

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-54-6  
Relating to Exemptions under Section 27156  
of the Vehicle Code

PRESTOLITE ELECTRICAL DIVISION  
FORD (MOTORCRAFT) "BID BREAKERLESS INDUCTIVE IGNITION SYSTEM"

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 "BID" breakerless inductive ignition system manufactured by the Prestolite Electrical Division, 511 Hamilton Street, Toledo, Ohio 43694, and marketed as indicated herein 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 1976 and older model year vehicles except as follows:

1. Those vehicles originally equipped with breakerless ignition systems or dual point ignition systems where one of the points is used to retard timing for emission control.
2. 1966-70 vehicles equipped with a retrofit NOx device which incorporates retard of basic ignition timing (i.e., Carter-CER, Echlin, STP-Air Computer, and AQP-Electro-NOx or Kar Kit).

This device consists of an electronic pack, trigger wheel and pick up assembly, Ford ignition coil and wiring harness. The following is a list of each device manufactured by the Prestolite Electrical Division and marketed for the following applications:

<u>Vehicle Application</u>	<u>Motorcraft Part Number</u>
Volkswagen-4 cylinder	DZ 5007
Toyota-4 cylinder	DZ 5008

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 PRESTOLITE ELECTRICAL DIVISION "BID" BREAKERLESS INDUCTIVE IGNITION SYSTEM ALSO MARKETED UNDER THE BRAND NAME MOTORCRAFT.

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 28<sup>th</sup> day of October, 1976.

Original Signed By

Thomas C. Austin  
Deputy Executive Officer-Technical

State of California

AIR RESOURCES BOARD

August 31, 1976

Staff Report

(Addendum to Staff Report dated April 13, 1976)  
Evaluation of Prestolite Electrical  
Division "BID" Breakerless Inductive  
Ignition System for Exemption  
from the Prohibitions of Section 27156  
of the Vehicle Code

I. Introduction

Prestolite Electrical Division, 511 Hamilton Street, Toledo, Ohio 43694, was issued Executive Order D-54-5 dated April 30, 1976.

This is an exemption from the prohibitions of Motor Vehicle Code Section 27156 for the Prestolite "Bid" Breakerless Ignition System which is also known by other brand names described in the Executive Order. The exemption was for certain 1976 and older model year vehicles equipped with a standard Kettering ignition system using device part numbers as specifically listed in the Executive Order.

The exemption did not apply to:

- 1) Those vehicles originally equipped with breakerless ignition systems or dual point ignition systems where one of the points is used to retard timing for emission control.
- 2) Those 1966 through 1970 vehicles equipped with "NOx retrofit devices" with a 4° retard in basic ignition timing (i.e., Carter, Echlin, STP Air Computer, AQP - Electro-NOx and Kar Kit).

Prestolite Electrical Division has now applied (Exhibit A) to add kits for Volkswagen and Toyota vehicle applications under the Brand Name of Motorcraft as follows:

<u>Vehicle Application</u>	<u>Motorcraft Part Number</u>
Volkswagen-4 cylinder	DZ 5007
Toyota-4 cylinder	DZ 5008

Prestolite Electrical Division also requests to allow usage of an equivalent Ford ignition coil instead of the Prestolite ignition coil part number P5-69 for the above vehicle applications.

## II. System Description

The "BID" is a breakerless, retrofit ignition system utilizing a resonant, magnetic pick-up coil and a metallic "toothed" trigger wheel which is mounted concentric to the distributor shaft and lowers the magnetic field strength in the pick-up coil intermittently when each tooth passes the coil. This voltage reduction triggers a change in a unistable switch which controls a power switching transistor. This power transistor controls current flow to the primary of the ignition coil of the Kettering ignition system.

## III. System Evaluation

The applicant submitted ignition timing data and electrical characteristics of the ignition system. In order to evaluate the new design of the device the applicant submitted baseline

data, device data with Prestolite coil as was previously exempted by Executive Order number D-54-5 and the new design device data which utilized the "Ford" coil. These data are presented in Tables I and II.

A review was made of the applicants test data and is considered within experimental and test variabilities and is evaluated as meeting the Air Resources Board's criteria. These results are as would be expected since the characteristics of the Ford coil (1.19 ohm primary resistance) are similar to the previously exempted system with Prestolite coil (1.3 ohm primary resistance). For these reasons an ARB confirmatory test is not required.

Cylinder to cylinder ignition timing for certain four cylinder Volkswagen applications did not match the manufacturers specifications. This condition is not considered acceptable under the revised Air Resources Board's Ignition Guidelines. Since this basic design was exempt by Executive Order D-54-5 prior to the change in criteria the staff accepts this proposal which does not expand the number of vehicle conversions but is essentially a brand name addition.

#### IV. Manufacturer's Claims

The benefits claimed by the manufacturer in the original application are discussed in the staff report dated April 13, 1976. The Air Resources Board notified the manufacturer that it did not fully agree with the benefits claimed. The manufacturer then submitted copies of their most recent advertising materials.

Some of their recent advertising is shown in exhibit B, certain excerpts are as follows:

- . Improved starting in temperatures as low as -20°F.
- . Improved performance at all speeds
- . Greatly extends spark plug life

A tune-up improves gas mileage, but after a few thousand miles, the tune-up begins to deteriorate, gas mileage drops off, and emissions increase. With the Prestolite Electronic Ignition System, spark plugs last longer, because timing and dwell are factory set and cannot change. That's why we say the tuned up engine stays tuned up longer, much longer.

More mileage in the aftermarket.

Increases plug life

Insures better wet and cold weather starting

Get more mileage in the aftermarket ... stock full

coverage Prestolite Electronic Ignition

The staff concurs that maintenance would be reduced by the "BID" Breakerless Inductive Ignition System due to removal of the points. It is the opinion of the staff that the device will not create increases in fuel economy, and operating performance over a properly tuned and maintained engine.

Starting conditions may be improved on the Volkswagen and Toyota vehicles with O.E.M. high resistance (3 to 4 ohms) primary ignition coils only. The manufacturers data showed an increase in spark energy at 200 RPM cranking speed and 9 volts source voltage when tested with the replacement coil.

V. Conclusions and Recommendations

It is the opinion of the staff that Prestolite Electrical Division's "BID" breakerless inductive ignition system will not reduce the effectiveness of required emission control systems except for certain 1966-70 vehicles retrofitted with a NOx control device utilizing a sustained retardation of 4 degrees crankshaft or more.

Therefore, it is recommended that Prestolite Electrical Division be granted an exemption from the prohibitions of Vehicle Code Section 27156 for its "BID" breakerless ignition system for 1976 and older model year domestic vehicles originally equipped with the standard Kettering ignition system except for the following:

- 1) Those vehicles originally equipped with breakerless ignition systems or dual point ignition systems where one of the points is used to retard timing for emission control.
- 2) 1966-70 vehicles equipped with a retrofit NOx device which incorporates retard of basic ignition timing (i.e., Carter - CER, Echlin, STP-Air Computer, and AQP-Electro-NOx or Kar Kit).

Table I - Prestolite Ignition System Data Summary for the "Bid"  
Breakerless Ignition System

A. Centrifugal Spark Advance in Crankshaft Degrees

1973 Volkswagen - 4 cylinder

<u>Engine RPM</u>	<u>Baseline</u> (VW coil - 4.0 ohms)	<u>Device</u> (Ford coil-1.19 ohms)	<u>Device</u> (Prestolite-1.3 ohms)
600	0	0	0
1400	5.0	5.0	5.0
2000	12.4	12.4	12.4
2600	16.0	16.0	16.0
3200	20.0	20.0	20.0
4000	21.8	21.8	21.8

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
3	0	0	0
6	6.0	6.0	5.0
9	10.4	10.4	9.4
12	11.4	11.4	10.8
15	11.6	11.6	11.4
20	11.6	11.6	11.6

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	950	1500	2000
600	1700	2100	2200
4000	1700	1500	1850

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	38	70	60
600	38	70	65
4000	38	70	60

Table I (cont'd)

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	8.2	21.0	25.9
600	21.7	30.8	32.9
4000	19.3	23.1	23.3

F. Available Voltage in Kilovolts (with Load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	20.5	24.5	28.0
600	27.0	25.5	29.5
4000	21.0	25.5	28.0

Table II - Prestolite Ignition System Data Summary for The "BID"  
Breakerless Ignition System

A. Centrifugal Spark Advance in Crankshaft Degrees

1975 Volkswagen - 4 cylinder

<u>Engine RPM</u>	<u>Baseline</u> (VW Coil-2.1 ohms)	<u>Device</u> (Ford coil -1.19 ohms)	<u>Device</u> (Prestolite coil-1.3 ohms)
600	0	0	0
1400	5.0	5.0	5.0
2000	12.4	12.4	12.4
2600	16.0	16.0	16.0
3200	20.0	20.0	20.0
4000	21.8	21.8	21.8

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
3	0	0	0
6	6.0	6.0	6.0
9	10.4	10.4	10.4
12	11.4	11.4	11.4
15	11.6	11.6	11.6
20	11.6	11.6	11.6

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	1600	950	1700
600	2600	2100	2400
4000	1700	1400	1900

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	38	70	85
600	38	70	85
4000	38	70	85

Table II (Cont'd)

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	14.3	16.2	16.3
600	30.1	30.8	30.7
4000	18.5	21.0	21.9

F. Available Voltage in Kilovolts (with Load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Device</u>
200	23	20	23
600	30	26	27
4000	24	24	24

## Prestolite Electrical Division

511 Hamilton Street  
Toledo, Ohio 43694

Phone: 419-244-2811

June 15, 1976

Air Resources Board Laboratory  
9528 Telstar Avenue  
El Monte, California 91731

ATTN: Mr. G. Haas

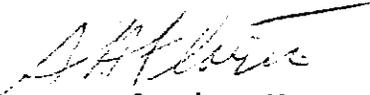
Dear Sir:

As you know we have been approved for sale in the state of California on our electronic BID ignition system which is used on four (4) cylinder foreign vehicles. Our system for this application, in California, requires the incorporation of a special coil (our #5-69) as part of the kit. Ford Motor Company is presently buying this system from us and we are packaging the system under the Motorcraft label. Ford Motor Company has asked us if instead of buying our coil for this application if they could use their own, since they are in the ignition coil business. The Ford coil is, for all practical purpose, exactly the same as our #5-69. I have run tests using the Ford proposed coil with our system comparing to baseline as well as supplying our data with the results using our coil (data enclosed). As you can see theirs is practically the same.

We would appreciate it if you could have this data critiqued and allow Ford to utilize their coil with our system.

Very truly yours,

PRESTOLITE ELECTRICAL DIVISION

  
S.A. Florio, Manager  
Aftermarket Engineering

SAF/vnh

Encl.

## Prestolite Electrical Division

511 Hamilton Street  
Toledo, Ohio 43694

Phone: 419-244-2811

Air Resources Board Laboratory  
9528 Telstar Avenue  
El Monte, California 91731

August 17, 1976

Attention: Mr. K. D. Drachand, Chief  
Vehicle Compliance

Subject: Prestolite BID Retrofit  
Volkswagen/Toyota  
Motorcraft Brand

Dear Mr. Drachand:

Executive Order D-54-5 approved Prestolite electronic ignition supplied under Motorcraft brand in the state of California. Per your letter of June 24, 1976, you agreed that the Motorcraft program would be acceptable for Volkswagen and Toyota vehicles with a Ford coil.

Ford has assigned the following numbers to their California package:

<u>Motorcraft</u> <u>Part Number</u>	<u>Prestolite</u> <u>Part Number</u>
DZ-5007	IDL-5017
DZ-5008	IDL-5018

As requested, we are attaching the following:

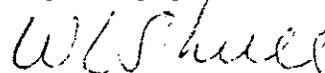
Ford Packaging Material Specification MF361

Mr. Kinney's people have the technical data.

We would appreciate receipt of your Executive Order as soon as possible.

Please call us if we can be of any assistance.

Very truly yours,



W. L. Shull  
Administrative Assistant  
Marketing - PED

dls 2-23

Attach.

an  company

UNIT CARTON

Size: 7 3/8" x 2 3/4" x 16 3/16"  
 Style: Straight Tuck  
 Material: .028 Olinkraft 80 degree bright  
 Printing: Per artwork in two colors Motorcraft  
 Red and Black

DETAIL A - Shipping Carton - 10 Packages of Unit Carton

Size: 16 1/2" x 14 7/8" x 15"  
 Style: Regular Slotted  
 Material: 200# Mullen Test, D. F. Kraft Corrugated  
 A or C Flute  
 Printing: Motorcraft-Ford printing style code "G"

DETAIL B - Interior Block for Unit Package

Size: 7 1/8" x 1 11/16" x 9 5/16"  
 Material: Expandable polystyrene molded 2 lb. density

DETAIL C - Interior Filler Block Pad for Detail B

Size: 2 1/2" x 2 1/2" x 4"  
 Material: Expandable polystyrene sheet 2 lb. density

DETAIL D - Label for Adhesion to Module Box

Size: 3 3/4" x 2"  
 Material: Bright silver laminated foil with permanent  
 adhesive - S277 Fasson with "Sta-Flat"  
 humidity resistant backing or equivalent

DETAIL E - Label - Loose in Interior Pack

Same as Detail D except for additional  
 wording above "Motorcraft Logo" per  
 artwork and label will be packaged  
 loose.

DETAIL F - Label for Part Number Identification

Size: 2" x 1 1/2"  
 Material: White label stock - rapid dry with permanent  
 adhesive

Type Size:  
 1st Line "One" 18 pt. type  
 2nd Line "Part Number" 36 pt. type  
 3rd & 4th Line "Application Data" 12 pt. type  
 5th Line "Vendor Code (Date  
 Code Optional)" 8 pt. type

Type Style: Condensed Gothic  
 Print Color: Black

DETAIL G - Film Overwrap of Detail H

Material: Polyolefin D925E Cryovac  
 Gauge: 100

DETAIL H - End Foldtray

Size: 16 1/8" x 7 1/4" x 2 11/16"  
 Material: .028 Olinkraft 80 Degree Bright  
 Printing: None

END FOLD TRAY: To hold 1 packaged coil (AHF-9 Ctn.),  
 1 packaged bracket for coil (ALF-101 Ctn.), 1 Ignition  
 Kit in Foam Tray, 3 pieces white corrugated (Dunnage)

CALIFORNIA ONLY

Ford Marketing Corporation, Packaging Engineering Section, P.O. Box 3020, Livonia, Michigan - 48151

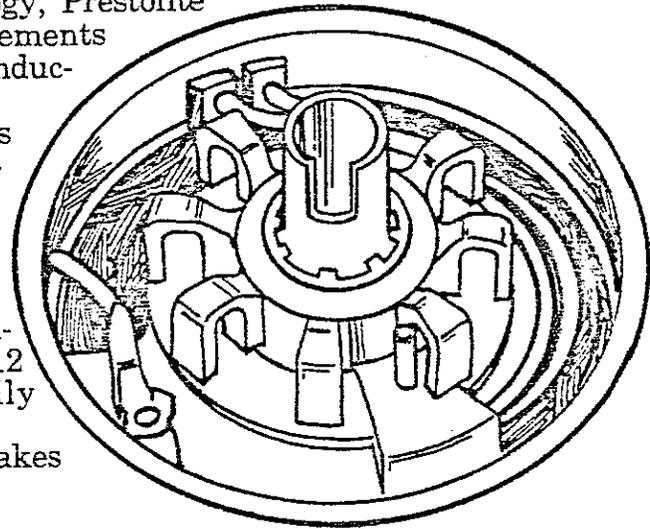
Designed BF	Approved RAB	Date 8-5-76	Revised
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Thanks to developments in electronic technology, Prestolite engineers surpassed the two previous achievements with the development of BID—Breakerless Inductive Discharge ignition.

As you can see, BID is the result of years of research and a series of design & performance improvements culminating in what we believe to be truly the ignition system of tomorrow.

Already it has been thoroughly tested in hundreds of thousands of miles of use. Reports indicate continued tuned performance after 10 or 12 thousand miles, when performance normally falls off.

Here is an electronic ignition system that makes your car's ignition as new as tomorrow.



PRESTOLITE  
GIVES YOU  
ALL OF THESE **BID**  
FEATURES AND ADVANTAGES!

- Improved starting in temperatures as low as  $-20^{\circ}\text{F}$ .
- Improved performance at all speeds
- Fires spark plugs at any RPM above 0
- Fires spark plugs with as little as 6 volts available battery voltage
- Greatly extends spark plug life
- Uses existing coil, distributor cap, rotor and spark plug wires
- Is easily installed without removing distributor
- Protected against reverse polarity

A tune-up improves gas mileage, but after a few thousand miles, the tune-up begins to deteriorate, gas mileage drops off, and emissions increase. With the Prestolite Electronic Ignition System, spark plugs last longer, because timing and dwell are factory set and cannot change. That's why we say the tuned up engine stays tuned up longer, much longer.

*Prestolite is the only independent ignition manufacturer furnishing an electronic ignition system to one of the Big Four car makers.*

Prestolite Electrical Division • Toledo, Ohio 43694 • an **Eltra** company

# MORE MILEAGE IN THE AFTERMARKET



Add these seven to the already established Prestolite performance-proven 6 and 8 cylinder Electronic Ignition kits and you have real profit opportunity.

- Easy to install
- Fires plugs at low rpm
- Increases plug life
- Insures better wet and cold weather starting

Get more mileage in the aftermarket...stock full coverage Prestolite® Electronic Ignition

# Prestolite Electrical Division

511 Hamilton Street  
Toledo, Ohio 43694

Phone: 419-244-2811

Air Resources Board Laboratory  
9528 Telstar Avenue  
El Monte, California 91731

August 17, 1976

Attention: Mr. K. D. Drachand, Chief  
Vehicle Compliance

Subject: Prestolite BID Retrofit  
Volkswagen/Toyota  
Motorcraft Brand

Dear Mr. Drachand:

Executive Order D-54-5 approved Prestolite electronic ignition supplied under Motorcraft brand in the state of California. Per your letter of June 24, 1976, you agreed that the Motorcraft program would be acceptable for Volkswagen and Toyota vehicles with a Ford coil.

Ford has assigned the following numbers to their California package:

<u>Motorcraft</u> <u>Part Number</u>	<u>Prestolite</u> <u>Part Number</u>
DZ-5007	IDL-5017
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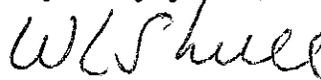
Ford Packaging Material Specification MF361

Mr. Kinney's people have the technical data.

We would appreciate receipt of your Executive Order as soon as possible.

Please call us if we can be of any assistance.

Very truly yours,



W. L. Shull  
Administrative Assistant  
Marketing - PED

dls 2-23

Attach.

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**Eltra**

company



UNIT CARTON

Size: 7 3/8" x 2 3/4" x 16 3/16"  
Style: Straight Tuck  
Material: .028 Olinkraft 80 degree bright  
Printing: Per artwork in two colors Motorcraft Red and Black

DETAIL A - Shipping Carton - 10 Packages of Unit Carton

Size: 16 1/2" x 14 7/8" x 15"  
Style: Regular Slotted  
Material: 200# Mullen Test, D. F. Kraft Corrugated A or C Flute  
Printing: Motorcraft-Ford printing style code "G"

DETAIL B - Interior Block for Unit Package

Size: 7 1/8" x 1 11/16" x 9 5/16"  
Material: Expandable polystyrene molded 2 lb. density

DETAIL C - Interior Filler Block Pad for Detail B

Size: 2 1/2" x 2 1/2" x 4"  
Material: Expandable polystyrene sheet 2 lb. density

DETAIL D - Label for Adhesion to Module Box

Size: 3 3/4" x 2"  
Material: Bright silver laminated foil with permanent adhesive - S277 Fasson with "Sta-Flat" humidity resistant backing or equivalent

DETAIL E - Label - Loose in Interior Pack

Same as Detail D except for additional wording above "Motorcraft Logo" per artwork and label will be packaged loose.

DETAIL F - Label for Part Number Identification

Size: 2" x 1 1/2"  
Material: White label stock - rapid dry with permanent adhesive

Type Size:  
1st Line "One" 18 pt. type  
2nd Line "Part Number" 36 pt. type  
3rd & 4th Line "Application Data" 12 pt. type  
5th Line "Vendor Code (Date Code Optional)" 8 pt. type

Type Style: Condensed Gothic  
Print Color: Black

DETAIL G - Film Overwrap of Detail H

Material: Polyolefin D925E Cryovac  
Gauge: 100

DETAIL H - End Foldtray

Size: 16 1/8" x 7 1/4" x 2 11/16"  
Material: .028 Olinkraft 80 Degree Bright  
Printing: None

END FOLD TRAY: To hold 1 packaged coil (AHF-9 Ctn.), 1 packaged bracket for coil (ALF-101 Ctn.), 1 Ignition Kit in Foam Tray, 3 pieces white corrugated (Dunnage)

CALIFORNIA ONLY

Ford Marketing Corporation, Packaging Engineering Section, P.O. Box 3020, Livonia, Michigan - 48151

Designed E	Approved RAB	Date 8-5-76	Revised
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