

T/R 35/55/BAE

TEST BOX DESCRIPTION & INSTRUCTIONS

This Test Box can be used on all Lear 35, 36 and 55 series aircraft also British Aerospace HS125-700 with Aeronca Thrust Reversers installed.

The Box is applied to aircraft thrust reverser system between the P1 (P2) and J1 (J2) main electrical connectors located inside the engine cowling which is accessible from the outside of the aircraft, and is usable on one thrust reverser at a time.

The Test Box has (2) distinct capabilities: (1) It can be used to test the operation of all aircraft signals to the thrust reverser and all thrust reverser signals back to the aircraft. Circuits are monitored with indicating L.E.D.s (lights) on the test box. (2) in addition the box can be used, independent of the aircraft controls, while plugged into the aircraft and the thrust reverser, to operate the thrust reverser, using it's own built in power source.

Unlike existing test boxes it monitors ALL circuits during any given test or operational mode of the thrust reverse cycle, with indicating lights and has a built in volt meter which can be switched into any circuit at any time during the operation, in the event that any circuit indicates a low voltage by a dim indicating light.

This method of testing is appropriate and saves valuable time in evaluating circuit problems in a system such as this that uses many switches, relays and diodes in its design operation.

When switches become Hi-resistant in a circuit, they are most effectively detected while being subjected to the normal loading of the circuit during the operation cycle.

Easily understood operating instructions, including diagrams showing which indicating lights should be illuminated during the various modes of the operation cycle of the thrust reverser as well as the switch positions for the various modes, are included.

CAUTION:

Do not plug the test box into a Thrust Reverser system in which obvious short circuits are present as evidenced by aircraft circuits breakers popping.

In the case of short circuits, evaluate source of shorts by using: "Tripped Circuits Breaker" Fault Isolation Chart Table "A" in the Thrust Reverser Maintenance Manual Chapter 78-30-00 Page 57 (Gates), Page 32 (BAe).

In the case of missing or deficient signals within thrust reverser, determine source of problem with the help of Electrical / Mechanical Fault Isolation Chart Table "B" in the Thrust Reverser Maintenance manual Chapter 78-30-00 Page 62 (Gates), Page 37 (BAe).

A. ILLUSTRATIONS:

- (1) Electrical Schematics - are included to illustrate the electrical signals that are available during any normal mode of the thrust reverser. The schematics are of the aircraft as attached to the L.H. reverser. The R.H. side is identical with one small exception: Pin (S) circuit is available to the L.H. reverser only, to supply power to switch S11A, to operate throttle interlock. R.H. corresponding switch S12A receives power for the identical purpose from a junction to pin (J) within the thrust reverser. Pin (C) on Lear 55 Series.
- (2) Test Box - Figures (A) thru (F) - illustrate the positions that switches should be in and the circuit indications that are available during any mode of operation of the thrust reverser using aircraft aux. throttles and aircraft power. Test box power is off in all cases when aircraft power is used to operate the thrust reverser.
- (3) Test Box - Figures (1) thru (6) - illustrate the position that switches should be in and the circuit indications that are available during any mode of operations of the thrust reverser using the test box to simulate aircraft operation. Aircraft power is off.

B. DESCRIPTION AND OPERATION OF TEST BOX COMPONENTS

* All alphabetically designed indicating lights correspond to the circuit indications at the main electrical connection of the T/R to the aircraft. See schematics.

* The D.C. volt meter can be turned on or off by the

meter switch below at any time during any mode of operation of the T/R. It's use is mainly to measure suspected low voltage conditions caused by high resistant contacts in switches etc.

- * The "Aircraft Auto Stow" momentary switch must be held to the "ON" position during any auto stow function using aircraft controls power.
- * The "Aircraft Test" switch must be in the "Aircraft" position when monitoring aircraft operation and in the "Test" position when operating thrust reverser with test box.
- * The "Deploy Stow" switch is used to operate T/R with Test Box and is in "center off" position during aircraft operation of T/R.
- * The "Bleed Test" switch is used to test the bleed valve thru the (R) circuit and monitored for proper bleed valve switch operation in the T/R thru the (B) circuit.
- * The "Emergency Stow" switch is used to check the emergency stow function of the T/R with the test box power on and all other switches in the normal test box deploy mode. Switch is momentary and must be held in "ON" position. CAUTION as soon as switch is released T/R will deploy again if "Deploy Stow" switch remains in the Deploy position.
- * The "Auto Stow" switch is also momentary and is used with test box operation of the T/R in the following procedure: arrange test box for normal test box deploy per figure (2). Stop translating unit at approximately the mid-translated position by decreasing shop air pressure to T/R. Configure pneumatic latches to their normal locked and stowed position by disengaging retaining roller arms which hold latches in the unlocked condition when pressure is not available to pneumatic latches. Hold "Auto Stow" switch to ON position while slowly increasing air pressure to 8 to 10 pounds. Continue to hold switch to ON position and move one pneumatic latch to the unlocked position. T/R should stow immediately. Check the same procedure with the other pneumatic latch.

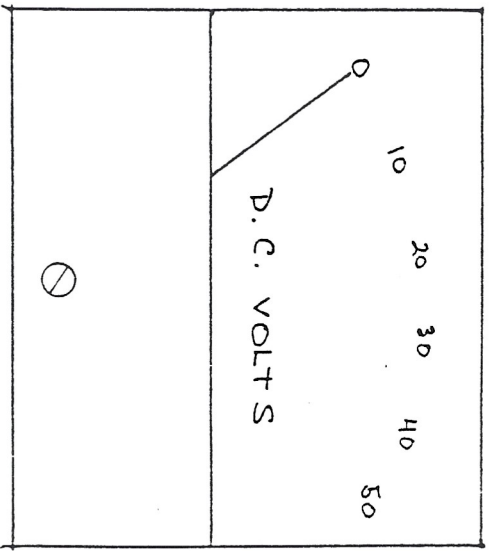
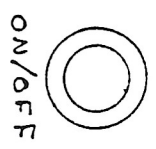
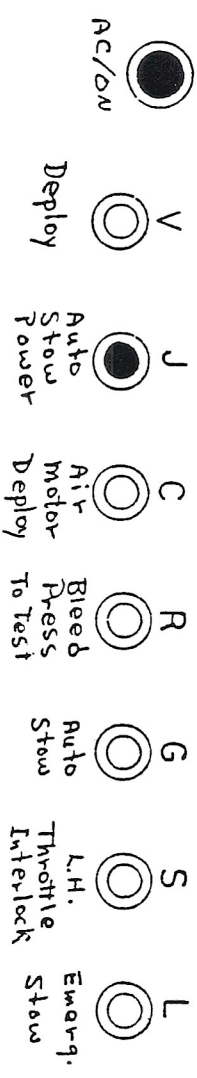
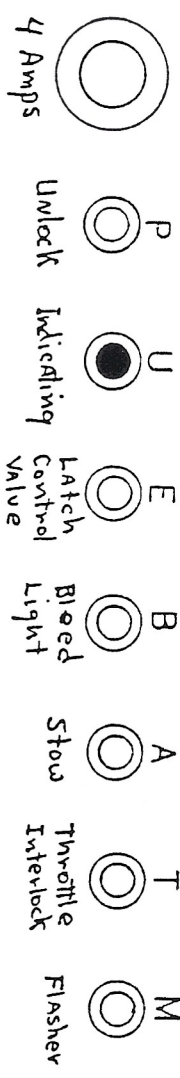
* The 35/55/BAe switch is to select the particular type aircraft T/R being monitored or operated: Lear 35, Lear 55 or British Aerospace HS 125-700.

* The Rotary Switch in the right hand corner of the test box is used to select the circuits corresponding to the indicating lights above in which voltage monitoring is desired.

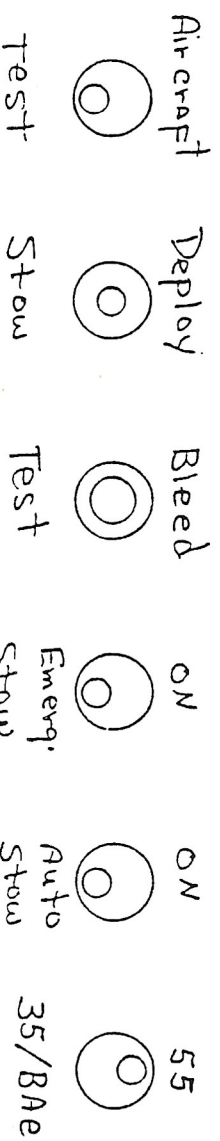
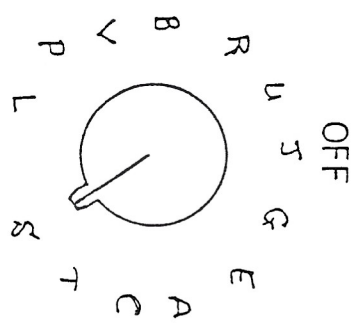
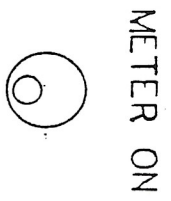
NOTE:

When depressing the Bleed Test Switch to simulate Full Power Reverse Thrust Mode of operation after T/R is fully Deployed, on Lear 55 Series Aircraft, the Deploy/Stow Switch must be moved to the Stow position momentarily to extinguish the bleed light. This is only necessary on Lear Model 55 Thrust Reversers.

Test Box On - Reverser Fully Stowed - Aircraft Power Off



TEST BOX T/R-35/55/BAE

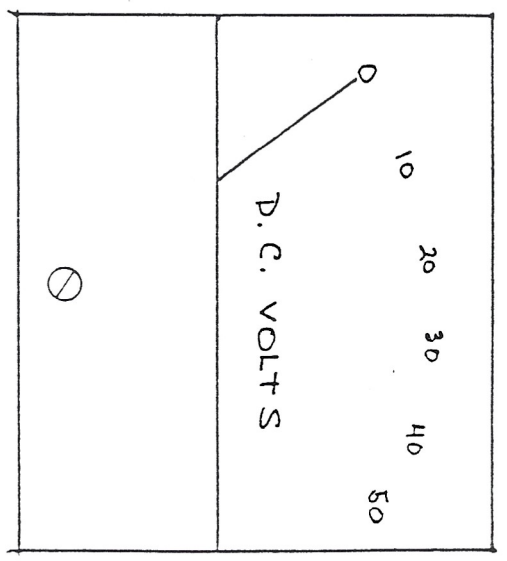


Test Box ON - Deploy Command

- 4 Amps
- Unlock P
- Indicating U
- Latch Control Valve E
- Bleed Light B
- Stow A
- Throttle Interlock T
- Flasher M

- AC/ON
- Deploy V
- Auto Stow Power J
- Air Motor Deploy C
- Bleed Press To Test R
- Auto Stow G
- L.H. Throttle Interlock S
- Emerg. Stow L

ON/OFF



TEST BOX T/R-35/55/BAE

ON AIRCRAFT AUTO STOW

- Aircraft
- Deploy
- Bleed
- ON
- Emerg. Stow
- ON
- Auto Stow
- 55
- 35/BAE

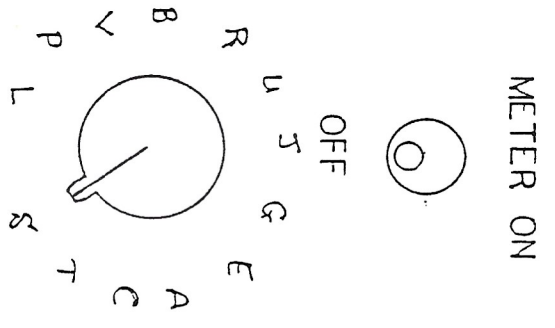
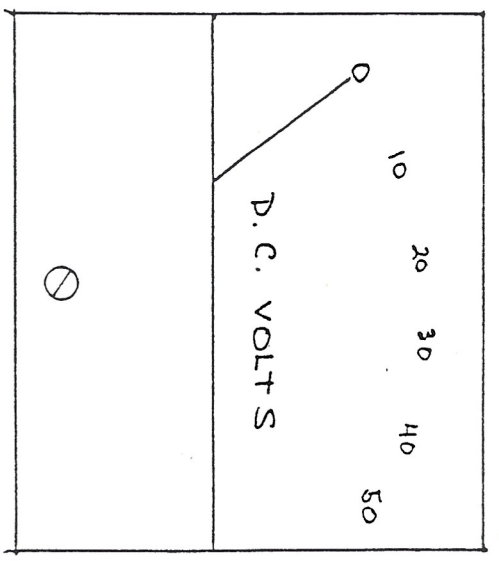
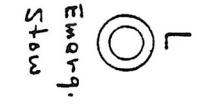
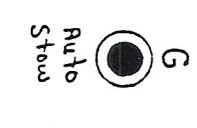
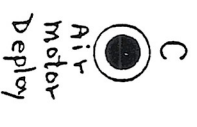
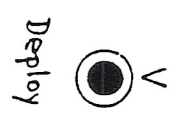
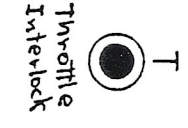
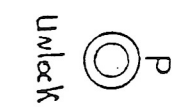


Fig. (2)

Test Box On - Reverser fully deployed



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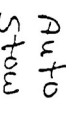
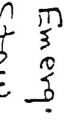
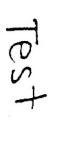
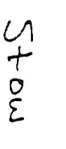
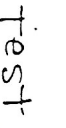
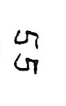
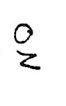
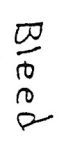
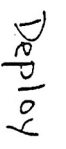
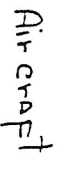
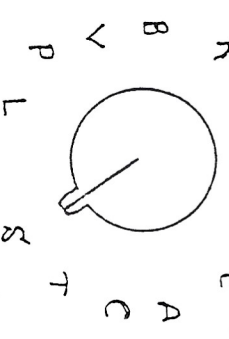
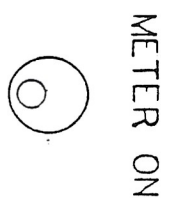
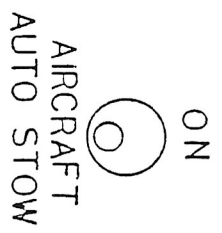
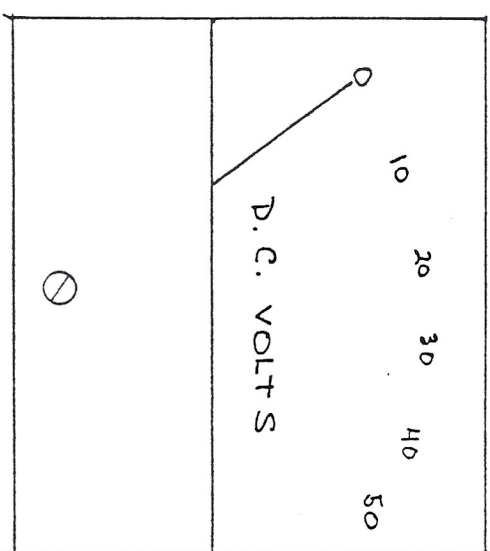
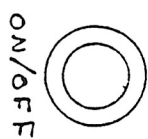
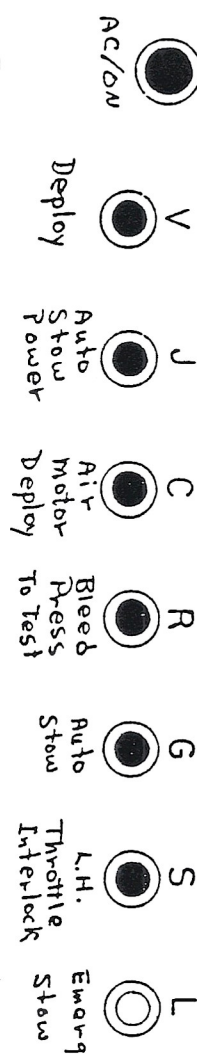
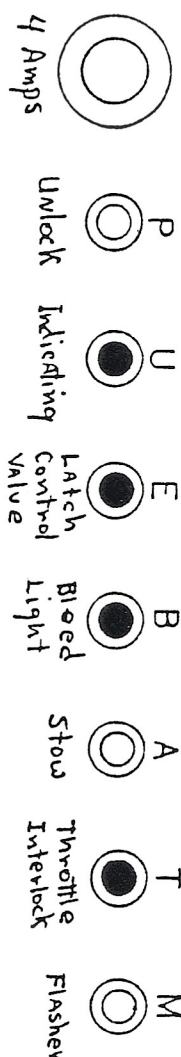


Fig. (3)

Test Box On - Reverser Fully Deployed - Shop Air Increased to Above 35 PSI



TEST BOX T/R-35/55/BAE



METER ON

OFF

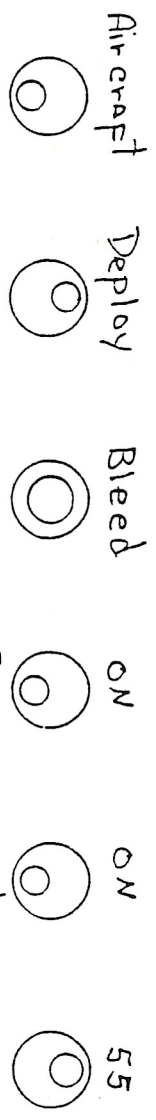
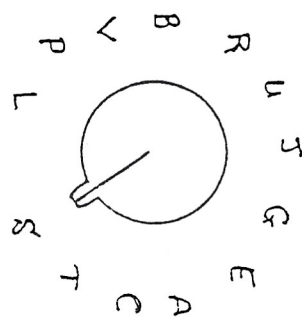
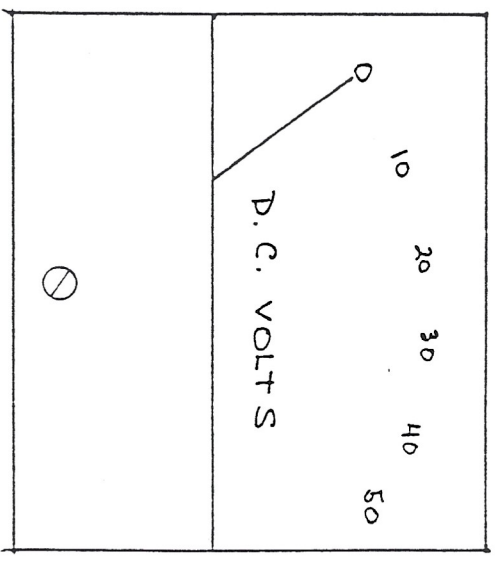
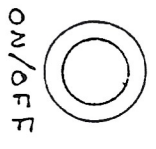
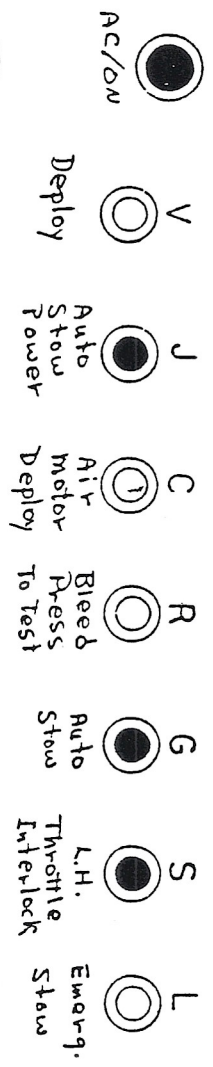
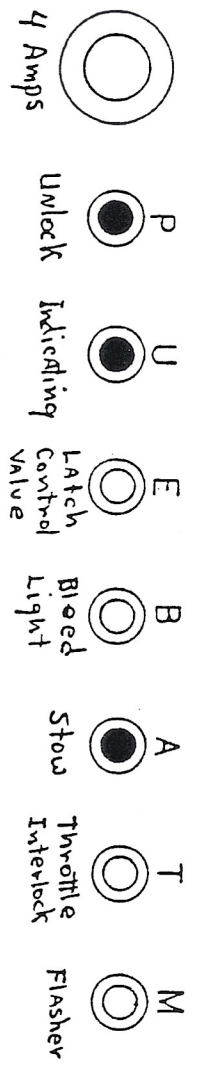


Fig. (4)

Test Box ON - Stow Command



TEST BOX T/R-35/55/BAE

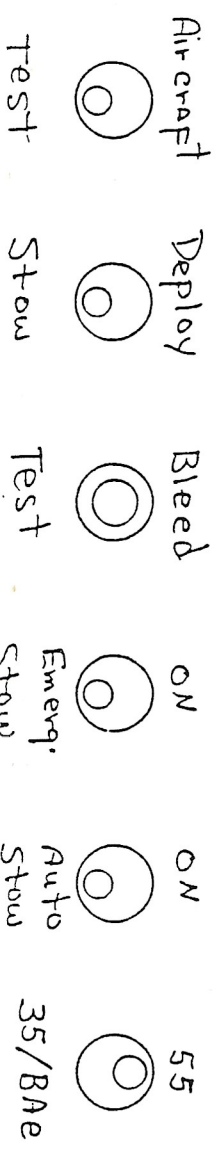
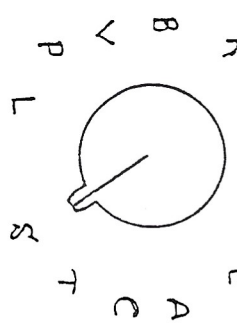
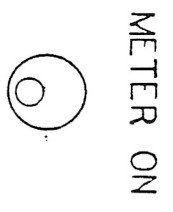
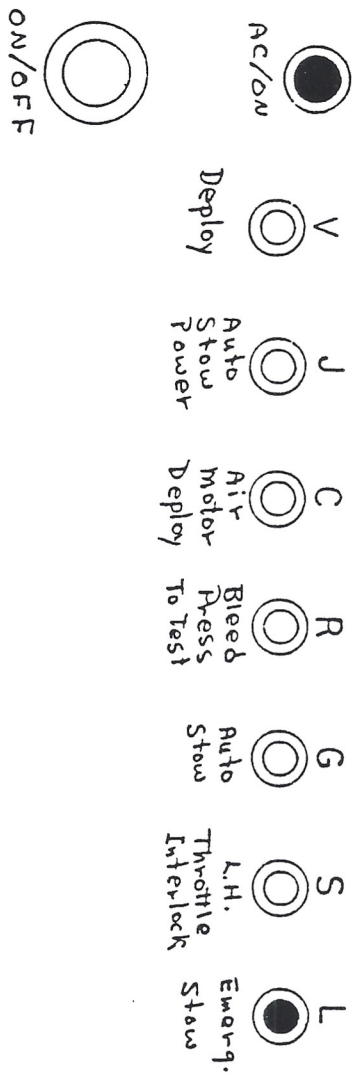
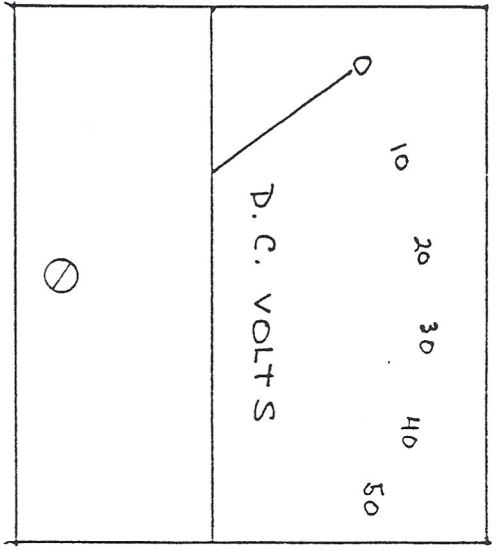
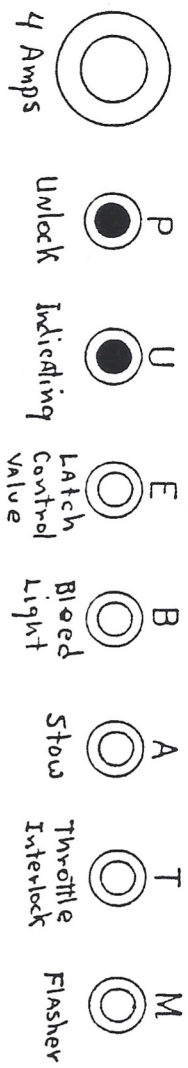


Fig. (5)

Test Box ON - Emergency Stow Command - Reverser Stowing



TEST BOX T/R-35/55/BAE



METER ON

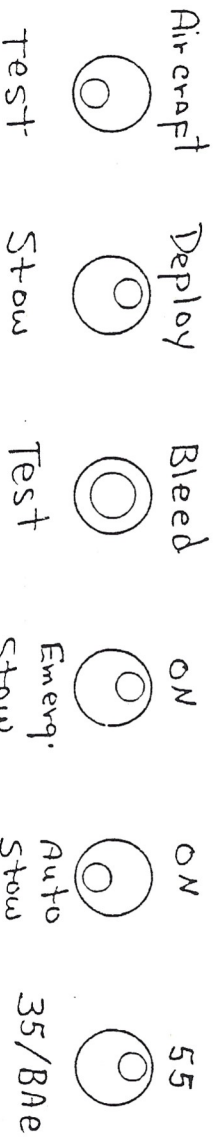
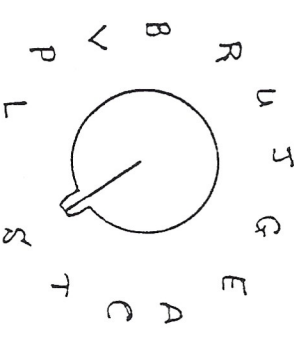
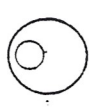
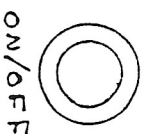
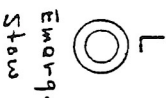
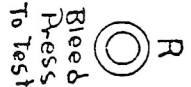
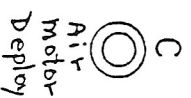
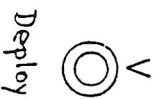
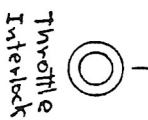
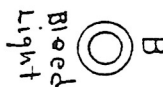
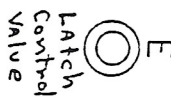
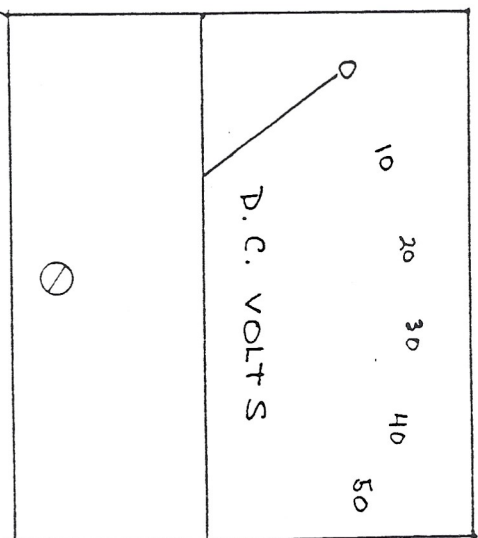


Fig. (6)

Throttle at Idle - Test Box OFF - Aircraft Power ON.



TEST BOX T/R-35/55/BAE

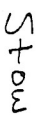
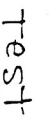
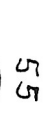
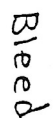
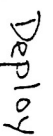
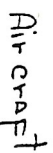
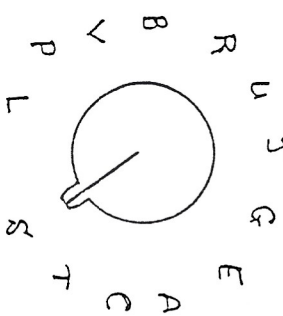
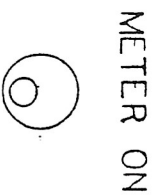
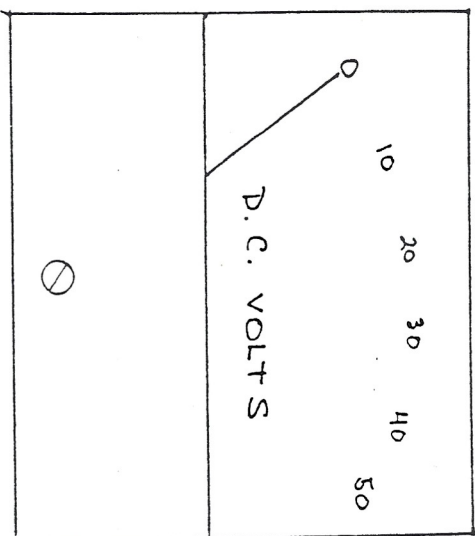
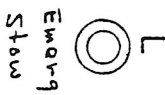
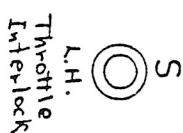


Fig. (A)

Deploy Command - Test Box OFF.



TEST BOX T/R-35/55/BAE

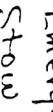
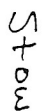
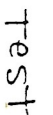
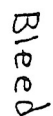
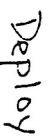
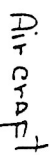
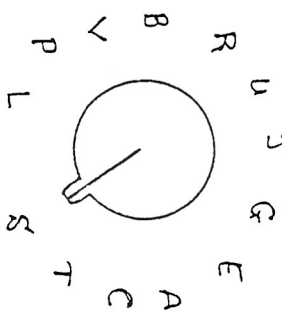
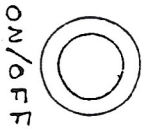
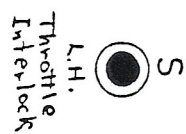
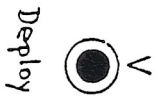
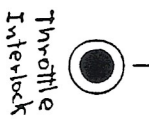
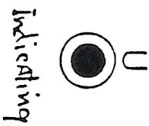
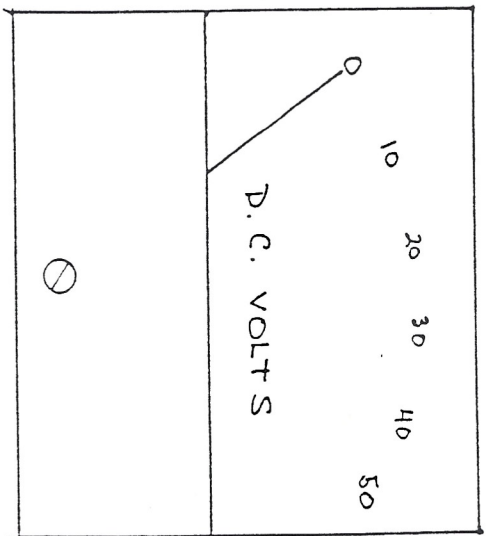
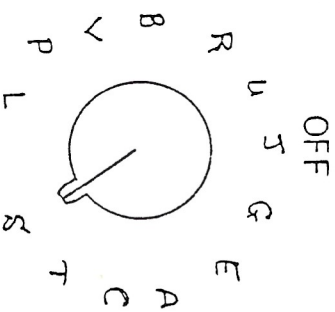


Fig (B)

Fully Deployed - Test Box OFF



TEST BOX T/R-35/55/BAE



Aircraft



Deploy



Bleed



ON



ON



55



Test



Stow



Test



Emerg. Stow



Auto Stow

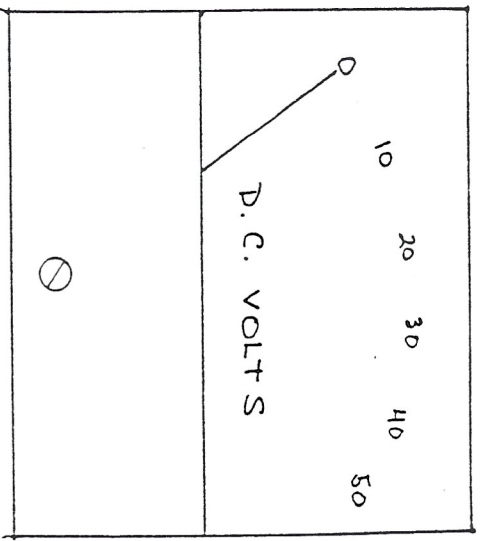
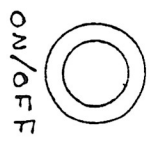
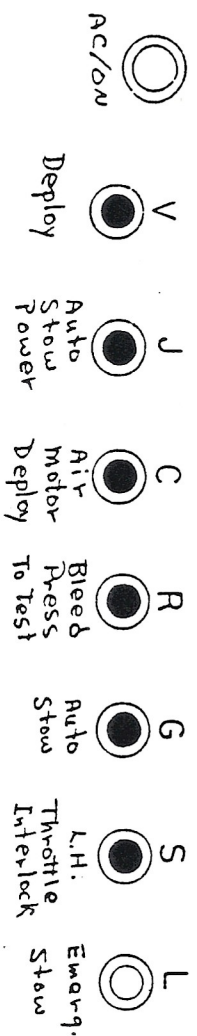
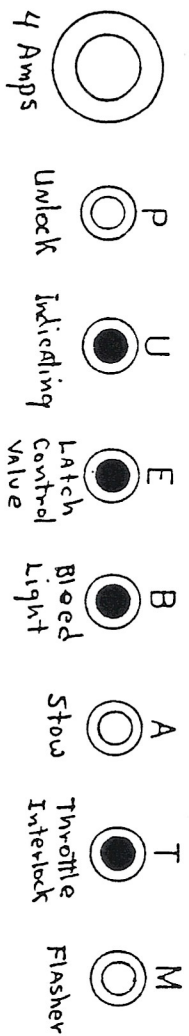


35/BAE

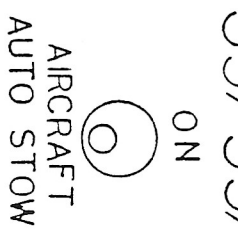


Fig. (c)

Full Reverse Power - (Air Pressure Above 35 P.S.I.) - Test Box OFF.



TEST BOX T/R-35/55/BAE



METER ON

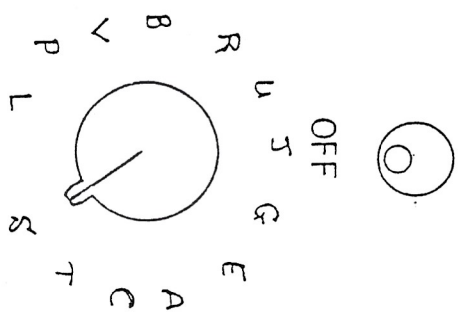
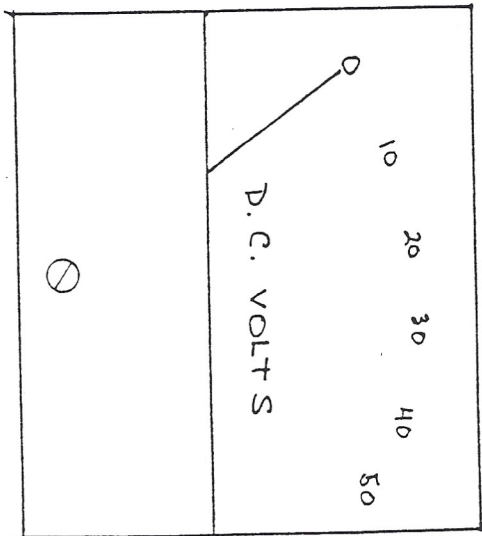
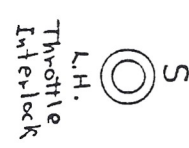
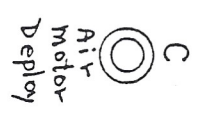
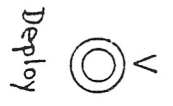
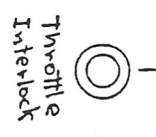
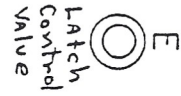
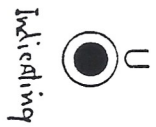
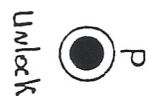


Fig. (D)

Stowing - Test Box OFF.



TEST BOX T/R-35/55/BAE

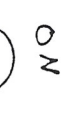
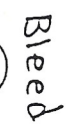
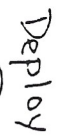
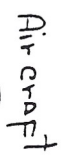
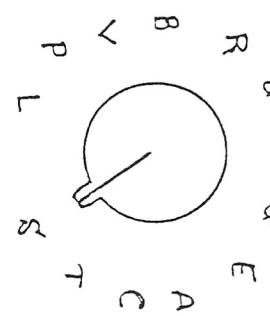
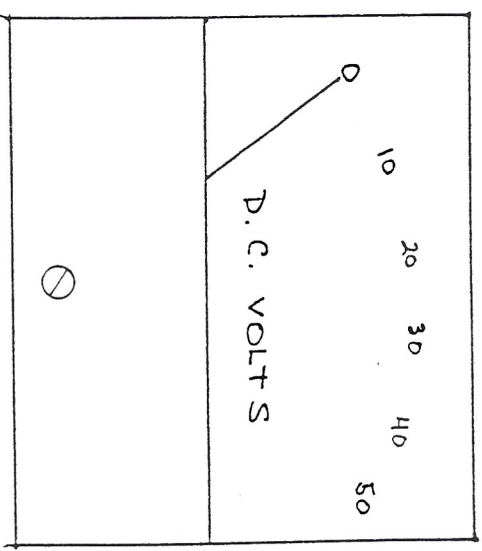
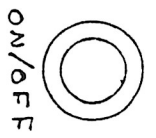
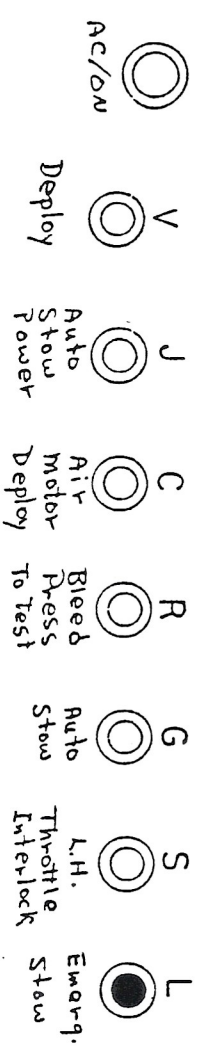
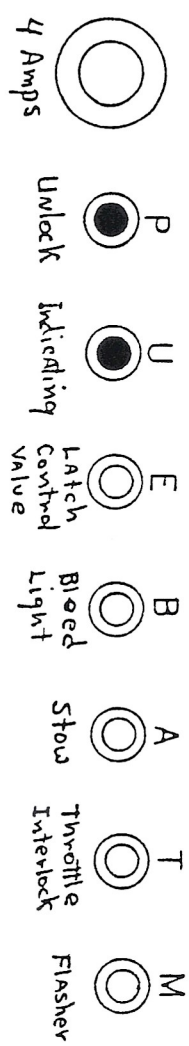


Fig. (E)

Emergency Stowing - (Reverser Initially at Full Deploy) - Test Box OFF.



TEST BOX T/R-35/55/BAE

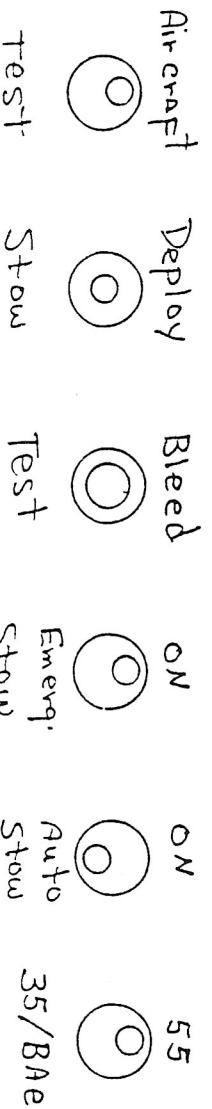
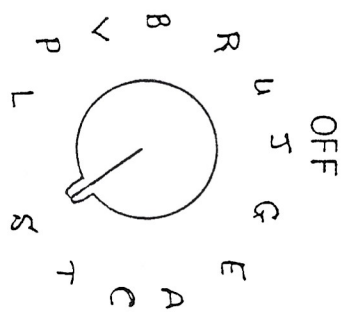
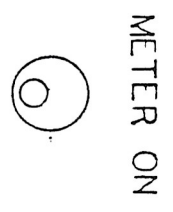
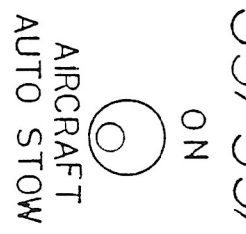
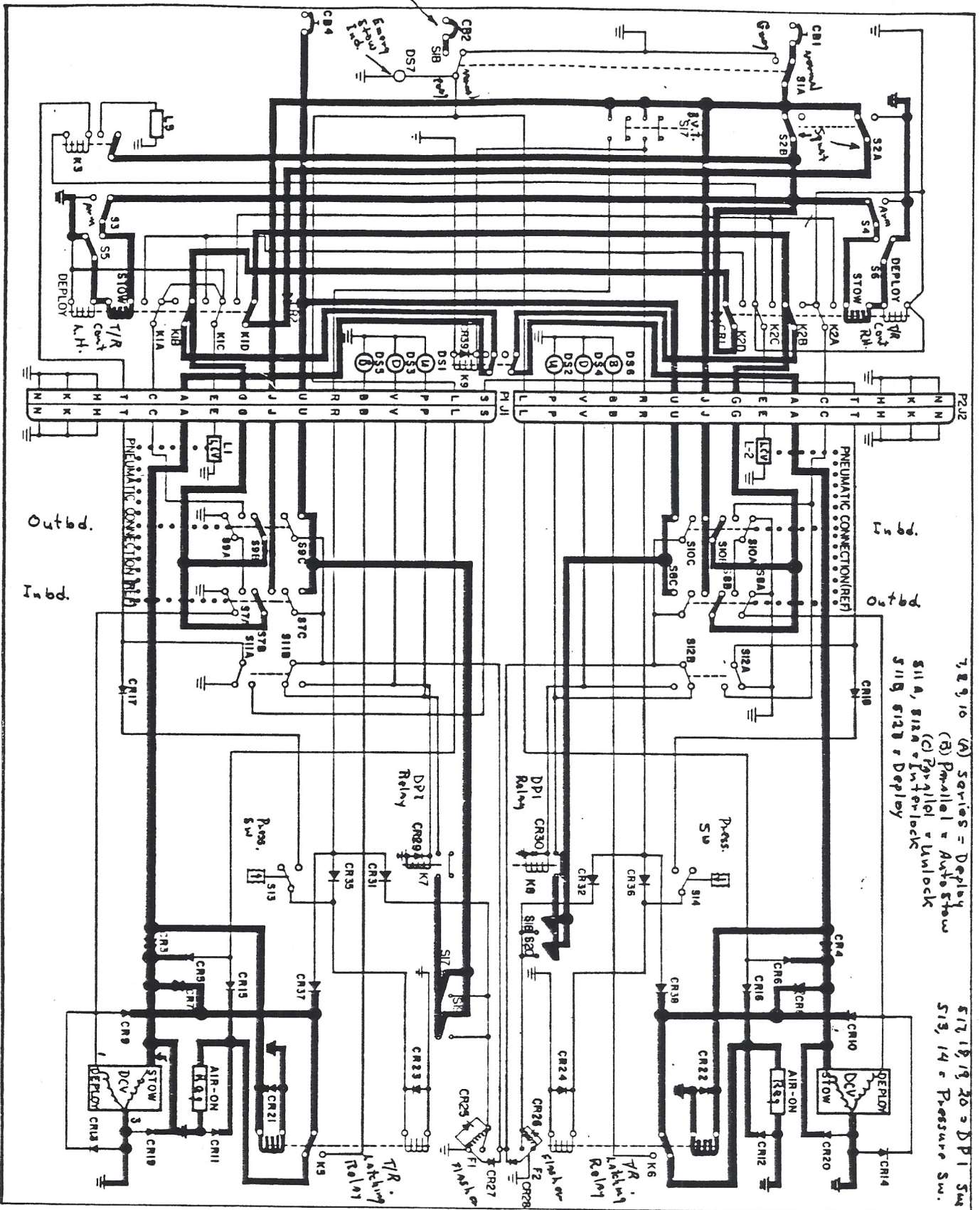


Fig. (E)

7, 9, 10 (A) Series = Deploy
 (B) Parallel = Auto Stow
 (C) Parallel = Lock
 511g, 512b = Deploy

512, 15, 19, 20 = DP1 Swg
 513, 14 = Pressure Sw.



Normal Control C.B.

78-30-00
 June 29, 1984
 Page 11

Emerg Stow C.B.
 Lights C.B.

Figure 5, Sheet 2 Electrical Schematic - Arming Sequence (GLC 55)

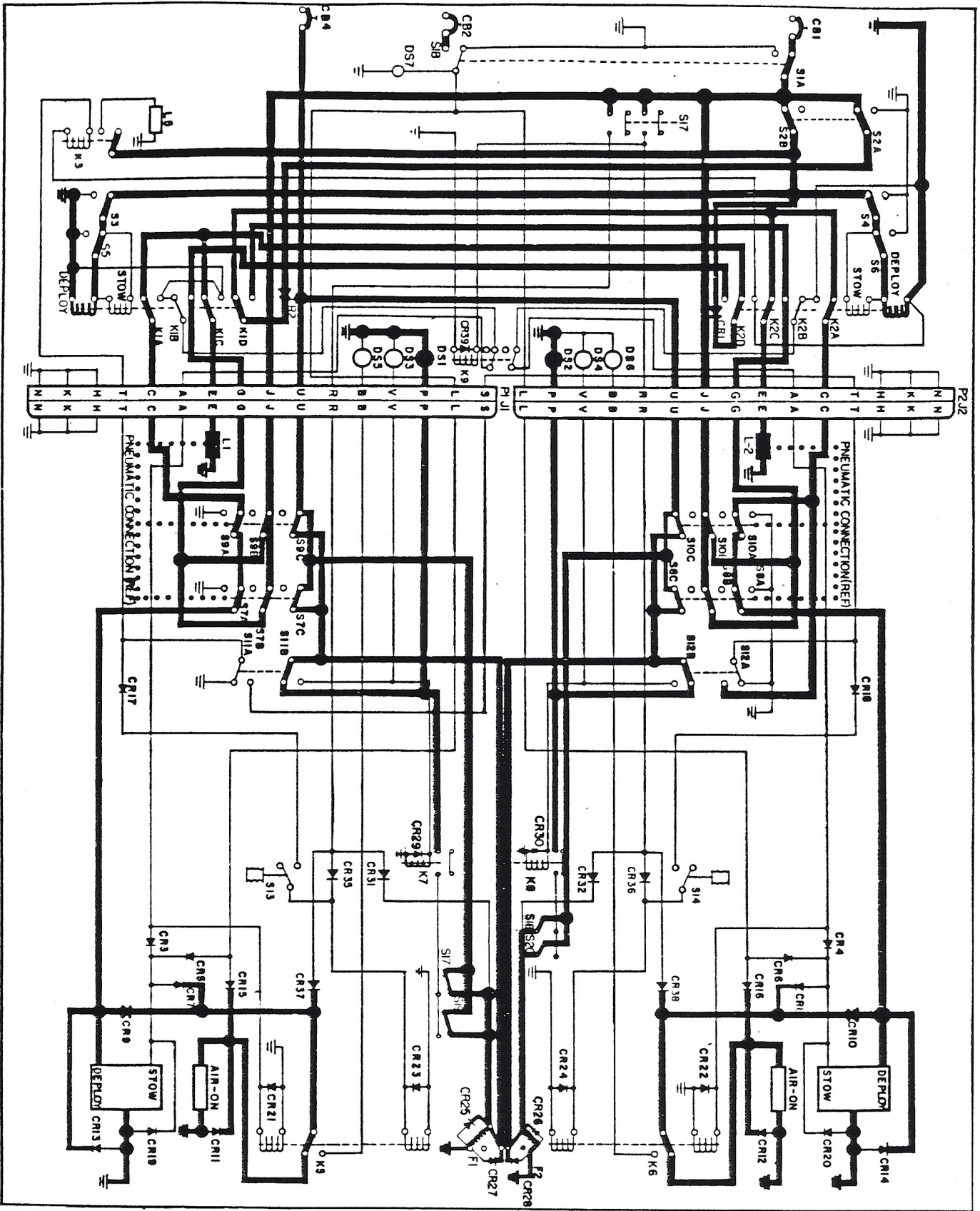
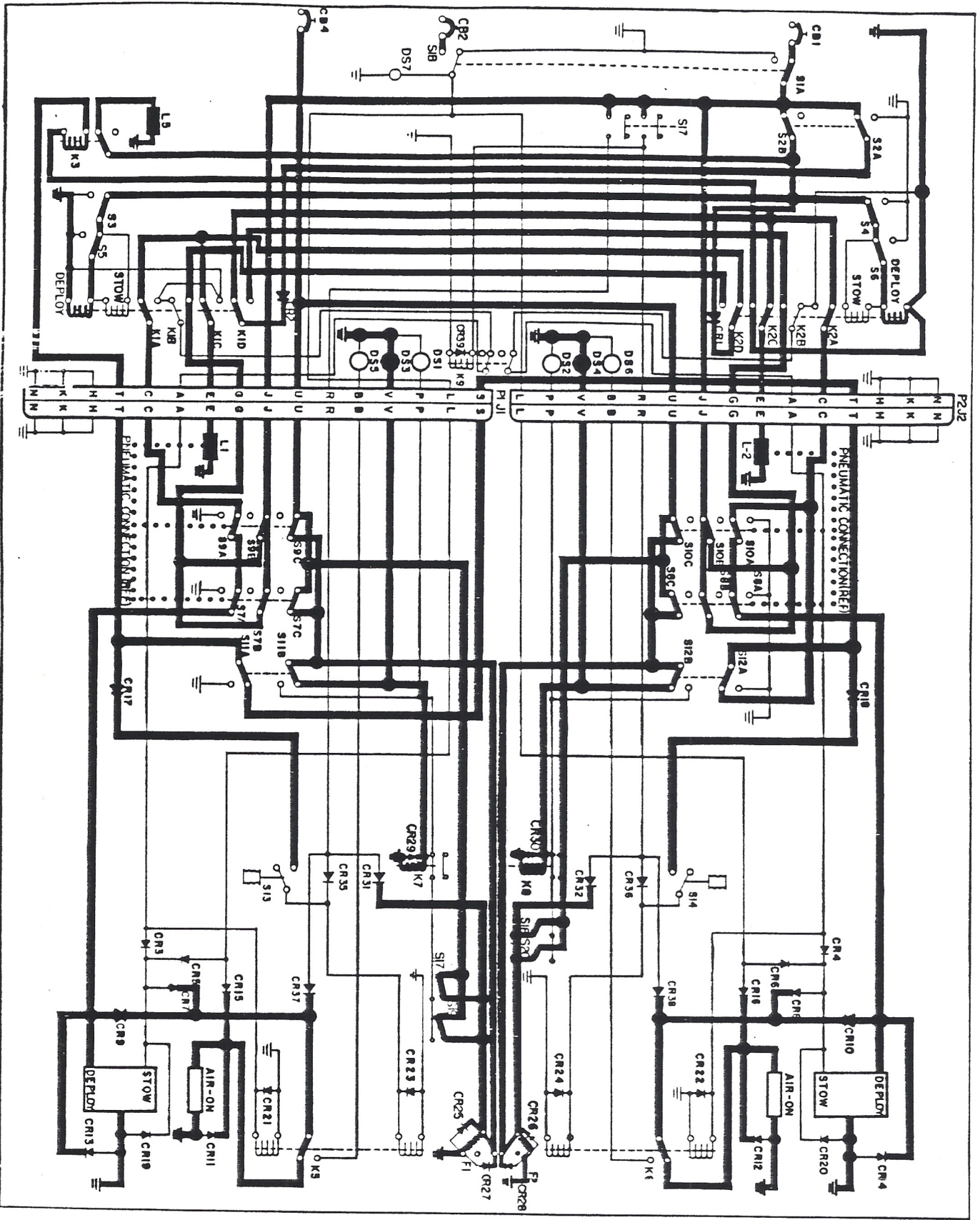
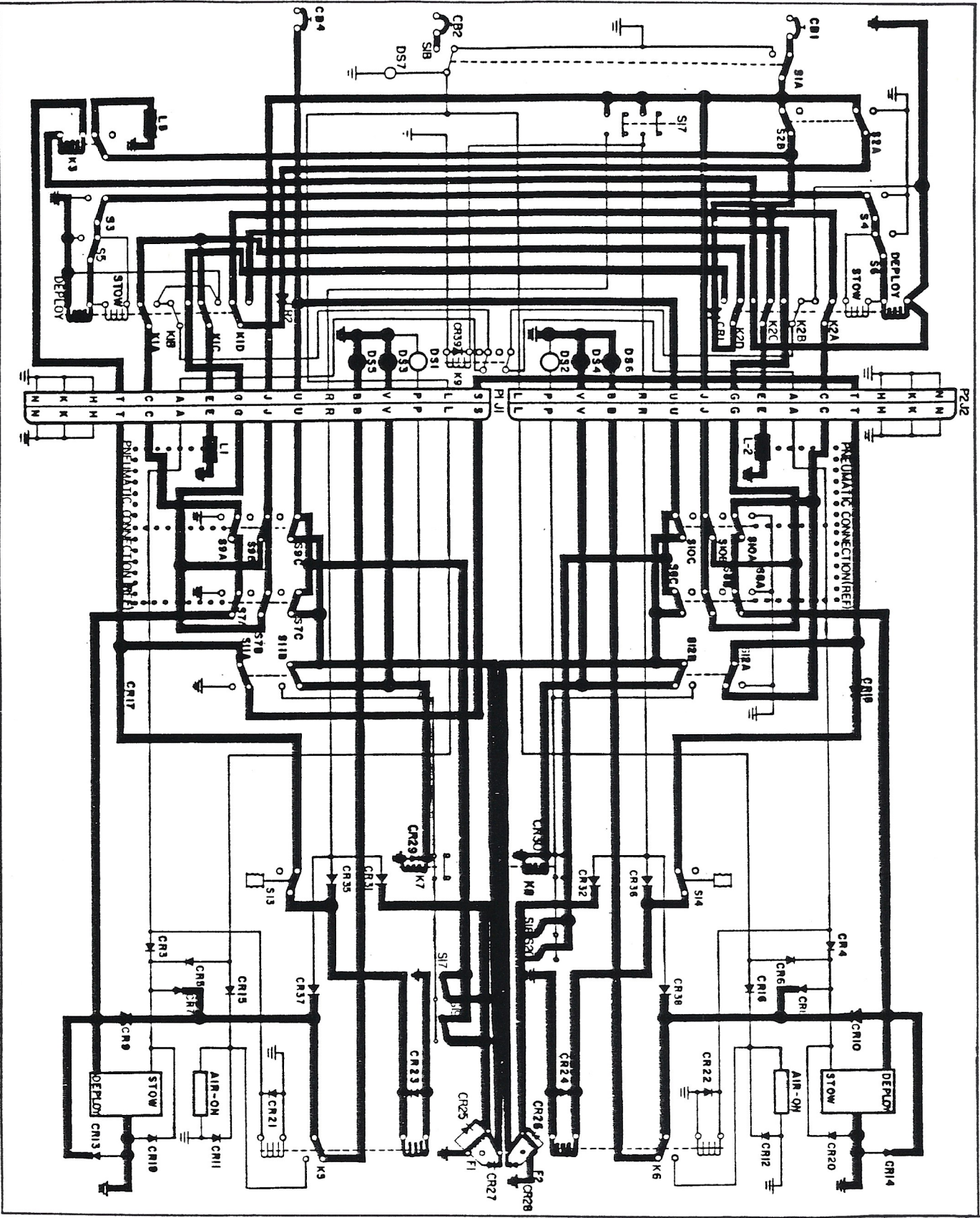


Figure 6, Sheet 2 Electrical Schematic - Deploy Sequence (GLC 55)



78-30-00
 June 29, 1984

Figure 7, Sheet 2 Electrical Schematic - Fully Deployed (GLC 55)



78-30-00
 June 29, 1984

Figure 8, Sheet 2 Electrical Schematic - Full Reverse Power (GLC 55)

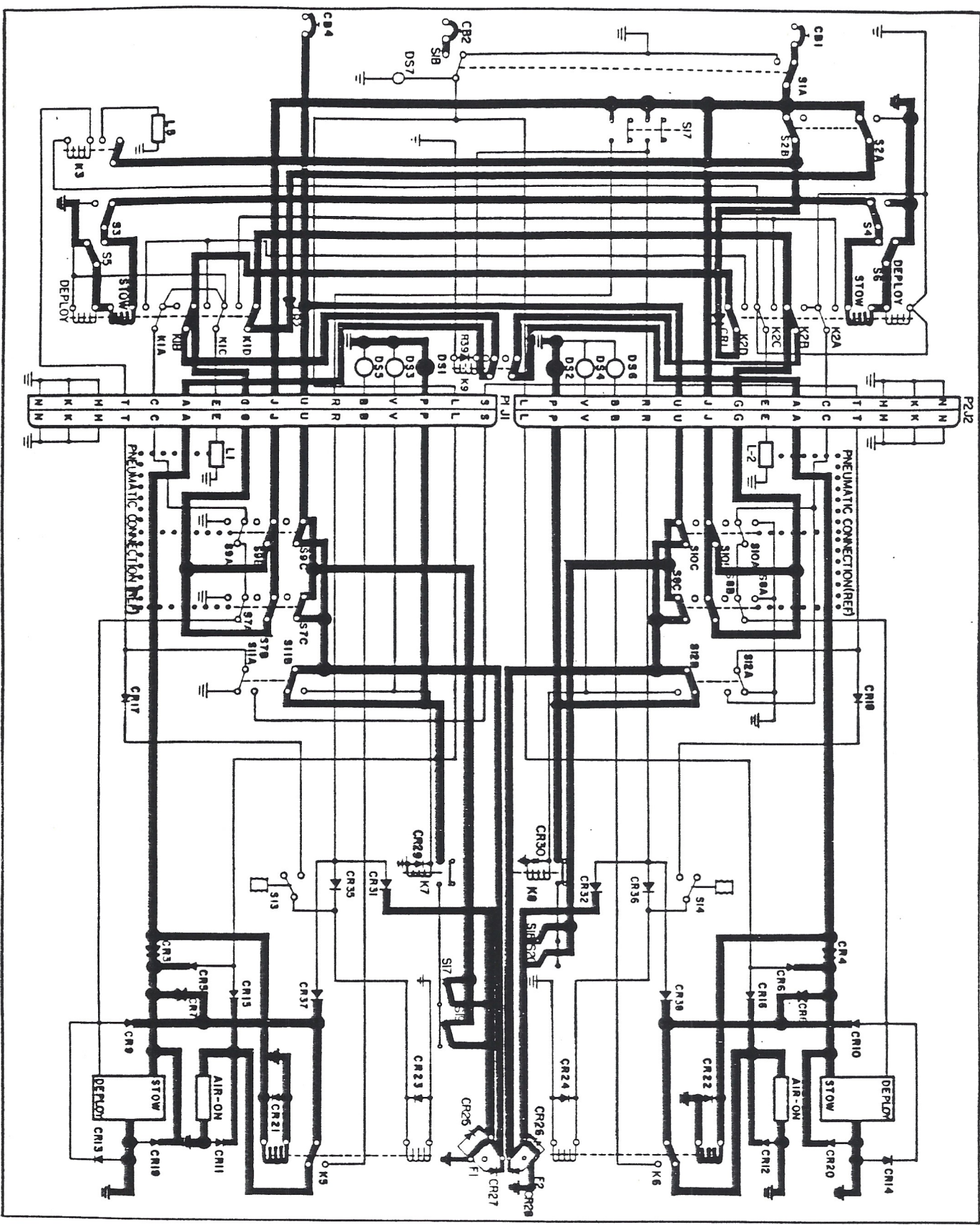


Figure 9, Sheet 2 Electrical Schematic - Stow Sequence (GLC 55)

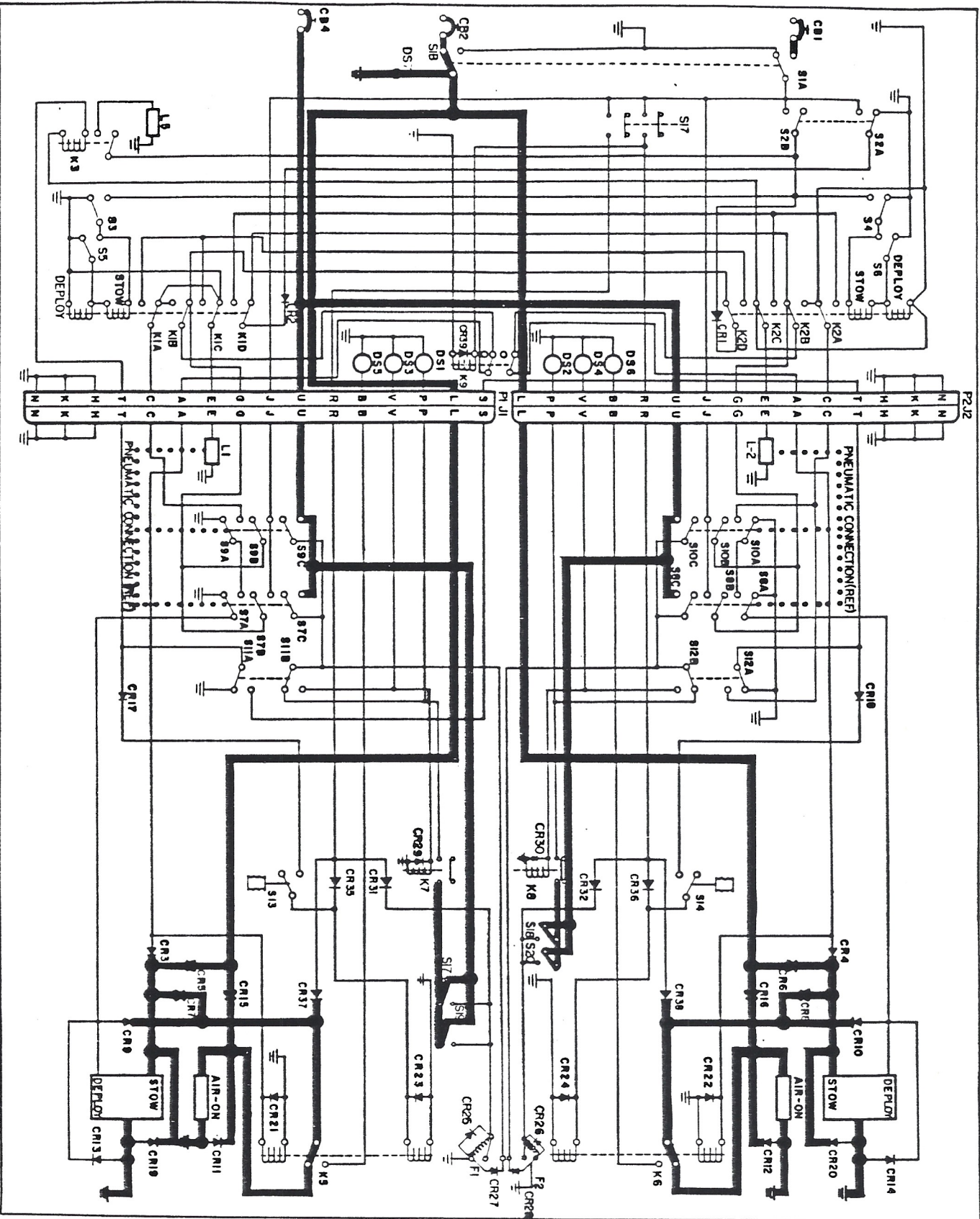


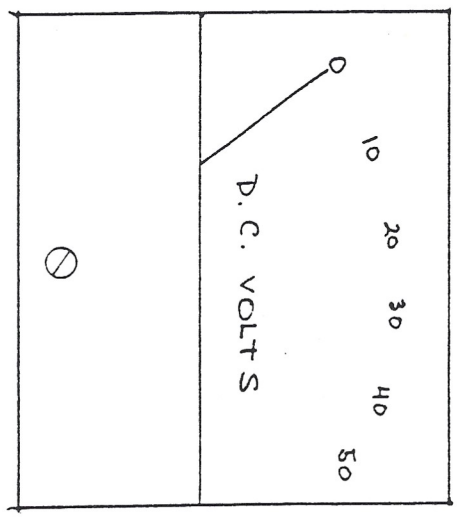
Figure 13, Sheet 2 Electrical Schematic - Emergency Stow (GLC 55)

Throttle at Idle - Test Box OFF - Aircraft Power ON

- 4 Amps
- Unlock
- Indicating
- Latch Control Valve
- Bleed Light
- Stow
- Throttle Interlock
- Flasher

- AC/ON
- Deploy
- Auto Stow Power
- Air Motor Deploy
- Bleed Press To Test
- Auto Stow
- L.H. Throttle Interlock
- Emerg. Stow

ON/OFF

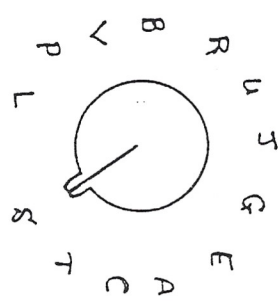


TEST BOX T/R-35/55/BAE

AIRCRAFT AUTO STOW

METER ON

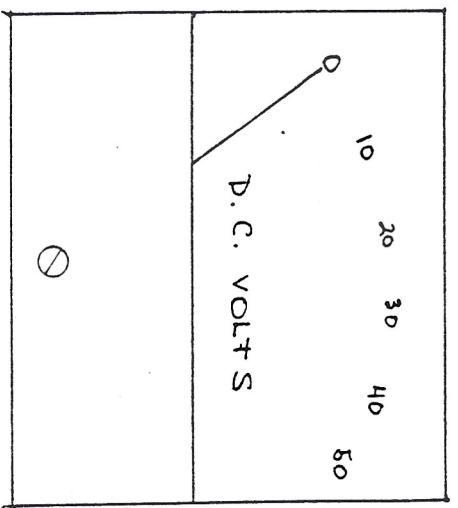
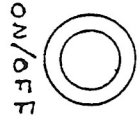
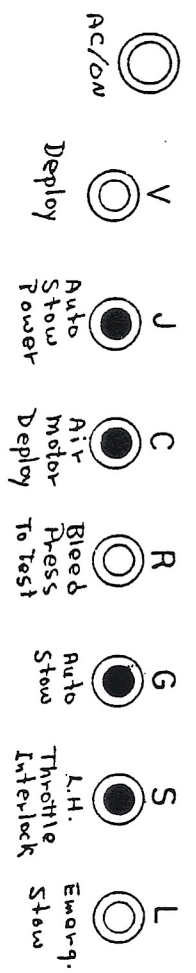
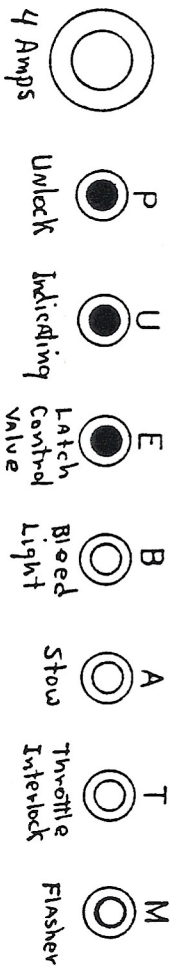
OFF



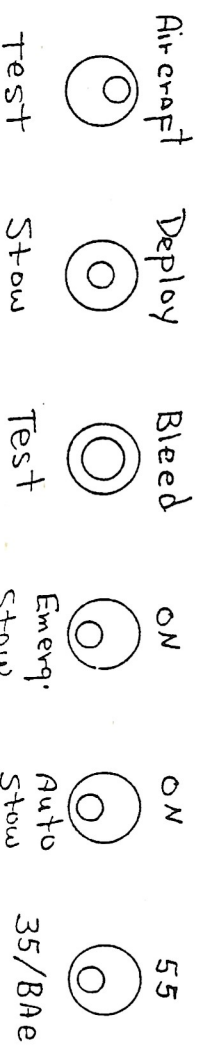
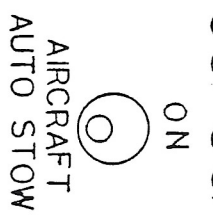
- Aircraft
- Deploy
- Bleed
- ON
- ON
- 55
- test
- Stow
- Test
- Emerg. Stow
- Auto Stow
- 35/BAE

Fig. (A)

Deploy Command - Test Box OFF



TEST BOX T/R-35/55/BAE



METER ON

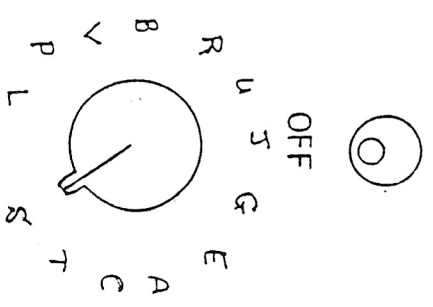
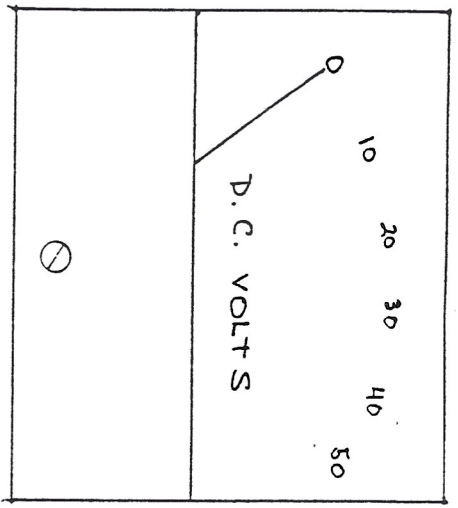


Fig (B)

Hi - Power Reverse - (Air Pressure Above 35 P.S.I.) - Test Box OFF



- 4 Amps
- Unlock
- Unlock Indicating
- Latch Control Valve
- Bleed Light
- Stow
- Throttle Interlock
- Flasher

- Ac/ow
- Deploy
- Auto Stow Power
- Air Motor Deploy
- Bleed Press To Test
- Auto Stow
- L.H. Throttle Interlock
- Emerg. Stow

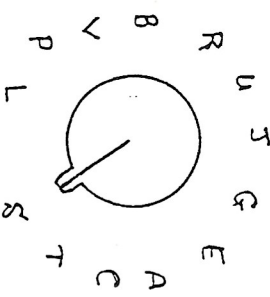
ON/OFF

TEST BOX T/R-35/55/BAE

AIRCRAFT AUTO STOW

METER ON

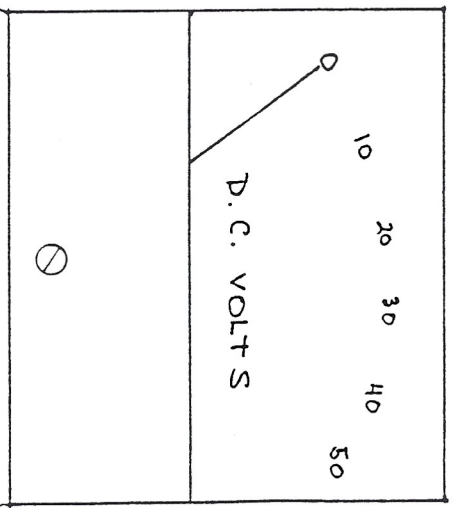
OFF



Aircraft Deploy Bleed ON ON 55

Fig. (D)

Stowing - Test Box OFF



- 4 Amps
- Unlock
- Indicating
- Latch Control Valve
- Bleed Light
- Stow
- Throttle Interlock
- Flasher

- ac/on
- Deploy
- Auto Stow Power
- Air Motor Deploy
- Bleed Press To Test
- Auto Stow
- L.H. Throttle Interlock
- Emerg. Stow

ON/OFF

TEST BOX T/R-35/55/BAE

- AIRCRAFT AUTO STOW ON
- METER ON
- Aircraft
- Deploy
- Bleed
- ON
- Emerg. Stow
- Auto Stow
- 55
- 35/BAE

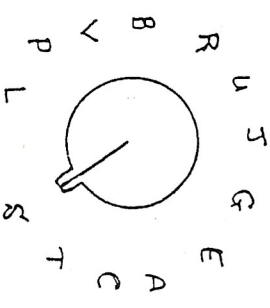
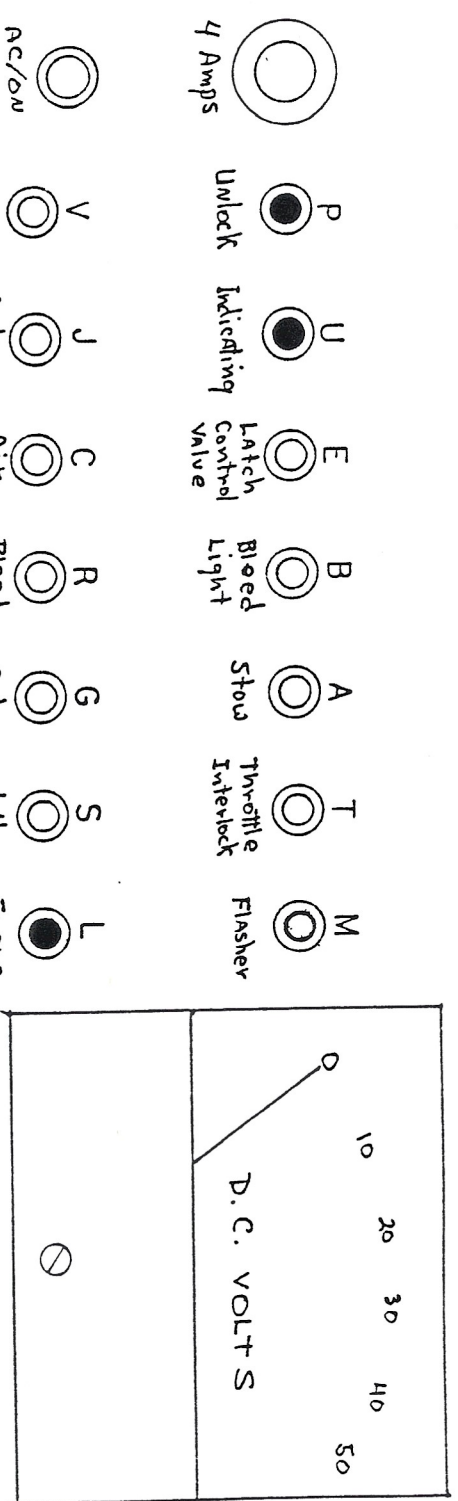


Fig. (E)

Emergency Stowing - Reverser Initially at full deploy - Test Box OFF



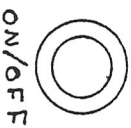
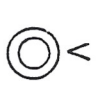
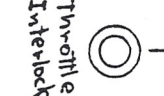
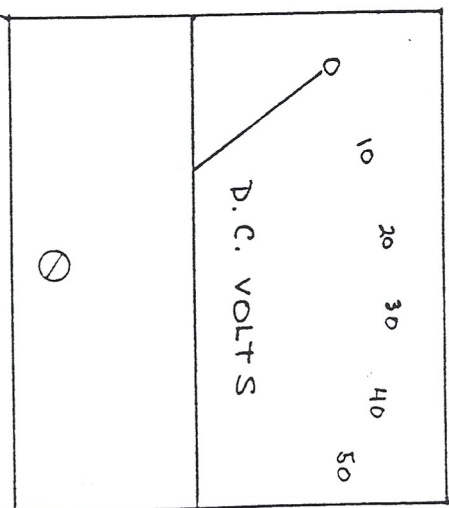
- 4 Amps
- Unlock
- Indicating
- Latch Control Valve
- Bleed Light
- Stow
- Throttle Interlock
- Flasher
- AC/ON
- Deploy
- Auto Stow Power
- Air Motor Deploy
- Bleed Press To Test
- Auto Stow
- L.H. Throttle Interlock
- Emerg. Stow
- ON/OFF

TEST BOX T/R-35/55/BAE

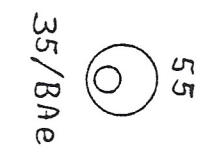
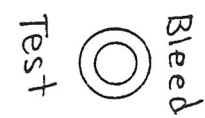
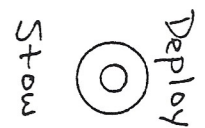
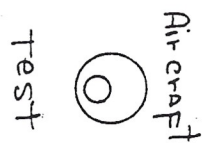
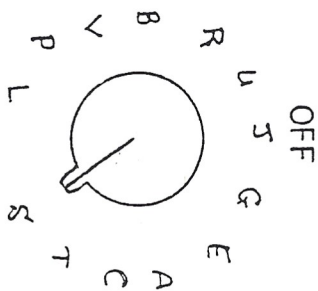
- AIRCRAFT AUTO STOW
- ON
- ON
- 55
- 35/BAE
- Aircraft
- Deploy
- Bleed
- Test
- ON
- ON
- 55
- 35/BAE
- Test
- Stow
- Test
- Stow
- Test
- Stow
- Emerg. Stow
- Auto Stow
- 35/BAE

Fig. (F)

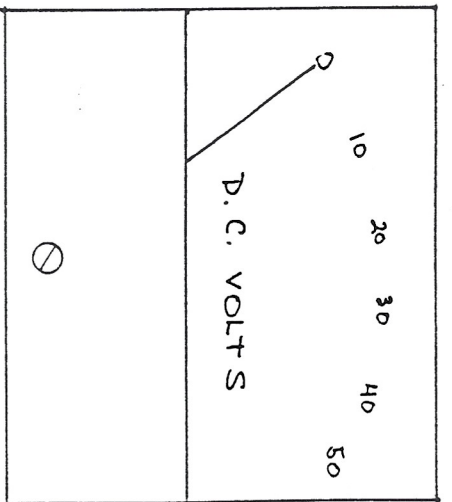
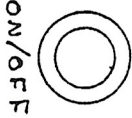
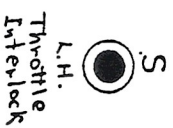
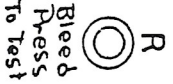
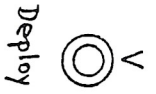
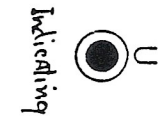
TEST BOX ON - Reverser Fully Stowed - Aircraft Power OFF.



TEST BOX T/R-35/55/BAE



Test Box ON - Deploy Command



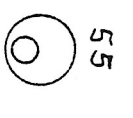
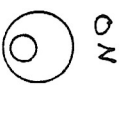
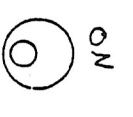
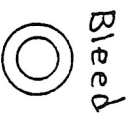
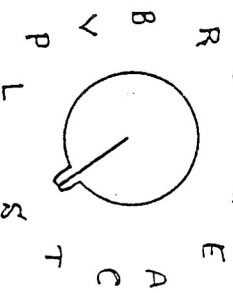
TEST BOX T/R-35/55/BAE

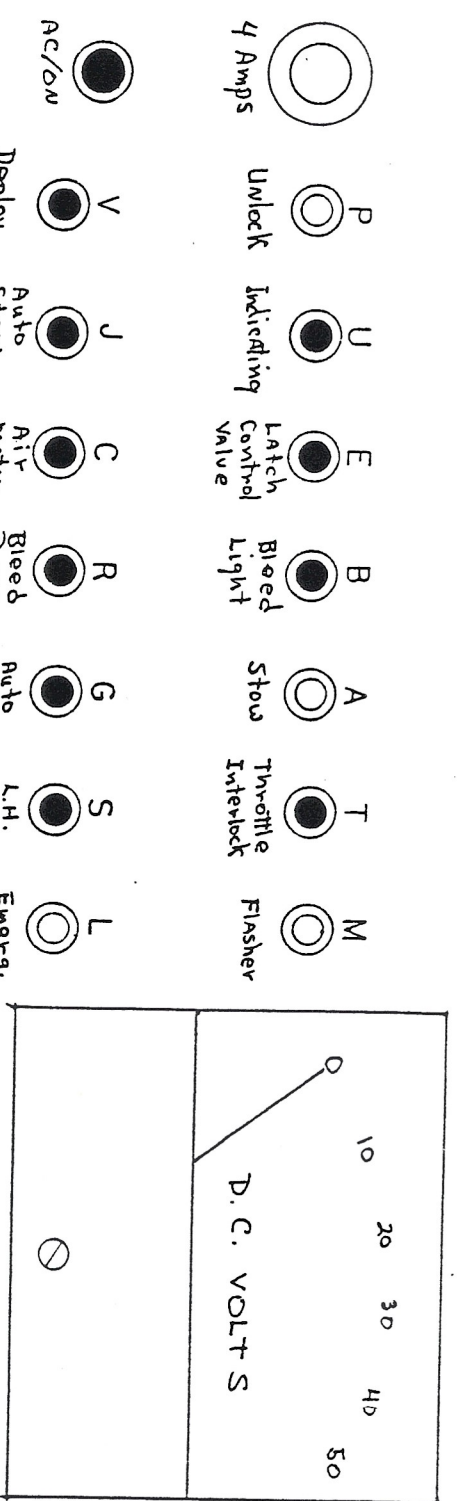


OFF

AIRCRAFT AUTO STOW

METER ON





- 4 Amps
- P Unlock
- U Indicating
- E Latch Control Valve
- B Bleed Light
- A Stow
- T Throttle Interlock
- M Flasher

- AC/ON
- V Deploy
- J Auto Stow Power
- C Air Motor Deploy
- R Bleed Press To Test
- G Auto Stow
- S L.H. Throttle Interlock
- L Emerg. Stow

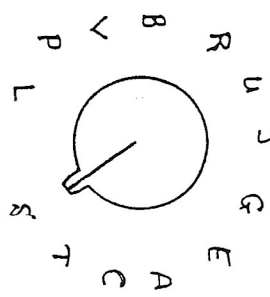
ON/OFF

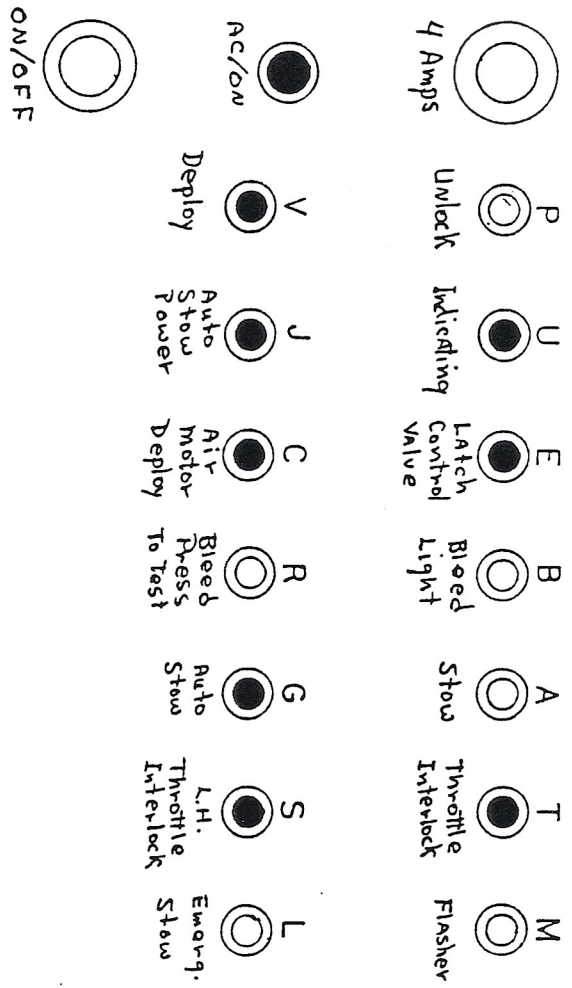
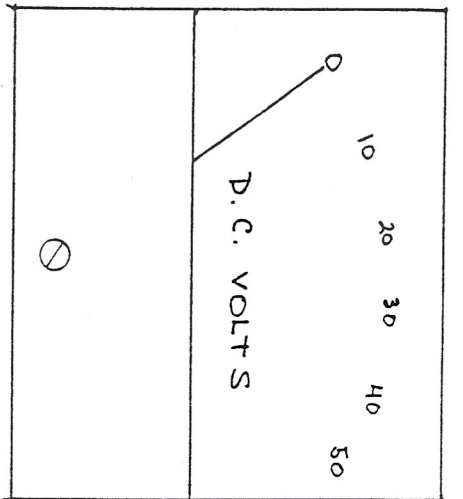
TEST BOX T/R-35/55/BAE

AIRCRAFT
AUTO STOW

METER ON

- Aircraft
- Deploy
- Bleed
- ON
- ON
- 55
- Test
- Stow
- Test
- Emerg. Stow
- Auto Stow
- 35/BAE





TEST BOX T/R-35/55/BAE

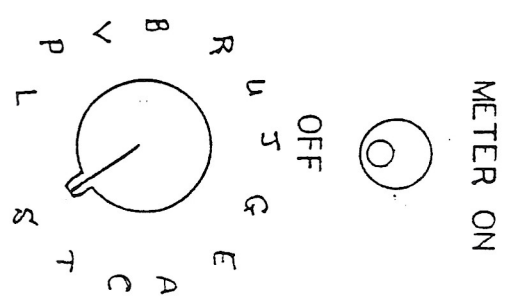
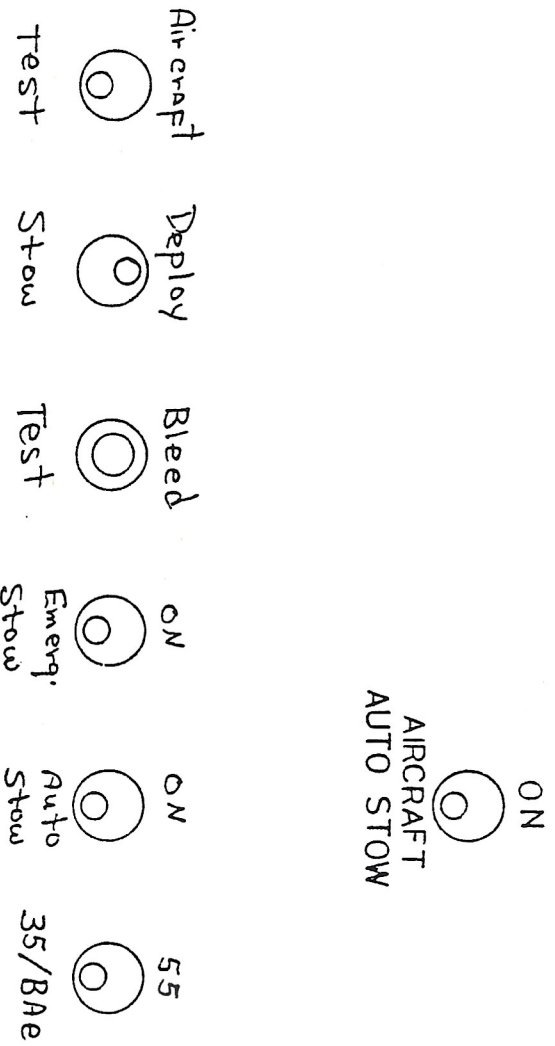
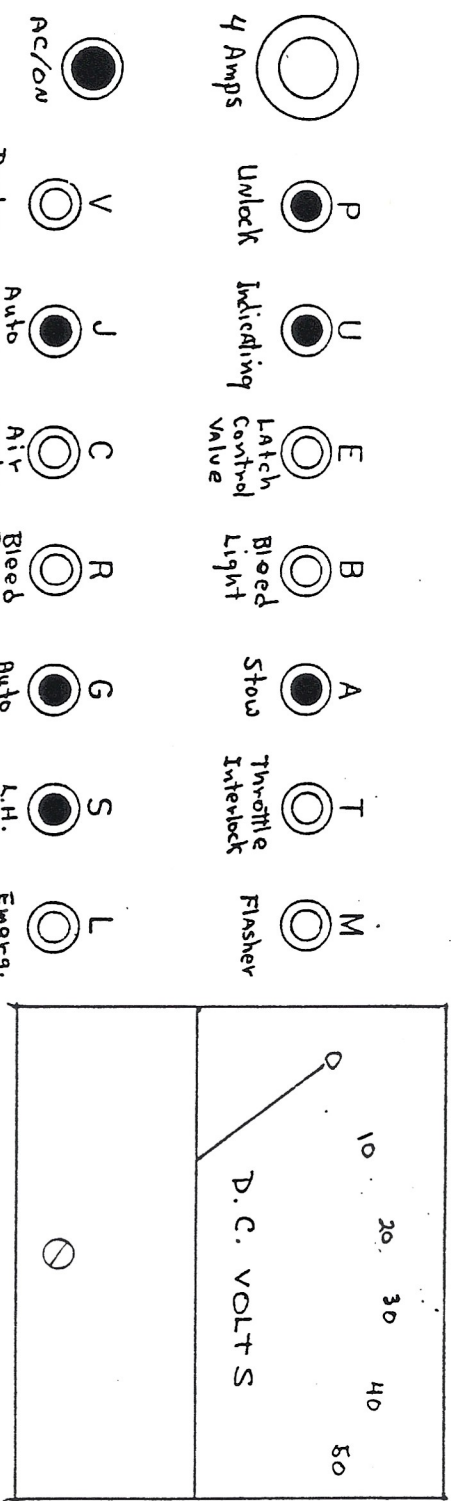


Fig. 3



- 4 Amps
- Unlock
- Indicating
- Latch Control Valve
- Bleed Light
- Stow
- Throttle Interlock
- Flasher
- Ac/on
- Deploy
- Auto Stow Power
- Air Motor Deploy
- Bleed Press To Test
- Auto Stow
- L.H. Throttle Interlock
- Emerg. Stow
- ON/OFF

TEST BOX T/R-35/55/BAE

- AIRCRAFT AUTO STOW
- METER ON
- OFF
- ON
- ON
- 55
- 35/BAE
- Aircraft
- Deploy
- Bleed
- Test
- ON
- Emerg. Stow
- Auto Stow
- 35/BAE

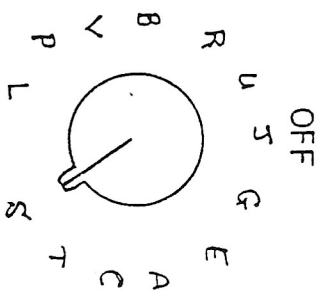
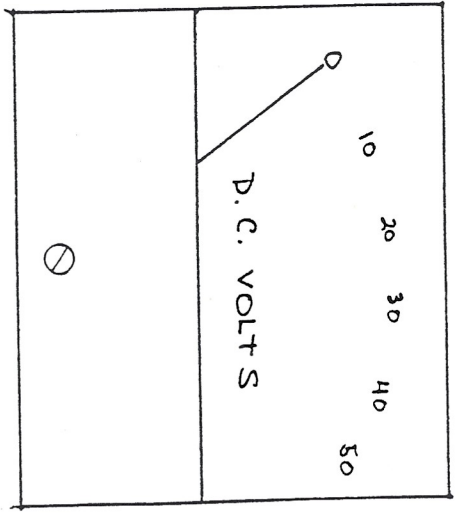
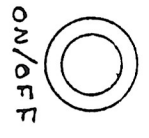
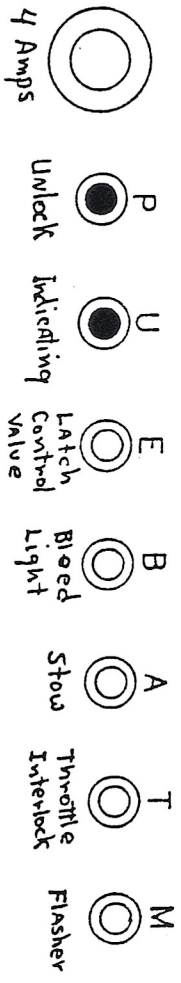
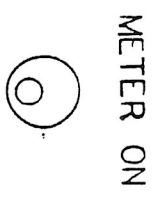
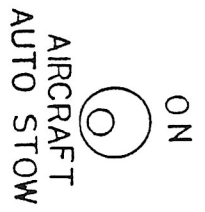


Fig. 5

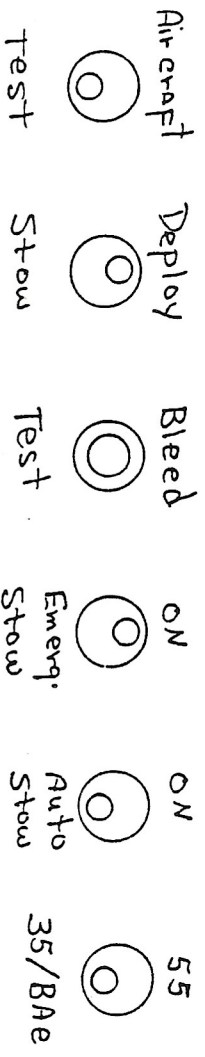
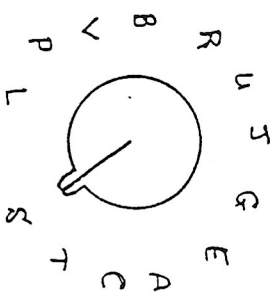
Test Box ON - Emergency Stow Command - Reverser Stowing



TEST BOX T/R-35/55/BAE



OFF



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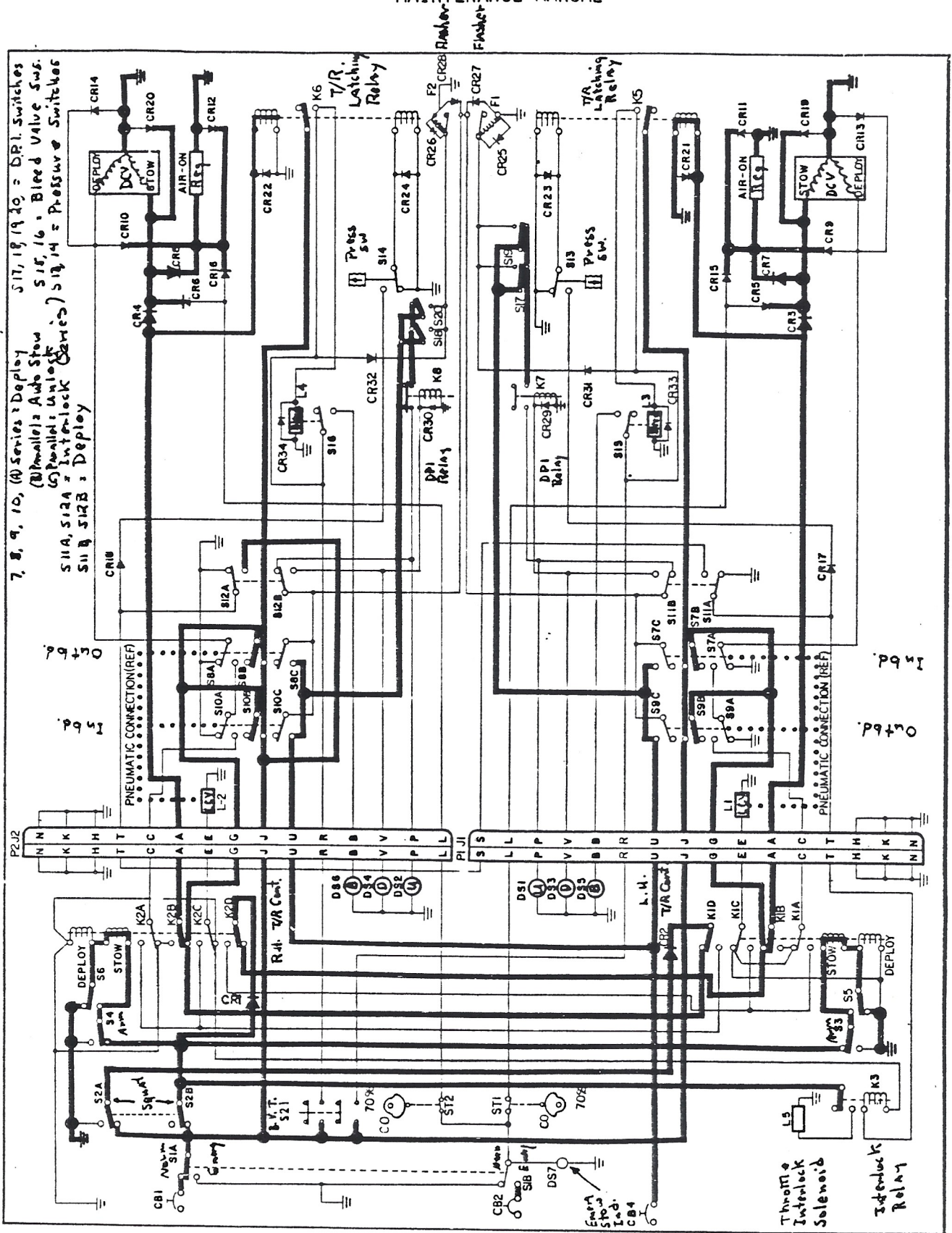


Figure 5, Sheet 1 Electrical Schematic - Arming Sequence (GLC 35/36)

T/R
Control
C.B.

78-30-00
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Ind.
Lights
C.B.

Eng.
Start
C.B.

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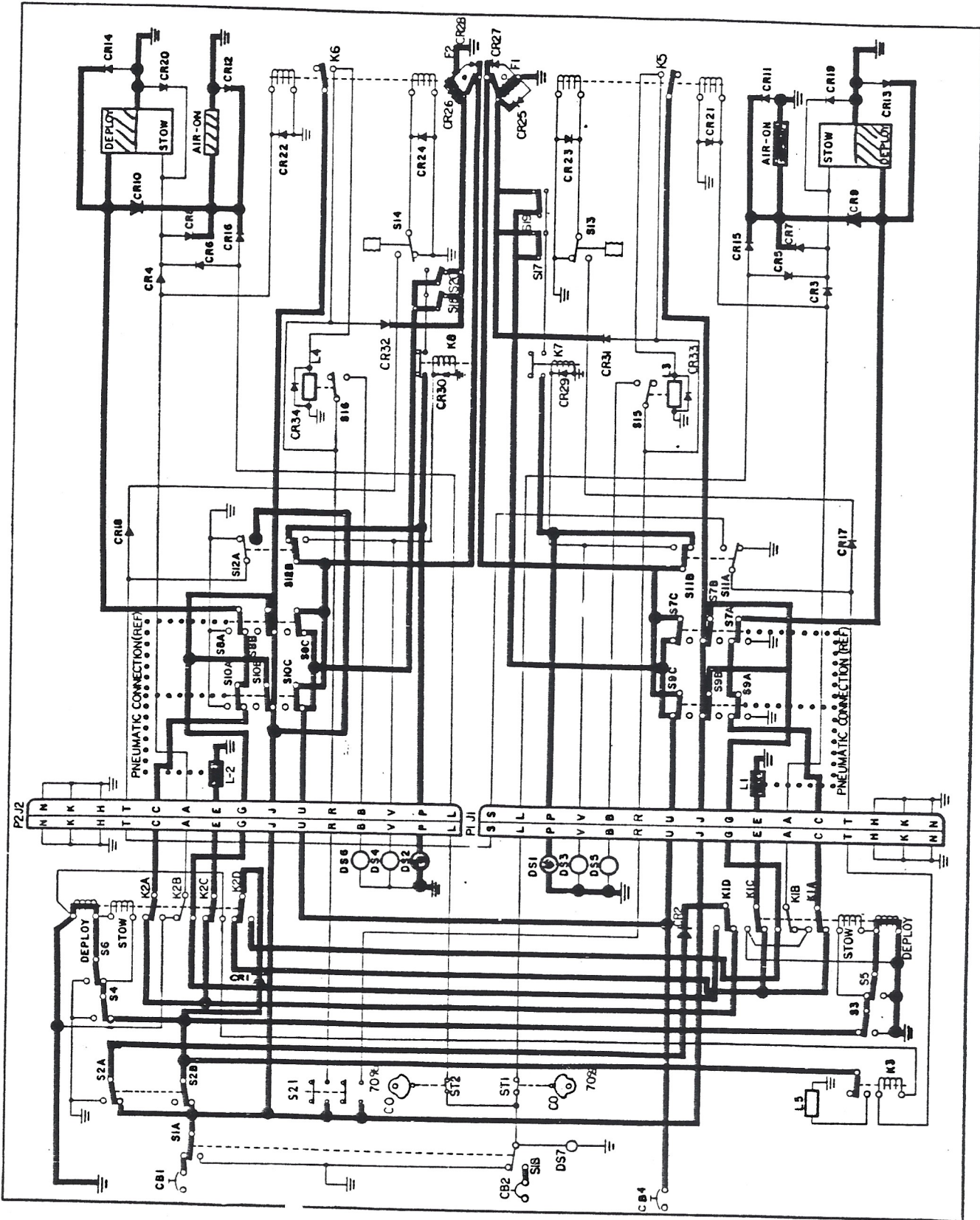


Figure 6, Sheet 1 Electrical Schematic - Deploy Sequence (GLC 35/36)

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MAINTENANCE MANUAL

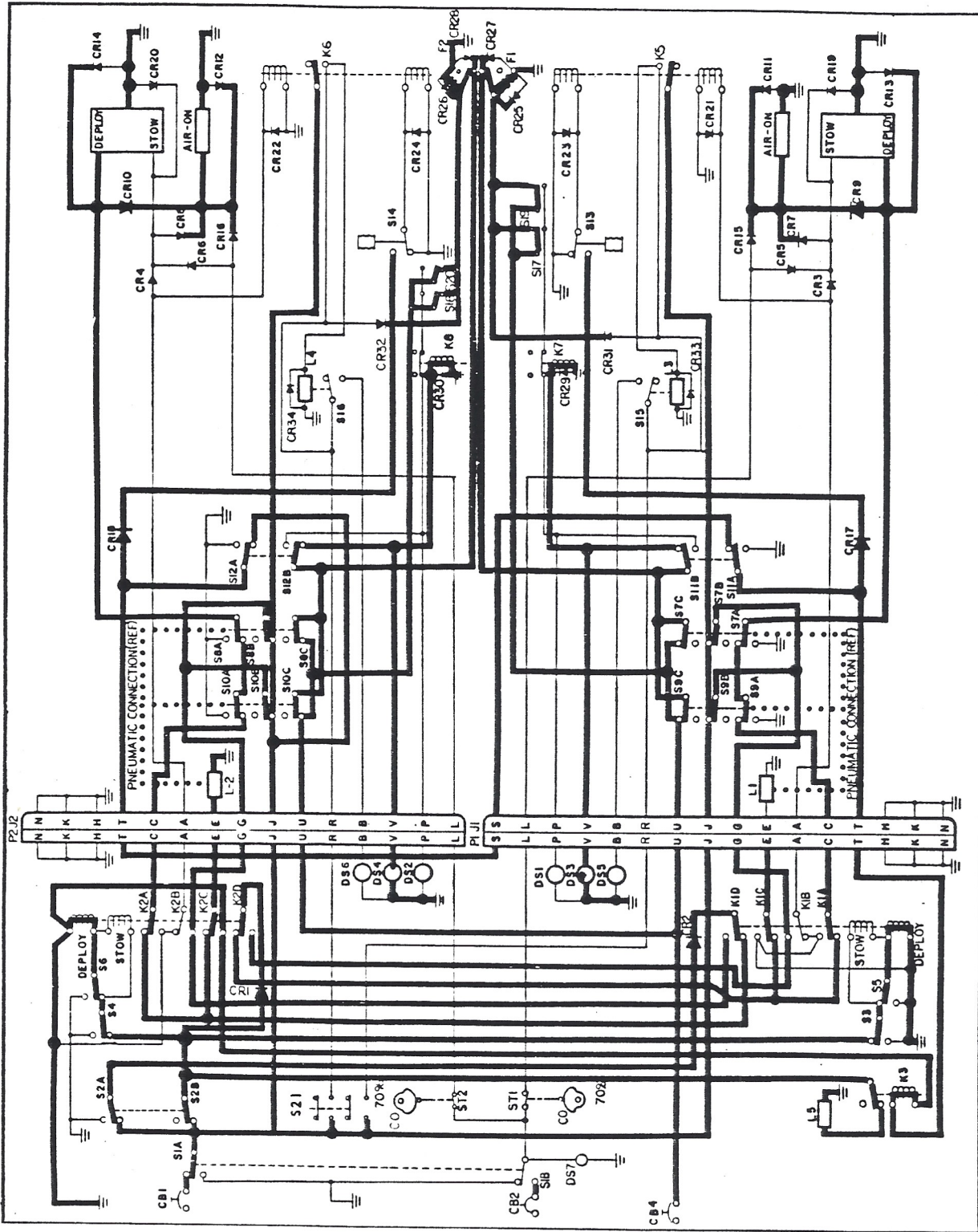


Figure 7, Sheet 1 Electrical Schematic - Fully Deployed (GLC 35/36)

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MAINTENANCE MANUAL

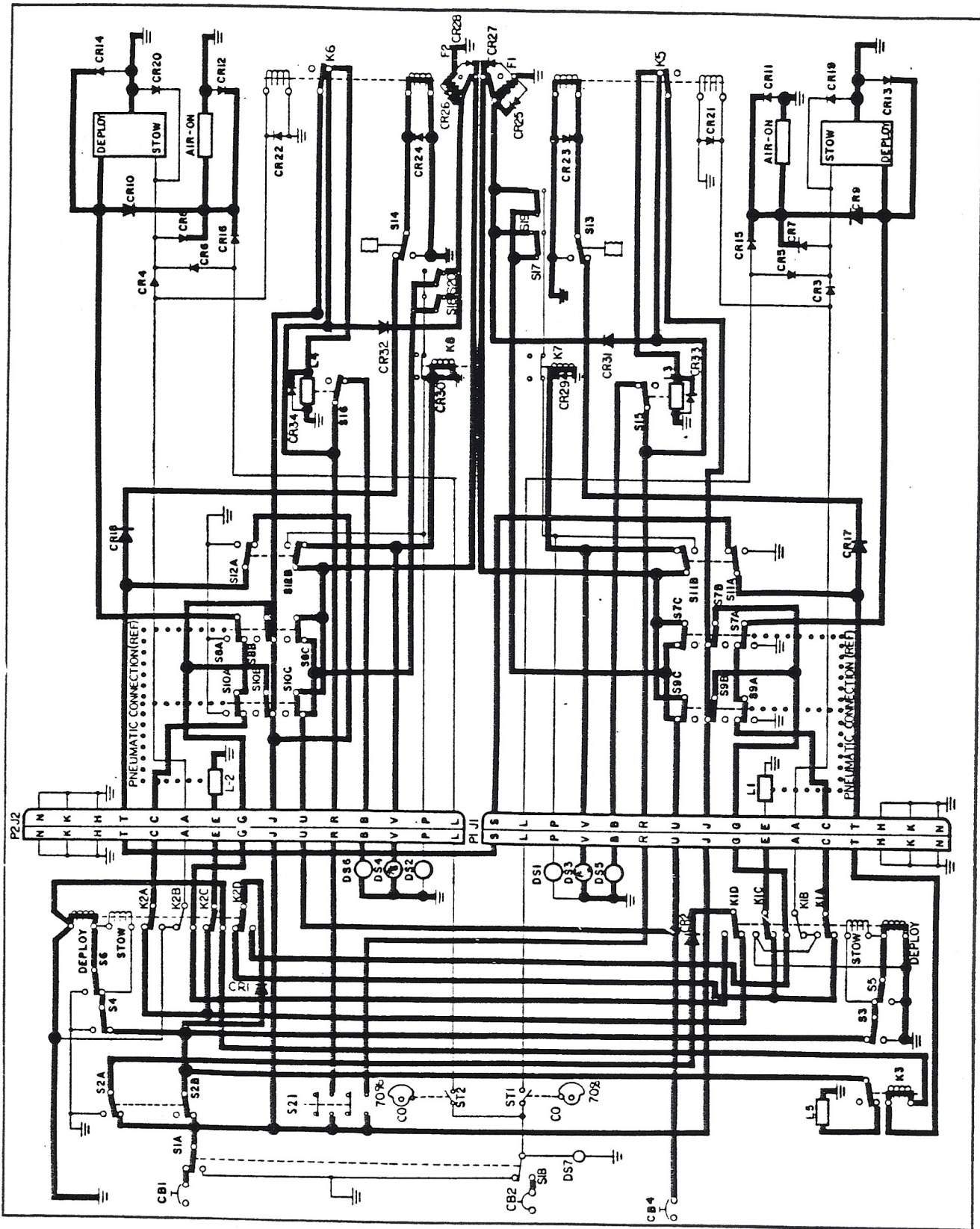


Figure 8, Sheet 1 Electrical Schematic - Full Reverse Power (GLC 35/36)

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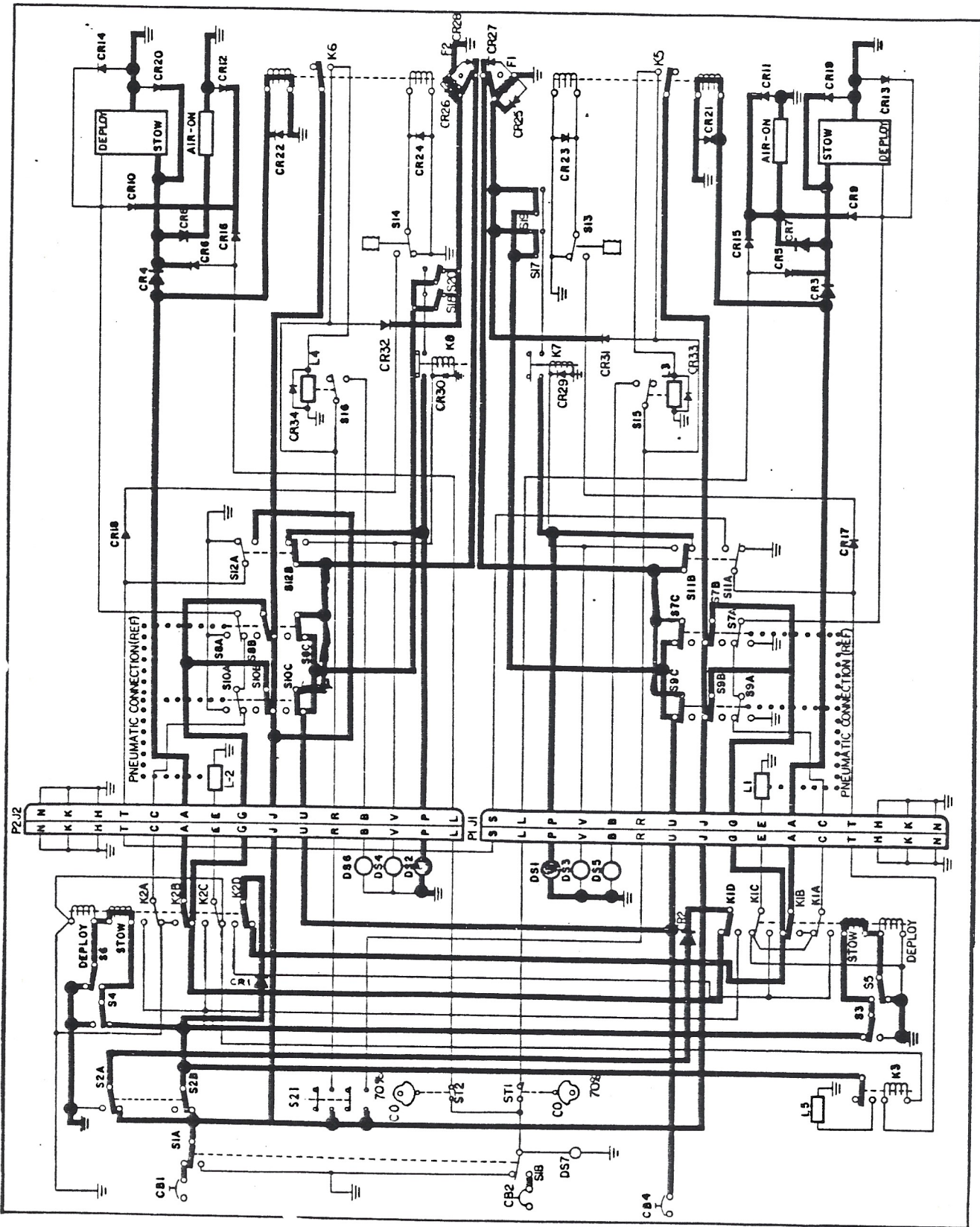


Figure 9, Sheet 1 Electrical Schematic - Stow Sequence (GLC 35/36)

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MAINTENANCE MANUAL

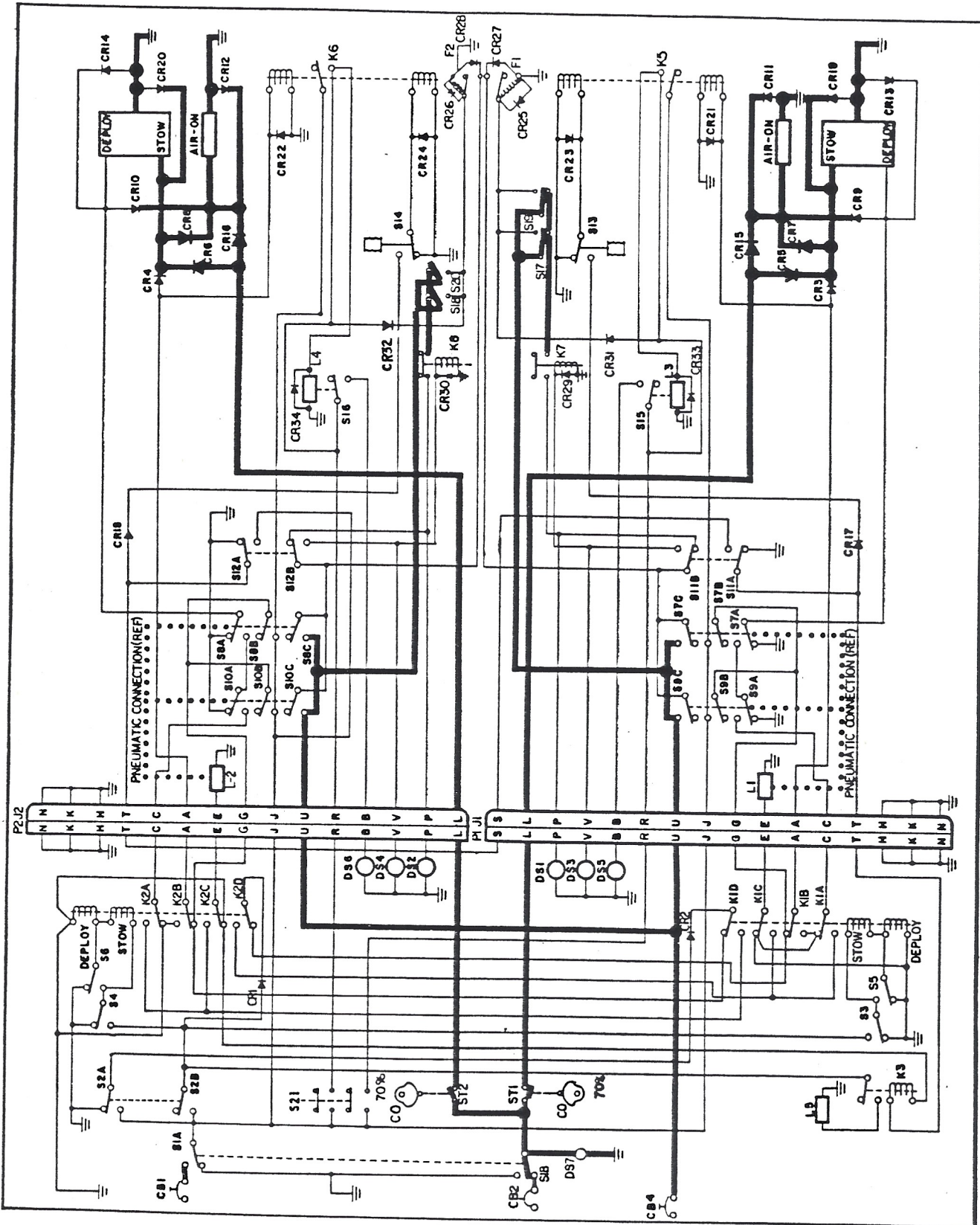


Figure 13, Sheet 1 Electrical Schematic - Emergency Stow (GLC 35/36)