0"-0.55" H_2O as measured during the first 250 seconds of the Federal cycle. The static pressure tap was located 3-1/3" upstream from the end of the tailpipe.
3. Preheater to bring CVS within ±10°F of set point prior to test startup.	±2°F
4. A heat exchanger to maintain set point within ±10°F during the Federal test cycle.	±5°F
5. A positive displacement pump of 300 to 350 CFM capacity calibrated per Appendix	Sutorbilt 5LV running at 1125 RPM, producing approximately 343 CFM. See calibration section for calibration information.
6. Temperature sensor within ±2°F allowing continuous recording.	±2°F
7. Gauge (G1) with accuracy of ±3 mm Hg.	±0.2 mm Hg
8. Gauge (G2) with accuracy of ±3 mm Hg.	±0.2 mm Hg
9. Sample probes (S1 and S2).	Five specially designed probes (S1, S2, continuous S1 and S2 plus raw exhaust)
10. Filters (F1 and F2).	F1 and F2
11. Pumps (P1 and P2).	Stainless steel Metal Bellows pumps (P1 and P2) plus 1 to 3 additional pumps for other purposes.
12 & 13. Flow control valves (N1 and N2) and flowmeters (FL1 and FL2) to ensure constant sample flow.	Flowmeters (FL1 and FL2) with integral valves (N1 and N2) plus, in some cases, flow control pressure regulators.

TABLE 2.5-1 (Continued)

Specification	CVS Performance
14. Three-way solenoid valves (V1 and V2).	Stainless steel Skinner 3-way valves (V1 and V2)
15. Quick connect leak-tight fittings (C1 and C2) to connect sample bags to CVS, EAC, purge cylinder and evacuation pump.	Specially designed leak-tight pneumatic system using solenoid and/or rotary valves to perform sample and bag management without any fittings or make/break operations. This facilitates rapid and accurate sample analysis.
16. Sample collection bags of sufficient capacity.	Four large sample bags made of Tedlar. These bags can be analyzed, evacuated, purged and reevaluated in alternate pairs such that the 1975 procedure calling for six samples can be performed with four bags.
17. A revolution counter for pump revolutions.	Two revolution counters electrically latched to the sample solenoid valves. As a backup the elapsed time of each test phase is recorded. The blower is driven by a synchronous motor such that a blower RPM is constant. Thus; N = ET (RPM).

performance specification of the constant volume sampler. Listed on the left are the specifications as itemized under Section 85.073-20 of the Federal Register, and on the right the performance specifications of the constant volume sampler.

2.5.3 Exhaust Analysis Console (EAC)

The exhaust analysis consoles used during the performance of this program were designed in accordance with specifications stipulated in various Federal Registers for vehicle emission testing by the 1972 Federal Test Procedure. The instruments used in the exhaust analysis consoles were the Beckman Model 315A or 315B Nondispersive Infrared Analyzers (NDIR's) for the measurement of carbon monoxide and carbon dioxide. The carbon monoxide instrument featured a stacked sample cell configuration and three - range amplifier. The carbon dioxide analyzer contained the standard 1/8 inch sample cell with a three-range amplifier. Table 2.5-2 lists the performance specifications of the exhaust analysis consoles.

A Beckman Model 400 Flame Ionization Detector (FID) was utilized to measure total hydrocarbons. Each of the Model 400 Flame Ionization Detectors was operated with a 40 percent hydrogen/60 percent nitrogen fuel mixture and special capillary to minimize the oxygen effect.

The Thermo Electron Corporation Model 10A Chemiluminescence Analyzer was used for the measurement of NO and NO_x. This instrument was equipped with seven ranges from 0 to 10 through 0 to 10,000 ppm NO. A thermal converter was employed to convert NO_2 and other nitrogen oxides to NO. A Thermo Electron Corporation Model 100 NO_x generator was added to each EAC unit in performing NO_x converter efficiency determinations in accordance with 38 Federal Register 124, Section 85.074-23.

TABLE 2.5-2

EXHAUST ANALYSIS CONSOLE - PERFORMANCE SPECIFICATIONS

	Specification	AESi EAC Performance
1.	Quick-connect, leak-tight fitting (C3) to attach sample bags to analytical system.	Specially designed leak-tight system using solenoid valves to manage sample and background bag analysis without disturbing system fittings or seals.
2.	Filter (F3) to remove any residual particulate matter from the collected samples.	Three filters are used: one filter for the FID instrument, one filter for the NO_x instrument; and one filter for both the CO and CO_2 instruments.
3.	Pump (P3)	Three sample pumps are used aligned in the same manner as described above for the filters.
4.	Selector valves (V3, V4, and V5)	Selector valves and solenoid selector valves.
5.	Flow control valves to regulate the the gas flow rates.	Flow control valves and sample by-pass flow control valves.
6.	Flowmeters (FL3, FL4, and FL5)	Four flowmeters, one for each instrument and sample by-pass flowmeters.
7.	Manifold to collect expelled gases from each analyzer.	Manifold to collect expelled gases.
8.	Pump (P4) to transfer expelled gases to a vent external to the test room (optional).	Pump not necessary. Expelled gases are vented to outlet side of the CVS positive displacement pump, which is exhausted external to the test facility.
9.	Analyzers to determine hydrocarbon, carbon monoxide and oxides of nitrogen concentrations	Analyzers to determine hydrocarbon, carbon monoxide, oxides of nitrogen and carbon dioxide concentrations.
10.	An oxides of nitrogen converter to convert any NO_2 present in the samples to NO before analysis	An oxides of nitrogen converter to convert any NO_2 present in the samples to NO before analysis
11.	Selector valves (V6 and V7) to allow gases to bypass the converter.	Stainless steel solenoid selector valves to manage bypass of the oxides of nitrogen converter.
12.	Recorders (R1, R2 and R3)	Two Honeywell Model 193 potentiometric recorders were used in each EAC

Honeywell Model 193 Potentiometric Recorders were used in the exhaust analysis console to record all instrument signal outputs. Table 2.5-3 indicates the ranges used for each instrument.

2.5.4 Fuel Conditioning Cart

The AESi fuel conditioning cart used to condition test fuel was of the same design and manufacture as those used by the Environmental Protection Agency in the Ann Arbor facility. The fuel conditioning cart was capable of maintaining a bulk fuel temperature of 60°F or less, and of transferring fuel from one tank to another. It featured an internal fuel circulating mode to expedite gasoline temperature conditioning and to prevent temperature stratification within the tank. The cart was fabricated in accordance with the National Electric Code specifications for equipment operated in hazardous atmospheres.

2.5.5 Laboratory Standard Calibration Gases

Two complete sets of laboratory standard calibraton gases were furnished to AESi. The contents of each cylinder were analyzed and concentrations were assigned by the Office of Mobile Source Air Pollution Control of the Environmental Protection Agency in Ann Arbor. Each laboratory used the standard set of gases for defining the complete instrument calibration curves and for subsequent assigning of values to the day-by-day "working" gases. The laboratory standard gases and their nominal concentrations are tabulated in Table 2.5-4.

2.5.6 Chassis Dynamometer

A Clayton Variable Inertia Chassis Dynamometer (CE-50) equipped with 250-pound increment inertia loading weights and low bridge torque and speed measuring systems utilized in the CE-50 provided an overall accuracy within 1.0% of full scale. AESi has added a tachometer

TABLE 2.5-3

INSTRUMENT RANGES

Instrument	AESi Range No.	Nominal Range Concentrations
Hydrocarbon	1	0 - 300 ppm
	2	0 - 1,000 ppm
	3	0 - 3,000 ppm
	4	0 - 10,000 ppm
Carbon Monoxide	2	0 - 5.0 percent
	3	0 - 3.0 percent
	6	0 - 0.3 percent
Carbon Dioxide	2	0 - 8.0 percent
	3	0 - 4.0 percent
NO and NO_x	4	0 - 100 ppm
	5	0 - 250 ppm
	6	0 - 1,000 ppm
	7	0 - 2,000 ppm

TABLE 2.5-4

LABORATORY STANDARD CALIBRATION GASES
(Los Angeles)

Gas Cylinder	AESi Range	Nominal Concentration		
MH-851	3	.633	%	CO_2
A-12247	3	1.581	%	CO_2
MH-558	3	2.363	%	CO_2
A-9277	3	3.144	%	CO_2
A-8788	3	3.926	%	CO_2
A-12247	2	1.581	%	CO_2
MH-558	2	2.363	%	CO_2
A-8788	2	3.926	%	CO_2
A-6198	2	5.73	%	CO_2
MH-860	2	7.94	%	CO_2
A-8358	4	45.9	PPM	NO_x
A-10576	4	94.0	PPM	NO_x
A-10576	5	94.0	PPM	NO_x
A-11983	5	213.5	PPM	NO_x
A-4479	6	435	PPM	NO_x
A-12235	6	954	PPM	NO_x
A-12235	7	954	PPM	NO_x
A-8505	7	1,875	PPM	NO_x
A-10190	1	135.8	PPM	C
MH-871	1	282.5	PPM	C
A-10934	2	469.0	PPM	C
A-8702	2	917.6	PPM	C
A-9629	3	1,296	PPM	C
A-9238	3	2,662	PPM	C
MH-2506	4	4,286	PPM	C
A-6465	4	8,519	PPM	C
A-497	6	.0504	%	CO
A-1468	6	.1066	%	CO
MH-1627	6	.1695	%	CO
A-9149	6	.2313	%	CO
MH-872	6	.2991	%	CO
MH-1627	3	.1695	%	CO
MH-872	3	.2991	%	CO
A-12870	3	.551	%	CO
A-8818	3	1.595	%	CO
A-11955	3	2.588	%	CO
A-12870	2	.551	%	CO
A-8818	2	1.595	%	CO
A-11955	2	2.588	%	CO
A-3452	2	3.56	%	CO
A-9654	2	4.49	%	CO

TABLE 2.5-4
(Continued)

LABORATORY STANDARD CALIBRATION GASES
(St. Louis)

Gas Cylinder	AESi Range	Nominal Concentration		
A-12461	3	.620	%	CO_2
A-9335	3	1.596	%	CO_2
A-8794	3	2.370	%	CO_2
MH-1764	3	3.142	%	CO_2
A-11917	3	3.901	%	CO_2
A-9335	2	1.596	%	CO_2
A-8794	2	2.370	%	CO_2
A-11917	2	3.901	%	CO_2
MH-793	2	5.74	%	CO_2
A-10115	2	7.94	%	CO_2
A-7288	4	45.9	PPM	NO_x
MH-2486	4	93.75	PPM	NO_x
MH-2486	5	93.75	PPM	NO_x
A-12412	5	213.0	PPM	NO_x
A-12252	6	446	PPM	NO_x
A-2959	6	954	PPM	NO_x
A-2959	7	954	PPM	NO_x
A-13044	7	1,881	PPM	NO_x
A-10620	1	135.5	PPM	C
A-9332	1	280.1	PPM	C
A-9257	2	463.1	PPM	C
A-10920	2	916.3	PPM	C
A-7339	3	1,296	PPM	C
MH-109	3	2,686	PPM	C
MH-700	4	4,218	PPM	C
A-10816	4	8,515	PPM	C
A-7023	6	.0504	%	CO
MH-919	6	.1063	%	CO
MH-151	6	.1680	%	CO
MH-1073	6	.2298	%	CO
MH-1558	6	.2297	%	CO
MH-151	3	.1680	%	CO
MH-1558	3	.2997	%	CO
MH-773	3	.532	%	CO
MH-343	3	1.592	%	CO
A-9964	3	2.612	%	CO
MH-773	2	.532	%	CO
MH-343	2	1.592	%	CO
A-9964	2	2.612	%	CO
MH-969	2	3.54	%	CO
A-10993	2	4.52	%	CO

generator driven by the front roll to the CE-50 to operate the driver's aid chart and facilitate calibration. Throughout the course of the program the breakage of dynamometer belts delayed testing operations since the dynamometer required a period of conditioning the belts and then a calibration check. The St. Louis laboratory was particularly plagued by this problem.

2.5.7 Miscellaneous Equipment

In addition to the equipment previously described, Varian driver aids were utilized to provide driving schedules for the various driving sequences performed during this program. An Autoscan ignition analyzer, timing lights, tach-dwell meter, other tuneup equipment, and small tools were used as necessary. To measure idle carbon monoxide and hydrocarbons, a Horiba Mexa 300 dual range NDIR exhaust gas analyzer was used. The nominal concentration ranges for this instrument are 0-2% and 0-10% carbon monoxide, and 0-400 ppm and 0-2000 ppm hexane equivalents.

Precise weighing of propane recovery test cylinders was accomplished using a Sartorius Balance which can weigh up to 2.2 Kg with Class S weights which are traceable to the National Bureau of Standards. For less precise measurement, an O'Haus Scale with an accuracy of $\pm$ 50 mg was used.

Absolute pressure was measured with a Meriam Model 310EF10 Mercury Manometer incorporating a 0.01 inch of mercury vernier scale and a thermometer. Calibration is traceable to the National Bureau of Standards and is within 0.009 inch of mercury throughout the working range.

Temperature measurements were made with certified ASTM 64F or 50F thermometers or pyrometers and thermometers calibrated against the ASTM thermometers. Calibration is traceable to the National Bureau of Standards.

For calibration of the constant volume sampler, AESi used Meriam Model 50 MC2-6SF and Model 50 MC2-4SF laminar flow elements. Both of these instruments have calibration curves traceable to the National Bureau of Standards. Moreover, these instruments have been operated in series such that total measurement differences could be observed. These differences are less than 0.5%.

Instruments used to monitor the laminar flow elements include the temperature and pressure devices listed above plus inclined manometers (Meriam Models 40GD10 and 40HE35) for determining the pressure drop across the laminar flow element. The inclined manometers have calibrations which are traceable to the National Bureau of Standards.

2.6 EQUIPMENT QUALIFICATION, CALIBRATION AND CROSS CHECK

This section describes in detail the qualification, calibration and cross check procedures utilized by AESi and EPA technical personnel to ensure the generation of precise emission test data. The requirement for system qualification was ± 2 percent overall accuracy. This requirement encompassed the constant volume sampler, exhaust analysis console, the primary CVS flow calibration device, and a laboratory balance. In addition, the chassis dynamometer was calibrated by the coast-down technique stipulated in the Federal Register.

In addition to the initial qualifications in each of the cities, EPA personnel supervised periodic calibration and cross check procedures in each city during the course of the program. No tests were performed in either city before meeting the qualification or cross check requirements. Throughout the course of the program, AESi maintained a schedule for daily, weekly and monthly calibration and maintenance. This procedure included one hour each morning, plus four hours each week, plus eight hours each month to perform this function.

2.6.1 Constant Volume Sampler

AESi's CVS's were calibrated with the laminar flow elements and accessories by the basic procedure specified in the Federal Register.

In addition to measuring CVS flow at ten pressure differentials (Figure 2.6-1), AESi measured flow at several points at inlet temperatures above and below the set point temperature. During flow testing all possible variables were measured and accounted for. This included an important parameter--the temperature of manometer fluid in the barometer and the inclined manometer. Blower speed was verified by means of a 60 Hz strobe light. The inlet and outlet pressures and temperatures were varied over ranges which surround and include in every dimension, the set of conditions at which the CVS is operated during emission testing.

AUTOMOTIVE ENVIRONMENTAL SYSTEMS INC

CVS FLOW TEST

DESCRIPTION: ☒ INLET NOMINAL 110 °F T_P

☐ OUTLET T_P IND SET 1°F HIGHER PRIOR TO FLOW TEST

Prj. No.	Site	Date
	SFL	2-13-74

$V_o = (\Delta P_L \cdot 127 + 4) f T_M \cdot f T_L \cdot P_L \div P_P \cdot T_P \div 596250$

TECH JGS

P_A cor $H_2O'' = (-0.00135 \cdot T_A\,°F + 13.6912) P_A$ Hg"

SH 1 OF 2

STEP NO.	ΔP H_2O''	V_o Ft^3/Rev.	T_A °F	P_A Hg" / P_A cor H_2O''	ΔP_L H_2O''	T_M / $f T_M$	T_L / $f T_L$	☐+ P_L $\Delta H_2O''$ / ☐− P_L $\Delta H_2O''$	P_P $\Delta H_2O''$ / P_P $\Delta H_2O''$	T_P °F / T_P °R	TIME SET / READ
1 WOT	13.0	① ~~0.3521~~	72	29.01 / 394.34	2.82 ①	73 / 1.00	72.1 / .9933	3.64 − 2.82 / 393.3	11.2 / 383.1	108.5 / 568.5	11:30 / 12:17
2	15.0	0.2974			2.36	74.5 / 0.9984	71.4 / 0.9950	3.78 − 2.36 / 392.92	13.25 / 381.1	110.0 / 570.0	12:18 / 12:36
3	14.9	0.2987			2.32	74 / 0.9987	64.8 / 1.0169	3.73 − 2.32 / 392.90	13.2 / 381.1	108.5 / 568.5	12:36 / 12:40
4	20.0	0.2962			2.305	73.5 / 0.999	69.8 / 1.000	3.68 − 2.305 / 393.0	18.3 / 376.0	110.0 / 570.0	12:54 / 1:07
5	25.0	0.2928			2.245	73.5 / 0.999	70.0 / 1.000	3.59 − 2.24 / 393.0	23.4 / 370.9	110.5 / 570.5	1:08 / 1:23
6	30.0	0.2893			2.185	73.5 / 0.999	70.6 / 0.9983	3.50 − 2.18 / 393.1	28.35 / 365.99	112.0 / 572.0	1:32 / 1:52
7	35.0	0.2878			2.142	74.0 / 0.9987	70.0 / 1.000	3.42 − 2.142 / 393.1	33.5 / 360.84	111.5 / 571.5	1:55 / 2:20
8	30.0	0.2910			2.197	73.5 / 0.999	70.4 / 1.000	3.51 − 2.197 / 393.027	28.4 / 365.94	111.5 / 571.5	2:25 / 2:45
9	25.0	0.2913			2.242	73.5 / 0.999	70.6 / 0.9983	3.61 − 2.242 / 392.97	23.35 / 370.99	109.5 / 569.5	2:50 / 3:02
10	20.0	0.2952			2.302	73.5 / 0.999	70.8 / 0.9983	3.70 − 2.302 / 392.942	18.28 / 376.06	110.0 / 570.0	3:07 / 3:21
11	18.0	0.2958			2.322	74.0 / 0.9981	70.6 / 0.9983	3.737 − 2.322 / 392.925	16.25 / 378.09	110.0 / 570.0	3:28 / 3:41
①	FRONT FITTING ON LFE LOOSE										

FIGURE 2.6-1

39102

Before inviting EPA personnel to the test site for qualification, AESi performed propane recovery tests in the 0-300 ppm carbon range to ensure proper calibration. For inspecting EPA officers, AESi repeated propane recovery tests to EPA's satisfaction.

Since CVS calibration is critical, continuous checks had to be made. Propane recovery tests were performed in the 0-300 ppm carbon range before testing every day. If the test was not within ± 2 percent, the cause of error was determined, remedied, and duplicate propane tests within ± 2 percent were run before testing began.

The propane test results were plotted so that any upward or downward trend could be detected. When such a trend developed, the CVS was immediately recalibrated using a laminar flow element. The CVS was also leak checked every day. Periodically the pyrometer, pressure gauges and other CVS instruments were checked for calibration regardless of need indicated by propane tests. A log book was maintained for the CVS in which all repairs, alterations, calibrations and propane tests were recorded. During the course of the program, the St. Louis CVS system required recalibration on one occasion.

2.6.2 Exhaust Analysis Console (EAC)

Calibration and qualification of the Exhaust Analysis Console (EAC) was performed as stipulated in the Federal Register. Some of the procedures discussed here were performed prior to the arrival of the Project Officer. Prerequisite to qualification of the EAC was analysis of on-site laboratory gases by the Office of Mobile Source Air Pollution Control.

Items which were checked and verified prior to individual instrument calibration were the following: (1) total EAC leak check, (2) checked zero air quality with hydrocarbon-free air, (3) adjusted all analyzers to optimize performance as specified by individual instrument manuals, and (4) checked response times for all instruments. The

following paragraphs describe individual analyzer optimization procedures and qualification items.

Hydrocarbon Analyzer (Beckman Model 400)

1. Obtain maximum sensitivity using the following method:
   a. Set fuel pressure to approximately 25 psig.
   b. Set air pressure to approximately 15 psig.
   c. Light burner (allow 30 minutes for warmup).
   d. Set sample pressure to approximately 4 psig.
   e. Flow zero grade air and set zero on meter or recorder.
   f. Flow mid-range calibration gas.
   g. With calibration gas flowing through instrument, adjust air pressure to obtain maximum upscale reading.
   h. Adjust sample pressure to obtain maximum reading and best response.
2. Develop instrument curves for ranges 0-300, 0-1000, 0-3000, and 0-10,000 ppm.
3. Verify results graphically.

Carbon Monoxide Analyzer (Beckman Model 315A or 315B)

1. Check and/or adjust instrument tuning.
2. Check and/or adjust demodulator switching pattern.
3. Check instrument response to water and 100% carbon dioxide (CO_2) on range 3.
4. Develop instrument curves for ranges 0-0.3, 0-3.0, and 0-5.0 percent.
5. Verify curve results graphically.

Carbon Dioxide Analyzer (Beckman Model 315A or 315B)

1. Check and/or adjust instrument tuning.
2. Check and/or adjust demodulator switching pattern.
3. Develop instrument curves for ranges 0-4.0 and 0-8.0 percent.
4. Verify curve results graphically.

Oxides of Nitrogen Analyzer (TECo Model 10A)

1. Verify reaction chamber pressure to be in the 5-12 torr range.
2. Check response time through thermal converter versus bypass of thermal converter.

3. Develop instrument curves for ranges 0-100, 0-250, 0-1000, and 0-2000 ppm. (Preliminary converter efficiency check can be performed during curve development.)
4. Converter efficiency checks were performed as described in 38 Federal Register 124, June 28, 1973, Section 85.074-23.

EAC daily and weekly checks which were performed and recorded are described below:

Daily Check

1. Leak check of HC, CO, CO_2 and NO instruments.
2. NO vacuum check.
3. HC analyzer - zero and span.
4. CO analyzer - zero, gain and tune.
5. CO_2 analyzer - zero, gain and tune.
6. NO analyzer gain.

Weekly Check

1. Individual instrument curve check of each range used.
2. Converter efficiency.
3. CO response to 100% wet CO_2.

2.6.3 Chassis Dynamometer

The Clayton CE-50 dynamometers were calibrated by the coast-down technique specified in 37 Federal Register 221. A precision tachometer generator was fitted to the absorption rolls for this purpose. AESi performed the coast-down at several power settings and over the entire range of inertia values. The driver's aid was adjusted to match the correct speed according to a 30- and a 60-Hz strobe light. Dynamometer calibration data was plotted graphically on a Dynamometer Road Load (DRL) form (Figure 2.6-2).

Periodic coast-down calibration checks were performed on each dynamometer. If the data points did not lie within tolerance (1% of full scale or 1/2 hp) of the standing calibration curve, the entire calibration curve set was rerun. A log book and curve file were maintained on all dynamometers.

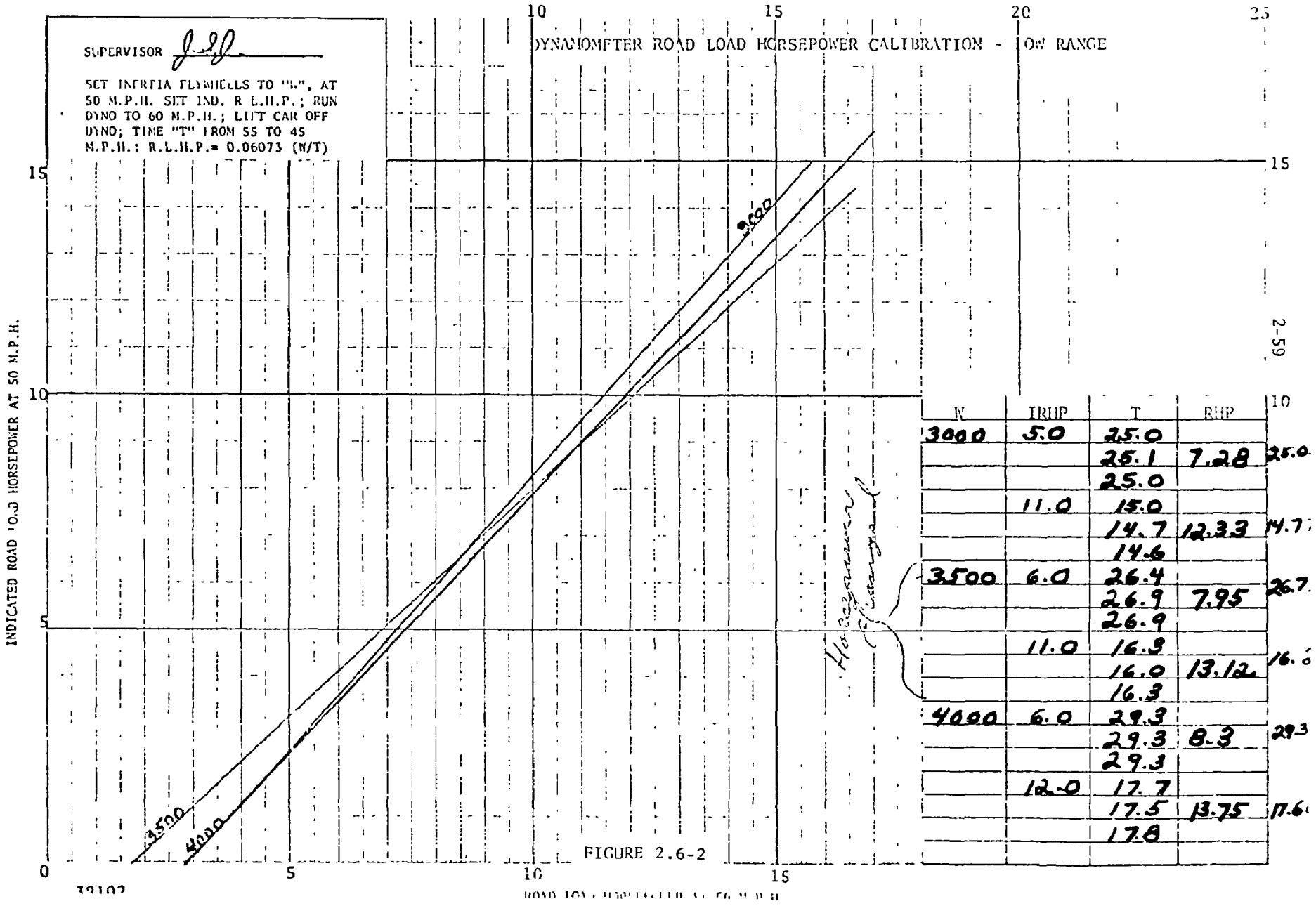
AESI
AUTOMOTIVE ENVIRONMENTAL SYSTEMS INC

DRL

Proj. No.	Sit	Date
2090		5-10-71

SUPERVISOR

SET INERTIA FLYWHEELS TO "6", AT 50 M.P.H. SET IND. R.L.H.P.; RUN DYNO TO 60 M.P.H.; LIFT CAR OFF DYNO; TIME "T" FROM 55 TO 45 M.P.H.: R.L.H.P.= 0.06073 (W/T)



W	IRHP	T	RHP	
3000	5.0	25.0		
		25.1	7.28	25.0
		25.0		
	11.0	15.0		
		14.7	12.33	14.7
		14.6		
3500	6.0	26.4		
		26.9	7.95	26.7
		26.9		
	11.0	16.3		
		16.0	13.12	16.0
		16.3		
4000	6.0	29.3		
		29.3	8.3	29.3
		29.3		
	12.0	17.7		
		17.5	13.75	17.6
		17.8		

Horsepower Calibration

FIGURE 2.6-2

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2.7 DATA HANDLING

2.7.1 Data Collection

Several data forms used in past programs were modified for the In-Use Compliance Program. The Test Data Sheet (Figure 2.7-1), arranged in keypunch format, contained necessary vehicle information, plus the raw data generated during the emissions test. Figure 2.7-2 is the Daily Instrument and CVS System Check form for recording system calibration check data. Used in conjunction with the Daily Check form is the Propane Recovery Test form (Figure 2.7-3) and the Converter Efficiency Test form (Figure 2.7-4) for recording CVS calibration and NO_x converter efficiency data. In addition to the daily systems checks, weekly and monthly checks (Figure 2.7-5) were performed to ensure each instrument curve remained within the limits originally developed.

For each test performed a separate file was maintained for all paper work dealing with that specific test. This file traveled with the vehicle through the several functional areas. When the vehicle was returned to its owner, the file was submitted to the Data Handling Department for further processing.

2.7.2 Data Review

Before a vehicle file was submitted to Data Handling, each task supervisor (Procurement, I&M, and Testing, in addition to the Laboratory Manager) was expected to review data generated in his area (see Figure 2.4-1). As vehicle file folders were received in Data Handling, they were coded, calculations performed, and all forms were reviewed manually. In addition, data contained on computer cards was subjected to a computerized edit before being forwarded to EPA.

2.7.3 Computer Operations

To develop instrument curves, EPA's curve program, BZERO, modified for AESi's formats, was used. This FORTRAN program generates all instrument curves using a second order polynomial method of least squares equation. All curve generation was performed via terminal entry of data to an IBM System 360 Model 67 located in Sunnyvale, California, functioning under National CSS's own operating system which is fully compatible with IBM's OS/360.

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

LICENSE # _____ VIN _____

TEST DATA SHEET

	PRJ NO	CAR NO	RUN NO	DATE	TIME	YR	MAKE	MODEL	VTP
01									

	CID	BBL	TRN	INRT	CURB WT	GVW		RDHP	DB	WB	BARO	CYL	A/C	EVP	EXH	PCV
01							02									

	ODOMR	FLC	FX	FV	HUCF	PIC	TEC	DRI	TVP	ENG	10'		IRPM	D-N	DWEL
02												03			

	IGNT A	RPM	TTAD	MECA		HC	CO	CO_2	NO	NO_x	NO_2
03					04						

		HC		CO		CO_2		NO_x		NO						
COLD TRANSIENT		R	DEF.	R	DEF.	R	DEF.	R	DEF.	R	DEF.	TEMP	PRESS	COUNT	DELTA P	MPH
11	S															
12	B															

		R	DEF.	R	DEF.	R	DEF.	R	DEF.	R	DEF.	TEMP	PRESS	COUNT	DELTA P	MPH
COLD STABILIZED.																
13	S															
14	B															

		HC		CO		CO_2		NO_x		NO						
HOT TRANSIENT.		R	DEF.	R	DEF	R	DEF	R	DEF	R	DEF	TEMP	PRESS	COUNT	DELTA P	MPH
15	S															
16	B															

		R	DEF.	R	DEF	R	DEF.	R	DEF.	R	DEF.	TEMP	PRESS	COUNT	DELTA P	MPH
HOT STABILIZED.																
17	S															
18	B															

PIC

Preconditioning Completed _____

Data Reviewed _____

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Figure 2.7-1

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

Prj.No.	Site	Date

DAILY CVS & EAC

DAILY EAC

DATE	LEAK CHECK				VAC CHECK		FID		CO			CO_2			NO	SHED FID		FID PRESSURE			SHED FID PRESS.			PIC
	HC	CO	CO_2	NO	NO	NOx	ZERO	GAIN	ZERO	GAIN	TUNE	ZERO	GAIN	TUNE	GAIN	ZERO	GAIN	SMPL	FUEL	AIR	SMPL	FUEL	AIR	

DAILY CVS

DATE	LEAK CHECK							BKGD BAG		SMPL BAG		PROPANE TEST				D/A		PIC
	B1	B2	S1	S2	S3	S4	CONT	DEF.	DEF.	DEF.	DEF.	Gp	HC	Δ	%E	50		

MAINTENANCE _____

Figure 2.7-2

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC

Prj.#	Site	Date

PRT

CVS # ___ PROPANE RECOVERY TEST # ___

Tech: _____

E.T.: _____

ΔP: _____

$13.586 \cdot P_A$ ____ " Hg - P_p ____ " H_2O + T_p ____ °R $\cdot$ 2.2454 $\cdot V_o$ ____ Ft^3/Rev $\cdot$ N ____ Rev $\cdot 10^{-5}$

$\cdot PPM_c^*$ = HCM ____ g $\div \frac{GP^{**}}{100}$ = ____ % Recovery = 100 ± 2? _____ PASS

FID Def.	PPM_c
S1 ____	____
B1 ____	____
Net PPM_c^* =	____

____	Cyl. Full
____	Cyl. Empty
____	= Net GP**

EXPLANATION: _____

_____

_____ Figure 2.7-3 _____

1074 R

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS INC.

Figure 2.7-4

Prj.No.	Site	Date

CET

CONVERTER EFFICIENCY TEST FOR CHEMILUMINESCENT CONVERTERS

CI Name _____ Range _____ PPM

Converter Temperature _____ °C

Barometric Pressure _____ "Hg

Operator _____

[NO] Cyl. No. _____ Vendor _____

Concentration _____ PPM NO/N_2

[AIR]/[O_2] Cyl. No. _____ Vendor _____

Test Sequence		Reading
Step	Description	
1	Converter in Bypass Mode Flow NO/N_2 Flow Rate _____ SCFM Calibration Pot Set _____	_____
2	Flow O_2 until reading equals 90% of 1.	_____
3	Turn on Ozonator and adjust powerstat to produce reading which is 20% of 2.	Avg. _____ ±
4	Converter to convert mode Read stable NO_x value	_____
5	Turn off Ozonator Record stable reading	_____
6	Shut off O_2 and record final NO reading.	_____

Perform the following calculation for percent conversion.

$$\% \text{ Efficiency} = \frac{[2 - 5] + [4 - 3]}{[2 - 3]} \times 100\%$$

$$= \frac{[\quad - \quad] + [\quad - \quad]}{[\quad - \quad]} \times 100\%$$

$$= \frac{\qquad + \qquad}{} \times 100\%$$

Eff. = _____ %

AESi
AUTOMOTIVE ENVIRONMENTAL SYSTEMS INC

Sq. No.	Prj. No.	Site	Date

WEEKLY CHECK

INST	AES1 RANGE	RANGE	SPAN		MID RANGE		MID RANGE		MID RANGE		MID RANGE		WORKING GAS		CYLINDER #	DATE	P.I.C
			CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.			
FID	2	10															
	3	100															
	4	1000															
CO	1	1-H															
	2	2-H															
	3	3-H															
	4	1-L															
	5	2-L															
	6	3-L															
CO_2	1	1															
	2	2															
	3	3															
NO-NO_x	4	100															
	5	250															
	6	1000															

	CONVERTER CHECK		
	DEF. START	DEF. END	TIME E.T.
NO			
NO_x			

	SHED LEAK CHECK		
	DEF. START	DEF. END	TIME E.T.
FID			

	100% CO_2 DEF.	WET 100% CO_2
CO		

MASTER CURVE

EFF RUN #_____

Figure 2.7-5

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To perform mass calculations, NCSS's Sunnyvale facility was used as well as Synalysis, Inc.'s IBM System /3 located adjacent to AESi's Westminster laboratory. The computerized edit program used to screen for logical errors on computer cards was operated solely on NCSS. Converting test data from AESi's format to EPA's format could be done by either NCSS or Synalysis to minimize down-time.

3. INVALID TESTS

Due to the nature of the program, the number of invalid tests performed was relatively high. Appendix D lists each invalid test by city, class, series number, and AESi run number, and gives the reason for which the data was rejected.

APPENDIX A

VEHICLE SAMPLING

Los Angeles and St. Louis

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class SUMMARY Test Site Los Angeles

a.	Total number of introductory letters		3,045
b.	Total number of telephone calls		1,416
	1st call	1,122	
	2nd call	278	
	3rd call	10	
	4th call	6	
c.	Total number of personal contacts		804
	1st contact	751	
	2nd contact	43	
	3rd contact	10	
	4th contact	0	
d.	Total number of vehicles rejected		271
	telephone	211	
	personal contact	37	
	field	3	
	laboratory	20	
e.	Total number of vehicles tested		326
f.	Total number of vehicle owners with no telephone or with unlisted telephone numbers		1,007
	33.1 Percent of total number of introductory letters mailed		
g.	Total number of vehicles which were leased or non-privately owned		872
	28.6 Percent of total number of introductory letters mailed		
h.	Total number of vehicle owners unable to contact		777
	Total number of vehicle owners who refused		579
	Total number of vehicle owners who moved		474
	Total number of vehicles sold		507
	Total number of vehicles rejected for mechanical problems		176
	Total number of vehicles rejected for maintenance		89
	Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation		49

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 2 27 Test Site Los Angeles

a. Total number of introductory letters 141

b. Total number of telephone calls 65

1st call	43
2nd call	22
3rd call	0
4th call	0

c. Total number of personal contacts 42

1st contact	38
2nd contact	2
3rd contact	2
4th contact	0

d. Total number of vehicles rejected 7

telephone	7
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 42

29.8 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 10

7.1 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 34
Total number of vehicle owners who refused 33
Total number of vehicle owners who moved 37
Total number of vehicles sold 10
Total number of vehicles rejected for mechanical problems 4
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 228 Test Site Los Angeles

a. Total number of introductory letters 196

b. Total number of telephone calls 62

1st call	48
2nd call	14
3rd call	0
4th call	0

c. Total number of personal contacts 52

1st contact	49
2nd contact	2
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 14

telephone	10
personal contact	3
field	0
laboratory	1

e. Total number of vehicles tested 14

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 72

36.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 43

21.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 82
Total number of vehicle owners who refused 27
Total number of vehicle owners who moved 36
Total number of vehicles sold 20
Total number of vehicles rejected for mechanical problems 7
Total number of vehicles rejected for maintenance 6
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 301 Test Site Los Angeles

a. Total number of introductory letters 129

b. Total number of telephone calls 92

1st call	78
2nd call	14
3rd call	0
4th call	0

c. Total number of personal contacts 17

1st contact	17
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 10

telephone	9
personal contact	1
field	0
laboratory	0

e. Total number of vehicles tested 14

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 35

27.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 67

51.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 20
Total number of vehicle owners who refused 34
Total number of vehicle owners who moved 14
Total number of vehicles sold 32
Total number of vehicles rejected for mechanical problems 5
Total number of vehicles rejected for maintenance 5
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 302 Test Site Los Angeles

a. Total number of introductory letters 139

b. Total number of telephone calls 60

1st call	35
2nd call	15
3rd call	5
4th call	5

c. Total number of personal contacts 58

1st contact	58
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 16

telephone	11
personal contact	4
field	0
laboratory	1

e. Total number of vehicles tested 18

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 79

56.8 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 51

36.7 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 31
Total number of vehicle owners who refused 28
Total number of vehicle owners who moved 22
Total number of vehicles sold 23
Total number of vehicles rejected for mechanical problems 12
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 303 Test Site Los Angeles

a. Total number of introductory letters 101

b. Total number of telephone calls 62

1st call	50
2nd call	12
3rd call	0
4th call	0

c. Total number of personal contacts 39

1st contact	36
2nd contact	2
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 9

telephone	5
personal contact	4
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 51

50.5 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 36

35.6 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 20
Total number of vehicle owners who moved 23
Total number of vehicles sold 29
Total number of vehicles rejected for mechanical problems 3
Total number of vehicles rejected for maintenance 6
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 304 Test Site Los Angeles

a. Total number of introductory letters 199

b. Total number of telephone calls 70

1st call	58
2nd call	10
3rd call	2
4th call	0

c. Total number of personal contacts 66

1st contact	61
2nd contact	5
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 8

telephone	6
personal contact	2
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 90

45.2 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 45

22.6 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 63
Total number of vehicle owners who refused 62
Total number of vehicle owners who moved 20
Total number of vehicles sold 26
Total number of vehicles rejected for mechanical problems 4
Total number of vehicles rejected for maintenance 4
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 305 Test Site Los Angeles

a. Total number of introductory letters 145

b. Total number of telephone calls 89

1st call	70
2nd call	19
3rd call	0
4th call	0

c. Total number of personal contacts 28

1st contact	25
2nd contact	3
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 10

telephone	8
personal contact	0
field	0
laboratory	2

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 31

21.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 94

64.8 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 26
Total number of vehicle owners who refused 30
Total number of vehicle owners who moved 16
Total number of vehicles sold 45
Total number of vehicles rejected for mechanical problems 4
Total number of vehicles rejected for maintenance 6
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 307 Test Site Los Angeles

a. Total number of introductory letters 200

b. Total number of telephone calls 108

1st call	100
2nd call	8
3rd call	0
4th call	0

c. Total number of personal contacts 65

1st contact	64
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 15

telephone	12
personal contact	1
field	0
laboratory	2

e. Total number of vehicles tested 12

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 53

26.5 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 126

63.0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 27
Total number of vehicle owners who refused 43
Total number of vehicle owners who moved 21
Total number of vehicles sold 77
Total number of vehicles rejected for mechanical problems 5
Total number of vehicles rejected for maintenance 8
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 310 Test Site Los Angeles

a. Total number of introductory letters 152

b. Total number of telephone calls 76

1st call	62
2nd call	14
3rd call	0
4th call	0

c. Total number of personal contacts 40

1st contact	33
2nd contact	7
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 8

telephone	5
personal contact	1
field	0
laboratory	2

e. Total number of vehicles tested 15

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 58

38.2 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 59

38.8 Percent of total number of introductory letters mailed

h.

Total number of vehicle owners unable to contact	34
Total number of vehicle owners who refused	27
Total number of vehicle owners who moved	25
Total number of vehicles sold	37
Total number of vehicles rejected for mechanical problems	4
Total number of vehicles rejected for maintenance	2
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation	0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 312 Test Site Los Angeles

a. Total number of introductory letters 202

b. Total number of telephone calls 97

1st call	89
2nd call	8
3rd call	0
4th call	0

c. Total number of personal contacts 36

1st contact	34
2nd contact	2
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 7

telephone	7
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 54

26.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 111

55.0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 69
Total number of vehicle owners who refused 48
Total number of vehicle owners who moved 13
Total number of vehicles sold 45
Total number of vehicles rejected for mechanical problems 5
Total number of vehicles rejected for maintenance 2
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 313 Test Site Los Angeles

a. Total number of introductory letters 160

b. Total number of telephone calls 66

1st call	52
2nd call	14
3rd call	0
4th call	0

c. Total number of personal contacts 37

1st contact	36
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 6

telephone	5
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 18

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 37

23.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 38

23.8 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 56
Total number of vehicle owners who refused 25
Total number of vehicle owners who moved 28
Total number of vehicles sold 25
Total number of vehicles rejected for mechanical problems 1
Total number of vehicles rejected for maintenance 5
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 324 Test Site Los Angeles

a. Total number of introductory letters 76

b. Total number of telephone calls 40

1st call	30
2nd call	10
3rd call	0
4th call	0

c. Total number of personal contacts 36

1st contact	36
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 5

telephone	3
personal contact	2
field	0
laboratory	0

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 36

47.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 10

13.2 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 19
Total number of vehicle owners who moved 17
Total number of vehicles sold 12
Total number of vehicles rejected for mechanical problems 3
Total number of vehicles rejected for maintenance 5
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 326 Test Site Los Angeles

a. Total number of introductory letters 90

b. Total number of telephone calls 48

1st call	35
2nd call	12
3rd call	1
4th call	0

c. Total number of personal contacts 24

1st contact	18
2nd contact	5
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 6

telephone	5
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 15

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 32

35.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 13

14.4 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 10
Total number of vehicle owners who refused 10
Total number of vehicle owners who moved 19
Total number of vehicles sold 19
Total number of vehicles rejected for mechanical problems 2
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 9

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 327 Test Site Los Angeles

a. Total number of introductory letters 65

b. Total number of telephone calls 45

1st call	30
2nd call	15
3rd call	0
4th call	0

c. Total number of personal contacts 20

1st contact	20
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 5

telephone	4
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 23

35.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 15

23.1 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 3
Total number of vehicle owners who refused 13
Total number of vehicle owners who moved 7
Total number of vehicles sold 17
Total number of vehicles rejected for mechanical problems 1
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 1

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 331 Test Site Los Angeles

a. Total number of introductory letters 114

b. Total number of telephone calls 54

1st call	42
2nd call	12
3rd call	0
4th call	0

c. Total number of personal contacts 21

1st contact	19
2nd contact	2
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 5

telephone	5
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 64

56.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 29

25.4 Percent of total number of introductory letters mailed

h.

Total number of vehicle owners unable to contact	17
Total number of vehicle owners who refused	24
Total number of vehicle owners who moved	12
Total number of vehicles sold	17
Total number of vehicles rejected for mechanical problems	2
Total number of vehicles rejected for maintenance	3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation	29

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 338 Test Site Los Angeles

a. Total number of introductory letters 227

b. Total number of telephone calls 48

1st call	31
2nd call	17
3rd call	0
4th call	0

c. Total number of personal contacts 58

1st contact	56
2nd contact	1
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 49

telephone	30
personal contact	17
field	2
laboratory	0

e. Total number of vehicles tested 4

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 58

25.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 48

21.2 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 110
Total number of vehicle owners who refused 15
Total number of vehicle owners who moved 30
Total number of vehicles sold 7
Total number of vehicles rejected for mechanical problems 45
Total number of vehicles rejected for maintenance 12
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 341 Test Site Los Angeles

a. Total number of introductory letters 85

b. Total number of telephone calls 47

1st call	34
2nd call	10
3rd call	2
4th call	1

c. Total number of personal contacts 20

1st contact	19
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 8

telephone	8
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 38

44.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 3

3.5 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 18
Total number of vehicle owners who refused 14
Total number of vehicle owners who moved 22
Total number of vehicles sold 3
Total number of vehicles rejected for mechanical problems 6
Total number of vehicles rejected for maintenance 2
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 342 Test Site Los Angeles

a.	Total number of introductory letters		89
b.	Total number of telephone calls		52
	1st call	42	
	2nd call	10	
	3rd call	0	
	4th call	0	
c.	Total number of personal contacts		28
	1st contact	25	
	2nd contact	2	
	3rd contact	1	
	4th contact	0	
d.	Total number of vehicles rejected		9
	telephone	6	
	personal contact	1	
	field	0	
	laboratory	2	
e.	Total number of vehicles tested		16
f.	Total number of vehicle owners with no telephone or with unlisted telephone numbers		37
	41.6	Percent of total number of introductory letters mailed	
g.	Total number of vehicles which were leased or non-privately owned		4
	4.5	Percent of total number of introductory letters mailed	
h.	Total number of vehicle owners unable to contact		9
	Total number of vehicle owners who refused		24
	Total number of vehicle owners who moved		20
	Total number of vehicles sold		9
	Total number of vehicles rejected for mechanical problems		5
	Total number of vehicles rejected for maintenance		2
	Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation		0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 349 Test Site Los Angeles

a.	Total number of introductory letters		139
b.	Total number of telephone calls		60
	1st call	44	
	2nd call	16	
	3rd call	0	
	4th call	0	
c.	Total number of personal contacts		34
	1st contact	31	
	2nd contact	2	
	3rd contact	1	
	4th contact	0	
d.	Total number of vehicles rejected		11
	telephone	8	
	personal contact	0	
	field	0	
	laboratory	3	
e.	Total number of vehicles tested		19
f.	Total number of vehicle owners with no telephone or with unlisted telephone numbers		34
	24.5 Percent of total number of introductory letters mailed		
g.	Total number of vehicles which were leased or non-privately owned		36
	25.9 Percent of total number of introductory letters mailed		
h.	Total number of vehicle owners unable to contact		33
	Total number of vehicle owners who refused		37
	Total number of vehicle owners who moved		17
	Total number of vehicles sold		12
	Total number of vehicles rejected for mechanical problems		2
	Total number of vehicles rejected for maintenance		6
	Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation		3

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 351 Test Site Los Angeles

a. Total number of introductory letters 150

b. Total number of telephone calls 57

1st call	44
2nd call	13
3rd call	0
4th call	0

c. Total number of personal contacts 22

1st contact	20
2nd contact	1
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 5

telephone	4
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 22

14.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 3

2.0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 71
Total number of vehicle owners who refused 23
Total number of vehicle owners who moved 21
Total number of vehicles sold 13
Total number of vehicles rejected for mechanical problems 3
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 355 Test Site Los Angeles

a. Total number of introductory letters 197

b. Total number of telephone calls 92

1st call	88
2nd call	4
3rd call	0
4th call	0

c. Total number of personal contacts 48

1st contact	45
2nd contact	2
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 53

telephone	52
personal contact	0
field	1
laboratory	0

e. Total number of vehicles tested 7

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 48

24.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 23

11.7 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 57
Total number of vehicle owners who refused 15
Total number of vehicle owners who moved 44
Total number of vehicles sold 21
Total number of vehicles rejected for mechanical problems 52
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 7

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 356 Test Site Los Angeles

a. Total number of introductory letters 49

b. Total number of telephone calls 26

1st call	17
2nd call	9
3rd call	0
4th call	0

c. Total number of personal contacts 13

1st contact	11
2nd contact	2
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 5

telephone	1
personal contact	1
field	0
laboratory	3

e. Total number of vehicles tested 8

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 13

26.5 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 8

16.3 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 7
Total number of vehicle owners who refused 7
Total number of vehicle owners who moved 10
Total number of vehicles sold 8
Total number of vehicles rejected for mechanical problems 1
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class SUMMARY Test Site St. Louis

a.	Total number of introductory letters		2,889
b.	Total number of telephone calls		3,104
	1st call	2,159	
	2nd call	541	
	3rd call	255	
	4th call	149	
c.	Total number of personal contacts		367
	1st contact	310	
	2nd contact	45	
	3rd contact	9	
	4th contact	3	
d.	Total number of vehicles rejected		822
	telephone	691	
	personal contact	101	
	field	9	
	laboratory	21	
e.	Total number of vehicles tested		423
f.	Total number of vehicle owners with no telephone or with unlisted telephone numbers		367
	12.7	Percent of total number of introductory letters mailed	
g.	Total number of vehicles which were leased or non-privately owned		506
	17.5	Percent of total number of introductory letters mailed	
h.	Total number of vehicle owners unable to contact		241
	Total number of vehicle owners who refused		524
	Total number of vehicle owners who moved		175
	Total number of vehicles sold		569
	Total number of vehicles rejected for mechanical problems		661
	Total number of vehicles rejected for maintenance		16
	Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation		250

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 227 Test Site St. Louis

a. Total number of introductory letters 58

b. Total number of telephone calls 61

1st call	38
2nd call	14
3rd call	5
4th call	4

c. Total number of personal contacts 9

1st contact	8
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 6

telephone	5
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 14

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 12

20.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 13
Total number of vehicle owners who refused 7
Total number of vehicle owners who moved 9
Total number of vehicles sold 7
Total number of vehicles rejected for mechanical problems 6
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 228 Test Site St. Louis

a. Total number of introductory letters 51

b. Total number of telephone calls 78

1st call	43
2nd call	17
3rd call	9
4th call	9

c. Total number of personal contacts 10

1st contact	9
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 22

telephone	17
personal contact	0
field	4
laboratory	1

e. Total number of vehicles tested 4

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 6

11.8 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 1

2.0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 9
Total number of vehicle owners who refused 6
Total number of vehicle owners who moved 3
Total number of vehicles sold 11
Total number of vehicles rejected for mechanical problems 17
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 1

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 301 Test Site St. Louis

a. Total number of introductory letters 74

b. Total number of telephone calls 112

1st call	70
2nd call	18
3rd call	12
4th call	12

c. Total number of personal contacts 4

1st contact	4
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 5

telephone	5
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 4

5.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 6
Total number of vehicle owners who refused 17
Total number of vehicle owners who moved 2
Total number of vehicles sold 24
Total number of vehicles rejected for mechanical problems 5
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 302 Test Site St. Louis

a. Total number of introductory letters 61

b. Total number of telephone calls 35

1st call	29
2nd call	5
3rd call	1
4th call	0

c. Total number of personal contacts 8

1st contact	8
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 4

telephone	3
personal contact	0
field	1
laboratory	0

e. Total number of vehicles tested 18

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 8

13.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 13

21.3 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 11
Total number of vehicle owners who refused 12
Total number of vehicle owners who moved 5
Total number of vehicles sold 11
Total number of vehicles rejected for mechanical problems 4
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 303 Test Site St. Louis

a. Total number of introductory letters 60

b. Total number of telephone calls 86

1st call	54
2nd call	18
3rd call	11
4th call	3

c. Total number of personal contacts 10

1st contact	5
2nd contact	4
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 9

telephone	9
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 6

10.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 11

18.3 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 1
Total number of vehicle owners who refused 12
Total number of vehicle owners who moved 6
Total number of vehicles sold 12
Total number of vehicles rejected for mechanical problems 6
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 304 Test Site St. Louis

a. Total number of introductory letters 56

b. Total number of telephone calls 84

1st call	53
2nd call	26
3rd call	4
4th call	1

c. Total number of personal contacts 0

1st contact	0
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 7

telephone	7
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 8

14.3 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 2
Total number of vehicle owners who refused 13
Total number of vehicle owners who moved 3
Total number of vehicles sold 11
Total number of vehicles rejected for mechanical problems 7
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 10

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 305 Test Site St. Louis

a. Total number of introductory letters 85

b. Total number of telephone calls 67

1st call	62
2nd call	3
3rd call	1
4th call	1

c. Total number of personal contacts 17

1st contact	16
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 6

telephone	6
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 17

20.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 23

27.1 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 3
Total number of vehicle owners who refused 21
Total number of vehicle owners who moved 13
Total number of vehicles sold 22
Total number of vehicles rejected for mechanical problems 6
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 307 Test Site St. Louis

a. Total number of introductory letters 118

b. Total number of telephone calls 110

1st call	92
2nd call	12
3rd call	6
4th call	0

c. Total number of personal contacts 12

1st contact	12
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 45

telephone	42
personal contact	0
field	0
laboratory	3

e. Total number of vehicles tested 14

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 17

14.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 66

55.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 4
Total number of vehicle owners who refused 19
Total number of vehicle owners who moved 7
Total number of vehicles sold 30
Total number of vehicles rejected for mechanical problems 40
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 3

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 309 Test Site St. Louis

a. Total number of introductory letters 64

b. Total number of telephone calls 79

1st call	56
2nd call	9
3rd call	7
4th call	7

c. Total number of personal contacts 5

1st contact	4
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 48

telephone	44
personal contact	4
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 17

26.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 7

10.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 13
Total number of vehicle owners who refused 20
Total number of vehicle owners who moved 2
Total number of vehicles sold 6
Total number of vehicles rejected for mechanical problems 7
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 310 Test Site St. Louis

a. Total number of introductory letters 72

b. Total number of telephone calls 79

1st call	47
2nd call	19
3rd call	7
4th call	6

c. Total number of personal contacts 24

1st contact	19
2nd contact	5
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 9

telephone	6
personal contact	3
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 17

23.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 5
Total number of vehicle owners who refused 13
Total number of vehicle owners who moved 7
Total number of vehicles sold 19
Total number of vehicles rejected for mechanical problems 5
Total number of vehicles rejected for maintenance 3
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 312 Test Site St. Louis

a. Total number of introductory letters 107

b. Total number of telephone calls 137

1st call	109
2nd call	17
3rd call	6
4th call	5

c. Total number of personal contacts 15

1st contact	14
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 21

telephone	13
personal contact	8
field	0
laboratory	0

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 16

15.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 55

51.4 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 3
Total number of vehicle owners who refused 36
Total number of vehicle owners who moved 3
Total number of vehicles sold 32
Total number of vehicles rejected for mechanical problems 13
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 313 Test Site St. Louis

a. Total number of introductory letters 81

b. Total number of telephone calls 118

1st call	61
2nd call	25
3rd call	17
4th call	15

c. Total number of personal contacts 21

1st contact	21
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 9

telephone	8
personal contact	0
field	0
laboratory	1

e. Total number of vehicles tested 15

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 12

14.8 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 10

12.4 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 5
Total number of vehicle owners who refused 14
Total number of vehicle owners who moved 20
Total number of vehicles sold 17
Total number of vehicles rejected for mechanical problems 7
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 1

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 324 Test Site St. Louis

a. Total number of introductory letters 86

b. Total number of telephone calls 85

1st call	73
2nd call	5
3rd call	4
4th call	3

c. Total number of personal contacts 4

1st contact	4
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 11

telephone	8
personal contact	0
field	0
laboratory	3

e. Total number of vehicles tested 10

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 7

8.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 3
Total number of vehicle owners who refused 23
Total number of vehicle owners who moved 5
Total number of vehicles sold 32
Total number of vehicles rejected for mechanical problems 8
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 3

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 326 Test Site St. Louis

a. Total number of introductory letters 43

b. Total number of telephone calls 56

1st call	32
2nd call	14
3rd call	7
4th call	3

c. Total number of personal contacts 8

1st contact	8
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 6

telephone	4
personal contact	0
field	1
laboratory	1

e. Total number of vehicles tested 15

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 8

18.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 8
Total number of vehicle owners who moved 7
Total number of vehicles sold 7
Total number of vehicles rejected for mechanical problems 4
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 1

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 327 Test Site St. Louis

a. Total number of introductory letters 51

b. Total number of telephone calls 66

1st call	39
2nd call	16
3rd call	7
4th call	4

c. Total number of personal contacts 15

1st contact	15
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 11

telephone	6
personal contact	5
field	0
laboratory	0

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 15

29.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 5
Total number of vehicle owners who moved 7
Total number of vehicles sold 6
Total number of vehicles rejected for mechanical problems 11
Total number of vehicles rejected for maintenance 2
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 331 Test Site St. Louis

a. Total number of introductory letters 55

b. Total number of telephone calls 47

1st call	34
2nd call	7
3rd call	4
4th call	2

c. Total number of personal contacts 9

1st contact	8
2nd contact	1
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 9

telephone	5
personal contact	4
field	0
laboratory	0

e. Total number of vehicles tested 13

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 7

12.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 1
Total number of vehicle owners who refused 15
Total number of vehicle owners who moved 5
Total number of vehicles sold 11
Total number of vehicles rejected for mechanical problems 8
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 338 Test Site St. Louis

a. Total number of introductory letters 45

b. Total number of telephone calls 30

1st call	17
2nd call	8
3rd call	3
4th call	2

c. Total number of personal contacts 3

1st contact	3
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 9

telephone	8
personal contact	0
field	1
laboratory	0

e. Total number of vehicles tested 0

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 10

22.2 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 4
Total number of vehicle owners who refused 1
Total number of vehicle owners who moved 3
Total number of vehicles sold 2
Total number of vehicles rejected for mechanical problems 35
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

VEHICLE SAMPLING

Vehicle Engine Class 341 Test Site St. Louis

a. Total number of introductory letters 41

b. Total number of telephone calls 42

1st call	28
2nd call	11
3rd call	3
4th call	0

c. Total number of personal contacts 3

1st contact	3
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 1

telephone	1
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 13

31.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 12
Total number of vehicle owners who refused 3
Total number of vehicle owners who moved 4
Total number of vehicles sold 3
Total number of vehicles rejected for mechanical problems 1
Total number of vehicles rejected for maintenance 1
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 342 Test Site St. Louis

a. Total number of introductory letters 7

b. Total number of telephone calls 7

1st call	6
2nd call	1
3rd call	0
4th call	0

c. Total number of personal contacts 1

1st contact	1
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 0

telephone	0
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 3

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 1

14.3 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 3
Total number of vehicle owners who moved 0
Total number of vehicles sold 1
Total number of vehicles rejected for mechanical problems 0
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 349 Test Site St. Louis

a. Total number of introductory letters 200

b. Total number of telephone calls 30

1st call	28
2nd call	2
3rd call	0
4th call	0

c. Total number of personal contacts 0

1st contact	0
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 19

telephone	16
personal contact	0
field	0
laboratory	3

e. Total number of vehicles tested 0

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 2

1.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 2

1.0 Percent of total number of introductory letters mailed

h.

Total number of vehicle owners unable to contact	0
Total number of vehicle owners who refused	1
Total number of vehicle owners who moved	5
Total number of vehicles sold	3
Total number of vehicles rejected for mechanical problems	19
Total number of vehicles rejected for maintenance	0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation	172

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 351 Test Site St. Louis

a. Total number of introductory letters 14

b. Total number of telephone calls 20

1st call	10
2nd call	6
3rd call	3
4th call	1

c. Total number of personal contacts 5

1st contact	5
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 1

telephone	1
personal contact	0
field	0
laboratory	0

e. Total number of vehicles tested 5

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 5

35.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 0
Total number of vehicle owners who refused 2
Total number of vehicle owners who moved 6
Total number of vehicles sold 0
Total number of vehicles rejected for mechanical problems 1
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 355 Test Site St. Louis

a. Total number of introductory letters 60

b. Total number of telephone calls 66

1st call	42
2nd call	15
3rd call	6
4th call	3

c. Total number of personal contacts 4

1st contact	4
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 54

telephone	48
personal contact	4
field	0
laboratory	2

e. Total number of vehicles tested 8

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 9

15.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 5

8.3 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 9
Total number of vehicle owners who refused 5
Total number of vehicle owners who moved 9
Total number of vehicles sold 7
Total number of vehicles rejected for mechanical problems 22
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 356 Test Site St. Louis

a. Total number of introductory letters 56

b. Total number of telephone calls 100

1st call	60
2nd call	20
3rd call	15
4th call	5

c. Total number of personal contacts 17

1st contact	14
2nd contact	3
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 45

telephone	28
personal contact	
field	
laboratory	

e. Total number of vehicles tested 12

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 14

25.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 5

8.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 10
Total number of vehicle owners who refused 15
Total number of vehicle owners who moved 7
Total number of vehicles sold 8
Total number of vehicles rejected for mechanical problems 2
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 401 Test Site St. Louis

a. Total number of introductory letters 159

b. Total number of telephone calls 206

1st call	171
2nd call	20
3rd call	9
4th call	6

c. Total number of personal contacts 39

1st contact	27
2nd contact	6
3rd contact	4
4th contact	2

d. Total number of vehicles rejected 44

telephone	28
personal contact	15
field	0
laboratory	1

e. Total number of vehicles tested 25

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 25

15.7 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 63

39.6 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 10
Total number of vehicle owners who refused 20
Total number of vehicle owners who moved 6
Total number of vehicles sold 52
Total number of vehicles rejected for mechanical problems * 46
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

*3 vehicles were stolen from the vehicle owners

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 402 Test Site St. Louis

a. Total number of introductory letters 225

b. Total number of telephone calls 264

1st call	168
2nd call	62
3rd call	25
4th call	9

c. Total number of personal contacts 20

1st contact	18
2nd contact	2
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 167

telephone	150
personal contact	14
field	2
laboratory	1

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 20

8.9 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 101

44.9 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 25
Total number of vehicle owners who refused 28
Total number of vehicle owners who moved 6
Total number of vehicles sold 48
Total number of vehicles rejected for mechanical problems 98
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 412/414 Test Site St. Louis

a. Total number of introductory letters 312

b. Total number of telephone calls 385

1st call	273
2nd call	60
3rd call	34
4th call	18

c. Total number of personal contacts 25

1st contact	20
2nd contact	3
3rd contact	2
4th contact	0

d. Total number of vehicles rejected 100

telephone	93
personal contact	6
field	0
laboratory	1

e. Total number of vehicles tested 25

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 40

12.8 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 77

24.7 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 31
Total number of vehicle owners who refused 63
Total number of vehicle owners who moved 9
Total number of vehicles sold 86
Total number of vehicles rejected for mechanical problems 94
Total number of vehicles rejected for maintenance 4
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 413 Test Site St. Louis

a. Total number of introductory letters 52

b. Total number of telephone calls 88

1st call	43
2nd call	26
3rd call	11
4th call	8

c. Total number of personal contacts 10

1st contact	8
2nd contact	2
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 23

telephone	15
personal contact	6
field	0
laboratory	2

e. Total number of vehicles tested 19

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 8

15.4 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 0

0 Percent of total number of introductory letters mailed

h.

Total number of vehicle owners unable to contact	0
Total number of vehicle owners who refused	11
Total number of vehicle owners who moved	1
Total number of vehicles sold	5
Total number of vehicles rejected for mechanical problems	14
Total number of vehicles rejected for maintenance	0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation	2

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 415 Test Site St. Louis

a. Total number of introductory letters 125

b. Total number of telephone calls 103

1st call	92
2nd call	7
3rd call	2
4th call	2

c. Total number of personal contacts 14

1st contact	14
2nd contact	0
3rd contact	0
4th contact	0

d. Total number of vehicles rejected 42

telephone	37
personal contact	5
field	0
laboratory	0

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 10

8.0 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 17

13.6 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 10
Total number of vehicle owners who refused 11
Total number of vehicle owners who moved 5
Total number of vehicles sold 14
Total number of vehicles rejected for mechanical problems 68
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 0

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 416 Test Site St. Louis

a. Total number of introductory letters 217

b. Total number of telephone calls 155

1st call	113
2nd call	25
3rd call	10
4th call	7

c. Total number of personal contacts 32

1st contact	20
2nd contact	10
3rd contact	1
4th contact	1

d. Total number of vehicles rejected 20

telephone	16
personal contact	4
field	0
laboratory	0

e. Total number of vehicles tested 16

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 10

4.6 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 49

22.6 Percent of total number of introductory letters mailed

h.

Total number of vehicle owners unable to contact	16
Total number of vehicle owners who refused	52
Total number of vehicle owners who moved	2
Total number of vehicles sold	35
Total number of vehicles rejected for mechanical problems	38
Total number of vehicles rejected for maintenance	0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation	56

APPENDIX A

VEHICLE SAMPLING

Vehicle Engine Class 419 Test Site St. Louis

a. Total number of introductory letters 254

b. Total number of telephone calls 308

1st call	216
2nd call	53
3rd call	26
4th call	13

c. Total number of personal contacts 23

1st contact	18
2nd contact	4
3rd contact	1
4th contact	0

d. Total number of vehicles rejected 69

telephone	62
personal contact	6
field	0
laboratory	1

e. Total number of vehicles tested 17

f. Total number of vehicle owners with no telephone or with unlisted telephone numbers 23

9.1 Percent of total number of introductory letters mailed

g. Total number of vehicles which were leased or non-privately owned 1

0.4 Percent of total number of introductory letters mailed

h. Total number of vehicle owners unable to contact 43
Total number of vehicle owners who refused 68
Total number of vehicle owners who moved 8
Total number of vehicles sold 47
Total number of vehicles rejected for mechanical problems 69
Total number of vehicles rejected for maintenance 0
Total number of vehicle owners who were sent letters but no attempt was made to solicit their participation 1

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Los Angeles and St. Louis

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. SUMMARY

Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	86
2. Fuel Tank & Lines	1	1	2
3. Idle Stop Solenoid	-	3	1
4. Carburetor Choke & Accelerator Linkage	-	4	-
5. Fuel Vapor Inlet Filter	1	1	55
6. Fuel Hoses & Vapor Lines	-	1	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	1	9	7
9. Crankcase Inlet Air Cleaner	5	1	74
10. Air Cleaner Element	-	-	203
11. Thermostatically Controlled Air Cleaner	-	2	-
12. A.I.R. System	-	-	2
13. EGR System	2	4	3
14. Electrical Heads & Vacuum Hoses	-	14	1
15. Exhaust System	-	2	1
16. Radiator Core	-	1	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	22	-	3
19. Engine Coolant Strength	8	1	1
20. Radiator Pressure Cap	-	-	4
21. Ignition Point Dwell	145	-	-
22. Ignition Timing	183	-	-
23. Idle CO	291	-	-
24. Idle RPM	309	-	-
25. Ignition Points	-	-	23
26. Ignition Condenser	-	-	9
27. Wires	-	-	17
28. Cap	-	-	18
29. Rotor	-	-	29

TOTAL NUMBER OF CARS TESTED = 326

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 227 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	8
10. Air Cleaner Element	-	-	-
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	1
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	14	-	-
23. Idle CO	15	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 228 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	1	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	8
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	9
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	1
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	2	-
15. Exhaust System	-	-	-
16. Radiator Core	-	1	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	4	-	-
22. Ignition Timing	6	-	-
23. Idle CO	12	-	-
24. Idle RPM	12	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	-
27. Wires	-	-	1
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 14

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 301 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	6
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	1	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	6
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	7
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	6	-	-
23. Idle CO	14	-	-
24. Idle RPM	13	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 14

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 302 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	2
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	1	-	12
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	4	1	-
10. Air Cleaner Element	-	-	11
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	-	-	-
22. Ignition Timing	8	-	-
23. Idle CO	18	-	-
24. Idle RPM	18	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	2
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 18

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 303 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	3
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	9
10. Air Cleaner Element	-	-	8
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	1	1	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	2	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	1
21. Ignition Point Dwell	6	-	-
22. Ignition Timing	9	-	-
23. Idle CO	13	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 304 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	4
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	2
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	7	-	-
23. Idle CO	16	-	-
24. Idle RPM	13	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	-
27. Wires	1	-	1
28. Cap	-	-	-
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 305 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	5
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	14
10. Air Cleaner Element	-	-	12
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	1	-	1
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	4	-	-
19. Engine Coolant Strength	3	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	6	-	-
22. Ignition Timing	11	-	-
23. Idle CO	14	-	-
24. Idle RPM	15	-	-
25. Ignition Points	-	-	3
26. Ignition Condenser	-	-	2
27. Wires	-	-	2
28. Cap	-	-	2
29. Rotor	-	-	5

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 307 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	2
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	11
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	1
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	1
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	10	-	-
23. Idle CO	12	-	-
24. Idle RPM	12	-	-
25. Ignition Points	-	-	3
26. Ignition Condenser	-	-	2
27. Wires	-	-	4
28. Cap	-	-	1
29. Rotor	-	-	6

TOTAL NUMBER OF CARS TESTED = 12

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 310 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	-
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	1	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	13
10. Air Cleaner Element	-	-	12
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	1	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	11	-	-
22. Ignition Timing	12	-	-
23. Idle CO	14	-	-
24. Idle RPM	14	-	-
25. Ignition Points	-	-	4
26. Ignition Condenser	-	-	1
27. Wires	-	-	-
28. Cap	-	-	3
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 15

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 312 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	7
2. Fuel Tank & Lines	-	-	1
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	13
10. Air Cleaner Element	-	-	12
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	3	1
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	12	-	-
23. Idle CO	13	-	-
24. Idle RPM	15	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 313 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	8
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	3
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	15
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	13	-	-
22. Ignition Timing	11	-	-
23. Idle CO	18	-	-
24. Idle RPM	17	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 18

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 324 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	8
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	1
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	2
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	3	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	10	-	-
23. Idle CO	16	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	3

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 326 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	9
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	1	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	4
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	11
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	11	-	-
23. Idle CO	15	-	-
24. Idle RPM	15	-	-
25. Ignition Points	-	-	4
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	3

TOTAL NUMBER OF CARS TESTED = 15

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 327 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	6
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	8
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	1	9	2
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	16
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	1
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	3	-	-
19. Engine Coolant Strength	2	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	5	-	-
22. Ignition Timing	9	-	-
23. Idle CO	18	-	-
24. Idle RPM	19	-	-
25. Ignition Points	-	-	4
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	2
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 331 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	1	8
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	1	5
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	9
11. Thermostatically Controlled Air Cleaner	-	2	-
12. A.I.R. System	-	-	1
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	8	-	-
23. Idle CO	16	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	2
27. Wires	-	-	3
28. Cap	-	-	1
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 338 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	2
2. Fuel Tank & Lines	-	-	1
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	3
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	2	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	1	-	-
22. Ignition Timing	4	-	-
23. Idle CO	4	-	-
24. Idle RPM	4	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	1
27. Wires	-	-	1
28. Cap	-	-	1
29. Rotor	-	-	2

TOTAL NUMBER OF CARS TESTED = 4

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 341 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	3
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	1
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	2	-	-
22. Ignition Timing	8	-	-
23. Idle CO	15	-	-
24. Idle RPM	14	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	2
29. Rotor	-	-	3

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 342 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	3
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	7
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	1
19. Engine Coolant Strength	-	1	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	5	-	-
22. Ignition Timing	3	-	-
23. Idle CO	9	-	-
24. Idle RPM	15	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 349 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	1	2
2. Fuel Tank & Lines	1	1	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	5
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	9
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	1	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	9	-	-
23. Idle CO	18	-	-
24. Idle RPM	18	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	1
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 351 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	-
2. Fuel Tank & Lines	-	-	1
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	11
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	7	-	-
23. Idle CO	7	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 355 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	2
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	6
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	2	-
15. Exhaust System	-	-	1
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	2	-	-
22. Ignition Timing	3	-	-
23. Idle CO	7	-	-
24. Idle RPM	7	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 7

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 356 Test Site Los Angeles

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	4
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	1	-	6
10. Air Cleaner Element	-	-	5
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	1
19. Engine Coolant Strength	-	-	1
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	5	-	-
22. Ignition Timing	5	-	-
23. Idle CO	7	-	-
24. Idle RPM	8	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	1
27. Wires	-	-	3
28. Cap	-	-	1
29. Rotor	-	-	2

TOTAL NUMBER OF CARS TESTED = 8

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. SUMMARY

Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	110
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	39
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	87	14
9. Crankcase Inlet Air Cleaner	1	32	81
10. Air Cleaner Element	-	1	202
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	2	-	-
13. EGR System	-	-	18
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	1	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	14	2	-
19. Engine Coolant Strength	6	1	-
20. Radiator Pressure Cap	-	-	23
21. Ignition Point Dwell	183	-	-
22. Ignition Timing	206	-	-
23. Idle CO	256	-	-
24. Idle RPM	263	-	-
25. Ignition Points	-	-	129
26. Ignition Condenser	-	-	122
27. Wires	-	-	22
28. Cap	-	-	7
29. Rotor	-	-	7

TOTAL NUMBER OF CARS TESTED = 423

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 227 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	4
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	7
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	10	-	-
23. Idle CO	11	-	-
24. Idle RPM	12	-	-
25. Ignition Points	-	-	5
26. Ignition Condenser	-	-	1
27. Wires	-	-	1
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 14

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 228 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	3
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	4
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	2
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	-
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	3	-	-
22. Ignition Timing	2	-	-
23. Idle CO	4	-	-
24. Idle RPM	4	-	-
25. Ignition Points	-	-	3
26. Ignition Condenser	-	-	2
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 4

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 301 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	8
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	14
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	15	-	-
22. Ignition Timing	15	-	-
23. Idle CO	17	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	12
26. Ignition Condenser	-	-	12
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 302 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	17
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	17	-
10. Air Cleaner Element	-	1	13
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	2
14. Electrical Heads & Vacuum Hoses	-	1	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	1	-	-
22. Ignition Timing	5	-	-
23. Idle CO	18	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 18

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 303 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	7
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	13	-
9. Crankcase Inlet Air Cleaner	-	-	14
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	4
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	3	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	3
21. Ignition Point Dwell	12	-	-
22. Ignition Timing	12	-	-
23. Idle CO	12	-	-
24. Idle RPM	14	-	-
25. Ignition Points	-	-	11
26. Ignition Condenser	-	-	11
27. Wires	-	-	1
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 304 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	6
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	16
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	2	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	7	-	-
23. Idle CO	15	-	-
24. Idle RPM	12	-	-
25. Ignition Points	-	-	9
26. Ignition Condenser	-	-	9
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 305 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	10
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	14	2
9. Crankcase Inlet Air Cleaner	-	-	17
10. Air Cleaner Element	-	-	15
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	1
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	1
21. Ignition Point Dwell	14	-	-
22. Ignition Timing	18	-	-
23. Idle CO	16	-	-
24. Idle RPM	19	-	-
25. Ignition Points	-	-	11
26. Ignition Condenser	-	-	10
27. Wires	-	-	5
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 307 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	7
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	10	3
9. Crankcase Inlet Air Cleaner	-	-	14
10. Air Cleaner Element	-	-	12
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	2
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	1	-	-
19. Engine Coolant Strength	2	-	-
20. Radiator Pressure Cap	-	-	1
21. Ignition Point Dwell	14	-	-
22. Ignition Timing	14	-	-
23. Idle CO	14	-	-
24. Idle RPM	14	-	-
25. Ignition Points	-	-	10
26. Ignition Condenser	-	-	10
27. Wires	-	-	2
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 14

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 309 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	16
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	1	15	-
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	4
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	-	-	-
22. Ignition Timing	7	-	-
23. Idle CO	16	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 310 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	8
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	12	-
9. Crankcase Inlet Air Cleaner	-	-	14
10. Air Cleaner Element	-	-	12
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	14	-	-
22. Ignition Timing	14	-	-
23. Idle CO	12	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	9
26. Ignition Condenser	-	-	8
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 312 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	7
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	14	1
9. Crankcase Inlet Air Cleaner	-	-	13
10. Air Cleaner Element	-	-	11
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	3
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	2	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	3
21. Ignition Point Dwell	13	-	-
22. Ignition Timing	13	-	-
23. Idle CO	16	-	-
24. Idle RPM	17	-	-
25. Ignition Points	-	-	10
26. Ignition Condenser	-	-	10
27. Wires	-	-	1
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 313 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	10
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	1
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	13
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	1	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	10	-	-
22. Ignition Timing	10	-	-
23. Idle CO	14	-	-
24. Idle RPM	13	-	-
25. Ignition Points	-	-	10
26. Ignition Condenser	-	-	10
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 15

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 324 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	9
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	1
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	10
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	1	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	6	-	-
23. Idle CO	10	-	-
24. Idle RPM	10	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	8
27. Wires	-	-	8
28. Cap	-	-	1
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 10

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 326 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	10
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	7
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	3
21. Ignition Point Dwell	8	-	-
22. Ignition Timing	12	-	-
23. Idle CO	15	-	-
24. Idle RPM	14	-	-
25. Ignition Points	-	-	4
26. Ignition Condenser	-	-	4
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 15

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 327 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	4
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	8
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	19	4
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	16
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	3	-	-
19. Engine Coolant Strength	1	-	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	13	-	-
22. Ignition Timing	12	-	-
23. Idle CO	15	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	8
26. Ignition Condenser	-	-	8
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 331 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	5
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	1
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	11
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	1	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	10	-	-
23. Idle CO	12	-	-
24. Idle RPM	12	-	-
25. Ignition Points	-	-	9
26. Ignition Condenser	-	-	9
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 13

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 341 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	1	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	9
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	1	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	15	-	-
22. Ignition Timing	15	-	-
23. Idle CO	15	-	-
24. Idle RPM	16	-	-
25. Ignition Points	-	-	8
26. Ignition Condenser	-	-	3
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 342 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	1
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	1	-	-
22. Ignition Timing	1	-	-
23. Idle CO	3	-	-
24. Idle RPM	2	-	-
25. Ignition Points	-	-	1
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	1
29. Rotor	-	-	1

TOTAL NUMBER OF CARS TESTED = 3

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 351 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	1
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	1
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	5	-	-
22. Ignition Timing	5	-	-
23. Idle CO	5	-	-
24. Idle RPM	5	-	-
25. Ignition Points	-	-	3
26. Ignition Condenser	-	-	1
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 5

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 355 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	2
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	-	-
9. Crankcase Inlet Air Cleaner	-	-	-
10. Air Cleaner Element	-	-	5
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	-
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	-
21. Ignition Point Dwell	2	-	-
22. Ignition Timing	4	-	-
23. Idle CO	7	-	-
24. Idle RPM	8	-	-
25. Ignition Points	-	-	-
26. Ignition Condenser	-	-	-
27. Wires	-	-	-
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 8

APPENDIX B

SUMMARY OF VEHICLE MAINTENANCE

Class No. 356 Test Site St. Louis

Item Inspected	Type of Maintenance		
	Number Adjusted	Number Repaired	Number Replaced
1. Fuel Filter	-	-	5
2. Fuel Tank & Lines	-	-	-
3. Idle Stop Solenoid	-	-	-
4. Carburetor Choke & Accelerator Linkage	-	-	-
5. Fuel Vapor Inlet Filter	-	-	-
6. Fuel Hoses & Vapor Lines	-	-	-
7. Evaporative Emissions Canister	-	-	-
8. PCV Valve & System	-	5	1
9. Crankcase Inlet Air Cleaner	-	-	9
10. Air Cleaner Element	-	-	9
11. Thermostatically Controlled Air Cleaner	-	-	-
12. A.I.R. System	-	-	-
13. EGR System	-	-	2
14. Electrical Heads & Vacuum Hoses	-	-	-
15. Exhaust System	-	-	-
16. Radiator Core	-	-	-
17. Air Conditioner Condenser Core	-	-	-
18. Engine Coolant Level	-	-	-
19. Engine Coolant Strength	-	-	-
20. Radiator Pressure Cap	-	-	2
21. Ignition Point Dwell	9	-	-
22. Ignition Timing	11	-	-
23. Idle CO	9	-	-
24. Idle RPM	11	-	-
25. Ignition Points	-	-	6
26. Ignition Condenser	-	-	6
27. Wires	-	-	4
28. Cap	-	-	-
29. Rotor	-	-	-

TOTAL NUMBER OF CARS TESTED = 12

APPENDIX C

STATE OF VEHICLE TUNE

St. Louis

APPENDIX C

STATE OF VEHICLE TUNE

Class No. SUMMARY Test Site ST. LOUIS

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	25	0
2. Fuel Tank & Lines	138	0
3. Thermostatically Controlled Air Cleaner	102	0
4. Carburetor Choke & Accelerator Linkage	121	0
5. EGR System	39	3
6. PCV System	17	0
7. Exhaust System	138	0
8. Radiator Core	121	0
9. Air Conditioner Condenser Core	108	0
10. Engine Coolant Level	119	2
11. Engine Coolant Strength	120	1
12. Radiator Pressure Cap	117	4
13. Limiter Caps	90	31
14. Dwell	78	32
15. Timing	52	86
16. Centrifugal Advance	114	24
17. Vacuum Advance	91	47
18. Idle CO	69	69
19. Idle RPM	23	115
20. Points	30	8

(1974 ONLY) TOTAL NUMBER OF CARS TESTED = 138

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 401 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	--
2. Fuel Tank & Lines	25	--
3. Thermostatically Controlled Air Cleaner	25	--
4. Carburetor Choke & Accelerator Linkage	25	--
5. EGR System	--	--
6. PCV System	--	--
7. Exhaust System	25	--
8. Radiator Core	25	--
9. Air Conditioner Condenser Core	24	--
10. Engine Coolant Level	25	--
11. Engine Coolant Strength	24	1
12. Radiator Pressure Cap	24	1
13. Limiter Caps	21	4
14. Dwell	21	4
15. Timing	10	15
16. Centrifugal Advance	12	13
17. Vacuum Advance	19	6
18. Idle CO	16	9
19. Idle RPM	2	23
20. Points	--	--

TOTAL NUMBER OF CARS TESTED = 25

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 402 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	--
2. Fuel Tank & Lines	19	--
3. Thermostatically Controlled Air Cleaner	--	--
4. Carburetor Choke & Accelerator Linkage	19	--
5. EGR System	--	--
6. PCV System	--	--
7. Exhaust System	19	--
8. Radiator Core	19	--
9. Air Conditioner Condenser Core	16	--
10. Engine Coolant Level	19	--
11. Engine Coolant Strength	19	--
12. Radiator Pressure Cap	19	--
13. Limiter Caps	9	10
14. Dwell	--	--
15. Timing	15	4
16. Centrifugal Advance	17	2
17. Vacuum Advance	17	2
18. Idle CO	0	19
19. Idle RPM	4	15
20. Points	--	--

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 412 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	8	-
2. Fuel Tank & Lines	8	-
3. Thermostatically Controlled Air Cleaner	-	-
4. Carburetor Choke & Accelerator Linkage	8	-
5. EGR System	6	2
6. PCV System	-	
7. Exhaust System	8	-
8. Radiator Core	8	
9. Air Conditioner Condenser Core	8	-
10. Engine Coolant Level	7	1
11. Engine Coolant Strength	8	
12. Radiator Pressure Cap	5	3
13. Limiter Caps	5	3
14. Dwell	6	2
15. Timing	2	6
16. Centrifugal Advance	6	2
17. Vacuum Advance	1	7
18. Idle CO	5	3
19. Idle RPM	2	6
20. Points	6	1

TOTAL NUMBER OF CARS TESTED = 8

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 413 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	--
2. Fuel Tank & Lines	19	--
3. Thermostatically Controlled Air Cleaner	19	--
4. Carburetor Choke & Accelerator Linkage	19	--
5. EGR System	--	--
6. PCV System	--	--
7. Exhaust System	19	--
8. Radiator Core	19	--
9. Air Conditioner Condenser Core	10	--
10. Engine Coolant Level	19	--
11. Engine Coolant Strength	19	--
12. Radiator Pressure Cap	19	--
13. Limiter Caps	9	10
14. Dwell	9	10
15. Timing	9	10
16. Centrifugal Advance	16	3
17. Vacuum Advance	3	16
18. Idle CO	2	17
19. Idle RPM	1	18
20. Points	--	--

TOTAL NUMBER OF CARS TESTED = 19

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 414 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	17	--
2. Fuel Tank & Lines	17	--
3. Thermostatically Controlled Air Cleaner	17	--
4. Carburetor Choke & Accelerator Linkage	17	--
5. EGR System	16	1
6. PCV System	--	--
7. Exhaust System	17	--
8. Radiator Core	17	--
9. Air Conditioner Condenser Core	17	--
10. Engine Coolant Level	16	1
11. Engine Coolant Strength	17	--
12. Radiator Pressure Cap	17	--
13. Limiter Caps	14	3
14. Dwell	16	1
15. Timing	1	16
16. Centrifugal Advance	16	1
17. Vacuum Advance	8	9
18. Idle CO	15	2
19. Idle RPM	0	17
20. Points	16	1

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 415 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	---
2. Fuel Tank & Lines	17	--
3. Thermostatically Controlled Air Cleaner	--	--
4. Carburetor Choke & Accelerator Linkage	--	--
5. EGR System	--	--
6. PCV System	--	--
7. Exhaust System	17	--
8. Radiator Core	--	--
9. Air Conditioner Condenser Core	--	--
10. Engine Coolant Level	--	--
11. Engine Coolant Strength	--	--
12. Radiator Pressure Cap	--	--
13. Limiter Caps	--	--
14. Dwell	13	4
15. Timing	4	13
16. Centrifugal Advance	17	--
17. Vacuum Advance	17	--
18. Idle CO	5	12
19. Idle RPM	7	10
20. Points	--	--

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 416 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	--
2. Fuel Tank & Lines	16	--
3. Thermostatically Controlled Air Cleaner	16	--
4. Carburetor Choke & Accelerator Linkage	16	--
5. EGR System	--	--
6. PCV System	--	--
7. Exhaust System	16	--
8. Radiator Core	16	--
9. Air Conditioner Condenser Core	16	--
10. Engine Coolant Level	16	--
11. Engine Coolant Strength	16	--
12. Radiator Pressure Cap	16	--
13. Limiter Caps	16	--
14. Dwell	12	--
15. Timing	7	9
16. Centrifugal Advance	15	1
17. Vacuum Advance	15	1
18. Idle CO	12	4
19. Idle RPM	2	14
20. Points	--	--

TOTAL NUMBER OF CARS TESTED = 16

APPENDIX C

STATE OF VEHICLE TUNE

Class No. 419 Test Site St. Louis

Item Inspected	Condition of Item	
	Pass	Fail
1. Fuel Filter	--	--
2. Fuel Tank & Lines	17	--
3. Thermostatically Controlled Air Cleaner	17	--
4. Carburetor Choke & Accelerator Linkage	17	--
5. EGR System	17	--
6. PCV System	17	--
7. Exhaust System	17	--
8. Radiator Core	17	--
9. Air Conditioner Condenser Core	17	--
10. Engine Coolant Level	17	--
11. Engine Coolant Strength	17	--
12. Radiator Pressure Cap	17	--
13. Limiter Caps	16	1
14. Dwell	2	11
15. Timing	4	13
16. Centrifugal Advance	15	2
17. Vacuum Advance	11	6
18. Idle CO	14	3
19. Idle RPM	5	
20. Points	8	6

TOTAL NUMBER OF CARS TESTED = 17

APPENDIX D

INVALID TESTS

Los Angeles and St. Louis

APPENDIX D

INVALID TESTS

SUMMARY SITE Los Angeles

CLASS	NUMBER OF ACCEPTED TESTS	NUMBER OF INVALID TESTS	TOTAL TESTS PERFORMED
227	17	5	22
228	14	9	23
301	14	4	18
302	18	6	24
303	16	13	29
304	16	5	21
305	16	8	24
307	12	3	15
310	15	10	25
312	16	5	21
313	18	6	24
324	17	11	28
326	15	8	23
327	19	8	27
331	16	2	18
338	4	3	7
341	16	15	31
342	16	7	23
349	19	3	22
351	17	2	19
355	7	3	10
356	8	7	15
TOTALS	326	143	469

APPENDIX D

INVALID TESTS

CLASS # 227

SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
3	1785	Fuel
4	1794	Fuel
9	2200	CVS Count
14	2474	Air cleaner set wrong
20	2580	PCV hose missing

APPENDIX D

INVALID TESTS

CLASS # 228 SITE Los Angeles

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
1	1791	Fuel
1	2251	I & M
2	1795	Fuel
2	2090	I & M
5	1912	Temp. Trace
9	2348	C.V.S. count
10	2370	Abort
11	2385	I & M
14	2465	I & M & Drivers trace

APPENDIX D

INVALID TESTS

CLASS # 301 SITE Los Angeles

SERIES NUMBERS	AESI RUN NO.	REASON FOR REJECTION
1	1700	Temp. Trace
2	1741	Fuel
2	2100	I & M
6	2070	Abort

APPENDIX D

INVALID TESTS

CLASS # 302 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1722	Temp. Trace
2	1748	Fuel
5	2149	Wrong Emission system
6	2187	CVS Count
10	2229	CVS Count
17	2440	Abort

APPENDIX D

INVALID TESTS

CLASS # 303 SITE Los Angeles

SERIES NUMBERS	AESI RUN NO.	REASON FOR REJECTION
1	1553	Temp. Trace
2	1560	Temp. Trace
2	2547	Filter missing
5	1640	Temp. Trace
6	1669	Temp. Trace
7	1685	Temp. Trace
8	1712	Temp. Trace
9	1780	Fuel
10	1922	Temp. Trace
11	1934	Centrifugal advance
13	1946	I & M
16	2185	Centrifugal advance
16	2567	Drivers trace

APPENDIX D

INVALID TESTS

CLASS # 304 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1724	Abort
6	2208	CVS Count
10	2328	Wrong RPM
16	2536	Fuel filter cleaned
20	2596	Fuel Filter Cleaned

APPENDIX D

INVALID TESTS

CLASS # 305 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1707	Temp Trace
2	1745	Fuel
3	1746	Fuel
4	1800	Fuel
5	1804	Fuel
6	2118	Cent. Adv.
14	2349	Vehicle tampered
15	2389	Driver Trace

APPENDIX D

INVALID TESTS

CLASS # 307 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
2	1578	Temp Trace
4	1665	Temp Trace
5	1876	Temp Trace

APPENDIX D

INVALID TESTS

CLASS # 310 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1489	Temp. Trace
2	1496	Driver Trace
2	2400	Temp. Trace
3	1526	Abort
4	1528	Temp. Trace
8	2109	Drivers Trace
9	2174	Drivers Trace
15	2351	PCV System
17	2361	Abort
20	2443	Vacuum adv. not adj.

APPENDIX D

INVALID TESTS

CLASS # 312 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1651	Temp. Trace
3	1664	Temp Trace
6	2107	CVS Count
10	2330	Idle CO not set to spec.
19	2597	Abort

APPENDIX D

INVALID TESTS

CLASS # 313 SITE Los Angeles

SERIES NUMBERS	AESI RUN NO.	REASON FOR REJECTION
1	1787	Abort
1	1793	Fuel
2	1812	Fuel
2	2148	I & M
3	1893	Temp. Trace
9	2364	Drivers Trace

APPENDIX D

INVALID TESTS

CLASS # 324 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1670	Missing I & M forms
4	1742	Fuel
4	2314	CVS COUNT
5	1753	Fuel
5	2139	CVS Count
6	1779	Fuel
7	1781	Fuel
8	1786	Fuel
9	1801	Fuel
14	2110	Abort
19	2283	Driver Trace

APPENDIX D

INVALID TESTS

CLASS # 326 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
2	1558	Temp Trace
3	1679	Abort
5	1757	Fuel
6	1754	Fuel
7	1782	Fuel
8	1790	Fuel
10	1949	Driver Trace
13	2140	CVS Count

APPENDIX D

INVALID TESTS

CLASS # 327 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1539	Abort
1	1540	Temp Trace
6	1653	Temp. Trace
10	1673	Temp Trace
14	1765	Fuel
15	1767	Fuel
16	1805	Fuel
20	2205	CVS Count

APPENDIX D

INVALID TESTS

CLASS # 331 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
7	2077	CVS Count
15	2311	CVS Count

APPENDIX D

INVALID TESTS

CLASS # 338 SITE Los Angeles

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
1	2049	Temp. Trace
2	2382	C.V.S. High
6	2590	Questionnaire

APPENDIX D

INVALID TESTS

CLASS # 341 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
2	1704	Temp. Trace
4	1725	Abort
4	1727	Abort
5	1758	Abort
5	1774	Fuel
6	1755	Fuel
7	1766	Fuel
8	1784	Fuel
9	1796	Fuel
9	2085	Inertia and HP
9	2405	Misuse
10	1797	Fuel
10	2098	Drivers Trace
13	2047	Temp. Trace
19	2301	CVS Count

APPENDIX D

INVALID TESTS

CLASS # 342 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1799	Fuel
5	2124	Driver Trace
6	2147	Driver Trace
8	2141	Driver Trace
14	2320	RPM set wrong
14	2552	Fast idle not checked
19	2394	Abort

APPENDIX D

INVALID TESTS

CLASS # 349 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
3	1814	Fuel
13	2462	Wrong Emission System
20	2575	No A I R System

APPENDIX D

INVALID TESTS

CLASS # 351 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
2	1747	Abort
7	2186	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 355 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
1	1709	Transmission
1	1938	CVS Count
2	2177	Transmission

APPENDIX D

INVALID TESTS

CLASS # 356 SITE Los Angeles

SERIES NUMBER	AESi RUN NO.	REASON FOR REJECTION
2	1554	Temp. Trace
2	2541	Cleaned fuel filter
4	1729	Temp. Trace
5	1743	Fuel
6	1807	Fuel
7	1928	Comp. check not run wet
8	2061	Cent. Advance ½ degree off

APPENDIX D

INVALID TESTS

SUMMARY SITE St. Louis

CLASS	NUMBER OF ACCEPTED TESTS	NUMBER OF INVALID TESTS	TOTAL TESTS PERFORMED
227	14	1	15
228	4	2	6
301	17	5	22
302	18	2	20
303	16	5	21
304	16	5	21
305	19	3	22
307	14	1	15
309	16	0	16
310	16	6	22
312	19	1	20
313	15	2	17
324	10	6	16
326	15	3	18
327	19	2	21
331	13	2	15
341	16	2	18
342	3	0	3
349	0	3	3
351	5	0	5
355	8	0	8
356	12	2	14
401	25	1	26
402	19	2	21
412	8	0	8
413	19	0	19
414	17	1	18
415	17	0	17
416	16	2	18
419	17	4	21
TOTALS	423	63	486

APPENDIX D

INVALID TESTS

CLASS #227 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
2	1206	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 228 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
2	1120	Temp. Trace
4	1654	Abort

APPENDIX D

INVALID TESTS

CLASS # 301 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
3	1246	Temp. Trace
3	1742	Fast idle
7	1276	Temp. Trace
8	1319	Temp. Trace
20	1771	Retest, same car

APPENDIX D

INVALID TESTS

CLASS # 302 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
1	1251	Temp. Trace
11	1343	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 303 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
1	1183	Temp. Trace
6	1226	Temp. Trace
7	1231	Temp. Trace
10	1240	Temp. Trace
14	1473	Centrifugal Advance

APPENDIX D

INVALID TESTS

CLASS # 304 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
6	1221	Temp. Trace
7	1238	Temp. Trace
15	1312	Temp. Trace
19	1459	Bag Reading
19	1687	Fast idle

APPENDIX D

INVALID TESTS

CLASS # 305 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
6	1227	Temp. Trace
14	1551	Abort
18	1594	Abort

APPENDIX D

INVALID TESTS

CLASS # 307 SITE St. Louis

SERIES NUMBERS	AESI RUN NO.	REASON FOR REJECTION
1	1134	Abort

APPENDIX D

INVALID TESTS

CLASS # 310 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
3	1222	Temp. Trace
6	1277	Temp. Trace
8	1286	S D V missing
9	1306	Temp. Trace
12	1540	Dwell set wrong
14	1577	Abort

APPENDIX D

INVALID TESTS

CLASS # 312 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
5	1210	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 313 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
6	1228	Temp. Trace
16	1743	Abort

APPENDIX D

INVALID TESTS

CLASS # 324 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
1	1158	Vacuum advance
4	1201	Temp. Trace
7	1274	Vacuum advance
8	1293	Low count
9	1303	Vacuum replaced
10	1315	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 326 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
3	1166	Temp. Trace
9	1534	Temp. Trace
13	1715	Drivers Trace

APPENDIX D

INVALID TESTS

CLASS # 327 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
18	1625	Abort
20	1728	Drivers trace

APPENDIX D

INVALID TESTS

CLASS # 331 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
5	1342	Temp. Trace
6	1346	Temp. Trace

APPENDIX D

INVALID TESTS

CLASS # 341 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
5	1358	Temp. Trace
14	1729	Abort

APPENDIX D

INVALID TESTS

CLASS # 349 SITE St. Louis

SERIES NUMBERS	AES1 RUN NO.	REASON FOR REJECTION
1	1144	wrong C I D
2	1154	wrong C I D
3	1160	wrong C I D

APPENDIX D

INVALID TESTS

CLASS # 356 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
9	1462	Abort
12	1568	inertia

APPENDIX D

CLASS # 401 INVALID TESTS SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
12	1491	Abort

APPENDIX D

INVALID TESTS

CLASS # 402 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
12	1629	Temp. Trace
17	1677	Abort

APPENDIX D

INVALID TESTS

CLASS # 414 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
6	1517	Abort

APPENDIX D

INVALID TESTS

CLASS # 416 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTION
4	1458	Wrong h.p. & inertia
5	1463	Drivers trace

APPENDIX D

INVALID TESTS

CLASS # 419 SITE St. Louis

SERIES NUMBERS	AESi RUN NO.	REASON FOR REJECTIONS
10	1512	Abort
15	1696	Abort
15	1707	Abort
20	1766	Drivers trace