

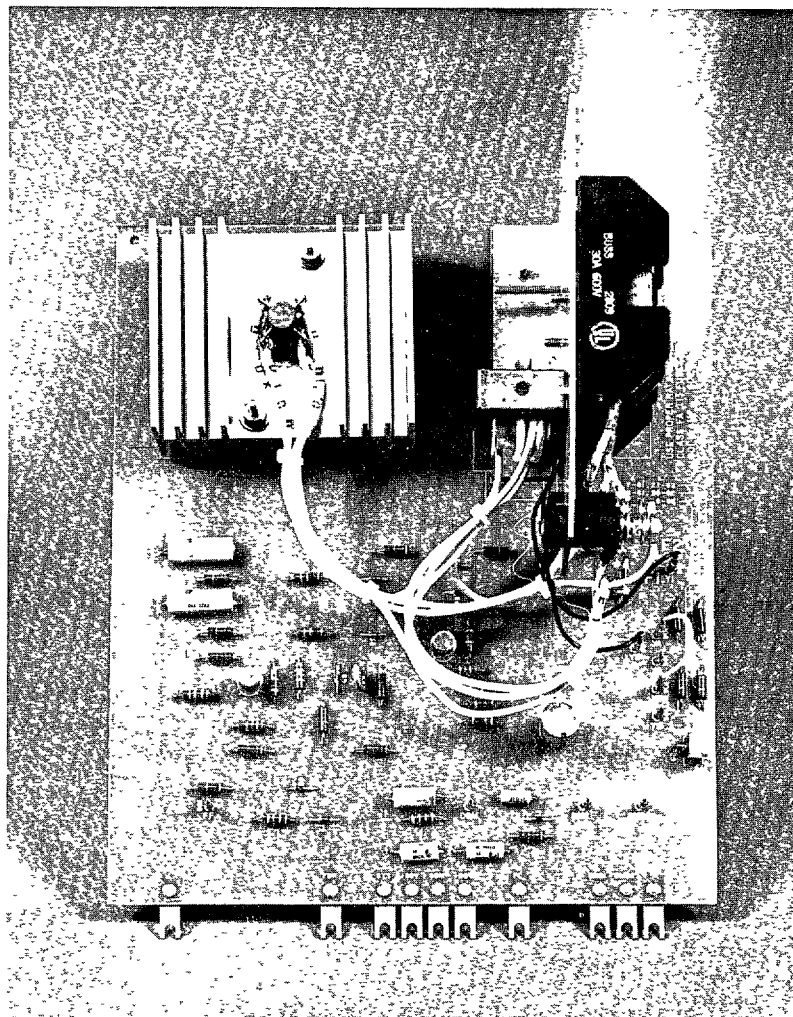


## INSTRUCTIONS

GEK-24972B

# *ValuTrol*<sup>\*</sup> DRIVE MOTOR FIELD EXCITER CARD

## GENERAL DESCRIPTION — ADJUSTMENTS



(Photo MG-5274-3)

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to General Electric Company.

**GENERAL**  **ELECTRIC**

\*TRADEMARK OF GENERAL ELECTRIC COMPANY, U.S.A.

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## **WARNING**

ALWAYS DISCONNECT ALL POWER TO THE DRIVE BEFORE REMOVING OR INSERTING A PRINTED CIRCUIT CARD. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY TO PERSONNEL AND DAMAGE TO THE DRIVE OR DRIVEN MACHINERY.

## **INTRODUCTION**

The motor field exciter card (MFE) is an AC to DC converter utilizing silicon rectifiers to supply a constant DC output at various current ratings. It is used primarily as a motor field supply for use with drive systems that require fixed field excitation for DC motors.

## **GENERAL DESCRIPTION**

The basic elements of the motor field exciter card (MFE) are shown in the simplified block diagram, Figure 1. A two thirds wave power rectifier provides:

150V DC from a 230VAC three phase source or

300V DC from a 460VAC three phase source.

By reconnecting the 2/3 wave power rectifier (See Figure 1) a half wave rectifier is made available for:

120V DC from a 266VAC single phase source.

The motor field output terminals are F1 and F2 located just below the fuse block with F1 being positive. The designations F1 and F2 are clearly labeled for easy identification. See Figure 2.

A motor field loss circuit (FLOSS) is provided and connected to a system loss trip circuit (SYS) which is used to provide an orderly shut down of the drive system.

The control circuitry provides several ranges of motor field current by arranging the jumpers YA, YB, YC and YD as shown in Table I.

## **ADJUSTMENTS**

It is assumed that the motor field exciter (MFE) is properly installed with AC main power and plus and minus 20V DC control power supplied.

Install or check the current scaling jumpers using Table I as a guide. Select the jumper connections on the basis of the output voltage and cold resistance of the motor field.

With no voltage or negative voltage applied at the field diagnostic reference (FDR) read the voltage at FC. (Motor field current is proportional to the voltage measured at FC. See Table II). Field loss (FLOSS) settings must allow for motor field heating and AC line voltage sag. A reasonable FLOSS setting would be a trip at 80% of the field current with a hot field and nominal AC line voltage or a trip at 50% of the motor field current with a cold field and nominal AC line voltage which would allow for a 10% low AC line and a 50% increase in motor field resistance when hot, plus a 10% margin.

Motor rated performance is always specified with a hot field. Turn the FLOSS potentiometer fully counter clockwise and apply a positive voltage to FDR while monitoring FC. Increase the voltage on FDR until the FC voltage is reduced to the appropriate proportion (either 80% or 50%) of the previously measured value. If a diagnostic card is available, positive voltage is applied to FDR by the LOC REF potentiometer turned in the +LR direction with the selector switch in the STATIC position. Turn FLOSS clockwise slowly until a positive voltage appears at SYS or the "Ready to Run" light turns off.

## **INPUT AND OUTPUT POINTS**

There are eight (8) terminal board points along the lower edge of the printed circuit card and five (5) terminals for power near the top of the card.

The AC power input terminals are at the top of the fuse block. Normally three phase power is applied and phase sequence is of no consequence. Single phase operation is also available by removing the connection from L2 and reconnecting L2 to XO (neutral connection on the main isolation transformer).

The DC output terminals are below the fuse block identified by F1 and F2, left to right with F1 being positive. See Figure 2.

The control terminals are numbered as if they were connected to a nineteen (19) point terminal board. See cover photo. They are as follows:

- 7. FDR    Field Diagnostic Reference Input for adjusting the field loss trip point (FLOSS). A positive voltage will cause FC voltage to decrease and simulates a decrease in motor field current.
- 9. SYS    This is system trip output that signals field loss or a reduction in motor field below the field loss point as set by the FLOSS adjustment. (+10 - 15 volts indicates a trip)

10. +20V Input terminal for the positive power supply to the control circuitry.
11. COM The common terminal for the control circuitry.
12. -20V Input terminal for the negative power supply to the control circuitry.
14. FC An output whose average value is proportional to the average value of the field current. The proportionality is valid only when

FDR is connected to common, opened, or at a negative voltage with respect to common. The proportionality constant is a function of current scaling jumper connections.

17. DM21 This terminal is connected to a contact pin also labeled DM21 which may be connected to internal contact pins with a jumper wire.
18. DM22 Same as above except connected to contact pin DM22.

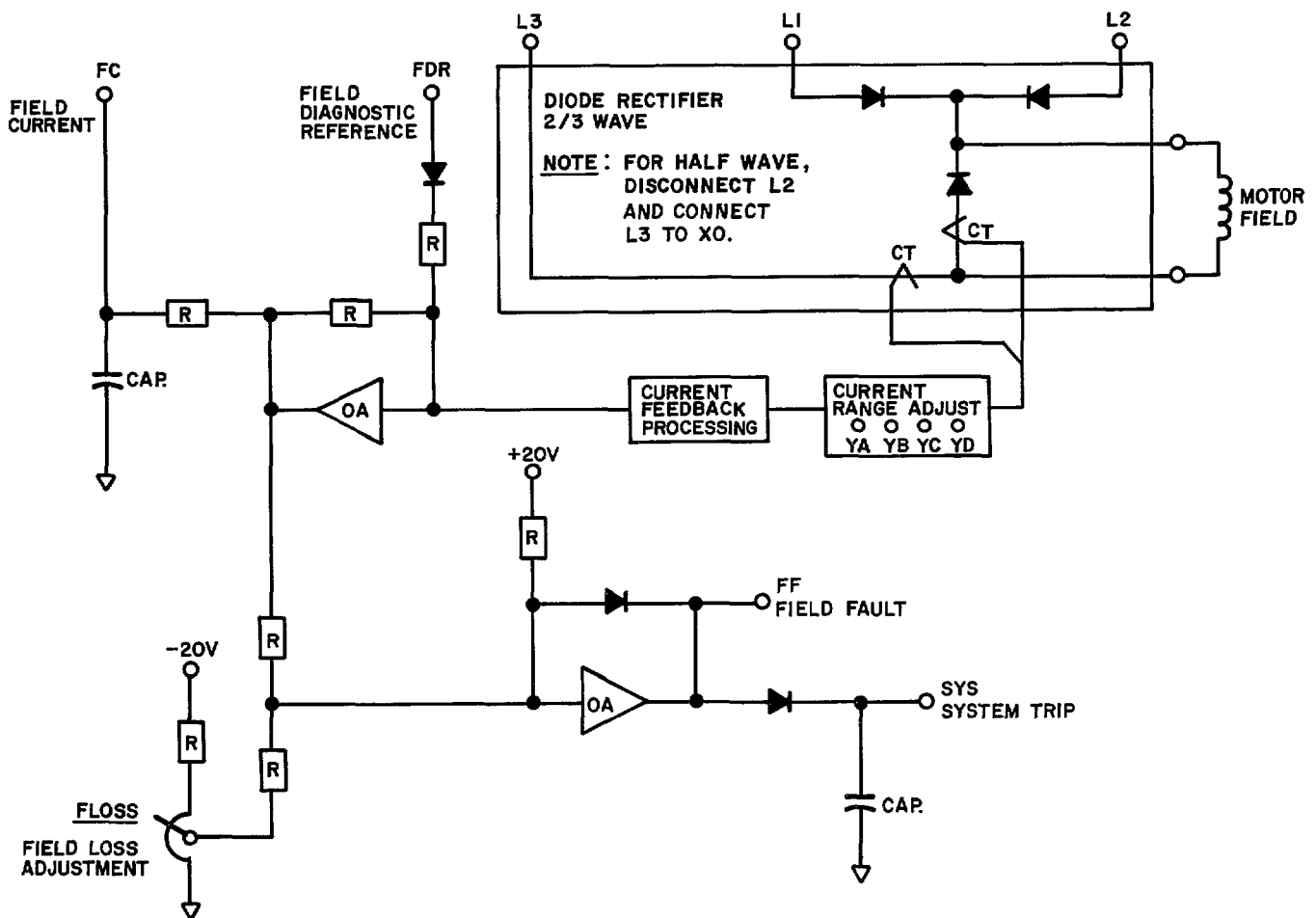
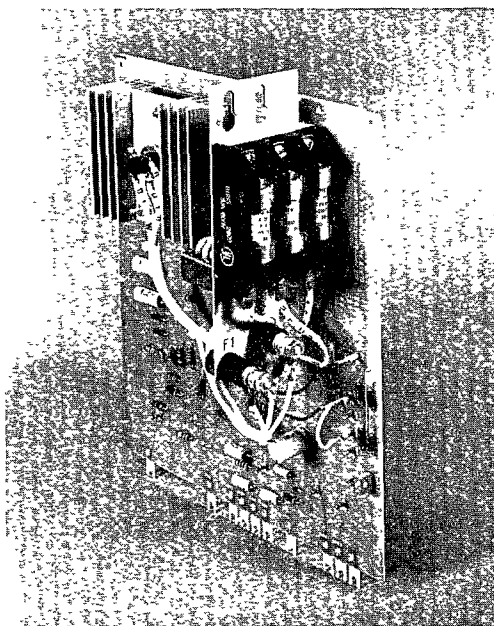


Figure 1. Motor Field Exciter Block Diagram



(Photo MG-5274-2)

**Figure 2. Motor Field Exciter Card**

**TABLE I Motor Field Ranges (Amps) for MFE  
193X525AA**

| JUMPERS      | GO-1       | GO-2       |
|--------------|------------|------------|
| None         | 0.45-0.90  | 0.94-1.88  |
| YB-YD        | 0.68-1.36  | 1.43-2.87  |
| YA-YB        | 1.33-2.65  | 2.73-5.45  |
| YA-YB, YC-YD | 2.05-4.11  | 4.55-9.09  |
| YA-YC        | 3.75-7.5   | 6.82-13.6  |
| YA-YC, YB-YD | 6.5 -13.0* | 12.9-25.7* |

\*Derate 30% unless force ventilated

**NOTE: THE ABOVE DATA IS VALID FOR THE 2/3, AND ALTERNATE 1/2 WAVE CONNECTION.**

**TABLE II FC Voltage Constant (Volts/Amp)**

| JUMPERS      | GO-1 | GO-2 |
|--------------|------|------|
| None         | 10.0 | 4.79 |
| YB-YD        | 6.6  | 3.14 |
| YA-YB        | 3.39 | 1.65 |
| YA-YB, YC-YD | 2.19 | 0.99 |
| YA-YC        | 1.20 | 0.66 |
| YA-YC, YB-YD | 0.69 | 0.35 |

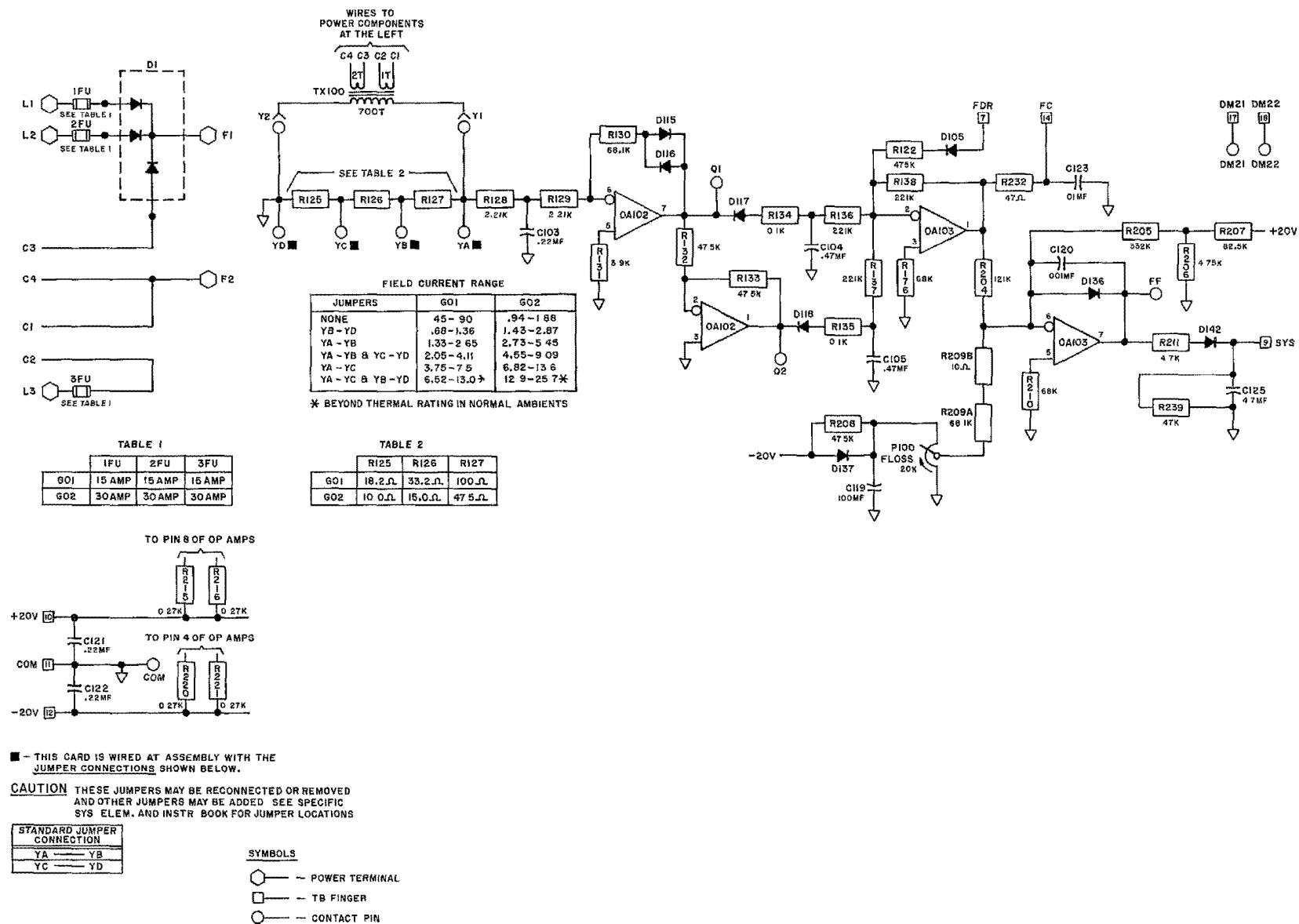
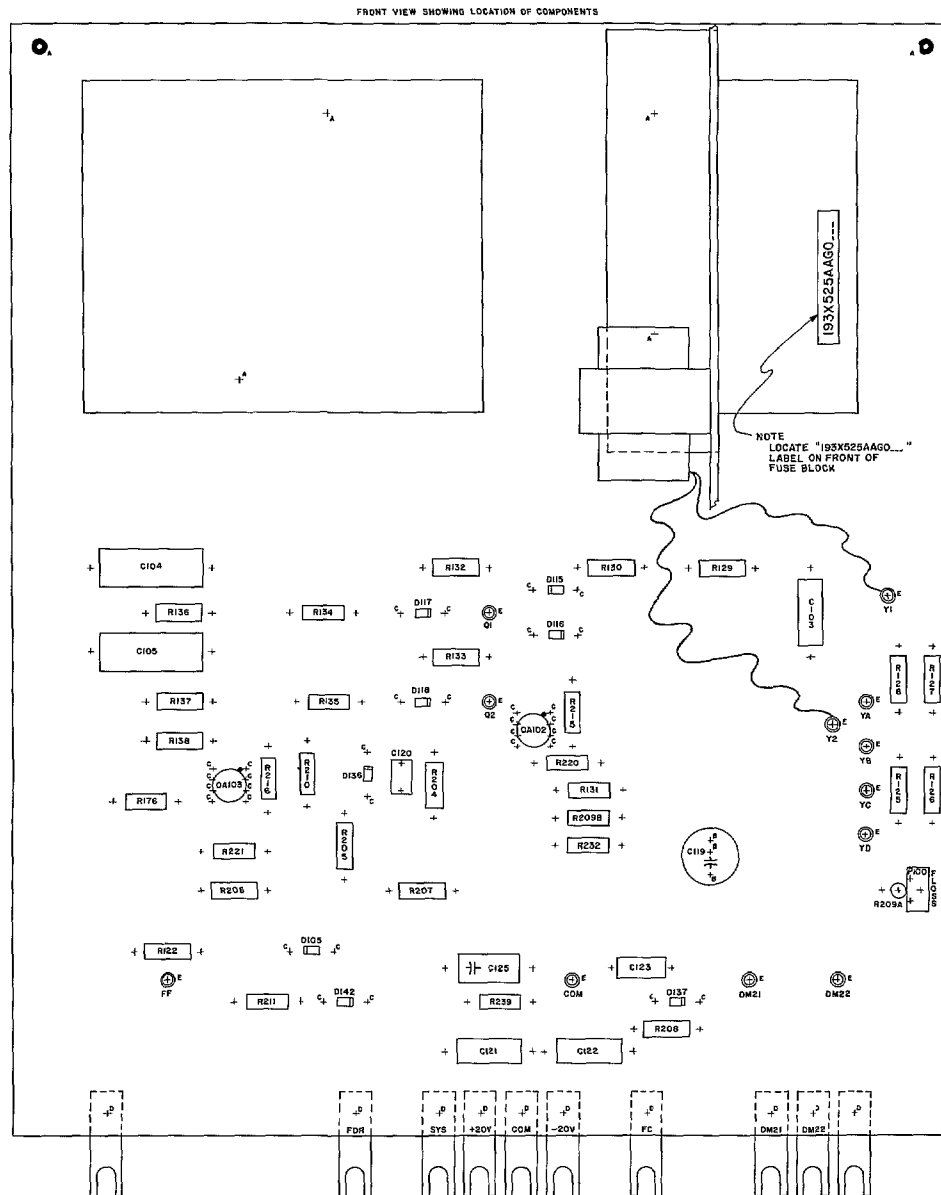


Figure 3. Elementary Diagram 2/3 Wave (36C764163AB)



#### OP AMP LEAD SKETCH

(TOP VIEW)



SKETCH FOR  
0A102, 0A103

#### SOLE MOUNTATION

ALL HOLES 0.40 DIA EXCEPT  
THE HOLES TABULATED BELOW

| LOC. | DIA  | QUAN |
|------|------|------|
| A    | 15.7 | 6    |
| B    | 052  | 3    |
| C    | 052  | 32   |
| D    | 128  | 10   |
| E    | 070  | 12   |

#### NOTE

CARD SIZE, 8 5000 + 000 - 019 X 10 000 + 002 - 008

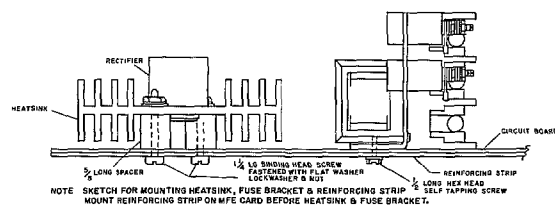


Figure 4. Printed Circuit Card Diagram (36D868814AB)

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**GEK-24972B (8/79) 3M (F)**