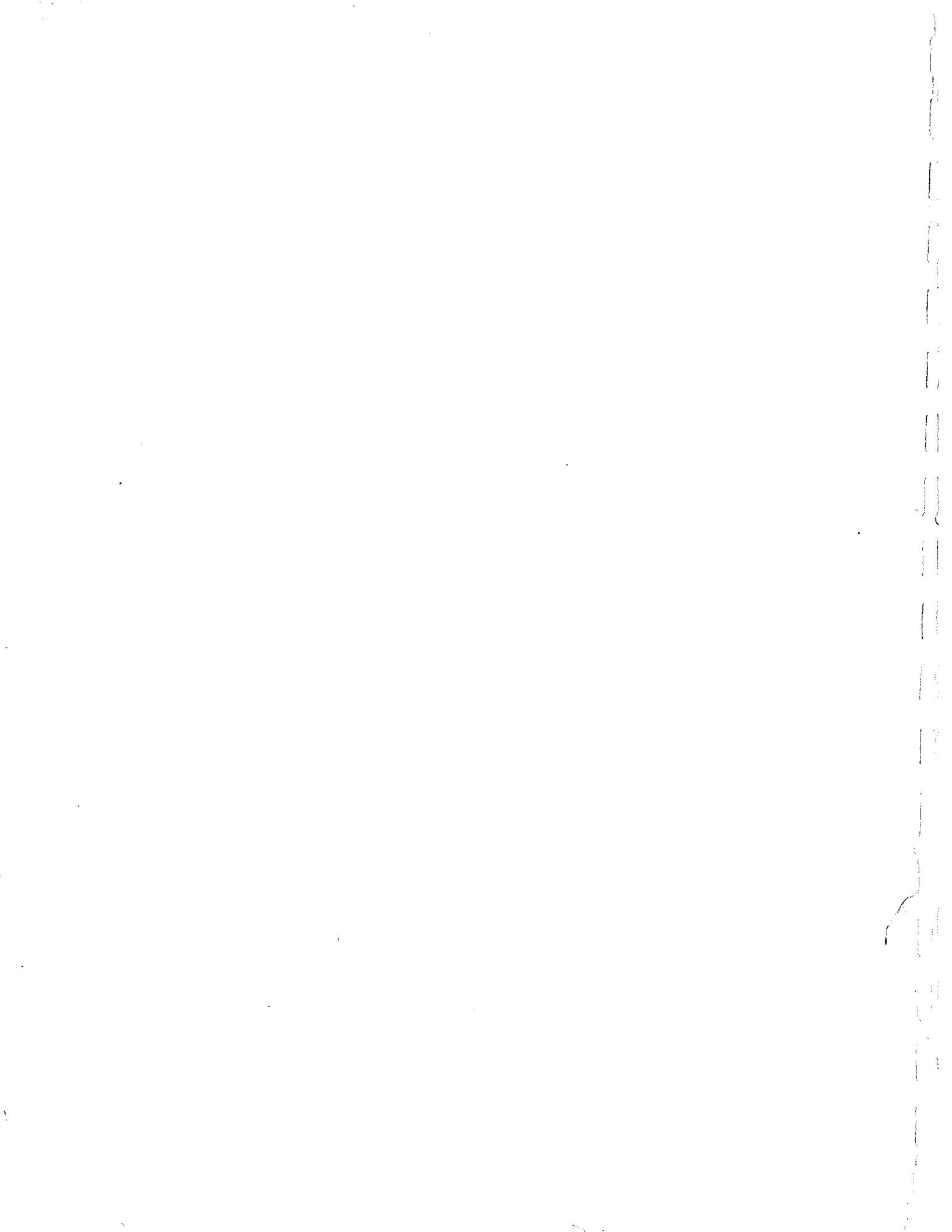


BENDIX  
S-20 & S-200 SERIES  
OVERHAUL & PARTS  
MAGNETO MANUAL



**System Support Manual  
S20/S-200 MAGNETO IGNITION SYSTEM**

**HIGHLIGHTS**

**TO:** Holders of Installation, Operation & Maintenance Instructions L-526-5, Overhaul Instructions L-205-10, L-527-4 and Service Parts Lists L-223-15, L-528-7.

**SUBJECT:** System Support Manual X42002

This System Support Manual supersedes L-526-5, L-205-10, L-233-15, L-528-7 and all pertinent supplements.

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**SERVICE BULLETIN LIST**

The following is a list of service bulletins which have been incorporated into this manual.

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556C	May/89
560A	May/89
568A	May/89
586A	May/89
599B	May/89
612	May/89
616	May/89
620	May/89
621	May/89
623A	May/89
625	May/89
626	May/89
629	May/89



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## S20/S-200 MAGNETO IGNITION SYSTEM

### SECTION 1. INTRODUCTION AND SPECIFICATIONS

#### 1.1 GENERAL

- A. This manual provides complete maintenance and overhaul instructions with illustrated parts list for S-20 and S-200 Series Magnetos, manufactured by Teledyne Continental Motors, Aircraft Products, Mobile, Alabama 36601. The S-20 and S-200 Series Magneto converts mechanical energy into a sequenced series of high-voltage pulses for reciprocating engine ignition.
- B. This manual is subdivided with sub-heads as listed in the Table of Contents. Revision service may be provided by ordering Form X40000. This manual may be included in Chapter 74-10 of applicable GAMA format publications.
- C. These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or particular problems arise which are not covered sufficiently for purchaser's purpose, the matter should be referred to Teledyne Continental Motors, Aircraft Products, Mobile, Alabama 36601.

- D. Good standard shop practices and safety precautions should be observed at all times to avoid damage to equipment and/or injury to personnel.
- E. All maintenance instructions in this manual have been shop verified. Shop verified procedures are those by which the manufacturer has accomplished all Disassembly, Assembly, Testing and Fault Isolation by performing the functions described in this manual on equipment identical in configuration to that described.
- F. Dimensions are given in US Standard Units. For reference, abbreviations used are listed in Table 101.
- G. Numbers in parentheses following part nomenclature refer to item numbers in Illustrated Parts List Figure 1 unless otherwise specified.

Table 101  
Abbreviations

US Standard Unit	Abbreviation
Degrees Fahrenheit	°F
Inch	in.
Pound Inches	lb in.
Pound Force	lbf
Pound (Mass)	lb
Pounds per Hour	pph
Pounds per Square Inch, Absolute	psia
Pounds per Square Inch Gage	psig
Feet	ft
Gallons	gal
Ounces	oz

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### 1.2 SPECIFICATIONS

Table 102  
Table of Leading Particulars

SUBJECT	DATA
<b>LUBRICATION &amp; COMPOUNDS</b>	
Aluminum Plugs	GO-JO NO-LOK 72 Compound
Bearing grease	Magneto Grease, 10-27165
Cam	Breaker Felt Lubricant, 10-86527
Cam follower felt	Breaker Felt Lubricant, 10-86527
Distributor block bushing	Distributor Block Lubricant, 10-391200
Felt washer	Distributor Block Lubricant, 10-391200
Gears	Magneto Grease, 10-27165
Housing pole shoes, magnet pole pieces	Rust preventive
Impulse Coupling Spring	Light Oil
Magneto Shaft	GO-JO NO-LOK 72 Compound
Oil Seal	SAE No. 30 oil
Sleeve bearing	SAE No. 30 oil
Buna Rubber and Phenolic Distributor Block Insulator	Distributor Block Coating, 10-391400
<b>TESTING</b>	
Coming-in-speed	150 RPM
Spark gap setting	5MM
<b>TOLERANCES</b>	
Cam washer thickness	.095 ± .010 Inch
Capacitor	0.30 microfarads minimum
Coil	Primary 0.2 to 0.6 ohms
	Secondary 12000 to 16000 ohms
Contact point clearance	
Main and Retard Contacts	0.018 ± 0.006 In.
Tachometer Contacts	0.019 ± 0.003 In.
"E" Gap	10° ± 4°
<b>TORQUES</b>	
Breaker Cover screws	20 to 25 lb.-in.
Cam Screw*	21 to 25 lb.-in.
Capacitor screws	8 to 12 lb.-in. (In cover)
	20 to 25 lb.-in. (In housing)
Coil core screws	20 to 25 lb.-in.
Coil primary lead	8 to 10 lb.-in.
Contact assembly screws	
Main and Retard Contacts	20 to 25 lb.-in.
Tachometer Contacts	10 to 12 lb.-in.
Drive shaft nut	15 to 25 lb.-ft.
Distributor block screws	16 to 20 lb.-in.
Ground terminal bushing	10 to 13 lb.-in.
Housing screws	Start 4 to 8 lb.-in.
	Final 25 to 35 lb.-in.
Timing window plug	10 to 15 lb.-in.
Ventilator plug	10 to 15 lb.-in.
Harness Outlet Plate	25 to 35 lb.-in.
<b>MISCELLANEOUS</b>	
Magneto drive speed	S6 magnetos - 1 1/2 engine
	S4 magnetos - engine
	<b>*CAUTION:</b>
<i>If self-locking screw is removed or loosened at any time, always replace with a new self-locking screw and apply torque to the specified value.</i>	



# System Support Manual

## S20/S-200 MAGNETO IGNITION SYSTEM

### SECTION 2. DESCRIPTION AND OPERATION

#### 2.1 GENERAL DESCRIPTION

- A. The S-20 and S-200 Series Magnetos, manufactured by Teledyne Continental Motors, Aircraft Products, Mobile, Alabama 36601, are designed to provide ignition for four and six cylinder aircraft engines. These magnetos generate and distribute high tension voltage through radio shielded high tension leads to the spark plugs.
- B. To obtain the retard spark necessary for starting, S-20 Series Magneto Ignition systems employ an Impulse coupling, and S-200 Magneto Ignition Systems include an additional contact assembly used in conjunction with a starting vibrator. Figure 201 shows the components used in a typical S-200 Ignition System incorporating a starting vibrator. This system consists of a single contact assembly magneto, a dual contact assembly magneto (item 1), an ignition harness (item 2), a combination ignition and starter switch (item 3), and a starting vibrator (item 4).

- C. The following detailed explanation gives the meaning of the various letters and numbers appearing in the type designations:

- (1) "S" indicates single type ignition unit.
- (2) "4" or "6" indicates number of cylinders fired.
- (3) "R" or "L" indicates direction of rotation of rotating magnet viewed from drive end; R for right-hand (clockwise), L for left-hand (counterclockwise).
- (4) "N" indicates manufactured by TCM.

The dash number (such as -25) indicates a certain execution of the basic type magneto.

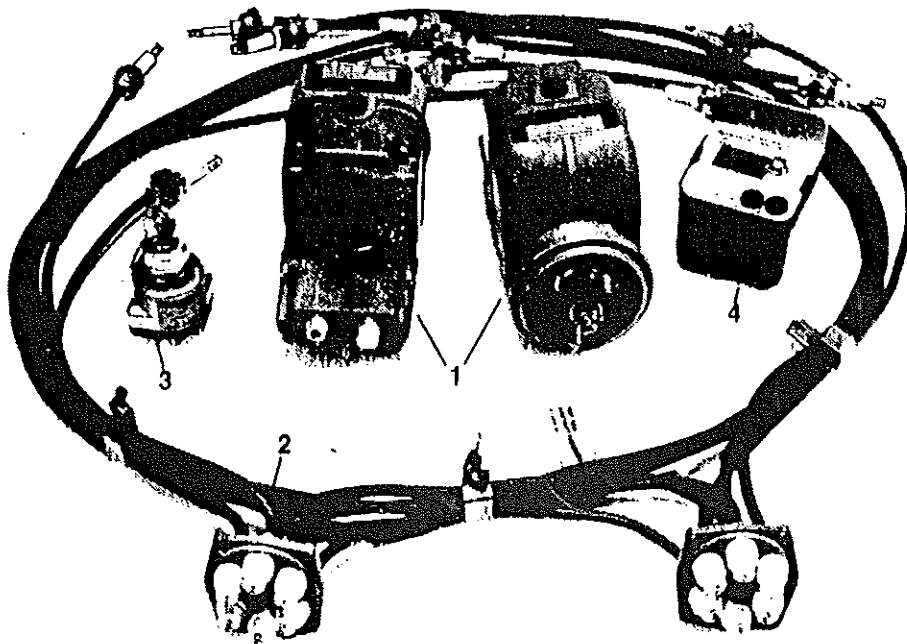


Figure 201. S-200 Magneto and Associated Components

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## S20/S-200 MAGNETO IGNITION SYSTEM

### 2.2 DETAILED DESCRIPTION

- A. The magneto is a completely self contained unit. The rotating magnet turns on two ball bearings, one located at the contact assembly end and the other at the drive end. A two lobe cam is secured to the contact assembly end of the rotating magnet shaft. In a six cylinder magneto, the rotating magnet turns 1-1/2 times engine speed. Thus, 6 sparks are produced through 720 degrees of engine rotation. In a four cylinder magneto, the rotating magnet turns at the engine speed. Therefore, four sparks are produced through 720 degrees of engine rotation.
- B. Some S-20 Series four and six cylinder magnetos incorporate impulse couplings. The purpose of the impulse coupling is to: (1) rotate the magnet between impulse trips faster than engine cranking speed, thus generating a better spark for starting the engine, (2) automatically retard the spark during engine cranking, and (3) act as a drive coupling for the magneto.
- C. The S-200 Dual Contact Assembly Magnetos incorporate a retard contact assembly. (See Figure 202.) This contact assembly is actuated by the same cam as the main contact assembly. It is positioned so that its points open a predetermined number of degrees after the main contact points open. A battery-operated starting vibrator used with this magneto provides electrical energy for starting, regardless of engine cranking speed. The retard ignition is in the form of a shower of sparks instead of a single spark, as obtained from an impulse coupling.
- D. All S-200 Series Magnetos and some S-20 Series Magnetos utilize feed-through capacitor technology for suppression of conducted radio interference.

### 2.3 RECOMMENDED MAINTENANCE AND OVERHAUL PERIODS

#### NOTE:

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View.

- A. After the first 50 hour and 100 hour periods in service and every 100 hours thereafter, the contact assemblies (item 39, Illustrated Parts List Figure 1) should be checked as specified in paragraph 6.2.1 of PERIODIC MAINTENANCE.
- B. Magnetos equipped with impulse couplings (item 8, Illustrated Parts List Figure 1) must be inspected at the first 500 hours in service and every 500 hours thereafter as specified in paragraph 6.2.2 of PERIODIC MAINTENANCE.
- C. Magnetos installed on Teledyne Continental Motors Aircraft Engines shall be inspected as specified in PERIODIC MAINTENANCE, paragraph 6.2.3, at the first 500 hours in service and every 500 hours thereafter. If the engine has more than 500 hours, inspection as outlined above shall take place within the next 100 hours, or at the next scheduled inspection period, whichever occurs first, and at 500-hour intervals thereafter. An appropriate logbook entry signifying compliance with this paragraph and referencing the magneto serial numbers involved should be made after completing these procedures.
- D. Magnetos are subject to the same environmental conditions and wear as the engine. It is therefore recommended that magnetos be overhauled when the engine is overhauled. Engine overspeeds, sudden stoppage or other unusual circumstances may require engine overhaul prior to engine manufacturer's recommendations. In such circumstances the magneto, regardless of "in service time", should also be overhauled with particular attention focused on rotating parts, bearings and electrical components.
- E. In addition, it is recommended that magnetos be overhauled at the expiration of four years, without regard to the accumulated operating hours since new or last overhaul.

# System Support Manual

## S20/S-200 MAGNETO IGNITION SYSTEM

### 2.4 S-20 AND S-200 MAGNETO OPERATION

#### 2.4.1 General Theory

- A. The rotating magnet is of a two pole design. As the magnet is turned the polarity continually changes, thereby producing flux reversals in the magneto coil core. The number of flux reversals during one complete revolution of the magnet is equal to the number of poles on the magnet.
- B. With the contact assembly points closed, the flux reversals cause a current to be generated in the primary winding of the magneto coil. The flow of current through this coil produces a magnetic field around the coil. When the contact assembly points open, the magnetic field around the primary winding collapses, causing a high tension voltage to be induced in the secondary winding of the coil. This high tension voltage is conducted to the distributor gear electrode by means of a carbon brush, to terminals in the distributor block, to high tension contact springs and through high tension leads to the spark plugs.

#### 2.4.2 Operation of S-200 Magneto System with Starting Vibrator

- A. Schematic diagrams of the magneto hookup with and without a relay in the starting vibrator are shown in Figures 203 and 204. In Figure 203, the starting vibrator consists of a vibrator and a relay. The starting vibrator with the relay supplies interrupted battery current to the retard contact assembly magneto and grounds the right magneto. This vibrator is used with a standard ignition and starter switch. Figure 204 shows a starting vibrator which does not incorporate a relay. This type of vibrator should be used with one of the TCM combination ignition and starter switches which controls the vibrator current flowing to the retard contact assembly magneto. In Figures 203 and 204, all switches and relays are shown in their normal OFF position. These diagrams are to be used for following the electrical operation of the magneto circuit and *not for installation purposes.*
- B. With the standard switch in its "BOTH" position (Figure 203) and starter switch S1 turned "ON" starter solenoid L3 and coil L1 are energized closing their relay contacts R1, R2, R3 and R4. Relay contact R3 connects the right magneto to ground, rendering it inoperative during starting procedures. Battery

current then flows through relay contact R1, vibrator points V1, coil L2, through retard contact assembly of left magneto to ground, as well as through relay contact R2 and through the main contact assembly to ground. The magnetic field around coil L2 produced from this current causes vibrator points V1 to open. Current stops flowing through coil L2, causing the magnetic field to collapse and vibrator points V1 to reclose. This allows coil L2 to energize and vibrator points V1 to again open. This interrupted battery current will be carried to ground through the main and retard contact assemblies.

- C. When the engine reaches its normal advance firing position, the main contact assembly of the magneto opens. However, the vibrator current is still carried to ground through the retard contact assembly, which does not open until the starting retard position of the engine is reached. When the retard contact assembly opens (main contact assembly is still open), the vibrator current flows through the primary of transformer T1 (magneto coil) producing a magnetic field around the coil. Each time vibrator points V1 open, the current flow through the primary of transformer T1 ceases. This causes a high voltage to be induced in the secondary which fires the spark plug. A shower of sparks is therefore produced at the spark plug due to this opening and closing of vibrator points V1 while the main and retard contact assemblies are both open.

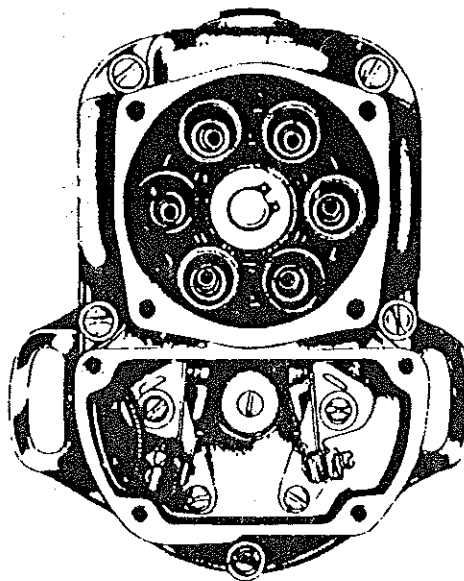


Figure 202. Cam End View of Dual Contact Assembly Magneto

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### S20/S-200 MAGNETO IGNITION SYSTEM

- D. When the engine fires and begins to pick up speed, the starter switch is released which de-energizes relay coil L1 and starter solenoid L3. This opens the vibrator circuit and retard contact circuit, rendering them inoperative. The single contact assembly (right) magneto is no longer grounded, therefore, both magnetos are simultaneously firing in full advance.
- E. With the combination ignition and starter switch in its "START" position, the right magneto is grounded (refer to Figure 204). Starter solenoid L1 is energized, closing its relay contact R1. Battery current flows through vibrator points V1, coil L2 (and L3 in 24 volt models), through the switch and through main and retard contact assemblies of the left magneto to ground. The magnetic field built up around coil L2 causes vibrator points V1 to open. Current flow ceases through coil L2 causing the magnetic field to collapse and the vibrator points to reclose. This allows coil L2 (and L3 where applicable) to energize and vibrator points V1 to again open. When the engine reaches its normal advance firing position, the main contact assembly opens. However, the vibrator current is still carried to ground through the retard contact assembly, which does not open until the starting retard position of the engine is reached. When the retard contact assembly opens (main contact assembly is still open), the vibrator current flows through the primary of transformer T1, producing a magnetic field around the coil. Each time vibrator points V1 open, current flow through the primary of transformer T1 ceases. This causes a high voltage to be induced in the secondary, which fires the spark plug. A shower of sparks is thus produced at the spark plug due to the opening and closing of vibrator points V1 while the main and retard contact assemblies are open.
- F. When the engine fires and begins to pick up speed, the switch is released and returns to its "BOTH" position, rendering the vibrator circuit and retard contact assembly circuit inoperative. The single contact assembly (right) magneto is no longer grounded, therefore, both magnetos are simultaneously firing in full advance.

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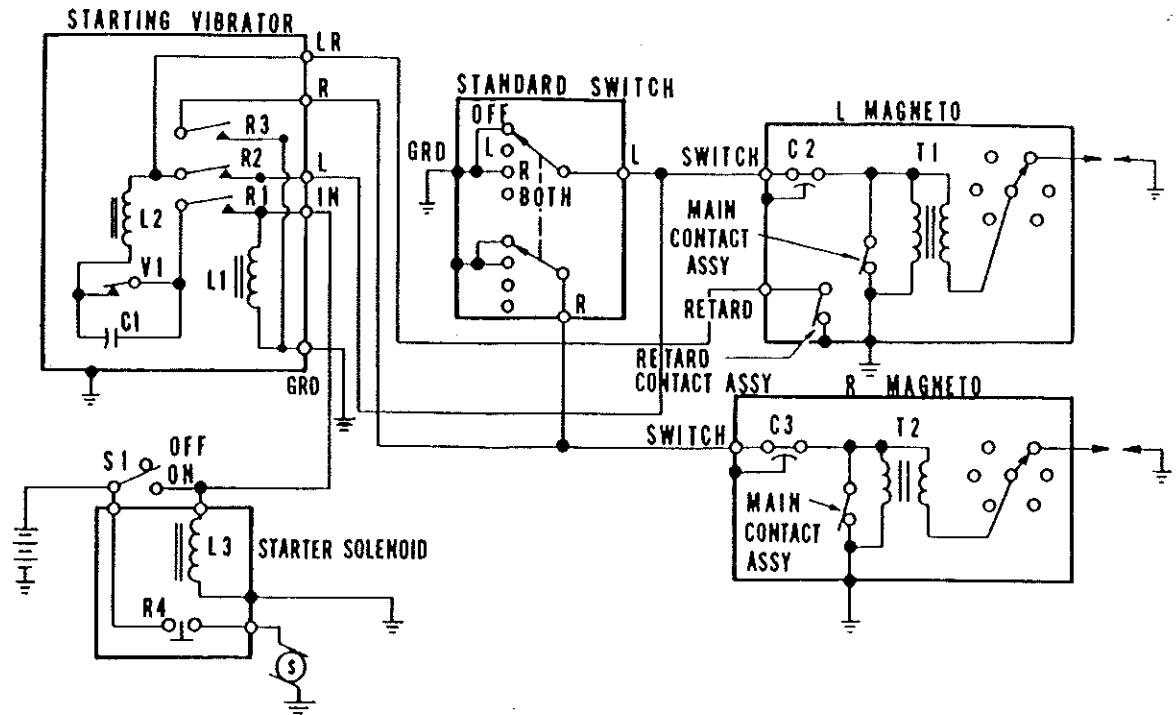


Figure 203. Schematic Diagram of Magneto Circuit and Starting Vibrator Incorporating Relay

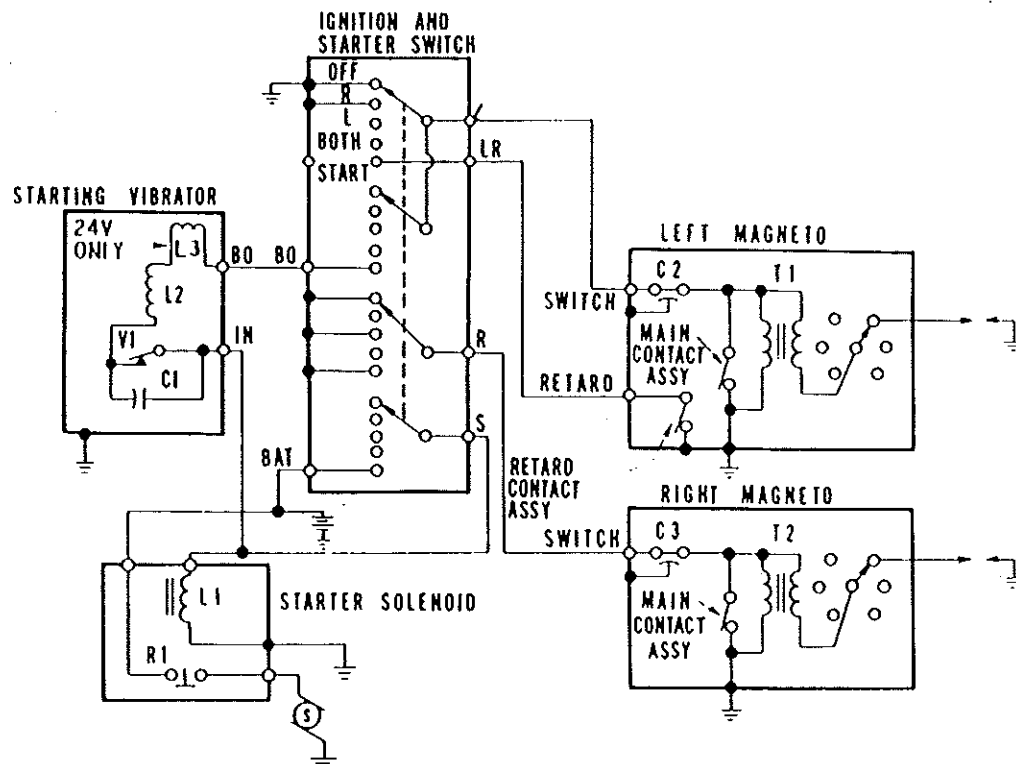


Figure 204. Schematic Diagram of Magneto Circuit and Starting Vibrator Without Relay

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**S20/S-200 MAGNETO IGNITION SYSTEM**

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# System Support Manual S20/S-200 MAGNETO IGNITION SYSTEM

## SECTION 3. TESTING AND FAULT ISOLATION

### 3.1 GENERAL

NOTE:

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View.

**Table 301  
Testing and Fault Isolation Materials and Tools**

Material/Tool	Description
11-10500 Magneto Test Stand or Suitable Equivalent	Used for Off-Engine Magneto Test

- A. If engine operating troubles develop which appear to be caused by the Ignition system, it is advisable to check the spark plugs and wiring first before working on the magnetos.

**WARNING**

Should the propeller be moved by hand during pre-flight inspection or during maintenance procedures and a functional ("hot") magneto condition exists, the engine may fire and cause injury to personnel

- B. Should the trouble appear definitely associated with the magneto, perform a Magneto RPM drop-off test as outlined in the applicable Pilot-Flight Manual. The purpose of the drop-off test is to determine that the ignition is in satisfactory condition. A drop in RPM is expected when one Magneto in a redundant ignition system is shut off. The absence of an RPM drop may indicate that:

- The magneto timing has been advanced beyond the setting specified, or
- A Magneto primary lead is open (Hot Magneto), or
- An Ignition switch is defective, or

- The grounding circuit of the feed-through Capacitor is open, or a combination of these factors.

Any engine which does not exhibit a normal drop-off in RPM when the Magneto is checked should be shut down and the cause for the problem investigated. The normal engine drop-off is specified in the appropriate Pilot Flight Manual and Engine Manufacturer Operator's Manual.

**WARNING**

During hand propping or manually moving the propeller, do not stand nor allow anyone else to stand within the arc of the propeller. A loose or broken wire or a component malfunction could cause the engine to fire and the propeller to rotate, causing injury to personnel.

(1) As a test precautionary measure, it is recommended that a test of the Magneto grounding circuit be performed prior to shutting down the engine using the following procedure:

- (a) With the engine at normal idle, rotate the switch key or lever momentarily to the off position.

## System Support Manual S20/S-200 MAGNETO IGNITION SYSTEM

1 If the engine continues to run with the switch key or lever in the off position, it is an indication that one Magneto is still functioning.

2 If the grounding circuit is working as prescribed, the engine should quit.

3 If the Magneto did not ground out, the cause should be investigated and corrected prior to continued operation of the engine and before the next flight.

(b) Return the switch key or lever to the "BOTH" position and shut down the engine using normal procedures.

C. If problems persist, install a replacement magneto which is known to be in satisfactory condition and send the suspected unit to the overhaul shop for test and repair.

D. Should this not be possible, a visual inspection may disclose the source of trouble. Inspect as follows:

(1) Remove harness securing screws and separate outlet plate from magneto. Inspect for presence of moisture and foreign matter on rubber grommets and high tension outlet side of the distributor block. Also check for broken or burned outlet towers. If either is present, remove magneto and replace with one known to be in satisfactory condition.

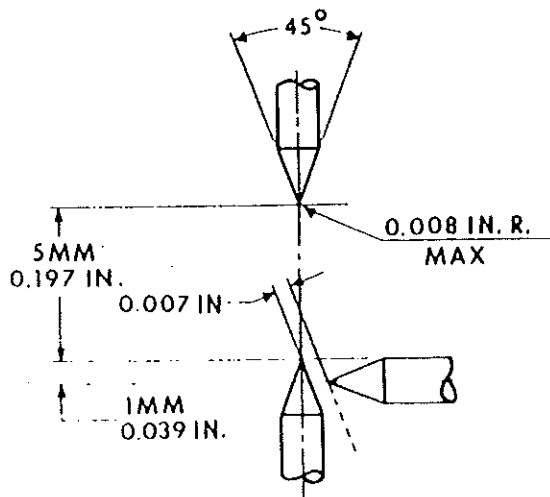


Figure 301. 5 mm Spark Gap Setting

(2) Check contact springs in block lowers for proper height. End of spring shall not be more than 0.422 inch (10.7 mm) from top of lower. Burned or otherwise short springs must be replaced. See ASSEMBLY, paragraph 9.2.3. Check for broken leads or damaged lead insulation. If either is present, replace magneto.

(3) Inspect contact assemblies as specified in PERIODIC MAINTENANCE, paragraph 6.2.1.

### 3.2 POST-OVERHAUL TESTING

A. Mount magneto on a 11-10500 test stand. Connect high tension outlets to spark gaps on test stand using a standard high tension harness assembly. The spark gaps must be set at 5 mm (0.197 in) as shown in Figure 301.

CAUTION:

*Do not operate magneto on test stand unless all high tension leads are connected to spark gaps, since an open secondary circuit would subject magneto parts to possible damage.*

CAUTION:

*Do not run magneto on test stand with oil seal (59) installed for longer than 5 minutes as hidden damage may result.*

B. Determine lowest speed at which rotating magnet can be turned and still spark all gaps without missing (coming-in speed). Magnetos shall spark consistently at 150 RPM. If coming-in speed is above specified RPM, the trouble may be due to dirty contact points, weak coil, weak magnet, defective capacitor, or improperly adjusted contacts. Clean contact assembly, try a new coil or capacitor, recharge magnet, recheck contact assembly adjustment and repeat test.

C. Observe electrical and mechanical performance at 150 and 1000 RPM. Perform high speed test run at 3500 RPM minimum. Do not exceed 5000 RPM. Magneto shall fire all gaps consistently and operate smoothly throughout its operating range.



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- D. Test magnetos equipped with impulse couplings. Couplings shall operate within parameters as shown in Table 302. Remove and replace any couplings which do not meet this test.
- E. After testing, check rotating magnet for end play and radial play. None is permissible. Adjust shims and/or replace parts as necessary and re-test.

Table 302

Magneto Type	Full Engagement	Full Disengagement
S6LN-25 S6RN-25	0-150 RPM Minimum	450 RPM Maximum
All Other S-20 Series	0-120 RPM Minimum	300 RPM Maximum

### 3.3 FAULT ISOLATION

- A. A fault isolation chart is provided as an aid for locating troubles thought to be in the ignition system.

Table 303  
Fault Isolation Chart

SYMPTOM:	PROBABLE CAUSE	TEST:
Hard Starting	<p>Worn or fouled spark plugs. Arcing Ignition wire.</p> <p>Mag Impulse Coupling not operating properly.</p> <p>Impulse Coupling is magnetized.</p> <p>Low voltage at vibrator input.</p> <p>Inoperative or defective vibrator.</p>	<p>Inspect and replace or repair as necessary.</p> <p>Remove and check for binding, worn or broken impulse coupling parts.</p> <p>Remove and demagnetize or replace impulse coupling</p> <p>Measure voltage between vibrator terminal marked "in" and the ground terminal while operating starter. Must be at least 8 volts on 12 volt systems, or 13 volts on 24 volt systems.</p> <p>If voltage is adequate, listen for buzzing of vibrator during starting. If no buzzing is heard, either the vibrator is defective or the circuit from the "Output" terminal on the vibrator to the retard (dual contact assembly) magneto is open. Check both "Switch" and "Retard" circuits. Also check for good electrical ground.</p>

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Table 303  
Fault Isolation Chart (Continued)

SYMPTOM:	PROBABLE CAUSE:	TEST:
Hard Starting (continued)	<p>Retard contact assembly in retard (dual contact) magneto not operating electrically. Engine may kick back during cranking due to advance timing of ignition.</p> <p>Vibrator-magneto combination not "putting out" electrically.</p> <p>Magneto improperly timed to engine.</p> <p>Advance contact assembly out of adjustment (Internal timing off).</p> <p>Retard points opening too late.</p>	<p>Retard points may not be closing due to improper adjustment, or may not be electrically connected in the circuit due to a poor connection. Inspect retard points to see if they close. Check for proper contact at the "SWITCH" and "RETARD" terminals of retard (dual contact assembly) magneto and at the vibrator. Check wiring.</p> <p>Turn engine in proper direction of rotation until retard points just open on No. 1 cylinder position. Remove input connection from starter to prevent engine turning, and while holding No. 1 plug lead 3/16 inch from ground, energize vibrator by turning switch to start. Plug lead should throw a 3/16 inch spark. If spark is weak or missing, try new vibrator. If this does not correct trouble, remove magneto and check for improper internal timing or improperly meshed distributor gears.</p> <p>Check magneto-to-engine timing in accordance with Engine Manufacturer's instructions.</p> <p>Check magneto timing per paragraph 6.2.3 step G. (4) of PERIODIC MAINTENANCE.</p> <p>Check timing of retard points according to paragraph 6.2.3 step G. (4) (e) of PERIODIC MAINTENANCE.</p>
Engine Roughness	<p>Faulty spark plugs. Faulty ignition leads.</p> <p>Faulty magneto contact assemblies</p> <p>Carbon-tracked distributor block (79)</p>	<p>Try new spark plugs. Check plug leads for continuity and breakdown. Check magneto contact assemblies for burning or dirt. (Main and Retard.) See PERIODIC MAINTENANCE, paragraph 6.2.1 steps A., B., and C.</p> <p>Replace distributor block (79)</p>
Magneto Drop-off Check Out of Limits	<p>Magneto out of time</p> <p>Contact assemblies not opening properly.</p> <p>Faulty plugs or leads No drop-off noted -- open capacitor</p> <p>Carbon-tracked distributor block (79)</p>	<p>Check magneto-to-engine timing in accordance with Engine Manufacturer's instructions. Inspect contact assemblies for proper opening. See PERIODIC MAINTENANCE, paragraph 6.2.3 step G. Check plugs and leads. Check capacitor as specified in GENERAL OVERHAUL, paragraph 7.2.5.</p> <p>Replace distributor block (79)</p>

**CAUTION:**

*If self-locking (cam-securing) screw (61) is removed or loosened at any time, always replace with a new self-locking screw and apply torque to 21-25 lb-in. .*

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## SECTION 4. DISASSEMBLY

### 4.1 GENERAL

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View.

Refer to Table 401 for a list of materials and tools required during disassembly.

#### NOTE:

Complete disassembly of magneto is not necessary in all instances. Disassemble magneto only to the extent required for maintenance procedures involved.

**Table 401  
Disassembly Materials and Tools**

Material/Tool	Description
11-702-1 Puller	Used to remove drive plate (7) and cam (11)
11-6924-1 Pressing Tool	Used to remove oil seal (59) and bearing outer race (70)
11-10192 Remove Tool	Used to remove bearing (70) inner races from magnet (54)
CG-40-8 Collar	Used to remove bearing (64) outer race
CG-40-4 Expander Rod	Used to remove bearing (64) outer race
Retaining Ring Pliers, No. 2	Used to remove retaining ring (74)

### 4.2 DETAILED DISASSEMBLY PROCEDURES

(Numbers listed are indicated on Illustrated Parts List; see Figure 1)

#### NOTE:

Main and retard contact assemblies (39), lockwashers (34,3,13), screws (41,56,78,47,12,61), retaining ring (74), oil deflector (55), bearings (64,70) felt strip (81), felt washer (82), identification plate (52), carbon brush (73) and pin (1) shall be replaced at each disassembly with new parts. Also if installed, spring (10) and gaskets (14, 49), shall be replaced at each disassembly with new parts.

#### 4.2.1 Disassemble Magneto for Initial Inspection

A. Remove cover retention screws and lockwashers (12) from cover (15). Carefully pull cover (15) away from housing (48). Remove and discard gasket (14), if installed. Pry or unscrew lead terminals of capacitor lead (42) and retard lead (17) (if installed) from terminals of contact assembly(ies) (39).

B. Remove plug (44) from distributor housing (48). Remove plug (46) from magneto housing (50). Remove five screws (47). Using care that coil primary lead is released from distributor housing as parts are separated, pull distributor housing straight away from magneto housing, leaving magnet in magneto housing. Remove and discard gasket (49), if used.

#### CAUTION

*Do not allow the two housings to turn in relation to each other as damage to coil or carbon brush may result.*

C. Using No. 2 retaining ring pliers, remove retaining ring (74), securing gear (72) to block (79), and discard ring (74). Remove washer (75) and slide gear (72) from block (79). Remove washers (76, 77). Using a pointed tool, remove felt washer (82) and felt strip (81) from block (79). Remove carbon brush (73) from distributor gear (72).

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#### 4.2.2 Disassemble Magneto for General Overhaul

- A. Remove contact assemblies (39) from magneto by taking out screws (41) and washers (34). Discard contact assemblies.

**NOTE:**

Tachometer breaker contact assembly, identified by smaller (0.125 in diameter) silver contact points, may be reused.

- B. Remove screws (41) and capacitor (42) from cover (15) or distributor housing (48). If retard lead (17) is installed, carefully remove it from cover (15). Remove screws with lockwashers (56) and coil core clamps (57). Lift coil (58) from housing.
- C. Using a pair of padded jaw pliers, grip drive member on drive end of rotating magnet (54). While holding rotating magnet, loosen cam securing screw (61) screw (61), washer (62), and cam (63).

**CAUTION:**

*If self-locking screw (61) is removed or loosened at any time, always replace with a new self-locking screw and apply torque 21-25 lb-in..*

#### 4.2.3 Disassemble Drive Plate (6,7) and Other Front-End Hardware

Remove cotter pin (1) from magnet shaft. While holding drive member with padded jaw pliers, remove nut (2). Lift off lockwasher (3), bushing (5) and washer (4) if used. If drive plate (6,7) is used, remove using 11-702-1 puller. Remove woodruff key(s) (53) as necessary.

#### 4.2.4 Disassembling Impulse Coupling (8) (if used)

- A. Using heavy gloves or a cloth, grasp coupling body (9) firmly to prevent the internal spring from unwinding suddenly. Pull outward on coupling body only enough to release it from cam assembly (11). Keep coupling body close against cam and allow body to run as spring (10) unwinds. After one or two turns, spring from coils will wedge against projections on body, restraining spring from further unwinding.
- B. Look into hole in body and note location of inner eye of spring where it engages with mating recess in cam hub. See Figure 401. Insert a screwdriver under spring end and pry spring eye out of recess. Remove body and spring together. Uncoil spring from body and pry spring eye from body recess to disengage spring. Discard spring (10).

- C. Thread appropriate protective cap of 11-702-1 Puller on end of shaft. Leave clearance between cap and cam. Engage puller over protective cap and cam assembly with wide jaws of puller hooked under cam assembly as shown in Figure 402.

**NOTE:**

On magnetos employing flange adapter, the coupling is recessed into flange and may prevent attachment of puller in the usual manner. Disassemble one jaw from puller and hook jaws flange individually. With jaws in place, reassemble puller.

**CAUTION:**

*Do not allow puller jaws to pull against flyweights. This can damage flyweights and will result in having to discard cam assembly.*

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- D. Tighten puller handle to remove coupling from shaft. If coupling does not release with maximum hand torque at puller handle, apply penetrating thread release compound between coupling and shaft. Then while puller is still fully tightened, hold tip of hot heavy-duty soldering iron in contact with hub of coupling cam assembly. See Figure 403. Solder wetting of the tip at point of contact with cam hub will assist in heat transfer to the parts. Retighten puller after about a minute of heat application.

**CAUTION:**

*Do not strike puller with hammer. If puller is struck with hammer, magneto ball bearings must be replaced.*

**CAUTION:**

*Do not tighten puller handle further after coupling cam releases from shaft. This could damage a flyweight if flyweight is caught under woodruff key.*

- E. Remove puller. Hold toe of flyweight inward, lift cam from shaft. See Figure 605.
- F. Remove woodruff key (53) from rotating magnet shaft.

### 4.2.5 Disassembling Rotating Magnet (54)

- A. Screw appropriate cap from 11-702-1 puller kit onto rotating magnet (54) with woodruff keys (53) removed from drive end, press magnet (54) from housing (50) using an arbor press. Oil Deflector (55) will come off during this operation.
- B. Remove and discard bearing (70) cage assembly.
- C. Clamp knife edge of 11-10192 removal tool between inner race of front bearing (70) and wide portion of rotating magnet (54). Remove bearing (70) inner race and sleeve bearing (69) by pressing on thread protector cap with arbor press. Discard bearing (70) inner race. Remove shim washers (71). Keep washers together and identify as drive end for reassembly.

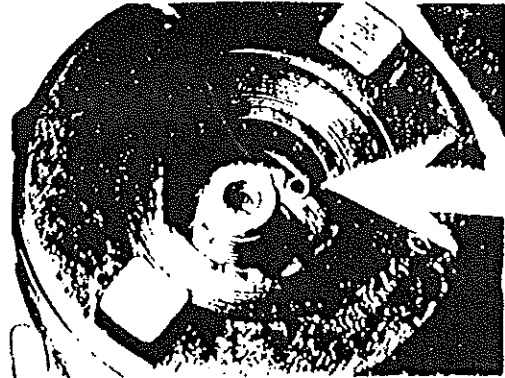


Figure 401. Spring Engaged with Cam

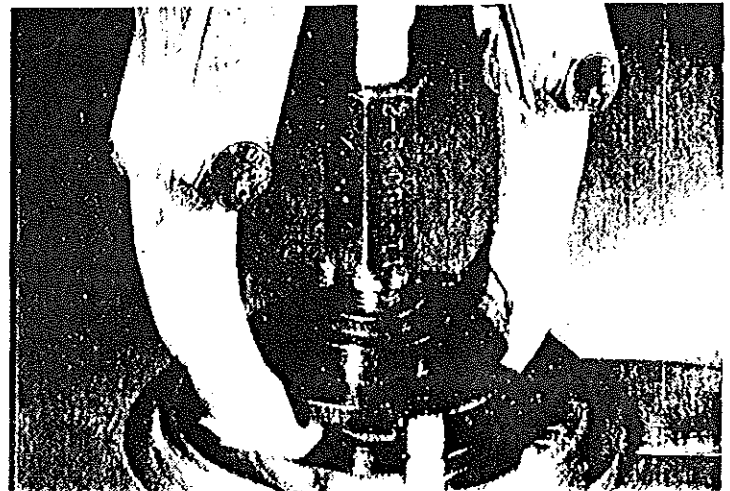


Figure 402. Removing Coupling Cam Assembly

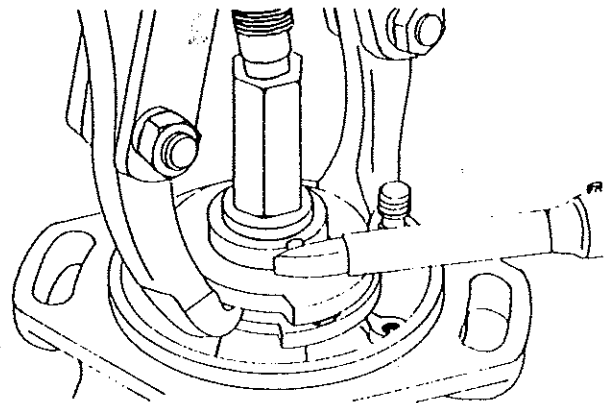


Figure 403. Applying Heat to Release Coupling From Shaft

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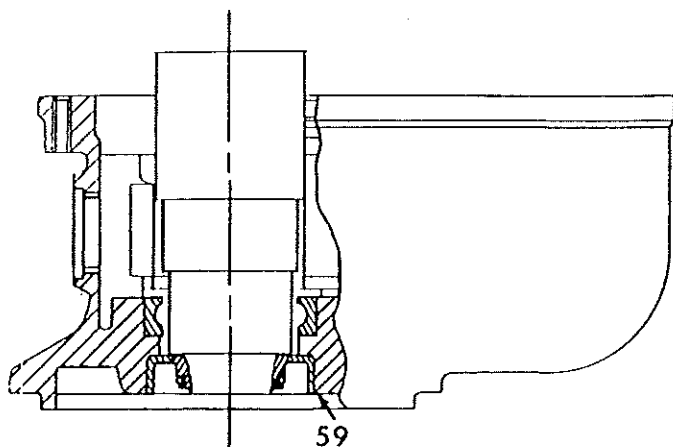


Figure 404. Pressing Oil Seal Out of Housing

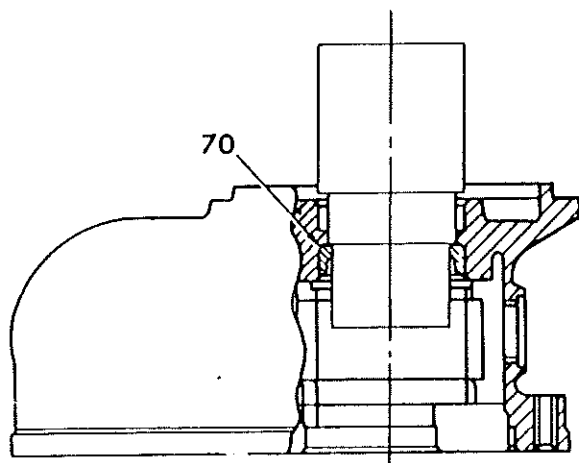


Figure 405. Pressing Outer Race Out of Housing

- D. Disassemble pinion gear (67) and bearing (64) inner race.

(1) Fabricate two support bars similar to the ones shown in Figure 1001, Special Tools, Fixtures and Equipment.

(2) Remove and discard bearing (64) cage assembly

(3) Position fabricated bars between casting of magnet assembly, and pinion gear (67).

(4) Position bars and magnet assembly in one of the recesses in the spider or base of an arbor press. Recess of spider should be large enough to allow the casting magnet to pass through, but small enough to hold the fabricated bars.

(5) Using arbor press, remove gear (67) and bearing (64) race.

**CAUTION:**

*A piece of copper or brass [approximately 1/4 inch thick] should be placed between end of shaft and the arbor press ram when removing gear.*

(6) Remove shim washers (65) and plain washer (66) from shaft. Keep washers together and identify as cam end for reassembly.

### 4.2.6 Disassembling Housings (48, 50)

- A. Support magneto housing, mounting flange down, on base plate of an arbor press using a block of wood to protect the impulse coupling stop pins (60). Insert the 11-6924-1 Pressing Tool through bearing outer race until it seats against oil seal (59, figure 404) as shown. Press oil seal out and discard.
- B. Place magneto housing (50), mounting flange up, on base plate of an arbor press. Insert the 11-6924-1 Pressing Tool through outer race of bearing (70, figure 405) until it bottoms as shown. Press outer race out and discard.
- C. Record magneto type and part number. Remove and discard nameplate (52).
- D. Using CG40-8 collar, CG40-4 expander rod and arbor press, remove bearing (64) outer race from distributor housing (48).

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**SECTION 5. CLEANING**

**5.1 GENERAL**

**NOTE:**

Refer to ILLUSTRATED PARTS LIST Figure 1  
for Magneto Exploded View.

- A. Using a clean, dry, lint-free cloth, wipe accessible areas of the housing (48,50 IPL Figure 1) and other external surfaces free of grease, oil film or other contaminants.

**5.2 DETAILED CLEANING PROCEDURES**

- A. Clean breaker contact points (39) as follows:

Using any hard finished paper (i.e., a typical business card), close breakers on cleaning paper, then open breakers and remove paper. Do not drag paper through closed breakers. Do not use emery cloth.

- B. All other parts of magneto except capacitor (42), retard lead (17), distributor block (79), cam (63) and coil (58) may be washed in a standard cleaning solvent and dried with compressed air. Blow out holes in ventilator (46) with compressed air.

**CAUTION:**

*Do not immerse cam (62), or distributor block (79) in any solvent. Solvents will cause damage to these items.*

- C. Clean capacitor (42), retard lead (17), cam (63), coil (58) and contact compartment by wiping with a clean dry cloth.

- D. Clean distributor block (79) as follows:

(1) Using a clean dry lint free cloth, carefully wipe the internal & external surfaces of the distributor block clean and free of all contaminants. If the dry, lint free cloth is insufficient, moisten the cloth with unleaded gasoline and wipe the accessible surfaces of the distributor block free of contaminants. Do not allow gasoline to contact brass bushing.

**WARNING**

**Unleaded Gasoline**

- Flammable -- do not use near welding areas, near open flames, electrical sparks, or on very hot surfaces.
- Use only with adequate ventilation.
- Do not smoke when using it.
- Do not get in eyes, on skin, or on clothing.
- Avoid prolonged or repeated breathing of vapors.
- Store in approved metal safety containers.

(2) Install 10-70506-10S protector caps to cover both ends of the distributor block bronze bushing. This masking will prevent contamination of the bearing during the second stage of the cleaning operation.

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(3) Hold the distributor block with the outlet towers in a vertical plane. Using a 1/2 inch bristle brush dipped in unleaded gasoline, clean around the electrodes of the block, allowing the cleaning fluid to flush out any remaining contaminants from the inside of the block. Also clean in and around the block outlet towers.

(4) Using clean, dry compressed air, blow the block dry and remove thread protector caps.

### WARNING

#### Cleaning with Compressed Air

- Use approved personnel protective equipment to protect eyes and face when using compressed air.
- Maximum allowable air pressure for cleaning operation is 30 psi.
- Do not direct airstream towards yourself or towards another person.

(5) Treat distributor blocks as specified in GENERAL OVERHAUL, Paragraph 7.2.4, Step H.



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**SECTION 6. PERIODIC MAINTENANCE**

**6.1 GENERAL**

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View.

Refer to Table 601 for a list of materials and tools required during PERIODIC MAINTENANCE.

- A. The use of a 4 to 5 power glass is recommended for all visual inspections.
- B. Main and retard contact assemblies (39), lockwashers (34,3,13), screws (41,56,78,47,12,61), retaining ring (74), oil deflector (55), bearings (64, 70), felt strip (81), felt washer (82), Identification plate (52), carbon brush (73) and pin (1) shall be replaced at each disassembly with new parts. Also if installed, spring (10) and gaskets (14, 49), shall be replaced at each disassembly with new parts.

- C. Paragraph 6.2.1 should be performed after the first 25 hour and 50 hour periods and every 50 hours thereafter. Paragraph 6.2.2 should be performed at the first 500 hours in service and every 500 hours thereafter for magnetos with impulse couplings (8) installed. Paragraph 6.2.3 should be accomplished for magnetos installed on Teledyne Continental Motors' Aircraft Engines at the first 500 hours in service and every 500 hours thereafter. An appropriate log book entry signifying compliance with paragraphs 6.2.1, 6.2.2, or 6.2.3 and referencing the magneto serial numbers involved should be made after completing paragraphs 6.2.1, 6.2.2, or 6.2.3.

**Table 601**  
**Periodic Maintenance Materials and Tools**

Material/Tool	Description
10-27165 Magneto Grease	Applied to teeth of distributor gear (72)
10-86527 High Temperature Lubricant	Applied to contact assembly (39) cam follower felt
11-8150-1 Timing Kit	Used to check internal timing
11-8465 Rotor Holding Tool	Use to hold rotating magneto to check internal timing
11-9110-1 Timing Light or suitable equivalent	Used to check magneto-to-engine timing

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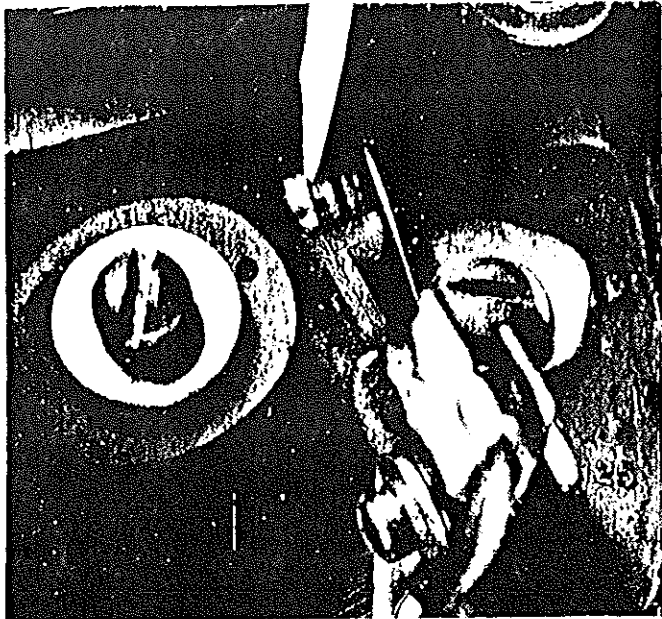


Figure 601. Checking Secureness of Contact Points

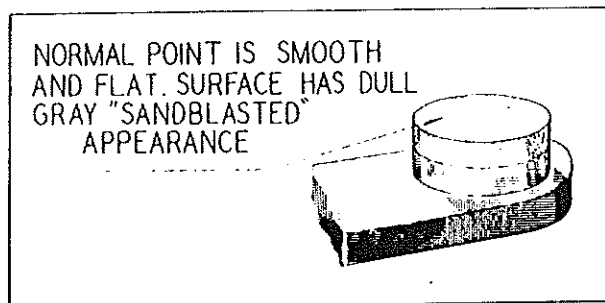


Figure 602. Normal Contact Point

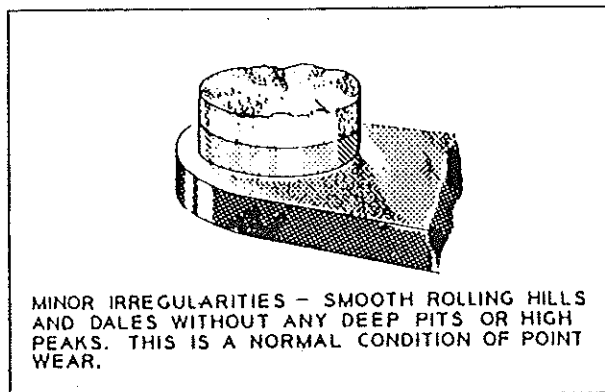


Figure 603. Point with Minor Irregularities Contact Assembly (39) Usable

### 6.2 DETAILED MAINTENANCE PROCEDURES

#### 6.2.1 Contact Assemblies

After the first 50 hour and 100 hour periods and every 100 hours thereafter, inspect contact assemblies (39) as follows:

- A. Remove cover (15) from housing (48) as specified in DISASSEMBLY, paragraph 4.2.1 step A.
- B. Turn magneto drive shaft until cam follower rests on high lobe of cam holding points in their open position. Using a fiber or plastic rod with a screw driver shaped end, prod contact points as indicated in Figure 601. If any looseness is noted, replace contact assembly.
- C. Examine contact points for excessive wear or burning. Contact assemblies (39) with points which are deeply pitted or burned must be discarded. Figure 602 shows how the average contact point will look when surfaces are separated for inspection. Desired contact surfaces have a dull gray sandblasted (almost rough) or frosted appearance over the area where electrical contact is made. This means that points are worn in and mated to each other, thereby providing the best possible electrical contact and highest efficiency of performance. Minor irregularities or roughness of point surfaces are not harmful (see Figure 603), and neither are small pits or mounds, if not too pronounced. If there is a possibility of pit becoming deep enough to penetrate pad (Figure 604), reject contact assembly.

#### NOTE:

No attempt should be made to stone or dress contact points. Do not clean contact points with emery cloth. Should contact assembly have bad points or show excessive wear, the complete contact assembly should be replaced.

- D. Check condition of cam follower felt. Squeeze felt tightly between thumb and forefinger. If fingers are not moistened with oil, re-oil using 2 or 3 drops of 10-86527 Lubricant. Allow approximately 30 minutes for felt to absorb the oil. Blot off excess with a clean cloth. Too much oil may foul contact points and cause excessive burning.

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E. If necessary, points can be cleaned as specified in paragraph 5.2 step A of CLEANING.

F. Check magneto-to-engine timing as follows:

(1) Connect the 11-9110-1 Timing Light or equivalent across the main contact assembly.

(2) Slowly bring engine up to number one cylinder advance firing position as instructed in engine handbook. At this instant timing light should go out. If it does, the magneto is properly timed to the engine. If the timing light does not go out, remove magneto from engine and perform internal timing check and inspection as specified in paragraph 6.2.3 step G of this chapter.

### 6.2.2 Impulse Couplings

Inspect impulse couplings (8) the first 500 hours in service and every 500 hours thereafter as follows:

A. With magnetos using impulse couplings, check clearance between each flyweight and each stop pin as follows:

#### NOTE:

Magnetos with one stop pin requires two checks (each flyweight at each stop pin) and magnetos with two stop pins require four checks.

(1) Bend end of a stiff piece of wire (such as a coat hanger wire) into a right angle, 1/8 inch long maximum.

(2) Position impulse coupling so that heel of flyweight (see Figure 605) is adjacent to stop pin. Reach between cam and flyweight with bent wire, as near as possible to the stop pin, and pull outward on the flyweight as shown in figure 605.

(3) While pulling flyweight outward, insert feeler gages to measure the clearance between the heel of the flyweight and the stop pin, assuring a minimum of 0.017 inch exists.

(4) If less than 0.017 inch clearance exists, this is cause for immediate rejection of the impulse coupling cam assembly, or possibly the entire impulse coupling. Refer to GENERAL OVERHAUL, paragraph 7.2.7 for inspection procedures to determine if other impulse coupling parts are still serviceable.

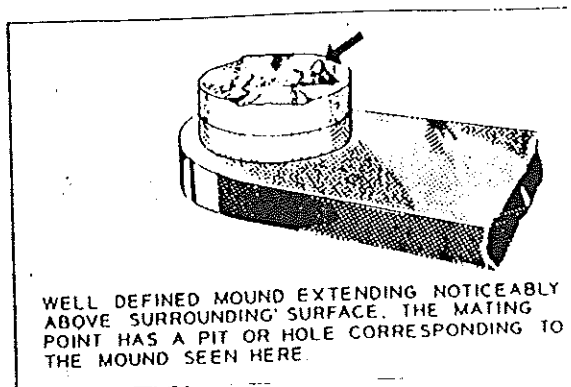


Figure 604. Point with Well Defined Mound Replace Contact Assembly (39)

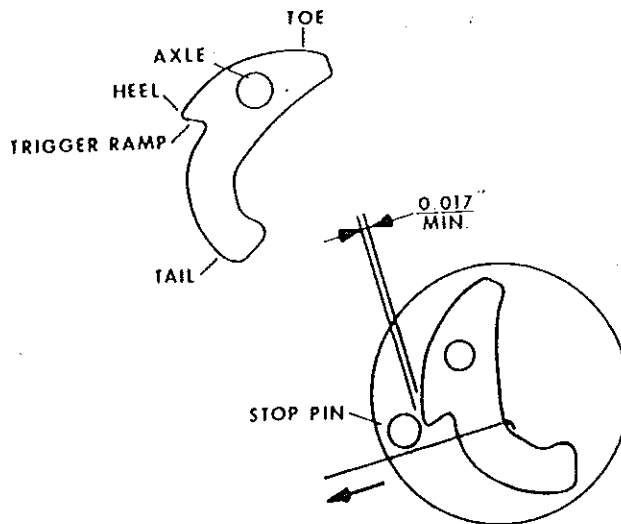


Figure 605. Checking Flyweight to Stop Pin Clearance

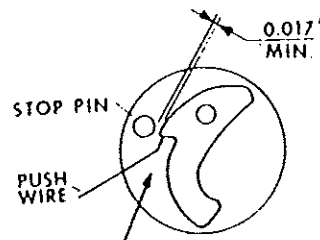


Figure 606. Checking Flyweight to Stop Pin Clearance, Recessed Impulse Coupling

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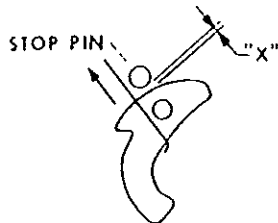


Figure 607. Flyweight/Axle Wear Check (Pull)

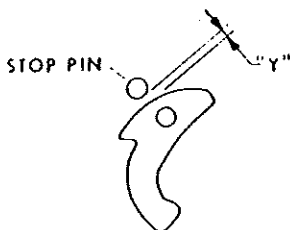


Figure 608. Flyweight/Axle Wear Check (Push)

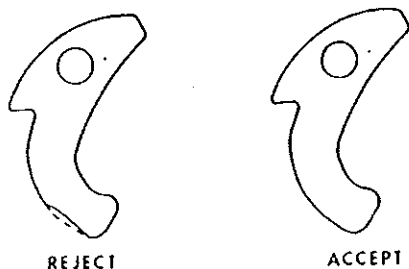


Figure 609. Flyweight Tail Condition Check

**CAUTION:**

An accurate clearance check can only be obtained by pulling the flyweight outward as described.

**NOTE:**

All magnetos with the impulse coupling recessed into the magneto flange require a different procedure for holding the flyweight outward. To make a clearance check on these magnetos, use a piece of stiff wire (such as coat hanger wire) bent to an angle that can be used to push outward on the notched area of the flyweight trigger ramp section as shown in Figure 606.

(5) If impulse coupling is found to be acceptable during the flyweight to stop pin clearance check, perform the additional inspection checks described in paragraphs B through E.

- B. The flyweight and axle wear must be checked to assure wear is within acceptable limits. Perform the wear check on each flyweight as follows:

(1) Rotate the impulse coupling so that the flyweight axles are adjacent to the stop pins. Pull the flyweight toward the stop pin using the same wire hook, and in the same manner as used in the preceding clearance check. (See Figure 607.)

(2) Insert feeler gages between the stop pin and flyweight to measure the clearance ("X" of Figure 607) while the flyweight is held outward. Maintain constant outward pressure on the flyweight while measuring clearance to ensure an accurate clearance check is being made, and record measurement "X".

**NOTE:**

The clearance measured in this check will not be the same as the clearance measured in Step A since the flyweight is in a different position relative to the stop pin.

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(3) Remove the hook wire from the flyweight and insert additional feeler gages between stop pin and flyweight as required to push the flyweight directly in toward the magneto rotor shaft as far as possible. Force exerted to insert feeler gages should be limited to that required for any normal feeler gage measurement. Record the measurement obtained ("Y" of Figure 608).

(4) Subtract measurement "X" from measurement "Y" to determine wear of flyweight and axle. If "Y - X" is greater than 0.016 inch, impulse coupling cam assembly must be rejected. If movement is 0.016 inch or less, flyweight and axle wear is within acceptable limits.

- C. Flyweight tail condition must be given a visual examination to determine if flyweight is still serviceable. The surface at the apex of the beveled edge must blend smoothly with the outer contour of the flyweight. No flattening, denting or chipping is permissible. Any irregularity of this surface is cause for immediate rejection of the cam assembly. (See Figure 609.)

### NOTE:

All magnetos with the impulse coupling recessed into the magneto housing require removal of the impulse coupling for inspection of the flyweight tail condition. Refer to DISASSEMBLY, paragraph 4.2.4. When impulse coupling (8) is disassembled, spring (10) must always be replaced.

- D. If the impulse coupling is found to be unacceptable as a result of any of the preceding checks described, replace the entire impulse coupling assembly or worn parts.
- E. When inspection of the impulse coupling assembly is being performed, the stop pins in the magneto flange or housing must also be examined. Visible damage or wear in the area where the flyweight contacts the stop-pin is caused for replacement of the magneto stop pin or housing depending on extent of damage or wear.

### 6.2.3 500 Hour TCM Check

Perform 500 hour inspection for magnetos installed on Teledyne Continental Motors aircraft engines as follows:

- A. Disassemble magneto as specified in paragraph 4.2.1 of DISASSEMBLY.
- B. Inspect and treat block as specified in GENERAL OVERHAUL, paragraph 7.2.4
- C. Inspect distributor gear assembly (72) and carbon brush (73) as follows:
- (1) Using a dry, lint-free cloth, wipe distributor gear and axle (72) free of all oil film and other contaminants. Inspect for damage or unusual wear. Replace as necessary.
- (2) Remove carbon brush and spring (73) from hole in gear axle (72). Clean hole with a pipe cleaner. Check carbon brush for side loading or unusual wear. Measure carbon brush from spring shoulder to working end of brush. Overall length shall be 0.375 in. minimum. Replace worn brushes as necessary with new brush and spring assembly (73). Seal new brush and spring (73) in hole in gear (72) axle hole and compress brush to within 1/8 in. of gear, then release slowly. Brush shall move freely within hole in axle.
- (3) Spread a 1/32 in. thick film of 10-27165 Magneto Grease over a flat, non-absorbant surface to produce a grease strip approximately 1 in. wide by 12 in. long. Roll the distributor gear teeth through the length of the grease strip for one complete revolution of the gear. This procedure will provide sufficient grease for the gear. Excess grease will only be thrown off during magneto operation.
- (4) Ensure washers (76, 77) are in place on gear axle and in good condition. Ensure that nylon washer (77) is positioned against distributor gear.
- D. Inspect housings (48, 50) for damage. Clean housings (48, 50) with a clean, dry, lint-free cloth.
- E. Inspect coil (58) as follows:
- (1) Using a dry, lint free cloth, clean contaminants from accessible surfaces of coil.
- (2) Ensure coil outlet tab is parallel with housing mating surface. Bend tab with finger as necessary.

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(3) If the carbon brush (73) has caused wear in the outlet tab, indicated by a visible depression in the tab, disassemble coil (58) from housing (55) as specified in DISASSEMBLY, paragraph 4.2.2, and repair coil (58) as specified in REPAIR, paragraph 8.2.1. Then assemble coil (58) into housing (50) as specified in ASSEMBLY, paragraph 9.2.2.

F. Assemble distributor block (79) and distributor gear (72) into housing (48) as specified in ASSEMBLY, paragraph 9.2.3. Assemble housing halves (48, 50) together as specified in ASSEMBLY, paragraph 9.2.4. If used, assemble gasket (49) between housing halves. Pay particular attention to proper distributor gear positioning.

G. Inspect contact assemblies (39) and related components as follows:

(1) The contact assembly area shall be free of moisture, dirt, oil or grease residue. Clean as necessary.

(2) Perform inspection per paragraph 6.2.1, steps A through E.

(3) Insure cam securing screw (61) is tightened to a torque value of 21-25 in.-lb.

(4) Check internal timing as follows:

(a) Loosen nut securing drive member to magnet shaft sufficiently in order to install the 11-8465 Rotor Holding Tool under nut and flat washer as shown in Figure 909. Tighten nut securely.

**CAUTION**

*When timing magneto on bench or when reinstalling magneto on engine, no gear holding timing device should be used as hidden gear tooth damage may result.*

(b) Remove timing inspection plug (44) from top of magneto. Turn rotating magnet in direction of normal rotation until applicable timing mark on distributor gear is approximately aligned with center of timing window. Then turn in back until magnet locates in its neutral position. Tighten adjusting knob of 11-8465 Holding Tool until pressure is applied on housing flange preventing magnet from turning freely. See note. With magnet held in this neutral position, install timing plate assembly and pointer assembly of the 11-8150-1 Timing Kit to contact compartment of magneto. (See Figure 918). Align pointer assembly with "O" mark on timing plate.

### NOTE:

Tighten adjusting knob of the 11-8465 Rotor Holding Tool only enough to hold magnet shaft firmly in desired position. Overtightening the adjusting knob may cause damage to drive end bearing.

(c) Loosen adjusting knob of the 11-8465 Holding Tool and turn rotating magnet in normal direction of rotation until pointer indexes with respective 10° mark. Using the 11-9110-1 Timing Light or equivalent, check that main contact points just open at "E" gap ( $10^\circ \pm 4'$ ) position.

(d) Turn rotating magnet until cam follower of contact assembly is on high point of cam lobe. Tighten adjusting knob of holding tool and measure contact clearance  $0.018 \pm 0.006$  in. If dimension does not fall within limits, readjust contact points and recheck to be sure points open within "E" gap ( $10^\circ \pm 4'$ ) tolerance. If points do not open within tolerance, replace contact assembly.

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- (e) On dual contact assembly magnetos, the retard contact assembly is adjusted to open a pre-determined number of degrees *after the main contact assembly opens*. The degree of retard for any particular magneto is stamped in the bottom of the contact compartment. Add degrees retard to the number of degrees past neutral where the main contacts actually open. Unlock holding tool and turn rotating magnet in normal direction until pointer of timing kit indexes this total. Lock holding tool in this position. Using a timing light, adjust retard contact assembly to just open. Tolerance of retard is  $+2^{\circ}-0^{\circ}$ . Unlock holding tool. Turn rotating magnet until cam follower is on high point of cam lobe. Measure point clearance  $0.018 \pm 0.006$  in. If dimension is not within limits, readjust contact assembly and recheck to be sure that points will open within retard degree tolerance. Replace contact assembly if retard degree tolerance and contact clearance cannot be obtained.
- H. If used, adjust tachometer contacts to maximum opening  $0.019 \pm 0.003$  in.
- I. Inspect magneto cover (15) for damage. Check capacitor (42) for case or flange looseness, and for evidence of lead chafing. Using clean, dry compressed air, clean as necessary and replace any component found defective. See appropriate procedures in DISASSEMBLY, paragraph 4.2.2 and ASSEMBLY, paragraph 9.2.6 if capacitor replacement is necessary.
- J. Form capacitor and coil leads and assemble magneto cover (15) and new gasket (14) if installed, onto housing (48) as specified in ASSEMBLY, paragraph 9.2.10.
- K. Install magneto on engine. Check and adjust "magneto-to-engine" timing to comply with the engine manufacturer's specifications.
- L. Replace any missing terminal eyelets on the harness wires before reinstalling the ignition harness on the magneto. Check the harness grommets for any signs of carbon tracking. Replace as necessary. Refer to Harness portion of master service manual, Form X40000.
- M. Reinstall the ignition harness adapter plate to the magneto. Evenly torque four securing screws, initially to 4-8 in.-lb, and then to 25-35 in.-lb.
- N. Complete installation by properly attaching the aircraft primary wiring and any other miscellaneous hardware items removed.

#### WARNING

##### Cleaning with Compressed Air

- Use approved personnel protective equipment to protect eyes and face when using compressed air.
- Maximum allowable air pressure for cleaning operation is 30 psi.
- Do not direct airstream toward yourself or another person.

INTENTIONALLY

LEFT

BLANK



**System Support Manual  
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## SECTION 7. GENERAL OVERHAUL

**7.1 GENERAL**

NOTE

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View. Refer to Table 701 for a list of materials and tools required during GENERAL OVERHAUL.

A. The use of a 4 to 5 power glass is recommended for all visual inspections.

B. Main and retard contact assemblies (39), lockwashers (34, 3, 13), screws (41, 56, 78, 47, 12, 61), retaining ring (74), oil deflector (55), bearings (64, 70), felt strip (81), felt washer (82), identification plate (52), carbon brush (73), and pin (1), shall be replaced after each disassembly, with new parts. Also, if installed, spring (10), gaskets (14, 49), shall be replaced after each disassembly with new parts.

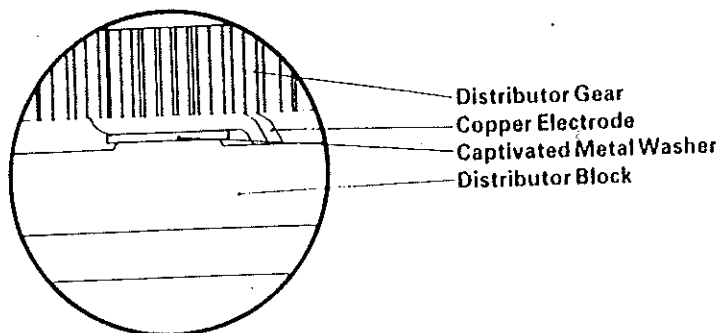
C. GENERAL OVERHAUL, as specified in paragraph 7.2 should be performed at time of engine overhaul, or in the event of severe environmental effects (engine overspeeds, sudden stoppage or other unusual circumstances, or at the expiration of four years without regard to accumulated engine operating hours since new or last overhaul.

**Table 701  
General Overhaul Materials and Tools**

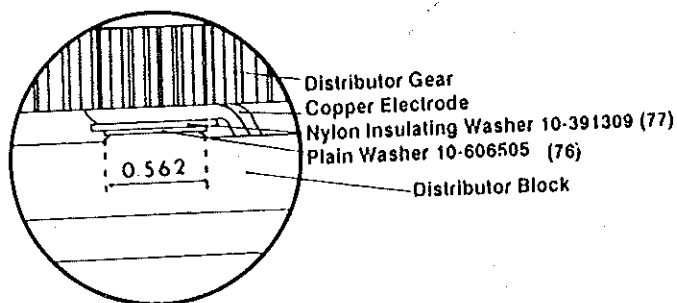
Material/Tool	Description
10-70506-10S Protective Caps (2 required)	Used to protect bushing during coating of block (79)
10-86527 High Temperature Lubricant	Applied to contact assembly cam follower felt
10-391200 Distributor Block Lubricant	Applied to provide proper lubrication for distributor shaft
10-391400 Distributor Block Coating	Applied to "black" blocks (79) to prevent moisture from collecting on dielectric surface
11-1767-3 Capacitor Tester	Used to test capacitor (42)
11-8150-1 Timing Kit	Used to check internal timing
11-8465 Rotor Holding Tool	Used to hold rotating magnet (54) to check internal timing
11-8950-2 High Tension Lead Tester Kit	Used to test distributor block insulation
11-9110-1 Timing Light or suitable equivalent	Used to check magneto-to-engine timing
Fluke 8840A Digital Multimeter	Used to test coil (58)

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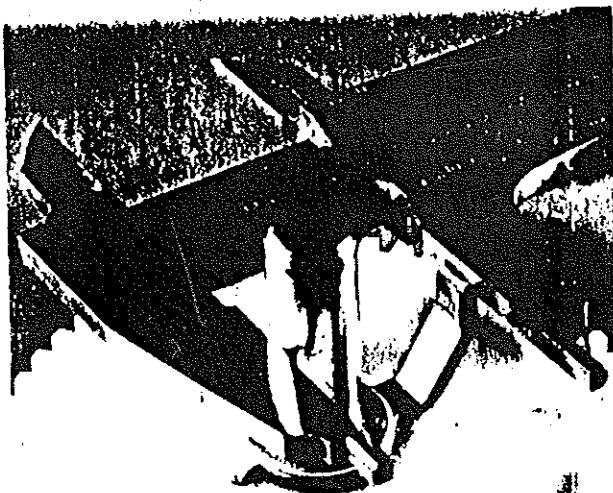
## S20/S-200 MAGNETO IGNITION SYSTEM



**Figure 701**  
Original Gear Make Up  
(Not Incorporating Insulating or plain steel skld washer)



**Figure 702.** Current Insulated Configuration



**Figure 703.** Checking Distributor Gear Electrode Wear

### 7.2 DETAILED OVERHAUL PROCEDURES

#### 7.2.1 Disassemble Magneto

Completely disassemble magneto as specified in DIS ASSEMBLY.

#### 7.2.2 Inspect Distributor Gear (72)

- A. Determine if gear is of old or new design. Very old gears are dark brown laminated phenolic. Old nylon gears use a captivated washer. See Figures 701 and 702. If gear is of old design, discard gear and replace with new type.
- B. If distributor gear (72) is of new design, inspect gear for excessive wear or damage. If gear teeth, axle or electrode are excessively worn or damaged, or there is any evidence of looseness between axle and gear, or electrode and gear, gear shall be replaced. If electrode surface is slightly carbonized, smooth it with a fine file or wire brush.
- C. Wipe gear (72) free of all oil film and contaminants.
- D. Check for excessive wear of gear (72) electrode. With vernier callipers or a micrometer applied as shown in figure 703, electrode must measure  $.92 \pm .000 \text{ } -.015 \text{ in.}$  If electrode is worn below limits, replace gear (72).

**CAUTION**

*Do not attempt to correct gear electrode position by bending.*

- E. Using Red dykem or Red Lacquer paint timing marks on gears as follows:
  1. For all S4LN magnetos, paint tooth and mark as indicated by CCW arrow. For all S4RN magnetos, use CW arrow. See Figure 704A.
  2. For S6LN-200 and -201 magnetos, paint tooth and mark as indicated by "outer" booster CCW arrow. For S6RN-200 and -201 magnetos, use "outer" CW booster arrow. These magnetos are used in conjunction with a starting vibrator (or "booster") and retard contacts. Refer to Figure 704B.

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3. For all other S6LN magnetos, paint tooth and mark as indicated by "inner" CCW normal arrow. For all other S6RN magnetos, use "inner" normal CW arrow. See Figure 704B.

**NOTE:**

Early production six cylinder gears only had "outer" arrows marked CW and CCW. These arrows correspond to booster arrows as shown in Figure 704B. Paint tooth and mark on such gears according to instructions above and Figure 704B.

### 7.2.3 Inspect Cam (63) And Washer (62)

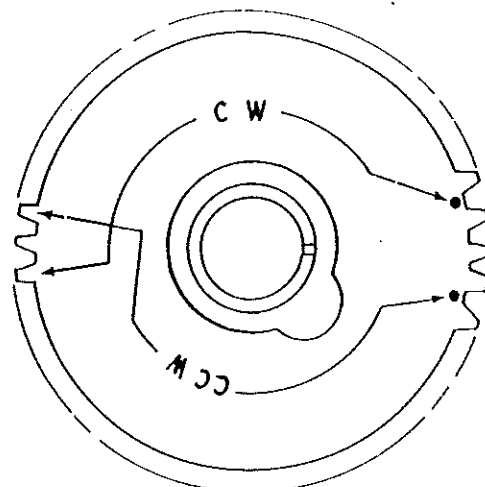
- A. Inspect cam (63) for scratches or excessive wear and replace if either is found. Measure thickness of cam washer (62) and replace if not  $.095 \pm .010$  inch thick.
- B. Wipe cam with clean lint free cloth.
- C. Cam shall be submerged in 10-391200 Distributor Block Lubricant held at 200°F for 30 minutes.
- D. While still submerged in oil, cam and oil shall be allowed to cool to room temperature
- E. After cooling, remove cam from oil, wipe with lint free cloth and put into service or store in a sealed plastic bag until needed.

### 7.2.4 Inspect Distributor Block (79)

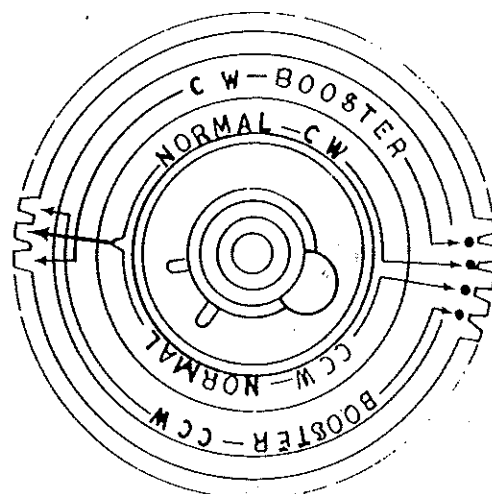
**NOTE:**

Current design Distributor Blocks (79) are made of brown polyester material and have part number and batch code molded into the surface. Older blocks made of phenolic (black) material or buna rubber (very dark brown, with letters "cc" molded into block) material may be used so long as they incorporate annular groove (see Figure 705) and pass tests outlined below. Polyester blocks supersede phenolic blocks and buna blocks on a use stock basis.

- A. Insert gear (72) into distributor block (79). Apply light hand pressure to first one side of gear, then the other. If any play can be felt as gear is "rocked" manually, block bushing is worn excessively. Replace block (79).



A. Four Cylinder



B. Six Cylinder

Figure 704. Distributor Gear Timing Marks

1/16 INCH OF BUSHING  
ABOVE FELT STRIP

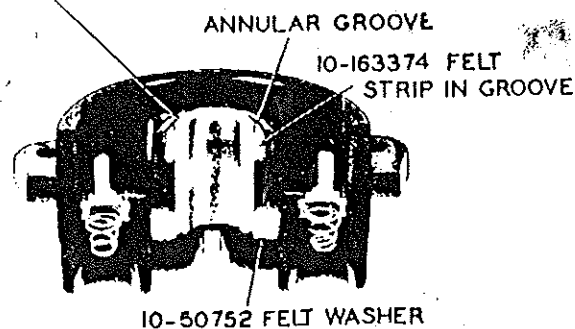


Figure 705. Cutaway View of Distributor Block

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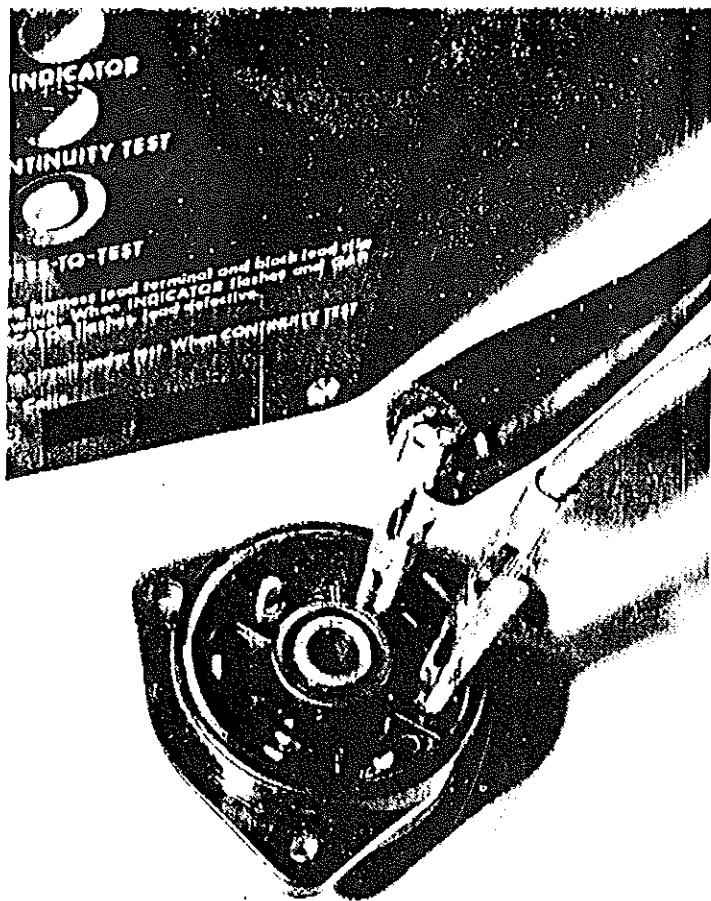


Figure 706. Checking Distributor Block for Carbon Tracking

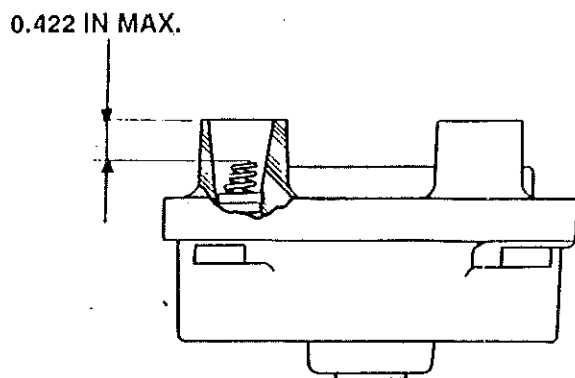


Figure 707. Contact Spring Height

- B. Examine distributor block (79) for cracks, particularly around high tension terminal towers, mounting ears and nose in center of electrode side. Reject any cracked blocks (79).
- C. Clean distributor block as specified in CLEANING, paragraph 5.2, step D.
- D. With block thoroughly cleaned, inspect for carbon tracking, which appears as a thin wavy line across dielectric surface. If any suspicious areas are noted check with the 11-8950-2 High Tension Lead Tester Kit as follows:
  - (1) Use a medium test clip to ground tester to an electrode of the block.
  - (2) With high tension lead of tester, probe electrode adjacent to grounded one. See Figure 706.
  - (3) Tester high voltage will follow a carbon track. Complete test of all Interelectrode spaces. Also test between grounded center bushing and all electrodes. Temporarily assemble block (79) into housing (48) and test for carbon tracking between electrodes and housing ground. Reject any carbon tracked blocks (79).
- E. Inspect contact springs (80), on tower side of block (79). If any look fuzzy or white, or show evidence of burning, rust or corrosion, remove with needle nose pliers and discard. Check springs for proper height by measuring down from top of tower. If measurement exceeds the .422 inch dimension shown in Figure 707 spring may be improperly installed. Using a scribe, or similar pointed instrument, wiggle top of spring in a circular motion to be sure only bottom turn of spring is captive in groove of block insert. Recheck spring height after. If measurement still exceeds .422 inch, remove and replace spring.
- F. Using a small scraper or knife, clean electrodes of distributor block (79) to remove any carbonized deposits. Do not attempt to grind or machine electrodes.

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- G. If block is phenolic or buna type (see Note above) and is not marked with a raised boss or a drill point indentation to the left and adjacent to No. 1 high tension tower (see Figure 708), remove old lubricant as follows:

(1) Place distributor block, high tension towers up, on a piece of absorbent material, such as cardboard, in a 250°F oven for 4 hours. This should cause impregnating oil to appear on surface of bushing and on absorbent materials.

(2) Remove block from oven and using a clean, dry cloth, immediately wipe all oil possible from inside diameter of bushing. It may be necessary to do this several times as part cools.

(3) Identify distributor block by drilling an indentation 0.125 inch diameter and 0.016 inch deep located as shown in Figure 708.

- H. Impregnate bronze bushing and coat distributor block as follows:

### NOTE:

Only "black" phenolic or buna rubber type distributor blocks (79) must be coated at each 500 hour inspection and at each overhaul period. DO NOT COAT POLYESTER "Brown" distributor blocks. Bronze bushings in all types of distributor blocks (79) must be oil impregnated at each 500 hour inspection and at each overhaul period. The bronze bushing in the distributor block (79) is impregnated with oil to provide proper lubrication for distributor shaft. The dielectric surfaces are coated to prevent moisture from collecting and possibly causing electrical failure. Care should be taken to keep coating away from bronze bushing and to keep oil from coated surfaces.

(1) Install a 10-70506-10S Protective cap over each end of bronze bushing in block (see Figure 709). Brushcoat all surfaces of the distributor block insulating material with 10-391400 Distributor Block Coating. Do not apply the coating to any exposed surface of the bronze bushing. Allow the block coating to dry for a minimum of 30 minutes before reassembling the block (79) to the housing (48) or gear assembly (72).

(2) Remove 10-70506-10S Protective Cap from electrode side of block and fill bushing with 10-391200 Distributor Block Lubricant.

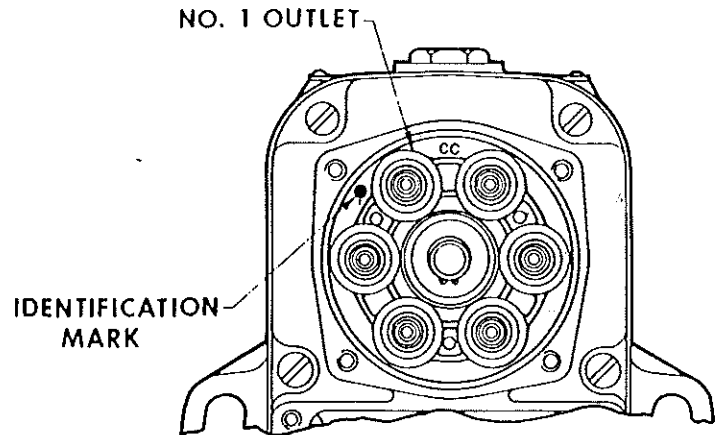


Figure 708. Location of Lubrication Identification Mark

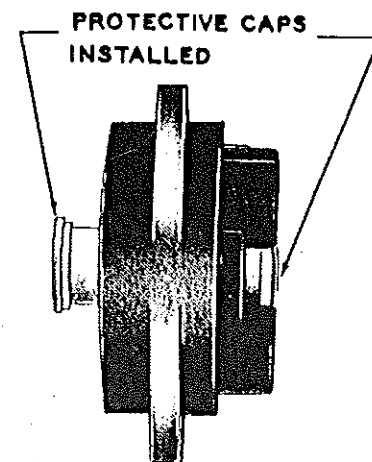


Figure 709. Protective Caps Installed

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(3) Using care not to spill oil on coated surfaces, place block in oven. Bake block at 190°F to 210°F for 2 to 3 hours.

(4) Remove block from oven and allow it to cool to room temperature. (Oil is absorbed into bushing during cooling).

(5) Carefully remove remaining 10-70506-10S Protective Cap and allow excess oil to drain from bushing.

- I. For all blocks, install a new dry felt strip (81), in groove on electrode side of distributor block. When strip is properly installed, approximately 1/16 inch of bushing shall be exposed above the strip.

#### NOTE:

Felt strip (81) must not be lubricated.

- J. For all blocks, before installing new felt washer (82) into the distributor block (79), saturate washer with 10-391200 Distributor Block Lubricant. Blot excess oil from washer until flat surfaces take on a "frosted" appearance, and seat washer in recess of block.

#### 7.2.5 Inspect Capacitor (42)

- A. Visually inspect capacitor (42) mounting brackets for cracks or looseness. Check capacitor lead for damaged insulation or loose connections. If any damage is found, discard capacitor (42).
- B. Using 11-1767-3 condenser tester, measured capacitance must be 0.30 microfarads minimum. Series resistance (for feed-through capacitors only) and leakage (for all capacitors) must be within limits as determined on tester.

#### 7.2.6 Inspect Coil (58) And Clamps (57)

- A. Ensure coil is of current design. Coil must exhibit red epoxy compound, external ground lead and part number 10-357164 or 10-357165 as shown in Figure 710. Coil may be cylinder or barrel shaped. Discard all old coils.

- B. Visually inspect coil (58)

(1) Inspect core laminations of coil (58) for wear at point of contact with pole shoe laminations in magneto housing. If wear is present coil will not fit tightly to laminations and must be replaced, regardless of electrical characteristics.

(2) Inspect leads for damaged insulation or loose connections. Discard coil with these conditions.

(3) Inspect high tension tab for wear caused by carbon brush (73), indicated by a visible depression in the tab. If tab is worn repair coil as specified in repair paragraph 8.2.1.

- C. Using 8840A Digital Ohmmeter, measure primary resistance between coil leads. Primary resistance shall be 0.2 to 0.6 ohms. Measure secondary resistance between ground lead and high tension tab. Secondary resistance shall be between 12,000 and 16,000 ohms. Replace coils that exceed either of these limits.

- D. Look at coil core clamps (57) closely. Obsolete design clamps not having identification mark shown in Figure 711 must be replaced with clamps having either a half moon indentation or a white dykem dot. Clamps with a circular indentation or no indentation must be discarded. Acceptable clamps may or may not have black oxide finish.

#### 7.2.7 Inspect Impulse Coupling (8) And Related Components

- A. Inspect impulse coupling stop pins (60) in housing (50). If stop pin is bent, damaged or shows signs of wear, remove pin from housing by using removal and replacement procedure outlined in paragraph 7.2.8, step F. Be certain to note from which hole pin is removed.

- B. Inspect Bushing (5).

(1) Inspect for wear or deformation. Look particularly at surface where lockwasher or nut contacts bushing. If wear or deformation is present, replace bushing (5).

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(2) Sintered iron bushing with shoulder must be replaced with machined steel bushings (5). The machined steel bushings have an undercut 0.062 x 0.005 in. Immediately behind the bushing shoulder (see Figure 712). Refer to illustrated parts list for correct part numbers. After compliance with this step magneto P/N 10-51360-30 becomes new P/N 10-51360-37. Overstamp the nameplate (52) with the new part number. All other part number magnetos complying with this step shall be identified by identifying by stamping a 1/8 inch high letter "B" in the lower left-hand corner of the nameplate. Discard old style bushing.

- C. Inspect the parts of impulse coupling separately as follows:

**CAUTION**

*Regardless of condition or appearance, all obsolete design coupling assemblies having riveted flyweights must be replaced with current parts having the flyweight axles integral with the machined coupling cam. See Figure 713.*

- (1) Ensure that impulse coupling cam flyweights have been properly heat treated as follows:

**NOTE:**

Cam assemblies with yellow paint (dykem or lacquer) on the heel of each flyweight or with stamped numbers on flyweight as shown in Figure 714 or with more than 300 hours service are not subject to this test. Proceed to step (b).

- (a) Use finger pressure to push inward on the toe of a flyweight so that the heel points outward. Then, using a fine #1, double cut, 1/2 in. wide file at least 3/32 in. thick, pass the file across the heel of the flyweight and attempt to remove material. Repeat for other flyweight. File should "glide" smoothly over the heel of the flyweight and remove no material. If the flyweight is soft, the file will not "glide" easily and material will be removed. Impulse coupling cams with soft flyweight(s) should be discarded and replaced with a cam with flyweights marked as specified in above Note.

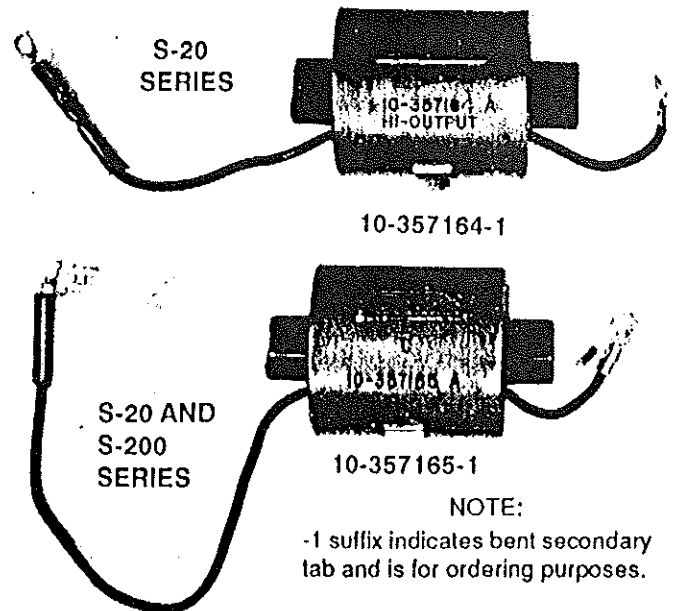


Figure 710. Current Design Coils (58)

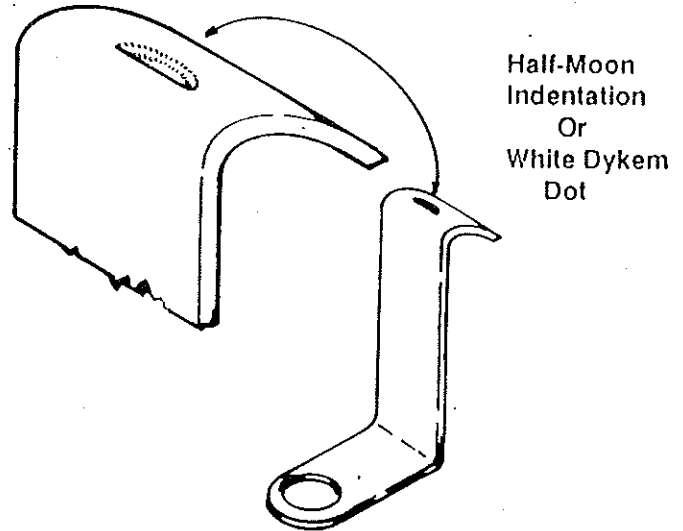


Figure 711. Current Design Clamp (57)

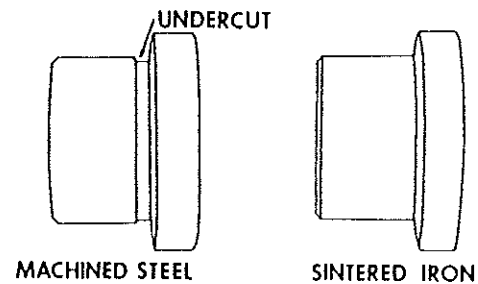


Figure 712. Machined Steel and Sintered Iron Bushings

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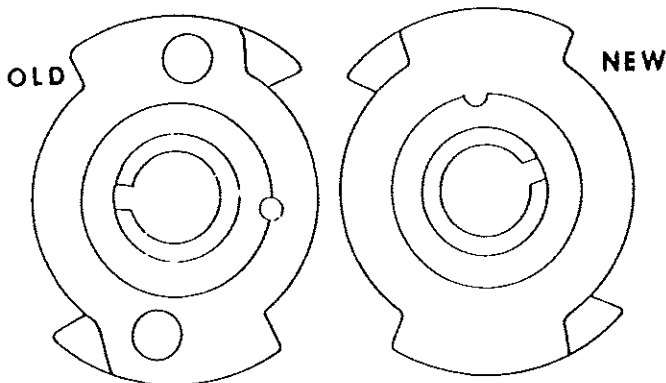
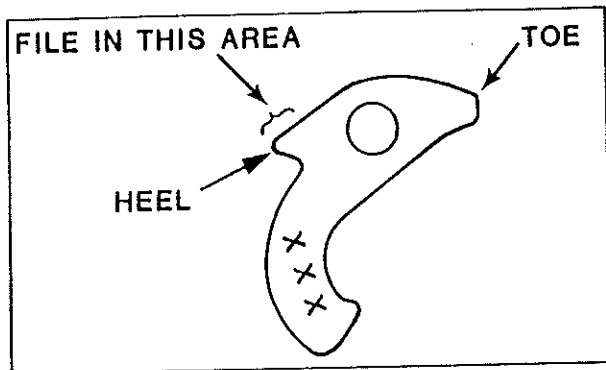


Figure 713. Old and New Coupling Cam Assemblies



**NOTE:**  
XXX Indicates location of stamped numbers.  
Figure 714. Soft Flyweight Check

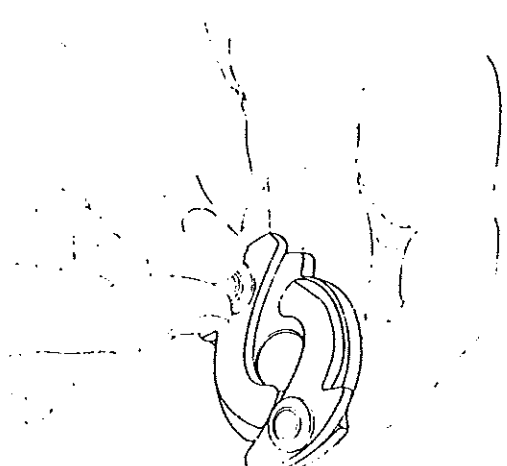


Figure 715. Inspection of Flyweight Securing Washers

(b) Make an appropriate log book entry signifying compliance with this step, mark heel flyweights on good cam with yellow dykem or yellow lacquer. If numbers are not stamped, and stamp a 1/16 in. high letter F in the upper right-hand corner of the identification plate.

(2) Visually inspect flyweight securing washers and flyweights, particularly in area around axle hole, for cracks. Grip washer with fingers as shown in Figure 715, and exert a turning force in each direction attempting to move the washer. If washer moves or any cracks are found, reject and replace the cam assembly.

**CAUTION**

*Never attempt to repair any part of a rejected cam and flyweight assembly.*

(3) Inspect drive lugs of body. If wear is noted, measure difference between worn and unworn areas of drive lug surface. If difference is in excess of 0.015 in., reject body (9). See Figure 716.

(4) Inspect ears of coupling body (9) for grooves worn by tail of flyweight and wear at triggering ramp and cam stop contact areas. (See Figure 717) If either ear shows a perceptible groove or a ridge can be felt when fingernail is drawn across surface, reject body (9).

### 7.2.8 Inspect Magneto Housings (48 and 50) and Cover (15)

A. Examine both housings (48 and 50) for cracks, stripped threads or other damage. Check bearing outer race seats in both housings for wear or "peening" due to operation with loose bearings. If these bearing bores are worn, or oversize, the housing must be replaced. Oversize bearing bores can be determined if, at the time of assembly of new bearing races, an interference or "press-fit" condition is not obtained.



# System Support Manual

## S20/S-200 MAGNETO IGNITION SYSTEM

### CAUTION

*Do not attempt to repair worn bearing bores by knurling, staking, punch marking or any other means. If bearing bores are oversize, replace housing. Do not reuse housings which have been staked or punched.*

- B. Inspect coil seat areas in magneto housing (50) for wear. See Figure 718. If a ridge can be felt when fingernail is drawn across coil seating surface at top of pole shoe laminations, replace housing.
- C. Check inner face of housings for surface irregularity in coil area as shown in Figure 719. Rework affected areas, using a small grinding wheel or a chisel and emery cloth. Reworked area should be smooth, flat and free of irregularities as shown in Figure 720. Remove all residue from housing and cover reworked area with a coat of zinc chromate primer or aluminum paint.
- D. Replace housing (48 or 50) if evidence of corrosion or galling is found at mating surfaces of housings.
- E. Inspect cover (15) for cracks, stripped threads or other damage. Replace as necessary.
- F. Inspect impulse coupling stop pin (60). If bent or damaged, remove or replace as follows:
  - (1) Remove pin (60) using a steel bar, 1/4-20 nut and a few plain washers as shown in Figure 721. The bar should be about 1 x 3 x 1/4 inch with a hole big enough to fit over the stop pin drilled in the center. Make careful note of which hole pin was removed from.
  - (2) Place housing (50) on a wood block and press new stop pin (60) into position using an arbor press. The dimension from top surface of pin to face of mounting flange shall be  $.688 + .016 - .000$  inch for all types except housing (50) P/N 10-81942 used with S6RN and S6LN-25 magnetos, in which case the dimension shall be  $.500 + .016 - .000$  inch.
  - (3) If new pin is loose in housing, housing must be replaced.

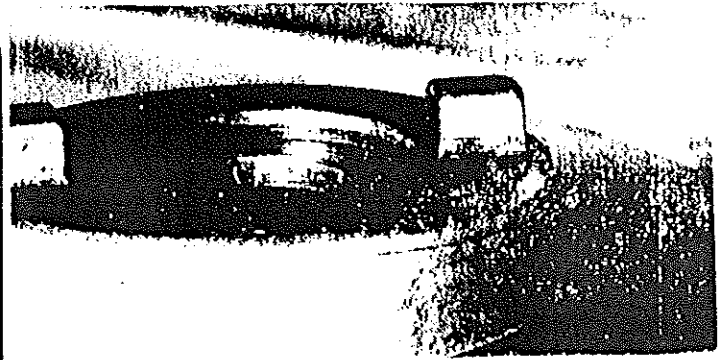


Figure 716. Worn Drive Lug

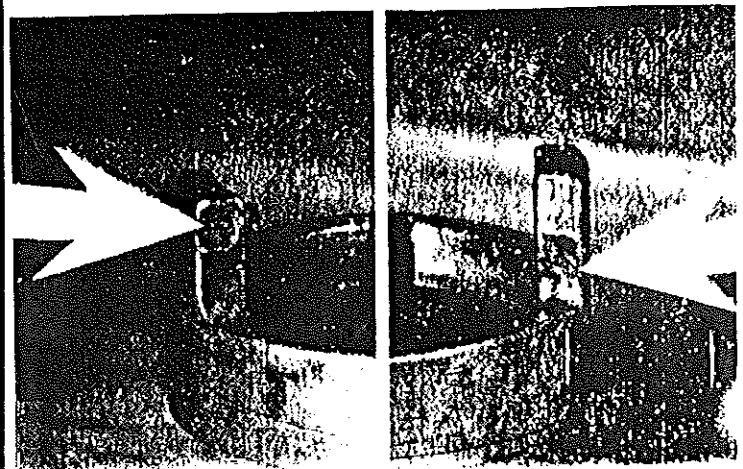
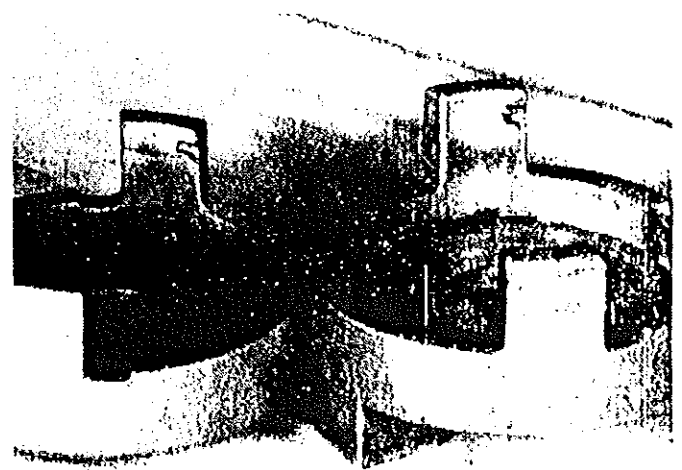


Figure 717. Points of Coupling Body Wear



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Figure 718. Wear in Coil Seat Area

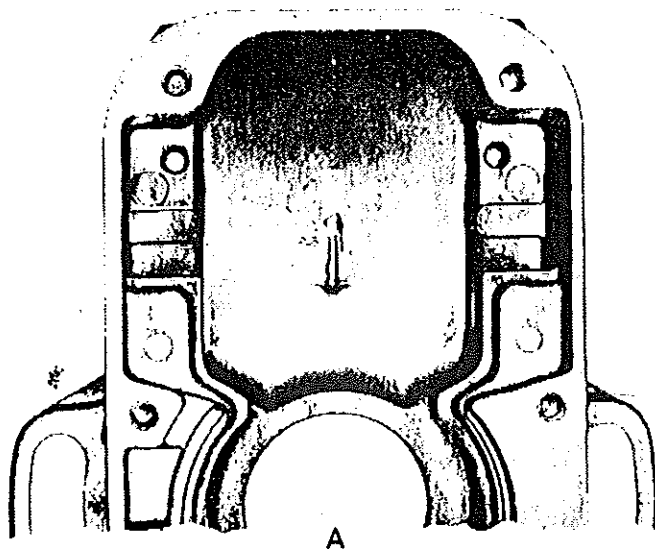


Figure 719. Rework of Magneto Housing

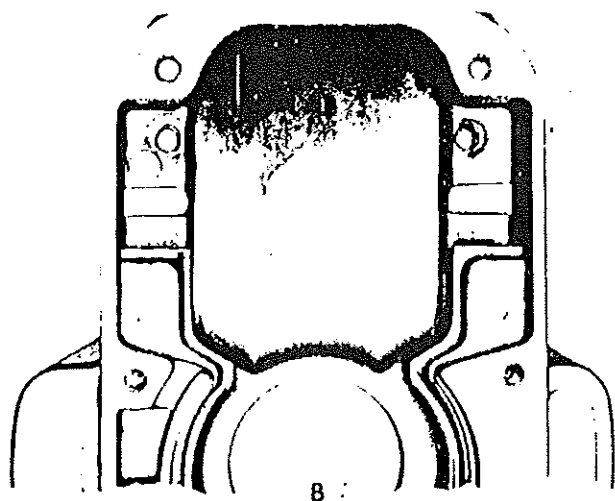


Figure 720. Rework of Magneto Housing

- G. Inspect retard lead assembly (23) for deformed insulating washer and secureness of solder joints. Examine spring washer for broken or cracked locking ears. Check lead wire for broken conductor strands or damaged insulation. Replace lead (23) if any defects are found. The insulation sheet (24) should be replaced at each overhaul.
- H. If cover (15) incorporates tachometer leads, inspect terminals for proper attachment to leads. Examine leads for damaged insulation. Check grommet in cover for damage. Replace any damaged components.

### 7.2.9 Inspect Rotating Magnet (54)

- A. Inspect magnet (54) for damaged threads, cracks in magnet casting, scored or otherwise damaged laminations, and wear or galling in bearing, cam and gear seat areas. Reject magnet if any of these conditions are found.

CAUTION

*Regardless of configuration or appearance, all obsolete design rotating magnets of configuration pictured in Figure 722 must be replaced with new magnets without brass inserts or rotor flats.*

- B. Visually inspect drive end of magnet shaft for grooves or scratches that might allow oil to enter under sleeve bearing.

### 7.2.10 Inspect Sleeve Bearing (69)

- A. Inspect sleeve bearing (69) to determine whether it is of old or new design. The new design is steel and has a ground finish characterized by a bright silvery surface. The old design is sintered iron which has a dull gray appearance. Regardless of condition, all old type sleeve bearings must be replaced with the new steel type. See Figure 723.
- B. If magneto already incorporates new sleeve bearing (69), inspect for scratches, pits or scoring that might allow oil to enter magneto. If sealing surface of steel sleeve bearing is worn, bearing can be reversed when installed to provide an unused surface. If sleeve bearing is worn at both locations, it must be replaced.

# System Support Manual

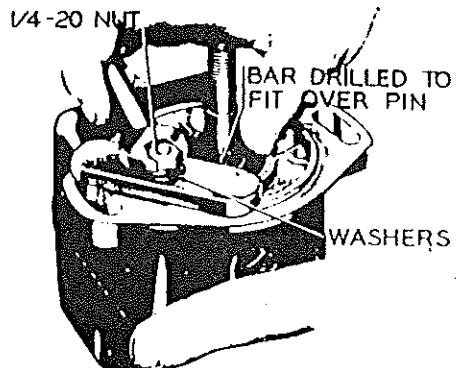
## S20/S-200 MAGNETO IGNITION SYSTEM

### 7.2.11 Assemble Magneto

Assemble Magneto as Specified in ASSEMBLY

### 7.2.12 Test Magneto

Test Magneto as Specified in TESTING AND FAULT ISOLATION



NOTE: RUN NUT TO END OF THD THEN REMOVE NUT. ADD MORE WASHERS AND REPEAT UNTIL PIN IS PULLED FROM FLANGE

Figure 721. Pulling the Impulse Coupling Stop Pins

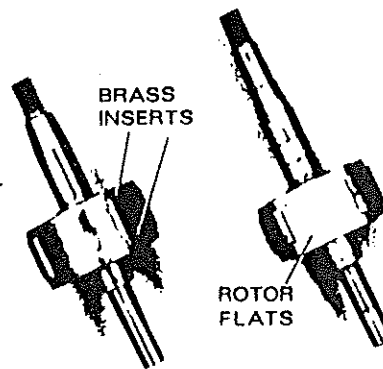


Figure 722. Magnets to be Replaced

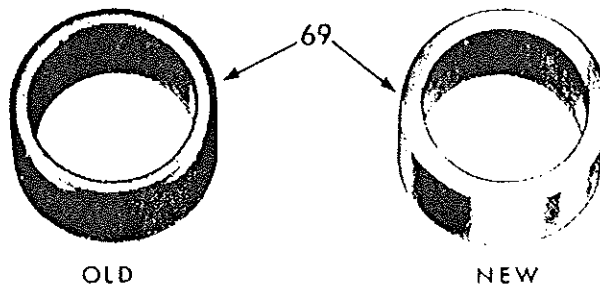


Figure 723. Old and New Sleeve Bearings

**System Support Manual**  
**S20/S-200 MAGNETO IGNITION SYSTEM**

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# System Support Manual S20/S-200 MAGNETO IGNITION SYSTEM

## SECTION 8. REPAIR

### 8.1 GENERAL

Refer to ILLUSTRATED PARTS LIST Figure 1 for Magneto Exploded View.

Refer to Table 801 for a list of materials and tools required for repair.

**Table 801  
Repair Materials and Tools**

Material/Tool	Description
Alcohol Local Purchase	Used to repair coil tab
Non-Corrosive Flux Local Purchase	Used to repair coil tab
50/50 Solder Local Purchase	Used to repair coil tab
10-76257 Contact	Used to repair coil tab

### 8.2 DETAILED REPAIR PROCEDURES

#### 8.2.1 Repair of High Tension Pad of Coil (58)

- A. Place a piece of phenolic or metal between the terminal pad and coil to prevent drill damage to coil. Drill a 1/8 Inch (3.2 mm) hole through center of high tension terminal pad.

- B. Clean face of terminal and pretin with 50/50 solder and non-corrosive flux. Then pretin entire protrusion side of 10-76257 contact.
- C. Position contact so protrusion extends through 1/8 inch hole in terminal pad. Flow solder between pretinned parts with a suitable soldering iron to make a good electrical joint.
- D. After contact and terminal have cooled, clean with alcohol. Check the  $90^\circ \pm 2^\circ$  angle as indicated in Figure 801. Dimension A shall be 1.246 inch.
- E. Inspect coil as specified in GENERAL OVERHAUL, paragraph 7.2.6.

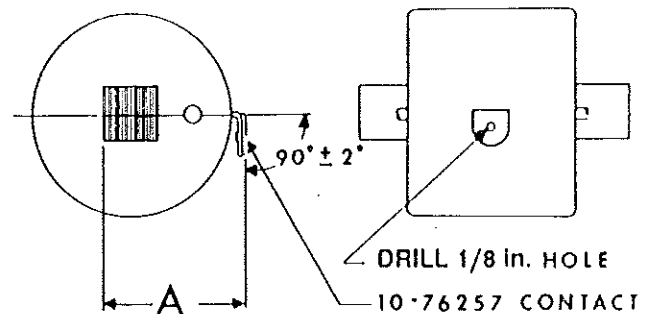


Figure 801. Correct Terminal Dimensions

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# System Support Manual

## S20/S-200 MAGNETO IGNITION SYSTEM

### ASSEMBLY

#### 9.1 GENERAL

Refer to Table 901 for a list of materials and tools required during assembly.

#### NOTE

Main and retard contact assemblies (39 IPL Figure 1), lock washers (34, 3 13), screws (41, 56, 78, 47, 12, 61), retaining ring (74), bearings (64, 70), felt strip (81), felt washer (82), oil deflector (55), identification plate (52), carbon brush (73), and pin (1) shall be replaced after each disassembly with new parts. Also, if installed, spring (10), and gaskets (14, 49), shall be replaced after each disassembly with new parts.

**CAUTION**

*Proper torque where specified in assembly instructions is an imperative requirement to the airworthiness of equipment.*

**Table 901  
Assembly Materials and Tools**

Material/Tool	Description
10-27165 Magneto Grease	Used to pack bearings (64,70) and to lubricate gear (72) teeth.
10-86527 Breaker Felt Lubricant	Used to lubricate felt of contact assembly (39)
10-391200 Distributor Block Lubricant	Used to lubricate distributor block (79) bushing
Go-Jo No-Lok Compound #72 Go-Jo Industries P. O. Drawer 991 Akron, OH 44309	Used to prevent drive members from locking onto rotating magnet shaft taper
MS122 Fluorocarbon Spray Miller-Stephenson Chemical Company P. O. Box 950 Danbury CT. 06813	Used to coat harness grommets to prevent sticking to distributor block (79)
11-6924-1 Drift	Used to install press fit parts
11-8150-1 Timing Kit	Used to aid magneto internal timing
11-8465 Rotor Holding Tool	Used to aid magneto internal timing
11-8627 Spring Seating Kit	Used to seat springs (80) in distributor block (79)
11-9110-1 Timing Light	Used to aid magneto internal timing
11-10600 Magnet Charger	Used to charge rotor (54)
Tru-Arc Retaining Ring Pliers No. 2 Waldes-Kohlnoor Long Island City, NY 11101	Used to install retaining ring (74) onto distributor gear shaft (72)

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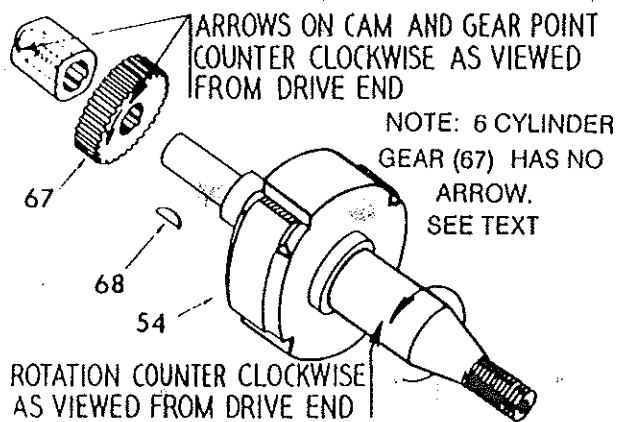
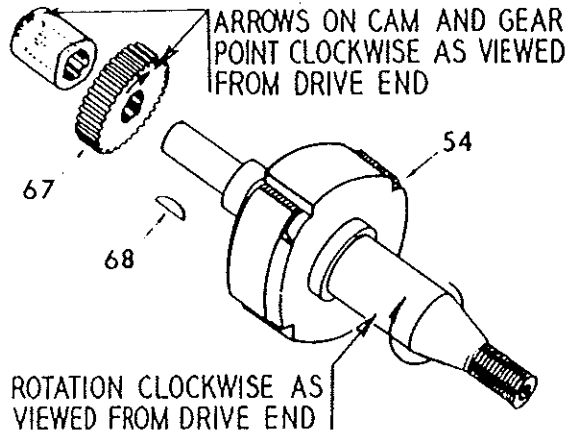


Figure 901. Correct Assembly of Gear and Cam

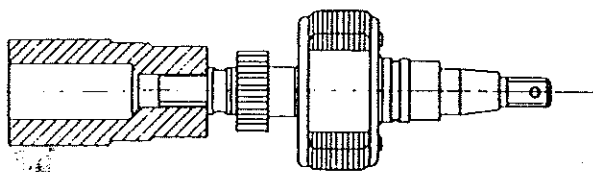


Figure 902. Installing Cam End Bearing Inner Race

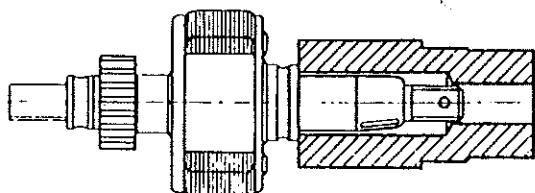


Figure 903. Installing Drive End Bearing Inner Race

### 9.2 DETAILED ASSEMBLY PROCEDURES

#### 9.2.1 Assembly of Bearings (64, 70), Gear (67), and Cam (63)

##### NOTE:

Rotating magnets which are found serviceable should be charged before installation in magneto.

- A. Support shaft of magnet (54) on a block of wood, tap small distributor gear key (68) into keyway and assembly gear (67) to shaft as follows:

(1) Four cylinder magnetos incorporate a small gear (67) which has an arrow on each side. If magneto is of clockwise rotation, install gear on shaft so arrow points in a clockwise direction when viewed from the drive end. See Figure 901. If magneto is of counter clockwise rotation, arrow must point in a counter clockwise direction when viewed from the drive end.

(2) Six cylinder magnetos incorporate a small gear (67) which has a chamfer on only one end of the tooth. There are no arrows on this gear. Chamfered end of tooth must be toward magnet when installed.

- B. Place plain washer (66) on shaft next to small gear, followed by original shim washers (65). Using small end of the 11-6924-1 Pressing Tool and an arbor press, press inner race of new bearing (64) on magnet shaft lettered side out. See Figure 902.
- C. Position original shim washers (71) on drive end of magnet shaft. Using large end of the 11-9624-1 Pressing Tool, press inner race of the new bearing (70), lettered side out, onto shaft. See Figure 903.
- D. Place cage assemblies of bearings (64 and 70) on their respective inner bearing races positioned on magnet shaft.



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- E. Using large end of the 11-6924-1 Pressing Tool and an arbor press, seat outer races of bearings (64 and 70) in magneto and distributor housing. See Figure 904.

**CAUTION**

*If bearings are not a press fit in housings, do not attempt to repair worn bearing seats by knurling, staking, punch marking or any other means. If bearing seats are oversize, replace housing.*

- F. To determine the proper bearing preload, temporarily assemble magnet (54) with gear, bearings and original shim washers in place into housings (48 and 50), using gasket (49) when applicable. Install screws with lockwashers (47) to secure housings together. To avoid possibility of excessive bearing preload, test magnet for free turning as screws are tightened. Magnet must turn freely and have no perceptible end play. If bearings become tight as screws are tightened, disassemble and remove about 1/4 of the shim washers on each side of magnet. Reassemble magneto and tighten screws with 30 to 35 lb-in. of torque. Hold magnet firmly in one hand, and while pushing inward as hard as possible on shaft, try magnet for radial play by rocking magnet up and down. If any play can be felt add a thin shim washer and repeat test.
- G. When proper bearing preload is achieved, magnet shall spin freely and there shall be no perceptible axial or radial play of the rotor shaft. If either a tight or loose condition is found, entire shimming procedure must be repeated.

**CAUTION**

*If magnet turns with any feel of binding or rubbing, this indicates the magnet shaft is probably bent. Do not attempt to straighten a bent magnet shaft. Replace the magnet (54).*

- H. After satisfactory preload is obtained, separate distributor and magneto housings and remove rotating magnet. Pack Magneto Grease 10-27165 in ball cages of bearings (64 and 70).

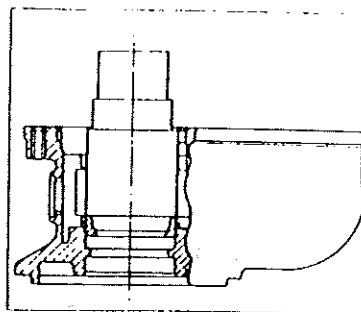


Figure 904. Installing Bearing Outer Race

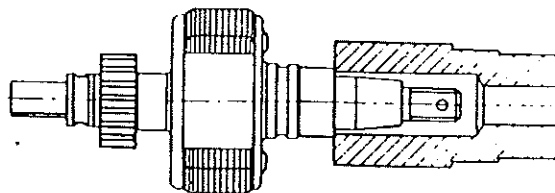


Figure 905. Installing Sleeve Bearing

- I. Position sleeve bearing (69) on drive end of magnet shaft and press into place using the 11-6924-1 Pressing Tool as shown. A small amount of oil on shaft will help prevent damage to sleeve bearing. See Figure 905.
- J. Place cam (63) on shaft so arrow on cam points in a clockwise direction for a clockwise rotating magneto or in a counter clockwise direction for a counter clockwise rotating magneto as viewed from the drive end. See Figure 901. Using screw with lockwasher (61) and plain washer (62), secure cam in position with 21 to 25 lb-in. of torque. Wipe contour of cam with a clean cloth dampened with Breaker Felt Lubricant 10-86527.

**CAUTION**

*If self-locking screw is removed or loosened at anytime, always replace with a new self-locking screw and apply torque to the specified value.*

**CAUTION**

*The current design plain washer (62) for cam securing screw is  $.096 \pm .010$  inch thick. Before installing, measure thickness and replace washer if it is not  $.096 \pm .010$  inch thick.*

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### 9.2.2 Assembly of Coil (58) Into Housing (50)

Place coil (58) in position in magneto housing (50) so coil primary lead will fit into housing slot provided for it. Secure coil and ground lead to magneto housing using screws with lockwashers (56) and coil core clamps (57). If lamps do not have the marking shown in Figure 714 they must be replaced. Tighten screws (56) with 20 to 25 lb-in. of torque. Press insulating sleeve on primary lead into recess in housing.

**CAUTION**

*After installing coil, check carefully to make sure coil core clamps secure coil tightly to pole shoes in housing. If there is any play at this point, vibration will cause wear and subsequent loosening of the parts.*

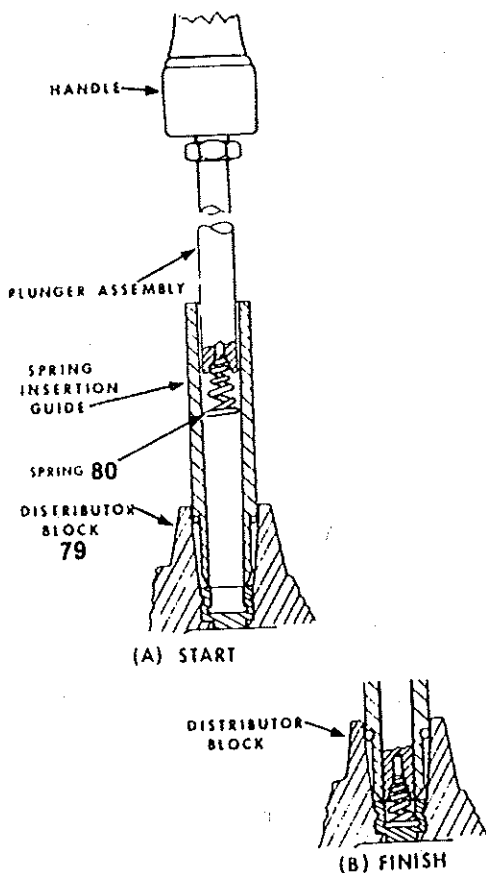


Figure 906. Installing Contact Springs

### 9.2.3 Assembly of Distributor Block (79) and Gear (72)

- A. If new contact springs (80) are to be installed in distributor block (79), use the 11-8627 Spring Sealing Kit. Insert the 11-8626 Spring Insertion Guide in cable outlet hole of distributor block as shown in Figure 906. Place contact spring (80), large end down, in top of the 11-8626 Guide and position the 11-8625 Plunger Assembly with the 11-3699 Handle attached, over the small end of spring. See Figure 906. With a firm counter clockwise pushing motion, seat spring in recess of block (79). Spring is properly installed when bottom turn is caught in groove of block and top turn is approximately centered in outlet. See Figure 906. Check spring height in accordance with paragraph 7.2.4.E.
- B. Position block (79) in distributor housing (48) and install screws with plain and lockwashers (78). Tighten all screws evenly with a torque of 16 to 20 lb-in.
- C. Saturate a new, or clean, undamaged felt washer (82) with Distributor Block Lubricant 10-391200. Blot excess oil from washer until flat surfaces take on a "frosted" appearance, and seat washer in recess of block.
- D. Assemble nylon washer (77) and steel skid washer (76) (0.562 in OD) onto gear (72) shaft. Slide large distributor gear (72) into place. Install washer (75) (0.750 in OD) and retaining ring (74). Be sure retaining ring snaps firmly into mating groove. If ring is a loose fit, replace it. Do not attempt to reform ring. Install new carbon brush (73) in gear.

**NOTE:**

The carbon brush in the large distributor gear may be a loose fit. Do not tip distributor housing at an angle that will allow brush to fall out.

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### S20/S-200 MAGNETO IGNITION SYSTEM

#### 9.2.4 Assemble Rotating Magnet (54) Into Housings (48, 50)

- A. Coat housing pole shoes and magnet pole pieces with rust preventive. Spread 3 drops of SAE No. 30 oil on surface of sleeve bearing (69). Position magnet (54) in distributor housing (48), being careful not to damage cam as it enters contact compartment.
- B. Mesh distributor gear (72) with pinion gear (67) such that chamfered tooth of pinion gear (67) aligns with mark painted in accordance with paragraph 7.2.2 step E. See Figure 907.
- C. From lead of coil at a right angle with magnet housing so it can be threaded through passage in distributor housing and into breaker compartment. Position gasket (49), if used, between housings (48 and 50). Push housings straight together, allowing magnet shaft to extend through distributor housing. Be sure bearing parts mate properly. Do not allow housings to twist or turn as this may break carbon brush. See that carbon brush rests on coil high tension terminal and secure housings together using screw with lockwashers (47) tightened with sealing torque of 4 to 8 lb-in. When all screws have been seated, final tighten with 25 to 35 lb-in. of torque and recheck to make certain magnet turns freely and has no bearing play.

#### 9.2.5 Assemble Contact Assemblies (39)

- A. Before installing new contact assemblies (39), check follower felt for adequate lubrication by squeezing felt tightly between thumb and forefinger. If fingers are moistened with oil, felt is adequately lubricated and no more oil is needed. If not, apply three drops of Breaker Felt Lubricant 10-86527 to the felt pad. Allow about 30 minutes for oil to penetrate into felt and its thinner to evaporate. Avoid getting oil on contacts. Blot off excess oil with a clean cloth.

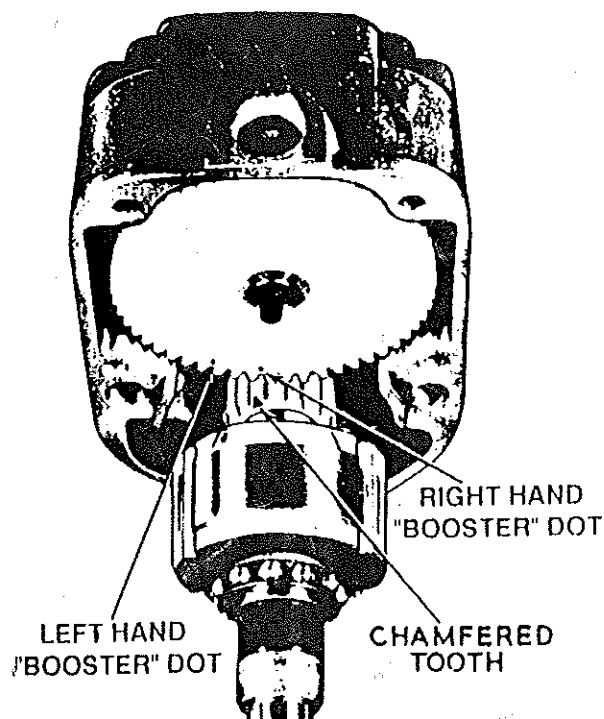


Figure 907. Correct Meshing of Distributor and Drive Gears Counterclockwise S6LN Type Magneto with Retard Contact

#### NOTE

Tungsten contact points used in these magnetos are capable of satisfactory performance over extremely long periods, if not contaminated. The presence of oil on contacts will tend to attract and hold contaminating metallic particles which may be airborne in the shop area. Contact assemblies should not be removed from protective containers until ready for installation. At installation, any oil on contact surfaces must be carefully blotted off with a clean hard cardboard, such as a business card, making sure no paper particles are left between the contact surfaces.

- B. Install contact assemblies (39) in contact compartment. Main and retard contact assemblies both require a screw with lockwasher (36) at pivot end, and a screw with lockwasher (36) and plain washer (37) at slotted end. If an insulated tachometer contact assembly is used, install contact assembly, insulating plate (40) and bushing (38) with screws and lockwashers (36) and plain washer (37). Do not tighten contact securing screws fully until final adjustment of contacts.

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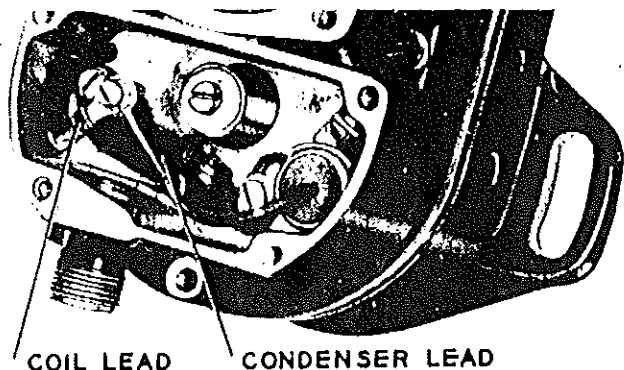


Figure 908. Correct Assembly of Leads to Contact Assembly

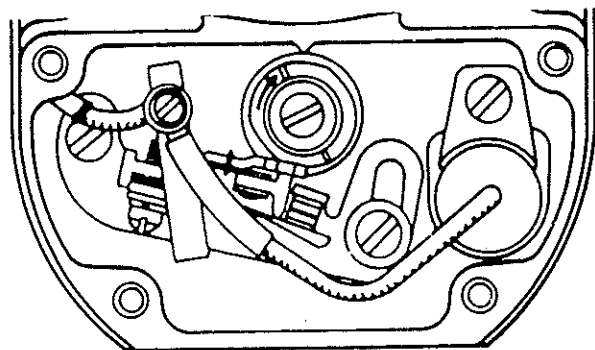


Figure 909. Lead Routing with Ground Terminal in Flat-Type Cover (15)

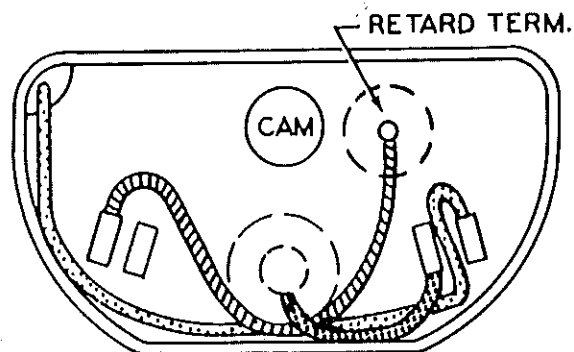


Figure 910. Forming Leads in Contact Compartment of Magneto with Counterclockwise Rotation

### 9.2.6 Assemble Capacitor (42)

- A. Secure capacitor (42) in contact compartment using screw with washer (41) and 20 to 25 lb-in. of torque. If feed-through capacitor is used, secure capacitor to contact cover (15) using screws with lockwashers (41) and 8 to 12 lb-in. of torque.
- B. For Capacitor mounted in housing (48), connect coil primary lead and capacitor lead to contact assembly with screw (33) and lockwasher (34), tightened with 8 to 10 lb-in. of torque. Magnetos having a ground terminal on flat-type contact cover use a separate ground terminal spring (35). This spring must be assembled at the same time leads are connected and must fit directly against bracket of breaker assembly to assure correct positioning. Ensure coil primary lead does not rest against edges of housing (48). See Figures 908 and 909. For capacitors mounted in cover (15) connect coil primary to main contact as shown in Figures 910 and 911. Set capacitor (42) and cover (15) aside until after magneto is timed.

#### NOTE:

The carbon brush in the large distributor gear may be a loose fit. Do not tip distributor housing at an angle that will allow brush to fall out.

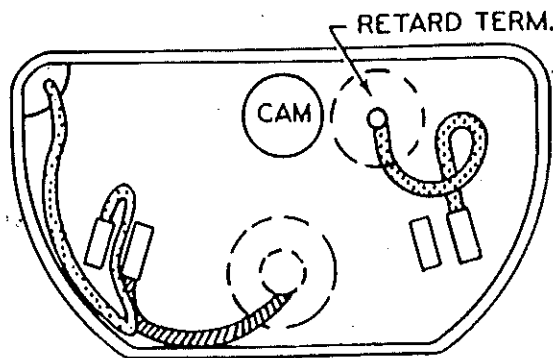


Figure 911. Forming Leads in Contact Compartment of Magneto with Clockwise Rotation

# System Support Manual

## S20/S-200 MAGNETO IGNITION SYSTEM

### 9.2.7 Install Oil Seal (59) and Oil Slinger (55)

- A. Wipe lip of new oil seal (59) with SAE No. 30 oil. Carefully slide oil seal onto magnet shaft, avoiding contact with threads or keyway, and position seal squarely at edge of recess in housing. Place magnet in an arbor press with contact compartment rim supported by a block of wood and press oil seal into position with the 11-6924-1 Pressing Tool. See Figure 912
- B. Rest cam securing screw on wooden block and press new oil deflector (55) up against sleeve bearing using the 11-6924-1 Pressing Tool.

**CAUTION**

*After installing oil seal and deflector, check torque of cam securing screw (61) for 21 to 25 lb-in. to make sure cam washer (62) did not deform during pressing operation. Replace washer, if deformed.*

### 9.2.8 Assembly & Installation of Impulse Coupling (8) and Stop Pins (60)

If impulse coupling (8) is used, assemble coupling as follows:

- A. Check cam assembly (11) and body (9) for magnetization which would prevent flyweights from engaging. Hold assembly as shown in Figures 913 and push upper position flyweight tail against body (9). When released, flyweight tail must drop down. If flyweight tail sticks to body, parts are magnetized and coupling may not function. Perform test on both flyweights.
- B. To demagnetize, place body (9) over shaft of a charged rotating magnet and spin body rapidly by hand. While body is still spinning, invert rotating magnet so body falls off. Catch body in hand and repeat test for magnetization.
- C. Clamp one drive lug of body (9) in a padded jaw vise with the spring recess side up.

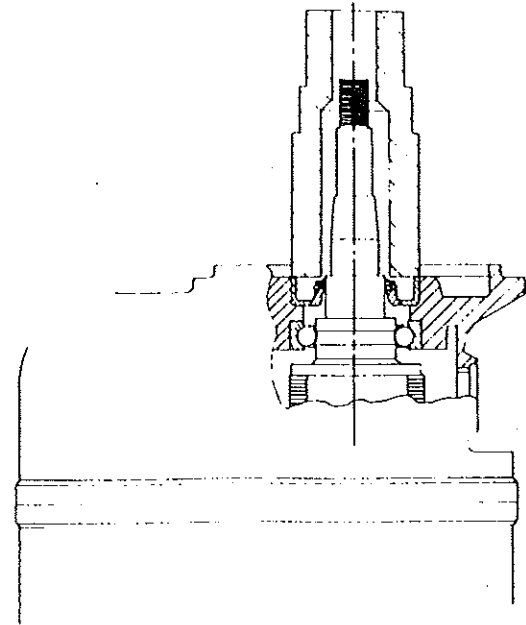


Figure 912. Installing Oil Seal

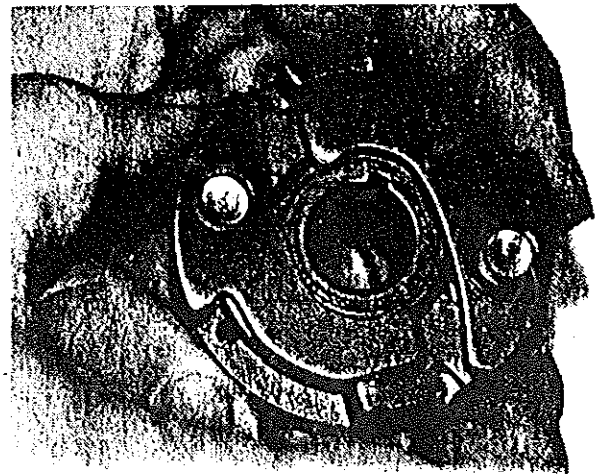


Figure 913. Checking Impulse Coupling for Magnetization

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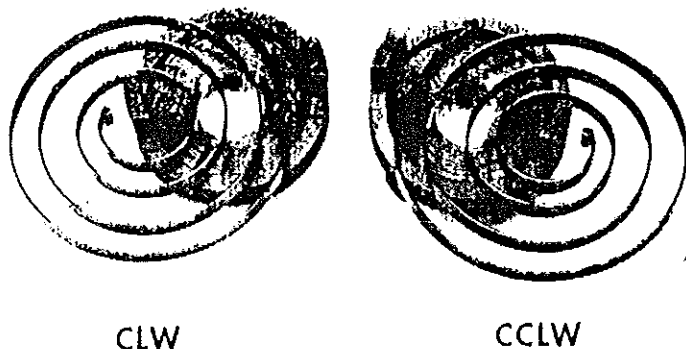


Figure 914. Orientation of Spring In Coupling Body



Figure 915. Lifting Inner End of Spring

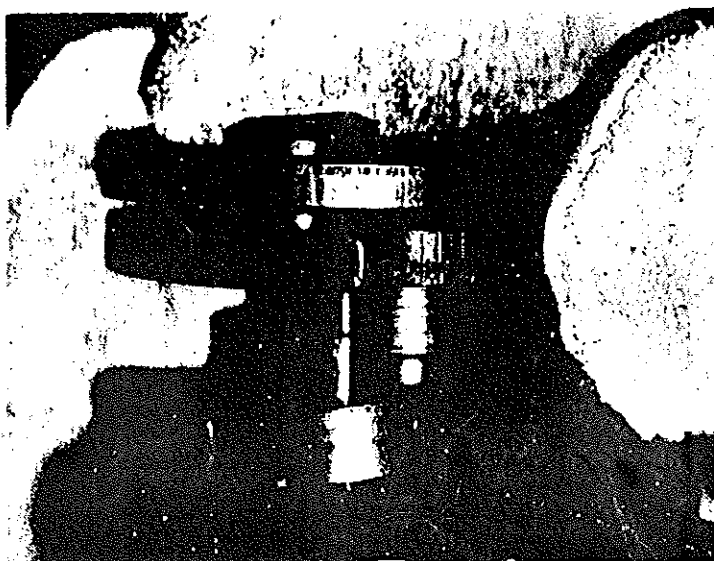


Figure 916. Engaging Spring and Cam

- D. Orient spring (10) with body (9) for correct rotation. On clockwise couplings, spring must coil in a clockwise direction from the outside toward the center when viewed from the spring recess side of body. On counterclockwise couplings, spring must coil in a counterclockwise direction when viewed from spring recess. Insert eye of outer end of spring (10) into hole drilled in inner rim of body (9). See Figure 914.
- E. Using heavy gloves to protect the hands, wind spring (10) into body (9) manually, lifting spring coils one at a time over projections on body. Extreme care should be used to avoid scratching or nicking the spring. After winding spring, brush a coating of light oil over spring coils.
- F. Pry up one and one half turns at inner end of spring with a small screwdriver and support in position as shown in Figure 915.
- G. Engage recess in hub on cam assembly (11) with eye at inner end of spring. See Figure 916. With eye engaged, rotate cam assembly slightly in direction to unwind spring to permit hub of cam to slip inner turn of spring. Rotate cam in opposite direction, winding spring slightly, until projections on edge of cam (11) clear over projections on body (9). Push cam assembly down into body, at the same time taking the screwdriver out.
- H. Insert a spare rotating magnet, with woodruff key installed in taper, into cam assembly. See Figure 917. Turn magnet slightly in direction of coupling rotation (to wind spring). Lift magnet with cam only enough to clear projections on body. Wind spring one half turn and re-engage cam assembly into body.

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- I. Apply light coating of 10-27165 Magneto Grease to impulse coupling stop pins to point where impulse coupling flyweights strike them.
- J. To install the impulse coupling on the magneto shaft, first apply a thin coating of GO-JO NO-LOK compound 72 to the taper of the rotating magnet shaft. (See Figure 916). This reduces seizure of the cam assembly to the shaft. Install woodruff key (53) in tapered portion of shaft, install coupling assembly (8) and washer (4). If applicable, install drive member woodruff key (53), and bushing (5). Install lockwasher (3) if used, and thread nut (2) onto shaft.
- K. Inspect coupling as described in Periodic Maintenance, paragraph 6.2.2.

#### 9.2.9 Magneto Timing Procedure

- A. Position 11-8465 rotor holding tool onto rotor (54) use bushings, washers and nut as necessary to hold tool securely on rotor. See Figure 919.

**CAUTION**

*When timing magneto on bench or when installing magneto on engine, no gear holding device should be used as hidden gear tooth damage may result.*

- B. Install the 11-8693 Timing Plate Assembly of the 11-8150-1 Timing Kit to contact compartment of magneto. See Figure 920. Turn rotating magnet in direction of normal rotation until painted charfered tooth on distributor gear is approximately centered in inspection window. Then turn it back until magnet locates in its neutral position.

**NOTE:**

The neutral position is located by "feel" of rotating magnet. As magnet is turned a few degrees backward from where distributor tooth is centered in inspection hole, magnet will have a natural tendency to "pull in" and locate in the neutral position.

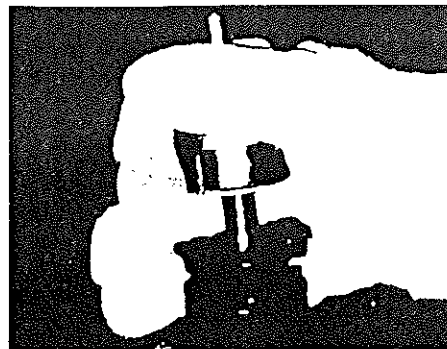


Figure 917. Winding Coupling Spring

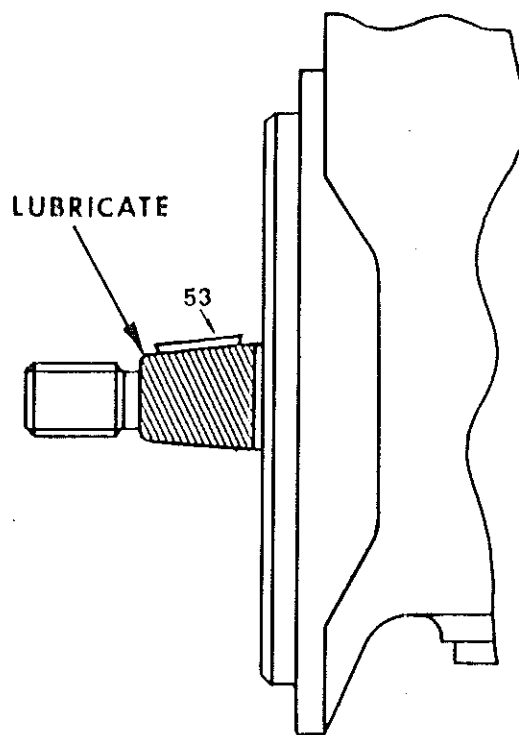


Figure 918. Applying Compound to Magnet Shaft

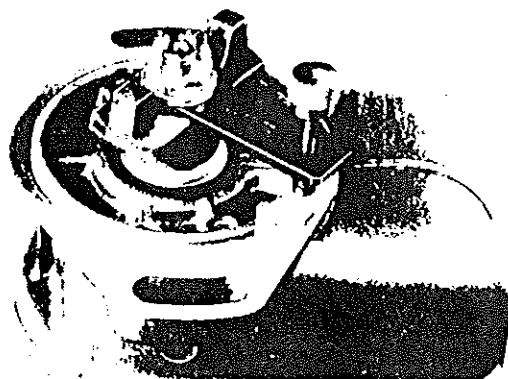
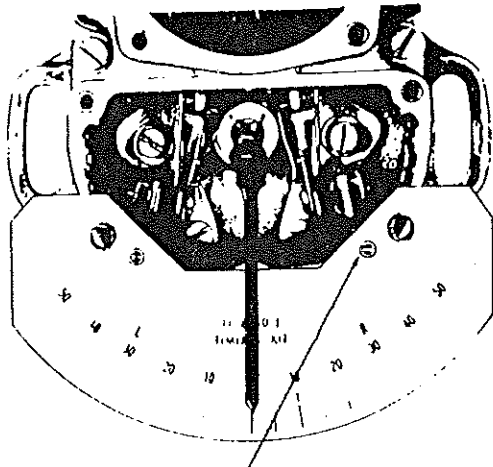


Figure 919. Rotor Holding Tool Installed

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PLUGS INSERTED IN BREAKER COVER SCREW HOLES.

Figure 920. Timing Kit Installed on Housing

- C. Tighten adjusting knob of rotor holding tool, locking rotating magnet in this neutral position. Install the 11-8149 Pointer Assembly on cam screw and align pointer with zero degree mark on timing plate.

**CAUTION**

*Tighten adjusting knob of holding tool only enough to hold magnet firmly in desired position. Over tightening may cause damage to drive end bearing.*

- D. Loosen adjusting knob of rotor holding tool and turn rotating magnet in normal direction of rotation until pointer indexes with respective 10° mark ("E" gap) and tighten holding tool. Using the 11-9110-1 Timing Light, or equivalent, adjust main contact points to open at this position.

**NOTE:**

Main contact of a clockwise magneto is located on the left hand side of contact compartment looking into contact compartment. Main breaker of a counterclockwise magneto is on the right.

- E. Loosen rotor holding tool and turn rotating magnet until cam follower of main contact assembly is on high point of cam lobe. Tighten holding tool in this position and measure contact point clearance. Clearance must be  $.018 \pm .006$  inch. If clearance is over .024 inch, readjust contact to .024 inch opening. If clearance is under .012 inch, readjust contact to .012 inch opening. If contact assembly was readjusted, recheck "E" gap. Replace contact assembly if "E" gap is less than 6° or more than 14°.

**NOTE:**

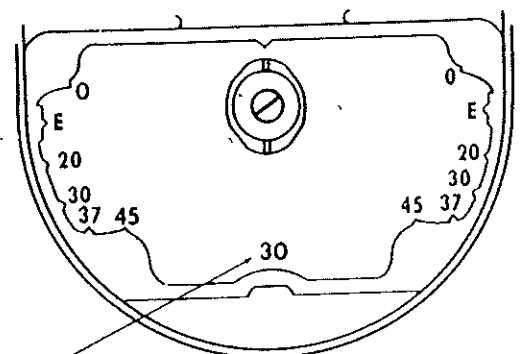
Current production contact assemblies are jig assembled to eliminate the problem of tolerance accumulations which might make contact replacement necessary.

- F. On retard contact assembly magnetos, the retard contact assembly is adjusted to open a predetermined number of degrees after the main contact assembly. See Table 902. The degree of retard for any particular magneto is stamped in the bottom of the contact compartment.

**CAUTION**

*The magneto distributor housing can be used only for retard angle stamped in housing as shown in Figure 921. Attempts to alter retard angle by changing adjustment of retard contact will result in improper operation of magneto.*

- G.



**NUMBER OF DEGREES RETARD**

Figure 921. Retard Angle Stamped in Housing



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At exact point of main contact assembly point opening, note degree reading. Add degrees of retard to this reading to determine retard contact assembly opening point.

- H. Turn rotating magnet forward from point of main contact opening the exact number of retard degrees, and lock in position with rotor holding tool. Connect the timing light to retard contact tab, and adjust retard contact to open at this position.
- I. Loosen holding tool and recheck adjustment. Retard contact must open within  $+2^{\circ} - 0^{\circ}$  of specified setting. For example, if main contact opened at  $12^{\circ}$ , and  $30^{\circ}$  retard is required, retard contact must open between the  $42^{\circ}$  and  $44^{\circ}$  marks.
- J. Continue turning magnet until retard cam follower is on high point of cam lobe. Tighten rotor holding tool measure point clearance. Clearance must be  $0.018 \pm .006$  inch. If retard clearance is over limits, repeat timing procedure with "E" gap set at maximum. If retard clearance is under limits, repeat timing procedure with "E" gap set at minimum.
- K. If a tachometer contact assembly is used, turn magnet until tachometer contact cam follower is on high point of cam lobe. Adjust tachometer contact to  $.019 \pm .003$  inch clearance. There are no angular timing requirements for tachometer contact.
- L. Tighten screws (41) with 20 to 25 lb.-in. of torque for main and retard contact assemblies, and with 10 to 12 lb.-in. for tachometer contact assemblies. Recheck "E" gap and contact opening clearances to make sure values did not change when screws were tightened.

**CAUTION**

*Use care that screwdriver does not interfere with contact assembly main spring when tightening contact securing screws.*

- M. Remove rotor holding tool and extra drive parts from rotating magnet. Remove timing kit from breaker compartment.

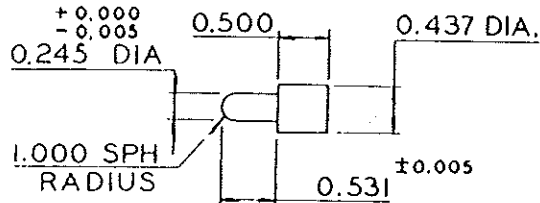
**TABLE 902**  
**Magneto Retard Angles**

Magneto Type	Part Number	Degree Retard
S4LN-200	10-163005-2, -3, -7	$25^{\circ}$
	10-163005-11	$15^{\circ}$
S6RN-200	10-163010-1	$30^{\circ}$
	10-163010-15	$25^{\circ}$
S6LN-200	10-163010-2	$30^{\circ}$
	10-163010-10	$37.5^{\circ}$
S4RN-201	10-163015-3	$20^{\circ}$
S6RN-201	10-163020-3, -103	$30^{\circ}$
S6LN-201	10-163020-4	$30^{\circ}$

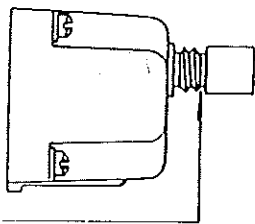
#### 9.2.10 Assemble Cover (15)

- A. If used, form a new insulation sheet (24) into a loop, and insert in place in retard lead recess in contact cover (15). Place retard lead (23) in position and secure by staking ears of spring washer so they wedge against recess wall. Check security of lead in housing by exerting a pulling force of 3 or 4 pounds on lead wire. Spring washer must not shift or slip out of position.
- B. If used, check depth of spring contact in switch and retard terminals using the depth gage as shown in Figure 920. If either spring contact is not within limit shown in Figure 922 remove capacitor or retard lead from contact cover and bend spring contact. Reinstall capacitor or retard lead back in contact cover and recheck depth.
- C. If not previously assembled, attach capacitor lead to main contacts. Attach any retard or tachometer leads to retard or tachometer contacts. Reinstall contact cover (15) and gasket (14), if used, and secure with screws (12) and washers (13), tighten with 20 to 25 lb.-in. of torque.

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MAT'L: BAKELITE OR PHENOLIC



CLEARANCE MUST BE VISIBLE BETWEEN  
OUTLET FACE AND BOTTOM OF GAGE  
WHEN GAGE TOUCHES SPRING CONTACT.

Figure 922. Checking Spring Depth

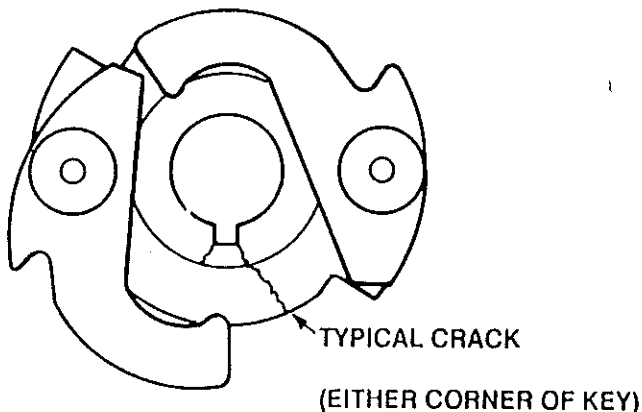


Figure 923. Typical Crack (Either Corner of Keyway)

9.2.11 Install Ventilator or Orifice (48, 48a), and Plug or Bushing (44, 44a). Apply 10-15 lb-in. of Torque

9.2.12 Install Nameplate (52)

- A. Type data onto nameplate. Coat with clear spray paint and allow to dry.
- B. Prepare surface of housing (50) by wiping with cloth moistened with Isopropyl alcohol.
- C. Transfer nameplate (52) onto housing (50). Press firmly across entire surface.

9.2.13 Test magneto as specified in paragraph 3.2 of TESTING AND FAULT ISOLATION.

9.2.14 Final Assembly

- A. If necessary, remove front end hardware to install engine drive gear. Reassemble bushing (5), washers (3,4) drive members (6,7) and nut (2) onto shaft.
- B. Using torque wrench tighten nut (2) to 15 lb-ft and install new cotter pin (1). If unable to install pin, tighten nut to next castle not to exceed 25 lb.-ft and install pin.

NOTE:

If impulse coupling cam (11) cracks during this procedure, an audible cracking noise is evident and nut torque reduces immediately. See Figure 923.

CAUTION

*If cam (11) cracks as described in note above it must be discarded and replaced.*

NOTE:

Do not re-use cotter pin (1).

NOTE:

Shouldered bushing (5) must be machined steel type. See general overhaul paragraph 7.2.7 step B and Figure 712.

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### 9.3 Installation On Engine

- A. Remove plug (44) to allow visual access to gear (72). Turn rotating magnet (54) until red tooth on gear is approximately centered in timing window in housing (48). This is approximately cylinder No. 1 normal firing position of magneto. Turn rotating magnet slightly in reverse direction of normal rotation and allow to rest in magnetic neutral position. Red tooth should appear off center in timing window.
- B. Using 11-9110-1 Timing Light and adapters made from appropriate ground terminal kits install and adjust magneto on engine in accordance with engine manufacturer's instructions.

**CAUTION:**

*When timing magneto to engine no gear holding timing device should be used as hidden gear tooth damage may result.*

- C. Apply MS-122 spray to harness grommets and assemble gasket 10-357520 (if used) and harness outlet plate to magneto. Evenly apply 25-35 lb-in. torque to outlet plate screws.
- D. Install switch and retard (if used) wiring by securing terminal nut(s) onto magneto.

**System Support Manual  
S20/S-200 MAGNETO IGNITION SYSTEM**

INTENTIONALLY

LEFT

BLANK

**System Support Manual**  
**S20/S-200 MAGNETO IGNITION SYSTEM**

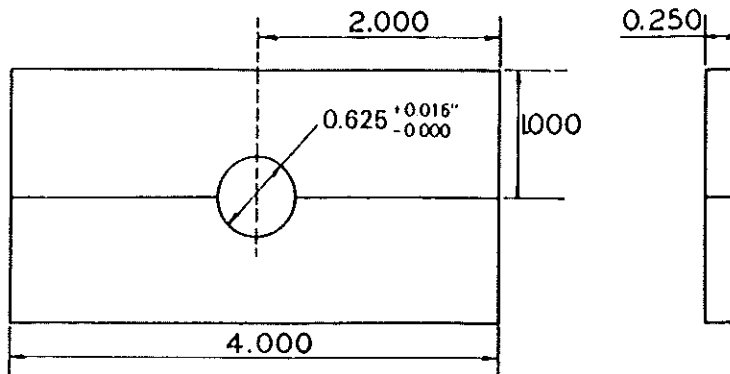
**SECTION 10. SPECIAL TOOLS, FIXTURES AND EQUIPMENT**

Refer to Table 1001 for a list of special tools, fixtures and equipment. Figure 1001 illustrates fabrication of special tools required for disassembly.

Table 1001

Item	Tool No.	Nomenclature	Application
1	11-702-1	Puller Kit Kell-Strom Tool Co., Inc. 214 Church Street Wethersfield, CT 06102	To remove drive member (6,7) or impulse coupling cam assembly (11)
2	11-1767-3	Condenser Tester Kell-Strom Tool Co., Inc.	To test capacitor (42)
3	11-6924-1	Pressing Tool Kell-Strom Tool Co., Inc.	To remove oil seal (59), Bearing Outer Race (70) and to install all press fit parts
4	11-8150-1	Timing Kit Kell-Strom Tool Co., Inc.	To time magneto
5	11-8465	Rotor Holding Tool Kell-Strom Tool Co., Inc.	To hold rotor in desired position when timing magneto
6	11-8627	Spring Seating Kit Kell-Strom Tool Co., Inc.	To install contact springs (80) in distributor block (79)
7	11-8950-2	High Tension Lead Tester Kit Kell-Strom Tool Co., Inc.	To check distributor block (79) for insulation strength
8	11-9110-1	Timing Light Kell-Strom Tool Co., Inc.	To adjust magneto timing
9	11-10192	Removal Tool Kell-Strom Tool Co., Inc.	To remove bearing inner race (70) from rotating magnet (54)
10	11-10500	Magneto Test Stand Kell-Strom Tool Co., Inc.	Used to test magneto
11	11-10600	Magnet Charger Kell-Strom Tool Co., Inc.	Used to charge rotating magneto (54)
12	8840A	Digital Multimeter John Fluke Mfg. Co. P. O. Box C-9090 Everett, WA 98206	Used to check coil
13	No. 2	Waldes TRU-ARC Retaining Pliers TRU-ARC Division Waldes Kohinoor, Inc. Long Island City, N.Y. 11101	Used to install and remove ring (74)
14	CG40-8	Collar Snap-On Tools 2611 Commerce Blvd. Birmingham, AL	Used to remove bearing (64) outer race from housing (48)
15	CG40-4	Expander Rod Snap-On-Tools	Used to remove bearing (64) outer race from housing (48)

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MATERIAL: COLD ROLLED STEEL

**Figure 1001. Fabricated Support Bars - Small Gear**

## SECTION 11. ILLUSTRATED PARTS LIST

TABLE 1101: EQUIPMENT COVERED

<u>PART NUMBER</u>	<u>MODEL NUMBER</u>	<u>DEGREES LAG/RETARD</u>	<u>USE TERMINAL KIT P/N</u>	<u>SEE PARTS LIST TABLE</u>
10-51360-25	S4LN-21	35	10-52305	1103
10-51360-26	S4LN-21	25	10-52305	1103
10-51360-27	S4RN-20	--	10-52305	1103
10-51360-28	S4RN-21	25	10-52305	1103
10-51360-29	S4LN-20	--	10-52305	1103
10-51360-37	S4LN-21	25	10-52305	1103
10-51360-40	S4RN-20	--	10-52305	1103
10-51360-41	S4RN-21	25	10-52305	1103
10-51360-45	S4LN-21	25	10-157209	1103
10-51360-46	S4RN-21	25	10-52305	1103
10-51360-47	S4LN-21	25	10-157209	1103
10-51360-54	S4LN-21	15	10-52305	1103
10-51360-55	S4LN-21	15	10-52305	1103
10-51360-58	S4LN-21	15	10-157209	1103
10-51365-32	S6LN-21	45	10-52305	1104
10-51365-33	S6LN-20	--	10-52305	1104
10-51365-34	S6RN-21	35	10-52305	1104
10-51365-35	S6RN-21	45	10-52305	1104
10-51365-39	S6LN-21	45	10-52305	1104
10-51365-40	S6LN-21	35	10-52305	1104
10-51365-43	S6LN-21	45	10-52305	1104
10-51365-44	S6LN-20	--	10-52305	1104
10-51365-45	S6LN-21	35	10-52305	1104
10-51365-46	S6LN-20	--	10-52305	1104
10-51365-47	S6LN-21	45	10-52305	1104
10-51365-48	S6RN-21	35	10-52305	1104
10-51365-54	S6RN-21	35	10-52305	1104
10-51365-57	S6LN-21	45	10-157209	1104
10-52350-19	S6RN-23	45	10-52306	1104
10-52350-20	S6LN-23	35	10-52306	1104
10-52350-22	S6LN-22	--	10-52306	1104
10-52350-23	S6RN-23	35	10-52306	1105
10-79020-6	S6LN-25	30	10-52305	1105
10-79020-10	S6RN-25	30	10-52305	1105
10-79020-11	S6LN-25	30	10-157209	1105
10-79020-16	S6LN-25	30	10-52305	1105
10-79020-17	S6LN-25	30	10-157209	1105
10-79020-18	S6LN-25	30	10-157209	1105
10-79020-19	S6RN-25	30	10-157209	1105
10-79020-118	S6LN-25P	30	10-382814	1105 & 1108
10-79020-119	S6RN-25P	30	10-382814	1105 & 1108
10-163005-2	S4LN-200	25	10-157208 & 10-157209	1106
10-163005-3	S4LN-200	25	10-157208 & 10-157209	1106
10-163005-7	S4LN-200	25	10-157208 & 10-157290	1106
10-163005-11	S4LN-200	15	10-157208 & 10-157209	1106
10-163010-1	S6RN-200	30	10-157208 & 10-157209	1107
10-163010-2	S6LN-200	30	10-157208 & 10-157209	1107

**TABLE 1101: EQUIPMENT COVERED**

*(CONTINUED)*

<u>PART NUMBER</u>	<u>MODEL NUMBER</u>	<u>DEGREES LAG/RETARD</u>	<u>USE TERMINAL KIT P/N</u>	<u>SEE PARTS LIST TABLE</u>
10-163010-10	S6LN-200	37.5	10-157208 & 10-157209	1107
10-163010-15	S6RN-200	25	10-157208 & 10-157209	1107
10-163015-3	S4RN-201	20	10-157208 & 10-157209	1106
10-163020-3	S6RN-201	30	10-157208 & 10-157209	1107
10-163020-4	S6LN-201	30	10-157208 & 10-157209	1107
10-163020-103	S6RN-201	30	10-382813 & 10-352814	1107
10-163045-1	S4LN-204	--	10-157209	1106
10-163045-3	S4LN-204	--	10-157209	1106
10-163045-6	S4LN-204	--	10-157209	1106
10-163050-1	S6LN-204	--	10-157209	1107
10-163050-7	S6RN-204	--	10-157209	1107
10-163050-9	S6LN-204	--	10-157209	1107
10-163050-12	S6LN-204	--	10-157209	1107
10-163055-1	S4RN-205	--	10-157209	1106
10-163060-1	S6RN-205	--	10-157209	1107
10-163060-2	S6LN-205	--	10-157209	1107
10-163060-101	S6RN-205	--	10-382813 & 10-382814	1107



**TABLE 1102: SUPERSEDED AND DISCONTINUED MAGNETOS**

<u>OLD PART NO.</u>	<u>SUPERSEDED BY</u>	<u>OLD PART NO.</u>	<u>SUPERSEDED BY</u>
10-51360-1	10-51360-26	10-52350-21	*
10-51360-3	10-51360-29	10-52350-24	*
10-51360-4	10-51360-27	10-52350-25	*
10-51360-6	10-51360-28	10-79020-5	10-79020-10**
10-51360-8	10-51360-37	10-79020-8	10-79020-10**
10-51360-10	10-51360-25	10-79020-13	*
10-51360-11	10-51360-29	10-79020-14	*
10-51360-12	10-51360-37	10-85290-2	*
10-51360-23	10-51360-29	10-85290-3	*
10-51360-30	10-51360-37	10-163005-1	10-163005-2
10-51360-31	*	10-163005-4	*
10-51360-33	10-51360-37	10-163005-5	*
10-51360-48	*	10-163005-10	*
10-51360-53	*	10-163010-3	*
10-51365-1	10-51365-39	10-163010-4	*
10-51365-2	10-51365-40	10-163010-5	*
10-51365-5	10-51365-41	10-163010-6	*
10-51365-7	10-51365-48	10-163010-7	*
10-51365-9	*	10-163010-8	*
10-51365-13	10-51365-40	10-163010-9	10-163010-10
10-51365-14	10-51365-48	10-163010-11	*
10-51365-15	10-51365-33	10-163010-17	*
10-51365-16	10-51365-42	10-163015-1	*
10-51365-17	10-51365-43	10-163015-2	*
10-51365-20	10-51365-32	10-163015-4	*
10-51365-25	10-51365-33	10-163020-1	10-163020-3
10-51365-26	10-51365-34	10-163020-2	*
10-51365-27	10-51365-46	10-163030-1	10-163010-1
10-51365-28	10-51365-47	10-163030-4	10-163010-6
10-51365-29	10-51365-44	10-163045-2	*
10-51365-30	10-51365-45	10-163045-4	*
10-51365-31	10-51365-33	10-163045-7	*
10-51365-41	*	10-163045-8	10-163045-3
10-51365-42	*	10-163050-2	*
10-51365-53	*	10-163050-3	*
10-52350-1	10-52350-25	10-163050-5	*
10-52350-2	10-52350-19	10-163050-6	*
10-52350-6	10-52350-20	10-163050-8	*
10-52350-7	10-52350-24	10-163055-2	*
10-52350-8	10-52350-21	10-163070-1	10-163050-1
10-52350-14	10-52350-22	10-163070-3	10-163050-5
10-52350-15	10-52350-23		
10-52350-17	10-52350-22		
10-52350-18	10-52350-23		

\* Superseding part number will be supplied upon request.

\*\* Magnetos should be updated in pairs. Refer to latest applicable engine parts list.

TABLE 1103: S4LN, S4RN-20 AND -21 MAGNETOS

REF NO.	DESCRIPTION	PART NO.	10-51360-25	10-51360-26	10-51360-27	10-51360-28	10-51360-29	10-51360-37	10-51360-40	10-51360-41	10-51360-45	10-51360-46	10-51360-47	10-51360-54	10-51360-55	10-51360-58
1	PIN-Cotter	10-90751-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	NUT-Drive Shaft	10-163151														
		10-51643	1	1												
		10-51652Y				1										
3	WASHER-Lock	10-3793	1				1	1				1	1	1	1	1
4	WASHER-Plain	10-4093			1											
		10-51370	1	1				1						1	1	1
	WASHER-Keyed	10-51613				1			1	1						
5	BUSHING	10-51651				1			1	1						
		10-163049	1					1			1	1	1	1	1	1
6	DRIVE PLATE	10-160850							1							
8	IMPULSE COUPLING															
	25° Lag	10-59473				1						1				
	25° Lag	10-59474		1				1			1		1			
	35° Lag	10-59477	1													
	25° Lag	10-160862								1						
	15° Lag	10-357265												1	1	
	15° Lag	10-357452														1
9	BODY-Impulse Coupling	10-51333				1						1				
		10-51395								1			1	1	1	1
		10-52903	1	1				1			1	1	1	1	1	1
10	SPRING-Main	10-51324	1	1		1		1		1	1	1	1	1	1	1
11	CAM ASSY-Impulse Coupling	10-59436				1				1						
		10-59437			1			1			1		1			
		10-59471	1											1	1	
		10-85231														
		10-357451														1
12	SCREW W/LOCK WASHER	10-157161	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		10-157160									4					
15	COVER-Contact	10-163199		1	1	1										
		10-52939Y	1				1	1	1	1		1		1		
		10-163136													1	1
		10-361637												1		
17	TERMINAL	10-163163												2		
18	SLEEVING, 20 Ft.	10-180128-1												AF		
19	GROMMET	10-622161-9												1		
20	WIRE, 25 Ft.	10-180161-1												AF		
21	NUT-Cap	10-163177										1			1	1
22	DISK	10-163384										1			1	1
33	SCREW-Fil hd	10-16476	1					1	1	1	1	1		1		
		10-51355		1	1	1	1	1	1	1	1	1				
34	WASHER-Lock	2-194	1	1	1	1	1	1	1	1	1	1		1		
35	SPRING	10-102090	1	1	1	1	1	1	1	1	1	1		1		
37	WASHER-Plain	10-14268	1	1	1	1	1	1	1	1	1	1	2	1		
38	BUSHING	10-361639											2			

TABLE 1103: S4LN, S4RN-20 AND -21 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-51360-25	10-51360-26	10-51360-27	10-51360-28	10-51360-29	10-51360-37	10-51360-40	10-51360-41	10-51360-45	10-51360-46	10-51360-47	10-51360-54	10-51360-55	10-51360-58	
39	.CONTACT ASSEMBLY	10-382585															
		10-357173		1													
		10-357174	1														
	.CONTACT ASSEMBLY- Tachometer	10-361631					1	1	1	1		1		1		1	
40	.PLATE-Insulating	10-361624															
41	.SCREW W/LOCK WASHER	10-35935-5		3							2		2			2	
		10-35936-7	3		3	3	3	3	3	3	2	3	2	3	2	2	2
42	.CAPACITOR	10-51676	1	1	1	1	1	1	1	1		1		1		1	
		10-357281															
44	.PLUG	10-157135	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
45	.BUSHING	10-51612		1	1	1											
46	.PLUG-Ventilator	10-157134	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
47	.SCREW, W/LOCK WASHER	10-157158	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
48	.HOUSING-Distributor	10-50757Y		1	1	1											
		10-52917	1				1	1	1	1		1		1		1	
		10-106498															
50	.HOUSING-Magneto	10-50727Y	1	1		1		1		1	1	1	1	1	1	1	
		10-160858															
52	.PLATE-Identification	10-400012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
53	.KEY-Woodruff	10-90788-5	3	3	2	3	2	3	3	3	3	3	3	3	3	3	
54	.MAGNET-Rotating	10-52945			1	1											
		10-52946															
		10-52947	1	1					1		1	1	1	1	1	1	1
55	.DEFLECTOR-OIL	10-51678	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
56	.SCREW, W/LOCK WASHER	10-35937-8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
57	.CLAMP-Coil Core	10-50765	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
58	.COIL	10-357164-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
		10-357165-1															
59	.OIL SEAL	10-357592	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
60	.PIN-Stop	10-56513	1	1		1		1		1	2	2	2	2	2	2	
61	.SCREW, W/LOCK WASHER	10-391213	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
62	.WASHER-Plain	10-51354	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
63	.CAM	10-88543-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
		10-88543-5															
64	.BEARING-Ball	2-202	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
65	.WASHER-Plain, 0.0025 in. thick	2-199-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
	.WASHER-Plain, 0.004 in. thick	2-199-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
	.WASHER-Plain, 0.005 in. thick	2-199-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
	.WASHER-Plain, 0.008 in. thick	2-199-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
	.WASHER-Plain, 0.010 in. thick	2-199-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	
	.WASHER-Plain, 0.012 in. thick	2-199-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	

TABLE 1103: S4LN, S4RN-20 AND -21 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-51360-25	10-51360-26	10-51360-27	10-51360-28	10-51360-29	10-51360-37	10-51360-40	10-51360-41	10-51360-45	10-51360-46	10-51360-47	10-51360-54	10-51360-55	10-51360-58
66	.WASHER-Plain	10-3503	1	1	1	1	1	1	1	1	1	1	1	1	1	1
67	GEAR-Small	10-157123Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	.BEARING-Sleeve	10-357078	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	.BEARING-Ball	10-81806	1	1	1	1	1	1	1	1	1	1	1	1	1	1
71	.WASHER-Flat, 0.0025 in. thick	2-161-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-161-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-161-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-161-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-161-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-161-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.0015 in. thick	2-161-7	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
72	.GEAR-Distributor Kit	10-357584	1	1	1	1	1	1	1	1	1	1	1	1	1	1
73	.BRUSH-Electrical Contact	10-160844	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	.RING-Retaining	10-92815-37	1	1	1	1	1	1	1	1	1	1	1	1	1	1
75	.WASHER-Plain .75 in. OD	10-349511	1	1	1	1	1	1	1	1	1	1	1	1	1	1
76	.WASHER-Plain .562 in. OD	10-606505	1	1	1	1	1	1	1	1	1	1	1	1	1	1
77	.WASHER, Nylon	10-391309	1	1	1	1	1	1	1	1	1	1	1	1	1	1
78	.SCREW, W/PLAIN & LOCKWASHER	10-102083	3	3	3	3	3	3	3	3	3	3	3	3	3	3
79	.BLOCK-Distributor	10-357424	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	.SPRING-Helical	10-50737	4	4	4	4	4	4	4	4	4	4	4	4	4	4
81	.STRIP-Felt	10-163374	1	1	1	1	1	1	1	1	1	1	1	1	1	1
82	.WASHER-Felt	10-50752	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE 1104: S6LN, S6RN-20, -21, -22 AND -23 MAGNETOS

REF NO.	DESCRIPTION	PART NO.	10-51365-32	10-51365-33	10-51365-34	10-51365-35	10-51365-39	10-51365-40	10-51365-43	10-51365-44	10-51365-45	10-51365-46	10-51365-47	10-51365-48	10-51365-54	10-51365-57	10-52350-19	10-52350-20	10-52350-22	10-52350-23
1	PIN-Cotter	10-90751-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	NUT-Drive Shaft	10-163151	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51643	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51652Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-163178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	WASHER-Lock	10-3793	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-4093	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	WASHER-Plain	10-51370	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-116860	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-52307	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51813	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51651	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	.BUSHING-Impulse Coupling	10-116861	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-163048	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-357193	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51651	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	.IMPULSE COUPLING	35° Lag	10-59476	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		45° Lag	10-59479	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		45° Lag	10-70370	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		35° Lag	10-89137	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		45° Lag	10-157164	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		35° Lag	10-116862	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		35° Lag	10-59478	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		35° Lag	10-59478	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	.BODY-Impulse Coupling	10-51333	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51395	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-52903	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-70371	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	.SPRING-Main (Impulse Coupling)	10-51324	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-76232	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	.CAM ASSY-Impulse Coupling	10-59439	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-59471	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-59472	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-102079	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	.SCREW	10-157161	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		10-357015	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
14	.GASKET CONTACT Cover	10-52321Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	.COVER CONTACT	10-163199	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-52939Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-163136	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-52937Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	NUT-Cap	10-72019Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-163177	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	.DISK-Neoprene	10-163384	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
33	.SCREW-Fil hd	10-16476	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51355	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	.WASHER-Lock	2-194	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE 1104, S6LN, S6RN-20, -21, -22 AND -23 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-51365-32	10-51365-33	10-51365-34	10-51365-35	10-51365-39	10-51365-40	10-51365-43	10-51365-44	10-51365-45	10-51365-46	10-51365-47	10-51365-48	10-51365-54	10-51365-57	10-52350-19	10-52350-20	10-52350-22	10-52350-23
35	.SPRING	10-102090	1	1	1	1	1		1	1	1	1	1		1					
		10-102092																		1
37	.WASHER-Plain	10-14268	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
		10-7611														1				
39	.CONTACT ASSEMBLY	10-382585														1				
		10-357173						1						1			1			
		10-357174	1	1	1	1	1		1	1	1	1	1		1				1	1
41	SCREW, W/LOCK WASHER	10-35936-7	4	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3
		10-35935-5													2					
42	.CAPACITOR	10-51676	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
		10-357281														1				
44	.PLUG	10-157135	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
		10-50732																		
45	.BUSHING-Ground Terminal	10-51612						1						1						
		10-51684														1				
46	.PLUG-Ventilator	10-157134	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
		10-51391															1	1	1	1
47	.SCREW, W/LOCK WASHER	10-157158	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
48	.HOUSING-Distributor	10-52917	1	1	1	1	1		1	1	1	1	1		1					
		10-50757Y						1						1						
		10-106498														1				
		10-52328															1			
		10-52931																1	1	1
49	.GASKET	10-52320															1	1	1	1
50	.HOUSING-Magneto	10-50727Y	1		1	1	1	1	1		1		1	1	1	1				
		10-160858		1						1		1								
		10-52327															1	1	1	1
52	.PLATE-Identification	10-400012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53	.KEY-Woodruff	10-90788-5	2	2	2	3	3	2	2	3	3	3	3	2	3	2	2	2	2	2
54	.MAGNET-Rotating	10-52945		1															1	
		10-52946						1							1					
		10-52947				1	1			1	1	1	1			1				
		10-52948	1		1				1					1			1	1	1	1
55	.DEFLECTOR-Oil	10-51678	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
56	.SCREW, W/LOCK WASHER	10-35937-8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
57	.CLAMP-Coil Core	10-50765	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
58	.COIL	10-357164-1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
		10-357165-1																		
59	.OIL SEAL	10-357592	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	.PIN-Stop (Impulse Coupling)	10-56513	2		2	2	1	1	1		2		2	1	1	2	1	1	1	2
61	SCREW, W/LOCK WASHER (Cam)	10-391213	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
62	.WASHER-Plain (Cam Screw)	10-51354	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
63	.CAM	10-88543-1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
		10-88543-5														1				

TABLE 1104: S6LN, S6RN-20, -21, -22 AND -23 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-51365-32	10-51365-33	10-51365-34	10-51365-35	10-51365-39	10-51365-40	10-51365-43	10-51365-44	10-51365-45	10-51365-46	10-51365-47	10-51365-48	10-51365-54	10-51365-57	10-52350-19	10-52350-20	10-52350-22	10-52350-23
64	.BEARING-Ball	2-202	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
65	.WASHER-Flat, 0.0025 in. thick	2-199-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-199-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-199-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-199-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-199-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-199-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
66	.WASHER-Plain	10-3503	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
67	.GEAR-Small	10-157120Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	.BEARING-Sleeve	10-357078	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	.BEARING-Ball	10-81806	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
71	.WASHER-Flat, 0.0025 in. thick	2-161-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-161-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-161-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-161-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-161-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-161-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.015 in. thick	2-161-7	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
72	.GEAR-Distributor, Kit	10-357586	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
73	..BRUSH-Carbon	10-160844	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	..RING-Retaining	10-92815-37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
75	..WASHER-Plain .750 IN OD	10-349511	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
76	..WASHER, Plain .562 IN OD	10-606505	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
77	..WASHER, Nylon	10-391309	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
78	.SCREW, W/PLAIN AND LOCK WASHER	10-102083	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
79	.BLOCK-Distributor	10-357426	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	..SPRING-Helical	10-50737	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
81	..STRIP-Felt (Electrode Side)	10-163374	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
82	.WASHER-Felt (Ring Side)	10-50752	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE 1105: S6LN, S6RN-25 AND -25P MAGNETOS

REF NO.	DESCRIPTION	PART NO.	10-79020-6	10-79020-10	10-79020-11	10-79020-16	10-79020-17	10-79020-18	10-79020-19	10-79020-118	10-79020-119
1	.PIN-Cotter	10-90751-18	1	1	1	1	1	1	1	1	1
2	.NUT	10-51643	1	1	1	1	1	1	1	1	1
3	.WASHER-Lock	10-3793	1	1	1	1	1	1	1	1	1
4	.WASHER-Plain	10-52307	1	1	1	1	1	1	1	1	1
8	.IMPULSE COUPLING										
	30° Lag	10-102053	1	1	1	1	1	1	1	1	1
	30° Lag	10-160892		1				1			1
9	..BODY-Impulse Coupling	10-70371	1	1	1	1	1	1	1	1	1
		10-76232		1				1			1
10	. SPRING-Main	10-51324	1	1	1	1	1	1	1	1	1
11	..CAM-Impulse Coupling	10-160893		1				1			1
		10-102052	1	1	1	1	1	1	1	1	1
12	.SCREW, W/LOCK WASHER, SHORT	10-157161	4	4				4	4	4	4
	.SCREW, W/LOCK WASHER, LONG	10-157160			4			4	4	4	4
	.SCREW-Hex hd, SHORT	10-357256				4					
	.SCREW-Hex hd, LONG	10-357257					4				
13	.WASHER-Lock	10-92879-42				4	4				
14	.GASKET, Contact Cover	10-357532							1	1	
15	.COVER CONTACT	10-52939Y	1	1		1					
		10-163136						1	1	1	1
		10-361637									
17	..TERMINAL	10-163163			1		1				
18	..SLEEVING, 20 Ft.	10-180128-1			2		2				
19	..GROMMET	10-622161-9			AR		AR				
20	..WIRE, 35 Ft.	10-180161-1			1		1				
21	.NUT-Cap, Round	10-163177			AR		AR				
22	.DISK-Neoprene	10-163384						1	1	1	1
33	.SCREW-Fil hd (Ground Terminal)	10-16476	1	1		1					
34	.WASHER-Lock	2-194	1	1		1					
35	.SPRING (Ground Terminal)	10-102090	1	1		1					
37	.WASHER-Plain	10-14268	1	1	2	1	2	1	1	1	1
38	.BUSHING	10-361639			2		2				
39	.CONTACT ASSEMBLY	10-382585			1		1	1		1	
		10-357174	1	1		1					
		10-382584						1			1
	Tachometer Contact Assembly	10-361631			1		1				
40	.PLATE-Insulating	10-361624			1		1				
41	.SCREW, W/LOCK WASHER	10-35936-7	3	3	2	3	2	2	2	2	2
		10-35935-5			2		2	2	2	2	2
	.SCREW	10-35936-8			2		2				
42	.CAPACITOR	10-51676	1	1		1					
		10-357281			1		1	1	1	1	1
44	PLUG-Distributor Housing	10-157135	1	1	1	1	1	1	1	1	1
46	.PLUG-Magneto Housing	10-157134	1	1	1	1	1	1	1	1	1
46a	.ORIFICE, Air Bleed	10-382861							1	1	
47	.SCREW, W/LOCK WASHER	10-157158	5	5	5	5	5	5	5	5	5



TABLE 1105: S6RN, S6LN-25 AND -25P MAGNETOS (Continued)

REF NO.	DESCRIPTION	PART NO.	10-79020-6	10-79020-10	10-79020-11	10-79020-16	10-79020-17	10-79020-18	10-79020-19	10-79020-118	10-79020-119
48	.HOUSING-Distributor	10-52917	1	1							
		10-106498			1		1	1	1	1	1
49	.GASKET-Housing	10-357533								1	1
50	.HOUSING-Magneto	10-81942	1	1	1	1	1	1	1	1	1
52	.PLATE-Identification	10-400012	1	1	1	1	1	1	1	1	1
53	.KEY-Woodruff	10-90788-5	2	2	2	2	2	2	2	2	2
54	.MAGNET-Rotating	10-52948	1	1	1	1	1	1	1	1	1
55	.DEFLECTOR-Oil	10-51678	1	1	1	1	1	1	1	1	1
56	.SCREW, W/LOCK WASHER	10-35937-8	2	2	2	2	2	2	2	2	2
57	.CLAMP-Coil Core	10-50765	2	2	2	2	2	2	2	2	2
58	.COIL	10-357164-1	1	1		1					
		10-357165-1			1		1	1	1	1	1
59	.OIL SEAL	10-357592	1	1	1	1	1	1	1	1	1
60	.PIN-Stop	10-79011	2	2	2	2	2	2	2	2	2
61	.SCREW, W/LOCK WASHER	10-391213	1	1	1	1	1	1	1	1	1
62	.WASHER-Plain	10-51354	1	1	1	1	1	1	1	1	1
63	.CAM	10-88543-1	1	1		1					
		10-88543-4						1			1
		10-88543-5			1		1	1	1	1	1
64	.BEARING-Ball	2-202	1	1	1	1	1	1	1	1	1
65	.WASHER-Flat, 0.0025 in. thick	2-199-1	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-199-2	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-199-3	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-199-4	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-199-5	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-199-6	AR	AR	AR	AR	AR	AR	AR	AR	AR
66	.WASHER-Plain	10-3503	1	1	1	1	1	1	1	1	1
67	.GEAR-Small	10-157120Y	1	1	1	1	1	1	1	1	1
69	.BEARING-Sleeve	10-357078	1	1	1	1	1	1	1	1	1
70	.BEARING-Ball	10-81806	1	1	1	1	1	1	1	1	1
71	.WASHER-Flat, 0.0025 in. thick	2-161-1	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-161-2	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-161-3	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-161-4	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-161-5	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-161-6	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.015 in. thick	2-161-7	AR	AR	AR	AR	AR	AR	AR	AR	AR
72	.GEAR-Distributor, Kit	10-357586	1	1	1	1	1	1	1	1	1
73	..BRUSH-Carbon	10-160844	1	1	1	1	1	1	1	1	1
74	..RING-Retaining	10-92815-37	1	1	1	1	1	1	1	1	1
75	..WASHER-Plain, .750 in. OD	10-349511	1	1	1	1	1	1	1	1	1
76	..WASHER, Plain .562 in. OD	10-606505	1	1	1	1	1	1	1	1	1
77	..WASHER, Nylon	10-391309	1	1	1	1	1	1	1	1	1
78	.SCREW, W/PLAIN AND LOCK WASHER	10-102083	3	3	3	3	3	3	3	3	3
79	.BLOCK-Distributor	10-357426	1	1	1	1	1	1	1	1	1
80	..SPRING-Helical	10-50737	6	6	6	6	6	6	6	6	6
81	..STRIP-Felt (Electrode Side)	10-163374	1	1	1	1	1	1	1	1	1
82	.WASHER-Felt (Ring Side)	10-50752	1	1	1	1	1	1	1	1	1

TABLE 1106: S4LN, S4RN-200, -201, -204 AND -205 MAGNETOS

REF NO.	DESCRIPTION	PART NO.	10-163005-2	10-163005-3	10-163005-7	10-163005-11	10-163015-3	10-163045-1	10-163045-3	10-163045-6	10-163055-11
1	.PIN-Cotter	10-90751-18	1	1	1	1	1	1	1	1	1
2	NUT-Drive Shaft	10-163151	1		1				1	1	
		10-51643		1	1		1	1			1
3	WASHER-Lock	10-3793		1	1		1	1			1
4	WASHER-Plain	10-4093	1		1	1			1	1	1
		10-51370			1						
		10-116860		1				1			
5	BUSHING	10-51651				1					
		10-163049		1	1			1			
7	PLATE, Drive	10-163003					1				1
		10-163214		1				1			
8	IMPULSE COUPLING	10-59474			1						
9	..BODY-Impulse Coupling	10-52903			1						
10	..SPRING-Main (Impulse Coupling)	10-51324			1						
11	..CAM-Impulse Coupling	10-59437			1						
12	..SCREW, W/LOCK WASHER	10-157160	4	4	4	4	4	4	4	4	4
15	..COVER CONTACT	10-163136	1	1	1	1	1	1	1	1	1
		10-361637								1	
17	..TERMINAL	10-163163								2	
18	..SLEEVING, 20 Ft.	10-180128-1								AR	
19	..GROMMET	10-622161-9								1	
20	..WIRE, 25 Ft.	10-180161-1								AR	
21	..NUT-Cap	10-163177						1	1		1
22	..DISK	10-163384					1	1			1
23	..LEAD ASSEMBLY	10-157241	1	1	1	1	1				
24	..PAPER	10-163194	1	1	1	1	1				
37	..WASHER-Plain	10-14268	2	2	2	2	2	1	1	1	1
38	BUSHING	10-361639								2	
39	CONTACT ASSEMBLY	10-382585	1	1	1	1	1	1	1	1	
		10-382584	1	1	1	1	1				1
	..CONTACT ASSEMBLY-Tachometer	10-361631								1	
40	..PLATE-Insulating	10-361624								1	
41	..SCREW, W/LOCK WASHER	10-35935-5	2	2	2	2	2	2	2	2	2
		10-35936-7	4	4	4	4	4	2	2	4	2
42	..CAPACITOR	10-357281	1	1	1	1	1	1	1	1	1
43	..TUBING	10-357494				1					
44	..PLUG	10-157135	1	1	1	1	1	1	1	1	1
46	..PLUG-Ventilator	10-157134	1	1	1	1	1	1	1	1	1
47	..SCREW, W/LOCK WASHER	10-157158	5	5	5	5	5	5	5	5	5
48	..HOUSING-Distributor	10-106492	1	1	1						
		10-357478				1					
		10-106498						1	1	1	1
		10-160895					1				
50	HOUSING-Magneto	10-160858	1	1	1	1		1	1	1	
		10-163402					1				1
52	..PLATE-Identification	10-400012	1	1	1	1	1	1	1	1	1

TABLE 1106: S4LN, S4RN-200, -201, -204 AND -205 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-163005-2	10-163005-3	10-163005-7	10-163005-11	10-163015-3	10-163045-1	10-163045-3	10-163045-6	10-163055-11
53	.KEY-Woodruff	10-90788-5	2	3	3	2	2	3	2	2	2
54	.MAGNET-Rotating	10-52945	1						1	1	
		10-357479				1					
		10-52947		1	1			1			
		10-52948					1				1
55	.DEFLECTOR-Oil	10-51678	1	1	1	1	1	1	1	1	
56	.SCREW, W/LOCK WASHER	10-35937-8	2	2	2	2	2	2	2	2	
57	.CLAMP-Coil Core	10-50765	2	2	2	2	2	2	2	2	
58	.COIL	10-357165-1	1	1	1	1	1	1	1	1	
59	.OIL SEAL	10-357592	1	1	1	1	1	1	1	1	
61	.SCREW, W/LOCK WASHER	10-391213	1	1	1	1	1	1	1	1	
62	.WASHER-Plain	10-51354	1	1	1	1	1	1	1	1	
63	.CAM	10-88543-4				1					1
		10-88543-5	1	1	1	1	1	1	1	1	
64	.BEARING-Ball	2-202	1	1	1	1	1	1	1	1	
65	.WASHER-Flat, 0.0025 in. thick	2-199-1	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-199-2	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-199-3	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-199-4	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-199-5	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-199-6	AR	AR	AR	AR	AR	AR	AR	AR	AR
		10-3503	1	1	1	1	1	1	1	1	1
67	.GEAR-Small	10-157123Y	1	1	1	1	1	1	1	1	
69	.BEARING-Sleeve	10-357078	1	1	1	1	1	1	1	1	
70	.BEARING-Ball	10-81806	1	1	1	1	1	1	1	1	
71	.WASHER-Flat, 0.0025 in. thick	2-161-1	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-2	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-3	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-4	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-5	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-6	AR	AR	AR	AR	AR	AR	AR	AR	AR
		2-161-7	AR	AR	AR	AR	AR	AR	AR	AR	AR
72	.GEAR-Distributor, Kit	10-357584	1	1	1	1	1	1	1	1	
73	.BRUSH-Electrical Contact	10-160844	1	1	1	1	1	1	1	1	
74	.RING-Retaining	10-92815-37	1	1	1	1	1	1	1	1	
75	.WASHER-Plain, .750 in. OD	10-349511	1	1	1	1	1	1	1	1	
76	.WASHER, Plain .562 in. OD	10-606505	1	1	1	1	1	1	1	1	
77	.WASHER, Nylon	10-391309	1	1	1	1	1	1	1	1	
78	.SCREW, W/PLAIN & LOCK WASHER	10-102083	3	3	3	3	3	3	3	3	
79	.BLOCK-Distributor	10-357424	1	1	1	1	1	1	1	1	
80	.SPRING-Helical	10-50737	4	4	4	4	4	4	4	4	
81	.STRIP-Felt	10-163374	1	1	1	1	1	1	1	1	
82	.WASHER-Felt	10-50752	1	1	1	1	1	1	1	1	

TABLE 1107: S6LN, S6RN-200, -201, -204 AND -205 MAGNETOS

REF NO.	DESCRIPTION	PART NO.	10-163010-1	10-163010-2	10-163010-10	10-163010-15	10-163020-3	10-163020-4	10-163020-103	10-163050-1	10-163050-7	10-163050-9	10-163050-12	10-163060-1	10-163060-2	10-163060-101
1	.PIN-Cotter	10-90751-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	NUT-Drive Shaft	10-163151	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-51643					1	1	1					1	1	1
		10-163178			1							1	1			
3	.WASHER-Lock	10-3793					1	1	1					1	1	1
4	.WASHER-Plain	10-4093	1	1	1	1	1	1	1	1	1			1	1	1
5	.BUSHING	10-163048			1							1	1			
7	.PLATE, Drive	10-163003					1	1	1					1	1	1
12	SCREW, W/LOCK WASHER	10-157160	4	4	4	4	4	4	4	4	4	4	4	4	4	4
14	GASKET, Contact Cover	10-357532							1							1
15	.COVER, CONTACT	10-163136	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		10-361637												1		
17	.TERMINAL	10-163163												2		
18	.SLEEVING, 20 Ft.	10-180128-1												AR		
19	.GROMMET	10-622161-9												AR		
20	.WIRE, 25 Ft.	10-180161-1														
21	.NUT-Cap	10-163177								1	1	1		1	1	1
22	.DISK-Neoprene	10-163384								1	1	1		1	1	1
23	.LEAD ASSEMBLY	10-157241	1	1	1	1	1	1	1							
24	.PAPER	10-163194	1	1	1	1	1	1	1							
37	WASHER-Plain	10-14268	2	2	2	2	2	2	2	1	1	1	1	1	1	1
38	.BUSHING	10-361638											2			
39	.CONTACT ASSEMBLY	10-382585	1	1	1	1	1	1	1	1		1	1	1	1	1
		10-382584	1	1	1	1	1	1	1	1	1			1	1	1
	.CONTACT ASSEMBLY, Tachometer	10-361631												1		
41	.SCREW, W/LOCK WASHER	10-35936-7	4	4	4	4	4	4	4	2	2	2	4	2	2	2
		10-35935-5	2	2	2	2	2	2	2	2	2	2	2	2	2	2
42	.CAPACITOR	10-357281	1	1	1	1	1	1	1	1	1	1	1	1	1	1
44	.PLUG-Distributor Housing	10-157135	1	1	1	1	1	1		1	1	1	1	1	1	
44a	.BUSHING, Air Inlet	10-382815							1							1
46	.PLUG-Ventilator, Magneto Housing	10-157134	1	1	1	1	1	1		1	1	1	1	1	1	
46a	.ORIFICE, Bleed Air	10-382861							1							1
47	.SCREW, W/LOCK WASHER	10-157158	5	5	5	5	5	5	5	5	5	5	5	5	5	5
48	HOUSING-Distributor	10-106498	1	1			1	1	1	1	1	1	1	1	1	1
		10-163056			1											
		10-163292				1										
49	.GASKET, Housing	10-357533							1							1
50	.HOUSING-Magneto	10-163402					1	1	1					1	1	1
		10-160858	1	1	1	1				1	1	1	1	1	1	1
52	.PLATE-Identification	10-400012	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53	.KEY-Woodruff	10-90788-5	2	2	3	3	2	2	2	2	2	3	3	2	2	2

TABLE 1107: S6LN, S6RN-200, -201, -204 AND -205 MAGNETOS

(Continued)

REF NO.	DESCRIPTION	PART NO.	10-163010-1	10-163010-2	10-163010-10	10-163010-15	10-163020-3	10-163020-4	10-163020-103	10-163050-1	10-163050-7	10-163050-9	10-163050-12	10-163060-1	10-163060-2	10-163060-101
54	.MAGNET-Rotating	10-52945 10-52947 10-52948	1	1	1	1	1	1	1	1	1	1	1	1	1	1
55	.DEFLECTOR-Oil (Drive Shaft)	10-51678	1	1	1	1	1	1	1	1	1	1	1	1	1	1
56	.SCREW, W/LOCK WASHER	10-35937-8	2	2	2	2	2	2	2	2	2	2	2	2	2	2
57	.CLAMP-Coil Core	10-50765	2	2	2	2	2	2	2	2	2	2	2	2	2	2
58	.COIL	10-357165-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
59	.OIL SEAL	10-357592	1	1	1	1	1	1	1	1	1	1	1	1	1	1
61	.SCREW, W/LOCK WASHER (Cam)	10-391213	1	1	1	1	1	1	1	1	1	1	1	1	1	1
62	.WASHER-Plain (Cam Screw)	10-51354	1	1	1	1	1	1	1	1	1	1	1	1	1	1
63	.CAM	10-88543-4 10-88543-5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
64	.BEARING-Ball	2-202	1	1	1	1	1	1	1	1	1	1	1	1	1	1
65	.WASHER-Flat, 0.0025 in. thick	2-199-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-199-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-199-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-199-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-199-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-199-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
66	.WASHER-Plain	10-3503	1	1	1	1	1	1	1	1	1	1	1	1	1	1
67	.GEAR-Small	10-157120Y	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	.BEARING-Sleeve (Drive Shaft)	10-357078	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	.BEARING-Ball	10-81808	1	1	1	1	1	1	1	1	1	1	1	1	1	1
71	.WASHER-Flat, 0.0025 in. thick	2-161-1	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.004 in. thick	2-161-2	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.005 in. thick	2-161-3	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.008 in. thick	2-161-4	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.010 in. thick	2-161-5	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.012 in. thick	2-161-6	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
	.WASHER-Flat, 0.015 in. thick	2-161-7	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
72	.GEAR-Distributor, Kit	10-357588	1	1	1	1	1	1	1	1	1	1	1	1	1	1
73	.BRUSH-Carbon	10-160844	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	.RING-Retaining	10-92815-37	1	1	1	1	1	1	1	1	1	1	1	1	1	1
75	.WASHER-Plain, .750 in. OD	10-349511	1	1	1	1	1	1	1	1	1	1	1	1	1	1
76	.WASHER, Plain .562 in OD	10-606505	1	1	1	1	1	1	1	1	1	1	1	1	1	1
77	.WASHER, Nylon	10-391309	1	1	1	1	1	1	1	1	1	1	1	1	1	1
78	.SCREW, W/PLAIN AND LOCK WASHER (Distributor Block)	10-102083	3	3	3	3	3	3	3	3	3	3	3	3	3	3
79	.BLOCK-Distributor	10-357426	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	.SPRING-Helical	10-50737	6	6	6	6	6	6	6	6	6	6	6	6	6	6
81	.STRIP-Felt (Electrode Side)	10-163374	1	1	1	1	1	1	1	1	1	1	1	1	1	1
82	.WASHER-Felt (Ring Side)	10-50752	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE 1108

S-20/S-200

PRESSURIZED MAGNETO SYSTEMS

DESCRIPTION	PART NO.	10-357802	10-357803
Magneto, S6LN-25P	10-79020-118	2	
Magneto, S6RN-25P	10-79020-119		2
Gasket, Magneto-to-Harness	10-357520	2	2
Screw, Magneto-to-Harness	10-35937-12	8	8
Harness	10-720320-108	1	1

NOTE: SEE IPL FIGURE 1 FOR ILLUSTRATION OF GASKET AND SCREW..

# TABLE 1109: S-20/S-200 NUMERICAL PARTS LIST

PART NO.	DESCRIPTION	REF. NO.	QUANTITY 100 UNIT O'HAUL	PART NO.	DESCRIPTION	REF. NO.	QUANTITY 100 UNIT O'HAUL
2-161-1 thru-7	WASHER-Flat	71	10	10-52917	HOUSING-Distributor	48	1
2-194	WASHER-Lock	34	100	10-52931	HOUSING-Distributor	48	1
2-199-1 thru-6	WASHER-Plain	65	10	10-52937Y	COVER	15	1
2-202	BEARING-Ball	64	100	10-52939Y	COVER	15	1
10-3503	WASHER-Plain	66	5	10-52945	MAGNET-Rotating	54	2
10-3793	WASHER-Lock	3	100	10-52946	MAGNET-Rotating	54	2
10-4093	WASHER-Plain	4	10	10-52947	MAGNET-Rotating	54	2
10-7611	WASHER-Plain	37	10	10-52948	MAGNET-Rotating	54	2
10-14268	WASHER-Plain	37	10	10-56513	PIN-Stop	60	10
10-16476	SCREW	33	10	10-59436	CAM-Impulse Coupling	11	2
10-35935-5	SCREW, W/LOCK WASHER	41	200	10-59437	CAM-Impulse Coupling	11	2
10-35936-7	SCREW, W/LOCK WASHER	41	300	10-59439	CAM-Impulse Coupling	11	2
10-35936-8	SCREW	41	300	10-59471	CAM-Impulse Coupling	11	2
10-35937-8	SCREW, W/LOCK WASHER	56	300	10-59472	CAM-Impulse Coupling	11	2
10-50727Y	HOUSING-Magneto	50	1	10-59473	IMPULSE COUPLING-25°	8	2
10-50732	PLUG-Ventilator	44	5	10-59474	IMPULSE COUPLING-25°	8	2
10-50737	SPRING-Helical	80	60	10-59476	IMPULSE COUPLING-35°	8	2
10-50752	WASHER-Felt	82	100	10-59477	IMPULSE COUPLING-35°	8	2
10-50757Y	HOUSING-Distributor	48	1	10-59478	IMPULSE COUPLING-35°	8	2
10-50765	CLAMP-Coil Core	57	10	10-59479	IMPULSE COUPLING-45°	8	2
10-51324	SPRING-Impulse Coupling	10	100	10-70370	IMPULSE COUPLING-45°	8	2
10-51333	BODY-Impulse Coupling	9	2	10-70371	BODY-Impulse Coupling	9	2
10-51354	WASHER-Plain	62	10	10-76232	BODY-Impulse Coupling	9	2
10-51355	SCREW	33	10	10-79011	PIN-Stop	60	10
10-51370	WASHER-Plain	4	10	10-79019Y	COVER	15	1
10-51391	PLUG	46	5	10-81806	BEARING-Ball	70	100
10-51395	BODY-Impulse Coupling	9	2	10-81942	HOUSING-Magneto	50	1
10-51612	BUSHING	45	5	10-85231	CAM ASSY-Impulse Coupling	11	2
10-51613	WASHER-Keyed	4	25	10-88543-1	CAM-Breaker	63	5
10-51643	NUT	2	10	10-88543-4	CAM-Breaker	63	5
10-51651	BUSHING-Impulse Coupling	5	5	10-88543-5	CAM-Breaker	63	5
10-51652Y	NUT	2	10	10-89137	IMPULSE COUPLING-35°	8	2
10-51676	CAPACITOR	42	10	10-90751-18	PIN-Cotter	1	100
10-51678	DEFLECTOR-Oil	55	100	10-90788-5	KEY-Woodruff	53	15
10-51684	BUSHING, Ground Terminal	45	1	10-92845-37	RING-Retaining	74	100
10-52307	WASHER	4	25	10-92879-42	WASHER-Lock	13	400
10-52320	GASKET-Magneto Housing	49	100	10-102052	CAM-Impulse Coupling	11	2
10-52321Y	GASKET-Contact Cover	14	100	10-102053	IMPULSE COUPLING-30°	8	2
10-52326	HOUSING-Distributor	48	1	10-102079	CAM-Impulse Coupling	11	2
10-52327	HOUSING-Magneto	50	1	10-102083	SCREW, W/PLAIN AND LOCK WASHER	78	300
10-52903	BODY-Impulse Coupling	9	2				

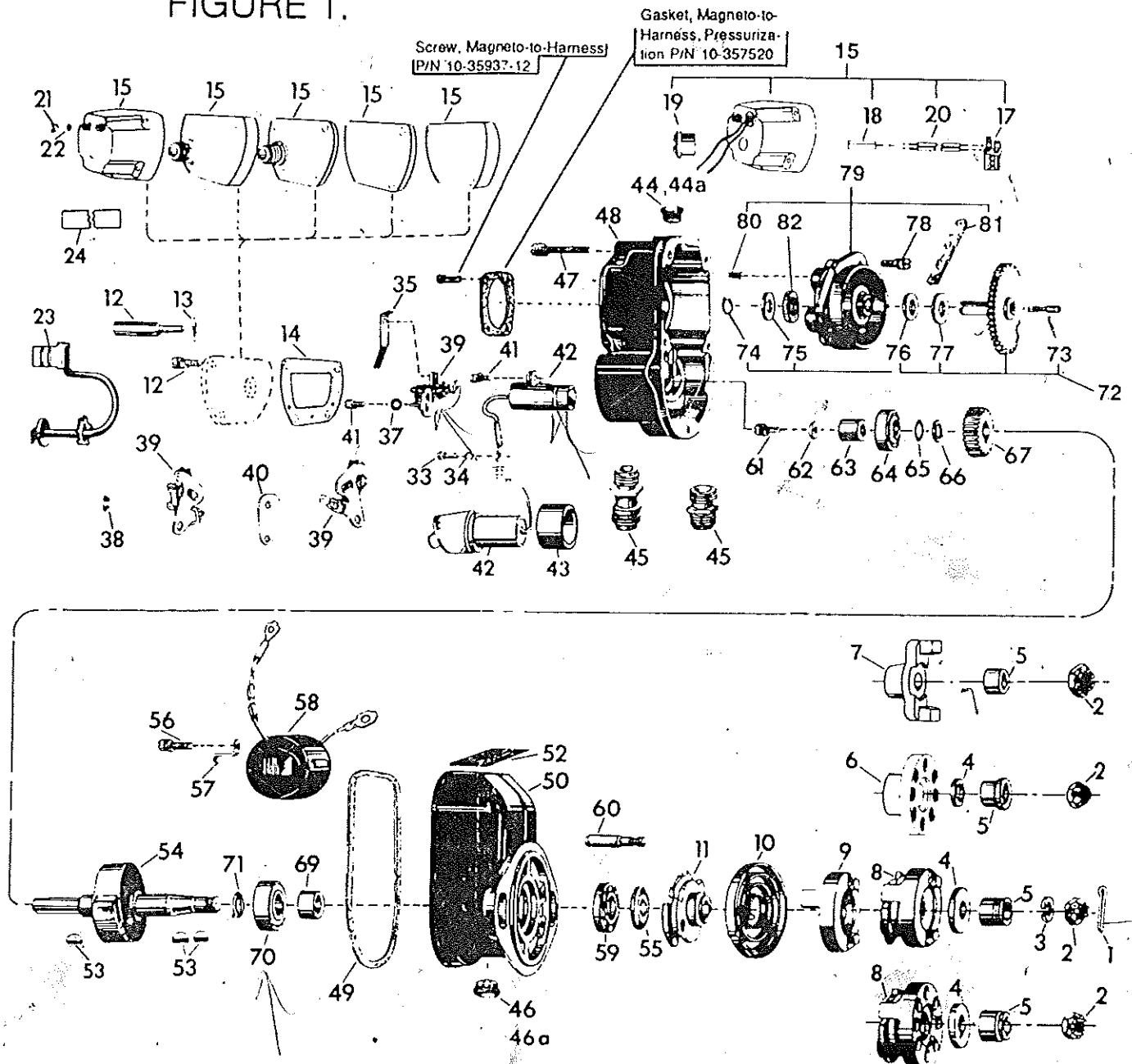
# TABLE 1109: S-20/S-200 NUMERICAL PARTS LIST (CONTINUED)

PART NO.	DESCRIPTION	REF. NO.	QUANTITY 100 UNIT O'HAUL	PART NO.	DESCRIPTION	REF. NO.	QUANTITY 100 UNIT O'HAUL
10-102090	SPRING	35	10	10-163402	HOUSING-Magneto	50	1
10-102092	SPRING	35	10	10-180128-1	SLEEVING, 20 Ft.	18	1
10-106492	HOUSING-Distributor	48	1	10-180161-1	WIRE, 25 Ft.	20	1
10-106498	HOUSING-Distributor	48	1	10-349511	WASHER, Plain, .750 In. OD	75	10
10-116860	WASHER-Plain	4	10	10-357015	SCREW, W/LOCK WASHER	12	400
10-116861	BUSHING-Impulse Coupling	5	5	10-357078	BEARING-Sleeve	69	50
10-116862	IMPULSE COUPLING-35°	8	2	10-357164-1	COIL	58	10
10-157120Y	GEAR-Small	67	2	10-357165-1	COIL	58	10
10-157123Y	GEAR-Small	67	2	10-357173	CONTACT ASSEMBLY	39	100
10-157134	PLUG-Ventilator	46	5	10-357174	CONTACT ASSEMBLY	39	100
10-157135	PLUG	44	5	10-357193	BUSHING-Impulse Coupling	5	5
10-157158	SCREW, W/LOCK WASHER	47	500	10-357256	SCREW, Hex hd	12	25
10-157160	SCREW, W/LOCK WASHER	12	400	10-357257	SCREW, Hex hd	12	25
10-157161	SCREW, W/LOCK WASHER	12	400	10-357265	IMPULSE COUPLING-15°	8	2
10-157164	IMPULSE COUPLING-45°	8	2	10-357281	CAPACITOR	42	50
10-157241	LEAD ASSEMBLY	23	5	10-357424	DISTRIBUTOR BLOCK, 4 cyl.	79	5
10-160844	BRUSH-Electrical Contact	73	100	10-357426	DISTRIBUTOR BLOCK, 6 cyl.	79	5
10-160850	PLATE, Drive	6	2	10-357451	CAM ASSEMBLY	11	2
10-160858	HOUSING-Magneto	50	1	10-357452	IMPULSE COUPLING-15°	8	2
10-160862	IMPULSE COUPLING-25°	8	2	10-357478	HOUSING	48	1
10-160892	IMPULSE COUPLING-30°	8	2	10-357479	MAGNET	54	2
10-160893	CAM-Impulse Coupling	11	2	10-357494	TUBING	43	1
10-160895	HOUSING-Distributor	48	1	10-357532	GASKET, CONTACT COVER	14	100
10-163003	PLATE, Drive	7	2	10-357533	GASKET, HOUSING	49	100
10-163048	BUSHING-Impulse Coupling	5	5	10-357584	DISTRIBUTOR GEAR KIT, 4 cyl.	72	5
10-163049	BUSHING-Impulse Coupling	5	5	10-357586	DISTRIBUTOR GEAR KIT, 6 cyl.	72	5
10-163056	HOUSING-Distributor	48	1	10-357592	OIL SEAL	59	100
10-163136	COVER	15	1	10-361624	PLATE-Insulating	40	50
10-163151	NUT-Drive Shaft	2	10	10-361631	CONTACT ASSEMBLY	39	100
10-163163	TERMINAL	17	10	10-361637	COVER ASSEMBLY	15	1
10-163177	NUT-Cap	21	10	10-361639	BUSHING	38	25
10-163178	NUT	2	10	10-382584	CONTACT ASSEMBLY	39	100
10-163194	PAPER	24	5	10-382585	CONTACT ASSEMBLY	39	100
10-163199	COVER	15	1	10-382815	BUSHING	44	5
10-163214	PLATE, Drive	7	1	10-382861	ORIFICE	46	5
10-163292	HOUSING-Distributor	48	1	10-391213	SCREW, W/LOCK WASHER	61	100
10-163374	STRIP-Felt	81	100	10-391309	WASHER, Nylon	77	10
10-163384	DISK-Neoprene	22	10	10-400012	PLATE-Identification	52	100
				10-606505	WASHER-Plain, .562 In. OD	76	10
				10-622161-9	GROMMET	19	5



# ILLUSTRATED PARTS LIST

## FIGURE 1.



**CAUTION**

If self-locking screw (61) is removed or loosened at any time, always replace with a new self-locking screw and torque to the specified value.

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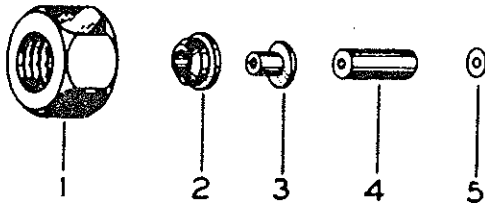
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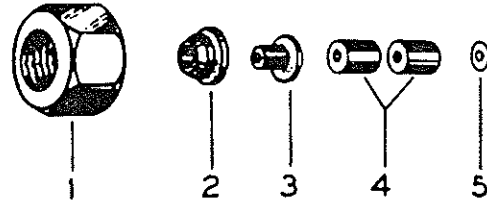
## GROUND TERMINAL KITS

(See Table 1101 for Applications)



Kit No. 10-52305

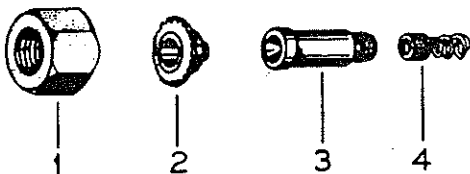
Ref. No.	Part No.	No. Req.	DESCRIPTION
1	10-37669	1	NUT - Coupling (Ground Terminal)
2	10-7030	1	FERRULE - Outer (Ground Wire)
3	10-7029	1	FERRULE - Inner (Ground Wire)
4	10-37668	1	SLEEVE - Insulating (Ground Wire)
5	2-155	1	WASHER - Ground Wire Contact



Kit No. 10-52305-1

Ref. No.	Part No.	No. Req.	DESCRIPTION
1	10-37669	1	NUT - Coupling (Ground Terminal)
2	10-7030	1	FERRULE - Outer (Ground Wire)
3	10-7029	1	FERRULE - Inner (Ground Wire)
4	10-52901	2	SLEEVE - Insulating (Ground Wire)
5	2-155	1	WASHER - Ground Wire Contact

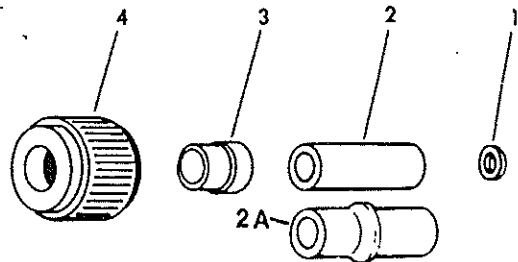
### AN STANDARD (AN 3105) GROUND TERMINAL ASSEMBLY



Kit No. 10-52306

Ref. No.	Part No.	No. Req.	DESCRIPTION
1	10-30299	1	NUT - Coupling (Ground Terminal)
2	10-56507	1	GROMMET ASSEMBLY (Ground Terminal)
3	10-3383	1	TERMINAL SCREW - Ground
4	10-25725	1	CONTACT - Ground Terminal Screw

### MAGNETO TERMINAL KIT



Kit Number	Description	Code
10-157208	KIT, Magneto Retard Terminal	A
10-157209	KIT, Magneto Ground Terminal	B
10-382813	KIT, Pressurized Retard Terminal	C
10-382814	KIT, Pressurized Ground Terminal	C

Index			Usage	Quantity
No.	Part Number	Description	Code	Required
1	10-77092	WASHER, Flat	A,B,C,D	1
2	10-157212	BUSHING, Insulated	A,B	1
2A	10-382812	INSULATOR	C,D	1
3	10-157213	BUSHING, Shouldered	A,B,C,D	1
4	10-157210	NUT, Coupling, 0.3750-32	A,C	1
	10-157211	NUT, Coupling, 0.4375-28	B,D	1