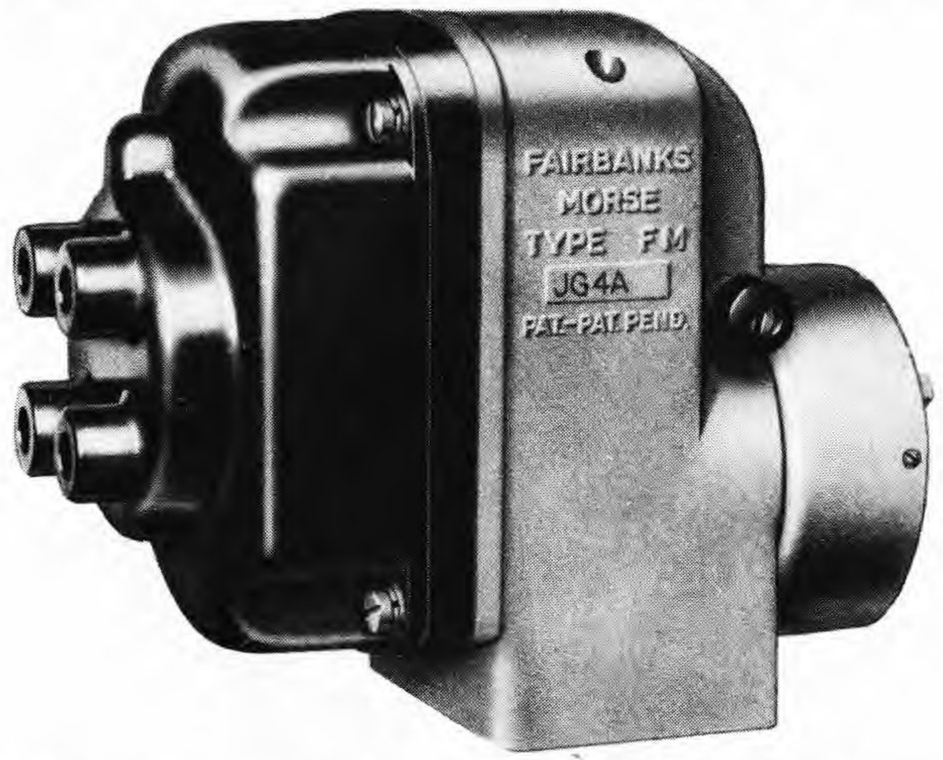
Instructions No. 2874

FAIRBANKS-MORSE

TYPE FM-JG4A MAGNETOS



Field Service and Adjustment Information

General Information

Magnetos are carefully designed to provide quick, easy starting and maximum operation with the least possible adjustment or service. Fairbanks-Morse Type FM-JG4 magnetos are especially compact in assembly and of sturdy construction. The powerful Alnico magnetic rotor assures an intensely hot ignition spark under the most difficult operating conditions. While field adjustments are simple and rarely necessary, the following directions should be carefully followed.

Service Procedure

A logically arranged service outline to be followed when tractor engines fail to start, start hard, or miss in operation is tabulated below. The use of this chart will often result in finding the trouble before the magneto is reached, and may prevent the misadjustment of parts in good condition. It is suggested that a magneto should be opened only when it is certain that the ignition spark produced is unsatisfactory. This condition may be determined by simple tests explained in the following paragraphs.

Testing the Ignition Spark

With properly adjusted spark plugs 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. Ignition tests made while any part of the system is wet are useless.

Testing the Magneto Spark

Pull the ignition cables out of the end cap sockets and insert a short, stiff wire. Bend this wire to within 1/8" of the engine block. Turn the engine over slowly and watch carefully for the spark discharge which should occur at the instant the impulse coupling releases. The test should then be repeated for each of the remaining terminals. It is highly recommended that, when a strong ignition spark is observed, no dismantling of the magneto take place and that cables, terminals and spark plugs be thoroughly inspected. If no spark is observed, the ignition switch should first be carefully examined to be certain it has not become accidentally closed.

Magneto - Dismantling

When no spark is obtained from one or more of the magneto terminals, the distributor end cap should be taken off by removing the four end cap screws. The following details should then be checked:

(a) Inspect the carbon brushes. These brushes should move freely in their holders and should have a slight spring pressure; replace brushes which are worn or irregular.

(b) Clean the distributor disc with a clean cloth and carbon tetrachloride. Do not use sandpaper.

Service of Breaker Points

Remove the distributor disc from the shaft by pulling the distributor disc cotter pin. Then slide the disc from the shaft.

Carefully examine the breaker contact points for

TROUBLE	POSSIBLE CAUSE	SUGGESTED REMEDY
A. Flooding	Hot or cold engine; over-rich fuel mixture.	Dry out cylinders: 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 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 cables; short circuited switch.	Clean or replace cable terminals; inspect soldered or clamped joints, test and replace cables; check ignition switch.
D. Spark Plug	Corroded, worn or damaged points; cracked or carbonized insulators.	New plugs; clean points and insulators; adjust point gap to recommended opening: never attempt to adjust center electrode.
E. Magneto	Brushes, points, impulse coupling.	See instructions beginning "Service Procedure"

indications of pitting or pyramiding.

(a) If necessary, the contact points should be made smooth with a small tungsten file or fine stone. The entire breaker mechanism may be easily removed from the magneto for point resurfacing, eliminating the possibility of dropping filings in the magneto housing. Points must be adjusted after resurfacing.

(b) Points which cannot be reconditioned satisfactorily should be replaced by a complete new set.

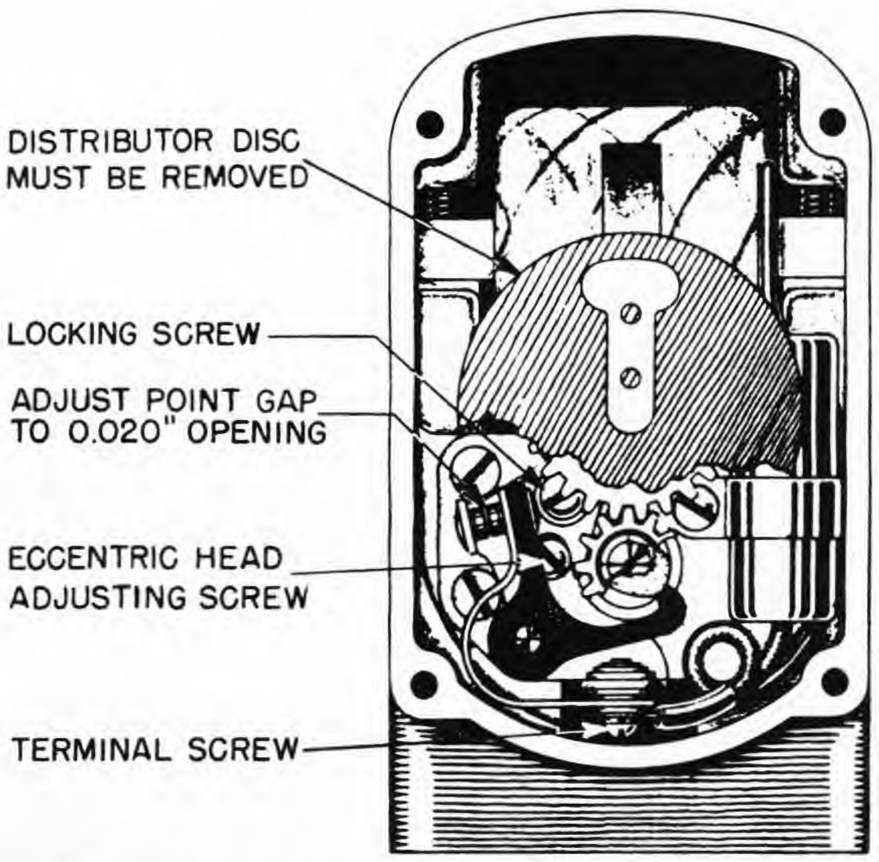


Figure 2 - End View of Type FM-JG4 Magneto

Magneto - Point Adjustment

The breaker point gap should measure .020 inch when fully open. To adjust the point gap the locking screw (Fig. 2) of the stationary point bracket should be loosened, after which the eccentric head adjusting screw can be turned until the proper position has been obtained. The locking screw should be tightened before final measurement of the breaker point gap is made.

Reassembly & Sealing

To reseal the magneto according to factory standards all gasket surfaces should be thoroughly cleaned and a new gasket provided. A thin coat of special FMC02 Gasket Sealing Varnish should be applied to the face of the end cap and the gasket fixed in place. Mount the distributor end cap on the frame and tighten the screws securely.

Magneto to Engine Timing

If the magneto has been removed from the engine, replacement necessitates accurate retiming. Two methods are described below: (A) the advance spark position method and (B) the impulse coupling trip method.

(A) The advance spark position method consists of setting the magneto for advance spark position and the engine for advance firing position, both for #1 cylinder. Advance spark position for the magneto is obtained by removing the end cap from the frame, then turn the drive shaft in the direction opposite to the indicated rotation until the white mark on the edge of the distributor disc is directly above the rotor cam. Engine instructions usually describe how the engine may be set for advance firing position; if this is not known, it is recommended that method (B) be used.

(B) The impulse coupling trip method consists of setting the magneto for actual spark discharge and the engine piston at top dead center, both for #1 cylinder. To set the magneto the cable from #1 terminal should be replaced by a short wire, holding the opposite end close to the mangeto frame. The impulse coupling should then be turned in the indicated direction until a spark is observed between the wire and the frame. To set the engine remove the spark plug of #1 cylinder and turn the crankshaft until the piston reaches top dead center on the compression stroke.

Magneto to Engine Connection

Without disturbing either magneto or engine settings as determined by methods (A) or (B) of the above paragraph, the magneto should be connected as explained below:

(A) Flange Mounting Magnetos - Simply engage the drive lugs of the impulse coupling with the driving slots of the engine drive member (a slight movement of the magneto may be necessary). Tighten capscrews and nuts securely.

(B) Base Mounting Magnetos - If no change has been made in the position of the drive member, it is only necessary to engage the drive lugs of the impulse coupling with the driving slots of the float disc; be certain that the shaft assembly is aligned before securing the base mounting screws.

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 L (Fig. 3) can be loosened to permit movement of the drive member lugs relative to the position of the engine drive shaft. The float disc slots J can then be turned to line up with the impulse coupling lugs, after which the nut L should be tightened. The locking lugs M of the washer should be turned around the nut to prevent loosening of the nut.

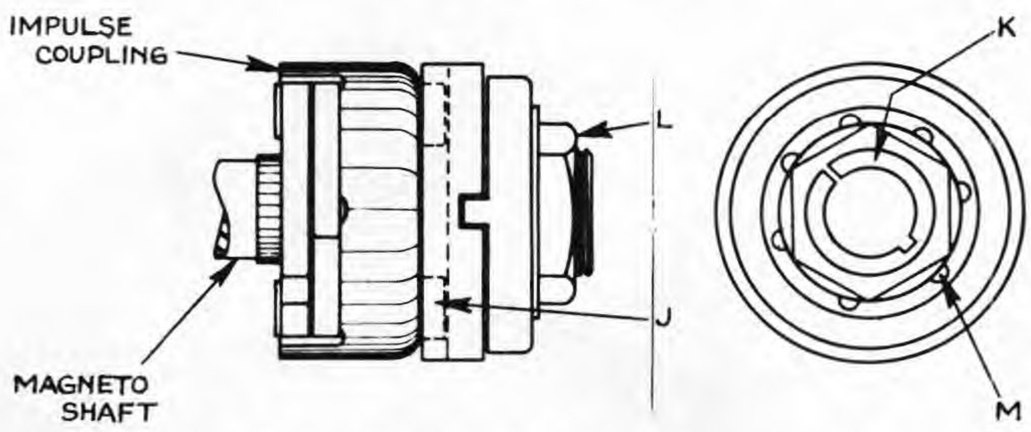


Figure 3 - Drive Member for Base Mounting Magnetos

Impulse Coupling

The impulse coupling facilitates starting by holding back the magneto rotor until the engine is in firing position, at which instant the rotor is snapped forward at high speed to produce an intense, hot spark, automatically retarded to prevent backfiring. The impulse feature disengages as soon as the engine has picked up speed. Absence of the characteristic snap at low speeds indicates that the coupling is not functioning properly and it should be sent together with the magneto to an Authorized Service Station.

Service Facilities

Authorized Service Stations, located throughout the U.S. and foreign countries, have been carefully selected by Fairbanks, Morse & Co. to assure highly efficient and complete repair and inspection service to owners of Fairbanks-Morse magnetos. These service stations are equipped with special tools and have had special training for magneto repair and, in addition, have the advantage of close contact with the factory service and engineering departments.

Genuine Fairbanks-Morse magneto replacement parts, which may be obtained from all Authorized Service Stations, should always be insisted upon for repairs. A complete directory of Authorized Fairbanks-Morse Magneto Service Stations is available upon request.

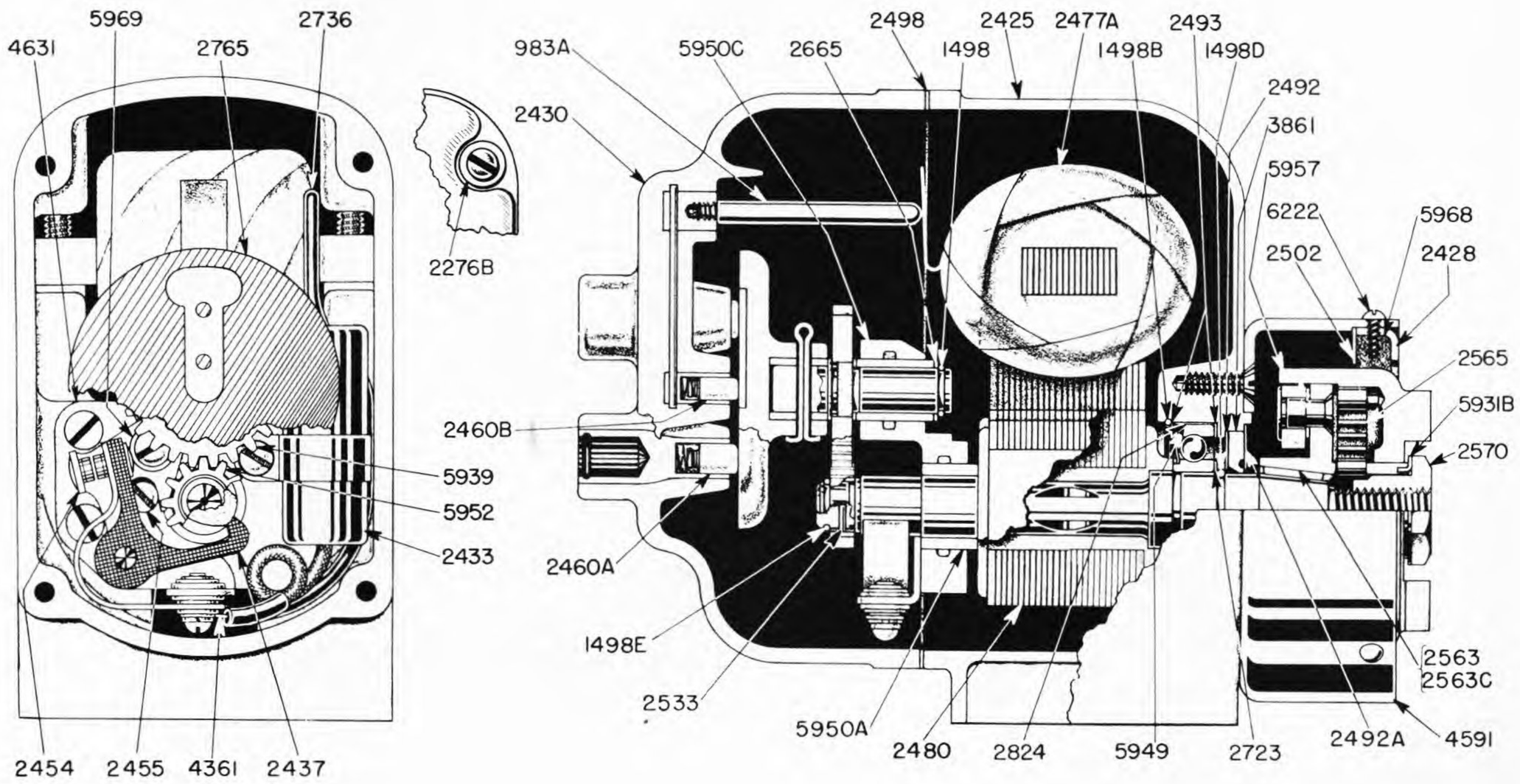
FAIRBANKS, MORSE & CO.

Manufacturers

Executive Offices:
Chicago, Illinois
014505M-310759

Magneto Sales & Factory:
Beloit, Wisconsin
123456

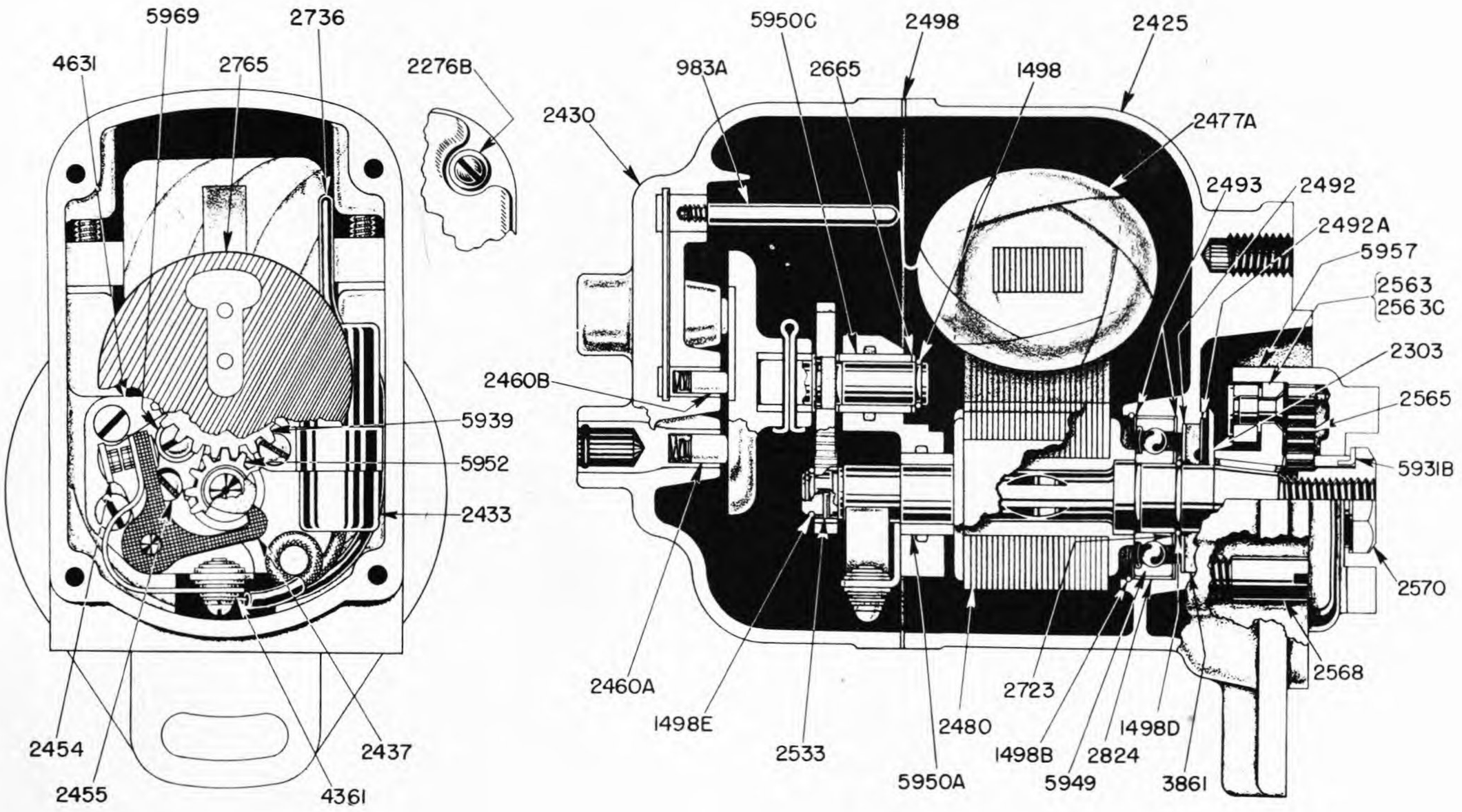
Repair Chart & List-Type FM-JG4A Magnetos



Identification Number	Order By Part Number	Name of Part-Unless otherwise specified, part is for SAE Base mounting magnetos of CW or CCW rotation.	No. Used
983A	F983A	Distributor Lead Rod	1
1498	D1498	Distributor Shaft Snap Ring	1
1498B	B1498B	Rotor Bearing Snap Ring	1
1498D	B1498D	Rotor Shaft Snap Ring	1
1498E	A1498E	Rotor Shaft Pinion Snap Ring . . .	1
2276B	B2276B	End Cap Screw Flat Washer	1
2425	V2425	Frame - 35 mm. Shaft Height . . . . (Use A2561A Plate)	1
	QX2425	Frame - 45 mm. Shaft Height	1
2428	D2428	Cplg. Housing Cupped Washer	1
2430	MX2430	Distributor End Cap	1
2433	R2433	Condenser - (Inc. A4361)	1
2477A	C2477A	Coil Assembly - (Inc. E2736, A4361)	1
2480	CX2480	Magnetic Rotor . . . . . (Inc. F5952, F2533, A1498E)	1
2492	C2492	Retaining Washer - Inner	1
2492A	A2492A	Retaining Washer - Outer	1
2493	C2493	Bearing Insulating Washer	2
2498	H2498	End Cap to Frame Gasket	1
2437	R2437	Brkr. Arm Sta'y Brkt. & Points - CW (Inc. G2454)	1
	S2437	Brkr. Arm Sta'y Brkt. & Points - CCW (Inc. H2454)	1
2454	G2454	Sta'y Contact Point & Support - CW	1
	H2454	Sta'y Contact Point & Support - CCW	1
2455	C2455	Sta'y Brkt. Eccentric Adj. Screw .	1
2460A	D2460A	Distributor Brush - (Pairs only) .	4
2460B	E2460B	Coil Lead Brush - (Pairs only) . .	1
2502	D2502	Coupling Housing Flat Washer . . .	1
2533	F2533	Rotor Gear Pin	1
2561A	A2561A	Standard (SAE) Demountable Base Plate	1
2563	Q2563	Coupling Hub Assembly - CW	
	R2563	Coupling Hub Assembly - CCW	1
2563C	T2563C	Coupling Complete - CW . . . . . (Inc. Q5957, D2565, Q2563)	1
	U2563C	Coupling Complete - CCW . . . . . (Inc. P5957, D2565, R2563)	1
2565	D2565	Coupling Drive Spring	1
2570	G2570	Coupling Nut	1
2665	C2665	Distributor Shaft Flat Washer . . .	2
2723	C2723	Bearing Shim	2
2736	E2736	Primary Lead Wire	1
2765	H2765	Distributor Disc Complete	1
2824	B2824	Rotor Shaft Brg. Insulating Strip .	1
3861	G3861	Bearing Seal Rubber Washer	1
4361	A4361	Lead Wire Terminal	2
4591	B4591	Coupling Housing Assembly - CCW . .	1
	C4591	Coupling Housing Assembly - CW . . .	1
4631	M4631	Bearing & Breaker Support Plate - CW (Inc. B5950A, D5950C)	1
	N4631	Bearing & Breaker Support Plate-CCW (Inc. B5950A, D5950C)	1
5931B	A5931B	Coupling Nut Lockwasher.	1
5939	Q5939	Distributor Shaft & Gear Assembly .	1
5949	C5949	Ball Bearing - Drive End	1
5950A	B5950A	Sleeve Brg. Opp. Drive End - Oilite	1
5950C	D5950C	Sleeve Brg. Dist. Shaft - Oilite . .	1
5952	F5952	Rotor Gear	1
5957	Q5957	Coupling Shell - CW	1
	P5957	Coupling Shell - CCW	1
5968	C5968	Coupling Housing Felt Washer	1
5969	B5969	Stationary Contact Support Washer .	1
6222	B6222	Cplg. Housing Cupped Washer Screw .	1
GK16	GK16	Gasket Kit . . . . . (Inc. A2492A, H2498, G3861)	1

Obtain Repair Parts From Authorized Fairbanks-Morse Magneto Service Stations

Repair Chart & List-Type FM-JG4B Magnetos



Identification Number	Order By Part Number	Name of Part-Unless otherwise specified, part is for Std. Flange mounting magnetos of CW or CCW rotation.	No. Used
983A	F983A	Distributor Lead Rod	1
1498	D1498	Distributor Shaft Snap Ring	1
1498B	B1498B	Rotor Bearing Snap Ring	1
1498D	B1498D	Rotor Shaft Snap Ring	1
1498E	A1498E	Rotor Shaft Pinion Snap Ring	1
2276B	B2276B	End Cap Screw Flat Washer	1
2303	E2303	Oil Flinger Baffle Disc	1
2425	V2425	Frame - (Use A2561 Plate)	1
	AX2425	Frame - Integral Flange	1
2430	MX2430	Distributor End Cap	1
2433	R2433	Condenser - (Inc. A4361)	1
2437	R2437	Breaker Arm Sta'y Brkt. & Points - CW (Inc. G2454)	1
	S2437	Breaker Arm Sta'y Brkt. & Points -CCW (Inc. H2454)	1
2454	G2454	Sta'y Contact Point & Support - CW	1
	H2454	Sta'y Contact Point & Support -CCW	1
2455	C2455	Sta'y Bracket Eccentric Adj. Screw	1
2460A	D2460A	Distributor Brush - (Pairs only) . .	4
2460B	E2460B	Coil Lead Brush - (Pairs only) . . .	1
2477A	C2477A	Coil Assembly - (Inc. E2736,A4361) .	1
2480	CX2480	Magnetic Rotor . . . . . (Inc. F5952, F2533, A1498E)	1
2492	C2492	Retaining Washer - Inner	1
2492A	A2492A	Retaining Washer - Outer	1
2493	C2493	Bearing Insulating Washer	2
2498	H2498	End Cap Gasket	1
2533	F2533	Rotor Gear Pin	1
2561	A2561	Std. Demountable Flange Plate . . .	1
2563	Q2563	Coupling Hub Assembly - CW	1
	R2563	Coupling Hub Assembly - CCW	1
2563	Q2563C	Coupling Complete - CW . . . . . (Inc. N5957, D2565, Q2563)	1
	R2563C	Coupling Complete - CCW . . . . . (Inc. M5957, D2565, R2563)	1
	2565	D2565	Coupling Drive Spring	1
2568	C2568	Coupling Pawl Stop Pin - CW	1
	D2568	Coupling Pawl Stop Pin - CCW . . .	1
2570	G2570	Coupling Nut.	1
2665	C2665	Distributor Shaft Flat Washer . . .	2
2723	C2723	Bearing Shim	2
2736	E2736	Primary Lead Wire Tube	1
2765	H2765	Distributor Disc Complete	1
2824	B2824	Rotor Shaft Bearing Insulating Strip	1
3861	G3861	Brg. Seal Rubber Washer	1
4361	A4361	Lead Wire Terminal	2
4631	M4631	Brg. & Brkr. Support Plate - CW . . (Inc. B5950A, D5950C)	1
	N4631	Brg. & Brkr. Support Plate - CCW . (Inc. B5950A, D5950C)	1
5931B	A5931B	Coupling Nut Lockwasher	1
5939	Q5939	Dist. Shaft & Gear Assembly	1
5949	C5949	Ball Bearing - Drive End	1
5950A	B5950A	Sleeve Brg. Opp. Drive End - Oilite	1
5950C	D5950C	Sleeve Brg. Dist. Shaft - Oilite .	1
5952	F5952	Rotor Gear	1
5957	N5957	Coupling Shell - CW	1
	M5957	Coupling Shell - CCW	1
5969	B5969	Stationary Contact Support Washer .	1

Obtain Repair Parts From Authorized Fairbanks-Morse Magneto Service Stations