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Mag-tronic

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COMPONENTS

American Bosch Mag-tronic ignition may very broadly be described as a self energizing, electronically controlled, low tension capacitor discharge system. Generally speaking, the system is applicable to engines utilizing natural gas or liquid hydrocarbon fuels in sizes ranging from 50 to 2000 horsepower. A unique and important feature of Mag-tronic ignition is the *rapid voltage rise-time* which provides a firing voltage potential across the spark plugs in 8 to 10 micro-seconds. This not only supplies an effective means of firing spark plugs which may be heavily fouled due to carbon deposits, electrical leakage or unfavorable thermal conditions, but minimizes the non-functional portion of the ignition pulse to the extent that, in most instances, spark plug erosion is substantially reduced. The Mag-tronic system comprises three basic components: the (MTC) ignition generator or energy producing, storage and distributing unit; the (HAA) low tension wiring harness, and the ignition transformers—one for each spark plug. The ignition system is designed to fire one or two spark plugs per cylinder and has an output capability of up to 36 KV depending upon the ignition transformers. Where there are two spark plugs per cylinder, two transformers are required. A single ignition generator will accommodate up to 12 engine cylinders.

The Mag-tronic system can be adapted to meet the requirements of a wide range of engines. Component parts such as generating coils and ignition transformers may be selected to meet the specific requirements of large, low speed engines, as well as medium and high speed applications.

CANADIAN STANDARDS ASSOCIATION

The shielded Mag-tronic ignition system, when used with the TCL 150 A1 transformer and approved spark plugs is listed by the Canadian Standards Association as certified Class 1, Group D, Division 2, suitable for use in hazardous locations.

The system complies with Section 18, Part 1, Clause 18-081 of the Canadian Electrical Code.

SECTIONAL VIEW OF IGNITION GENERATOR

1 DRIVE COUPLING
2 MOUNTING FLANGE
3 INDUCTOR ROTOR
4 MAGNETS
5 COIL ASSEMBLY
6 ROTOR SHAFT
7 DRIVE GEAR
8 DISTRIBUTOR GEAR
9 CAPACITOR
10 TIMER-DISTRIBUTOR PLATE
11 TIMING WINDOW
12 TRIGGERING COIL ASSY.
13 DISTRIBUTOR SHAFT
14 DISTRIBUTOR MAGNET ROTOR
15 TERMINAL PLUG CONNECTOR
16 HOUSING



IGNITION GENERATOR (MTC)

First of three functional sections in the ignition generator is the generating or energy producing section. Driven from the engine through a suitable drive disc and drive plate, it comprises a two-pole or three-pole induction rotor mounted on ball bearings, a low tension generating coil, pole shoes and stationary magnets. The generating section produces four or six pulses per revolution, depending upon the application, so a single ignition generator driven at engine speed will serve up to 12 cylinders on a four-stroke cycle engine. In applications where two conventional magnetos and two drive gears are required, Mag-tronic ignition represents a *considerable reduction in over-all system cost.*

The energy storage section of the ignition generator includes the diode rectifiers and either single or twin capacitors, depending upon the number of cylinders involved. Here the energy produced in the generating section is first rectified and then stored in the capacitors for release at the exact time and to the proper engine cylinder by the distributor rotor. Capacitive storage, as opposed to inductive energy which must be used as soon as it is generated, greatly *increases the versatility of the Mag-tronic system in accommodating odd firing patterns and bank angles.*

The distributor rotor is driven from the inductor rotor shaft by a 3:1, 2.5:1 or 2:1 gear set to reduce the distributor rotor speed to 1/2 engine speed on four-stroke cycle engines or engine speed on two-stroke cycle engines. A silicon controlled rectifier, acting as an electronic switch, and a triggering coil are employed for each engine cylinder. As the distributor magnet rotor, which is timed to the engine sweeps over each triggering coil, it generates an electrical pulse which activates the silicon controlled rectifier. This in turn instantly releases the stored energy in the capacitor to the corresponding ignition transformer. This design concept permits operation at speeds considerably higher than those previously obtainable. There is also an inherent spark advance of about 6° as speed increases. As there are no contacts, breakers or rubbing parts to wear, engine timing never requires adjustment. Moreover, there is no arcing or sparking outside of the engine cylinders.

Attached to the engine by means of a base mounting plate or several types of mounting flanges, the ignition generator may be mounted in a normal upright position or rotated 90° to avoid interference with the engine block or other accessories. Dimensional drawings of available mountings are shown on pages 4 and 5.

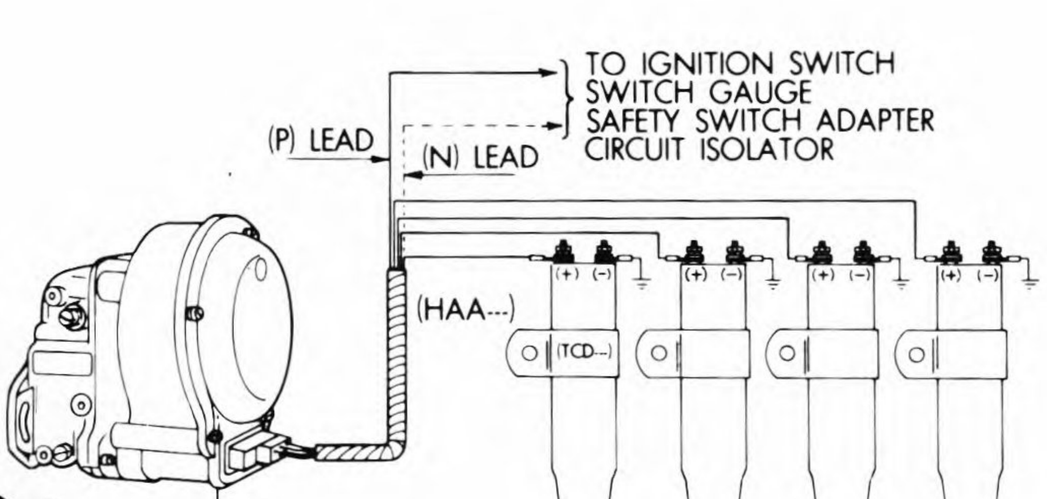
IGNITION GENERATOR—OPERATING SPEEDS

2-CYCLE EVEN FIRING ENGINES

ENGINE RPM			IGNITION GENERATOR		
			ROTOR SPEED—RPM		Internal
No. Cyls.	Max.	Min.	Inductor	Distributor	Gear Ratio
1, 2, 4	1800	50	2x Engine	Engine	2:1
5	1200	40	2.5x Engine	Engine	2.5:1
6	1200	35	3x Engine	Engine	3:1
8	1200	50	2x Engine	Engine	2:1
10	950	40	2.5x Engine	Engine	2.5:1
12	800	35	3x Engine	Engine	3:1
4-CYCLE EVEN FIRING ENGINES					
1, 2, 4	3600	100	Engine	½ Engine	2:1
5	2400	80	1.25x Engine	½ Engine	2.5:1
6	2400	70	1.5x Engine	½ Engine	3:1
8	2400	100	Engine	½ Engine	2:1
10	1900	80	1.25 Engine	½ Engine	25:1
12	1600	70	1.5x Engine	½ Engine	3:1

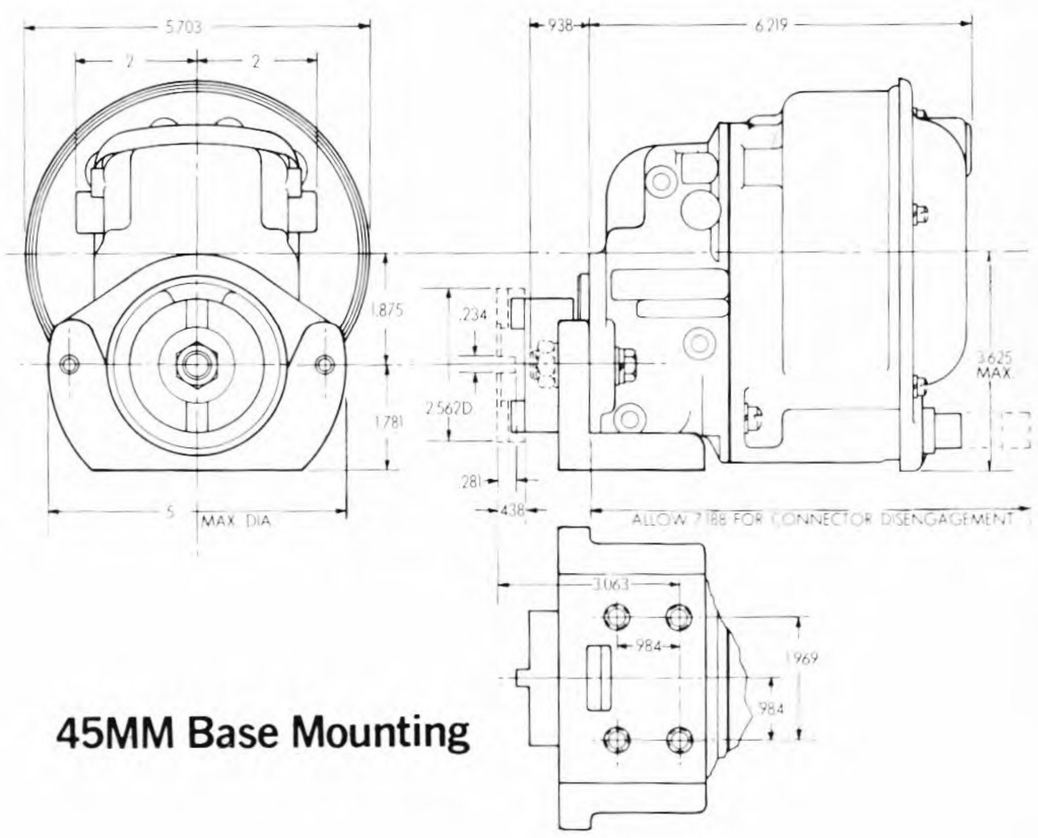
VARIOUS GENERATING COILS FOR SHIELDED (C) EDITION

Coil No.	Typical Gen. Speed Range	Complete Unit Suffix
CL 10625	65 to 1500 RPM	T
CL 521033 (std.)	100 to 3000 RPM	none
CL 521022	125 to 3750 RPM	W



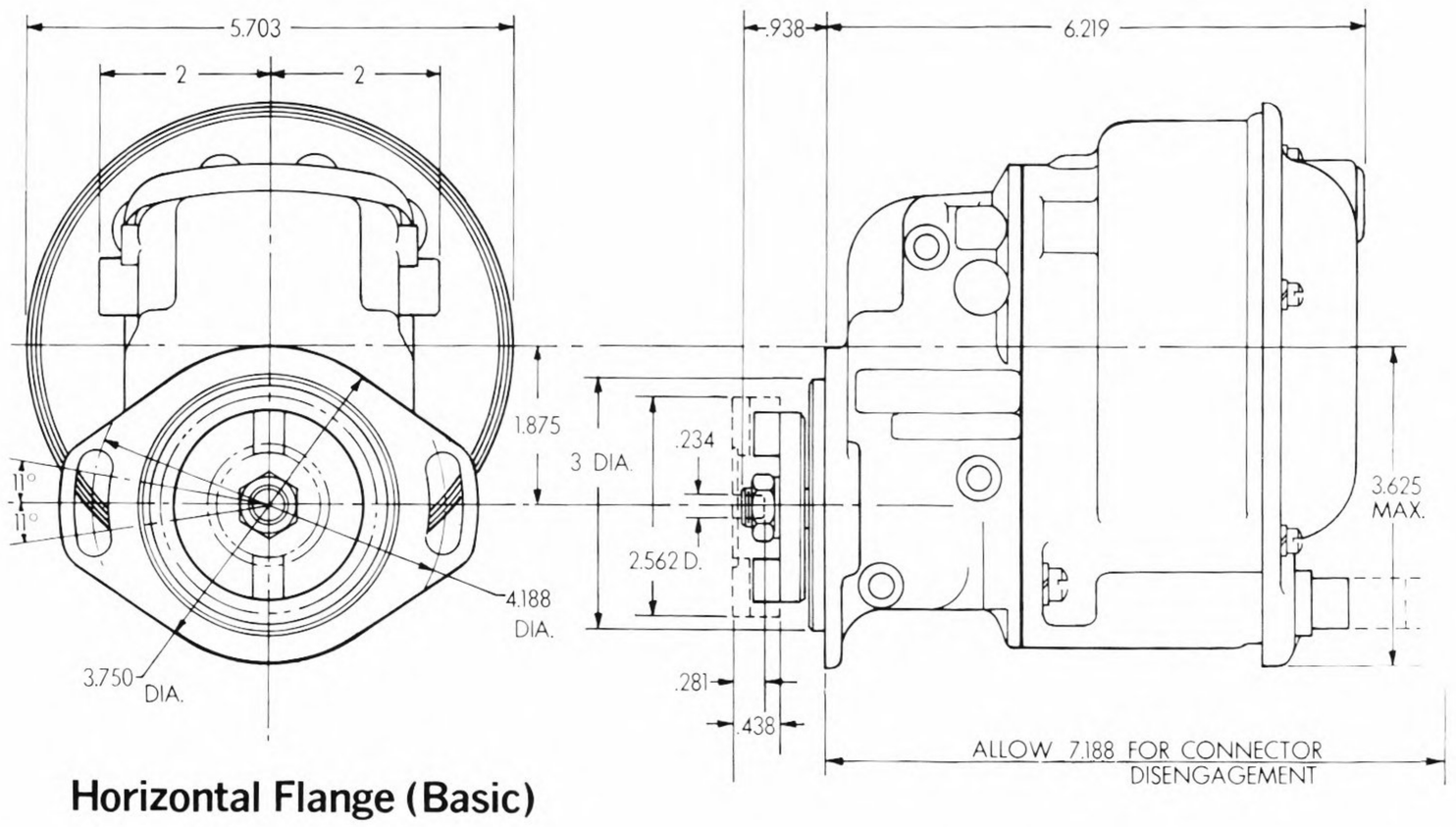
TYPICAL WIRING DIAGRAM FOR MAG-TRONIC IGNITION SYSTEM

IGNITION GENERATOR OUTLINES

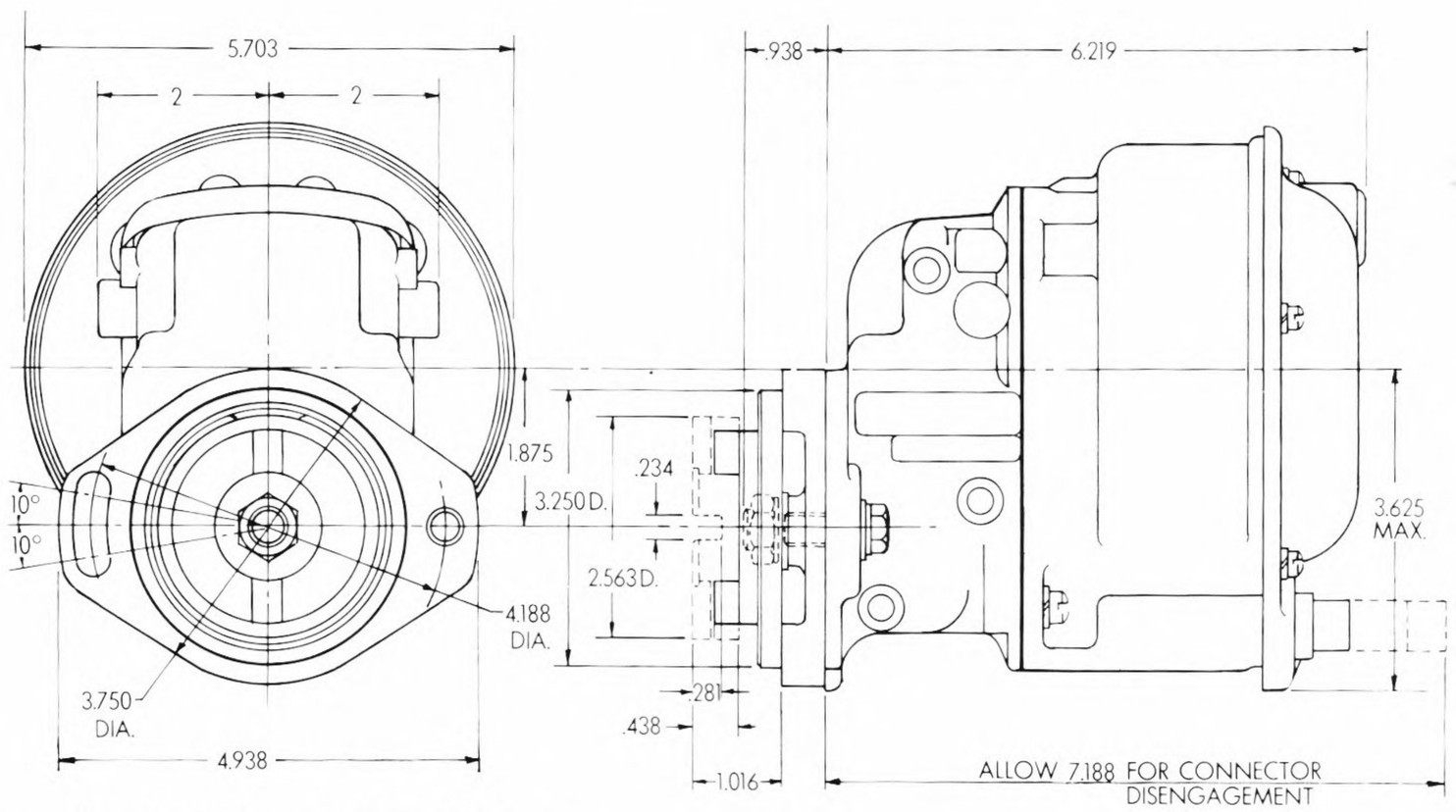


45MM Base Mounting

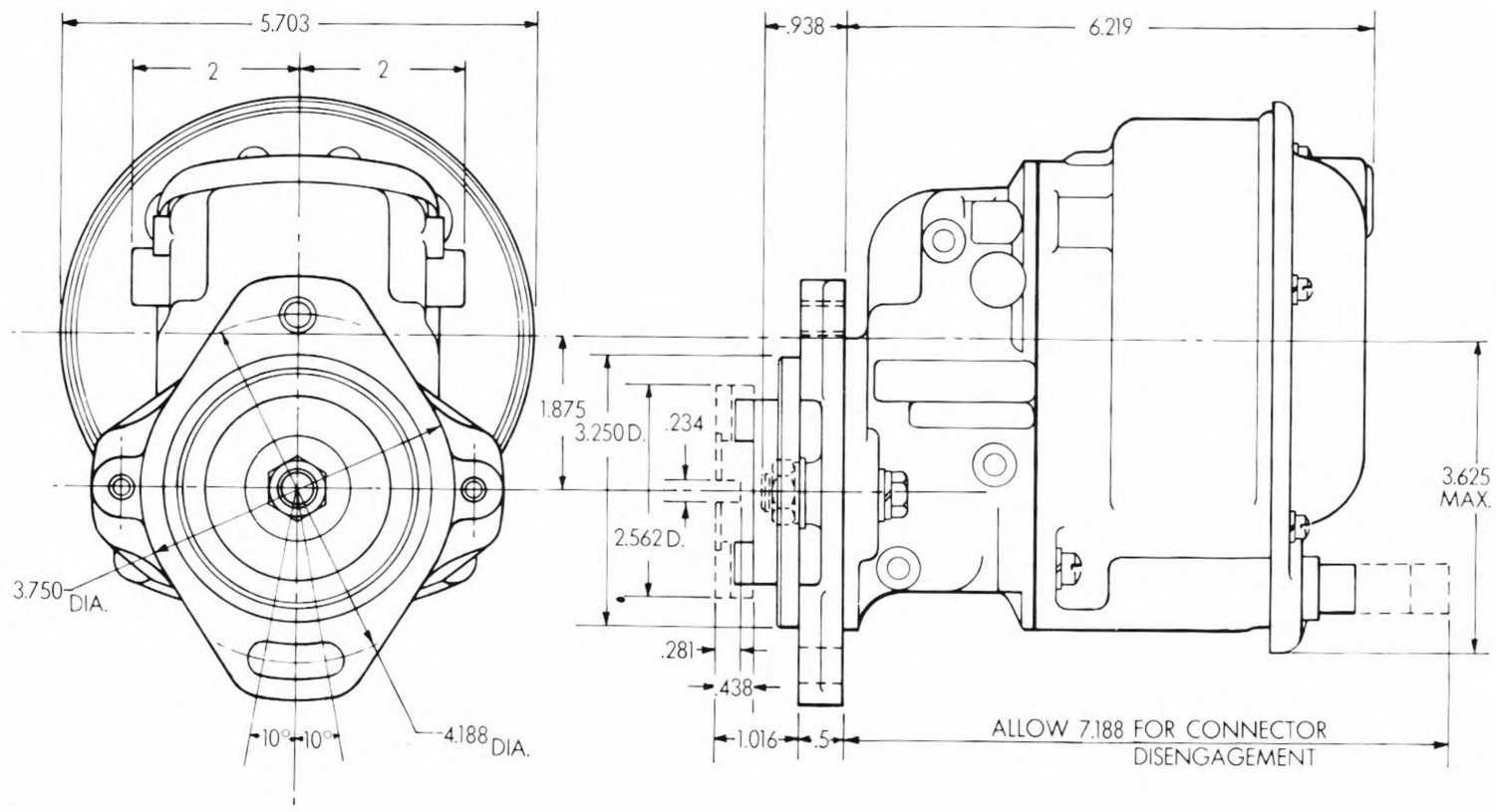
IGNITION GENERATOR OUTLINES



Horizontal Flange (Basic)

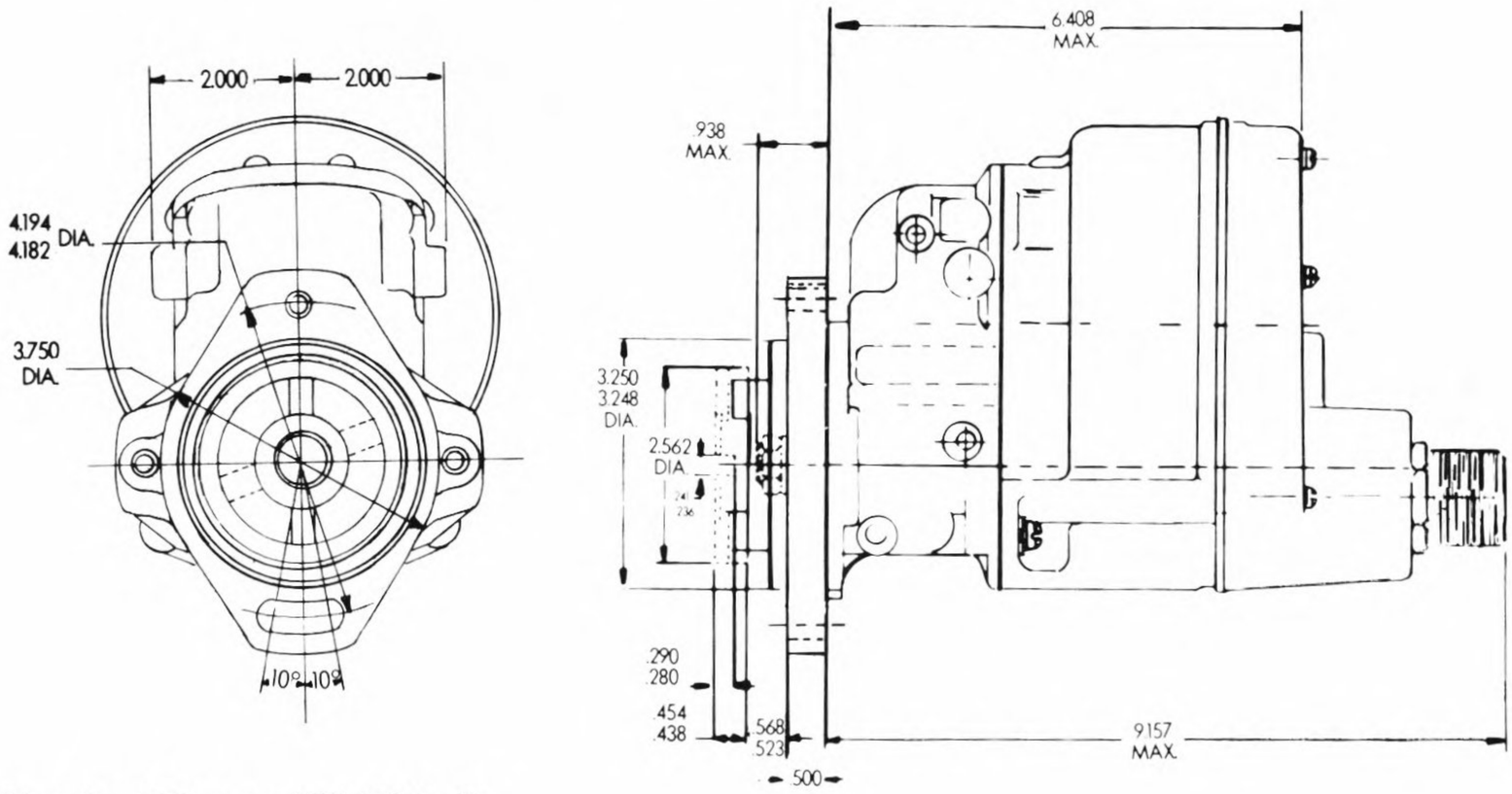


Vertical Flange 90° Offset

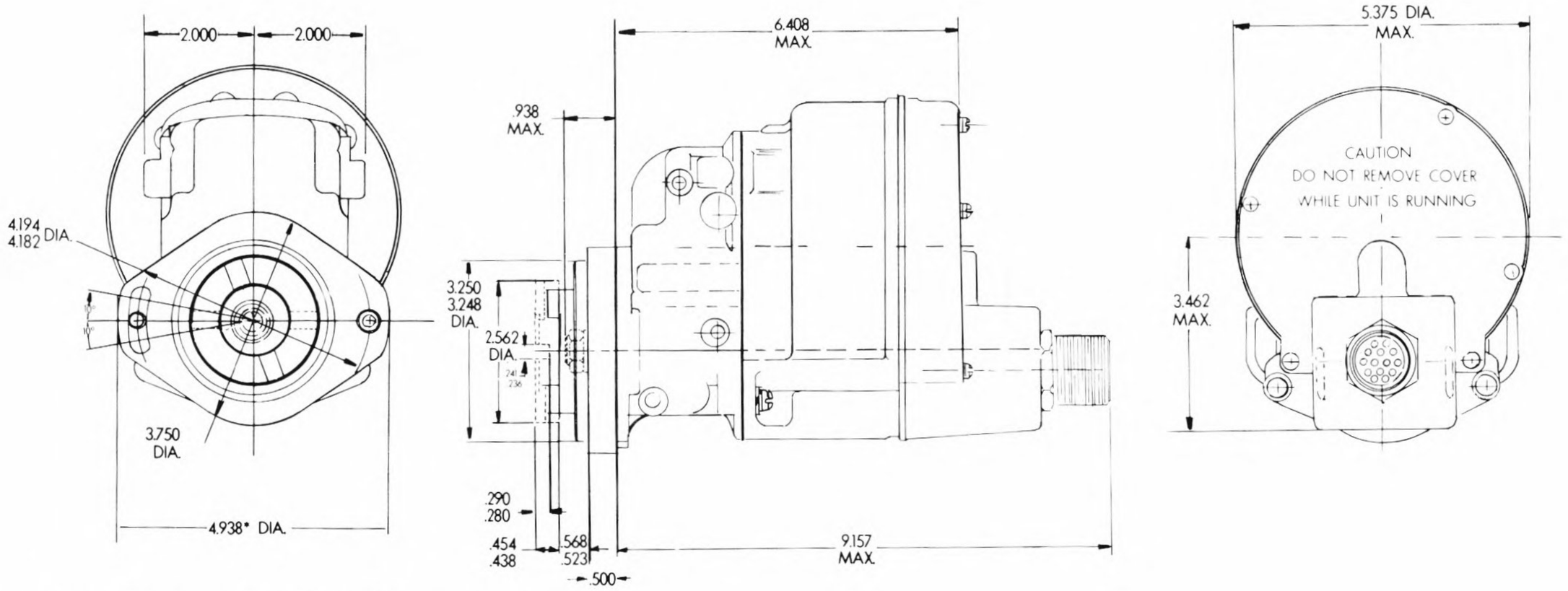


SAE Vertical Flange

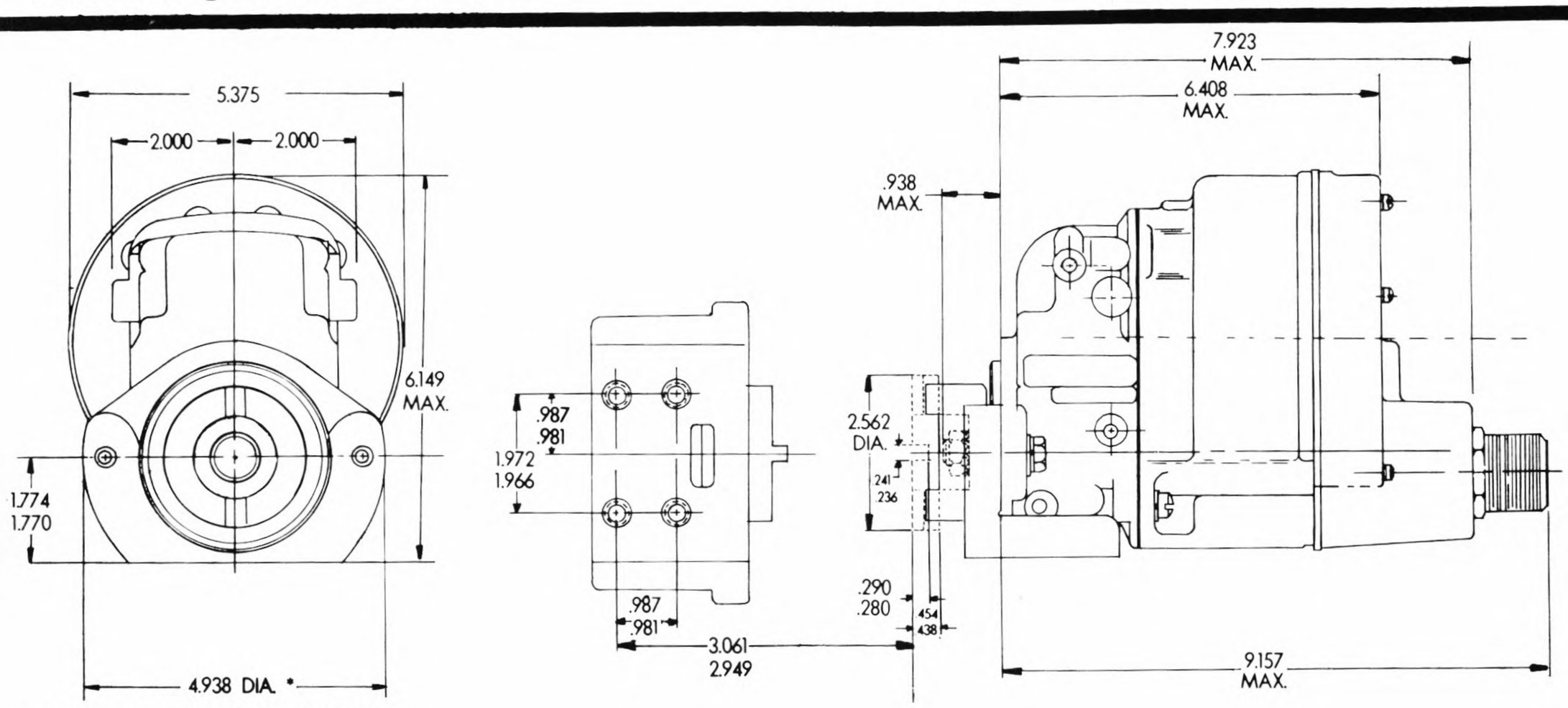
IGNITION GENERATOR OUTLINES



Vertical Flange (Shielded)



Vertical Flange 90° Offset (Shielded)

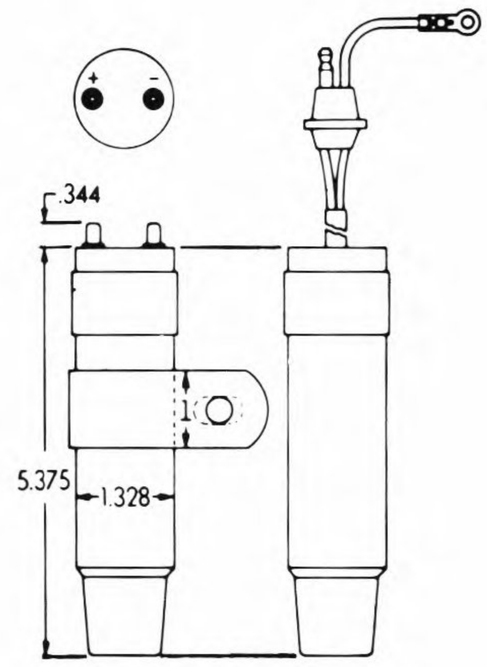


Base Mounted (Shielded)

IGNITION TRANSFORMERS

Unlike slow rise time induction transformers with large iron cores, Magtronic system transformers have cores of fast responding magnetic material. Ignition energy is stored in capacitors outside the transformers and not in them as in conventional transformers. Several types of transformers are available to assure optimum engine operating efficiency. TCG 90A3S, TCG 90B4S, and TCL 150A1 transformers are for large, low speed engines which may utilize an extended ignition spark. In another group are TCD type transformers which mount directly on top of the spark plug terminals, eliminating all high tension leads.

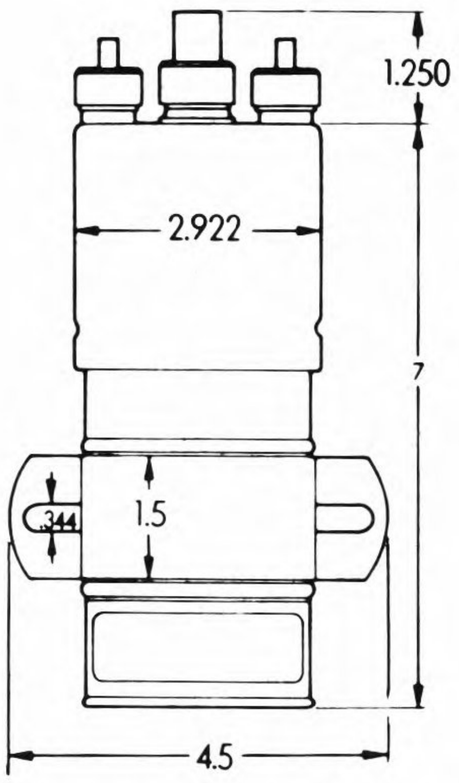
This is particularly advantageous in deep well spark plug installations where lead capacitance is often increased by the proximity of the metal walls. Where direct mounting on the spark plugs is not practical, short high tension leads and mounting brackets are available for attachment to the TCD transformers. In the latter arrangement, the contact spring is removed and replaced by the standard distributor terminal on the short high tension lead. The primary terminals marked + and − on the top of the transformers connect to the wiring harness and to ground respectively. The transformers are solidly impregnated with shock and heat resistant material. TCD types have a molded-in shield which prevents flash-over from the spark plug terminals to ground. The TCL transformer mates with special spark plugs to form an integral unit which eliminates the secondary lead. This combination offers the ultimate in secondary wiring safety.



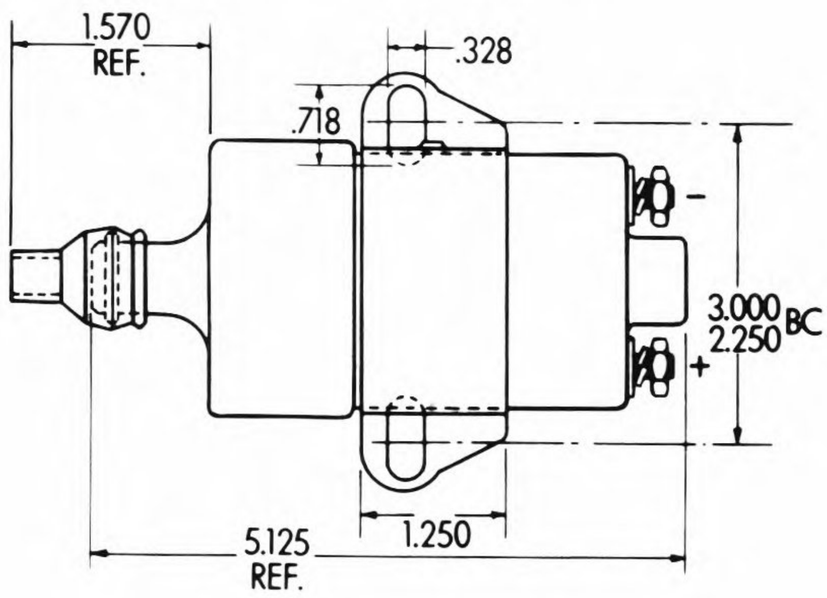
TCD 90A4S

TCD 90A1

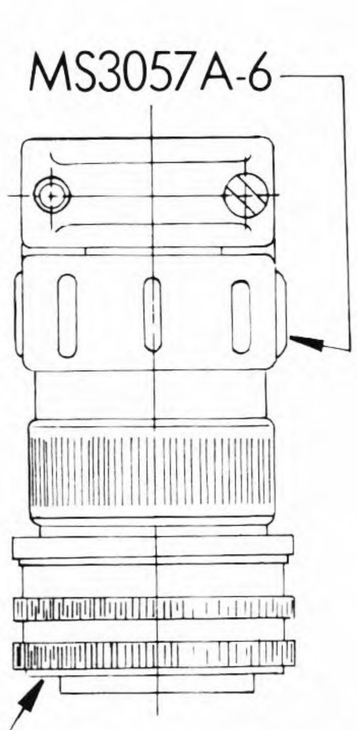
EXTENDED SPARK



TCG 90A3S



TCG 90B4S

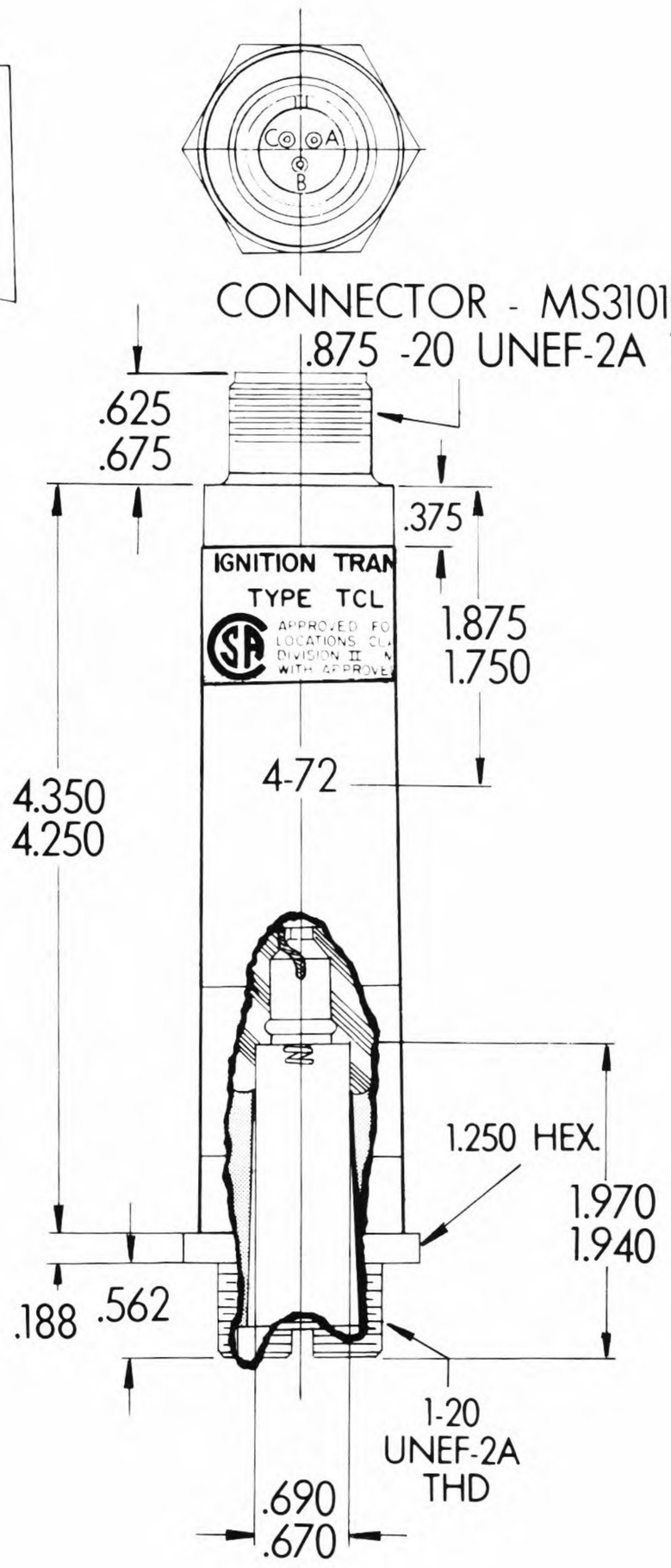


MATING CONNECTOR

TCL 150A1

Compatible Spark Plugs:
Champ series RGC
Stitt series CP
or equivalent

For TCL Adapter Kits See page 8



WIRING HARNESSES—IGNITION SWITCHES—TEMPERATURE LIMITATIONS

The wiring harness comprises a specified number of stranded copper wires and a heat resistant insulation, both of which terminate in a molded plug that mates with a receptacle in the ignition generator. Although special harnesses are available which are tailored to specific engines, the free ends of the wires are without terminals. This meets the needs of a variety of customer applications.

Each lead in the wiring harness is identified by a letter, stamped on the plug, which corresponds to a similarly marked terminal on the ignition generator receptacle. The firing order of the ignition generator at the receptacle terminals is in alphabetical sequence beginning with the letter "A". With the exception of the harness leads "N" and "P", which are ignition switch or grounding leads, all leads in the wiring harness are connected to the ignition transformers according to the firing order of the engine.

Standard wiring harnesses are available in 8 inch and 6 and 12 foot lengths. The 8 inch lead is for field conversions already having a wiring harness. On certain installations where it is necessary to minimize electrical interaction on 8, 10, and 12 cylinder engines, shielded wiring harnesses are recommended. Special harnesses including the molded terminal plug and leads of exact length will be fabricated for OEM accounts where 50 or more identical pieces are ordered. Wiring harnesses are identified as follows:

HAA(4,5,6,8,10,12)A1—harness and plug with 8 inch leads

HAA(4,5,6,8,10,12)A2—harness and plug with 6 foot leads

HAA(4,5,6,8,10,12)A3—harness and plug with 12 foot leads

HAA8A4—harness and plug with 22 foot leads

HAA12A4—harness and plug with 20 foot leads

Example: If the application is for an 8 cylinder engine and 12 foot leads, wiring harness part number would be HAA8A3.

The ignition switches for the Mag-tronic system depends upon whether the wiring harness is equipped with lead "P" only or both "N" and "P" leads. In the former, lead "P" is connected to a single pole ignition switch; in the latter, leads "N" and "P" are individually connected to a double pole ignition switch. Where safety shut-down devices are employed, the SSA 101 and SSA 203 (pages 8-9) provide a means of isolation between the "N" and "P" leads.

The outlet plugs on shielded units use leads "I" and "N" for ignition kill, rather than "P" and "N".

AMBIENT TEMPERATURE LIMITATIONS
MAG-TRONIC SYSTEM UNITS

a. Ignition Generator . . . . . 200°F maximum
b. Ignition Transformers
TCD 90 1 and 4S . . . . . 300°F maximum
TCG 90B4S . . . . . 250°F maximum
TCG 90A3S . . . . . 200°F maximum
TCL 150A1S . . . . . 500°F maximum (at plug)
c. Wiring Harness . . . . . 220°F maximum
d. SSA 101 Safety Switch Adapter . . . . . 180°F maximum
e. SSA 203 Circuit Isolator . . . . . 200°F maximum

PART NUMBERS

MTC 12 C 1 5 2 0 L

TYPE:

CYLINDERS: 1, 2, 5,

6, 8, 10, 12

EDITION:

MOUNTING: 1=45 MM Base,

3=SAE Vertical Flange, 4=

Horizontal Flange, 6=90° Offset Vert.

Flange

DRIVE GEAR RATIO: 2=2:1 (Eng. Speed),

3=3:1 (1-1/2 Eng. Speed), 5=2-1/2:1 (1-1/4

Engine Speed)

ROTATION: Standard-1 C'CLW, 2=CLW;

Fungi-Proofed-7=C'CLW, 8=CLW

Timer Firing Pattern—2 cycle

Timer Firing Pattern—4 cycle

W=3500 Turn Generator Coil

C=Factory Shielded Units

B=Special Minneapolis-Moline

L=Slow Start

T=7500 Turn Generator Coil

2-Cycle Engine

	4-Cyl.	5-Cyl.	6-Cyl.	8-Cyl.	10-Cyl.	12-Cyl.
O EVEN	90°	72°	60°	.45°	36°	.30°
1 UNEVEN	60°-120°		45°-75°	30°-60°	60°-12°	37.5°-22.5°
2 UNEVEN	63°-117°		90°-30°	22.5°-67.5°	63°-9°	40°-20°
3 UNEVEN			82.5°-37.5°		58.5°-13.5°	45°-15°
4 UNEVEN			63°-57°	36°-54°	66°-6°	22.5°-37.5°
5 UNEVEN			36°-84°	67.5°-27.5°		25°-35°
6 UNEVEN				60°-30°		15°-45°
7 UNEVEN				63°-27°		

4-Cycle Engine

	4-Cyl.	5-Cyl.	6-Cyl.	8-Cyl.	10-Cyl.	12-Cyl.
0 EVEN	180°	144°	120°	90°	72°	60°
1 UNEVEN	120°-240°		90°-150°	60°-120°	120°-24°	75°-45°
2 UNEVEN	126°-234°		180°- 60°	45°-135°	126°-18°	80°-40°
3 UNEVEN			165°-75°		117°-27°	90°-30°
4 UNEVEN			126°-114°	72°-108°	132°-12°	45°-75°
5 UNEVEN			72°-168°	135°-45°		50°-70°
6 UNEVEN				120°-60°		30°-90°
7 UNEVEN				126°-54°		

ACCESSORIES



ELECTRONIC STARTING UNIT (EU 521001)

Providing output for the Mag-tronic ignition system at speeds just over 0 RPM, the electronic starting unit precludes the possibility of hard starting on engines where low speed starting is a requisite. Basically a battery powered transistorized oscillator, it charges the storage capacitor in the ignition generator to full zener voltage and applies a pulsating current to an auxiliary triggering coil. All presently manufactured Mag-tronic systems now incorporate the start coil. For units made prior to December 1974, a retrofit kit is available (KT 521035A).



ELECTRONIC TACHOMETERS (TAA 1 and TAA 2)

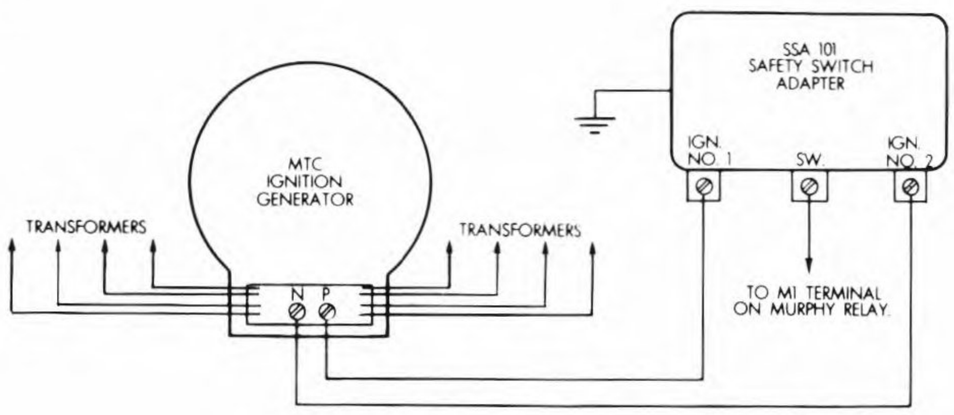
Utilizing solid state components and printed circuitry, these panel mounted instruments are offered in two versions: Model TAA 1 with direct reading scales of 0 to 1500 RPM and 0 to 3000 RPM (factory calibrated for 6- and 12-cylinder 4-cycle engines); and Model TAA 2 with scales of 0 to 600 RPM and 0 to 1200 RPM (factory calibrated for 4- and 8-cylinder 4-cycle engines). A switch permits reading of either scale while the system is in operation. Two leads are required for connection, and power requirements are obtained from the energy storage section of the ignition generator. Installation is simple with the template provided with the unit. Both models are universally applicable to 1-, 2-, 4-, 5-, 6-, 8-, 10-, and 12-cylinder, two and four cycle engines.



SAFETY SWITCH ADAPTER (SSA 101)

For Relay Type Safety Switches Used on Mag-tronic Ignition Systems

Relay type safety switches with manual re-set, such as Murphy and other makes, are often used in conjunction with the automatic shut-off devices because the latter keeps the ignition system inoperative (grounded) only as long as temperature, oil pressure, engine speed, etc. exceed normal operating limits. The purpose of the relay type switch is to shut down the engine and prevent its repeated cycling until the malfunction can be determined and corrected. Because Mag-tronic ignition is a high voltage, low current system, insufficient current is generated to operate the relay type grounding switches which usually require about 3 amperes. Consequently, where these switches are employed, a SSA 101 safety switch adapter is necessary with the Mag-tronic ignition system. The SSA 101 takes its power from the system only during the first few revolutions of the ignition generator, so it has absolutely no effect on starting or normal system operation.



Hook-up of 8-cylinder system using one MTC. For 8-cylinder system using two MTC units connect in similar manner and attach SW terminals on SSA 101 units together.

Directions for connecting SSA 101 Safety Switch Adapter

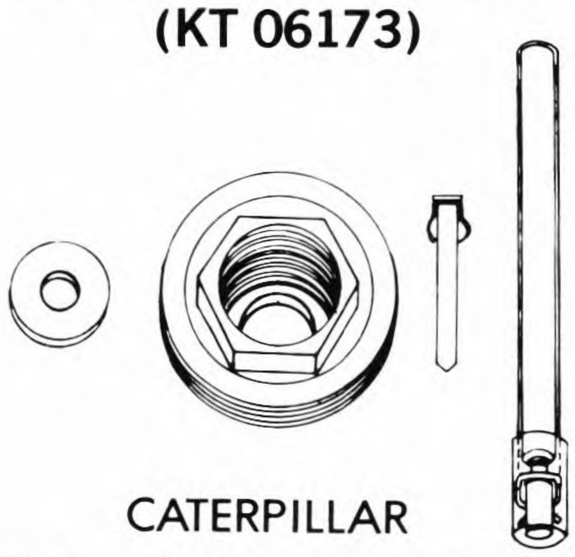
	NO. CYLS.	SSA 101 UNITS REQUIRED	TERMINAL CONNECTIONS
ONE MTC IGN. GEN.	6 or less	1	IGN 1 to "P" on MTC, SW to M1 term on Murphy relay.
	8 or more	1	IGN 1 to "P" on MTC. IGN 2 to "N" on MTC. SW to M1 term on Murphy relay.
TWO MTC IGN. GEN.	6 or less	1	IGN 1 to "P" on first MTC. IGN 2 to "P" on second MTC. SW to M1 term on Murphy relay.
	8 or more	2*	IGN 1 to "P" on first MTC. IGN 2 to "N" on first MTC. Connect second SSA 101 to second MTC in same manner. SW term on both SSA 101 units to M1 term on Murphy Relay.

*Only one SSA 101 is necessary if SSA 203 circuit isolators are incorporated in system.



WAUKESHA

TCL ADAPTER KIT (KT 06173)

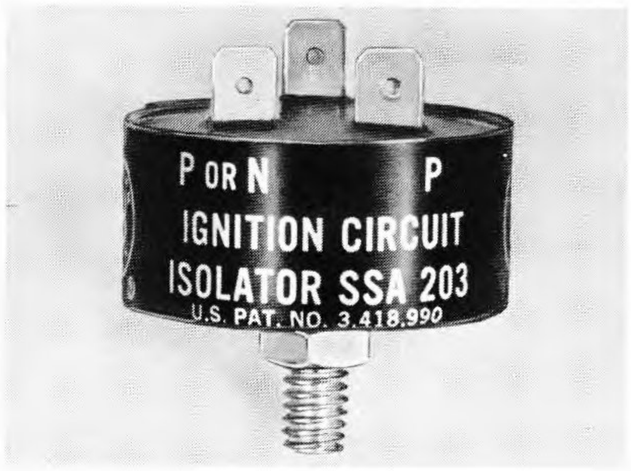


CATERPILLAR

TCL ADAPTER KIT (KT 06194)

Adapter Kits are available for those Caterpillar and Waukesha engines on which the spark plugs are located so that the TCL transformer cannot be mounted directly on the plug.

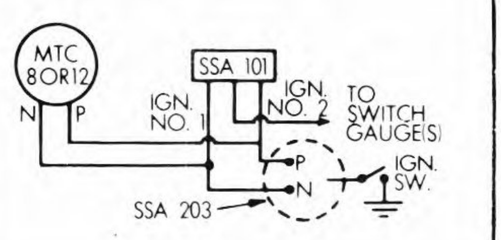
ACCESSORIES



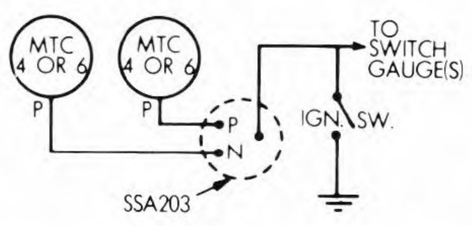
CIRCUIT ISOLATORS (SSA 203)

The principle reason for incorporating this device into the ignition switch circuit is to eliminate the high energy discharge across the switch contacts when a "live" SSA 101 safety switch adapter is included in the system. The SSA 203 also permits the use of a single pole ignition switch in the circuit by preventing interaction between the ignition generator "P" and "N" leads or two "P" leads as the case may be. The following diagrams illustrate four typical examples of the use of the SSA 203 circuit isolator.

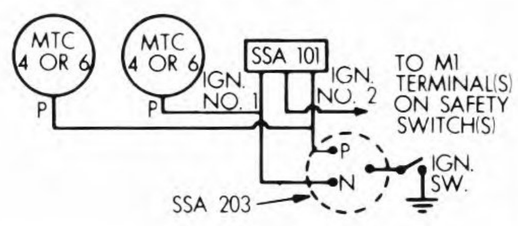
TYPICAL CIRCUIT ISOLATOR INSTALLATIONS



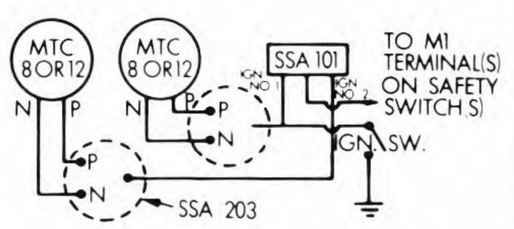
8-or 12-cylinder MTC ignition generator with SSA 101 safety switch adapter, SSA 203 circuit isolator and single pole ignition switch applied to engine with switch gauge.



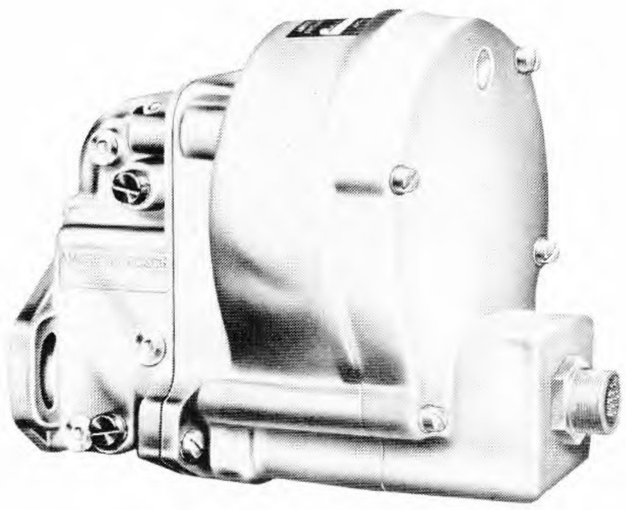
Dual 4-or 6-cylinder MTC ignition generators with SSA 203 circuit isolator and single pole ignition switch applied to engine with switch gauge.



Dual 4-or 6-cylinder MTC ignition generators with SSA 101 safety switch adapter, SSA 203 circuit isolator and single pole ignition switch applied to engine with relay type safety switch.



Dual 8-or 12-cylinder MTC ignition generators with SSA 101 safety switch adapter, two SSA 203 circuit isolators and single pole ignition switch applied to engine with relay type safety switch.



SHIELDING KITS (KT 521036 thru KT 521039)

Mag-tronic Shielding Kits provide an economical method of converting existing Mag-tronic installations where improved safety precautions are demanded. The Kits are available in 1-12 cylinder executions and are easily installed by merely removing the existing die cast distributor cover and replacing it with this new assembly. A complete conversion can be accomplished with the TCG 90A 3S or TCL 150 A1S shielded transformer. A mating connector, furnished without wiring harness, is also available for all kits. Factory shielded units are available.

QUICK REFERENCE CHART FOR SHIELDING MAG-TRONIC IGNITION SYSTEMS

MAG-TRONIC IGNITION GENERATOR	SHIELDING KIT NUMBER	MATING PLUG	150 VOLT POWER MODULE	SHIELDED TRANSFORMER
MTC 4C4 Series	KT 521039	EC 521035	PL 521093	TCG 90A 3S
MTC 6C4 Series	KT 521038	EC 521035	PL 521093	TCG 90A 3S
MTC 8C4 Series	KT 521037	EC 521035	PL 521092	TCG 90A 3S
MTC 12C4 Series	KT 521036	EC 521035	PL 521092	TCG 90A 3S
MTC 4C1, 4C3, 4C6 Series	KT 521039	EC 521035	PL 521093	TCG 90A 3S
MTC 6C1, 6C3, 6C6 Series	KT 521038	EC 521035	PL 521093	TCG 90A 3S
MTC 8C1, 8C3, 8C6 Series	KT 521037	EC 521035	PL 521092	TCG 90A 3S
MTC 12C1, 12C3, 12C6 Series	KT 521036	EC 521035	PL 521092	TCG 90A 3S

MOUNTING CODE: 1-Base Mount, 3-Vertical Mount, 4-Horizontal Mount 6-90° Offset Vertical Mount.

Note: Shielding conversion kits available for all cylinder applications.

APPLICATIONS (for complete listing see section 105-10-1)

ENGINE MODEL	IGNITION GENERATOR (SEE NOTE 22)	WIRING HARNESS	IGNITION TRANSFORMER	QTY	MOUNTING & DRIVE PARTS	NOTES
CATERPILLAR AJAX						
1 Cyl. Models	MTC 1 3220L	HAA 1A2	TCG 90B4S			
2 Cyl. Models	MTC 2 3220L	HAA 2A2	TCG 90B4S			
G—333	MTC 6 3320L	HAA 6A2	TCG 90B4S	6		20
G—342 (CW)	MTC 6 6320L	HAA 6A2	TCG 90B4S	6		1
G—342 (CCW)	MTC 6 3310L	HAA 6A2	TCG 90B4S	6		
G—353	MTC 6 6310L	HAA 6A2	TCG 90B4S	6		
G—379 (CW)	MTC 8 3221L	HAA 8A3	TCG 90B4S	8		
G—379 (CCW)	MTC 8 3211L	HAA 8A3	TCG 90B4S	8		
G—397	MTC 12 3310L	HAA 12A3	TCG 90B4S	12		
G—398 (CW)	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
G—398 (CCW)	MTC 12 3310L	HAA 12A3	TCG 90B4S	12		
G—399	1 ea. MTC 8 3210L 1 ea. MTC 8 6210L	HAA 8A3	TCG 90B4S	16		2 ea. HAA 8A3
CLIMAX						
K—67 (CW)	MTC 6 3320L	HAA 6A2	TCG 90B4S	6		
K—67 (CCW)	MTC 6 3310L	HAA 6A2	TCG 90B4S	6		
K—75 (CW)	MTC 6 3320L	HAA 6A2	TCG 90B4S	6		
K—75 (CCW)	MTC 6 3310L	HAA 6A2	TCG 90B4S	6		
L—3230	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
L—3711	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
R—41	MTC 4 1210L	HAA 4A2	TCG 90B4S	4	DC 731003	
R—61	MTC 6 1310L	HAA 6A2	TCG 90B4S	6	DC 731003	
R—165	MTC 6 1310L	HAA 6A2	TCG 90B4S	6	DC 731003	
V—80	MTC 8 1221L	HAA 8A3	TCG 90B4S	8	DC 731003	
V—85	MTC 8 3221L	HAA 8A3	TCG 90B4S	8		
V—120	MTC 12 1320L	HAA 12A3	TCG 90B4S	12	DC 731003	
V—122	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
V—125	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
CONTINENTAL						
F—226	MTC 6 6320L	HAA 6A2	TCG 90B4S	6		1
F—244	MTC 6 6320L	HAA 6A2	TCG 90B4S	6		1
M—363	MTC 6 6320L	HAA 6A2	TCG 90B4S	6		1
R—602	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	KT 731003	1, 4, 5
S—820	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	KT 731003	1, 4, 5
CUMMINS						
GNH—220 (1)	MTC 6 4220L	HAA 6A5	TCD 90A1	6	DC 731002	
GNH—220 (2)	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 8
GNH—220 (3)	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 8
GNH—250 (1)	MTC 6 4220L	HAA 6A5	TCD 90A1	6	DC 731002	
GNH—250 (2)	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 8
GNH—250 (3)	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 8
GNHC—4 (1)	MTC 4 4220L	HAA 4A4	TCD 90A1	4	DC 731002	
GNHC—4 (4)	MTC 4 6210L	HAA 4A2	TCG 90B4S	4	DC 731002	1, 8
GNVH—450	MTC 12 4212L	HAA 12A6	TCD 90A1	12	DC 731002	
GV 12—525	MTC 12 4212L	HAA 12A6	TCD 90A1	12	DC 731002	
LEROI (Roiline)						
F—1500 (CW)	MTC 6 6320L	HAA 6A2	TCG 90B4S	6		1
F—1500 (CCW)	MTC 6 6310L	HAA 6A2	TCG 90B4S	6		1
F—1850 (CW)	MTC 6 3320L	HAA 6A2	TCG 90B4S	6		
F—1850 (CCW)	MTC 6 3310L	HAA 6A2	TCG 90B4S	6		
H—540 (CW)	MTC 8 3220L	HAA 8A2	TCG 90B4S	8		13
H—540 (CCW)	MTC 8 3210L	HAA 8A2	TCG 90B4S	8		13
H—570 (CW)	MTC 8 3220L	HAA 8A2	TCG 90B4S	8		13
H—570 (CCW)	MTC 8 3210L	HAA 8A2	TCG 90B4S	8		13
H—844 (CW)	MTC 8 3220L	HAA 8A2	TCG 90B4S	8		13
H—844 (CCW)	MTC 8 3210L	HAA 8A2	TCG 90B4S	8		13
H—884 (CW)	MTC 8 3220L	HAA 8A2	TCG 90B4S	8		13
H—884 (CCW)	MTC 8 3210L	HAA 8A2	TCG 90B4S	8		13
H—2000	MTC 8 6221L	HAA 8A3	TCG 90B4S	8		1
H—2150 (5)	MTC 8 1221L	HAA 8A3	TCG 90B4S	8	DC 731003	
H—2150 (6)	MTC 8 3221L	HAA 8A3	TCG 90B4S	8		
L—3000 (5)	MTC 12 1320L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—3000 (6)	MTC 12 6320L	HAA 12A3	TCG 90B4S	12		1
L—3230	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
L—3460 (CW)	MTC 12 3321L	HAA 12A3	TCG 90B4S	12		
L—3460 (CCW)	MTC 12 3311L	HAA 12A3	TCG 90B4S	12		
L—4000 (CW)	MTC 12 3321L	HAA 12A3	TCG 90B4S	12		

—Continued—

MINNEAPOLIS MOLINE — LEROI (Roiline) — cont'd.

ENGINE MODEL	IGNITION GENERATOR (SEE NOTE 22)	WIRING HARNESS	IGNITION TRANSFORMER	QTY	MOUNTING & DRIVE PARTS	NOTES
L—4000 (CCW)	MTC 12 3311L	HAA 12A3	TCG 90B4S	12		
RXISV (CW) (6)	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
RXISV (CW) (5)	MTC 12 1320L	HAA 12A3	TCG 90B4S	12	DC 731003	
RXISV (CCW) (5)	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
RXIV	MTC 8 6221L	HAA 8A3	TCG 90B4S	8		1
220—4	MTC 4 3220L	HAA 4A2	TCG 90B4S	4		
283—4	MTC 4 6220L	HAA 4A2	TCG 90B4S	4		1
336A—4A	MTC 4 6220L	HAA 4A2	TCG 90B4S	4		1
403—4A	MTC 4 6220L	HAA 4A2	TCG 90B4S	4		1
425 A—6A	MTC 6 3320B	HAA 6A2	TCG 90B4S	6		
504—6A	MTC 6 3320B	HAA 6A2	TCG 90B4S	6		
605—6A	MTC 6 3320B	HAA 6A2	TCG 90B4S	6		
800—6A	MTC 6 3320B	HAA 6A2	TCG 90B4S	6		
6—LRO	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—LROR	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—LRZ	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—LRZ—B	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—NKR	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—NKR—B	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—WAK Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
135 Series	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	KT 731003	1, 4, 14
140 Series	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 15
145—G Series	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 15
190—GLB Series	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	KT 731003	1, 4, 17
195—GKU	MTC 6 6320L	HAA 6A2	TCG 90B4S	6	KT 731003	1, 4, 17
817	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	1, 16
F—554—GU	MTC 6 6310L	HAA 6A2	TCG 90B4S	6	DC 731002	
F—1197—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—1905—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—2894—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—2895—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—3520—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—3521—G Series	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
F—3711—GU	MTC 12 3320L	HAA 12A3	TCG 90B4S	12		
H—1077—G (CW)	MTC 8 3221L	HAA 8A2	TCG 90B4S	8		
H—1077—G (CCW)	MTC 8 3211L	HAA 8A2	TCG 90B4S	8		
H—2475—GU	MTC 8 3221L	HAA 8A3	TCG 90B4S	8		
LRORB	MTC 6 1320L	HAA 6A2	TCG 90B4S	6	DC 731003	
L—5100—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—5108—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—5788—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—5790—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—7040—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—7042—G Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	
L—9390	MTC 8 1220L	HAA 8A3	TCG 90B4S	16	DC 731003	2 units per engine
V—LRO Series	MTC 12 1310L	HAA 12A3	TCG 90B4S	12	DC 731003	

WAUKESHA

6—G—510	MTC 6 1310L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—GT—510	MTC 6 1310L	HAA 6A2	TCG 90B4S	6	DC 731003	
6—GT—825	MTC 6 1310L	HAA 6A3	TCG 90B4S	6	DC 731003	
8—G—825	MTC 8 1310L	HAA 8A3	TCG 90B4S	8	DC 731003	18
8—GT—825	MTC 8 1210L	HAA 8A3	TCG 90B4S	8	DC 731003	

WHITE

NOTES

1. The ignition generator is to be mounted on its side, 90° from the normal position.
4. Use the spacing washers in the kit to obtain .005" play between the drive gear and nut.
5. The drive gear is supplied by the engine manufacturer.
8. The accessory case drain may require re-routing.
13. Requires Roiline drive adapter #4A—81601, if the engine is not so equipped.
14. Requires Waukesha drive gear #135119.
15. Early production 140 & 145 series engines were equipped with a metal to metal ignition drive which did not incorporate an intermediate drive disc. These engines should be converted to accept a drive disc through the use of Waukesha drive member #157869.
16. When the ignition generator is to be driven by the distributor drive, an MTC 6—6320 is required.
17. Requires Waukesha drive gear #195119.
18. This recommendation is applicable *only* to 8—G—825 engines that were originally equipped with Mag-tronic Ignition.
20. In some instances, the ignition generator must be mounted in the inverted position due to exhaust manifold interference. Assemble the flange adapter to the ignition generator 180° from the standard position.
22. An "L" suffix following the ignition generator part number indicates that the unit is factory equipped to accept the electronic starting device, EU 521001A. The latter unit is required due to the slow cranking speed of the engine.

(1) Originally equipped with a Mag-tronic Ignition System.
(2) Originally equipped with an MRB 6A 321 magneto.
(3) Originally equipped with an MRB 6A 322 magneto.
(4) Originally equipped with an MRB magneto.
(5) For engine requiring a base mounted ignition generator.
(6) For engine requiring a flange mounted ignition generator.

All ignition generators in this list are factory equipped to accept the starting device.

Mag-tronic ignition systems

Mag-tronic ignition systems

Mag-tronic ignition systems