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AN-08-5DA-24

HANDBOOK
OPERATION, SERVICE, AND OVERHAUL
INSTRUCTIONS WITH PARTS CATALOG

Return to:
Jack Schifferer
760-743-4540



Savage
MAGNETO SERVICE
since 1946

Al Marcucci
2415 Radley Court #7 Hayward, Ca 94544
tel. 510-782-7081 fax. 510-782-7186
1-510-782-7081

AIRCRAFT MAGNETOS
VMN7D, VMN7DF, AND VMN7DF-5

(SCINTILLA)

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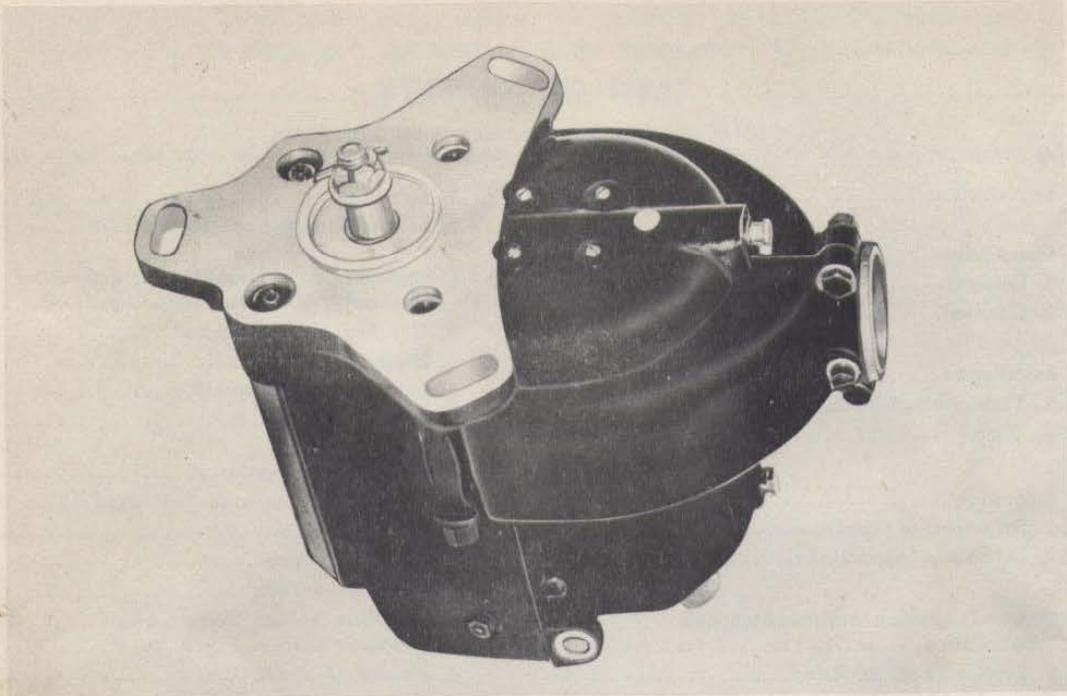


Figure 1—VMN7DF Magneto

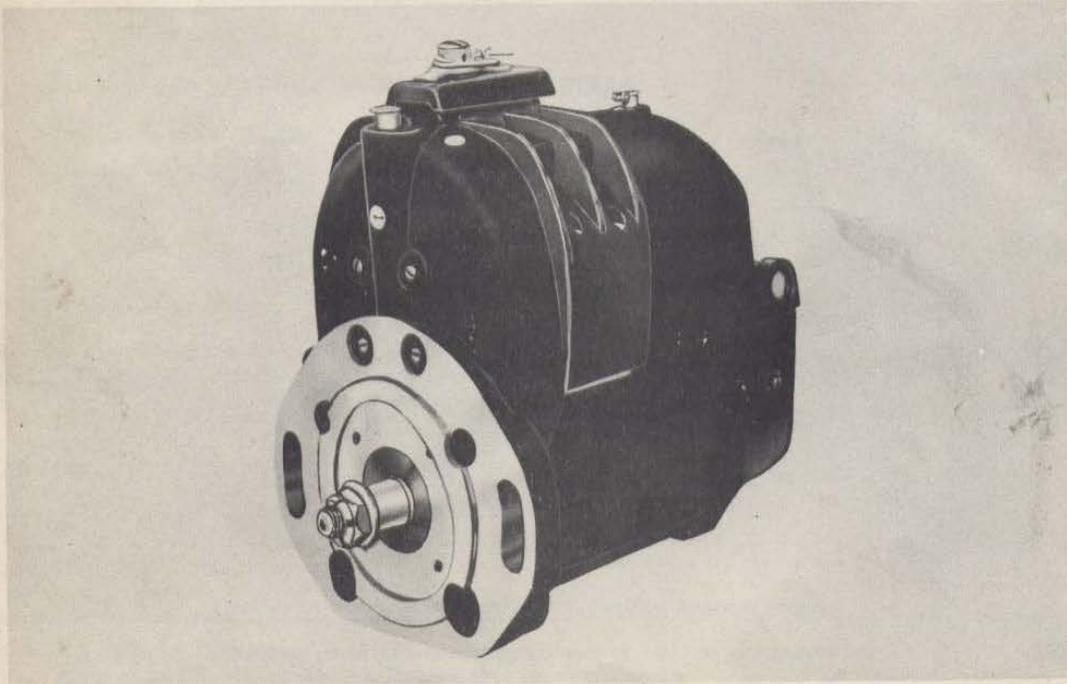


Figure 2—VMN7DF-5 Magneto

SECTION I INTRODUCTION

1. This Handbook is issued as the basic technical instructions for the equipment involved.
2. This Handbook contains Service and Overhaul

Instructions with Parts Catalog for the VMN7D, VMN7DF, and VMN7DF-5 magnetos, manufactured by Scintilla Magneto Division of the Bendix Aviation Corporation, Sidney, New York.

SECTION II DESCRIPTION

1. GENERAL. (See figure 3.)

a. The VMN7 type magnetos are single, seven cylinder magnetos driven at $\frac{7}{8}$ engine crankshaft speed. The general features of the internal construction of the VMN7D, VMN7DF, and VMN7DF-5 type magnetos are basically alike, however they differ in the method of mounting the magneto to the engine.

b. The VMN7DF-5 is a two bolt, flange mounted magneto, with a three inch mounting pilot. The VMN7DF is a three bolt, flange mounted magneto with either one and seven eighth inch or three inch mounting pilot. The VMN7D type magnetos are base mounted with a three inch mounting pilot.

c. The general service instructions in this Handbook may be used for all these magnetos, unless exceptions are made in the instructions.

d. These magnetos are profiled for easy installation of radio shields when required.

2. DETAILED.

a. ROTATING MAGNET.—The four pole rotating magnet used is made of a high grade magnet steel which enables a stable magnetic field to be maintained, producing adequate energy output for long periods of time. The magnet turns on two annular bearings, one located at the breaker end and the other at the drive end.

b. CAM.—The four lobe cam is located on the magnet shaft extension and is secured with a Woodruff key and a screw. The cam actuates a lever type breaker which can be set for either fixed or variable spark.

c. BREAKER ASSEMBLY.—The breaker cage is secured in the rear of the magneto housing by a retaining ring and two screws. Two stop screws in the housing establish the limits of the spark advance range. An

oil felt strip in the bottom of the breaker cage provides lubrication for the cam follower. A spark advance lever is secured to the breaker housing for use when variable spark is required.

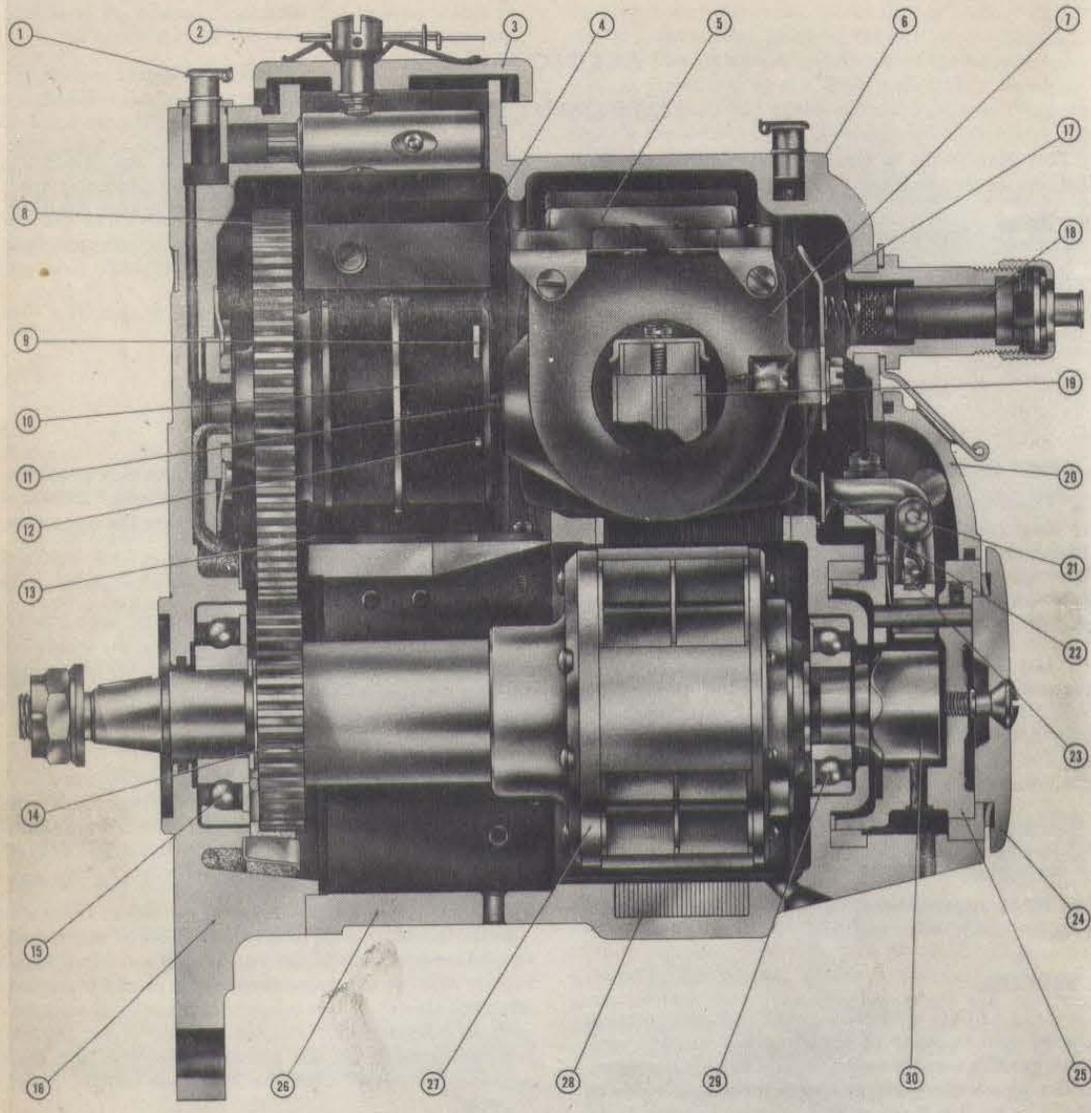
d. DISTRIBUTOR GEARS.

(1) LARGE GEAR.—The large distributor gear is mounted on an axle which is secured on the inside of the front end plate. The axle is adjustable for obtaining the proper backlash between the large gear and the small distributor gear. Oilers are provided for lubricating all bearings.

(2) SMALL GEAR.—The small distributor drive gear mounted on the magnet shaft has forty-four teeth and meshes with the large seventy-seven tooth distributor gear carrying the distributor cylinder. Therefore, the distributor cylinder turns at $\frac{7}{8} \times \frac{4}{7}$, or one half engine speed.

e. COIL AND CONDENSER.—The primary and secondary windings of the coil are enclosed in a hard rubber case which protects the coil chiefly from the effects of moisture. The condenser is similarly encased in hard rubber and is mounted on top of the coil. A laminated brush on the primary bridge of the coil provides a contact with the insulated contact point support.

f. DISTRIBUTOR CYLINDER AND BLOCKS.—The distributor cylinder is clamped to the large distributor gear by a snap ring and secured in proper position with a dog screw. The cylinder carries two high tension segments, two booster segments, and a booster collector ring. The distributor blocks are secured between the coil cover and front end plate by the clamp at the top of the magneto. Radio shielding is secured by two clamping springs which engage suitable latches, and are locked with safety pins.



- 1. Oiler
- 2. Lock—Safety Pin
- 3. Clamp—Distributor Lock
- 4. Block—Distributor
- 5. Condenser
- 6. Cover—Coil
- 7. Coil
- 8. Gear—Distributor—Large
- 9. Segment—High Tension
- 10. Cylinder—Distributor
- 11. Brush—Carbon—High Tension

- 12. Segment—Booster High Tension
- 13. Plate—Insulating
- 14. Gear—Distributor—Small
- 15. Bearing—Ball—Drive End
- 16. Plate—Front End
- 17. Bridge—Primary Grounding Terminal Contact
- 18. Terminal—Primary Grounding—Ignition Switch
- 19. Pole Shoe—Magneto Housing

- 20. Cover—Breaker
- 21. Point—Breaker Contact
- 22. Support
- 23. Spring—Breaker Main
- 24. Cover—Breaker End
- 25. Housing—Breaker
- 26. Housing—Magneto
- 27. Magnet—Rotating
- 28. Keeper—Magnetic
- 29. Bearing—Ball—Breaker End
- 30. Cam—Breaker

Figure 3—Sectional View of VMN7DF Magneto

SECTION III INSTALLATION

Before installing a magneto to an engine, make sure that it has been properly checked and inspected.

1. TIMING MAGNETO TO ENGINE.

a. Install the drive member on the magneto and secure it with its washer, castellated nut, and cotter pin. Remove the breaker cover, radio shielding, if used, and the distributor blocks. Set the breaker to full advance position by turning it as far as it will go in a direction opposite to forward rotation.

b. Turn the engine crankshaft in the direction of normal rotation to the full advance firing position of No. 1 cylinder on the compression stroke, as directed by the engine manufacturer's instructions.

c. Turn the magneto shaft until the timing marks (A) on the large distributor gear come approximately opposite the timing marks (B) on the inside of the front end plate. (See figure 4.) Install the magneto to the engine as nearly as possible in this position but do not tighten the mounting screws until final adjustment has been made.

Note

Never attempt to adjust engine timing by altering clearance between the breaker contacts, as this would alter the internal timing of the magneto.

d. By turning the VMN7DF and VMN7DF-5 magnetos through the range provided by the slots in the mounting flange, or by adjustment of the drive coupling of the VMN7D magneto, adjust magneto so that the contact points (C) (figure 4) just begin to open. Use the Abbott A-100 timing light or equivalent to determine the position where the contact points start to open. After this adjustment is made, tighten and lock the mounting studs.

2. WIRING.

a. Remove the cable piercing screws from the distributor blocks to avoid any possibility of the high tension cable not being fully seated in the cable holes. Insert the spark plug cable for No. 1 cylinder into the distributor block cable hole marked No. 1, and secure it with the cable piercing screw. Insure that cable piercing screw is tight. Place the spark plug cable for the next cylinder to fire in the distributor block hole marked No. 2, etc. The numerals on the distributor blocks indicate the order in which the sparks are delivered by the magneto and have no relation whatsoever to engine cylinder numbers. It is recommended that the section of cable within the distributor blocks be treated with powdered talc to prevent the cable from fusing to the wall of the hole. Insert the cable from the booster source into the cable hole marked (H) and secure it with the cable piercing screw. No

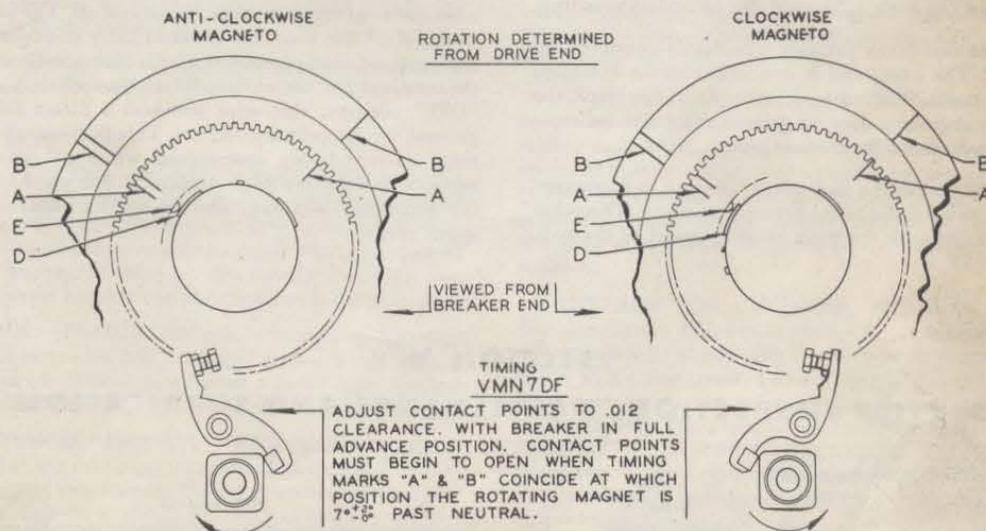


Figure 4—Timing Marks on Large Distributor Gear

lock washer is required beneath the head of this screw when a booster cable is installed. However, if the magneto is to be operated without the booster cable in place, the screw should be secured with a lock washer.

b. Before installing the radio shields it is recommended that the connections be checked for any short or open circuit and to ascertain whether or not the cables lead to the proper cylinders from the magneto. Either a buzzer or light system or a booster magneto can be used. When using a buzzer or light system, touch the distributor block electrode with one point and the spark plug end of the cable for the proper cylinder with the other. The circuit is complete when the buzzer

gives a signal or the lamp lights. If the circuit is not complete, check for a possible open circuit or wrong connection of the cable. To check for a short-circuit due to faulty insulation of the cable, a booster magneto is used. The high tension terminal of the booster magneto is connected to the distributor block electrode. The spark plug end of the cable is held about $\frac{1}{4}$ inch from a grounded object. If no spark occurs, check the cable for faulty insulation.

c. In installing the radio shields, allow enough slack in the cable to prevent extreme sharp bends. Install the breaker cover, radio shields, and distributor blocks on the magnetos.

SECTION IV OPERATION

1. PRINCIPLES OF OPERATION.

a. The poles of the rotating magnet are arranged in alternate polarity so that the flux can pass from a north pole through the coil core and back to a south pole. (See figure 5.) As the magnet is turned the polarity continually changes thereby producing flux reversals in the coil core. The number of flux reversals during one complete revolution of the magnet is equal to the number of poles of the magnet.

b. The flux reversals induce current in the primary winding when the contact points close. The flow of current in the primary winding stores energy which is released later by the opening of the contact points, thereby producing high voltage in the secondary winding.

c. One end of the primary winding is connected to ground. The other end is connected to the insulated contact point. When the contact points are closed, the primary current passes to ground. The condenser is connected across the contact points.

d. One end of the secondary winding is connected to the insulated end of the primary winding. The other end terminates at the high tension insert of the coil.

High tension current in the secondary winding is then conducted to the central insert of the distributor cylinder by means of a carbon brush. From here it is conducted to the high tension electrodes on the cylinder and across a small air gap to the electrodes of the distributor blocks. High tension cables then carry it to the spark plugs where the discharge or spark occurs for ignition purposes.

e. The booster electrodes are located so that they trail the high tension electrode on the distributor cylinder to give a retarded spark for starting the engine.

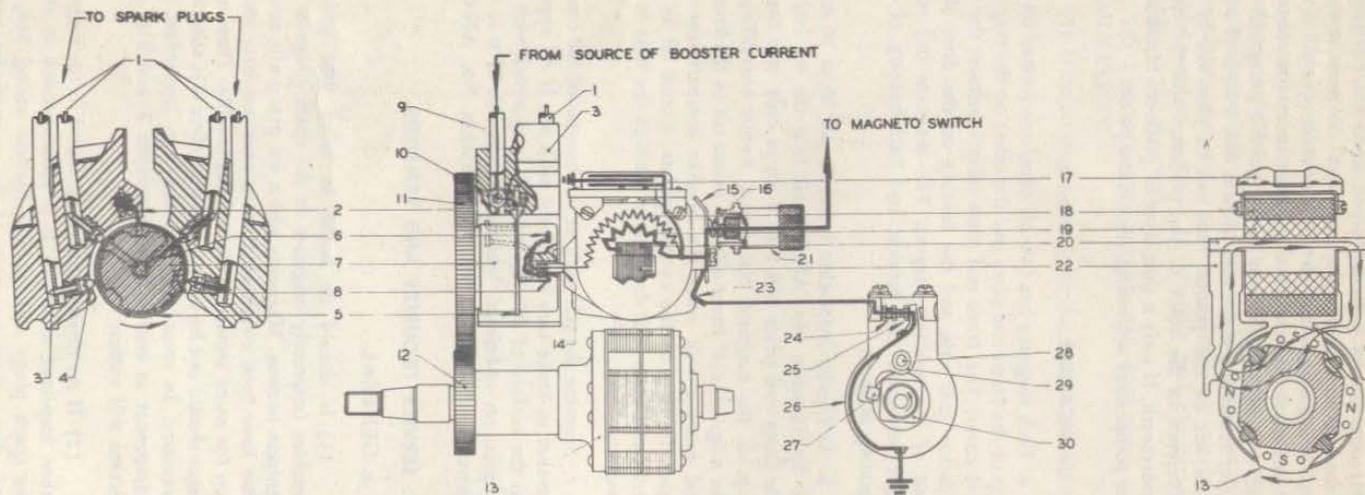
2. OPERATION INSTRUCTIONS.

An ignition switch electrically connected to the magneto serves to turn the magneto on and off. The switch terminal of the magneto is electrically connected to the insulated contact point. A wire is connected between the terminal and the switch. When the switch is in the "OFF" position, this wire provides a direct path to ground for the primary current. This prevents the primary current being interrupted when the contacts open, and therefore high voltage is not produced in the secondary winding, and no sparks occur at the spark plugs.

SECTION V SERVICE INSPECTION, MAINTENANCE AND LUBRICATION

1. SERVICE TOOLS REQUIRED.

| <i>Tool No.</i> | <i>Name</i> | <i>Application</i> |
|-----------------|--------------|--|
| Abbott A-100 | Timing Light | To determine the position where the contact points open. |
| 11-490 | Wrench | To adjust contact points. |



- | | | | | | |
|---|--|----|--------------------------------|----|--------------------------------|
| 1 | IGNITION CABLES | 10 | BOOSTER CABLE PIERCING SCREW | 21 | GROUND TERMINAL OUTLET |
| 2 | BOOSTER ELECTRODE IN DISTR. BLOCK | 11 | LARGE DISTRIBUTOR GEAR | 22 | POLE SHOES |
| 3 | DISTRIBUTOR BLOCK | 12 | SMALL DISTRIBUTOR GEAR | 23 | PRIMARY CONTACT BRUSH ASSEMBLY |
| 4 | DISTRIBUTOR BLOCK ELECTRODE | 13 | ROTATING MAGNET | 24 | LONG CONTACT POINT - INSULATED |
| 5 | BOOSTER COLLECTOR RING | 14 | HIGH TENSION CARBON BRUSH | 25 | SHORT CONTACT POINT |
| 6 | DISTRIBUTOR CYLINDER SEGMENT CARRYING SECONDARY CURRENT | 15 | PRIMARY BRIDGE | 26 | BREAKER LEVER MAIN SPRING |
| 7 | DISTRIBUTOR CYLINDER | 16 | SPRING - GROUND CONTACT BUTTON | 27 | CAM FOLLOWER |
| 8 | DISTRIBUTOR CYLINDER SEGMENT CARRYING BOOSTER CURRENT | 17 | PRIMARY CONDENSER | 28 | BREAKER LEVER AXLE |
| 9 | BOOSTER CABLE | 18 | SECONDARY WINDING | 29 | BREAKER LEVER |
| | | 19 | PRIMARY WINDING | 30 | BREAKER CAM |
| | | 20 | COIL CORE | | |

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Figure 5—Schematic Diagram of Electrical and Magnetic Circuits

2. SERVICE INSPECTION.

— COLUMN No. 22 —

IGNITION AND ELECTRICAL

Preflight Inspection

For preflight inspection, see the Handbook for the airplane in which the engine is installed.

100 Hour Army—30 Hour Navy Inspection

NAVAER INSPECTION FORM 3120

Take off magneto cover and inspect breaker assembly.

At regular routine inspection periods, check the adjustment of the contact points.

At regular inspection intervals remove the breaker cover and check the clearance between the contact points when held wide open by the cam. The clearance should be from .010 inch to .014 inch, the most desirable .012 inch. Make sure that the feeler gage is clean and free from oil before gaging the point clearance. (See figure 6.)

With proper lubrication as described in paragraph 4 of this section, there should be very little wear on the cam follower, and if excessive oil is kept from the contact points they should not pit or burn and therefore should not require frequent adjustment. However, if the clearance is less than .010 inch or more than .014 inch, the contact points should be adjusted.

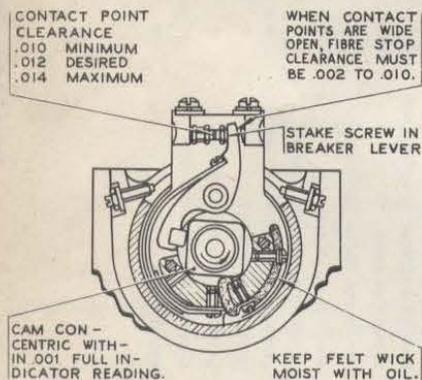


Figure 6—Breaker Contact Inspection

3. MAINTENANCE.

a. To adjust the clearance of the contact points loosen the lock nut on the long screw with wrench No. 11-490. Adjust the long contact screw so that there is .012 inch clearance between the contact points. Hold the contact point in place with one wrench and tighten the lock nut with another wrench.

b. After adjustment turn the engine until the points close, and check to see if the contacts meet squarely, as only one contact point is turned when the adjustment is made, it may be that the points will not mate squarely after being adjusted. If they do not meet squarely it will be necessary to remove the points from the magneto and redress them. (Refer to section VI paragraph 3.) After redressing make sure there is still a layer of platinum left on the points. This can be observed by the difference in the color of the platinum and the metal underneath. If only a thin layer of platinum remains on the points after redressing, replace the points.

4. LUBRICATION.

a. Each magneto has two oil cups, one located on the top of the front end plate and the other on the magneto coil cover. The front end plate oiler lubricates the distributor gear axle and the bearing on the drive shaft end of the rotating magnet. The magneto coil cover oiler lubricates the breaker end ball bearing of the rotating magnet.

b. At regular inspection intervals put 20 or 30 drops of Specification No. AN-O-8 oil into the oil cup on the front end plate and 5 to 8 drops only into the oil cup on the magneto coil cover. Avoid over-oiling at the magneto coil cover oiler as excess oil in the breaker end bearing will enter the breaker compartment and cause fouling of the contact points. Excess oil in the front end plate will drain away through the hole in the magneto base.

c. Examine the felt wick at the bottom of the contact breaker to make sure it is moist with oil. If oil appears on the surface of the felt when it is squeezed with the fingers, no additional lubricant is needed. If it is dry, however, moisten it with Specification No. AN-O-8.

5. SERVICE TROUBLES AND REMEDIES.

a. GENERAL.

(1) It should be borne in mind that ignition troubles frequently originate in the spark plugs or the ignition harness. Magnetos which are practically new or that have been overhauled at an overhaul base should run for many service hours without trouble. These magnetos should not be tampered with unless it is absolutely necessary. In most cases the cleaning, inspection, and adjustment as outlined in paragraphs 2 and 3 of this section will suffice.

(2) If no obvious faults are found in the magneto when inspected as above, it is recommended to check the spark plugs and ignition harness wiring first, before dismantling any parts of the magneto for test. If trouble persists after a check has revealed that other ignition system components are in satisfactory condition the trouble is probably in the magneto.

(3) In general, the most satisfactory correction for troubles known to originate in the magneto is to install another magneto which is in good operating condition, and to turn the defective unit over to the overhaul shop for repair by personnel trained in this work. This recommendation is made because random adjustments and alterations by inexperienced personnel may do more harm than good. Under some circumstances however, it may be impossible to follow this recommendation, and in such cases the following chart may be used as a guide in locating and correcting troubles in the magneto.

b. TO LOCATE TROUBLES BY PROCESS OF ELIMINATION.

(1) If inspection and adjustment fails to locate the

fault, the application of a test may locate the trouble. By a process of elimination one can usually determine what is wrong. If serviceable parts are available, change one unit at a time until the trouble has been located. The coil or primary condenser can be changed without removing the magneto from the engine.

(2) Should it become necessary to remove a magneto from the engine because of magneto trouble before the regular overhaul period, consideration should be given the amount of service the magneto has had since its last overhaul. If the magneto has had a large number of service hours, it should be overhauled at this time. However, if the magneto has had a small amount of service, it should only be necessary to locate and remedy the present trouble.

| c. TROUBLE | PROBABLE CAUSE | REMEDY |
|---------------------------------------|--|--|
| ENGINE FAILS TO START | Moisture condensation in distributor. | Thoroughly clean the dielectric surfaces of the distributor and coat with wax (Refer to section VI paragraph 3, e.) |
| | Condensation in spark plug wells or firing chambers. | Refer to engine handbook of service instructions. |
| | Moisture in ignition harness or leads. | Refer to engine handbook of service instructions. |
| | Booster system defective. | Refer to engine or airplane handbook of service instructions. |
| | Dead magneto. | Refer below. |
| ENGINE IS ROUGH, OPERATES ERRATICALLY | Moisture condensation in distributor. | Thoroughly clean the dielectric surfaces of the distributor and coat with wax. (Refer to section VI paragraph 3, e.) |
| | Condensation in spark plug wells or firing chambers. | Refer to engine handbook of service instructions. |
| | Loose connections in magneto primary circuit. | Check primary circuit and primary condenser connector for tightness of screws and possible short circuits. |
| | Magneto out of time internally. | Check adjustment of contact points. Refer to paragraphs 2 and 3, of this section. |
| | Defective primary condenser. | Remove and test primary condenser. Refer to section VII paragraph 8 for procedure. |
| | Moisture in magneto. | Dry all dielectric parts of magneto and wipe with an oily cloth. |
| | Dielectric failure. | Check distributor cylinder, distributor blocks, coil housing for carbon tracks or burning. Replace parts if necessary. |
| DEAD MAGNETO | Contact points fouled with oil or foreign particles. | Replace contact point assembly or carefully clean point surfaces. |
| | Defective primary condenser. | Test condenser as instructed in section VII, paragraph 8. Replace if defective. |
| | Shorted primary circuit. | Inspect connectors for defective insulation. Inspect ground wires and switch for defects. |
| | Defective coil. | Remove and test. Refer to section VII paragraph 7. |

SECTION VI

DISASSEMBLY, INSPECTION, REPAIR AND REASSEMBLY

1. OVERHAUL TOOLS REQUIRED.

The following list of tools are required in connection with the work outlined in this section.

| <i>Present Tool No.</i> | <i>Former Tool No.</i> | <i>Tool Name</i> | <i>Application</i> |
|-----------------------------|----------------------------|--|---|
| 11-490 | 4-490 | Contact Point Wrench Assembly (Incorporates .012 inch feeler gage) | For adjusting the contact points. |
| 11-700 | 4-17011 | Test Stand | For running test of magneto. |
| 11-705 | 4-2510 | Cutting Tool | To trim bearing insulating strips. |
| Abbott A-100 | | Timing Light | To check position where contact points open. |
| 11-970 | 4-134 | Pressing Tool | To install outer race of 15 mm. bearing. |
| 11-976 | 4-136 | Pressing Tool | To install outer race of 17 mm. bearing. |
| 11-980 | 4-145 | Rotor Handle | To turn drive shaft by hand. |
| 11-986 | 4-168 | Socket Wrench | For drive shaft nut. |
| 11-992 | 4-218 | Puller | To remove outer race of 15 mm. bearing. |
| 11-1002 | 4-222 | Puller | To remove outer race of 17 mm. bearing. |
| 11-1005 | 4-224 | Screw Driver Set (4) | For general use. |
| 11-1032 | 4-229 | Pressing Tool | To install small gear and inner race of 17 mm. bearing. |
| 11-1033 | 4-230 | Socket Wrench | For short contact screw. |
| 11-1036 | 4-232 | Pressing Tool | To install inner race of 15 mm. bearing. |
| 11-1037 | 4-233 | Puller | To remove small gear. |
| 11-1049 | 4-235 | Puller | To remove inner race of 15 mm. bearing. |
| 11-1058 | 4-237-1 | Locking Tool | For staking contact screw. |
| 11-1060 | 4-241 | Puller | To remove breaker cam. |
| 11-1065 | 4-243 | Puller | To remove inner race of 17 mm. bearing. |
| 11-1072 | 4-1337 | Socket Wrench | For front end plate stud nuts. |
| 11-1078 | 4-1842 | Template | To check the height of distributor block electrodes. |
| 11-1081 | 4-2316 | Screw Driver (Special bit) | For safety head screws securing distributor gear axle. |
| 11-1083 | 4-2317 | Screw Driver (Special bit) | For safety head screw securing booster electrode. |
| 11-1098 | 4-2509 | Locking Tool | For distributor block electrodes. |
| 11-1099 | 4-2511 | Clinching Pliers | To clinch lock ring on distributor gear axle. |
| 11-1100 | 4-2512 | Timing Disc | For setting or checking the "E" gap. |
| 11-1138 | 4-7823 | End Play Gage | To check magnet bearing end play. |
| 11-1221 | 4-9886 | Indicator | To check gear backlash and cam eccentricity. |
| 11-1225 | 4-9886-1 | Locking Tool | To lock rotating magnet in position while checking gear backlash. |
| 11-1248 | 4-12176 | Contact Point Dressing Kit (Includes stone 11-1269) | For dressing the contact point surfaces. |
| 11-1269 | 4-12868 | Stone | For replacement of stone furnished with 11-1248 tool. |
| *11-1301 | 4-14215 | Magnet Charger (110 volt dc) | To magnetize rotating magnet. |
| *11-1302 | 4-14215 | Magnet Charger (36 volt dc) | To magnetize rotating magnet. |
| 11-1307 | 4-14325 | Tap (3 mm. Loew.) | For cleaning threads of cable piercing screw holes. |
| 11-1350 | 4-15690 | Sleeve | To support magnet when pressing on inner bearing races. |
| 11-1395 | 4-1715 | Socket Wrench | For breaker stop screw lock nuts. |
| 11-1538 | 11-1124 | Ammeter | To check primary current. |
| 11-1767 | None | Primary Condenser Tester | To check primary condenser. |
| 11-1864 | 11-1217 | Gage | To check breaker main spring tension. |
| 11-2602 | 11-1274 | Ohmmeter | To check coil secondary resistance. |

*Order charger according to voltage source available.

2. DISASSEMBLY.

a. CONTACT BREAKER.—Remove breaker cover and advance lever. Take out the two screws which hold the breaker securing ring. Place one of these screws in the tapped hole in the center of the breaker assembly and lift out the breaker and retaining ring. Take out the friction spring ring in the recess behind the breaker assembly.

b. COIL COVER AND DISTRIBUTOR BLOCKS.—Remove the safety pin from the clamp screw on top of the distributor blocks. Loosen the screw and remove the clamp assembly and the distributor blocks. Remove the two long screws which hold the coil cover and lift off the cover.

c. COIL AND CONDENSER.—Remove the two screws and lock washers and clamps which secure the coil to the pole shoes. Compress carbon brush and lift off the coil and condenser.

d. FRONT END PLATE, ROTATING MAGNET AND MAGNETO HOUSING.

(1) Remove the front end plate after having taken out its two screws and the four lock nuts. Use socket wrench No. 11-1072 for the lock nuts. Tap each side of the front end plate lightly with a rawhide mallet to remove it from the housing.

(2) Remove distributor cylinder after prying out its lock ring with a screw driver.

(3) Take off the split lock ring on distributor gear axle. Lift off large distributor gear. Make sure the shim washers are kept together for reassembly purposes to maintain the correct adjustment between gear and axle.

(4) Do not loosen the four special screws which secure the axle to the front end plate unless replacement is necessary. The original gear backlash adjustment will then be retained.

(5) Remove rotating magnet from housing and place it in a clean place. Take off insulating plate located in front of pole shoes of the housing. Remove breaker cam using No. 11-1060 puller.

3. INSPECTION AND REPAIR.

a. CONTACT BREAKER ASSEMBLY

(1) Check the breaker lever bushing for looseness on its axle. If it is loose, the bushing is probably worn thus requiring replacement of the breaker lever. Inspect the contact points. Should the surfaces need dressing, remove contact screws and place them in the No. 11-1248 contact point dressing kit for redressing with the special No. 11-1269 stone. (See figure 7.) To do this remove main spring securing screw from breaker housing, the breaker lever axle lock screw, the axle, and the lever assembly, and use socket wrench No. 11-1033 to remove the short contact screw from the lever. Some care should be taken as the screw is staked to the lever. Use wrench No. 11-490 to remove the long contact screw from the support. Always be sure to restake the short contact screw to the lever after

replacing the screw in the lever. Locking tool No. 11-1058 is used for this operation. The contact point on the long screw should always be redressed when a new breaker lever assembly is installed. If new parts are installed it may be necessary to add or remove shims under the contact support to obtain alignment of the contact points. This may be done by removing the two screws which secure the support to the breaker.

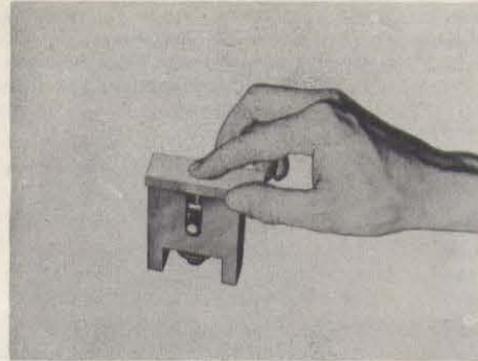


Figure 7—Using No. 11-1248 Dressing Kit

(2) Clean the breaker assembly thoroughly before reassembling.

(3) Check breaker lever tension with gage No. 11-1864. Tension should be from 16 to 32 ounces. If tension is low, it usually can be increased by installing a new long reinforcing spring. (See figure 8.)

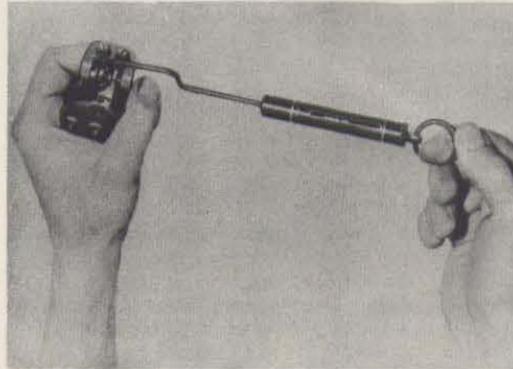


Figure 8—Checking Breaker Main Spring Tension

b. COIL COVER AND DISTRIBUTOR BLOCKS.

(1) Clean the electrode surfaces in the distributor blocks. Make sure that all electrodes and screws are in good condition. If any electrodes are burned or worn excessively, replace with new ones. Staking tool No. 11-1098 is used to expand new electrodes slightly to hold them in the block when installing for the first time. Place the tool over the electrode and strike it several light quick blows with the mallet. After expand-

ing the electrode, insert and tighten the cable piercing screw. Check height of electrode with No. 11-1078 gage, removing metal from top of the electrode with a file, if necessary, until the tip of the electrode will just touch the surface on the gage. (See figure 9.)

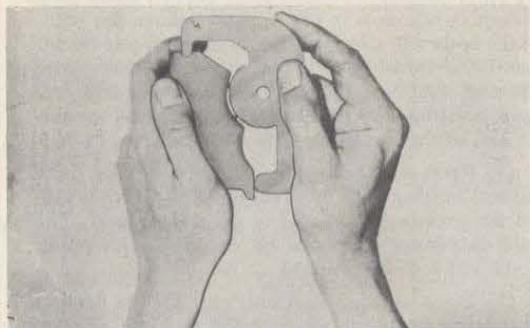


Figure 9—Checking Height of Distributor Block Electrodes

(2) The booster electrode securing screw does not pierce the booster cable. Accordingly, this screw need be loosened only when replacement of the booster electrode is necessary. Since this does not often occur, the screw is of the half cut type, to prevent inadvertent loosening of the screw when servicing the other electrodes. However, when necessary to tighten or loosen this screw, the No. 11-1083 slotted screw driver is used. The booster cable fastening screw is located in the hole nearest the booster electrode.

c. COIL AND CONDENSER.—Examine the coil and condenser carefully to be sure there are no breaks or cracks in the dielectric material. For electrical test of the coil and condenser, see section VII, paragraphs 7 and 8.

d. DISTRIBUTOR CYLINDER.—Examine the distributor cylinder for cracks or burns. Clean cylinder electrodes with a piece of fine emery cloth. If the cylinder electrodes are worn down to the level of the dielectric at any point, replace the cylinder. Check carbon brush to make sure it operates smoothly without sticking or binding.

e. TREATING DIELECTRIC PARTS AGAINST MOISTURE ABSORPTION.

(1) Dielectric parts of magnetos and distributors whose surfaces have been subjected to conditions such as arcs and highly stressed corona should be thoroughly cleaned and given a wax treatment periodically.

(2) Clean the dielectric surfaces of the distributor block, distributor cylinder, and the coil with acetone, Federal Specification No. O-A-51-A, using a stiff non-metallic brush or a clean cloth.

(3) After cleaning the parts, dry them thoroughly

in an oven at 54.4°C (130°F) to 65.6°C (150°F) for ½ hour.

CAUTION

Use a clean cloth moistened in cleaner for cleaning the coils. Do not dip or saturate coils in any liquid solution as that might impair the insulation. Acetone, Federal Specification No. O-A-51-A is inflammable and should be used in a well ventilated area where no open flame is present. Parts should be allowed to air dry thoroughly before they are placed in the oven for drying.

Note

Exhaust facilities should be provided to insure proper ventilation.

(4) Heat the wax to 54.5°C (130°F) and mix a solution of one part by volume of wax to two parts trichlorethylene, Specification No. 97-54-133, Stock No. 8500-950500. This makes a solution which can be applied with a small brush. No. 72 wax compound may be obtained from Scintilla Magneto Division, Bendix Aviation Corporation, Sidney, N. Y. Simoniz Corol No. S-155 wax may be obtained from the Simoniz Company, Chicago, Illinois.

Note

USAF personnel will requisition Wax—Ignition treating, Stock No. 7300-983750, Class 07, in lieu of Scintilla No. 72 wax compound.

(5) Remove the parts from the oven and while they are still hot apply a thin coating of the wax solution.

Note

Inasmuch as trichlorethylene evaporates very quickly, the mixture will become thick if left exposed to the air. When treating a large number of parts it may be necessary to thin the mixture by adding more solvent to bring it back to its original consistency of one to two.

(6) After applying the protective wax coating, place the parts in the oven at 71.1°C (160°F) to 76.7°C (170°F) for 1½ to 2 hours to drive off all solvents in the wax. After removal from the oven the parts are ready for use.

(7) Do not attempt to dry the wax to a hard glossy finish as the wax is rather soft even when thoroughly dry. If an excess of wax remains on the parts it can be removed with a clean cloth so that only a thin coat remains. Should this be necessary it indicates that the wax was not thinned sufficiently for application. Heavy deposits of wax should not be allowed to remain on the dielectric as this may cause carbon tracks.

f. DISTRIBUTOR GEARS.—Inspect the distributor gears for burrs or excessive wear. If either gear needs replacement, replace both the pinion and large distributor gears.

g. REPLACEMENT OF DRIVE SHAFT AND BREAKER END BALL BEARINGS.

(1) Clean and examine the ball bearings making sure that the ball races or balls are not pitted or worn.

(2) If any one part of a ball bearing is defective and needs replacement, the complete bearing must be replaced.

(3) The outer ball races are insulated from the magneto by insulating strips and are also backed by washers of the same material as used in the insulating strips.

(4) Remove the outside race from the front end plate with puller No. 11-1002 (figure 10) and remove the inside race from the drive end of the rotating magnet with puller No. 11-1065.

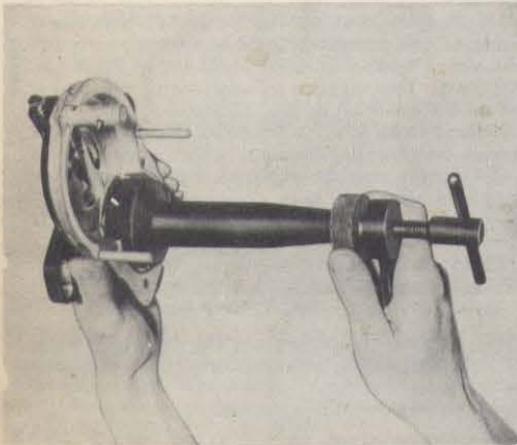


Figure 10—Removing Outside Ball Race From Front End Plate

(5) Remove the outside ball race from the housing with puller No. 11-992 and the inside race from the breaker end of the rotating magnet with puller No. 11-1049. (See figure 11.)

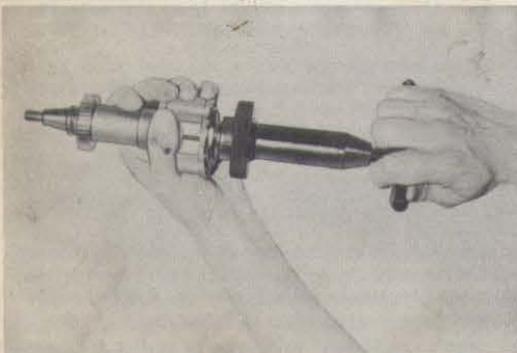


Figure 11—Removing Inside Ball Race From Breaker End of Rotating Magnet

(6) Before installing new races in the front end plate and housing, first put in the flat insulating washer in the bottom of the recess for the bearing so that the cut in it will line up with the oil recess. Then spread a few drops of oil evenly over one side of the insulating strip. Bend the strip in a circular form with the oiled side inside and overlap the ends enough to allow the strip to fit loosely into the recess for the outer race. When it is released, it will expand against the walls and the ends will overlap slightly in the recess cut for them. Press in the outside ball race for the front end plate with tool No. 11-976 and the outside ball race for the housing with tool No. 11-970. Cut off the surplus part of the insulating strip with tool No. 11-705.

(7) Press on the inside ball race for the drive shaft end bearing with tool No. 11-1032 which is also used for pressing on the small distributor gear. The small distributor gear can be removed with puller No. 11-1037. (See figure 12.)

(8) Press on the inside ball race for the breaker end bearing with tool No. 11-1036.

(9) Tool No. 11-1350 is used to support magnet in arbor press when pressing on the inner bearing races.

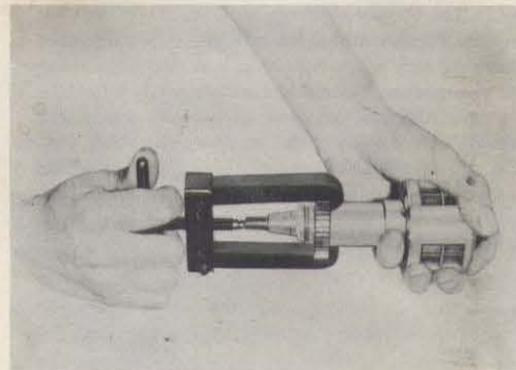


Figure 12—Removing Small Distributor Gear With No. 11-1037 Puller

4. REASSEMBLY.

Before reassembling the magneto make sure that all parts are clean and free from chips or foreign particles.

a. FRONT END PLATE.—Moisten felt wicks with Specification No. AN-O-8 oil. Place large distributor gear in position using the original shim washers which were removed so as to insure correct adjustment. Secure gear with a new lock ring, using tool No. 11-1099. The gear must turn freely on its axle with the minimum perceptible end play. Place paper washer in position on face of gear. Install distributor cylinder which is located in position with a dog screw. Secure cylinder with its lock ring.

b. HOUSING.—Make sure that the housing is free from burrs. Install insulating plate.

c. ROTATING MAGNET.

(1) There are two breaker cam keyways located on the magnet shaft extension of the standard rotating magnet used in the VMN7D, VMN7DF5 and VMN7DF magnetos. One keyway is marked (R) and the other (L). Place the cam key in keyway marked (R) for clockwise rotation or in keyway marked (L) for counterclockwise rotation.

(2) Secure cam in position using keyway marked (D) for clockwise rotation and keyway marked (G) for counterclockwise rotation.

(3) Recharge magnet using the No. 11-1301 magnet charger which operates on 110 volts dc or the No. 11-1302 magnet charger which operates on 36 volts dc. Clean and inspect the ball bearings. If satisfactory, repack with Specification No. AN-G-5 grease. Make sure that all chips or foreign particles have been removed from the magnet. Place a light coating of oil on the pole pieces of the magnet.

(4) Place the rotating magnet in the front end plate being sure to mesh the chamfered tooth of the small distributor gear with the tooth on the large distributor gear marked (R) for clockwise and (L) for counterclockwise rotation. (See figure 13.) Place the housing over the magnet and secure it to the front end plate with the two screws, two lock washers, and four nuts.

RELATION OF TIMING MARKS WHEN
MESHING GEARS
THE MARKED TOOTH ON SMALL GEAR
ENGAGES TOOTH ON LARGE GEAR
MARKED "R" FOR CLOCKWISE MAGNETS
AND "L" FOR ANTI-CLOCKWISE MAGNETS

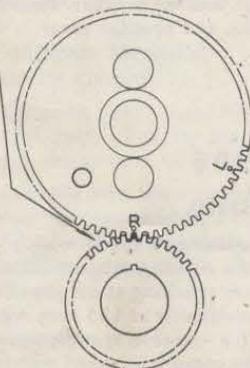


Figure 13—Relation of Timing Marks
When Meshing Gears

(5) Make sure the rotating magnet turns freely and does not bind at any place. Check the clearance between each pole piece and the pole shoes of the housing. The clearance must not be less than .0015 inch for any pole piece of the magnet. (See figure 14.)

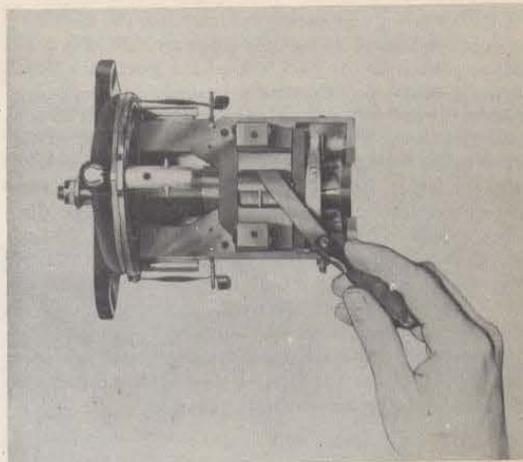


Figure 14—Checking Clearance Between the Rotating
Magnet and the Pole Shoes

d. ADJUSTMENT OF ROTATING MAGNET
BEARINGS.

(1) Adjustment of end play is obtained by placing steel spacing washers back of the inner ball races of the magnet shaft. These washers are available in thicknesses of .0025, .004, .005, .008, .010, and .012 inch. If the inner races are removed always keep the spacing washers which are already installed in the same position. If additional washers are required to take up end play, install them equally in thickness in back of each inner ball race.

(2) If the original spacing washers are kept in place, it will be rarely necessary to adjust the rotating magnet bearings. If either or both of the bearings have been removed or replaced they should be adjusted following the procedure as given below.

(3) Remove one of the inside bearing races and remove about one-half of the steel spacing washers. Replace the race and install the rotating magnet in the housing and front end plate. Determine the amount of end play by using tool No. 11-1138. Install steel spacing washers equal to the amount of end play plus .001 inch. (For example, rotating magnet end play .004 plus .001 inch equals .005 inch or amount of steel spacing washers to be added.) Replace inner bearing race and reassemble. This adjustment gives the bearings the correct amount of preload which should be .001 to .0015 inch.

e. ADJUSTING BACKLASH OF DISTRIBUTOR
GEAR.

(1) It will be rarely necessary to adjust the backlash of the gears if the position of the distributor gear axle has not been changed. If a new gear is installed,

c. ROTATING MAGNET.

(1) There are two breaker cam keyways located on the magnet shaft extension of the standard rotating magnet used in the VMN7D, VMN7DF5 and VMN7DF magnetos. One keyway is marked (R) and the other (L). Place the cam key in keyway marked (R) for clockwise rotation or in keyway marked (L) for counterclockwise rotation.

(2) Secure cam in position using keyway marked (D) for clockwise rotation and keyway marked (G) for counterclockwise rotation.

(3) Recharge magnet using the No. 11-1301 magnet charger which operates on 110 volts dc or the No. 11-1302 magnet charger which operates on 36 volts dc. Clean and inspect the ball bearings. If satisfactory, repack with Specification No. AN-G-5 grease. Make sure that all chips or foreign particles have been removed from the magnet. Place a light coating of oil on the pole pieces of the magnet.

(4) Place the rotating magnet in the front end plate being sure to mesh the chamfered tooth of the small distributor gear with the tooth on the large distributor gear marked (R) for clockwise and (L) for counterclockwise rotation. (See figure 13.) Place the housing over the magnet and secure it to the front end plate with the two screws, two lock washers, and four nuts.

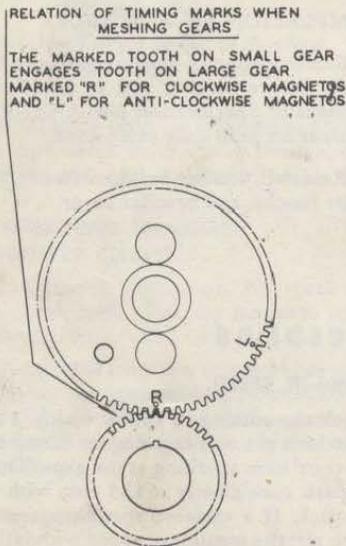


Figure 13—Relation of Timing Marks When Meshing Gears

(5) Make sure the rotating magnet turns freely and does not bind at any place. Check the clearance between each pole piece and the pole shoes of the housing. The clearance must not be less than .0015 inch for any pole piece of the magnet. (See figure 14.)

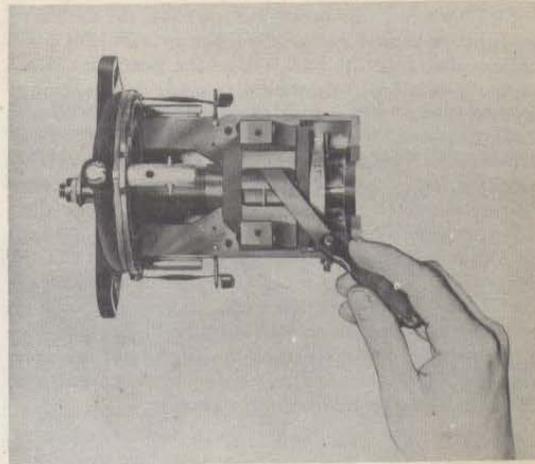


Figure 14—Checking Clearance Between the Rotating Magnet and the Pole Shoes

d. ADJUSTMENT OF ROTATING MAGNET BEARINGS.

steer the nes. If the was tion play inn plac mag been follo rem Rep hou end

to Increase (advance) Spark

ing of k. h. g. i. d. h. in ig ve d. d. s. e of

pay by using TOOL NO. 11-1136. Install steel spacing washers equal to the amount of end play plus .001 inch. (For example, rotating magnet end play .004 plus .001 inch equals .005 inch or amount of steel spacing washers to be added.) Replace inner bearing race and reassemble. This adjustment gives the bearings the correct amount of preload which should be .001 to .0015 inch.

e. ADJUSTING BACKLASH OF DISTRIBUTOR GEAR.

(1) It will be rarely necessary to adjust the backlash of the gears if the position of the distributor gear axle has not been changed. If a new gear is installed,

however, it will be necessary to adjust the backlash of the gears as given in the following paragraph.

(2) If new gears have been installed, the distributor cylinder should be omitted from the assembly procedure until after the backlash of the gears has been properly adjusted. Adjustment is made by loosening the four screws which hold the distributor axle to the front end plate. Turn the axle slightly with a screw driver to the right to raise the large gear (loosen mesh) or to the left to lower large gear (tighten mesh). The correct amount of backlash between the large distributor gear and the small distributor gear is .002 to .003 inch and is measured with gage No. 11-1221. If the gears have not been replaced, a service tolerance of .007 inch backlash is allowed. After adjustment is made, tighten and lock the four screws holding the distributor gear axle. Reinstall the distributor cylinder and apply Specification No. AN-G-5 grease evenly on the teeth of the large distributor gear.

f. CONTACT BREAKER.

(1) Check the eccentricity of the cam with the No. 11-1221 indicator. The cam should run true within .001 inch, full indicator reading. It is permissible to tap the cam lightly using a fiber drift to fulfill eccentricity requirements.

(2) Insert the spring tension rings in the recess in the breaker housing and install the breaker assembly, securing it with the retaining ring and two screws. Check the clearance between the contact lever and the fiber stop on full contact opening. A clearance of .006 inch is desirable. Replacement of the fiber stop is not necessary however unless the clearance exceeds .012 inch, nor is it necessary to file the stop down unless the clearance is less than .002 inch.

g. INTERNAL TIMING.

(1) Set the clearance between the contact points to

.012 inch using the contact wrench and feeler gage assembly No. 11-490.

(2) Check the "E" gap of the magneto which is the number of degrees that the magnet turns past neutral in its normal rotation to the place where the contact points begin to open. If variable spark is used, the breaker must be placed in full advance position when measuring the "E" gap.

(3) The "E" gap is measured with the No. 11-1100 timing disc. A suitable pointer must be provided to be used in conjunction with the timing disc. Place timing disc on magnet shaft and place magnet in its neutral position. Note the reading on the timing disc. Then turn magnet in direction of normal rotation until the contact points just begin to open and record the reading. The difference between the two readings is the actual "E" gap which should be from 7° to 9°. If reading is outside these limits, adjust breaker stop screws until correct reading is obtained. Socket wrench No. 11-1395 is used for the breaker stop screw lock nuts.

(4) Use Abbott A-100 timing light or equivalent to determine the position where the contact points start to open.

(5) With the breaker in full advance position, the timing marks (A) on the large distributor gear (*figure 4*) should be opposite the timing marks (B) on the inside of the front end plate.

b. COMPLETION OF ASSEMBLY.

(1) Remove contact breaker and install coil and condenser. Before placing coil in position, apply a small amount of Specification No. AN-G-5 grease or its equivalent on pole shoe extensions.

(2) Reinstall contact breaker. Install coil cover, distributor blocks, and breaker cover.

SECTION VII

MAGNETO TEST PROCEDURE

1. MOUNTING MAGNETO TO TEST STAND.

Mount the magneto on the No. 11-700 or equivalent test stand. Connect the high tension cables to the 7 mm. three point spark rack.

2. MECHANICAL TEST.

a. Run the magneto at various speeds for several minutes to observe mechanical operation. Shut off power for any unusual noise as the magneto speed declines. Observe contact points for excessive arcing. However, slight arcing of points after overhaul is not objectionable.

b. When the operator has made sure there are no obvious faults in the operation of the magneto, it should be operated about 30 minutes at about 2000 rpm for a running test.

3. COMING-IN SPEED.

a. Check the coming-in speed, which is the lowest speed at which the rotating magnet must be turned to produce consistent sparking at the gaps. The magneto should spark consistently at 135 rpm with a fully advanced spark. If a variable spark magneto is being tested also test the coming-in speed with fully retarded spark. It should spark consistently at 250 rpm.

b. If coming-in speed is above the value given, check the adjustment of the spark gap on the test stand. The correct spark gap for the coming-in speed test is a 7 mm. (.275 inch) three point gap, the electrodes of which are sharpened to a 45 degree included angle with not greater than .008 inch radius at the apex of the cone thus formed. (*See figure 15.*) The teaser electrode

is mounted at right angles to the main electrode, and spaced .007 inch from the nearest surface of the live electrode. If gaps are properly adjusted, check the high tension wiring. If all connections are satisfactory, recheck primary condenser and all primary connections. Make sure contact points are clean and properly adjusted, and that the magneto is being operated in the correct rotation direction. See that the magnet is properly charged as instructed under paragraph 6 of this section.

ADJUST POINTS AS SHOWN BELOW

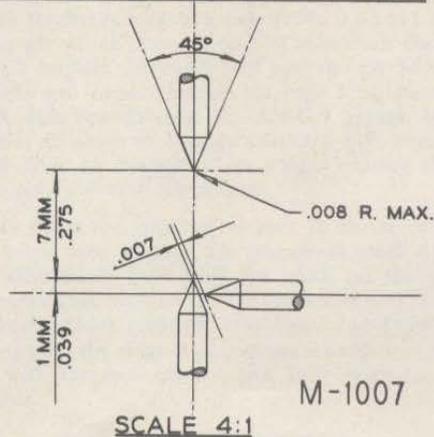


Figure 15—Correct Setting of Standard 7 mm. Three Point Spark Gap

4. HIGH SPEED TEST.—Operate magneto at 2500 rpm. If missing occurs check main spring tension, contact point adjustment, coil, and condenser.

5. CHECKING GROUND TERMINAL AND BOOSTER CIRCUIT.

a. Check the ground connection. No spark should occur at the spark rack when the magneto is short-circuited through the ground wire terminal screw.

b. Connect the cable from the source of booster current to the booster connection in the magneto. Run the magneto at 150 rpm and observe the booster spark at the spark rack. The booster spark always trails the secondary spark.

6. ROTATING MAGNET.

Operate the magneto for about five minutes at 3500 rpm. During this run, short-circuit the primary current several times. Then operate magneto at 400 rpm. (This speed must not vary more than 10 rpm.) Hold contact points open by hand and connect ammeter No. 11-1538 in parallel or across the contact points. The ammeter should not read below 1.7 amperes. If reading is below 1.7 amperes, recharge the rotating magnet with either magnet charger No. 11-1301 which oper-

ates on 110 volts dc, or magnet charger No. 11-1302 which operates on 36 volts dc. Repeat ammeter test. If reading is still below, repeat test with a new coil before rejecting the magnet.

7. COIL.

a. Before installing the coil in the magneto check the resistance of the secondary winding with the No. 11-2602 ohmmeter. The reading must be from 5000 to 8000 ohms. (See figure 16.)

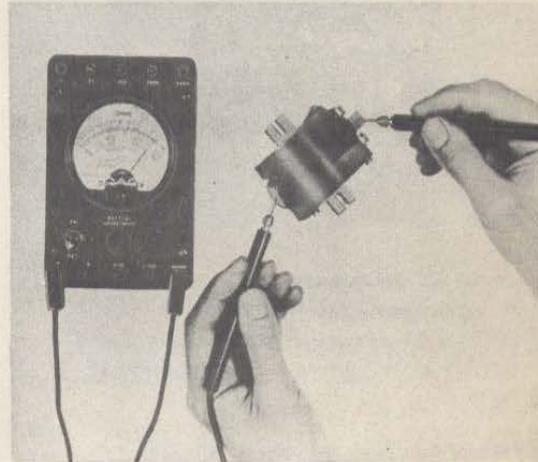


Figure 16—Checking Resistance of Secondary Winding of Coil

b. The final test of a coil must be made an actual running test of the magneto on the test bench. Also, as heat from the engine affects the insulating materials of the coil, the final test should be made at an elevated temperature. This is done by directing a reflector type heater on the magneto while it is being run on the test bench. When the temperature of the coil has reached approximately 74° (165F°) the spark gaps should be increased by means of the adjustable panel from 7 mm. to 9 mm. At 2000 rpm the coil must spark consistently at this temperature and spark gap. Increase the gaps to 10 mm. If consistent sparking occurred with the 9 mm. gap, intermittent missing with the 10 mm. gap will not be sufficient cause to reject the coil.

c. It may be found that the coil produces consistent sparking at room temperature with 7 mm. gaps, however, if the coil does not spark consistently at the elevated temperature with 9 mm. gaps, it should not be used for further service.

8. PRIMARY CIRCUIT CONDENSER.

The condenser should be tested before it is installed on the magneto. At locations where 110 volt, 60 cycle, alternating current is available, use the No. 11-1767

Section VII
Paragraph 8

AN-03-5DA-24

primary condenser tester, in accordance with the instructions furnished with this tool. For other locations use No. 11-1400 Megger, if available. The condenser must be heated to 87.8°C (190°F) for the Megger

test, if used. If the reading of the Megger is less than 50,000 ohms when condenser is tested at 87.8°C (190°F) the condenser is not fit for further service and should be replaced.

PARTS CATALOG

SECTION I

INTRODUCTION

1. This catalog refers only to the VMN7DF, VMN7D, and VMN7DF-5 types of aircraft magnetos manufactured by the Scintilla Magneto Division, Bendix Aviation Corporation.

2. The Group Assembly Parts List, Section II, consists of a breakdown of the complete accessory in serviceable subassemblies and detailed parts. Each sub-assembly listed is directly followed by its component parts properly indented to show their relationship to the subassembly. The quantities specified are those used at the location shown and not necessarily the total used per unit.

3. The Numerical Parts List, Section III, lists part numbers numerically, exclusive of standard parts which are shown in section IV. The column headed "Group List Page No." refers to pages of the Group Assembly Parts List. The column headed "Total Quantity" indicates total number used per accessory.

4. The Standard Parts List, Section IV, lists AN parts and total quantity.

5. The basic magneto assembly covered by this parts list is designated by a part number. Variations of this basic assembly due to the difference in engines on which these magnetos are installed are indicated by a suffix number separated from the basic assembly number by a dash . . . i.e. 10-00000-0. When ordering spare parts, the variations under the installations numbers should be consulted to insure that the correct parts are being ordered. The installation number should correspond with the manufacturer's drawing number given on the magneto identification plate.

SECTION II—GROUP ASSEMBLY PARTS LISTS

| FIG. NO. | INDEX NO. | SYMBOL | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | | |
|--|-----------|--------|---|---|---|---|---|---|----------------|-------------------------|-----------|---------|------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7DF | | | | | | | U.S. NAVY | U.S. ARMY | BRITISH | |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | | 6 |
| 17 | 97 | | AN3105-3 | | | | | | 1 | | 4716 | | |
| 17 | 98 | | AN3105-4 | | | | | | 1 | | 4716 | | |
| 17 | 99 | | AN3105-5 | | | | | | 1 | | 4716 | | |
| 17 | 100 | | 10-3743 | | | | | | 1 | | 4704 | 137A | |
| 17 | 101 | | 10-3657 | | | | | | 1 | | 4704 | 137A | |
| 17 | 102 | | 10-5510Z | | | | | | 1 | | 4704 | 137A | |
| 17 | 103 | | 10-4744 | | | | | | 4 | | 4704 | 137A | |
| 17 | 104 | | 10-7439 | | | | | | 4 | | 4704 | 137A | |
| 17 | 105 | | 10-5511Z | | | | | | 1 | | 4704 | 137A | |
| 17 | 103 | | 10-4744 | | | | | | 4 | | 4704 | 137A | |
| 17 | 104 | | 10-7439 | | | | | | 4 | | 4704 | 137A | |
| 17 | 69 | | 2-220 | | | | | | 1 | | 4704 | 137A | |
| 17 | 106 | | 10-13591 | | | | | | 1 | | 4704 | 137A | |
| 17 | 69 | | 2-220 | | | | | | 1 | | 4704 | 137A | |
| 17 | 107 | | 10-2489Y | | | | | | 1 | | 4704 | 137A | |
| 17 | 108 | | 10-2745Z | | | | | | 1 | | 4704 | 137A | |
| 17 | 109 | | 10-13640 | | | | | | 1 | | 4704 | 137A | |
| 17 | 110 | | 10-13637 | | | | | | 1 | | 4704 | 137A | |
| 17 | 111 | | 10-2746Z | | | | | | 1 | | 4704 | 137A | |
| 17 | 112 | | 10-2633 | | | | | | 1 | | 4704 | 137A | |
| 17 | 113 | | 10-13638 | | | | | | 1 | | 4704 | 137A | |
| 17 | 114 | | 2-152Z | | | | | | 1 | | 4704 | 137A | |
| 17 | 115 | | 10-13897 | | | | | | 1 | | 4704 | 137A | |
| 17 | 19 | | 2-274 | | | | | | AR | | 4704 | 137A | |
| 17 | 116 | | 10-14489 | | | | | | 1 | | 4704 | 137A | |
| 17 | 117 | | 10-5779 | | | | | | 2 | | 4704 | 137A | |
| 17 | 118 | | AN935-10- | | | | | | 2 | | 6700 | 128 | |
| 17 | 119 | | 10-5780 | | | | | | 2 | | 4704 | 137A | |
| 17 | 120 | | 10-12846W | | | | | | 1 | | 4704 | 137A | |
| 17 | 121 | | 10-13190 | | | | | | 2 | | 4704 | 137A | |
| 17 | 118 | | AN935-10 | | | | | | 2 | | 6700 | 128 | |
| 17 | 122 | | 10-9915 | | | | | | 2 | | 4704 | 137A | |
| 17 | 123 | | AN280-H404 | | | | | | 1 | | 6700 | 128 | |
| 17 | 124 | | 2-965 | | | | | | 1 | | 4704 | 137A | |
| 17 | 125 | | 10-4092 | | | | | | 1 | | 4704 | 137A | |
| 17 | 126 | | AN380C3-3 | | | | | | 1 | | 6700 | 128 | |
| 17 | 127 | | 10-4140 | | | | | | 2 | | 4704 | 137A | |
| 17 | 128 | | 10-3154-2 | | | | | | 2 | | 4704 | 137A | |
| 17 | 114 | | 2-152Z | | | | | | 2 | | 4704 | 137A | |
| NOTE | | | | | | | | | | | | | |
| Present production magnetos incorporate distributor blocks with molded cable identification numerals. The following parts are special for use on magnetos incorporating cable identification discs in the distributor block. | | | | | | | | | | | | | |
| 17 | 129 | | 2-318 | | | | | | 1 | | 4704 | 137A | |
| 17 | 130 | | 2-321 | | | | | | 1 | | 4704 | 137A | |
| 17 | 131 | | 2-322 | | | | | | 1 | | 4704 | 137A | |
| 17 | 132 | | 2-323 | | | | | | 1 | | 4704 | 137A | |
| 17 | 133 | | 2-324 | | | | | | 1 | | 4704 | 137A | |
| 17 | 134 | | 2-325 | | | | | | 1 | | 4704 | 137A | |
| 17 | 135 | | 2-326 | | | | | | 1 | | 4704 | 137A | |
| 17 | 136 | | 2-327 | | | | | | 1 | | 4704 | 137A | |
| | | | 10-20273-1 | Magneto Assembly—Type VMN7DF | | | | | | | | 4704 | 137A |
| | | | | Same as Basic Magneto Assembly 10-20273-2 | | | | | | | | 4704 | 137A |
| | | | | Except: | | | | | | | | | |
| | | | | Omit: | | | | | | | | | |
| 17 | 107 | | 10-2489Y | | | | | | 1 | | 4704 | 137A | |
| 17 | 73 | | 10-3761Y | | | | | | 1 | | 4704 | 137A | |
| 17 | 116 | | 10-14489 | | | | | | 1 | | 4704 | 137A | |
| 17 | 117 | | 10-5779 | | | | | | 2 | | 4704 | 137A | |
| 17 | 118 | | AN935-10 | | | | | | 2 | | 6700 | 128 | |
| 17 | 119 | | 10-5780 | | | | | | 2 | | 4704 | 137A | |
| 17 | 120 | | 10-12846W | | | | | | 1 | | 4704 | 137A | |
| 17 | 121 | | 10-13190 | | | | | | 2 | | 4704 | 137A | |
| 17 | 118 | | AN935-10 | | | | | | 2 | | 6700 | 128 | |
| 17 | 122 | | 10-9915 | | | | | | 2 | | 4704 | 137A | |
| | | | | Add: | | | | | | | | | |
| | | | 10-13636 | | | | | | 1 | | 4704 | 137A | |
| | | | 10-20185 | | | | | | 1 | | 4704 | 137A | |

AN-03-5DA-24

SECTION II—GROUP ASSEMBLY PARTS LISTS

| FIG. NO. | INDEX NO. | STOCKED | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | |
|----------|-----------|---------|---|---|---|---|---|---|----------------|-------------------------|-----------|---------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7DF | | | | | | | U.S. NAVY | U.S. ARMY | BRITISH |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | |
| | | | 10-20273-3 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | 107 | | 10-2489Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | 10-13636 | | | | | | | | 4704 | 137A |
| | | | 10-20273-4 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 17 | 107 | | 10-2489Y | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | 10-13636 | | | | | | | | 4704 | 137A |
| | | | 10-17411 | | | | | | | | 4704 | 137A |
| | | | 10-20273-5 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 17 | | | 10-20185 | | | | | | | | 4704 | 137A |
| 17 | | | 10-7445Y | | | | | | | | 4704 | 137A |
| 17 | | | 10-1525 | | | | | | | | 4704 | 137A |
| 17 | 16 | | 2-339 | | | | | | | | 4704 | 137A |
| 17 | | | 10-1467 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | | | 10-3164 | | | | | | | | 4704 | 137A |
| | | | 10-20273-6 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 17 | 107 | | 10-2489Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 17 | | | 10-13636 | | | | | | | | 4704 | 137A |
| 17 | | | 10-17322 | | | | | | | | 4704 | 137A |

SECTION II—GROUP ASSEMBLY PARTS LISTS

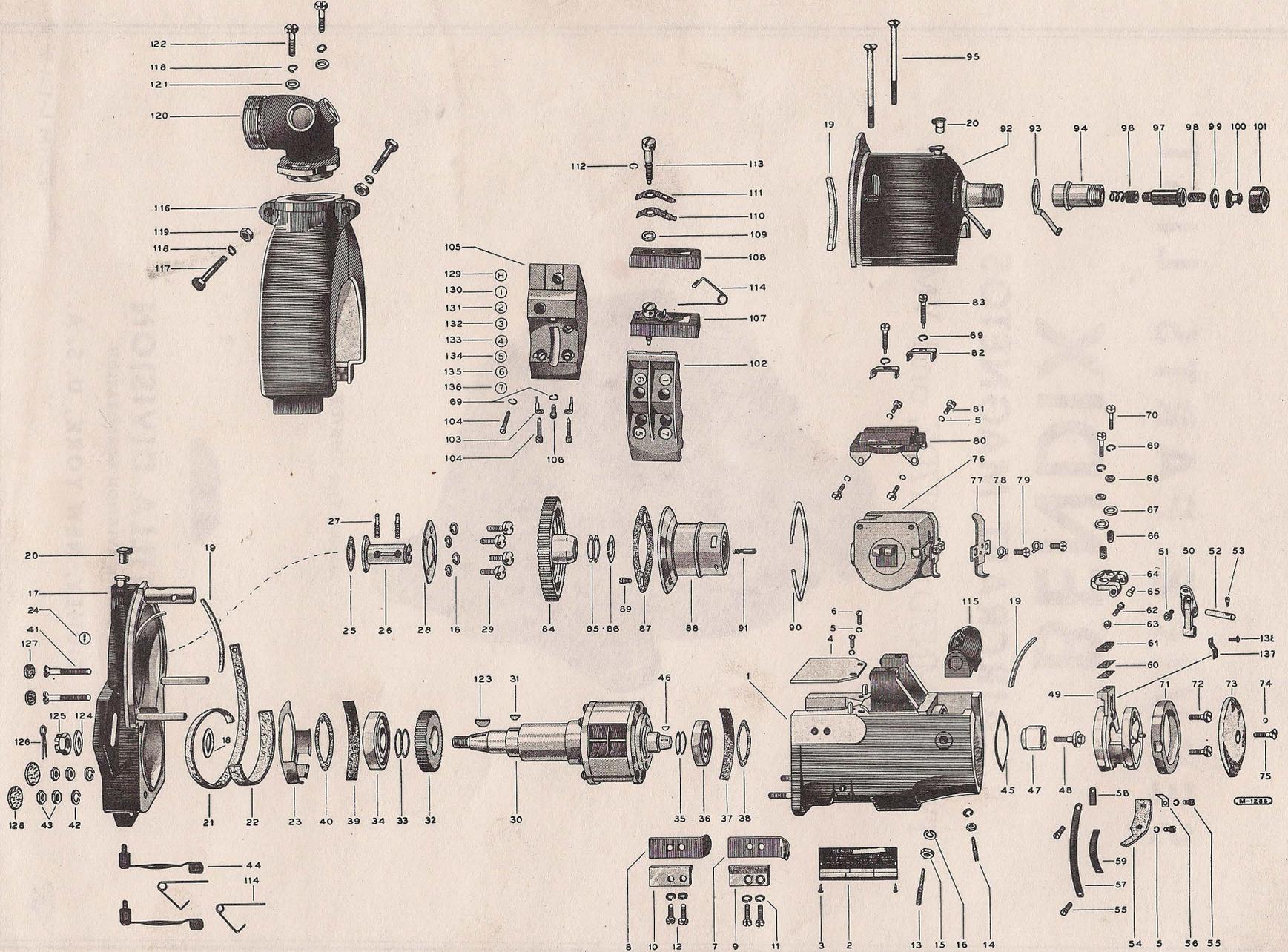
| FIG NO. | INDEX NO. | STOCKED | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | |
|---------|-----------|---------|---|---|---|---|---|---|----------------|-------------------------|-----------|---------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7DF and VMN7D | | | | | | | U.S. NAVY | U.S. ARMY | BRITISH |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | |
| | | | 10-20273-7 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | 102 | | 10-5510Z | | | | | | | | 4704 | 137A |
| 17 | 103 | | 10-4744 | | | | | | | | 4704 | 137A |
| 17 | 104 | | 10-7439 | | | | | | | | 4704 | 137A |
| 17 | 105 | | 10-5511Z | | | | | | | | 4704 | 137A |
| 17 | 103 | | 10-4744 | | | | | | | | 4704 | 137A |
| 17 | 104 | | 10-7439 | | | | | | | | 4704 | 137A |
| 17 | 69 | | 2-220 | | | | | | | | 4704 | 137A |
| 17 | 106 | | 10-13591 | | | | | | | | 4704 | 137A |
| 17 | 69 | | 2-220 | | | | | | | | 4704 | 137A |
| 17 | 107 | | 10-2489Y | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | | | 10-13636 | | | | | | | | 4704 | 137A |
| 17 | | | 10-17411 | | | | | | | | 4704 | 137A |
| 17 | 24 | | 2-319 | | | | | | | | 4704 | 137A |
| | | | 10-22499-2 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | 1 | | 10-2483W | | | | | | | | 4704 | 137A |
| 17 | 7 | | 10-1890Z | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | | | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | | | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | | | 10-7629Z | | | | | | | | 4704 | 137A |
| 17 | | | 10-4138Y | | | | | | | | 4704 | 137A |
| 17 | | | 10-16991Y | | | | | | | | 4704 | 137A |
| 17 | | | 10-7445Y | | | | | | | | 4704 | 137A |
| 17 | | | 10-1525 | | | | | | | | 4704 | 137A |
| 17 | 16 | | 2-339 | | | | | | | | 4704 | 137A |
| 17 | | | 10-1467 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |
| 17 | | | 10-3164 | | | | | | | | 4704 | 137A |
| | | | 10-22499-1 | | | | | | | | 4704 | 137A |
| | | | | | | | | | | | | |
| 17 | 1 | | 10-2483W | | | | | | | | 4704 | 137A |
| 17 | 7 | | 10-1885 | | | | | | | | 4704 | 137A |
| 17 | 8 | | 10-2487 | | | | | | | | 4704 | 137A |
| 17 | 9 | | 10-1886Y | | | | | | | | 4704 | 137A |
| 17 | 10 | | 10-2486Y | | | | | | | | 4704 | 137A |
| 17 | 44 | | 10-3074 | | | | | | | | 4704 | 137A |
| 17 | 114 | | 2-152Z | | | | | | | | 4704 | 137A |
| 17 | 17 | | 10-1890Z | | | | | | | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | | | | 4704 | 137A |
| 17 | 107 | | 10-2489Y | | | | | | | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | | | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | | | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | | | | 6700 | 128 |

SECTION II—GROUP ASSEMBLY PARTS LISTS

| FIG. NO. | INDEX NO. | STOCKED | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | |
|----------|-----------|---------|--|---|---|---|---|--|----------------|-------------------------|-----------|---------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7D | | | | | | | U.S. NAVY | U.S. ARMY | BRITISH |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | |
| 17 | 119 | | 10-5780 | | | | | | 2 | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | Outlet—Radio shield | 1 | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | Washer—Plain, outlet screw | 2 | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | Washer—Lock, outlet screw | 2 | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | Screw—Outlet | 2 | | 4704 | 137A |
| 17 | 11 | | 10-2493 | | | | | Washer—Lock, Distr. clamp screw | 4 | | 4704 | 137A |
| 17 | 12 | | 10-780 | | | | | Screw—Distributor clamp | 4 | | 4704 | 137A |
| | | | | | | | | Add: | | | | |
| 17 | | | 10-7629Z | | | | | Housing—Magneto | 1 | | 4704 | 137A |
| 17 | | | 10-4138Y | | | | | Plate—Front end | 1 | | 4704 | 137A |
| 17 | 16 | | 2-339 | | | | | Washer—Lock, radio shield clamp plugging screw | 6 | | 4704 | 137A |
| 17 | | | 10-960 | | | | | Screw—Plugging, radio shield clamp | 6 | | 4704 | 137A |
| 17 | | | 10-13636 | | | | | Clamp Assembly—Distributor block | 1 | | 4704 | 137A |
| 17 | | | 10-16991Y | | | | | Lever—Breaker, advance and retard | 1 | | 4704 | 137A |
| 17 | | | 10-22499-3 | | | | | Magneto Assembly—Type VMN7D | | | 4704 | 137A |
| | | | | | | | | Same as Basic Magneto Assembly—10-20273-2 | | | | |
| | | | | | | | | Except: | | | | |
| | | | | | | | | Omit: | | | | |
| 17 | 114 | | 2-152Z | | | | | Pin—Safety, radio shield clamp | 2 | | 4704 | 137A |
| 17 | 1 | | 10-2483W | | | | | Housing—Magneto | 1 | | 4704 | 137A |
| 17 | 17 | | 10-1890Z | | | | | Plate—Front end | 1 | | 4704 | 137A |
| 17 | 107 | | 10-2489Y | | | | | Clamp Assembly—Distributor block | 1 | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | Cover—Breaker end | 1 | | 4704 | 137A |
| 17 | 7 | | 10-1885 | | | | | Hook—Radio shield clamp—R.H. side | 1 | | 4704 | 137A |
| 17 | 8 | | 10-2487 | | | | | Hook—Radio shield clamp—L.H. side | 1 | | 4704 | 137A |
| 17 | 9 | | 10-1886Y | | | | | Spacer—Radio shield clamp—R.H. side | 1 | | 4704 | 137A |
| 17 | 10 | | 10-2486Y | | | | | Spacer—Radio shield clamp—L.H. side | 1 | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | Shield Assembly—Radio | 1 | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | Screw—Radio shield fastening | 2 | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | Washer—Lock, radio shield screw | 2 | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | Nut—Radio shield screw | 2 | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | Outlet—Radio shield | 1 | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | Washer—Plain, outlet screw | 2 | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | Washer—Lock, outlet screw | 2 | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | Screw—Outlet | 2 | | 4704 | 137A |
| 17 | 44 | | 10-3074 | | | | | Clamp—Radio shield | 2 | | 4704 | 137A |
| 17 | 11 | | 10-2493 | | | | | Washer—Lock, radio shield clamp screw | 4 | | 4704 | 137A |
| 17 | 13 | | 10-780 | | | | | Screw—Radio shield clamp | 4 | | 4704 | 137A |
| | | | | | | | | Add: | | | | |
| 17 | 16 | | 2-339 | | | | | Washer—Lock, radio shield plugging screw | 6 | | 4704 | 137A |
| 17 | | | 10-7629Z | | | | | Housing—Magneto | 1 | | 4704 | 137A |
| 17 | | | 10-25596 | | | | | Plate—Front end | 1 | | 4704 | 137A |
| 17 | | | 10-13636 | | | | | Clamp Assembly—Distributor block | 1 | | 4704 | 137A |
| 17 | | | 10-16991Y | | | | | Lever—Breaker, advance and retard | 1 | | 4704 | 137A |
| 17 | | | 10-960 | | | | | Screw—Plugging, radio shield clamp | 6 | | 4704 | 137A |
| | | | 10-30525-1 | | | | | Magneto Assembly, Type VMN7D (Anti-clw.) | | | 4704 | 137A |
| | | | | | | | | Same as Basic Magneto Assembly—10-20273-2 | | | | |
| | | | | | | | | Except: | | | | |
| | | | | | | | | Omit: | | | | |
| 17 | 1 | | 10-2483W | | | | | Housing—Magneto | 1 | | 4704 | 137A |
| 17 | 17 | | 10-1890Z | | | | | Plate—Front end | 1 | | 4704 | 137A |
| 17 | 88 | | 10-13400 | | | | | Cylinder—Distributor | 1 | | 4704 | 137A |
| 17 | 102 | | 10-5510Z | | | | | Block—Distributor (clw.) R.H. side | 1 | | 4704 | 137A |
| 17 | 105 | | 10-5511Z | | | | | Block—Distributor, clw., L.H. side | 1 | | 4704 | 137A |
| 17 | 9 | | 10-1886Y | | | | | Spacer—Radio shield clamp—R.H. side | 1 | | 4704 | 137A |
| 17 | 10 | | 10-2486Y | | | | | Spacer—Radio shield clamp—L.H. side | 1 | | 4704 | 137A |
| 17 | 11 | | 10-2493 | | | | | Washer—Lock, radio shield clamp screw | 4 | | 4704 | 137A |
| 17 | 12 | | 10-780 | | | | | Screw—Radio shield clamping | 4 | | 4704 | 137A |
| 17 | 7 | | 10-1885 | | | | | Hook—Radio shield clamp—R.H. side | 1 | | 4704 | 137A |
| 17 | 8 | | 10-2487 | | | | | Hook—Radio shield clamp—L.H. side | 1 | | 4704 | 137A |
| 17 | 44 | | 10-3074 | | | | | Clamp—Radio shield | 2 | | 4704 | 137A |
| 17 | 114 | | 2-152Z | | | | | Pin—Safety, radio shield clamp | 2 | | 4704 | 137A |
| 17 | 107 | | 10-2489Y | | | | | Clamp Assembly—Distributor block | 1 | | 4704 | 137A |
| 17 | 73 | | 10-3761Y | | | | | Cover—Breaker end | 1 | | 4704 | 137A |
| 17 | 116 | | 10-14489 | | | | | Shield Assembly—Radio | 1 | | 4704 | 137A |
| 17 | 117 | | 10-5779 | | | | | Screw—Radio shield fastening | 2 | | 4704 | 137A |
| 17 | 118 | | AN935-10 | | | | | Washer—Lock, radio shield screw | 2 | | 6700 | 128 |
| 17 | 119 | | 10-5780 | | | | | Nut—Radio shield screw | 2 | | 4704 | 137A |
| 17 | 120 | | 10-12846W | | | | | Outlet—Radio shield | 1 | | 4704 | 137A |
| 17 | 121 | | 10-13190 | | | | | Washer—Plain, outlet screw | 2 | | 4704 | |

SECTION II—GROUP ASSEMBLY PARTS LISTS

| FIG. NO. | INDEX NO. | STOCKED | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | |
|----------|-----------|---------|--|---|---|---|---|---|----------------|-------------------------|-----------|----------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7D | | | | | | | U.S. NAVY | U.S. ARMY | BRIT-ISH |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | |
| 17 | 118 | | AN935-10 | | | | | | 2 | | 6700 | 128 |
| 17 | 122 | | 10-9915 | | | | | | 2 | | 4704 | 137A |
| 17 | 16 | | 2-339 | | | | | | 6 | | 4704 | 137A |
| 17 | | | 10-960 | | | | | | 6 | | 4704 | 137A |
| 17 | | | 10-7629Z | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-4138Y | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-13358 | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-5522Z | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-5523Z | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-13636 | | | | | | 1 | | 4704 | 137A |
| 17 | | | 10-16991Y | | | | | | 1 | | 4704 | 137A |



EXPLODED VIEW OF DETAIL PARTS

SECTION II—GROUP ASSEMBLY PARTS LISTS

| FIG. NO. | INDEX NO. | STOCKED | GROUP Engine Accessories | | | | | | UNITS PER ASSY | PROPERTY CLASSIFICATION | | |
|----------|-----------|---------|---|---|---|---|---|---|----------------|-------------------------|-----------|---------|
| | | | MAJOR ASSEMBLY Magneto Assembly—Type VMN7DF-5 | | | | | | | U.S. NAVY | U.S. ARMY | BRITISH |
| | | | PART NUMBER | 1 | 2 | 3 | 4 | 5 | | | | |
| 18 | 71 | | 2-220 | | | | | | 2 | | 4704 | 137A |
| 18 | 85 | | 2-177 | | | | | | 2 | | 4704 | 137A |
| 18 | 86 | | 10-4861Z | | | | | | 1 | | 4704 | 137A |
| 18 | 12 | | 2-628 | | | | | | 1 | | 4704 | 137A |
| 18 | 13 | | 2-274 | | | | | | AR | | 4704 | 137A |
| 18 | 87 | | 10-3666 | | | | | | 1 | | 4704 | 137A |
| 18 | 88 | | 10-4860 | | | | | | 1 | | 4704 | 137A |
| 18 | 89 | | 10-14119 | | | | | | 2 | | 4704 | 137A |
| 18 | 90 | | AN3105-3 | | | | | | 1 | | 4716 | |
| 18 | 91 | | AN3105-2 | | | | | | 1 | | 4716 | |
| 18 | 92 | | AN3105-4 | | | | | | 1 | | 4716 | |
| 18 | 93 | | AN3105-5 | | | | | | 1 | | 4704 | 137A |
| 18 | 94 | | 10-3743 | | | | | | 1 | | 4704 | 137A |
| 18 | 95 | | 10-3657 | | | | | | 1 | | 4704 | 137A |
| 18 | 96 | | †10-18554 | | | | | | 1 | | 4704 | 137A |
| 18 | 97 | | 10-4744 | | | | | | 4 | | 4704 | 137A |
| 18 | 98 | | 10-7439 | | | | | | 4 | | 4704 | 137A |
| 18 | 99 | | †10-18555 | | | | | | 1 | | 4704 | 137A |
| 18 | 97 | | 10-4744 | | | | | | 4 | | 4704 | 137A |
| 18 | 71 | | 2-220 | | | | | | 1 | | 4704 | 137A |
| 18 | 98 | | 10-7439 | | | | | | 4 | | 4704 | 137A |
| 18 | 71 | | 2-220 | | | | | | 1 | | 4704 | 137A |
| 18 | 100 | | 10-13591 | | | | | | 1 | | 4704 | 137A |
| 18 | 101 | | 10-23842 | | | | | | 1 | | 4704 | 137A |
| 18 | 102 | | 10-24001 | | | | | | 1 | | 4704 | 137A |
| 18 | 103 | | 10-13640 | | | | | | 1 | | 4704 | 137A |
| 18 | 104 | | 10-24002 | | | | | | 1 | | 4704 | 137A |
| 18 | 105 | | 10-24003 | | | | | | 1 | | 4704 | 137A |
| 18 | 106 | | 10-13638 | | | | | | 1 | | 4704 | 137A |
| 18 | 107 | | 10-2633 | | | | | | 1 | | 4704 | 137A |
| 18 | 108 | | 10-29619 | | | | | | 1 | | 4704 | 137A |
| 18 | 35 | | 2-141-4 | | | | | | AR | | 4704 | 137A |
| 18 | 35 | | 2-141-5 | | | | | | AR | | 4704 | 137A |
| 18 | 35 | | 2-141-6 | | | | | | AR | | 4704 | 137A |
| 18 | 36 | | 10-5643Y | | | | | | 1 | | 4704 | 137A |
| 18 | 37 | | 2-181 | | | | | | 1 | | 4704 | 137A |
| 18 | 38 | | 2-292Z | | | | | | 1 | | 4704 | 137A |
| 18 | 39 | | 2-189-1 | | | | | | AR | | 4704 | 137A |
| 18 | 39 | | 2-189-2 | | | | | | AR | | 4704 | 137A |
| 18 | 39 | | 2-189-3 | | | | | | AR | | 4704 | 137A |
| 18 | 39 | | 2-189-4 | | | | | | AR | | 4704 | 137A |
| 18 | 39 | | 2-189-5 | | | | | | AR | | 4704 | 137A |
| 18 | 39 | | 2-189-6 | | | | | | AR | | 4704 | 137A |
| 18 | 40 | | ND17EX | | | | | | 1 | | 6700 | 137A |
| 18 | 41 | | 2-161-1 | | | | | | AR | | 4704 | 137A |
| 18 | 41 | | 2-161-2 | | | | | | AR | | 4704 | 137A |
| 18 | 41 | | 2-161-3 | | | | | | AR | | 4704 | 137A |
| 18 | 41 | | 2-161-4 | | | | | | AR | | 4704 | 137A |
| 18 | 41 | | 2-161-5 | | | | | | AR | | 4704 | 137A |
| 18 | 41 | | 2-161-6 | | | | | | AR | | 4704 | 137A |
| 18 | 42 | | ND15X | | | | | | 1 | | 6700 | 137A |
| 18 | 43 | | 2-182 | | | | | | 1 | | 4704 | 137A |
| 18 | 44 | | 10-20223 | | | | | | 1 | | 4704 | 137A |
| 18 | 45 | | 2-167 | | | | | | 1 | | 4704 | 137A |
| 18 | 46 | | 2-158 | | | | | | 2 | | 4704 | 137A |
| 18 | 47 | | 2-281 | | | | | | 2 | | 4704 | 137A |
| 18 | 48 | | 2-164 | | | | | | 4 | | 4704 | 137A |
| 18 | 7 | | 2-339 | | | | | | 6 | | 4704 | 137A |
| 18 | 49 | | 10-960 | | | | | | 6 | | 4704 | 137A |
| 18 | 50 | | 10-1792-1 | | | | | | AR | | 4704 | 137A |
| 18 | 50 | | 10-1792-2 | | | | | | AR | | 4704 | 137A |
| 18 | 50 | | 10-1792-3 | | | | | | AR | | 4704 | 137A |
| 18 | 50 | | 10-1792-4 | | | | | | AR | | 4704 | 137A |
| 18 | 50 | | 10-1792-5 | | | | | | AR | | 4704 | 137A |
| 18 | 51 | | 10-25453 | | | | | | 1 | | 4704 | 137A |
| 18 | 51 | | 10-3145Z | | | | | | 1 | | 4704 | 137A |
| 18 | 52 | | 2-350 | | | | | | 1 | | 4704 | 137A |
| 18 | 53 | | 10-28909 | | | | | | 1 | | 4704 | 137A |
| 18 | 54 | | 10-2148 | | | | | | 1 | | 4704 | 137A |
| 18 | 55 | | 10-13332 | | | | | | 1 | | 4704 | 137A |

SECTION III—NUMERICAL PARTS LIST
TYPE VMN7DF and VMN7D MAGNETS

| PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY | PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY | PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY |
|-------------|-------------------------|----------------|-------------|-------------------------|----------------|-------------|-------------------------|----------------|
| 10-528Z | 20 | 4 | 10-13328-2 | 20 | As req. | 2-140 | 19 | 1 |
| 10-600 | 20 | 1 | 10-13328-3 | 20 | As req. | 2-141-1 | 19 | As req. |
| 10-780 | 19 | 4 | 10-13328-4 | 20 | As req. | 2-141-2 | 19 | As req. |
| 10-960 | 24 | 2 | 10-13328-5 | 20 | As req. | 2-141-3 | 19 | As req. |
| 10-1338 | 19 | 2 | 10-13329 | 20 | 1 | 2-141-4 | 19 | As req. |
| 10-1467 | 22, 23 | 2 | 10-13330 | 20 | 1 | 2-141-5 | 19 | As req. |
| 10-1525 | 22, 23 | 2 | 10-13331 | 20 | 1 | 2-141-6 | 19 | As req. |
| 10-1792-1 | 19 | As req. | 10-13332 | 20 | 1 | 2-145 | 20 | 1 |
| 10-1792-2 | 19 | As req. | 10-13358 | 25 | 1 | 2-146 | 20 | 1 |
| 10-1792-3 | 19 | As req. | 10-13373 | 20 | 1 | 2-150 | 20 | 1 |
| 10-1792-4 | 20 | As req. | 10-13374 | 20 | 1 | 2-152Z | 21 | 2 |
| 10-1792-5 | 20 | As req. | 10-13400 | 20 | 1 | 2-158 | 19 | 2 |
| 10-1885 | 19 | 1 | 10-13591 | 21 | 1 | 2-161-1 | 19 | As req. |
| 10-1886Y | 19 | 1 | 10-13636 | 21, 22, 23 | 1 | 2-161-2 | 19 | As req. |
| 10-1890Z | 19 | 1 | | 24, 25 | | 2-161-3 | 19 | As req. |
| 10-2024 | 20 | 1 | 10-13637 | 21 | 1 | 2-161-4 | 19 | As req. |
| 10-2148 | 20 | 1 | 10-13638 | 21 | 1 | 2-161-5 | 19 | As req. |
| 10-2483W | 19 | 1 | 10-13640 | 21 | 1 | 2-161-6 | 19 | As req. |
| 10-2486Y | 19 | 1 | 10-13722 | 20 | 1 | 2-164 | 19 | 4 |
| 10-2487 | 19 | 1 | 10-13723 | 20 | 2 | 2-165 | 20 | 2 |
| 10-2489Y | 21 | 1 | 10-13773 | 19 | 1 | 2-167 | 20 | 1 |
| 10-2493 | 19 | 4 | 10-13774 | 19 | 1 | 2-172 | 20 | 2 |
| 10-2633 | 21 | 1 | 10-13775 | 19 | 1 | 2-176 | 20 | 4 |
| 10-2745Z | 21 | 1 | 10-13776 | 19 | 1 | 2-177 | 20 | 2 |
| 10-2746Z | 21 | 1 | 10-13777 | 19 | 1 | 2-181 | 19 | 1 |
| 10-3074 | 19, 24 | 2 | 10-13778 | 19 | 4 | 2-182 | 20 | 1 |
| 10-3145Z | 20 | 1 | 10-13779 | 20 | 1 | 2-189-1 | 19 | As req. |
| 10-3154-2 | 21 | 2 | 10-13780 | 20 | 1 | 2-189-2 | 19 | As req. |
| 10-3657 | 21 | 1 | 10-13897 | 21 | 1 | 2-189-3 | 19 | As req. |
| 10-3164 | 22, 23 | 1 | 10-14119 | 20 | 2 | 2-189-4 | 19 | As req. |
| 10-3666 | 20 | 1 | 10-14489 | 21 | 1 | 2-189-5 | 19 | As req. |
| 10-3743 | 21 | 1 | 10-14857 | 20 | 1 | 2-189-6 | 19 | As req. |
| 10-3761Y | 20 | 1 | 10-16640 | 19 | As req. | 2-194 | 19, 20 | 8 |
| 10-4092 | 21 | 1 | 10-16691Y | 23, 24, 25 | 1 | 2-220 | 20, 21 | 6 |
| 10-4138Y | 23, 24, 25 | 1 | 10-17322 | 22 | 1 | 2-274 | 19, 20 | As req. |
| 10-4140 | 21 | 2 | 10-17411 | 22, 23 | 1 | 2-281 | 19 | 2 |
| 10-4744 | 21 | 8 | 10-20185 | 21 | 1 | 2-292Z | 19 | 1 |
| 10-4860 | 20 | 1 | 10-20223 | 20 | 1 | 2-318 | 21 | 1 |
| 10-4861Z | 20 | 1 | 10-20273-1 | 21 | | 2-319 | 19, 23 | 1 |
| 10-4874 | 20 | 2 | 10-20273-2 | 19 | | 2-321 | 21 | 1 |
| 10-5289-11 | 20 | As req. | 10-20273-3 | 22 | | 2-322 | 21 | 1 |
| 10-5289-12 | 20 | As req. | 10-20273-4 | 22 | | 2-323 | 21 | 1 |
| 10-5289-13 | 20 | As req. | 10-20273-5 | 22 | | 2-324 | 21 | 1 |
| 10-5289-14 | 20 | As req. | 10-20273-6 | 22 | | 2-325 | 21 | 1 |
| 10-5510Z | 21 | 1 | 10-20273-7 | 23 | | 2-326 | 21 | 1 |
| 10-5511Z | 21 | 1 | 10-21721 | 19 | 1 | 2-327 | 21 | 1 |
| 10-5522Z | 25 | | 10-22499-1 | 23 | | 2-339 | 19, 22, 23 | 6 |
| 10-5523Z | 25 | | 10-22499-2 | 23 | | | 24, 25 | |
| 10-5643Y | 19 | 1 | 10-22499-3 | 24 | | 2-350 | 20 | 1 |
| 10-5779 | 20 | 2 | 10-25171 | 20 | 1 | 2-440 | 20 | 1 |
| 10-5780 | 21 | 2 | 10-25453 | 20 | 1 | 2-466 | 20 | 1 |
| 10-7308 | 20 | 2 | 10-25596 | 24 | | 2-514-8 | 19 | 1 |
| 10-7439 | 21, 23 | 8 | 10-28908 | 20 | 1 | 2-544-11 | 19 | 1 |
| 10-7445Y | 22, 23 | | 10-28909 | 20 | 1 | 2-532 | 19 | 2 |
| 10-7629Z | 23 | 1 | 10-30525-1 | 24 | | 2-545 | 20 | 1 |
| 10-9373Y | 20 | 1 | 2-65 | 20 | 1 | 2-552 | 19 | 2 |
| 10-9622 | 19 | 1 | 2-138 | 19 | 1 | 2-628 | 19, 20 | 2 |
| 10-9624 | 20 | 1 | 2-139-1 | 19 | As req. | 2-782Z | 19 | 1 |
| 10-9915 | 21 | 2 | 2-139-2 | 19 | As req. | 2-801 | 20 | 2 |
| 10-12647 | 20 | 1 | 2-139-3 | 19 | As req. | 2-819 | 20 | 2 |
| 10-12846W | 21, 24 | 1 | 2-139-4 | 19 | As req. | 2-965 | 21 | 1 |
| 10-13190 | 21 | 2 | 2-139-5 | 19 | As req. | | | |
| 10-13328-1 | 20 | As req. | 2-139-6 | 19 | As req. | | | |

SECTION III—NUMERICAL PARTS LIST
TYPE VMNDF-5 MAGNETOS

| PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY | PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY | PART NUMBER | GROUP LIST PAGE NUMBERS | TOTAL QUANTITY |
|-------------|-------------------------|----------------|-------------|-------------------------|----------------|-------------|-------------------------|----------------|
| 10-528Z | 27 | 4 | 10-23842 | 28 | 1 | | | |
| 10-600 | 27 | 1 | 10-24001 | 28 | 1 | | | |
| 10-960 | 28 | 6 | 10-24002 | 28 | 1 | | | |
| 10-1338 | 27 | 2 | 10-24003 | 28 | 1 | | | |
| 10-1792-1 | 28 | As req. | 10-25171 | 29 | 1 | | | |
| 10-1792-2 | 28 | As req. | 10-25453 | 28 | 1 | | | |
| 10-1792-3 | 28 | As req. | 10-28908 | 29 | 1 | | | |
| 10-1792-4 | 28 | As req. | 10-28909 | 28 | 1 | | | |
| 10-1792-5 | 28 | As req. | 10-29619 | 28 | 1 | | | |
| 10-2024 | 27 | 1 | 2-65 | 29 | 1 | | | |
| 10-2148 | 28 | 1 | 2-138 | 27 | 1 | | | |
| 10-2483W | 27 | 1 | 2-139-1 | 27 | As req. | | | |
| 10-2633 | 28 | 1 | 2-139-2 | 27 | As req. | | | |
| 10-3145Z | 28 | 1 | 2-139-3 | 27 | As req. | | | |
| 10-3154-2 | 29 | 2 | 2-139-4 | 27 | As req. | | | |
| 10-3657 | 28 | 1 | 2-139-5 | 27 | As req. | | | |
| 10-3666 | 28 | 1 | 2-139-6 | 27 | As req. | | | |
| 10-3719 | 27 | 1 | 2-140 | 27 | 1 | | | |
| 10-3743 | 28 | 1 | 2-141-1 | 27 | As req. | | | |
| 10-4092 | 29 | 1 | 2-141-2 | 27 | As req. | | | |
| 10-4140 | 29 | 2 | 2-141-3 | 27 | As req. | | | |
| 10-4744 | 28 | 8 | 2-141-4 | 28 | As req. | | | |
| 10-4860 | 28 | 1 | 2-141-5 | 28 | As req. | | | |
| 10-4861Z | 28 | 1 | 2-141-6 | 28 | As req. | | | |
| 10-4874 | 27 | 2 | 2-145 | 29 | 1 | | | |
| 10-5289-11 | 27 | As req. | 2-146 | 29 | 1 | | | |
| 10-5289-12 | 27 | As req. | 2-150 | 29 | 1 | | | |
| 10-5289-13 | 27 | As req. | 2-158 | 28 | 2 | | | |
| 10-5289-14 | 27 | As req. | 2-161-1 | 28 | As req. | | | |
| 10-5643Y | 28 | 1 | 2-161-2 | 28 | As req. | | | |
| 10-7198Y | 27 | 1 | 2-161-3 | 28 | As req. | | | |
| 10-7308 | 27 | 2 | 2-161-4 | 28 | As req. | | | |
| 10-7439 | 28 | 8 | 2-161-5 | 28 | As req. | | | |
| 10-9373Y | 27 | 1 | 2-161-6 | 28 | As req. | | | |
| 10-9622 | 27 | 1 | 2-164 | 28 | 4 | | | |
| 10-9624 | 27 | 1 | 2-165 | 27 | 2 | | | |
| 10-12647 | 27 | 1 | 2-167 | 28 | 1 | | | |
| 10-13328-1 | 27 | As req. | 2-172 | 27 | 2 | | | |
| 10-13328-2 | 27 | As req. | 2-176 | 29 | 4 | | | |
| 10-13328-3 | 27 | As req. | 2-177 | 28 | 2 | | | |
| 10-13328-4 | 27 | As req. | 2-181 | 28 | 1 | | | |
| 10-13328-5 | 27 | As req. | 2-182 | 28 | 1 | | | |
| 10-13329 | 27 | 1 | 2-189-1 | 28 | As req. | | | |
| 10-13330 | 29 | 2 | 2-189-2 | 28 | As req. | | | |
| 10-13331 | 29 | 1 | 2-189-3 | 28 | As req. | | | |
| 10-13332 | 28 | 1 | 2-189-4 | 28 | As req. | | | |
| 10-13373 | 27 | 1 | 2-189-5 | 28 | As req. | | | |
| 10-13374 | 27 | 1 | 2-189-6 | 28 | As req. | | | |
| 10-13400 | 27 | 1 | 2-194 | 27, 28 | 8 | | | |
| 10-13591 | 28 | 1 | 2-220 | 27, 28 | 6 | | | |
| 10-13638 | 28 | 1 | 2-274 | 27, 28, 29 | As req. | | | |
| 10-13640 | 28 | 1 | 2-281 | 28 | 2 | | | |
| 10-13722 | 27 | 1 | 2-292Z | 28 | 1 | | | |
| 10-13723 | 27 | 2 | 2-319 | 27 | 1 | | | |
| 10-13773 | 27 | 1 | 2-339 | 27, 28 | 12 | | | |
| 10-13774 | 27 | 1 | 2-350 | 28 | 1 | | | |
| 10-13775 | 27 | 1 | 2-440 | 29 | 1 | | | |
| 10-13776 | 27 | 1 | 2-446 | 29 | 1 | | | |
| 10-13777 | 27 | 1 | 2-514-6 | 27 | 1 | | | |
| 10-13778 | 27 | 4 | 2-514-8 | 27 | 1 | | | |
| 10-13779 | 27 | 1 | 2-532 | 27 | 2 | | | |
| 10-13780 | 27 | 1 | 2-545 | 27 | 1 | | | |
| 10-13897 | 29 | 1 | 2-552 | 27 | 2 | | | |
| 10-14119 | 28 | 2 | 2-628 | 27, 28 | 2 | | | |
| 10-14857 | 27 | 1 | 2-782Z | 27 | 2 | | | |
| 10-16640 | 27 | As req. | 2-801 | 27 | 2 | | | |
| 10-18554 | 28 | 1 | 2-819 | 27 | 2 | | | |
| 10-18555 | 28 | 1 | 2-965 | 29 | 1 | | | |
| 10-20223 | 28 | 1 | | | | | | |
| 10-21721 | 27 | 1 | | | | | | |
| 10-21819 | 27 | | | | | | | |
| 10-21819-1 | 29 | | | | | | | |
| 10-21819-2 | 29 | | | | | | | |

SECTION IV—STANDARD PARTS LIST

TYPE VMN7DF and VMN7D MAGNETOS

TYPE VMNDF-5 MAGNETOS

| PART NUMBER | NOMENCLATURE | TOTAL QUANTITY | ATTACHING QUANTITY |
|-------------|----------------|----------------|--------------------|
| AN280-H404 | Key—Woodruff | 1 | |
| AN380C3-3 | Pin—Cotter | 1 | |
| AN535-0-3 | Drive Screw | 2 | |
| AN935-10 | Washer—Lock | 4 | |
| AN3105-2 | Contact | 1 | |
| AN3105-3 | Terminal Screw | 1 | |
| AN3105-4 | Sleeve | 1 | |
| AN3105-5 | Washer—Plain | 1 | |
| ND15X | Bearing—Ball | 1 | |
| ND17EX | Bearing—Ball | 1 | |

| PART NUMBER | NOMENCLATURE | TOTAL QUANTITY | ATTACHING QUANTITY |
|-------------|----------------|----------------|--------------------|
| AN280-H404 | Key—Woodruff | 1 | |
| AN380C3-3 | Pin—Cotter | 1 | |
| AN535-0-3 | Drive Screw | 2 | |
| AN3105-3 | Terminal Screw | 1 | |
| AN3105-2 | Contact | 1 | |
| AN3105-4 | Sleeve | 1 | |
| AB3105-5 | Washer—Plain | 1 | |
| ND15X | Bearing—Ball | 1 | |
| ND17EX | Bearing—Ball | 1 | |