

**AC / DC TRANSMISSION LOCO MOTIVES
(WDG 3A (WDG 2), WDM 3A (WDM 2C) & WDP 1 LOCOMOTIVES)**

1. CKR1 & CKR2 :

Location : Front panel left side Purpose : whenever start button is pressed these relays will be energized and makes to disconnect Generator circuits in both Auxiliary Generator and Exciter Generator during working as motors and also energizing CKC contactor.

2. CKC :

Location : Back panel

Purpose : It makes to pick up CK1, CK2 & CK3 contactors.

3. CK1, CK2, & CK3 :

Location : Front panel right side bottom.

Purpose : Battery supply will be connected to Auxiliary & Exciter Generators to work as motors for engine cranking.

4. TDR :

Location : Front panel left side.

Purpose : Whenever CK3 cranking contactor closes this relay will be energized and delays generator circuits of both Auxiliary and Exciter for 1.5 seconds extra after releasing start button (After dropping CKR1& CKR2, CK1, CK2 & CK3).

5. EXCITATION PANEL :

In 6th and 7th excitation cards numbers 492 & 493 are upgraded to suit the output voltage of traction alternator.

6. TRANSITION PANEL :

There will be only two cards (i.e. 207 & 210-1) and only one transition is available i.e. series-parallel to parallel.

7. GR2 (CONTROL GR) :

Location : Front panel left side :

Purpose : whenever engine is starting, if there is any control earth fault this relay will get energize and it will not allow the engine for cranking, by de-energizing CKC.

8. GRCO2 (GROUND RELAY CUT-OUT SWITCH) :

Location : Front panel left side.

Purpose : for isolating the GR2 from the circuit on emergency.

9. RECTIFIER PANEL :

Location : Back panel (IN WDM3A & WDP1), In between back panel and Main Generator (IN WDG3A)

Purpose : To convert Main Generator AC voltage to DC voltage for traction motors. It is cooled by FTTM blower and in some locomotives separate motor driven blower is provided.

10. GFOLR (GENERATOR FIELD OVER LOAD RELAY) :

Location : Front panel right side :

Purpose : Whenever over current drawn by the generator field or rectifier panel (due to defective), this relay will get energized and the following changes will takes place.

- a. GF contactor will drop and load meter comes to zero.
- b. Engine comes to idle.
- c. Over load indication with bell.

It will have two coils :

1. Operating coil : For operation
2. Resetting coil : For resetting automatically.

11. ACCR (ARMATURE CURRENT CONTROL REACTOR) :

Location : Near rectifier panel.

12. LAS (LOAD AMMETER SHUNT) :

Location: Side of BKT.

13 . BKT & REV :

1. Only one BKT and one REV will be there.
2. P32 & P22 location is inter changed.
3. In place of BKR relay, BKR1, BKR2 and BKR3 relays are provided.
4. During DB only 5 power contactor will pick up.

14. BSR (BATTERY SAFETY RELAY) :

Available only in W.W. Gov. Locos.

Location : Front panel right side top.

Purpose : If MUSD is in STOP position, this relay will be energized and will not allow the engine for re-cranking. There by batteries discharge will not take place.

15. EPG Governor:

On SH control stand toggle switch (Main switch), In nose compartment pressure switch and in compressor room Governor will be there.

WDM3A, WDG3A, WDP1, GE GOVERNOR

ENGINE STARTING CIRCUIT

Cranking:

1. Put on 'BS' (Battery knife switch) in nose compartment.
Result:
 - (a) Battery positive supply readily available near MB2, CK1 and Aux. Generator Armature.
 - (b) Battery negative supply readily available near MB1, CK3 and battery discharge lamp will glow (through Aux. Generator armature, VRCLS, Aux. Generator fail LED and through battery ammeter)
2. Put on MB2 on front panel.
Result:

Battery positive supply charged up to MFPB1 and FPC contactor fixed tip (49-50).
3. Put on MB1 on front panel.
Result:

Battery negative supply charged to entire control circuit (44F-4).
4. Put on MFPB1 in SH driver desk (control stand).
Result:

Battery positive supply charged up to MFBP2 (50 - 13C).
5. Put on MFPB2 in LH driver desk.
Result:

FPC Coil will be energized (13-4) FPC contactor will be closed (50-70) CCEM LED will glow (70 - 70A).

6. Put on CCEB on front panel.
Result:
CCE motor starts working (70A-4) CCEB lamp will goes off.
7. Put on FPB breaker on Front Panel (70-71).
Result:
Fuel pump motor stats working (71-4) .
Engine starting lamp will glow through OPS N/C - CK3 N/C (71-50F-50N-50P).
8. Keep ECS 3 times idle to run.
Result:
LLOB indication with SR energizing and alarm gong will operate (50F-1A-1B) bell (13-2)
9. Press start button.
Result:
 - a. CKR1 & CKR2 coils will energize through (ESR4 N/C (71-50T), ECS IDLE (50T-50C), start button (50C - 43), P22 N/C (43-43A), S21 N/C (43A-43B).
 - b. CKC will pickup through GR2 N/C (71-43E) and CKR1 closed inter lock (43E-43C).
 - c. CK1 & CK2 contactors will energies through CKC closed contactor (71-43D).
 - d. CK3 will pick up through CK1 closed interlock (71-43SS), CK2 closed interlock (43SS-43KK).
 - e. TDR pick up through CK3 closed interlock (71 - 71AA).
10. Engine will crank through CK1, CK2 & CK3 contactors closing.

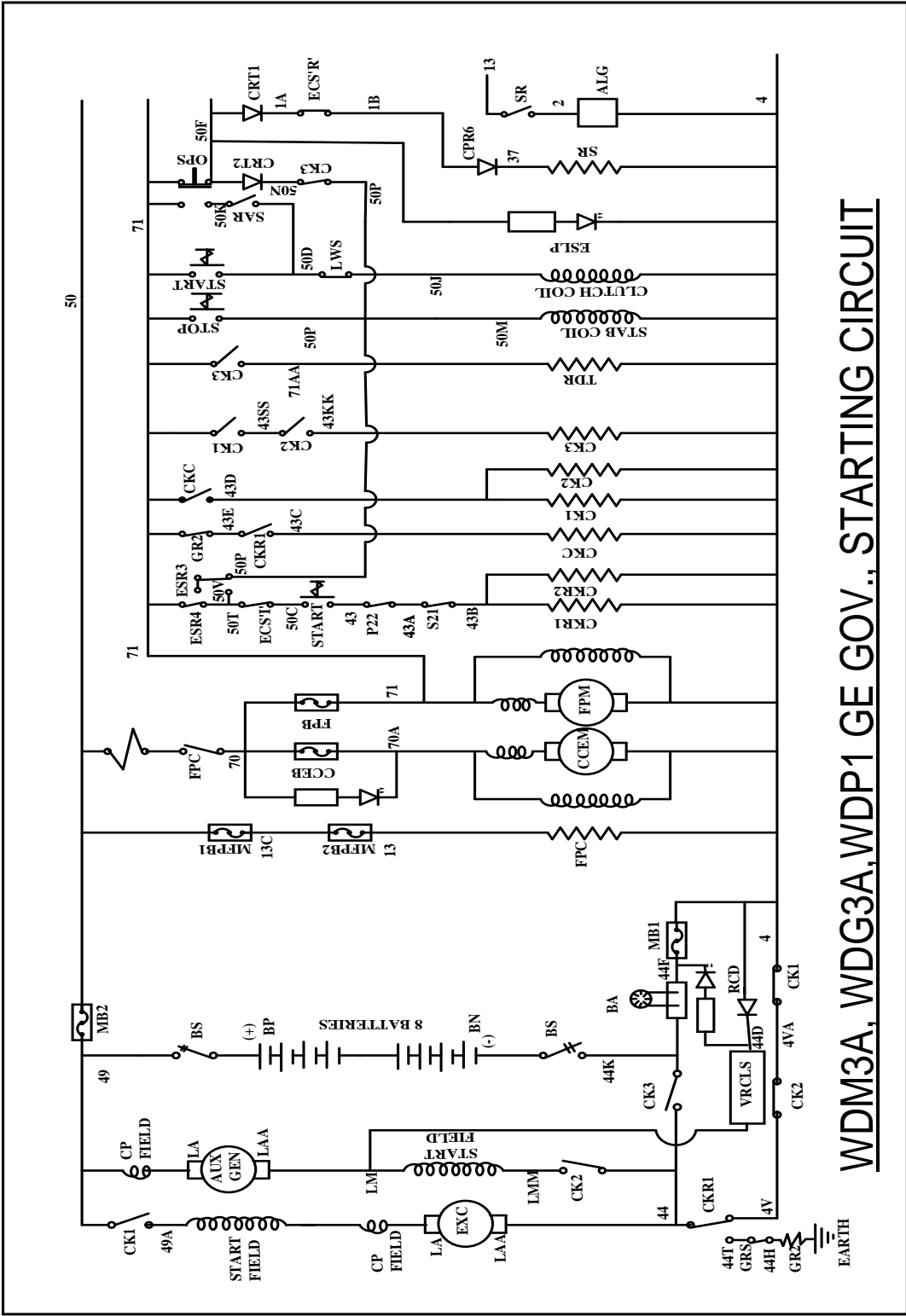
Firing:

1. When FPB breaker switched on stabilizing coil will energize through OPS N/C switch (71-50F), CK3 N/C interlock (50N-50P-50M-4).
2. When start Button pressed clutch coil will energize through start button (70-50D), LWS N/C switch (if sufficient water) (50D-50J-4).
3. When CK3 relay picks up stabilizing coil will de-energize (50N-50M)

Holding:

1. When ever lube oil pressure reaches 1.6 kg/cm² OPS will pick up (71-50K)
2. When ever engine speed reaches more than 220 RPM SAR relay will energize and SAR interlock will close (50K-50D).

Now clutch coil will energize permanently. Now release the start button. CKR1, CKR2, CKC, CK1, CK2, CK3 will drop but TDR will not drop. After 1.5 sec TDR will drop, till such time bell will ring with contact tip welded indication.(Auxiliary and Exciter generator circuit will be in open)



WDM3A, WDG3A, WDP1 GE GOV., STARTING CIRCUIT