Instructions No. 2883

FAIRBANKS-MORSE

TYPES FM-JE1A7 & FM-JE1B7 MAGNETOS

Adapted to One Cylinder Engines Made by Wisconsin Motor Corp.

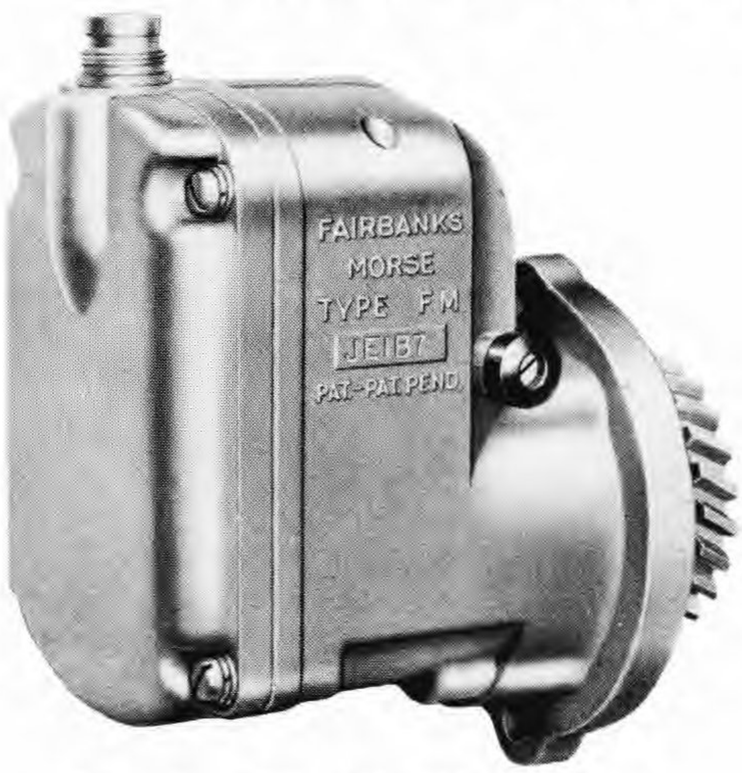


Fig. 1 - Type FM-JE1B7 Magneto

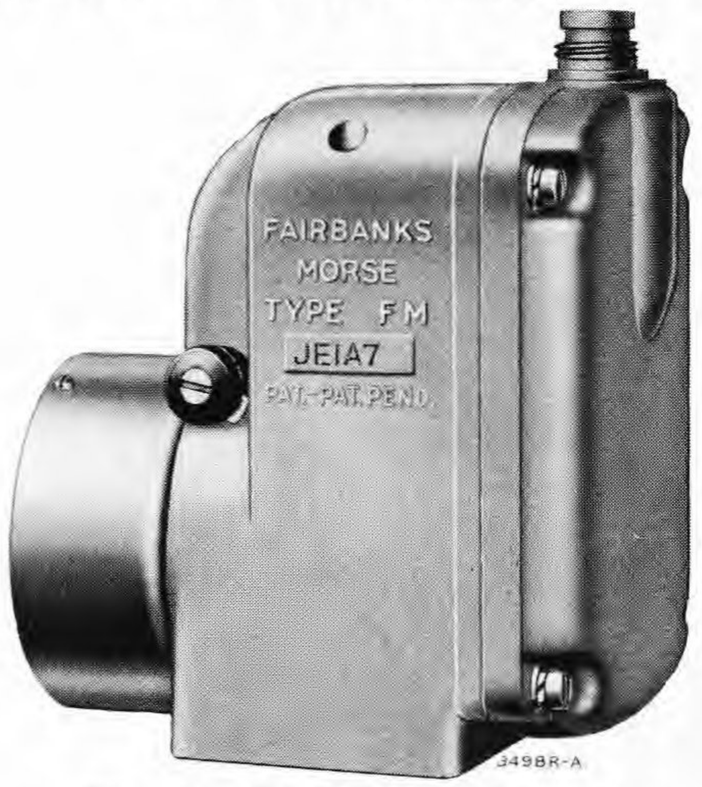


Fig. 2 - Type FM-JE1A7 Magneto

Field Service and Adjustment Information

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

Fairbanks-Morse Types FM-JE1A7 and FM-JE1B7 magnetos are built specifically for installation on Wisconsin single cylinder, air-cooled engines used in applications where complete radio-shielding of the ignition system is required. The Type FM-JE1A7 magneto (Figure 2) is built with a special base mounting housing, and is of counter-clockwise rotation, while the Type FM-JE1B7 (Figure 1) has a special flange mounting housing and is of clockwise rotation. The magnetic and electric circuits of the two units are identical, a two-pole magnetic rotor with a single lobe cam producing one ignition spark per revolution. Both models are equipped with dependable, single pawl impulse couplings which facilitate starting by intensifying and retarding the ignition spark at slow speeds.

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 ignition spark is observed, no dismantling of the mag-

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.

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neto take place and that cable, terminals and spark plug be thoroughly inspected.

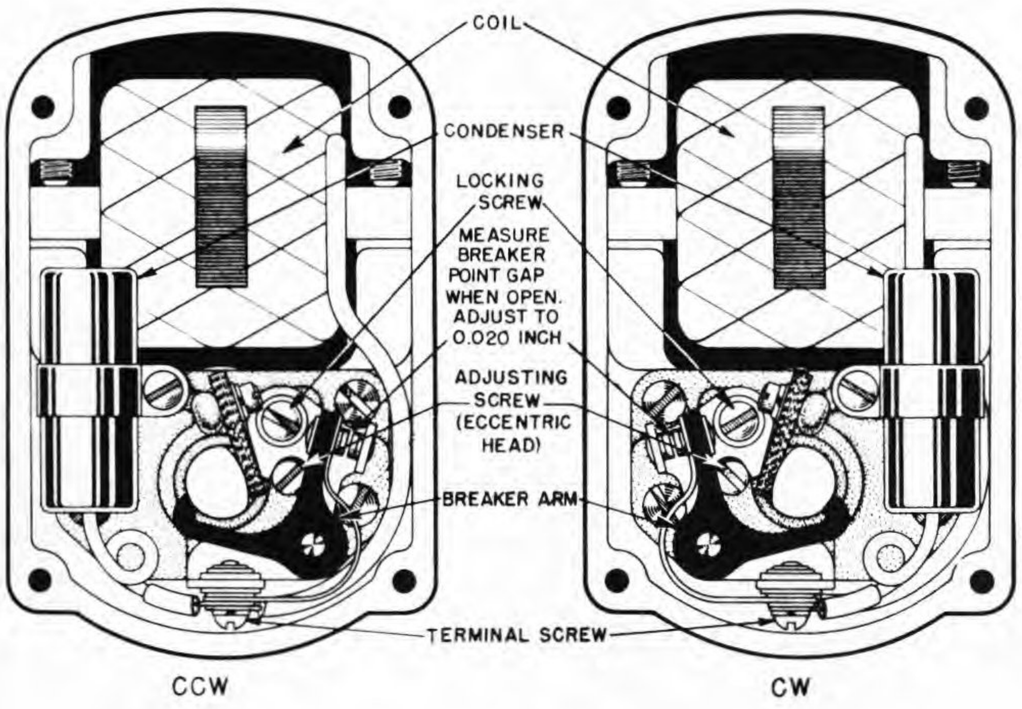


Figure 3 - End Views of Type FM-JE1 Magneto

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 may 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 servicemen.

Reassembly & Sealing

Type FM-JE1 magnetos are sealed at the factory against the entry of dust, oil or moisture. To obtain the electrical contact necessary between the frame and the end cap for complete radio-shielding, a soft lead gasket is provided for this joint. In reassembling the magneto a new lead gasket should be obtained and inserted carefully between the adjoining surfaces, so that no breaks occur along the sealing edge.

Radio-Shielded Unit

The entire mechanism of the Type FM-JE1 magnetos is enclosed within a grounded metal housing in order to permit complete radio-shielding of the ignition system. Provision is made in their construction for the simple attachment of a shielded ignition cable at the high voltage outlet on the end cap. Radio-shielded ignition systems are especially desirable on engines used to generate electricity or where the engine is located within a short distance of radio receivers, or other electrical equipment or lines.

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.

Gear Drive

Flange mounting Type FM-JE1B7 magnetos require a drive gear assembled to the impulse coupling by means of an extended rotor shaft. To engage the slotted drive gear correctly with the drive lugs of the coupling, the magneto rotor should be turned by hand until the coupling pawl engages the stop pin in the flange, the coupling drive lugs then being in the position shown by A of Figure 4. The drive gear should then be fitted to the coupling so that the marked tooth is on the upper edge of the gear as shown in B of Figure 4.

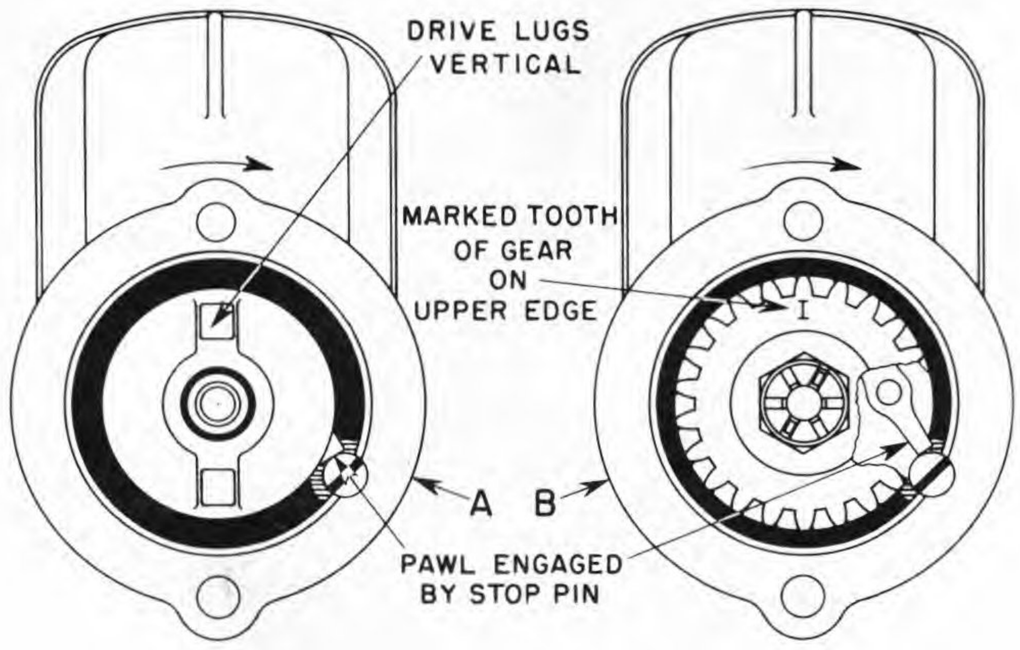


Figure 4 - Mounting Drive Gear

Ground Switches

Magnetos for Wisconsin Motor Corporation one cylinder engines are furnished with either a push button or turn button switch. Both designs function to ground the primary circuit of the magneto when the engine is to be stopped. The switch must be kept closed until the engine is completely at a standstill.

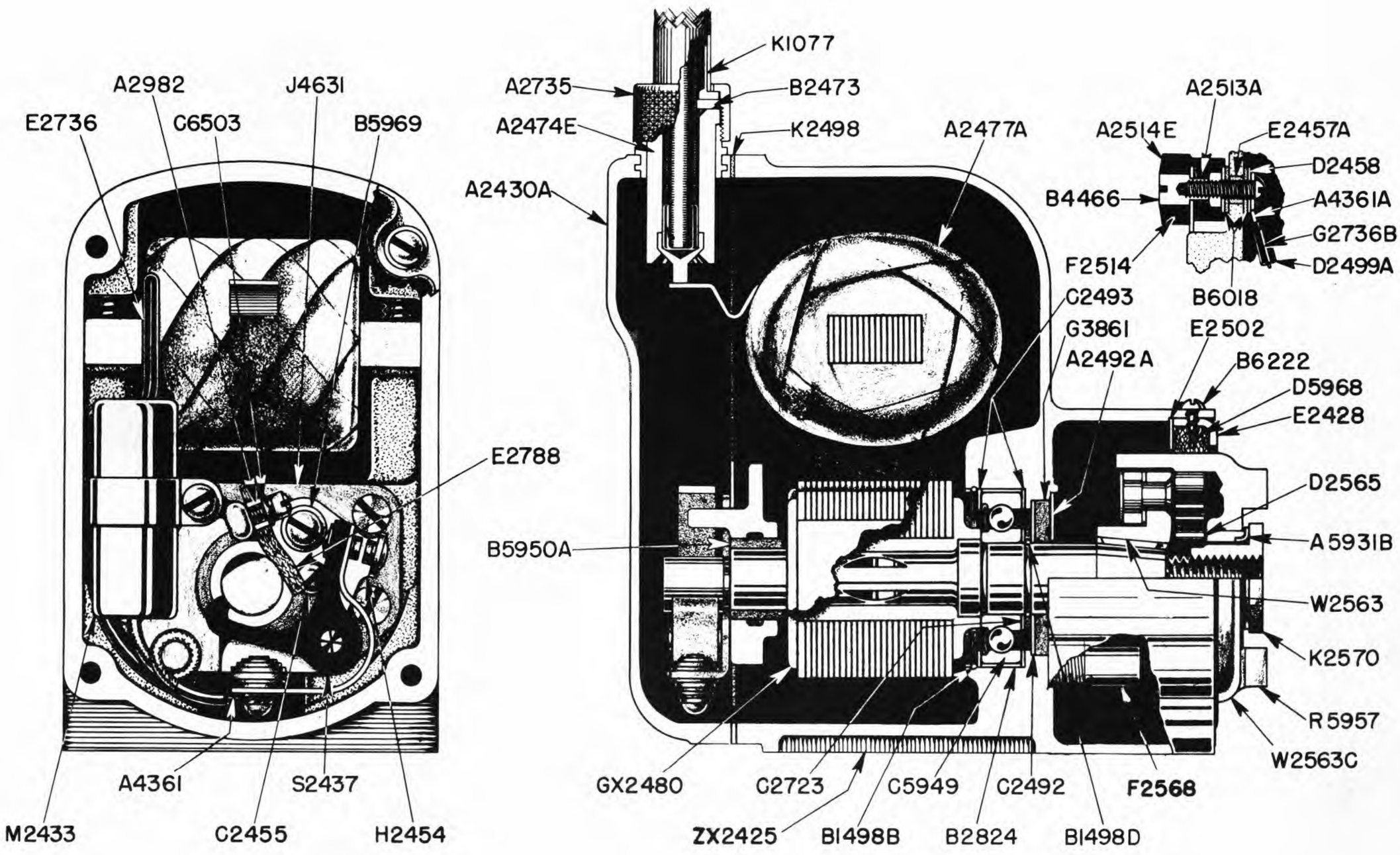
Service Facilities

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

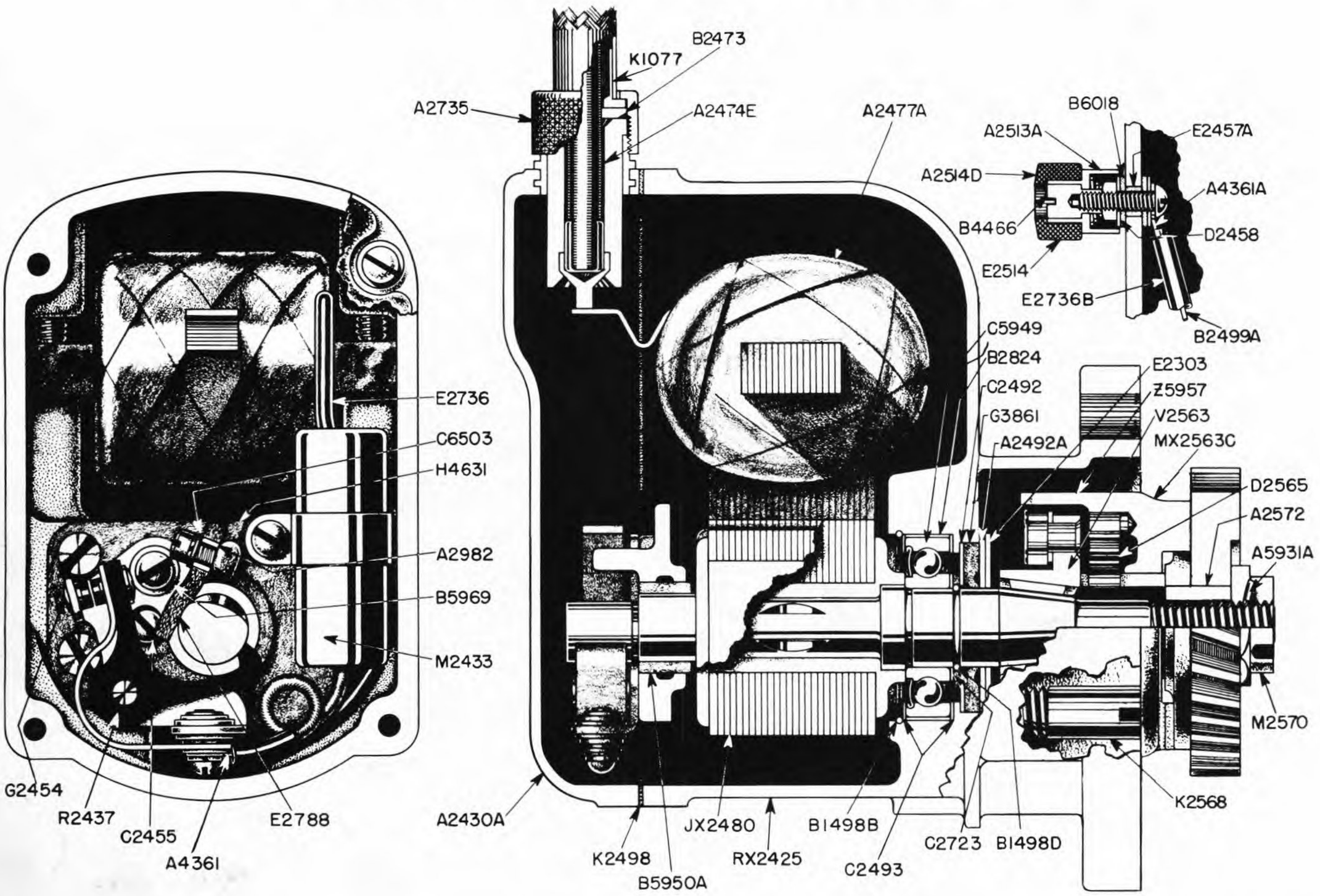
Genuine Fairbanks-Morse magneto replacement parts are stocked by all Authorized Service Stations and should always be insisted upon for repairs. The use of spurious parts usually proves less satisfactory and less economical than the use of the manufacturer's original replacements, besides voiding the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

Repair Chart & List-Type FM-JE1A7 Magnetos



Order by Part No.	Name of Part	No. Used	Order by Part No.	Name of Part	No. Used
K1077	Cable Outlet Ferrule	1	W2563	Impulse Coupling Hub Assembly	1
B1498B	Rotor Bearing Snap Ring.	1	W2563C	Impulse Coupling Complete	1
B1498D	Rotor Shaft Snap Ring.	1		(W2563C inc. W2563,D2565,A5931B,R5957)	
ZX2425	Frame.	1	D2565	Impulse Coupling Drive Spring	1
E2428	Impulse Coupling Housing Cupped Washer .	1	F2568	Impulse Coupling Pawl Stop Pin.	1
A2430A	End Cap.	1	K2570	Impulse Coupling Nut.	1
M2433	Condenser.	1	C2723	Thrust Bearing Shim (as needed)	2
S2437	Breaker Point Set (Inc. H2454, E2788). .	1	A2735	Cable Outlet Nut.	1
H2454	Stationary Bracket and Point	1	E2736	Primary Lead Wire Tube.	1
C2455	Breaker Point Adjustment Screw	1	G2736B	Primary Ground Wire Tube.	1
E2457A	Primary Ground Insulating Bushing . . .	1	E2788	Cam Felt Wick	1
D2458	Primary Ground Flat Washer	2	B2824	Rotor Bearing Insulating Strip.	1
B2473	Cable Socket Rubber Seal	1	A2982	Cam Felt Wick Spacer.	1
A2474E	Cable Outlet	1	G3861	Bearing Seal Rubber Washer.	1
A2477A	Coil Assembly (Inc. E2736, A4361). . . .	1	A4361	Lead Wire Terminal (#8)	3
GX2480	Magnetic Rotor	1	A4361A	Lead Wire Terminal (#6)	1
C2492	Inner Retaining Washer	1	B4466	Primary Ground Screw End Nut.	1
A2492A	Outer Retaining Washer	1	J4631	Bearing and Breaker Support Assembly. .	1
C2493	Bearing Insulating Washer.	2		(J4631 inc. E2788,A2982,B5950A,C6503)	
K2498	End Cap to Frame Gasket.	1	A5931B	Impulse Coupling Nut Lockwasher	1
D2499A	Primary Ground Wire.	1	C5949	Rotor Ball Bearing.	1
	(D2499A inc. G2736B,A4361,A4361A)		B5950A	Rotor Sleeve Bearing.	1
E2502	Impulse Coupling Housing Flat Washer . .	1	R5957	Impulse Coupling Shell.	1
A2513A	Ground Switch Button Spring.	1	D5968	Impulse Coupling Housing Felt Washer. .	1
F2514	Ground Switch Turn Button.	1	B5969	Stationary Control Flat Washer.	1
A2514E	Primary Ground Switch Group.	1	B6018	Primary Ground Switch Insulating Washer	1
	(A2514E inc. E24577A,D2458,A2513A,F2514, A4361A,B4466,B6018)		B6222	Coupling Housing Cupped Washer Screw. .	2
			C6503	Cam Felt Wick Holding Washer.	1

Repair Chart & List - Type FM-JE1B7 Magnetos



Order by Part No.	Name of Part	No. Used	Order by Part No.	Name of Part	No. Used
K1077	Cable Outlet Ferrule	1	V2563	Impulse Coupling Hub Assembly	1
B1498B	Rotor Bearing Snap Ring.	1	MX2563C	Impulse Coupling Complete	1
B1498D	Rotor Shaft Snap Ring.	1		(MX2563C inc. V2563,D2565,Z5957)	
E2303	Oil Slinger Baffle Disc.	1	D2565	Impulse Coupling Drive Spring	1
RX2425	Frame.	1	K2568	Impulse Coupling Pawl Stop Pin.	1
A2430A	End Cap.	1	M2570	Impulse Coupling Nut.	1
M2433	Condenser.	1	A2572	Impulse Coupling Gear Bushing	1
R2437	Breaker Point Set (Inc.G2454, E2788) . .	1	C2723	Thrust Bearing Shim (as needed)	2
G2454	Stationary Bracket and Point	1	A2735	Cable Outlet Nut.	1
C2455	Breaker Point Adjustment Screw	1	E2736	Primary Lead Wire Tube.	1
E2457A	Primary Ground Insulating Bushing. . . .	1	E2736B	Primary Ground Wire Tube.	1
D2458	Primary Ground Flat Washer	2	E2788	Cam Felt Wick	1
B2473	Cable Socket Rubber Seal	1	B2824	Rotor Bearing Insulating Strip.	1
A2474E	Cable Outlet	1	A2982	Cam Felt Wick Spacer.	1
A2477A	Coil Assembly (Inc. E2736, A4361). . . .	1	G3861	Bearing Seal Rubber Washer.	1
JX2480	Magnetic Rotor	1	A4361	Lead Wire Terminal (#8)	3
C2492	Inner Retaining Washer	1	A4361A	Lead Wire Terminal (#6)	1
A2492A	Outer Retaining Washer	1	B4466	Primary Ground Screw End Nut.	1
C2493	Bearing Insulating Washer.	2	H4631	Bearing and Breaker Support Assembly. .	1
K2498	End Cap to Frame Gasket.	1		(H4631 inc. E2788,A2982,B5950A,C6503)	
B2499A	Primary Ground Wire.	1	A5931A	Impulse Coupling Nut Lockwire	1
	(B2499A inc. E2736B,A4361,A4361A)		C5949	Rotor Ball Bearing.	1
A2513A	Ground Switch Button Spring.	1	B5950A	Rotor Sleeve Bearing.	1
E2514	Ground Switch Push Button.	1	Z5957	Impulse Coupling Shell.	1
A2514D	Primary Ground Switch Group.	1	B5969	Stationary Contact Flat Washer.	1
	(A2514D inc. E2457A,D2458,E2514,A4361A, B4466,A2513A,B6018)		B6018	Primary Ground Switch Insulating Washer	2
			C6503	Cam Felt Wick Holding Washer.	1

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