



MAINTENANCE INSTRUCTION

MODERNIZATION RECOMMENDATION DYNAMIC BRAKE GRID PROTECTION

PURPOSE: To provide the necessary instructions for applying dynamic brake grid protection in the event of a blower motor failure.

APPLICATION: Six Axle, Dash-2 model locomotives equipped with standard or extended range dynamic brake. This includes SD38-2, SD40-2, SD45-2, F40C, and SDP40F locomotives.

REFERENCE: Applicable locomotive schematic and Figs. 1, 2 and 3 of this publication. To ensure proper wiring, individual locomotive schematics should be reviewed thoroughly before applying dynamic brake grid protection. This instruction cannot account for all special circuits or modifications made subsequent to delivery.

DISCUSSION: In the event of a blower motor failure, an unnecessary grid failure will result if no type of protective circuitry is provided. With grid protection applied, a motor failure will be sensed and the unit will automatically lock out of dynamic brake.

The modification as described in this publication offers considerable improvement in cost and application time over the original DG10 system by eliminating the need for a current transducer. With the new system, strategic voltages are sensed in the grid circuit; a magsense comparator on the DG12 module then interprets these signals to determine the condition of the grid cooling system. If one or both motors fail to operate, the module locks the unit out of dynamic brake until reset via a switch on the module faceplate; also, an annunciator on the module faceplate indicates a blower failure. Note that complete control during power operation is maintained.

In addition to cost and time savings, the DG12 system offers greater protection than the DG10 system. The previous system looks for an imbalance in blower motor currents to determine if the fans are operating. If a simultaneous failure occurs, or both fans stall during the initial start, the DG10 module will not detect this; the DG12 module, by sensing voltage, will react to these conditions and protect the dynamic brake system.

COST OF MATERIAL: The approximate price of new material required for one locomotive is \$750.00. This price is for job estimating purposes only. Material will be billed at prices in effect at time of shipment.

**MATERIAL
REQUIRED:**

Kit 9513352 contains material for modifying locomotives included in this instruction.
The kit contains the following parts.

<u>QTY.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	9322062	DG12 Module
1	8463952	Pin Holder Asm.
2	8439303	Guide
1	9332061	Nameplate
2	8441136	Rivet-Rd. Hd.
1	8363168	Relay
28	8250906	Term. Recept.
2	8130629	Term. Lug - 1/4"
2	8123282	Term. Lug - 1/4"
2	8155747	Term. Lug - 1/2"
2	8035144	Nut - 1/4"-20, Slf Lkg.
2	179793	Hex Bolt - 1/4"-20
4	120392	Washer 1/4" Flat
2	9416536	Nut - 1/2"-13, Slf Lkg.
2	179877	Hex Bolt - 1/2"-13
2	120396	Washer - 1/2" Flat
1	8239506	Resistor RE34, 10 Ohm, 25 W
1	8341282	Capacitor CA35, 10 μ F
1	8474262	Angle

In addition to the kit the following cable will be required.

AR	8468612	No. 12 Cable (500 Ft. Roll)
AR	8468611	No. 14 Cable (500 Ft. Roll)
AR	9326092	III E Cable (100 Ft. Roll)

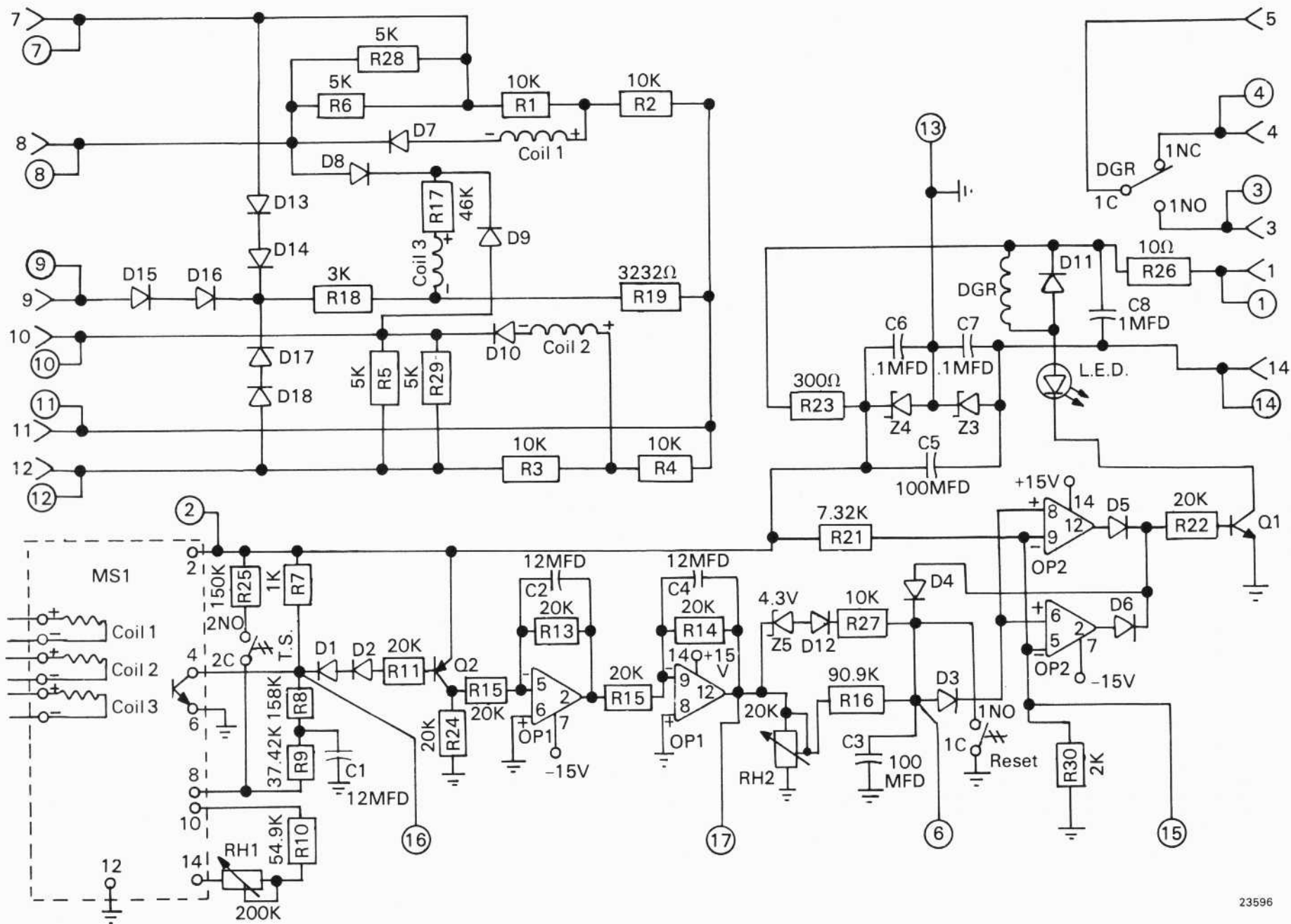


Fig.1 - DG12 Module 9322062, Schematic Diagram

PROCEDURE

1. Refer to Fig. 2 for modifying SD38-2D, SD40-2D, SD45-2D, F40C-D, and SDP40F-2D model locomotives.
2. Mount DGX relay 8363168 in main control panel.
3. Mount and label resistor RE34, 8239506, to the left of RE36.
4. Mount and label capacitor CA35, 8341282, to the left of CR76.
5. On all models except SD38-2D, remove NM66 wire from EQP-Y to PR-Z.
6. Remove the following No. 14 wires from all models.

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
NM3 (NM10 on SD38-2D)	DP-14	FCT-X4
6H6	FOR-F1	TB46-R7
MBG9	BR1-F1	SW-DBCO-D

7. Add the following No. 14 wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
PM39	DG-1	TB60-R2
J	DG-1	DG-5
BB14	DG-7	MB/L3-2
DGX6	DG-4	DGX-Y/Coil
BKA34	DG-11	DR-13
PPJ2	EQP-Y	RE34 Front
PPYX	RE34 Back	CA35 Red
NM66	EQP-Z	CA35 Black
NM67	CA35 Black	PR-Z (EQP-Z on SD38-2D)
BB24	DG-9	MB/L2-2
BB34	DG-12	MB/L1-2
6H6	DGX-1C	TB46-R7
6L	DGX-1NO	FOR-F1
MBGX	BR1-F1	DGX-2NO
MBG9	DGX-2C	SW-DBCO-D
NM40	DG-14	DP-14
NM41	DG-14	FCT-X4
NM72	DGX-Z/Coil	TB60-L3

8. Add the following No. 12 wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
BM	DG-8	Splice (Zone 70)
BM1	DG-10	Splice (Zone 70)

9. Add the following III E cabling:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
BM2	RE GRID B-4	Splice (Zone 70)
BM12	RE GRID F-4	Splice (Zone 70)

10. Apply DG12 module 9322062.

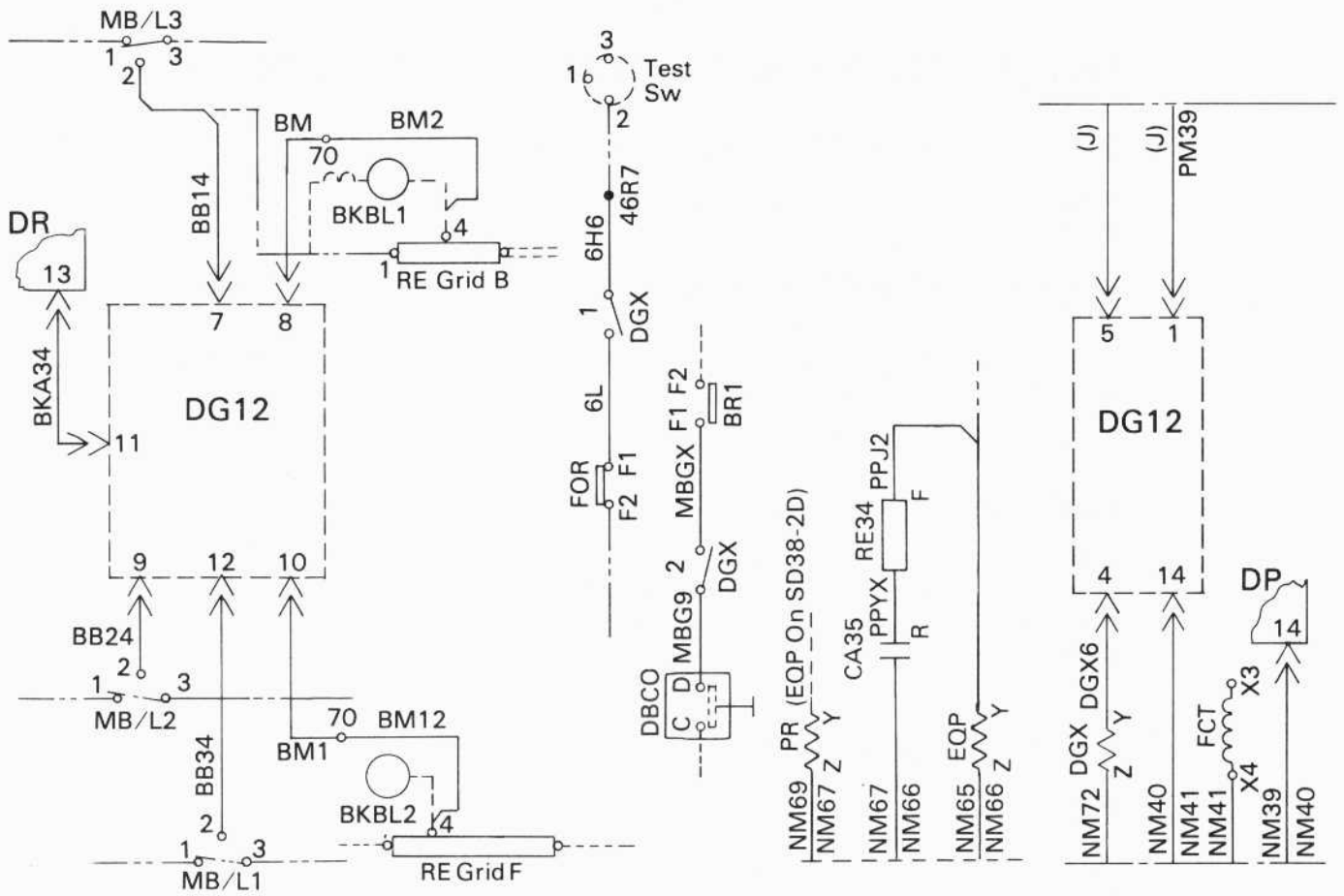


Fig.2 - Wiring Instructions For DG12 Application To SD-2 Locomotives With Basic Dynamic Brakes

PROCEDURE

1. Refer to Fig. 3 for modifying SD38-2DE, SD40-2DE, and SD45-2DE model locomotives.
2. Mount DGX relay 8363168 in main control panel.
3. Mount and label resistor RE34, 8239506, (RE42 on SD38-2DE) to the left of RE36.
4. Mount and label capacitor CA35, 8341282, (CA42 on SD38-2DE) to the left of CR76.
5. On all models except SD38-2DE, remove NM66 wire from EQP-Y to PR-Z. On SD38-2DE models, remove NM60 wire from MR-K2 to TB60L3.
6. Remove the following No. 14 wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
NM3	BCT-X4	DE14
MBK6 (MBK on SD38-2DE)	OCP-H (OCL-2C on some models)	S25G (SPX-1C on SD38-2DE)
6H6	FOR-F1	TB45-R7

7. Add the following No. 14 wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
PM39	DG-1	TB60-R2
J	DG-1	DG-5
DGX6	DG-4	DGX-Y/Coil
BB14	DG-7	MB/L3-2
BKA34	DG-11	TB47-R12
BB23	DG-9	MB/L2-2
BB34	DG-12	MB/L1-2
6H6	DGX-1C	TB46-R7
6L	DGX-1NO	FOR-F1
MBKX	DGX-2C	OCP-H (OCL-2C on some models)
PPJ2	EQP-Y	RE34 Front (RE42 on SD38-2DE)
PPYX	RE34 Back	CA35 Red CA42 on SD38-2DE)
MBK6	DGX-2NO	S25-G (SPX-1C on SD38-2DE)
NM41	DE-14	DG-14
NM72	DGX-Z/Coil	TB60-L3
NM3	DG-14	BCT-X4

8. On all models except SD38-2DE add the following wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
NM66	EQP-Z	CA35 Black
NM67	CA35 Black	PR-Z

On SD38-2DE add the following wires:

NM59	TB60L3	CA42 Black
NM60	CA42 Black	MR-K2

9. Add the following No. 12 wires:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
BM3	DG-8	TB47-R7
BM13	DG-10	TB47-R9
BM	TB47-R7	Splice (Zone 70)
BM1	TB47-R9	Splice (Zone 70)

10. Add the following III E cabling:

<u>WIRE TAG</u>	<u>FROM</u>	<u>TO</u>
BM2	RE GRID B4	Splice (Zone 70)
BM12	RE GRID F4	Splice (Zone 70)

11. Apply DG-12 module 9322062.

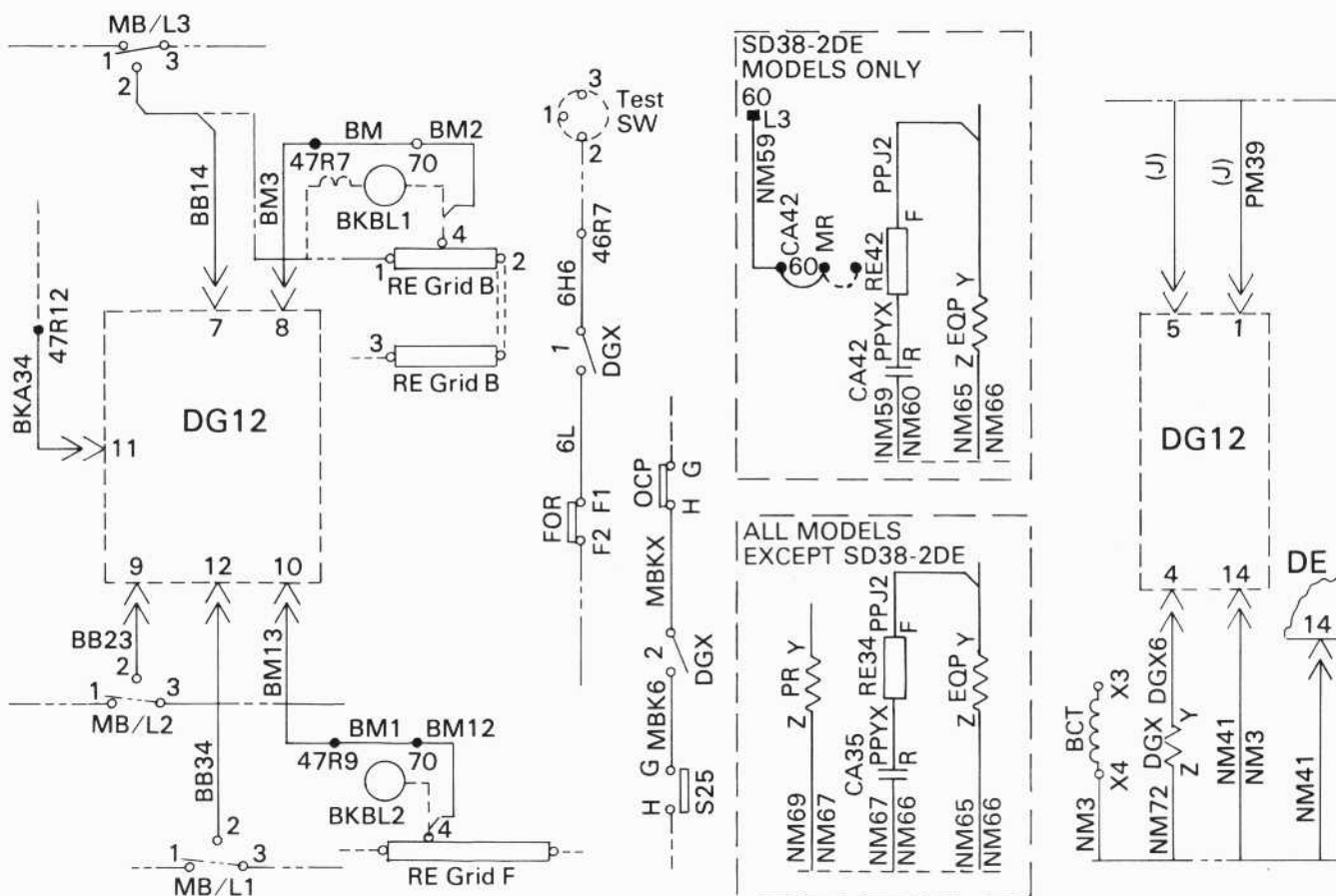


Fig.3 - Wiring Instructions For DG12 Application To SD-2 Locomotives With Extended Range Dynamic Brakes

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