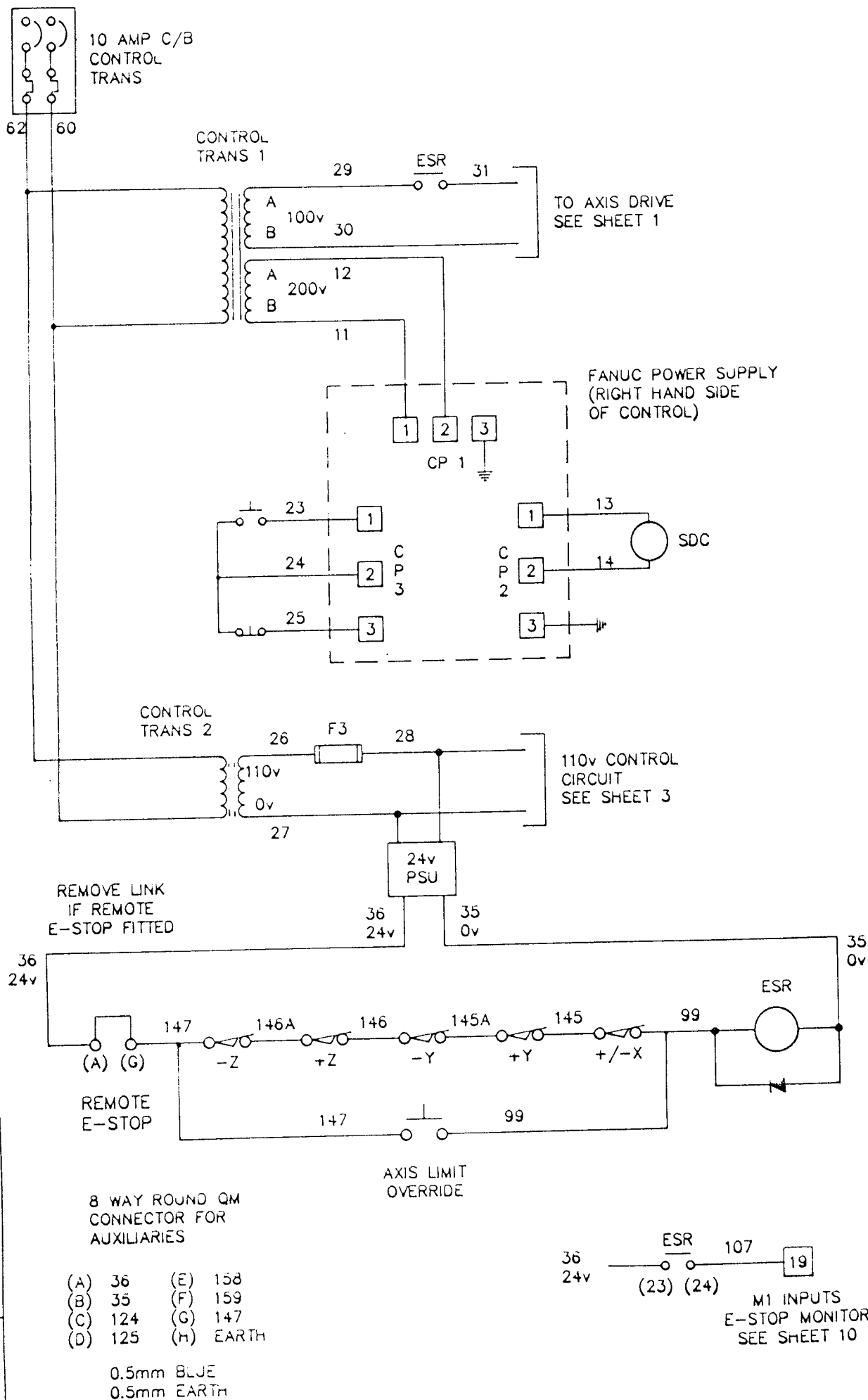


IF IN DOUBT ASK

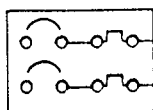


TRIAC FANUC
E-STOP AND
CONTROL CIRCUIT

SHEET 2
[IF]

IF IN DOUBT ASK

CONTROL TRANS
CIRCUIT
BREAKER
10 AMP



9

10

CONTROL TRANS 2
300VA 415v/110v

28

F3
6.3A

26

110v

0v

27

DRAWBAR
RELAY

DBR

45

RC

DBS

CABINET
FAN

DRAWBAR
SOLENOID

CAROUSEL IN
RELAY

CIR

46

RC

CIS

CAROUSEL IN
SOLENOID

CAROUSEL
DOWN
RELAY

CDR

47

RC

CDS

CAROUSEL
DOWN
SOLENOID

VICE OPEN
RELAY

VOR

54

RC

VOS

VICE OPEN
SOLENOID

DOOR OPEN
RELAY

DOR

56

RC

DOS

DOOR OPEN
SOLENOID

DOOR CLOSE
RELAY

DCR

57

RC

DCS

DOOR CLOSE
SOLENOID

AIR BLAST
RELAY

ABR

58

RC

ABS

AIR BLAST
SOLENOID

COOLANT ON
RELAY

COR

48

RC

CMC

COOLANT
MOTOR
CONTACTOR

SPINDLE
FORWARD
RELAY

SFR

50

RC

LUBE
PUMP

28

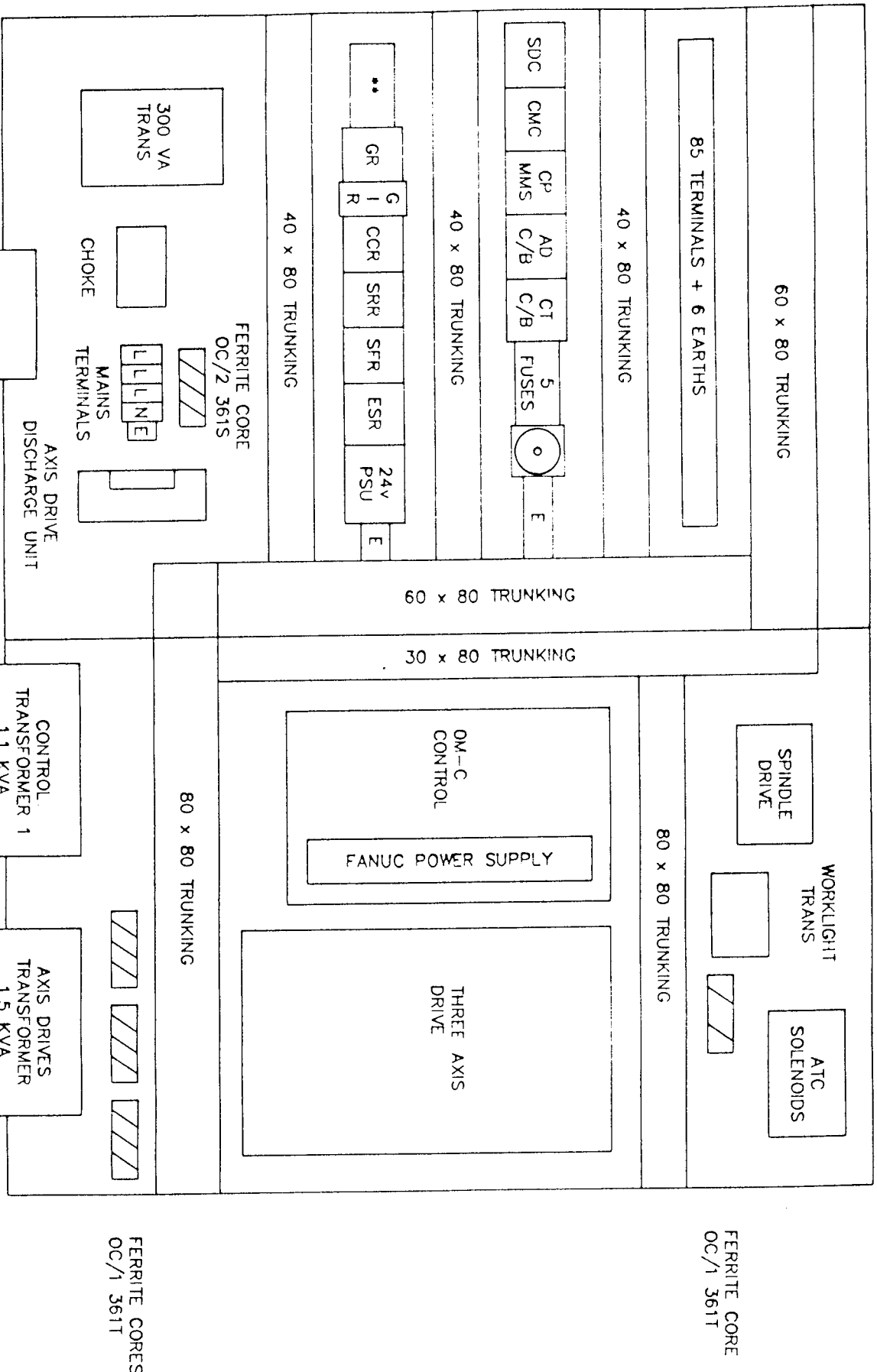
27

1.5mm EARTH

TRIAC FANUC
110v
SCHEMATIC

SHEET 3

[TF]

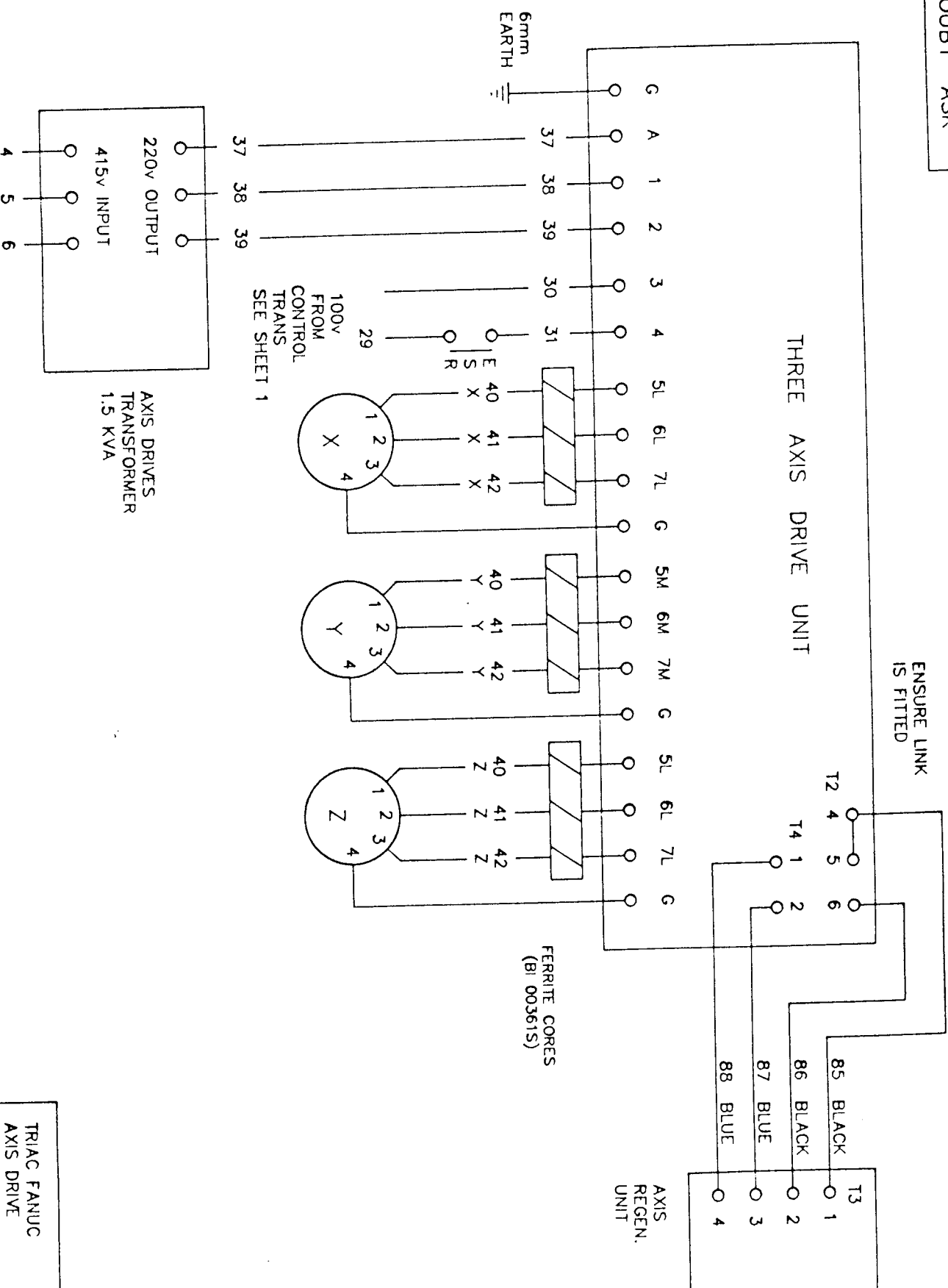


•• RELAY MODULES
SEE SHEET 5 FOR DETAILS

FILTER
ON BOTTOM OF CABINET

TRANSFORMERS MOUNTED ON
BOTTOM OF CABINET

IF IN DOUBT ASK

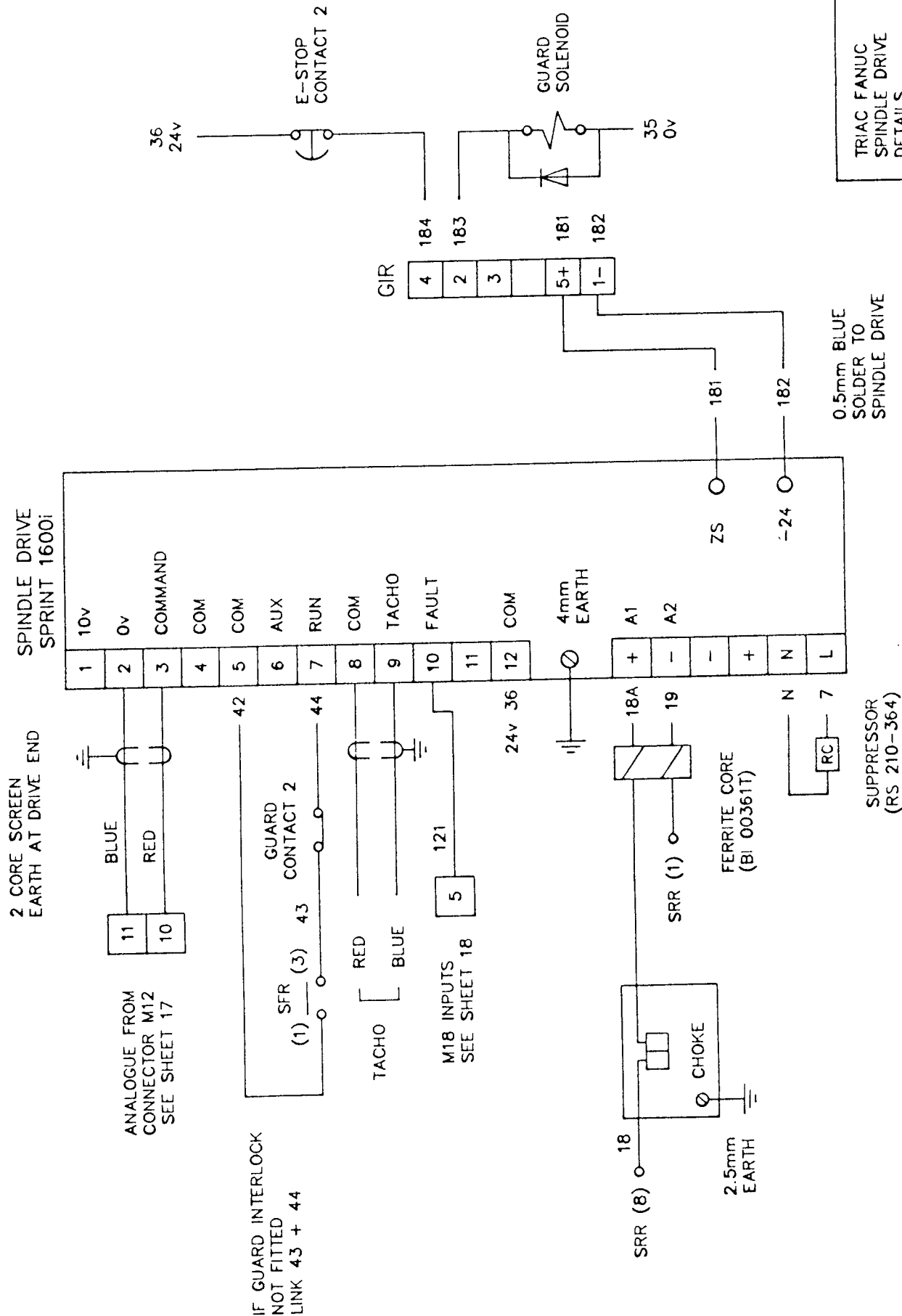


TRIAC FANUC
AXIS DRIVE
CONNECTIONS

SHEET 6

[TF]

IF IN DOUBT ASK



0.5mm BLUE
SOLDER TO
SPINDLE DRIVE

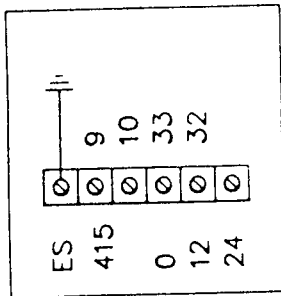
SUPPRESSOR
(RS 210-364)

TRIAC FANUC
SPINDLE DRIVE
DETAILS

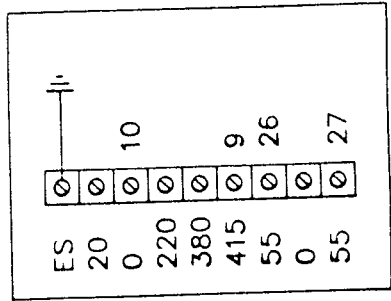
SHEET 7

[31]

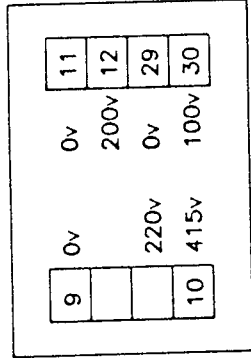
WORKLIGHT
TRANSFORMER
50 VA



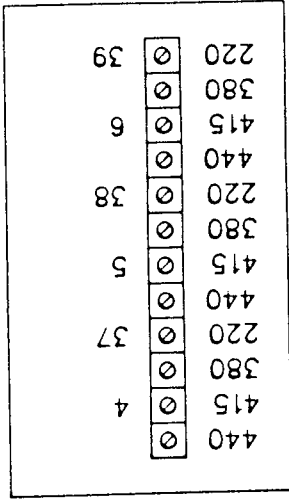
CONTROL
TRANSFORMER 2
300 VA



CONTROL
TRANSFORMER 1
1.1 KVA



AXIS DRIVES TRANSFORMER
1.5 KVA



TRANSFORMERS ON BOTTOM
OF CABINET

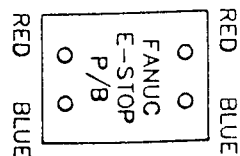
IF IN DOUBT ASK

TRIAC FANUC
TRANSFORMER
WIRING

SHEET 8

[TF]

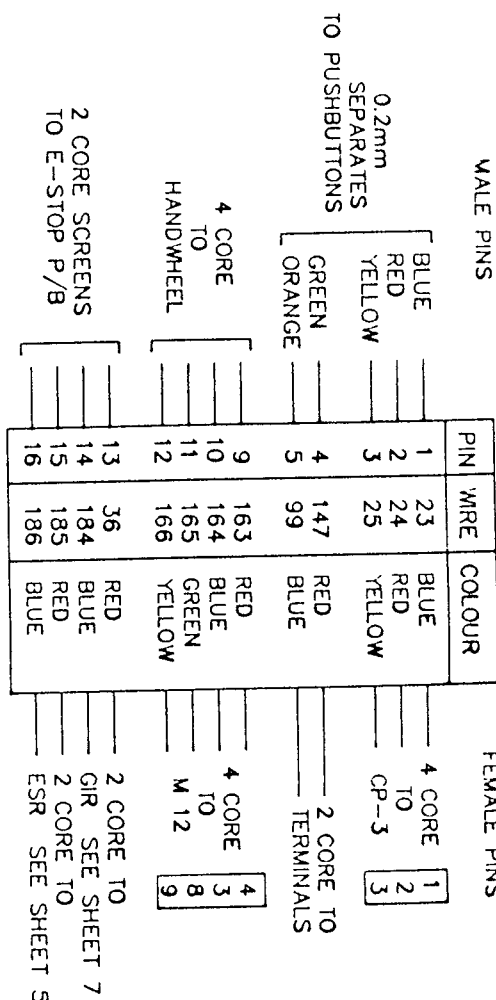
REMOVE AND LINK
ORIGINAL GREY WIRES
FROM E-STOP P/B



PUSHBUTTON SIDE
FEMALE QM
MALE PINS

24 WAY QM

PANEL SIDE
MALE QM
FEMALE PINS



CONTROL
ON P/BUTTON
(GREEN LENS)

CONTROL
OFF P/BUTTON
(RED LENS AND SHIELD)

SPINDLE
RELEASE
P/BUTTON
(RED LENS AND SHIELD)

CAROUSEL
CLOCKWISE P/BUTTON
(ORANGE LENS)

CAROUSEL
COUNTERCLOCKWISE
P/BUTTON
(ORANGE LENS)

AXIS OVERRIDE
P/BUTTON
(WHITE LENS)

GUARD
OVERRIDE
(WHITE LENS)

HANDWHEEL

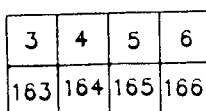
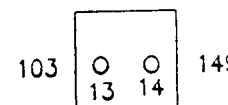
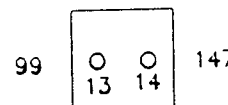
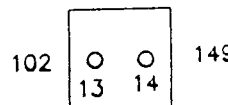
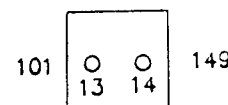
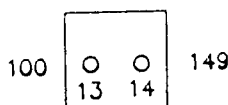
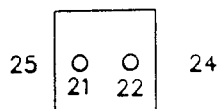
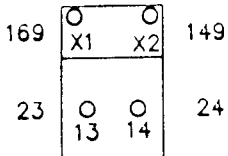


CHART NUMBER
CH 415B

IF IN DOUBT ASK

DENFORD MACHINE TOOLS LTD

BRIGHOUSE

WEST YORKSHIRE

DRN BY A. NEWSOME

DATE 15-8-95

TR4-09

TRIAC FANUC
OPERATORS PANEL
DIAGRAM

SHEET 9

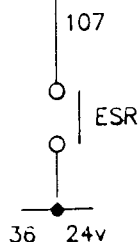
[TF]

IF IN DOUBT ASK

MAIN PCB
M1 50 WAY
HONDA FEMALE

OPERATORS PANEL
M1A 50 WAY
MALE

DESCRIPTION	BIT No	PIN No		PIN No
	0v	1	RED/BROWN	1
	0v	2	RED/BLACK	2
	0v	3	YELLOW/MAUVE	3
	0v	4		4
KD 5	X20.5	5	BLACK	5
	X16.7	6	BROWN	6
	X17.7	7	RED	7
TOOL RELEASE PUSHBUTTON	X18.7	8	ORANGE	8
CAROUSEL CLOCKWISE P/B	X17.1	9	YELLOW	9
CAROUSEL ANTI- CLOCKWISE P/B	X17.0	10	GREEN	10
	X16.1	11	BLUE	11
	X16.0	12	VIOLET	12
KD 7	X20.7	13	GREY	13
KD 4	X20.4	14	WHITE	14
KD 3	X20.3	15	PINK	15
KD 2	X20.2	16	TURQUOISE	16
KD 1	X20.1	17	RED/BLUE	17
KD 0	X20.0	18	GREEN/RED	18
E-STOP MONITOR	X21.4	19	GREEN *	19
	X16.3	20	WHITE/RED	20
GUARD OVERRIDE PUSHBUTTON	X16.2	21	YELLOW/BROWN	21
	X17.3	22		22
	X17.2	23		23
	X18.3	24		24
	X18.2	25		25



36 CORE
ALL CORES USED

* 4 CORE
ALL CORES USED

TRIAC FANUC
M1 TO M1A
INPUTS (1-25)

SHEET 10

[TF]

IF IN DOUBT ASK

DENFORD MACHINE TOOLS LTD

BRIGHOUSE

WEST YORKSHIRE

DRN BY A McHENRY

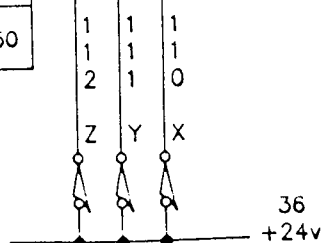
DATE 2-7-96

TR4-11A

MAIN PCB
M1 50 WAY
HONDA FEMALE

OPERATORS PANEL
M1A 50 WAY
MALE

DESCRIPTION	BIT No	PIN No		PIN No
	X21.6	26		26
RSV 1	X21.5	27	WHITE/BROWN	27
		28		28
	+24v	29		29
	+24v	30	GREY/GREEN	30
	+24v	31	GREY/BROWN	31
	+24v	32	WHITE/MAUVE	32
• OV 8	X21.3	33	YELLOW/BLUE	33
• OV 4	X21.2	34	WHITE/BLUE	34
• OV 2	X21.1	35	BLUE/BLACK	35
• OV 1	X21.0	36	ORANGE/BLUE	36
KD 6	X20.6	37	YELLOW/GREEN	37
X DATUM SWITCH	X16.5	38	110 RED *	38
Y DATUM SWITCH	X17.5	39	111 BLUE *	39
Z DATUM SWITCH	X18.5	40	112 YELLOW *	40
KEY	X21.7	41	WHITE/GREEN	41
KST	X22.7	42	ORANGE/GREEN	42
	X22.6	43		43
RSV 3	X22.5	44	GREEN/BLUE	44
RSV 2	X22.4	45	GREY/BLUE	45
KA 3	X22.3	46	GREEN/BLACK	46
KA 2	X22.2	47	VIOLET/BLACK	47
KA 1	X22.1	48	BROWN/BLACK	48
KA 0	X22.0	49	YELLOW/RED	49
		50		50



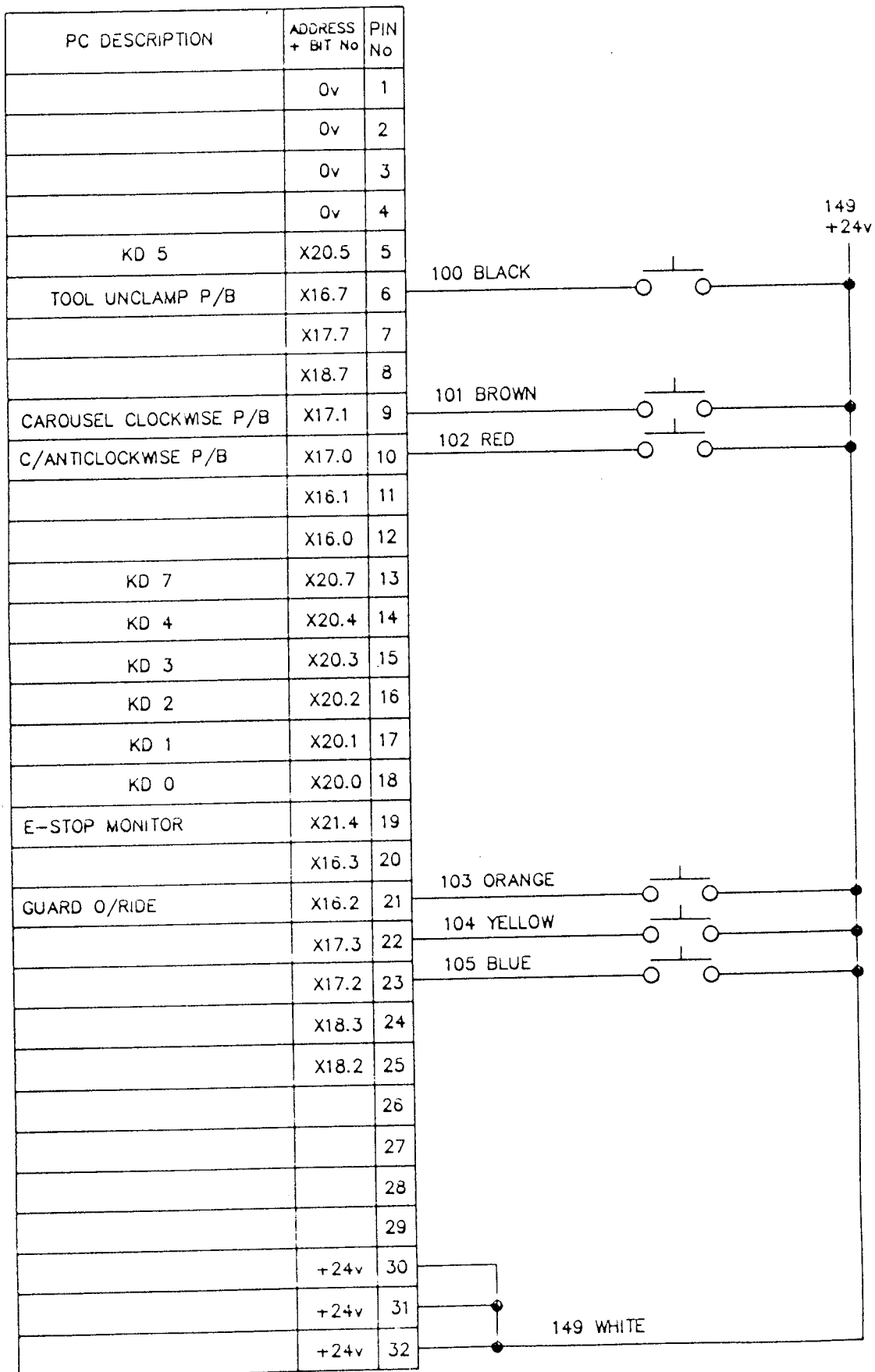
TRIAC FANUC
M1 TO M1A
INPUTS (25-50)

SHEET 11

[TF]

FANUC OPERATORS PANEL
TO PUSHBUTTONS

M1B 50 WAY HONDA FEMALE



PINS 26-29
AND 33-50
ARE NOT USED

IF IN DOUBT ASK

DENFORD MACHINE TOOLS BRIGHOUSE WEST YORKSHIRE

DRN BY A MCHENRY

DATE 2-7-96

TR4-13A

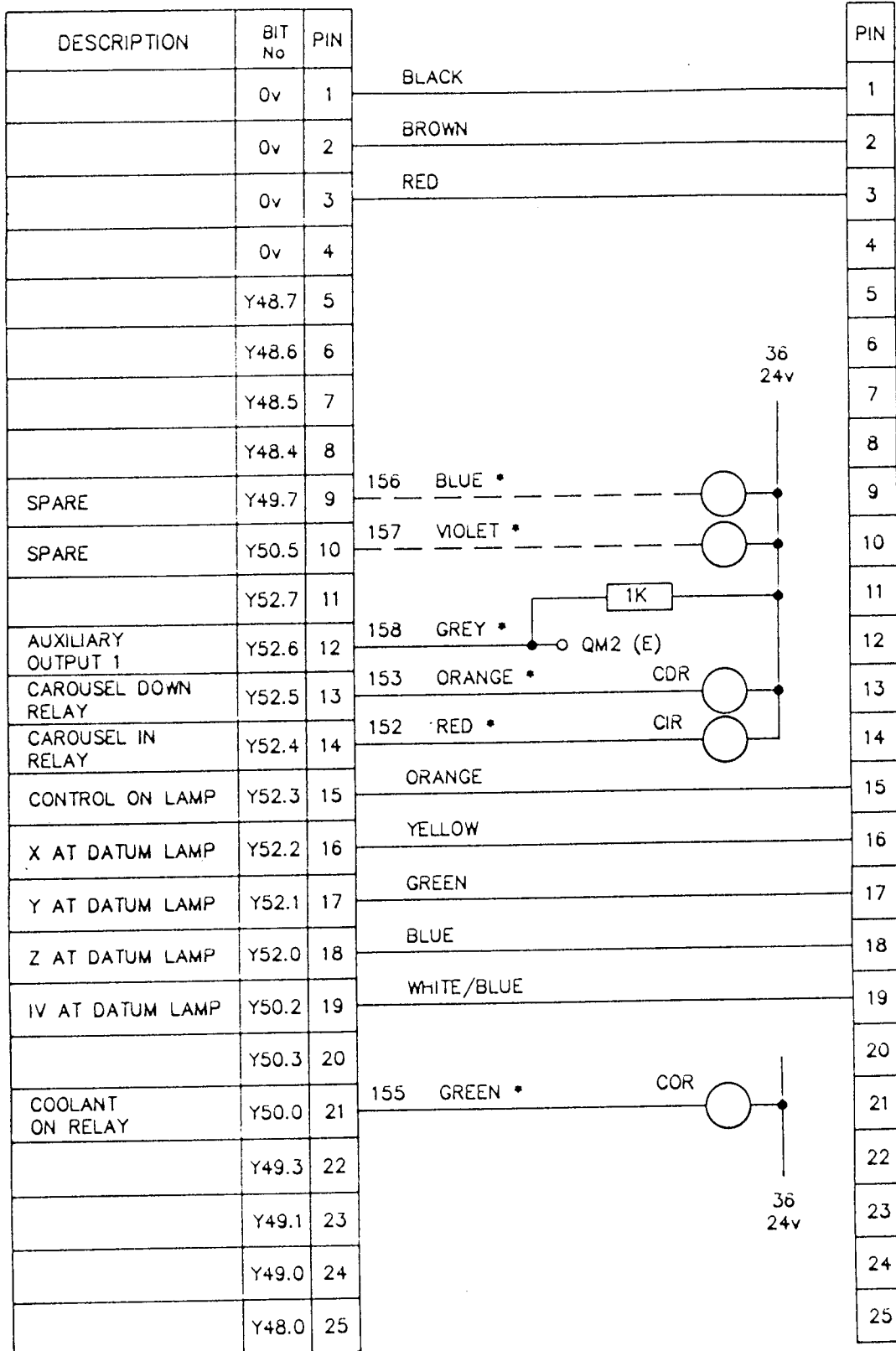
TRIAC FANUC
M2 TO M2A
OUTPUTS (1-25)

SHEET 13

[IF]

M2 MAIN PCB
50 WAY HONDA FEMALE

M2A OPERATORS PANEL
50 WAY HONDA MALE



20 CORE
TO OPERATORS PANEL

12 CORE *
TO RELAYS

CUT OUT
RED/BLUE
GREEN/RED
RED/BROWN
YELLOW/BLUE

CUT OUT
BLACK
TURQUOISE

1K
RESISTOR
(RS 132-494)

IF IN DOUBT ASK

DENFORD MACHINE TOOLS BRIGHOUSE WEST YORKSHIRE

DRN BY A McHENRY

DATE 2-7-96

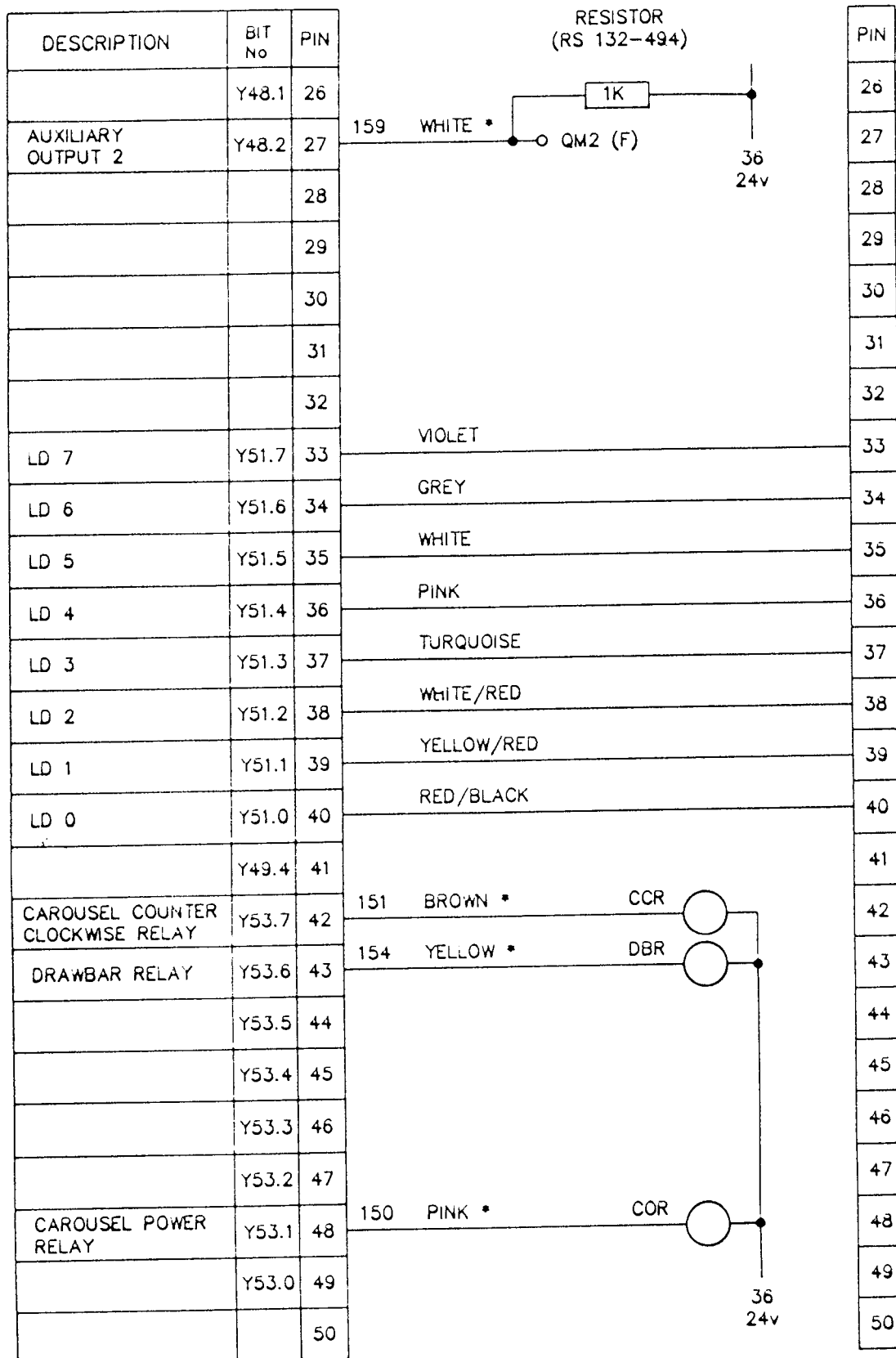
TR4-14A

TRIAC FANUC
M2 TO M2A
OUTPUTS (26-50)

SHEET 14
[TF]

M2 MAIN PCB
50 WAY HONDA FEMALE

M2A OPERATORS PANEL
50 WAY HONDA MALE



20 CORE
TO OPERATORS PANEL

12 CORE *
TO RELAYS

CUT OUT
RED/BLUE
GREEN/RED
RED/BROWN
YELLOW/BLUE

CUT OUT
BLACK
TURQUOISE

M2B OPERATORS PANEL
50 WAY HONDA FEMALE

DESCRIPTION	BIT No	PIN
	0v	1
	0v	2
	0v	3
	0v	4
	Y48.7	5
	Y48.6	6
	Y48.5	7
	Y48.4	8
	Y49.7	9
	Y50.5	10
	Y52.7	11
	Y52.6	12
	Y52.5	13
	Y52.4	14
CONTROL ON LAMP	Y52.3	15
	Y52.2	16
	Y52.1	17
	Y52.0	18
	Y50.2	19
SPARE	Y50.3	20
SPARE	Y50.0	21
	Y49.3	22
	Y49.1	23
	Y49.0	24
	Y48.0	25

PINS 26 TO 50
NOT USED

0.2mm SINGLE WIRES

150 GREY/BLUE

151 WHITE/BLACK

152 RED/BLACK

24v
149

32

24v FROM
CONNECTOR M1B
SEE SHEET 12

IF IN DOUBT ASK

DENFORD MACHINE TOOLS BRIGHOUSE WEST YORKSHIRE

DRN BY A MCHENRY

DATE 23-8-95

TR4-15

TRIAC FANUC
M2B LAMP
OUTPUTS

SHEET 15
[TF]

IF IN DOUBT ASK

M3

(CONTROL)
20 WAY FEMALE
CONNECTOR

KM1

(MONITOR UNIT)
20 WAY MALE
CONNECTOR

DESCRIPTION	PIN No		PIN No	DESCRIPTION
	1		1	
KCM0-0	2	BLACK	2	KCM0-0
KCM0-1	3	BROWN	3	KCM0-1
SW0-6	4	RED	4	SW0-6
SW0-4	5	ORANGE	5	SW0-4
SW0-2	6	YELLOW	6	SW0-2
SW0-0	7	GREEN	7	SW0-0
KCM0-2	8	BLUE	8	KCM0-2
KCM0-3	9	MAUVE	9	KCM0-3
SW0-7	10	GREY	10	SW0-7
SW0-5	11	WHITE	11	SW0-5
SW0-3	12	PINK	12	SW0-3
SW0-1	13	LIGHT BLUE	13	SW0-1
KCM0-4	14	WHITE/BLUE	14	KCM0-4
KCM0-5	15	YELLOW/BLUE	15	KCM0-5
KCM0-6	16	RED/BROWN	16	KCM0-6
KCM0-7	17	BLACK/RED	17	KCM0-7
	18		18	
	19		19	
	20		20	

SCREEN AT
CONTROL END20 CORE SCREEN
CUT OUT
YELLOW/RED
WHITE/RED
RED/BLUE
GREEN/REDTRIAC FANUC
CONTROL TO KEYPAD
SIGNALS
M3 - KM1

SHEET 16

[TF]

IF IN DOUBT ASK

DENFORD MACHINE TOOLS BRIGHOUSE WEST YORKSHIRE

DRN BY A McHENRY

DATE 23-8-95

TR4-17

TRIAC FANUC
M12 HANDWHEEL
CONNECTIONS

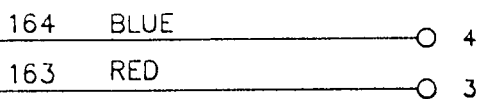
SHEET 17

[TF]

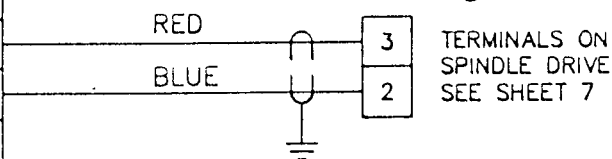
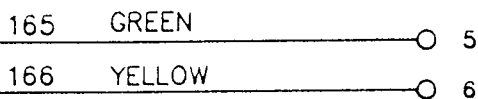
M12
HANDWHEEL
CONNECTOR
20 WAY FEMALE CONNECTOR

DESCRIPTION	PIN
0v	1
0v	2
0v	3
+5v	4
+5v	5
+5v	6
	7
HA1	8
HB1	9
COMMAND	10
0v	11
	12
	13
	14
	15
	16
	17
	18
	19
	20

4 CORE SCREEN



TERMINALS ON
HANDWHEEL



2 CORE SCREEN
EARTH AT DRIVE END

IF IN DOUBT ASK

M18 CONTROL INPUTS

50 WAY
FEMALE
HONDA
CONNECTOR

DESCRIPTION	BIT	PIN
	0v	1
	0v	2
	0v	3
	COM1	4
SPINDLE ALARM	X00.5	5
LUBE FLOAT SWITCH	X02.0	6
CAROUSEL 1 REV SENSOR	X02.3	7
CAROUSEL UP SWITCH	X02.6	8
	X04.1	9
	X04.4	10
	X04.7	11
AUXILIARY INPUT 2	X06.2	12
CAROUSEL IN SWITCH	X06.4	13
	X06.6	14
XAE	X08.0	15
+MITX	X08.2	16
+MITZ	X08.4	17
GUARD CLOSED SWITCH	X08.6	18
	X00.1	19
	X00.3	20
CAROUSEL OUT SWITCH	X00.6	21
	X02.1	22
	X02.4	23
	X02.7	24
	X04.2	25

LINK TO PINS
28 + 29

36
+24v

SPINDLE DRIVE
TERMINALS

(10) (12)

121 VIOLET

123 WHITE

114 BLACK

117 ORANGE

35
0v

125 WHITE/BLUE

QM1 (D)

115 BROWN

148A YELLOW/RED

116 RED

36
+24v

20 CORE SCREEN TO TERMINALS
CUT OUT
RED/BROWN
GREEN/RED
TURQUOISE

QM1 8 WAY SOCKET (AUXILIARIES)

TRIAC FANUC
M18
INPUTS (1-25)

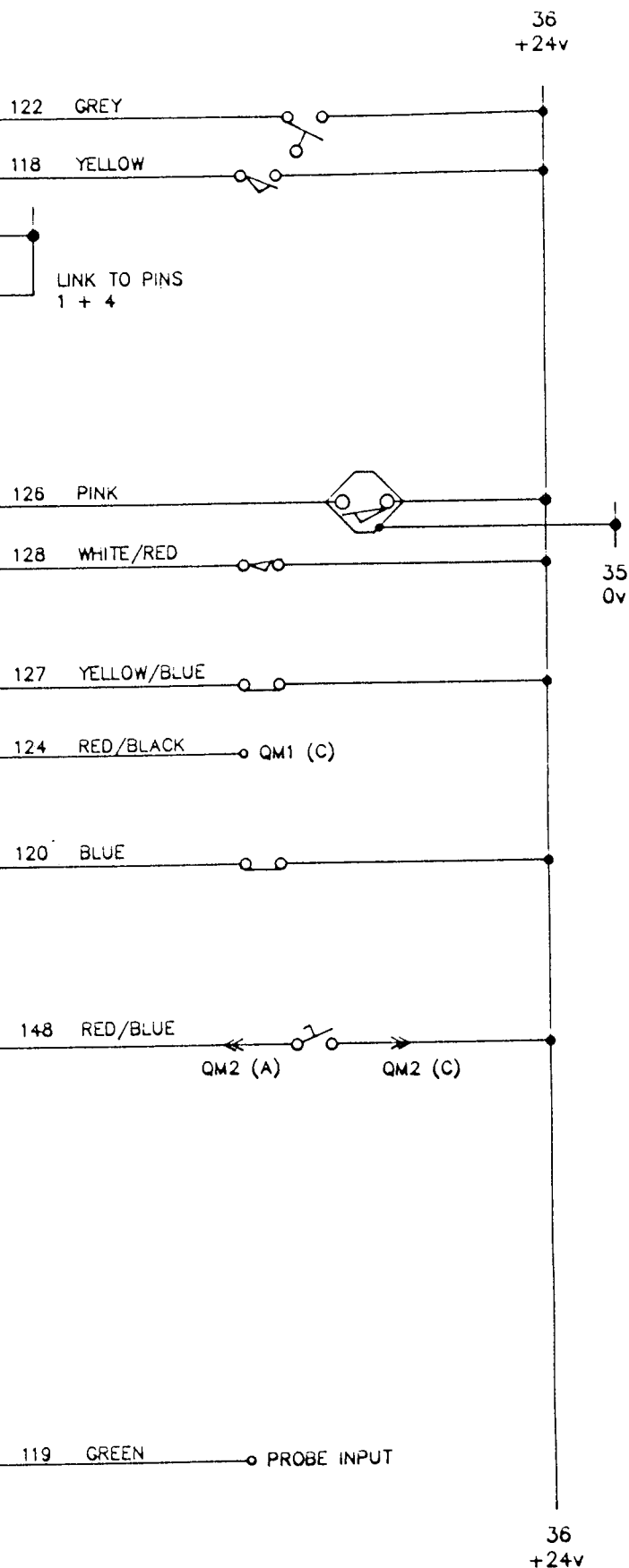
SHEET 18
[TF]

IF IN DOUBT ASK

M18 CONTROL INPUTS

50 WAY
FEMALE
HONDA
CONNECTOR

DESCRIPTION	BIT	PIN
AIR PRESSURE SWITCH	X04.5	26
CAROUSEL DOWN SWITCH	X06.0	27
	COM2	28
	COM3	29
		30
		31
		32
SPINDLE ORIENTATION SENSOR	X00.0	33
GUARD FULLY OPEN SWITCH	X00.2	34
	X00.4	35
SPINDLE MOTOR THERMAL	X00.7	36
AUX INPUT 1	X02.2	37
	X02.5	38
DRIVE TRANS THERMAL	X04.0	39
	X04.3	40
	X04.6	41
VICE OPEN FOOT SWITCH	X06.1	42
	X06.3	43
	X06.5	44
	X06.7	45
ZAE	X08.1	46
-MITX	X08.3	47
-MITZ	X08.5	48
SKIP	X08.7	49
		50



20 CORE SCREEN TO TERMINALS
CUT OUT
RED/BROWN
GREEN/RED
TURQUOISE

QM1 8 WAY SOCKET (AUXILIARIES)
QM2 8 WAY SOCKET (FOOT SWITCH)

TRIAC FANUC
M18
INPUTS (26-50)

SHEET 19
[TF]

IF IN DOUBT ASK

DENFORD MACHINE TOOLS LTD BRIGHOUSE WEST YORKSHIRE DRN BY A McHENRY DATE 25-8-95 TR4-20

TRIAC FANUC
M19
OUTPUTS

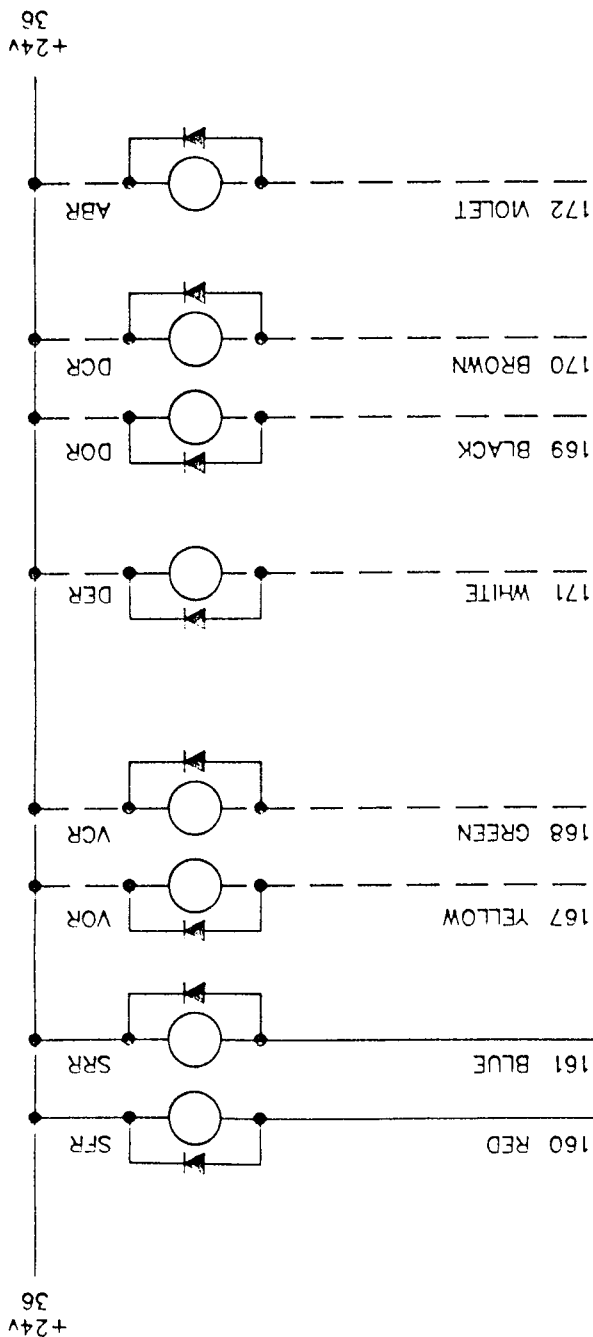
SHEET 20

[TF]

M19 20 WAY FEMALE
HONDA
CONNECTOR

8 CORE SCREEN

DESCRIPTION	BIT No	PIN No
	Y80.0	1
SPINDLE FORWARD	Y80.1	2
SPINDLE REVERSE	Y80.2	3
	Y80.3	4
VICE OPEN RELAY	Y80.4	5
VICE CLOSE RELAY	Y80.5	6
	Y80.6	7
	Y80.7	8
DRAWBAR EXHAUST RELAY	Y82.0	9
	Y82.1	10
DOOR OPEN RELAY	Y82.2	11
DOOR CLOSE RELAY	Y82.3	12
	Y82.4	13
AIR BLAST RELAY	Y82.5	14
	Y82.6	15
	Y82.7	16
		17
	0V	18
	0V	19
		20



CONTROL TO AXIS DRIVES

X AXIS

M184 TO CN1L

Y AXIS

M187 TO CN1M

Z AXIS

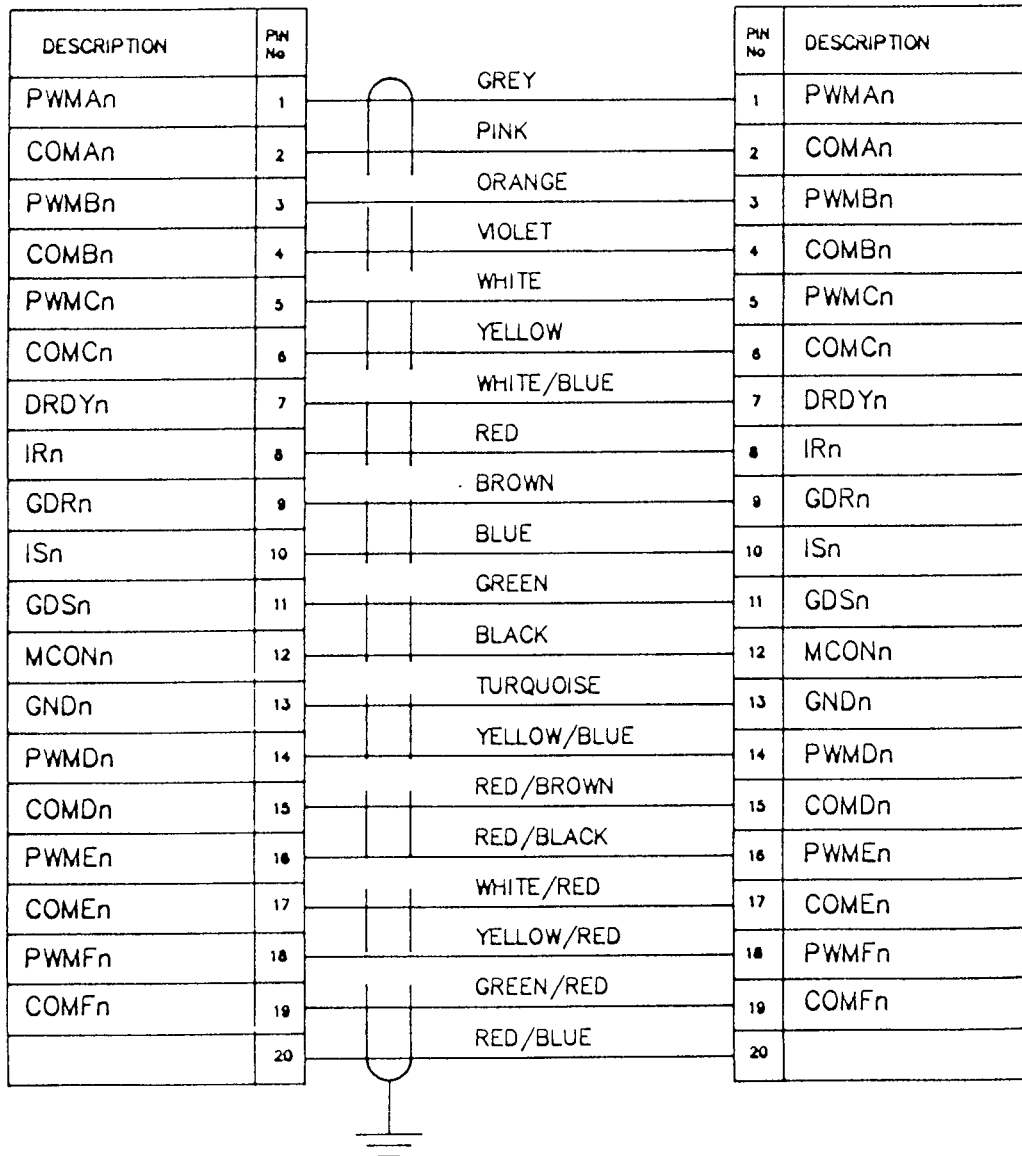
M194 TO CN1N

20 WAY MALE

HONDA CONNECTOR

20 WAY FEMALE

HONDA CONNECTOR



SCREEN AT

CONTROL END

20 CORE SCREEN

ALL COLOURS USED

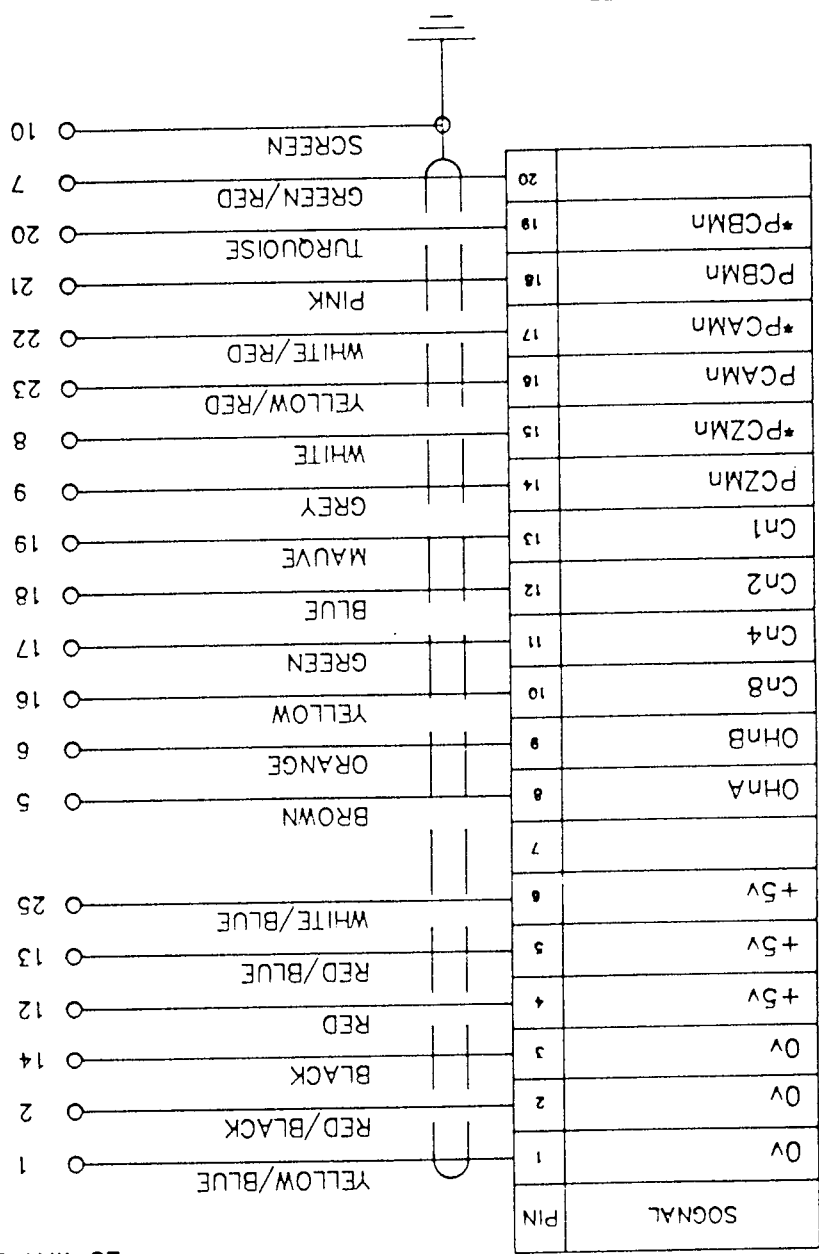
TRIAC FANUC

CONTROL TO AXIS

DRIVE SIGNALS

M184, M187, M194

AXIS MOTOR
ENCODER CONNECTOR
25 WAY D TYPE



MAIN PCB TO AXIS MOTORS

M185 X AXIS
M188 Y AXIS
M195 Z AXIS
M198 IV AXIS

20 CORE SCREEN
CUT OUT
RED/BROWN

TRIAC FANUC
AXIS MOTOR TO
CONTROL SIGNALS
M185, M188, M195

SHEET 22

[TF]

TR4-22A

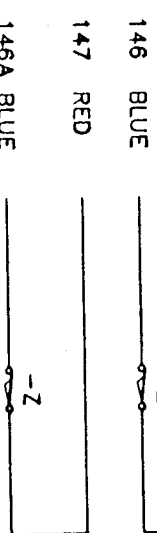
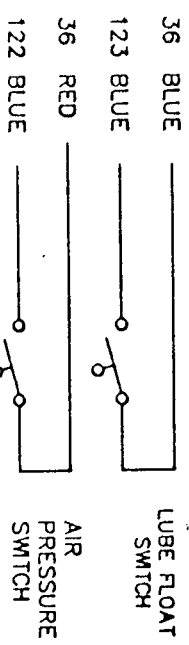
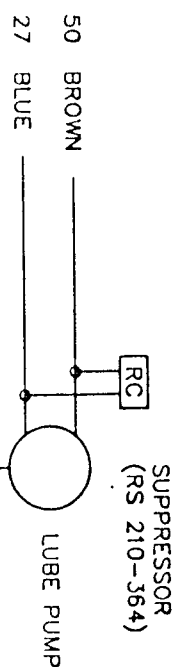
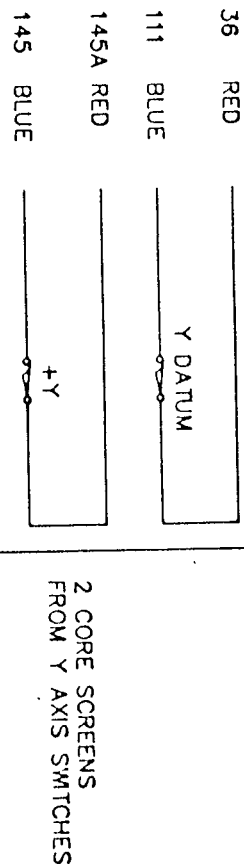
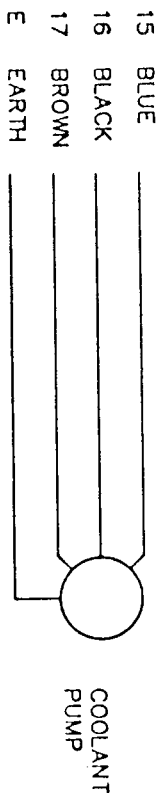
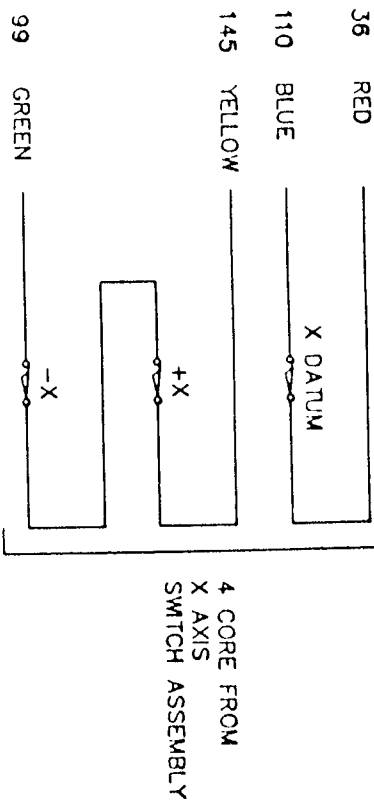
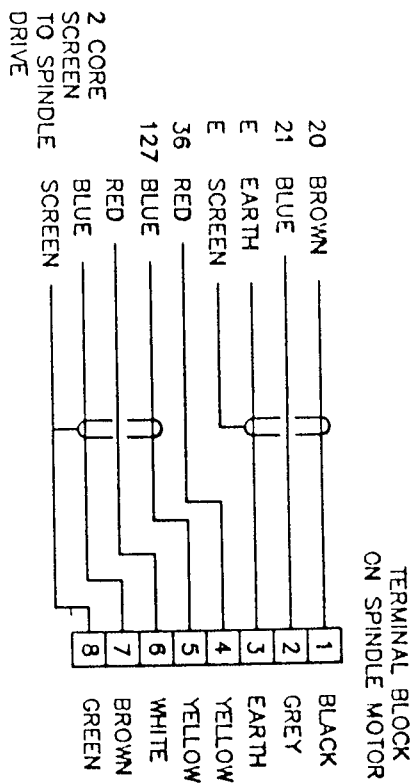
DATE 18-11-96

DRN BY A MCHENRY

WEST YORKSHIRE

BRIGHOUSE

DENFORD MACHINE TOOLS LTD



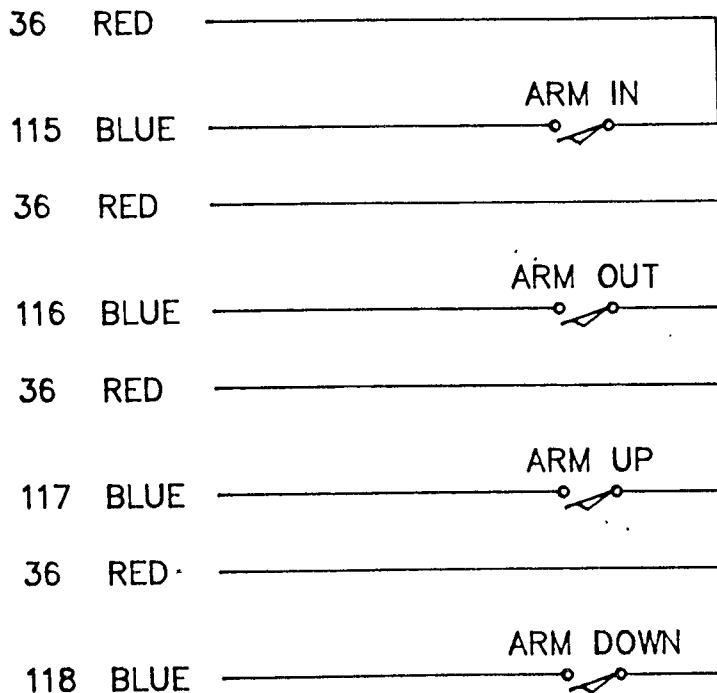
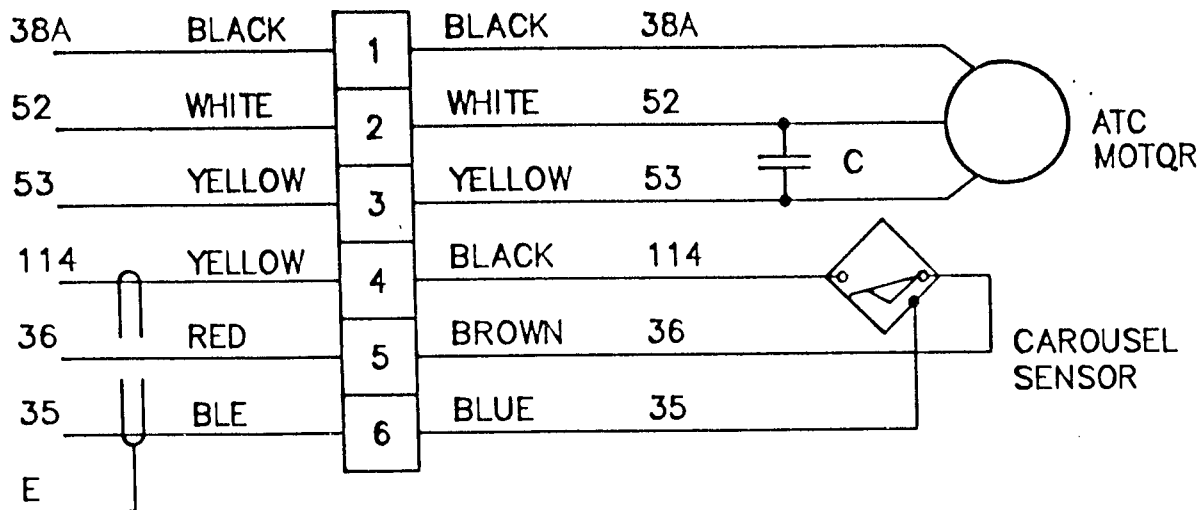
IF IN DOUBT ASK

TRIAC FANUC SPINDLE MOTOR AND SWITCH WIRING

SHEET 23
[TF]

6 WAY TERMINAL BLOCK
MOUNTED ON CAROUSEL

== CAPACITOR



IF IN DOUBT ASK

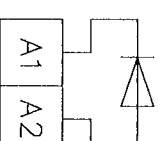
GUARD INTERLOCK
WITH SOLENOID

(REMOVE LINK 12 - 41)

GUARD
SWITCH
CONTACTS

148A	BLACK	11	12	BROWN	36
43	RED	21	22	YELLOW	44
36	GREEN	33	34	BLUE	180

GUARD
SOLENOID



183 35

WHITE VIOLET

DENFORD LIMITED

DATE 20-2-97

DRN BY A McHENRY

TR4-25

TRIAC FANUC
GUARD
INTERLOCK

SHEET 25
[TF]