SCR
MOTOR SPEED CONTROLS

CHALLENGER II SERIES

INSTRUCTION MANUAL

MODEL 665 & 675

SECO ELECTRONICS
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LANCASTER, SOUTH CAROLINA 29720
Phone: (803) 286-6927

DANA INDUSTRIAL
Seco DANA

JULY 12, 1983

1.0 GENERAL DESCRIPTION

The 665 and 675 motor controls provide speed control from zero RPM to normal motor speed for DC shunt wound or permanent magnet field motors elther 3 or 5 horsepower respectively. Standard features are: power on indication, start/stop interface, auxiliary "form C" run contact and tach feedback. Each control is identified by a model number and a serial number. These numbers should be referenced if it is necessary to consult the factory.

1.1 SPECIFICATIONS AND TECHNICAL DATA

1.1.1 MODEL 665

Input Voltage	230VAC, ±10%, 50/60Hz
Horsepower Rating	3 HP
Armature Voltage	0-180VDC
Field Voltage	200VDC at 1 AMP max
Speed Range	20 to 1
Speed Regulation (95% load change)	
1. Armature feedback mode	±2% of base speed
2. Tach feedback mode	±1% of base speed
Tachometer Input Voltage	7VDC/1000 RPM for 1750RPM Motor
Operating Temperature	0-55° C, SEE NOTE 2
Acceleration Rate	2.5-10 seconds
Current Limit	Range 0-150%
IR Compensation	Adjustable
Minimum Speed	0-20% of base speed
Maximum Speed	80-110% of base speed
Auxiliary Run Contact	1 AMP, 50 VAC

1.1.2 MODEL 675

Input Voltage	230VAC, ±10%, 50/60 Hz
Horsepower Rating	5 HP
Armature Voltage	0-180VDC
Field Voltage	200VDC at 1 AMP max.
Speed Range	20 to 1
Speed Regulation (95% load change)	
1. Armature feedback mode	±2% of base speed
2. Tach feedback mode	±1% of base speed
Tachometer Input Voltage	7VDC/1000RPM for 1750RPM Motor
Operating Temperature	0-55° C, SEE NOTE 2
Acceleration Rate	2.5 - 10 seconds
Current Limit	Range 0-150%
IR Compensation	Adjustable
Minimum Speed	0-20% of base speed
Maximum Speed	80-110% of base speed
Auxiliary Run Contact	1 AMP, 50 VAC

NOTES:
1. Wire size should be based upon local electrical codes.
2. For unit placed in enclosure, enclosure size should be sufficient to ensure temperature inside enclosure does not exceed 55° C.

Clockwise rotation of this adjustment increases the amount of feedback. If the feedback is too low, the motor speed will fall off as the motor load is increased. If the feedback is too high, the motor speed will increase as the motor load increases. If the feedback is extremely high, the system becomes unstable and pulsations result.

The actual IR compensation adjustment is made as follows:

With **NO LOAD** on the motor, apply power to the control and slowly increase the speed adjust potentiometer. The motor speed will increase as the potentiometer is turned. Set the speed control to approximately 900 RPM (about 50 on the dial). The motor will now be running smoothly. Measure the **NO LOAD** speed. Apply full load to the motor (retaining speed adjust setting-turn off power if necessary). If the motor speed drops, increase the IR compensation feedback until the unloaded speed is obtained.

In tachometer feedback mode I.R. compensation is not required and the I.R. comp. adjustment is disconnected from the control via the TACH/ARM switch.

4.0 DIAGRAMS

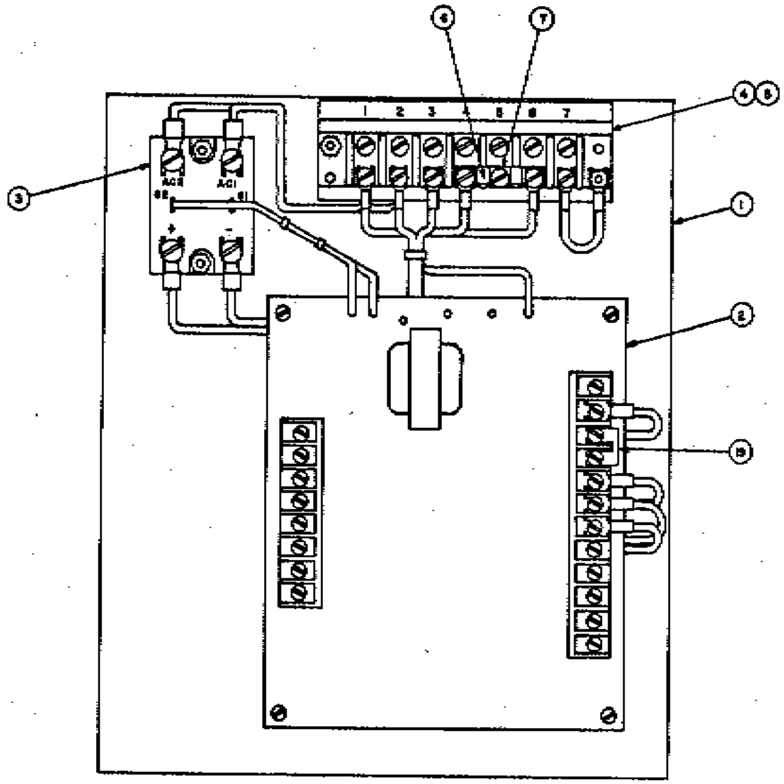
4.1 MODEL 665

Final Assembly	D35083
Mounting	C35085
Connection	C35084
Wiring	C35086
P.C. Board Assembly	D35115
Schematic of P.C. Board	D35087

4.2 MODEL 675

Final Assembly	D35083
Mounting	C35118
Connection	C35117
Wiring	C35119
P.C. Board Assembly	D35115
Schematic of P.C. Board	D35087

	REVISIONS		
ZONE LTR	DESCRIPTION	DATE	APPROVED



MODEL NUMBER	DASH NUMBER	HORSE POWER
665	-00	3
675	-01	5

-01	-00	ITEM	PART NUMBER	DESCRIPTION
1	1	19	PJU3001-00	JUMPER, TERMINAL STRIP
1		18	HLA1075-01	LABEL, MODEL 675
	1	18	HLA1075-00	LABEL, MODEL 665
1	1	17		WIRE LIST
4	4	16		EXT STAR WASHER #6
4	4	15		ROUND HD SCREW 6X32, 3/8
	4	14		FLAT HD SCREW 6X32, 1/2
	4	13		NUT 8 X 32
2	2	12		EXT STAR WASHER #8
2	2	11		SPLIT WASHER #8
2		10		ROUND HD SCREW 8X32, 7/8
	2	10		FLAT HD SCREW 8X32, 7/8
2		9		ROUND HD SCREW 8X32, 1/2
	2	9		FLAT HD SCREW 8X32, 1/2
4		8	HFA4006-01	STANDOFF
	4	8	HFA4009-00	STANDOFF
1	1	7	HHB1007-00	FILLISTER HEAD SCREW 6X32,5/16
1	1	6	PRE2006-00	SHUNT RESISTOR
1	1	5	HWA2057-07	MARKER STRIP, 7 POS.
1	1	4	HWA2021-05	TERMINAL STRIP, 7POS.
1		3	ATY4009-00	POWER MODULE
	1	3	ATY4008-00	POWER MODULE
1	1	2	WD35116-01	ASSY. P.C. BOARD
1		1	FCH3061-02	CHASSIS DRILLED PER C36120
	1	1	FCH1060-01	CHASSIS DRILLED PER C35082

QUANTITY PER ASSEMBLY — ASSEMBLY DASH NUMBER

NEXT ASSY | USED ON — APPLICATION

MAT'L

FINISH

DRAWN BY JTB 8-30-82

CHECKED BY 9-13-82

SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.

TITLE ASSEMBLY-FINAL MODELS 665 & 675

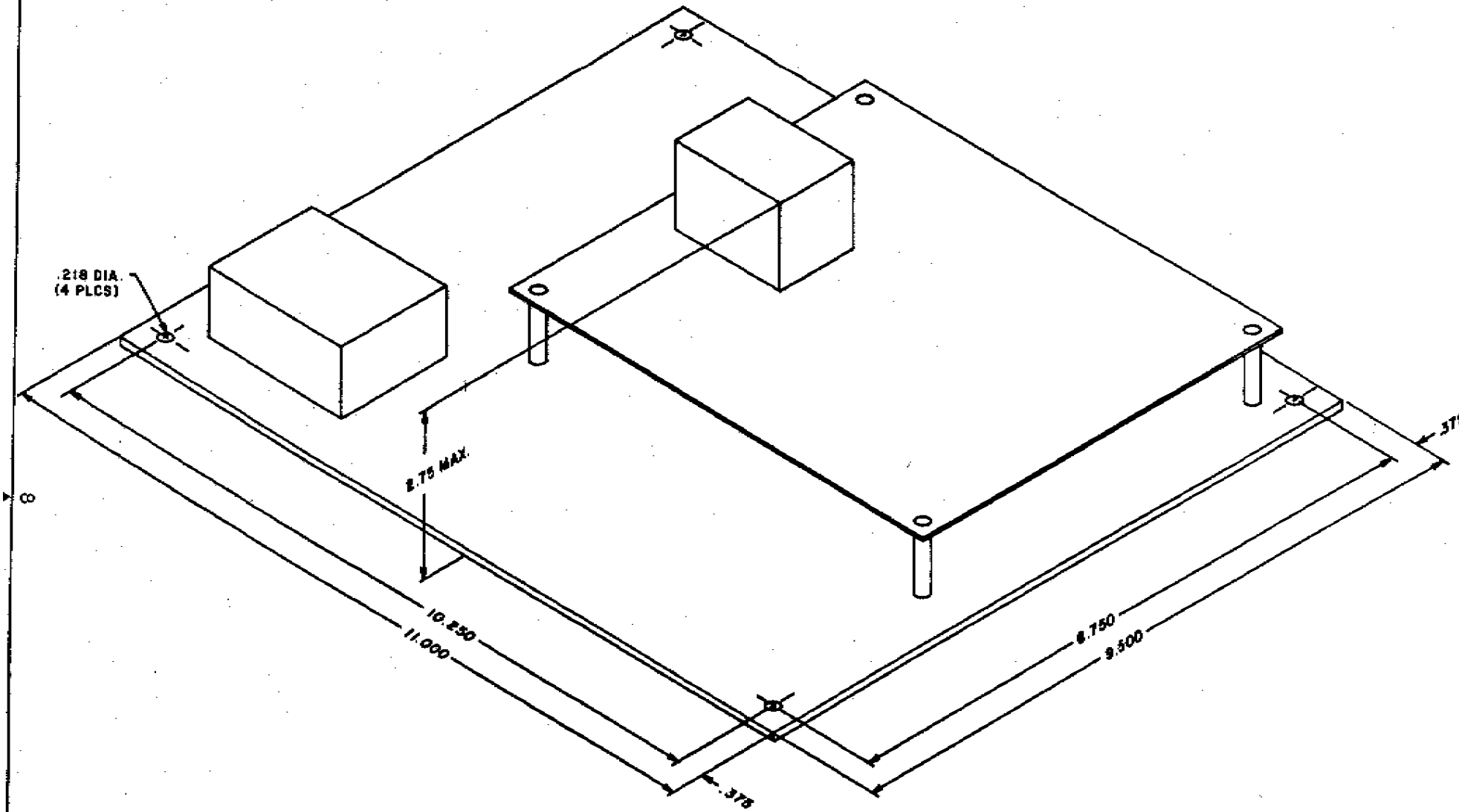
SIZE D DRAWING NO. D35083

SCALE | SHEET 1 OF 1

NOTES:

1. REF. CONNECTION DIAG. C35084 FOR MODEL 665.
   REF. CONNECTION DIAG. C35117 FOR MODEL 675.
2. APPLY SILICONE COMPOUND BETWEEN POWER MODULE & CHASSIS.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



1. REF. CONNECTION DIAG. C35084

NOTES:

QUANTITY PER ASSEMBLY	ITEM	PART NUMBER	DESCRIPTION
ASSEMBLY DASH NUMBER			
		MAT'L	
		FINISH	
NEXT ASSY.	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ± ANGLES ± 2 PLACE DECIMALS ±

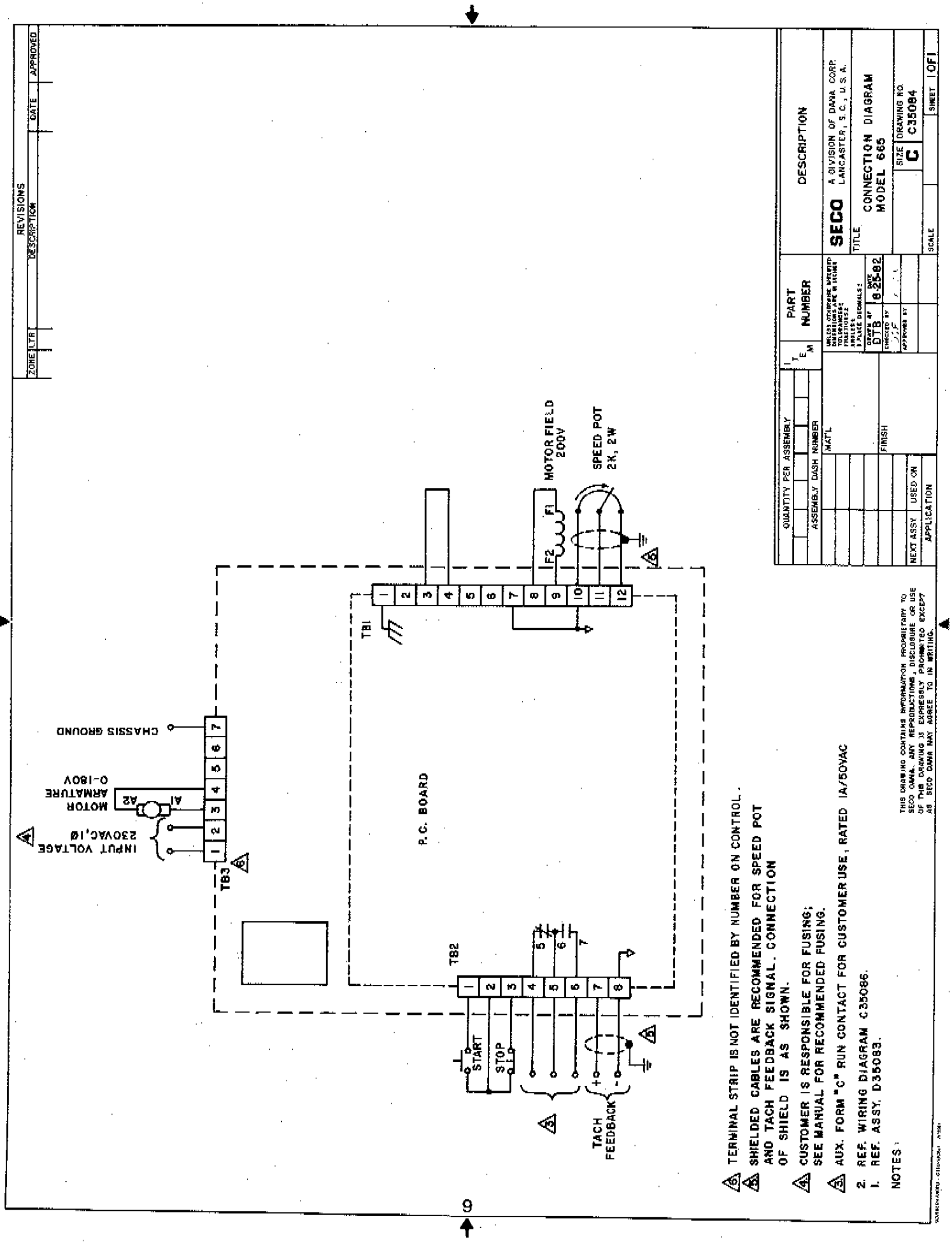
DRAWN BY	DATE
DTB	8-5-82
CHECKED BY	
DSF	8-5-82
APPROVED BY	

SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.

TITLE: MOUNTING DIMENSIONS MODEL 665

SIZE C | DRAWING NO. C35085

SCALE | SHEET 1 OF 1


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
DESCRIPTION
SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.
TITLE CONNECTION DIAGRAM MODEL 665
SIZE C DRAWING NO C35084
SHEET 1 OF 1
QUANTITY PER ASSEMBLY
ASSEMBLY DASH NUMBER
PART NUMBER
MATL
FINISH
NEXT ASSY USED ON
APPLICATION
DRAWN BY DTB 8-25-92
CHECKED BY
APPROVED BY
SCALE
MOTOR FIELD 200V
SPEED POT 2K, 2W
F1
F2
TB1
TB2
TB3
P.C. BOARD
CHASSIS GROUND
INPUT VOLTAGE 230VAC,1Ø
MOTOR ARMATURE 0-180V
A1
A2
START
STOP
TACH FEEDBACK
TERMINAL STRIP IS NOT IDENTIFIED BY NUMBER ON CONTROL.
SHIELDED CABLES ARE RECOMMENDED FOR SPEED POT AND TACH FEEDBACK SIGNAL. CONNECTION OF SHIELD IS AS SHOWN.
CUSTOMER IS RESPONSIBLE FOR FUSING; SEE MANUAL FOR RECOMMENDED FUSING.
AUX. FORM "C" RUN CONTACT FOR CUSTOMER USE, RATED 1A/50VAC
2. REF. WIRING DIAGRAM C35086.
1. REF. ASSY. D35083.
NOTES:
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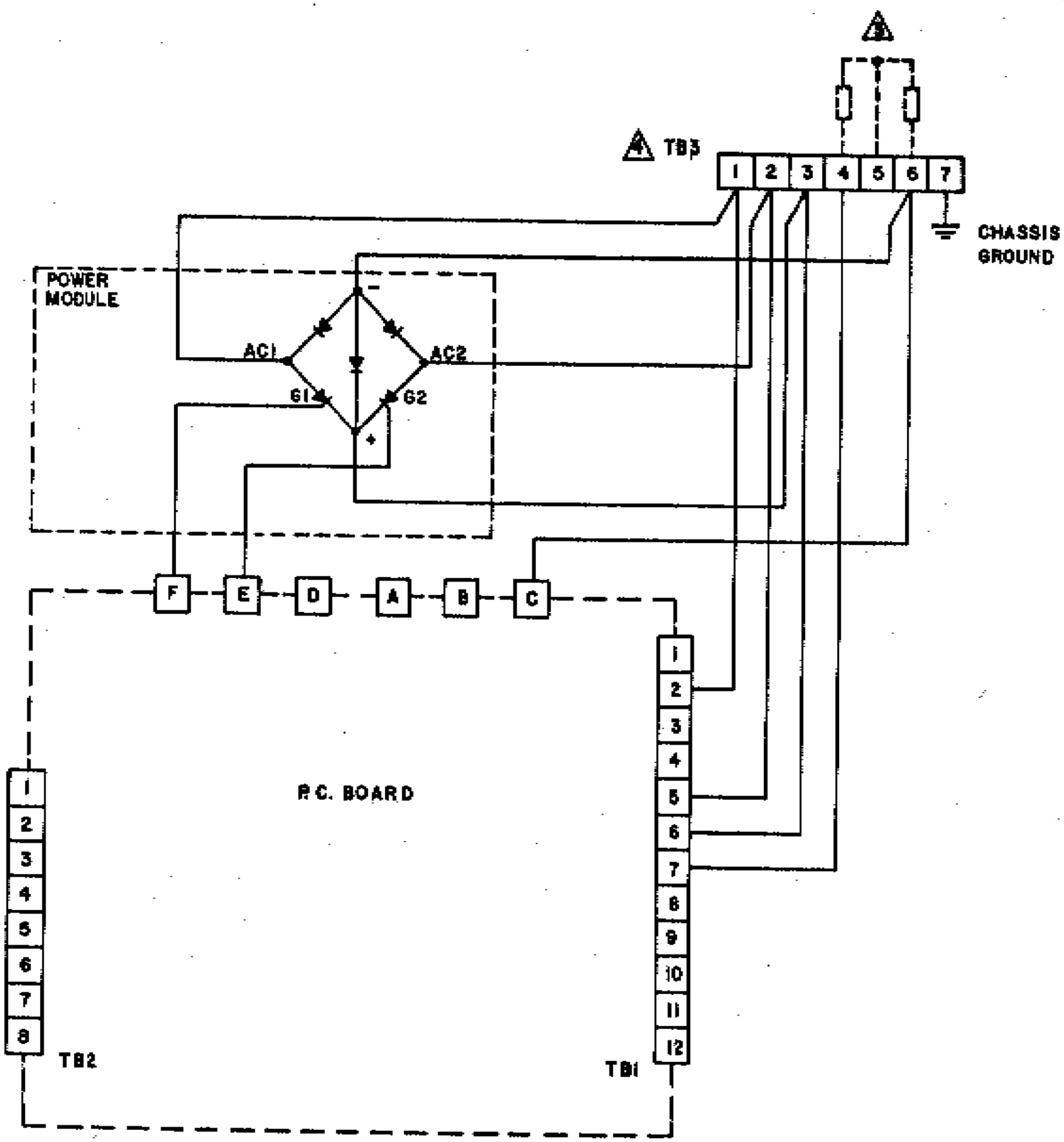
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



NOTES:

1. REF. ASSY. D35083.
2. REF. CONNECTION C35084.
3. (△3) CURRENT SHUNT RESISTOR LOCATED ON TERMINAL STRIP; TERMINALS 4,5 AND 6.
4. (△4) TERMINAL STRIP IS NOT IDENTIFIED BY NUMBER ON CONTROL.

QUANTITY PER ASSEMBLY	ITEM	PART NUMBER	DESCRIPTION
ASSEMBLY DASH NUMBER			
MAT'L			
FINISH			
NEXT ASSY. / USED ON			
APPLICATION			

SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.

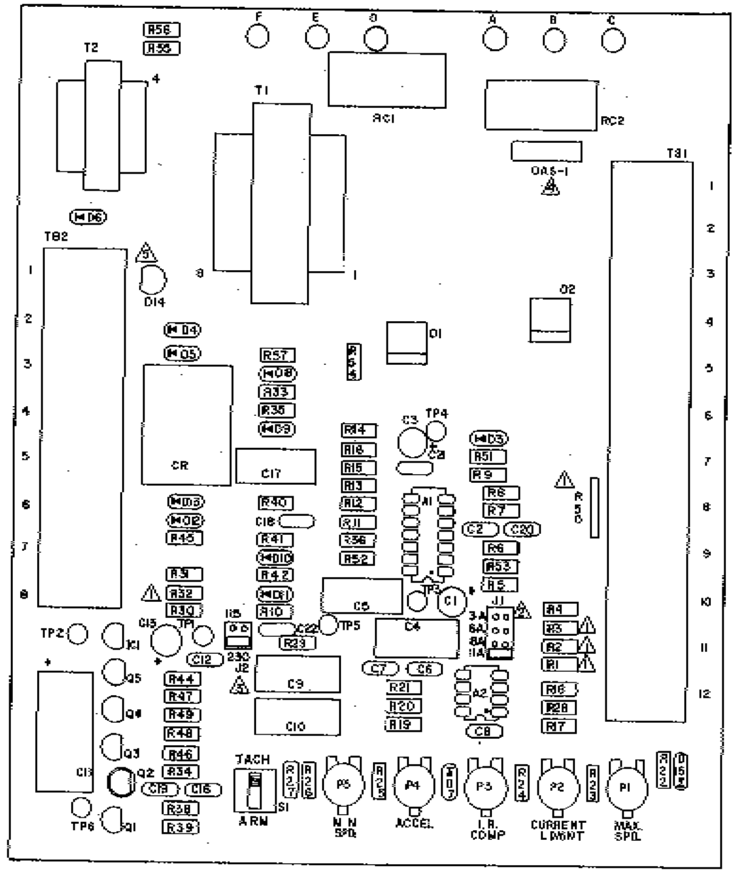
TITLE: WIRING DIAGRAM MODEL 665

DRAWN BY	DATE
DTB	8-20-82
CHECKED BY: DSF	8-26-82
APPROVED BY	

SIZE | DRAWING NO. C35086 | SCALE | SHEET 1 OF 1

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ECO 1065	12-9-82	
	B	ECO 1111	5-12-83	OSF
	C	ECO 1122	6-2-83	DSF



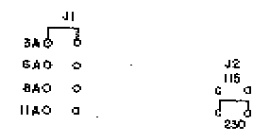

DETAIL A DETAIL B

TABLE I

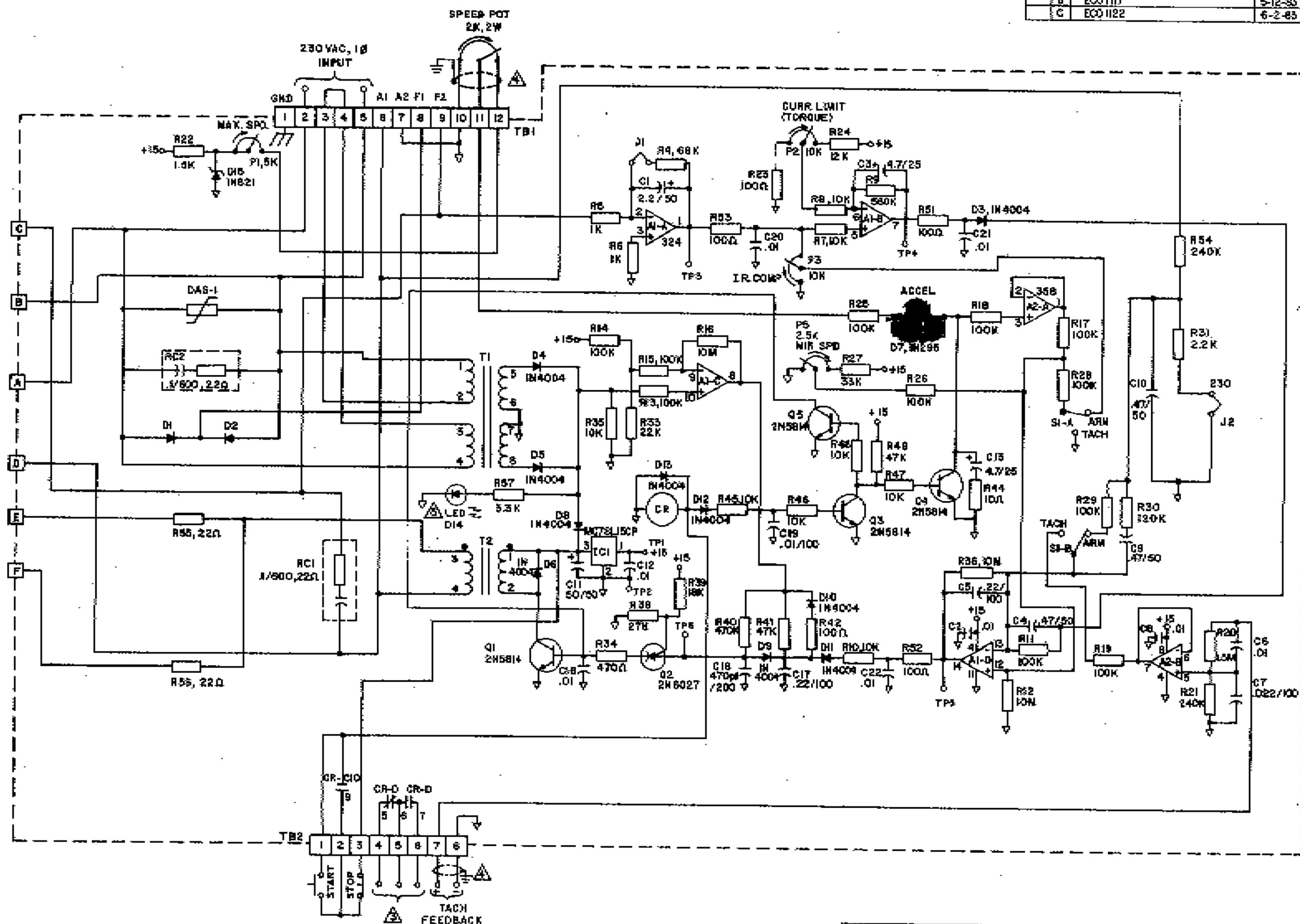
MODEL NUMBER	ASSY DASH NUMBER	SCHEMATIC DWG. NUMBER
655	-00	D35121
665	-01	D35087
675	-01	D35087

NOTES:
1. AC VOLTAGE "ON" INDICATION.
2. LEADS ON DAS-1 TO BE INSULATED.
3. FOR ASSY.-01, JUMPER J2 IS HARDWIRED PER DETAIL "B".
4. FOR ASSY.-01, JUMPER J1 IS HARDWIRED PER DETAIL "A".
5. THE FOLLOWING PARTS ARE NOT REQUIRED ON THE -01 ASSY.: R1, R2, R3, R32 AND R50.

REF. SEE A35115 FOR BILL OF MATERIALS

SECO — A DIVISION OF DATA CORP. LANCASTER, S.C., U.S.A.
TITLE: ASSEMBLY, PC BOARD MODELS 655, 665 AND 675
DRAWN BY: SDC DATE: 8-25-82
SIZE: D DRAWING NO.: D35115

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ECO 1101A	4-25-83	DSF
	B	ECO 1111	5-12-83	DSF
	C	ECO 1122	6-2-83	DSF



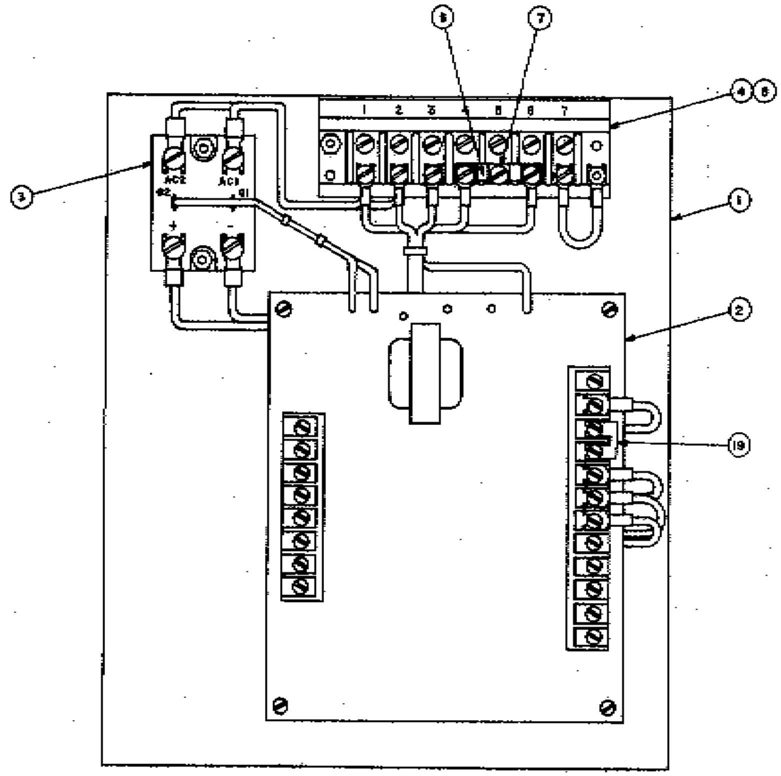
NOTES:
1. REF. P.C. BOARD ASSY. D35118.
2. □ DENOTES P.C. BOARD WIRE HOLES.
3. AUX. FORM "C" RUN CONTACT, RATED 1A/30VAC
4. SHIELDED CABLES ARE RECOMMENDED FOR SPEED POT AND TACH FEEDBACK SIGNAL. CONNECTION OF SHIELD IS AS SHOWN.
5. A.C. VOLTAGE "ON" INDICATION.

SECO
A DIVISION OF DANA CORP.
LANCASTER, S.C., U.S.A.

TITLE: SCHEMATIC, PRINTED CIRCUIT BOARD, MODELS 665 & 675

SIZE D DRAWING NO. D35087 SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



MODEL NUMBER	DASH NUMBER	HORSE POWER
665	-00	3
675	-01	5

Qty -01	Qty -00	ITEM	PART NUMBER	DESCRIPTION
1	1	19	PAU3001-00	JUMPER, TERMINAL STRIP
1	/	18	HLA1075-01	LABEL, MODEL 675
/	1	18	HLA1075-00	LABEL, MODEL 665
1	1	17	A4248	WIRE LIST
4	4	16		EXT STAR WASHER #6
4	4	15		ROUND HD SCREW 6X32, 3/8
/	4	14		FLAT HD SCREW 8X32, 1/2
/	4	13		NUT 8X32
2	2	12		EXT STAR WASHER #8
2	2	11		SPLIT WASHER #8
2	/	10		ROUND HD SCREW 8X32, 7/8
/	2	10		FLAT HD SCREW 8X32, 7/8
2	/	9		ROUND HD SCREW 8X32, 1/2
/	2	9		FLAT HD SCREW 8X32, 1/2
4	/	8	HFA4005-01	STANDOFF
/	4	8	HFA4009-00	STANDOFF
1	1	7	HMB1007-00	FILLISTER HEAD SCREW 8X32, 5/8
1	1	6	PRE2006-00	SHUNT RESISTOR
1	1	5	HWA2057-07	MARKER STRIP, 7 POS.
1	1	4	HWA2025-06	TERMINAL STRIP, 7POS.
1	/	3	ATY4009-00	POWER MODULE
/	1	3	ATY4008-00	POWER MODULE
1	1	2	WD3511B-01	ASSY. P.C. BOARD
1	/	1	FCH1061-02	CHASSIS DRILLED PER C35120
/	1	1	FCH1060-01	CHASSIS DRILLED PER C35082

QUANTITY FOR ASSEMBLY / ASSEMBLY DASH NUMBER

NOTES:

1. REF. CONNECTION DIAG. C35084 FOR MODEL 665.
   REF. CONNECTION DIAG. C35117 FOR MODEL 675.
2. APPLY SILICONE COMPOUND BETWEEN POWER MODULE & CHASSIS.

NEXT ASSY	USED ON
APPLICATION	
FINISH	
DRAWN BY: DTS	DATE: 6-10-82
CHECKED BY: DSF	7-Ja-82

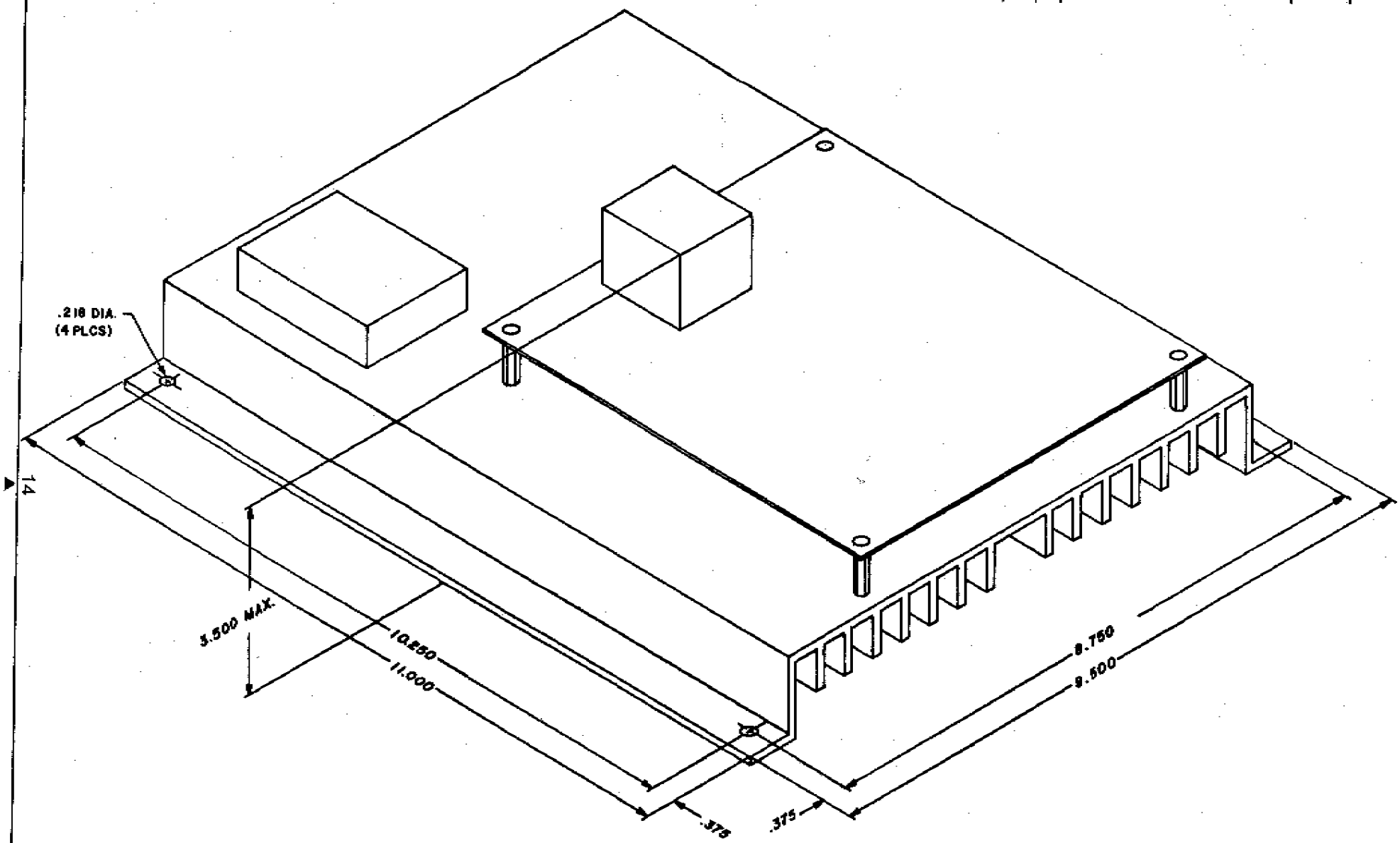
SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.

TITLE: ASSEMBLY - FINAL MODELS 665 & 675

SIZE: D DRAWING NO. D35083

SCALE | SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



1. REF. CONNECTION DIAG. C35117.

NOTES:

QUANTITY PER ASSEMBLY	ITEM	PART NUMBER	DESCRIPTION
ASSEMBLY DASH NUMBER			
		MAT'L	
		FINISH	
NEXT ASSY. USED ON			
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR ± 2 PLACE DECIMAL ±

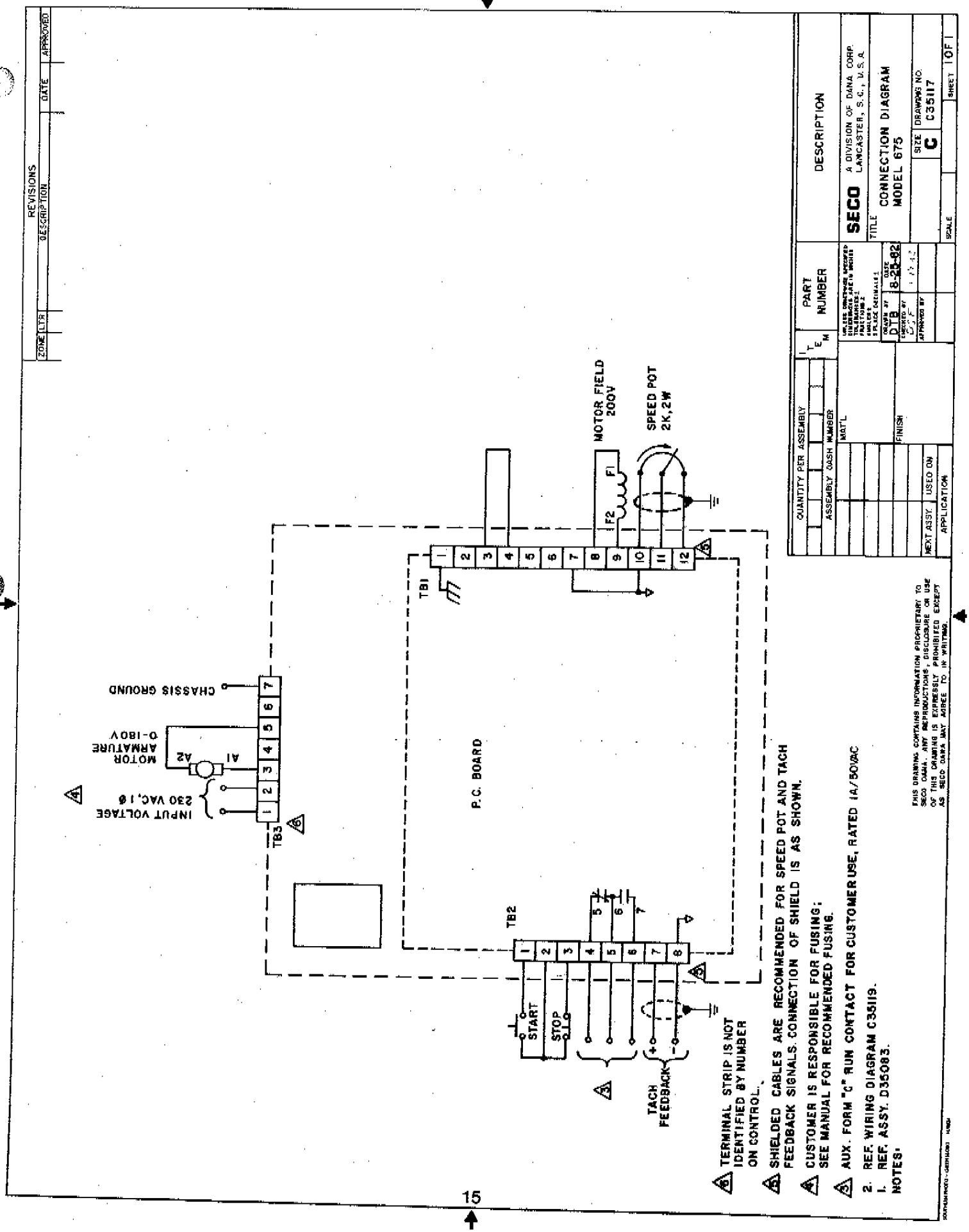
DRAWN BY	DATE
DTB	8-10-82
CHECKED BY	
DSF	1-10-83
APPROVED BY	

SECO A DIVISION OF DANA CORP. LANCASTER, S. C., U. S. A.

TITLE: MOUNTING DIMENSIONS MODEL 675

SIZE C | DRAWING NO. C35118

SCALE FULL | SHEET 1 OF 1


REVISIONS
ZONE LTR
DESCRIPTION
DATE
APPROVED
DESCRIPTION
SECO
A DIVISION OF DANA CORP.
LANCASTER, S.C., U.S.A.
TITLE
CONNECTION DIAGRAM
MODEL 675
SIZE
C
DRAWING NO.
C35117
SHEET 1 OF 1
SCALE
QUANTITY PER ASSEMBLY
ITEM
PART NUMBER
ASSEMBLY DASH NUMBER
MATL
FINISH
NEXT ASSY
USED ON
APPLICATION
MOTOR FIELD 200V
SPEED POT 2K,2W
F1
F2
TB1
TB2
TB3
P.C. BOARD
CHASSIS GROUND
INPUT VOLTAGE 230 VAC, 1 Ø
MOTOR ARMATURE 0-180V
A1
A2
START
STOP
TACH FEEDBACK
+
-
TERMINAL STRIP IS NOT IDENTIFIED BY NUMBER ON CONTROL.
SHIELDED CABLES ARE RECOMMENDED FOR SPEED POT AND TACH FEEDBACK SIGNALS. CONNECTION OF SHIELD IS AS SHOWN.
CUSTOMER IS RESPONSIBLE FOR FUSING; SEE MANUAL FOR RECOMMENDED FUSING.
AUX. FORM "C" RUN CONTACT FOR CUSTOMER USE, RATED 1A/30VAC
2. REF. WIRING DIAGRAM C35119.
1. REF. ASSY. D35083.
NOTES:
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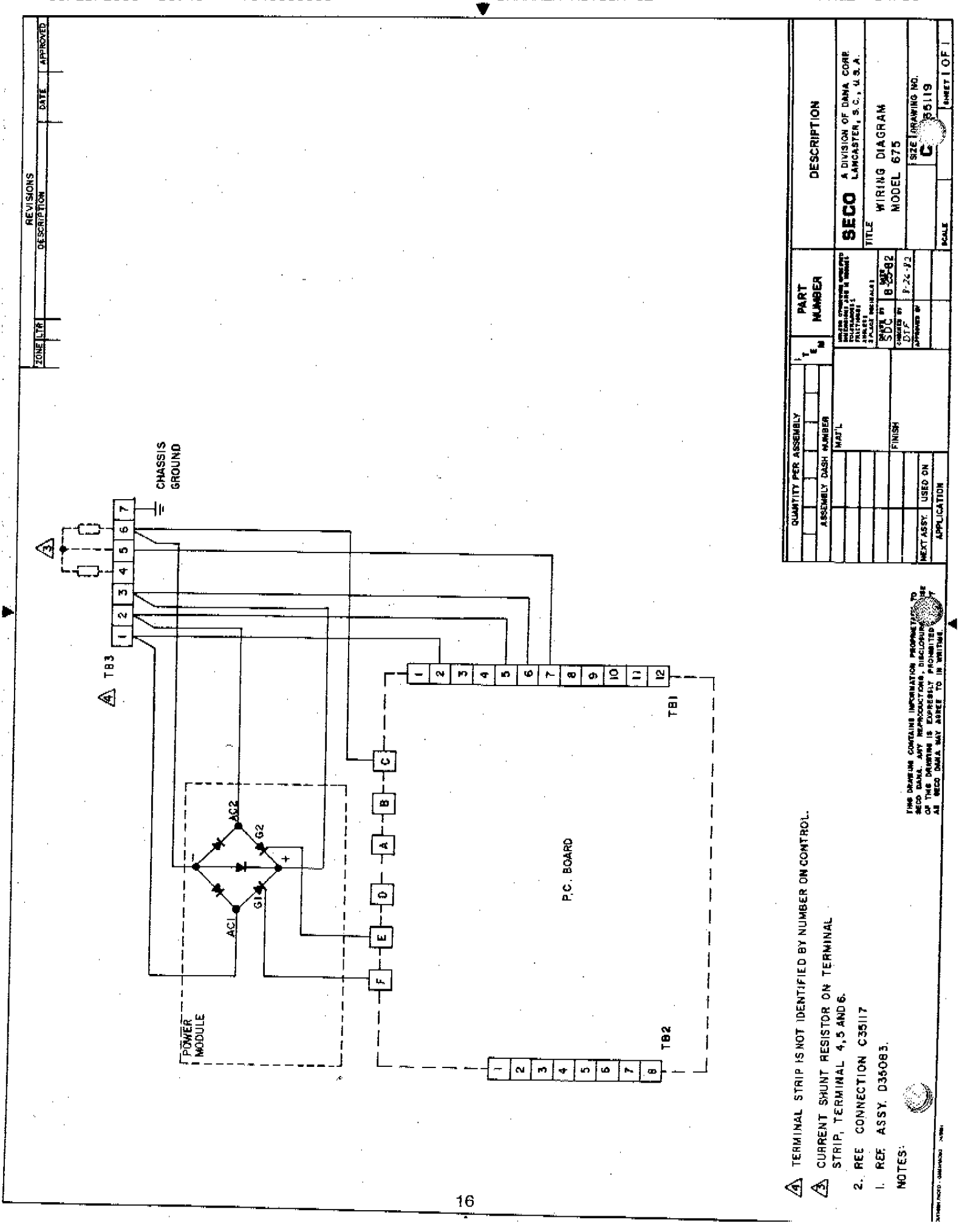

NOTES:

1. REF ASSY. D35083.
2. REF CONNECTION C35117
3. CURRENT SHUNT RESISTOR ON TERMINAL STRIP, TERMINAL 4,5 AND 6.
4. TERMINAL STRIP IS NOT IDENTIFIED BY NUMBER ON CONTROL.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
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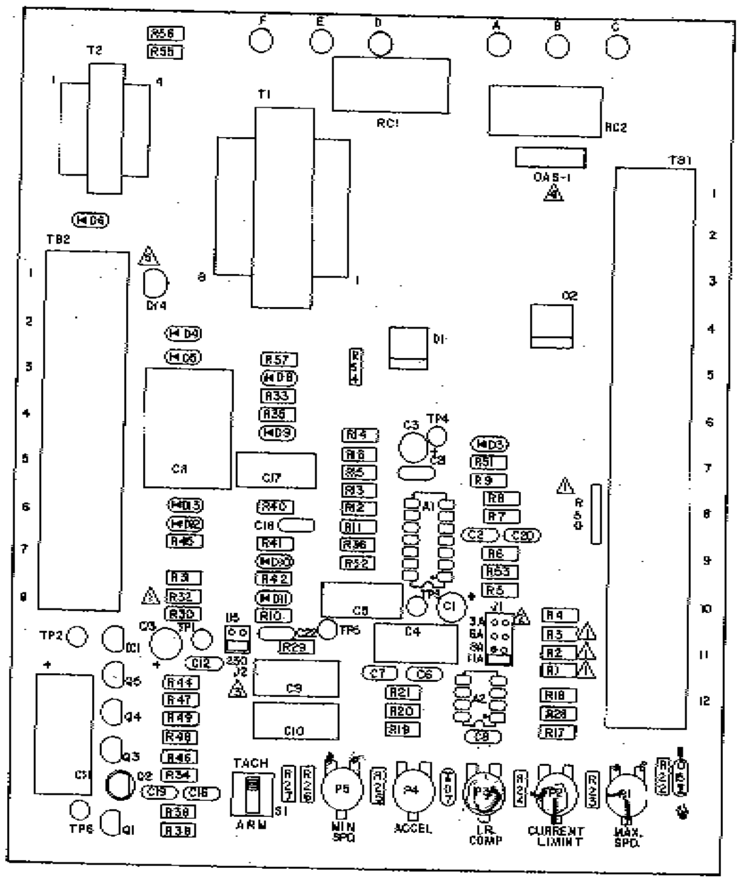
	B	ECO1111	5-12-83	DSF
	C	ECO1122	6-2-83	DSF



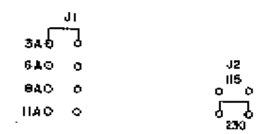

DETAIL A DETAIL B

TABLE 1		
MODEL NUMBER	ASSY DASH NUMBER	SCHEMATIC DWG. NUMBER
655	-00	D35121
665	-01	D35087
675	-01	D35087

NOTES:

1. A.C. VOLTAGE "ON" INDICATION.
2. LEADS ON OAS-1 TO BE INSULATED.
3. FOR ASSY. -01, JUMPER J2 IS HARDWIRED PER DETAIL "B".
4. FOR ASSY -01, JUMPER J1 IS HARDWIRED PER DETAIL "A".
5. THE FOLLOWING PARTS ARE NOT REQUIRED ON THE -01 ASSY.: R1, R2, R3, R32 AND R50.

REF. SEE A35115 FOR BILL OF MATERIALS

QUANTITY PER ASSEMBLY	ITEM	PART NUMBER	DESCRIPTION
ASSEMBLY DASH NUMBER			

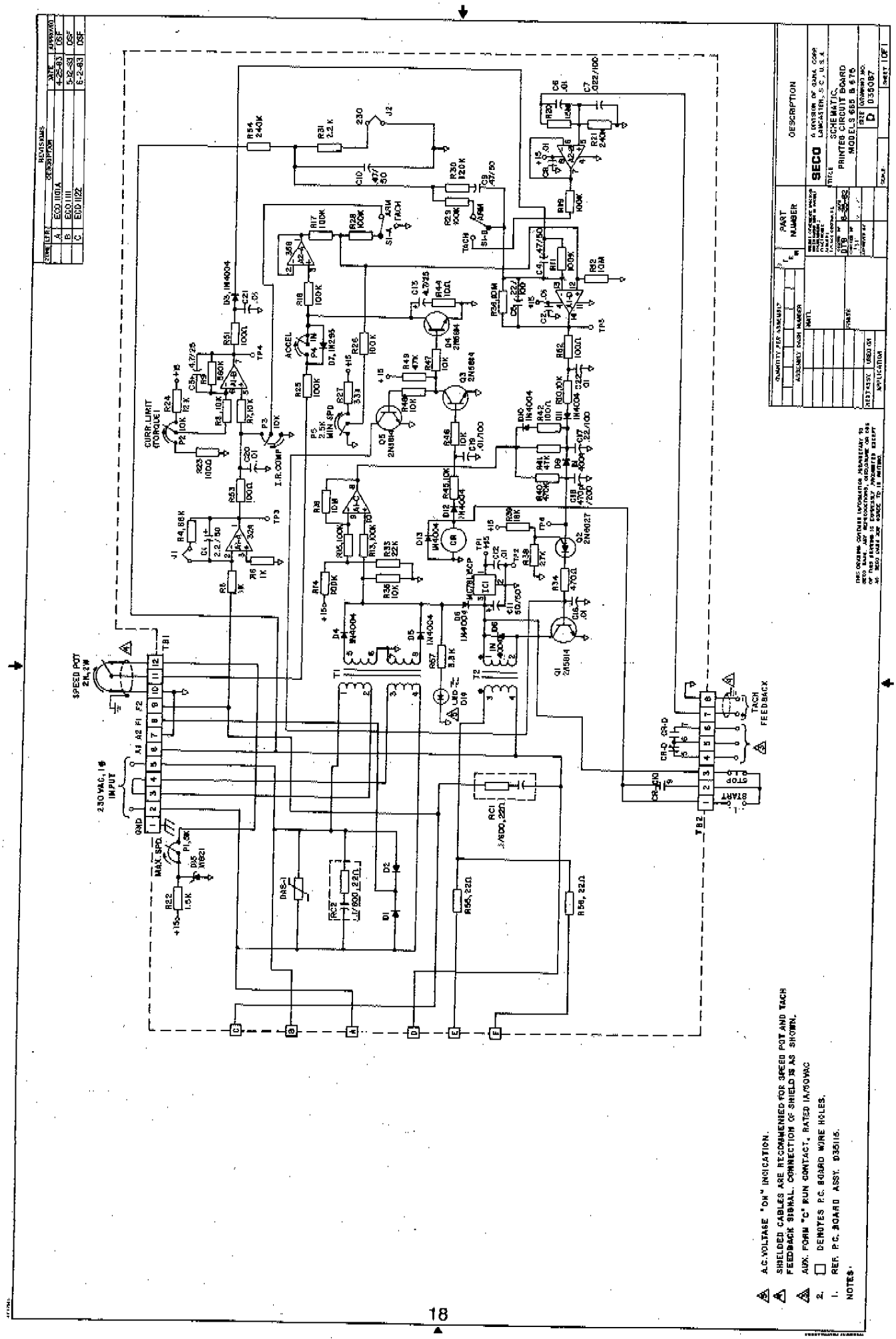
SECO A DIVISION OF DANA CORP. LANCASTER, S.C., U.S.A.

TITLE ASSEMBLY, PC BOARD MODELS 655, 665 AND 675

SIZE D DRAWING NO. D35115

DRAWN SDC 8-25-82

MAT'L / FINISH / NEXT ASSY / USED ON / APPLICATION / SCALE / SHEET



NOTES:

1. REF. P.C. BOARD ASSY. 035115.
2. □ DENOTES P.C. BOARD WIRE HOLES.
AUX. FORM "C" RUN CONTACT, RATED 1A/250VAC
SHIELDED CABLES ARE RECOMMENDED FOR SPEED POT AND TACH FEEDBACK SIGNAL. CONNECTION OF SHIELD IS AS SHOWN.
A.C. VOLTAGE "ON" INDICATION.