

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-11-4
Relating to Exemptions under Section 27156
of the Vehicle Code

WESTERN CONTROLS, INC.
"BREAKERLESS TRANSISTOR 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 "Breakerless Transistor Ignition System" manufactured by Western Controls, Inc., 805 West Madison, Phoenix, Arizona, 85007 and marketed as indicated below 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 model year vehicles except as follows:

- 1) Those vehicles equipped with General Motors 4 cylinder engines.
- 2) Those vehicles equipped with General Motors, American Motors, Checker Motors, and International Harvester 6 cylinder engines.
- 3) Those vehicles equipped with Chrysler Corporation 4, 6 or 8 cylinder engines.
- 4) Those vehicles originally equipped with transistorized, capacitor discharge, breakerless ignition systems or dual point ignition systems where one of the points is used to retard timing for emission control.
- 5) Those 1966 through 1970 vehicles equipped with a retrofit NOx device which incorporates retard of basic ignition timing (i.e., Carter, Echlin, GRANCOR (STP) - Air Computer, AQP - Electro-NOx and Kar Kit.)
- 6) Mazda and Fiat vehicles.

The device consists of a magnetic sensor unit and an electronic transistor switching module.

The following is a list of marketing companies and the amplifier module number sold by each firm:

<u>Marketing Organization</u>	<u>Amplifier Model Nos.</u>
Western Controls Inc. 805 W. Madison St. Phoenix, AZ 85007	1058 TR System
"Max" Western Controls Inc. 805 W. Madison St. Phoenix, AZ 85007	1008 TR System
"Filkotronic Ignition" Filko Div. of F & B Mfg. 5480 N. Northwest Highway Chicago, Ill. 60630	F1-150 TR System
"Hays" Hays Sales 15116 Adams Street Midway City, CA 92655	TR-2048 TR System

The following is a list of magnetic sensor kit numbers and their application:

<u>Magnetic Sensor Kit Number</u>	<u>Application</u>
3050	Vauxhall - 4 and 6 cylinder
3051	AMC - 8 cylinder Checker - 8 cylinder GM - 8 cylinder Jeep - 8 cylinder
3056	Ford (English) - 4 cylinder Ford - 4 cylinder Ford - 8 cylinder Sunbeam - 8 cylinder
3057	A.C. (Great Britain) - 8 cylinder Ford - 8 cylinder (Dual Point) Ford - 6 cylinder

Magnetic Sensor
Kit NumberApplication

3065

Alpha Romeo - 4 cylinder
Audi - 4 cylinder
BMW - 4 and 6 cylinder
Ford (German) - 4 cylinder
Opel - 4 cylinder
NSU - 4 cylinder
Porsche - 4 and 6 cylinder
Saab - 4 cylinder
Volvo - 4 cylinder
Volkswagen - 4 cylinder

3066

Alpha Romeo - 4 cylinder (1970-1972)
Mercedes Benz - 4 and 6 cylinder
Porsche - 4 and 6 cylinder
Volvo - 4 and 6 cylinder

3067

Datsun - 4 and 6 cylinder
Ford (72-74) - 4 cylinder
Honda - 4 cylinder
LUV - 4 cylinder
Subaru - 4 cylinder

3068

Toyota 4 and 6 cylinder

3069

Aston Martin - 6 cylinder
Austin - 4 and 6 cylinder
Ford (English) - 4 cylinder
Hillman - 4 cylinder
Humber - 4 and 6 cylinder
Jaguar - 6 cylinder
Lotus - 4 cylinder
M.G. - 4 and 6 cylinder
Morgan - 4 cylinder
Morris - 4 cylinder
Riley - 4 cylinder
Rover - 4 and 6 cylinder
Singer - 4 cylinder
Sunbeam - 4 cylinder
Triumph - 4 and 6 cylinder

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 WESTERN CONTROLS' "BREAKERLESS TRANSISTOR IGNITION SYSTEM".

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 16 day of July, 1976.

Original signed by
Thomas C. Austin
Deputy Executive Officer-Technical

State of California

AIR RESOURCES BOARD

Staff Report

May 3, 1976

Evaluation of Western Controls Inc.'s.
"Breakerless Transistor Ignition System" for Exemption
from the Prohibitions of Motor Vehicle Code Section 27156

I. Introduction

Western Controls Inc., 805 West Madison, Phoenix, Arizona, 85007 has applied (Exhibit I) for an exemption from the prohibitions of Motor Vehicle Code Section 27156 for their "Breakerless Transistor Ignition System".

The applicant is requesting an exemption to be granted for 1975 and older model year vehicles for the devices marketed as follows:

<u>Marketing Organization</u>	<u>Amplifier Model Nos.</u>
Western Controls Inc. 805 W. Madison St. Phoenix, AZ 85007	1058 TR System
"Max" Western Controls Inc. 805 W. Madison St. Phoenix, AZ 85007	1008 TR System
"Filkotronic Ignition" Filko Div. of F & B Mfg. 5480 N. Northwest Highway Chicago, Ill. 60630	F1-150 TR System
"Hays" Hays Sales 15116 Adams Street Midway City, CA 92655	TR-2048 TR System

May 3, 1976

II. System Description

The Western Controls "Breakerless Transistor Ignition System" is designed to replace the breaker points within a distributor. It consists primarily of a magnetic sensor and transistor switching module. The magnetic pickup unit senses the cam lobes of the distributor and triggers the electronic module which uses transistor switching instead of points to make and break the primary current to the ignition coil.

The amplifier (transistor switching module) units will be packaged separately and the magnetic sensor will be packaged as an adapter kit.

The following adapter kit numbers and vehicle application are as follows:

<u>Magnetic Sensor Kit Number</u>	<u>Application</u>
3050	Vauxhall - 4 and 6 cylinder
3051	AMC - 8 cylinder Checker - 8 cylinder GM - 8 cylinder Jeep - 8 cylinder
3056	Ford (English) - 4 cylinder Ford - 4 cylinder Ford - 8 cylinder (Single Point) Sunbeam - 8 cylinder
3057	A.C. (Great Britain) - 8 cylinder Ford - 8 cylinder (Dual Point) Ford - 6 cylinder
3065	Alpha Romeo - 4 cylinder Audi - 4 cylinder BMW - 4 and 6 cylinder Ford (German) - 4 cylinder Opel - 4 cylinder NSU - 4 cylinder Porsche - 4 and 6 cylinder Saab - 4 cylinder Volvo - 4 cylinder Volkswagen - 4 cylinder

Evaluation of Western Controls Inc.'s "Breakerless
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<u>Kit Number</u>	<u>Application</u>
3066	Alpha Romeo - 4 cylinder (1970-1972) Mercedes Benz - 4 and 6 cylinder Porsche - 4 and 6 cylinder Volvo - 4 and 6 cylinder
3067	Datsun - 4 and 6 cylinder Ford (72-74) - 4 cylinder Honda - 4 cylinder LUV - 4 cylinder Subaru - 4 cylinder
3068	Toyota 4 and 6 cylinder
3069	Aston Martin - 6 cylinder Austin - 4 and 6 cylinder Ford (English) - 4 cylinder Hillman - 4 cylinder Humber - 4 and 6 cylinder Jaguar - 6 cylinder Lotus - 4 cylinder M.G. - 4 and 6 cylinder Morgan - 4 cylinder Morris - 4 cylinder Riley - 4 cylinder Rover - 4 and 6 cylinder Singer - 4 cylinder Sunbeam - 4 cylinder Triumph - 4 and 6 cylinder

Other devices which were included in the original application
but did not meet the criteria and were subsequently deleted from the
application (See Exhibit II) are as follows:

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<u>Magnetic Sensor Kit Number</u>	<u>Application</u>
3052	General Motors - 4 cylinder
3053	American Motors - 6 cylinder Checker Motors - 6 cylinder General Motors - 6 cylinder Jeep - 6 cylinder International Harvester - 6 cylinder
3055	International Harvester - 6 cylinder
3058, 3067, 3069, 4052	Chrysler - 4, 6, 8 cylinders (includes Dodge and Plymouth)

Exception is also taken to the application guide notes (Exhibit II) in that the drilling of location holes in the distributor vacuum advance plate or the grinding of cams is not acceptable.

III. System Evaluation

A. Applicants Test Data

The applicant submitted data for centrifugal and vacuum advance and electrical characteristics for the device when tested according to the SAE J973a test procedure. In order to evaluate the device the ignition system characteristics with and without the device are compared.

The data submitted was for a 1972 Chrysler 8 cylinder, 1972 General Motors 8 cylinder, 1972 Ford 8 cylinder, and 1969 Volkswagen 4 cylinder ignition systems. A data summary is presented as Tables

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I and II. These results are considered within experimental and test variabilities and are evaluated as meeting the Air Resources Board's criteria for ignition system modifications.

B. ARB Confirmatory Test

Confirmatory tests were conducted by the Air Resources Board Laboratory on an ignition system simulator which consists of a Sun distributor tester, Tektronix Oscilloscope, Sun Ignition analyzer and associated accessories in accordance with SAE J973a instructions. A summary of electrical tests performed on Chrysler and Ford 8 cylinder distributors are shown in Table III.

The ARB data summary indicates a spark timing retardation in crankshaft degrees as follows:

	<u>Centrifugal Retard</u>	<u>Vacuum Retard</u>	<u>Combined Retard</u>
Chrysler	1.0° @ 3600 RPM	6.5 @ 20 in. Hg.	7.5°
Ford	2° @ 2600 RPM	2.5 @ 9, 12 & 15 in. Hg.	4.5°

The Air Resources Board tolerance on ignition timing is 0° advance and 4° maximum retard. The 4.5° degrees retard experienced with the 1967 Ford is considered within experimental and test variabilities and is evaluated as meeting the Air Resources Boards criteria of +0° to -4°.

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The Chrysler data is clearly beyond the allowable tolerance. This degree of retardation is expected to have an adverse effect on the valve life of an engine. The deterioration of exhaust valve sealing leads to higher hydrocarbon emissions. The applicant was notified of the excessive retardation and has amended (Exhibit II) his application to omit all Chrysler 6 and 8 cylinder and General Motors 4 and 6 cylinder vehicles.

It was noted that the device did cause an increase in coil primary current on both the 1972 Chrysler and 1967 Ford application at the 600 RPM idle condition as follows:

	<u>Ignition Primary Current Amperes</u>	
	<u>1972 Chrysler</u>	<u>1967 Ford</u>
Baseline	2.1	2.5
Device	3.1	3.3

This condition can cause some increased heating of the ignition coil at idle, however this is not considered to be critical.

The data on energy and spark duration are judged as meeting the Air Resources Board criteria.

The ARB laboratory tests also indicated that the device was compatible with 1966-1970 NOx retrofit devices using electronic speed sensors.

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IV. Manufacturer's Claims

The manufacturer stated the purpose of the device is to retrofit breaker point ignition systems but makes no performance claims in the application. It is the staff's judgement that the installation of the device on a vehicle could result in the following:

1. This breakerless system offers potential for reduced maintenance.
2. The electrical characteristics of this system do not indicate any significant benefit on performance, economy or emission reduction than would be obtained from a properly tuned engine.

V. Conclusions and Recommendations

It is the opinion of the staff that Western Controls' "Breakerless Transistor Ignition System" may reduce the effectiveness of required emission control systems by increasing the likelihood of premature exhaust valve burning caused by the device's retardation of OEM timing schedules on certain vehicles.

Therefore, it is recommended that Western Controls be granted an exemption from the prohibitions of Vehicle Code Section 27156 for its "Breakerless Transistor Ignition System" for 1975 and older model year vehicles except as follows:

Evaluation of Western Controls Inc.'s "Breakerless Transistor Ignition System" for Exemption from the Prohibitions of Motor Vehicle Code Section 27156

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- 1) Those vehicles equipped with General Motors 4 cylinder engines.
- 2) Those vehicles equipped with General Motors, American Motors, Checker Motors, and International Harvester 6 cylinder engines.
- 3) Those vehicles equipped with Chrysler Corporation 4, 6 or 8 cylinder engines.
- 4) Those vehicles originally equipped with transistorized, C.D., breakerless ignition systems or dual point ignition systems where one of the points is used to retard timing for emission control.
- 5) Those 1966 through 1970 vehicles equipped with a retrofit NOx device which incorporates retard of basic ignition timing (i.e., Carter, Echlin, GRANCOR (STP) - Air Computer, AQP - Electro-NOx and Kar Kit.)
- 6) Mazda and Fiat vehicles.

Table I - Western Controls, Inc. Ignition System Data Summary

A. Centrifugal Spark Advance in Crankshaft Degrees

Engine RPM	<u>1972 Chrysler - 8 cylinder</u>		<u>1972 Oldsmobile - 8 cylinder</u>	
	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	0	0	0	0
1400	17	16	4	2
2000	20	19	7	6
2600	24	21	9	8
3000	26	25	12	11

B. Vacuum Spark Advance in Crankshaft Degrees

Vacuum in. Hg.	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
3	0	0	0	0
6	0	0	0	0
9	0	0	4	4
12	9	7	8	8
15	14	14	12	12
20	15	15	20	20

C. Spark Duration in Microseconds

Engine RPM	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	1500	1600	2000	1900
2000	1600	1800	1600	1800

D. Secondary Voltage Rise Time in Microseconds

Engine RPM	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	125	110	100	100
2000	120	113	100	105

E. Spark Energy in Millijoules

Engine RPM	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	25.9	28.8	32.0	32.8
2000	27.6	31.7	26.9	27.0

F. Available Voltage in Kilovolts (with load)

Engine RPM	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	24	24	27.5	25
2000	24	24	23.0	23.5

Table II - Western Controls, Inc. Ignition System Data Summary

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>1972 Ford - 8 cylinder</u>			<u>1969 Volkswagen - 4 cylinder</u>	
<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	1.0	1.0	0	0.4
1400	16.0	15.0	0.4	0.4
2000	21.0	20.0	12.0	9.0
2600	21.0	20.0	16.2	13.4
3000	21.0	20.0	17.0	14.0
3400	21.0	20.0	17.2	14.2
4000			20.0	17.0

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
3	1.0	1.0	0	0
6	8.0	7.0	5.4	5.4
9	14.0	14.0	10.0	10.0
12	18.0	18.0	12.0	12.0
15	22.0	22.0	12.0	12.0
20	23.0	24.0	12.0	12.0

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	1600	1900	1950	1000
2000	2000	2000	*1900	1000

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	120	88	45	47
2000	80	90	*47	47

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	24.5	29.1	23.9	24.0
2000	31.5	31.5	*22.8	24.0

F. Available Voltage in Kilovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	25	24	22.5	19
2000	24	23	*22.0	20

*Tested at 3000 RPM.

Table III - ARB Data Summary for Western Controls "Breakerless Transistor Ignition System"

A. Centrifugal Spark Advance in Crankshaft Degrees

	<u>1967 Ford - 8 Cylinder</u>		<u>1972 Chrysler - 8 Cylinder</u>	
<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	0	0	0	0
1400	11.5	11.0	18.5	18.0
2000	16.0	15.5	20.5	20.0
2600	19.0	17.0	22.5	22.0
3200	20.5	19.5	24.5	24.0
3600	22.0	20.5	26.0	25.0

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
3	0	0	0	0
9	11.0	8.5	1.0	0
12	16.5	14.0	10.0	7
15	20.5	18.0	21.0	15
20	24.0	22.0	21.5	15

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	1450	1300	1800	1800
3000	1000	1000	1300	1200

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	40	30	40	30
3000	40	35	40	30

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	19.0	22.2	27.2	28.5
3000	16.8	17.5	25.6	22.0

Table III (Continued)

F. Available Voltage in Kilovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	23.5	22.0	25.0	24
3000	21.0	17.5	19.0	19

G. Available Voltage in Kilovolts (Simulating fouled spark plugs)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>	<u>Baseline</u>	<u>Device</u>
600	18.5	16.0	20	19
3000	16.0	12.0	13	12.5



October 23, 1975

Mr. G. C. Hass
Division of Vehicle Emissions Control
Air Resources Board
9528 Telstar Avenue
El Monte, Calif. 91713

Dear Mr. Hass:

We respectfully request that you review the attached data and if satisfactory issue exemption status for the Western Controls Transistor Ignition Model 1058 and Filkotronic Model FI-150.

Enclosed is baseline test data and devise test data. All measurements per SAE J973A. High voltage measurements were made per SAE AIR 84A as specified in SAE J973A paragraph 6.1.

Materials for evaluation are OEM replacement parts specified below.

Chrysler Corp:	Ballast Resistor	2775590
	coil	2495531
Delco Remy:	Ballast Resistor	1957154
	coil	1115238
Ford Motor Co:	Ballast Resistor	COLF 12250-A
	coil	BGA 12029-B

Additional data is supplied to verify engine timing to be within specification for all engine distributors including foreign makes.

No data from road tests involving late model vehicles was recorded as Western Controls Model 1058 Transistor Ignition system spark energy levels equaled or exceeded all OEM standard ignition energy levels under road conditions--no misfires were encountered.

Western Controls system Model 1058 incorporates a ballast resistor shunt of 10 ohm to make up for transistor voltage drop. This is wired directly across the existing ballast resistor.

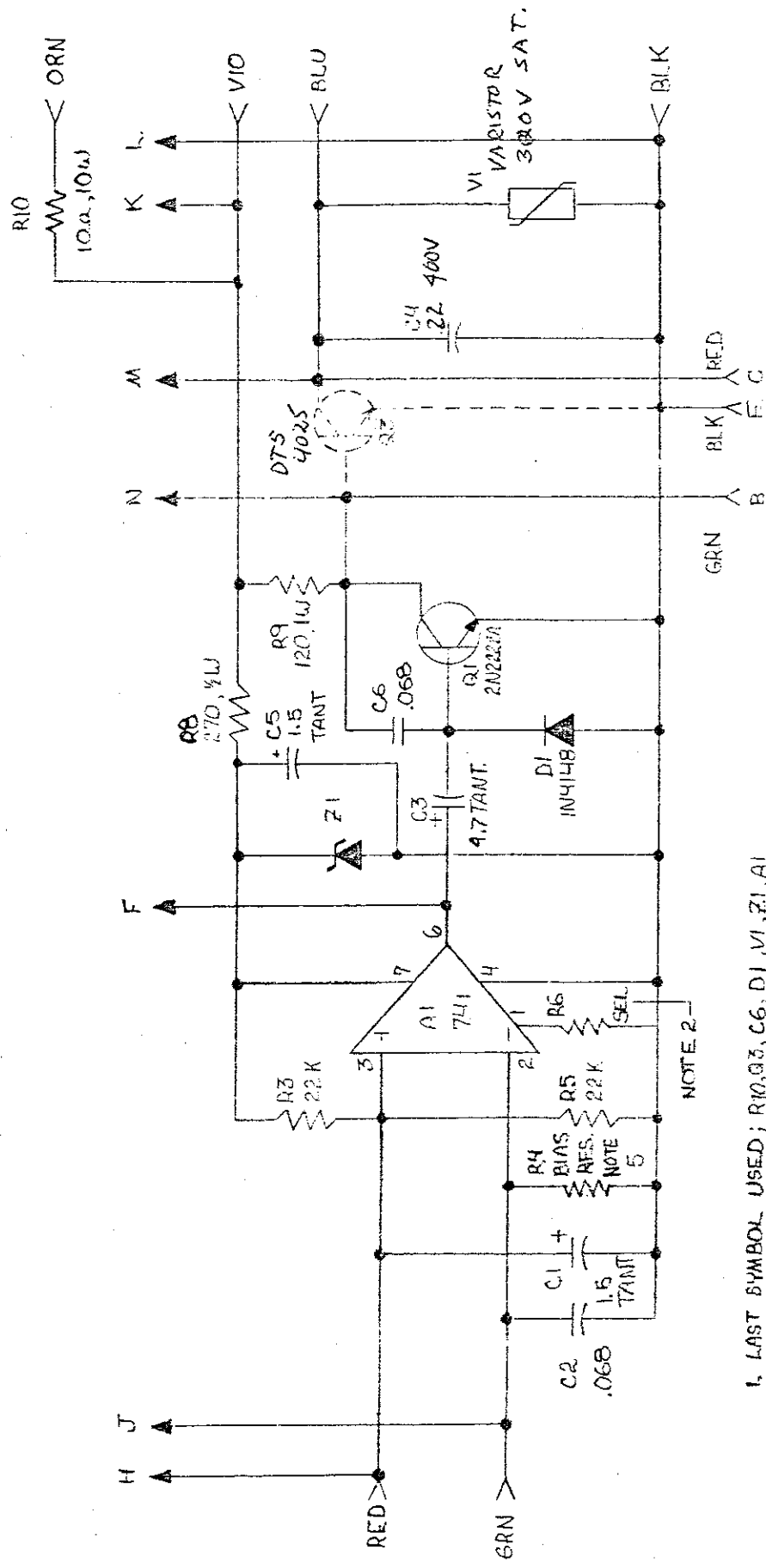
Sincerely,

Charles L. Shano
Charles L. Shano

CLS/tm

encl:

Western Controls, Inc. 805 WEST MADISON, PHOENIX, ARIZONA 85007 (602) 258-2821

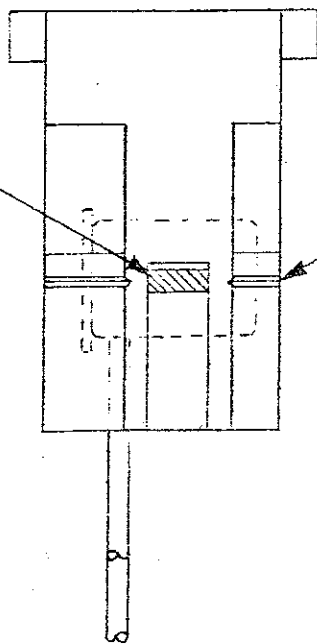


1. LAST SYMBOL USED; R10, Q3, C6, D1, V1, Z1, A1
2. MATCHED WITH IC AS PER TA 141 130.
3. ALL RESISTORS ARE 1/4W, 5% UNLESS OTHERWISE SPECIFIED.
4. ALL CAPACITOR VALUES ARE IN MICROFARADS.
5. MATCHED WITH IC.
6. SYMBOLS NOT USED Q2, R1, R2, R7

western controls. inc.
PHOENIX, ARIZONA

SCALE	TOLERANCE: .xx = UNLESS OTHERWISE SPECIFIED	FINISH:
INITIALS	DATE	USED ON
DWN	11/1/75	100B-2
CHKD		
APPVD		
NEXT ASSEMBLY 100B-2		
DWG NO 100B-1		
SCHEMATIC		

EXPOSED POLE PIECE.



POLE PIECE IN LINE WITH NOTCH ON HOUSING $\pm .005"$

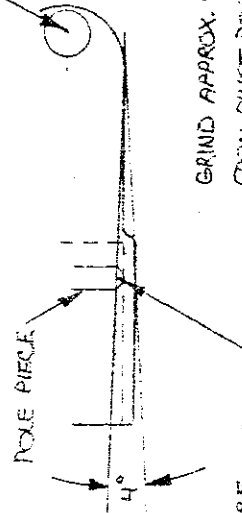
MAGNET
481-100
NOTE 1

TRIGGER HOUSING
411-126
NOTE 2

POLE PIECE
561-124

TRIGGER HX. ASSY
2001-2
NOTE 3

PIVOT POINT

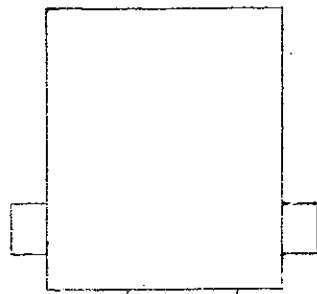


GRIND APPROX. 4° MEASURED FROM PIVOT POINT.

0.05 MIN. EXPOSURE AFTER GRINDING.

NOTES:

1. POSITION MAGNET TO POLE PIECE ON TRIGGER BD. FLAT SURFACE TOWARD POLE PIECE.
2. FILL TRIGGER HOUSING $\frac{1}{2}$ FULL WITH THERMOSET DC 568 MIX 2% HYSOL ALK COLOR DISPERSION.
3. INSERT BD. ASSY INTO HOUSING, POLE PIECE SHOULD BE IN LINE WITH NOTCH ON HOUSING.
4. ADD DC 568 TO FILL HOUSING, CURF. AT 250°F FOR 3 HRS.
5. TRIGGER POLARITY: RED POS REL. TO BRN. WITH FERROUS METAL PROBE MOVED AWAY FROM POLE TIP (INCREASING AIR GAP).



AFTER ENCAPSULATION GRIND HERE TO EXPOSE POLE PIECE.

western controls, inc.

PHOENIX, ARIZONA

SCALE	TOLERANCE: .XX = UNLESS OTHERWISE SPECIFIED	FINISH:
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INITIALS	DATE
DWN	10-27-77
CHKD	11-2-77
APVD	11-2-77

THIS DRAWING CONTAINS DESIGNS AND OTHER INFORMATION WHICH ARE THE PROPERTY OF WESTERN CONTROLS, INC. THIS DRAWING MAY NOT, IN WHOLE OR IN PART, BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT WRITTEN PERMISSION OF WESTERN CONTROLS, INC.
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USED ON	2001	NEXT ASSEMBLY	NONE
DWG NO	2001-3	TRIGGER FINAL ASSEMBLY	

INSTALLATION INSTRUCTIONS

1. Mount the trigger unit in the distributor using the instructions and material in the adapter kit and hardware bag.
2. Mount the Transistor Electronic Switch Unit in a cool location away from the exhaust manifold. Be certain the harness will reach the distributor and ignition coil connections.

Mount the unit with 3 #12 sheet metal screws. Use the unit base as a template and punch or drill the screw holes with a 5/32" bit.

3. Disconnect the breakerpoint wire from the - negative terminal "Dist" of the ignition coil. Do not remove the tachometer wire or radio suppression condenser if connected.

Connect the Blue wire from the unit to this terminal. Ford engines, use the #10 nut supplied with the adapter kit. Ignition coils with push-on terminals, use the mating terminal supplied. Securely crimp a mating push-on terminal to the Blue wire after removing the fork terminal.

4. Connect the Black wire to engine electrical ground. Secure under a coil mounting bolt, head bolt or other convenient place in contact with the engine block.

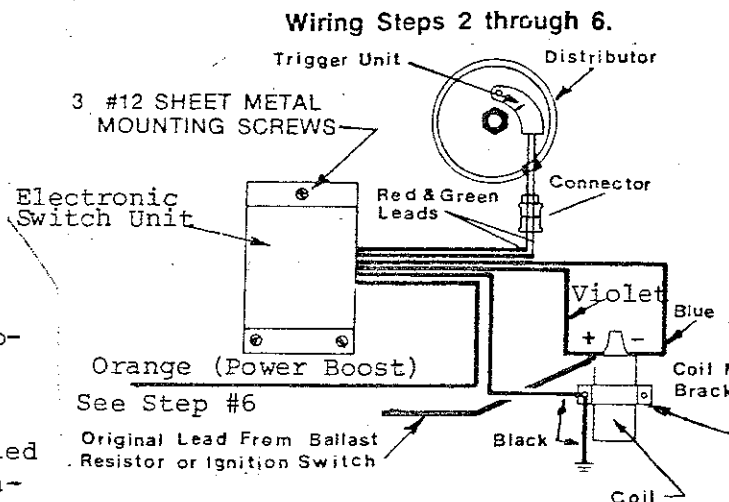
5. Connect the Violet wire to the positive "BAT" terminal of the ignition coil. Use the wire tapper supplied for a convenient, simple connection. See diagram.

6. Connect the Orange (Power Boost) wire to an accessory power connection that is turned on and off with the ignition switch. A convenient connection point can be found at the fuse block, ignition switch side of the ballast resistor or the wire to the anti-dieseling solenoid near the carburetor. Use the remaining wire tapper for this connection.

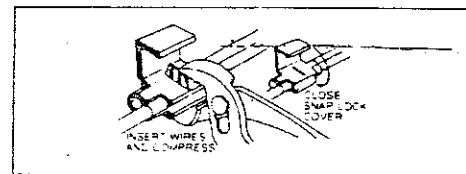
7. Push the red leadwire from the Trigger Unit into the connector half containing the red leadwire from the Amplifier, and the green lead from the Trigger Unit to the connector half containing the green Amplifier lead. Make sure to match red to red and green to green, see illustration.

Now separate the connector halves and firmly push the Trigger leads into the holes until a snap is felt. Then, reconnect the connector halves.

8. Time engine to manufacturer's specifications. Reset sparkplug gap to specifications. Inspect secondary wiring for heat hardening or cracking. Replace if necessary. Dress the Amplifier and Trigger Unit leads for a neat installation.



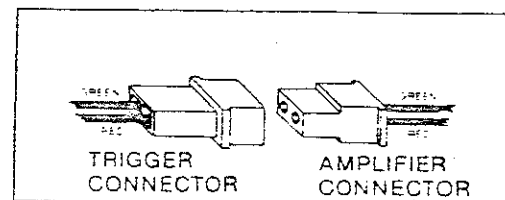
HOW TO INSTALL SELF-STRIPPING ELECTRICAL TAP CONNECTORS



NOTE:

This ignition system will operate with the Orange wire not connected. Its purpose is to increase the available voltage at the sparkplugs providing longer plug life and greater resistance to fouling than other ignition systems of this type. The connection is required on California cars and trucks.

Connector Wiring — Step #7



6 AND 8 CYLINDER CHRYSLER ENGINES

IMPORTANT

THE 383 AND 440 ENGINE DISTRIBUTORS ROTATE IN THE COUNTERCLOCKWISE (CCW) DIRECTION. OTHER ENGINES SUCH AS THE SLANT 6 AND 318 ROTATE IN THE CLOCKWISE (CW) DIRECTION. BE SURE TO DETERMINE THE DISTRIBUTOR SHAFT ROTATION DIRECTION TO CORRECTLY INSTALL THE TRIGGER UNIT.

- () 1. Remove the distributor cap, rotor, condenser and leadwire.
- () 2. Install the adapter plate as shown in figure 1. Use the 8-32 flat head screw provided and tighten securely.

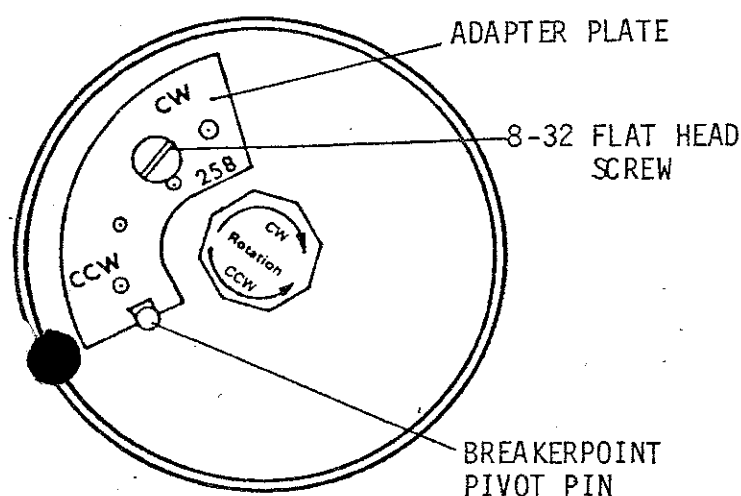


FIGURE 1

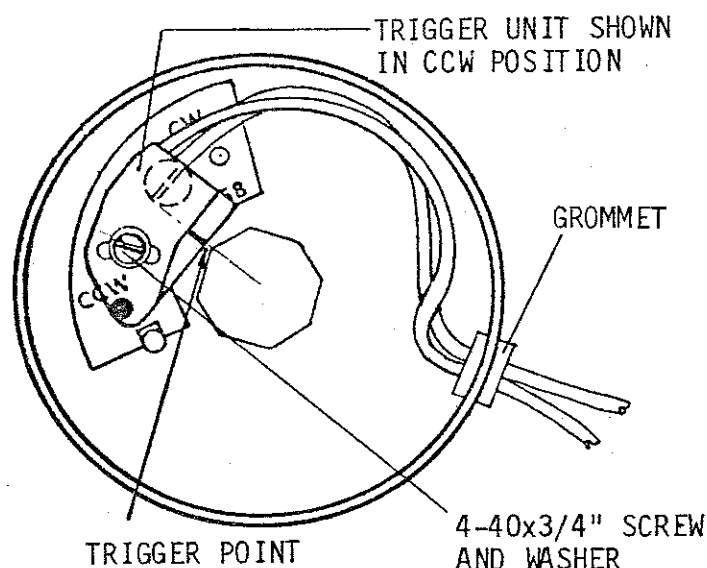


FIGURE 2

- () 3. Install the trigger unit with the 4-40x3/4" screw and compression washer. Do not tighten the screw yet. Be sure the trigger unit is in the correct holes for the rotation direction of the distributor. See figure 2.
- () 4. Crank or rotate the engine so that a peak on the distributor cam is opposite the trigger point.
- () 5. Set the gap between the cam peak and the trigger point to $.010 \pm .004$ inches. Insert a feeler gauge and tighten the screw while pressing against the side of the trigger unit.
- () 6. Insert the rubber grommet into the hole in the distributor wall. Run the trigger wires through the grommet. Drape the wires inside the distributor as shown in the figure.
- () 7. Examine the distributor cap and rotor for cracks and wear. Replace if needed. Install the cap and rotor. Proceed to the main instruction sheet.



April 27, 1976

Mr. K. D. Drachand
Chief Vehicle Compliance
California Air Resources Labr.
9528 Telstar Avenue
El Monte, Calif. 91731

Dear Mr. Drachand:

Thank you for your letter of April 5, 1976. We would like to accept the alternative restrictions you have proposed for breakerless transistor ignition system and omit all Chrysler and all 4 and 6 cylinder General Motors from the exemption list.

Enclosed is a copy of our adapter kit guide showing all vehicles not exempted with asterisk. The asterisk refers to a note #8 on the back page of the guide.

A bold fact type statement on the front cover will call attention to the California requirements.

Please review the marked up application guide to see that it meets your requirements and advise me if any changes are necessary.

Yours Sincerely,

Charles L. Shano

CLS/ts

encl:



July 6, 1976

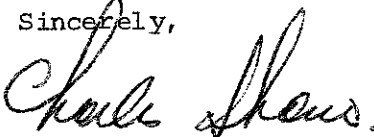
Mr. Mitch Luczynski
California Air Resources Board
9528 Telestar Avenue
El Monte, Calif. 91731

Dear Mr. Luczynski:

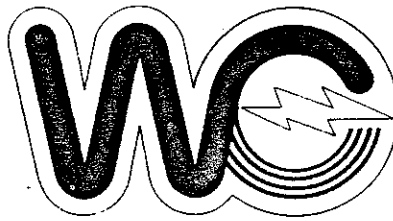
Please note that Western Controls Inc. will completely eliminate all reference to notes 1 through 4 on the application guide. The guide with corrections will be printed and circulated as soon as exemption is obtained.

For your exemption statement please refer to Western Controls application guide No. AG551-303 effective August 1, 1976.

Sincerely,


Charles L. Shano

CSL/ts



Western Controls. inc.

805 WEST MADISON • PHOENIX, ARIZONA 85007
(602) 252-4927

**SERIES 3000
ADAPTER KITS**

**APPLICATION GUIDE
FOR ALL
BREAKERLESS ELECTRONIC IGNITION SYSTEMS**

All trigger units for WESTERN CONTROLS BREAKERLESS IGNITION SYSTEMS can be installed quickly and easily with the Adapter Kits listed in this guide. There is a suitable adapter kit for virtually every domestic and imported engine. The tables list the proper kit to be used with passenger cars, trucks and busses, lift trucks, tractors, farm equipment and industrial engines.

All adapter kits are supplied with necessary hardware and detailed installation instructions.

CONTACT FACTORY FOR APPLICATIONS NOT LISTED.

- INDEX:**
- 1 - Passenger Cars & Light Trucks
 - 2 - Trucks & Busses
 - 3 - Lift Trucks
 - 4 - Tractor & Farm Equipment
 - 5 - General Guide for Industrial Engines
 - 6 - Application Guide Notes

CALIFORNIA VEHICLES

Some of the ignition system applications are not exempt from prohibition. For details see note #4 on the back cover of this guide. This prohibition applies to all highway applications of makes and models marked with * asterisk.

AG-551-303

PASSENGER CARS AND LIGHT TRUCKS

YEAR & MAKE	CYL.	MODEL	KIT NO.
A.C.	8	Cobra	3057
		Scimitar & Others	(Note 1)
ALFA ROMEO	4	1750 Berlina, Spyder Veloce, GTV	3085
68-69		Dist. No. 0231129034	
	4	1750 Berlina, Spyder, Coupe	3066
		Dist. No. 0231112070	
	4	2000 Berlina, GT & Spyder Veloce	3065
		Dist. No. 0231129036	
		All Others	(Note 1)
AMERICAN MOTORS	8	All	3051
57-74			
63-74	6	All SEE NOTE #4	3053
ASTON MARTIN	6	DB6 & Vantage, Volante	3069
66-68		DBS	3069
67-74	6		(Note 1)
		All Others	(Note 1)
AUDI	4	All	3065
65-75			(Note 1)
AUSTIN (AUSTIN-HEALEY)	4 & 6	A 30, 35, 38, 100, Healey 100-M, C, 100 G, 3000	(Note 1)
55-62		Healey 3000 (Dist. No. 406622)	(Note 1)
63-69		Healey Sprite	(Note 1)
67-69			(Note 1)
56-74	4 & 6	All not listed above	3069
		All Others	(Note 1)
BMW	4 & 6	All using Bosch Pts. (1-237-013-044, 057, 062) and similar (1 piece pt. set)	3065
65-75			(Note 1)
		All Others	(Note 1)
BUICK		See General Motors	
CADILLAC		See General Motors	
CAPRI		See Ford Motor Co.	
CHECKER	8	All	3051
57-74			
63-74	6	All SEE NOTE #4	3053
CHEVROLET		See General Motors	
* CHRYSLER CORP.	6 & 8	All	3058
62-72		With Elec. Ign. SEE NOTE #4	(Note 1)
72-75	6 & 8		3067
71-75	4	Colt	3067
71-72	4	Cricket	3069
CORVETTE		See General Motors	
COURIER		See Ford Motor Co.	
DATSUN	4	410, 411	3067
66-67		All w/single pt. set	3067
67-75	4	240Z, 260Z, w/Manual Trans.	3067 (Note 1)
71-74	6	W/o Elec. Ign. (6 cyl. only - Note 5)	(Note 1)
All others	4 & 6	With Elec. Ign.	(Note 5 & 6)
75	6		
* DODGE		See Chrysler Corp.	
FIAT		All except Dual Point	(Note 1 & 2)
FORD (ENGLISH)	4	Anglia, Cortina (Dist. No. C8AH)	3055
66-67		Cortina (Lucas Dist.)	3069
67-71	4	(Ford Dist.)	3056
65-71	4	All not listed Above	3069
60-62	4	Anglia, Classic, Capri, Corsair, Cortina, Prefect	3069
63-64	4	" " " " " Corsair	3069
		All Others	(Note 1)
FORD (GERMAN)	4	Taurus	3065
67-68			(Note 1)
All Others			(Note 1)
FORD MOTOR CO.	8	All except Dual Point	3056 (Note 1)
57-74		All Dual Point	3057 (Note 1)
57-74	6	All except V-6	3057
75	4, 6 & 8	All w/Elec. Ign.	4053 (Note 1 & 2)
73-74 (72-74 Calif.)	4	Courier	3067
75		Courier (with Dual Point)	(Note 1)
Capri, Mustang II, Pinto	V-6	All	3065 (Note 1)
73-74		2000 cc	3065
71-74	4	1800 cc, 2300cc	3056
71-74	4 & V-6	W/o Elec. Ign.	(see proper '74 model)
GENERAL MOTORS CORP.	8	All	3051
57-74			
63-74	6	All except V-6 SEE NOTE #4	3053
68-74	V-6	All (without window in dist. cap)	3053
63-74	4	Except LUV & Opel SEE NOTE #4	3052
66-75	4	Opel	3065
72-74		LUV (Type 1 & 2)	(Note 1)
73-75	4	LUV (Type 3)	3067

YEAR & MAKE	CYL.	MODEL	KIT NO.
HILLMAN	4	Mirra, Super Mira (Dist. 116434)	(Note 1)
55-69		Healy (High Compression)	(Note 1)
58-69	4	All not listed above	3069
		All Others	(Note 1)
HONDA	4	Civic	3067
73-75			
HUMBER	4	Super Snipe	3069
63-68		Sceptre (Dist. No. 40799A, B: 40942A; 41125A, 51A)	3069
63-69	4		3069
68	4	Hawk	3069
65-68	6	Imperial	3069
		All Others	(Note 1)
JAGUAR	6	MXK Saloon, XKE	3069
63-64			3069
65-75	6	All	3069
72-75	V12	All	(Note 1) NOTE 2
All Others			(Note 1)
INTERNATIONAL HARVESTER		See Truck and Bus Guide	
JEEP	V-6	Late model Distributors w/o adjustment window	3053
68-74		All except V-6 SEE NOTE #4	3053
66-74	8	All	3051
66-74	4, 6 & 8	All others models	(Note 1)
LINCOLN		See Ford Motor Co.	
LOTUS	4	ELAN + 2, 5, 45, 130S, Sprint	3069
70-73			
LUV		See General Motors	
MERCEDES-BENZ	4	220 Using Bosch Pts. (1-237-013-059, 061, 062, 082)	3066
68-72		280 SE (Using Bosch Pts. above)	3066
70-73	6	280 SL/8 (Using Bosch Pts. above)	3066
70-72	6	All others	(Note 1) NOTE 2
64-74			
MERCURY		See Ford Motor Co.	
M. G.	4	Midget; Magnette; MGA 1500; 1600	3069
56-59			3069
60-75	4 & 5	All	
MORGAN	4	All	3069
59-67		Plus Four	3069
58	4		
MORRIS	4	All	3069
59-71		Oxford, Cowley, Minor	3069
56-58	4		
MUSTANG		See Ford Motor Co.	
NASH	4	Metropolitan	3069
55-64			
NSU	4	All	3065
67-72			(Note 1)
All Others			(Note 1)
OLDSMOBILE		See General Motors	
OPEL		See General Motors	
PINTO		See Ford Motor Co.	
PLYMOUTH		See Chrysler Corp.	
PONTIAC		See General Motors	
PORSCHE	6	911	(Note 1) NOTE 2
67			3066
68-71	6	911	(Note 1) NOTE 2
67-69	6	911S	3065
68-70	6	911T	3066
68-72	4	912	3066
70-71	4	914/4	3065
70-72	4	914 (w/411E engine)	3065
		Dist. 0-231-174-001	(Note 1) NOTE 2
		0-231-174-002	3065
73-75	4	914	3065
72-74	6	911 Series	3066
RILEY	4	All except 57-58 2.5 & 59-60 2.6	3069
56-70		2.5 & 2.6	(Note 1)
60-69			(Note 1)
ROVER	4 & 6	All	3069
64-74		Landrover	3069
56-63	4	80	3069
59-63	4	2000	3069
63	4		(Note 1)
All Others			(Note 1)
SAAB	4	95V4, 96V4	3065
66-70		98E, EA, EMS	3065
70-74	4	Sonnet	3065
68-72	4		(Note 1 & 2)
All Others			(Note 1)
SINGER	4	All except early '68 Gazelle	3069
59-70			(Note 1)
All Others			(Note 1)
SUBARU	4	1000, 1100, 1300 S	3067
69-74			

PASSENGER CARS AND LIGHT TRUCKS

Exhibit 11

YEAR & MAKE	CYL.	MODEL	KIT NO.	YEAR & MAKE	CYL.	MODEL	KIT NO.
SUNBEAM				VAUXHALL			
56 - 70	4	All except 56 - 59 Saloon	3069	57 - 58	4	Wyvern	3069
66 - 67	8	Tiger (Ford V-8)	3056	57 - 66	4	Envy, Victor, Super, Estate Wagon	3050
				63 - 68	4	Vira	3050
				58 - 66	6	Velox, Cresta	3050
THUNDERBIRD		See Ford Motor Co.					
TOYOTA				VOLKSWAGON			
66 - 75	4 & 6	All w/o Elec. Ign.	3068	66 - 75	4	All except 1970 & 71 411E & EL	3065
75	4 & 6	With Elec. Ign.	NOTE				
TRIUMPH				VOLVO			
65 - 70	4	Spitfire (Delco Ignition)	3050	62 - 68	4	All	NOTE 2
63 - 70	6	Vitesse w/Delco Ignition	3050	68 - 69	4	142S, 144S, 145S, 1800S	3066
		w/Lucas Ignition	3069	68 - 74	6	164	3066
56 - 75	4 & 6	All not listed above	3069	69 - 74	4	All not listed above	3065

TRUCKS AND BUSES

MAKE & YEAR	CYLINDERS	MODEL	W-C KIT No.	MAKE & YEAR	CYLINDERS	MODEL	W-C KIT No.
AMERICAN LAFRANCE				FLEXIBLE			
59 - 64	6	All	3055 (Note 3)	58 - 66	6	All	3055 (Note 3)
60 - 64	8	All	3050				
48 - 64	12	All 12 volt	3050	FORD			
AUTO CAR				58 - 74	8	All	3056
54 - 60	6	All 12 volt	3055 (Note 3)	56 - 74	6	All	3057
53 - 57	6	All 12 volt	3050	75	6 & 8	All w/Elect. Ign.	NOTE 2
BROCKWAY				GMC COACH AND TRUCK			
49 - 67	6	All 12 volt	3061 (Note 3)	65 - 72	6	All	3053
CHEVROLET				55 - 64	6	All	3055 (Note 3)
56 - 74	8	All except with Delco D-103 pts	3051	55 - 64	4	On Refrigeration Engine	3054 (Note 3)
63 - 74	6	All SEE NOTE #4	3053	57 - 74	8	All	3051
63 - 74	4	All except LUV	3052	63 - 74	6	All Except V-6	3053
LUV		See "Passenger Cars and Light Trucks Guide"		65 - 74	V-6	All Except Dist. 1110 277	3053
DIAMOND T (REO)				60 - 66	12	All	3072
72	8	230 LPG, OV-250	3057	INTERNATIONAL HARVESTER			
72	6	6-200	3057	With Delco Distributor			
72	6	6-130, 145, 162, 169, 190	3062	61 - 64	4	Scout 152	3051
67 - 71	6	6-142, 162, 170, 186, 190, 200 (w/1510 Dist.)	3062	67 - 74	6	All except w/pt. sets D-100, 111, 105, 105P	3053
67 - 71	8	1308, 1456, 235	3062	58 - 74	8	w/pt. D-100, 111, 105, 105P	3055 (Note 3)
		with D-4141 A, D-4292 AAS Dist.	3062	With I.H.C. - Holley Dist.			
		with D-2475-1A Dist.	3057	56 - 74	4 & 8	w/Ford Pt. Sets 7RA-12171; C9AZ, FAB-12171B; C3AZ, C3DZ, C8AZ, FAA, FAB, FDS-12171 A	3057
57 - 71	8	OV-195, 207, 235	3050	64 - 74	4 & 8	w/I.H.C. Pt. Set 361-764-C1	3062
		with 1110620, 21, 23, 31, 32, 33 Dist.	3051	MACK			
DIVCO				49 - 71	6	All 12 volt	3055 (Note 3)
55 - 65	4	All	3054 (Note 3)	OSHKOSH			
60 - 65	6	Continental Engines	3050	48 - 64	6	All Delco Distributors 12 volt	3055 (Note 3)
55 - 60	6	Nash Engines	3050	48 - 57	6	IAD Dist	3061 (Note 3)
62 - 65	6	All others	3055 (Note 3)	WHITE			
DODGE TRUCK				68 - 72	6	w/Holley Dist.	3062
62 - 73	6 & 8	with Chrys. Dist. w/o Elec. Ign.	3058	67 - 72	8	w/Holley 1510 Dist.	3062
68 - 73	8	with 361-764-C1, 2932887, 3620771, 76D-711A Point sets	3062	67 - 72	8	w/Delco Dist.	3051
62 - 67	6	with Autolite Dist.	3062	66 - 69	8	w/Holley D4108A Dist.	3062
63 - 67	8	with Autolite Dist.	3062	49 - 65	6	w/Delco Dist.	3055 (Note 3)
70	8	with Chrys. Dist. 287576, 77	3058	60 - 65	8	Lansing Engine 8-235A	3051
61	8	with Chrys. Dist. 2095270, 1889750	3058			w/Dist. No. 1111660	3050
72 - 75	6 & 8	All w/Elect. Ign.	NOTE 2	48 - 62	6	w/Dist. No. 1110632	3057
				REO		See Diamond T	

LIFT TRUCKS

MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.	MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.
ALLIS - CHALMERS				CLARK			
(FP30 & FT-FTL-FTB-FTBL 20-25-30)	4	With FC 133 Waukesha	3	"C" Series	4	All w/D155G Waukesha, F-163, Y112	
		Before s/n 194791 (Pts. No. 4042731-2)	3054 (Note 3)			Continental (Except C, CY, CFY-20)	3052
		After s/n 194791 (Pts. No. 4056705-9)	3052	C, CY, CFY-20	4	With Y112 Continental	
FT-FTL-FP-FPL 30-40-50	4	With s/c B153 - After s/n 368558	3054 (Note 3)			w/Screw-on Dist. Cap (Pts. No. 896952)	3052
F-FL-FP-FPL 30 to 55	4	With s/c G153	3			w/Clip-on Dist. Cap (Pts. No. 853628)	3054 (Note 3)
		Before s/n G56196 (Pts. No. 4042731-2)	3054 (Note 3)	C, CF, CY, CFY-30, 40, 50	4	With F162 Continental	
		After s/n G56196 (Pts. No. 4056705-9)	3052			w/Screw-on Dist. Cap (Pts. No. 896952)	3052
AT-ATL 30-40-50	4	With s/c B153	3	"C" Series	6	All w/F227, 245 Continental and JXLD Hercules (Pts. No. 896952)	3053
		Before s/n G56196 (Pts. No. 4042731-2)	3054 (Note 3)			With F6209, F209 Continental	
		After s/n G56196 (Pts. No. 4056705-9)	3052			w/Screw-on Dist. Cap (Pts. No. 896952)	3053
(ACC-ACL-ACP-ACPL 20 to 55)	4	All (Pts. No. 4056705-9)	3052			w/Clip-on Dist. Cap (Pts. No. 853628)	3055 (Note 3)
(FT-FTL-FTP-FTPL 60 to 100)	6	After s/n 393705 (Pts. No. 4042731-2)	3055 (Note 3)	"C" Series	8	With 477 V-8 Ford	3056
FR 150 to 250	6	With s/c G2800 (Pts. No. 4056705-9)	3053	Clarktor	6	Models 20, 30, 40, 50	3053
(F-FL-FPL-FC-FLC-60 to 120)	6	Before s/n G56088 (Pts. No. 4042731-2)	3055 (Note 3)	IT50, 60N, 60W, 70N, 70W	6	w/Chrysler Industrial 6	3061 (Note 3)
AT-ATL-ATM-ATML-AY 60 to 120)	6	After s/n G56088 (Pts. No. 4056705-9)	3053			w/Chrysler Slant 6	3058
ACC-ACP-60 to 120	6	All (Pts. No. 4056705-9)	3053	DATSUN			
				All	4 & 6	With Single Point Set	3067

Exhibit II

TRACTOR & FARM EQUIPMENT

MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.	MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.
ALLIS - CHALMERS				JOHN DEERE			
ID 10, 12, 14, 15; RT-40, 50;				(215A Windrower; JD 301,			
H3 Crawler Tractor;				310, 380, 400, 410, 440, 480,			
Combine E, "E" III)	4	All	3054 (Note 3)	1520, 2020, 2030 Series;			
TL-10, 12	4	Delco Dist. w/clip-on Cap	3054 (Note 3)	2510, 2520 Tractors; 323			
	6	" " " " "	3055 (Note 3)	Baler; 266, 600 Hi-Cycle;			
				40, 45 Combine; JD-350B			
(D-17, 19; TL-14, 16;				Crawler)	4	All	3059 (Note 3)
Combine A, B, C;							
RT-60, 70, 80, 100)	6	All	3055 (Note 3)	1010, 2010 Tractors	4	Prestolite 1BT Dist.	3059 (Note 3)
Combine F	6	Delco Dist. w/Clip-on Cap	3055 (Note 3)			Delco Dist. w/Clip-on Cap	3054 (Note 3)
		Delco Dist. w/Screw-on Cap	3053	40, 45 Combine S.P.	4	All	3054 (Note 3)
(170, 180, 190, 190XT Trac.;				3010 Tractor	4	Delco Dist. w/Clip-on Cap	3054 (Note 3)
TL-545 Tractor Loader;						Delco Dist. w/Screw-on Cap	3052
EIII, K Combine)	6	All	3053	(500, 3020 Tractor;	4	All	3052
Combine G	6	Delco Dist. w/Clip-on Cap	3050	500C Loader)	4	Delco Dist w/Clip-on Cap	3054 (Note 3)
		Delco Dist. w/Screw-on Cap	3053	105 Combine	4	" " " " "	3055 (Note 3)
Combine L, M	6	All	3050		6	Delco Dist w/Screw-on Cap	3053
All Others			(Note 4)		6	Prestolite 1BT Dist.	3060 (Note 3)
					6		
JOHN BEAN				(12 Harvester; 99, 299			
40RC, 300 G Rotomist	6	IAD Prestolite Dist.	3061 (Note 3)	Cotton Picker)	6	All	3060 (Note 3)
All Others			(Note 4)	55, 65, 95 Combine	6	Prestolite 1BT Dist.	3060 (Note 3)
						Delco Dist. w/Clip-on Cap	3055 (Note 3)
JOHN BLUE				[55 Combine S.P.; No. 8			
			(Note 4)	Cotton Picker; Cotton			
J. I. CASE				Picker (NA-217)]	6	All	3055 (Note 3)
[200B thru 600B,				4010 Tractor	6	Delco Dist. w/Clip-on Cap	3055 (Note 3)
310, 420 (G148 Eng.)]	4	1111908, 909 Dist.	3054 (Note 3)			Delco Dist. w/Screw-on Cap	3053
900 LPG	6	Prestolite IAD Dist	3061 (Note 3)	(600, 4020 Tractor; 4400, 6602,			
All Others			(Note 4)	7700 Combine; H7 Forage Harvester;			
				155 Self-Propelled Harvester)	6	All	3053
				All Others			(Note 4)
JOHN DEERE							
mental Engine	4	Prestolite 1BT Dist.	3059 (Note 3)				
				FORD			
COCKSHUTT, CO-OP				(620, 30, 40, 50, 60; 740; 820;			
430, 31; 535, 42, 45	6	Chrysler 251, 265 Engine	3061 (Note 3)	860; 950; 960; 2000,			
540, 550	4	Delco Dist. Only	3054 (Note 3)	4000 Series)	4	w/FAC 121270 Dist Only	3073
570	6	Delco Dist. Only	3055 (Note 3)	Super Major 5000	4	All	3056
All Others			(Note 4)	S.P. Combine & 6000 Series	6	All	3057
				All others			(Note 4)

TRACTOR & FARM EQUIPMENT

Exhibit II

MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.	MAKE & MODEL	CYL.	ENGINE/DIST.	KIT NO.
RORDSON				MINNEAPOLIS - MOLINE			
J.A. FREEMAN				(UBE, UBN, UTC, UTI, UTIL, UTS, UTU, GB, GSD, GTB, GTC, ZAS, ZBE, ZBN, ZBU; Uni-Tractor; Harvester G-4; B-4; 445, 550; 4 Star; 4 Star Super; 5 Star; Jet Star; M5; M602 Trac.)	4	All	3054 (Note 7) 3
FRIEND				Jet Star 3; U-302 Tractor	4	Delco Dist. W/Clip-on Cap Delco Dist. W/Screw-on Cap	3054 (Note 7) 3 3052
GRAVELEY TRACTORS				(M670 Tractor; 11-302; Eng. 336-4A, HD-220-4A)	4	All	3052 3
HAGUE				G-704, 5, 6, 7, 8, 900	6	All	3055 (Note 7) 3
HAMM				(G 900, 1000 Tractor; Eng. HD-425A-6A, HD-504A-6A, HD-605B-6A, HD-800-6A)	6	All	3053
HARDIE				(2890; 3490, 96; 4290, 92, 96 Combine)	6	All	3061 (Note 7) 3
HARRINGTON				All Others			(Note 7) 3
HARVESTER IMPLEMENT	6	GO-339A Eng.	3055 (Note 3)	MYERS	6	Prestolite IAD Dist.	3061 (Note 7) 3
98 Harvester				Chry. Ind. 30			(Note 7) 3
HESSTON			(Note 7)	All Others			
INTERNATIONAL HARVESTER				NEW HOLLAND			
(C-175, C-200 Tractor; C-157 World Engine)	4	Prestolite IBT Dist.	3059 (Note 3)	800, 810 Forage Harvester	6	Prestolite IAD Dist.	3061 (Note 7) 3
(TD-6, 9; HA Payloader; HAH-F Payloader)	4	Delco Dist.	3054 (Note 3)	All Others			(Note 7) 3
C-263, 301	6	Prestolite IBT Dist.	3050 (Note 3)				
TD-18A, 24	6	Delco Dist.	3055 (Note 3)	OLIVER			
All Others			(Note 7)	Tractors			
KAISER				248, 283, 310 Eng.	6	Holley Dist.	3057
FJ, F4-134, L4-134	4	IAT Dist. only	3059 (Note 3)	OV-235	8	Holley Dist.	3057
6-230, L6-226	6	All	3060 (Note 3)	1600	6	Oliver Dist.	3053
All Others			(Note 7)	1800	6	W/Screw-on Dist. Cap W/Clip-on Dist. Cap	3053 3055 (Note 7) 3
KROMER			(Note 7)	(77, 88, 770, 880; Super 950; HC, DG)	6	W/Clip-on Dist. Cap	3055 (Note 7) 3
LUNDELL			(Note 7)	55, 56, 550	4	W/Clip-on Dist. Cap	3054 (Note 7) 3
MASSEY - FERGUSON				(430, 431 Rice Comb.; 525, 535, 542, 545)	6	Prestolite IAD Dist.	3061 (Note 7) 3
(TD-20, 30, 35; TO-35; MF-85, 90; MH-50; AHO Power Unit; 35S.P. Combine; 44 Windrower; 34 Swather)	4	All	3054 (Note 3)	All Others			(Note 7) 3
(MF 50, 65, 202, 204, 358 Industrial Tractor; 35)	4	Delco Dist W/Clip-on Cap Delco Dist W/Screw-on Cap	3054 (Note 3) 3052	OWATONNA			(Note 7) 3
(35 Spec.; MF-135, 150, 165, 175, 180, 285, 2135, 2200, 2250, 3165; MF36 Swather)	4	All	3052	POLAND			(Note 7) 3
MF-410, 1100	6	All	3053	UNIVERSAL			(Note 7) 3
92 S.P. Combine	6	All	3055 (Note 3)	WILLYS			
(60, 70, 72, 80, 82, 90, 92, S.P. Combine; MF-300 S.P. Combine; MF-205 Combine; Corn Picker, Forager S.P.)	6	All	3061 (Note 3)	L6-226 Engine	6	IAT 4404A Dist. IAT-4206B Dist.	3060 (Note 7) 3 3061 (Note 7) 3
48 Haypacker	6	All	3060 (Note 3)	6-230 Engine	6	IAT-4416 Dist.	3060 (Note 7) 3
MF-570 S. P. Combine	8	All	3050	6-232 Engine	6	All	3053
All Others			(Note 7)	V-8-327 Engine	8	All	3051
MCCORMICK - DEERING			(Note 7)	WISCONSIN			
MERCURY MFG.				4 cyl. Delco Remy	4	W/Clip-on Dist. Cap	3054 (Note 7) 3
A 460 (FC 278 Eng.)	4	625-5 Dist.	3054 (Note 7) 3	All Others			(Note 7) 3

GENERAL GUIDE FOR AMERICAN BUILT ENGINES USED IN LIFT TRUCKS, FARM EQUIPMENT, AND INDUSTRIAL APPLICATIONS

DISTRIBUTOR MODEL	CYL.	O.E.M. POINT SET NOS.	KIT NO.	DISTRIBUTOR MODEL	CYL.	O.E.M. POINT SET NOS.	KIT NO.
AUTO-LITE (PRESTOLITE)			3	FOMOCO			
IBT	4	1-33, 1-47	3059 (Note 7) 3	172 Indus. Eng. Dist.	4	CSAZ-12171-B	3073
IBT	6	" "	3060 (Note 7) 3	All	6	" "	3057
IAD, IAY	6	1-15, -20, -22, -45, -48	3061 (Note 7) 3	All single point set	8	CSAZ-12171-A	3058
Chrysler	Slant 6 & V-8	Chrys. No. 2098244, 2299322, 2421173	3058	HOLLEY			
				4, 6 & 8	4, 6 & 8	76D-711A (I.H.C. No. 361-764-C1) only	3062
				All other	4, 6 & 8		(Note 7) 3
DELCO - REMY			3				
Clip-on Dist. Cap	4	D-105, -105P, -100, -111	3054 (Note 7) 3				
	6	" " " "	3055 (Note 7) 3				
Screw-on Dist. Cap	4	D-108P	3052				
	6	" "	3053				
w/o Adjust. Window	8	D-103, -103P, -104, -104P	3050				
w/Adjust. Window	8	D-106P, -106PS, -112P, -1007	3051				
12 cylinder dist.	12	Dist No. 1111663-76-88	3072				

* This is a general guide to engine distributors of American manufacture. The adapter kits will "in most cases" fit the distributors. In some cases a slight modification of the adapter plate or relocation of the trigger mounting holes will be required. Refer to instruction sheet included with system for positioning of trigger unit.

APPLICATION GUIDE NOTES

Notes 1 through 4 will be eliminated per your request.

~~NOTE 1 - There is no adapter kit available at this time, however the unit may be installed in the distributor by drilling two holes in the distributor advance plate. All basic hardware and instructions necessary to do this are included with the basic ignition system kit.~~

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~~NOTE 2 - On some 4 cylinder cars, it may be necessary to grind the distributor cam lobes slightly to allow the trigger to properly sense the lobe. This is covered in the basic ignition system instructions included with the basic ignition system kit.~~

~~NOTE 3 - On vehicles with breakertype CD ignition, it will be necessary to remove the complete old system, and replace with WC.~~

~~NOTE 4 - This kit permits operating the Western Controls CD Converter unit with the original equipment breakerless distributor. Refer to Western Controls Ignition System brochure DS-551-300 for details.~~

NOTE 1 - If vehicle has an original equipment series tachometer, a 1052 (High Performance) or 1054 (High Performance with limiter) system is recommended to prevent limiting at lower than desired engine RPM.

NOTE 2 - Contact your dealer for availability.

NOTE 3 - Adapter kit is only for distributors having no vacuum advance.

NOTE 4 - Makes and models of vehicles marked with *asterisk are not exempt from prohibition in the state of California when the vehicle is used on the highway. This prohibition applies to all Chrysler Engines, General Motors (Delco) 4 cylinder and 6 cylinder engines.