Instructions No. 2871

FAIRBANKS-MORSE

TYPE FM-JH2B & FM-JHE2B MAGNETOS

(Standard) (Radio-Shielded)

Adapted Only to Kiekhaefer Corp. Two Cylinder Engines

1. GENERAL INFORMATION - Modern ignition systems are carefully engineered to provide quick, easy starting and maximum dependability of operation without adjustment or service. The advanced design and sturdy construction of Fairbanks-Morse Type FM-J magnetos have established field performance leadership. Especially compact in assembly, the powerful Alnico magnetic rotor assures an intensely hot ignition spark.

2. DESCRIPTION - The Types FM-JH2 and FM-JHE2 magnetos are two cylinder units with a spark interval of 180° and have the jump-spark system of distribution. The Type FM-JH2 magneto is made with a molded end cap for standard installations, while the Type FM-JHE2 magneto is entirely enclosed in a metal housing for installations which require radio-shielding. Provision is made to permit connection to shielded high tension cables.

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 Plugs	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.

3. SERVICE PROCEDURE - Field adjustment is rarely necessary and should be undertaken strictly according to the following directions. Before dismantling the magneto, attention should be given the logically arranged service outline in which common causes of engine difficulties are tabulated. In many cases this will prevent unnecessary adjustment of parts in good condition. Simple tests are described in the following discussion which should determine whether the ignition spark is unsatisfactory.

4. 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.

5. TESTING THE MAGNETO SPARK - Pull the ignition cables out of the end cap sockets 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. 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 re-examined.

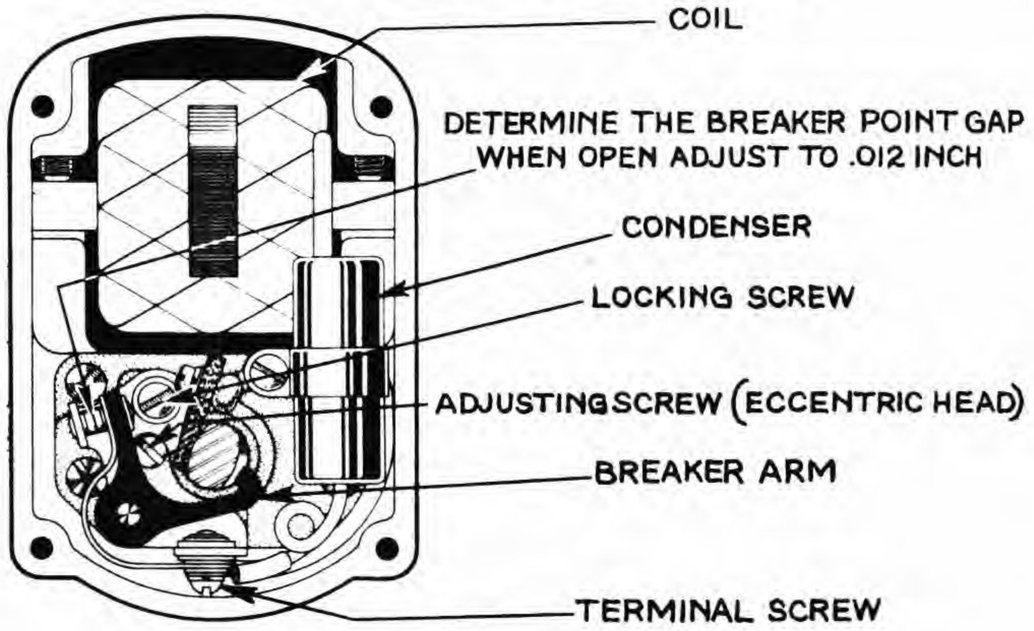


Figure 1 - End View - Type FM-JH2 Magneto

6. ADJUSTMENT OF BREAKER POINTS - After the end cap has been removed (either standard or radio-shielded) the breaker points can be easily located by reference to the end view (Fig. 1). Examine the point surfaces for evidence of pitting or pyramiding. Contact points can be resurfaced by using a small tungsten file or fine stone; complete replacement is easily accomplished by removing the locking and terminal screws (Fig. 1). After either resurfacing or replacement the breaker point gap must be adjusted. Loosen the locking screw and turn the eccentric head adjustment screw until the proper gap is obtained (.012 inch at full separation). Oil film can be removed from breaker points by using a small, stiff brush moistened with carbon tetrachloride or naptha.

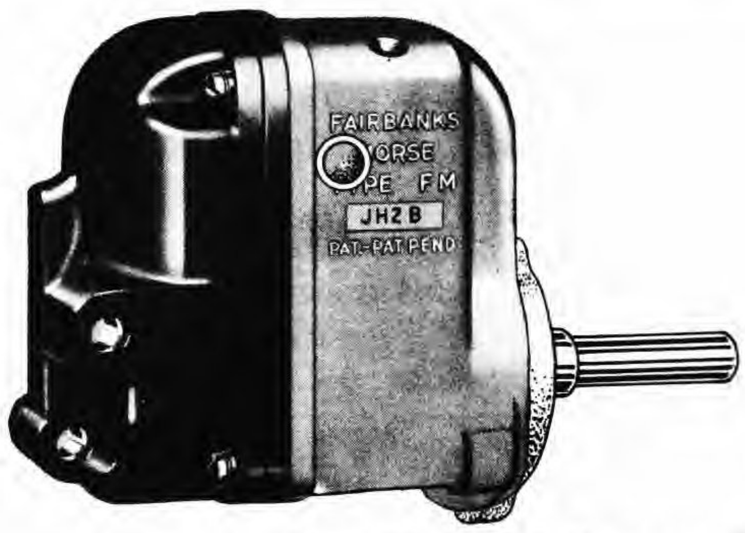
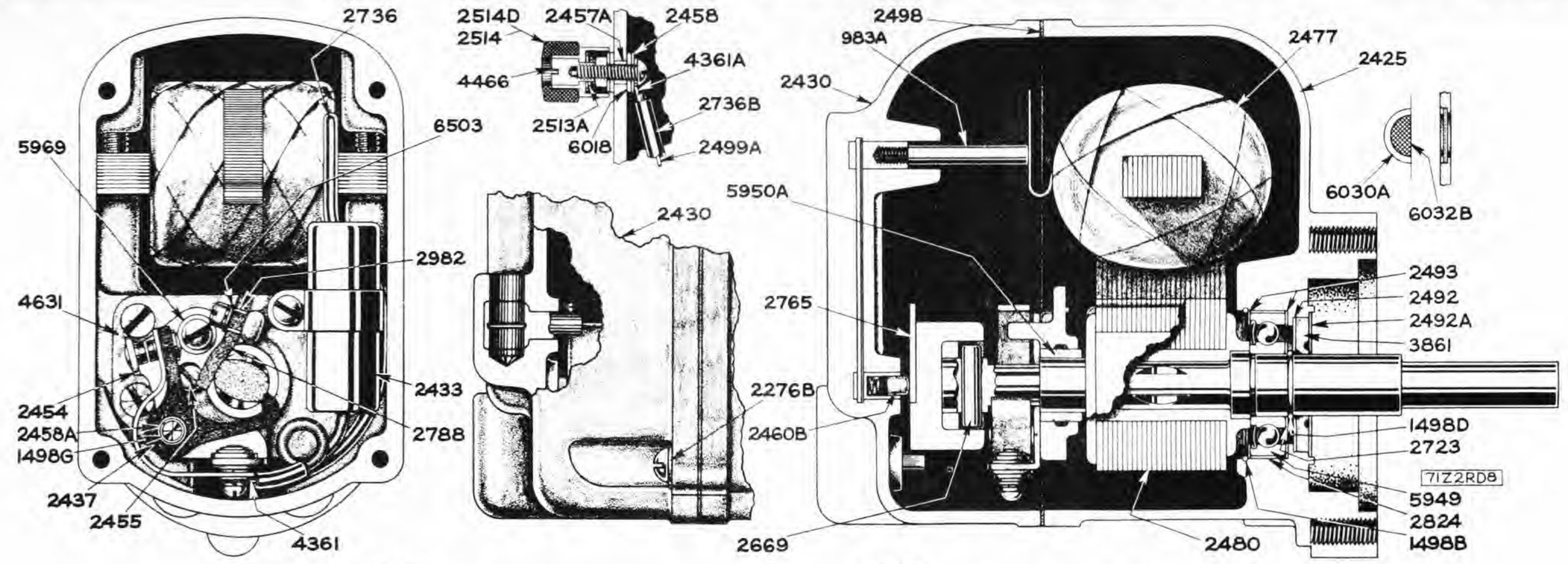
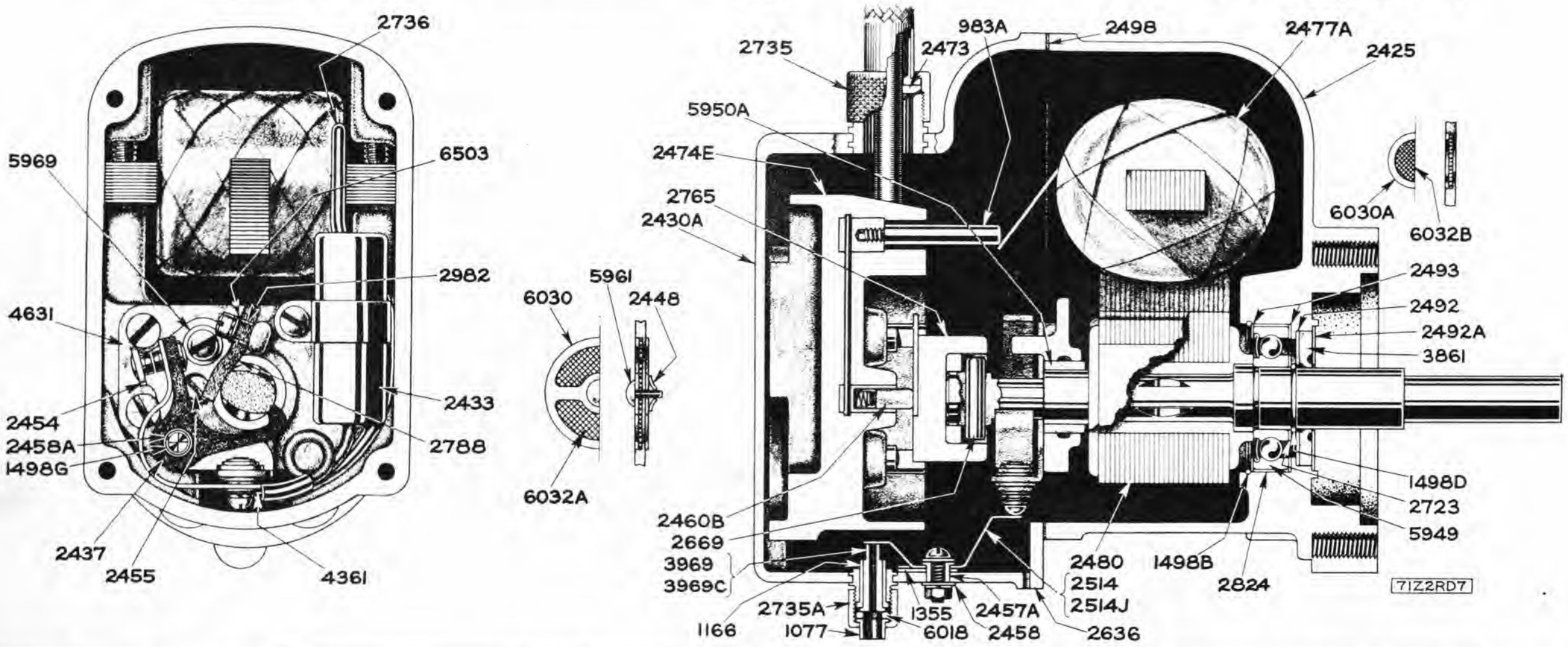


Figure 2 - Type FM-JH2B70 Magneto

7. LUBRICATION AND REASSEMBLY - Type FM-J magnetos are designed to operate for long periods without field lubrication. The cam felt wick (Fig. 1), if dry or hard, should be replaced by a new, factory-impregnated wick; do not oil or grease this wick. When a complete overhaul of the magneto is made, only the factory recommended FMC03 grease should be used for ball bearings and the FMC04 grease for sleeve bearings. Do not attempt to remove the rotor from the frame without specific instructions (Bulletin FM71A). Before reassembling the end cap to the frame, the small carbon brush which contacts the center of the distributor rotor should first be examined; be sure that it is not worn or damaged, and that it moves freely in its socket and has a slight spring pressure when compressed. Use a new end cap to frame gasket and coat the joint with FMC02 gasket sealing varnish.

8. APPLICATION - Types FM-JH2B70 (standard) and FM-JHE2B70 (radio-shielded) magnetos are especially designed for operation on two cylinder engines made by the Kiekhaefer Corp., Cedarburg, Wis. A special drive arrangement is used, the magneto as shown on this sheet being part of an engine sub-assembly. Refer to the engine instructions for timing and mounting information.





Identification	Order By Part No.	NAME OF PART - Replacement parts listed are for CCW rotation magnetos.	No. FMJH 2B70	Used FMJHE 2B70	Symbols for factory use only
983A	B983A	Dist.High Tension Lead Rod. .	1	. .	Z2RD983A
983A	D983A	Dist.High Tension Lead Rod. .	. .	1	Z4RF983A
1077	B1077	Ground Cable Ferrule.	. .	1	Z4RD1077B
1166	A1166	Ground Cable Term. Insulator.	. .	1	Z4RD1166A
1355	B1355	Ground Switch Strip Guide . .	. .	1	Z4RD1355A
1498B	B1498B	Rotor Bearing Snap Ring . . .	1	1	ZRD5955A1
1498D	B1498D	Rotor Shaft Snap Ring	1	1	Z4RB1498A1
1498G	A1498G	Breaker Arm Snap Ring. . . .	1	1	ZRE1498E
2276B	B2276B	End Cap Screw Washer	4	4	ZRB2276A1
2425	TX2425	Frame (Inc. A6030A,A6032B) .	1	1	Z2RD2425U
2430	LX2430	End Cap - Vertical Outlets .	1	. .	Z2RD2430M
2430A	E2430A	End Cap-Radio-Shld.(Inc.A6032AC)		1	Z2RD2430K
2433	S2433	Condenser (Inc. A4361) . . .	1	1	2433Z2RD2
2437	U2437	Breaker Arm, Sta.Bracket & Points (Inc.E2788,G2454) .	1	1	2437Z4RD6
2448	A2448	Vent.Screen Locking Washer .	. .	2	ZRD2448A
2454	G2454	Stationary Bracket With Point	1	1	2453Z4RD4
2455	C2455	Brkr.Point Adjustment Screw	1	1	Z4RD2455A3
2457A	E2457A	Grd.Screw Insulating Bushing	1	. .	ZRD2457A
2457A	G2457A	Grd.Screw Insulating Bushing	. .	1	ZRF2457A
2458	D2458	Ground Screw Flat Washer . .	1	1	ZRD2458A
2458A	A2458A	Brkr. Arm Flat Washer. . . .	1	1	Z9RF2458A
2460B	E2460B	Coil Lead Brush	1	1	Z4RD2267A3
2473	B2473	Cable Outlet Rubber Washer .	. .	1	ZRD2473A
2474E	D2474E	Dist. Block Cable Outlet . .	. .	1	Z2RD2474C
2477	G2477	Coil (Inc. E2736, A4361) . .	1	. .	4051Z4RD11
2477A	B2477A	Coil (Inc. E2736, A4361) . .	. .	1	4051Z2RD3
2480	CY2480	Magnetic Rotor	1	1	2475Z2RD14
2492	C2492	Inner Retaining Washer . . .	1	1	Z4RD2492A1
2492A	A2492A	Outer Retaining Washer . . .	1	1	Z4RD2492B
2493	C2493	Bearing Insulating Washer. .	2	2	ZRB2493A
2498	H2498	End Cap to Frame Gasket. . .	1	1	Z2RD2498B
2499A	D2499A	Pri. Grd. Wire Assembly. . . (Inc. G2736B,A4361,A4361A)	1	. .	2499Z4RD2
2513A	A2513A	Ground Switch Button Spring.	1	. .	ZRD2513B
2514	E2514	Ground Switch Push Button. .	1	. .	ZRD2514F
2514	J2514	Primary Ground Switch Strip.	. .	1	Z4RF2514A
2514D	A2514D	Pri. Grd. Switch-Push Button.	1	. .	2514ZRD6
		(Inc. E2457A,A2513A,E2514,D2458,A4631A,B4466,B6018)			
2514J	A2514J	Pri.Grd.Switch-Radio Shld. .	. .	1	2514Z4RF1
		(Inc. G2457A,D2458,J2514,B1355)			
2636	A2636	End Cap Plate	. .	1	Z4RF2636A
2669	A2669	Dist. Rotor Locating Pin . .	1	1	Z2RD2669A2
2723	C2723	Thrust Bearing Shim	2	2	Z2RB2723C
2735	A2735	Cable Outlet Nut	. .	2	Z4RD2735A
2735A	A2735A	Ground Cable Outlet Nut. . .	. .	1	Z4RD2735B
2736	E2736	Primary Lead Wire Tube . . .	1	1	Z4RD2736A
2736B	G2736B	Primary Ground Wire Tube . .	1	. .	Z4RD2736B1
2765	Q2765	Distributor Rotor (Inc.A2669)	1	1	Z2RD2765F1
2788	E2788	Rotor Cam Felt Wick	1	1	Z4RD2788C2
2824	B2824	Rotor Brg. Insulating Strip.	1	1	Z4RD2824B
2982	A2982	Cam Felt Wick Spacer	1	1	Z4RD2982A
3861	G3861	Bearing Seal Rubber Washer .	1	1	Z4RD3861D
3969	B3969	Ground Cable Terminal . . .	. .	1	Z4RD3969A
3969C	B3969C	Ground Cable Term. Assembly (Inc. B1077,A1166,A2735A,B3969,A6018)	. .	1	. . . .
4361	A4361	Terminal - #8 Screw.	3	2	ZRB4361A
4361A	A4361A	Terminal - #6 Screw.	1	. .	ZRD4361A
4466	B4466	Pri. Ground Screw End Nut. .	1	. .	ZRD4466B2
4631	H4631	Brg. & Brkr. Support Plate . (Inc. E2788,A2982,C6503,B5950A)	1	1	4631Z4RD7
5949	C5949	Ball Bearing - Drive End . .	1	1	Z4RD5949A
5950A	B5950A	Sleeve Bearing - Oilite. . .	1	1	Z2RD5950A2
5961	A5961	Ventilating Screen Rivet . .	. .	2	Z4RD5961C1
5969	B5969	Stationary Bracket Washer. .	1	1	Z4RD5969A1
6018	A6018	Grd. Screw Ins. Washer . . .	. .	1	Z4RB6018A
6018	B6018	Grd. Screw Ins. Washer-Inner	1	. .	ZRD6018B
6030	A6030	Ventilating Screen Washer. .	. .	4	Z4RD6030A1
6030A	A6030A	Ventilating Screen Washer. .	3	3	Z4RD2665F1
6032A	A6032A	Vent. Screen - End Cap . . .	. .	2	Z4RD6032F
6032AC	A6032AC	Ventilating Screen Group . . (Inc. A6032A,A6030,A5961,A2448)	. .	2	. . . .
6032B	A6032B	Ventilating Screen - Frame .	3	3	Z4RD6032D
6503	C6503	Cam Felt Wick Holder	1	1	ZRA2458A

Executive Offices:
Chicago, Illinois

FAIRBANKS, MORSE & CO.

Manufacturers

Printed in U.S.A.

Magneto Sales & Factory:
Beloit, Wisconsin

23456

Instructions No. 2872

FAIRBANKS-MORSE

TYPES FM-J1B70 & FM-JE1B70 MAGNETOS

(Standard) (Radio-Shielded)

Adapted Only to Kiekhaefer Corp. One Cylinder Engines

1. General Information - Modern ignition systems are carefully engineered to provide quick, easy starting and maximum dependability of operation without adjustment or service. The advanced design and sturdy construction of Fairbanks-Morse Type FM-J magnetos have established field performance leadership. Especially compact in assembly, the powerful Alnico magnetic rotor assures an intensely hot ignition spark.

2. Description - The Types FM-J1B70 and FM-JE1B70 magnetos are one cylinder units, built with a one lobe breaker cam to provide a spark interval of 360°. A special flange mounting and drive shaft is used on both variations, the Type FM-J1B70 having a molded end cap for standard installations, while the Type FM-JE1B70 is entirely enclosed within a metal housing for installations requiring complete radio-shielding.

Trouble	Possible Cause	Suggested Remedy
A. Flooding	Hot or cold engine; over-rich fuel moisture.	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 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. Service Procedure - Field adjustment is rarely necessary and should be undertaken strictly according to the following directions. Before dismantling the magneto, attention should be given the logically arranged service outline in which common causes of engine difficulties are tabulated. In many cases this will prevent unnecessary adjustment of parts in good condition. Simple tests are described in the following discussion which should determine whether the ignition spark is unsatisfactory.

4. 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 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.

5. Testing the Magneto Spark - Pull the ignition cable out of the end cap 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. 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.

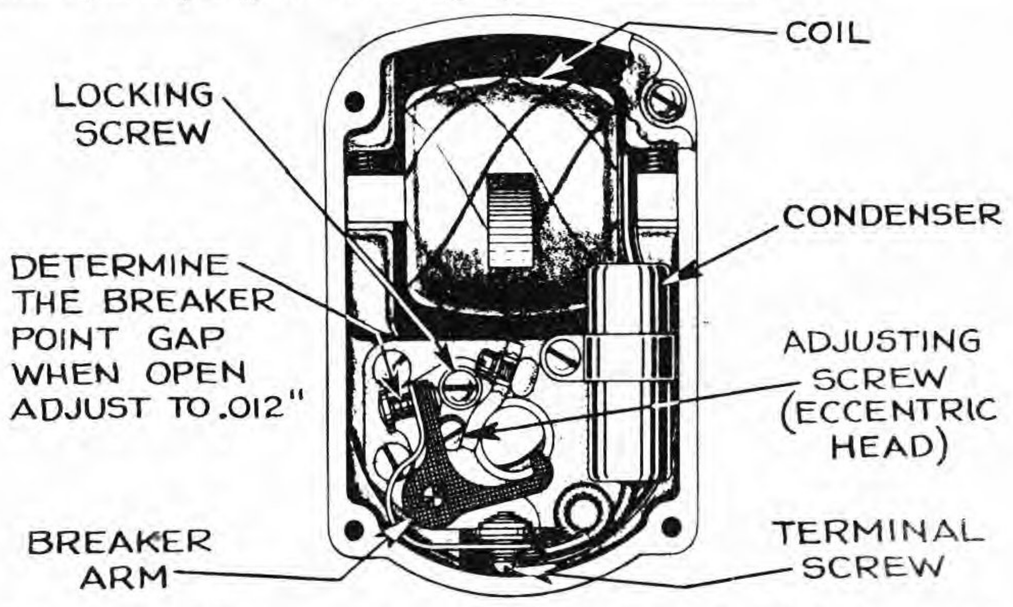


Fig. 1 - End View - Type FM-J1B70 & FM-JE1B70 Magnetos

6. Adjustment of Breaker Points - After the end cap has been removed (either standard or radio-shielded) the breaker points can be easily located by reference to the end view (Fig. 1). Examine the point surfaces for evidence of pitting or pyramiding. Contact points

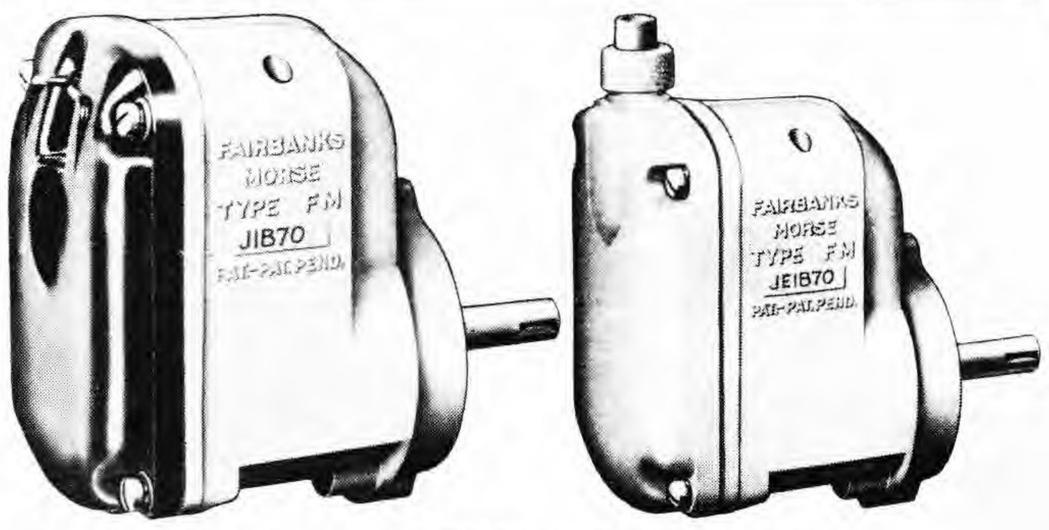


Fig. 2 - Types FM-J1B70 & FM-JE1B70 Magnetos

can be resurfaced by using a small tungsten file or fine stone; complete replacement is easily accomplished by removing the locking and terminal screws (Fig. 1). After either resurfacing or replacement the breaker point gap must be adjusted. Loosen the locking screw and turn the eccentric head adjustment screw until the proper gap is obtained (.012 inch at full separation). Oil film can be removed from breaker points by using a small. stiff brush moistened with carbon tetrachloride or naphtha.

7. Lubrication & Overhaul - The Type FM-J magnetos are designed to operate for long periods without field lubrication. The cam felt wick (Fig. 1), if dry or hard, should be replaced by a new, factory-impregnated wick; do not oil or grease this wick. When a complete overhaul of the magneto is made, only the factory-recommended FMC03 grease should be used for ball bearing and the FMC04 grease for sleeve bearing. Do not attempt to remove the rotor from the frame without specific instructions (Bulletin FM71A).

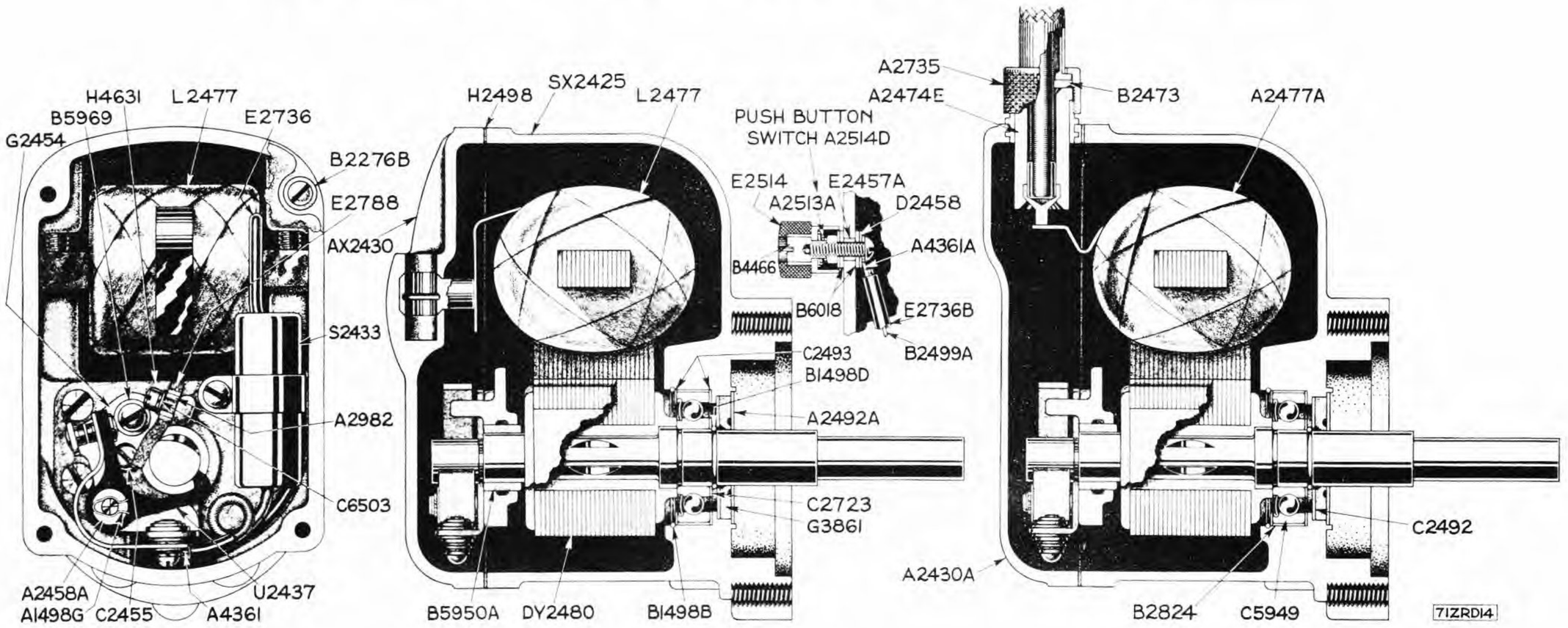
8. Reassembly & Sealing - The Types FM-J1B70 and FM-JE1B70 magnetos are sealed at the factory against the entry of dust and moisture through the use of a varnish-coated gasket joint. Opening the magneto for breaker point adjustment or other service necessitates resealing the magneto when reassembly is made. A new gasket should be provided, the joint cleaned thoroughly and the new seal coated with Special FMC02 Sealing Varnish.

9. Drive Arrangement - A special drive assembly is used to connect the magneto to the engine and reference must be made to engine instructions for timing information.

10. Radio-Shielded Units - Applications which require complete radio-shielding of the ignition system are furnished with the Type FM-JE1B70 magneto. This unit is similar to standard models except that the plastic end cap is replaced by an all metal cover through which the high tension lead is conducted by means of a special insulated socket. This cable socket is so arranged in the metal end cap cover as to permit simple connection of the standard radio-shielded high tension cables.

11. 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 equipment and training for magneto repair and close contact with the factory service and engineering departments. Genuine Fairbanks-Morse replacement parts are carried in stock by all Service Stations.

Repair Chart & List- Types FM-J1B70 & FM-JE1B70 Magnetos



Order By Part Number	Name of Part - This list covers the Types FM-J1B70 (std.) and FM-JE1B70 (radio-shld.) magnetos	No. Used FM-J 1B 70	No. Used FM-J E1B 70	Symbols (for factory use only)
B1498B	Rotor Bearing Snap Ring . . .	1	1	ZRD5955A2
B1498D	Rotor Shaft Snap Ring	1	1	Z4RB1498A1
A1498G	Breaker Arm Snap Ring	1	1	ZRE1498E
B2276B	End Cap Screw Flat Washer . .	4	. .	ZRB2276A1
SX2425	Frame with Special Flange . .	1	1	ZRD2425X
AX2430	End Cap - Standard	1	. .	ZRD2430B3
A2430A	End Cap - Radio-Shielded . . .	. .	1	ZRD2430E
S2433	Condenser	1	1	2433Z2RD2
U2437	Breaker Arm, Sta'y Brkt.& Pt.Set	1	1	2437Z4RD6
G2454	Sta'y Bracket with Contact Pt.	1	1	2453Z4RD4
C2455	Sta'y Point Adjustment Screw .	1	1	Z4RD2455A3
E2457A	Ground Screw Insulating Bushing	1	1	ZRD2457A1
D2458	Ground Screw Flat Washer . . .	2	2	ZRD2458A
A2458A	Breaker Arm Fulcrum Pin Washer	1	1	Z9RF2458A
B2473	Cable Outlet Rubber Washer . .	. .	1	ZRD2473A
A2474E	Cable Outlet Radio-Shielded .	. .	1	Z4RB2474E2
L2477	Coil - Standard	1	. .	4051ZRD8
A2477A	Coil - Radio-Shielded	. .	1	4051ZRD5
DY2480	Magnetic Rotor - Complete . .	1	1	2475ZRD30
C2492	Inner Retaining Washer	1	1	Z4RD2492A1
A2492A	Outer Retaining Washer	1	1	Z4RD2492B
C2493	Bearing Insulating Washer . .	2	2	ZRB2493A
H2498	End Cap to Frame Gasket . . .	1	1	Z2RD2498B
B2499A	Primary Ground Wire Assembly	1	1	2499Z4RD3
A2513A	Ground Switch Button Spring .	1	1	ZRD2513B
E2514	Ground Switch Button	1	1	ZRD2514F
A2514D	Grd.Switch Group - Push Button	1	1	2514ZRD6
C2723	Rotor Shaft Thrust Brg. Shim	2	2	Z2RB2723C
A2735	Cable Outlet Nut	1	1	ZRD2735A
E2736	Primary Lead Wire Tube . . .	1	1	Z4RD2736A
E2736B	Primary Ground Wire Tube . .	1	1	Z4RD2736C
E2788	Rotor Cam Felt Wick	1	1	Z4RD2788C2
B2824	Rotor Brg. Insulating Strip .	1	1	Z4RD2824B
A2982	Cam Felt Wick Spacer	1	1	Z4RD2982A
G3861	Bearing Seal Rubber Washer .	1	1	Z4RD3861D
A4361	Lead Wire Terminal - #8 . . .	3	3	ZRB4361A
A4361A	Lead Wire Terminal - #6 . . .	1	1	ZRD4361A
B4466	Ground Screw End Nut	1	1	ZRD4466B2
H4631	Bearing & Brkr. Support Plate	1	1	4631Z4RD7
C5949	Rotor Ball Bearing	1	1	Z4RD5949A
B5950A	Rotor Sleeve Bearing - Oilite	1	1	Z2RD5950A2
B5969	Sta'y Contact Brkt.Flat Wshr.	1	1	Z4RD5969A
B6018	Ground Screw Insulating Wshr.	2	2	ZRD6018B
C6503	Cam Felt Wick Holder	1	1	ZRA2458A

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