Instructions No. 2850B

FAIRBANKS-MORSE

FAIRBANKS-MORSE TYPES FM-J1A & FM-J1B MAGNETOS

1. GENERAL DESCRIPTION - Modern ignition systems are carefully engineered to provide quick, easy starting and maximum dependability of operation without adjustment or service. Through advanced design and sturdy, simple construction Fairbanks-Morse Type FM-J magnetos have become field performance leaders. Especially compact in assembly, the powerful Alnico magnetic rotor assures an intensely hot ignition spark under the most difficult of operating conditions. Field adjustment is rarely necessary and should only be undertaken according to the following directions.

2. SERVICE PROCEDURE - A logically arranged service outline to be followed when engines fail to start, are hard to start, or miss in operation is tabulated below. Since the use of this chart locates the engine trouble in many cases before the magneto is reached, it prevents too common misadjustment of parts in good condition. Type FM-J magnetos are built in sealed housings which should be opened only when it is certain that the ignition spark produced is unsatisfactory. This condition may be determined through ignition spark tests which are easily made in the field.

TROUBLE	POSSIBLE CAUSE	SUGGESTED REMEDY
A. Flooding	Hot or cold engine; over-rich fuel mixture.	Dry out cylinder: crank engine slowly, fuel shut off; or let engine stand idle.
B. Insufficient Fuel or Air	Empty fuel tank; clogged fuel supply lines; clogged air intake.	Replenish fuel; clean fuel supply system and check carburetor; clean air intake system.
C. Ignition Connections	Loose or corroded terminals; broken cable; short-circuited switch.	Clean or replace cable terminals; inspect soldered or clamped joints, test and replace cable; check ignition switch.
D. Spark Plug	Corroded, worn or damaged points; cracked or carbonized insulator.	New plug; clean points and insulator; adjust point gap to recommended opening: never attempt to adjust center electrode.

3. TESTING THE IGNITION SPARK - With a properly adjusted spark plug in good condition the ignition spark should be strong enough to bridge a short gap in addition to the actual spark plug discharge; this may be determined by holding the ignition cable end not more than 1/16" away from the spark plug terminal. The engine should not miss fire when this is done.

4. TESTING THE MAGNETO SPARK - Pull the ignition cable out of the end cover socket and insert a short piece of stiff wire. Bend this wire to within 1/8" of the engine block. Turn the engine over slowly and watch carefully for the spark which should occur at the instant the impulse coupling releases. It is highly recommended that, when a strong ignition spark is observed, no dismantling of the magneto take place and that cable, terminals and spark plug be thoroughly re-examined.

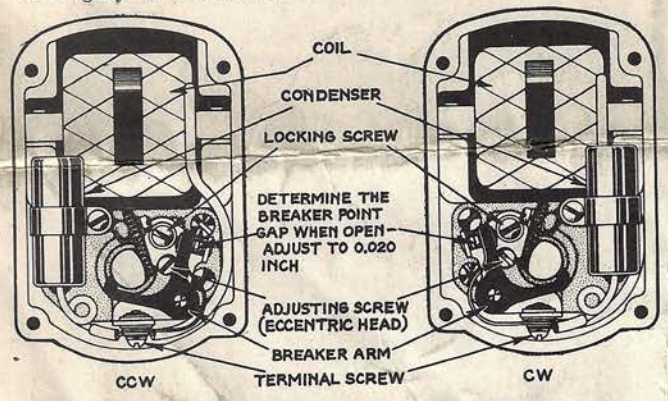


Figure 1 - End Views of Type FM-J1 Magneto

5. ADJUSTMENT OF BREAKER POINTS - If the contact points are found pitted or pyramided upon examination they should be resurfaced, using a small tungsten file or fine stone. Complete replacement, when necessary, can readily be made by removing the locking screw of the contact support bracket and the terminal screw (See Figure 1). The breaker point gap must be adjusted after either resurfacing or replacement of the points. Loosen the locking screw and turn the eccentric head adjusting screw until the proper gap is obtained. This gap should be 0.020" at full separation. The cam felt wick, if dry or hard, should be replaced by a new factory-impregnated wick.

6. LUBRICATION AND BEARINGS - Lubrication of the Type FM-J magnetos in the field is unnecessary and inadvisable. When a complete overhaul of the magneto is made by an Authorized Fairbanks-Morse Service Station, the lubricants will be renewed. Long, continued use of the magneto will eventually necessitate the inexpensive replacement of the sleeve bearing in the breaker plate, at which time its oil reservoir supply should be replenished. The grease-packed ball bearing of the drive end controls rotor thrust and as the rotor is locked in this bearing, no attempt must ever be made to remove the rotor from the housing without specific, detailed instructions. Such work should always be done by trained service men.

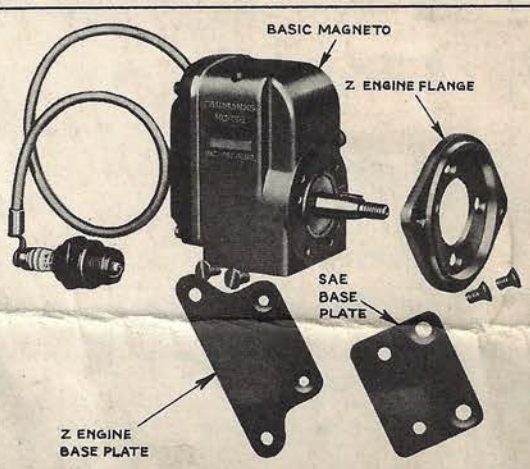


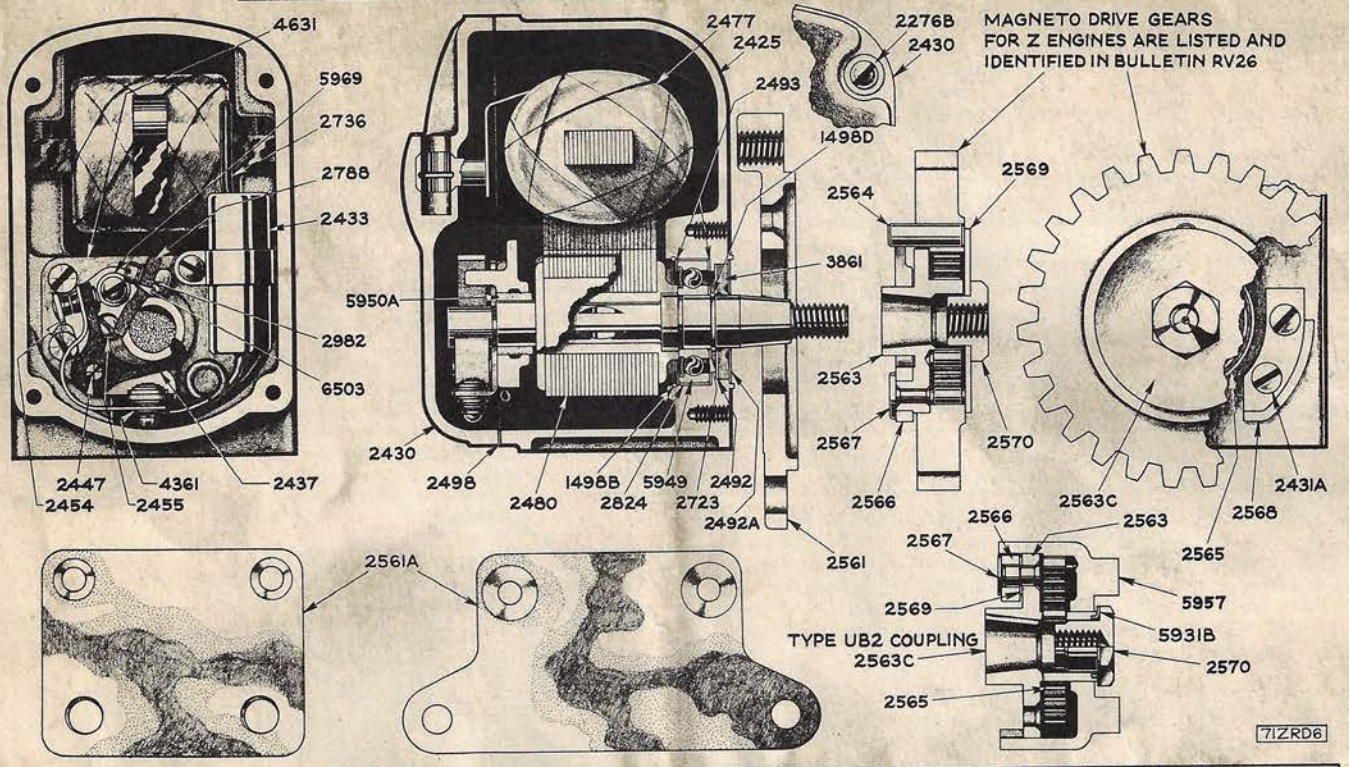
Figure 2 - Type FM-J1 Magneto & Mountings

7. REASSEMBLY AND SEALING - The Type FM-J1 magnetos are sealed at the factory against the entry of dust and moisture by means of a varnish-coated gasket joint. Opening the magneto for point adjustment or other service necessitates resealing when reassembly is made. A new gasket should be provided, the joint cleaned thoroughly and the new seal coated with Special FMC02 Sealing Varnish.

8. IMPULSE COUPLINGS AND DRIVE GEARS - Various methods of coupling these magnetos to the engines are in use. Larger engines usually have an impulse coupling located at the drive end of the magneto. A sharp snap as the engine is turned over slowly indicates that the impulse coupling is functioning satisfactorily. The impulse feature disengages as soon as the engine has picked up speed, after which the coupling serves as a conventional drive member. Occasional cleaning with kerosene and lubrication with a light oil will keep the coupling in good operating condition. Many adaptations of these magnetos provide for a gear drive, the gear sometimes serving as the outer shell of the impulse coupling. The magneto gear should be meshed carefully with the engine pinion, as explained in the individual engine instruction books.

SERVICE FACILITIES - Authorized Magneto Service Stations, located throughout the U. S. and foreign countries, have been carefully selected by Fairbanks, Morse & Co. in order to assure highly efficient and complete repair and inspection service to owners of Fairbanks-Morse magnetos. Service Stations have special tools and training for magneto repair, and have close contact with the factory service and engineering departments. Use the Service Station Directory to locate the service station most convenient. Authorized Stations stock genuine replacement parts which should be insisted upon for repairs. The use of spurious parts usually proves less economical and satisfactory, besides voiding the manufacturer's warranty.

REPAIR CHART AND PARTS LIST — TYPES FM-J1A & FM-J1B MAGNETOS



Identification	Order By Part No.	Name of Part - Unless otherwise specified, part is for flange or base, CW or CCW magnetos.	No. Used	Symbols for factory use only
1498B	B1498B	Rotor Bearing Snap Ring	1	ZRD5955A1
1498D	B1498D	Rotor Shaft Snap Ring	1	Z4RB1498A1
2276B	B2276B	End Cap Screw Washer	4	ZRB2276A1
2425	HX2425	Frame (or Housing) - CCW	1	ZRD2425H
2425	KX2425	Frame (or Housing) - CW	1	ZRD2425E
2430	AX2430	End Cap	1	ZRD2430B3
2431A	A2431A	Coupling Stop Screw - Type Z	2	ZRA2431C
2433	M2433	Condenser (Inc. Lead, A4361)	1	2433Z4RD2
2437	R2437	Brkr.Pt.Set-CW(Inc.G2454,E2788)	1	2437Z4RD4
2437	S2437	Brkr.Pt.Set-CCW(Inc.H2454,E2788)	1	2437Z4RD4
2447	G2447	Breaker Arm Fulcrum Pin	1	Z4RD2447C
2454	G2454	Sta. Support & Contact Point-CW	1	2453Z4RD4
2454	H2454	Sta. Support & Contact Point-CCW	1	2453Z4RD3
2455	C2455	Sta. Contact Adjustment Screw	1	Z4RD2455A3
2477	L2477	Coil (Inc. Lead, E2736, A4361)	1	4051ZRD7
2480	WX2480	Magnetic Rotor - Std.	1	2475ZRD21
2480	YX2480	Magnetic Rotor - Z Eng. (Base)	1	2475ZRD22
	NOTE:	Other rotors per magneto type designation.		
2492	C2492	Retaining Washer - Inner	1	Z4RD2492A1
2492A	A2492A	Retaining Washer - Outer	1	Z4RD2492B
2493	C2493	Bearing Insulating Washer	2	ZRB2493A
2498	H2498	End Cap Gasket	1	Z2RD2498B
2561	C2561	Flange Adapter Plate - Z Eng.	1	ZRD2561G
2561A	A2561A	Standard SAE Base Plate	1	ZRD2561D3
2561A	B2561A	Special Z Engine Base Plate	1	ZRD2561B
2563	Z2563	Hub Assembly - Type Z - CW (Z2563 Inc. C2566, C2567)	1	.....
2563	AX2563	Hub Assembly - UB2 - CCW (AX2563 Inc. G2566, E2567, B2569)	1	Specify Lag Angle
2563	BX2563	Coupling Hub Assembly - UB2 - CW (BX2563 Inc. G2566, E2567, B2569)	1	Specify Lag Angle
2563C	Z2563C	Coupling Group - Type Z - CW (Z2563C Inc. A2431A,Z2563,A2564,C2565,G2568,A2569)	1	.....
2563C	AX2563C	Coupling-Complete - UB2 - CCW (AX2563C Inc. AX2563,D2565,A5931B,M5957)	1	Specify Lag Angle
2563C	BX2563C	Coupling-Complete - UB2 - CW (BX2563C Inc. BX2563,D2565,A5931B,N5957)	1	Specify Lag Angle
2564	A2564	Coupling Gear Pin - Type Z	1	ZCA2564A
2565	C2565	Coupling Drive Spring - Type Z	1	ZCA2565B
2565	D2565	Coupling Drive Spring-Series U	1	Z4RD6012A
2566	C2566	Coupling Pawl - Type Z	1	ZCA2566A2
2566	G2566	Coupling Pawl - UB2	1	Z4RD2566B2
2567	C2567	Coupling Pawl Rivet - Type Z	1	ZCA2567A
2567	E2567	Coupling Pawl Rivet - UB2	1	Z4RD2567A
2568	C2568	Coupling Stop Pin - UB2 - CW	1	Z2RB2568B2
2568	D2568	Coupling Stop Pin - UB2 - CCW	1	Z2RB2568A3
2568	G2568	Coupling Stop Plate - Type Z	1	ZCA2568A
2569	A2569	Coupling Nut Washer - Type Z	1	ZCA2569A1
2569	B2569	Coupling Pawl Washer-Series U	1	Z4RD2569A1
2570	G2570	Coupling Nut - Series U	1	Z4RD2570A2
2570	H2570	Coupling Nut - Type Z	1	ZCA2570C
2723	C2723	Shaft Thrust Bearing Shim	2	Z2RB2723C
2736	E2736	Primary Lead Wire Tube	1	Z4RD2736A
2788	E2788	Cam Felt Wick	1	Z4RD2788C2
2824	B2824	Bearing Insulating Strip	1	Z4RD2824B
2982	A2982	Cam Felt Wick Spacer	1	Z4RD2982A
3861	G3861	Bearing Seal Rubber Washer	1	Z4RD3861D
4361	A4361	Lead Wire Terminal	2	ZRB4361A
4631	H4631	Bearing & Breaker Plate - CW (H4631 Inc. G2447, E2788, A2982, B5950A, C6503)	1	4631Z4RD7
4631	J4631	Bearing & Breaker Plate - CCW (J4631 Inc. G2447, E2788, A2982, B5950A, C6503)	1	4631Z4RD6
5931B	A5931B	Coupling Nut Lockwasher - UB2	1	Z4RD5931B
5949	C5949	Rotor Drive End Ball Bearing	1	Z4RD5949A
5950A	B5950A	Rotor Sleeve Bearing	1	Z2RD5950A2
5957	M5957	Coupling Shell - UB2 - CCW	1	Z4RD5957H4
5957	N5957	Coupling Shell - UB2 - CW	1	Z4RD5957G5
5969	B5969	Stationary Support Washer	1	Z4RD5969A
6503	C6503	Cam Felt Wick Holder	1	ZRA2458A