Instructions No. 2888B
Supersedes Instructions 2888A

FAIRBANKS-MORSE

TYPE FM-J1A MAGNETOS

S. A. E. Base Mounting Units - 35 mm. & 45 mm. Shaft Heights

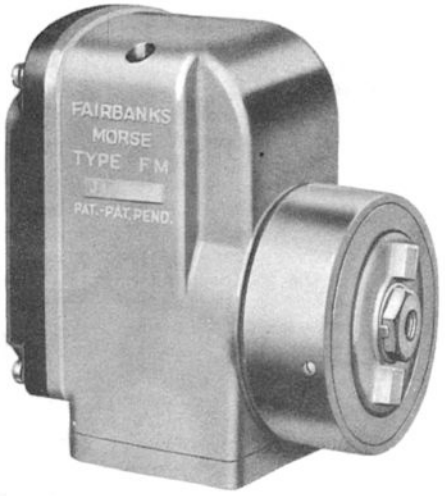


Fig. 1 - Type FM-J1A Magneto
(45 mm. Shaft Height - Type UA2 Impulse Coupling)

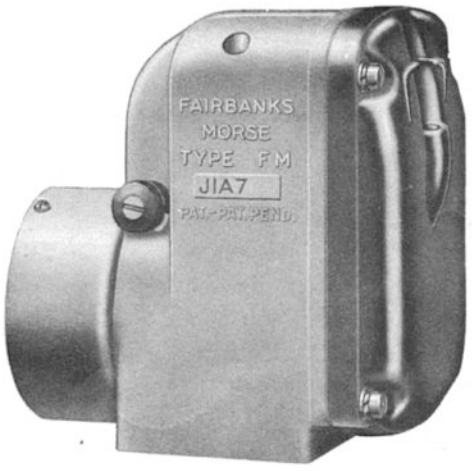


Fig. 2 - Type FM-J1A Magneto
(35 mm. Shaft Height - Type UC Impulse Coupling)

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.

Application

Base mounting Type FM-J1A magnetos are for use on single cylinder engines requiring a 360° ignition spark interval. Available for either clockwise or counterclockwise rotation, Type FM-J1A magnetos are built for 35 and 45 mm. shaft height installations. Standard models have S.A.E. base mounting dimensions, but a number of special applications require suitable base adapter plates. On the 35 mm. shaft height magneto the Type UC impulse coupling is standard equipment, while the 45 mm. unit is equipped with the Type UA2 coupling. Type FM-J1A magnetos are also furnished without impulse couplings. A two-pole magnetic rotor is used, together with a single lobe breaker cam, providing a single ignition spark per revolution. Magnetos on one cylinder engines usually operate at crankshaft speed.

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.

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.

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

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 for short interval.
B. Insufficient Fuel or Air	Empty fuel tank; clogged fuel supply line; 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 points to recommended opening; never attempt to adjust center electrode.
E. Magneto	Points, impulse coupling.	See instructions beginning "Testing the Ignition Spark".

ignition spark is observed, no dismantling of the magneto take place and that cable, terminals and spark plug be thoroughly inspected.

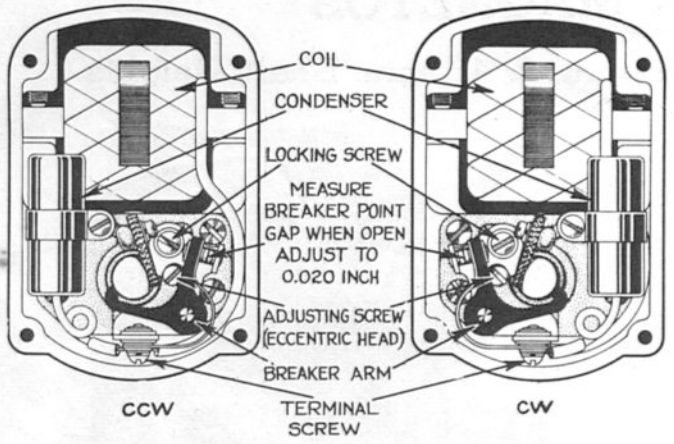


Figure 3 - End Views of Type FM-J1 Magneto

Adjustment of Breaker Points

Remove the magneto end cover and compare the arrangement of parts with the drawings of Figure 3. 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 easily be made by removing the locking screw of the contact support bracket and the terminal screw, which frees the breaker arm. 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.

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.

Reassembly & Sealing

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

Impulse Couplings

The impulse coupling is used to facilitate starting of the engine and at the same time to automatically retard the ignition spark while starting. Through this device the rotor of the magneto is held back, while the engine is turned to its firing position, at which instant the pawl of the coupling releases and the rotor is snapped forward at high speed, thereby producing an intense, hot spark, automatically retarded to prevent backfiring. The magnetos furnished for one cylinder engines are equipped with single pawl couplings.

Magneto to Engine Timing

If the magneto has been removed from the engine, replacement necessitates accurate retiming. Directions given by the individual engine manufacturer should be followed closely with careful attention given flywheel and gear markings. In general, the principle consists of setting the magneto in the position at which the impulse spark occurs and setting the engine piston at top dead center on its compression stroke, then coupling the magneto to the engine drive shaft. In applications where the engine flywheel is marked for advance spark position, the magneto may also be turned to advance spark position and coupled to the engine. Advance spark position can be ascertained for a single cylinder magneto by removing the end cap and turning the magnetic rotor until the rotor cam begins to open the breaker points. Under such conditions the impulse coupling automatically retards the ignition spark during the starting period.

Adjustable Drive Members

Most engines using base mounting magnetos are equipped with adjustable drive members. Ordinarily the position of the drive member is not altered when removing the magneto, but when necessary, the drive collar nut (Fig. 4) can be loosened to permit movement of the drive collar in relation to the drive shaft collar. The drive collar can then be turned until the slots of the float disc line up with impulse coupling lugs, after which the nut should be tightened securely and the locking lugs of the washer turned up to hold the nut in position.

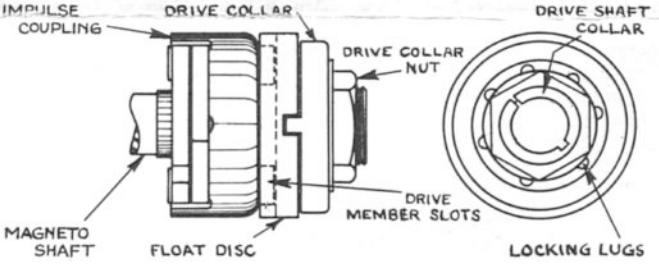


Figure 4 - Drive Member and Impulse Coupling Assembly

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. These Service Stations have special equipment and training for magneto repair and close contact is maintained with the factory service and engineering departments. The Service Station Directory should be consulted to locate the Service Station most convenient.

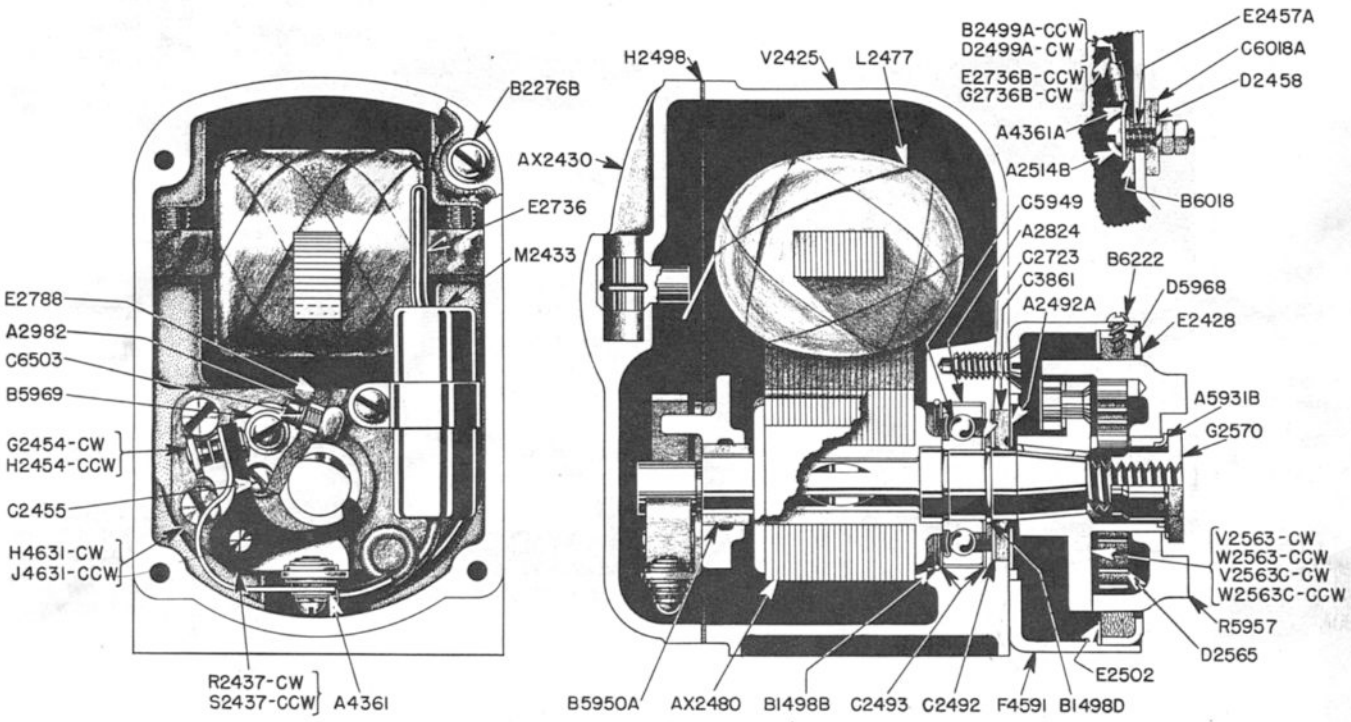
Genuine Replacement Parts

Genuine Fairbanks-Morse magneto replacement parts are stocked by all Authorized Service Stations and should always be insisted upon for repairs. The use of spurious parts usually proves less satisfactory and less economical than the use of the manufacturer's original replacements, besides voiding the magneto guarantee.

REPAIR CHART & LIST - TYPE FM-J1A MAGNETOS

35 mm. S.A.E. Base Mounting – Type UC Impulse Coupling

Refer to Repair Price List No. 9837F for Prices



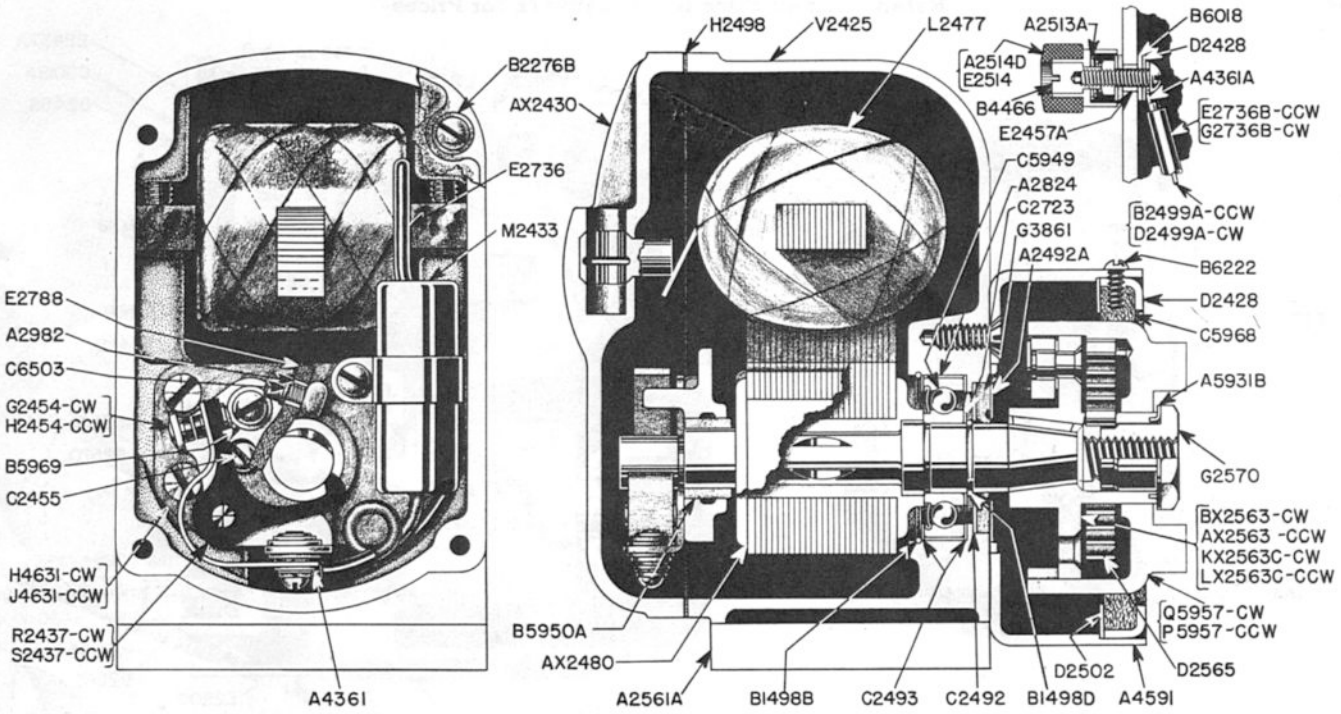
Order By Part No.	Name of Part	No. Used
B1498B	Rotor Bearing Snap Ring	1
B1498D	Rotor Shaft Snap Ring	1
B2276B	End Cap Screw Flat Washer	4
V2425	Frame - 35 mm. SAE Base	1
E2428	Cplg. Hsg. Cupped Washer	1
AX2430	End Cap	1
M2433	Condenser (Inc. A4361)	1
R2437	Brkr.Pt.Set-CW(Inc.G2454,E2788)	1
S2437	Brkr.Pt.Set-CCW(Inc.H2454,E2788)	1
G2454	Sta'y Bracket and Point - CW	1
H2454	Sta'y Bracket and Point - CCW	1
C2455	Brkr. Pt. Adjustment Screw	1
E2457A	Pri. Grd. Insulating Bushing	1
D2458	Pri. Grd. Flat Washer	2
L2477	Coil Assembly (Inc.2736,A4361)	1
AX2480	Magnetic Rotor	1
C2492	Inner Retaining Washer	1
A2492A	Outer Retaining Washer	1
C2493	Bearing Insulating Washer	2
H2498	End Cap to Frame Gasket	1
B2499A	Pri.Grd. Wire-CW (Inc. E2736B, A4361, A4361A)	1
D2499A	Pri.Grd. Wire-CCW (Inc. G2736B, A4361, A4361A)	1
E2502	Cplg. Hsg. Flat Washer	1
A2514B	Pri.Grd. Terminal Group (Inc. E2457A,D2458,A4361A,B6018)	1
V2563	Cplg. Hub Assembly - Type UC-CW	1
W2563	Cplg. Hub Assembly - Type UC-CCW	1
V2563C	Coupling Complete - Type UC-CW (Inc. V2563,D2565,A5931B,R5957)	1

Order By Part No.	Name of Part	No. Used
W2563C	Coupling Complete - Type UC-CCW (Inc.W2563,D2565,A5931B,R5957)	1
D2565	Coupling Drive Spring	1
G2570	Coupling Nut	1
C2723	Thrust Bearing Shim	2
E2736	Primary Lead Wire Tube	1
E2736B	Pri. Grd. Wire Tube - CW	1
G2736B	Pri. Grd. Wire Tube - CCW	1
E2788	Cam Felt Wick	1
B2824	Rotor Brg. Insulating Strip	1
A2982	Cam Felt Wick Spacer	1
G3861	Bearing Seal Rubber Washer	1
A4361	Lead Wire Terminal (#8)	2
A4361A	Lead Wire Terminal (#6)	1
F4591	Coupling Housing Assembly	1
H4631	Brg. Plate Assembly - CW (Inc. E2788,A2982,B5950A,C6503)	1
J4631	Brg. Plate Assembly - CCW (Inc. E2788,A2982,B5950A,C6503)	1
A5931B	Coupling Nut Lockwasher	1
C5949	Rotor Ball Beáring	1
B5950A	Rotor Sleeve Bearing	1
R5957	Coupling Shell	1
D5968	Cplg. Hsg. Felt Washer	1
B5969	Sta'y Contact Flat Washer	1
B6018	Pri. Grd. Insulating Washer	2
B6222	Cplg. Hsg. Cupped Washer Screw	2
C6503	Cam Felt Wick Holding Washer	1
GK16	Complete Gasket Kit (Inc.A2492A, H2498, G3861)	1

Obtain Repair Parts From Authorized Fairbanks-Morse Magneto Service Stations

REPAIR CHART & LIST - TYPE FM-J1A MAGNETOS

45 mm. S.A.E. Base Mounting - Type UA2 Impulse Coupling



Order By Part No.	Name of Part	No. Used
B1498B	Rotor Bearing Snap Ring	1
B1498D	Rotor Shaft Snap Ring	1
B2276B	End Cap Screw Flat Washer	4
QX2425	Frame - 45 mm. SAE Base	1
D2428	Cplg. Hsg. Cupped Washer	1
AX2430	End Cap	1
M2433	Condenser (Inc. A4361)	1
R2437	Brkr.Pt.Set-CW(Inc.G2454,E2788)	1
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C2493	Bearing Insulating Washer	2
H2498	End Cap to Frame Gasket	1
B2499A	Pri.Grd.Wire-CW (Inc. E2736B, A4361, A4361A)	1
D2499A	Pri.Grd.Wire-CCW (Inc. G2736B, A4361, A4361A)	1
D2502	Cplg. Hsg. Flat Washer	1
A2513A	Pri. Grd. Button Spring	1
E2514	Pri. Grd. Push Button	1
A2514D	Pri. Grd. Push Button Group (Inc. E2457A,A2513A,E2514, D2458,A4361A,B4466,B6018)	1
AX2563	Cplg. Hub Assembly - Type UA2-CCW	1
BX2563	Cplg. Hub Assembly - Type UA2-CW	1
AX2563C	Coupling Complete - Type UA2-CCW (Inc.AX2563,D2565,A5931B,M5957)	1
BX2563C	Coupling Complete-Type UA2-CW (Inc.BX2563,D2565,A5931B,N5957)	1
D2565	Coupling Drive Spring	1
G2570	Coupling Nut	1
C2723	Thrust Bearing Shim	2
E2736	Primary Lead Wire Tube	1
E2736B	Pri. Grd. Wire Tube - CW	1
G2736B	Pri. Grd. Wire Tube - CCW	1
E2788	Cam Felt Wick	1
B2824	Rotor Brg. Insulating Strip	1
A2982	Cam Felt Wick Spacer	1
G3861	Brg. Seal Rubber Washer	1
A4361	Lead Wire Terminal (#8)	2
A4361A	Lead Wire Terminal (#6)	1
B4466	Ground Screw End Nut	1
B4591	Coupling Housing Assembly - CCW	1
C4591	Coupling Housing Assembly - CW	1
H4631	Brg. Plate Assembly - CW (Inc. E2788,A2982,B5950A,C6503)	1
J4631	Brg. Plate Assembly - CCW (Inc. E2788,A2982,B5950A,C6503)	1
A5931B	Coupling Nut Lockwasher	1
C5949	Rotor Ball Bearing	1
B5950A	Rotor Sleeve Bearing	1
M5957	Coupling Shell - CCW	1
N5957	Coupling Shell - CW	1
C5968	Cplg. Hsg. Felt Washer	1
B5969	Sta'y Contact Flat Washer	1
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C6503	Cam Felt Wick Holding Washer	1
GK16	Complete Gasket Kit (Inc.A2492A, H2498, G3861	1

334480-047803M-BDN
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Chicago, Illinois

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