DR 0 | SH A | CONTD. 0B | ELEMENTARY DIAGRAM 902M122YX

# VALUTROL-AW
# HOLD & CLOSE THYRISTOR DRIVE EQUIPMENT FOR FOUR ROPE GRABBING CRANE

MANUFACTURED FOR –

INDEPENDENT SEA TERMINALS LTD

SERIAL Nº. 122N04

INDEX


| | |
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EXISTING CONNECTION DIAGRAM – 117909

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | MF | NGM | | 31-7-81 |

| | | | | |
|---|---|---|---|---|
| 3 | AS COMMISSIONED SEE SHEET 0M 16/4/82 | 2 | AS. SHIPPED SEE SHEET 0M DATE: 16-11-81 | TECHN. / ENG. NGM / APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TITLE PAGE & INDEX

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 0B | 0 | A |

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# VARIABLE SPEED DRIVES OPERATION

## SILCON S DRIVE SYSTEM

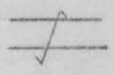
GENERAL NOMENCLATURE

THE FOLLOWING NOMENCLATURE IS NORMALLY USED. PREFIXES OR SUFFIXES MAY BE ADDED TO DESIGNATE A PARTICULAR UNIT, SECTION OR DRIVE OR MERELY TO DIFFERENTIATE BETWEEN SIMILAR DEVICES.

| | |
|---|---|
| A | AMMETER |
| BMC | BLOWER MOTOR CONTACTOR |
| C | CAPACITOR |
| CB | CIRCUIT BREAKER |
| CVE | CONSTANT VOLTAGE EXCITER |
| CVT | CONTROL VOLTAGE TRANSFORMER |
| CT | CURRENT TRANSFORMER |
| DBC | DYNAMIC BRAKING CONTACTOR |
| DBRES | DYNAMIC BRAKING RESISTOR |
| ESR | EMERGENCY STOP RELAY |
| F | SCR MODULE FAULT RELAY |
| FTR | FIELD TRIM RESISTOR |
| FLR | FIELD LOSS RELAY |
| FS | FUSE |
| FC | FORWARD CONTACTOR |
| FR | FORWARD CONTACTOR |
| THSW | HEATSINK THERMAL SWITCH |
| IVT | ISOLATION TRANSFORMER |
| IOC | INSTANTANEOUS OVER CURRENT |
| IOL | INSTANTANEOUS OVER CURRENT RELAY |
| IR | INCH RELAY |
| IFR | INCH FORWARD RELAY |
| IRR | INCH REVERSE RELAY |
| LS | LIMIT SWITCH |
| M | MOTOR |
| MA | AC LINE CONTACTOR OR STARTER |
| MD | DC LOOP CONTACTOR |
| MRH | MOTOR OPERATED RHEOSTAT |
| MTH | MOTOR THERMAL SWITCH |
| OL | OVERLOAD |
| POT | POTENTIOMETER |
| PL | PILOT LIGHT |
| PB | PUSH BUTTON |
| RC | REVERSE CONTACTOR |
| RR | REVERSE RELAY |
| R | RESISTOR |
| REC | RECTIFIER |
| SUP | COIL SUPPRESSION |
| SH | (AMMETER) SHUNT |
| SS | SELECTOR SWITCH |
| TI | TACHO INDICATOR |
| TG | TACHO GENERATOR |
| TR | TIMING RELAY |
| UVR | UNDERVOLTAGE RELAY |
| V | VOLTMETER |
| VR | VOLTAGE SENSING RELAY |

SYMBOLS :-


- SCREENED LEADS


- TWISTED LEADS

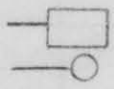

- TERMINAL BOARD JUMPERS

[M] - MOUNTED IN MOTOR

[R] - REMOTE MOUNTED DEVICE

[OS] - DEVICES IN OPERATOR STATION

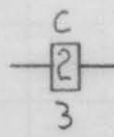
▼ - DENOTES COIL FITTED WITH R-C SUPPRESSOR.


- TERMINALS FOR CUSTOMER CONNECTION

[NC] - NO CONNECTION

[C] - CUBICLE MOUNTED OPERATOR'S CONTROLS AND INDICATORS

● - EQUIPMENT SUPPLIED BY OTHERS



- TERMINAL IN VALVTROL-AW, I.E. 2TB3 IN CLOSE MOTION.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 15/7/81 | ALLENWEST Simplex | NOTES & KEY | | | | IDENT | |
| | | | | | | TECHN. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | | | | | DR | SH |
| | | | | | | ENG. NGM | | GO NUMBER 112N04 | ELEMENTARY DIAGRAM 902M122YX | | CONTD. OC | O | B |
| | | | | | | APPD. | | | | | | | |

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902M122YX SH 3

DR 0 | SH 3 | CONTD. 0D | ELEMENTARY DIAGRAM 902M122YX

DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "0B", THE SECOND SHEET OF DRIVE "0",I.E. THE INTRODUCTORY MATERIAL.

WIRE NUMBERING SYSTEM

WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. 01, 02, 10, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2A04 INDICATES WIRE NUMBER 04 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C.

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

   A) THE BRACKETS ARE ELIMINATED, AND
   B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

   THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

   AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET 0A.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER. THE FULL WIRE NUMBER MAY ALSO BE SHOWN E.G.

1A27 [1B05]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 15/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

NOTES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 112N04 | 902M122YX | 0D | 0 | C |

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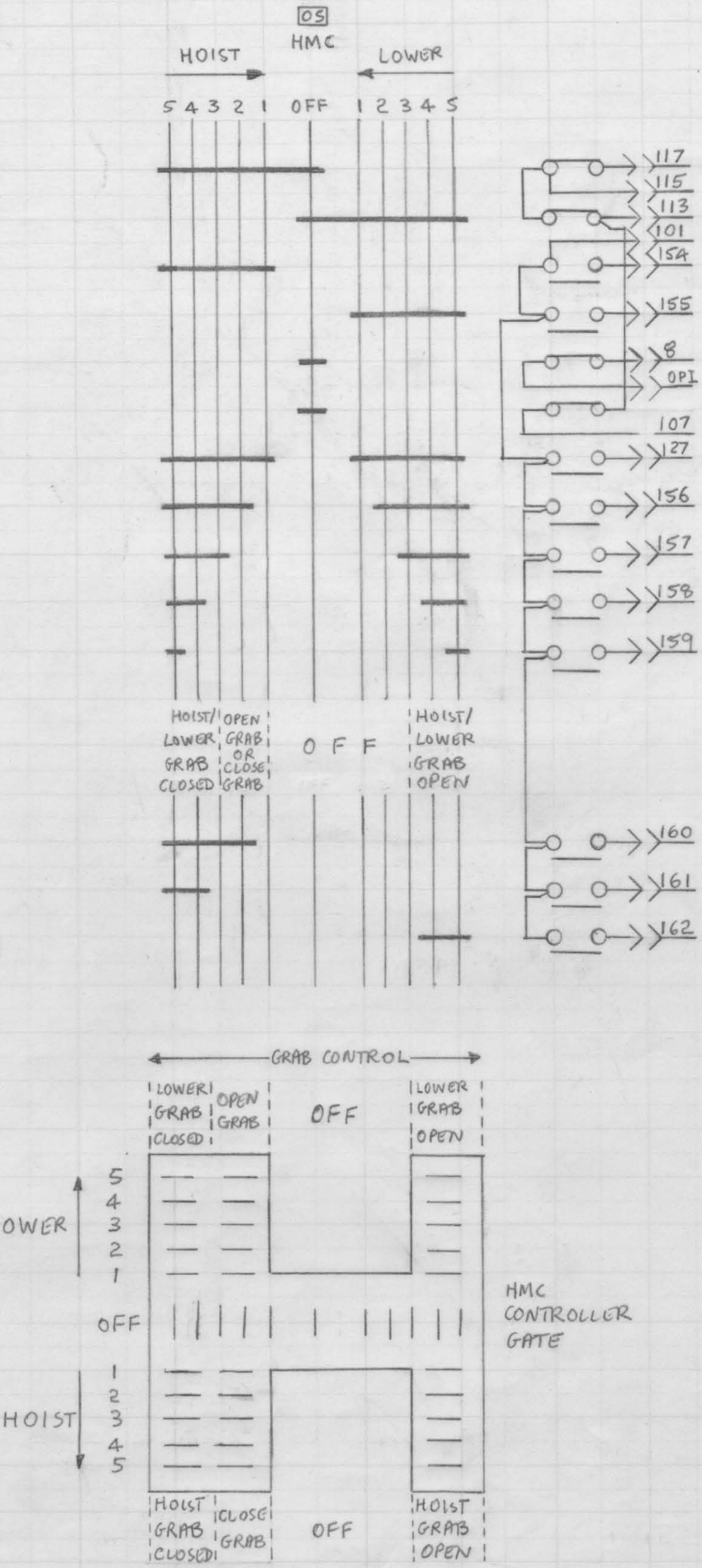


| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 9/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
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VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT
EXISTING
HOLD/CLOSE MASTER CONTROLLER.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 0E | 0 | D |

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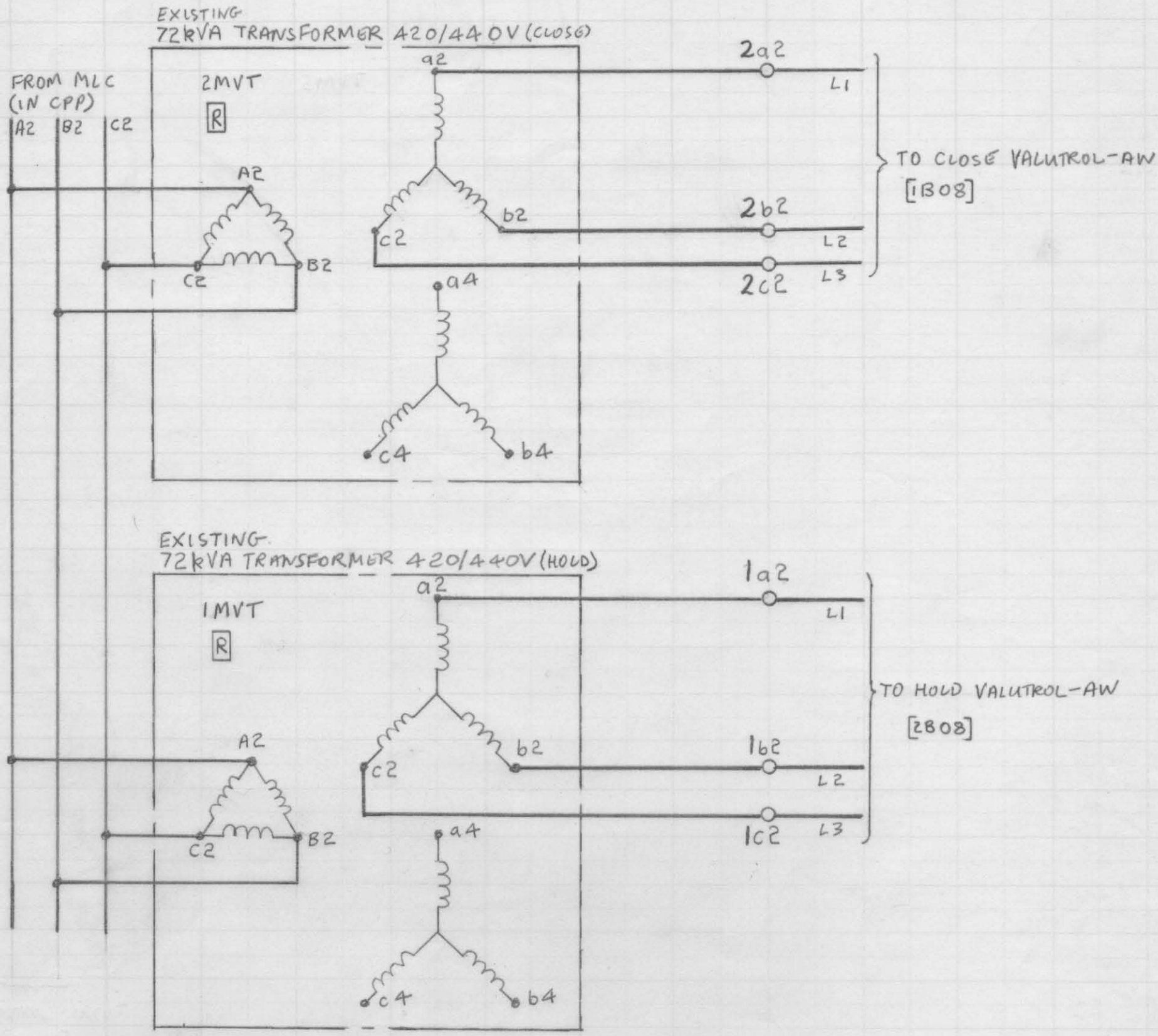


DR O | SH E | CONTD. OF | ELEMENTARY DIAGRAM 902M122YX

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | MF | NGM | | 15/7/81 |

| | | OUTGOING TERM | TECHN. |
|---|---|---|---|
| | 2 | Nº PREFIX ADDED | ENG. NGM |
| | | DATE: 13-11-81 | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT

MAINS & AUX. CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | OF | O | E |

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FROM CPP
31
32
31
32 [0J02]
CPFS 10AMP
CPFS 10AMP
01 420V 02
C 2 27
2CSFs, 2AMP
04
1CSFs, 4AMP
107
03
CVT 500VA
110V
05
CLK
99
HMC(OPI)
OHC
OHH
115
OLC
OLH
117
114
116
C 2 13 SP1
CTHSW
C 2 3
CFLT
C 2 4
06
[TS] HUV
113
HMC(0-5L)
HMC(0-5H)
[TS] HUV 101
H 2 13 SP1
HHSTW
H 2 3
HFLT
H 2 4
07
[03] DCUV
08
[1B] COL
09
[2B] HOL
T2
HCR
MLC
125
IN CPP
126
HUV
HOIST UNDERVOLTAGE RELAY 0F11 0F14, 0J23, 1D32, 2D32
HMC(1-5H) 154
[TS] LR
11
HR
HOIST RELAY 0F22, 0G23 0G33, 0H07 1F10, 2F10
(LLR) RA-1P
C 2 15 SP2
3
HRR
11
C 4 11
SP41
HOIST REFERENCE RELAY 0K04
HMC(1-5L) 155
[TS] HR
12
LR
LOWER RELAY 0F18; 0G25 0G35, 1F11 2F11
(LLR) RB-1P
C 2 16 SP3
14
LRR
21
LOWER REFERENCE RELAY 0K06
HMC(2-5H,2-5L) 156
(LLR) RC-1P
C 2 17 SP4
23
2RR
25
NOTCH 2-5 REFERENCE RELAY 0K15, 0K17
HMC(3-5H,3-5L) 157
(LLR) RA-1R
C 2 18 SP5
3
3RR
11
NOTCH 3-5 REFERENCE RELAY 0K13, 0K15
HMC(4-5H,4-5L) 158
(LLR) RB-1R
C 2 19 SP6
14
4RR
21
NOTCH 4-5 REFERENCE RELAY 0K11, 0K13
HMC(5H,5L) 159
(LLR) RC-1R
C 2 24 SP7
23
5RR
25
NOTCH 5 REFERENCE RELAY 0K07, 0K11
[NS]
[NS]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 9/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

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VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT
HOLD/CLOSE CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 0G | O | F |

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DR 0 | SH G | CONTD. 0H | ELEMENTARY DIAGRAM 902M122YX

[PS] OF04 101

HMC(GRAB CLOSED) 161 — CR — CLOSED RELAY OG15, OG33 0H07

HMC(GRAB OPEN) 162 — OR — OPEN RELAY OG13, OG35 0H03

HMC(1-5H, 1-5L) 127 — C 3 1 — (TDR) RLA-1G 12 CR (PR) — CLOSE RUN PERMISSIVE RELAY OG17

(LLR) RA-1J 3 CRR 11 — CLOSE REF. RELAY 1F03, 1F04

[TS] OR 13 — H 3 1 — (TDR) RLA-1G 12 HR (PR) — HOLD RUN PERMISSIVE RELAY OG27

[TS] CR

(LLR) RA-1J 3 HRR 11 — H 4 SP41 — HOLD REF. RELAY 2F03, 2F04

C 4 4 — [TS] 3 SEC CRPR (RLA-1G)(CLOSE) 5X 3X — [1E] SLA-1E 28 27 — SP38 — C 4 8 — CR UR — CLOSE RUN RELAY. OG19, OG21 1D32

SP37 C 4 7 [TS] CRUR 14 15

[TS] CRUR 16 — C 4 6 SP36 — [1E] SLB-1E (CLOSE) 9 3 — [1F] CBPR — C 3 6 — CBR — CLOSE BRAKE RELAY OJ23

[OF] HR — C 3 7 17

[OJ] CBC 18

[OF] LR

H 4 4 — [TS] HRPR 3 SEC (RLA-1G)(HOLD) 5X 3X — [2E] SLA-1E 28 27 — SP38 — H 4 8 — HR UR — HOLD RUN RELAY OG29, OG31 2D32

SP37 H 4 7 [TS] HRUR 19 20

[TS] HRUR 21 — H 4 6 SP36 — [2E] SLB-1E (HOLD) 9 3 — [2F] HBPR — H 3 6 — HBR — HOLD BRAKE RELAY OJ27

[OF] HR 22 — [TS] CR 23 — H 3 7 — [OJ] HBC 24

[OF] LR — [TS] OR

OF 04 101 [NS] — OF99 [NS]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | MF | NGM | | 10/7/81 |
| 2 | WIRE Nº 127 DESIGNATION ADDED DATE :13-11-81 | | TECHN. | | | |
| | | | ENG. | NGM | | |
| | | | APPD. | | | |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT
HOLD/CLOSE CONTROL.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
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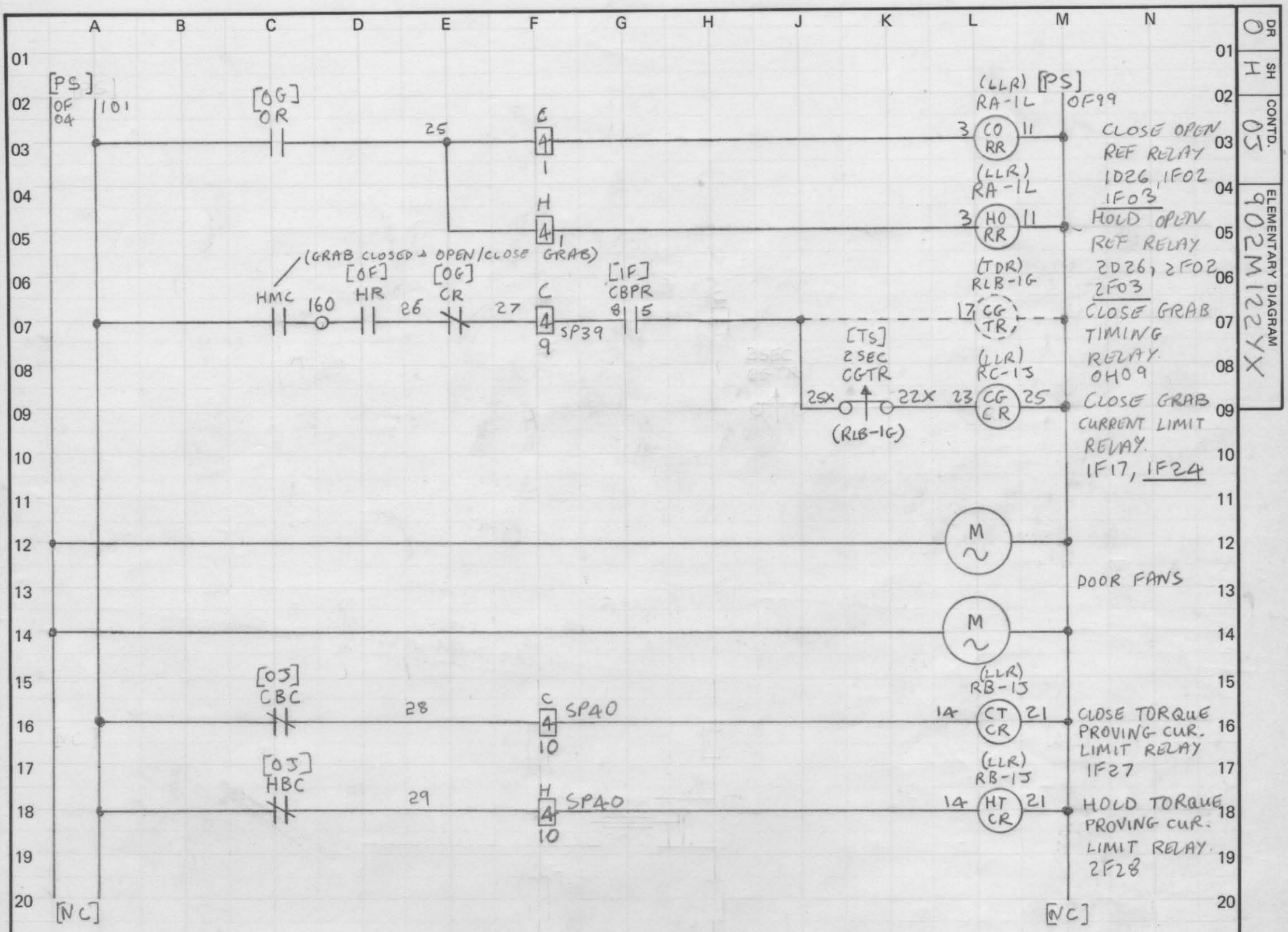


DR 0 | SH H | CONTD. 05 | ELEMENTARY DIAGRAM 902M122YX

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 13/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

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VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT
HOLD/CLOSE CONTROL.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | 05 |

IDENT DR 0 SH H

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DR 0 | SH J | CONTD. OK | ELEMENTARY DIAGRAM 902M122YX

[0F03]

31 — BPFS 20AMP — 01 — 420V — 02 — BPFS 20AMP — 32

BVT, 2KVA — EARTH

265/245V

03 — 10AMP BSFS — 04 — 10AMP BSFS

BSUP

97 — BRECT — 05 — 06 — 99

[TS] CBC — R 220V, 2-5A CLOSE BRAKE — 2B — 2BB — MET — BSUP — [TS] CBC

[TS] HBC — R 220V, 2-5A HOLD BRAKE — 1B — 1BB — MET — BSUP — [TS] HBC

[0F] HUV — 07 — [0G] CBR — 08 — [1B] CMA — 09 — CBC — MET — BSUP

CLOSE BRAKE CONTACTOR 0G24, 0J13 0J13, 0H16

[0G] HBR — 10 — [2B] HMA — 11 — HBC — MET — BSUP

HOLD BRAKE CONTACTOR 0G34, 0J18 0J18, 0H18

DC UV — BSUP

DC UNDER-VOLTAGE RELAY. 0F15

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 13/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT

HOLD CLOSE BRAKE CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
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DR 0 | SH K | CONTD. 0L | ELEMENTARY DIAGRAM 902M122YX

-20V — 2 — R1-1M 2K21 2X — [OF] HRR (RA-1P) 5 6

+20V — 31 — R2-1M 2K21 31X — [OF] LRR (RB-1P) 13 16

[OF] SRR (RC-1R) 26 24

29 — NOTCH 5 SPEED 562R R3-1M — 29X

SET NOTCH 4 SPEED 500R SP4-1M — 19 — 19X — 22X

[OF] ARR (RB-1R) 16 13

27

SET NOTCH 3 SPEED 500R SP3-1M — 25 — 25X

[OF] 3RR (RA-1R) 17 6 5

SET NOTCH 2 SPEED 500R SP2-1M — 27X — 30

[OF] 2RR (RC-1P) 8 26 24

SET NOTCH 1 SPEED 500R SP1-1M — 32X — 32

27

MOUNTED IN CLOSE VALUTROL-AW

A-1S

17X — 10K

18X — 10K

19X

20X

OA1 — 21X

20K

(CLOSE DC COMMON)

SP8 C 2 25 — C 2 27 — [1F02] SPEED REF TO CLOSE

01 — 02

H 2 25 — H 2 27

SP8

(HOLD DC COMMON)

[2F02] SPEED REF TO HOLD

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | MF | NGM | | 15/7/81 |

2 — R1-1M & R2-1M WERE 1K. SET NOTCH SPEEDS WERE 200R. NOTCH SPEED 5 WAS 221R. DATE 13-11-81

TECHN.

ENG. NGM

APPD.

ALLENWEST Simplex GE

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

COMMON EQUIPMENT

HOLD/CLOSE SPEED REFERENCE CIRCUIT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | OL |

IDENT — DR 0 — SH K

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| DR | SH | CONTD. | ELEMENTARY DIAGRAM |
|---|---|---|---|
| 0 | L | 0M | 902M122YX |

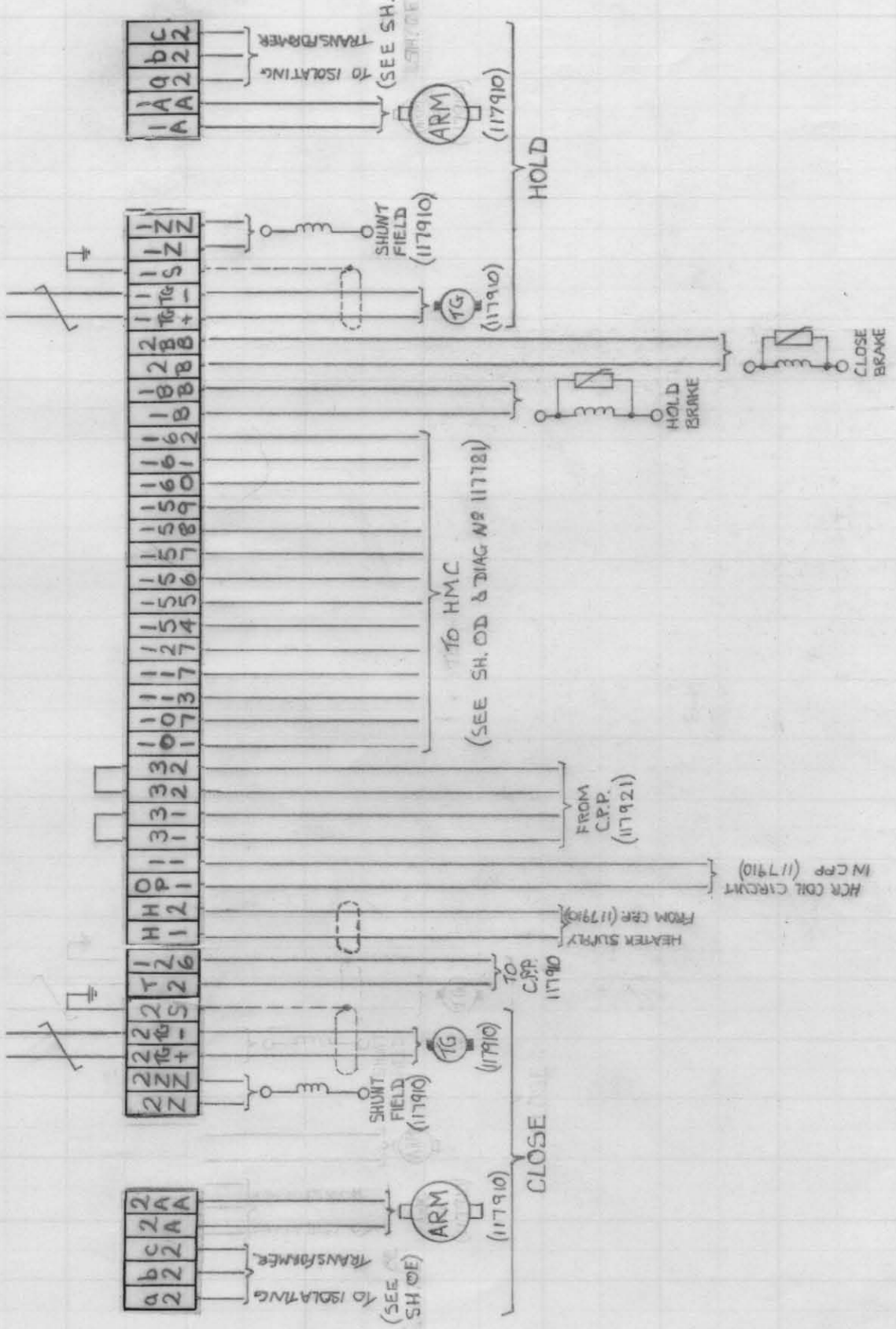


DIAGRAM NUMBERS IN BRACKETS ARE EXISTING CONNECTION DIAGRAMS.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 28-7-81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. MF |
| | | | | | | ENG. N.G.M. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

EXTERNAL CONNECTIONS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 0M | 0 | L |

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902HM1006CY SH3

DR 0 | SH M | CONTD. ON | ELEMENTARY DIAGRAM 902M122YX

RECORD OF ELEMENTARY DIAGRAM CHANGES

| SHEET No. | ISSUE | DATE | LOCATION AND DESCRIPTION OF CHANGE | ISSUED BY |
|---|---|---|---|---|
| OE. | 2 | 13-11-81 | OUTGOING TERMINAL NUMBER PREFIXES ADDED. | M.F. |
| OG | 2 | 13-11-81 | LINE 09 - WIRE Nº 127 DESIGNATION ADDED. | M.F |
| OK | 2 | 13-11-81 | LINES 04 & 06 - R1-1M & R2-1M WERE 1K.<br>LINES 11.13.15 & 17 - SET NOTCH SPEEDS 1-4 WERE 200R.<br>LINE 8 - SET NOTCH SPEED 5 WAS 221R. | M.F |
| ON | 2 | 13-11-81 | LINES 10-14 - DROOP CIRCUIT VALUES ADDED.<br>LINE 31 - TACHOGENERATOR WAS TACHOMETER. | MF |
| 1B | 2 | 13-11-81 | SHUNT FIELD PREFIXES ADDED | MF. |
| 1D | 2 | 13-11-81 | LINE 12 - D1-D2 CONNECTION ADDED. | MF |
| 1G | 2 | 13-11-81 | TDR CODE NUMBER CHANGED TO 193W543ACG02 | MF |
| 1J | 2 | 13-11-81 | LINES 5,6&32 - R1-R3 CHANGED<br>LINES 5,9,12&15 - SET NOTCH SPEEDS 1-4 CHANGED.<br>LINE 34 - CARD PART NR CHANGED TO 909W317AACG63. | MF |
| 2B | 2 | 13-11-81 | SHUNT FIELD PREFIXES ADDED. | MF |
| 2C | 2 | 13-11-81 | LINES 10&11 - 1TG- & 1TG+ ADDED. | MF |
| 2D | 2 | 13-11-81 | LINE 12 - D1-D2 CONNECTION ADDED.<br>LINE 32&34 - H TB DESIGNATIONS WERE C | MF |
| 2G | 2 | 13-11-81 | CARD CODE NUMBERS ADDED. | MF |
| 2H | 2 | 13-11-81 | 1M16X - 1M17, 1E19 - 1E21, 1E13 - 1E17 ADDED | MF. |
| ON<br>1A<br>1D<br>1E<br>1F<br>1J<br>2A<br>2D<br>2E<br>2J | 3 | 16/4/82 | COMMISSIONING MODIFICATIONS | NGM |

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | MF | NGM | | 15/7/81 |

| | | | |
|---|---|---|---|
| 3 | 16/4/82 | 2 | ISSUE 2 DETAILS ADDED.<br>DATE: 16-11-81 |

TECHN.
ENG. NGM
APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

RECORD OF DIAGRAM CHANGES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | ON |

IDENT | DR 0 | SH M

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DR 0 | SH N | CONTD. 1A | ELEMENTARY DIAGRAM 902M122YX

## OPERATING NOTES

## ADJUSTMENTS

CURRENT LIMIT (DIAG. STATIC)

CLOSE MOTOR — REMOVE MCC JUMPER 1LA-DM1 AND ADJUST 'CUR. LIM.' (MCC) FOR CURRENT LIMIT AT CFB = 5V (200%FLC). REFIT JUMPER 1LA-DM1 AND ADJUST 'NORMAL CURRENT LIMIT' (SP7-1M), WITH RELAY RC-1J DE-ENERGISED, FOR CFB = 3·125V (125% FLC)

HOLD MOTOR — SET 'CUR.LIM.' (MCC) FOR CURRENT LIMIT AT CFB = 3·125V (125% FLC)

HOIST & LOWER WITH A CLOSED GRAB.

UNDER THESE CONDITIONS THE TWO MOTORS MUST BE ACCURATELY SPEED MATCHED. THEY MUST ALSO LOAD SHARE (DROOP CIRCUITS ARE PROVIDED FOR THIS PURPOSE), ALTHOUGH IT WILL BE NECESSARY FOR THE CLOSE MOTOR TO TAKE SLIGHTLY MORE THAN HALF THE LOAD IN ORDER TO KEEP THE GRAB CLOSED.

HOIST AND LOWER WITH AN OPEN GRAB.

UNDER THESE CONDITIONS THE TWO MOTORS MUST BE ACCURATELY SPEED MATCHED. ALL THE LOAD OF THE GRAB SHOULD BE TAKEN ON THE HOLD ROPES. IF THE LOAD ON THE CLOSE ROPES EXCEEDS 5% THEN THE GRAB WILL START TO CLOSE. INCREASED DROOP ON THE CLOSE MOTOR IS PROVIDED TO HELP PREVENT THIS HAPPENING.
THE 'MAX NEG(GRAB OPEN)' POT (SP8-1M) ON THE CLOSE MOTION MAY BE ADJUSTED TO FRACTIONLY DECREASE THE CLOSE MOTOR SPEED WHEN HOISTING. SIMILARLY THE 'MAX POS (GRAB OPEN)' POT ON THE HOLD MOTION MAY BE ADJUSTED TO FRACTIONLY DECREASE THE HOLD MOTOR SPEED WHEN LOWERING. BOTH THESE ADJUSTMENTS WILL REDUCE THE TENSION IN THE CLOSE ROPES. OVER-ADJUSTMENT WILL RESULT IN EXCESSIVE SLACK CLOSE ROPES.

OPENING AND CLOSING GRAB

THESE FUNCTIONS ARE PERFORMED BY RUNNING THE CLOSE MOTOR ONLY.
TO FORCE THE GRAB SHUT AND BREAK UP OBSTRUCTIONS THE CLOSE MOTOR CURRENT LIMIT IS INCREASED TO 200% FLC WHEN 'CLOSE GRAB' NOTCHES ARE SELECTED. 200% FLC IS AVAILABLE FOR 4 SECONDS (ADJUSTABLE BY 'TMB' ON TDR-1G) ONLY, EACH TIME 'CLOSE GRAB' NOTCHES ARE SELECTED, TO PREVENT THE CLOSE MOTOR OVERHEATING. CURRENT LIMIT IS THEN REDUCED TO 125%.

SPEED FEEDBACK

SPEED FEEDBACK IS PROVIDED BY MOTOR MOUNTED TACHOGENERATORS. A TACHO-MONITOR IS PROVIDED ON EACH MOTOR FIELD CARD (MFC). THE 'ALIGN' POT SHOULD BE ADJUSTED TO GIVE ZERO VOLTS* AT 'TA' (ON MCC). THE 'SLIM' POT SHOULD BE ADJUSTED TO TRIP THE DRIVE AT SFB = 11·5V (115% SPEED). OVERSPEED AND/OR TRACKING ERROR ARE INDICTATED BY ILLUMINATION OF THE 'OCK' LED ON THE REFERENCE CARD (REF-1D).

SEE INSTRUCTION BOOK FOR OTHER OPERATING NOTES AND ADJUSTMENTS.

NOTE * — WITH DRIVE RUNNING.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | MF | NGM | | 31/7/81 |

| | | | | |
|---|---|---|---|---|
| 3 | 16/4/82 | 2 | DROOP CIRCUIT VALUES ADDED. SPEED FEEDBACK TACHOGENERATOR WAS TACHOMETER DATE 13-11-81 | TECHN. / ENG. NGM / APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

OPERATING NOTES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 1A | 0 | N |

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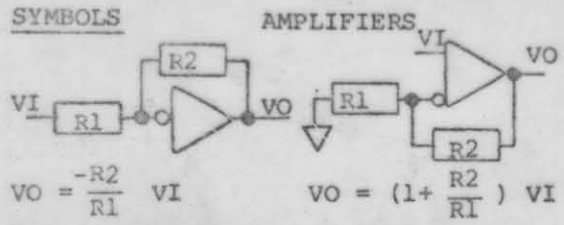
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DAl(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

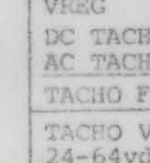
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1+\frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | X | | NONE) |
| 9 - 20v | | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | | | NT-CEMF CC-COM |
| DC TACHO | X | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. | | | |
| 24-64vdc | X | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | X | DGC | D1-D2 (IF USED) |
| INH DRV CL | | MCC | DC1 - COM |
| FUSELESS | | ACC | CFY - CFX |
| TRX IN | X | MCC | RJ - DM8 |
| MOD.REG.CL. | X | MCC | ILA - DM1 |
| INH.CROSSOVER | X | MFC | CMA - COM |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC. | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤|⊤ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERSPEED | X | MFC | TF - DM22 |
| INH.FIELD ECON | X | MCC | FEA - DM4 |
| DRIVER C/L | X | MCC | DCX - DCY |
| | | | |

| | | | | | |
|---|---|---|---|---|---|
| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | CLOSE MOTION CARD JUMPERS | IDENT DR 1 SH A |
| | 3 16/4/82 | TECHN. ENG. NGM APPD. | | GO NUMBER 122N04 ELEMENTARY DIAGRAM 902M122YX CONTD 1B | |

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902HM100EE

BDC 3064R

A B C D E F G H J K L M N

NOTES:-

▲ THESE RESISTORS CRIMPED IN WIRE HARNESS

CFU1, 2 & 3 ARE 1.6A, 500V.

[QE05]

L1 FU1 K1 MA J1 J2

L2 FU2 K2 MA J3 J4

L3 FU3 K3 MA J5 J6

CT PR1:SEC 1:2000

MOV 1 2 3

CF U1 CF U2 CF U3

(BLU/W) 115 VAC (BLU) (R) (Y) (R) (R)

BLK/BLU 440V BLK/W 415V BLK/R 380V BLK/Y 0V BLK 20V

CPT

R1 R1 R1 RT1 RT2 RT3

1FC 1FG 4RC 4RG 2FC 2FG 5RC 5RG 3FC 3FG 6RC 6RG

.22 40Ω SCR (A) MTBA

1RC 1RG 4FC 4FG 2RC 2RG 5FC 5FG 3RC 3RG 6FC 6FG

40Ω .22 SCR (B) MTBB

AIRFLOW UP

SH IP IN DA1

COL OF 15

2AA I/P 2AH

ARM

2A

DC Bus Fuse DA2

R2 R2 DCN DCP

[NS01]

MTBB (LOW) 0 TO 3 FANS DEPENDING ON RATING 1 2

MTBA (H1) 0 TO 3 FANS DEPENDING ON RATING 1 2

50V

PSC AC1 AC2 X1 FX1 1A 2TB 10

RTB X2

MAX 7 4 1

MA B A 0323

FU101 1.5A FU100

REG -30 +30 -20 +20

L1 1FU L2 2FU L3 3FU MFC F1 F2 2Z 2ZZ SHUNT FIELD

-30 Z7 -20 COM +20 +30 Z1 COMX 20

FDR CRM CEMF WFR SA SB SC RF ZF SFB DM21 DM22

SPILLOVER CROSS FMIN FMAX

CURRENT REGULATOR

50/60 HZ SELECT SEE TABLE 1

L/R<.25S SEE TABLE 1

CURRENT SELECT SEE TABLE 1

TACH TF SLIM ALIGN

FAULT OUTPUT

FIELD LOSS FF FLOSS

SFC FC

+20 COM -20 TA SYS

ACC +20 COM -20

J1 J2 1D1 1D2 J3 J4 1D3 1D4 J5 J6 1D5 1D6 FO RO DFP

IL1 IL2 IL3

FIRING LOGIC & PULSE TR'FS

RES

CFX CFY CT CW CY CX CZ

OR

R112 R113 3 PARALLEL FULL WAVE RECTIFIERS

PO ZC TRIP SYS

1FC 1FG 2FC 2FG 3FC 3FG 4FC 4FG 5FC 5FG 6FC 6FG

1RC 1RG 2RC 2RG 3RC 3RG 4RC 4RG 5RC 5RG 6RC 6RG

[1D12] TO CIRCUITS AS SHOWN [NS-05]

[NS16] [NS-35] [NS-13] [NS-34]

| | | | | | |
|---|---|---|---|---|---|
| TECHN: ENG: APPD: | TECHN: ENG: APPD: MF NGM | DATE: 14/7/81 | ALLENWEST VARIABLE SPEED DRIVES OPERATION BRIGHTON. ENGLAND. | CLOSE MOTION MAINS, THYRISTOR FIRING & FIELD CONTROL | IDENT. DR 1 SH 13 |
| | 2 SHUNT FIELD PREFIXES ADDED DATE: 13-11-81 | TECHN: ENG: NGM APPD: | | G.O. NUMBER 122N04 ELEMENTARY DIAGRAM. 902M122YX CONTD: 1C | |

DR 1 SH CONTD: ELEMENTARY DIAGRAM 902M122YX

DR 1 | SH C | CONTD. 1D | ELEMENTARY DIAGRAM 902M122YX

OPENED FOR SOME CONTROL OP.

INSTRUMENT LO HI

(A) [PS-17]

-30V [PS-16]

IFC MAC R STOP + +20V COM -20V PRE PRE COM RN RP

OR AND (+) ABS OA7 CMFA ZSPD

MAX 2 8 MAX A B

RT1 RT2 RT3 ISOLATE & PHASE SHIFT

DCP DCN IN IP (+) (-)(-) (+) ISOLATE ISOLATE (-) (-)

7 3 MAX 6 9 MAX 6 5

APPROX 2.5V AT RATED IABS IA 22

REMOVE IF DC TACH

30 2TG- TG 2TG+ 29

150K 150K TKN TKP TC TC

TACH V SCALING NT NT 47.5K

SEE TABLE 1 PT- PT 47.5K OA3 (-)

56 K

CEMF

(-) ABS OA4 5K IMET 7.3V AT TOP SPEED

(-) ABS OA5 SABS 10K SMET DM13 23

COM CC OA6

(C) TO ME [PS-34] 9

SYS EST FAULT TRIP FALT Ø SEQ FAULT + 20

OA6-2 TFR 18 PUL/REV

OSC 6KHZ

ILO IH1 I RSET RTR FT1 FT2 SMAX TFB CEMF SA SB SC VFB DM11 CFB IPU OSC DM12

3 5 7 4 FLT

B FLT A R CFB

RESET RESET

12 [PS-35]

[NS-09]

MCC MAC WFR TA FC SFB SYS RTR SMAX TFB CEMF VFB DAMP CFB IPU SA SB OSC

PRE RUN JOG DP1 DP2 FEA DFP FET CONTROL LOGIC (SEE NOTE) TO FETS 10V AT TOP SP

READY TO RUN 20K MAX SPEED

5.6V FOR RATED ARM. VOLTS (-) OA8 47.5K COMP

SPILL OVER CLR CLF ILA CUR LIMIT

AT2AT1 10K RECTIFY POLARITY FBI POL 0-0-1-1 27.4K CEMF RJ LIMIT

(+) OA12 20K C52 R257 (TS-28) SFB TL

SPILL OVER ELR ELF ELJ

CLJ R381 CL1 C70

COM SRH 2.2K 20K 332 (2-60SEC) COM GAIN 47.5K

NDE PHASE CONTROL PCR DFP (TS-26)

3.3K 4.75K 4.0K REF SCALE (-) 10K SR CMIN MIN SPEED 1K 1-RUN-1-1 RUN=0

TIR OA10-1 LIN TIME 2.2K 4MFD LT1 OA10-2 47.5K 10V AT TOP SP (-) OA11-2 RERR RLJ DRX

1D1 1D2 1D3 1D4 LINE Z 1D5 1D6 50HZ - 60HZ FO CL-INHRO SEE TABLE TRIP ZC PO

RESP 50K 2.2K 50K 4MFD OA11-1 DR (+) +10V FOR RATED ARMATURE VOLTS

MSW RRB RRA 1-WF-1/0-1 WEAK FIELD=0 FULL FIELD=1 1-0-1-1

0-0-1-1 1-0-0-0 0-0-1-0

28 26 0-0-1-1 (-) 20K JOGR 12K JH COM LT2 RJ 27K 1-JOG-1-1 JOG=0

+30 +20 COM -20 LR DM1 DM2 TR DM3 DM4 DM5 EAO DM6 DM7 DM8 DR

[NS-02] [NS-02] [PS-35] [PS-35]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 14/7/81 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

INTERFACE & MAIN CONTROL PCB'S

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 1D | 1 | C |

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902HM100DX

DR 1 | SH D | CONTD. 1E | ELEMENTARY DIAGRAM 902M122YX

[PS35]

[PS34]

DP2 DP1 RESET

MONO STABLE PG

LOC+ REF

LR FDR FDR

CUR REF

CFB

[PS18]

DIAG RUN +20V

NORM

DIAG STATIC

CRM CRM

MAC +20

-20V COM -20

D2 D1 -20V

DGC

[IB34]

[IC32] MCC(DM4) (FEA)

D1-1M

13 13X

REF-1D

22K1

27X R CFB 22K1

OA2

26X

10K

MCC(DM5)

SET OPEN DROOP 5K SP5-1M

16X 17

21 R8-1M 100K 21X MCC(DM8) (RJ) [IC32].

16

12 9 CORR [OH] (RA-1L)

26 2K R5-1M 26X

14X SET CLOSED DROOP

11X 10K SP6-1M 14

24 1K R6-1M 24X

-30V C 2 1 01 [OF] HUV 02 [OG] CRUR 03 C 2 2 [IC02] (CONTROL ON)

C 2 14 [IC21] (RUN)

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | MF | NGM | | 14/7/81 |

| | | | | |
|---|---|---|---|---|
| 3 | 16/4/82 | 2 | DI-D2 CONNECTION ADDED<br>DATE: 13-11-81 | TECHN.<br>ENG. NGM<br>APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

DIAGNOSTIC & DROOP CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 122N04 | 902M122YX | 1E | | 1 | D |

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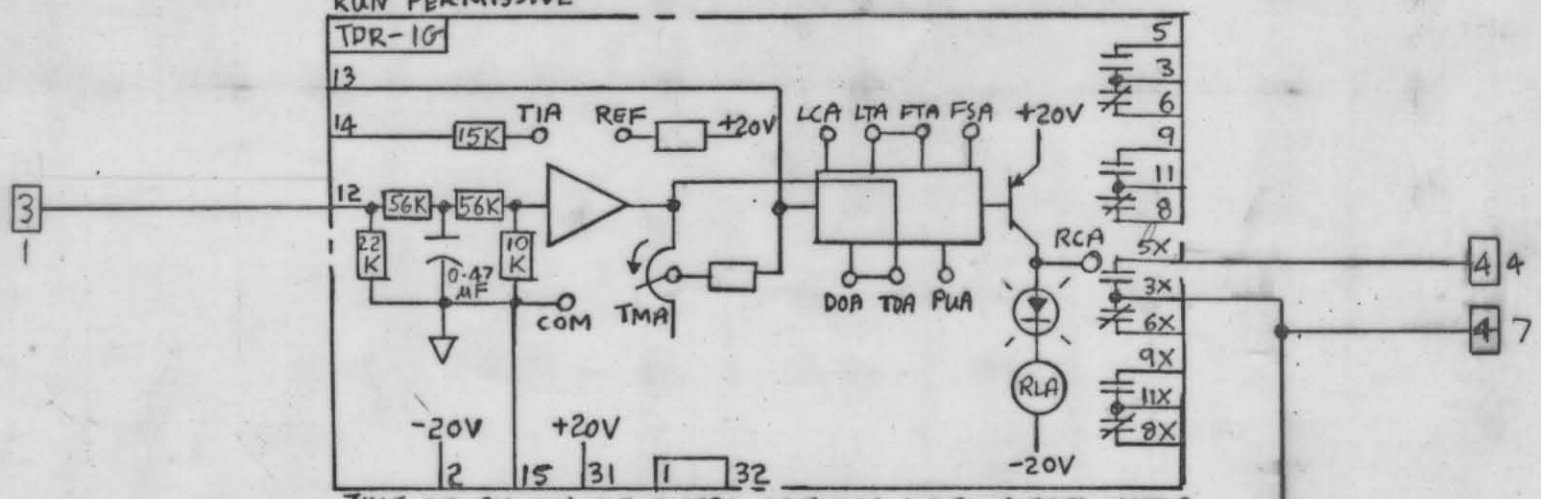
DR 1 | SH E | CONTD. 1F | ELEMENTARY DIAGRAM 902M122YX

RUN PERMISSIVE

TDR-1G

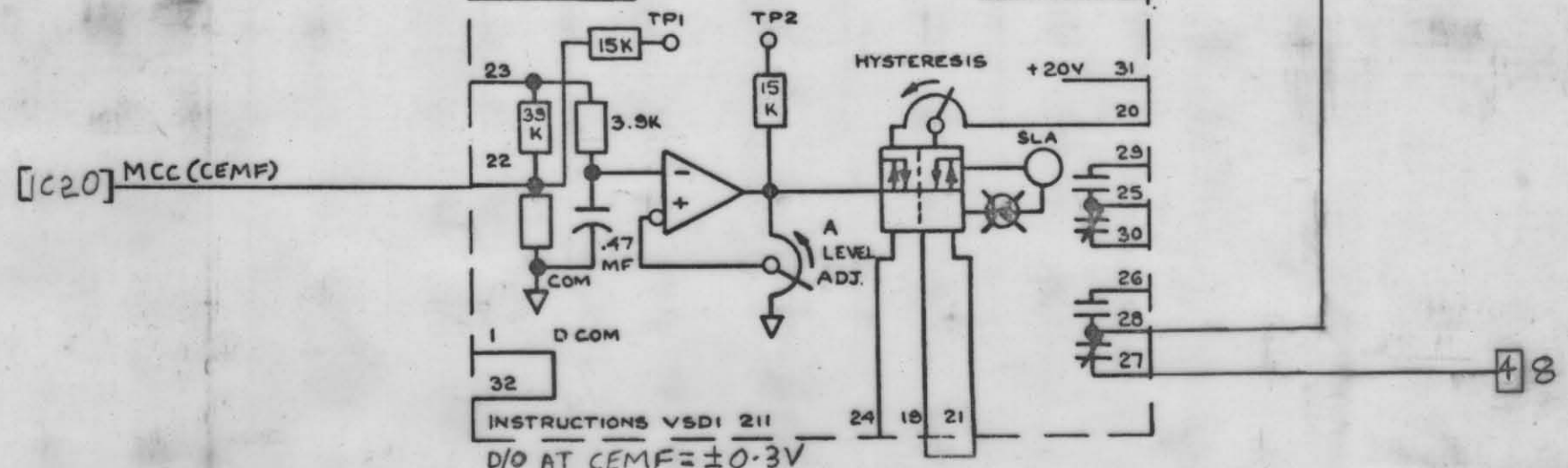



TIME DELAY ON DE-ENERGISATION 1 SEC AFTER MOTOR STOP

ZERO CEMF RELAY

SLD-1E

SLA

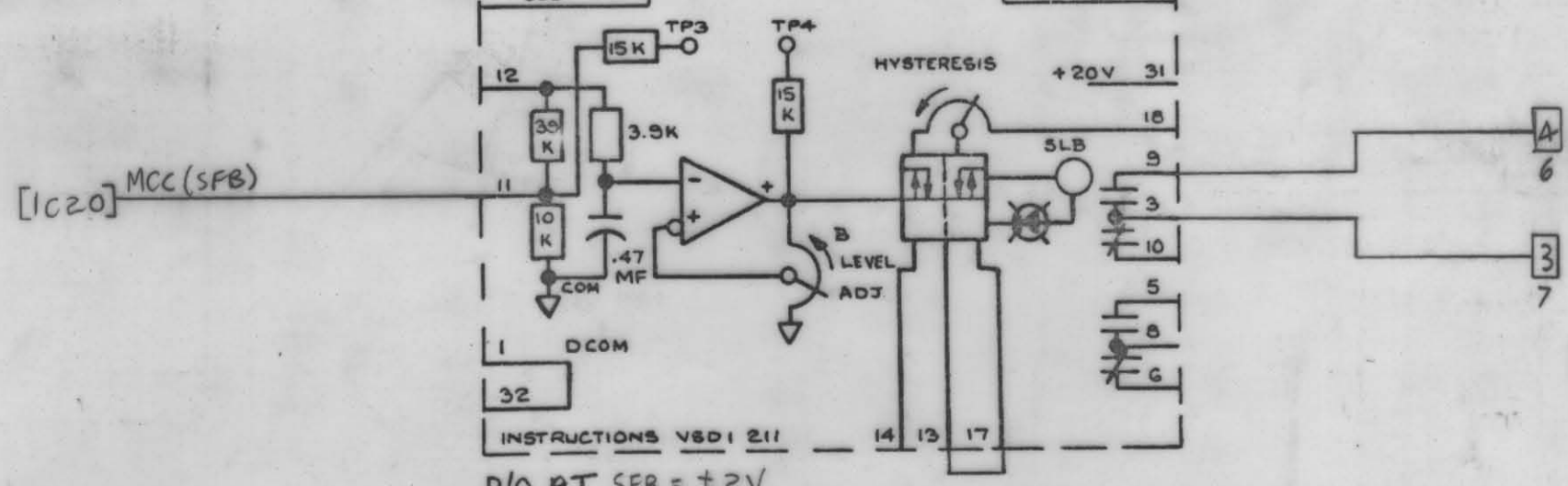



D/O AT CEMF = ±0·3V

BRAKE VOLTAGE RELAY

SLD-1E

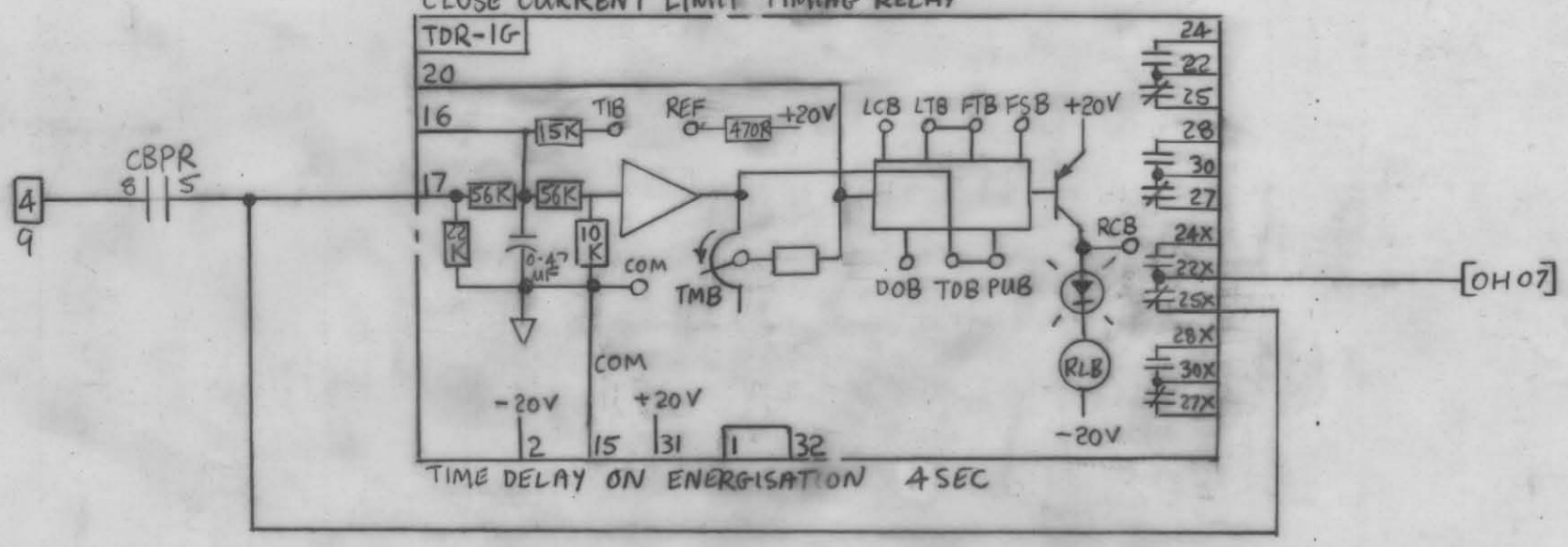
SLB




D/O AT SFB = ±2V

CLOSE CURRENT LIMIT TIMING RELAY

TDR-1G




TIME DELAY ON ENERGISATION 4SEC

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 14/7/81 |
| | | | 3 | | | 16/4/82 |

TECHN.

ENG. NGM

APPD.

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

VOLTAGE & TIMING RELAY CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | 1F |

IDENT

| DR | SH |
|---|---|
| 1 | E |

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902HM100FD

CRANES

DR 1 | SH F | CONTD. 1G | ELEMENTARY DIAGRAM 902M122YX

MAX NEG (GRAB OPEN)

6X 3 6 10K SP8-1M

6 CORR [OH] (RA-1L) 5

8

[OG] CRR (RA-1J)

6 5 MCC (SR) [1C29]

8

[0K25] (SPEED REF)

REF-1D

DIS 10

8X X4

9 X3

8 X2

6 X1

14 PRE

ZERO ADJ 1K

19X 30X 3X

T1

T2

MAXNEG 10K

MAX POS 10K

30 NREF

PREF

5X

SLOW 20K 5

3

[1C21] CGCR (RC-1J) 28 30

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS

MCC(SYS) [1C20]

TF 16

MFC(DM22) (TF) [1B33]

+30V SP45 4 15

01 HR [OF] 02 4 2

03 LR [OF] 4 3

-30V

11 NSW T1

13 PSW T2

10X -30V

+20V 22.1K FEA 18

56K 13X

39K 16X

22K 17X

12

MCC (SFB) [1C20]

[1C33] MCC(DR) R9-1M 221K 7 7X

29 DR

28 CFB

DR INVERT AND MONITOR IR COMP

56.2K

56.2K

47.5K

SFB SHAPING

[1C22] MCC(DM2)

21 10K

26 11X 9X 12X 6X 18X 28X

+20V COM -20V

31 15 2

[1C33] MCC(TR)

TQP-1C

20 TR

29 ATR

[1C32] MCC(LT2)

19 LT2

T1 T3 T6

T2

OA1-1

10K 12.1K TRX 28

MCC(DM8) (RJ) [1C33]

T7 UTP2 6

+20V

LC HC

OR

T6 T7 T2 T3

AND

AND

13

R CFB

30 CFB

27

14 REL

12

ATR(+) AND CFB(+)

ATR(-) AND CFB(-)

OR

AND

10

3 PRE

5 DP2

8 UTP1

PRE (-4V) OR DP2(+20V)

[1C24] MCC(DP2)

330Ω ILR 9

MCC (DM1) (ILA) [1C33]

24 CGCR [OH] (RC-1J)

27

11

8X

1K SP7-1M SET NORMAL CURRENT LIMIT

8

23 R7-1M 825R 23X

13 CTCR [OH] (RB-1J) 16

BR 18

OA1-2

REF DELAY 25K

T1 IMF

TBR

3.92K T17

17 -30V

-30V

15K CBPR

OG21 OH07

+20V COM -20V

31 15 2

22

TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE

NGM

14/7/81

TECHN.

ENG. NGM

APPD.

3 16/4/82

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

REFERENCE & TORQUE PROVING PCB's

GO NUMBER 122N04 | ELEMENTARY DIAGRAM 902M122YX | CONTD. 1G

IDENT | DR 1 | SH F

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| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TQP | REF | SLD | | TDR | | LLR | | LLR | CC | |
| | | 193W 545 AAG01 | 193W 546 AAG01 | 193W 277 AAG02 | | 193W 543 ACG02 | | 193W 279 AAG03 | | 193W 279 AAG03 | 909W 317 AAG63 | |
| | | TORQUE PROVING | REF | SIG LEV DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | SELECT COMP | |

| P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|
| LLR | | LLR | A | | | |
| 193W 279 AAG03 | | 193W 279 AAG03 | 193W 256 AAG02 * | | | |
| LOW LEVEL RELAY | | LOW LEVEL RELAY | AMP | | | |

DR 1 | SH G | CONTD. 1H | ELEMENTARY DIAGRAM 902M122YX

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

NOTE * IF '601' CARD FITTED '1LIM+','1LIM-','2LIM+','2LIM-' MUST BE TURNED FULLY C.W.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ☼ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(-20V) - 1C02 | SP1 - MTBB(TS1) | MTBB(OL1) - 2TB3 | 1G12 - 1J03 |
| RTB(COM) - 1C15 | SP2 - 1P03 | 1G12 - 3TB1 | 1G3X - 1E28 |
| RTB(+20V) - 1C31 | SP3 - 1P14 | 1G5X - 4TB4 | CBPR(5) - 1G17 |
| BUS PINS 2 1C - 1G | SP4 - 1P23 | | 1G17 - 1G25X |
| BUS PINS 15 1C - 1S | SP5 - 1R03 | | 1G22X - 1J23 |
| BUS PINS 31 1C - 1G | SP6 - 1R14 | 1E03 - 3TB7 | 1M02X - 1P05 |
| 1G02 - 1M02 | SP7 - 1R23 | 1L03 - 4TB1 | 1M31X - 1P13 |
| 1M02 - 1S02 | SP8 - 1D19X | 1D11 - 4TB2 | 1M29 - 1P16 |
| 1G31 - 1M31 | SP36 - 1E09 | 1D13 - 4TB3 | 1P16 - 1P06 |
| 1M31 - 1S31 | SP37 - 1E03X | 1C17 - 3TB4 | 1P06 - 1R26 |
| | SP38 - 1E27 | 1C18 - 3TB5 | 1M29X - 1M19 |
| | SP39 - BPR(8) | | 1M19X - 1M25 |
| | SP40 - 1J14 | | 1M22 - 1M27X |
| | SP41 - 1R25 | | 1M27 - 1M32X |
| | | | 1M30X - 1M15 |
| | | | 1M22X - 1R27 |
| | | | 1R24 - 1R16 |
| | SP45 - MCC(+30V) | | 1M25X - 1R17 |
| | | | 1R13 - 1R06 |
| | | | 1M30 - 1R08 |
| | | | 1R05 - 1P26 |

| TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|
| MF | NGM | | 22/7/81 |

2 — TDR CODE Nº WAS AAG02 — DATE : 13-11-81

TECHN.

ENG. NGM

APPD.

ALLEN WEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

MDR LAYOUT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 1H | 1 | G |

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902M1100CY SHT.16

DR 1 | SH H | CONTD. 15 | ELEMENTARY DIAGRAM 902M122YX

CARD RACK WIRE JUMPER TABLE

| | |
|---|---|
| 1M32 – 1P27 | 1M08 – 1M23 |
| 1P24 – 1S20X | 1M23X – 1M15 |
| 1S19X – 1S21X | MCC(DM4) – 1M13 |
| 1S21X – 1D19X | 1M13X – 1M23X |
| 1D30X – 1M06X | 1C30 – 1D27X |
| 1M06X – 1M03 | 1D26X – 1M28 |
| 1M06 – 1L06 | 1M28X – 1M16X |
| 1D30 – 1L08 | 1M16 – 1M26 |
| 1D05X – 1L05 | 1M26X – 1M24X |
| 1L05 – 1J06 | 1M24X – 1M13X |
| 1J08 – 1J15 | 1M17 – 1M21 |
| 1J05 – MCC(SR) | 1M21 – 1L12 |
| MCC(PRE) – 1D14 | 1L12 – MCC(DM5) |
| 1D14 – 1C03 | 1C28 – MCC(DM8) |
| RTB(-30V) – 1D10X | 1M21X – MCC(DM8) |
| MCC(DR) – 1D29 | 1D09X – 1E11 |
| MCC(DM2) – 1D21 | MCC(CEMF) – 1E22 |
| 1D21 – 1J29 | 1E13 – 1E17 |
| 1J28 – 1J15 | 1E19 – 1E21 |
| 1J30 – 1D11X | 1R25 – 1R21 |
| 1D26 – 1D28X | 1R21 – 1R11 |
| MCC(SFB) – 1D09X | 1R11 – 1P11 |
| MFC(DM22) – 1D16 | 1P11 – 1P21 |
| IFC(SYS) – 1D23 | 1P21 – 1P25 |
| MCC(TR) – 1C20 | 1P25 – 1L25 |
| MCC(LT2) – 1C19 | 1L25 – 1L21 |
| RTB(CFB) – 1C30 | 1L21 – 1L11 |
| MCC(DP2) – 1C05 | 1L11 – 1J11 |
| RTB(-30V) – 1C17 | 1J11 – 1J21 |
| 1C09 – 1J16 | 1J21 – 1J25 |
| 1J13 – 1J24 | 1L09 – 1M14X |
| 1J24 – MCC(DM1) | 1M14X – 1M11X |
| 1J27 – 1M11 | 1M14 – 1M24 |
| 1M08X – 1M08 | |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 30/7/81 | ALLENWEST Simplex GE VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | CLOSE MOTION WIRE JUMPER CHART | IDENT DR 1 SH H |
|---|---|---|---|---|---|
| | | TECHN. | | | |
| | | ENG. NGM | | | |
| | | APPD. | | GO NUMBER 122N04 / ELEMENTARY DIAGRAM 902M122YX / CONTD. 1J | |

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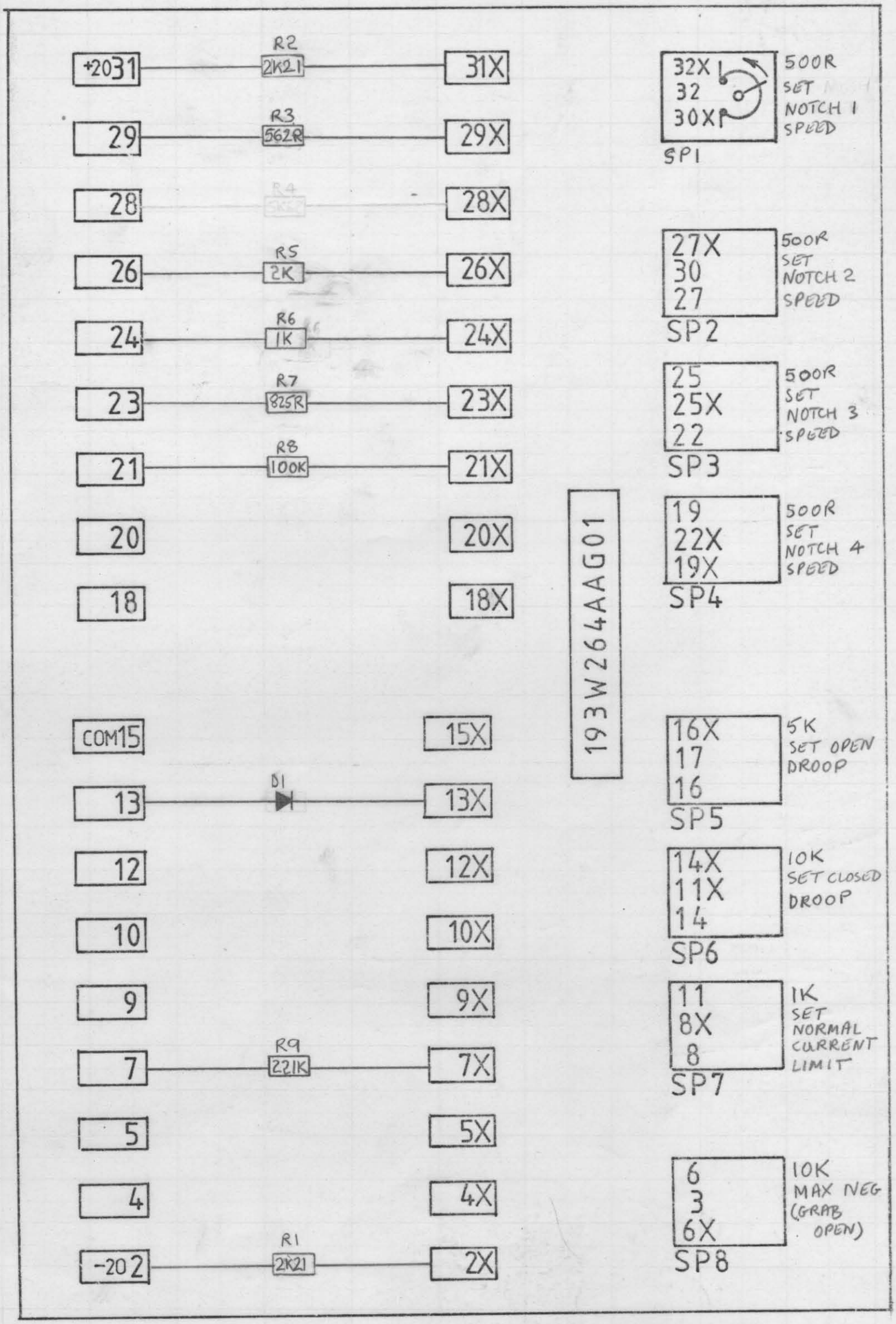
902HM100CY SHT12

DR 1 | SH J | CONTD. 2A | ELEMENTARY DIAGRAM 902M122YX




CARD PART NO. 909W317AAG63 FIT IN RACK POSITION 1M

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | MF | NGM | | 23/7/81 |

| | | | | |
|---|---|---|---|---|
| 3 | 16/2/82 | 2 | R1, R2, R3 CHANGED SET NORM SPEED 1-4 CHANGED CARD PART Nº CHANGED. DATE: 13-11-81 | TECHN. |
| | | | | ENG. NGM |
| | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CLOSE MOTION

COMPONENT CARD LAYOUT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 2A | 1 | J |

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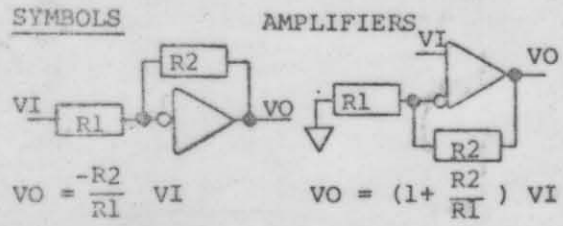
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND

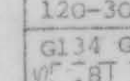



VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [X] - RTBX2

TERMINAL AT T.B.'s



POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | X | | NONE) |
| 9 - 20v | | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | | | NT-CEMF CC-COM |
| DC TACHO | X | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | X | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | X | DGC | D1-D2 (IF USED) |
| INH DRV CL | | MCC | DC1 - COM |
| FUSELESS | | ACC | CFY - CFX |
| TRX. IN | X | MCC | RJ-DM8 |
| MOD.REG.CL. | X | MCC | ILA-DM1 |
| INH.CROSSOVER | X | MFC | CMA-COM |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤⊥⊤ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERSPEED | X | MFC | TF-DM22 |
| INH FIELDECON | X | MCC | FEA-DM4 |
| DRIVER C/L | X | MCC | DCY-DCX |
| | | | |

DR 2 SH A CONTD. 2B ELEMENTARY DIAGRAM 902M122YX

| TECHN. ENG. APPD. | TECHN. | DATE |
|---|---|---|
| 3 16/4/82 | NGM | 14/7/81 |
| | ENG. NGM | |
| | APPD. | |

Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND

HOLD MOTION

CARD JUMPERS

GO NUMBER 122N04 | ELEMENTARY DIAGRAM 902M122YX | CONTD. 2B | IDENT | DR 2 | SH A

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902HM100EE

BDC 3064R

DR 2 | SH B | CONTD: 2C | ELEMENTARY DIAGRAM 902M122YX

NOTES:-

▲ THESE RESISTORS CRIMPED IN WIRE HARNESS

CFU1, 2 & 3 ARE 1.6A, 500V.

[OE16]

L1 FU1 K1 MA J1 J2

L2 FU2 K2 MA J3 J4

L3 FU3 K3 MA J5 J6

CT PR1: SEC 1:2000

MOV 1 2 3

CF U1 CF U2 CF U3

1FC 1FG 4RC 4RG 2FC 2FG 5RC 5RG 3FC 3FG 6RC 6RG

.22 40Ω SCR (A) MTBA

1RC 1RG 4FC 4FG 2RC 2RG 5FC 5FG 3RC 3RG 6FC 6FG

40Ω .22 SCR (B) MTBB

SH IP IN DA1 DA2

HOL DF15

1AA I/P 1AH ARM 1A

.22 40Ω

(BLU/W) 115 VAC (BLU) (R) (Y) (R) CPT

BLK/BLU 440V BLK/W 415V BLK/R 380V BLK/Y 0V BLK 20V

R1 R1 R1 RT1 RT2 RT3

R2 R2 DCN DCP

AIRFLOW UP

[NSO1]

MTBB (LOW) 0 TO 3 FANS DEPENDING ON RATING 1 2

MTBA (HI) 0 TO 3 FANS DEPENDING ON RATING 1 2

50V

PSC AC1 X1 FU101 1A AC2 FX1 2TB 10

X2 RTB X2

MAX 7 4 1 MA B A 0J27

F U 1 0 1 1.5A F U 1 0 0

REG -30 +30 -20 +20

ACC +20 COM -20

J1 J2 1D1 1D2 J3 J4 1D3 1D4 J5 J6 1D5 1D6 FO RO DFP

IL1 IL2 IL3

FIRING LOGIC & PULSE TR'FS

1FC 1FG 2FC 2FG 3FC 3FG 4FC 4FG 5FC 5FG 6FC 6FG

1RC 1RG 2RC 2RG 3RC 3RG 4RC 4RG 5RC 5RG 6RC 6RG

RES

CFX CFY CT CW CY OR

R112 R113 3 PARALLEL FULL WAVE RECTIFIERS

R112 R113 CX CZ PO ZC TRIP SYS

L1 1FU L2 2FU L3 3FU MFC F1 F2 IZ IZZ SHUNT FIELD

FDR CRM CEMF WFR SA SB SC RF ZF SFB DM21 DM22

SPILLOVER CROSS FMIN FMAX

CURRENT REGULATOR

50/60 HZ SELECT SEE TABLE 1

L/R<.25S SEE TABLE 1

CURRENT SELECT SEE TABLE 1

TACH TF SLIM ALIGN

FAULT OUTPUT

FIELD LOSS FF FLOSS

SFC FC

+20 COM -20 TA SYS

-30 R 27 Z -20 R COM R +20 R +30 R 21 Z COMX R 20 Z

[2D12] TO CIRCUITS AS SHOWN [NS-05]

[NS16] [NS-35] [NS-13] [NS-34]

| | | | | | |
|---|---|---|---|---|---|
| TECHN: ENG: APPD: | TECHN: ENG: APPD: MF NGM | DATE: 14/7/81 | ALLENWEST VARIABLE SPEED DRIVES OPERATION BRIGHTON. ENGLAND. | HOLD MOTION MAINS, THYRISTOR FIRING & FIELD CONTROL | IDENT. |
| | 2 SHUNT FIELD PREFIXES ADDED. DATE = 13-11-81 | TECHN: ENG: NGM APPD: | | G.O. NUMBER 122N04 ELEMENTARY DIAGRAM. 902M122YX CONTD: 2C | DR 2 SH B |

DR 2 | SH C | CONTD. 2D | ELEMENTARY DIAGRAM 902M122YX

OPENED FOR SOME CONTROL OP.

INSTRUMENT LO HI

(A) [PS-17]

-30V [PS-16]

IFC +20V COM -20V PRE COM RN RP

MAC R STOP + OR AND

(+) ABS OA7 CMFA ZSPD

MAX 2 8 A B MAX

PRE COM RN RP

RT1 RT2 RT3 DCP DCN IN IP

ISOLATE & PHASE SHIFT

ISOLATE (+) (-) (+)

ISOLATE (-) (-)

APPROX 2.5V AT RATED

7 3 MAX 6 9 MAX 6 5

REMOVE IF DC TACH

30 TG- TG TG+ 29

150K 150K TKN TKP

TACH V SCALING NT NT 47.5K

TC TC SEE TABLE 1 PT- PT 47.5K

CEMF

OA3 (-)

OA6

COM CC

(C) TO ME [PS-34] 9

SYS EST

FAULT TRIP FALT Ø SEQ FAULT

+ 20

ILO IH1 I RSET

RTR FT1 FT2 SMAX TFB CEMF SA SB SC VFB DM11 CFB IPU OSC DM12

RESET RESET R

B FLT A

R CFB

3 5 7 4 FLT

12 [PS-35]

[NS-09]

(-) ABS OA4 IABS IA 22

5K IMET 7.3V AT TOP SPEED

(-) ABS OA5 SABS 23

10K SMET DM13

OA6-2 TFT 18 PUL/REV

OSC 6KHZ

MCC

MAC WFR TA FC SFB SYS RTR SMAX TFB

CEMF VFB (-) DAMP CFB IPU SA SB OSC

5.6V FOR RATED ARM. VOLTS

MAX SPEED

PRE RUN JOG DP1 DP2

FET CONTROL LOGIC (SEE NOTE)

TO FETS READY TO RUN 20K

14

AT2AT1 10K RECTIFY POLARITY

(+) OA12 FBI

(-) OA8 47.5K

47.5K

SPILL OVER CLR CLF ILA

CUR LIMIT

COMP

POL 0-0-1-1

10V AT TOP SP → FEA DFP

20K 27.4K CEMF RJ LIMIT

SPILL OVER ELR ELF

ELJ

CLJ R381 CL1

C70

C52 R257

(TS-28) SFB TL

COM SRH 2.2K 20K 332 (2-60SEC)

3.3K 4.75K 4.0K REF SCALE (-) 10K

TIR OA10-1 LIN TIME

4MFD 10V AT TOP SP (-) 47.5K

LT1 OA10-2 47.5K

GAIN 47.5K

RERR RLJ OA11-2

DRX OA11-1 DR (+) 4MFD

NDE PHASE CONTROL PCR DFP (TS-26)

1D1 1D2 1D3 1D4 LINE Z 1D5 1D6 50HZ - 60HZ FO CL-INH RO SEE TABLE

TRIP 2C PC

28 29 SR 3MIN MIN SPEED 1K 26

1-RUN-1-1 RUN=0

2.2K 0-0-1-0 1-0-0-0

50K 2.2K RESP 50K RRB RRA 4MFD

MSW 1-WF-1/0-1

WEAK FIELD=0 FULL FIELD=1

+10V FOR RATED ARMATURE VOLTS

0-0-1-1 27K

(-) 20K JOGR 12K JH COM

1-JOG-1-1 JOG=0

LT2 RJ

1-0-1-1

+30 +20 COM -20 LR DM1 DM2 TR DM3 DM4 DM5 EAO DM6 DM7 DM8 DR

[NS-02] [NS-02] [PS-35] [PS-35]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | MF | NGM | | 14/7/81 |
| | | 2 | ITG- & ITG+ ADDED | | | |
| | | | DATE: 13-11-81 | TECHN. | ENG. NGM | APPD. |

Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

INTERFACE & MAIN CONTROL PCB's

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 122N04 | 902M122YX | 2D | | 2 | C |

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902HM100DX

DR 2 | SH D | CONTD. 2E | ELEMENTARY DIAGRAM 902M122YX

[PS35]

[PS34]

DP2 DP1 RESET

MONO STABLE PG

LOC+ REF

LR FDR FDR

CUR REF

CFB

[PS18]

DIAG RUN +20V

NORM

DIAG STATIC

CRM CRM

MAC +20

-20V COM -20

D2 D1 -20V

DGC

[2B32]

[2C33] MCC (DM4) (FEA)

D1-1M 13 13X

REF-1D

22K1

27X 22K1

R CFB

OA2

26X

10K

14X

MCC (DM5)

SET CLOSED DROOP 2K SP6-1M

11X

R3-1M 100K 26 26X MCC (DM8) (RJ) [2C33].

14

12 10 HORR [OH] (RA-1L)

28 1K5 R2-1M 28X

16X 17 SET OPEN DROOP 16 SP5-1M

10K

-30V H 2 1

[OF] HUV

[OG] HRUR

H 2 2 [2C02] (CONTROL ON)

H 2 14 [2C21] (RUN)

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECHN. ENG. APPD. NGM | | TECHN. MF ENG. NGM APPD. | | DATE 14/7/81 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOLD MOTION DIAGNOSTIC & DROOP CIRCUITS | | | | | IDENT | | |
| 3 | 16/4/82 | 2 | D1-D2 CONNECTION ADDED. H-TB's WERE C DATE = 13-11-81 | TECHN. | | GO NUMBER 122N04 | ELEMENTARY DIAGRAM 902M122YX | CONTD. 2E | | | DR 2 | SH D | |
| | | | | ENG. NGM | | | | | | | | | |
| | | | | APPD. | | | | | | | | | |

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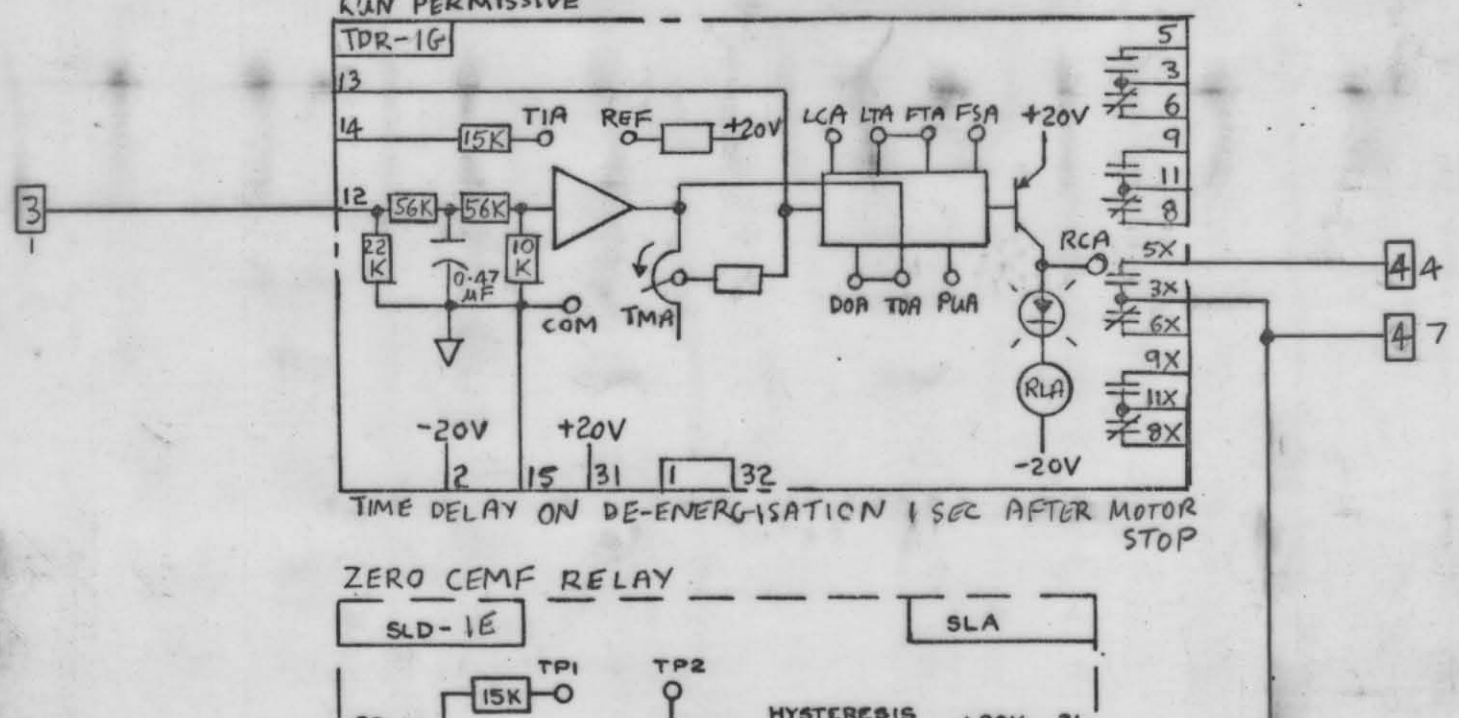
902HM100FE

CRANES

DR 2 | SH 4E | CONTD. 2F | ELEMENTARY DIAGRAM 902M122YX

RUN PERMISSIVE

TDR-1G

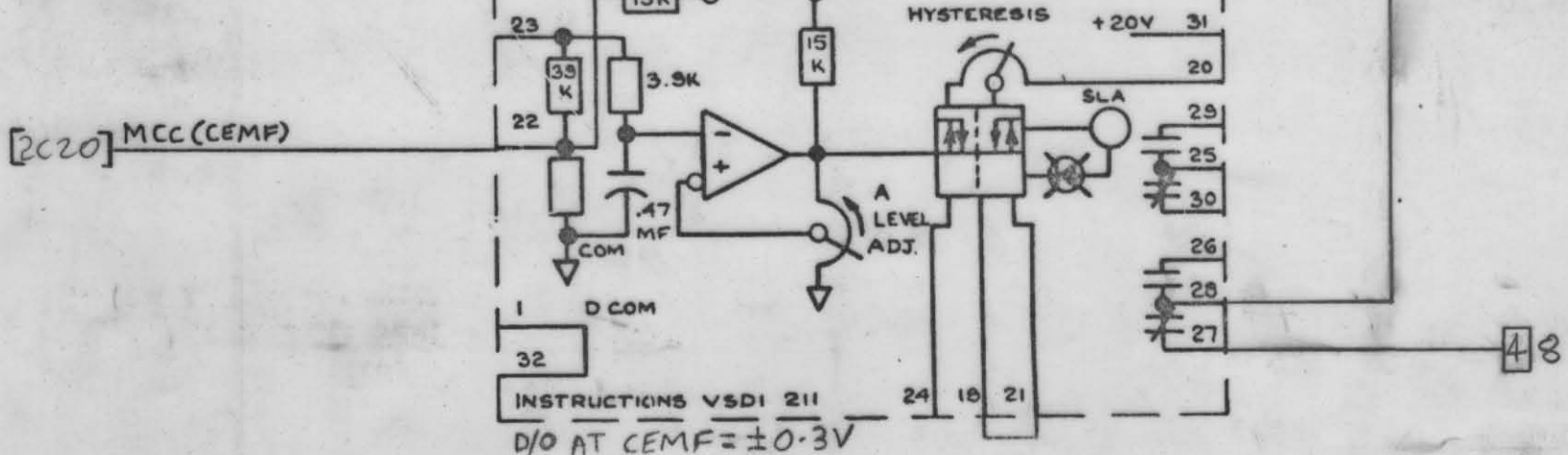



TIME DELAY ON DE-ENERGISATION 1 SEC AFTER MOTOR STOP

ZERO CEMF RELAY

SLD-1E

SLA

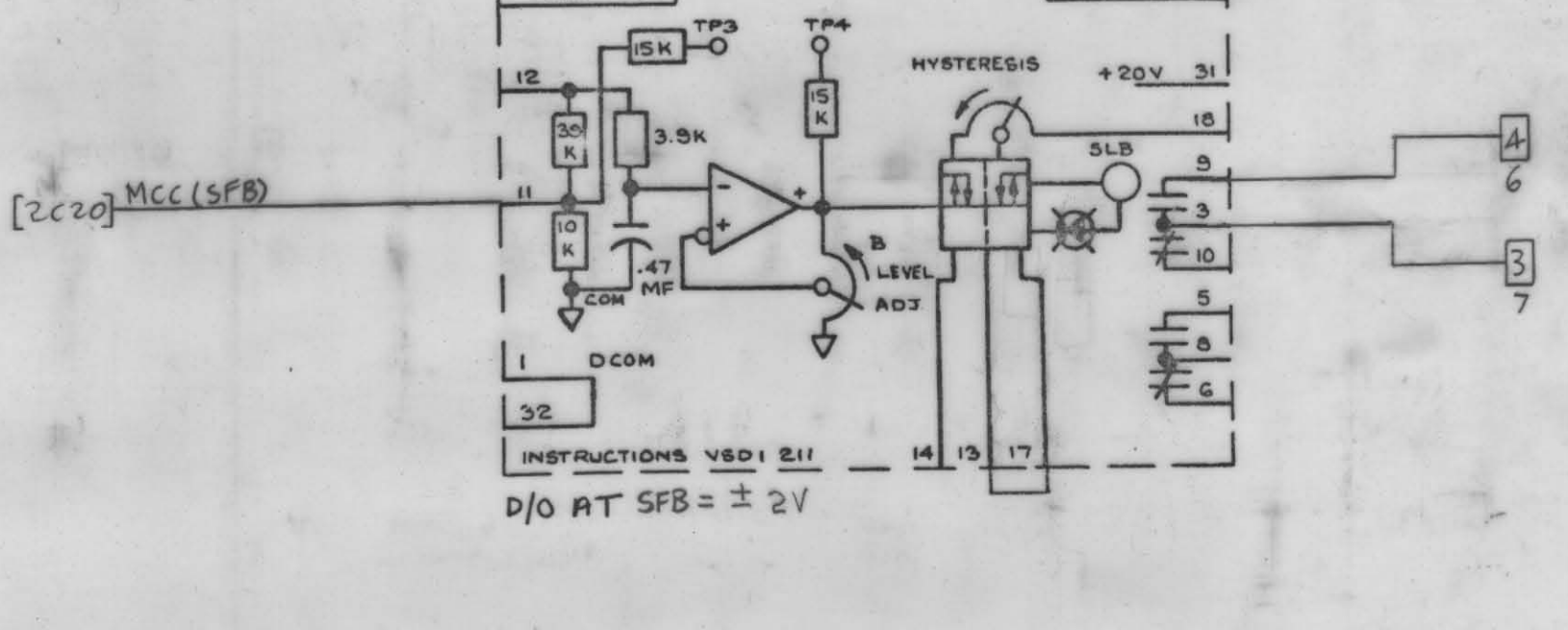



D/O AT CEMF = ±0.3V

BRAKE VOLTAGE RELAY

SLD-1E

SLB




D/O AT SFB = ± 2V

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 14/7/81 |
| | | | 3 | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | 16/4/82 | | | APPD. |

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

VOLTAGE & TIMING RELAY CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 2F | 2 | E |

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902HM100FD

CRANES

DR 2 | SH F | CONTD. 2G | ELEMENTARY DIAGRAM 902M122YX

[0K32] (SPEED REF)

MAX POS (GRAB OPEN) 10K SP8-1M 6X 3 6

HORR [0H] 6 5 8

[0G] HRR 6 5 8 MCC (SR) [2C29]

REF-1D DIS 10

8X X4 9 X3 8 X2 6X1 ZERO ADJ 1K

19X 30X 3X T1 T2

MAXNEG 10K MAXPOS 10K NREF PREF

30 5X 3 SLOW 20K 5

[2C21] MCC(PRE) 14 PRE

+30V SP45 4 15 01 HR [0F] 02 4 2 LR [0F] 03 4 3 -30V

11 NSW T1 13 PSW T2 10X -30V

MONITOR PRECONDITION COMPARE

LATCH TRACKING ERROR OR OVERVOLTAGE 23 SYS

MCC(SYS) [2C20]

TF 16 MFC(DM22) (TF) [2B33]

+20V 22.1K FEA 18

56K 13X 39K 16X 22K 17X 12

+20V COM -20V 31 15 2

[2C33] MCC(DR) 29 DR DR INVERT AND MONITOR IR COMP 28 CFB

[2C33] MCC(DM2) 21 10K

56.2K 56.2K 4.75K SFB SHAPING

26 11X 9X 12X 6X 18X 28X

MCC(SFB) [2C20]

[2C33] MCC(TR)

TQP-1C 20 TR 29 ATR

[2C32] MCC(LT2) 19 LT2 T1 T3 T6 OA1-1 T2

10K 12.1K TRX 28 MCC(DM8) (RJ) [2C33]

T7 UTP2 6

+20V LC HC

13 OR T6 T7 T2 T3

R CFB 30 CFB ATR(+) AND CFB(+) OR AND

27 14 REL 12 ATR(-) AND CFB(-) OR AND AND

10

3 PRE PRE (-4V) OR DP2(+20V)

[2C24] MCC(DP2) 5 DP2 8 UTP1

[0H] HTCR (RB-13) 16 13 MCC(DM1) (ILR) [2C33]

330Ω ILR 9 BR 18

OA1 -2 REF DELAY 25K T1 IMF TBR 3.92K T17 17 -30V

15K HBPR 0G31 3 5 A B 3 4 3 6 3 7

-30V

+20V COM -20V 31 15 2 22

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 14/7/81 | TECHN. | ENG. NGM | APPD. |
|---|---|---|---|---|---|---|---|---|---|

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

REFERENCE & TORQUE PROVING PCB's

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 122N04 | 902M122YX | 2G | 2 | F |

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| TQP | REF | SLD | | TDR | | LLR | | LLR | CC |
|---|---|---|---|---|---|---|---|---|---|
| 193W | 193W | 193W | | 193W | | 193W | | 193W | 909W |
| 545 | 546 | 277 | | 543 | | 279 | | 279 | 317 |
| AAG01 | AAG01 | AAG02 | | AAG02 | | AAG03 | | AAG03 | AAG62 |
| TORQUE PROVING | REF | SIG LEV DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | SELECT COMP |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(-20V) - 1C02 | SP1 - MTBB(TS1) | MTBB(OL1) - 2TB3 | 1G12 - 1J03 |
| RTB(COM) - 1C15 | SP2 | 1G12 - 3TB1 | 1G03X - 1E28 |
| RTB(+20V) - 1C31 | SP3 | 1G05X - 4TB4 | MCC(DM4) - 1M13 |
| BUS PINS 2 1C - 1G | SP4 | 1E03 - 3TB7 | 1M13X - 1M15 |
| BUS PINS 15 1C - 1M | SP5 | 1L03 - 4TB1 | RTB(CFB) - 1D27X |
| BUS PINS 31 1C - 1G | SP6 | 1D11 - 4TB2 | 1D26X - 1M29 |
| 1G02 - 1M02 | SP7 | 1D13 - 4TB3 | 1M29X - 1M14X |
| 1G31 - 1M31 | SP8 - 1D19X | 1C17 - 3TB4 | 1M14 - 1M28 |
| | SP36 - 1E09 | 1C18 - 3TB5 | 1M28X - 1M16 |
| | SP37 - 1G03X | | 1M16 - 1M13X |
| | SP38 - 1E27 | | 1M11X - 1M26 |
| | SP39 | | 1M26 - 1L12 |
| | SP40 - 1J14 | | 1L12 - MCC(DM5) |
| | SP41 - 1L25 | | 1L10 - 1M16X |
| | | | 1M26X - MCC(DM8) |
| | | | MCC(CEMF) - 1E22 |
| | | | MCC(SFB) - 1E11 |
| | SP45 - MCC(+30V) | | MCC(PRE) - 1D14 |
| | | | 1D14 - 1C03 |
| | | | RTB(-30V) - 1D10X |
| | | | MCC(DR) - 1D29 |

| TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|
| MF | NGM | | 22/7/81 |

2 CODE NUMBERS ADDED. DATE: 13-11-81

TECHN.

ENG. NGM

APPD.

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

MOR LAYOUT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | 2H |

IDENT

DR 2 SH 6

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902HM100CY SHT.1

DR 2 | SH H | CONTD. 2J | ELEMENTARY DIAGRAM 902M122YX

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| MCC(DM2)-1D21 | | | | |
| 1D26—1D28X | | | | |
| 1E11-1D09X | | | | |
| MFC(DM22)-1D16 | | | | |
| IFC(SYS)-1D23 | | | | |
| 1D03X-1M06X | | | | |
| 1M06X-1M03 | | | | |
| 1M06-1L06 | | | | |
| 1D05X-1L08 | | | | |
| 1D30-1J06 | | | | |
| 1J06-1L05 | | | | |
| 1J08-1J15 | | | | |
| 1J05—MCC(SR) | | | | |
| MCC(TR)-1C20 | | | | |
| MCC(LT2)-1C19 | | | | |
| 1D27X-1C30 | | | | |
| MCC(DP2)-1C05 | | | | |
| MCC(DM8)-1C28 | | | | |
| 1C09-1J16 | | | | |
| 1J13-MCC(DM1) | | | | |
| RTB(-30V)-1C17 | | | | |
| 1L25-1L21 | | | | |
| 1L21-1L11 | | | | |
| 1L11-1J11 | | | | |
| 1J11-1J21 | | | | |
| 1J21-1J25 | | | | |
| 1M16X-1M17 | | | | |
| 1E19-1E21 | | | | |
| 1E13-1E17 | | | | |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | MF | NGM | | 31/7/81 |

2 — 1M16X—1M17, 1E19-1E21, 1E13-1E17 — DATE: 16-11-81

TECHN.

ENG. NGM

APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

WIRE JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 122N04 | 902M122YX | 2J |

IDENT

DR 2 | SH H

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SO2HM100CY SHT:2

DR 2 | SH J | CONTD. FL | ELEMENTARY DIAGRAM 902M122YX

+20 31

29 — R1 4K75 — 29X

28 — R2 1K5 — 28X

26 — R3 100K — 26X

24 — 24X

23 — 23X

21 — 21X

20 — 20X

18 — 18X

COM 15 — 15X

13 — D1 — 13X

12 — 12X

10 — 10X

9 — 9X

7 — 7X

5 — 5X

4 — 4X

-20 2 — 2X

31X

32X
32
30X

193W264AAG01

27X
30
27
SP2

25
25X
22
SP3

19
22X
19X
SP4

16X
17
16
SP5
10K SET OPEN DROOP

14X
11X
14
SP6
2K SET CLOSED DROOP.

11
8X
8
SP7

6
3
6X
SP8
10K MAX POS (GRAB OPEN)

CARD PART NO. 909W317AAG62 FIT IN RACK POSITION 1M

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 23/7/81 |
| | | | 3 | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | 16/4/82 | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOLD MOTION

COMPONENT CARD LAYOUT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 122N04 | 902M122YX | FL | | 2 | J |

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# VALUTROL-AW BDC 3064R THYRISTOR DRIVES FOR HOIST & LUFF MOTIONS FOR 9·6/20 TONNE FOUR ROPE GRAB/ CARGO CRANE

SIMPLEX-GE REF 233900

MANUFACTURED FOR :-

STOTHERT & PITT PLC,
BATH
REF - 34/1470 (ABERDEEN)

## INDEX


| | | |
|---|---|---|
| NOTES | — | OB |
| RECORD OF DIAGRAM CHANGES | — | OC |
| OPERATING NOTES | — | OD-OE |
| HOIST MOTIONS | — | 1A-1V |
| LUFF MOTION | — | 2A-2J |


## ASSOCIATED DIAGRAMS

| | | |
|---|---|---|
| SIMPLIFIED CRANE DRIVE SCHEMATIC | — | 906P118CY |
| AC & DC MAINS, MACHINES, BRAKES ETC, SCHEMATIC | — | 1/8/233900/SCH1 |
| AC AUX & HOIST CONTROL SCHEMATIC | — | 1/8/233900/SCH2 |
| LUFF, SLEW, & TRAVEL CONTROL | — | 1/8/233900/SCH3 |
| BLOCK DIAGRAM | — | 3/8/233900/BD |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | |
|---|---|---|---|---|
| NGM | NGM | 5/1/82 | ALLENWEST Simplex | TITLE & INDEX |
| 5 SITE MODS SEE SHEET OC 19/7/84 | 2 AS SHIPPED. SEE SHEET OC 22/2/83 | TECHN. / ENG. NGM / APPD. REL | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 233900 · ELEMENTARY DIAGRAM 902M126RC · CONTD. OB · IDENT DR 0 SH A |

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DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "0B", THE SECOND SHEET OF DRIVE "0",I.E. THE INTRODUCTORY MATERIAL.

~~WIRE NUMBERING SYSTEM~~

~~WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. 01, 02, 10, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2A04 INDICATES WIRE NUMBER 04 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C.~~

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

   A) THE BRACKETS ARE ELIMINATED, AND
   B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

   THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

   AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET 0A.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER. THE FULL WIRE NUMBER MAY ALSO BE SHOWN E.G.

1A27 [1805]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 15/1/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

NOTES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 0C | 0 | B |

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902HM100CY SHT3

DR 0 | SH C | CONTD. 0D | ELEMENTARY DIAGRAM 902M126RC

## RECORD OF ELEMENTARY DIAGRAM CHANGES

| SHEET No. | ISSUE | DATE | LOCATION AND DESCRIPTION OF CHANGE | ISSUED BY |
|---|---|---|---|---|
| 0A<br>0D<br>0E<br>2F<br>2H | 2 | 22/2/83 | AS SHIPPED.<br>SHEET 0D & 0E ADDED.<br>SHEETS 0A, 2F, 2H – MINOR CORRECTIONS | NGM |
| 0D<br>0E<br>1C<br>1F<br>1G<br>1J<br>1K<br>1M<br>1N<br>1Q<br>1R<br>1S<br>1T<br>1U<br>1V<br>2B<br>2F<br>2G | 3 | 1/8/83 | AS COMMISSIONED.<br>HOIST SPEED MATCH CIRCUITS REPLACED BY LOAD SHARE CIRCUIT. (IN DRIVE No. 2)<br>BOTH HOIST FIELDS CONTROLLED FROM MFC ON DRIVE No. 1<br>DIAGNOSTIC INTERLOCKING RELAY ADDED TO DRIVE No. 2<br>OTHER MINOR MODIFICATIONS<br>LLR RELAY CARD (1U) ADDED TO DRIVE No. 2. | NGM |
| 0A<br>1A<br>1R<br>1U<br>1V | 4 | 18/5/84 | DRIVE No. 1 – CONNECTIONS TO 3RA-1Q COIL & MCC(DM8)-R3 REVISED<br>DRIVE No. 2 – CONNECTIONS TO SLD(SLA)-1S REVISED. 0A4(A-1R) & ASSOCIATED COMPONENTS ADDED. SPEED MATCH CIRCUITS IMPROVED WHEN GRABBING – SPEED ERROR SIGNAL ALSO APPLIED TO DRIVE No. 1 | NGM |
| 0A<br>1D<br>1N<br>1Q<br>1R<br>1U<br>1V | 5 | 19/7/84 | SITE MODS.<br>GRABBING SPEED MATCH CIRCUITS IMPROVED | NGM |
| | | | | |

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

| TECHN. ENG. APPD. | | TECHN. ENG. APPD. | | DATE | |
|---|---|---|---|---|---|
| NGM | | NGM | | 15/1/82 | |
| 5 | 19/7/84 | 2 | 22/2/83 | TECHN. | |
| | | | | ENG. NGM | |
| | | | | APPD. | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

RECORD OF DIAGRAM CHANGES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | 0D |

IDENT | DR 0 | SH C

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DR 0 | SH D | CONTD. 0E | ELEMENTARY DIAGRAM 902M126RC

# OPERATING NOTES

## HOIST MOTION - GENERAL OPERATION

The Hoist is operated by two motors, each controlled by it's own thyristor drive. Both drives are operated from a common speed reference, but each has its own armature voltage feedback circuit. The two shunt fields are connected in series and controlled by the motor field controller (MFC) in Drive No. 1. The MFC is Drive No. 2 is used for armature over-voltage trip only.

When operated in cago mode the shunt fields are initially set at base speed level (700 RPM). However, speeds above base are available with reduced loads to give up to 250% speed (1750 RPM) with 40% load or less. This is the constant horsepower characteristic obtained by weakening both fields simultaneously, under control of the Hoist. Lower programme PCB's located in Drive No. 1. See Instruction VSDI 304A for more details. Note, in this instance the current signal controlling these PCB's is an average of the armature current signals from both drives. When checking or adjusting the PCB's, the current signal mentioned in the Instruction & Test instruction should be measured at test point MCC (DM5) in Drive No. 1.

When operating in Grabbing mode, the motor fields are both weakened to the 1750 RPM level permanently, so this is top speed available under all Grabbing loads.

## CARGO MODE

A differential current signal is obtained by subtracting the armature current signal of Drive No. 2 (2CFB) from the armature current signal of No.1 (1CFB). This signal is used to modify the speed reference on Drive No.2 to ensure that both motors take the same armature current. This ensures equal tension in each rope. By the nature of the mechanical system both motors are speed matched. If one rope tends to slacken under light hook conditions, then the system ensures both ropes 'pull-in' to equal tension when lifting a load.

## GRABBING MODE

The Hold and Close lines are interchangeable to allow for two different grab configurations. Selection is made by the 'Grab' selector switch, as follows-

'GRAB 1' - Hoist No. 1 (Inner Ropes) selected as 'Close', Hoist No. 2 as 'Hold'
'GRAB 2' - Hoist No. 2(Outer Ropes) selected as 'Close', Hoist No. 1 as 'Hold'

## HOIST & LOWER WITH GRAB CLOSED

Under these conditions the differential current signal (see under Cargo Mode) is used to ensure equal tnesion in both ropes. Thereby forcing the Grab Closed in both Hoist & (Regenerative) Lower directions.

## HOIST & LOWER WITH GRAB OPENED

Under these conditions the two motors must be speed matched, although all the load of the Grab should be taken by the Hold motor. Any load on the Close motor will tend to cause the Grab to close.

To prevent this happening, the 'Max. Neg. Trim (Grab opened - Close, SP1-1T)' on the selected close motor should be adjusted, fractionally to decrease the close motor speed when hoisting. Similarly the 'Max.Pos. Trim (Grab opened - Hold, SP2-1T)' on the selected Hold motor should be adjusted fractionally to decrease the Hold motor speed when lowering. Both adjustments reduce the tension in the close ropes. Over-adjusted will result in excessively slack ropes. The differential current signal circuit used to ensure load sharing is in-operative during these conditions.

## OPENING & CLOSING GRAB

These functions are performed by running the Close motor only. To force the Grab shut and break-up obstructions, the selected Close motor current limit is increased to 200% FLC when 'Close Grab' notches are selected. 200% FLC is available for 4 seconds (adjustable by 'TMB' on TDR-1G) only, each time 'Close Grab' notches are selected. To prevent the selected Close motor overheating. Current limit is then reduced to 150%.

## LUFF MOTION - GENERAL OPERATION

The Luff motion is powered by a single motor with its own thyristor drive. The drive operates from an independent reference and is arranged for armature voltage feedback.

The drive also operates in three levels of field weakening according to load, controlled by the external safe-load indicator, to give constant horsepower with increased top speeds.

Base speed field is set by 'FMAX' (MFC). Reduced fields are set by pots. 'SP5-1T' (318 RPM), 'SP6-1T'(363 RPM) and 'SP7-1T' (585 RPM). The desired level of field is automatically pre-selected when the Luff is stationary and maintained at that level when it is running.

## ADJUSTMENTS - ALL DRIVES

**Current Limit** (Diagnostic static)

The standard current limit setting is 150% FLC.

When checking or adjusting current limit the torque proving PCB (TQP-IC) should first beunplugged otherwise the reduced (non-adjustable) torque proving level will be measured.

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | IDENT |
|---|---|---|---|---|
| 3 RE-WRITTEN NGM 1/8/83 | 2 22/2/83 | TECHN. | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | OPERATING NOTES |
| | | ENG. NGM | | DR 0 / SH D |
| | | APPD. | GO NUMBER 233900 / ELEMENTARY DIAGRAM 902M126RC / CONTD. 0E | |

On the Hoist drives, the standard current limit (150%) should be set by 'CUR-Limit' (MCC) Pot. first with relay 1RA-IS (No.1) or 2RA-IN(No.2) de-energised. The 'Close Grab current limit' (SP3-IT on No.1 or SP3-1P on No.2) should be set second to 200% FLC with the appropriate relay (see above) closed.

## OTHER ADJUSTMENTS

See 'Engineering Test Instructions' (Section 5) and data sheets attached to Drives for settings. See also Instructions VSDI 304A and VSDI 314B (Section 2) for procedures.

**Note** - The given settings for 'Max Neg. Trim', 'Max. Pos. Trim' should be considered as typical only and will probably require further adjustment when commissioning.

## LOAD SHARE/SPEED MATCH CIRCUIT FOR CARGO/GRAB CLOSED NOTCHES (LOCATED IN DRIVE NO.2)

Ensure SP2-1Q (set load share proportion) and SP3-1Q (set load share grabbing) are both set fully clockwise. Set up load share circuits as follows. Un-plug PCB 'IU' (Drive No.2). Select Diag. static in Drive No. 2. Adjust 'CUR-REF' pot to max.+VE. Adjust '1LIM'-' on PCB 'IR' to give - 3 volts at MCC (DM7). Now set 'CUR Ref' pot to max.-VE. Adjust 'ILIM+' to give +3 volts at MCC(DM7). This limits max. speed correction on drive No.2 to safe figure of $\pm$15% speed. Replace PCB 'IU'

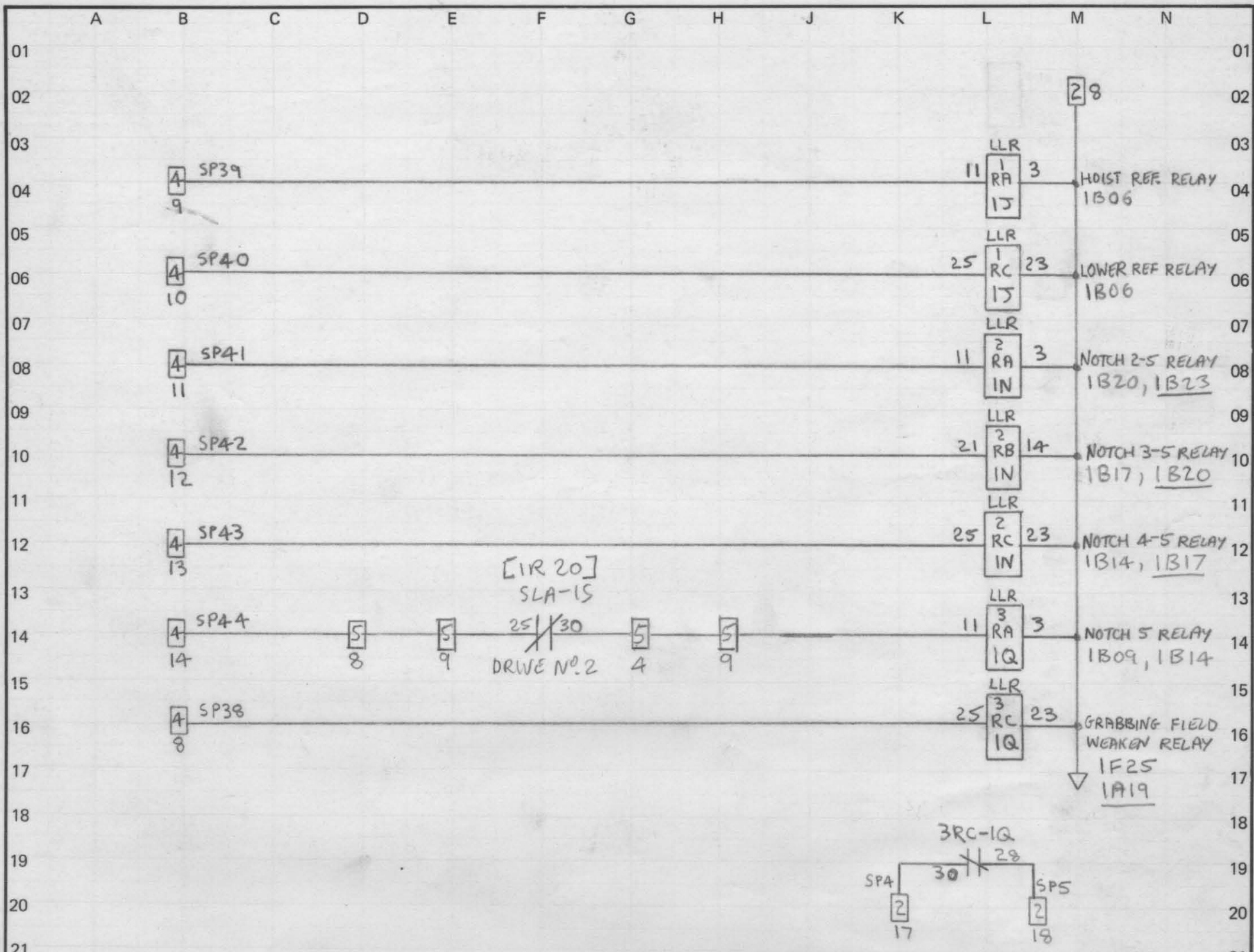
Now change 'R29-1P' (1K resistor) to 20K. Set both drives to 'Diag.static'. Adjust both 'CUR-Ref' pots to give +5V ($\pm$ 0.05V - use digital meter) at both 'CFB ' test points. Adjust SP1-1Q (load share scale) to give 0V ($\pm$0.05V) at MCC (DM7). Replace 1K Res. at 'R29-1P'

## RE-COMMISSIONING NOTES

Set-up load share circuit in diag. static as above. Check with 3 to 6 tonne load, Running with tong test.
Set-up and run drives in Cargo mode first, initially with top speed limited to base by setting 'crossover' pot (MFC) fully clockwise. When operating correctly set 'crossover' fully anti-cw and run in field weakening. Take care to ensure motors do not overspeed (see VSDI 304A, Section 2). Check discrimination with varying loads. Then run in Grabbing modes, making the adjustments pertaining to Grabbing as required.

**Warning** If load share circuit in-operative or arm. currents not within 5% of each other DO NOT RUN IN CARGO FIELD WEAKENING

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NGM | | | NGM | | 22/2/83 | | | | | |
| 3 | REVISED 1/8/83 | | 2 | | 22/2/83 | TECHN. | ENG. NGM | APPD. | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | OPERATING NOTES – CONTINUED | IDENT DR 0 SH E |
| | | | | | | | | | | GO NUMBER 233900 / ELEMENTARY DIAGRAM 902M126RC / CONTD. 1A | |




DR 1 SH A CONTD. 1B ELEMENTARY DIAGRAM 902M126RC

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| | | | | NGM | | 14/12/82 | |
| | | | 4 | | | TECHN. | |
| | | | | | | ENG. NGM | |
| | | | | 22/2/83 | | APPD. | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº.1
COMMON MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1B | 1 | A |

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CRANES – 5 NOTCH REF.

DR 1 | SH B | CONTD. 1C | ELEMENTARY DIAGRAM 902M126RC

+20V

2
R2-1U
1K
2X

5
1RA-1J
6

-20V

31
R31-1U
1K
31X

24
1RC-1J
26

3RA-1Q
6 5

'NOTCH 5 SPEED'

4
R4-1U
562R
4X

19
'SET NOTCH 4 SPEED' SP4-1U 500R
22X
19X

8

2RC-IN
26 24

25
'SET NOTCH 3 SPEED' SP3-1U 500R
25X
22

27

2RB-IN
16 13

27X
'SET NOTCH 2 SPEED' SP2-1U 500R
30
27

17

2RA-IN
6 5

32X
'SET NOTCH 1 SPEED' SP1-1U 500R
32
30X

8

(SPEED REF)
(-VE = HOIST)

TO HOIST NO1 [1E01]

SP6
2 19 2 27

2 19 2 27
SP6

[1P01]
HOIST NO 2

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 16/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO 1
COMMON SPEED REFERENCE CCT.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1C | | 1 | B |

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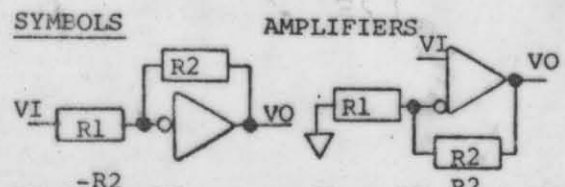
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

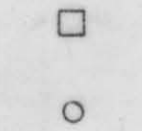
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1+\frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

□ TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

○ TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| MAX AMPS .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13.1 25 | X | MF | YA-YC, YB-YD |
| L/R < .25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 220% DRV CL | X | MCC | 82KS FROM DCX TO DCL |
| FUSELESS | | ACC | CFY - CFX |
| REF. JUNCTION | X | MCC | RJ - DM8 |
| MOD. REG. CL. | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤⊥⊤ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF - DM22 |
| INH. CROSSOVER | X | MFC | CMA - COM |
| " " | X | MFC | CRS - COM |
| | | | |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE |
|---|---|---|
| | NGM | 14/12/82 |
| | | TECHN. |
| 3 | 1/8/83 | ENG. NGM |
| | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO 1

FUNCTION JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1D | 1 | C |

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RUN PERMISSIVE

TDR-1G

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

MCC (CEMF)

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

SLB

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±1·2V

HEATSINK THERMAL SWITCHES

CLOSE CURRENT LIMIT TIMING RELAY

TDR-1G

TIME DELAY ON ENERGISATION

3RB-1Q LLR — RUN REF. RELAY 1E03, 1E04 1E04

RA-1L RA-1L LOR — RUN RELAY 1D14 1D18, 1D21

RA-1L -30V — SP36

RA-1L 5X 3X

4RA-1S LLR — CLOSE GRAB CL RELAY 1E22

1RB-1S LLR — GRAB OPENED RELAY (HOLD) 1E02

LLR 4RB-1S — 1F07 1E02 GRAB OPENED DROOP RELAY (CLOSE)

4RC-1S LR — GRAB CLOSED DROOP RELAY (HOLD) 1F07, 1F12

| | | |

[1B23] (SPEED REF)

R4-1T 2K

4X

3RB-1Q 20 18

REF-1D

DIS 10

8x x4

9 x3

8 x2

6 x1

ZERO ADJ 1K

19x 30X 3X

T1

T2

MAXNEG 10K

MAXPOS 10K

NREF

PREF

30 5X 3

SLOW 20K 5

4RB -1S 13 17 (GRAB OPENED)- (CLOSE)

'MAX NEG TRIM'

32X SP1-1T 32 1K 30X

1RB-1J 17 13

'MAX POS TRIM' GRAB OPENED)- (HOLD)

SP2-1T 1K 27 30 27X

3RB-1Q 16 13 MCC(SR) (≃ 12V) 17

MCC(PRE)

14 PRE

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS MCC (SYS)

TF 16 MFC (DM22) TF

+20V 22.1K FEA 18

56K 13X

39K 16X

22K 17X

12

+20V COM -20V

31 15 2

11 NSW T1

13 PSW T2

10X -30V

-30V

MCC(DR)

29 DR

DR INVERT AND MONITOR IR COMP

28 CFB

21 10K

26 11X 9X 12X 6X 18X 28X

56.2K

56.2K

SFB SHAPING

4.75K

15K

ERR

MCC(SFB)

+30V

MCC(TR)

TQP-1C

20 TR

29 ATR

MCC(LT2)

19 LT2

T1 T3 T6

T2

OA1-1

10K 12.1K TRX 28 MCC(DM8) RJ

T7

UTP2 6

+20V

LC HC

OR

T6 T7 T2 T3

AND

13

ATR(+) AND CFB(+)

R CFB

30 CFB

27

14 REL

12

ATR(-) AND CFB(-)

10

3 PRE

5 DP2

8 UTP1

PRE (-4V) OR DP2(+20V)

MCC(DP2)

330Ω ILR 9

8R 18

OA1-2

PEF DELAY 25K

T1 IMF

TBR

3.92K T17

17 -30V

-30V

4RA -1S 5 6

SP3-1T 25 25X 5K 22

'SET CLOSE GRAB CURRENT LIMIT'

MCC (DM1) (ILA)

R31-1T 31X 3K92 +20V 31

3 3 9 6

3 5

BPR A B 15K

3 4

3 6 3 7 3 8

7 4 1 1

+20V COM -20V

31 15 2

22

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 16/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 1

REFERENCE & TORQUE PROVING PCB's

| CO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | 1F |

IDENT

| DR | SH |
|---|---|
| 1 | E |

DR 1 SH E CONTD. 1F ELEMENTARY DIAGRAM 902M126RC

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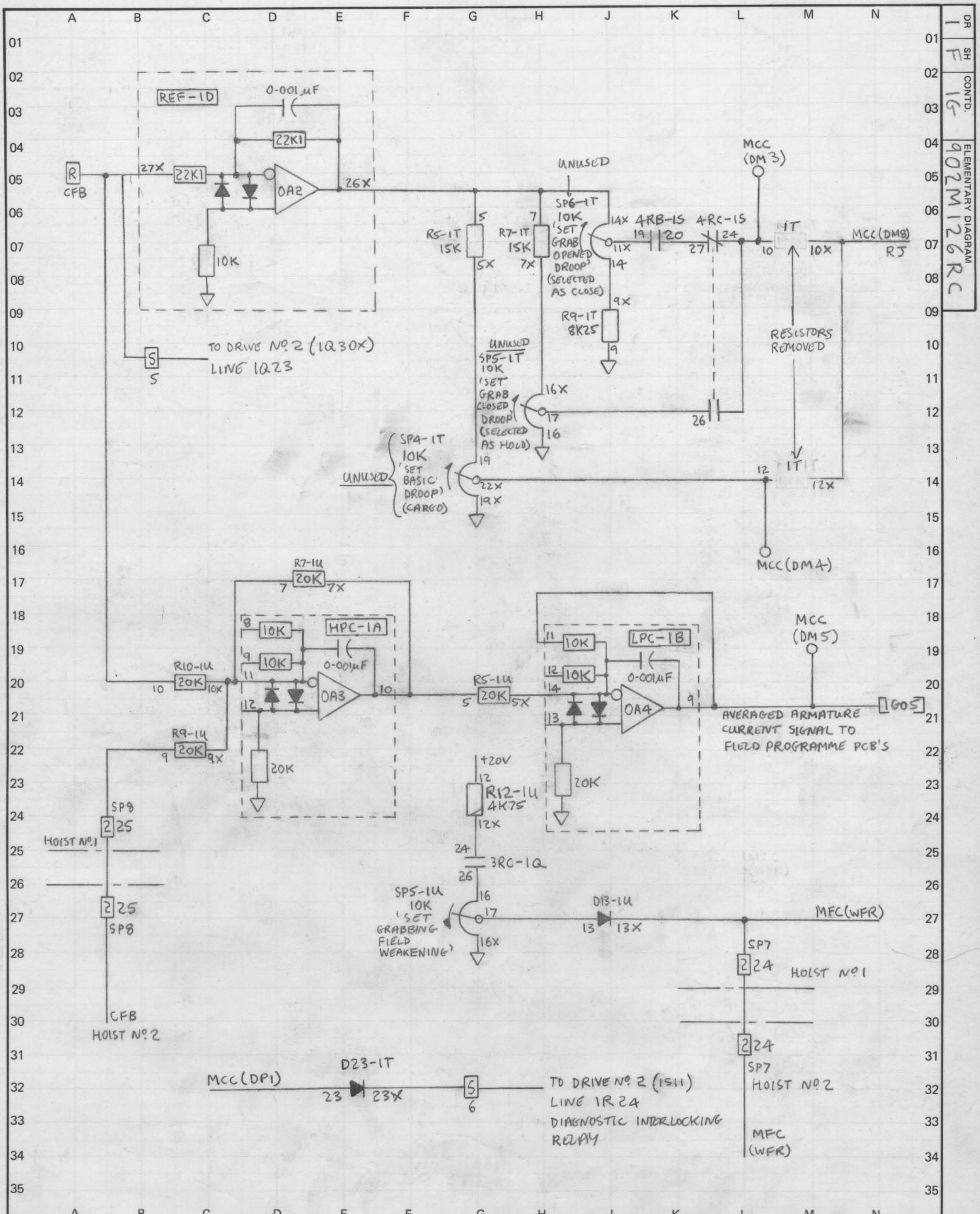


DR 1 | SH F | CONTD. 1G | ELEMENTARY DIAGRAM 902M126RC

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 17/12/82 |
| | | | 3 | | | TECHN. |
| | | | | | 1/6/83 | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 1

CURRENT DROOP & COMMON CURRENT AV. CCT.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1G | 1 | F |

Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A. which is not connected with the English Company of a similar name.

DR 1 | SH G | CONTD. 1H | ELEMENTARY DIAGRAM 902M126RC

HPC-1A

MCC(CEMF)

5 DFDR

[IF21] CURRENT FEEDBACK (AVERAGE)

25 CEMF

26 FDR

17 CFB

23

DIRECTION SENSING

KL 28

KH 27

30

LV 29

47.5K

47.5K

47.5K

.47MF

MFH

10K

OA1-2

VOLTAGE PROGRAMMING

MFL 10K

274K

148K

SFC 21

MFC(SFC)

10K

2MF

10K

-20V

SFA

-1.4V

20K

47.5K

27K

18K

182K

-20V

HB

HB 10K

CURRENT PROGRAMMING

OA3-1

CRM 13

R CRM

.15MF

221K

68.1K

1MF

DMAC 3

5 DMAC

33.2K

20K

47.5K

332K

681K

475K

LI 14

24CFB

10K

OA2-1

22 CFB

274K

5

6

OA2-2

+20V COM -20V

31 15 2

LPC-1B

19

18CEMF

17 FDR

47.5K

47.5K

.47MF

OA1-1

681K

681K

LV 25

OA1-2

2.21K

24

22 KL

27K

20 2CFB

47.5K

OA2-1

20K

VOLTAGE PROGRAMMING

2.21K

21

2.21K

18

2.21K

-20V

LB2 20K

LB2

22.1K

SL1 10K

1MF

80

26

2.74K

150K

1M

LI 6

27K

OA3-1

20K

2.21K

8

47.5K

.1MF

-20V

47.5K

SL2 10K

LB3 20K

LB3

2.21K

7

RED JUMPER

CURRENT PROGRAMMING

2.21K

10

2.21K

2.74K

150K

4MF

3

27K

OA3-2

20K

1M

LCP

47.5K

.1MF

10K

DMAC29

SL3 10K

82.5K

FDR 28

R FDR

T2

LR 27

MCC(LR)

2.74K

+20V COM -20V

31 15 2

23

5

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 16/12/82 |
| | | | 3 | | | TECHN. |
| | | | 1/8/83 | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO 1

COMMON HOIST & LOWER FIELD PROGRAMME

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1H | 1 | G |

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CRANES - MOTOR FIELD PROGRAMME

| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPC | LPC | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | | 3LLR | | 4LLR | ICC | 2CC | |
| 193W 547 AAG01 | 193W 548 AAG01 | 193W 545 AAG01 | 193W 546 ABG01 | 193W 277 AAG02 | | 193W 543 AAG01 | | 193W 279 AAG03 | | 193W 265 AAG04 | | 193W 279 AAG03 | | 193W 279 AAG03 | | 193W 279 AAG03 | 909W 317 ABG08 | 909W 317 ABG05 | |
| HOIST PROGRAM | LOWER PROGRAM | TORQUE PROVE | REFER-ENCE | SIG LEV DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | SELECT COMP | SELECT COMP | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2Y |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE.

| | | | |
|---|---|---|---|
| RTB(COM) - 1G15 | STB(DMAC) - 1A3 | 4TB5 - 1S21 | 1U22 - 1U27X |
| RTB(+20) - 1G31 | SP1 - 1J21 | SP36 - 1E9 | 1U30 - 1N17 |
| RTB(-20) - 1G2 | SP2 - MTBB(TS1) | SP37 - 1S25 | 1U27 - 1U32X |
| RTB(CFB) - 1C30 | SP3 - 1G17 | SP38 - 1Q25 | 1U32 - 1N8 |
| RTB(-30) - 1L5 | SP4 - 1Q30 | SP39 - 1J11 | 1Q5 - 1N26 |
| MCC(SFB) - 1D12X | SP5 - 1Q28 | SP40 - 1J25 | 1N24 - 1N16 |
| MCC(TR) - 1C20 | SP6 - 1D19X | SP41 - 1N11 | 1N13 - 1N6 |
| MCC(SR) - 1Q13 | SP7 - MFC(WFR) | SP42 - 1N21 | 1N5 - 1T4 |
| MCC(SYS) - 1D23 | SP8 - 1U9 | SP43 - 1N25 | 1N5 - 1D19X |
| MCC(DR) - 1D29 | 3TB1 - 1G12 | SP44 - 1Q11 | 1G12 - 1Q21 |
| MCC(CEMF) - 1E11 | 3TB2 - 1L10 | SP45 - MCC(+30) | 1E11 - 1E22 |
| MCC(DM8) - 1C28 | 3TB3 - | 2TB3 - MTBB(OL2) | 1G17 - 1G25X |
| MCC(LT2) - 1C19 | 3TB4 - 1C17 | 1U2X - 1J5 | 1G3X - 1E28 |
| MCC(DP2) - 1C5 | 3TB5 - 1G18 | 1U31X - 1J24 | 1G3X - 1L9 |
| MCC(PRE) - 1D14 | 3TB6 - | 1J6 - 1J26 | 1E27 - 1L11 |
| MFC(DM22) - 1D16 | 3TB7 - 1L3X | 1J26 - 1Q6 | 1L11 - 1L10 |
| RTB(FDR) - 1B28 | 3TB8 - | 1Q6 - 1U4 | 1E3 - 1L5X |
| MCC(LR) - 1B27 | 4TB1 - 1A3 | 1U4X - 1U19 | 1G27X - 1E6 |
| MFC(SFC) - 1A21 | 4TB2 - 1D11 | 1U22X - 1Q8 | 1E8 - 1S11 |
| RTB(CRM) - 1A13 | 4TB3 - 1D13 | 1U19X - 1U25 | 1T4X - 1Q20 |
| 5TB(DFDR) - 1B17 | 4TB4 - 1G5X | 1U25X - 1N27 | 1D30 - 1S17 |

| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 28/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLEN WEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO. 1

MDR LAYOUT & WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1J | | 1 | H |

DR 1 SH H CONTD. 1J ELEMENTARY DIAGRAM 902M126RC

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902M1006CT SHT16

DR 1 | SH J | CONTD. 1K | ELEMENTARY DIAGRAM 902M126RC

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1S17 – 1T30X | 1T12X – MCC(DM8) | BUS PINS 3,14,23 1N – 1S | BUS PINS 2 1A – 1G | |
| 1T30X – 1T32 | 1U9X – 1U10X | RTB(COM) – 1J23 | BUS PINS 15 1A-1J, 1N-1U | |
| 1D5X – 1J13 | 1U9X – 1U7 | 1J23 – 1J14 | BUS PINS 31 1A – 1G | |
| 1J13 – 1T27 | 1U10X – 1A11 | 1J14 – 1J3 | 1G02 – 1T02 | |
| 1T27 – 1T30 | 1U5 – 1U7X | 1J3 – 1L1 | 1T02 – 1U02 | |
| 1J17 – 1Q16 | 1U7X – 1A10 | 1L1 – 1L4 | 1J15 – 1N15 | |
| 1Q16 – 1S13 | 1U5X – 1B14 | 1L4 – 1L13 | 1G31 – 1T31 | |
| 1S13 – 1T27X | 1B9 – 1B11 | 1L13 – 1L23 | 1T31 – 1U31 | |
| 1T27X – 1T32X | 1B11 – 1A17 | 1L23 – 1N23 | | |
| 1D14 – 1C3 | 1A17 – 1A24 | 1Q15 – 1Q17 | | |
| 1L5 – 1D10X | 1A24 – MCC(DM5) | 1Q17 – 1Q18 | | |
| 1D12X – 1D9X | 1U31 – 1U12 | 1T15 – 1T9 | | |
| 1T31X – 1S5 | 1U12X – 1Q24 | 1T9 – 1T16 | | |
| 1S6 – 1T25 | 1Q26 – 1U16 | 1T16 – 1T19X | | |
| MCC(DM1) – 1C9 | 1U17 – 1U13 | 1U15 – 1U16X | | |
| 1C9 – 1T22 | 1U13X – MCC(WFR) | 1U16X – 1U30X | | |
| 1T22 – 1T25X | 1E22 – 1B16 | | | |
| 1C17 – 1D10X | 1B16 – 1A25 | | | |
| 1C30 – 1D27X | 1B17 – 1A26 | | | |
| 1D27X – 1U10 | 1A22 – 1B20 | | | |
| 1D26X – 1T14X | 1B22 – 1A28 | | | |
| 1T14X – 1T7 | 1A29 – 1B25 | | | |
| 1T7 – 1T5 | 1A3 – 1B29 | | | |
| 1T5X – 1T19 | 1A14 – 1B6 | | | |
| 1T22X – 1T12 | | | | |
| 1T12 – MCC(DM4) | | | | |
| 1T7X – 1T16X | | | | |
| 1T17 – 1S26 | | | | |
| 1T14 – 1T9X | | | | |
| 1T11X – 1S19 | | | | |
| 1S20 – 1S27 | | | | |
| 1S24 – 1T10 | | | | |
| 1T10 – MCC(DM3) | | | | |
| 1T10X – 1T12X | | | | |

INCOMPLETE

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 22/12/82 |
| | | | 3 | | | TECHN. |
| | | | | | 1/8/83 | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No.1
MDR WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1K | | 1 | J |

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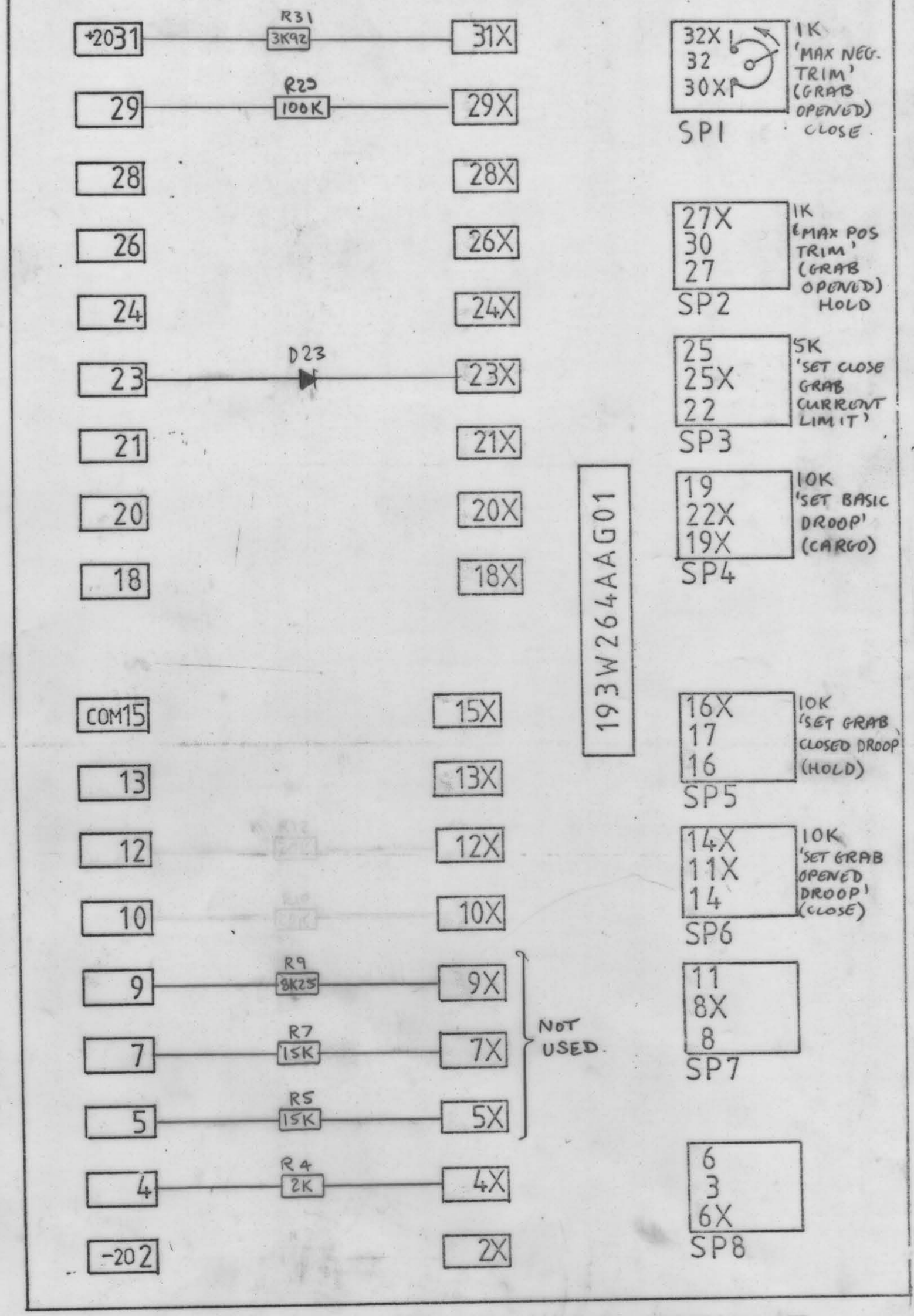


CARD PART NO. 909W317ABG08 FIT IN RACK POSITION IT

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 22/12/82 |
| | | | 3 | | 1/6/83 | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 1

COMPONENT CARD ICC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1L | | 1 | K |

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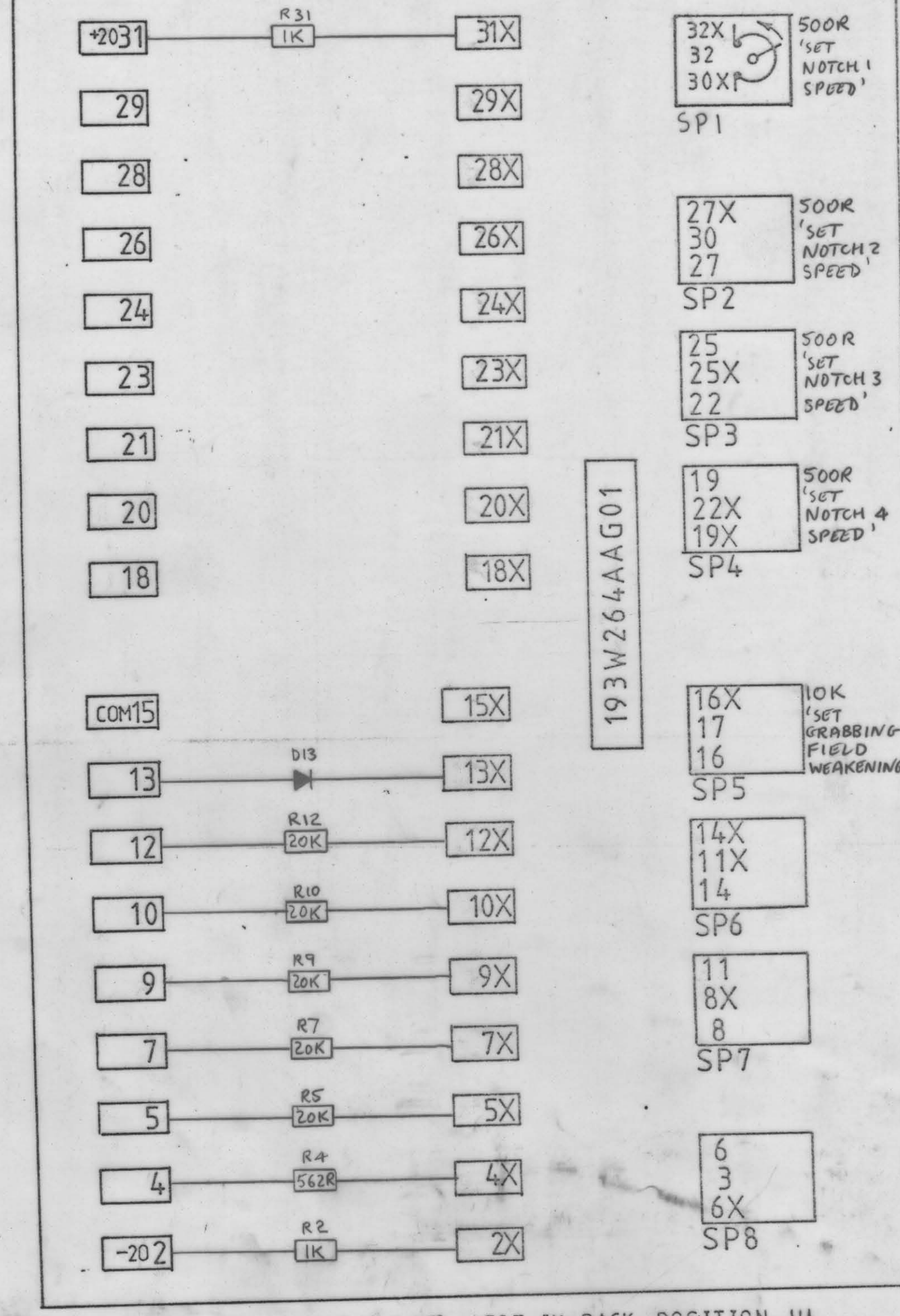


CARD PART NO. 909W317ABG05 FIT IN RACK POSITION 10

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 22/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO1

COMPONENT CARD 2CC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1M | | 1 | L |

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902HM100ER

DC - 3064R

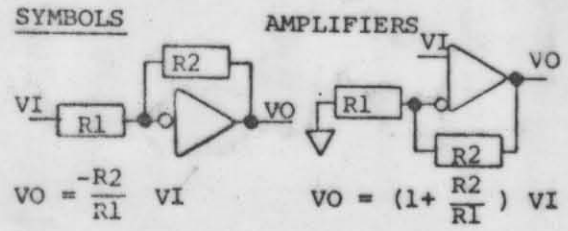
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s



POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G13④ G256 | | IFC | MFC OR MFE |
| .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD * |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 220%DRV CL | X | MCC | 82KS FROM DCX TO DCL |
| FUSELESS | | ACC | CFY - CFX |
| REF. JUNCTION | X | MCC | RJ - DM8 |
| MOD.REG.CL | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤|⊤ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF-DM22 |
| INH.CROSSOVER | X | MFC | CMA-COM |
| INH. FIELD LOSS | X | MFC | FF-COM * |
| | | | |

NOTE *
THIS MFC NOT USED FOR FIELD CONTROL. AC SUPPLY FUSES (1FU, 2FU, 3FU) REMOVED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 14/12/82 |
| | | | | | | TECHN. |
| | | | 3 | | | ENG. NGM |
| | | | | 1/8/83 | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 2
FUNCTION JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | IN | 1 | M |

1 M IN 902M126RC

Disclaimer Statement The ⊕ trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

SP44

RUN PERMISSIVE

TDR-1G

TIA REF +20V LCA LTA FTA FSA +20V RCA COM TMA DOA TDA PUA RLA -20V

TIME DELAY ON DE-ENERGISATION

IRC-1J 25 23 LLR — GRAB SELECT RELAY IR14, IR27

IRB-1J 21 14 LLR — RUN REF. RELAY IP03, IP04, IP04

ZERO CEMF RELAY

SLD-1E — SLA

TP1 TP2 HYSTERESIS +20V

MCC (CEMF)

A LEVEL ADJ. — SLA

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0-3V

RA-1L 9 11 — 10 4 LDR — RUN RELAY IN14, IN18 IN21

BRAKE RELAY

SLD-1E — SLB

TP3 TP4 HYSTERESIS +20V

B LEVEL ADJ. — SLB

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±1·2V

-30V RA-1L 5 3

SP36 — SP37

RA-1L 5X 3X

2RA-1N 11 3 LLR — CLOSE GRAB CL RELAY IP22 — [IR22]

SP2 15 — HEATSINK THERMAL SWITCHES — 2 3

SP1 13

CLOSE CURRENT LIMIT TIMING RELAY

TDR-1G

TIB REF +20V LCB LTB FTB FSB +20V RCB COM TMB DOB TDB PUB RLB -20V

TIME DELAY ON ENERGISATION

SP3 16

[IR-12]

1RA-1S 11 3 LLR — GRAB OPENED RELAY (HOLD) IP01

3RA-1U LLR — IR02 LOAD-SHARE PRE-CONDITION RELAY — IP01, IQ07

2RB-1N 21 14 LLR — GRAB OPENED DROOP RELAY (CLOSE) IQ07

2RC-1N 25 23 LLR — GRAB CLOSED DROOP RELAY (HOLD) IQ07, IQ12

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | NGM | | | NGM | | 15/12/82 |
| 5 | | 19/7/84 | 3 | | 1/8/83 | |

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 2

MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1P | | 1 | N |

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[1B32] (SPEED REF)

4 R4-1P 2K 4X

IRB-1J 20 18

REF-1D DIS 10

8X X4

9 X3

8 X2

6 X1

ZERO ADJ 1K

MCC(PRE) 14 PRE

4 2 11 NSW T1

4 3 13 PSW T2

-30V 10X -30V

MCC(DR) 29 DR

28 CFB

4 +30V 15

21 10K

26

DR INVERT AND MONITOR IR COMP

MONITOR PRECONDITION

COMPARE

4.75K

56.2K

56.2K

SFB SHAPING

11X 9X 12X 6X 18X 28X

2RB -1N 13 17 (GRAB OPENED)- (CLOSE)

'MAX NEG TRIM'

32X SP1-1P 32 1K 30X

IRA-1J 8 5

'MAX POS TRIM' (GRAB OPENED)- (HOLD) SP2-1P 1K

27 30 27X

IRB-1J 16 13 MCC(SR) (≃ 12V) 17

19X 30X 3X

T1 T2

MAXNEG 10K

MAXPOS 10K

NREF PREF

50 5X 3

SLOW 20K 5

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS MCC (SYS)

TF 16 MFC (DM22) TF

+20V 22.1K FEA 18

53K 13X

39K 16X

22K 17X

12

+20V COM -20V

31 15 2

ERR

1 5 K

MCC(SFB)

MCC(TR)

TOP-1C 20 TR 29 ATR

MCC(LT2) 19 LT2 T1 T3 OA1-1 T6

T2

10K 12.1K TRX 28 MCC(DMB) RJ

T7 UTP2 6

+20V

LC HC

13

30 CFB ATR(+) AND CFB(+)

27

14 REL

12

ATR(-) AND CFB(-)

10

OR AND

OR AND

OR

AND

T6 T7 T2 T3

R CFB

3 PRE PRE (-4V) OR DP2(+20V)

MCC(DP2) 5 DP2

8 UTP1

330Ω ILR 9

BR 18

OA1 -2

PEF DELAY 25K

T1 IMF

TBR

3.92K T17

17 -30V

+20V COM -20V

31 15 2

22

-30V

31X R31-1P 3K92 +20V 31

2RA-1N 5 6 1

SP3-1P 25X 5K 22 'SET CLOSE GRAB CURRENT LIMIT'

MCC (DMI) (ILA)

3 3 9 6

3 5

A BPR B 15 K

3 4

7 4 1

3 6 3 7 3 8

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 16/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 2

REFERENCE & TORQUE PROVING PCB's

| CO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | 1Q |

IDENT DR 1 SH P

DR 1 SH P CONTD. 1Q ELEMENTARY DIAGRAM 902M126RC

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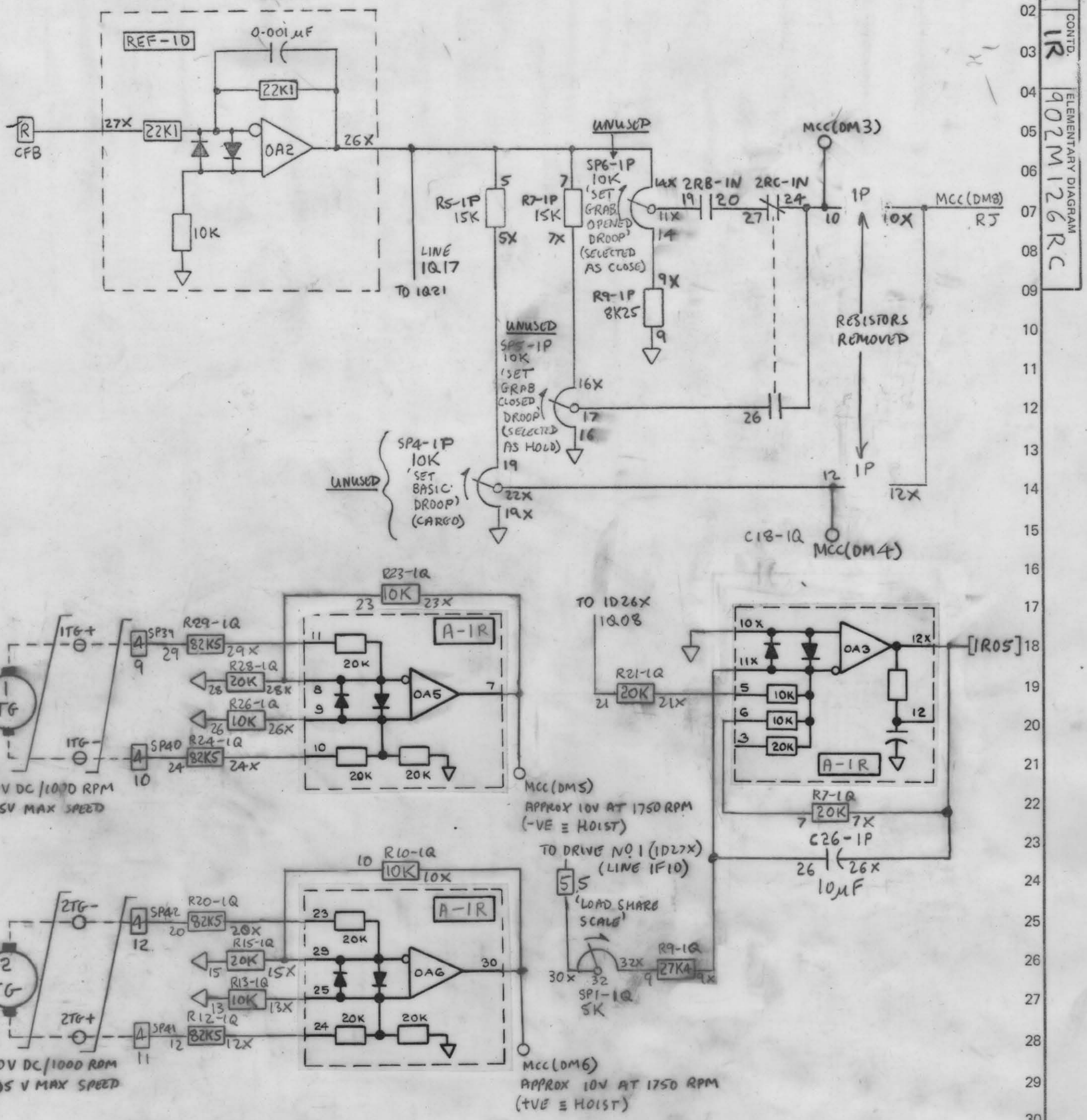


| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NGM | | | NGM | | 17/12/82 | | | | | |
| 5 | | 19/7/84 | 3 | | 1/8/83 | TECHN. | | | | | |
| | | | | | | ENG. | NGM | | | | |
| | | | | | | APPD. | | | | | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 2

DROOP & SPEED CORRECTION CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1R | 1 | Q |

DR 1 | SH R | CONTD. 15 | ELEMENTARY DIAGRAM 902M126RC

R29-1P 1K 29 29X — 3RA-1U 5 8

R18-1P 61K9 18 18X

A-1R

17X 10K
18X 10K
19X
20X
20K
0A1 21X

R13-1P 22K 13 13X

[1Q18]

+20V

R23-1P 8K25 23 23X

25X 22X

R21-1P 100K 21 21X

RLB-1G 24X

3RB-1U 20 18

25X
24X
+20
1 LIM+
1 LIM-

SET 1 LIM+ & 1 LIM- TO 4 VOLTS AT MCC(DM7)

CURRENT ERROR RELAY (GRABBING)

SLD-1S — SLA

TP1 15K — TP2 15K

23 — 39K — 3.9K — 22

.47 MF — COM

HYSTERESIS — +20V 31 — 20

SLA — 29 — 25 — 30

A LEVEL ADJ.

26 — 28 — 27

1 D COM — 32

INSTRUCTIONS VSD1 211 — 24 19 21

P/U AT CFB = ±0-3V

C26-1P 10MF 15X — 15

9 — 2RA-12 IN

[1A14] TO DRIVE No 1

IN11 [IN24]

LLR 3RB-1U 21 — 14

DIAGNOSTIC INTERLOCKING RELAY

FROM DRIVE No 1
PIN 1T23X
LINE 1F32
5 — 6

SLD-1S — SLB

TP3 15K — TP4 15K

12 — 39K — 3.9K — 11 — 10K

.47 MF — COM

HYSTERESIS — +20V 31 — 18

SLB — 9 — 3 — 10

B LEVEL ADJ.

5 — 8 — 6

1 DCOM — 32

INSTRUCTIONS VSD1 211 — 14 13 17

MCC(DP1) 24 — D24-1P — 24X

SP43 — 4 13 — 2 4

SET B LEVEL FCW

2 24 — SP7 — MFC(WFR)

2 25 — SP8 — R CFB

22X — 0A4 22 — 23X — 9X

28 10K
27 10K
26 20K

A-1R

20X 10K 20 — R20-1P

30 — 28 — 1RC-1J

4 5 — A 5 — 29 — 1-100K — 29X — MCC(DM) RJ

DRIVE No 1 (GRABBING ONLY)

MCC(DM7)

SP2-1Q 10K — SET LOAD SHARE PROPORTION — 27X — 30 — 27

R4-1Q 100K 4 — 4X — MCC(DM8) RJ

24 — 1RC-1J — 26

SP3-1Q 50K — SET LOAD SHARE GRABBING (FCW) — 25 — 25X — 22

19 — 2RB-1N 20 — 10 — 12 — 1RA-1S

2X WIRE LINK 1Q — 2

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| NGM | NGM | 20/12/82 | | | |
| 5 — 19/7/84 | 3 — 1/8/83 | TECHN. | ENG. NGM | APPD. | |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 2

SPEED ERROR & CORRECTION CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 1S | 1 | R |

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CRANES – NO MOTOR FIELD PROGRAMME

| | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | ICC | 2CC | A | 2SLD | | 3LLR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 193W 545 AAG01 | 193W 546 ABG01 | 193W 277 AAG02 | | 193W 543 AAG01 | | 193W 279 AAG03 | | 193W 265 AAG02 | | 193W 279 AAG03 | 909W 317 ABG08 | 909W 317 ABG06 | 193W 256 AAG01 | 193W 277 AAG02 | | 193W 279 AAG03 | |
| | TORQUE PROVE | REFER-ENCE | SIG. LEV. DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | SELECT COMP | SELECT COMP | AMPLI-FIER | SIG. LEV. DET. | | LOW LEVEL RELAY | |

UA 1 | SH S | CONTD. LT | ELEMENTARY DIAGRAM 902M126RC

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATALOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(COM) – 1G15 | SP6 – 1D19X | SP41 – 1Q12 | 1D5X – 1J5 |
| RTB(+20) – 1G31 | SP7 – MFC(WFR) | SP42 – 1Q20 | 1P30X – 1P32 |
| RTB(-20) – 1G2 | SP8 – 1D27X | SP43 – 1S27 | 1J5 – 1P27 |
| RTB(CFB) – 1C30 | 3TB1 – 1G12 | SP44 – 1J25 | 1P27 – 1P30 |
| RTB(-30) – 1L5 | 3TB2 – 1L10 | SP45 – MCC(+30) | 1J16 – 1J8 |
| MCC(SFB) – 1D12X | 3TB3 – | 2TB3 – MTBB(OL2) | 1J8 – 1N13 |
| MCC(TR) – 1C20 | 3TB4 – 1C17 | | 1N13 – 1P27X |
| MCC(SR) – 1J13 | 3TB5 – 1C18 | 1G12 – 1J21 | 1P27X – 1P32X |
| MCC(SYS) – 1D23 | 3TB6 – | 1E11 – 1E22 | 1D14 – 1C3 |
| MCC(DR) – 1D29 | 3TB7 – 1L3X | 1G17 – 1G25X | 1L5 – 1D10X |
| MCC(CEMF) – 1E11 | 3TB8 – | 1G27X – 1E6 | 1D12X – 1D9X |
| MCC(DM8) – 1C28 | 4TB1 – 1L3 | 1E8 – 1N11 | 1P31X – 1N5 |
| MCC(LT2) – 1C19 | 4TB2 – 1D11 | 1E28 – 1G3X | 1N6 – 1P25 |
| MCC(DP2) – 1C5 | 4TB3 – 1D13 | 1G3X – 1L9 | MCC(DM1) – 1C9 |
| MCC(PRE) – 1D14 | 4TB4 – 1G5X | 1E27 – 1L11 | 1C9 – 1P22 |
| MFC(DM22) – 1D16 | 4TB5 – 1N21 | 1L11 – 1L10 | 1P22 – 1P25X |
| SP1 – 1J11 | SP36 – 1E9 | 1E3 – 1L5X | 1C17 – 1D10X |
| SP2 – MTBB(TS1) | SP37 – 1N25 | 1D19X – 1P4 | 1C30 – 1D27X |
| SP3 – 1G17 | SP38 – | 1P4X – 1J20 | 1D26X – 1P14X |
| SP4 – | SP39 – 1Q29 | 1D30 – 1N17 | 1P14X – 1P7 |
| SP5 – | SP40 – 1Q24 | 1N17 – 1P30X | 1P7 – 1P5 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 22/12/82 |
| | | 3 | | | | 11/8/83 |

TECHN.
ENG. NGM
APPD.

ALLEN WEST
Stothert & Pitt
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND

HOIST MOTION No 2

MDR LAYOUT & WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CON. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1T | | 1 | S |

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902M1126RC SH1 DR1

DR 1 | SH T | CONTD. 1U | ELEMENTARY DIAGRAM 902M1126RC

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1P5X – 1P19 | 1Q7X – 1Q18X | RTB(10M) – 1J03 | BUS PINS 2 1C – 1G | |
| 1P22X – 1P12 | 1Q18X – 1R18X | 1J03 – 1J14 | BUS PINS 15 1C – 1J, 1N – 1S | |
| 1P12 – MCC(DM4) | 1R18X – 1R12X | 1J14 – 1J23 | BUS PINS 31 1C – 1G | |
| 1P7X – 1P16X | 1R12X – 1S22 | 1J23 – 1L23 | 1G02 – 1P02 | |
| 1P17 – 1N26 | 1R17X – 1R21X | 1L23 – 1L13 | 1P02 – 1R02 | |
| 1P14 – 1P9X | 1R21X – 1Q5 | 1L13 – 1L04 | 1R02 – 1S02 | |
| 1P11X – 1N19 | 1Q5X – 1Q27X | 1L04 – 1L01 | 1G31 – 1P31 | |
| 1N20 – 1N27 | 1Q30 – 1Q4 | 1L01 – 1N03 | 1P31 – 1R31 | |
| 1N24 – 1P10 | 1Q4 – 1J24 | 1N03 – 1N14 | 1R31 – 1S31 | |
| 1P10 – MCC(DM3) | 1J24 – MCC(DM7) | 1N14 – 1N23 | | |
| 1P10X – 1P12X | 1J26 – 1Q25 | 1J15 – 1J17 | | |
| 1P12X – MCC(DM8) | 1Q25 – 1Q25X | 1J17 – 1J18 | | |
| 1Q29X – 1R11 | 1Q22 – 1Q2X | 1J18 – 1J30 | | |
| 1Q28X – 1Q23 | 1Q4X – 1P10X | 1P15 – 1P19X | | |
| 1Q23 – 1R8 | 1S23 – 1J29 | 1P19X – 1P16 | | |
| 1Q26X – 1R9 | 1S19 – 1S21 | 1P16 – 1P09 | | |
| 1Q24X – 1R10 | 2TB4 – 1S28 | 1Q15 – 1Q02 | | |
| 1Q23X – 1Q21 | 1E19 – 1E21 | 1Q02 – 1Q13 | | |
| 1Q21 – 1R7 | 1E13 – 1E17 | 1Q13 – 1Q26 | | |
| 1R7 – MCC(DM5) | | 1Q26 – 1Q27 | | |
| 1Q21X – 1R5 | | 1Q27 – 1Q28 | | |
| 1Q20X – 1R23 | | 1R15 – 1R10X | | |
| 1Q15X – 1Q10 | | | | |
| 1Q10 – 1R29 | | | | |
| 1Q13X – 1R25 | | | | |
| 1Q12X – 1R24 | | | | |
| 1Q10X – 1Q30X | | | | |
| 1Q30X – 1Q32 | | | | |
| 1Q32 – 1R30 | | | | |
| 1R30 – MCC(DM6) | | | | |
| 1Q32X – 1Q9 | | | | |
| 1Q18 – 1Q9X | | | | |
| 1Q9X – 1R11X | | | | |
| 1R6 – 1Q7 | | | | |

INCOMPLETE

| TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|
| | NOM | | 22/12/82 |
| 3 | | | TECHN. |
| | | 1/8/83 | ENG. NOM |
| | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO. 2

MDR WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 1U | | 1 | T |

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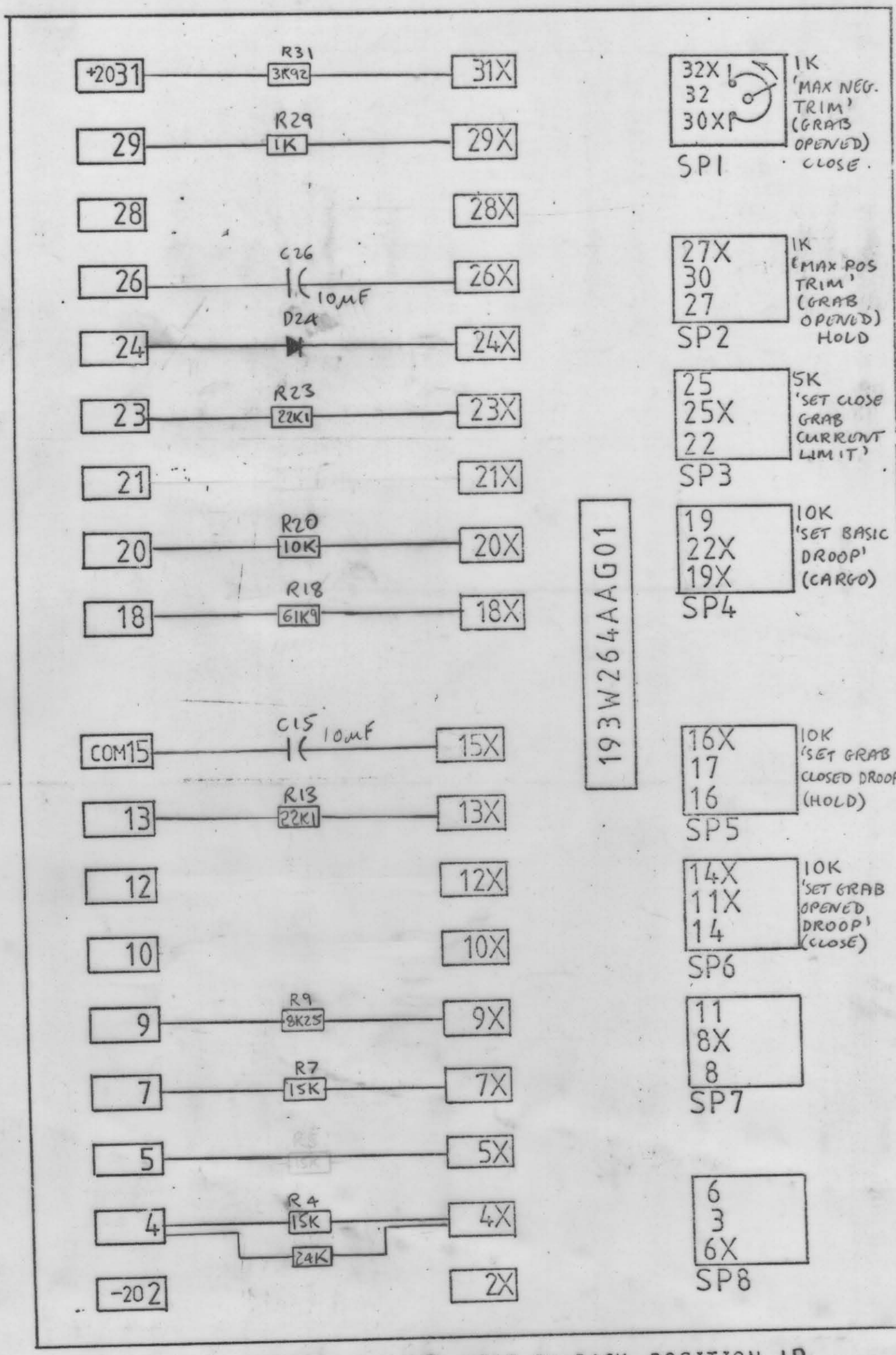


CARD PART NO. 909W317ABG08 FIT IN RACK POSITION 1P .

| TECHN. ENG. | APPD. | TECHN. ENG. | APPD. | DATE | |
|---|---|---|---|---|---|
| NGM | | NGM | | 22/12/82 | |
| 5 | 19/7/84 | 3 | 11/8/83 | TECHN. | |
| | | | | ENG. NGM | |
| | | | | APPD. | |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 2

COMPONENT CARD ICC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | IV | | 1 | U |

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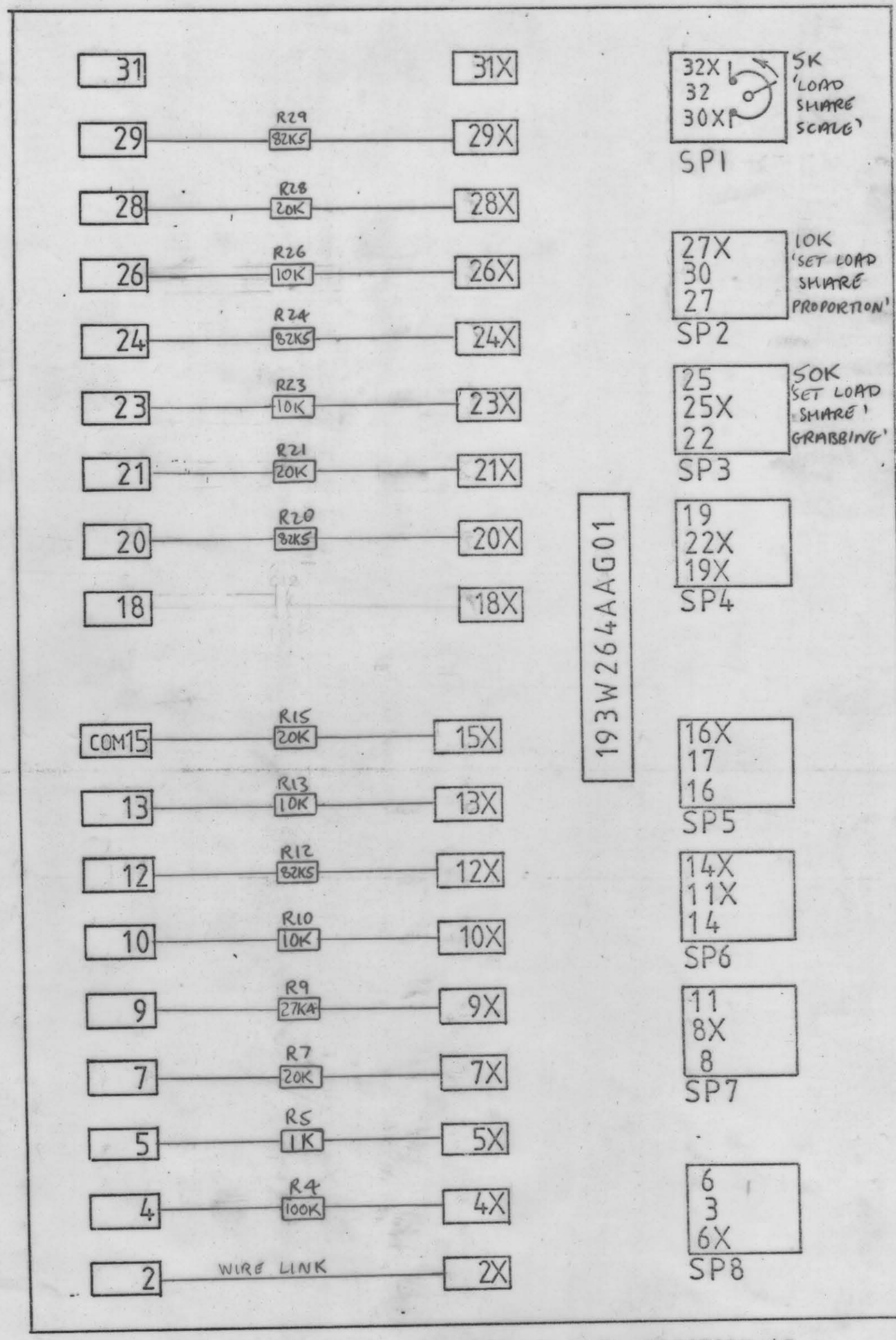
| DR | SH | CONTD. | ELEMENTARY DIAGRAM |
|---|---|---|---|
| 1 | V | 2A | 902M126RC |




CARD PART NO. 909W317ABG06 FIT IN RACK POSITION 1Q.

| TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|
| | NGM | | 22/12/82 |
| 5 | 19/7/84 | | TECHN. |
| 3 | 1/8/83 | | ENG. NGM |
| | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO.2

COMPONENT CARD 2CC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 2A | 1 | V |

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DR 2 | SH 1A | CONTD. 2B | ELEMENTARY DIAGRAM 902M126RC

[2] 8

| | | | | | |
|---|---|---|---|---|---|
| [2] 17 | SP4 | 4RC-1S 24 \|\| 26 | LLR 4 RC 1S | 25 / 23 | FIELD RELAY (585 RPM) |
| [2] 18 | SP5 | 4RB-1S 13 \|\| 16 | LLR 4 RB 1S | 21 / 14 | FIELD RELAY (363 RPM) |
| [2] 24 | SP7 | 4RA-1S 5 \|\| 6 | LLR 4 RA 1S | 11 / 3 | FIELD RELAY (318 RPM) |
| [2] 25 | SP8 | 3RC-1Q 24 \|\| 26 | LLR 3 RC 1Q | 25 / 23 | FIELD RELAY (172 RPM) |
| [2] 5 | MAX, [2] 6 | | | | |
| [4] 9 | SP39 | | LLR 1 RA 1J | 11 / 3 | IN REF. RELAY |
| [4] 10 | SP40 | | LLR 1 RC 1J | 25 / 23 | OUT REF RELAY |
| [4] 11 | SP41 | | LLR 2 RA 1N | 11 / 3 | NOTCH 2-5 RELAY |
| [4] 12 | SP42 | | LLR 2 RB 1N | 21 / 14 | NOTCH 3-5 RELAY |
| [4] 13 | SP43 | | LLR 2 RC 1N | 25 / 23 | NOTCH 4-5 RELAY |
| [4] 14 | SP44 | | LLR 3 RA 1Q | 11 / 3 | NOTCH 5 RELAY |
| [4] 8 | SP38 | | LLR 1 RB 1J | 21 / 14 | SLOWDOWN RELAY |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 8/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION
MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | 2B |

IDENT | DR 2 | SH A

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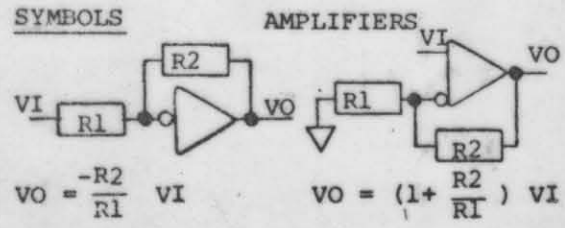
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

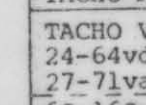
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| MAX AMPS .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R < .25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 200% DRV CL | X | MCC | DCX - DCY |
| FUSELESS | | ACC | CFY - CFX |
| REF SUNCTION | X | MCC | RJ - DM8 |
| MOD. REG. CL | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊣⊢ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF - DM22 |
| INH. CROSSOVER | X | MFC | CMA - COM |
| LINE COMP. | X | MCC | RLA - PCR |
| | | | |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | NGM | | | 8/12/82 |
| | | 3 | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | 1/8/83 | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION

FUNCTION JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 2C | △ | 2 | B |

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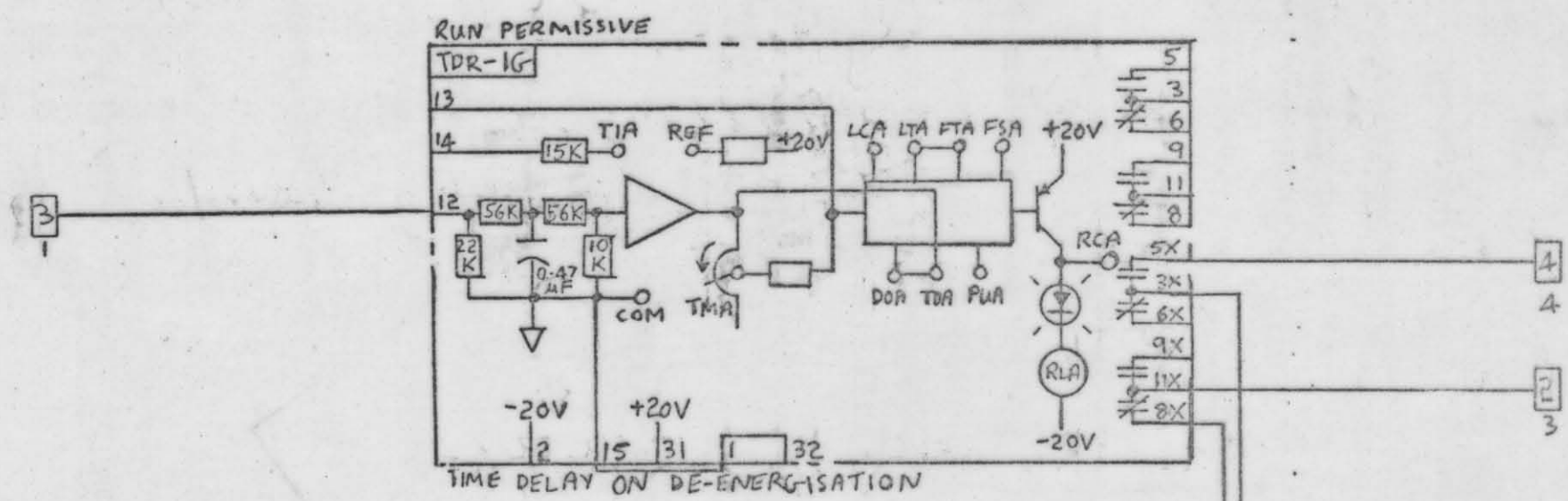
2 B 2C 902M126RC

RUN PERMISSIVE

TDR-1G

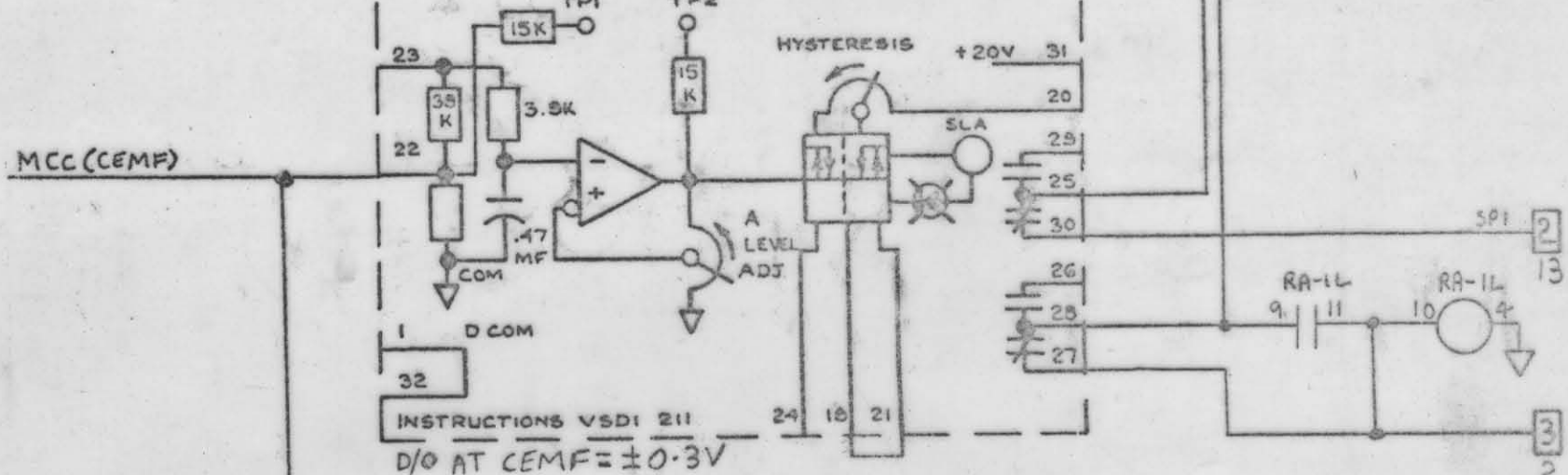



TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

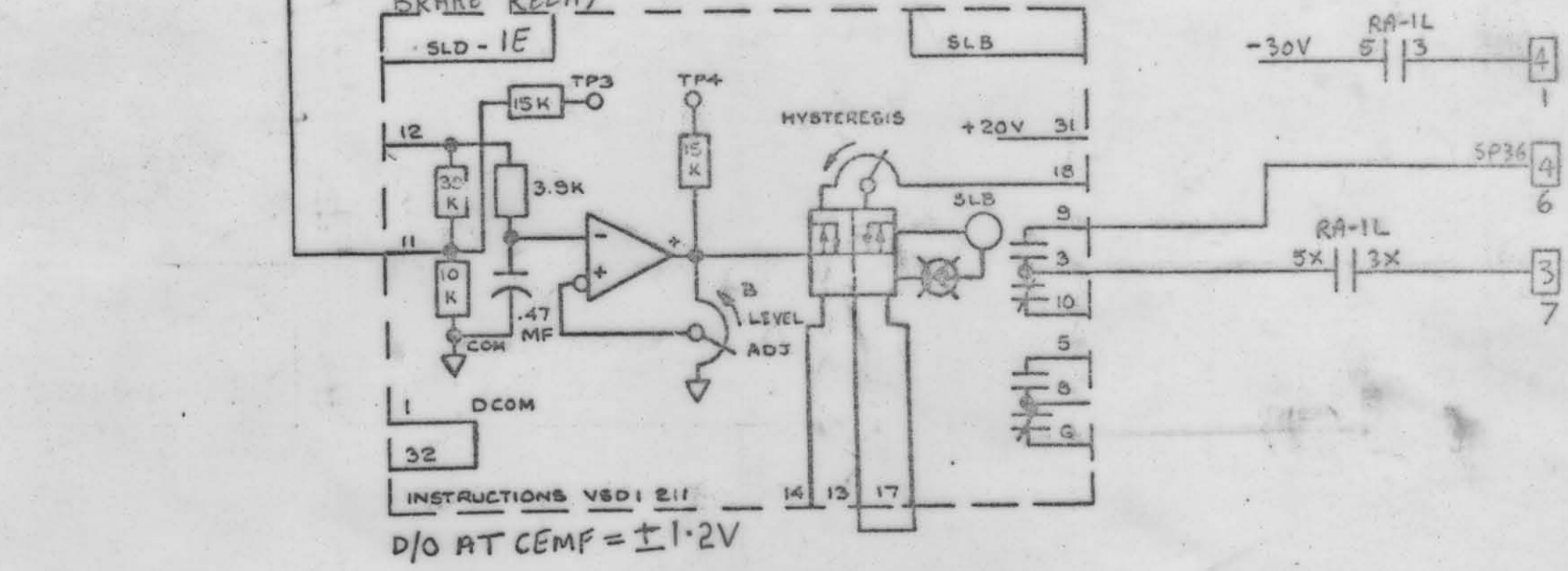



D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

SLB

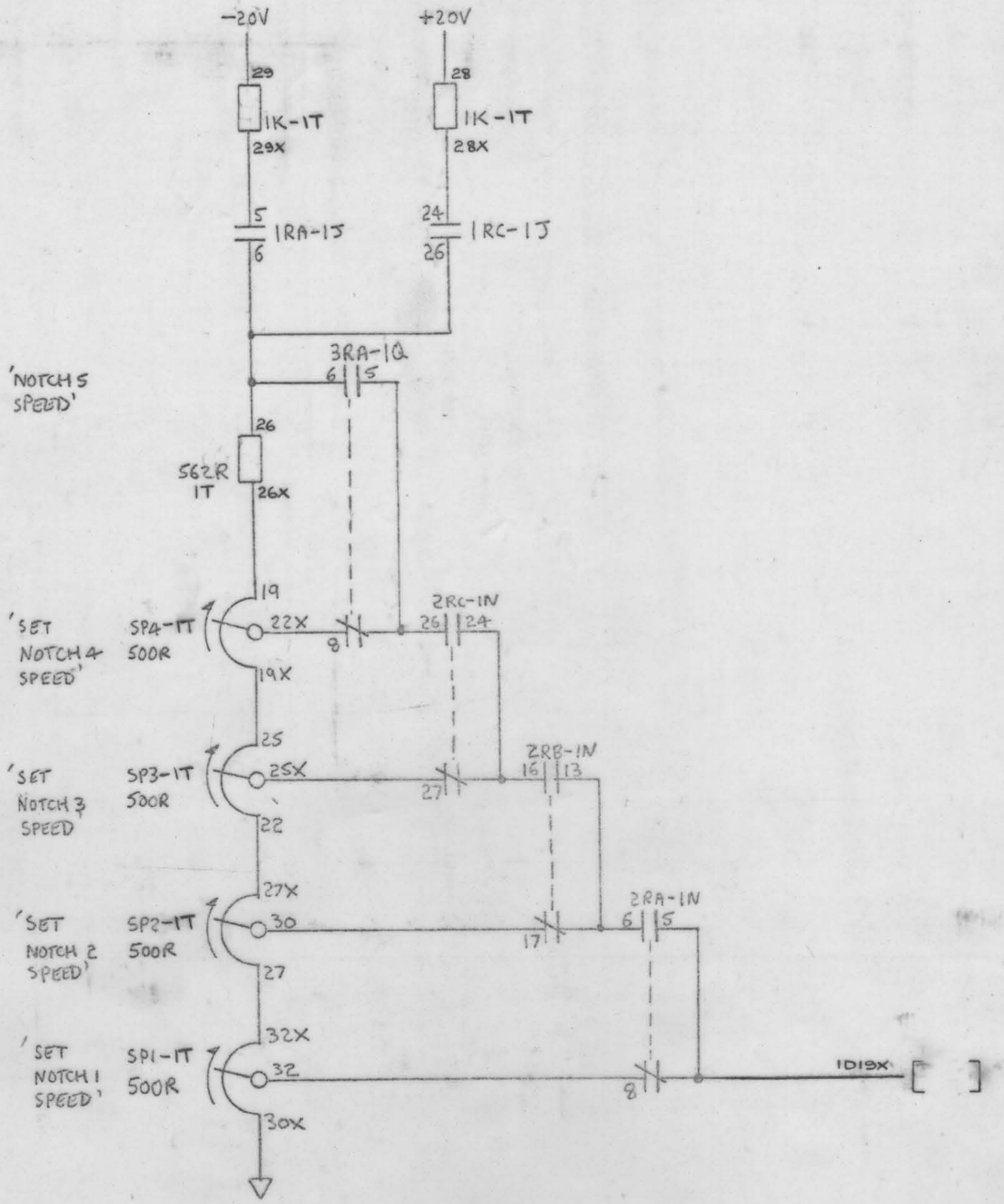



D/O AT CEMF = ±1·2V

| | | |

CRANE3 – 5 NOTCH REF.

DR 2 | SH D | CONTD. 2E | ELEMENTARY DIAGRAM




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 15-12-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

# LUFF MOTION SPEED REFERENCE CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 233900 | 902M126RC | 2E | | 2 | D |

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IN8

IRB-13 16 13 MCC(SR)

IRB-13 18 20 17

REF-1D DIS 10

8x X4

9 X3

8 X2

6 X1

ZERO ADJ 1K

19X 30X 3X

T1

T2

MAXNEG 10K

MAX POT 10K

30 NREF

5X PREF

SLOW 20K 3 5

MCC(PRE) 14 PRE

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS MCC(SYS)

TF 16 MFC(DM22) TF

11 NSW T1

13 PSW T2

-30V 10X -30V

-20V 22.1K FEA 18

MCC(DR) 29 DR

DR INVERT AND MONITOR IR COMP

28 CFB

21 10K 26

47K

56.2K

56.2K

SFB SHAPING

15K

ERR

5GK 13X

39K 16X

22K 17X

12

+20V COM -20V 31 15 2

11X 9X 12X 6X 18X 28X

MCC(SFB)

MCC(TR)

TQP-1C 20 TR 29 ATR

MCC(LT2) 19 LT2

T1 T3 T6 OA1-1

T2

10K 12.1K TRX 28 MCC(DM8) RSR

UTP2 6

T7

+20V

LC HC

OR

T6 T7 T2 T3

13

R CFB

30CFB 27

ATR(+) AND CFB(+)

14 REL

12

ATR(-) AND CFB(-)

OR

AND

AND

10

3 PRE

5 DP2

8 UTP1

MCC(DP2)

PRE(-4V) OR DP2(+20V)

MCC(DM1) ILA

330Ω ILR 9

BR 18

OA1-2

REF DELAY 25K

T1 IMF

TBR

3.92K T17

17 -30V

-30V

+20V COM -20V 31 15 2

22

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 14-12-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLEN-WEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

# LUFF MOTION TORQUE PROVING & REFERENCE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 2F | 2 | E |

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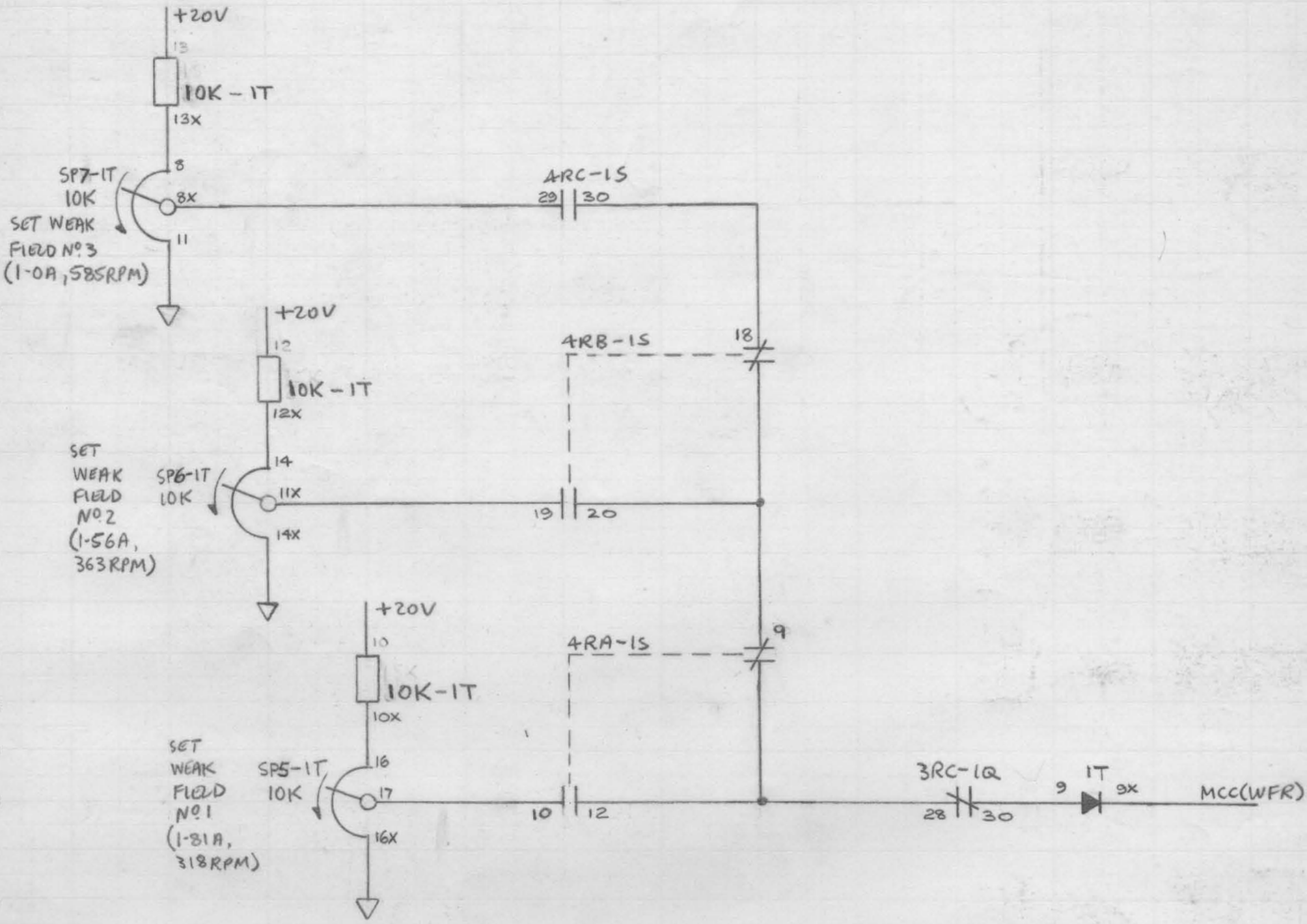


| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | J | K | L | M | N | |

DR 2 | SH F | CONTD. 2G | ELEMENTARY DIAGRAM 902M126RC

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NGM | | | NGM | | 10/12/82 | | | | | |
| 3 | | 1/6/83 | 2 | | 22/2/83 | TECHN. | | | | | |
| | | | | | | ENG. | NGM | | | | |
| | | | | | | APPD. | | | | | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION
MOTOR FIELD CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 2G | 2 | F |

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+20 31

29 — 1K — 29X

28 — 1K — 28X

26 — 562R — 26X

24 — 24X

23 — 23X

21 — 21X

20 — 20X

18 — 18X

COM 15 — 15X

13 — 10K — 13X

12 — 10K — 12X

10 — 10K — 10X

9 — 9X

7 — 7X

5 — 5X

4 — 4X

-20 2 — 2X

193W264AAG01

31X — 32X, 32, 30X — 500R — SET NOTCH 1 SPEED

29X — 27X, 30, 27 — 500R — SET NOTCH 2 SPEED — SP2

25, 25X, 22 — 500R — SET NOTCH 3 SPEED — SP3

19, 22X, 19X — 500R — SET NOTCH 4 SPEED — SP4

16X, 17, 16 — 10K — SET WEAK FIELD No.1 — SP5

14X, 11X, 14 — 10K — SET WEAK FIELD No.2 — SP6

11, 8X, 8 — 10K — SET WEAK FIELD No.3 — SP7

6, 3, 6X — SP8

CARD PART NO. 909W317AB G07 FIT IN RACK POSITION IT

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 15-12-82 |
| | | 3 | | | 1/8/83 | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION COMPONENT CARD

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 233900 | 902M126RC | 2H | 2 | G |

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CRANES – NO MOTOR FIELD PROGRAMME

| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | | 3LLR | | 4LLR | CC | | | |
| | | 193W 545 AAG01 | 193W 546 ABG01 | 193W 377 AAG02 | | 193W 543 AAG01 | | 193W 279 AAG03 | | 193W 265 AAG04 | 193W279AAG03 | | 193W279AAG03 | | 193W279AAG03 | | | | | |
| | | TORQUE PROVE | REFER-ENCE | SIG. LEV. DET. | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | LOW LEVEL RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | 909W317AB607 COMPONENT CARD. | | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

TEST POST — POT ADJUSTMENT — INDICATING LIGHT

CARD BACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(Com) – 1D15 | SP6 – | SP41 – 1N11 | 1Q24 – 1S5 |
| RTB(+20) – 1G31 | SP7 – 1S11 | SP42 – 1N21 | 1S5 – 1S13 |
| RTB(-20) – 1G2 | SP8 – 1Q25 | SP43 – 1N25 | 1S13 – 1S24 |
| RTB(CFB) – 1C30 | 3TB1 – 1G12 | SP44 – 1Q11 | 1S24 – 2TB6 |
| RTB(-30) – 1L5 | 3TB2 – 1L10 | SP45 – MCC(+30) | MCC(WFR) – 1T9X |
| MCC(SFB) – 1D12X | 3TB3 – | 2TB3 – MTBB(OL2) | 1T9 – 1Q30 |
| MCC(TR) – 1C20 | 3TB4 – 1C17 | 5TB(DFDR) – RTB(FDR) | 1Q28 – 1S12 |
| MCC(SR) – 1J13 | 3TB5 – 1C18 | 2TB8 – 1T30 | 1S9 – 1T17 |
| MCC(SYS) – 1D23 | 3TB6 – | 1S23 – 1S14 | 1S10 – 1S20 |
| MCC(DR) – 1D29 | 3TB7 – 1L3X | 1S14 – 1S3 | 1S19 – 1T11X |
| MCC(CEMF) – 1E11 | 3TB8 – | 1S3 – 1Q3 | 1S18 – 1S30 |
| MCC(DM8) – 1C28 | 4TB1 – 1L3 | 1Q3 – 1Q23 | 1S29 – 1T8X |
| MCC(LT2) – 1C19 | 4TB2 – 1D11 | 1Q23 – 1J3 | 1T11 – 1T14X |
| MCC(DP2) – 1C5 | 4TB3 – 1D13 | 1J23 – 1N3 | 1T14X – 1T16X |
| MCC(PRE) – 1D14 | 4TB4 – 1G5X | 1N3 – 1N14 | 1T16X – 1S23 |
| MFC(DM22) – 1D16 | 4TB5 – | 1N14 – 1N23 | 1T8 – 1T13X |
| SP1 – 1E30 | SP36 – 1E9 | 1N23 – 1G15 | 1T14 – 1T12X |
| SP2 – | SP37 – | 1S25 – 1S26 | 1T16 – 1T10X |
| SP3 – | SP38 – 1J21 | 1S21 – 1S16 | 1T10 – 1T12 |
| SP4 – 1S25 | SP39 – 1J11 | 1S11 – 1S6 | 1T12 – 1T13 |
| SP5 – 1S21 | SP40 – 1J25 | 1Q25 – 1Q26 | 1T13 – 1T28 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 15-12-82 |
| | | | 2 | | | 22/2/83 |

TECHN.
ENG.
APPD.

ALLEN WEST
Stapleks
VARIABLE SPEED DRIVES OPERATION BRIGHTON, ENGLAND

LUFF MOTION
MODIFICATION RACK WIRING

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | 2J |

IDENT
DR 2 SH H

UR 2 | SH H | CONTD. 2J | ELEMENTARY DIAGRAM 902M126RC

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902M1006CT SH16

| DR | SH | CONTD. | ELEMENTARY DIAGRAM |
|---|---|---|---|
| 2 | J | FL | 902M126RC |

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1T28 - 1G31 | | | | |
| 1T28X - 1J24 | | | | |
| 1T29X - 1J5 | | | | |
| 1T29 - 1G2 | | | | |
| 1J6 - 1J26 | | | | |
| 1J26 - 1Q6 | | | | |
| 1Q6 - 1T26 | | | | |
| 1T26X - 1T19 | | | | |
| 1T19X - 1T25 | | | | |
| 1T22 - 1T27X | | | | |
| 1T27 - 1T32X | | | | |
| 1T30X - 1S23 | | | | |
| 1T26 - 1Q6 | | | | |
| 1T22X - 1Q8 | | | | |
| 1T25X - 1N27 | | | | |
| 1T30 - 1N17 | | | | |
| 1T32 - 1N8 | | | | |
| 1Q5 - 1N26 | | | | |
| 1N24 - 1N16 | | | | |
| 1N13 - 1N6 | | | | |
| 1N5 - 1D19X | | | | |
| MCC(DMI) - 1C9 | | | | |
| | | | | |
| | | | | |
| | | | | |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | | | 15-12-82 |

TECHN.

ENG.

APPD.

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION MODIFICATION RACK WIRING (SHEET 2)

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 233900 | 902M126RC | FL |

IDENT

| DR | SH |
|---|---|
| 2 | J |

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DR 0 | SH A | CONTD. 0B | ELEMENTARY DIAGRAM 902M128BX

# VALUTROL-AW STATIC FIELD WARD-LEONARD DRIVES FOR HOIST FOR FOUR ROPE GRAB/CARGO CRANE

ALLENWEST REF. 449901

MANUFACTURED FOR:-

STOTHERT & PITT PLC
BATH
REF- 34/1507 (BELFAST)

## INDEX


| | | |
|---|---|---|
| NOTES | — | 0B |
| RECORD OF DIAGRAM CHANGES | — | 0C |
| HOIST Nº1 | — | 1A-1N |
| HOIST Nº2 | — | 2A-2M |


## ASSOCIATED DIAGRAMS

| | | |
|---|---|---|
| SCHEMATIC FOR MAINS | — | 1/8/449901/SCH1 |
| SCHEMATIC FOR HOIST CONTROL | — | 1/8/449901/SCH2 |
| SCHEMATIC FOR SLEW, LUFF, TRAVEL CONTROL | — | 1/8/449901/SCH3 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| EGH | MJS | | | | | 22/5/85 |
| 3 COMMISSIONING MODS. | | | 2 — AS SHIPPED | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TITLE → INDEX

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 0B | 0 | A |

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902HM100CY SH2



DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "OB", THE SECOND SHEET OF DRIVE "O",I.E. THE INTRODUCTORY MATERIAL.

~~WIRE NUMBERING SYSTEM~~

~~WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. 01, 02, 10, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2A04 INDICATES WIRE NUMBER 04 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C.~~

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

   A) THE BRACKETS ARE ELIMINATED, AND
   B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

   THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

   AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET OA.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER,—

——————— [1805]

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | NOTES | IDENT |
|---|---|---|---|---|---|
| RGM. | | 22/5/85 | TECHN. | | |
| 3. | | | ENG. NGM | | DR 0 / SH B |
| | | | APPD. | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 0C | |

ALLENWEST Simplex — VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

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902HM1008CY SHT3

DR 0 | SH C | CONTD. 1A | ELEMENTARY DIAGRAM 902M128BX

## RECORD OF ELEMENTARY DIAGRAM CHANGES

| SHEET No. | ISSUE | DATE | LOCATION AND DESCRIPTION OF CHANGE | ISSUED BY |
|---|---|---|---|---|
| ALL | 2 | 2.7.85 | AS SHIPPED | |
| ALL | 3 | 18.2.86. | COMMISSIONING MODS. | RGM. |

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| RGM. | | | | | | 22/5/85 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

3

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

RECORD OF DIAGRAM CHANGES

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 1A | 0 | C |

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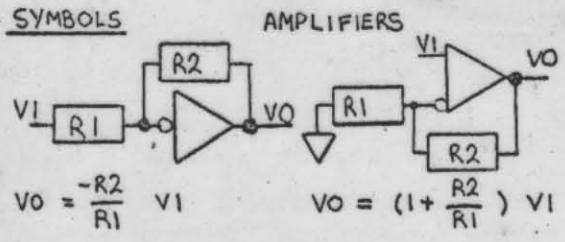
VOLTAGE POLARITIES SHOWN ARE FOR GF+

HARDWARE ABBREVIATIONS

| | | |
|---|---|---|
| MCC | — | MAIN CONTROL CARD |
| IFC | — | INTERFACE CARD |
| PSC | — | POWER SUPPLY CARD |
| SCR | — | THYRISTOR ASSEMBLY |
| DGC | — | DIAGNOSTIC CARD |
| MFC | — | MOTOR FIELD CONTROL |
| MFE | — | MOTOR FIELD EXCITER |
| MDR | — | MODIFICATION RACK |

SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND

VI ( ) VO ABS — VO = SIGN ( ) X ABSOLUTE VALUE OF VI

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

— STAB ON TERMINAL

□ — TERMINAL AT 2TB, 3TB, 4TB, 5TB, RTB
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MCC | X-Y |
| | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | | (NONE) |
| 10C-400% | X | | (NONE) |
| -500% | | IFC | 1-1HI |
| -300% | | IFC | 1-1LO |
| SR 5-9V | | | (NONE) |
| 9-20V | X | MCC | SRH-COM |
| LT. 3-7 SEC | X | | (NONE) |
| 1-25 SEC | | MCC | 562Ω FROM LTI TO COM |
| CEMF REG | X | IFC | NT-CEMF, PT-COM |
| DC TACH | | | (NONE) |
| TACH FILT | | IFC | TC-TC |
| TACH VOLTS | | | |
| 18-49 VDC | | IFC | NT-NT1, PT-PT1 |
| 46-123 VDC | | IFC | NT-NT2, PT-PT2 |
| 85-232 VDC | | IFC | NT-NT3, PT-PT3. |
| G1,3,4 ; G2,5,6 | | | MFC OR MFE |
| 8 ; 1·7 | | MFC | (NONE) |
| 1·3 ; 2·8 | | MFC | YB-YD |
| 2·4 ; 5·0 | | MFC | YA-YB |
| 4·0 ; 8·0 | | MFC | YA-YB, YC-YD |
| 7·0 ; 13·0 | | MFC | YA-YC |
| 13·0 ; 25·0 | X | MFC | YA-YC, YB-YD. |
| L/R < ·25S | X | MFC | QA-QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| RFC AMPS | | | |
| ·8-1·7 | | | (NONE) |
| 1·3-2·7 | | MCC | FB-FD, RB-RD |
| 2·6-5·5 | | MCC | FA-FB, RA-RB |
| 3·7-8·2 | X | MCC | FA-FB, RA-RB<br>FC-FD, RC-RD |
| 7·4-15 | | MCC | FA-FC, RA-RC |
| 12·3-25 | | MCC | FA-FC, RA-RC<br>FB-FD, RB-RD |
| 23-49 | | MCC | FA-FE, RA-RE |
| 45-70 | | MCC | FA-FE, RA-RE<br>FA-FC, RA-RC<br>FB-FD, RB-RD |
| MCC REG | X | MCC | DR-GFR. |
| HOIST FIELD PROGRAMME | X | MFC | CRS-COM<br>CMA-COM<br>TF-DM22 |
| | | | |
| | | | |
| TRX. IN | X | MCC | DM8-RJR |

| USE | LOC | JUMPERS |
|---|---|---|
| X | MCC | DM4--NRG |
| X | IFC | CMFA—IHI |
| | | |
| | | |

| | |
|---|---|
| *ALM | A CURRENT LIMIT SWITCH INPUT |
| *ALT | AUX LINEAR TIME SWITCH INPUT |
| *BLM | B CURRENT LIMIT SWITCH INPUT |
| *CEMF | COUNTER EMF |
| *CFB | CURRENT FEEDBACK |
| CMFA | ABSOLUTE VALUE CEMF |
| CRM | CROSSOVER MODIFY |
| DFP | DELAYED FIRING POWER |
| *DMAC | DIAGNOSTIC MAC INPUT |
| *DR | DRIVER REFERENCE |
| *EAO | ERROR AMP OUTPUT |
| EST | EXTERNAL FLT STOP INPUT |
| FALT | FAULT |
| *FC | FIELD CURRENT |
| FDR | FIELD DIAGNOSTIC REFERENCE |
| FEA | FIELD ECONOMY ADJUST |
| FF | FIELD FAULT |
| *FGC | FORWARD FIELD CURRENT FEEDBACK |
| IABS | MOTOR CURRENT ABSOLUTE |
| ILA | CURRENT LIMIT ADJUST |
| IMET | CURRENT SIGNAL FOR METER |
| *LR | LOCAL REF. FROM DGC |
| *LT2 | LINEAR TIME INTEGRATOR SUMMING JUNCTION. |
| *MAC | MAX/MA CONTROL SIGNAL |
| OSC | OSCILLATOR |
| *PCR | PHASE CONTROL REF. |
| *PRE | DRIVE PRECONDITION |
| ØSEC | PHASE SEQUENCE |
| RERR | REGULATOR ERROR |
| *RGC | REVERSE FIELD CURRENT FEEDBACK |
| RIJ | INTEGRATOR SUMMING JUNCTION |
| RJ | REGULATOR SUMMING JUNCTION |
| RRA | REGULATOR RESPONSE ADJUST |
| RSET | RESET |
| *RS1-2 | AC SYNCHRONIZING INPUT |
| *RTR | READY TO RUN |
| *RUN | RUN SWITCH INPUT |
| SA-C | PHASE SYN OUTPUT |
| *SFB | SPEED FEEDBACK |
| SMET | SPEED SIGNAL FOR METER |
| *SR | SYSTEM REFERENCE INPUT |
| *SYS | SYSTEM FAULT TRIP |
| TA | OUTPUT FOR TACHO TRIP ADJUST |
| TF | TACHO FAULT |
| *TFB | TACHOMETER FEEDBACK |
| TFR | AC TACHO FREQUENCY OUTPUT |
| *TR | TIMED REFERENCE |
| *VFB | VOLTAGE FEEDBACK |
| *WFR | WEAK FIELD REFERENCE |

(* — TEST POINT ON DOOR FRONT AS ARE ALL MCC TERMINALS.)

| 3PH VAC | RT1, 2, 3R |
|---|---|
| 415 | 2·64MΩ |
| 230 | 1·506MΩ |
| 460 | 3·0MΩ |
| 1PH VAC | RS1, 2 |
| 340 | 2·21MΩ |
| 575 | 3·71MΩ |
| VDC | DCPR, DCNR |
| 240 | 1·681MΩ |
| 500 | 3·562MΩ |
| 350 | 2·475MΩ |

DR 1 | SH A | CONTD. 1B | ELEMENTARY DIAGRAM 902M1128BX

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE |
|---|---|---|
| REM | | 13/5/85 |
| | | TECHN. |
| | | ENG. NGM |
| | | APPD. |

3

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST Nº1 (CLOSE)
REVERSING FIELD MODULE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449901 | 902M1288X | 1B |

IDENT DR 1 SH A

| DR | SH | CONTD | ELEMENTARY DIAGRAM |
|---|---|---|---|
| 1 | B | 1C | 902M128BX |

CFU1,2&3

| VAC | AMPS | VOLTS |
|---|---|---|
| 230 | 3·2 | 500 |
| 460 | 1·6 | 500 |

GPT SEC

K12 FU2 10A K12F

K11 FU1 10A K11F

RS2 RS1

K1 A CFU1 RT1R

K2 A CFU2 RT2R

K3 A CFU3 RT3R

(R) CPT. (R1Y) (R) (BLK) (BLK/R) (BLK/y) (BLK/W)

460V: BLK/y–BLK/R

230V: BLK/y–BLK/W BLK–BLK/R

11 2 10 2 115VAC (BLU/W) (BLU)

50V FU102 FC2 FC1 X1

PSC

(NS-13)

(NS-3)

FU101 5A REG FU103

-30 -20 COM +20 +30

21 2 27 2 20 2

R X2 R -30 R -20 R COM R +20 R COMX

TO CIRCUITS AS SHOWN

SCR SCR 2F FCT C2 0·22μF R2 100Ω RCT SCR 2R

FCT 2 1 RCT 2 SCR 1R C1 0·22μF R1 100Ω SCR 1F GF

FC1 FC2 RC1 RC2 1FC 2FC 2RC 1RC 1FG 2FG 2RG 1RG MTB

⑧ TO MCC (NS-16)

MTB 0 OR 2 FANS DEPENDING 2 ON RATING AIR UP

⑦ TO IFC (NS-2)

DCPR DCP B DCNR DCN B IN B IP B

MD G M

MFC

K1 L1 1FU K2 L2 2FU K3 L3 3FU F1 F2

R FDR R CRM FDR CRM CIMF WFR SA SB SC RF ZF SFB

SPILLOVER CRS COM FMIN CMA COM FMAX

CURRENT REGULATOR

50/60 HZ SELECT SEE TABLE 1

L/R<.25S SEE TABLE 1

CURRENT SELECT SEE TABLE 1

SFC FC

TACH TF SLIM ALIGN

FAULT OUTPUT

FIELD LOSS FF FLOSS

D M21 D M22 REF (16) +20 COM -20 TA SYS

© (NS-11)

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| RGM | | | | | | 13/5/85. |

TECHN.

ENG. NGM

APPD.

3

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST Nº 1 (CLOSE)

REVERSING FIELD MODULE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 1C | 1 | B |

DR 1 C | CONTD. 1D | ELEMENTARY DIAGRAM 902M128BX

OPENED FOR SOME CONTROL OP.

INSTRUMENT — LO — HI

CONTROL ON

-30V (PS-21)

IEC

RSTOP

MAC

+20V COM -20V PRE PRC COM RN RP

OR AND

(+) ABS — OA7 — CMFA — ZSPD

CEMF

RT1 RT2 RT3 DCP DCN IN IP

ISOLATE & PHASE SHIFT

ISOLATE — ISOLATE

(-) APPROX. 2·5V (-) AT RATED IA

IARS — IMET — 5K

(-) ABS — OA4 — 7·5V AT TOP SPEED

SARS — SMET — 10K — DM13

(-) ABS — OA5

OA6-2 — TER — 18 PUL/REV

TACH V SCALING — NT — 47·5K

150K — TKN — TC — SEE TABLE 1 — PT — 47·5K

OA3

COM C — OA6-1

TO MFC (PS-35)

SVS — EST

FAULT — TRIP — FAULT — FALT — DSEQ

+20

ILO — IHI — RESET — RSET — REF(12X) — REF(23)

OSC 6kHz — DM12

RSET RTR FT1 FT2 SMAX TFB CEMF SA SC VFB DM11 CFB IPU OSC

B FLT A — B 4 — R CFB — FLT

TO MTB (PS-13)

MCC

MAC WFR FC SFB SYS RTR SMAX TFB CEMF VFB COMP CFB ALM LIM

READY TO RUN

5·6V FOR RATED ARM VOLTS

FET CONTROL LOGIC (SEE NOTE) — TO FETS

PRE RUN DMAX DPI DP2 FEA DFP

REF(14)

39·2K — 22·1K — OA3-2 — FB1 — 1-0-1-1 — 20K — 274K — C14 — R71 — RJ

SMR — MAX SPEED

121K — 21K — OA3

CURR LIM — A LIM — B LIM

CURR LIMIT SELECT — SPILL OVER — ILA — CLF — CLR

10V TOP SPEED — SFB

COM — 2·2K — 20K — SRH — 1-0-1-1 — 3·3K — 4·75K — 4·0K — OA1-1 — 1M — REF SCALE 10K — (-) — SR

T1R — (2-60 Sec) — 332K — 4MFD — COM

OA1-2 — 47·5K — 10V @ TOP SPEED

221K — GAIN — OA2-2 — FBR — RJT

DR — C48 — CL1 — R227 — CLJ

GEN. FLD. REGULATOR — GFR — IMAX — FLD CURR AND 50/60 HZ SEE TABLE — PCR TAC FSC TS1 TS2 1FC 1FG 2FC 2FG 1RC 1RG 2RC 2RG FC1 FC2 RC1 RC2

OA2-1 — 4MFD — RESP — 50K — RRA — +10V FOR RATED ARM VOLTS

LIN TIME — AUX TIME — TIME RANGE SELECT — LT — 1-0-0-0 — TER

ALT — 1-0-1-1

+30 +20 COM -20 DM1 LR LT2 DM2 TR DM3 DM4 DM5 ERO DM6 DM7 DM8 DR

TAP (19) — TAP (20) — MCC-DP2 — TAP (28) — REF(24)

MONO STABLE PG — DP2 DP1 RSET LOC REF CURR REF — FDP — CFT — DFDR

RAMP TIME — +20 — NORM — RAMP STATIC — ADMD — IMAC — -20 — D2 — D1 — -20V — CRM — DCRM

DGC

NOTE — FIELD EFFECT TRANSISTOR

THE CLOSED/OPEN (1/0) STATE OF THESE SWITCHES FOR "PRECONDITION" — "RUN" — "DIAGNOSTIC STATIC" — "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE AS LISTED ABOVE.

| TECHN. ENG. APPD. | TECHN. APPD. | DATE 13/5/85 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST Nº1 (CLOSE) REVERSING FIELD MODULE | IDENT DR SH |
|---|---|---|---|---|---|
| R6M | | TECHN. | | | |
| 3 | | ENG. NGM | | GO NUMBER 449901 · ELEMENTARY DIAGRAM 902M128BX · CONTD 1D | 1 C |
| | | APPD. | | | |

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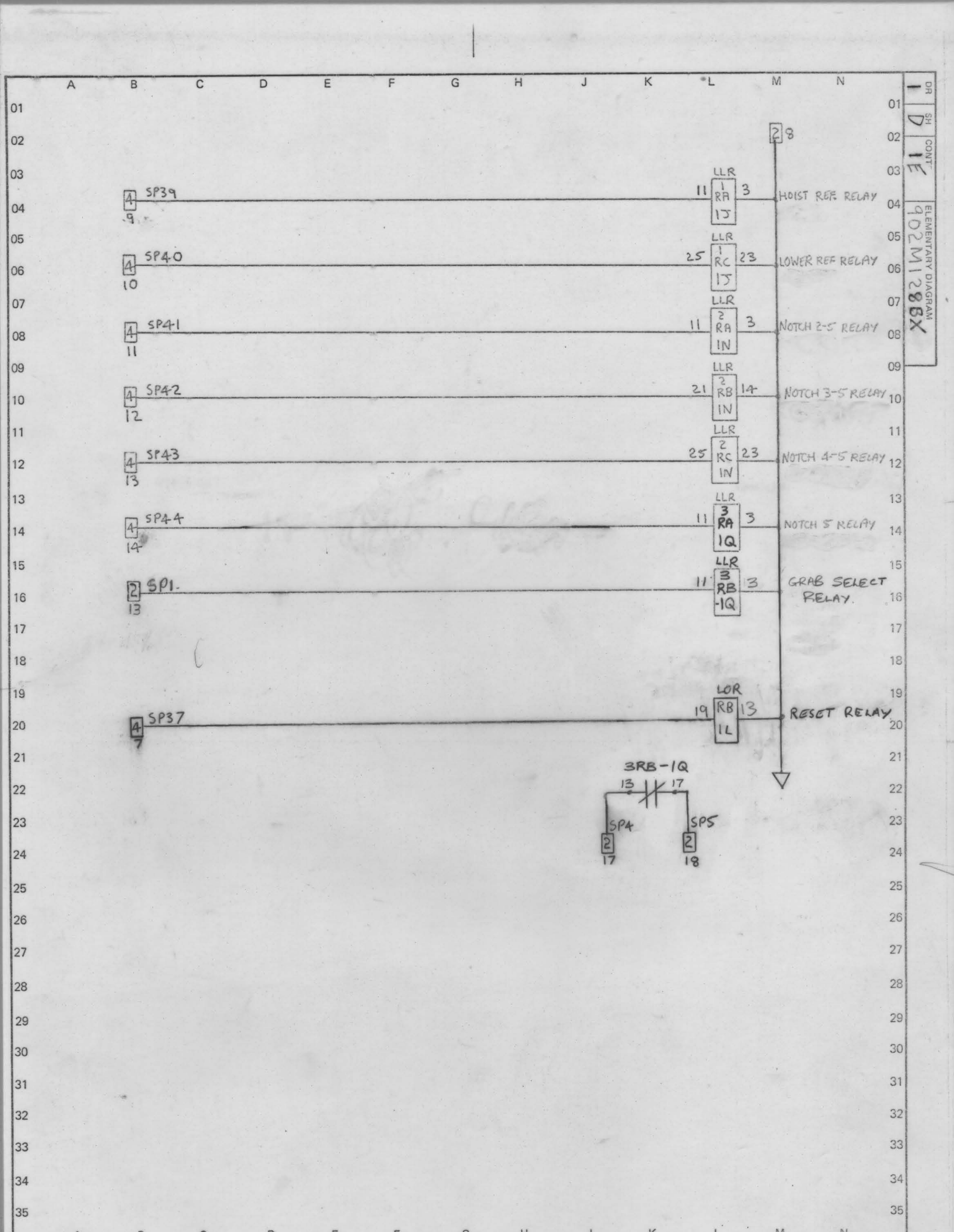


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | | |
|---|---|---|---|---|---|---|
| RGM | | 10/5/85 | ALLENWEST Simplex | HOIST MOTION Nº 1 (CLOSE) MDR CONTROL | | IDENT |
| 3 | | TECHN. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 449901 | ELEMENTARY DIAGRAM 902M128BX | CONT 1E |
| | | ENG. NGM | | | | DR 1 SH D |
| | | APPD. | | | | |

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CRANES – 5 NOTCH REF.

+20V

2

R2-1U

1K

2X

5

1RA-1J

6

+20V

31

R31-1U

1K

31X

24

1RC-1J

26

3RA-1Q

6 5

'NOTCH 5 SPEED'

4

R4-1U

562R

4X

19

70% 'SET NOTCH 4 SPEED' SP4-1U 500R

22X

8

2RC-IN

26 24

19X

25

45% 'SET NOTCH 3 SPEED' SP3-1U 500R

25X

27

2RB-IN

16 13

22

27X

25% 'SET NOTCH 2 SPEED' SP2-1U 500R

30

17

2RA-IN

6 5

27

32X

10% 'SET NOTCH 1 SPEED' SP1-1U 500R

32

8

(SPEED REF)

(-Ve = HOIST)

TO HOIST A/D REF-1D [G02]

30X

DR 1 SH E CONTD 1F ELEMENTARY DIAGRAM 902M128BX

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10/5/85 |
|---|---|---|---|---|---|---|
| | K.H. | | | | | TECHN. |
| 3 | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 1 (CLOSE.)

SPEED REFERENCE CCT.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 449901 | 902M128BX | 1F | △ | 1 | E |

RUN PERMISSIVE

TPR-1G

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

[IC17] MCC (CEMF)

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

INSTRUCTIONS VSD1 211

D/O AT CEMF = ± 1·2V

RB-1L

RSET

| | | | | | |
|---|---|---|---|---|---|
| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 13/5/85 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST No. 1 (CLOSE) MDR CONTROL | IDENT DR 1 SH F |
| RGM | | TECHN. | | | |
| 3 | | ENG. NGM | | | |
| | | APPD. | | CO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 1G | |

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DR 1 | SH G | CONTD. 1H | ELEMENTARY DIAGRAM 902M128BX

[1E23] SPEED REF

MCC(SR) [1C26]

REF-1D

DIS 10

8x x4

9 x3

8 x2

6 x1

ZERO ADJ 1K

19x 30x 5x

T1

T2

MAXNEG 10K

MAX POS 10K

NREF

PREF

30 5x 3

SLOW 20K 5

[1C19] MCC(PRE)

14 PRE

11 NSW

13 PSW

10x -30V

-30V

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS

MCC(SYS) [1C16]

TF 16

MFC(DM22) TF [1B33]

+20V 22.1K FEA 18

5.6K 13x

39K 16x

22K 17x

12

+20V COM -20V

31 15 2

56.2K

56.2K

SFB SHAPING

1K ERR

[1C30] MCC(DR)

29 DR

28 CFB

DR INVERT AND MONITOR IR COMP

4K7

21 10K

26 11x 9x 12x 6x 18x 28x

MCC(SFB) [1C5]

18 R18-14 4K7 18x

[1C30] MCC(TR)

TQP-1C

20 TR

29 ATR

[1C30] MCC(LT2)

19 LT2

T1 T3 T6

T2

DA1-1

10K 12.1K TRX 28

MCC(DM8) RJR [1C30]

T7 UTP2 6

+20V

LC HC

13

OR

T6 T7 T2 T3

[1C14] R CFB

30 CFB

27

14 REL

12

ATR(+) AND CFB(+)

ATR(-) AND CFB(-)

OR

AND

AND

10

3 PRE

5 DP2

8 UTP1

PRE(-4V) OR DP2(+20V)

[1C30] MCC(DP2)

330Ω ILR 9

BR 18

DA1-2

PEF DELAY 2.5K

T1 1MF

T6R

3.92K T17

17 -30V

-30V

+20V COM -20V

31 15 2

22

BPR 15K

BRAKE PROVING RELAY

3 8 1 3 7 4 3 6 3 3 9 6 3 5 4

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| RGM | | | | | | 13/5/85 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

3

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST No 1 (CLOSE)

REFERENCE & TORQUE PROVING

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 1H | 1 | G |

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DR 1 | SH H | CONTD. 15 | ELEMENTARY DIAGRAM 902M128BX

REF-1D
0·001 μF
22K1
R
CFB
27X
22K1
OA2
26X
10K
(SLA-1T) [1K14]
SP8
2
25
TO DRIVE No 2 ( )
1CFB LINE

R7-1U
20K
7
7X
8
10K
HPC-1A
9
10K
0·001μF
R10-1U
20K
10
10X
11
OA3
10
12
20K
R9-1U
20K
9
9X
R5-1U
20K
5
5X
11
10K
LPC-1B
12
10K
0·001μF
14
OA4
9
13
20K
MCC
(DM5)
[1J05]
AVERAGED ARMATURE CURRENT SIGNAL TO FIELD PROGRAMME PCB'S
+20V
28
R28-1U
4K75
28X
19
3RB-1Q
20
8
SP7-1U
10K
'SET GRABBING FIELD WEAKENING'
(SET FOR 5A FIELD)
11
8X
D13-1U
13
13X
MFC(WFR) [1B29]
SP7
2
24
HOIST No 1
SP6
2
19
HOIST No 1
2CFB
2
19
SP6
CFB
HOIST No 2
(2CFB)
SP7
2
24
HOIST No 2
MFC
(WFR)
D12-1U
MCC(DP1)
12
12X
SP38
4
8
TO DRIVE No 2 ( ) LINE
DIAGNOSTIC INTERLOCKING RELAY

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 13/5/85 | | | |
|---|---|---|---|---|---|
| R6M | | TECHN. | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST MOTION No 1 (CLOSE) COMMON CURRENT AV. CCT. | IDENT |
| 3 | | ENG. NGM | | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 15 | DR 1 / SH H |
| | | APPD. | | | |

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902HM100FC

CRANES

DR 1 SH 3 CONTD. 1K ELEMENTARY DIAGRAM 902M128BX

[1C17] MCC(CEMF)

[1C31] 5 DFDR

[1H20] CURRENT FEEDBACK (AVERAGE)

HPC-1A

23

25 CEMF

26 FDR

17 CFB

DIRECTION SENSING

KL 28

KH 27

30

LV 29

47.5K

.47MF

MFH

10K

OA1-2

VOLTAGE PROGRAMMING

274K

MFL 10K

148K

SFC 21

MFC(SFC) [1C30]

K-212

1K

2MF

-20V

SFA

-1.4V

20K

47.5K

27K

18K

182K

18K

HB

HB 10K

33.2K

CURRENT PROGRAMMING

OA3-1

CRM 13

R CRM [1C28]

221K

5.47K

69.1K

1MF

.15M

DMAC 3

5 DMAC [1D33]

20K

47.5K

E32K

681K

475K

LI 14

24CFB

10K

OA2-1

22 CFB

OA2-2

274K

5

6

+20V COM -20V

31 15 2

LPC-1B

19

16 CEMF

17 FDR

47.5K

.47MF

OA1-1

681K

LV 25

OA1-2

2.21K

24

21

18

30

VOLTAGE PROGRAMMING

4MF

22 KL

27K

20 2CFB

OA2-1

20K

SL1 10K

LB2 20K

LB2

2.74K

5.1K

26

LI 6

1M

OA4-2

8

7

RED JUMPER

CURRENT PROGRAMMING

10

5

LB3 20K

LB3

SL2 10K

SL3 10K

82.5K

OA3-2

LCP

10K

DMAC29

FDR 28

R FDR [1C28]

T2

LR 27

MCC(LR) [1D30]

+20V COM -20V

31 15 2

23

5

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 13/5/85 |
|---|---|---|
| RGM | | TECHN. |
| 3 | | ENG. NGM |
| | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO. 1 (CLOSE).

COMMON HOIST & LOWER FIELD PROGRAMME

IDENT

| CO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 1K | 1 | 3 |

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4
5

CLOSE STALLING RELAY

TDR-1G

20

16

17

15K

TIB

REF

470R

+20V

5.6K

5.6K

12K

0.47 MF

10K

COM

TMB

-20V

2

COM

+20V

15

31

1

32

LCB LTB FTB FSB +20V

DOB TDB PUB

RCB

RLB

-20V

24

22

25

28

30

27

24X

22X

25X

28X

30X

27X

21

1 RB -15

1A

CLOSE SLALL TRIP RELAY.

+20V

13

16

14 21

4K7

14 21X

SYS

DELAY ON ENERGISATION

2 SP3

16

CLOSE ARMATURE CURRENT RELAY

SLD-1T

SLA

TP1

TP2

15K

15K

HYSTERESIS

+20V 31

20

23

39K

3.9K

22

SLA

29

25

30

.47 MF

COM

A LEVEL ADJ.

26

28

27

1 D COM

32

INSTRUCTIONS VSD1 211

24 18 21

[1H05]

(REF-10)

SLB-1E

1E8

1E6

(OPEN ABOVE 75V ARM)

(SPARE)

SLD-1T

SLB

TP3

TP4

15K

15K

HYSTERESIS

+20V 31

18

12

39K

3.9K

SLB

9

3

10

11

10K

.47 MF

COM

B LEVEL ADJ

5

8

6

1 DCOM

32

INSTRUCTIONS VSD1 211

14 13 17

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | IDENT |
|---|---|---|---|---|
| RGM | | 13/5/85 | | |
| 3 | | TECHN. | HOIST Nº 1 (CLOSE) | |
| | | ENG. NGM | CLOSE STALLING CCT | DR 1 / SH K |
| | | APPD. | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 1L | |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A. which is not connected with the English Company of that name

902HM100EA

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPC | LPC | TQP | REF | ISLD | | TDR | | 1LLR | | LOR | | 2LLR | | 3LLR | | 4LLR | 2SLD | CC | |
| 193W 547 A-601 | 193W 548 A-601 | 193W 545 A-601 | 193W 546 A-601 | 193W 277 A-602 | | 193W 543 A-602 | | 193W 279 A-603 | | 193W 265 A-604 | | 193W 279 A-603 | | 193W 279 A-603 | | 193W 279 A-603 | 193W 277 A-602 | 909W 317 ABG53 | |
| HOIST PROGRAM | LOWER PROGRAM | TORQUE PROVE | REFER-ENCE | SIG. LEV. DET. | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | SIG. LEV. DET. | SELECT COMP | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 32 - 32X |
| 31 | 31 - 31X |
| 30 | 30 - 30X |
| 29 | 29 - 29X |
| 28 | 28 - 28X |
| 27 | 27 - 27X |
| 26 | 26 - 26X |
| 25 | 25 - 25X |
| 24 | 24 - 24X |
| 23 | 23 - 23X |
| 22 | 22 - 22X |
| 21 | 21 - 21X |
| 20 | 20 - 20X |
| 19 | 19 - 19X |
| 18 | 18 - 18X |
| 17 | 17 - 17X |
| 16 | 16 - 16X |
| 15 | 15 - 15X |
| 14 | 14 - 14X |
| 13 | 13 - 13X |
| 12 | 12 - 12X |
| 11 | 11 - 11X |
| 10 | 10 - 10X |
| 9 | 9 - 9X |
| 8 | 8 - 8X |
| 7 | 7 - 7X |
| 6 | 6 - 6X |
| 5 | 5 - 5X |
| 4 | 4 - 4X |
| 3 | 3 - 3X |
| 2 | 2 - 2X |
| 1 | 1 - 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(COM) - 1G15 | 5TB(DMAC) - 1A03 | 4TB5 - 1G24 | BUS PINS 02 1A - 1G |
| RTB(+20) - 1G31 | SP1 - 1Q21 | SP36 - 1E09 | BUS PINS 15 1A-1J, 1N - 1U |
| RTB(-20) - 1G02 | SP2 - | SP37 - 1L19 | BUS PINS 31 1A - 1G |
| RTB(CFB) - 1C30 | SP3 - 1Q25 | SP38 - 1U12X | BUS PINS 3, 14, 23 1N - 1S |
| RTB(-30) - 1L05 | SP4 - 1S09 | SP39 - 1J11 | 1G02 - 1T02 |
| MCC(SFB) - 1D12X | SP5 - 1S12 | SP40 - 1J25 | 1T02 - 1U02 |
| MCC(TR) - 1C20 | SP6 - 1U09 | SP41 - 1N11 | 1G31 - 1T31 |
| MCC(SR) - 1Q27 | SP7 - MFC(WFR) | SP42 - 1N21 | 1T31 - 1U31 |
| MCC(SYS) - 1D23 | SP8 - 1D27X | SP43 - 1N25 | 1S15 - 1N15 |
| MCC(DR) - 1D29 | 3TB1 - 1G12 | SP44 - 1Q11 | 1Q21 - S11 |
| MCC(CEMF) - 1E11 | 3TB2 - 1L10 | SP45 - MCC(+30) | 1U02X - 1S05 |
| MCC(DM8) - 1C28 | 3TB3 - | RTB(RSET) - 1L18 | 1U31X - 1S24 |
| MCC(LT2) - 1C19 | 3TB4 - 1C17 | MCC(DM5) - 1A24 | 1S06 - 1S26 |
| MCC(DP2) - 1C05 | 3TB5 - 1C18 | MCC(WFR) - 1U13X | 1S26 - 1Q06 |
| MCC(PRE) - 1D14 | 3TB6 - | MCC(DP1) - 1U12 | 1Q06 - 1U04 |
| MFC(DM22) - 1D16 | 3TB7 - 1L03X | MCC(ALM) - 1S16 | 1U04X - 1U19 |
| RTB(FDR) - 1B28 | 3TB8 - | RTB(RSET) - 1L18 | 1U19X - 1U25 |
| MCC(LR) - 1B27 | 4TB1 - 1L03 | 2TB26 - 1T29 | 1U22 - 1U27X |
| MFC(SFC) - 1A21 | 4TB2 - 1D11 | MCC(DM4) - MCC(DP2) | 1U27 - 1U32X |
| RTB(CRM) - 1A13 | 4TB3 - 1D13 | | 1U30X - 1U15 |
| 5TB(DFDR) - 1B17 | 4TB4 - 1G05X | | 1Q05 - 1N26 |

REMOVE LINK 2TB1 - 2TB2

DR 1 | SH L | CONTD. 1M | ELEMENTARY DIAGRAM 902M128BX

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | RGM | | | | | 14/5/85 |
| 3 | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST NO 1 (CLOSE)

MDR RACK LAYOUT & JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449901 | 902M128BX | 1M |

IDENT | DR 1 | SH L

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902HM100CY SHT.16

DR 1 | SH M | CONTD. 1N | ELEMENTARY DIAGRAM 902M128BX

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1N24 – 1N16 | 1U07X – 1U05 | 1L01 – 1N03 | | |
| 1N13 – 1N06 | 1U05 – 1A10 | | | |
| 1U22X – 1Q08 | 1U05X – 1B14 | | | |
| 1U25X – 1N27 | 1B11 – 1B09 | 1C17 – 1D10X | | |
| 1U30 – 1N17 | 1B09 – 1A17 | 1A14 – 1B6 | | |
| 1U32 – 1N08 | 1A17 – 1A24 | 1A26 – 1B17 | | |
| 1N05 – 1D19X | 1D26X – 1Q13 | DM4 – DP2 | | |
| 1E28 – 1G03X | 1Q13 – 1T22 | 1014 – 1011 | | |
| 1G03X – 1L09 | 1Q16 – 1U14X | | | |
| 1L10 – 1L11 | 1U14 – 1U20 | | | |
| 1L11 – 1E27 | 1U11X – 1U29 | 1G15 – 1G01 | | |
| 1L05X – 1E03 | 1U29X – 1C28 | 1U4X – 1U19 | | |
| 1E11 – 1E22 | 1U31 – 1U28 | | | |
| 1E19 – 1E21 | 1U28X – 1S05 | | | |
| 1E13 – 1E17 | 1S06 – 1U08 | | | |
| 1L20 – 1U20X | 1U11 – 1U15 | | | |
| | 1U08X – 1U13 | | | |
| 1L17 – 1U15X | 1E22 – 1A25 | | | |
| 1D30 – 1D05X | 1A25 – 1B16 | | | |
| 1D05X – 1Q24 | 1A22 – 1B20 | | | |
| 1Q24 – 1U16 | 1B22 – 1A28 | | | |
| 1U16X – 1Q27 | 1A29 – 1B25 | | | |
| 1U16 – 1U17 | 1A03 – 1B29 | | | |
| 1D29 – 1U18 | 1G22 – 1J21 | | | |
| 1U18X – 1D18X | 1E31 – 1J13 | | | |
| 1D14 – 1C03 | 1T25 – 1G17 | | | |
| 1C30 – 1D28 | 1T19 – 1T21 | | | |
| 1D28 – 1D11X | 1G15 – 1J03 | | | |
| 1L05 – 1C17 | 1J03 – 1J14 | | | |
| 1D11X – 1D27X | 1J14 – 1J23 | | | |
| 1D27X – 1U10 | 1J23 – 1L23 | | | |
| 1A11 – 1U07 | 1L23 – 1L13 | | | |
| 1U07 – 1U10X | 1L13 – 1L04 | | | |
| 1U10X – 1U09X | 1L04 – 1L01 | | | |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 15/5/85 | | | IDENT |
|---|---|---|---|---|---|
| RGM | | TECHN. | ALLENWEST Simplex GE | HOIST NO 1 (CLOSE) MDR JUMPER CHART | DR 1 / SH M |
| 3 | | ENG. NGM | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 1N | |
| | | APPD. | | | |

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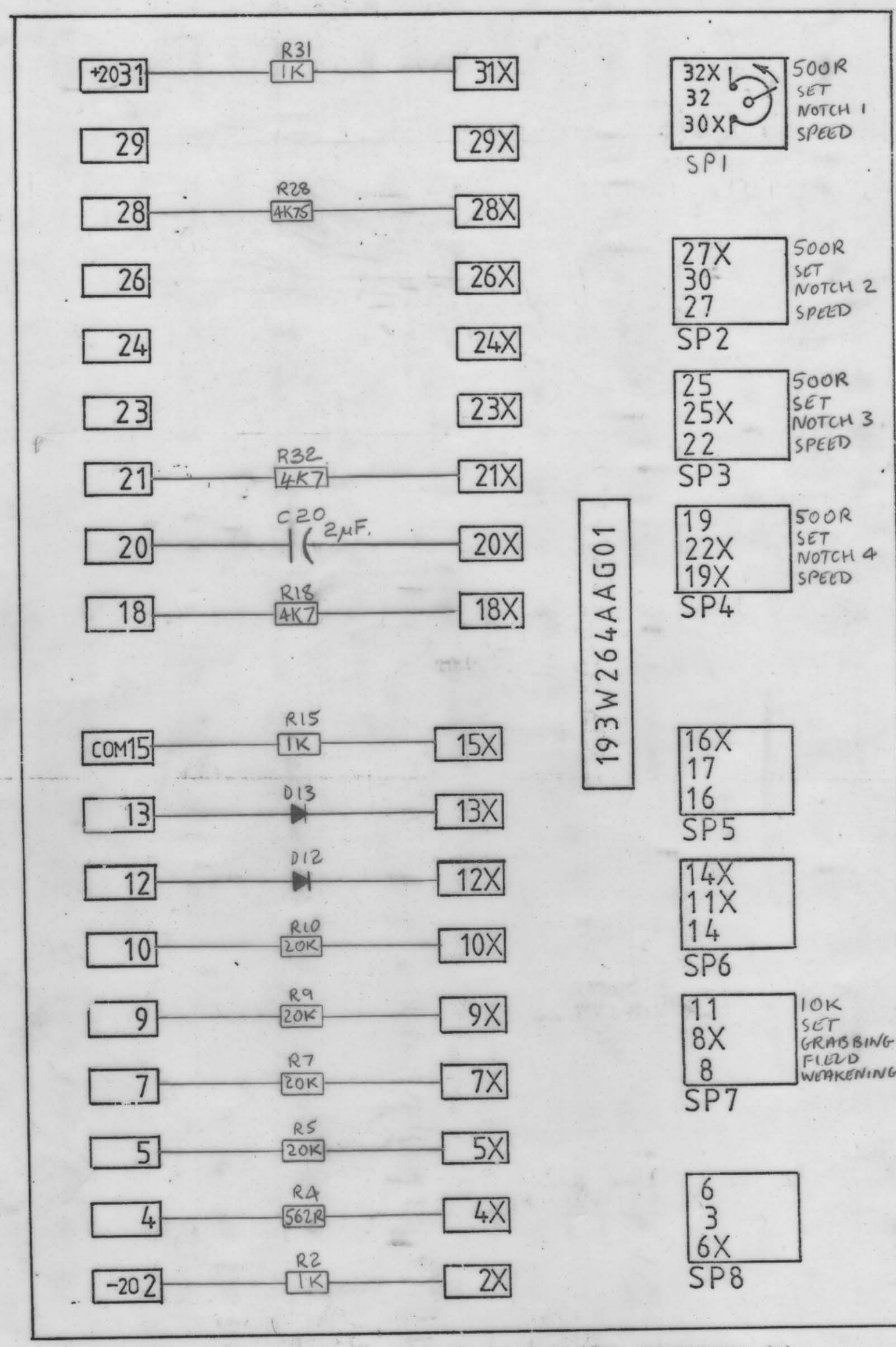



CARD PART NO. 902W317ABG53 FIT IN RACK POSITION 14

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | ALLENWEST | HOIST Nº1 (CLOSE) | IDENT |
|---|---|---|---|---|---|---|---|---|---|
| KGM | | | | | | 14/5/85 | | SELECT COMPONENT PCB | |
| 3 | | | | | | TECH. | Simplex | | DR 1 SH N |
| | | | | | | ENG. NGM | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 2A | |
| | | | | | | APPD. | | | |

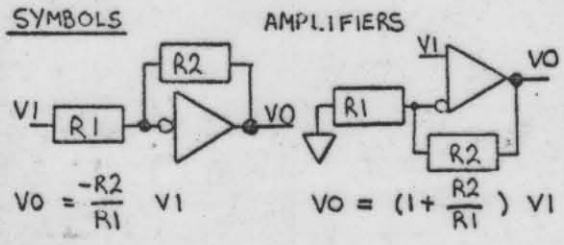
VOLTAGE POLARITIES SHOWN ARE FOR GF+

HARDWARE ABBREVIATIONS

| | | |
|---|---|---|
| MCC | — | MAIN CONTROL CARD |
| IFC | — | INTERFACE CARD |
| PSC | — | POWER SUPPLY CARD |
| SCR | — | THYRISTOR ASSEMBLY |
| DGC | — | DIAGNOSTIC CARD |
| MFC | — | MOTOR FIELD CONTROL |
| MFE | — | MOTOR FIELD EXCITER |
| MDR | — | MODIFICATION RACK |

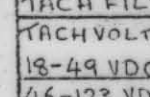
SYMBOLS

AMPLIFIERS

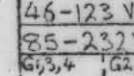



$V_O = \frac{-R2}{R1} V1$ $\quad V_O = (1 + \frac{R2}{R1}) V1$

CASE GROUND




VO = SIGN ( ) X ABSOLUTE VALUE OF VI



POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

● — STAB ON TERMINAL

□ — TERMINAL AT 2TB, 3TB, 4TB, 5TB, RTB
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MCC | X-Y |
| | | IMFC | ZA-ZB (IF USED) |
| 50HZ | X | | (NONE) |
| 10C-400% | X | | (NONE) |
| -500% | | IFC | 1-1HI |
| -300% | | IFC | 1-1LO |
| SR 5-9V | | | (NONE) |
| 9-20V | X | MCC | SRH-COM |
| LT. 3-7SEC | X | | (NONE) |
| 1-25SEC | | MCC | 562Ω FROM LTI TO COM |
| CEMF REG | X | IFC | NT-CEMF, PT-COM |
| DC TACH | | | (NONE) |
| TACH FILT | | IFC | TC-TC |
| TACH VOLTS | | | |
| 18-49 VDC | | IFC | NT-NT1, PT-PT1 |
| 46-123 VDC | | IFC | NT-NT2, PT-PT2 |
| 85-232 VDC | | IFC | NT-NT3, PT-PT3. |
| G3,4 \| G2,5,6 | | | MFC OR MFE (NEITHER FITTED) |
| .8 \| 1.7 | | MF | (NONE) |
| 1.3 \| 2.8 | | MF | YB-YD |
| 2.4 \| 5.0 | | MF | YA-YB |
| 4.0 \| 8.0 | | MF | YA-YB, YC-YD |
| 7.0 \| 13.0 | | MF | YA-YC |
| 13.0 \| 25.0 | | MFC | YA-YC, YB-YD. |
| L/R < .25S | | MFC | QA-QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| RFC AMPS | | | |
| .8-1.7 | | | (NONE) |
| 1.3-2.7 | | MCC | FB-FD, RB-RD |
| 2.6-5.5 | | MCC | FA-FB, RA-RB |
| 3.7-8.2 | X | MCC | FA-FB, RA-RB<br>FC-FD, RC-RD |
| 7.4-15 | | MCC | FA-FC, RA-RC |
| 12.3-25 | | MCC | FA-FC, RA-RC<br>FB-FD, RB-RD |
| 23-49 | | MCC | FA-FE, RA-RE |
| 45-70 | | MCC | FA-FE, RA-RE<br>FA-FC, RA-RC<br>FB-FD, RB-RD |
| MCC REG | X | MCC | DR-GFR. |
| INHIBIT CROSSOVER | | MFC | CMA-COM |
| OVERVOLTAGE | | MFC | TF-DM22 |
| INH. RSTOP | X | IFC | CMFA-IHI |
| | X | MCC | DM4-NRG |
| TRX.IN | X | MCC | DM8-RJR |

| | |
|---|---|
| *ALM | A CURRENT LIMIT SWITCH INPUT |
| *ALT | AUX LINEAR TIME SWITCH INPUT |
| *BLM | B CURRENT LIMIT SWITCH INPUT |
| *CEMF | COUNTER EMF |
| *CFB | CURRENT FEEDBACK |
| CMFA | ABSOLUTE VALUE CEMF |
| CRM | CROSSOVER MODIFY |
| DFP | DELAYED FIRING POWER |
| *DMAC | DIAGNOSTIC MAC INPUT |
| *DR | DRIVER REFERENCE |
| *EAO | ERROR AMP OUTPUT |
| EST | EXTERNAL FLT STOP INPUT |
| FALT | FAULT |
| *FC | FIELD CURRENT |
| FDR | FIELD DIAGNOSTIC REFERENCE |
| FEA | FIELD ECONOMY ADJUST |
| FF | FIELD FAULT |
| *FGC | FORWARD FIELD CURRENT FEEDBACK |
| IABS | MOTOR CURRENT ABSOLUTE |
| ILA | CURRENT LIMIT ADJUST |
| IMET | CURRENT SIGNAL FOR METER |
| *LR | LOCAL REF. FROM DGC |
| *LT2 | LINEAR TIME INTEGRATOR SUMMING JUNCTION. |
| *MAC | MAX/MA CONTROL SIGNAL |
| OSC | OSCILLATOR |
| *PCR | PHASE CONTROL REF. |
| *PRE | DRIVE PRECONDITION |
| ØSEC | PHASE SEQUENCE |
| RERR | REGULATOR ERROR |
| *RGC | REVERSE FIELD CURRENT FEEDBACK |
| RIJ | INTEGRATOR SUMMING JUNCTION |
| RJ | REGULATOR SUMMING JUNCTION |
| RRA | REGULATOR RESPONSE ADJUST |
| RSET | RESET |
| *RSI-2 | AC SYNCHRONIZING INPUT |
| *RTR | READY TO RUN |
| *RUN | RUN SWITCH INPUT |
| SA-C | PHASE SYN OUTPUT |
| *SFB | SPEED FEEDBACK |
| SMET | SPEED SIGNAL FOR METER |
| *SR | SYSTEM REFERENCE INPUT |
| *SYS | SYSTEM FAULT TRIP |
| TA | OUTPUT FOR TACHO TRIP ADJUST |
| TF | TACHO FAULT |
| *TFB | TACHOMETER FEEDBACK |
| TFR | AC TACHO FREQUENCY OUTPUT |
| *TR | TIMED REFERENCE |
| *VFB | VOLTAGE FEEDBACK |
| *WFR | WEAK FIELD REFERENCE |

(* — TEST POINT ON DOOR FRONT AS ARE ALL MCC TERMINALS.)

| 3PH VAC | RT1, 2, 3R |
|---|---|
| 415 | .2-64MΩ |
| 230 | 1.506MΩ |
| 460 | 3.0MΩ |
| 1PH VAC | RS1, 2 |
| 340 | 2.21MΩ |
| 575 | 3.71MΩ |
| VDC | DCPR, DCNR |
| 240 | 1.681MΩ |
| 500 | 3.562MΩ |
| 350 | 2.475MΩ |

| TECHN. | ENG. | APPD. | TECHN. | ENG | APPD. | DATE 13/5/85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST NO2 (HOLD)
REVERSING FIELD MODULE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449901 | 902M128BX | 2B |

IDENT

| DR | SH |
|---|---|
| 2 | A |

DR 2 | SH B, 2C | CONTD. | ELEMENTARY DIAGRAM 902M128BX

CFU1,2&3

| VAC | AMPS | VOLTS |
|---|---|---|
| 230 | 3·2 | 500 |
| 460 | 1·6 | 500 |

460v: BLK/Y--BLK/R

230V: BLK/Y—BLK/W
BLK—BLK/R

115VAC

50V

TO CIRCUITS AS SHOWN

MTB
0 OR 2 FANS DEPENDING 2 ON RATING
AIR UP

(5) TO MCC (NS-16)

(4) TO IEC (NS-2)

MD

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| PGM | | | | | | 13/5/85 |
| | | | TECHN. | | | |
| | | | ENG. | NGM | | |
| | | | APPD. | | | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST No. 2 (HOLD)
REVERSING FIELD MODULE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 2C | 2 | B |

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OPENED FOR SOME CONTROL OP.

INSTRUMENT

CONTROL ON

-30V (PS-21)

IEC

RSTOP

MAC

OR AND

(+) ABS

OA7

CMFA

ZSPO

+20V COM -20V DRE PRC COM RN RP

MAX

(PS-15)

RT1 RT2 RT3 DCP DCN IN IP

ISOLATE & PHASE SHIFT

ISOLATE

ISOLATE

(-) APPROX. 2.5V (-) AT RATED IA

IMAS IMET 5K

(-) ABS OA4

7.5V AT TOP SPEED

SMAS SMET 10K

(-) ABS OA5

DM13

OA6-2 TFR 18 PUL/REV

OSC 6kHz

DM12

FLT

CFB

DM11

TFB CEMF SA SC VFB

IPU OSC

FAULT TRIP FAULT

FALT ØSEQ

+20

ILO IHI

RSET RTR FT1 FT2 SMAX

RESET RSET REF(12X) REF(23)

B FLT A

TO MTB (PS-13)

MCC MAC WFR FC SFB SYS

FET CONTROL LOGIC (SEE NOTE) TO FETS

PRE RUN DMAC DP1 DP2 FEA DFP

REF(14)

TACH

150K TKN 150K TKP

TACH V SCALING NT PT

SEE TABLE I

TC TC

CEMF

47.5K 47.5K

OA3 (-)

READY TO RUN

SMR MAX SPEED

39.2K

OA3-2

22.1K FB1

1-0-1-1

20K 274K

10V TOP SPEED SFB C14 TL R71 RJ

COM C

OA6-1

NO CONNECTION

SYS FAULT TRIP FAULT

EST FALT ØSEQ

ILO IHI

RESET RSET

REF(12X) REF(23)

5.6V FOR RATED ARM VOLTS

OA3 121K 12K

CURR LIM

A LIM B LIM

CURR LIMIT SELECT ILA CLF

SPILL OVER CLR

GAIN

FERR RJT

DR C48 CL1 R227 CLJ

GEN.FLD. REGULATOR

GFR

IMAX

FLD CURR AND 50/60 HZ SCR

+10V FOR RATED ARM VOLTS

OA2-1 OA2-2

RESP 50K RRA 4MFD

2-2K

RJT RJR 1-0-1-1

2.2K 20K

1-0-1-1

(2-60 Sec) 332K 4MFD

3.3K 4.0K 4.75K 1M

OA1-1 OA1-2

REF SCALE 10K

LIN TIME AUX TIME

TIME RANGE SELECT

LT LTI TR 1-0-0-0 1-0-1-1

10V TOP SPEED 47.5K

221K

SB ALT

+30 +20 COM -20 DM1 LR LT2 DM2 TR DM3 DM4 DM5 ERO DM6 DM7 DM8 DR

REF(24)

MCC-DP2

DP2 DP1 RSET LOC REF LR

MONO STABLE PG

CURR REF FDR CFB

DFDR

DIAG RUN +20 NORM DIAG STATIC

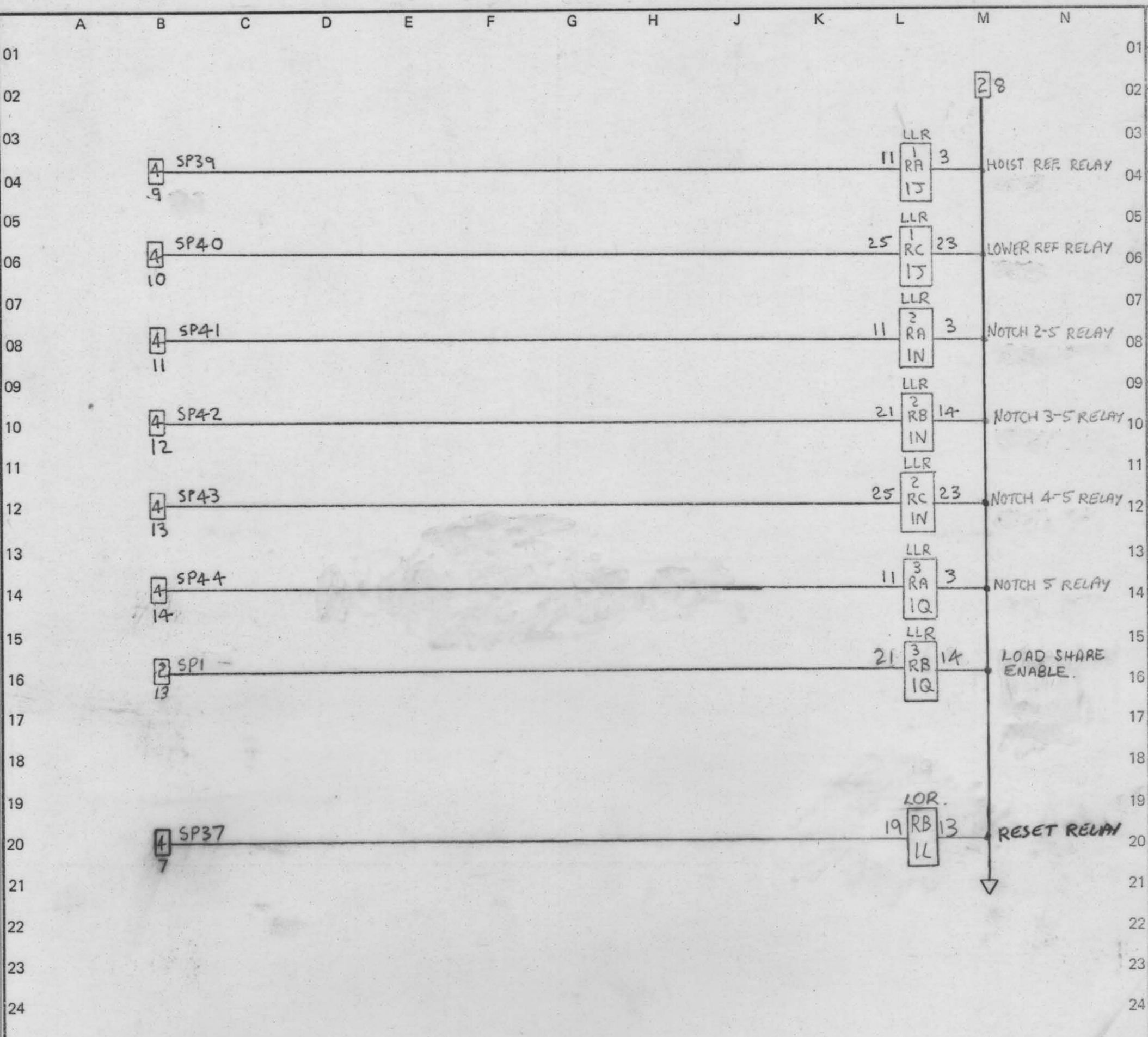
NO3D MAC -20 D2 -20V D1 COM DCRM

DGC

NOTE FIELD EFFECT TRANSISTOR

THE CLOSED/OPEN (1/0) STATE OF THESE SWITCHES FOR "PRECONDITION"—"RUN"—"DIAGNOSTIC STATIC"—"DIAGNOETIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE AS LISTED ABOVE.

| TECHN. ENG. APPD. | TECHN. ENG APPD. | DATE 13/5/85 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST Nº 2 (HOLD) REVERSING FIELD MODULE | IDENT |
|---|---|---|---|---|---|
| RGM | | TECHN. | | | DR 2 SH C |
| 3 | | ENG. NGM | | GO NUMBER 449901 ELEMENTARY DIAGRAM 902M128BX CONTD. 2D | |
| | | APPD. | | | |




DR 2 SH D CONTD. 2E ELEMENTARY DIAGRAM 902M128BX

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10/5/85 |
|---|---|---|---|---|---|---|
| RGM | | | | | | TECHN. |
| 3 | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 2 (HOLD)
COMMON MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 2E | 2 | D |

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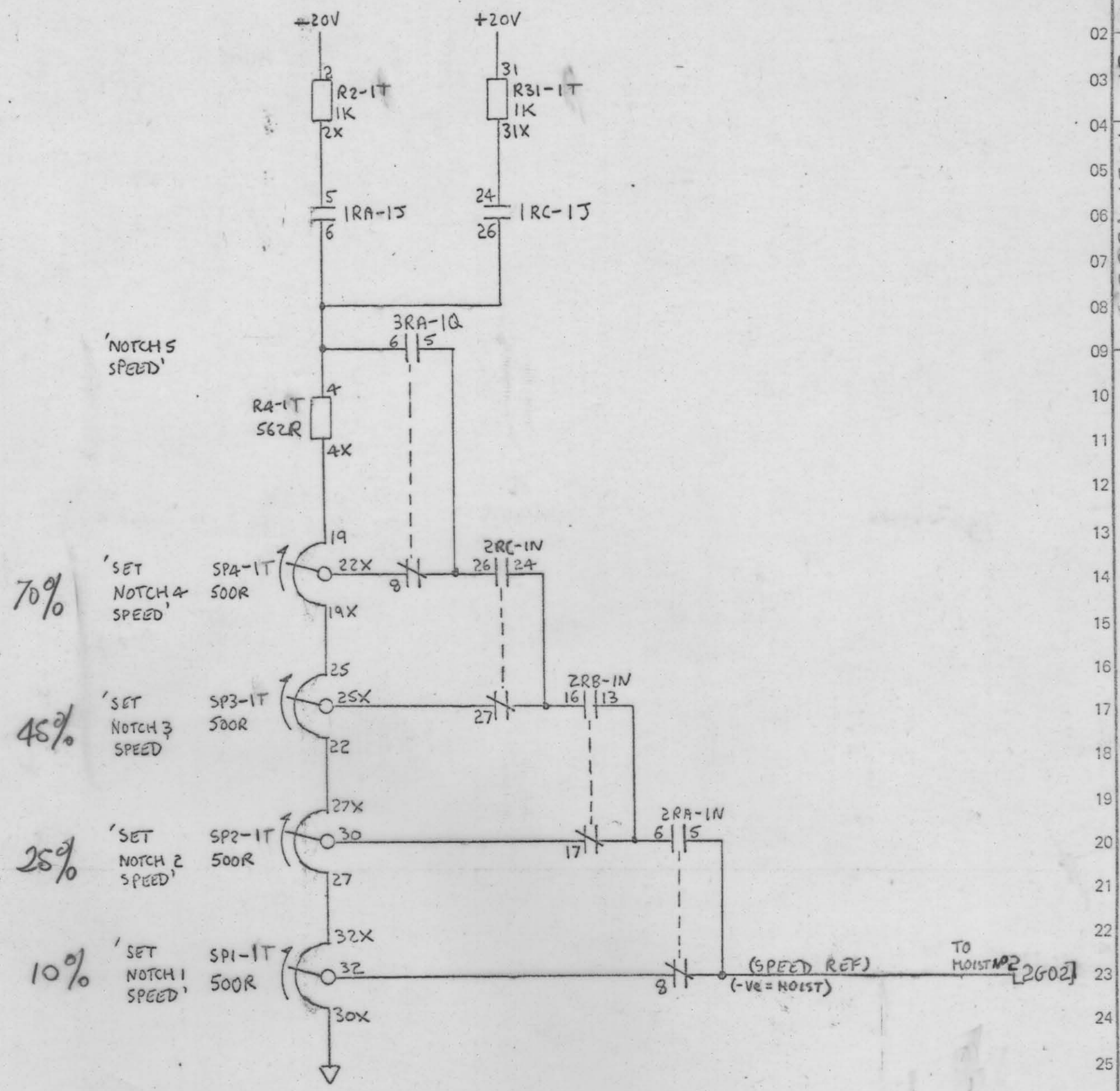
CRANES – 5 NOTCH REF.




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| RGM | | | | | | 10/5/85 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

3

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No2 (HOLD)
SPEED REFERENCE CCT.

| GO NUMBER | ELEMENTARY DIAGRA' | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 2F | 2 | E |

2 E 2F CONT. 902M128BX ELEMENTARY DIAGRAM

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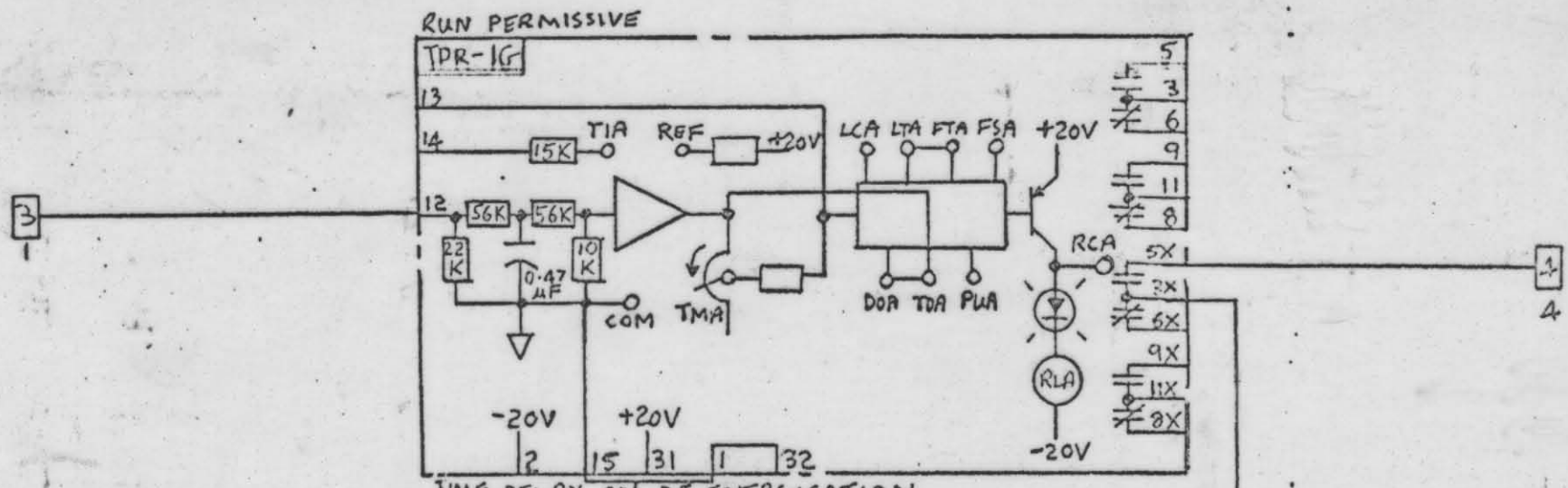
RUN PERMISSIVE

TPR-1G

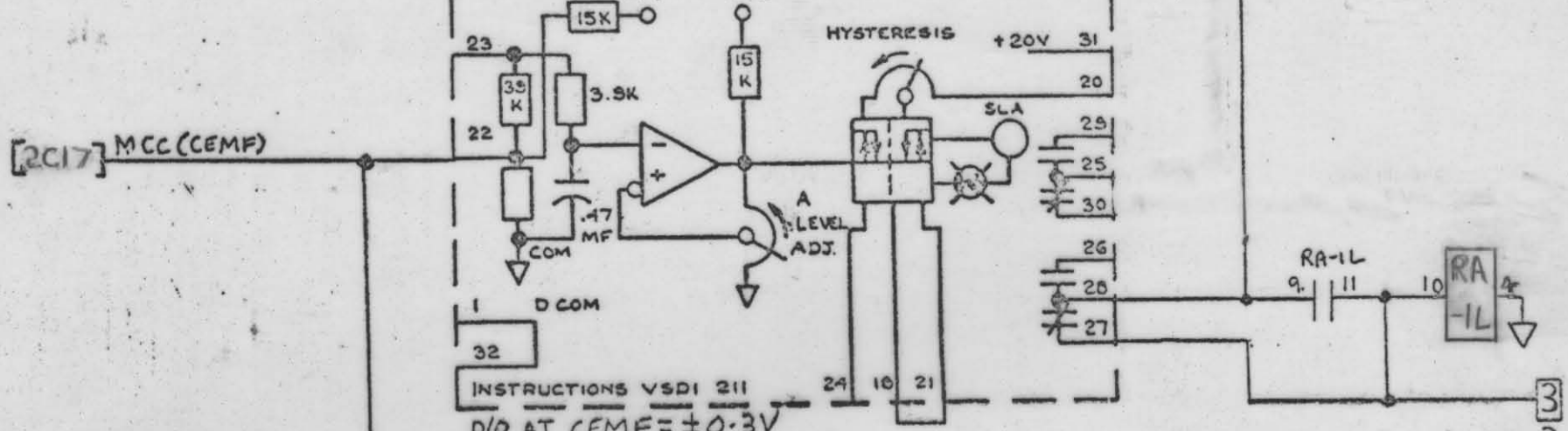



TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

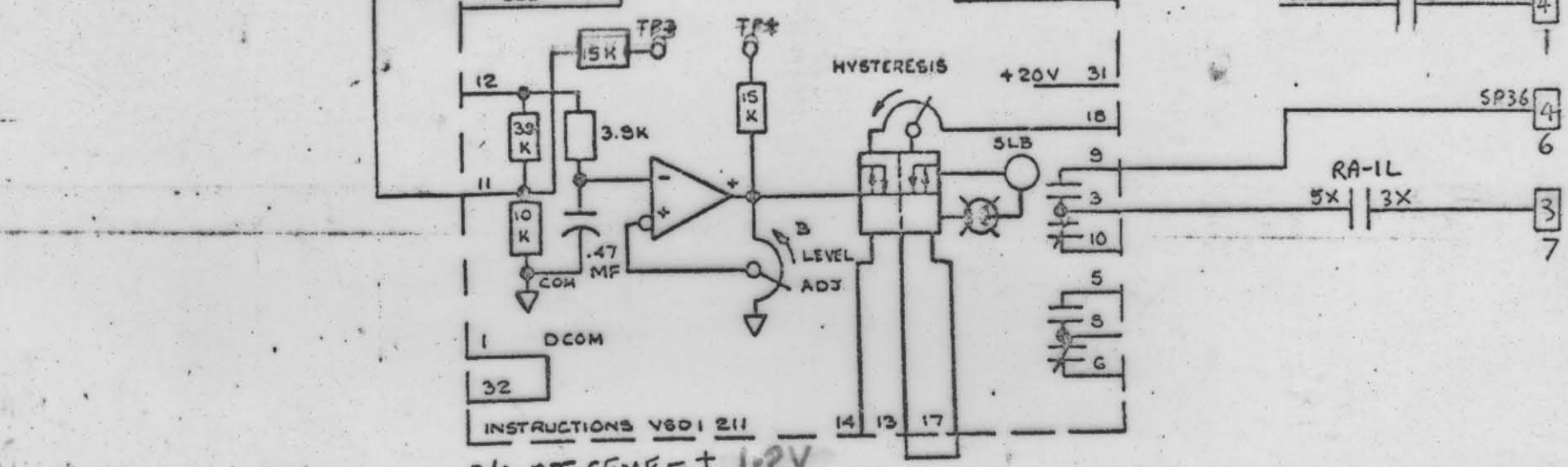



D/O AT CEMF = ±0.3V

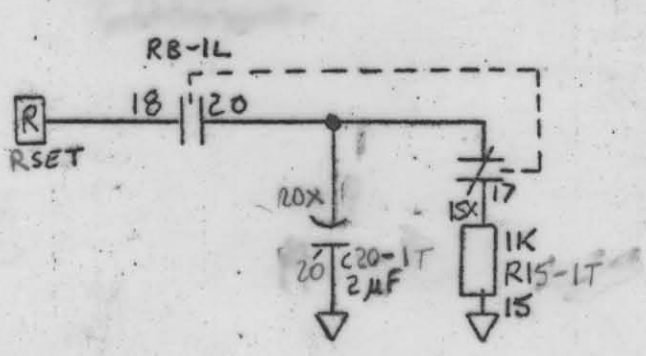
BRAKE RELAY

SLD-1E

SLB




D/O AT CEMF = ± 1.2V




| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | IDENT |
|---|---|---|---|---|---|
| R6M | | 13/5/85 | | HOIST No. 2 (HOLD) | |
| 3 | | TECHN. | | MDR CONTROL | DR 2 SH F |
| | | ENG. NGM | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER A49901 ELEMENTARY DIAGRAM 902M128BX CONTD. 2G | |
| | | APPD. | | | |

2F 2G ELEMENTARY DIAGRAM 902M128BX

[2E23] SPEED REF

MCC(SR) [2C26]

REF-1D

DIS 10

8X X4

9 X3

8 X2

6X1

ZERO ADJ 1K

19X 30X 5X

T1

T2

MAXNEG 10K

MAXPOS 10K

NREF

PREF

30 5X 3

SLOW 20K 5

[2C19] MCC(PRE)

14 PRE

11 NSW T1

13 PSW T2

10X -30V

-30V

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS

MCC(SYS) [2C16]

TF 16

+20V 22.1K FEA 18

53K 13X

39K 16X

22K 17X

12

+20V COM -20V

31 15 2

ERR

[2C30] MCC(DR)

29 DR

28 CFB

21

DR INVERT AND MONITOR IR COMP

10K

26 11X 9X 12X 6X 18X 28X

47K

56.2K

56.2K

SFB SHAPING

1.5K

MCC(SFB) [2C15]

18 R18-1T 4K7 18X

[2C30] MCC(TR)

TOP-1C

20 TR

19 LT2

T1 T3 T2

OA1-1

29 ATR

T6

10K 12.1K TRX 28

MCC(DM8) RJR [2C30]

T7

UTP2 6

+20V

LC HC

OR

AND

AND

TG T7 T2 T3

[2C14] R CFB

30 CFB

27

14 REL

12

10

ATR(+) AND CFB(+)

ATR(-) AND CFB(-)

OR

AND

3 PRE

5 DP2

8 UTP1

[2C30] MCC(DP2)

PRE (-4V) OR DP2 (+20V)

330Ω ILR 9

BR 18

OA1-2

T1 IMF

PEF DELAY 25K

TBR

3.92K T17

17 -30V

-30V

+20V COM -20V

31 15 2

22

BPR 15K

BRAKE PROVING RELAY

3 8 1 7 4 6 3 3 9 6 3 5 4

A B C D E F G H J K L M N

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| RGM | | | | | | 13/5/85 | |
| | | | | | | TECHN. | |
| | | | | | | ENG. NGM | |
| | | | | | | APPD. | |

ALLEN WEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST Nº2 (HOLD)

REFERENCE & TORQUE PROVING

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449901 | 902M128BX | 2H | 2 | G |

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DR 2 SH G CONTD. 2H ELEMENTARY DIAGRAM 902M128BX

REF-1D

0.001 µF

22K1

R 27X CFB

22K1

0A2

26X

(SLA-1R) [2J14]

10K

SP6

2 19 2CFB

TO DRIVE No. 1 LINE

R26-1Q. 3RB-1Q.

1T 26 — 1K — 1T 26X — 1Q 18 — 1Q 20

C23-1T 10µF 23 — 23X

R12-1T 56K2 12 — 12X

A-1S

10X 11X 0A3 12X

R5-1T 20K 5 — 5X

20K 7 — 7X R7-1T

5 10K

6 10K

3 20K

12

A-1S

R10-1T 20K 10 — 10X

17X 10K

18X 10K

19X 20K 0A1 21X

20K

MCC (DM7)

SP7-1T 10K SET LOAD SHARE PROPORTION (SET FCW)

11 8X 8

R29-1T 100K 29

MCC (DM8) RJR [2C29]

25X

24X +20

I LIM+

I LIM-

SET ILIM+ TO CLAMP AT + 3 VOLTS AT DM7

SET ILIM- TO CLAMP AT - 3 VOLTS AT DM7

SP8

2 25 DRIVE No. 2

1CFB

2 25 DRIVE No. 1

SP8

LINE

CFB

[2C17] MCC (WFR) SP7 2 24 WFR 2 24 SP7 WFR

DRIVE No. 2 DRIVE No. 1

R CFB 2CFB

SP6 2 19 2 19 2P6

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | ALLENWEST / Simplex | HOIST No. 2 (HOLD) | IDENT |
|---|---|---|---|---|---|---|---|---|---|
| RGM | | | | | | 14/5/85 | | | |
| 3 | | | | | | TECHN. | | CARGO LOAD SHARE CIRCUITS | DR 2 SH H |
| | | | | | | ENG. NGM | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 449901 / ELEMENTARY DIAGRAM 902M128BX / CONTD. 2J | |
| | | | | | | APPD. | | | |

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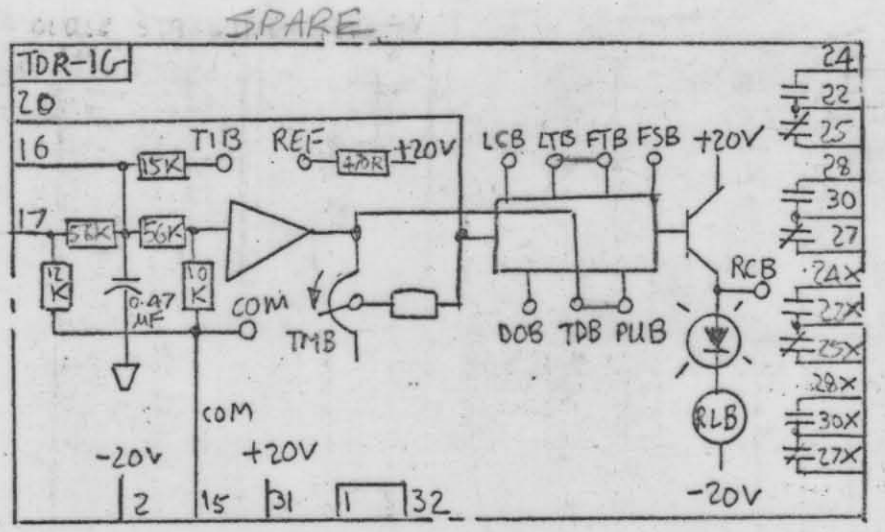
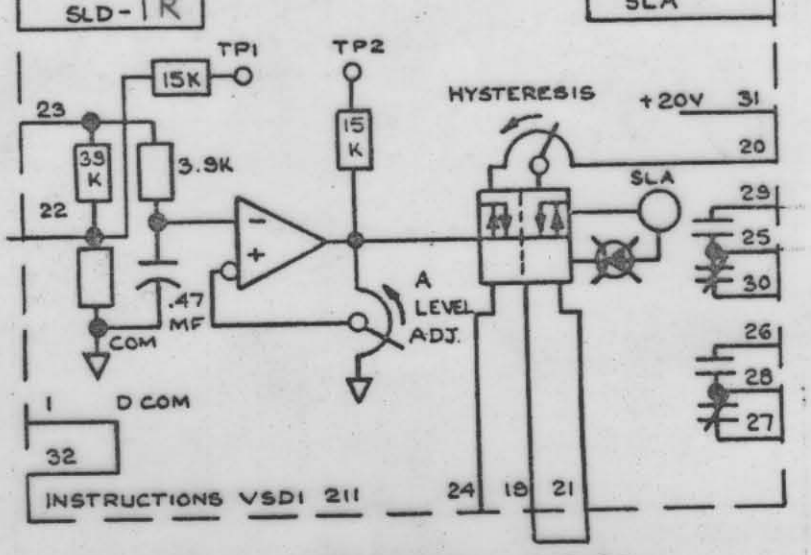
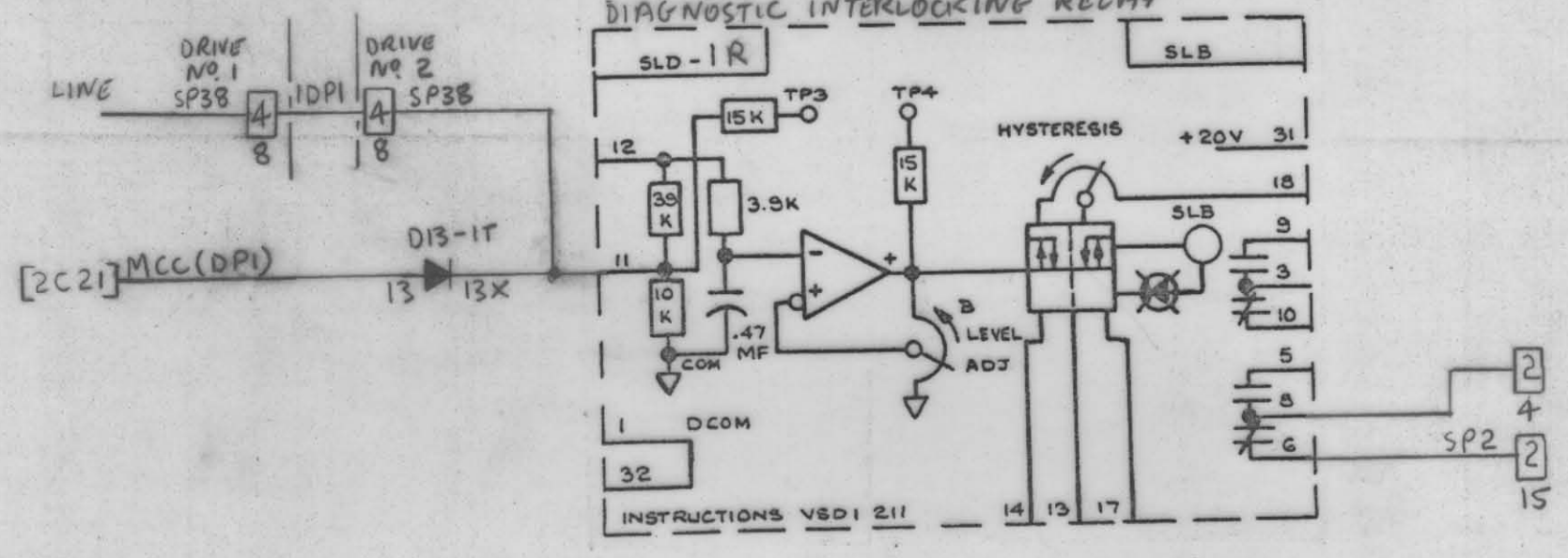
SPARE.




SPARE.




DIAGNOSTIC INTERLOCKING RELAY




| | | |

| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TQP | REF | ISLD | | TDR | | 1LLR | | LOR | | 2LLR | | 3LLR | 2SLD | A | CC | | |
| | | 193W | 193W | 193W | | 193W | | 193W | | 193W | | 193W | | 193W | 193W | 193W | 909W | | |
| | | 545 | 546 | 277 | | 543 | | 279 | | 265 | | 279 | | 279 | 277 | 256 | 317 | | |
| | | A-601 | A-601 | A-602 | | A-602 | | A-603 | | A-604 | | A-603 | | A-603 | A-602 | A-601 | AB654 | | |
| | | TORQUE PROVE | REFER-ENCE | SIG. LEV DET. | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | | LOW LEVE RELAY | SIG. LEV. DET. | AMPLI-FIER | SELECT COMP | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 32 - 32X |
| 31 | 31 - 31X |
| 30 | 30 - 30X |
| 29 | 29 - 29X |
| 28 | 28 - 28X |
| 27 | 27 - 27X |
| 26 | 26 - 26X |
| 25 | 25 - 25X |
| 24 | 24 - 24X |
| 23 | 23 - 23X |
| 22 | 22 - 22X |
| 21 | 21 - 21X |
| 20 | 20 - 20X |
| 19 | 19 - 19X |
| 18 | 18 - 18X |
| 17 | 17 - 17X |
| 16 | 16 - 16X |
| 15 | 15 - 15X |
| 14 | 14 - 14X |
| 13 | 13 - 13X |
| 12 | 12 - 12X |
| 11 | 11 - 11X |
| 10 | 10 - 10X |
| 9 | 9 - 9X |
| 8 | 8 - 8X |
| 7 | 7 - 7X |
| 6 | 6 - 6X |
| 5 | 5 - 5X |
| 4 | 4 - 4X |
| 3 | 3 - 3X |
| 2 | 2 - 2X |
| 1 | 1 - 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(COM) – 1C15 | SP7 – MFC(WFR) | SP42 – 1N21 | BUS PINS 02 1C – 1G, 1R – 1T |
| RTB(+20) – 1C31 | SP8 – 1T07 | SP43 – 1N25 | BUS PINS 15 1C – 1J, 1N – 1T |
| RTB(–20) – 1C02 | 3TB1 – 1G12 | SP44 – 1Q11 | BUS PINS 31 1C – 1G, 1R – 1T |
| RTB(CFB) – 1C30 | 3TB2 – 1L10 | SP45 – MCC(+30) | 1G02 – 1R02 |
| RTB(–30) – 1L05 | 3TB3 – | MCC(DM7) – 1Q20 | 1G31 – 1R31 |
| MCC(SFB) – 1D12X | 3TB4 – 1C17 | MCC(DP1) – 1T13 | 1J15 – 1N15 |
| MCC(TR) – 1C20 | 3TB5 – 1C18 | 2TB4 – 1R08 | 1T02X – 1J05 |
| MCC(SR) – 1Q27 | 3TB6 – | 2TB26 – 1R29 | 1T31X – 1J24 |
| MCC(SYS) – 1D23 | 3TB7 – 1L03X | MCC(ALM) – 1J16 | 1J06 – 1J26 |
| MCC(DR) – 1D29 | 3TB8 – | MCC(DM4) – MCC(DP2) | 1J26 – 1Q06 |
| MCC(CEMF) – 1E11 | 4TB1 – 1L03 | | 1Q06 – 1T04 |
| MCC(DM8) – 1C28 | 4TB2 – 1D11 | | 1Q05 – 1N26 |
| MCC(LT2) – 1C19 | 4TB3 – 1D13 | | 1N24 – 1N16 |
| MCC(DP2) – 1C05 | 4TB4 – 1G05X | | 1N13 – 1N06 |
| MCC(PRE) – 1D14 | 4TB5 – 1G24 | | 1T04X – 1T19 |
| SP1 – 1Q21 | SP36 – 1E09 | | 1T19X – 1T25 |
| SP2 – 1R06 | SP37 – 1L19 | | 1T22 – 1T27X |
| SP3 – 1Q25 | SP38 – 1R11 | | 1T27 – 1T32X |
| SP4 – | SP39 – 1J11 | | 1T30X – 1T15 |
| SP5 – | SP40 – 1J25 | | 1T22X – 1Q08 |
| SP6 – 1D27X | SP41 – 1N11 | | 1T25X – 1N27 |

REMOVE LINK 2TB1 – 2TB2

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| RGM | | | | | | 14/5/85 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST No. 2 (HOLD)
MDR RACK LAYOUT & JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449901 | 902M128BX | 2L |

IDENT DR 2 SH K

DR 2 | SH K | CONTD. 2L | ELEMENTARY DIAGRAM 902M128BX

Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

302HM100CT SHT16

DR 2 | SH L | CONTD. 2M | ELEMENTARY DIAGRAM 902M128BX

## CARD RACK WIRE JUMPER TABLE

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1T30-1N17 | 1T07X-1S06 | 1G22-1J21 | | | 1L11-1E27 | 1L17-1T15X | 1T23-1S11X | 1T26-1T12 | 1T16X-1Q27 | 1T30-1T30X | 1T14-1T30X |
| 1T32-1N08 | 1S10X-1S15 | 1E31-1J13 | | | 1E03-1L05X | 1L05-1D10X | 1T09-1S03 | 1T12-1T10X | 1D29-1T18 | 1T05-1T14X | 1T05X-1S05 |
| 1N05-1D19X | 1T23-1S11X | | | | 1L20-1T20X | 1D05X-1D30 | 1T23X-1T10 | 1T10X-1S18X | 1T18X-1D18X | 1T11X-1T28 | 1Q13-1R22 |
| 1E11-1E22 | 1T09-1S03 | | | | 1T20-1T30X | 1D30-1Q24 | 1T10-1T9X | 1T26X-1Q19 | 1D28-1D11X | 1T14-1T30X | 1R22-1T05 |
| 1E19-1E21 | 1T23X-1T10 | | | | 1L17-1T15X | 1Q24-1T16 | 1T9X-1S12X | 1T12X-1T11 | 1D11X-1C30 | 1T05X-1S05 | 1Q16-1T14X |
| 1E13-1E17 | 1T10-1T9X | | | | 1L05-1D10X | 1T16-1T17 | 1T26-1T12 | 1T11-1S21X | 1D14-1C03 | 1Q14-1Q03 | |
| 1E28-1G03X | 1T9X-1S12X | | | | 1D05X-1D30 | 1T16X-1Q27 | 1T12-1T10X | 1S21X-1Q20 | 1D10X-1C17 | | |
| 1G03X-1L09 | 1T26-1T12 | | | | 1D30-1Q24 | 1D29-1T18 | 1T10X-1S18X | 1T08-1T14 | 1D28-1D27X | | |
| 1L10-1L11 | 1T12-1T10X | | | | 1Q24-1T16 | 1T18X-1D18X | 1T26X-1Q19 | 1T08X-1T29 | 1D26X-1Q13 | | |
| 1L11-1E27 | 1T10X-1S18X | | | | 1T16-1T17 | 1D28-1D11X | 1T12X-1T11 | 1T29X-1T28X | 1Q13-1R22 | | |
| 1E03-1L05X | 1T26X-1Q19 | | | | 1T16X-1Q27 | 1D11X-1C30 | 1T11-1S21X | 1T28X-1C28 | 1R22-1T05 | | |
| 1L20-1T20X | 1T12X-1T11 | | | | 1D29-1T18 | 1D14-1C03 | 1S21X-1Q20 | 1G17-1R25 | 1Q16-1T14X | | |
| 1T20-1T30X | 1T11-1S21X | | | | 1T18X-1D18X | 1D10X-1C17 | 1T08-1T14 | 1R11-1T13X | 1T11X-1T28 | | |
| 1L17-1T15X | 1S21X-1Q20 | | | | 1D28-1D11X | 1D28-1D27X | 1T08X-1T29 | 1R19-1R21 | 1T14-1T30X | | |
| 1L05-1D10X | 1T08-1T14 | | | | 1D11X-1C30 | 1D26X-1Q13 | 1T29X-1T28X | 1E15-1J03 | 1T05X-1S05 | | |
| 1D05X-1D30 | 1T08X-1T29 | | | | 1D14-1C03 | 1Q13-1R22 | 1T28X-1C28 | 1J03-1J14 | | | |
| 1D30-1Q24 | 1T29X-1T28X | | | | 1D10X-1C17 | 1R22-1T05 | 1G17-1R25 | 1J14-1J23 | | | |
| 1Q24-1T16 | 1T28X-1C28 | | | | 1D28-1D27X | 1Q16-1T14X | 1R11-1T13X | 1J23-1L23 | | | |
| 1T16-1T17 | 1G17-1R25 | | | | 1D26X-1Q13 | 1T11X-1T28 | 1R19-1R21 | 1L23-1L13 | | | |
| 1T16X-1Q27 | 1R11-1T13X | | | | 1Q13-1R22 | 1T14-1T30X | 1E15-1J03 | 1L13-1L04 | | | |
| 1D29-1T18 | 1R19-1R21 | | | | 1R22-1T05 | 1T05X-1S05 | 1J03-1J14 | 1L04-1L01 | | | |
| 1T18X-1D18X | 1E15-1J03 | | | | 1Q16-1T14X | | 1J14-1J23 | 1L01-1N03 | | | |
| 1D28-1D11X | 1J03-1J14 | | | | 1T11X-1T28 | | 1J23-1L23 | 1N03-1N14 | | | |
| 1D11X-1C30 | 1J14-1J23 | | | | 1T14-1T30X | | 1L23-1L13 | 1N14-1N23 | | | |
| 1D14-1C03 | 1J23-1L23 | | | | 1T05X-1S05 | | 1L13-1L04 | 1N23-1Q23 | | | |
| 1D10X-1C17 | 1L23-1L13 | | | | | | 1L04-1L01 | 1Q23-1Q14 | | | |
| 1D28-1D27X | 1L13-1L04 | | | | | | 1L01-1N03 | 1Q14-1Q03 | | | |
| 1D26X-1Q13 | 1L04-1L01 | | | | | | 1N03-1N14 | | | | |
| 1Q13-1R22 | 1L01-1N03 | | | | | | 1N14-1N23 | | | | |
| 1R22-1T05 | 1N03-1N14 | | | | | | 1N23-1Q23 | | | | |
| 1Q16-1T14X | 1N14-1N23 | | | | | | 1Q23-1Q14 | | | | |
| 1T11X-1T28 | 1N23-1Q23 | | | | | | 1Q14-1Q03 | | | | |
| 1T14-1T30X | 1Q23-1Q14 | | | | | | | | | | |
| 1T05X-1S05 | 1Q14-1Q03 | | | | | | | | | | |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| RGM | | | | | |
| 3 | | TECHN. | ALLENWEST Simplex GE | HOIST NO. 2 (HOLD) | IDENT |
| | | ENG. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | MDR JUMPER CHART | DR 2 SH L |
| | | APPD. | GO NUMBER 449901 | ELEMENTARY DIAGRAM 902M128BX | CONTD. 2M |

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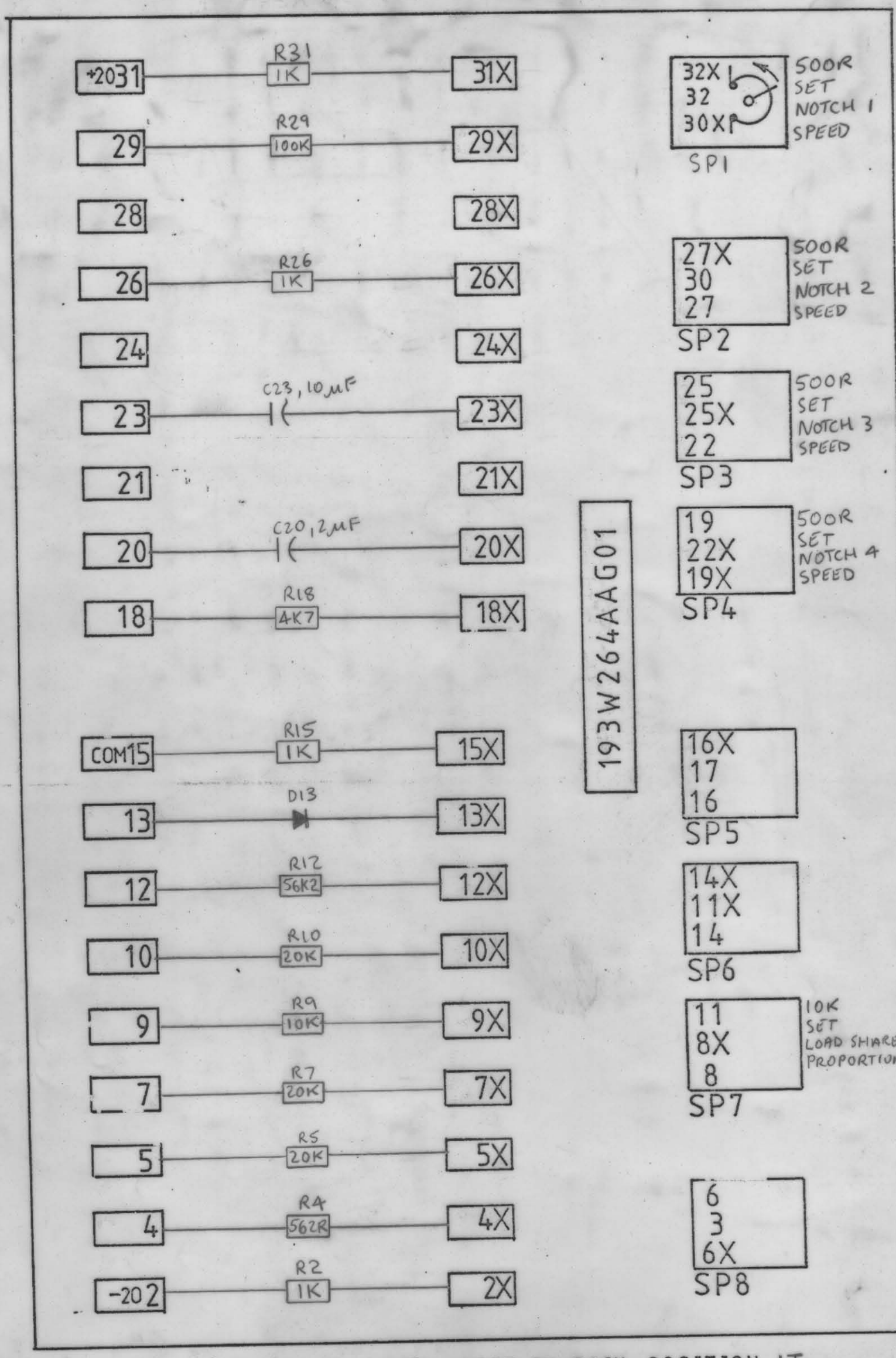



CARD PART NO. 909W317ABG54 . FIT IN RACK POSITION IT .

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| RGM | | | | | | 14/5/85 | |
| | | | | | | TECHN. | |
| 3 | | | | | | ENG. NGM | |
| | | | | | | APPD. | |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST Nº2 (HOLD)
SELECT COMPONENT PCB

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449901 | 902M128BX | FL |

IDENT | DR 2 | SH M

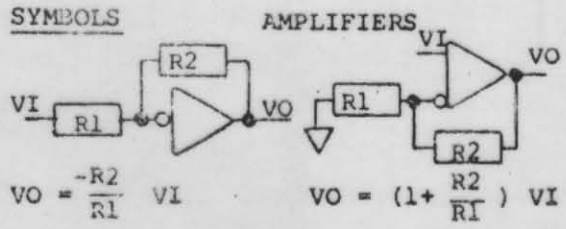
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

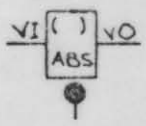
| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

SYMBOLS

AMPLIFIERS




CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s



POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | ✓ | MCC | HZA - PHA |
| IOC-400% | ✓ | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | ✓ | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | ✓ | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | ✓ | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| MAX AMPS G134 .8 1.7 / G256 1.3 2.8 / 2.4 5.0 / 4.0 8.0 / 7.0 13 / 13 25 | | IFC | MFC OR MFE |
| | | MF | NONE |
| | ✓ | MF | YB - YD |
| | | MF | YA - YB |
| | | MF | YA-YB, YC-YD |
| | | MF | YA - YC |
| | | MF | YA-YC, YB-YD |
| L/R < .25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| INH DRV CL | | MCC | DC1 - COM |
| FUSELESS | | ACC | CFY - CFX |
| DRV CL 200% | ✓ | MCC | DCX - DCY |

SIGNAL DEFINITIONS AND LOCATIONS

SEE DIAGRAM 906P118CY

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊣⊢ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

READ IN CONJUNCTION WITH DIAGRAM 906P118CY

CMA -COM
CRS - COM.
MFC DM22 -TF.
MCC DM1 -ILA
MCC DM8 RJ.

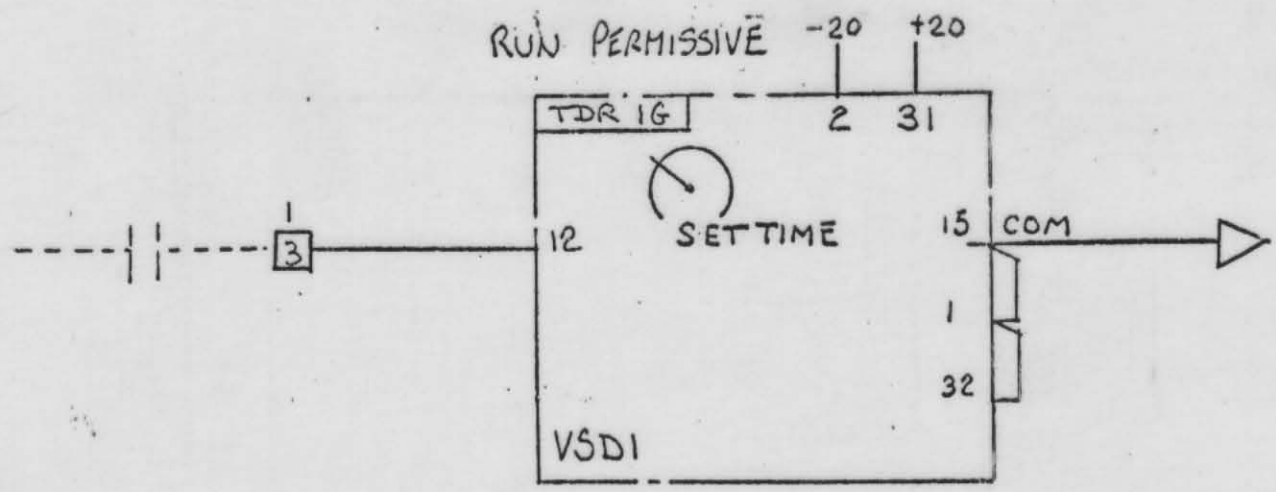
| TECHN. | ENG | APPD. | TECHN. | ENG | APPD. | DATE 5.7.85 |
|---|---|---|---|---|---|---|
| | | | 3 | SEE SH 9. 15.10.85 | | TECHN. ENG. APPD. |

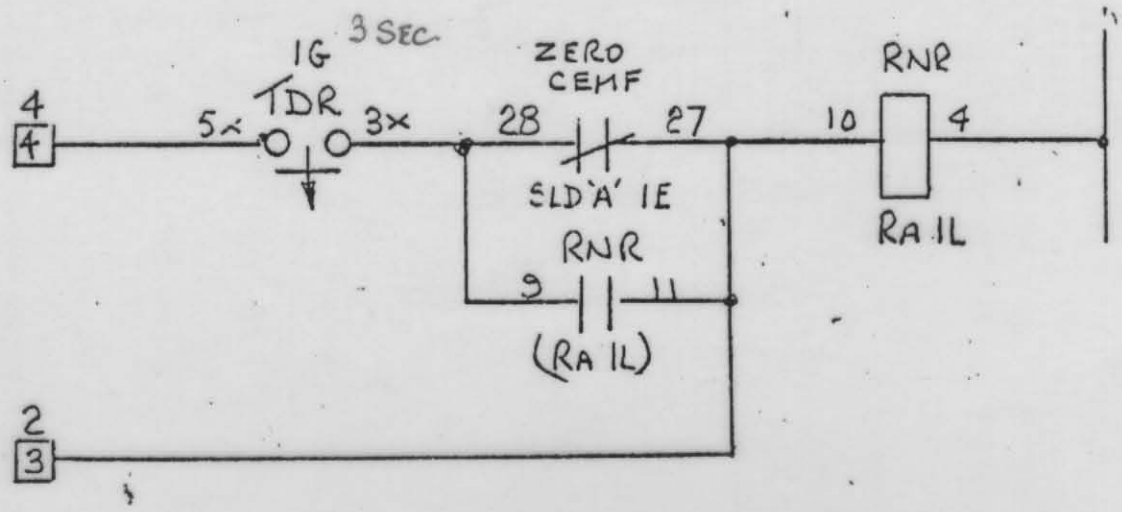
ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

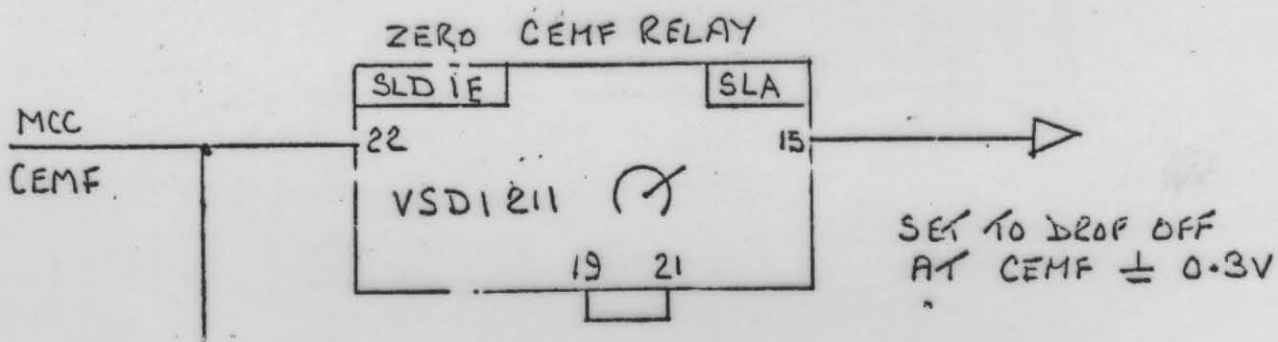
HOIST AND LONG TRAVEL
GRABBING CRANE (SH PITT)

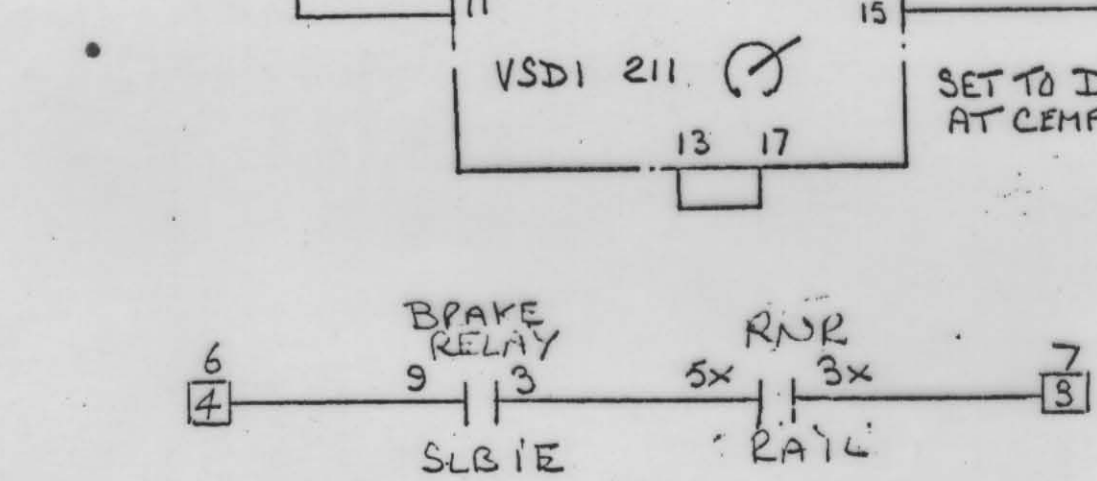
| GO NUMBER | ELEMENTARY DIAGRAM | CONTD | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 449900 | 902M128BY | 2 | | 1 |

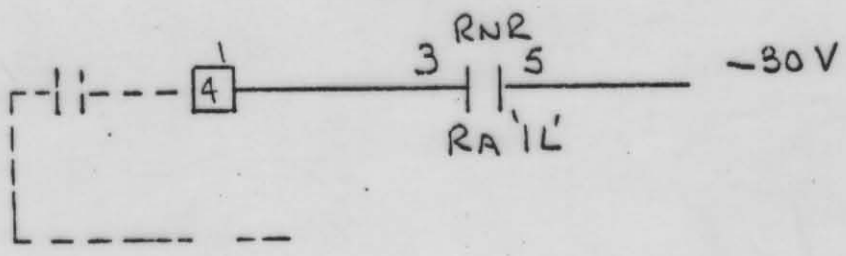
DR 1 SH 2 CONTD 2 ELEMENTARY DIAGRAM 902M128BY

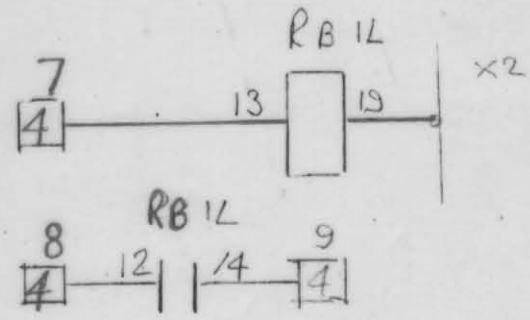



| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5.7.85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 44-9900 | 902M128 BY | 3 | | 2 |

REFERENCES VIA SWITCHING CIRCUITS

[3A 35] CLOSE

[3A 35] HOLD

REF 1D
DIS
10
19X
30X
3X
MAXNEG 10K
NREF
T1
T2
MAX POT 10K
PREF
SLOW 20K
5
SX
17 2
18 2
24 2
25 2
8X X4
9 X3
8 X2
6 X1
ZERO ADJ 1K
14 PRE
MCC PRE
MONITOR PRECONDITION
COMPARE
LATCH
TRACKING ERROR OR OVERVOLTAGE
23 SYS
MCC SYS
TF 16
MFC DM22 IF
2 4
3 4
11 NSW
13 PSW
10X -30V
-30V
T1
T2
+20V
22.1K
FEA 18
5GK
13X
39K
16X
22K
17X
12
56.2K
56.2K
SFB SHAPING
MCC DR
29 DR
DR INVERT AND MONITOR IR COMP
28 CFB
21
10K
+20V COM -20V
31 15 2
26 11X 9X 12X 6X 18X 28X
MCC SFB
MCC TR
TQP-1C
20 TR
29 ATR
MCC LT2
19 LT2
T1
T3
T6
OA1-1
10K
12.1K
TRX 28
MCC DM8 RJ
[4 08]
UTP2 6
T7
T2
+20V
LC
HC
OR
T6
T7
T2
T3
AND
13
R
CFB
30 CFB
27
14 REL
12
ATR(+) AND CFB(+)
ATR(-) AND CFB(-)
OR
AND
AND
10
3 PRE
5 DP2
8 UTP1
PRE (-4V) OR DP2(+20V)
MCC DP2
330Ω
ILR 9
MCC DM11LA
BR 18
5 3
3 3
BPR
15 K
BPR
3 4
OA1-2
REF DELAY 2.5K
T1
1MF
TBR
3.92K
T17
17
-30V
+20V COM -20V
31 15 2
22
6 3
BPR
8 3
3 7

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION.

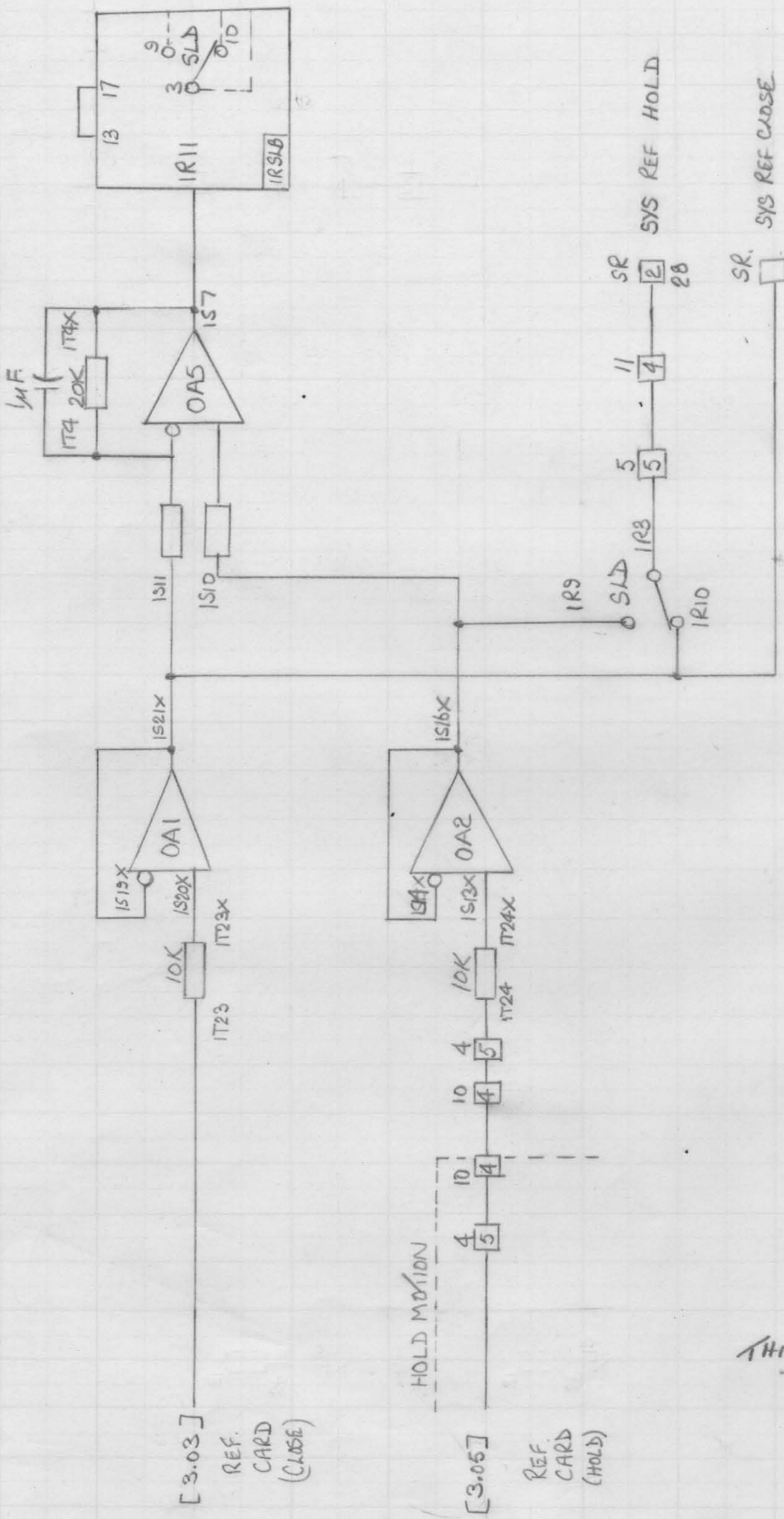
REFERENCE AND TORQUE PROVING CARDS
HOIST 1

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD |
|---|---|---|
| 149900 | 902M128 BY | 3A |

IDENT DR SH 3

CONTD. 3 4

ELEMENTARY DIAGRAM 902M128 BY

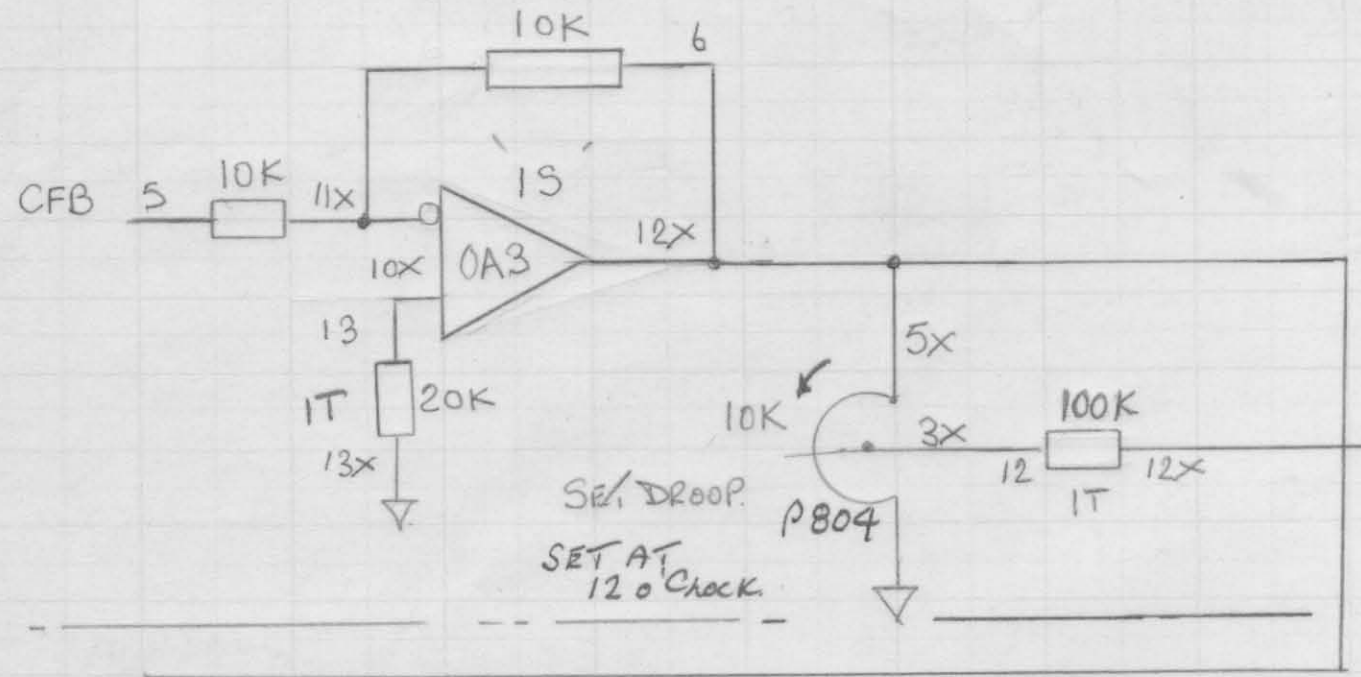


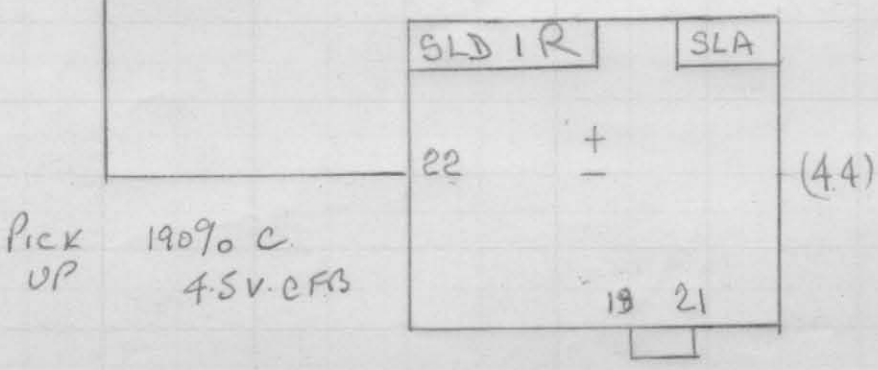

DR | SH | CONTD. | ELEMENTARY DIAGRAM

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| | 3 NEW. 15.10.85 | DATE 15.10.85 | ALLENWEST Simplex GE VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | COMMON / INDIVIDUAL REFERENCE SWITCHING CIRCUIT. | IDENT DR 3A SH |
| | | TECHN. | | GO NUMBER 449900 | ELEMENTARY DIAGRAM 902M128BY |
| | | ENG. | | | CONTD. 4 |
| | | APPD. | | | |

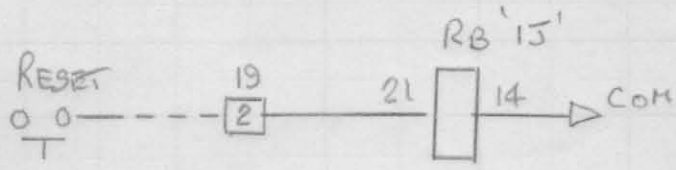
Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

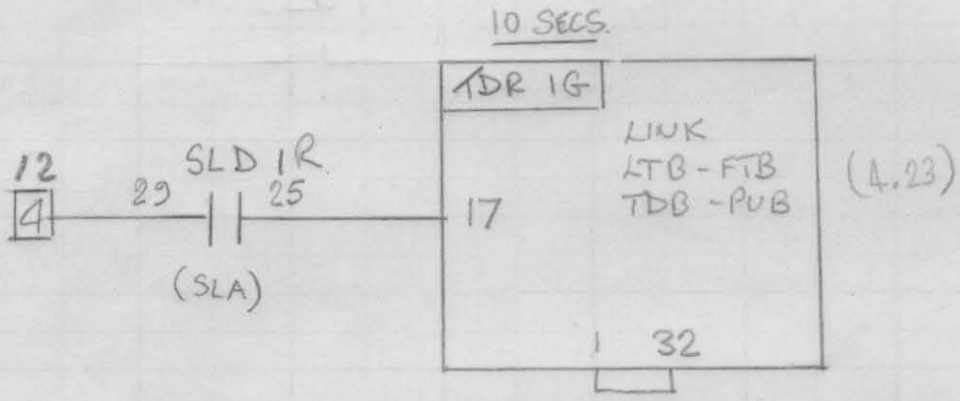
DROOP CIRCUITS.
HOLD AND CLOSE.

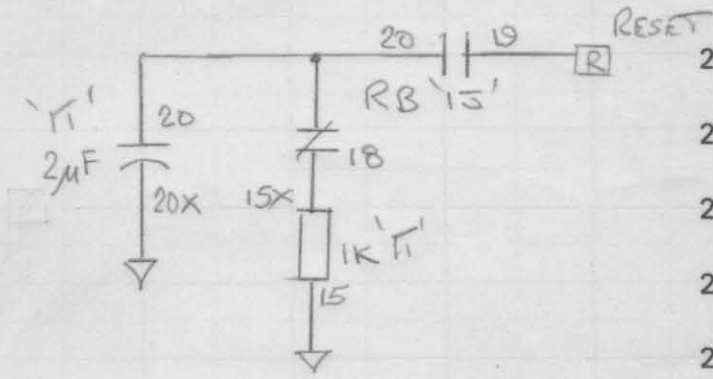


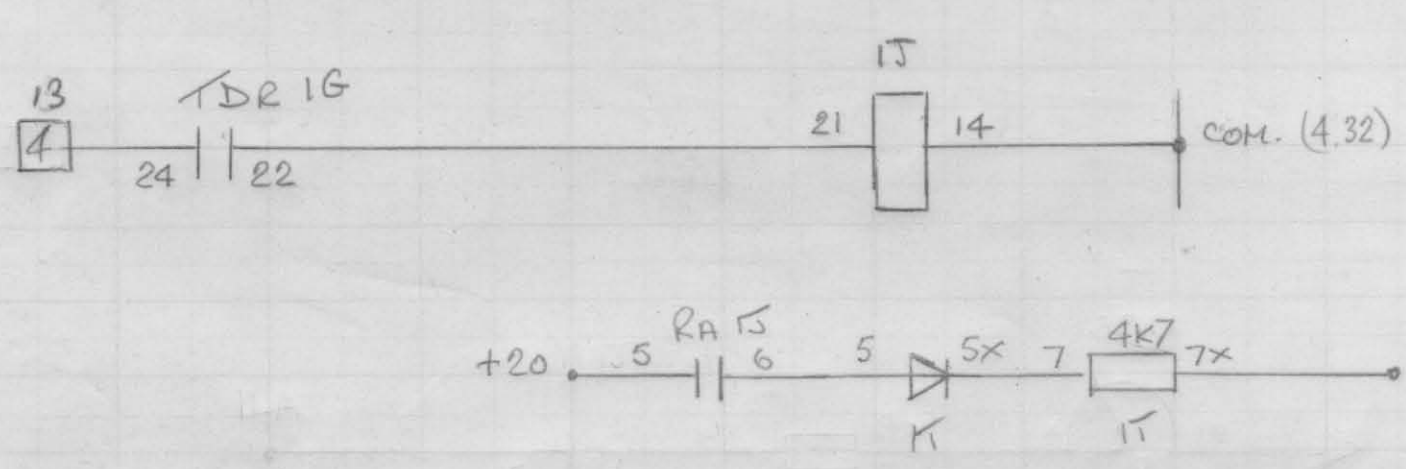




PICK UP 190% C
4.5V. CFB



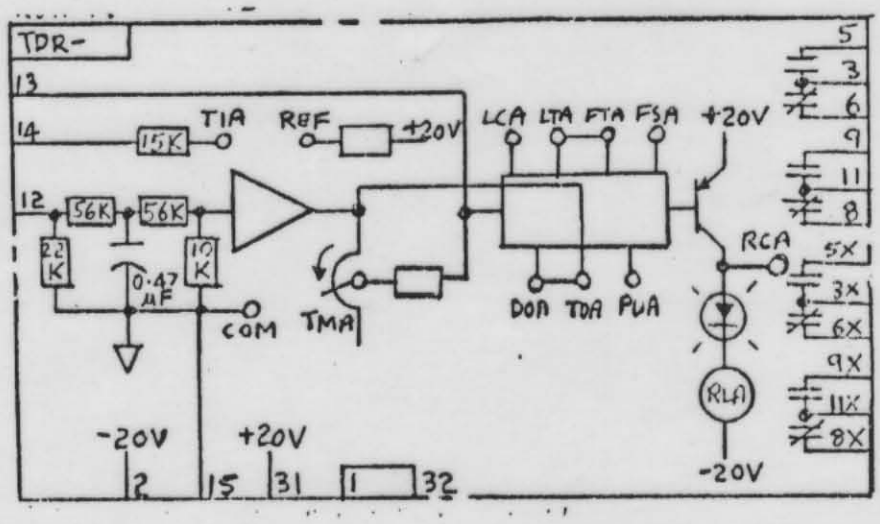


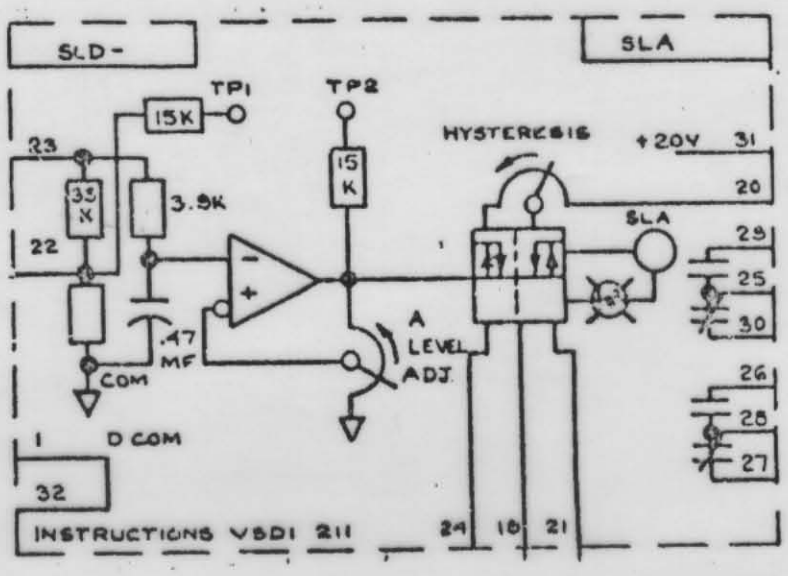


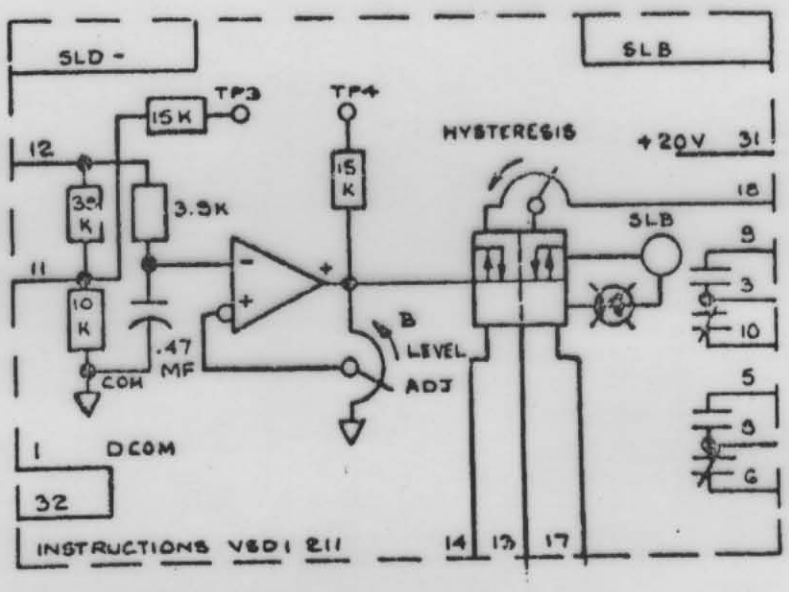
CLOSE O.L CUTOUT CIRCUIT.

ALL CIRCUITS BELOW LINE 10 ON GRAB CLOSE ONLY.

| | | |







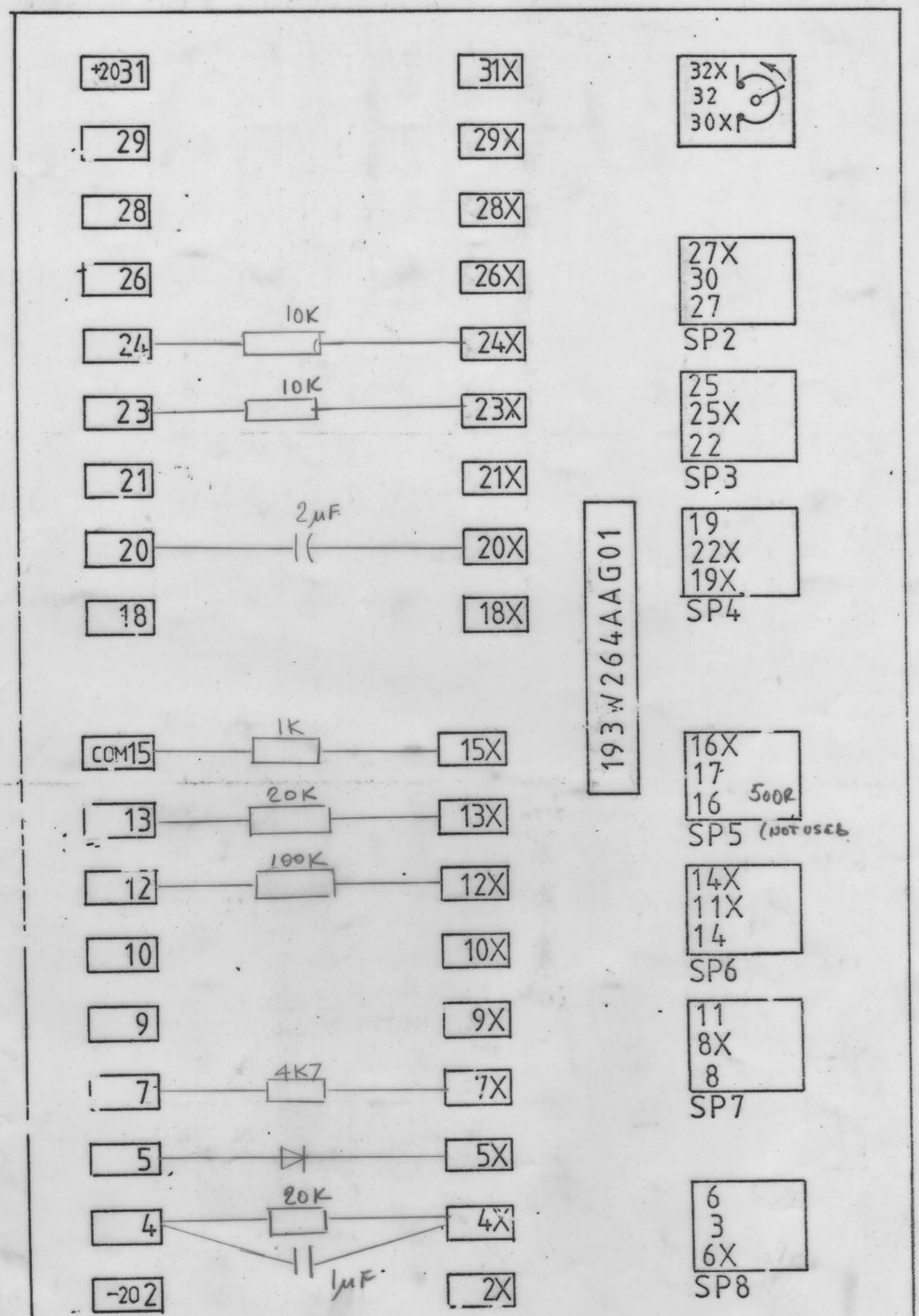
| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5.7.85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CARD DIAGRAMS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD |
|---|---|---|
| 449900 | 902M128 BY | 6/6A |

IDENT DR 5 SH 5




CARD PART NO. 909W317ABG55 FIT IN RACK POSITION 1T

GRAB CLOSE

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | | |
|---|---|---|---|---|---|---|
| | 3 15.10.85 | 5.7.85 TECHN. ENG. APPD. | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 449900 | ELEMENTARY DIAGRAM 902M128BY | CONTD. 7 | DENT DR 6 SH |

+20 31

29

28

26

24

23

21

20 — 2μF. — 20X *

18

COM 15 — 1K * — 15X

13 — 20K — 13X

12 — 100K — 12X

10

9

7 — 4K7 * — 7X

5 — * —

4

-20 2

31X

29X

28X

26X

24X

23X

21X

18X

18

2X

32X
32
30X

27X
30
27
SP2

25
25X
22
SP3

19
22X
19X
SP4

193W264AAG01

16X
17
16 Sock
SP5 *

14X
11X
14
SP6

11
8X
8
SP7

6
3
6X
SP8

CARD PART NO. 909W317ABG56 FIT IN RACK POSITION 1T

* NO CONNECTION.

GRAB HOLD

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 8.7.85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449300 | 902M128BY | 7 |

DENT

| DR | SH |
|---|---|
| | 6A |

| TQP | REF | ISLD | | TDR | | LLR | | LOR | | | | | | SLD | A | CC | | | RACK 909W316 AB G42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 193W545AAG01 | 193W546AAG01 | 193W277AAG02 | | 193W543AAG02 | | 193W279AAG03 | | 193W266AAG04 | | | | | | 193W277AAG02 | 193W256AAG01 | 909W317 ABG55 | | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

'R' ONLY ON GRAB CLOSE
* IT 909W317 AB G56 ON GRAB CLOSE

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

| | |
|---|---|
| 32 - 64 | 32 - 32X |
| 31 - 63 | 31 - 31X |
| 30 - 62 | 30 - 30X |
| 29 - 61 | 29 - 29X |
| 28 - 60 | 28 - 28X |
| 27 - 59 | 27 - 27X |
| 26 - 58 | 26 - 26X |
| 25 - 57 | 25 - 25X |
| 24 - 56 | 24 - 24X |
| 23 - 55 | 23 - 23X |
| 22 - 54 | 22 - 22X |
| 21 - 53 | 21 - 21X |
| 20 - 52 | 20 - 20X |
| 19 - 51 | 19 - 19X |
| 18 - 50 | 18 - 18X |
| 17 - 49 | 17 - 17X |
| 16 - 48 | 16 - 16X |
| 15 - 47 | 15 - 15X |
| 14 - 46 | 14 - 14X |
| 13 - 45 | 13 - 13X |
| 12 - 44 | 12 - 12X |
| 11 - 43 | 11 - 11X |
| 10 - 42 | 10 - 10X |
| 9 - 41 | 9 - 9X |
| 8 - 40 | 8 - 8X |
| 7 - 39 | 7 - 7X |
| 6 - 38 | 6 - 6X |
| 5 - 37 | 5 - 5X |
| 4 - 36 | 4 - 4X |
| 3 - 35 | 3 - 3X |
| 2 - 34 | 2 - 2X |
| 1 - 33 | 1 - 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

**CARD RACK WIRE JUMPER TABLE**

| | | | |
|---|---|---|---|
| RTBCOM - 1G15 | | | 1C17 - 1D10X |
| RTB+20 - 1G31 | SP1 (2TB 13) | 4TB1 1L3 | 1D12X - 1D9X |
| RTB-20 - 1G2 | SP2 ( 15) MTTB TS1 | - 2 1D11 | 1D10X - 1L5 |
| RTB CFB - 1C20 | SP3 ( 16) MTTB OL1 | - 3 1D13 | |
| RTB-30 - 1L5 | SP4 ( 17) 1D3X | - 4 1G5X | 1E28 - 1G3X |
| MCC SFB - 1D12X | SP5 ( 18) 1D9 | - 5 | - 1L9 |
| MCC TR - 1C20 | — | - 6 1E9 | |
| MCC SR - | SP7 ( 24) 1D8 | - 7 1L13 | 1L10 - 1L11 |
| MCC S/S - 1D23 | SP8 ( 25) 1D6 | - 8 1L12 | - 1E27 |
| MCC DR - 1D29 | | - 9 1L14 | |
| MCC CEMF - 1E11 | 3TB1 1G12 | - 10 | 1E11 - 1E22 |
| MCC DM8 - 1C28 | 2 1L10 | - 11 | 1E19 - 1E21 |
| MCC 2T2 - 1C19 | 3 | — | 1E3 - 1L5X |
| MCC DP2 - 1C5 | 4 1C17 | — | 1E13 - 1E17 |
| MCC PRE - 1D14 | 5 1C18 | - 14 | |
| MFC DM22 - 1D16 | 6 | - 15 MCC+30 | 1G32 - 1J1 |
| | 7 1L3X | MCC DM1 1LA - 1C9 | - 1G15 |
| | 8 | | 1D10 - 1D19X |
| | | | 1D30 - 1D5X |
| | | | - 1D10X |
| | | | 1D14 - 1C3 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5.7.85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449900 | 902M128BY | 8 |

IDENT DR 7 SH 7

DR 7 SH CONTD. 8 ELEMENTARY DIAGRAM 902M128BY

902MM100CT SHT

DR | SH 8 | CONTD. | ELEMENTARY DIAGRAM

HOLD ONLY

EXTRA JUMPERS FOR GRAB CLOSE

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| | | | 1R13 - 1R17 | |
| | | ↓ | 4TB10 - 5TB4 | 1S5X - 1R22 |
| 1C30 - 1S5 | | 1D5X - 5TB4 | 5TB4 - 1K24 | 1R19 - 1R21 |
| 1S6 - 1S12X | | 5TB4 - 4TB10 | 1K24X - 1S13X | 1R25 - 1G16 |
| 1S12X - 1S5X | | | 1S14X - 1S16X | 1G22 - 1J21 |
| | | | 1S16X - 1S10 | |
| 1S10X - 1T13 | | | 1S10 - 1R9 | 4TB12 - 1R29 |
| 1T12 - 1S3X | | | 1T4 - 1S8 | 4TB13 - 1G24 |
| 1K12X - 1C28 | | | 1T4X - 1S7 | |
| | | | 1S7 - 1R11 | 1J21 - 1G22 |
| +20 - 1J5 | | | | 1J6 - 1T5 |
| | | | 1D5X - 1T23 | 1T5X - 1T7 |
| 1K15 - 1T13X | | | 1T23X - 1S20X | 1T7X - SYS |
| | | | 1S19X = 1S21X | |
| 1L19 - 1S15 | | | 1S21X - 1S11 | 2TB19 - 1J21 |
| | | | 1S11 - 1R10 | RESET - 1J19 |
| 1G15 - 1S15 | | | 1R10 - 2TB28 | 1J20 - 1T20 |
| - 1T15 | | | 1R3 - 5TB5 | 1T20X - 1T15 |
| | | | 5TB5 - 4TB11 | 1T15X - 1J18 |
| 1G2 - 1S2 | | | | |
| - 1T2 | | | | |
| | | | | |
| 1G31 - 1S31 | | | | |
| - 1T31 | | | | |
| | | | | |
| 1J14 - 1E15 | | | | |
| 1G1 - 1G32 | | | | |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 2.8.85 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 449900 | 902M128BY | 9 |

IDENT | DR | SH 8

DR | SH | CONTD. | ELEMENTARY DIAGRAM

# VALUTROL - AW 3064R

# HOIST CONTROL EQUIPMENT

# FOR STOTHERT & PITT

# 6 TON DD2 CRANE.

MANUFACTURED FOR -

THE MERSEY DOCKS & HARBOUR COMPANY.

ORDER Nos M/131656/BA & C/025932/YA

AW. REF'S 228900 & 346900

INDEX


| | |
|---|---|
| NOTES | 0B - 0C |
| RECORD OF DIAGRAM CHANGES | 0D |
| HOIST MOTION | 1A - 1R |
| BLOCK DIAGRAM OF INTERCONNECTIONS | 1T |


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | IDENT |
|---|---|---|---|---|
| CWH | CWH. | 10-8-82 | ALLENWEST Simplex | |
| 4 SEE SHEET 0D. 2-12-83. | 2 AS SHIPPED. 10-12-82 | TECHN. / ENG. CWH. / APPD. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | TITLE PAGE |

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 228900 | 902M126FR | 0B | 0 | A |

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902HM1126FR SH1

DR | SH | CONTD. | ELEMENTARY DIAGRAM

# VARIABLE SPEED DRIVES OPERATION

## SILCON DRIVE SYSTEM

GENERAL NOMENCLATURE

THE FOLLOWING NOMENCLATURE IS NORMALLY USED. PREFIXES OR SUFFIXES MAY BE ADDED TO DESIGNATE A PARTICULAR UNIT, SECTION OR DRIVE OR MERELY TO DIFFERENTIATE BETWEEN SIMILAR DEVICES.

| | | | |
|---|---|---|---|
| A | AMMETER | LS | LIMIT SWITCH |
| BMC | BLOWER MOTOR CONTACTOR | M | MOTOR |
| C | CAPACITOR | MA | AC LINE CONTACTOR OR STARTER |
| CB | CIRCUIT BREAKER | MD | DC LOOP CONTACTOR |
| CVE | CONSTANT VOLTAGE EXCITER | MRH | MOTOR OPERATED RHEOSTAT |
| CVT | CONTROL VOLTAGE TRANSFORMER | MTH | MOTOR THERMAL SWITCH |
| CT | CURRENT TRANSFORMER | OL | OVERLOAD |
| DBC | DYNAMIC BRAKING CONTACTOR | POT | POTENTIOMETER |
| DBRES | DYNAMIC BRAKING RESISTOR | PL | PILOT LIGHT |
| | | PB | PUSH BUTTON |
| | | RC | REVERSE CONTACTOR |
| | | RR | REVERSE RELAY |
| ESR | EMERGENCY STOP RELAY | R | RESISTOR |
| F | SCR MODULE FAULT RELAY | REC | RECTIFIER |
| FTR | FIELD TRIM RESISTOR | SUP | COIL SUPPRESSION |
| FLR | FIELD LOSS RELAY | SH | (AMMETER) SHUNT |
| FS | FUSE | SS | SELECTOR SWITCH |
| FC | FORWARD CONTACTOR | TI | TACHO INDICATOR |
| FR | FORWARD CONTACTOR | TG | TACHO GENERATOR |
| HTH | HEATSINK THERMAL SWITCH | TR | TIMING RELAY |
| | | UVR | UNDERVOLTAGE RELAY |
| IVT | ISOLATION TRANSFORMER | V | VOLTMETER |
| IOC | INSTANTANEOUS OVER CURRENT | VR | VOLTAGE SENSING RELAY |
| IOL | INSTANTANEOUS OVER CURRENT RELAY | | |
| IR | INCH RELAY | | |
| IFR | INCH FORWARD RELAY | | |
| IRR | INCH REVERSE RELAY | | |

SYMBOLS :-

- SCREENED LEADS
- TWISTED LEADS
- TERMINAL BOARD JUMPERS
- [M] - MOUNTED IN MOTOR
- [R] - REMOTE MOUNTED DEVICE
- [OS] - DEVICES IN OPERATOR STATION
- ⊗ - TERMINAL IN MAIN CONTACTOR PANEL
- ○ - TERMINAL IN HOIST PANEL
- ◑ - TERMINAL IN MASTER CONTROLLER UNIT.
- [NC] - NO CONNECTION
- [C] - CUBICLE MOUNTED OPERATOR'S CONTROLS AND INDICATORS
- ● - EQUIPMENT SUPPLIED BY OTHERS

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10-8-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. CWH |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

INDEX & SYMBOLS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 228900 | 902M126FR | OC | 0 | B |

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902HM126FR SH2

DR | SH | CONTD. | ELEMENTARY DIAGRAM

DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "OB", THE SECOND SHEET OF DRIVE "O",I.E. THE INTRODUCTORY MATERIAL.

WIRE NUMBERING SYSTEM

WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. O1, O2, 1O, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2AO4 INDICATES WIRE NUMBER O4 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

   A) THE BRACKETS ARE ELIMINATED, AND
   B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET OA.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER. THE FULL WIRE NUMBER MAY ALSO BE SHOWN E.G.

1A27 [1805]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10-8-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. C.WH |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

NOTES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 228900 | 902M126FR | OD | O | C |

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902HM100CY SHT3

DR | SH | CONTD. | ELEMENTARY DIAGRAM

## RECORD OF ELEMENTARY DIAGRAM CHANGES

| SHEET No. | ISSUE | DATE | LOCATION AND DESCRIPTION OF CHANGE | ISSUED BY |
|---|---|---|---|---|
| 1D | 2 | 10-12-82 | 2TB3 WAS SHOWN AS 3TB2. WIRE N° 10 WAS SHOWN AS 74. | CWH |
| 1E | 2 | 10-12-82 | WIRE N° 1D10 WAS SHOWN AS 74. | CWH |
| 1J | 2 | 10-12-82 | LINK BETWEEN 2TB1 & 2TB2 REMOVED | CWH |
| 1Q | 2 | 10-12-82 | 2TB3 WAS SHOWN AS 3TB2. WIRE 1D10 WAS SHOWN AS 74 | CWH |
| 1R | 2 | 10-12-82 | BA & BB ADDED. | CWH |
| 1S | 2 | 10-12-82 | TERMINALS RE ARRANGED | CWH |
| 1A<br>1B<br>1D | 3<br>3<br>3 | 22-2-83 | CROSS REFERENCE WITH DIAG. 1/8/228900/SCH1 ADDED. | C.WH |
| 0A | 4 | 2-12-83 | TITLE PAGE REVISED TO COVER 4 SETS OF CRANE HOIST EQUIPMENT ORDERED ON G.O 346900. MERSEY DOCKS & HARBOUR COMPANY REF. C/025932/YA | C.W.H. |
| 1C | 4 | 2-12-83 | SAFE LOAD INDICATION LAMP SL2-SL3 WAS GREEN. TERMINAL SL4 ADDED. | C.W.H. |
| 1S | 4 | 2-12-83 | TERMINAL SL4 ADDED. | C.WA |
| 1T | 4 | 2-12-83 | CONNECTION SL4 ADDED FROM SAFE LOAD INDICATOR TO HOIST CONTROLLER. | C.W.H. |

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | CWH. | | | 10-8-82 |
| | | | 3 | | | TECHN. |
| | | | 22-2-83 | | | ENG. CWH |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

RECORD OF DIAGRAM CHANGES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 228900 | 902M126FR | 1A | △ | 0 | D |

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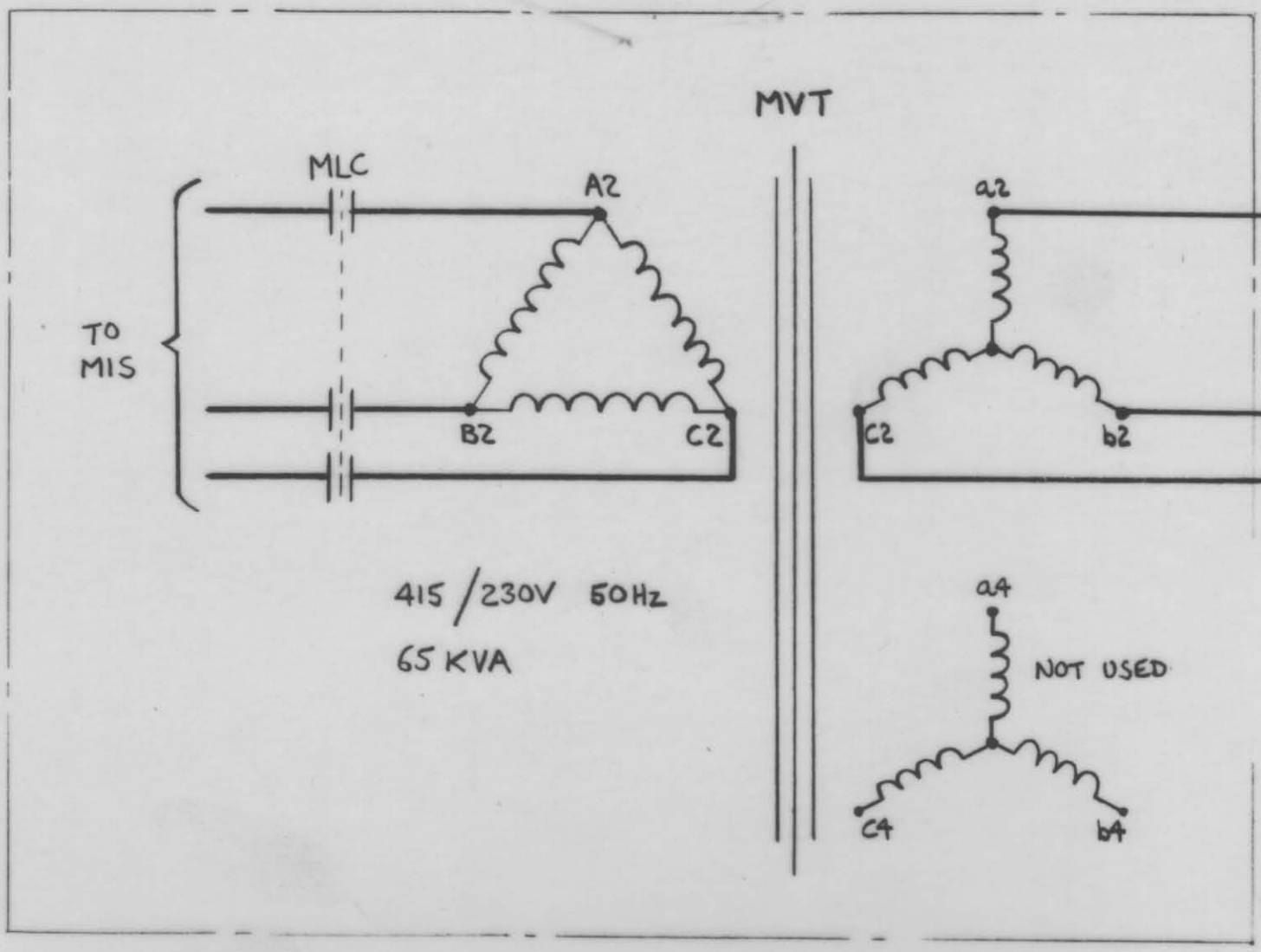
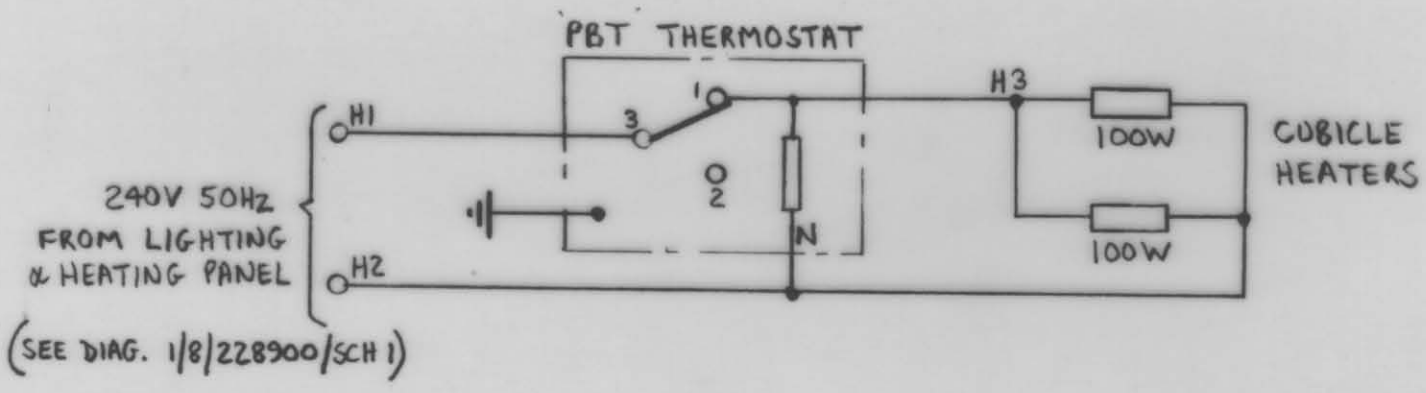
EXISTING EQUIPMENT IN MAIN CONTACTOR PANEL (SEE DIAG. 1/8/228900/SCH 1)




| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| | CWH. | 10-8-82 | ALLENWEST Simplex | HOIST ISOLATION TRANSFORMER AND CUBICLE HEATERS. | IDENT |
| | 3 | TECHN. | | | DR 1 / SH A |
| | 22-2-83 | ENG. C.W.H. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD. 1B | |
| | | APPD. | | | |

DR | SH | CONTD. | ELEMENTARY DIAGRAM

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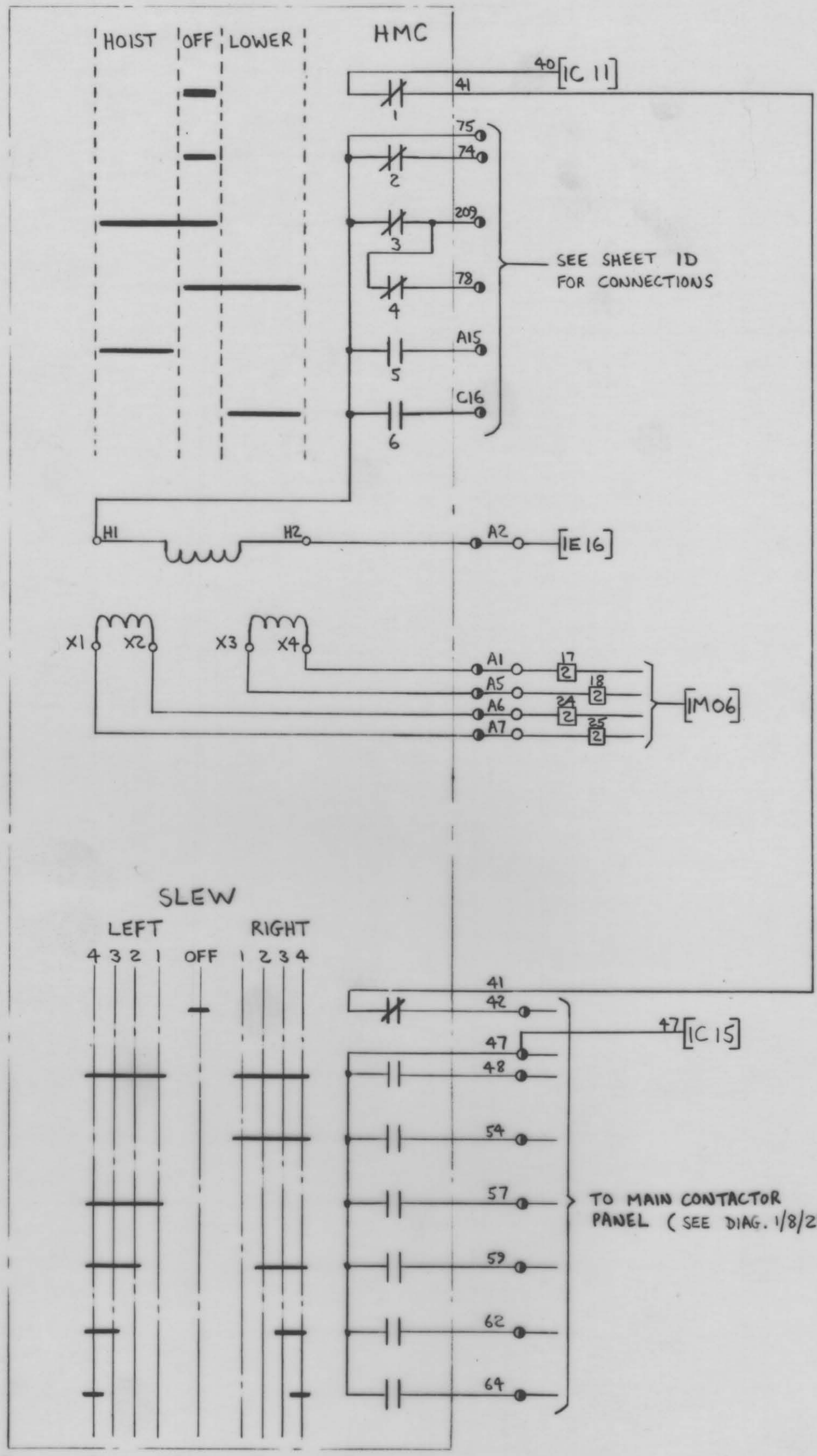


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| | CW.H. | 10-8-82 | ALLENWEST Simplex | HOIST / SLEW CONTROLLER | IDENT |
| | 3 | TECHN. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | | DR 1 / SH B |
| | 22-2-83 | ENG. CW.H. | | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD. IC | |
| | | APPD. | | | |

DR | SH | CONTD. | ELEMENTARY DIAGRAM

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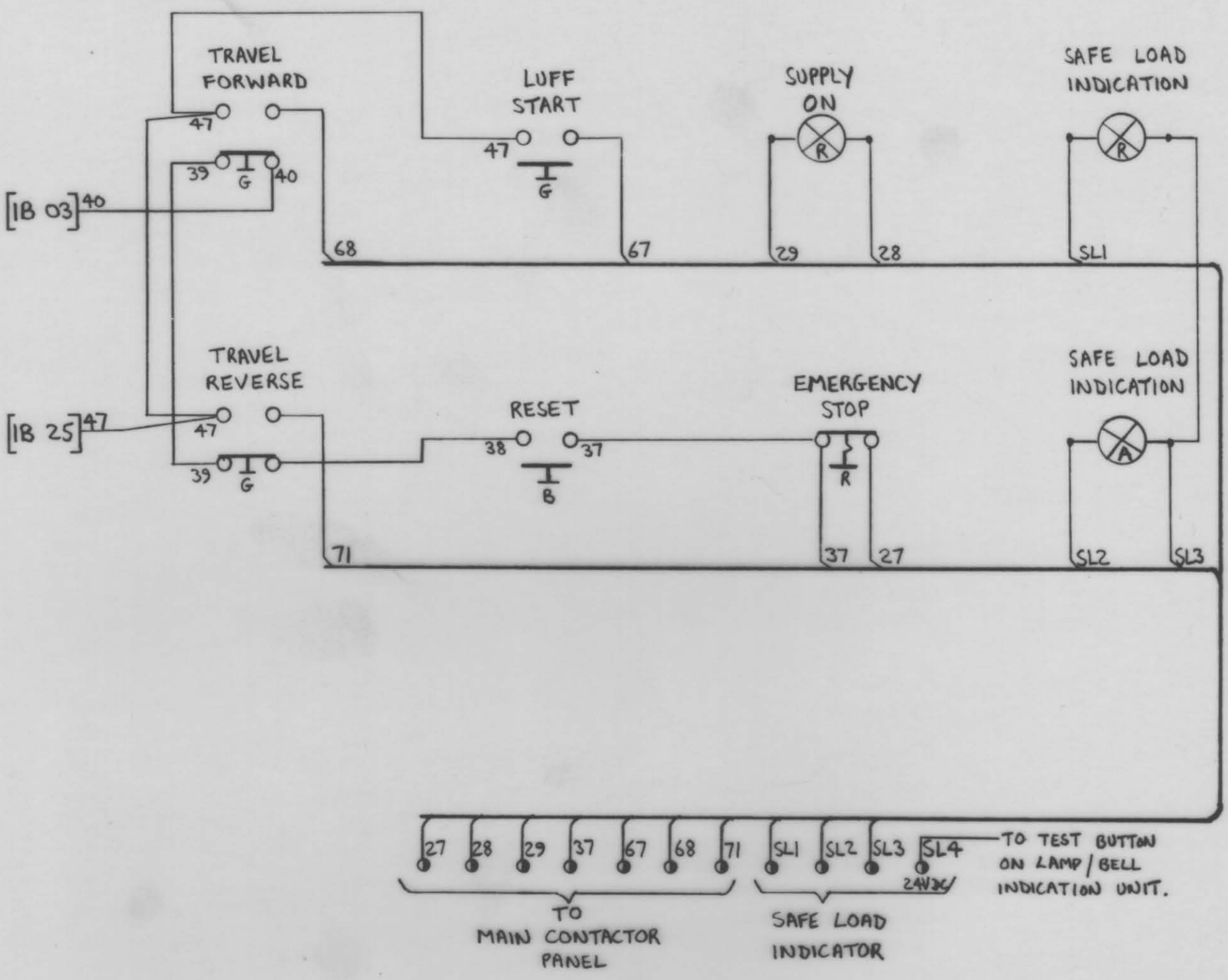
DR | SH | CONTD. | ELEMENTARY DIAGRAM

PUSHBUTTONS & PILOT LAMPS MOUNTED IN CONTROLLER UNIT




A = AMBER
G = GREEN
R = RED
B = BLACK

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | C.W.H. | | | 10-8-82 |
| | | 4 | | | | TECHN. |
| | | | | C.W.H. | | ENG. |
| | | | 2-12-83 | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

PUSHBUTTONS & PILOT LAMPS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 228900 | 902M126FR | 1D | 1 | C |

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415V 50Hz SUPPLY FROM MAIN CONTACTOR PANEL (SEE DIAG. 1/8/228900/SCH 1)

93 94 [1F 02]

CPFS 6A F21

1 415V 2

CVT 250VA 110V

CFS 4A F21

3 4 CLK A2

74 HMC OPI 2 75 LLS 209 HLS 210 SL 78 HOL 87 MLR 87B MLC 87A

HUV

HMC OFF-HOIST 3

HMC OFF-LOWER 4

15 THSW SP2 SP3 16 5 4 FLT 3 6 DCUV 7 HUV HOIST UNDER-VOLTAGE RELAY TYPE-UOOR

SUP

DOOR FAN

HMC HOIST 5 A15 LR 8 HR HOIST RELAY TYPE-UOOR

SUP

HMC LOWER 6 C16 HR 9 LR LOWER RELAY TYPE-UOOR

SUP

HUV

10 8 SP38 RB-1J 21 14 8 SLOW REFERENCE RELAY TYPE - LLR

HR 11 1 12 RLA-1G RUN PERMISSIVE RELAY TYPE - TDR

LR

10 [NS 02]

A2 [NS 02]

DR SH CONTD. ELEMENTARY DIAGRAM

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| | C.W.H | | | C.W.H | | 10-8-82 | |
| 3 | 22-2-83 | | 2 | 10-12-82 | | TECHN. | |
| | | | | | | ENG. C.W.H | |
| | | | | | | APPD. | |

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST AC CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 228900 | 902M126FR | 1E | | 1 | D |

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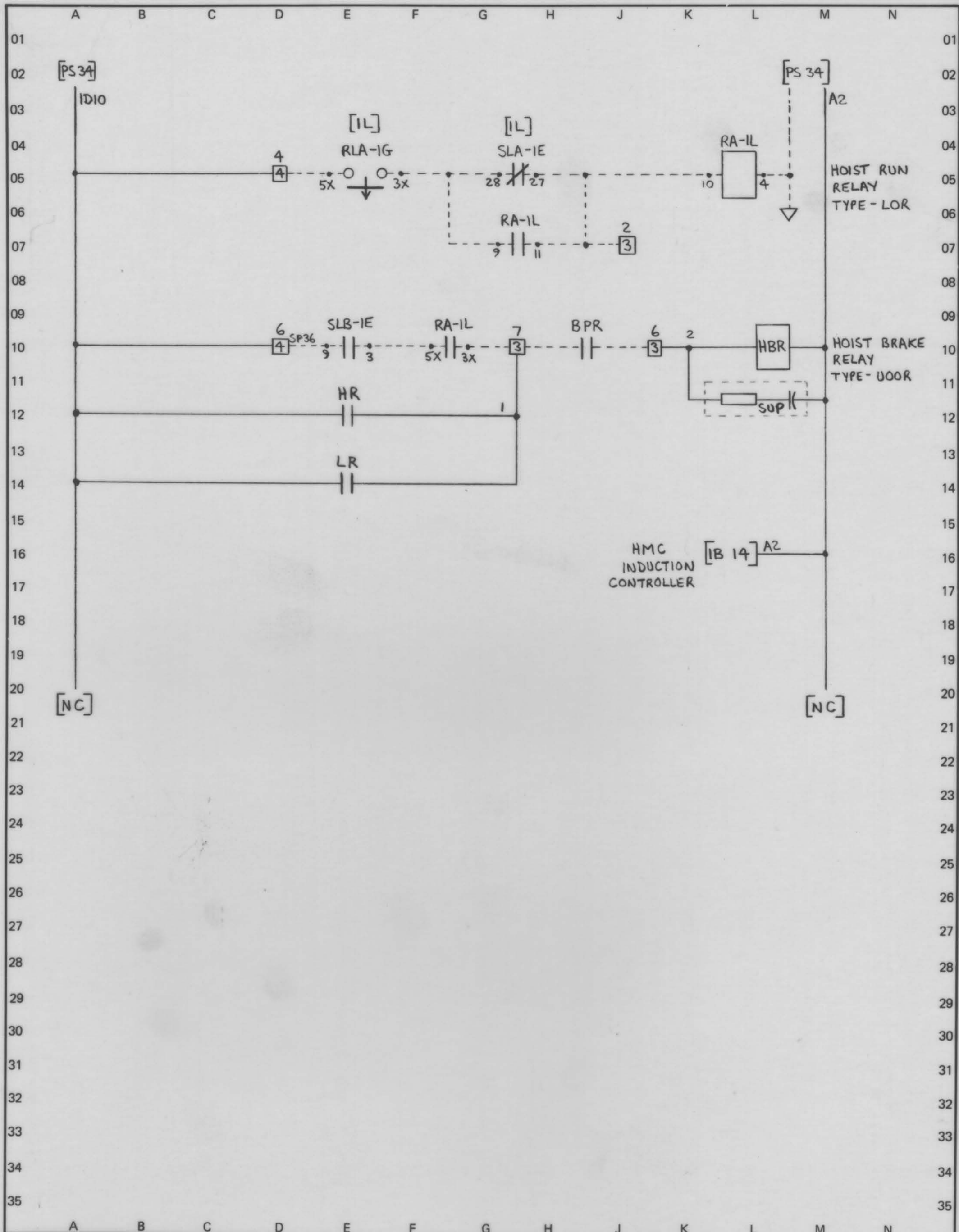


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | IDENT |
|---|---|---|---|---|---|
| | CWH | 10-8-82 | | HOIST AC CONTROL | |
| | 2 | TECHN. | | | DR 1 / SH E |
| | 10-12-82 | ENG. C.W.H. | | | |
| | | APPD. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD. 1F | |

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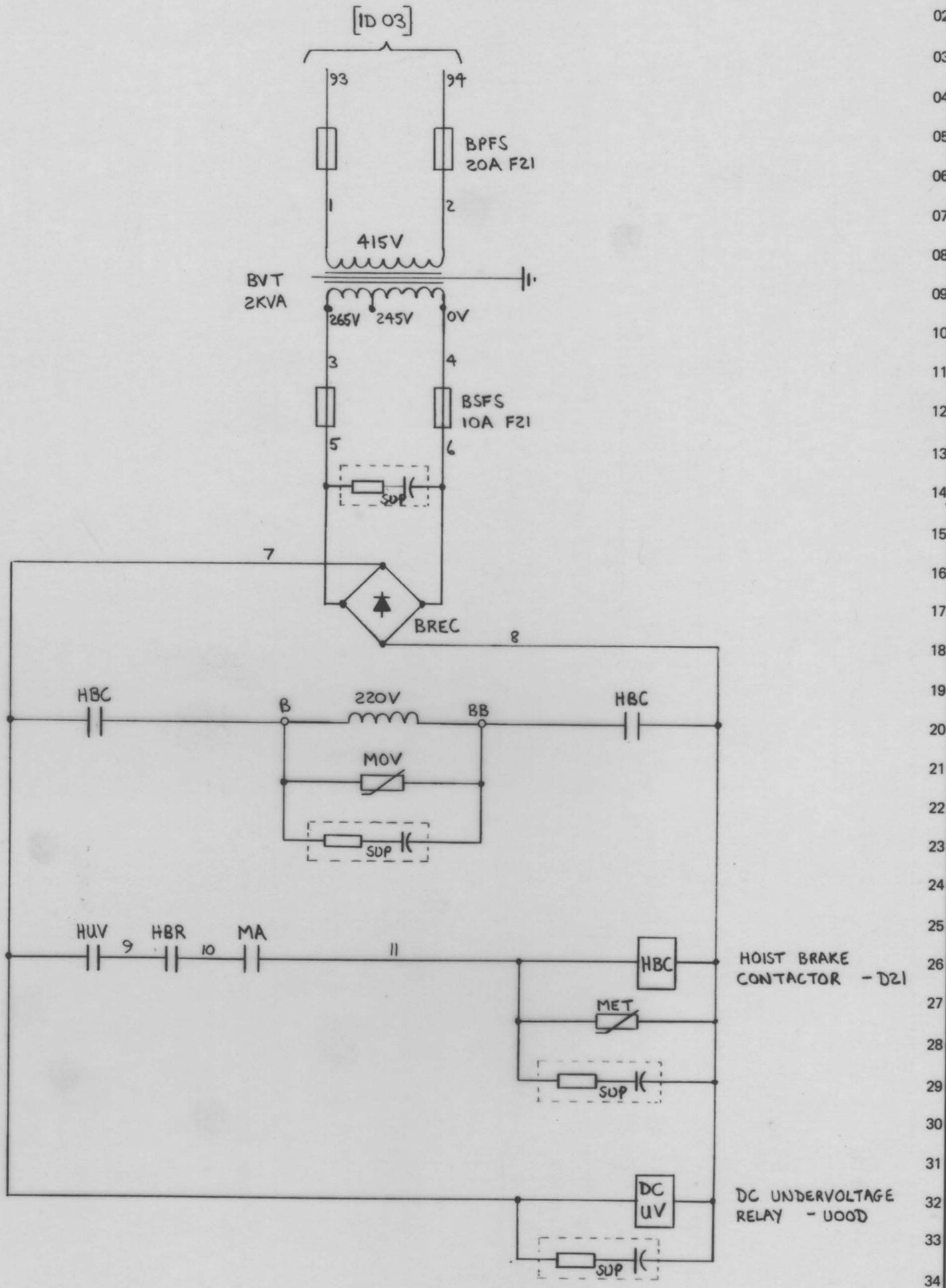
DR | SH | CONTD. | ELEMENTARY DIAGRAM




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | TECHN. | ENG. | APPD. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 10-8-82 | | C.W.H. | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BRAKE CIRCUIT

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 228900 | 902M126FR | 1G | 1 | F |

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902HM100ER

DC - 3064R

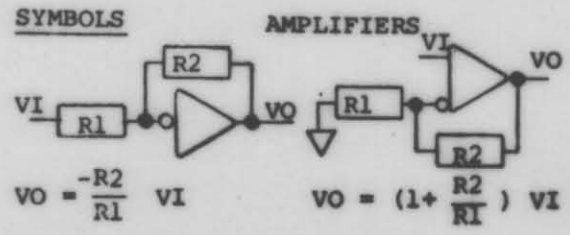
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

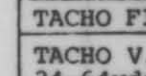
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT. 3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | IFC | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | | MF | YA-YB, YC-YD |
| 7.0 13 | X | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R < .25S | X | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 200% DR CL. | X | MCC | DCX - DCY |
| FUSELESS | | ACC | CFY - CFX |
| HOIST FIELD PROGRAMME | X | MFC | TF - DM22<br>CMA - COM<br>CRS - COM |
| AUX TYPE REF. | X | MCC | RJ - DM8 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF (1J16) |
| * | CFB | CURRENT FEEDBACK (1J16) |
| | CMFA | ABSOLUTE VALUE CEMF (1J08) |
| | CRM | CROSSOVER MODIFY (1H29) |
| | DFP | DELAYED FIRING POWER (1J25) |
| * | DR | DRIVER REFERENCE (1J33) |
| * | EAO | ERROR AMP OUTPUT (1J33) |
| | EST | EXTERNAL FLT STOP INPUT (1J14) |
| | FALT | FAULT (1J14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE (1K08) |
| | FEA | FIELD ECONOMY ADJUST (1J25) |
| | FF | FIELD FAULT (1H33) |
| | IABS | MOTOR CURRENT ABSOLUTE (1J09) |
| | ILA | CURRENT LIMIT ADJUST (1J23) |
| | IMET | CURRENT SIGNAL FOR METER (1J10) |
| * | IPU | INITIAL PULSE (1J20) |
| * | LR | LOCAL REF. FROM DGC (1J33) |
| * | JOG | JOG SWITCH INPUT (1J23) |
| * | JOGR | JOG REFERENCE INPUT (1J31) |
| * | MAC | MAX/MA CONTROL SIGNAL (1J20) |
| | MSW | MODE SWITCH (1J30) |
| * | OSC | OSCILLATOR (1J17) |
| * | PCR | PHASE CONTROL REF. (1J26) |
| * | PRE | DRIVE PRECONDITION (1J21) |
| | ØSEQ | PHASE SEQUENCE (1J14) |
| | RERR | REGULATOR ERROR (1J27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION (1J27) |
| | RJ | REGULATOR SUMMING JUNCTION (1J31) |
| | RRA | REGULATOR RESPONSE ADJUST (1J30) |
| | RSET | RESET (1J16) |
| * | RTR | READY TO RUN (1J16) |
| * | RUN | RUN SWITCH INPUT (1J21) |
| * | SA-C | PHASE SYN OUTPUT (1J16) |
| * | SFB | SPEED FEEDBACK (1J20) |
| | SMET | SPEED SIGNAL FOR METER (1J12) |
| * | SR | SYSTEM REFERENCE INPUT (1J29) |
| * | SYS | SYSTEM FAULT TRIP (1J13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST (1J20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK (1J20) |
| | TFR | AC TACHO FREQUENCY OUTPUT (1J13) |
| * | TR | TIMED REFERENCE (1J33) |
| * | VFB | VOLTAGE FEEDBACK (1J19) |
| * | WFR | WEAK FIELD REFERENCE (1J20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊣⊢ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 10-8-82 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST BDC 3064R | IDENT |
|---|---|---|---|---|---|
| | | TECHN. | | | DR SH |
| | | ENG. C.W.H | | | 1 G |
| | | APPD. | | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD 1H | |

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902HM100EE

BDC 3064R

NOTES:-

▲ THESE RESISTORS CRIMPED IN WIRE HARNESS

CFU1, 2 & 3 ARE 3·2A, 500V.

1FC 1FG 4RC 4RG 2FC 2FG 5RC 5RG 3FC 3FG 6RC 6RG

SCR (A)

MTBA

SCR (B)

1RC 1RG 4FC 4FG 2RC 2RG 5FC 5FG 3RC 3RG 6FC 6FG

MTBB

SH IP IN DA1 HOL A ARM AA DA2

.22 40Ω

[1A 08]

L1 L2 L3 FU1 FU2 FU3

K1 K2 K3 MA

CT PR1: SEC 1:2000 J1 J2 J3 J4 J5 J6

MOV

CF U1 CF U2 CF U3

R1 R2 R3

RT1 RT2 RT3

AIRFLOW UP

R2 DCN DCP

[NS 02]

(BLU/W) 115 VAC (BLU) (BLK) (BLK-Y) (BLK-R) (BLK-W) (R) (Y) (R) (R) CPT

MTBB (LOW) 0 TO 3 FANS DEPENDING ON RATING

MTBA (HI) 0 TO 3 FANS DEPENDING ON RATING

50V

PSC AC1 X1 FU1 FU2 1A AC2 FX1 2TB 10

RTB X2

MAX 7 4 1 B MA A

F U 1 0 1 1.5A F U 1 0 0

REG -30 +30 -20 +20

L1 L2 L3 1FU 2FU 3FU MFC F1 F2 ZZ

-30 27 -20 COM +20 +30 21 COMX 20

FDR CRM CEMF WFR SA SB SC RF ZF SFB

HPC(13) LPC(28) REF(14)

SPILLOVER CROSS FMIN FMAX

CURRENT REGULATOR

50/60 HZ SELECT SEE TABLE 1

L/R<.25S SEE TABLE 1

CURRENT SELECT SEE TABLE 1

TACH TF SLIM ALIGN

FAULT OUTPUT

FIELD LOSS FF FLOSS

IDM21 IDM22 +20 COM -20 TA SYS

SFC FC HPC(21)

TO CIRCUITS AS SHOWN [NS-05]

[NS 16]

ACC +20 COM -20

J1 J2 1D1 1D2 J3 J4 1D3 1D4 J5 J6 1D5 1D6 FO RO DFP

IL1 IL2 IL3

FIRING LOGIC & PULSE TR'FS

RES

CFX CFY CT CW CY CX CZ

OR

3 PARALLEL FULL WAVE RECTIFIERS

R112 R113

PO ZC TRIP SYS

1FC 1FG 2FC 2FG 3FC 3FG 4FC 4FG 5FC 5FG 6FC 6FG

1RC 1RG 2RC 2RG 3RC 3RG 4RC 4RG 5RC 5RG 6RC 6RG

[NS-13] [NS-34] [NS-35]

DR SH CONTD: ELEMENTARY DIAGRAM

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

| TECHN: ENG: APPD. | TECHN: ENG: APPD. | DATE: 10-8-82 | ALLENWEST VARIABLE SPEED DRIVES OPERATION BRIGHTON. ENGLAND. | HOIST BDC 3064R | IDENT. DR 1 SH H |
|---|---|---|---|---|---|
| | | TECHN: | | | |
| | | ENG: C.W.H. | | | |
| | | APPD: | | G.O. NUMBER 228900 / ELEMENTARY DIAGRAM. 902M126FR / CONTD: 1J | |

OPENED FOR SOME CONTROL OP.

INSTRUMENT LO HI

(A) [PS-17]

-30V PS-16

IFC MAC R STOP + OR AND

+20V COM -20V PRE PRE COM RN RP

MAX MAX MAX

RT1 RT2 RT3 ISOLATE & PHASE SHIFT

DCP DCN IN IP (+) (-) (-) (+) ISOLATE ISOLATE (-) (-)

(+) ABS OA7 CMFA ZSPD

REMOVE IF DC TACH

TACH V SCALING TKN TC TC TKP SEE TABLE 1 NT NT RT- RT 47.5K 47.5K OA3 (-) CEMF

150K 150K 56K 30 29

APPROX 2.5V AT RATED

(-) ABS OA4 IABS IA 5K IMET 7.3V AT TOP SPEED 22

(-) ABS OA5 SABS 10K SMET DM13 23

COM CC OA6

(C) TO ME PS-31 9 8

SYS EST FAULT TRIP FALT Ø SEQ FAULT + 20

OA6-2 TFR 18 PUL/REV

OSC 6KHZ

ILO IH1 I RSET RTR FT1 FT2 SMAX TFB CEMF SA SC SB VFB DM11 CFB IPU OSC DM12

[PS-35] B

RESET RESET

B FLT A R CFB FLT

12

REF(23) [NS-09]

REF(12) SLB-1E (11)

MAC WFR TA FC SFB SYS RTR SMAX TFB CEMF VFB DAMP CFB IPU SA SC OSC SB

MCC

REF(14) PRE RUN JOG DP1 DP2 FET CONTROL LOGIC (SEE NOTE) TO FETS

14

TQP(5)

READY TO RUN 20K MAX SPEED

AT2AT1 10K RECTIFY POLARITY OA12 (+) FBJ POL 0-0-1-1

5.6V FOR RATED ARM. VOLTS (-) OA8 47.5K 47.5K COMP

SPILL OVER CLR CLF ILA CUR LIMIT

10V AT TOP SP FEA DEP SP (TS-28) SFB C52 TL 20K 27,4K RJ CEMF LIMIT R257 332 (2-60SEC) COM

SPILL OVER ELR ELF ELJ

CLJ R381 CL1 C70

COM SRH 2.2K 20K 3.3K 4.75K 4.0K TIR OA10-1 LIN TIME 2.2K 1-RUN-1-1 RUN=0 SR SMIN MIN SPEED 1K REF SCALE (-) 10K

4MFD 10V AT TOP SP LT1 OA10-2 47.5K OA11-2 RERR RLJ GAIN

NDE PHASE CONTROL PCR DFP (TS-26) DRX OA11-1 DR (+) 4MFD

1D1 1D2 1D3 1D4 LINE Z 1D5 1D6 50HZ - 60HZ FO CL-INH RO SEE TABLE TRIP ZC PO

RESP 50K 2.2K 50K RRB RRA MSW 1-WF-1/0-1 WEAK FIELD=0 FULL FIELD=1 1-0-0-0 0-0-1-1 1-0-1-1 +10V FOR RATED ARMATURE VOLTS

IM 02 28 26 JOGR 20K 27K 12K JH COM 1-JOG-1-1 JOG=0 LT2 RJ

+30 +20 COM -20 LR DM1 DM2 TR DM3 DM4 DM5 EAO DM6 DM7 DM8 DR REF(29)

TQP(19) TQP(20) TQP(28) [PS-35] [PS-35]

[N 32] [NS-02] [NS-02]

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | ALLEN-WEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | HOIST BDC 3064R MAIN CONTROL CARD & INTERFACE CARD. | IDENT |
|---|---|---|---|---|---|
| | C.W.H. | 10-8-82 | | | DR 1 SH J |
| | 2 | TECHN. | | | |
| | 10-12-82 | ENG. C.W.H. | | | |
| | | APPD. | | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD. 1K | |

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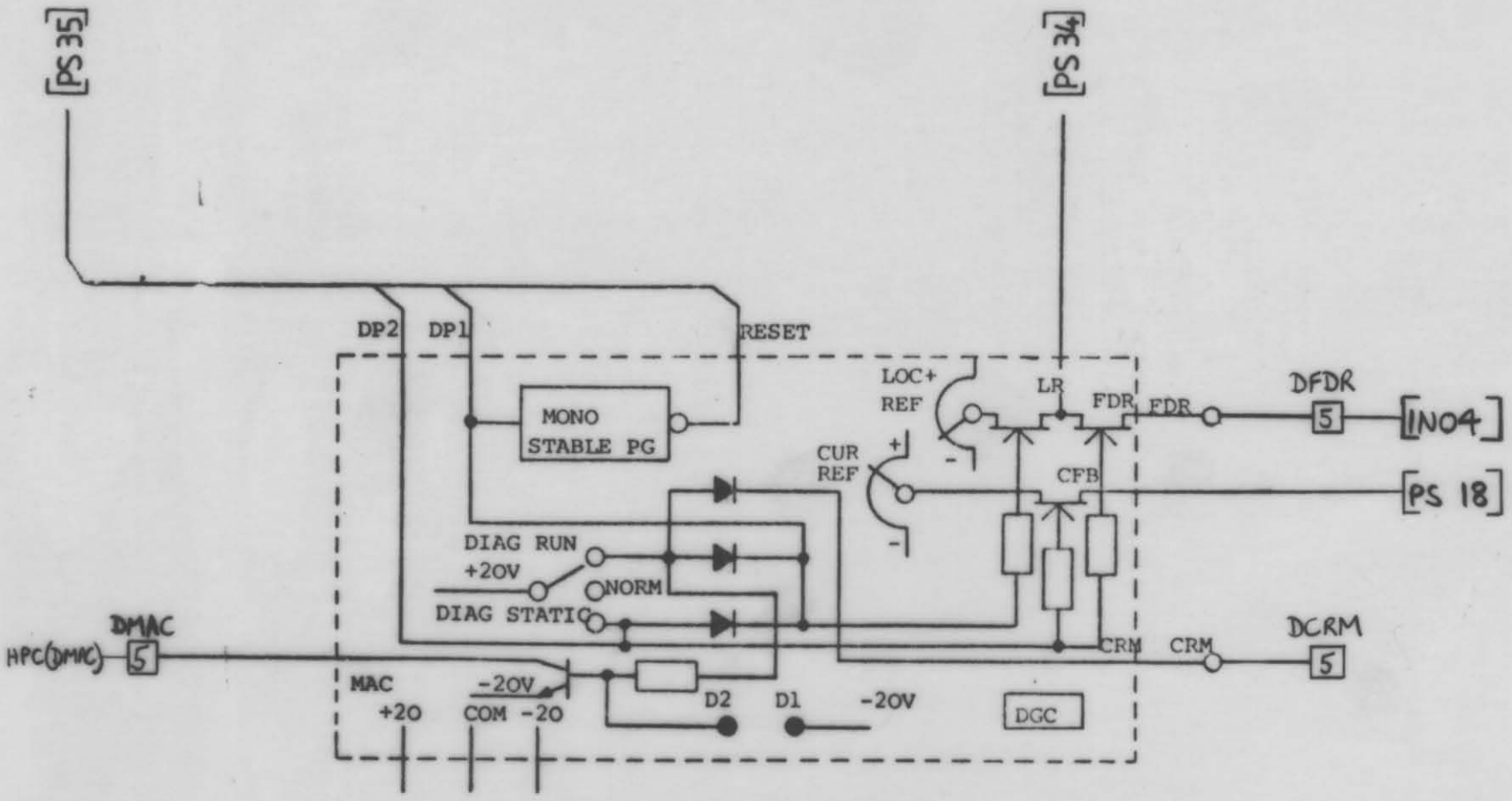
902HM100DX

DR | SH | CONTD. | ELEMENTARY DIAGRAM




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10-8-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. C.W.H. |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BDC 3064R
DIAGNOSTIC CARD

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 228900 | 902M126FR | 1L | 1 | K |

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902HM100FE

CRANES

DR | SH | CONTD. | ELEMENTARY DIAGRAM

RUN PERMISSIVE

TDR-1G

15

14 — 15K — T1A — REF — +20V

LCA LTA FTA FSA +20V

12 — 56K — 56K — 22K — 10K — 0·47 MF — COM

TMA

DOA TDA PLA

RCA

5 3 6 9 11 8

5X 3X 6X 9X 11X 8X

RLA

-20V

[3] 1

[4] 4

[2] 3

-20V 2 — +20V 15 31 — 1 32

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

TP1 TP2

15K 15K

23 — 33K — 3.9K — 22

[IN 04] (CEMF)

.47 MF — COM

HYSTERESIS +20V 31 — 20

SLA

25 25 30

A LEVEL ADJ.

SP1 [2] 13

26 28 27

RA-1L 9 11 — RA-1L 10 4 — RUN RELAY

1 DCOM

32

INSTRUCTIONS VSD1 211 — 24 19 21

D/O AT CEMF = ±0·3V (5% VA)

[3] 2

BRAKE RELAY

SLD-1E

SLB

TP3 TP4

15K 15K

12 — 30K — 3.9K — 11

[IJ 19] MCC (CEMF)

10K — .47 MF — COM

HYSTERESIS +20V 31 — 18

SLB

9 3 10

5 8 6

B LEVEL ADJ

-30V — RA-1L 5 3 — [4] 1

SP36 [4] 6

RA-1L 5X 3X — [3] 7

1 DCOM

32

INSTRUCTIONS VSD1 211 — 14 13 17

D/O AT CEMF = ± 1·2V (20% VA)

RA-1J

SPARE — 3 — 11

RB-1J

SLOW REFERENCE RELAY — 14 — 21 — SP38 [4] 8

RC-1J

SPARE — 23 — 25

RB-1L

SPARE — 13 — 19

RC-1L

SPARE — 23 — 29

RD-1L

SPARE — 1 — 32

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10-8-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. C.W.H. |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BDC 3064R

TIME DELAY RELAY, SIGNAL LEVEL DETECTORS & CARD RELAYS.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 228900 | 902M126FR | 1M | | 1 | L |

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902HM100FD

CRANES

DR | SH | CONTD. | ELEMENTARY DIAGRAM

[IB 18]

SP4 17 — 8X X4
SP5 18 — 9 X3
SP7 24 — 8 X2
SP8 25 — 6X1

REF-ID — DIS — 10 — 19X — 30X — 3X

T1 — MAXNEG 10K — NREF
T2 — MAX POT 10K — PREF

ZERO ADJ 1K

SLOW 20K — 5

IRB-15 16 13 — MCC (SR) [IJ28]
IRB-15 19 20 — 17
30 — 5X — 3

[IJ21] MCC (PRE) — 14 PRE

MONITOR PRECONDITION
COMPARE

LATCH — 23 SYS — MCC (SYS) [IJ18]
TRACKING ERROR OR OVERVOLTAGE
TF 16 — MFC (DM22) TF [IH 33]

+30V SP45 — 15 — HR [IB] 2 — 11 NSW — T1
LR [IB] 3 — 13 PSW — T2
-30V — 10X -30V

+20V — 22.1K — FEA 18
56K — 13X
39K — 16X
22K — 17X
12

[IJ33] MCC (DR) — 29 DR — DR INVERT AND MONITOR IR COMP
28 CFB
21 — 10K
56.2K — 56.2K
SFB SHAPING
1.5K
+20V COM -20V — 31 15 2
26 11X 9X 12X 6X 18X 28X ERR

MCC (SFB) [IJ19]

[IJ34] MCC (TR)

TQP-1C — 20 TR — 29 ATR
[IJ34] MCC (LT2) — 19 LT2 — T1 T3 — OAI-1 — T6
T2
10K — 12.1K — TRX 28 — MCC (DM8) RJR [IJ34]
T7 — UTP2 6
+20V
LC HC
13
OR — T6 T7 T2 T3
AND
AND

[IN 04] R CFB
30 CFB — ATR (+) AND CFB (+)
27
14 REL
12 — ATR (-) AND CFB (-)
10
OR
AND

3 PRE — PRE (-4V) OR DP2 (+20V)
[IJ24] MCC (DP2) — 5 DP2
8 UTP1

330Ω — ILR 9
BR 18
OAI -2
PEF DELAY 2.5K
T1 — IMF
TBR
3.92K — T17
17 — -30V
-30V

3 8 — 1
3 7 — 1
4
3 6
3 3
9
6
3 5
A BPR B — 15K
3 4

+20V COM -20V — 31 15 2
22

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 10-8-82 | TECHN. | ENG. C.W.H | APPD. |
|---|---|---|---|---|---|

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BDC 3064R
REFERENCE & TORQUE PROVING CARDS

IDENT — DR 1 — SH M

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 228900 | 902M126FR | IN |

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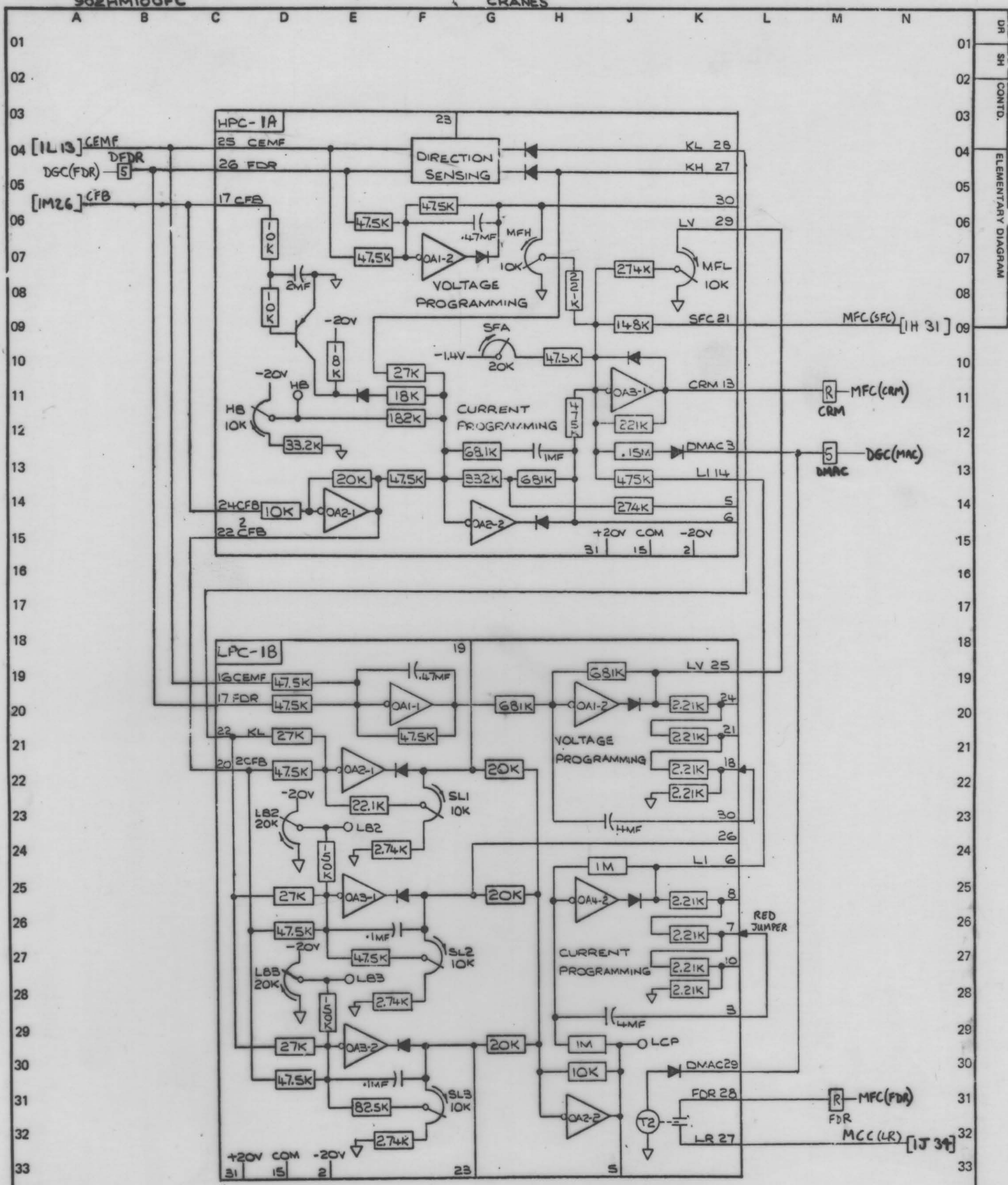
902HM100FC

CRANES

DR | SH | CONTD. | ELEMENTARY DIAGRAM




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 10-8-82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. C.W.H. |
| | | | | | | APPD. |

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BDC 3064R

HOIST & LOWER CARDS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 228900 | 902M126 FR | 1P |

IDENT

| DR | SH |
|---|---|
| 1 | N |

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CRANES - MOTOR FIELD PROGRAMME

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPC | LPC | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | | | | | | | | |
| 1A3W 547 AAG01 | 193W 548 AAG01 | 193W 545 AAG01 | 193W 546 AAG01 | 193W 277 AAG02 | | 193W 543 AAG01 | | 193W 279 AAG03 | | 193W 265 AAG04 | | | | | | | | | |
| HOIST PROGRAM | LOWER PROGRAM | TORQUE PROVE | REFER-ENCE | SIG LEV DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | | | | | | | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

● TEST POST ⊘ POT ADJUSTMENT ⌘ INDICATING LIGHT

SEE ALSO 836A349229AAG04 FOR STANDARD WIRE JUMPERS

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(COM) - 1G15 | 5TB(DMAC) - 1A3. | 4TB5 - | 2TB4 - 2TB16 |
| RTB(+20) - 1G31 | SP1 - 1E30 | SP36 - 1E9 | |
| RTB(-20) - 1G2 | SP2 - MTBB (TSI) | SP37 - | |
| RTB(CFB) - 1C30 | SP3 - MTBB (OLI) | SP38 - 1J21 | |
| RTB(-30) - 1L5 | SP4 - 1D8X | SP39 - | |
| MCC(SFB) - 1D12X | SP5 - 1D9 | SP40 - | |
| MCC(TR) - 1C20 | SP6 - | SP41 - | |
| MCC(SR) - 1J13 | SP7 - 1D8 | SP42 - | |
| MCC(SYS) - 1D23 | SP8 - 1D6 | SP43 - | |
| MCC(DR) - 1D29 | 3TB1 - 1G12 | SP44 - | |
| MCC(CEMF) - 1E11 | 3TB2 - 1L10 | SP45 - MCC(+30) | |
| MCC(DMB) - 1C28 | 3TB3 - | 2TB3 - 1G11X | |
| MCC(LT2) - 1C19 | 3TB4 - 1C17 | | |
| MCC(DP2) - 1C5 | 3TB5 - 1C18 | | |
| MCC(PRE) - 1D14 | 3TB6 - | | |
| MFC(DM22) - 1D16 | 3TB7 - 1L3X | | |
| RTB(FDR) - 1B28 | 3TB8 - | | |
| MCC(LR) - 1B27 | 4TB1 - 1L3 | | |
| MFC(SFC) - 1A21 | 4TB2 - 1D11 | | |
| RTB(CRM) - 1A13. | 4TB3 - 1D13 | | |
| 5TB(DFDR) - 1B17 | 4TB4 - 1G5X | | |

UR F SH CONTD.

ELEMENTARY DIAGRAM

| TECHN. | ENG | APPD. | TECHN. | ENG. | APPD. | DATE | 10-8-82 |
|---|---|---|---|---|---|---|---|
| | | | | | | TECHN. | |
| | | | | | | ENG. | C.W.H. |
| | | | | | | APPD. | |

ALLEN WEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST BDC 3064R

MODIFICATION RACK & WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 228900 | 902M126FR | 1Q | 1 | P |

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230V 50Hz
SUPPLY FROM
HOIST TRANSFORMER
SHEET 1A

L1 L2 L3

60 HP
VA - 250V
IA - 198A

DA1 — HOL — A — ARM — AA — DA2

F1 — SHUNT FIELD — Z — F2 — ZZ

$R_f$ = 16·7/20 OHMS

$I_f$ = 5·22A AT 600RPM
2·1A AT 1200 RPM
1·26A AT 2000 RPM

TO HOIST CONTROLLER SHEET 1B

A1 → 17 [2]
A5 → 18 [2]
A6 → 24 [2]
A7 → 25 [2]

HUV
2 — 1 — [4] RA-1L — -30V
[2] 2 CONTROL ON
[4] 14 RUN

3 — [4] 15 +30V
HR — 4 — [4] 2 NSW
LR — 5 — [4] 3 PSW

VALUTROL - AW

BDC 3064 R

HUV CIRCUIT SHEET 1D

87A — [2] 15 — THSW — [2] 16
[2] 4 — FLT — [2] 3 — 1D6

AC CONTROL CIRCUITS SHEETS 1D & 1E

A2 → [2] 8
1D10 → [4] 8 — RB-1J — SLOW REFERENCE
1D11 → [3] 1 — RLA-1G — RUN PERMISSIVE
[3] 2 — RA-1L — RUN

RA-1L
SLA-1E
1D10 → [4] 4 — RLA-1G

RA-1L — SLB-1E — [4] 6 — 1D10
[3] 7 — 1E1
BPR — [3] 6 — 1E2
HBR CIRCUIT SHEET 1E

| | | | | | | |
|---|---|---|---|---|---|---|
| TECHN. ENG. APPD. | TECHN. ENG. APPD. CWH | DATE 10-8-82 | ALLENWEST Simplex | HOIST BDC 3064R | | IDENT |
| | 2 10-12-82 | TECHN. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | INPUTS & OUTPUTS | | DR 1 SH Q |
| | | ENG. C.W.H. | | GO NUMBER 228900 | ELEMENTARY DIAGRAM 902M126FR | CONTD. 1R |
| | | APPD. | | | | |

DR | SH | CONTD. | ELEMENTARY DIAGRAM

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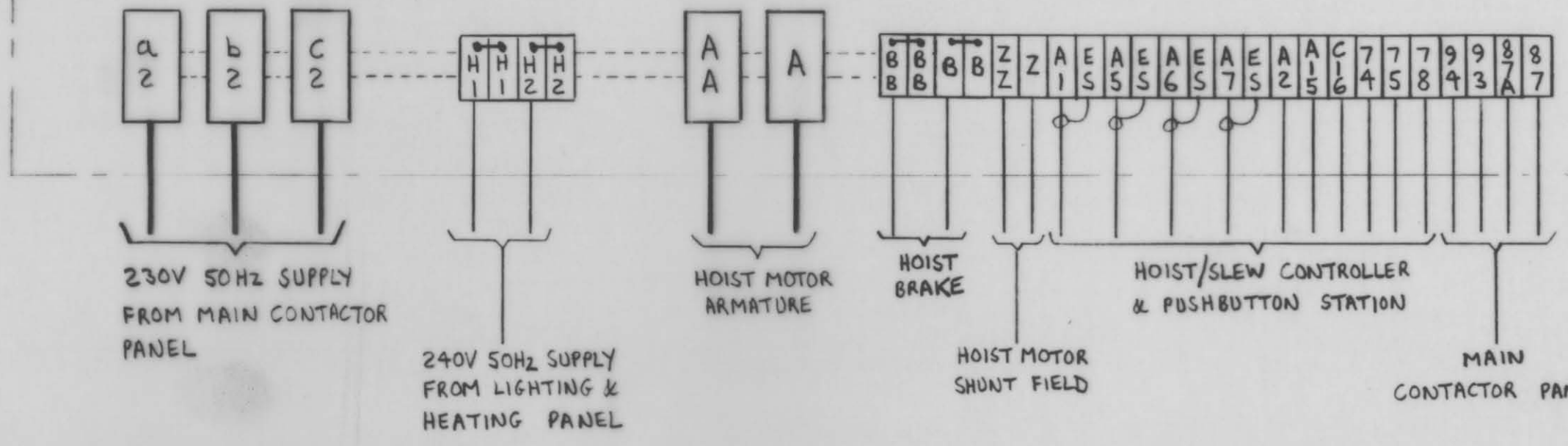
# VALUTROL-AW HOIST PANEL




| | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|
| 2 | C.W.H. | | | 10-8-82 |
| 10-12-82 | | C.W.H. | | |

Simplex — VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

ALLEN-WEST

GO NUMBER 228900 | ELEMENTARY DIAGRAM 902M126FR | CONTD. 15 | DR 1 | SH R | IDENT

HOIST PANEL TERMINAL LAYOUT

ELEMENTARY DIAGRAM | CONTD. | SH | DR

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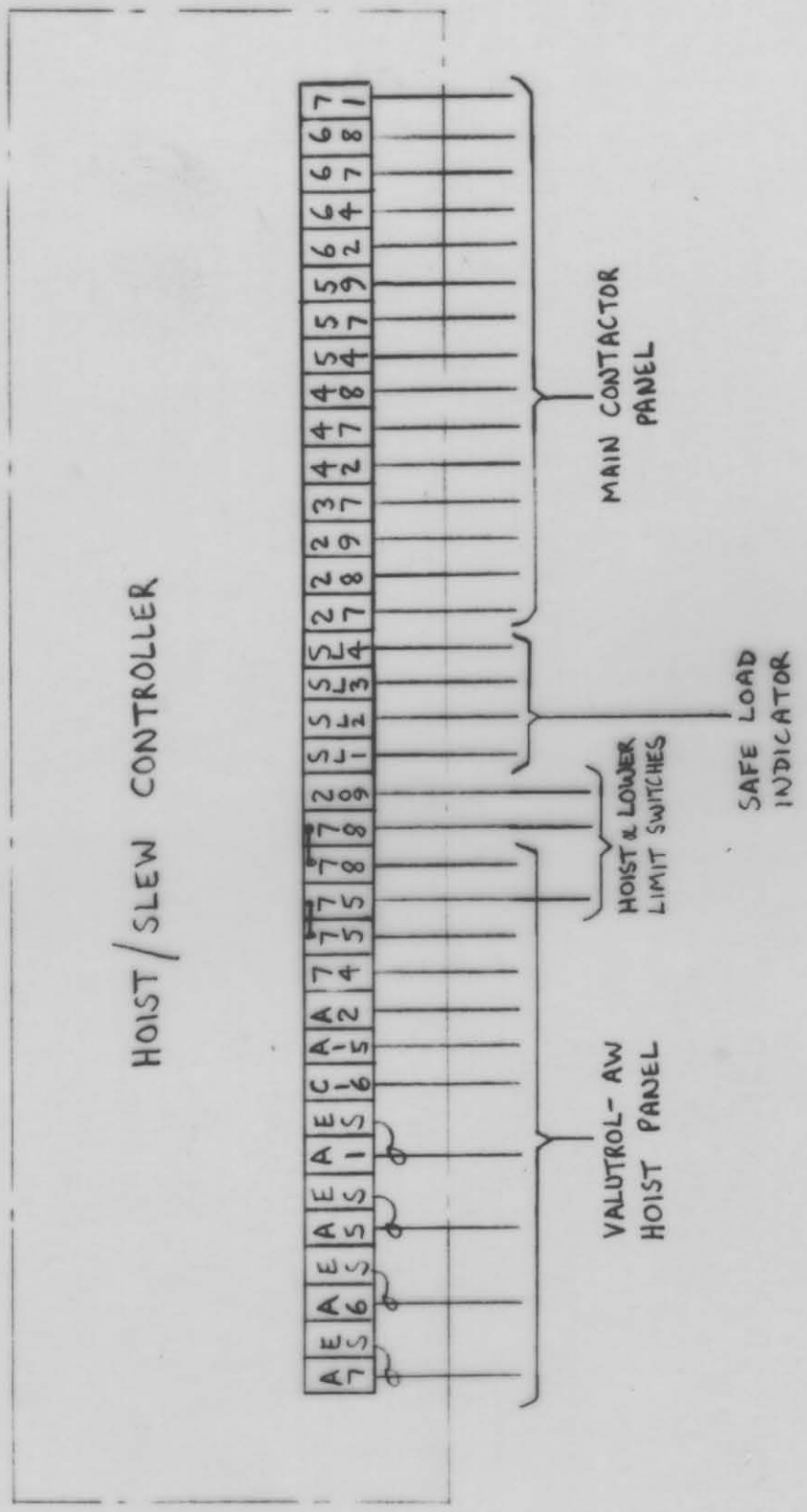
DR | SH | CONTD. | ELEMENTARY DIAGRAM




| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | IDENT |
|---|---|---|---|---|---|
| C.W.H. | CWH | 10-8-82 | ALLENWEST Simplex | HOIST/SLEW CONTROLLER TERMINAL LAYOUT | DR 1 / SH S |
| 4 2-12-83 | 2 10-12-82 | TECHN. / ENG. C.W.H. / APPD. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126FR / CONTD. 1T | |

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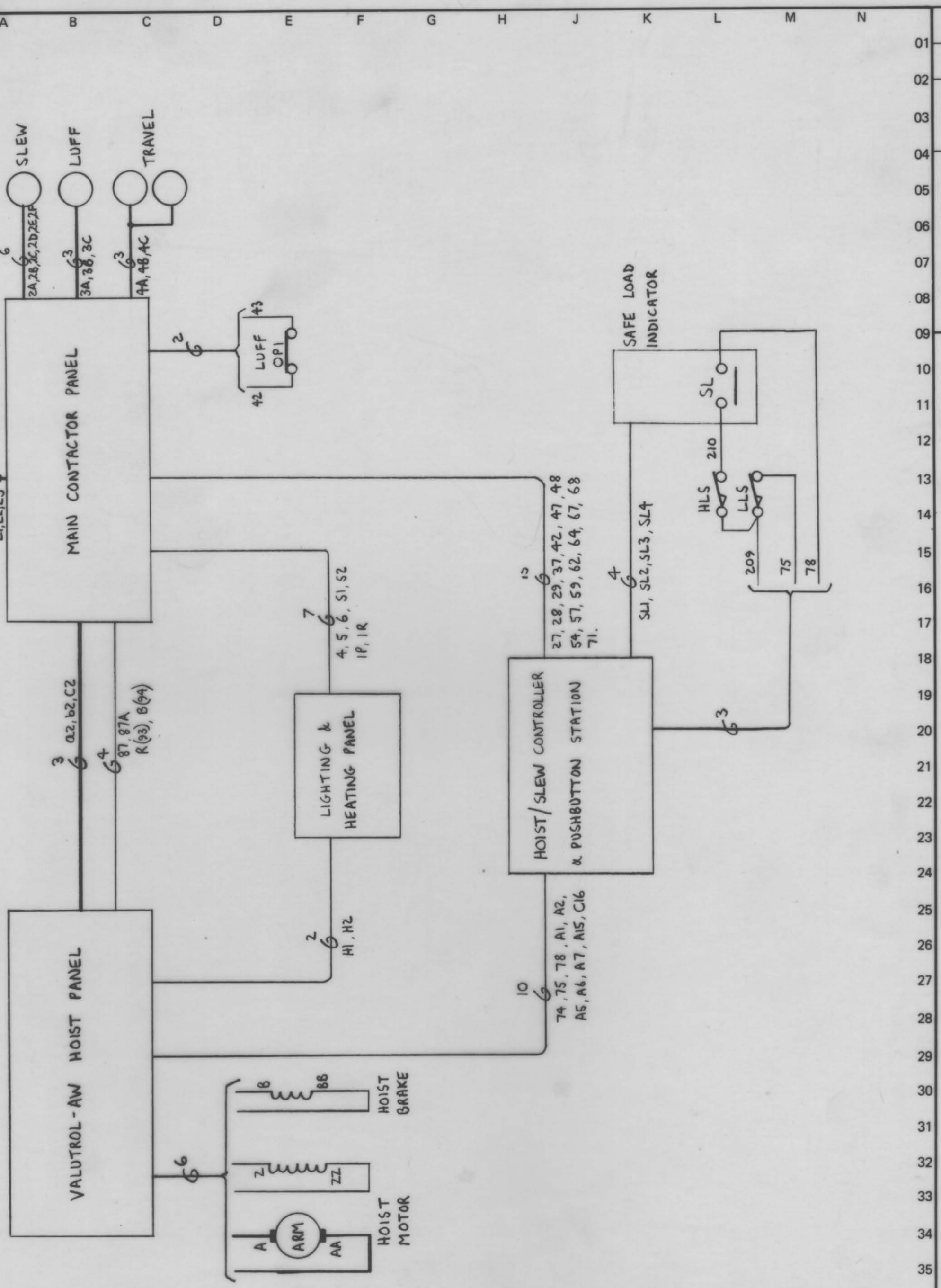


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| | C.W.H | 10-8-82 | ALLENWEST Simplex | BLOCK DIAGRAM OF INTERCONNECTIONS | IDENT |
| | 4 | TECHN. | VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | | DR 1 / SH T |
| | 2-12-83 | ENG. C.W.H. | | GO NUMBER 228900 / ELEMENTARY DIAGRAM 902M126 FR / CONTD. FINAL | |
| | | APPD. | | | |

DR | SH | CONTD. | ELEMENTARY DIAGRAM

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# VALUTROL - AW BDC 3064 R
# THYRISTOR DRIVES FOR HOIST + LUFF MOTIONS FOR 9·6 - 20 TONNE FOUR ROPE GRAB / CARGO CRANE

A.W. S.G.E. REF 350900

MANUFACTURED FOR :—

STOTHERT & PITT P.L.C
BATH

INDEX


| | | |
|---|---|---|
| NOTES | — | 0B |
| OPERATING NOTES | — | 0D - 0E |
| HOIST | | 1A - 1V |
| LUFF | | 2A - 2J |


ASSOCIATED DIAGRAMS

| | |
|---|---|
| SIMPLIFIED 3064R | 906P118CY |
| AC. DC MAINS ETC | 1/8/350900/SCH1 |
| AC AUX. & HOIST CONTROL | 1/8/350900/SCH2 |
| LUFF SLEW + TRAVEL | 1/8/350900/SCH3 |

DR | SH | CONTD. | ELEMENTARY DIAGRAM

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE | | | |
|---|---|---|---|---|---|
| | 3 SEE SH 0C 2.10.84 | DATE 25.5.84 | ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | TITLE + INDEX | IDENT DR 0 SH A |
| | | TECHN. | | GO NUMBER 350900 | ELEMENTARY DIAGRAM 902M128AY |
| | | ENG. | | CONTD. 0B | |
| | | APPD. | | | |

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DRIVE NUMBERING SYSTEM

1. TO BREAK THE ELEMENTARY DIAGRAM INTO EASY-TO-USE SECTIONS, A SERIES OF ARBITRARY "DRIVES" HAS BEEN ESTABLISHED, WITH THE ELEMENTARY SHEETS ALPHABETICALLY NUMBERED IN EACH DRIVE. FOR EXAMPLE:- SHEETS 3A, 3B AND 3C ARE THE FIRST THREE ELEMENTARY SHEETS IN DRIVE No.3.

2. THE DRIVE CONCEPT IS ESTABLISHED TO CONVENIENTLY SECTIONALIZE THE ELEMENTARY DIAGRAM, AND NOT NECESSARILY TO DENOTE SEPARATE PHYSICAL EQUIPMENTS. HOWEVER, ALL THE SYSTEM ELEMENTS INCLUDED IN A DRIVE WILL BEAR AN OBVIOUS FUNCTIONAL RELATIONSHIP; FOR EXAMPLE A NUMBER OF AUXILIARY MOTOR STARTERS MAY BE GROUPED TOGETHER AND REFERRED TO AS "DRIVE 1". THIS SHEET IS "0B", THE SECOND SHEET OF DRIVE "0",I.E. THE INTRODUCTORY MATERIAL.

~~WIRE NUMBERING SYSTEM~~

~~WIRE NUMBERS ARE SHOWN ON EACH SHEET AS TWO-DIGIT NUMBERS (E.G. 01, 02, 10, 42 ETC.) EXCEPT FOR WIRES ORIGINATING ON ANOTHER SHEET, WHICH ARE SHOWN AS 4-DIGIT OR 5-DIGIT NUMBERS. IN ALL CASES, THE COMPLETE WIRE NUMBER (WHICH APPEARS ON THE ACTUAL WIRES IN THE EQUIPMENT AND ON THE TERMINAL BOARDS) IS A 4-DIGIT OR 5-DIGIT NUMBER. THE FIRST TWO OR THREE DIGITS INDICATE THE NUMBER OF THE ELEMENTARY DIAGRAM SHEET ON WHICH THE WIRE ORIGINATES AND THE LAST TWO DIGITS INDICATE THE WIRE ON THAT SHEET. THUS 2A04 INDICATES WIRE NUMBER 04 ORIGINATING ON SHEET 2A OF THE DIAGRAM; AND 15C34 INDICATES WIRE NUMBER 34 ORIGINATING ON SHEET 15C.~~

LOCATING MAPPING SYSTEM

4 OR 5 DIGIT NUMBERS WITHIN BRACKETS, SUCH AS (15C35), ALWAYS INDICATE A LOCATION WITHIN THE ELEMENTARY DIAGRAMS. THE LAST TWO DIGITS OF THE BRACKETED NUMBER INDICATES THE LINE NUMBER ON A SHEET AND THE FIRST TWO OR THREE DIGITS INDICATE WHICH SHEET; THUS (15C35) INDICATES LINE 35 ON SHEET 15C.

RELAY MAPPING SYSTEM

1. UNDER EACH CONTACT (EXCEPT MAIN CONTACTS OF CONTACTORS AND STARTERS) A LOCATION MAPPING NUMBER INDICATES WHERE THE OPERATING COIL IS TO BE FOUND IN THE ELEMENTARY DIAGRAMS.

2. IN THE DIAGRAM MARGIN BESIDE EACH OPERATING COIL, LOCATION NUMBERS GIVE THE LOCATION OF DEVICE CONTACTS THAT ARE USED. LOCATION NUMBERS AT OPERATING COILS DIFFER FROM THE USUAL LOCATION NUMBERING SYSTEM IN THAT:-

A) THE BRACKETS ARE ELIMINATED, AND
B) UNDERSCORING INDICATES A NORMALLY CLOSED CONTACT AND LACK OF UNDERSCORING INDICATES A NORMALLY OPEN CONTACT.

THUS 3B56 INDICATES A NORMALLY OPEN CONTACT LOCATED ON LINE 56 OF SHEET 3B OF THE ELEMENTARY DIAGRAM, AND 13B48 INDICATES A NORMALLY CLOSED CONTACT LOCATED ON SHEET 13B, LINE 48.

AGAIN MAIN CONTACTS OF CONTACTORS AND STARTERS ARE NOT "MAPPED".

CONTACTS FOR PURCHASER'S USE

CONTACTS FOR PURCHASER'S USE WILL BE SHOWN ISOLATED, IN THE BODY OF THE DIAGRAM, AS NEAR AS CONVENIENT TO THE ASSOCIATED OPERATING COIL.

WIRE NUMBERS WILL BE SHOWN ON THE WIRES COMING OUT OF THE CONTACT WITH THE LABEL "FOR PURCHASER'S USE" OR SIMILAR WORDING; THE SYMBOL FOR TERMINALS FOR CUSTOMER'S USE IS SHOWN ON SHEET 0A.

THESE CONTACTS WILL ALSO BE "MAPPED" AT THE COIL LOCATION.

IN THE ACTUAL EQUIPMENT, THESE WIRES WILL BE RUN TO THE TERMINAL BOARD, WHICH WILL BE MARKED WITH THE WIRE NUMBERS.

WHEN KNOWN, PURCHASERS WIRE NUMBERS WILL BE USED.

CONTINUATION OF WIRES ON OTHER SHEETS

WHERE A WIRE IS CONTINUED FROM ONE SHEET TO ANOTHER, THE POINT OF ITS CONTINUATION IS INDICATED BY A BRACKETED LOCATION MAPPING NUMBER. THE FULL WIRE NUMBER MAY ALSO BE SHOWN E.G.

1A27 [1805]

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | TECHN. | ENG. | APPD. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 25.5.84 | | | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

NOTES

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 0C | 0 | B |

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902HM100CY SH3

DR | SH | CONTD. | ELEMENTARY DIAGRAM

## RECORD OF ELEMENTARY DIAGRAM CHANGES

| SHEET No. | ISSUE | DATE | LOCATION AND DESCRIPTION OF CHANGE | ISSUED BY |
|---|---|---|---|---|
| ALL | 2 | 25.5.84 | AS SHIPPED | |
| 1A | 3 | 2.10.84 | TB Nos ADDED | |
| 1D | 3 | 2.10.84 | LLR CIRCUIT CHANGED (TDR REMOVED) | |
| 1N | 3 | 2.10.84 | LLR CIRCUIT MODIFIED<br>TIMER CONTACTS NOW TO SHEET 1R | |
| 1Q | 3 | 2.10.84 | 10μF ADDED ACROSS 0A3 | |
| 1R | 3 | 2.10.84 | 3RB ADDED<br>INPUT CIRCUIT TO A-1R (0A1), SCD IS MODIFIED | |
| 1U | 3 | 2.10.84 | COMPONENT CHANGES | |
| 1V | 3 | 2.10.84 | COMPONENT CHANGE | |
| 1E<br>1K<br>1L<br>1P<br>1R | 4 | 10/12/84 | ASS COMMISSIONED | |

THIS FORM ALSO USED FOR 'REPEAT' TYPE ORDERS WHEN DESCRIPTION OF CHANGE INCLUDES REFERENCE TO EARLIEST SERIAL NUMBER AFFECTED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | 2.10.84 | 25.5.84 |

TECHN.
ENG.
APPD.

AUSTRALIAN WESTINGHOUSE
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

CHANGE RECORD

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 350900 | 902M128AY | OD | 0 | C |

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# OPERATING NOTES

## HOIST MOTION - GENERAL OPERATION

The Hoist is operated by two motors, each controlled by it's own thyristor drive. Both drives are operated from a common speed reference, but each has its own armature voltage feedback circuit. The two shunt fields are connected in series and controlled by the motor field controller (MFC) in Drive No. 1. The MFC is Drive No. 2 is used for armature over-voltage trip only.

When operated in cago mode the shunt fields are initially set at base speed level (700 RPM). However, speeds above base are available with reduced loads to give up to 250% speed (1750 RPM) with 40% load or less. This is the constant horsepower characteristic obtained by weakening both fields simultaneously, under control of the Hoist. Lower programme PCB's located in Drive No. 1. See Instruction VSDI 304A for more details. Note, in this instance the current signal controlling these PCB's is an average of the armature current signals from both drives. When checking or adjusting the PCB's, the current signal mentioned in the Instruction & Test instruction should be measured at test point MCC (DM5) in Drive No. 1.

When operating in Grabbing mode, the motor fields are both weakened to the 1750 RPM level permanently, so this is top speed available under all Grabbing loads.

## CARGO MODE

A differential current signal is obtained by subtracting the armature current signal of Drive No. 2 (2CFB) from the armature current signal of No.1 (1CFB). This signal is used to modify the speed reference on Drive No.2 to ensure that both motors take the same armature current. This ensures equal tension in each rope. By the nature of the mechanical system both motors are speed matched. If one rope tends to slacken under light hook conditions, then the system ensures both ropes 'pull-in' to equal tension when lifting a load.

## GRABBING MODE

The Hold and Close lines are interchangeable to allow for two different grab configurations. Selection is made by the 'Grab' selector switch, as follows-

'GRAB 1' - Hoist No. 1 (Inner Ropes) selected as 'Close', Hoist No. 2 as 'Hold'
'GRAB 2' - Hoist No. 2(Outer Ropes) selected as 'Close', Hoist No. 1 as 'Hold'

## HOIST & LOWER WITH GRAB CLOSED

Under these conditions the differential current signal (see under Cargo Mode) is used to ensure equal tnesion in both ropes. Thereby forcing the Grab Closed in both Hoist & (Regenerative) Lower directions.

## HOIST & LOWER WITH GRAB OPENED

Under these conditions the two motors must be speed matched, although all the load of the Grab should be taken by the Hold motor. Any load on the Close motor will tend to cause the Grab to close.

To prevent this happening, the 'Max. Neg. Trim (Grab opened - Close, SP1-1T)' on the selected close motor should be adjusted, fractionally to decrease the close motor speed when hoisting. Similarly the 'Max.Pos. Trim (Grab opened - Hold, SP2-1T)' on the selected Hold motor should be adjusted fractionally to decrease the Hold motor speed when lowering. Both adjustments reduce the tension in the close ropes. Over-adjusted will result in excessively slack ropes. The differential current signal circuit used to ensure load sharing is in-operative during these conditions.

## OPENING & CLOSING GRAB

These functions are performed by running the Close motor only. To force the Grab shut and break-up obstructions, the selected Close motor current limit is increased to 200% FLC when 'Close Grab' notches are selected. 200% FLC is available for 4 seconds (adjustable by 'TMB' on TDR-1G) only, each time 'Close Grab' notches are selected. To prevent the selected Close motor overheating. Current limit is then reduced to 150%.

## LUFF MOTION - GENERAL OPERATION

The Luff motion is powered by a single motor with its own thyristor drive. The drive operates from an independent reference and is arranged for armature voltage feedback.

The drive also operates in three levels of field weakening according to load, controlled by the external safe-load indicator, to give constant horsepower with increased top speeds.

Base speed field is set by 'FMAX' (MFC). Reduced fields are set by pots. 'SP5-1T' (318 RPM), 'SP6-1T'(363 RPM) and 'SP7-1T' (585 RPM). The desired level of field is automatically pre-selected when the Luff is stationary and maintained at that level when it is running.

## ADJUSTMENTS - ALL DRIVES

**Current Limit** (Diagnostic static)

The standard current limit setting is 150% FLC.

When checking or adjusting current limit the torque proving PCB (TQP-IC) should first beunplugged otherwise the reduced (non-adjustable) torque proving level will be measured.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| | | | | | | 25.5.84 | TECHN. |
| | | | | | | | ENG. |
| | | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | OE | | 0 | D |

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On the Hoist drives, the standard current limit (150%) should be set by 'CUR-Limit' (MCC) Pot. first with relay 1RA-IS (No.1) or 2RA-IN(No.2) de-energised. The 'Close Grab current limit' (SP3-IT on No.1 or SP3-1P on No.2) should be set second to 200% FLC with the appropriate relay (see above) closed.

## OTHER ADJUSTMENTS

See 'Engineering Test Instructions' (Section 5) and data sheets attached to Drives for settings. See also Instructions VSDI 304A and VSDI 314B (Section 2) for procedures.

**Note** - The given settings for 'Max Neg. Trim', 'Max. Pos. Trim' should be considered as typical only and will probably require further adjustment when commissioning.

## LOAD SHARE/SPEED MATCH CIRCUIT FOR CARGO/GRAB CLOSED NOTCHES (LOCATED IN DRIVE NO.2)

Ensure SP2-1Q (set load share proportion) and SP3-1Q (set load share grabbing) are both set fully clockwise. Set up load share circuits as follows. Un-plug PCB 'IU' (Drive No.2). Select Diag. static in Drive No. 2. Adjust 'CUR-REF' pot to max.+VE. Adjust '1LIM'-' on PCB 'IR' to give - 3 volts at MCC (DM7). Now set 'CUR Ref' pot to max.-VE. Adjust 'ILIM+' to give +3 volts at MCC(DM7). This limits max. speed correction on drive No.2 to safe figure of $\pm$15% speed. Replace PCB 'IU'

Now change 'R29-1P' (1K resistor) to 20K. Set both drives to 'Diag.static'. Adjust both 'CUR-Ref' pots to give +5V ($\pm$ 0.05V - use digital meter) at both 'CFB ' test points. Adjust SP1-1Q (load share scale) to give 0V ($\pm$0.05V) at MCC (DM7). Replace 1K Res. at 'R29-1P'

## RE-COMMISSIONING NOTES

Set-up load share circuit in diag. static as above. Check with 3 to 6 tonne load, Running with tong test.
Set-up and run drives in Cargo mode first, initially with top speed limited to base by setting 'crossover' pot (MFC) fully clockwise. When operating correctly set 'crossover' fully anti-cw and run in field weakening. Take care to ensure motors do not overspeed (see VSDI 304A, Section 2). Check discrimination with varying loads. Then run in Grabbing modes, making the adjustments pertaining to Grabbing as required.

**Warning** If load share circuit in-operative or arm. currents not within 5% of each other DO NOT RUN IN CARGO FIELD WEAKENING

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 25.8.84 / TECHN. / ENG. / APPD. | ALLENWEST Simplex — VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND. | | IDENT: DR 0, SH E |
|---|---|---|---|---|---|
| | | | GO NUMBER 350900 | ELEMENTARY DIAGRAM 902M128AY | CONTD. 1A |

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DR 1 | SH A | CONTD. 1B | ELEMENTARY DIAGRAM

2 8

SP39 — 4 / 9 — 11 — LLR 1 RA 1J — 3 — HOIST REF. RELAY 1B06

SP40 — 4 / 10 — 25 — LLR 1 RC 1J — 23 — LOWER REF RELAY 1B06

SP41 — 4 / 11 — 11 — LLR 2 RA 1N — 3 — NOTCH 2-5 RELAY 1B20, 1B23

SP42 — 4 / 12 — 21 — LLR 2 RB 1N — 14 — NOTCH 3-5 RELAY 1B17, 1B20

SP43 — 4 / 13 — 25 — LLR 2 RC 1N — 23 — NOTCH 4-5 RELAY 1B14, 1B17

SP44 — 4 / 14 — 5 / 8 — 5 / 9 — [1R20] SLA 1S 25 / 30 DRIVE No.24 — 5 / 9 — 11 — LLR 3 RA 1Q — 3 — NOTCH 5 RELAY 1B09, 1B14

SP38 — 4 / 8 — 25 — LLR 3 RC 1Q — 23 — GRABBING FIELD WEAKEN RELAY 1F25 1A19

3RC-1Q 28 / 30

SP4 — 2 / 17

SP5 — 2 / 18

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | 2.10.84 | 5.5.84 |

TECHN. [illegible]

ENG. [illegible]

APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 1

COMMON MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 1B | 1 | A |

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CRANES – 5 NOTCH REF.

+20V

2
R2-1U
1K
2X
5
1RA-1J
6

+20V

31
R31-1U
1K
31X
24
1RC-1J
26

3RA-1Q
6 5

'NOTCH 5 SPEED'

4
R4-1U
562R
4X

19
'SET NOTCH 4 SPEED'
SP4-1U
500R
22X
19X
8

2RC-IN
26 24

25
'SET NOTCH 3 SPEED'
SP3-1U
500R
25X
22
27

2RB-IN
16 13

27X
'SET NOTCH 2 SPEED'
SP2-1U
500R
30
27
17

2RA-IN
6 5

32X
'SET NOTCH 1 SPEED'
SP1-1U
500R
32
30X
8

(SPEED REF)
(-Ve = HOIST)

TO HOIST NO1 [1E01]

SP6
2 19
2 27
2 19
SP6
2 27

[1P01]
HOIST NO 2

DR 1 | SH B | CONTD. 1C | ELEMENTARY DIAGRAM 902M128AY

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5.5.84. |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO 1

COMMON SPEED REFERENCE CCT.

GO NUMBER 350900 | ELEMENTARY DIAGRAM 902M128AY | CONTD. 1C | IDENT | DR 1 | SH B

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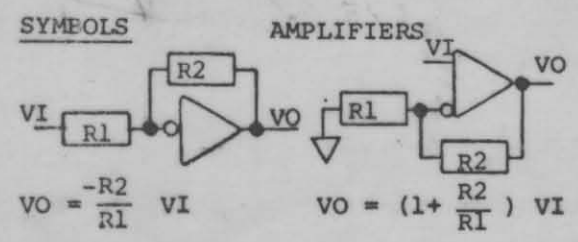
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

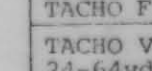
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1 + \frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSCLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G13④ G256 | | IFC | MFC OR MFE |
| .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13 25 | X | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 220% DRV CL | X | MCC | 82KS FROM DCX TO DCL |
| FUSELESS | | ACC | CFY - CFX |
| REF. JUNCTION | X | MCC | RJ - DM8 |
| MOD. REG. CL. | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤⊥ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF - DM22 |
| INH.CROSSOVER | X | MFC | CMA - COM |
| " " | X | MFC | CRS - COM |
| | | | |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | | | 5.5.84 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO1

FUNCTION JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 1D | 1 | C |

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1 C 1D 902M128AY

RUN PERMISSIVE

TDR-1G

TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

SLB

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±1·2V

CLOSE CURRENT LIMIT TIMING RELAY

TDR-1G

TIME DELAY ON ENERGISATION

HEATSINK THERMAL SWITCHES

MCC (CEMF)

3RB-1Q RUN REF. RELAY 1E03, 1E04 1E04

RA-1L RUN RELAY 1D14 1D18, 1D21

RA-1L -30V

SP36

RA-1L 5X 3X

4RA-1S CLOSE GRAB CL RELAY 1E22

1RB-1S GRAB OPENED RELAY (HOLD) 1E02

LLR 4RB-1S 1F07 1E02 GRAB OPENED DROOP RELAY (CLOSE)

4RC-1S GRAB CLOSED DROOP RELAY (HOLD)

1F07, 1F12

| | | |

[1B23] (SPEED REF)

15K

R4-1T 24K

4X

3RB-1Q 20 18

REF-1D

DIS 10

8X X4

9 X3

8 X2

6 X1

ZERO ADJ 1K

MCC(PRE)

14 PRE

11 NSW T1

13 PSW T2

-30V

10X -30V

MCC(DR)

29 DR

28 CFB

DR INVERT AND MONITOR IR COMP

+30V

21

10K

26

4RB -1S 13 17 (GRAB OPENED)- (CLOSE)

'MAX NEG TRIM'

32X

SP1-1T 32 1K

30X

1RB-1J 17 13

'MAX POS TRIM' GRAB OPENED)- (HOLD)

SP2-1T 1K

27 30 27X

3RB-1Q 16 13 MCC(SR) (≃12V) 17

19X 30X 3X

T1

T2

MAXNEG 10K

MAX POS 10K

NREF

PREF

30 5X 3

SLOW 20K 5

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS MCC (SYS)

TF 16 MFC (DM22) TF

+20V 22.1K FEA 18

56K 13X

39K 16X

22K 17X

12

+20V COM -20V

31 15 2

56.2K

56.2K

SFB SHAPING

15K

ERR

11X 9X 12X 6X 18X 28X

MCC(SFB)

MCC(TR)

TQP-1C

20 TR

29 ATR

MCC(LT2)

19 LT2

T1 T3 OA1-1 T6

10K 12.1K TRX 28 MCC(DM8) RJ

T7

UTP2 6

T2

+20V

13

LC HC

OR

T6 T7 T2 T3

AND

R CFB

30CFB

27

ATR(+) AND CFB(+)

14 REL

12

ATR(-) AND CFB(-)

10

3 PRE

5 DP2

8 UTP1

PRE(-4V) OR DP2(+20V)

MCC(DP2)

330Ω ILR 9

BR 18

OA1-2

PEF DELAY 25K

T1 IMF TBR

3.92K T17

17 -30V

+20V COM -20V

31 15 2

22

-30V

R31-1T 31X 3K92 +20V 31

4RA -1S 5 6

SP3-1T 25 25X 5K 22 'SET CLOSE GRAB CURRENT LIMIT'

MCC (DM1) (ILA)

3 3 9 6

3 5

A BPR B 15K

3 4

7 4 1

3 6 3 7 3 8

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE |
|---|---|---|
| | NGM | 16/12/82 |
| | A | TECHN. |
| | 10/12/84 | ENG. NGM |
| | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 1

REFERENCE & TORQUE PROVING PCB's

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 350900 | 902M128AY | 1F |

IDENT

| DR | SH |
|---|---|
| 1 | E |

DR 1 SH E CONTD. 1F ELEMENTARY DIAGRAM 902M128AY

Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

DR 1 | SH F | CONTD. 1G | ELEMENTARY DIAGRAM 902M128AY

REF-1D

0·001 µF

22K1

27X

22K1

R

CFB

OA2

26X

10K

S

5

TO DRIVE No 2 (1Q30X)
LINE 1Q23

R7-1U
20K
7
7X

8
10K
HPC-1A
9
10K
0·001µF
11

R10-1U
20K
10
10X

12

OA3

10

20K

R9-1U
20K
9
9X

SP8
2 25
HOIST No 1

CFB
HOIST No 2

R5-1U
20K
5
5X

11
10K
LPC-1B
12
10K
0·001µF
14

OA4

9

13

20K

MCC
(DM5)

AVERAGED ARMATURE
CURRENT SIGNAL TO
FIELD PROGRAMME PCB'S

1G05

+20V
12
R12-1U
4K75
12X

24
3RC-1Q
26

SP5-1U
10K
'SET
GRABBING
FIELD
WEAKENING'
16
17
16X

D13-1U
13
13X

MFC(WFR)

SP7
2 24
HOIST No 1

2 24
SP7
HOIST No 2

MFC
(WFR)

MCC(DP1)

D23-1T
23
23X

5
6

TO DRIVE No 2 (1S11)
LINE 1R24
DIAGNOSTIC INTERLOCKING
REPLY

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 5.5.84 |
|---|---|---|
| | | TECHN. |
| | | ENG. |
| | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED
DRIVES OPERATION,
BRIGHTON, ENGLAND.

HOIST MOTION No 1

CURRENT DROOP & COMMON CURRENT AV. CCT.

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 3509.00 | 902M128AY | 1G | 1 | F |

Disclaimer Statement The trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

MCC(CEMF)

5 DFDR

[1F21] CURRENT FEEDBACK (AVERAGE)

HPC-1A

25 CEMF

26 FDR

17 CFB

23

DIRECTION SENSING

KL 28

KH 27

30

LV 29

47.5K

47.5K

47.5K

.47MF

MFH

10K

OA1-2

VOLTAGE PROGRAMMING

10K

2MF

10K

10K

K-212

274K

MFL 10K

148K

SFC 21

MFC(SFC)

-20V

SFA

-1.4V

20K

47.5K

18K

27K

18K

182K

-20V

HB

HB 10K

33.2K

CURRENT PROGRAMMING

OA3-1

CRM 13

R CRM

221K

68.1K

1MF

.15M

DMAC 3

5 DMAC

LI 14

475K

20K

47.5K

332K

681K

274K

5

6

24CFB

10K

OA2-1

22 CFB

OA2-2

+20V COM -20V

31 15 2

LPC-1B

19

18CEMF

17 FDR

47.5K

47.5K

.47MF

OA1-1

47.5K

681K

LV 25

681K

OA1-2

2.21K

24

2.21K

21

VOLTAGE PROGRAMMING

2.21K

18

2.21K

30

11MF

22 KL

27K

20 2CFB

47.5K

OA2-1

20K

-20V

LB2 20K

LB2

22.1K

SL1 10K

2.74K

26

1M

LI 6

1.5-10K

27K

OA3-1

20K

OA4-2

2.21K

8

RED JUMPER

47.5K

.1MF

-20V

47.5K

SL2 10K

7

2.21K

CURRENT PROGRAMMING

LB3 20K

LB3

2.74K

10

2.21K

3

1.5-10K

4MF

27K

OA3-2

20K

1M

LCP

47.5K

.1MF

10K

DMAC29

SL3 10K

82.5K

FDR 28

R FDR

T2

2.74K

LR 27

MCC(LR)

+20V COM -20V

31 15 2

23

5

ALLENWEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 5.5.84 | TECHN. | ENG. | APPD.

HOIST MOTION NO 1

COMMON HOIST & LOWER FIELD PROGRAMME

GO NUMBER 350900 | ELEMENTARY DIAGRAM 902M128AY | CONTD. 1H | IDENT | DR 1 | SH 6

Disclaimer Statement The GE trade mark is the trade mark of General Electric Company of U.S.A., which is not connected with the English Company of a similar name.

CRANES - MOTOR FIRED PROGRAMME

| A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPC | LPC | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | | 3LLR | | 4LLR | ICC | 2CC | | |
| 193W 547 AAG01 | 193W 548 AAG01 | 193W 545 AAG01 | 193W 546 ABG01 | 193W 277 AAG02 | | 193W 543 AAG04 | | 193W 279 AAG03 | | 193W 265 AAG04 | | 193W 279 AAG03 | | 193W 279 AAG03 | | 193W 279 AAG03 | 909W 317 ABG08 | 909W 317 ABG05 | | |
| HOIST PROGRAM | LOWER PROGRAM | TORQUE PROVE | REFER-ENCE | SIG LEV DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | SELECT COMP | SELECT COMP | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

SYMBOLS:

● TEST POST  ⊘ POT ADJUSTMENT  ⌘ INDICATING LIGHT

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

CARD RACK WIRE JUMPER TABLE.

| | | | |
|---|---|---|---|
| RTB(COM) - 1G15 | 5TB(DMC) - 1A3. | 4TB5 - 1S21 | 1U22 - 1U27X |
| RTB(+20) - 1G31 | SP1 - 1J21 | SP36 - 1E9 | 1U30 - 1N17 |
| RTB(-20) - 1G2 | SP2 - MTBB(TS1) | SP37 - 1S25 | 1U27 - 1U32X |
| RTB(CFB) - 1C30 | SP3 - 1G17 | SP38 - 1Q25 | 1U32 - 1N8 |
| RTB(-30) - 1L5. | SP4 - 1Q30 | SP39 - 1J11 | 1Q5 - 1N26 |
| MCC(SFB) - 1D12X | SP5 - 1Q28 | SP40 - 1J25 | 1N24 - 1N16 |
| MCC(TR) - 1C20 | SP6 - 1D19X | SP41 - 1N11 | 1N13 - 1N6 |
| MCC(SR) - 1Q13 | SP7 - MFC(WFR) | SP42 - 1N21 | 1N5 - 1T4 |
| MCC(SYS) - 1D23 | SP8 - 1U9 | SP43 - 1N25 | 1N5 - 1D19X |
| MCC(DR) - 1D29 | 3TB1 - 1G12 | SP44 - 1Q11 | 1G12 - 1Q21 |
| MCC(CEMF) - 1E11 | 3TB2 - 1L10 | SP45 - MCC(+30) | 1E11 - 1E22 |
| MCC(DM8) - 1C28 | 3TB3 - | 2TB3 - MTBB(OL2) | 1G17 - 1G25X |
| MCC(LT2) - 1C19 | 3TB4 - 1C17 | 1U2X - 1J5 | 1G3X - 1E28 |
| MCC(DP2) - 1C5 | 3TB5 - 1G18 | 1U31X - 1J24 | 1G3X - 1L9 |
| MCC(PRE) - 1D14 | 3TB6 - | 1J6 - 1J26 | 1E27 - 1L11 |
| MFC(DM22) - 1D16 | 3TB7 - 1L3X | 1J26 - 1Q6 | 1L11 - 1L10 |
| RTB(FDR) - 1B28 | 3TB8 - | 1Q6 - 1U4 | 1E3 - 1L5X |
| MCC(LR) - 1B27 | 4TB1 - 1A3 | 1U4X - 1U19 | 1G27X - 1E6 |
| MFC(SFC) - 1A21 | 4TB2 - 1D11 | 1U22X - 1Q8 | 1E8 - 1S11 |
| RTB(CRM) - 1A13. | 4TB3 - 1D13 | 1U19X - 1U25 | 1T4X - 1Q20 |
| 5TB(DFDR) - 1B17 | 4TB4 - 1G5X | 1U25X - 1N27 | 1D30 - 1S17 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 22/12/82 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLEN WEST
Stapler
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO. 1

MDR LAYOUT & WIRE JUMPER TABLE

GO NUMBER 350.900 | ELEMENTARY DIAGRAM 902M128AY | CONTD. 1J

IDENT | DR 1 | SH H

DR 1 | SH H | CONTD. 1J | ELEMENTARY DIAGRAM 902M128AY

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## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1S17 – 1T30X | 1T12X – MCC(DM8) | BUS PINS 3,14,23 1N – 1S | BUS PINS 2 1A – 1G | |
| 1T30X – 1T32 | 1U9X – 1U10X | RTB(COM) – 1J23 | BUS PINS 15 1A-1J, 1N-1U | |
| 1D5X – 1J13 | 1U9X – 1U7 | 1J23 – 1J14 | BUS PINS 31 1A – 1G | |
| 1J13 – 1T27 | 1U10X – 1A11 | 1J14 – 1J3 | 1G02 – 1T02 | |
| 1T27 – 1T30 | 1U5 – 1U7X | 1J3 – 1L1 | 1T02 – 1U02 | |
| 1J17 – 1Q16 | 1U7X – 1A10 | 1L1 – 1L4 | 1J15 – 1N15 | |
| 1Q16 – 1S13 | 1U5X – 1B14 | 1L4 – 1L13 | 1G31 – 1T31 | |
| 1S13 – 1T27X | 1B9 – 1B11 | 1L13 – 1L23 | 1T31 – 1U31 | |
| 1T27X – 1T32X | 1B11 – 1A17 | 1L23 – 1N23 | | |
| 1D14 – 1C3 | 1A17 – 1A24 | 1Q15 – 1Q17 | | |
| 1L5 – 1D10X | 1A24 – MCC(DM5) | 1Q17 – 1Q18 | | |
| 1D12X – 1D9X | 1U31 – 1U12 | 1T15 – 1T9 | | |
| 1T31X – 1S5 | 1U12X – 1Q24 | 1T9 – 1T16 | | |
| 1S6 – 1T25 | 1Q26 – 1U16 | 1T16 – 1T19X | | |
| MCC(DM1) – 1C9 | 1U17 – 1U13 | 1U15 – 1U16X | | |
| 1C9 – 1T22 | 1U13X – MCC(WFR) | 1U16X – 1U30X | | |
| 1T22 – 1T25X | 1E22 – 1B16 | | | |
| 1C17 – 1D10X | 1B16 – 1A25 | | | |
| 1C30 – 1D27X | 1B17 – 1A26 | | | |
| 1D27X – 1U10 | 1A22 – 1B20 | | | |
| 1D26X – 1T14X | 1B22 – 1A28 | | | |
| 1T14X – 1T7 | 1A29 – 1B25 | | | |
| 1T7 – 1T5 | 1A3 – 1B29 | | | |
| 1T5X – 1T19 | 1A14 – 1B6 | | | |
| 1T22X – 1T12 | | | | |
| 1T12 – MCC(DM4) | | | | |
| 1T7X – 1T16X | | | | |
| 1T17 – 1S26 | | | | |
| 1T14 – 1T9X | | | | |
| 1T11X – 1S19 | | | | |
| 1S20 – 1S27 | | | | |
| 1S24 – 1T10 | MCC DP1 – 1T23 | | | |
| 1T10 – MCC(DM3) | 1T23X – 5/B6 | | | |
| 1T10X – 1T12X | | | | |

INCOMPLETE

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE |
|---|---|---|
| | | TECHN. |
| | | ENG. NGM |
| | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No 1
MDR WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 1K | | 1 | J |

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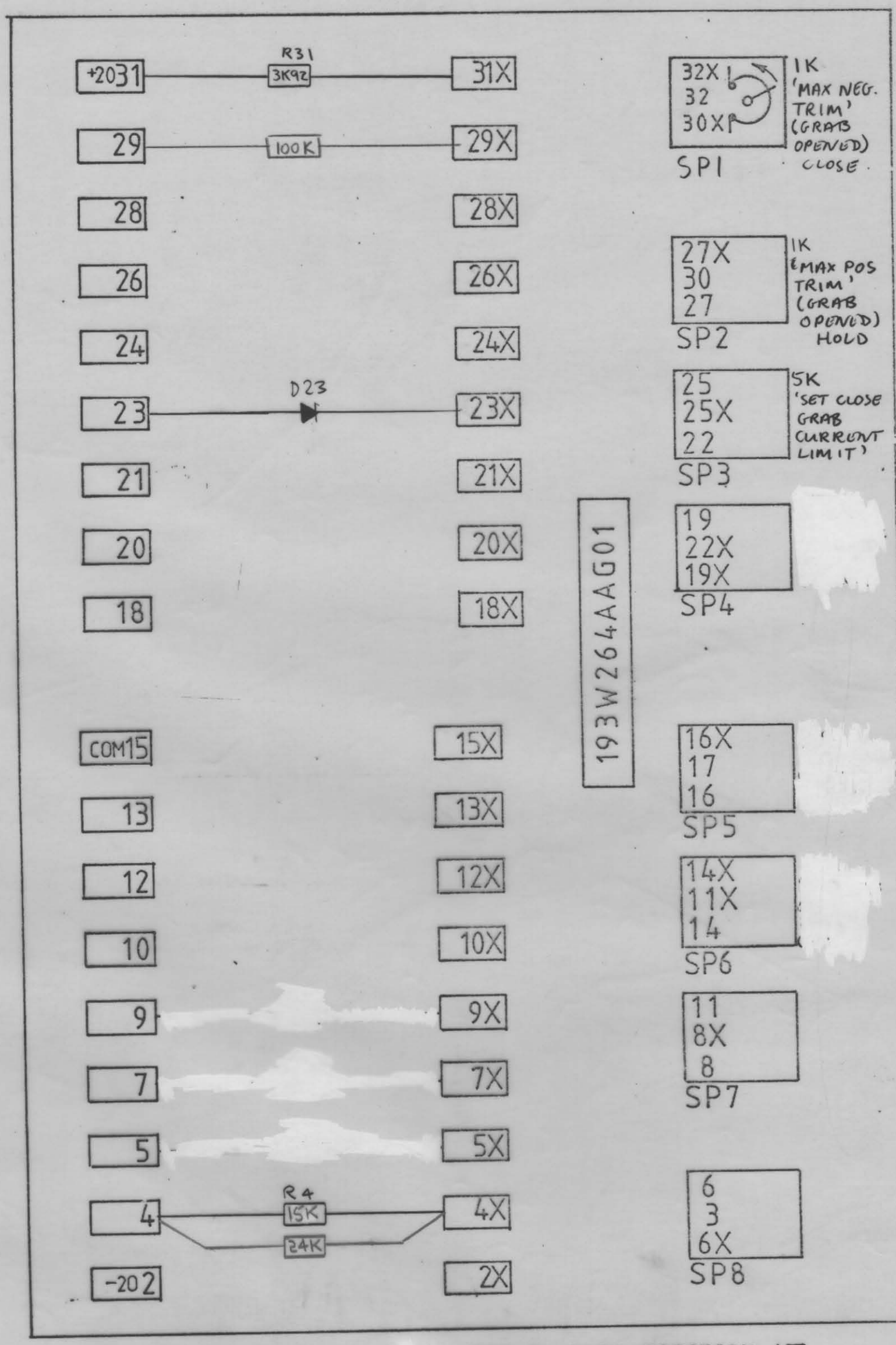


CARD PART NO. 909W317ABG 39 FIT IN RACK POSITION IT

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | NGM | | | 5 5 84 |
| | | | 4 | | 10/12/84 | TECHN. / ENG. / APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 1

COMPONENT CARD ICC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 1L | | 1 | K |

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+20 31 — R31 1K — 31X

29 — 29X

28 — 28X

26 — 26X

24 — 24X

23 — 23X

21 — 21X

20 — 20X

18 — 18X

193W264AAG01

32X
32
30X
500R 'SET NOTCH 1 SPEED'
SP1

27X
30
27
500R 'SET NOTCH 2 SPEED'
SP2

25
25X
22
500R 'SET NOTCH 3 SPEED'
SP3

19
22X
19X
500R 'SET NOTCH 4 SPEED'
SP4

COM 15 — 15X

13 — D13 — 13X

12 — R12 4K75 — 12X

10 — R10 20K — 10X

9 — R9 20K — 9X

7 — R7 20K — 7X

5 — R5 20K — 5X

4 — R4 562R — 4X

-20 2 — R2 1K — 2X

16X
17
16
10K 'SET GRABBING FIELD WEAKENING'
SP5

14X
11X
14
SP6

11
8X
8
SP7

6
3
6X
SP8

CARD PART NO. 909W317ABG40 FIT IN RACK POSITION 1U

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | NGM | | | 5.5.84 |
| | | | 4 | | | TECHN. |
| | | | 10/12/84 | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO1

COMPONENT CARD 2CC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 1M | | 1 | L |

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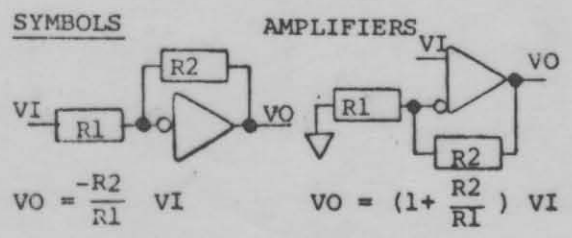
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

SYMBOLS

AMPLIFIERS




CASE GROUND

VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G13 (4) G256 | | IFC | MFC OR MFE |
| MAX AMPS .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD * |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 220%DRV CL | X | MCC | 82KS FROM DCX TO DCL |
| FUSELESS | | ACC | CFY - CFX |
| REF. JUNCTION | X | MCC | RJ - DM8 |
| MOD.REG.CL | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊣⊢ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF - DM22 |
| INH.CROSSOVER | X | MFC | CMA - COM |
| INH. FIELD LOSS | X | MFC | FF - COM * |

NOTE *
THIS MFC NOT USED FOR FIELD CONTROL. AC SUPPLY FUSES (1FU, 2FU, 3FU) REMOVED.

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5 5 84 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND

HOIST MOTION Nº2

FUNCTION JUMPER CHART

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | IN | 1 | M |

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902HM100FE

CRANES

DR 1 | SH N | CONTD. 1P | ELEMENTARY DIAGRAM 902M128AY

SP44 4 14

RUN PERMISSIVE

TDR-1G

13 14 12 15K 56K 56K 22K 10K 0·47 µF TIA REF +20V COM TMA LCA LTA FTA FSA +20V DOA TDA PUA RCA 5 3 6 9 11 8 5X 3X 6X 9X 11K 8X RLA -20V

-20V 2 | +20V 15 31 | 1 32

TIME DELAY ON DE-ENERGISATION

3

4 4

IRC-1J 25 23 LLR — GRAB SELECT RELAY 1R14, 1R27

IRB-1J 21 14 LLR — RUN REF. RELAY 1P03, 1P04, 1P04

ZERO CEMF RELAY

SLD-1E

SLA

MCC (CEMF)

23 22 39K 10K 3.9K .47 MF COM TP1 15K TP2 15K HYSTERESIS +20V 31 20 SLA A LEVEL ADJ

1 DCOM 32

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±0·3V

29 25 30 26 28 27 24 18 21

RA-1L 9 11 | RA-1L 10 4 LDR — RUN RELAY 1N14, 1N18 1N21

3 2

BRAKE RELAY

SLD-1E

SLB

HEATSINK THERMAL SWITCHES

2 SP2 15

2 3

12 11 39K 10K 3.9K .47 MF COM TP3 15K TP4 15K HYSTERESIS +20V 31 18 SLB B LEVEL ADJ

1 DCOM 32

INSTRUCTIONS VSD1 211

D/O AT CEMF = ±1·2V

14 13 17

9 3 10 5 8 6

-30V RA-1L 5 3 — 4 1

SP36 4 6

RA-1L 5X 3X — 3 7

2RA-1N 11 3 LLR — CLOSE GRAB CL RELAY 1P22

1S27 [1R22]

1RA-1J 11 3 LLR — GRAB OPENED RELAY (HOLD) 1P01

2 SP1 13

CLOSE CURRENT LIMIT TIMING RELAY

TDR-1G

20 16 17 15K 56K 56K 22K 10K 0·47 MF COM TIB REF 470R +20V COM TMB LCB LTB FTB FSB +20V DOB TDB PUB RCB RLB -20V 24 22 25 28 30 27 24X 22X 25X 28X 30X 27X

-20V 2 | +20V 15 31 | 1 32

TIME DELAY ON ENERGISATION

2 SP3 16

[1R12]

5 4 — LLR 3RA-1L — 1R02 LOAD-SHARE PRE-CONDITION RELAY

1P01, 1Q07

LLR 2RB-1N 21 14 — GRAB OPENED DROOP RELAY (CLOSE)

4 SP35 5

2RC-1N 25 23 — GRAB CLOSED DROOP RELAY (HOLD)

4 SP37 7

1Q07, 1Q12

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | | 2-10-84 |

5 5 84

TECHN.

ENG.

APPD.

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

# HOIST MOTION No. 2

# MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 1P | | 1 | N |

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[B32] (SPEED REF)

15K

4

R4-1P 24K

4K

20

IRB-1J 18

REF-1D

DIS 10

8X X4

9 X3

8 X2

6 X1

ZERO ADJ 1K

19X 30X 5X

T1

T2

MAXNEG 10K

MAXPOS 10K

50 NREF

PREF

5X 3

SLOW 20K 5

2RB-1N 13 17 (GRAB OPENED) (CLOSE)

'MAX NEG TRIM'

32X SP1-1P 32 1K 30X

IRA-1J 5 8

'MAX POS TRIM' (GRAB OPENED) (HOLD)

SP2-1P 1K

27 30 27X

IRB-1J 16 13 MCC(SR) (≃12V)

17

MCC(PRE)

14 PRE

MONITOR PRECONDITION

COMPARE

LATCH

TRACKING ERROR OR OVERVOLTAGE

23 SYS MCC(SYS)

TF 16 MFC(DM22) TF

11 NSW T1

13 PSW T2

10X -30V

-30V

MCC(DR)

29 DR

DR INVERT AND MONITOR IR COMP

28 CFB

21 10K

26 11X 9X 12X 6X 18X 28X

56.2K

56.2K

SFB SHAPING

4.75K

15K ERR

+20V 22K FEA 18

33K 13X

39K 16X

22K 17X

12

+20V COM -20V

31 15 2

+30V 15

MCC(SFB)

MCC(TR)

TQP-1C

20 TR

29 ATR

MCC(LT2)

13 LT2

T1 T2 T3 TG

OAI-1

10K

12.1K

TRX 28

MCC(DMB) RJ

T7

UTP2 6

+20V

LC HC

OR

AND

ATR(+) AND CFB(+)

ATR(-) AND CFB(-)

30CFB

27

14 REL

12

10

R CFB

3 PRE

5 DP2

8 UTP1

PRE (-4V) OR DP2(+20V)

MCC(DP2)

330Ω ILR 9

BR 18

OAI-2

PEF DELAY 25K

T1 IMF

TBR

8.92K T17

17 -30V

-30V

+20V COM -20V

31 15 2

22

3K42 R31-1P 31X +20V

2RA-1N 5 6

SP3-1P 5K 25X 65 22

'SET CLOSE GRAB CURRENT LIMIT'

MCC(DM1) (ILA)

BPR A B 15K

3 3 9 6 3 5 3 4

7 4 1 1

3 6 3 7 3 8

DR 1 SH P CONTD. 1Q

ELEMENTARY DIAGRAM 902M128AY

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 16/12/82 |
| | | | 4 | | | 10/12/84 |

TECHN.

ENG. NGM

APPD.

ALLEN WEST

Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 2

REFERENCE & TORQUE PROVING PCB's

| CO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 350900 | 902M128AY | 1Q |

IDENT

DR 1 SH P

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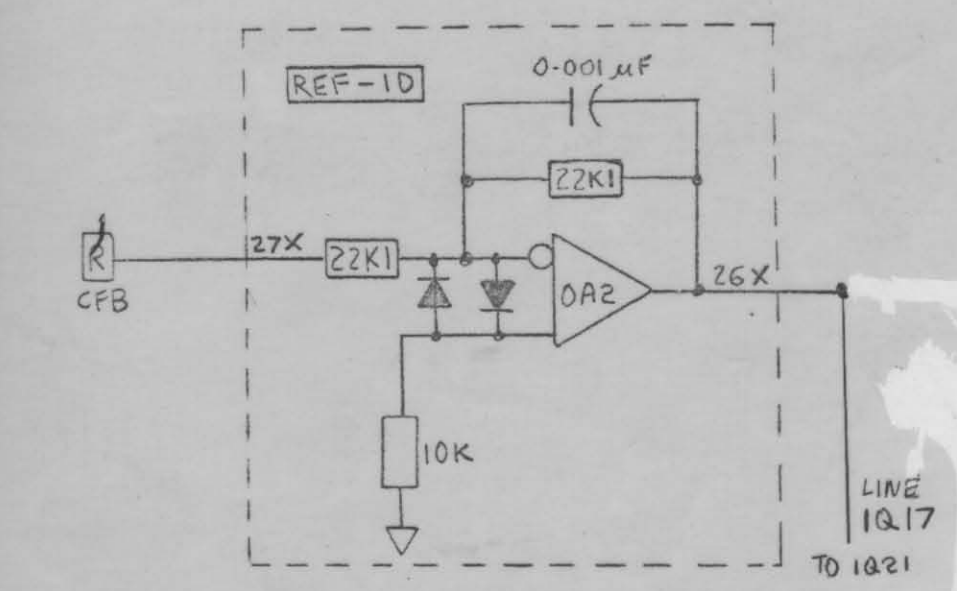


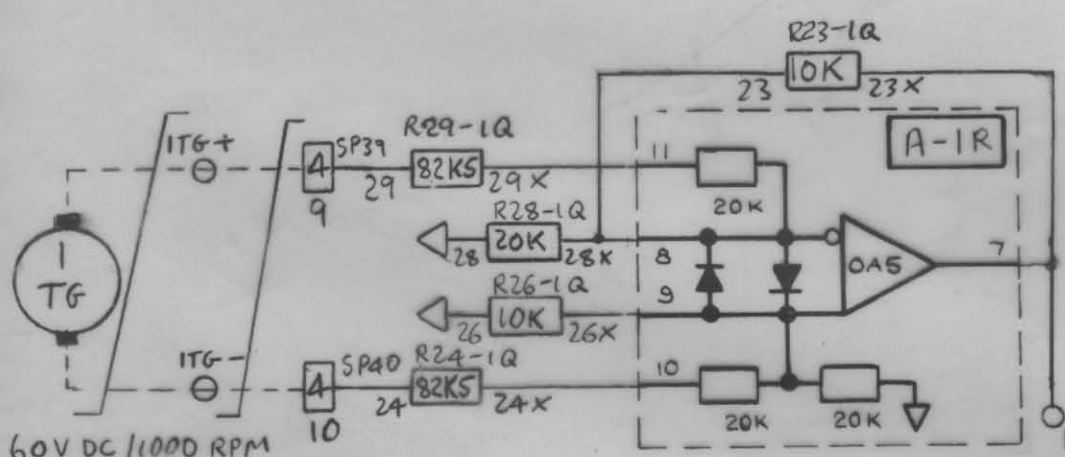


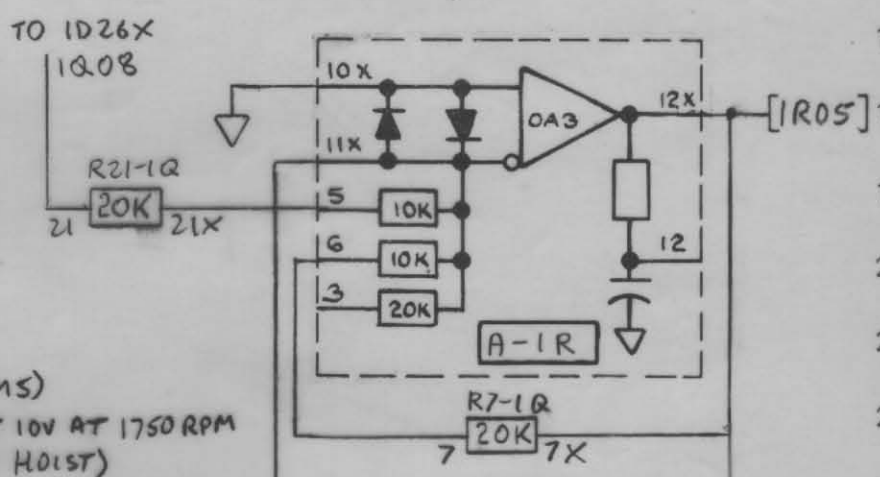


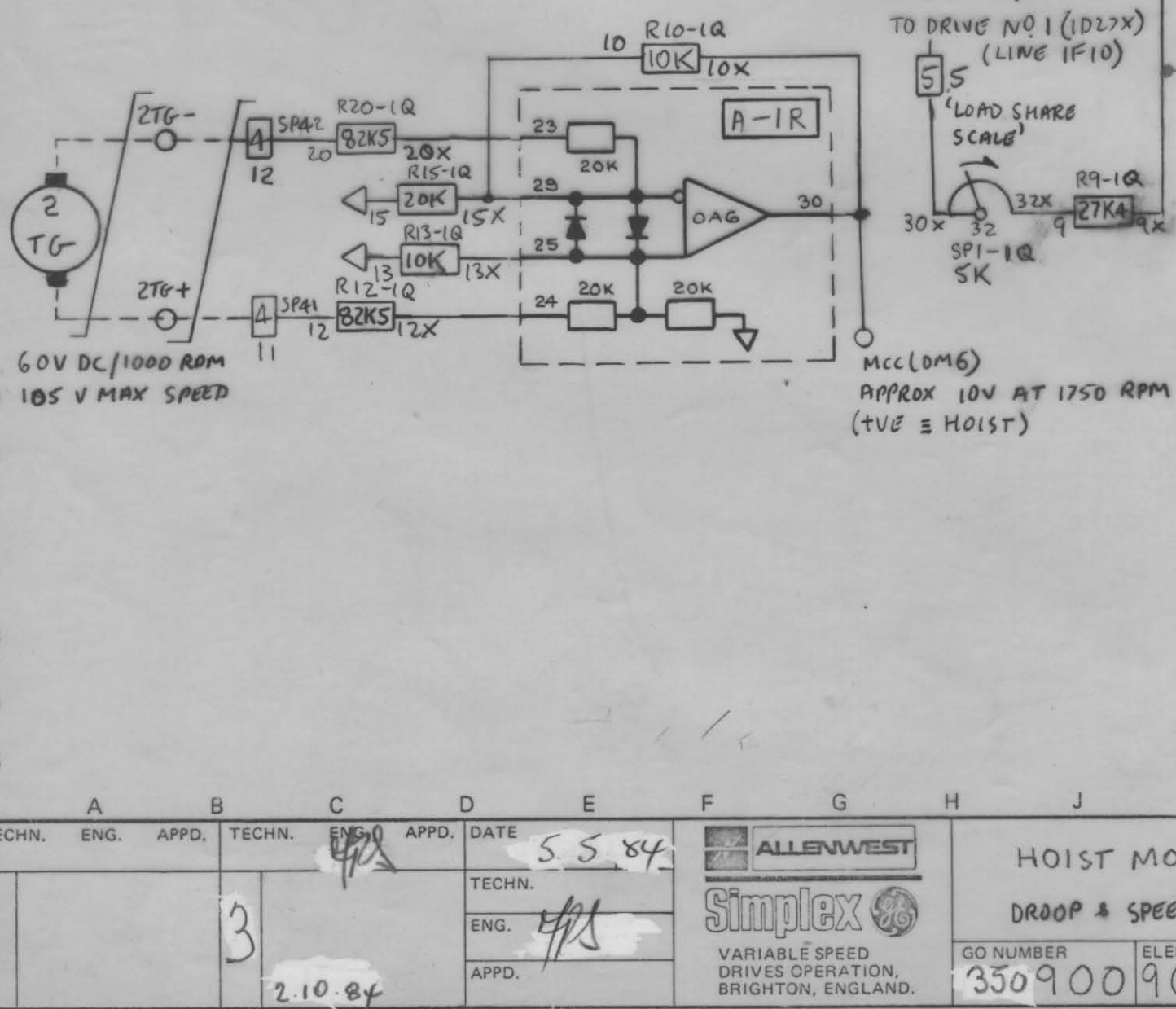





| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | | 5.5.84 |
| | | | | | | 2.10.84 |

TECHN.
ENG.
APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 2

DROOP & SPEED CORRECTION CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 1R | | 1 | Q |

R29-1P 1K 29 29X
3RA-1U 5 8
IRC-1U 29
R18-1P 61K9 18 18X
30 10 182K 10X 28
A-1R
17X 10K
R13-1P
[1Q18] 22K 13 13X
18X 10K
19X 21X
20X
0A1
20K
+20V
23 R23-1P 8K25 23X
21 R21-1P 100K 21X
25X 22X
RLB-1G
24X 20 3RB-1U 18
25X
24X
+20
1LIM+
1LIM-
SET 1LIM+ & 1LIM- TO 4VOLTS AT MCC(DM7)
CURRENT ERROR TRIP RELAY (CARGO) - LINKED OUT
SLD-1S
SLA
TP1 15K
TP2 15K
HYSTERESIS
+20V 31
20
23 39K 3.9K 22
.47 MF
COM
A LEVEL ADJ.
SLA
29 35 30
26 28 27
[1A14] DRIVE 1
1 D COM
32
INSTRUCTIONS VSD1 211
24 18 21
P.U. AT CFB ±0.3V
10μF 15 C26 15X
9 2RA IN
FROM DRIVE NO 1 PIN 1T23X LINE 1F32
5 6
DIAGNOSTIC INTERLOCKING RELAY
SLD-1S
SLB
TP3 15K
TP4 15K
HYSTERESIS
+20V 31
18
12 39K 3.9K 11
10K .47 MF
COM
B LEVEL ADJ.
SLB
9 3 10
5 8 6
1 D COM
32
INSTRUCTIONS VSD1 211
14 13 17
SET B LEVEL FCW
MCC(DPI) 24
D24-1P 24X
SP43 4 13
2 4
2 2A SP7 MFC(WFR)
2 25 SP8 R CFB
22X 23X 0A4 22
28 10K 27 10K 26 20K
9X
R20 1P 101K 20X 20
30 28 IRC 1J
100K R22 1T 29X
4 5 4 5
MCC DM RJ
DRIVE NO 1 GRABBING ONLY
MCC(DM7)
5 R5-1Q 1K 5X
SP2-1Q 10K 'SET LOAD SHARE PROPORTION' 27X 30 27
R4-1Q 100K 4 4X
MCC(DM8) RJ
24 IRC-1J 26
SP3-1Q 50K 'SET LOAD SHARE GRABBING' (FCW) 25 25X
19 10
2RB-IN 22 20 12 IRA-1S
2X WIRE LINK 1Q 2
IN11 [IN24]
LLR 3RB-1U 21 14

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| TECHN. | ENG. NGM | APPD. | TECHN. | ENG. | APPD. | DATE 5.5.84 | |
| 4 | 10/12/84 | | 3 | 25.5.84 | | TECHN. | |
| | | | | | | ENG. NGM | |
| | | | | | | APPD. | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO 2
SPEED ERROR & CORRECTION CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. |
|---|---|---|
| 350900 | 902M128AY | 1S |

IDENT

| DR | SH |
|---|---|
| 1 | R |

DR 1 SH R CONTD. 1S ELEMENTARY DIAGRAM 902M128AY

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CRANES – NO MOTOR FIELD PROGRAMME

| | TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | ICC | 2CC | A | 2SLD | | 3LLR | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 193W 545 AAG01 | 193W 546 ABG01 | 193W 277 AAG02 | | 193W 543 AAG01 | | 193W 279 AAG03 | | 193W 265 AAG07 | | 193W 279 AAG03 | 909W 317 ABG08 | 909W 317 ABG06 | 193W 256 AAG01 | 193W 277 AAG02 | | 193W 279 AAG03 | | |
| | TORQUE PROVE | REFER-ENCE | SIG. LEV. DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOGIC RELAY | | LOW LEVEL RELAY | SELECT COMP | SELECT COMP | AMPLI-FIER | SIG. LEV. DET. | | LOW LEVEL RELAY | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATALOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

SYMBOLS:

TEST POST — POT ADJUSTMENT — INDICATING LIGHT

| | |
|---|---|
| 32 | 64 |
| 31 | 63 |
| 30 | 62 |
| 29 | 61 |
| 28 | 60 |
| 27 | 59 |
| 26 | 58 |
| 25 | 57 |
| 24 | 56 |
| 23 | 55 |
| 22 | 54 |
| 21 | 53 |
| 20 | 52 |
| 19 | 51 |
| 18 | 50 |
| 17 | 49 |
| 16 | 48 |
| 15 | 47 |
| 14 | 46 |
| 13 | 45 |
| 12 | 44 |
| 11 | 43 |
| 10 | 42 |
| 9 | 41 |
| 8 | 40 |
| 7 | 39 |
| 6 | 38 |
| 5 | 37 |
| 4 | 36 |
| 3 | 35 |
| 2 | 34 |
| 1 | 33 |

| | |
|---|---|
| 32 | 32X |
| 31 | 31X |
| 30 | 30X |
| 29 | 29X |
| 28 | 28X |
| 27 | 27X |
| 26 | 26X |
| 25 | 25X |
| 24 | 24X |
| 23 | 23X |
| 22 | 22X |
| 21 | 21X |
| 20 | 20X |
| 19 | 19X |
| 18 | 18X |
| 17 | 17X |
| 16 | 16X |
| 15 | 15X |
| 14 | 14X |
| 13 | 13X |
| 12 | 12X |
| 11 | 11X |
| 10 | 10X |
| 9 | 9X |
| 8 | 8X |
| 7 | 7X |
| 6 | 6X |
| 5 | 5X |
| 4 | 4X |
| 3 | 3X |
| 2 | 2X |
| 1 | 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(COM) – 1G15 | SP6 – 1D19X | SP41 – 1Q12 | 1D5X – 1J5 |
| RTB(+20) – 1G31 | SP7 – MFC(WFR) | SP42 – 1Q20 | 1P30X – 1P32 |
| RTB(-20) – 1G2 | SP8 – 1D27X | SP43 – 1S27 | 1J5 – 1P27 |
| RTB(CFB) – 1C30 | 3TB1 – 1G12 | SP44 – 1J25 | 1P27 – 1P30 |
| RTB(-30) – 1L5 | 3TB2 – 1L10 | SP45 – MCC(+30) | 1J16 – 1J8 |
| MCC(SFB) – 1D12X | 3TB3 – | 2TB3 – MTBB(OL2) | 1J8 – 1N13 |
| MCC(TR) – 1C20 | 3TB4 – 1C17 | | 1N13 – 1P27X |
| MCC(SR) – 1J13 | 3TB5 – 1C18 | 1G12 – 1J21 | 1P27X – 1P32X |
| MCC(SYS) – 1D23 | 3TB6 – | 1E11 – 1E22 | 1D14 – 1C3 |
| MCC(DR) – 1D29 | 3TB7 – 1L3X | 1G17 – 1G25X | 1L5 – 1D10X |
| MCC(EMI) – 1E11 | 3TB8 – | 1G27X – 1E6 | 1D12X – 1D9X |
| MCC(DM8) – 1C28 | 4TB1 – 1L3 | 1E8 – 1N11 | 1P31X – 1N5 |
| MCC(LT2) – 1C19 | 4TB2 – 1D11 | 1E28 – 1G3X | 1N6 – 1P25 |
| MCC(DP2) – 1C5 | 4TB3 – 1D13 | 1G3X – 1L9 | MCC(DM1) – 1C9 |
| MCC(PRE) – 1D14 | 4TB4 – 1G5X | 1E27 – 1L11 | 1C9 – 1P22 |
| MFC(DM22) – 1D16 | 4TB5 – 1N21 | 1L11 – 1L10 | 1P22 – 1P25X |
| SP1 – 1J11 | SP36 – 1E9 | 1E3 – 1L5X | 1C17 – 1D10X |
| SP2 – MTBB(TS1) | SP37 – 1N25 | 1D19X – 1P4 | 1C30 – 1D27X |
| SP3 – 1G17 | SP38 – | 1P4X – 1J20 | 1D26X – 1P14X × |
| SP4 – | SP39 – 1Q29 | 1D30 – 1N17 | 1P14X – 1P7 × |
| SP5 – | SP40 – 1Q24 | 1N17 – 1P30X | 1P7 – 1P5 × |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | | NGM | | 22/12/82 |
| | | | 3 | | | 1/8/83 |

TECHN. ENG. NGM APPD.

ALLEGRO — VARIABLE SPEED DRIVES DIVISION BRIGHTON, ENGLAND

HOIST MOTION No 2

MDR LAYOUT & WIRE JUMPER TABLE

CO NUMBER 233900 | ELEMENTARY DIAGRAM 902M12BAY | CONT. 1T | DR 1 | SH 5

IDENT

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902M128AY 5HT16

| DR | SH | CONTD. | ELEMENTARY DIAGRAM |
|---|---|---|---|
| 1 | T | 1U | 902M128AY |

## CARD RACK WIRE JUMPER TABLE

| | | | | |
|---|---|---|---|---|
| 1P5X – 1P19 | 1Q7X – 1Q18X | RTB(COM) – 1J03 | BUS PINS 2 1C – 1G | |
| 1P22X – 1P12 | 1Q18X – 1R18X | 1J03 – 1J14 | BUS PINS 15 1C – 1J, 1N – 1S | |
| 1P12 – MCC(DM4) | 1R18X – 1R12X | 1J14 – 1J23 | BUS PINS 31 1C – 1G | |
| 1P7X – 1P16X | 1R12X – 1S22 | 1J23 – 1L23 | 1G02 – 1P02 | |
| 1P17 – 1N26 | 1R17X – 1R21X | 1L23 – 1L13 | 1P02 – 1R02 | |
| 1P14 – 1P9X | 1R21X – 1Q5 | 1L13 – 1L04 | 1R02 – 1S02 | |
| 1P11X – 1N19 | 1Q5X – 1Q27X | 1L04 – 1L01 | 1G31 – 1P31 | |
| 1N20 – 1N27 | 1Q30 – 1Q4 | 1L01 – 1N03 | 1P31 – 1R31 | |
| 1N24 – 1P10 | 1Q4 – 1J24 | 1N03 – 1N14 | 1R31 – 1S31 | |
| 1P10 – MCC(DM3) | 1J24 – MCC(DM7) | 1N14 – 1N23 | | |
| 1P10X – 1P12X | 1J26 – 1Q25 | 1J15 – 1J17 | | |
| 1P12X – MCC(DM8) | 1Q25 – 1Q25X | 1J17 – 1J18 | | |
| 1Q29X – 1R11 | 1Q22 – 1Q2X | 1J18 – 1J30 | | |
| 1Q28X – 1Q23 | 1Q4X – 1P10X | 1P15 – 1P19X | | |
| 1Q23 – 1R8 | 1S23 – 1J29 | 1P19X – 1P16 | | |
| 1Q26X – 1R9 | 1S19 – 1S21 | 1P16 – 1P09 | | |
| 1Q24X – 1R10 | 2TB4 – 1S28 | 1Q15 – 1Q02 | | |
| 1Q23X – 1Q21 | 1E19 – 1E21 | 1Q02 – 1Q13 | | |
| 1Q21 – 1R7 | 1E13 – 1E17 | 1Q13 – 1Q26 | | |
| 1R7 – MCC(DM5) | | 1Q26 – 1Q27 | | |
| 1Q21X – 1R5 | | 1Q27 – 1Q28 | | |
| 1Q20X – 1R23 | | 1R15 – 1R10X | | |
| 1Q15X – 1Q10 | | | | |
| 1Q10 – 1R29 | | | | |
| 1Q13X – 1R25 | | | | |
| 1Q12X – 1R24 | | | | |
| 1Q10X – 1Q30X | | | | |
| 1Q30X – 1Q32 | | | | |
| 1Q32 – 1R30 | | | | |
| 1R30 – MCC(DM6) | | | | |
| 1Q32X – 1Q9 | | | | |
| 1Q18 – 1Q9X | | | | |
| 1Q9X – 1R11X | | | | |
| 1R6 – 1Q7 | | | | |

INCOMPLETE

| TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|
| | NGM | | 22/12/82 |
| | | | TECHN. |
| 3 | | | ENG. NGM |
| 1/8/83 | | | APPD. |

ALLEN WEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION No. 2
MDR WIRE JUMPER TABLE

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 233900 | 902M128AY | 1U | 1 | T |

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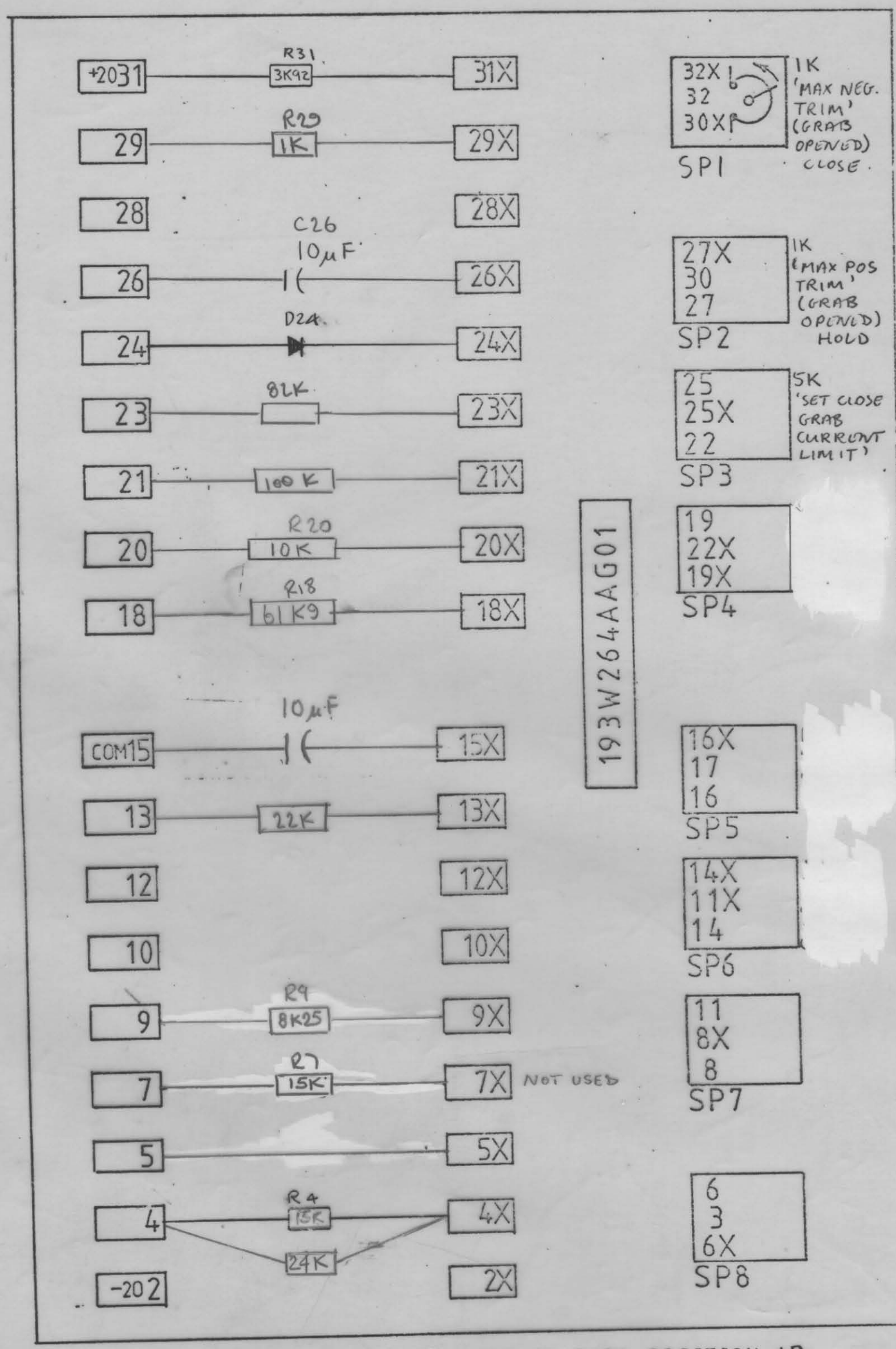



CARD PART NO. 909W317ABG40 FIT IN RACK POSITION 1P

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | 25 5 84 | -5.5.84 |

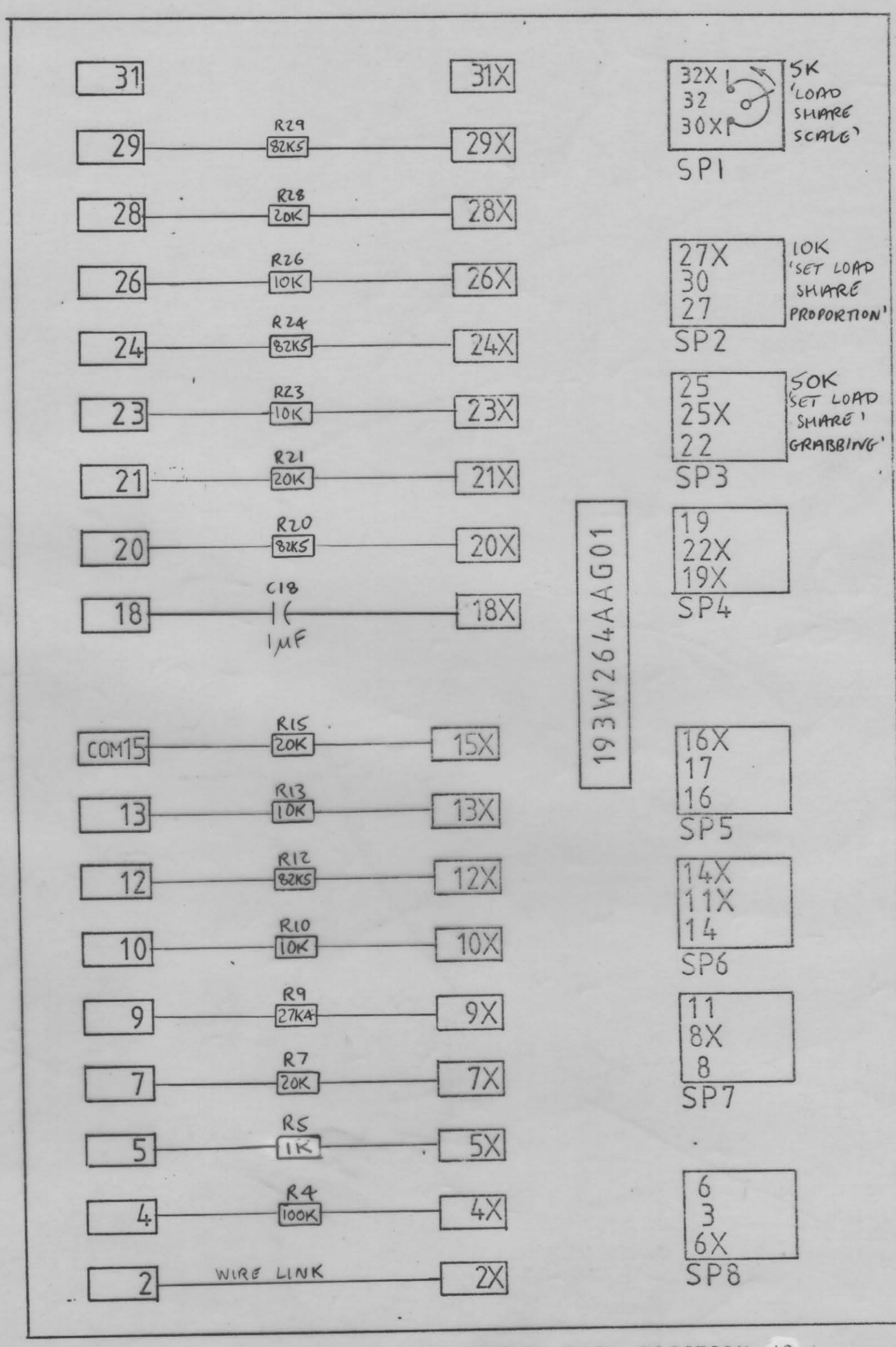
TECHN. 4PS
ENG. NGM
APPD.

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION Nº 2
COMPONENT CARD ICC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 1V | 1 | U |

Simplex is the trade mark of General Electric Company of U.S.A. which is not connected with the Simplex Company of Australia.




CARD PART NO. 909W317ABG4[illegible] FIT IN RACK POSITION 1Q

| TECHN. | ENG. | APPD. | TECHN. | ENG | APPD. | DATE |
|---|---|---|---|---|---|---|
| | | | 3 | | | 5.5.84 |
| | | | | | | TECHN. |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

HOIST MOTION NO.2
COMPONENT CARD 2CC

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 2A | | 1 | V |

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DR 2 | SH A | CONTD. 2B | ELEMENTARY DIAGRAM 902M128AY

| | | | |
|---|---|---|---|
| SP4 | 2 17 | 4RC-1S 24 \| 26 | LLR 4 RC 1S 25 → 23 | FIELD RELAY (585 RPM) |
| SP5 | 2 18 | 4RB-1S 13 \| 16 | LLR 4 RB 1S 21 → 14 | FIELD RELAY (363 RPM) |
| SP7 | 2 24 | 4RA-1S 5 \| 6 | LLR 4 RA 1S 11 → 3 | FIELD RELAY (318 RPM) |
| SP8 | 2 25 | 3RC-1Q 24 \| 26 | LLR 3 RC 1Q 25 → 23 | FIELD RELAY (172 RPM) |
| MAX | 2 5 | 2 6 | | |
| SP39 | 4 9 | | LLR 1 RA 1J 11 → 3 | IN REF. RELAY |
| SP40 | 4 10 | | LLR 1 RC 1J 25 → 23 | OUT REF RELAY |
| SP41 | 4 11 | | LLR 2 RA 1N 11 → 3 | NOTCH 2-5 RELAY |
| SP42 | 4 12 | | LLR 2 RB 1N 21 → 14 | NOTCH 3-5 RELAY |
| SP43 | 4 13 | | LLR 2 RC 1N 25 → 23 | NOTCH 4-5 RELAY |
| SP44 | 4 14 | | LLR 3 RA 1Q 11 → 3 | NOTCH 5 RELAY |
| SP38 | 4 8 | | LLR 1 RB 1J 21 → 14 | SLOWDOWN RELAY |

28

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5 5 84 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. |
| | | | | | | ENG. |
| | | | | | | APPD. |

ALLENWEST Simplex GE
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION
MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2B | 2 | A |

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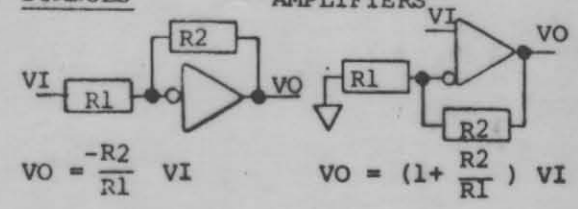
VOLTAGE POLARIES SHOWN ARE FOR MOTORING DA1(+)

HARDWARE ABBREVIATIONS

| | |
|---|---|
| MCC | MAIN CONTROL CARD |
| IFC | INTERFACE CARD |
| PSC | POWER SUPPLY CARD |
| SCR | THYRISTOR ASSEMBLY |
| DGC | DIAGNOSTIC CARD |
| MFC | MOTOR FIELD CONTROL |
| MFE | MOTOR FIELD EXCITER |
| MDR | MODIFICATION RACK |
| ACC | AUXILIARY CONTROL CARD |

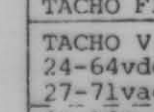
SYMBOLS

AMPLIFIERS




$VO = \frac{-R2}{R1} VI$ $VO = (1+\frac{R2}{R1}) VI$

CASE GROUND




VO = SIGN () X ABSOLUTE VALUE OF VI

STAB ON TERMINAL

□ TERMINAL AT 2TB, 3TB, 4TB, RTB.
EX: 9 [2] - 2TB9; X2 [R] - RTBX2

○ TERMINAL AT T.B.'s

POTENTIOMETER ARROWS ON THE CARD ELEMENTARY DIAGRAMS INDICATE THE WIPER DIRECTION AS THE POTENTIOMETER SHAFT IS ROTATED CLOCKWISE TO INCREASE FUNCTION.

▲ THESE RESISTORS ARE CRIMPED IN WIRE HARNESS.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| 60HZ | | MFC | ZA-ZB (IF USED) |
| 50HZ | X | MCC | HZA - PHA |
| IOC-400% | X | | (NONE) |
| -500% | | IFC | I - IHI |
| -300% | | IFC | I-ILO |
| SR5 - 9v | | | NONE) |
| 9 - 20v | X | MCC | SRH - COM |
| JOGR 10v | | | (NONE) |
| 20V | | MCC | JH - COM |
| LT.3-7sec. | X | | (NONE) |
| 2 - 60sec | | | 332Ω FROM LTI TO COM |
| VREG | X | | NT-CEMF CC-COM |
| DC TACHO | | | (NONE) |
| AC TACHO | | MCC | AT1 - AT2 |
| TACHO FILT | | IFC | TC - TC |
| TACHO V. 24-64vdc | | IFC | NT-NT1 PT - PT1 |
| 27-71vac | | IFC | NT-NT1 PT - PT1 |
| 60-160vdc | | IFC | NT-NT2 PT - PT2 |
| 66-177vac | | IFC | NT-NT2 PT - PT2 |
| 110-300vdc | | IFC | NT-NT3 PT - PT3 |
| 120-300vac | | IFC | NT-NT3 PT - PT3 |
| G134 G256 | | IFC | MFC OR MFE |
| MAX AMPS .8 1.7 | | MF | NONE |
| 1.3 2.8 | | MF | YB - YD |
| 2.4 5.0 | | MF | YA - YB |
| 4.0 8.0 | X | MF | YA-YB, YC-YD |
| 7.0 13 | | MF | YA - YC |
| 13 25 | | MF | YA-YC, YB-YD |
| L/R<.25S | | MFC | QA - QB |
| INH RUN | | DGC | D1-D2 (IF USED) |
| 200%DRV CL | X | MCC | DCX - DCY |
| FUSELESS | | ACC | CFY - CFX |
| REF JUNCTION | X | MCC | RJ - DM8 |
| MOD.REG.CL | X | MCC | ILA - DM1 |

SIGNAL DEFINITIONS AND LOCATIONS

| | | |
|---|---|---|
| * | CEMF | COUNTER EMF ( 16) |
| * | CFB | CURRENT FEEDBACK ( 16) |
| | CMFA | ABSOLUTE VALUE CEMF ( 08) |
| | CRM | CROSSOVER MODIFY ( 11) |
| | DFP | DELAYED FIRING POWER ( 25) |
| * | DR | DRIVER REFERENCE ( 33) |
| * | EAO | ERROR AMP OUTPUT ( 33) |
| | EST | EXTERNAL FLT STOP INPUT ( 14) |
| | FALT | FAULT ( 14) |
| * | FC | FIELD CURRENT (NS26) |
| | FDR | FIELD DIAGNOSTIC REFERENCE ( 08) |
| | FEA | FIELD ECONOMY ADJUST ( 25) |
| | FF | FIELD FAULT ( 28) |
| | IABS | MOTOR CURRENT ABSOLUTE ( 09) |
| | ILA | CURRENT LIMIT ADJUST ( 23) |
| | IMET | CURRENT SIGNAL FOR METER ( 10) |
| * | IPU | INITIAL PULSE ( 20) |
| * | LR | LOCAL REF. FROM DGC ( 33) |
| * | JOG | JOG SWITCH INPUT ( 23) |
| * | JOGR | JOG REFERENCE INPUT ( 31) |
| * | MAC | MAX/MA CONTROL SIGNAL ( 20) |
| | MSW | MODE SWITCH ( 30) |
| * | OSC | OSCILLATOR ( 17) |
| * | PCR | PHASE CONTROL REF. ( 26) |
| * | PRE | DRIVE PRECONDITION ( 21) |
| | ØSEQ | PHASE SEQUENCE ( 14) |
| | RERR | REGULATOR ERROR ( 27) |
| | RIJ | INTEGRATOR SUMMING JUNCTION ( 27) |
| | RJ | REGULATOR SUMMING JUNCTION ( 31) |
| | RRA | REGULATOR RESPONSE ADJUST ( 30) |
| | RSET | RESET ( 16) |
| * | RTR | READY TO RUN ( 16) |
| * | RUN | RUN SWITCH INPUT ( 21) |
| * | SA-C | PHASE SYN OUTPUT ( 16) |
| * | SFB | SPEED FEEDBACK ( 20) |
| | SMET | SPEED SIGNAL FOR METER ( 12) |
| * | SR | SYSTEM REFERENCE INPUT ( 29) |
| * | SYS | SYSTEM FAULT TRIP ( 13) |
| * | TA | OUTPUT FOR TACHO TRIP ADJUST ( 20) |
| | TF | TACHO FAULT (NS28) |
| * | TFB | TACHOMETER FEEDBACK ( 20) |
| | TFR | AC TACHO FREQUENCY OUTPUT ( 13) |
| * | TR | TIMED REFERENCE ( 33) |
| * | VFB | VOLTAGE FEEDBACK ( 19) |
| * | WFR | WEAK FIELD REFERENCE ( 20) |

( * - TEST POINT ON DOOR FRONT)

MAPPING SYSTEM

(NS/PS/TS) PS - PAST SHEET
NS - NEXT SHEET
TS - THIS SHEET

HENCE (PS - 12) DENOTES LOCATION ON PAST SHEET LINE 12. OTHER LOCATIONS ARE DENOTED BY SHEET NUMBER AND LINE? E.G. (1A16) SIGNIFIES LOCATION ON SHEET 1A, LINE 16 ETC.

NOTE: ⊤⊤ FIELD EFFECT TRANSISTOR: THE CLOSED/OPEN (I/O) STATE OF THESE SWITCHED FOR "PRECONDITION" - "RUN" OR JOG" - "DIAGNOSTIC STATIC" - "DIAGNOSTIC RUN" IS SHOWN BY A FOUR DIGIT WORD WITH STATE SEQUENCE.

| FUNCTION | USE | LOC | JUMPERS |
|---|---|---|---|
| OVERVOLTAGE | X | MFC | TF - DM22 |
| INH.CROSSOVER | X | MFC | CMA - COM |
| LINE COMP. | X | MCC | RLA - PCR |
| | | | |

| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 5.5.84 |
|---|---|---|
| | | TECHN. |
| | | ENG. NGM |
| | | APPD. |

ALLENWEST Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION

FUNCTION JUMPER CHART

GO NUMBER 350900 | ELEMENTARY DIAGRAM 902M128AY | CONTD. 2C

IDENT | DR 2 | SH B

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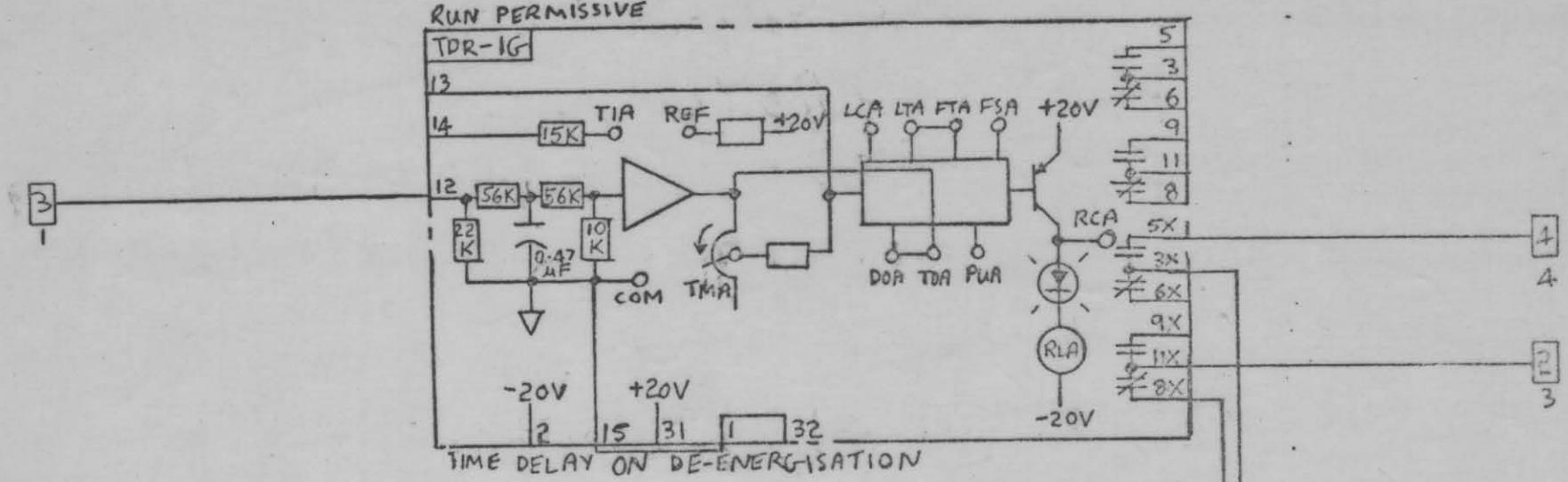
902HM100FE

CRANES

DR 2 | SH C | CONTD. 2D | ELEMENTARY DIAGRAM 902M128AY

RUN PERMISSIVE

TDR-1G

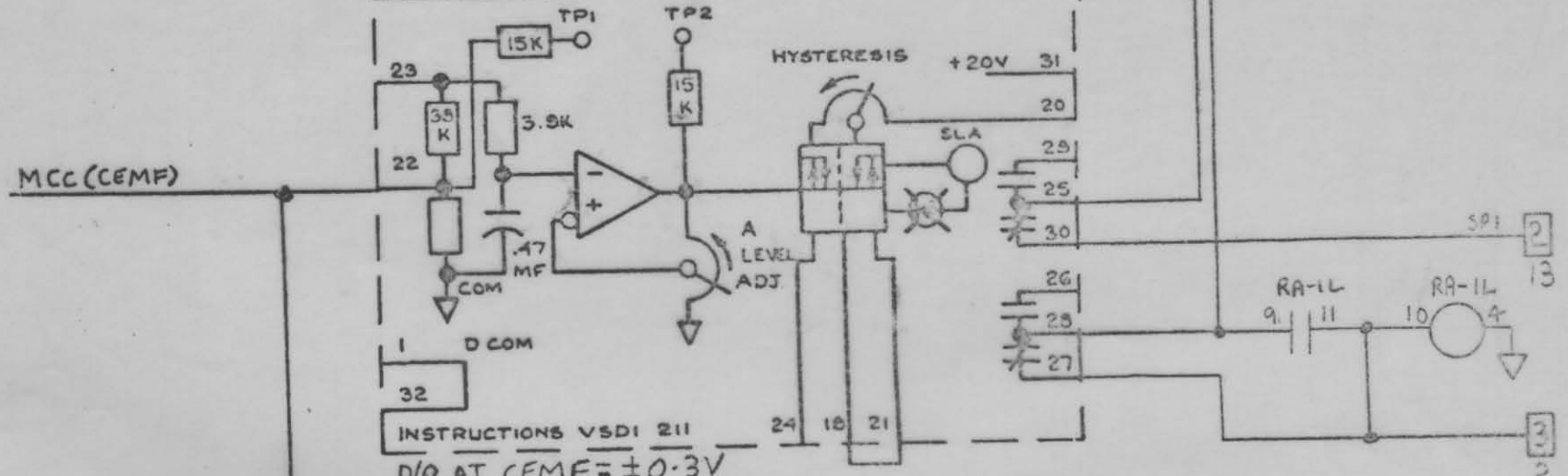



TIME DELAY ON DE-ENERGISATION

ZERO CEMF RELAY

SLD-1E

SLA

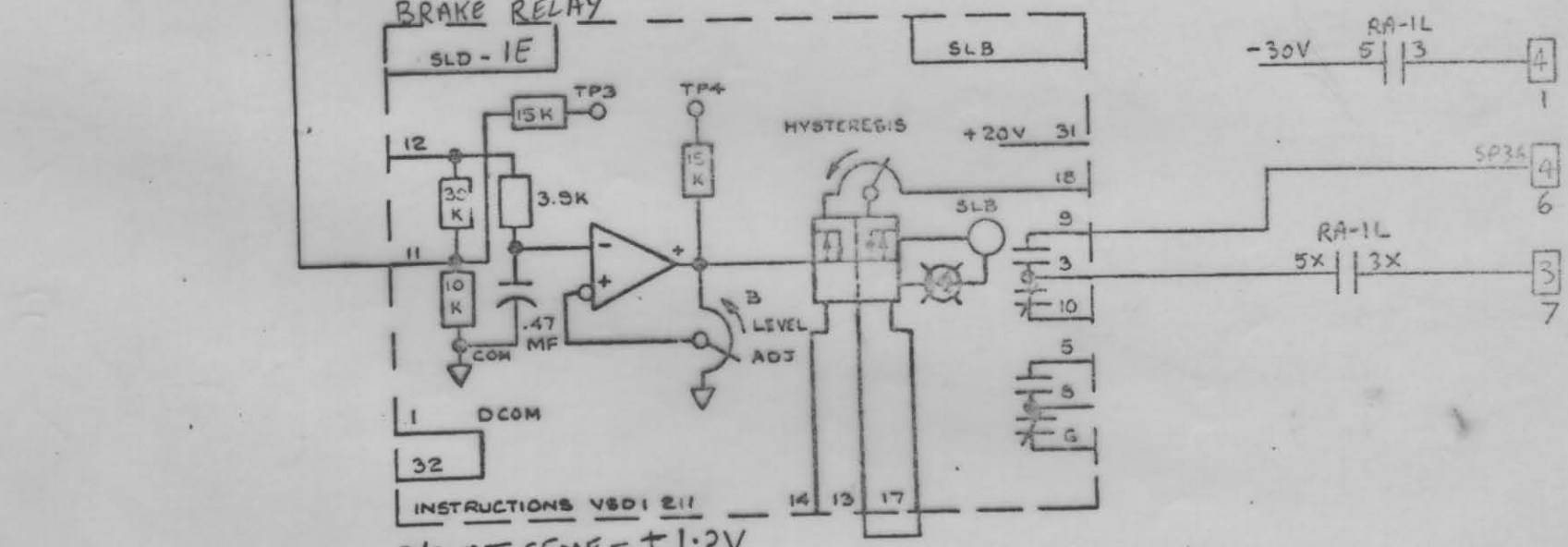



D/O AT CEMF = ±0·3V

BRAKE RELAY

SLD-1E

SLB




D/O AT CEMF = ±1·2V

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5 4 84 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION

MDR CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2D | 2 | C |

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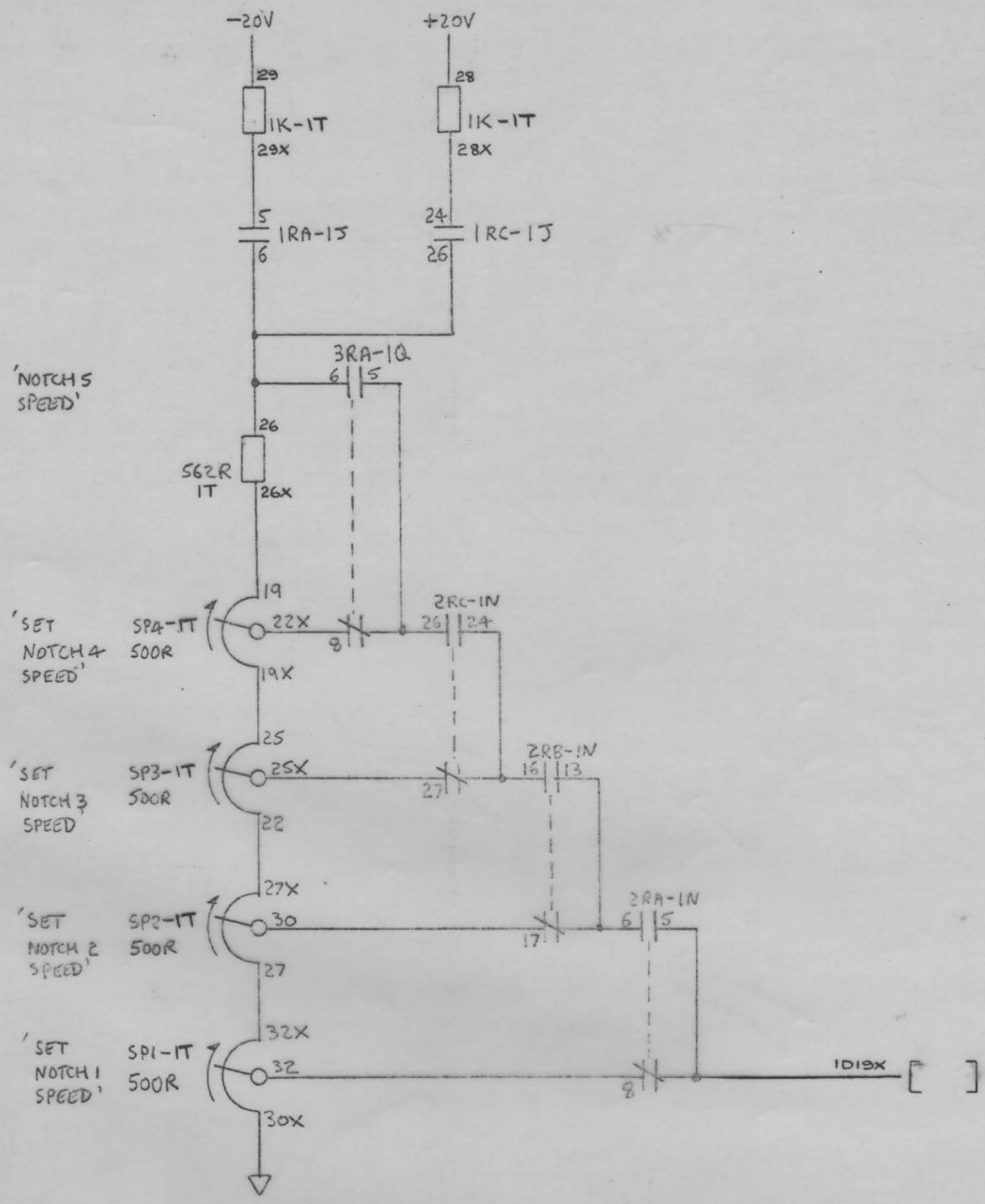
CRANES – 5 NOTCH REF.




| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 5.5.84 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLENWEST Simplex

VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

# LUFF MOTION SPEED REFERENCE CIRCUITS

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2E | 2 | D |

DR 2 SH D CONTD. 2E ELEMENTARY DIAGRAM 902M128AY

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IN8

IRB-13 16 13 — MCC(SR)

IRB-13 18 20 — 17

REF-ID — DIS — 10

19X — 30X — 5X — MAXNEG 10K — 30 — 5X — 3

T1 — NREF

SLOW 20K — 5

MAX POT 10K — T2 — PREF

8X X4 — 9 X3 — 8 X2 — 6 X1 — ZERO ADJ 1K

MCC(PRE) — 14 PRE

MONITOR PRECONDITION — COMPARE

LATCH — 23 SYS — MCC(SYS)

TRACKING ERROR OR OVERVOLTAGE — TF 16 — MFC(DM22) TF

+20V — 22.1K — FEA 16

4 2 — 11 NSW — T1

4 3 — 13 PSW — T2

-30V — 10X -30V

MCC(DR) — 29 DR — DR INVERT AND MONITOR IR COMP

28 CFB

21 — 10K — 26

56.2K — 56.2K — SFB SHAPING — 47K — 15K — ERR

5K — 13X

39K — 16X

22K — 17X — 12

+20V COM -20V — 31 15 2

11X 9X 12X 6X 18X 23X

MCC(SFB)

MCC(TR)

TQP-1C — 20 TR — 29 ATR

MCC(LT2) — 19 LT2 — T1 — T3 — OA1-1 — T6 — T2

10K — 12.1K — TRX 28 — MCC(DM8) RJR

T7 — UTP2 6

+20V — LC HC

13

R CFB — 30 CFB — ATR(+) AND CFB(+) — OR — AND — OR — T6 T7 T2 T3

27

14 REL

12 — ATR(-) AND CFB(-) — OR — AND — AND

3 8 — 1 — 3 7 — 4 — 7 — 3 6 — MCC(DM1) ILA

10

3 PRE — PRE (-4V) OR DP2(+20V)

MCC(DP2) — 5 DP2

8 UTP1

330Ω — ILR 9

BR 18 — 3 5 — A BPR B — 15K

OA1-2 — REF DELAY 25K — T1 — IMF — TER — 3.92K — T17 — 17 — -30V — 3 4

+20V COM -20V — 31 15 2 — 22 — -30V

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE 7.4.84 |
|---|---|---|---|---|---|---|
| | | | | | | TECHN. DM |
| | | | | | | ENG. NGM |
| | | | | | | APPD. |

ALLEN-WEST Simplex — VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

# LUFF MOTION TORQUE PROVING & REFERENCE

IDENT

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | DR | SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2F | 2 | E |

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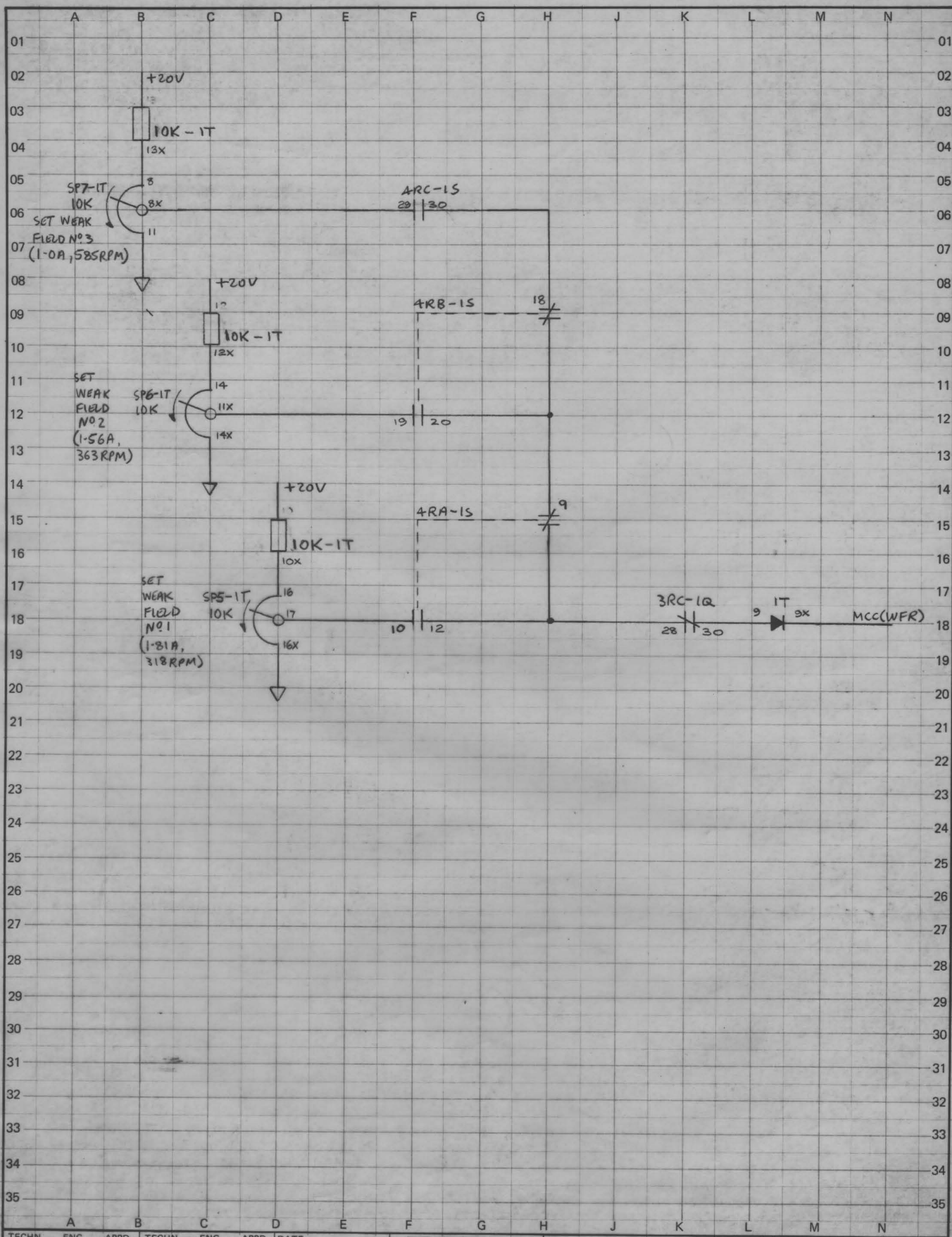


| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 7.4 84 |
|---|---|---|
| | | TECHN. |
| | | ENG. NGM |
| | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION
MOTOR FIELD CONTROL

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2G | 2 | F |

DR 2 | SH F | CONTD. 2G | ELEMENTARY DIAGRAM 902M128AY

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+20 31

29 — 1K — 31X

28 — 1K — 29X

26 — 562R — 28X

24 — 26X

23 — 24X

21 — 23X

20 — 21X

18 — 20X

18X

COM 15

13 — 10K — 15X

12 — 10K — 13X

10 — 10K — 12X

9 — 10X

7 — 9X

5 — 7X

4 — 5X

-20 2 — 4X

2X

193W264AAG01

32X
32
30X
500R
SET NOTCH 1 SPEED

27X
30
27
500R
SP2
SET NOTCH 2 SPEED

25
25X
22
500R
SP3
SET NOTCH 3 SPEED

19
22X
19X
500R
SP4
SET NOTCH 4 SPEED

16X
17
16
10K
SP5
SET WEAK FIELD No.1

14X
11X
14
10K
SP6
SET WEAK FIELD No.2

11
8X
8
10K
SP7
SET WEAK FIELD No.3

6
3
6X
SP8

CARD PART NO. 909W317ABG43 FIT IN RACK POSITION IT

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE | |
|---|---|---|---|---|---|---|---|
| | | | | | | 7 4 84 | |
| | | | | | | TECHN. DM | |
| | | | | | | ENG. NGM | |
| | | | | | | APPD. | |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION COMPONENT CARD

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M128AY | 2H | 2 | G |

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CRANES – NO MOTOR FIELD PROGRAMME

| TQP | REF | ISLD | | TDR | | ILLR | | LOR | | 2LLR | | 3LLR | | 4LLR | CC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 193W 545 AAG01 | 193W 546 ABG01 | 193W 377 AAG02 | | 193W 543 AAG01 | | 193W 879 AAG03 | | 193W 265 AAG04 | | 193W279AAG03 | | 193W279AAG03 | | 193W279AAG03 | 909W317ABG43 COMPONENT CARD. 1. | | |
| TORQUE PROVE | REFER-ENCE | SIG. LEV. DET | | TIME DELAY RELAY | | LOW LEVEL RELAY | | LOCK RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | LOW LEVEL RELAY | | | |

ON PRINTED CIRCUIT CARDS USED IN THIS RACK THE LETTERS 'AA' AFTER BASIC CATOLOGUE NUMBER INDICATES ORIGINAL DESIGN. SUBSEQUENT DESIGNS WITH THE SAME BASIC NUMBERS AND GROUP NUMBER WITH THE SECOND LETTER CHANGED, SUCH AS: AB, AC, AD, ETC., ARE DIRECTLY INTERCHANGEABLE AND MAY BE SUPPLIED IN PLACE OF THE 'AA' CARDS.

THE PRINTED CIRCUIT CARD SHOULD ALWAYS BE REMOVED WITH THE CARD EXTRACTOR WHICH IS ATTACHED ON TOP OF THE CARD RACK. SOME CARDS CONTAIN PARTS WHICH WILL BE THERMALLY HOT AFTER BEING IN OPERATION. CARE SHOULD BE EXERCISED IN HANDLING ALL CARDS AFTER REMOVAL UNTIL THESE PARTS HAVE COOLED. DO NOT REMOVE OR INSERT CARDS WITH POWER APPLIED.

FRONT VIEW OF 64 PIN RECEPTACLE AS SEEN IN RACK CLOSED POSITION.

| | |
|---|---|
| 32 | 32 - 64 |
| 31 | 31 - 63 |
| 30 | 30 - 62 |
| 29 | 29 - 61 |
| 28 | 28 - 60 |
| 27 | 27 - 59 |
| 26 | 26 - 58 |
| 25 | 25 - 57 |
| 24 | 24 - 56 |
| 23 | 23 - 55 |
| 22 | 22 - 54 |
| 21 | 21 - 53 |
| 20 | 20 - 52 |
| 19 | 19 - 51 |
| 18 | 18 - 50 |
| 17 | 17 - 49 |
| 16 | 16 - 48 |
| 15 | 15 - 47 |
| 14 | 14 - 46 |
| 13 | 13 - 45 |
| 12 | 12 - 44 |
| 11 | 11 - 43 |
| 10 | 10 - 42 |
| 9 | 9 - 41 |
| 8 | 8 - 40 |
| 7 | 7 - 39 |
| 6 | 6 - 38 |
| 5 | 5 - 37 |
| 4 | 4 - 36 |
| 3 | 3 - 35 |
| 2 | 2 - 34 |
| 1 | 1 - 33 |

| | |
|---|---|
| 32 | 32 - 32X |
| 31 | 31 - 31X |
| 30 | 30 - 30X |
| 29 | 29 - 29X |
| 28 | 28 - 28X |
| 27 | 27 - 27X |
| 26 | 26 - 26X |
| 25 | 25 - 25X |
| 24 | 24 - 24X |
| 23 | 23 - 23X |
| 22 | 22 - 22X |
| 21 | 21 - 21X |
| 20 | 20 - 20X |
| 19 | 19 - 19X |
| 18 | 18 - 18X |
| 17 | 17 - 17X |
| 16 | 16 - 16X |
| 15 | 15 - 15X |
| 14 | 14 - 14X |
| 13 | 13 - 13X |
| 12 | 12 - 12X |
| 11 | 11 - 11X |
| 10 | 10 - 10X |
| 9 | 9 - 9X |
| 8 | 8 - 8X |
| 7 | 7 - 7X |
| 6 | 6 - 6X |
| 5 | 5 - 5X |
| 4 | 4 - 4X |
| 3 | 3 - 3X |
| 2 | 2 - 2X |
| 1 | 1 - 1X |

NOTE: RECEPTACLE PINS MAY BE NUMBERED AS SHOWN IN EITHER SKETCH. (PIN 33 CORRESPONDS TO PIN 1X, 34 TO 2X, ETC.)

SYMBOLS:

TEST POST — POT ADJUSTMENT — INDICATING LIGHT

CARD RACK WIRE JUMPER TABLE

| | | | |
|---|---|---|---|
| RTB(Com) – 1D15 | SP6 – | SP41 – 1N11 | 1Q24 – 1S5 |
| RTB(+20) – 1G31 | SP7 – 1S11 | SP42 – 1N21 | 1S5 – 1S13 |
| RTB(-20) – 1G2 | SP8 – 1Q25 | SP43 – 1N25 | 1S13 – 1S24 |
| RTB(CFB) – 1C30 | 3TB1 – 1G12 | SP44 – 1Q11 | 1S24 – 2TB6 |
| RTB(-30) – 1L5 | 3TB2 – 1L10 | SP45 – MCC(+30) | MCC(WFR) – 1T9X |
| MCC(SFB) – 1D12X | 3TB3 – | 2TB3 – MTBB(OL2) | 1T9 – 1Q30 |
| MCC(TR) – 1C20 | 3TB4 – 1C17 | 5TB(DFDR) – RTB(FOR) | 1Q28 – 1S12 |
| MCC(SR) – 1J13 | 3TB5 – 1C18 | 2TB8 – 1T30 | 1S9 – 1T17 |
| MCC(SYS) – 1D23 | 3TB6 – | 1S23 – 1S14 | 1S10 – 1S20 |
| MCC(DR) – 1D29 | 3TB7 – 1L3X | 1S14 – 1S3 | 1S19 – 1T11X |
| MCC(CEMF) – 1E11 | 3TB8 – | 1S3 – 1Q3 | 1S18 – 1S30 |
| MCC(DM8) – 1C28 | 4TB1 – 1L3 | 1Q3 – 1Q23 | 1S29 – 1T8X |
| MCC(LT2) – 1C19 | 4TB2 – 1D11 | 1Q23 – 1J3 | 1T11 – 1T14X |
| MCC(DP2) – 1C5 | 4TB3 – 1D13 | 1J23 – 1N3 | 1T14X – 1T16X |
| MCC(PRE) – 1D14 | 4TB4 – 1G5X | 1N3 – 1N14 | 1T16X – 1S23 |
| MFC(DM22) – 1D16 | 4TB5 – | 1N14 – 1N23 | 1T8 – 1T13X |
| SP1 – 1E30 | SP36 – 1E9 | 1N23 – 1G15 | 1T14 – 1T12X |
| SP2 – | SP37 – | 1S25 – 1S26 | 1T16 – 1T10X |
| SP3 – | SP38 – 1J21 | 1S21 – 1S16 | 1T10 – 1T12 |
| SP4 – 1S25 | SP39 – 1J11 | 1S11 – 1S6 | 1T12 – 1T13 |
| SP5 – 1S21 | SP40 – 1J25 | 1Q25 – 1Q26 | 1T13 – 1T28 |

| TECHN. | ENG. | APPD. | TECHN. | ENG. | APPD. | DATE |
|---|---|---|---|---|---|---|
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TECHN.

ENG.

APPD.

ALLEN WEST

Stapbuks

VARIABLE SPEED DRIVES OPERATION BRIGHTON, ENGLAND

# LUFF MOTION MODIFICATION RACK WIRING

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT | DR | SH |
|---|---|---|---|---|---|
| 350900 | 902M128AY | 2J | | 2 | H |

UR 2 | SH H | CONTD. 2J | ELEMENTARY DIAGRAM 902M128AY

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902M1128AY SH 3

DR 2 | SH 3 | CONTD. FL | ELEMENTARY DIAGRAM 902M1128AY

## CARD RACK WIRE JUMPER TABLE

| | | | | | |
|---|---|---|---|---|---|
| 1T28 – 1G31 | | | | | |
| 1T28X – 1J24 | | | | | |
| 1T29X – 1J5 | | | | | |
| 1T29 – 1G2 | | | | | |
| 1J6 – 1J26 | | | | | |
| 1J26 – 1Q6 | | | | | |
| 1Q6 – 1T26 | | | | | |
| 1T26X – 1T19 | | | | | |
| 1T19X – 1T25 | | | | | |
| 1T22 – 1T27X | | | | | |
| 1T27 – 1T32X | | | | | |
| 1T30X – 1S23 | | | | | |
| 1T26 – 1Q6 | | | | | |
| 1T22X – 1Q8 | | | | | |
| 1T25X – 1N27 | | | | | |
| 1T30 – 1N17 | | | | | |
| 1T32 – 1N8 | | | | | |
| 1Q5 – 1N26 | | | | | |
| 1N24 – 1N16 | | | | | |
| 1N13 – 1N6 | | | | | |
| 1N5 – 1D19X | | | | | |
| MCC(DMI) – 1C9 | | | | | |
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| TECHN. ENG. APPD. | TECHN. ENG. APPD. | DATE 1484 |
|---|---|---|
| | | TECHN. |
| | | ENG. |
| | | APPD. |

ALLENWEST
Simplex
VARIABLE SPEED DRIVES OPERATION, BRIGHTON, ENGLAND.

LUFF MOTION MODIFICATION RACK WIRING (SHEET 2)

| GO NUMBER | ELEMENTARY DIAGRAM | CONTD. | IDENT DR | IDENT SH |
|---|---|---|---|---|
| 350900 | 902M1128AY | FL | 2 | 3 |

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