

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-55
Relating to Exemptions under Section 27156
of the Vehicle Code

DEALER TOOL SYSTEMS, INC.
"SCOTSMAN FUEL ENERGIZER"

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 39023 of the Health and Safety Code;

IT IS ORDERED AND RESOLVED: That the installation of the "Scotsman Fuel Energizer" manufactured by Dealer Tool Systems, Inc., 4825 North Scott Street, Schiller Park, Illinois 60176 has been found not to 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 model year vehicles.

This device consists of a formed screen mounted under the carburetor. In the center of the screen, a brass plated steel grommet is installed with its center completely open. The grommet size is 0.388 inch I.D. and 0.558 inch O.D.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different than 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 the vehicle's pollution control devices 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 "SCOTSMAN FUEL ENERGIZER" 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 unlawful, untrue or misleading advertising and Section 17534 makes violation punishable as a misdemeanor.

Sections 39130 and 39184 of the Health and Safety Code provide as follows:

"39130. No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for certification of a device, represent, any device as a motor vehicle pollution control device unless that device has been certified by the 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 section is a misdemeanor."

"39184. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the board for accreditation 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 accredited by the board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as an accredited device which, in fact, is not an accredited 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 30th day of July, 1975.

WILLIAM SIMMONS
Executive Officer

State of California

AIR RESOURCES BOARD

July 10, 1975

Staff Report

Evaluation of Dealer Tool System, Inc.
"Scotsman Fuel Energizer" Intake Manifold
Screen for Exemption from the Provisions of
Section 27156 of the Vehicle Code

I. Introduction

Dealer Tool System, Inc. 4825 North Scott Street, Schiller Park, Illinois 60176, has applied (application and amendment - Exhibit A) for an exemption for their "Scotsman Fuel Energizer" intake manifold screen gasket Models 100, 110, 120, 200, 210, 220, 230, 240, 250, 260, 400, 410, 420, 430 and 440. Dealer Tool Systems, Inc. intends to market this device for use with 1975 and older model-year vehicles both foreign and domestic.

II. Device Description and Function

The "Scotsman Fuel Energizer" is an intake manifold screen constructed by sandwiching a stainless steel, formed screen (24 mesh size) between two automotive intake manifold gaskets. For extra thick OEM gaskets a spacer gasket is also supplied. In the center of the screen, a brass plated steel grommet is installed with its center completely open (no screen). This grommet and screen is present in a single barrel gasket, both sides of a 2 barrel gasket, and only in the primaries of a 4 barrel gasket. The manufacturer states that the primary use of the device is to improve fuel economy.

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According to the manufacturer, at high flow rates the screen acts as a restriction to flow and the grommet hole then acts to provide an alternate, low restriction, flow path. In addition, the flow path through the grommet hole is claimed to create a vortex which helps prevent the gasoline droplets from impinging on the intake manifold walls. The presence of this grommet distinguishes the "Scotsman Fuel Energizer" from other intake manifold screen devices.

III. Device Evaluation

This device is in its fourth design configuration. The four configurations are briefly described below:

- 1) The first form contained installation instructions that included advancing the initial timing and possibly adjusting the idle mixture richer than the vehicle manufacturer's specifications. This application was denied.
- 2) The second form was the same hardware as above. The installation instructions were revised to show engine settings according to manufacturers specifications. This application was denied due to an increase in carbon monoxide.
- 3) The third form was a re-design of the grommet to reduce the blockage area. This application was also denied due to an increase in carbon monoxide.

Evaluation of Dealer Tool Systems, Inc. "Scotsman Fuel Energizer" Intake Manifold Screen for Exemption from the Provisions of Section 27156 of the Vehicle Code

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- 4) The fourth form was to further reduce the grommet blockage area. The grommet size was 0.388 in. I.D. and 0.558 in. O.D.

Detailed descriptions of the first three configurations are in the ARB staff report dated March 6, 1975.

Device Evaluation of Fourth Configuration

The manufacturer presented data on a 1974 Chevrolet Nova, 350 CID engine, two barrel carburetor and automatic transmission with the 49 state emission control system. The tests were CVS-1975 Cold start tests with results as follows:

<u>Test Condition</u>	<u>Emissions (gm/mi)</u>			<u>Calculated Fuel Economy in MPG</u>
	<u>HC</u>	<u>CO</u>	<u>NOx</u>	
Baseline	1.89	18.65	1.54	12.4
With device	1.91	17.12	1.57	12.5
Percent change	1.06	-8.20	1.95	0.81

The manufacturer also presented data on a 1974 AMC Hornet, 232 CID engine, single barrel carburetor and automatic transmission with the 49 state emission control system. The tests were CVS-1974 hot start tests with results as follows:

<u>Test Condition</u>	<u>Emissions (gm/mi)</u>			<u>Calculated Fuel Economy (MPG)</u>
	<u>HC</u>	<u>CO</u>	<u>NOx</u>	
Baseline	1.80	32.17	2.33	17.0
With device	1.27	14.06	2.93	16.9
Percent change	-29.44	-56.29	3.53	-0.59

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An ARB confirmatory test was made. The vehicle tested was a California approved version 1975 AMC Hornet, 232 CID engine, single barrel carburetor and automatic transmission. The tests were CVS-1974 hot start tests. The results of the emission tests are as follows:

<u>Test Condition</u>	<u>Emissions (gms/mi)</u>			<u>Calculated Fuel Economy in MPG</u>
	<u>HC</u>	<u>CO</u>	<u>NOx</u>	
Baseline	2.09	40.5	1.03	12.7
Device Test	2.31	42.8	1.00	13.0
Percent Change	10.5	3.9	-2.9	2.4

An apparent installation problem was experienced upon installing the device on the vehicle. It was discovered that the spacing between the carburetor and the intake manifold had increased. The replacement gasket with its incorporated screen was assembled with the original O.E.M. gasket contrary to the installation instructions. An increase in the idle RPM resulted and could not be corrected due to a change in throttle linkage geometry thereby increasing the throttle opening. It is also suspected that vacuum leaks may have occurred in the vacuum lines. This throttle link is not adjustable. Before the idle RPM could be re-set to the vehicle manufacturers specification, an extension to the linkage had to be improvised. Due to these problems the ARB data was considered invalid and the device was retested.

Evaluation of Dealer Tool Systems, Inc. "Scotsman Fuel Energizer" Intake Manifold Screen for Exemption from the Provisions of Section 27156 of the Vehicle Code

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The second test was made and the results were as follows:

<u>Test Condition</u>	<u>Emissions (gm/mi)</u>			<u>Calculated Fuel Economy in MPG</u>
	<u>HC</u>	<u>CO</u>	<u>NOx</u>	
Baseline	1.93	29.1	1.14	14.2
Device Test	1.82	26.8	1.21	14.0
Percent Change	-5.7	-7.9	6.1	-1.4

This data is considered typical of carburetor screen devices.

IV. Conclusion and Recommendations

It is the opinion of the staff that the "Scotsman Fuel Energizer" manufactured by Dealer Tool Systems, Inc., in its fourth design form, has no significant effect on exhaust emission control systems or fuel economy with California version vehicles.

Therefore, it is recommended that Dealer Tool Systems, Inc. be granted an exemption from the prohibitions of Vehicle Code Section 27156 for its "Scotsman Fuel Energizer" device for use on 1975 and older model-year vehicles.

DEALER TOOL SYSTEMS, INC.

4825 NORTH SCOTT STREET SCHILLER PARK, ILLINOIS 60176 (312) 671-0200

April 21, 1975

Chief-Division of Emission Control
State of California
9528 Telstar Avenue
El Monte, California 91731

Gentlemen:

I want to amend my application of March 25th by providing the additional data requested by Mr. J. J. Kenny in his letter of April 3, 1975.

1. All production units of Model 100 will have the air bleed passage between the intake manifold and the carburetor throttle body assembly to accommodate single barrel Chrysler vehicles. This was alluded to in the penultimate paragraph of our application.
2. On April 17, 1975 Olson Laboratories, Inc. performed a CVS 1974 Hot Start (Baseline and Device) on an AMC 232 C.D. without air pump. The results are enclosed.
3. The adhesives and gaskets used in the assembly of the Scotsman are developed for use with gasoline.
4. In all production models of the Scotsman Fuel Energizer the stainless steel mesh will be electrically connected to the bolt hole eyelet which in turn will be in contact to both the carburetor base and the intake manifold.

I hope this information enables you to proceed with your evaluation of our application.

Cordially



Robert P. Cameron
President

RPC/vi

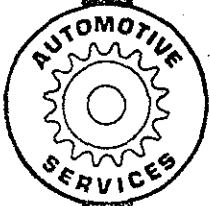
Enclosures



DEALER TOOL SYSTEMS, INC.

4825 NORTH SCOTT STREET SCHILLER PARK, ILLINOIS 60176 (312) 671-0200

March 25, 1975



Chief - Div. of Emission Control
State of California
9528 Telstar Avenue
El Monte, California

Gentlemen:

We manufacture a device known as the Scotsman Fuel Energizer U. S. Patent Office #4577700.

The Scotsman is an asbestos gasket that has a stainless steel mesh cup with a brass eyelet insert. The purpose of the Scotsman is to provide better fuel economy by maximizing the combustion and thereby getting the most energy from each drop of fuel.

The Scotsman is installed by raising the carburetor and replacing the carburetor base gasket with the Energizer. (Installation instructions are enclosed.)

Components: We use a high grade stainless steel in the mesh and have inspected vehicles with as much as 65,000 miles without any evidence of corrosion.

All production models of the Scotsman Fuel Energizer will be grounded by a capacitor from the stainless steel mesh to the underside of the gasket. This will ground the mesh to the manifold.

Some 2V models will have an extra gasket with a third bolt hole. This is to accommodate the PCV in some models of Chevrolet.

All production units of the Scotsman Fuel Energizer will have a protruding tag bearing the words "Scotsman" on one side and "Do Not Remove" on the other side. The tag will be located at the left front for the convenience of State inspection personnel.

DEALER TOOL SYSTEMS, INC.

Exhibit A

Chief - Div. of Emission Control
State of California
March 25, 1975
Page Two

In order to comply with California standards we have reduced the amount of brass restriction surrounding the center port by still another one-third from our previous design.

Enclosed are a complete battery of E.P.A. Dynamometer Schedules from Olson Laboratories, Inc. These include the 1975 cold start and other tests.

We are also enclosing prototypes of our new models 100. (production models of model 100 will have aperture to correspond with the Chrysler single barrel gasket), 200, and 400 with the still smaller brass restriction so that you can see the improvement.

We request a Board Certification under the provisions of Section 27156 of the Vehicle Code for all carburetor equipped motor vehicles both foreign and domestic up to and including 1975 models.

Respectfully submitted,



Robert P. Cameron
President

Enclosure: Installation instructions
Olson Report
Design News
Prototypes of Models 100, 200, 400

DEALER TOOL SYSTEMS, INC.**INSTALLATION INSTRUCTIONS FOR 2 AND 4 BARREL FUEL ENERGIZERS**

1. Check manifold vacuum at idle before removing the carburetor. Compare at the same RPM after atomizer installation.
2. Disconnect the throttle linkage, fuel line, and vacuum lines at the carburetor as necessary.
3. Remove the carburetor hold-down cap screws or nuts.
4. Remove the carburetor and discard the carburetor mounting gasket:

NOTE: Rochester 4 barrel carburetors sometimes use a steel heat deflector shim; clean and re-install this shim below the Fuel Energizer.

NOTE: On Ford Motor Company products the Fuel Energizer is installed over the spacer plate directly under the carburetor.

5. Inspect the manifold/carburetor mounting surface to be sure that it is clean.
6. Place the gas atomizer in position over the manifold with "Front-Up" facing toward the front of the vehicle.
7. On vehicles using a 1/4" or thicker stock carburetor mounting gasket, place the supplementary gasket provided directly over the Fuel Energizer.
8. Re-install the carburetor and tighten the cap screws or nuts evenly following O.E.M. recommendations.

POST INSTALLATION REQUIREMENTS AND RECOMMENDATIONS

1. Check to see that all vacuum hoses are in their original position.
2. Start engine and check manifold vacuum. The vacuum should be equal or slightly greater than the reading taken prior to installation of the gas atomizer.
3. Occasionally carburetor idle jets are set excessively lean. The Fuel Energizer will not function properly when this occurs and engine roughness, hydrocarbon pollution, and/or idle speed fluctuation will be excessive. Check first for a vacuum leak. If a vacuum leak is found, re-tighten the carburetor hold-down cap screws or nuts while watching a vacuum gauge to obtain a maximum reading. Engine smoothness should improve immediately and hydrocarbon pollutants should decrease. Idle jets should be set to give carbon monoxide levels in agreement with the automobile manufacturer's recommendations.
4. While the Fuel Energizer will increase gas mileage and generally improve performance, maximum efficiency can only be realized by keeping your engine in good running condition and maintaining proper tire inflation. Tune-up periods should not exceed 10,000 miles and tires should be checked regularly for proper inflation.
5. Best mileage will be obtained from your engine when the ignition timing is not retarded from the recommended factory setting.

INSTALLATION INSTRUCTIONS FOR SINGLE BARREL FUEL ENERGIZER

1. Check manifold vacuum at idle before removing the carburetor. Compare at the same RPM after atomizer installation.
2. Disconnect throttle linkage, fuel line, and vacuum lines at the carburetor as necessary.
3. Remove the carburetor hold-down cap screws or nuts.
4. Remove the carburetor and discard the carburetor mounting gasket.
5. Inspect the manifold and carburetor base to be sure that they are clean.
6. Place the Fuel Energizer in position over the manifold noting top position.
7. On those units which use an insulator between the manifold and carburetor use the insulator provided with the kit installing it over the Fuel Energizer.
8. Re-install the carburetor and tighten cap screws/or nuts following O.E.M. recommendations.

POST INSTALLATION REQUIREMENTS AND RECOMMENDATIONS

1. Check to see that all vacuum hoses are in their original position.
2. Start engine and check manifold vacuum. The vacuum should be equal or slightly greater than the reading taken prior to installation of the Fuel Energizer.
3. Occasionally carburetor idle jets are set excessively lean. The Fuel Energizer will not function properly when this occurs and engine roughness, hydrocarbon pollution, and/or idle speed fluctuation will be excessive. Check first for a vacuum leak. If a vacuum leak is found, re-tighten the carburetor hold-down cap screws or nuts while watching a vacuum gauge to obtain a maximum reading. Engine smoothness should improve immediately and hydrocarbon pollutants should decrease. Idle jets should be set to give carbon monoxide levels in agreement with the automobile manufacturer's recommendations.
4. While the Fuel Energizer will increase gas mileage and generally improve performance, maximum efficiency can only be realized by keeping your engine in good running condition and maintaining proper tire inflation. Tune-up periods should not exceed 10,000 miles and tires should be checked regularly for proper inflation.
5. Best mileage will be obtained from your engine when the ignition timing is not retarded from the recommended factory setting.

Wire gasoline atomizer cuts auto fuel consumption

Increases hp while decreasing exhaust pollutants

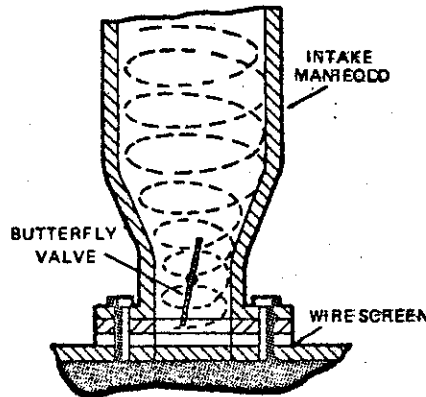
J. Ronald Ullmann, Midwest Editor

Background: Until recently, gasoline consumption has been of relatively little importance to the American public. But with concern over air cleanliness, more and more pollution control devices have been placed on autos, resulting in both horsepower output per cu inch displacement as well as mileage reductions. With the current gasoline shortages, the public has been urged to buy only small cars and the national speed limit has been lowered to 55 mph to help conserve fuel.

Problem: Most wire screen-type atomizers cause an eight-cylinder engine to choke out at about 50 mph and six-cylinder engines to choke out at about 70 mph because the gasoline cannot pass through the screen at those speeds. Automobiles equipped with atomizers must be able to go at least 55 mph.

Solution: Compression Dynamics Inc., in Skokie, IL has developed a wire screen-type gasoline atomizer made from 24 by 24 strand stainless steel mesh with a brass grommet insert to solve both the problems of complete atomization of the gasoline and the problem of chokeout at high speeds. The device is located between the carburetor and the intake manifold. At low speeds the wire mesh breaks the gasoline into droplets that can be burned more efficiently by the engine. At high speeds the grommet acts to create a vortex so that the gasoline can pass through the now opaque screen and still be in droplet form for more complete combustion.

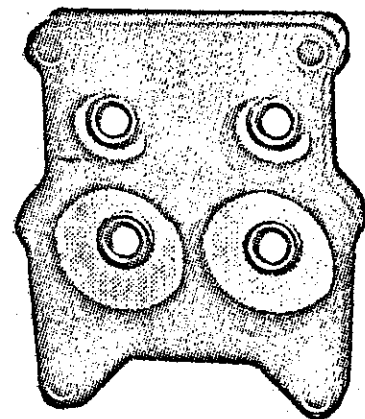
Test data on the same car showed



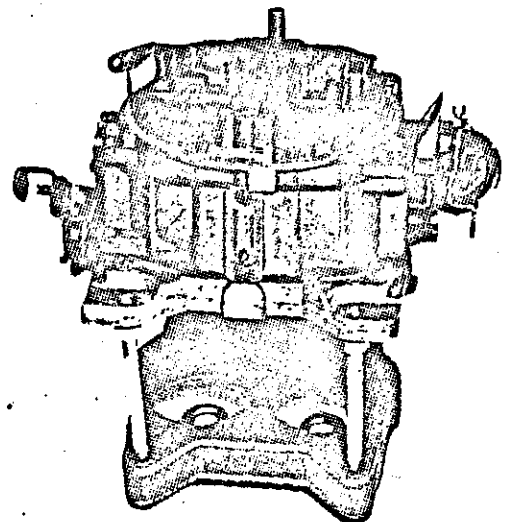
The wire screen mesh sets up a vortex in the carburetor, breaking up gasoline into tiny droplets. As side benefit, both horsepower and engine vacuum are increased when device is installed.

a 22% increase in horsepower at 48 mph, an increase in vacuum of 47%, a hydrocarbon decrease of 400% and a carbon monoxide decrease of about 55%. And the data were gathered from a 1974 car with all its pollution devices intact for the tests.

Mileage for this car increased about 30% for city driving and from 35% at 50 mph to 15% at 60 mph under expressway conditions. But since this device is made for saving gas when the car is in a cruising or idling mode, it won't save you much if you have a "lead foot".



Since wire screens become opaque to gasoline flow at high running speeds, grommet allows gasoline to flow to engine at these higher speeds. Wire mesh serves to break up gasoline into droplets at low speeds and grommet sets up vortex to break up gasoline at high speeds.



Patented device is located between intake manifold and carburetor.

SPARTAN II MODEL NUMBERS FOR
AMERICAN PASSENGER AUTOMOBILES

1 BARREL CARBURETOR

<u>MODEL #</u>	<u>% MARKET PENETRATION</u>	<u>VEHICLE MAKE</u>	<u>YEAR/C.I.D.</u>
100	5%	AMERICAN MOTORS 6 INLINE BUICK 6 & V6 CHEVROLET 4 INLINE CHEVROLET 6 INLINE CHRYSLER PRODUCTS: (Dodge, Plymouth) FORD PRODUCTS: (Ford, Mercury) OLDSMOBILE 6 INLINE & V6 PONTIAC 6 INLINE	64-74 232, 258 C.I.D. 64-74 ALL 63-70 ALL single Carburetor 63-74 ALL Inline Engines 62-74 ALL 63-64 ALL 68-72 240 C.I.D. 64-74 ALL 64-74 ALL
110	2%	FORD PRODUCTS: (Ford, Mercury)	70-74 170, 200, 250 C.I.D.
120	1%	CHEVROLET 4 INLINE	71-74 Vega
<u>2 BARREL CARBURETOR</u>			
200	22½%	BUICK 6 & V6 BUICK V8 CHEVROLET V8 OLDSMOBILE V8 PONTIAC V8	70-71 ALL 70-74 ALL 69-74 327 C.I.D. Biscayne, Bellaire, Impala(Large Base), 350, 396, 400 C.I.D. 61-64 Except F85, J88 65-74 ALL 60-62 Except Tempest 63-74 Except 307 C.I.D.
210	12½%	AMERICAN MOTORS V8 CHRYSLER PRODUCTS: (Chrysler, Dodge, Plymouth) FORD PRODUCTS: V8 (Ford, Lincoln, Mercury)	68-74 ALL 70-71 340, 440 (Holley) 62-74 ALL
220	5%	AMERICAN MOTORS 6 INLINE BUICK 6 & V6 BUICK V8 CHEVROLET 4 INLINE CHEVROLET V8 PONTIAC V8	65-70 196, 232 C.I.D. 62-69 ALL 65-69 ALL 71-74 Vega (Rochester) 55-60 ALL 69-74 307, 327 Camero, Chevelle, Nova (Small Base) 71-74 307 C.I.D.
230	5%	CHRYSLER PRODUCTS: (Chrysler, Dodge, Plymouth)	59-74 360, 361, 383, 400 C.I.D. (Large Base)
240	5%	CHRYSLER PRODUCTS: (Dodge, Plymouth)	60-74 273, 318 C.I.D. (Small Base)

2 BARREL CARBURETOR (Con't)

250	1%	FORD PRODUCTS: 4 INLINE (Ford, Mercury)	71-73 122 C.I.D.
260	1%	CHEVROLET 4 INLINE FORD PRODUCTS: 4 INLINE V6 (Ford, Mercury)	73-74 Vega GT (Holley) 72-74 140, 159, 171 C.I.D.

4 BARREL CARBURETOR

400	25%	BUICK CADILLAC CHEVROLET OLDSMOBILE PONTIAC	68-74 ALL 70-74 ALL 65-74 Rochester, Carter Quadrajjet 66-74 Quadrajjet 67-74 Quadrajjet
410	10%	AMERICAN MOTORS CHEVROLET CHRYSLER PRODUCTS (Chrysler, Dodge Plymouth) FORD PRODUCTS (Ford, Lincoln, Mercury)	67-74 ALL 69-72 Holley 67-72 Holley, Carter (Not T/Q) 57-74 Except Spread Bore
420	2%	CHRYSLER PRODUCTS (Chrysler, Dodge, Plymouth)	71-74 Carter (T/Q)
430	1%	BUICK CADILLAC CHRYSLER PRODUCTS (Chrysler, Dodge, Plymouth) OLDSMOBILE PONTIAC	57-65 Except 215, 300 C.I.D. 66-67 340, 401 C.I.D. 57-66 ALL Single Carburetor 64-66 ALL Single Carburetor 67-71 426 C.I.D. 61-63 Except FB5 64-65 ALL 63-67 NOT Quadrajjet
440	2%	BUICK CADILLAC	66-67 400 High Performance 425, 430 C.I.D. 67-69 ALL

All prices F.O.B. Skokie, Illinois.
Prices effective as of June 6, 1974.