

Evaluation of the Paser Magnum/Paser 500/Paser 500 HEI
Under Section 511 of the Motor Vehicle Information
and Cost Savings Act

May, 1981

by

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U.S. Environmental Protection Agency

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 610]

[FRL _____]

FUEL ECONOMY RETROFIT DEVICES

Announcement of Fuel Economy Retrofit Device Evaluation
for "Paser Magnum, Paser 500, and Paser 500 HEI"

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Fuel Economy Retrofit Device Evaluation.

SUMMARY: This document announces the conclusions of the EPA evaluation of the "Paser Magnum, Paser 500, and Paser 500 HEI" devices under provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act.

BACKGROUND INFORMATION: Section 511(b)(1) and Section 511(c) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2011(b)) requires that:

(b)(1) "Upon application of any manufacturer of a retrofit device (or prototype thereof), upon the request of the Federal Trade Commission pursuant to subsection (a), or upon his own motion, the EPA Administrator shall evaluate, in accordance with rules prescribed under subsection (d), any retrofit device to determine whether the retrofit device increases fuel economy and to determine whether the representations (if any) made with respect to such retrofit devices are accurate."

(c) "The EPA Administrator shall publish in the Federal Register a summary of the results of all tests conducted under this section, together with the EPA Administrator's conclusions as to -

(1) the effect of any retrofit device on fuel economy;

(2) the effect of any such device on emissions of air pollutants; and

(3) any other information which the Administrator determines to be relevant in evaluating such device."

EPA published final regulations establishing procedures for conducting fuel economy retrofit device evaluations on March 23, 1979 [44 FR 17946].

ORIGIN OF REQUEST FOR EVALUATION: On July 30, 1980, the EPA received a request from AmerImex Industries, Inc. for evaluation of fuel saving devices termed "Paser Magnum, Paser 500, and Paser 500 HEI". These Devices are claimed to "... promote efficiency in an internal combustion engine by discharging induced electrical pulses into the firing chamber to promote chemical activity before the interception of and during combustion of the fuel."

Availability of Evaluation Report: An evaluation has been made and the results are described completely in a report entitled: "EPA Evaluation of the Paser Magnum, Paser 500, and Paser 500 HEI Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act." This entire report is contained in two volumes. The discussions, conclusions and list of all attachments are included in EPA-AA-TEB-511-81-5A, which consists of 21 pages. The attachments are contained in EPA-AA-TEB-511-81-5B, which consists of 180 pages. The attachments include patent information, correspondence between the Applicant and EPA and all documents submitted in support of the application.

Copies of this report may be obtained from the National Technical Information Service by using the above report numbers. Address requests to:

National Technical Information Service

U.S. Department of Commerce

Springfield, VA 22161

Phone: Federal Telecommunications System (FTS) 737-4650

Commercial 703-487-4650

Summary of Evaluation

The Paser Magnum, Paser 500, and Paser 500 HEI are add-on ignition devices that are claimed to improve vehicle emissions and fuel economy by discharging induced electrical impulses into the combustion chamber before and during the engine's combustion cycle.

EPA fully considered all of the information submitted by the Device manufacturer in the Application. The evaluation of the "Paser Magnum, Paser 500, and Paser 500 HEI" devices was based on that information and results of the previous EPA test program.

The Applicant submitted no valid data to support the claim for increased fuel economy. The Applicant was advised by letter on several occasions of EPA's requirement that Applicants submit valid test data following the proper EPA Test procedures.

Test data submitted by the Applicant did not prove that use of the "Paser Magnum, Paser 500, or Paser 500 HEI" would enable a vehicle operator to improve vehicle fuel economy or reduce emissions.

EPA tested the Paser Magnum ten years ago. This testing showed that the Paser Magnum (which the Applicant stated is equivalent to the Paser 500 and Paser 500 HEI) showed no significant effect on either exhaust emissions or fuel economy.

Thus, there is no technical basis to support any claims for a fuel economy improvement due to the use of the "Paser Magnum, Paser 500, or Paser 500 HEI" device.

FOR FURTHER INFORMATION CONTACT: Merrill W. Korth, Emission Control Technology Division, Office of Mobile Source Air Pollution Control, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, 313-668-4299.

Date

Edward F. Tuerk
Acting Assistant Administrator
for Air, Noise, and Radiation

Evaluation of the Paser Magnum, Paser 500 and Paser 500 HEI Devices under
Section 511 of the Motor Vehicle Information and Cost Savings Act

The following is a summary of the information on the device as submitted by the Applicant and the resulting EPA analysis and conclusions.

1. Marketing Identification of the Devices:

- A. "Paser Magnum or Paser 500 (for engines with standard distributor caps)"
- B. "Paser HEI (for engines with non-standard distributor caps)"

2. Inventor of the Devices and Patents:

A. Inventor

Eugene Irvin, Jr.
8720 Empress Row
Dallas, TX 75247

B. Patent

Patent No. 3613653 (see Attachment A)
Patent Application No. 2118G (see Attachment B)

3. Manufacturer of the Devices:

AmerImex Industries
8720 Empress Row
Dallas, TX 75247

4. Manufacturing Organization Principals:

"95% of stock owned by Eugene Irvin, Jr."

5. Marketing Organization in U.S. Making Application:

AmerImex Industries
8720 Empress Row
Dallas, TX 75247

6. Applying Organization Principals:

Eugene Irvin, Jr. - owns 95% of stock."
"Contact Person: Eugene Irvin, Jr."

7. Description of Devices:

- A. Purpose of the Devices (as supplied by Applicant): "To increase combustion efficiency in multi-cylinder ignition equipped internal combustion engine."
- B. Theory of Operation (as supplied by Applicant): "See Exhibit No. 3" (see Attachment C)

- C. Detailed Description of Construction and Operation (as supplied by Applicant): "See patent specifications - Exhibits 1 and 2." (see Attachments A and B)
8. Applicability of the Devices (as supplied by Applicant):
- "All ignition equipped multi-cylinder internal combustion engines. This includes not only cars, trucks, buses, and motorcycles, but also tractors, forklifts, marine engines, compressors, generators, and any other mechanism in which a multi-cylinder ignition equipped internal combustion engine is used."
9. Device Installation (as supplied by Applicant):
- A. "Paser 500 - See Exhibit No. 4" (see Attachment D)
- B. "Paser 500 HEI - See Exhibit No. 5" (see Attachment E)
10. Device Operation (as supplied by Applicant):
- A. "Paser 500 - See Exhibit No. 4" (see Attachment D)
- B. "Paser 500 HEI - See Exhibit No. 5" (see Attachment E)
11. Device Maintenance (as supplied by Applicant):
- "None"
12. Effect on Vehicle Emissions (non-regulated) (as supplied by Applicant):
- "Effects on Vehicle Emissions (non-regulated): See analysis of test data (procured from both General Testing Laboratories - Exhibit No. 6, and from Dr. Mel Adams of MIT - Exhibit No. 7) which indicates that the installation of the Paser 500 results in an increase in combustion efficiency, which means that the chemical reaction of the burning of the fuel proceeds further to the right. The emissions measured after installation of the Paser indicate a reduction in carbon monoxide and hydrocarbon." (Attachment F is Applicant's Exhibit 6, Attachment G is Applicant's Exhibit 7)
13. Effects on Vehicle Safety (as supplied by Applicant):
- "None"
14. Test Results - Regulated Emissions and Fuel Economy (submitted by Applicant):
- "See Exhibit 6" (Attachment G is Exhibit 6)
15. Analysis:

A. Marketing Identification of Devices:

In Section 1, AmerImex stated the "Paser Magnum or Paser 500 (for engines with standard distributor caps)". Since it appeared to EPA that the Paser Magnum and Paser 500 were basically the same device, EPA requested clarification (See Attachment K).

EPA met with AmerImex on January 6, 1981 at a meeting held at AmerImex's request. When asked about the differences between the models, AmerImex stated:

- (1) there was no functional difference between the Paser Magnum and Paser 500.
- (2) the only differences between the Paser Magnum and Paser 500 were changes in materials and manufacturing specifications to improve durability and reliability (see also Attachments H and J).
- (3) that the Paser Magnum has been withdrawn from the market.
- (4) that the Application should have stated the Paser 500 was for engines with standard ignition systems rather than stating the device was "for engines with standard distributor caps."
- (5) that the Application should have stated the Paser 500 HEI was for engines with electronic ignition systems rather than stating the device was "for engines with non-standard distributor caps."

B. Description of Devices:

- (1) Purpose of the devices as stated in the Application, Section 7, is to increase combustion efficiency.
- (2) The theory of operation for the Paser 500 is described in section III of Attachment C.
 - (a) "The Paser 500 promotes combustion efficiency in an internal combustion engine by discharging induced electrical pulses into the firing chamber to promote chemical activity before the inception of and during combustion of the fuel. The Paser 500 accomplishes this through the attachment to the secondary circuit of the ignition system of an additional capacitive circuit which is charged and discharged by employing the principle of electro-magnetic induction. Basically, the operation of the Paser 500 proceeds in the following manner in a multi-cylinder engine:
 - "a. When any spark plug fires, the electrical current moving through the spark plug wires radiates an elec-

tro-magnetic field. Without the Paser 500 installed, this energy simply radiates from the spark plug wire and is wasted.

"b. With the Paser 500 installed, the electro-magnetic field radiated by the current flowing to the firing spark plug charges a circuit inside the Paser 500 induction sleeve by the process known as electro-magnetic induction.

"c. The Paser 500 circuit which has been charged by induction from the firing cylinder spark plug wire is in electrical series with like circuits connected to the non-firing cylinder spark plug wires. Hence, when one of the Paser 500 circuits is charged, all are charged.

"d. The Paser 500 circuits connected in series with the non-firing cylinder spark plug wires induce electrical fields through the spark plugs into the non-firing cylinders.

"e. The result is that when any cylinder fires, an induced electrical field, which is of high intensity but not high enough to pre-ignite the fuel/air mixture, is discharged in all the remaining cylinders. This action occurs not only prior to ignition of the fuel/air charge in the normal manner, but also during combustion. This electrical discharge into the gaseous mixture enhances chemical activity of fuel and air prior to and throughout the combustion process.

"The effect is a more complete combustion in the fuel/air mixture. In more technical terms, the Brake Specific Fuel Consumption is reduced; that is, less fuel is required to produce a given measure of horsepower."

- (b) Since the Application did not specify the theory of operation for the Paser Magnum and Paser 500 HEI, EPA requested the Applicant submit the theory of operation for these two Devices (see Attachment K). Amerimex stated "The theory of operation for all versions of the Paser is the same." (see Attachment M).
- (c) Since the Paser 500 HEI patent application (Attachment B) indicated the Paser 500 HEI developed 40% more potential than the Paser 500, EPA requested the Applicant clarify this apparently substantial difference and provide data (Attachment K). The Applicant responded (Attachment M):

"The Paser 500 induces approximately 1/3 of the firing voltage into the non-firing cylinders.

The Paser 500 induces approximately 7/15 of the firing voltage into the non-firing cylinders. The relative voltages result from the inductive relationship designed into the unit's circuits."

- (d) Because the Applicant's response (Attachment M) to EPA's December 24, 1980 letter (Attachment K) made several apparently conflicting statements about the Paser Device's theory of operation, EPA requested (Attachment P) the Applicant to clarify the information previously provided:

"Your January 13, 1980 (1981?) letter makes several apparently conflicting statements about the Paser Devices. The letter claims in effect that the Paser 500 and Paser 500 HEI give the same performance. However, the letter also states the Paser 500 induces 1/3 the firing voltage while the Paser 500 HEI induces 7/15 the firing voltage. Therefore, the operation of these devices in a vehicle is clearly different - unless the observed effects on emissions or fuel economy are the same. Please clarify these points by March 31, 1981."

The Applicant did not respond to these questions in the Applicant's response (Attachment R) to this request and the Applicant was so advised (Attachment S).

- (e) Although it is true that the spark plug wires radiate an electromagnetic field when the spark plug fires, EPA is unable to judge:
- (i) whether the device is able to efficiently interact with the electromagnetic field of the firing plug.
 - (ii) whether any electromagnetic field induced in the firing plugs is able to materially affect the combustion process.
- (f) Therefore, since the Applicant did not provide sufficiently detailed information, EPA is unable to properly assess the claimed theory of operation.

(3) Detailed Description of Construction and Operation:

The mechanical Description of the Devices given in the patent and patent application (see Attachments A and B) are judged to be an adequate physical description of the Devices.

C. Applicability of the Devices:

The applicability of the Devices, as stated in section 8, to "all ignition equipped multi-cylinder internal combustion engines" is judged to be valid. However, the specific applicability of the individual devices is not clear.

- (1) In section 1 the Paser 500 was identified as being for engines with standard distributor caps and the Paser 500 HEI was identified as being for engines with non-standard distributor caps.
- (2) During the meeting at EPA on January 6, 1981, AmerImex stated, 15(A)(4) and 15(A)(5), that the Paser 500 was for engines with standard ignition systems and the Paser 500 HEI was for engines with electronic ignition systems.
- (3) AmerImex's January 13, 1980 (1981?) letter (Attachment M) replying to EPA's December 24, 1980 letter (Attachment K), did not sufficiently clarify the applicability and usage of the Paser Devices.
- (4) EPA therefore requested, March 3, 1981 (Attachment P) that AmerImex respond and clarify.

"Your January 13, 1980 (1981?) letter replying to EPA's December 24, 1980 letter stated "The Paser 500 HEI can be used with both female and male connectors on the distributor cap. It can be used with either point - condenser and electronic ignition systems." This conflicts with the information provided in the discussion of the device during your January 6, 1981 visit to EPA. At that meeting, AMERIMEX stated that the Paser 500 was for conventional ignition systems and the Paser 500 HEI was for electronic ignition systems. Therefore, in order to resolve these seeming inconsistencies, please answer the following questions by March 31, 1981.

1. For conventional ignition systems with sockets in the distributor cap, which is the recommended Device, Paser 500 or Paser 500 HEI?
2. For conventional ignition systems with sockets in the distributor cap, would there be any benefit to using the Paser 500 HEI instead of the Paser 500?
3. For electronic ignition systems with sockets in the distributor cap, which is the recommended Device, Paser 500 or Paser 500 HEI?

4. For electronic ignition systems with sockets in the distributor cap, would there be any benefit to using the Paser 500 HEI instead of the Paser 500?"

The Applicant did not respond to these questions in the Applicant's response (Attachment R) to this request and the Applicant was so advised (Attachment S).

- (5) Therefore, since the Applicant did not provide sufficiently detailed information after repeated requests, EPA is unable to properly identify to which ignition systems (conventional or electronic) and distributor caps (standard or non-standard) the Paser 500 and Paser 500 HEI are applicable.

D. Costs

"The suggested retail price of the Paser is \$49.95." (Attachment M) It is assumed this price applies to both the Paser 500 and Paser 500 HEI since the Applicant did not specify any difference.

E. Device Installation - Tools and Expertise Required:

- (1) The Paser 500 and Paser 500 HEI instructions/warranty information are judged to be complete for the physical installation of the device.
- (2) The installation of the Paser devices appears to be within the mechanical skills of many vehicle operators. The checkout of the engine to insure ". . . that the engine is in normal good running order." will require some mechanical skills, common tools, and working knowledge of the engine. Amerlmex recommends ". . . that installation be performed by a qualified mechanic, who insures that the engine is in good running order."

F. Device Operation:

The Applicant requires that the oil and oil filter be changed 1000 miles after the installation of the Paser 500/Paser 500 HEI and to adjust the idle speed, if required, to the normal setting.

G. Device Maintenance:

The Application specifies that no maintenance is required for the Paser 500/Paser 500 HEI device. Although this is true in the general usage of the word maintenance, the Paser 500/Paser 500 HEI caps would require the normal, periodic inspection accorded the spark plug wires to insure the distributor caps, Paser, and spark plug wires are properly connected.

H. Effect on Vehicle Emissions (non-regulated):

- (1) The Applicant infers that because the emission data supplied in Attachments F and G proves the claims for lower emissions, that non-regulated emissions would not be adversely affected.
- (2) Non-regulated emissions were not assessed as part of the evaluation. However, since the device does not appear to modify the vehicle's emission control system (although it is claimed to modify the combustion process), it appears reasonable to assume that the device would not significantly affect a vehicle's non-regulated emissions.

I. Effects on Vehicle Safety:

As claimed, it is judged unlikely that the Devices would adversely affect vehicle safety when properly installed.

J. Test Results Supplied by Applicant:

Applicant did not submit any test data per the current Federal Test Procedure or Highway Fuel Economy Test. These are the only EPA recognized test procedures⁽¹⁾. This requirement for test data following these procedures was stated in the application test policy documents and three subsequent letters that EPA sent to the applicant (Attachments I, K, P, and S).

Since EPA had previously tested the Paser Magnum (see Section 15 K), the Applicant was advised in the initial July 9, 1980 letter (Attachment I) and again in the December 24, 1980 letter (Attachment K) that for the Paser devices to be reevaluated

(1) From EPA 511 Application test policy documents:

Test Results (Regulated Emissions and Fuel Economy):

Provide all test information which is available on the effects of the device on vehicle emissions and fuel economy.

The Federal Test Procedure (40 CFR Part 86) is the only test which is recognized by the U.S. Environmental Protection Agency for the evaluation of vehicle emissions. The Federal Test Procedure and the Highway Fuel Economy Test (40 CFR Part 600) are the only tests which are normally recognized by the U.S. EPA for evaluating vehicle fuel economy. Data which have been collected in accordance with other standardized fuel economy measuring procedures (e.g. Society of Automotive Engineers) are acceptable as supplemental data to the Federal Test Procedure and Highway Fuel Economy Data will be used, if provided, in the preliminary evaluation of the device. Data are required from the test vehicle(s) in both baseline (all parameters set to manufacturer's specifications) and modified forms (with device installed).

there needed to be either (1) technological improvements in the Devices or (2) new data. The Applicant's response (Attachment M) was that there were no technological improvements and that the Paser 500 and Paser 500 HEI were merely production improvements of the Paser Magnum. The Applicant did not submit valid data documenting an improvement for the Devices.

The test data submitted by the Applicant are listed below and evaluated.

(1) General Testing Laboratories Vehicle Testing

The vehicle test data, contained in the General Testing Laboratory Report Summary (Attachment F) contained fuel economy test data for the four vehicles tested with the Paser Magnum installed. The vehicles were tested in 1971 using the 1370 second cold start Federal Test Procedure (FTP) then in effect. These results are summarized below:

Vehicle Fuel Economy, MPG

	1970 Maverick 200 CID	1965 Oldsmobile 300 CID	1968 Plymouth 318 CID	1968 Volkswagen 1500 CC
initial baseline without Paser	12.3	11.0	9.7	14.8
initial with Paser	18.1	12.9	12.3	21.2
Paser after 1000 miles	16.1	14.2	14.8	20.3
Paser after 2000 miles	13.7	11.2	11.9	20.0
Paser after 3000 miles	16.8	10.9	12.2	20.0

These tests show considerable unexplained variability in the test results with the Paser Device.

The current procedure, the 1975 FTP, repeats the first 505 seconds of the cold start cycle after a 10 minute hot soak. Therefore, data obtained using this procedure can be used for comparison to the 1971 FTP by using the fuel economy data for the first 1370 seconds of the current FTP.

EPA recently conducted tests on a group of 1970-71 vehicles as part of a study on the effects of temperature on vehicle emissions, "Effects of Ambient Temperature and Driving Cycle on Exhaust Emissions, EPA-460/3-80-012". These vehicles selected for testing were verified to be in good mechanical condition and properly tuned prior to testing. A group of these vehicles similar to the preceeding is given below with fuel economy calculated for the same 1370 second driving cycle.

Vehicle Fuel Economy, MPG

1970	1970	1970	1970	1970
Maverick	Chevrolet	Dodge	Plymouth	Volkswagen
200 CID	307 CID	318 CID	318 CID	1500 CC
18.0	13.4	14.4	13.9	23.1

When the fuel economy of this group of vehicles is compared to those submitted by the Applicant, the data suggests that the baseline fuel economy for the Applicant's fleet was too low for the vehicles to be considered representative of vehicles in satisfactory mechanical condition and properly tuned to manufacturer's specifications.

Since the Applicant specifies in the instructions (Attachments D and E) that the vehicle's engine must be ". . . in normal good running order.", the Applicant's data is judged to be non-supportive of the conclusion that the Device improves fuel economy.

As previously noted, the EPA also requires that valid FTP/HFET test results be obtained by Applicants at one of the independent laboratories currently listed on the EPA list of acceptable laboratories and use representative current vehicles. The four vehicles tested are not representative of current vehicles and the Applicant was so advised (Attachment P). The Applicant was advised of this requirement for valid current vehicle testing in the EPA test policy documents provided the Applicant on July 9, 1980 and again reminded in more recent communications (Attachments I, K, P, and S).

(2) General Test Laboratories Engine Dynamometer Testing

The Applicant also submitted test data on a 1968 Oldsmobile 330 CID V-8 engine (see Attachment G) with the Paser 500. These tests consisted of engine dynamometer tests modeled after the EPA heavy duty engine dynamometer test cycle. However, a post test inspection of the engine by the Applicant revealed evidence of a ". . . substantial amount of rust accumulation on the cylinder walls from rain and moisture" (see Attachment G). Therefore the initial condition of the engine was really unknown and it cannot be considered a representative engine. Therefore this engine data cannot be used to evaluate the Device and the Applicant was so advised (Attachment P).

(3) During the January 6, 1981 meeting with EPA, AmerImex provided EPA with copies of tests of the Paser Devices conducted by several organizations using a variety of test methods. The tests are discussed below.

- (a) Mexican Government Environmental Protection Agency Test of the Paser 500 (Attachment Q, pages 5, 6, and 7).

The Applicant stated the test procedures used were identical to those required by the U.S. EPA. At that time, EPA informed the Applicant that the data could be of some use for evaluating the Devices if (1) the Applicant provided EPA a detailed description of the Mexican test procedures including a translation to English, (2) the Mexican test procedures were identical to the EPA test procedures as claimed, (3) the test vehicles were representative of current U.S. motor vehicles, and (4) the Applicant provided detailed test results including the raw data.

The information provided by the Applicant in response to this request (Attachment Q, pages 1 thru 6) was the information previously provided with a copy (including translation of the Mexican Government's authorization for the Paser 500. It did not include the necessary information requested by EPA.

Therefore, since the Applicant failed to provide the requested information, EPA is unable to evaluate these test results.

- (b) Mexican Government Department of Public Works (see Attachment T. Attachment T was provided in Spanish with an English translation. Only the English translation is attached.)

The test data consisted of tailpipe emission concentrations at various engine rpm (no load). These tests cannot be used to indicate what might be achieved by a vehicle on a chassis dynamometer during the EPA cold/hot start transient vehicle tests.

The test data also included what is apparently road test fuel economy taken during extended periods of vehicle operation. These tests represent relatively uncontrolled tests and therefore cannot be used to validate a fuel economy change due to the Device.

Also, it is unclear why this recently (1980) conducted testing used the Applicant's Paser Magnum (1) since the Applicant no longer markets the Paser Magnum (see Section 15 A(3) of this report), and (2) since the Applicant apparently cooperated with the testing group by supplying detailed technical information about the Device.

- (c) Consumer's Report of Japan (magazine's tests) Paser 500 (see Attachment U of this report).

The test data consisted of road test fuel economy taken over the magazine's city and highway routes. Again, these tests represent relatively uncontrolled tests and therefore cannot be used to validate a fuel economy change due to this device.

Also, the test data has several anomalies. (1) The current gas mileage data was added to previous year's data to arrive at a baseline - why not use the current? (2) The test without the device showed substantially different fuel economy for the magazine's city and highway routes, however, the tests with the Device showed the same fuel economy for both routes.

- (d) Japanese National Defense Academy's testing of the Paser 500 (see Attachment V of this report. Attachment V was provided in Japanese with an English translation. Only the English translation is attached).

The Japanese National Defense Academy testing consisted of constant speed tests of a small single cylinder engine on an engine dynamometer. These results cannot be extrapolated nor inferred to directionally indicate what might be achieved by a multi-cylinder, automotive engine during the EPA cold/hot start transient vehicle tests.

- (e) Auto Mechanic Magazine of Japan testing of the Paser 500 (see Attachment W of this report. Attachment W was provided in Japanese with an English translation. Only the English translation is attached).

The tests consisted of steady state fuel economy tests, acceleration tests, and road tests. Although there were changes noted, there were insufficient test details to verify the steady state and acceleration tests. Also, the road tests are relatively uncontrolled tests and therefore cannot be used to evaluate the device.

- (f) Royal Automobile Club testing of the Paser Magnum (see Attachment X. Note this Device is no longer marketed).

The tests consisted of road tests under relatively uncontrolled test conditions and therefore cannot be used to evaluate the Device.

- (g) Carlos W. Coon, Jr., Ph.D, P.E. tests of the Paser 500 (see Attachment Y).

This letter briefly reviews the GTL test results which were previously discussed in 15 (J)(1) and 15 (J)(2).

The letter also briefly discusses steady state tests conducted over 9 years ago using a 1968 Buick. However, no detailed data was provided.

- (h) Boyce and Hughes Engineering Associates test of the Paser 500 device by Professor J. Martin Hughes (see Attachment Z).

This letter summarizes the test results of chassis dynamometer test of the Paser 500. However, since no details of the tests were provided, these tests cannot be used to evaluate the device.

- (i) Wayland Baptist College tests of the Paser 500 device by Professor James C. Cox, Jr. (see Attachment AA).

This letter contains results of tailpipe emission concentration tests for two vehicles under some unspecified standard conditions. These tests cannot be used to indicate what might be achieved by a vehicle on a chassis dynamometer during the EPA cold/hot start transient vehicle tests.

K. Test Results Obtained by EPA:

EPA tested the Paser Magnum ten years ago. (EPA reports 71-6 and 71-31). This testing showed that the Paser Magnum (which the Applicant states is equivalent to the Paser 500) showed no significant effect on either exhaust emissions or fuel economy.

During a meeting with AmerImex on January 6, 1981, AmerImex requested EPA to discontinue the distribution of these two EPA reports on the Paser Magnum and essentially disavow the reliability of these reports. AmerImex's primary reasons for requesting this course of action were (1) EPA could not verify that the ignition wire continuity had been checked, (2) only 250 miles of mileage accumulation was performed, and (3) one of the EPA test vehicles was modified.

Since the Device manufacturer's installation instructions, packaged with the Device, did not specify that the ignition wire continuity check or mileage accumulation were required, EPA judged that the test engineer had not used poor test procedures as alleged by AmerImex. Also, EPA judged that the vehicle modifications would not have invalidated the test conclusions (see Attachment N for a more detailed discussion of EPA's decision. See Attachment O for AmerImex's reply).

16. Summary of Evaluation

EPA fully considered all of the information submitted by the Device manufacturer in the application. The evaluation of the "Paser Magnum, Paser 500, Paser 500 HEI" devices were based on that information and the results of the previous EPA test program.

The Applicant submitted no valid data to support the claim for increased fuel economy. The Applicant was advised by letter on several occasions of EPA's requirement that Applicants submit valid test data following the proper EPA Test procedures.

Test data submitted by the Applicant did not prove that use of the "Paser Magnum, Paser 500, or Paser 500 HEI" would enable a vehicle operator to improve vehicle fuel economy or reduce emissions.

EPA tested the Paser Magnum ten years ago. This testing showed that the Paser Magnum (which the Applicant stated is equivalent to the Paser 500 and Paser 500 HEI) showed no significant effect on either exhaust emissions or fuel economy.

Thus, there is no technical basis to support any claims for a fuel economy improvement due to the use of the "Paser Magnum, Paser 500, or Paser 500 HEI" device.