 E.O. D-73

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-73
Relating to Exemptions under Section 27156
of the Vehicle Code

KINSEY OF CALIFORNIA, INC.
"POWER STEAMER" DEVICE

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Section 39515 of the Health and Safety Code and Executive Order G-30A;

IT IS ORDERED AND RESOLVED: That the installation of the "Power Steamer" device manufactured by Kinsey of California, Inc. 7135 Hollywood Blvd., Los Angeles, California 90046 has been found to not reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1975 and older vehicles equipped with a conventional carburetor. The "Power Steamer" kit must include a stop valve and a regulator valve and is available in two models as follows:

(1) Type I with maximum water flow of 5 ml/min for 50-250 CID engines (0.82-2.3L)
(2) Type III with maximum water flow of 8 ml/min for greater than 250 CID engines (4.1L)

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those listed by the vehicle manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE "POWER STEAMER" DEVICE.

No claim of any kind, such as "Approved by Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

> "43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 23rd day of January, 1977.

Original Signed By
Thomas C. Austin
Deputy Executive Officer-Technical

State of California

AIR RESOURCES BOARD

December 10, 1976

Staff Report

Evaluation of Kinsey of California "Power Steamer" Device for Compliance with Requirements of Section 27156 of the Motor Vehicle Code

I. Introduction

Kinsey of California Inc., 7135 Hollywood Blvd., Los Angeles, California 90046, has applied for an exemption for its "Power Steamer" device. The applicant intends to market the device for installation on 1975 and older model year vehicles equipped with conventional carburetors (Exhibit A). The regulator valve included in the "Power Steamer" kit is available in two models: (1) Type I for 50-250 CID engines; (2) Type III for greater than 250 CID engines. (A Type II design for 140-250 CID application was withdrawn from the initial submittal per letter dated December 6, 1976).

II. System Description and Function

The "Power Steamer" device is an aftermarket add-on device which operates on the principle of inducting steam into the intake manifold of the vehicle. According to the applicant the installation of the device on motor vehicles will improve fuel economy.

The "Power Steamer" kit consists of an air tight plastic water bag reservoir, bracket, filter, regulator valve, stop valve, steam generator, hoses, nozzle, "Y" fitting, and installation instructions (Exhibit B).

In operation, water from the sealed water bag flows through the filter to the regulator valve where the proper amount is metered to the steam generator. The regulator valve is designed to be closed when the engine is not running, when decelerating and at idle. The valve is open during acceleration and cruise, allowing the flow of water to the steam generator. The stop valve placed between the regulator valve and steam generator prevents the water flow at 18 in. Hg and higher manifold vacuum and when the engine is not operating. The steam generator is attached to the exhaust pipe by means of heat resistant cement and clamps. The water flowing to the steam generator is converted to steam by means of the heat from the exhaust pipe. The steam is then fed to the intake manifold via the PCV system. A steam nozzle inserted between the PCV hose and the generator has an orifice size of 1 mm to prevent a large amount of air to be sucked into the intake manifold in case of system leakage.

III. System Evaluation

The applicant submitted 3 Power Steamer kits (one for each class of engine application) for our evaluation. The ARB Laboratory encountered problems during the course of the device testing as discussed below. The applicant later submitted a redesigned system which incorporated an added stop valve to prevent siphoning of water or leakage during high vacuum conditions for our evaluation.

A. Original System

The applicant submitted CVS-75 emission test data indicating the installation of the device on typical vehicles would not increase exhaust emissions. The applicant also submitted bench flow curves for each of the three types of regulator valves.

The ARB performed back-to-back CVS-75 and steady state emission tests on four vehicles. The test results showed no significant change in exhaust emissions and fuel economy of the vehicles tested except at idle conditions which showed an excessive increase of HC and CO emissions.

An investigation of operating conditions on the chassis dynamometer test revealed that the device allowed a small amount of water at idle conditions when the device was supposed to be closed. To confirm the above condition, and to determine the calibration of the regulator valves, bench flow tests were conducted on the three regulator valves (Type I, II, and III). The bench flow test results showed poor correlation with the manufacturers data. The valves showed excessive leakage at idle, and at other vacuum conditions the water flow was significantly lower compared with the flow curves submitted by the applicant. Since the device was apparently not operating properly, the ARB test results were not appropriate and the test data was not presented in this report. Likewise the applicants' emission test data and flow curves with these same valves was not acceptable. The applicant was notified of our findings by letter dated May 20, 1976.

B. Redesigned System

On August 24, 1976 (Exhibit C) the applicant submitted 3 kits of the redesigned system incorporating a modified regulator valve and a stop valve placed at the outlet end of the regulator valve. The redesigned system improves flow control of the regulator valves and insures complete shut off of the water flow at 18 in. Hg. and higher manifold vacuum. The applicant also submitted flow curves of the modified regulator valves as shown in Figure 1, 2, and 3.

1. Bench flow tests - the ARB Laboratory conducted bench flow tests on the three regulator valves (with the stop valve included) prior to emission testing. The flow data were plotted and superimposed on the applicant's submitted flow curves. As shown on Figure 1, 2, and 3 only Type I and III approximately match the applicant's flow curves. Another Type II regulator valve was submitted for testing and again showed improper flow control.

2. Emission Tests - Only the kits equipped with Type I and III regulator valves were emission tested. The ARB Laboratory performed back-to-back CVS-75, Hot Start CVS-72 and Key Mode tests on a 1971 Datsun (1.2L-1V), and a 1974 AMC (7.45L-2V). Fuel economy, water consumption,

and manifold vacuum were also measured for Key Mode tests only. Table I through III are the summaries of test results. The Key Mode test data for the 1971 Datsun was not shown since the device was not operational under these test conditions. (The manifold vacuum was above the operating range of the device.)

Back-to-back tests using the official CVS-75 test procedure on the two test vehicles indicated no significant increase in exhaust emissions. Hot Start CVS-72 and Key mode test data supported these results except on the 1974 AMC which showed a 14% increase in HC, and 32% increase in CO. These emissions increase on the AMC car, however, could not be considered conclusive since other data and an engineering analysis of the quantities of steam injected did not support this finding.

3. Engineering Analysis -- A heat transfer analysis (Appendix I-A) showed that incomplete evaporation of water in the steam generator of the "Power Steamer" device is not likely to occur. When steam enters the engine combustion chamber it does not participate in the chemical reaction process. Instead it acts as an inert substance, like the nitrogen in the air, and comes out in the tailpipe chemically unchanged. Since the steam displaces part of the air that would have been otherwise available for combustion, steam inducted into the combustion chamber tends to reduce

the volumetric efficiency of the engine. The air fuel mixtures, however, is only slightly affected. Like an EGR system and depending on the amount of charge dilution, the use of a steam induction system could reduce NOx and increase HC emissions due to lower cylinder and exhaust gas temperatures. Typical EGR systems installed on motor vehicles recirculate up to 10% of exhaust gas for control of NOx without any adverse effect on HC emission.

Using the flow curves of Type I and Type III regulator valves, the ARB staff has determined that the amount of steam inducted into the engine would not reduce the volumetric efficiency of typical in-use vehicles by more than 1.6% (See Appendix IB for calculations). It is the staff's judgement that this reduction is considered insignificant, therefore the installation of the "Power Steamer" device on motor vehicles should not theoretically have any significant effect on exhaust emissions. ARB Laboratory tests generally confirmed these findings.

C. Manufacturer's Claims

The manufacturer claims the installation of the "Power Steamer" on an automobile engine will result in a fuel savings due to improvement in engine combustion efficiency. This is claimed to be caused by increasing combustion pressure in the cylinder as a result of superheating of the steam charge during combustion.

Although an increase in steam pressure would occur due to the heat taken from the combustion of the fuel, it is the staff's opinion that this increase in pressure of the steam charge will not increase the mean effective pressure of the combustion process. On the contrary the charge diluent would decrease the volumetric and thermal efficiency of the engine. A substantial charge diluent would in fact result in a decrease in fuel economy for most operating conditions. The CVS-75 and hot start CVS-72 test data on the device confirms the theoretical argument that no significant improvement in fuel economy can be achieved as a result of the device installation.

The applicant also claims the injection of steam in the cylinder reduces the combustion temperature, thus reducing the formation of nitrogen oxides. Theoretical and experimental studies done in the past showed that injection of an inert fluid such as water or steam in the inlet manifold has an influence in reducing the production of nitric oxides. SAE Paper No. 690018 on "Inlet Manifold Water Injection for Control of Nitrogen Oxides", by Nichols, et. al., showed that for a water injection rate of 1 1/4 times the engine fuel consumption rate, nitric oxide reduction of over 90% were achieved. At a 0.20 water/fuel ratio the studies showed a 15% reduction in nitric oxides.

The power steamer injection rate is less than 5% of the fuel flow rate (See Appendix I-C for calculations). It appears therefore that the amount of steam inducted by the power steamer into the cylinder is well below the amount necessary to cause any significant effect in the nitric oxide emissions. The ARB Laboratory tests also showed no significant reduction in NOx emissions as a result of the device installation.

D. Discussion

The applicant has withdrawn the Type II regulator valve from his initial submittal since it was not functioning properly and extended the engine size range for the Type I valve (Exhibit D). Since the Type I valve would not cause more water flow than the Type II, no adverse effect would result from this change.

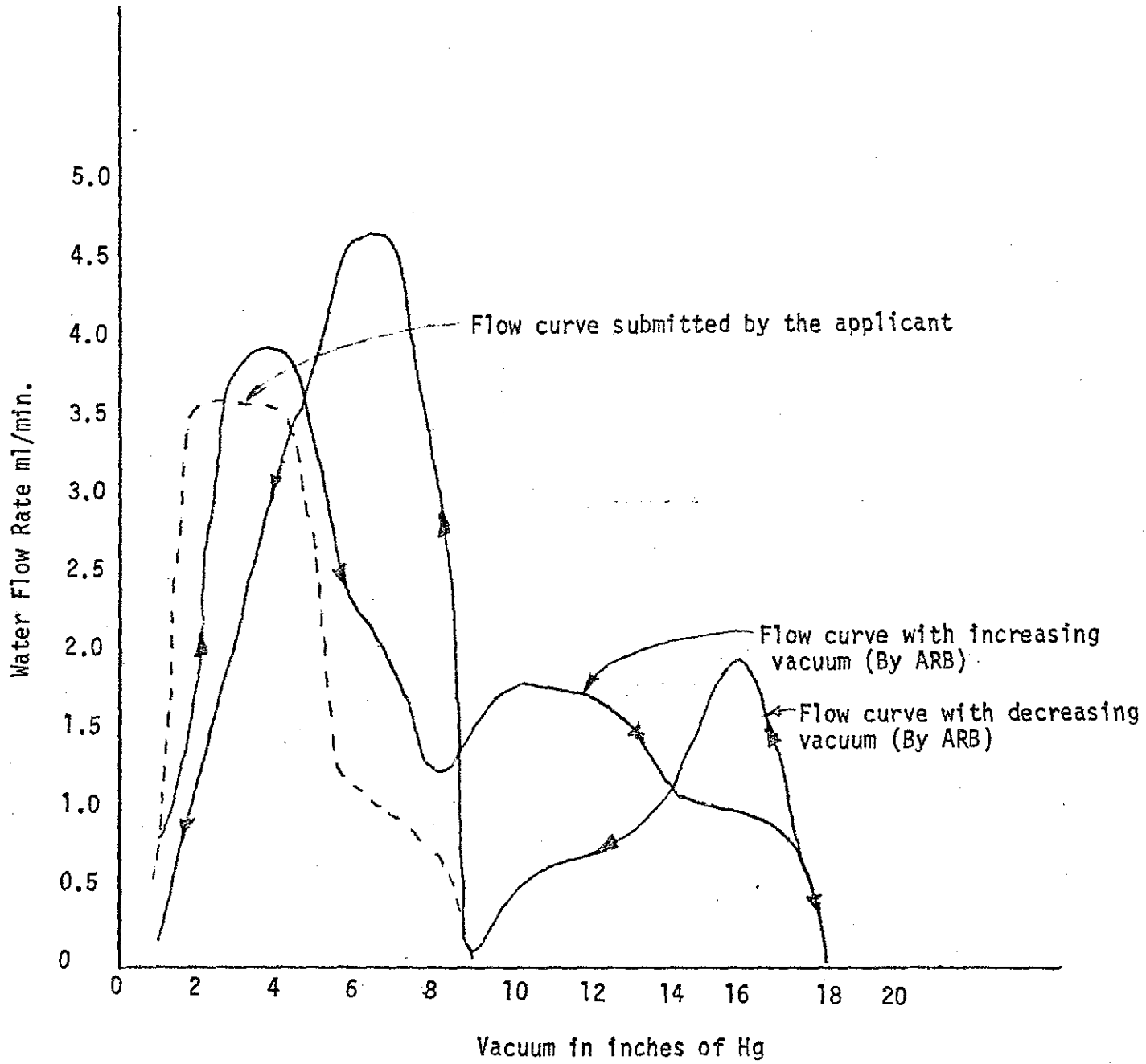
The applicant has indicated his intention to withdraw his fuel economy claims until further testing has been done by an Independent Testing Laboratory(s), or by motor vehicle fleet owner(s). In addition no claim would be made regarding NOx reduction according to the terms of Section 43644 of the Health and Safety Code.

IV. Conclusion and Recommendation

The ARB test and engineering evaluation indicated that the installation of the "Power Steamer" device on typical in-use vehicles would not have any adverse effects on exhaust emission control systems. Therefore the staff recommends that Kinsey of California Inc. be granted an exemption from the prohibitions of Section 27156 of the Vehicle Code for its Power Steamer device for installation on 1975 and older motor vehicles equipped with conventional carburetors. The "Power Steamer" kit must include a stop valve and a regulator valve and is available in two models as follows:

(1) Type I with maximum water flow of 5 ml/min for 50-250 CID engines (0.82-2.3L)

(2) Type III with maximum water flow of 8 ml/min for greater than 250 CID engines (4.1L).



Fib. 1 - Type I Regulator Valve (0.82 - 2.3L engine)
Bench Flow Curves

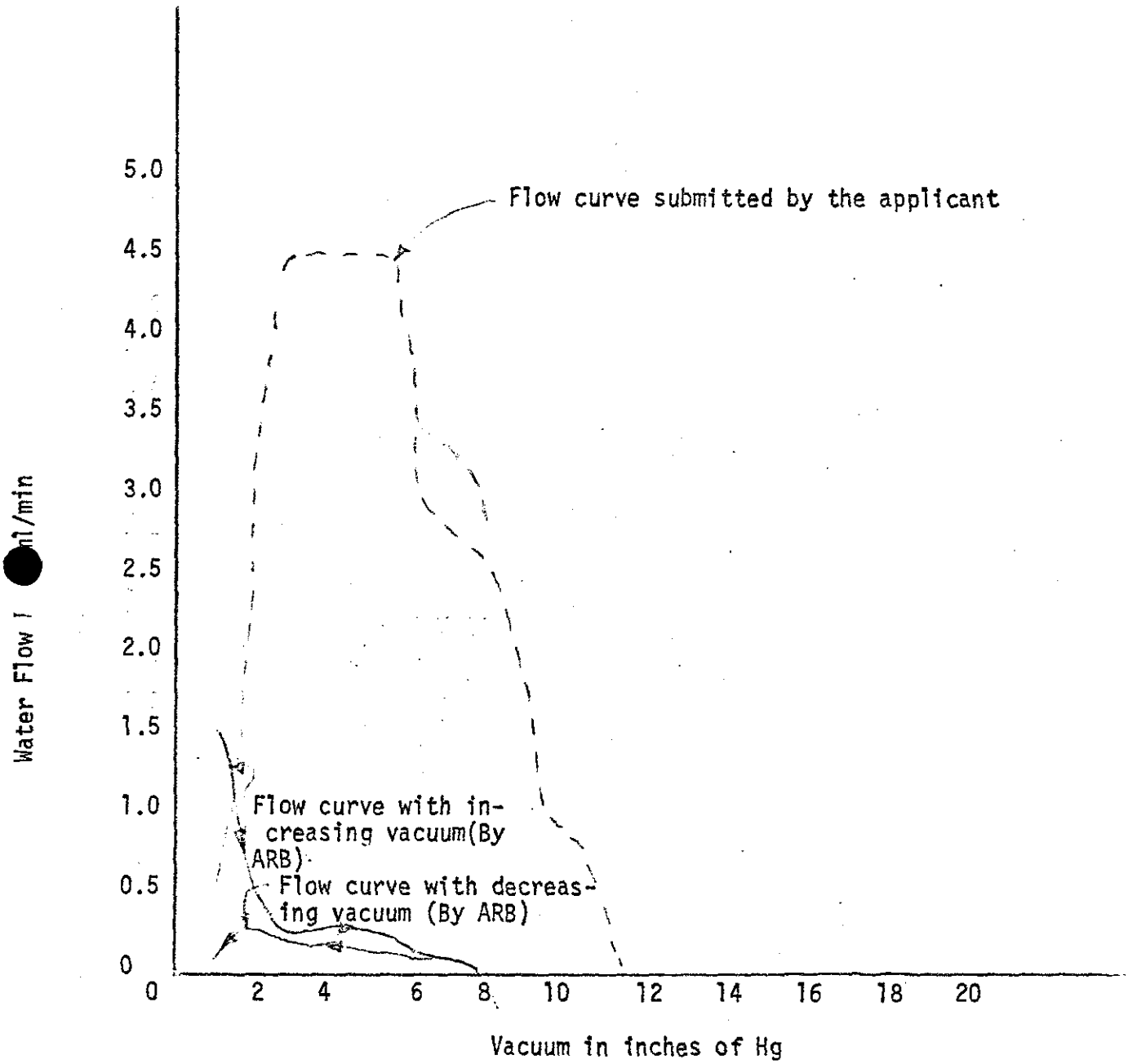


Fig. 2 - Type II Regulator Valve (2.36 - 4.1L engine)

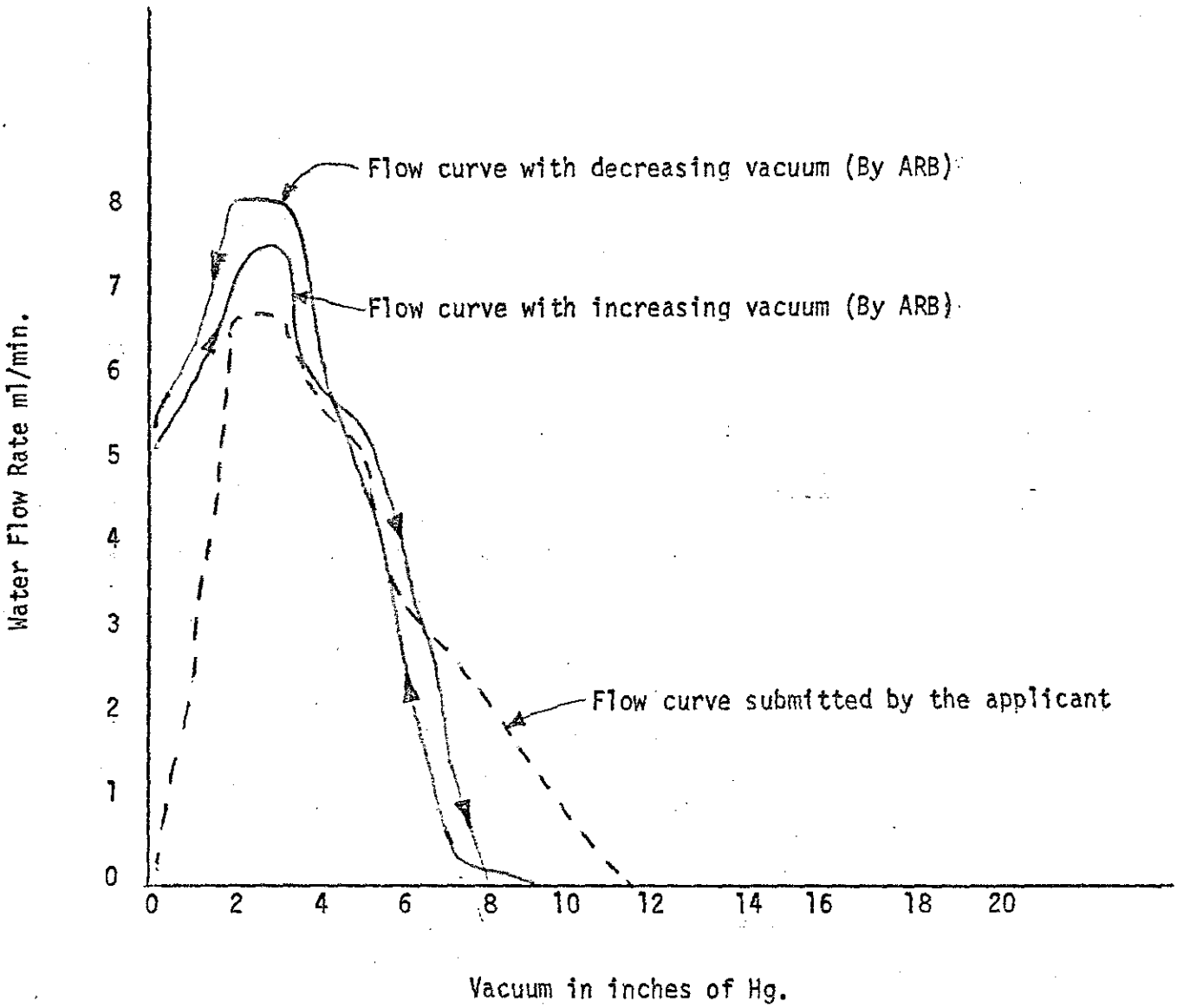


Fig. - 3 Redesigned Type III Regulator Valve (Over 4.1L engine) Bench Flow Curves

Table I

CVS-75 Test Data Comparison
Power Steamer Device

		HC (Grams per Mile)	CO (Grams per Mile)	NOx (Grams per Mile)	Fuel Economy (MPG)	Water Flow (ml)
1971 Datsun (1.2L-1V)	Baseline	3.0	14.7	4.6	24.2	-
	Device	2.8	17.5	4.6	24.1	15.0
	% Change	-7	19	0	-0.4	-
1974 AMC (7.45L-2V)	Baseline	2.9	12.3	2.4	11.1	-
	Device	3.0	13.1	2.1	11.0	100.2
	% Change	3	6.5	-12	-1	-

Table II

Hot Start CVS-72 Test Data Comparison*
Power Steamer Device

		HC (Grams per Mile)	CO (Grams per Mile)	NOx (Grams per Mile)	Fuel Economy (MPG)	Water Flow (ml)
1971 Datsun (1.2L-1V)	Baseline	2.2	11.0	4.5	25.1	-
	Device	2.2	12.2	4.4	25.4	21.4
	% Change	0	11	-8	1	-
1974 AMC (7.45L-2V)	Baseline	2.2	6.8	2.3	11.8	-
	Device	2.5	9.0	2.0	11.4	85.4
	% Change	14	32	-13	-3	-

*Average of two Hot Start CVS-72 tests

Table III

Key Mode Test Data Comparison for
1974 AMC Ambassador 7.45L-2V
Power Steamer Device

High Cruise	HC (PPM)	CO (%)	NOx (PPM)	Water Flow (ml/min)	Manifold Vacuum (in. Hg.)
Baseline	31	0.17	628	-	-
Device	21	0.17	482	1.6	5.6
% Change	-32	0	-23	-	-
Low Cruise					
Baseline	42	0.17	256	-	-
Device	42	0.12	256	2.5	8.2
% Change	0	-29	0	-	-
Idle					
Baseline	63	0.12	366[2]	-	-
Device	160[1]	0.12	93	0	15.5
% Change	154[1]	0	-	-	-

[1]This increase cannot be attributed to the device since the device was not operational at this manifold condition.

[2]Data questionable, reading too high.

APPENDIX I

A. Heat Transfer Calculations

Maximum water flow allowed is 8 ml (Type III regulator valve)

$Q_1 = WH$, $Q_2 = hA\,(\Delta t)$

where Q_1 = heat transferred required
Q_2 = available heat
W = water flow
H = heat of evaporation
h = heat transfer coefficient
A = area of heat transfer surface
Δt = temperature differential between exhaust gas and water

Use $h = 1 \frac{Btu}{ft^2\text{-}°F}$ (very conservative) $H = 970 \frac{Btu}{lb.}$

$A = 0.2\ ft^2$ $W = 8 \frac{ml}{min} \times 220 \times 10^{-2} \frac{lb}{ml.}$

$\Delta t = 1000\ °F$

$Q_1 = WH$

$= 8 \frac{ml}{min} \times 2.20 \times 10^{-5} \frac{lb}{ml} \times 970 \frac{Btu}{lb}$

$= 17.1 \frac{Btu}{min}$

$Q_2 = 1 \frac{Btu}{ft^2\text{-}°F} \times 0.2\ ft^2 \times 1000°F$

$= 2{,}000 \frac{Btu}{min}$

Since Q_2 is much greater than Q_1 all the water in the steam generator would be evaporated.

B. Calculation of Reduction in Volumetric Efficiency (Worst Case)

1. For Type I regulator valve applications:

Maximum water flow allowed in 5 ml/min at < 5 in. Hg.

$Vo = Vg \times W$

$V.E = \frac{V_1 - Vo}{V_1} \times 100\%$

where Vo = volume of charge dilution due to steam
Vg = specific volume of saturated steam
V_1 = engine air flow requirement
V.E= volumetric efficiency

use Vg = 26.8 $\frac{ft^3}{lb}$ at atmospheric pressure

W = 5 ml/min x 2.20 x 10^{-5} $\frac{lb}{ml}$

V_1 = 18 CFM (for 1.2L engine) at 85% Vol efficiency and 1,000 engine rpm

Vo = 26.8 $\frac{ft^3}{lb}$ x 5 ml/min x 2.20 x 10^{-5} $\frac{lb}{ml}$

= 0.29 ft^3/min.

V.E. = $\frac{18-0.29}{18}$ x 100% = 98.4 %

Reduction in Vol efficiency = 100% - 98.4% = 1.6%

2. For Type III regulator valve applications

Maximum water flow allowed is 8 ml/min at < 5 in. Hg.

Use V_1 = 61.5 CFM (for 250 CID engine) at 85% Vol. efficiency and 1,000 engine rpm.

V_o = 26.8 $\frac{ft^3}{lb}$ x 8 $\frac{ml}{min}$ x 2.20 x 10^{-5} $\frac{lb}{ml}$

= 0.47 ft^3/min.

V.E = $\frac{61.5 - 0.47}{61.5}$ x 100%

= 99.2%

Reduction in Vol. efficiency = 100% - 99.2% = 0.8%

C. Water Fuel Ratio (By Volume)

$$\text{gasoline used } Vg = \frac{D}{MPG}$$

$$\text{water fuel ratio} = \frac{Vg}{Vw}$$

Where: D = 7.5 miles (CVS-72) and 11.1 miles (CVS-75)
Vw = water used in the test cycle
MPG = miles per gallon

1. For the 1971 Datsun (1.2L-1V)

$$Vg = (CVS\text{-}72) = \frac{7.5}{25} = 0.925 \text{ gal.}$$

$$Vg = (CVS\text{-}75) = \frac{11.1}{25} = 0.444 \text{ gal.}$$

$$Vw\ (CVS\text{-}72) = \frac{21.4}{3785} = 0.00565 \text{ gal.}$$

$$Vw\ (CVS\text{-}75) = \frac{15}{3785} = 0.004 \text{ gal.}$$

$$\text{Water fuel ratio } (CVS\text{-}72) = \frac{0.00565}{0.925} = 0.006 \text{ or } 0.6\%$$

$$\text{Water fuel ratio } (CVS\text{-}75) = \frac{0.004}{0.444} = 0.009 \text{ or } 0.9\%$$

2. For the 1974 AMC (7.45L-2V)

$$Vg\ (CVS\text{-}72) = \frac{7.5}{11.7} = 0.68 \text{ gal.}$$

$$Vg\ (CVS\text{-}75) = \frac{11.1}{11.1} = 1.0 \text{ gal}$$

$$Vw\ (CVS\text{-}72) = \frac{85.4}{3785} = 0.0226 \text{ gal}$$

$$Vw\ (CVS\text{-}75) = \frac{100}{3785} = 0.026$$

$$\text{Water fuel ratio } (CVS\text{-}72) = \frac{0.0226}{0.68} = 0.033 \text{ or } 3.3\%$$

$$\text{Water fuel ratio } (CVS\text{-}75) = \frac{0.026}{1.0} = 0.026 \text{ or } 2.6\%$$

EXHIBIT A

KINSEY OF CALIFORNIA, INC.

7135 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA 90046
TELEPHONE (213) 874-3037
TELEX 67-7272
CABLE ADDRESS "YESNIK LOS ANGELES"

Mr. G. C. Haas, Chief
Division of Emission Control
Air Resources Board
State of California
9525 Telstar Avenue
El Monte, California 91731

March 25, 1976
Y-1322

Re: POWER STEAMER (A Fuel-saving Device)

Dear Mr. Haas:

In accordance with the Board's Directive dated February 17, 1971, we are hereby seeking a Request for a Board Finding that we have complied with Section 27156 of the Vehicle Code.

Our Power Steamer device injects steam into the vehicle engine's intake manifold in order to increase the combustion efficiency which would result in a fuel savings.

This procedure is done by increasing combustion pressure in the cylinder as a result of super-heated steam by combustion. The insignificant amount of water in the cylinder during the combustion cycle reduces the combustion temperature, thus reducing production of nitrogen oxide.

Our Power Steamer does not interfere with the normal operation of emission control equipment; and has only a slight effect in terms of pollutants emitted in the exhaust of any gasoline engines used in motor vehicles.

The following items are submitted herewith in accordance with your February 17, 1971, Directive:

1. Detailed Description of the device, apparatus or mechanism. (See Attach. No. 1)

2. Purpose of the device, apparatus or mechanism. (See Paragraphs Two and Three hereof)

3. Detailed Instructions for Installation on a vehicle. (See Attach. No. 3)

We have made various surveys of GM, Ford, Chrysler, American Motors, European and Japanese cars and have found that placement in each Engine Compartment differs per model, basically due to the type of engine installed.

After we receive your approval for installing the Power Steamer device on vehicles operating in the State of California, we will have separate detailed installation instructions printed for each manufacturer in accordance with it's engine models.

Attached is a typical example of the Ford Motor Company Passenger Cars and Trucks using a 351 CID-2V Engine for installation of the Power Steamer.

Also attached are various sketches of Engine Compartments of 1975 vehicles. The installed Power Steamer appears on each drawing.

4. Print Outs of Emission Test Data taken in accordance with the appropriate Air Resources Board test procedures were previously submitted to you on November 12, 1975, and are therefore not duplicated here. (Olson Engineering Testing Laboratories)

5. A listing of makes and models of vehicles and Emission Control Systems for which a Board finding is required:

   ALL PASSENGER CARS PRECEDING 1975, MADE IN THE UNITED STATES, EUROPE, AND JAPAN, EXCEPT CARS EQUIPPED WITH FUEL INJECTION GASOLINE ENGINES AND WITH DIESEL ENGINES.

6. For your independent evaluation, one (1) sample kit of this device, and three (3) pre-set Regulator Valves (Type 1, 2 & 3) are delivered simultaneously with this letter as follows:

Type	Classification	CID
1.	A	50-140
2.	B & C	140-250
3.	D, E, F	250 & over

Thank you for your attention and cooperation in this matter.

Yours very truly,

KINSEY OF CALIFORNIA, INC.

George Y. Sasaki
President

GYS:km

Encls.

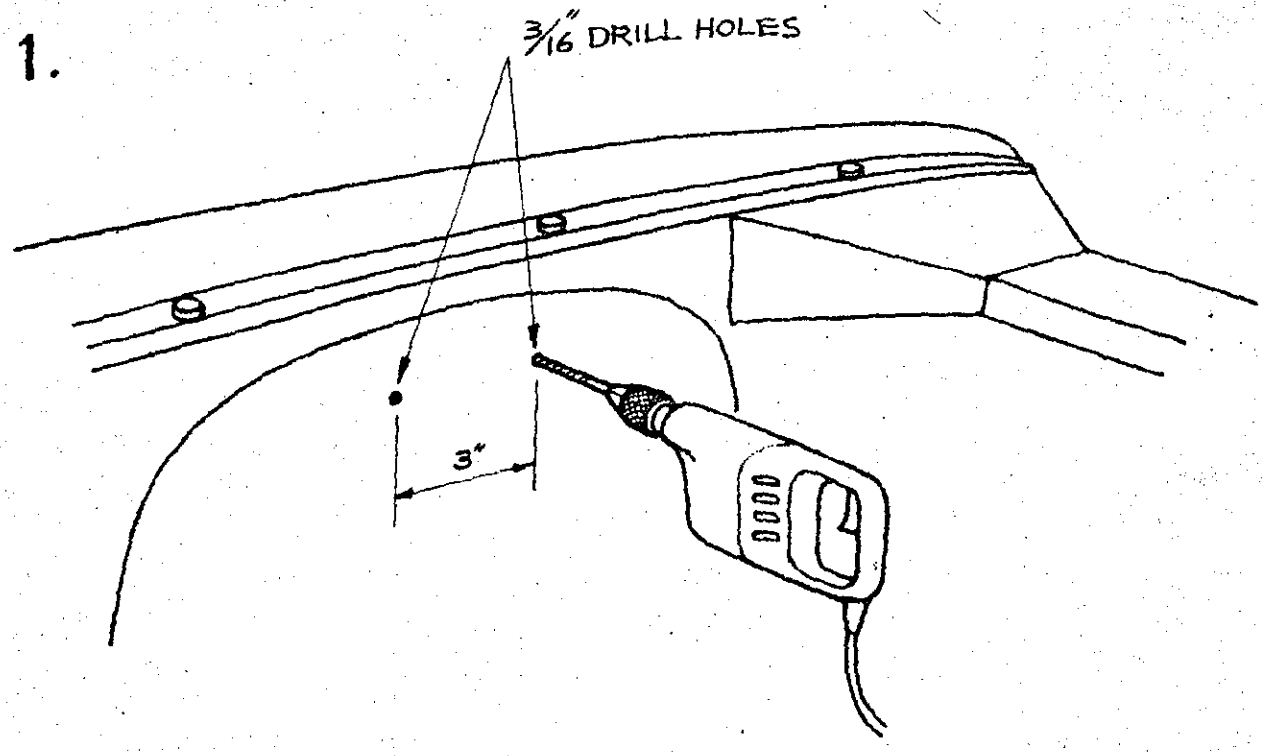
HAND DELIVERED

EXHIBIT B

ILLUSTRATED INSTALLATION PROCEDURE FOR CARS WITH "FORD MOTOR COMPANY 351 - 2V ENGINE"

KINSEY OF CALIFORNIA, INC.

1.



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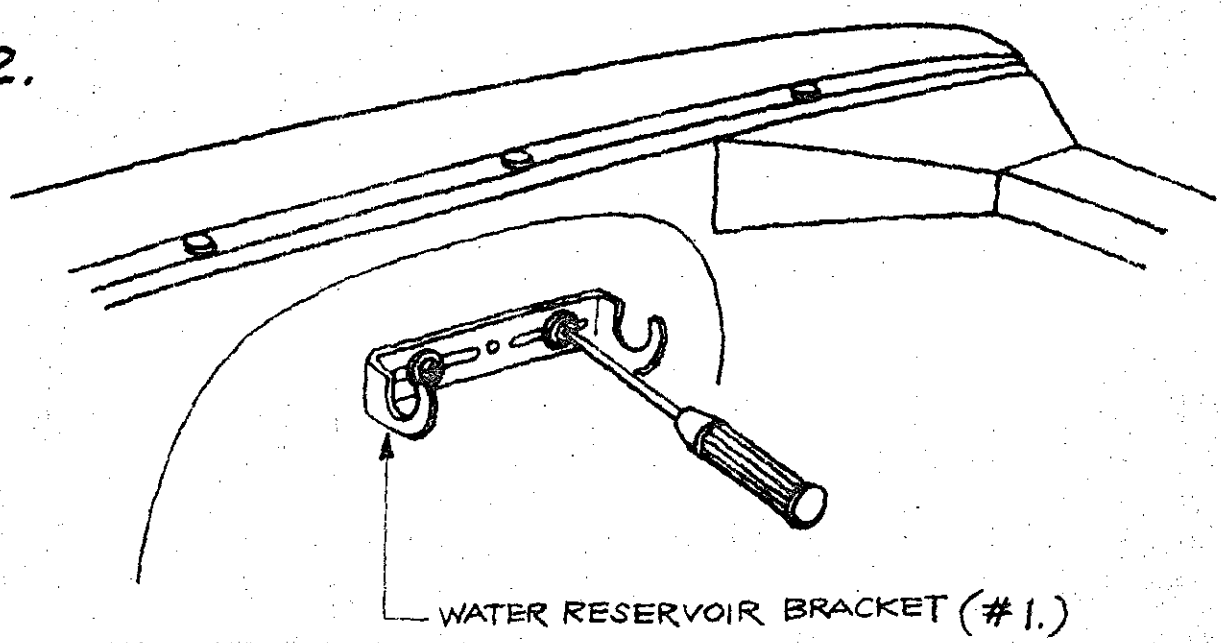

7135 HOLLYWOOD BOULEVARD
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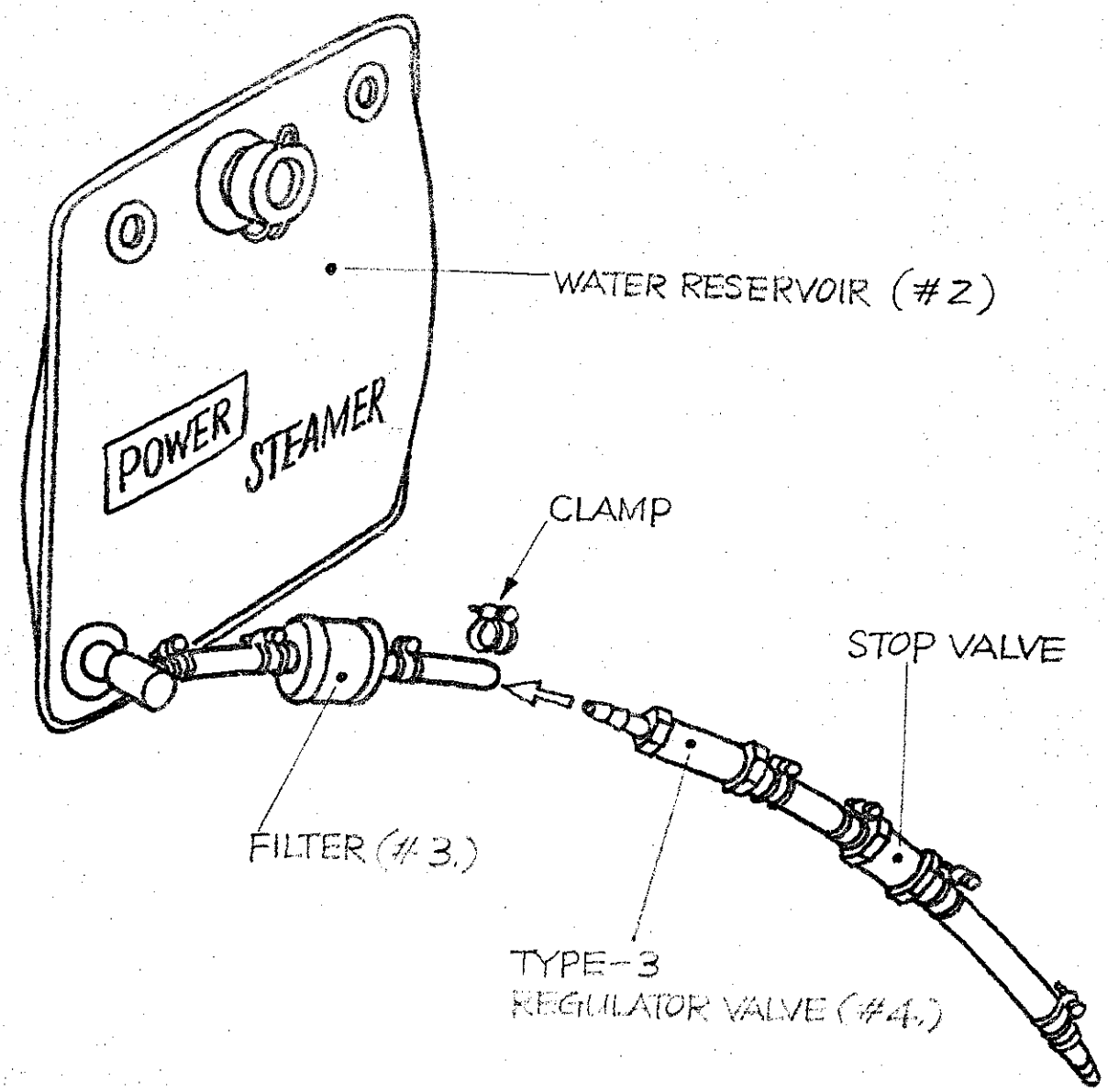
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POWER STEAMER
CLAMP
STOP VALVE
FILTER (#3.)
TYPE-3
REGULATOR VALVE (#4.)

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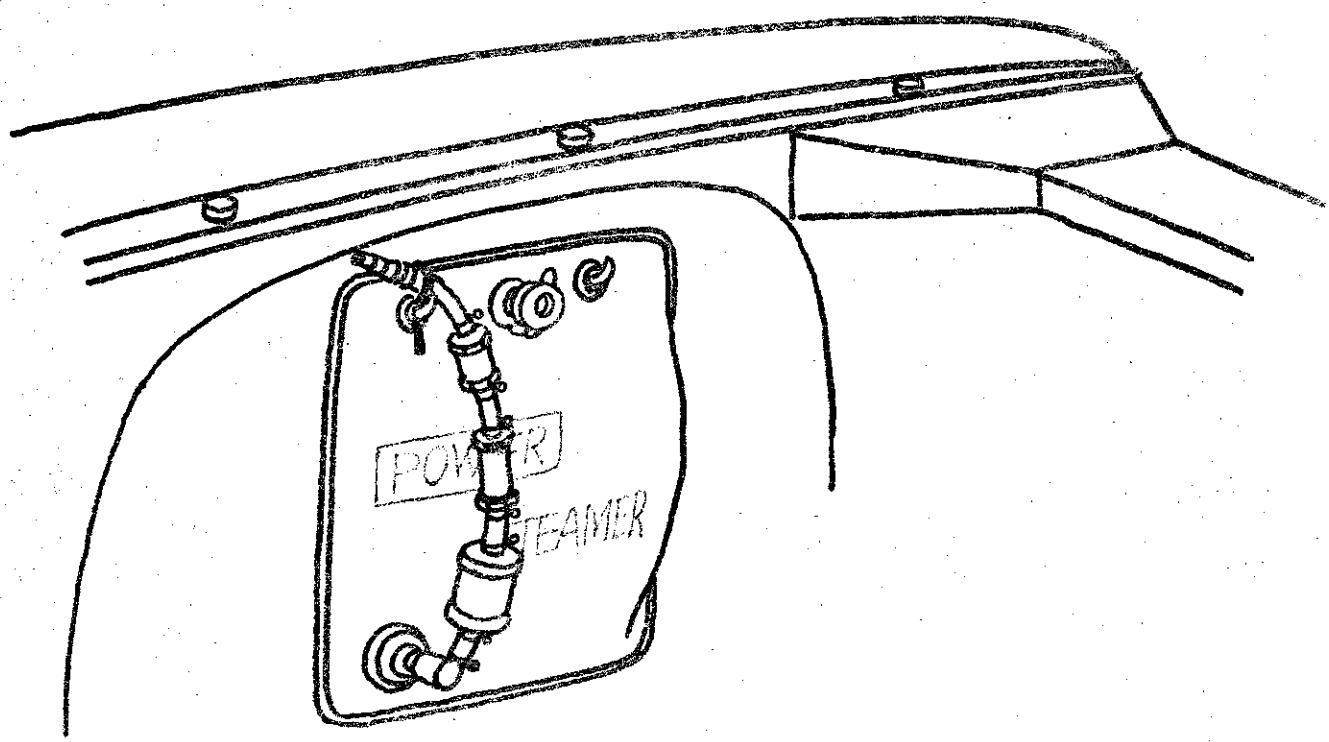

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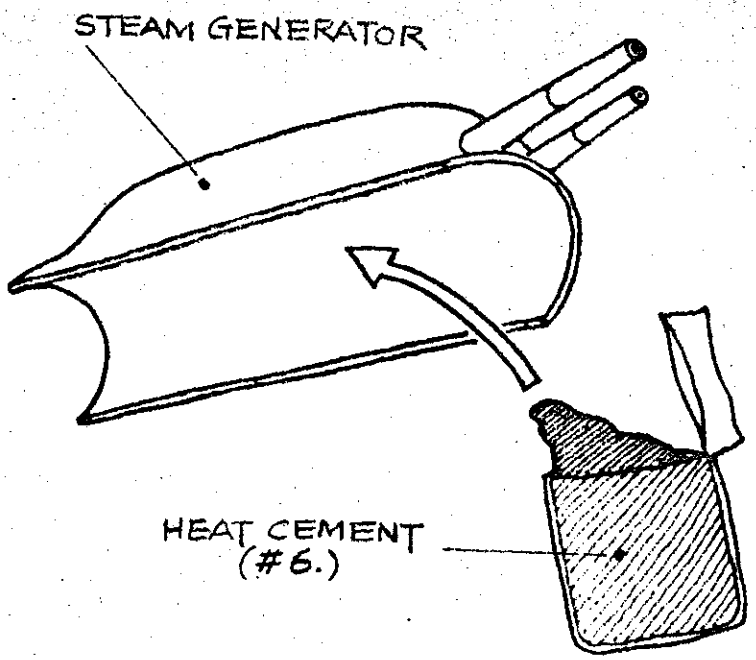
STEAM GENERATOR
HEAT CEMENT
(#6.)

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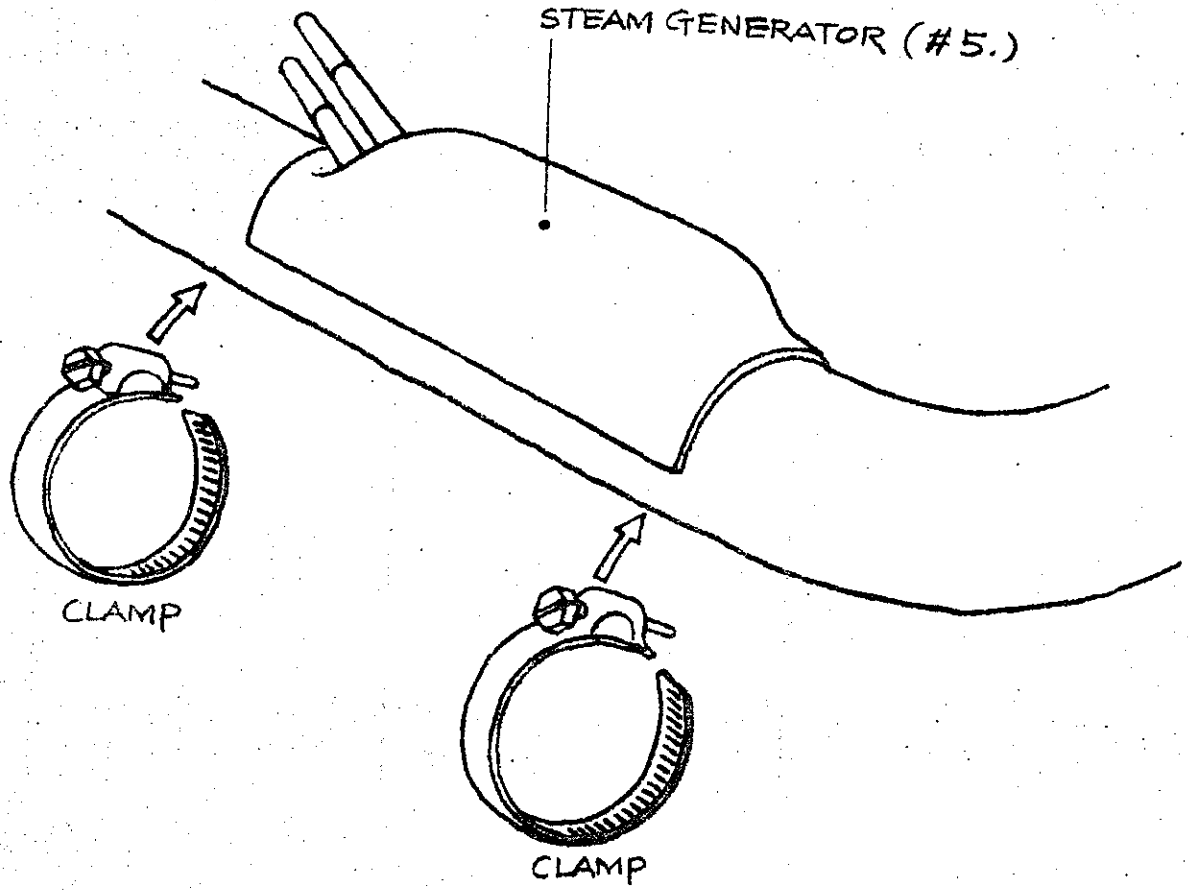
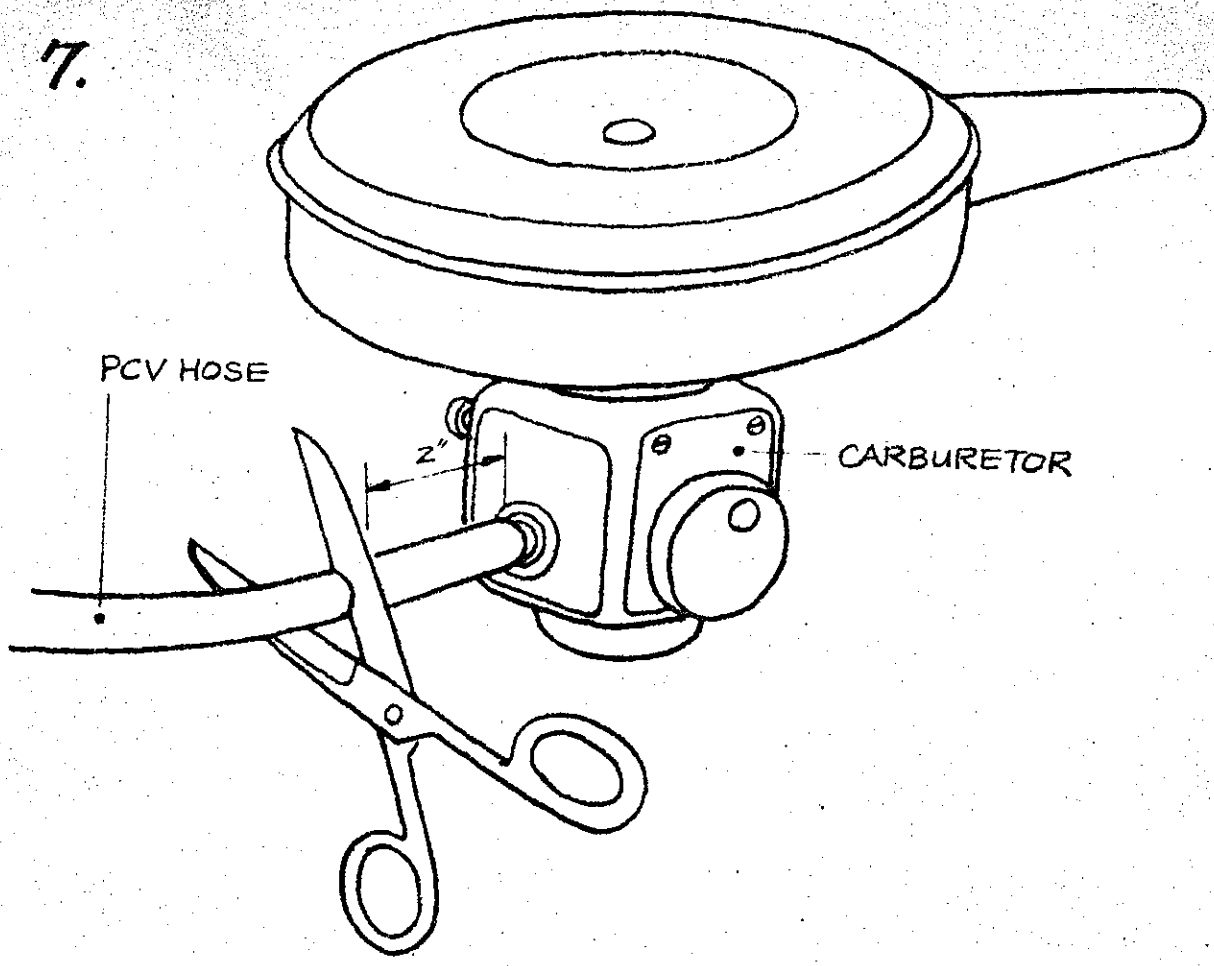

STEAM GENERATOR (#5.)
CLAMP
CLAMP

7.



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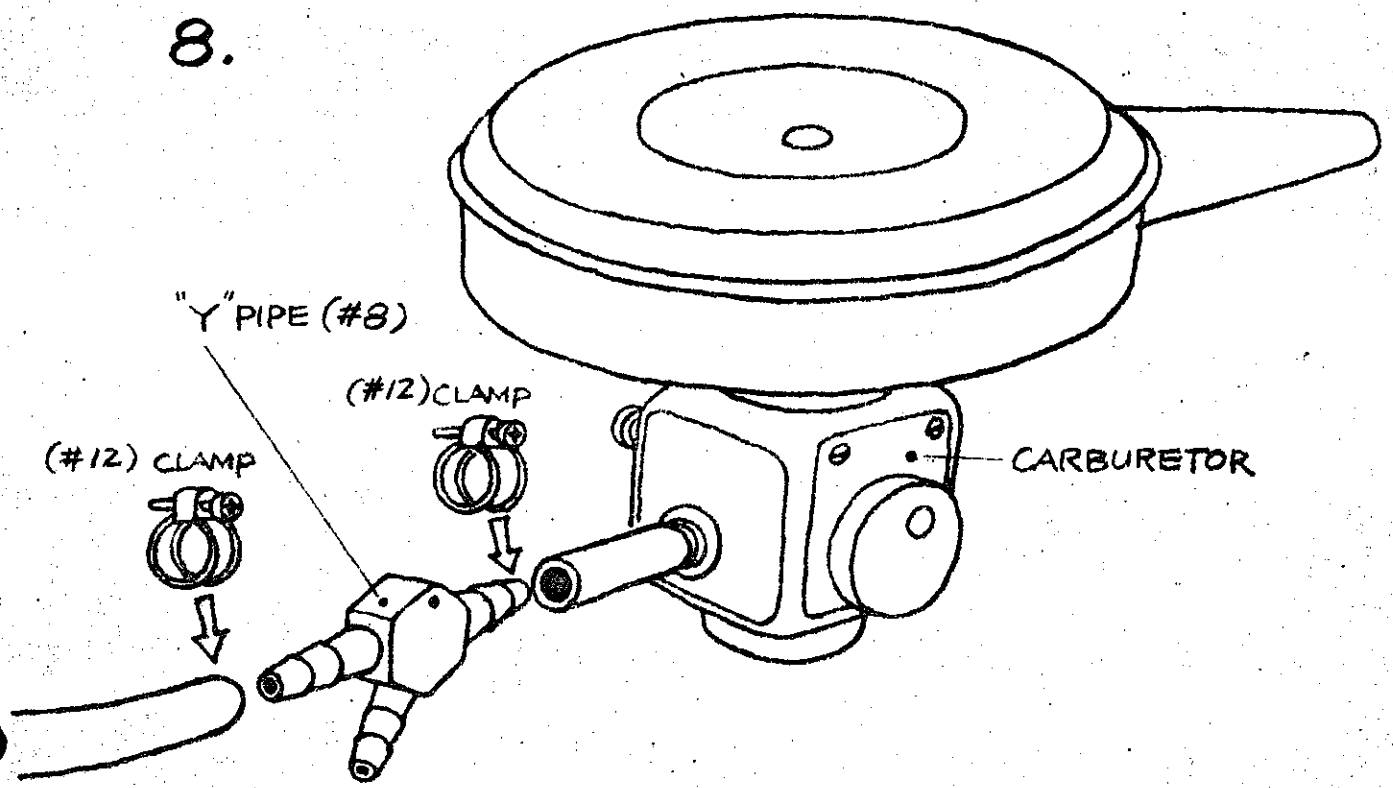

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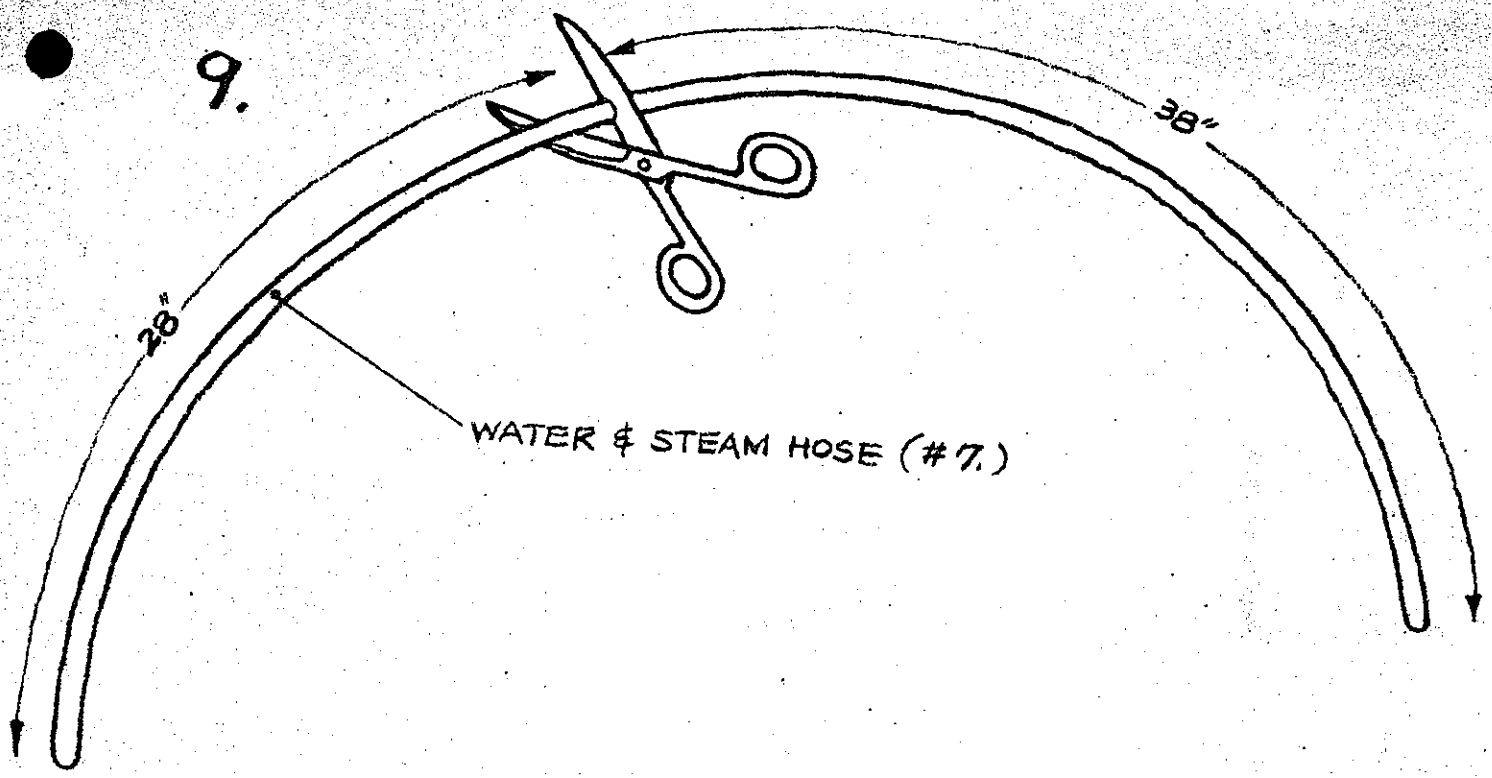

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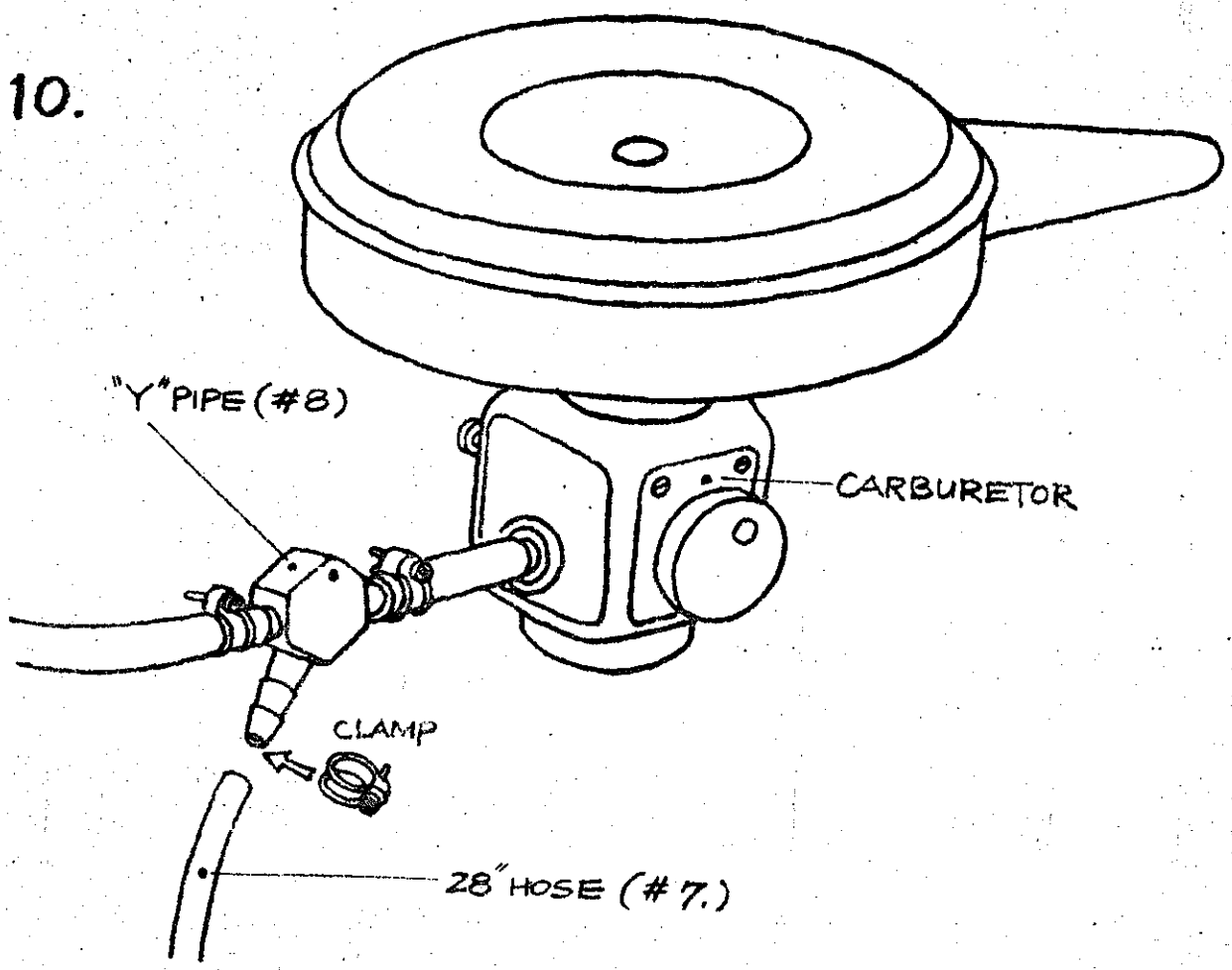
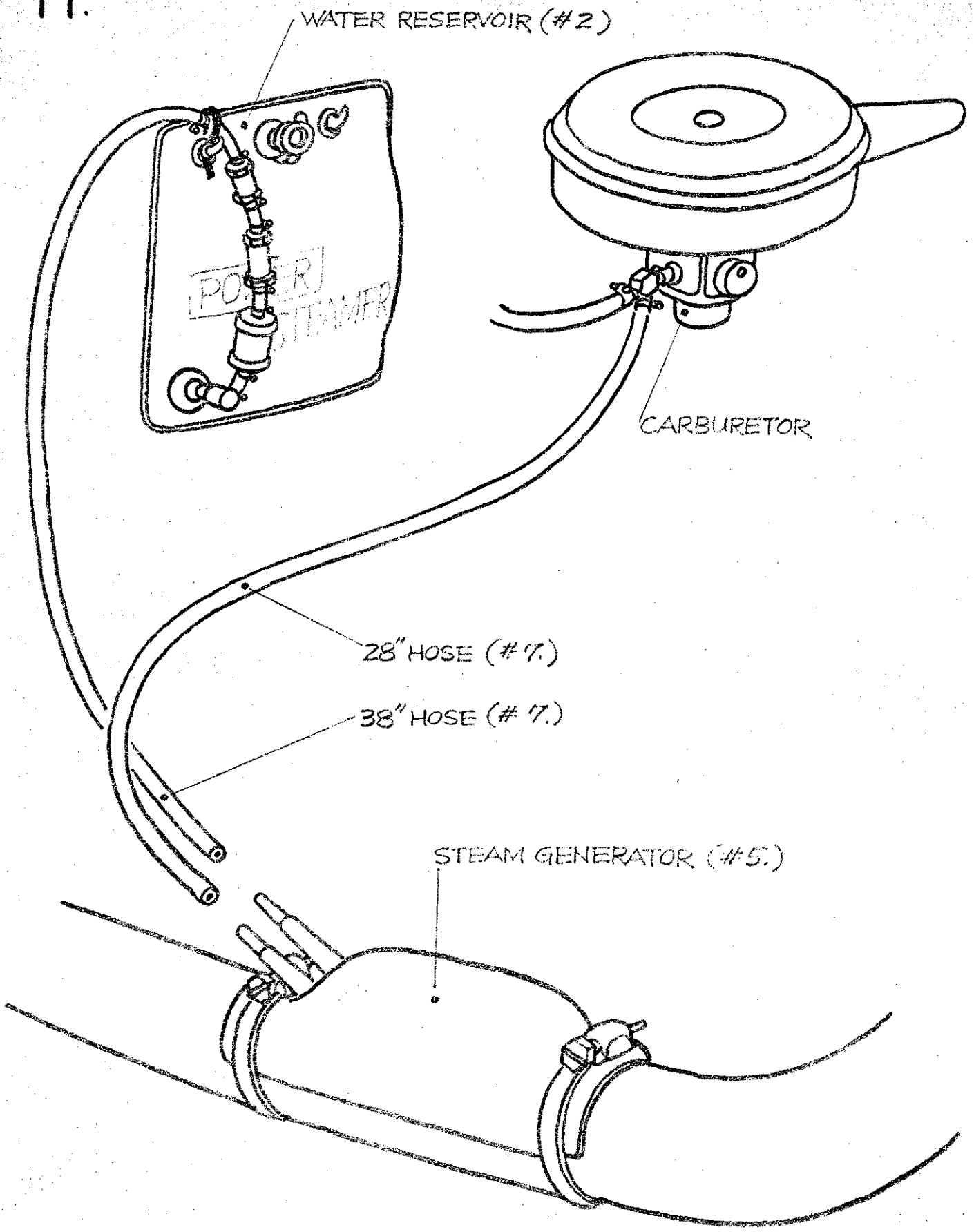


11.


WATER RESERVOIR (#2)
CARBURETOR
28" HOSE (#7.)
38" HOSE (#7.)
STEAM GENERATOR (#5.)

12.

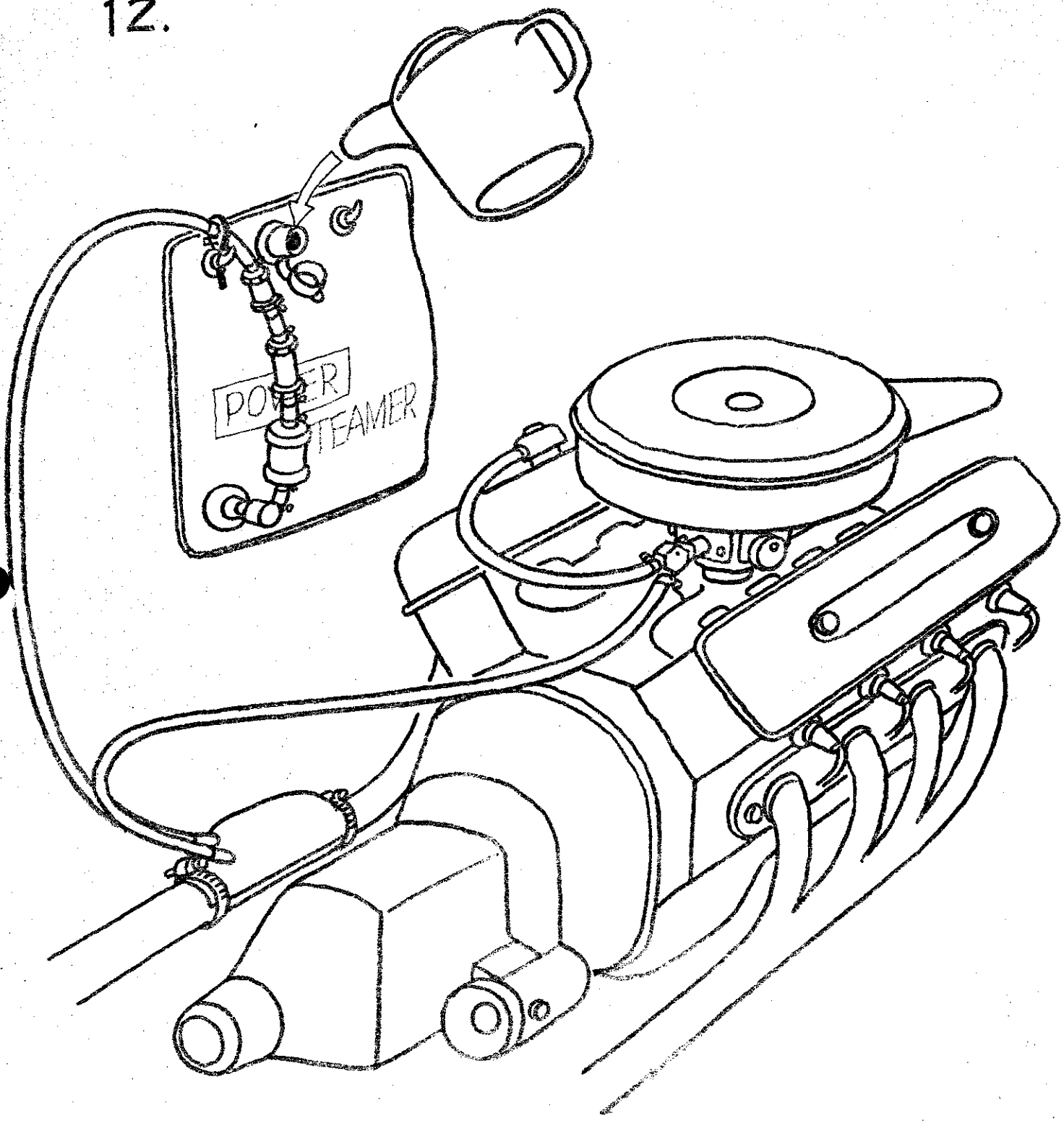


EXHIBIT C

KINSEY OF CALIFORNIA, INC.

7135 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA 90046
TELEPHONE (213) 874-3037
TELEX 67-7272
CABLE ADDRESS "YESNIK LOS ANGELES"

Mr. K. D. Drachand, Chief
Vehicle Compliance
Air Resources Board Laboratory
State of California-Resources Agency
9528 Telstar Avenue
Elmonte, California 91731

August 24,1976

Y-1445

Re: POWER STEAMER(A Fuel-saving Device)

Dear Mr. Drachand:

With reference to our letter of June 12, 1976, ref.#Y-1385, we are presenting to you our redesigned sample of the subject device for your evaluation.

Based on your letter of May 20, 1976 in which you have mentioned four(4) reasons why you cannot recommend granting our device an exemption from the prohibitions of Section 27156 of the Vehicle Code, we wish to mention as follows:

(1) The new sample has been checked, and will not leak in the closed positions at atmospheric pressure, if you do not disconnect the Water Reservoir, Filter, Regulator Valve, Stop Valve(newly attached) and Water Hose.

Also, the Stop Valve will prevent any water to flow thru the system when subjected to 18 in.Hg. Vacuum.

This new device sample showed the flow calibration when subjected to increasing and decreasing vacuum as attached.

(2) As mentioned above, no water will be siphoned into the engine during vehicle storage.

(3) With the water flow stopped when subjected to 18 in.Hg. Vacuum, the HC and CO average in idle will be lesser than the former sample device.

(4) We will work out the Durability Test Data or submit the manufacturer's Liability Warranty, as soon as we receive your advice that the redesigned sample has met your other requirements.

With best regards,

Kinsey of California, Inc.

George Y. Sasaki
President

GYS:km 3/3

Encl:

cc: Mr. Fernando Tan
Mr. Jerry C. Coker

EXHIBIT D

KINSEY OF CALIFORNIA, INC.

7135 HOLLYWOOD BOULEVARD
LOS ANGELES, CALIFORNIA 90046
TELEPHONE (213) 874-3037
TELEX 67-7272
CABLE ADDRESS "YESNIK LOS ANGELES"

Mr. Richard J. Kenny
Senior Engineer
Division of Emission Control
Air Resources Board
State of California
9525 Telstar Avenue
El Monte, California 91731

Dec.6,1976

Z-2725

Certified Mail#518846
Special Delivery

Re: POWER STEAMER

Dear Mr. Kenny:

With reference to our telephone conversation with your Mr. Fernando Tan today, we wish to confirm the following:

1. We will withdraw our Type 2 Regulator Valve from our application, and substitute it with Type 1 Regulator Valve for installation to motor vehicles equipped with engines of 50 to 250 CID.

2. We will not advertise the Power Steamer for sale as Fuel Saving Device, until such time further testings have been done by Independent Testing Laboratory(s), or by motor vehicle Fleet Owner(s), and have the datas to substantiate the fuel saving claim.

3. We will not state the Power Steamer Device will reduce the Nitrogen Oxide emission when installed to motor vehicles.

Using this opportunity, we wish to express our deep appreciation for all the time and efforts spent by you and your staff, to test our Power Steamer Device in the past, and will await your further advice on your decision on our application dated March 25, 1976 ref.#Y-1322.

With best regards,

Kinsey of California, Inc.

George Y. Sasaki
President

cc: Mr. Fernando Tan
Mr. Jerry C. Coker, Olson Engineering Inc.