

# DIGITAL BUSHEL COUNTER

This Digital Bushel Counter displays a dryer's output in bushels on a digital readout mounted on the ASC control panel. The counter may also be configured to count the number of batches unloaded from a batch type dryer.

The counter is available in field installed or factory installed versions for all Farm Fans dryer models listed below (does not include the 'R' series). Factory installed versions include a shutdown feature which can be set to stop the dryer at a predetermined number of bushels or batches.

COUNTER VERSIONS PART NUMBER & DESCRIPTION
<b>DGCTR-CFABL-FCT</b> Factory installed CF/AB-400, 460, 510 & 600
<b>DGCTR-CFABS-FCT</b> Factory installed CF/AB- 150, 190, 270 & 320
<b>DGCTR-FCT</b> Factory installed CF/SA, C2100A, C2100B, H and M series
<b>DGCTR-FLD *</b> Field installed CF/AB-400 - 600, CF/SA, C2100A, C2100B, H and M
<b>DGCTR-CFABS-FLD *</b> Field installed CF/AB-150, 190, 270 and 320
* NOTE: Shutdown feature is not included with the field installed kits.

## FUNCTION

The counter receives pulse signals from the meter roll proximity switch and multiplies this number by a scaling number. The result is displayed on the counter as the number of bushels discharged, or, in the batch counter configuration, the number of batches dried. The factory installed option also includes the provision to have the dryer stop operating when a predetermined number of bushels or batches has been dried. This feature may be useful to stop the dryer before a storage bin becomes full.

## KEY DEFINITIONS

- 1. Present Value display:** Current number of bushels or batches dried. See Fig. 1 for button and display locations.
- 2. Set Value display:** The count value at which the dryer will shut down. Important note: The counter

display should always display SET 1 in the lower left hand corner of the display. The Set Value is only used for the factory installed automatic shutdown feature.

- 3. Reset key:** Resets the count display to zero
- 4. Mode key:** Used to program the counter
- 5. Display key:** Selects set point 1 or 2, shown in the lower left corner of the digital readout area. Set point 1 should ALWAYS be displayed.
- 6. Keys 1 to 6:** Used to enter a Set-Value Count. Keys 1 to 6 increase the corresponding digits: key 1 changes 1st digit, key 2 changes 2nd digit, etc.
- 7. OUT1 display:** Displays "OUT 1" when the actual count value has exceeded the set point value.

## OPERATION

The factory installed counter option is shipped with the counter set to display the number of bushels dried. The automatic shutdown feature of the counter is shipped disabled.

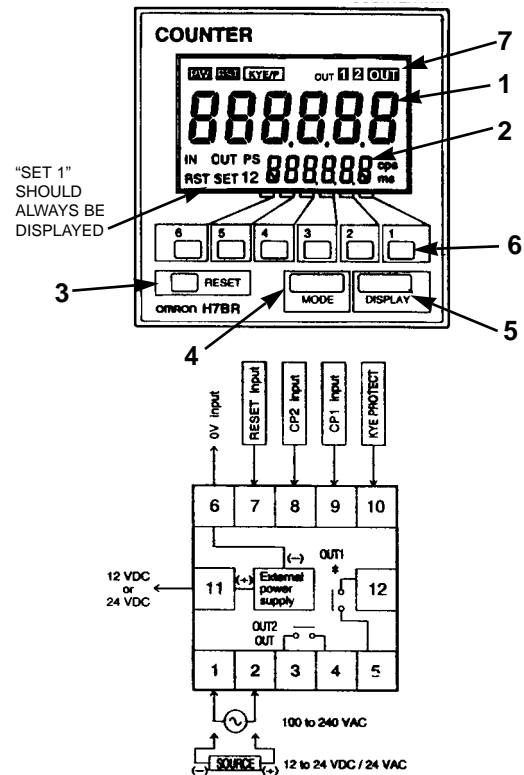


Fig. 1 Digital counter

## BUSHEL COUNTER OPERATION

As the dryer unloads, the counter will increment by the number of bushels discharged in one meter-roll revolution. This value is displayed in the Present Value location on the counter. To reset or clear the count value, press the counter's Reset button.

## BATCH COUNTER OPERATION

If the counter has been configured for counting batches, the count value will increment by one each time the dryer starts to unload. This value is displayed in the Present Value location on the counter. To reset or clear the count value, press the counter's Reset button.

## AUTOMATIC SHUTDOWN OPERATION (Factory installed counters only)

The counter's Automatic Shutdown feature is shipped from the factory disabled. The feature is enabled by removing a jumper in the control circuit. See the appropriate dryer's schematic later in this bulletin for the location of this jumper.

**ENTERING A SHUTDOWN SETPOINT:** Using keys 1 through 6, enter the number of bushels or batches to be dried. Each key changes a single digit. Pressing a key increases the digit by one; when the changing digit is nine, pressing the key once more advances it to zero. Be sure SET 1 is displayed in the lower left corner of the display. If this is not displayed, the automatic shutdown will not occur. Press the Display key if SET 1 is not displayed.

The dryer will operate until the current value equals or exceeds the set point value. When the count is exceeded, the dryer will stop operating. No failure indicator lights will be displayed on the dryer. The letters OUT1 will be displayed on the top right side of the display. This means that the counter has shut the dryer down because the current count value exceeded the set point.

The Set-Value may be changed at any time. To avoid an accidental shutdown when changing the set point, set digit 6 to a nine and the change the remaining digits to the desired set-point. Once set, return digit 6 back to the original value.

## TESTING THE SHUTDOWN FEATURE

1. Enter 6.0 as the set point value
2. Press the Reset button to zero the count
3. Turn the dryer's unloading circuit ON
4. Every time the target on the metering roll monitor passes in front of the meter roll proximity switch, the count value should increment. When the value equals or exceeds the set point of 6.0, the dryer should stop operating.

## BUSHEL COUNTER SCALING VALUES

The counter is programmed and wired from the factory to count the number of bushels. The counter uses a scaling number to convert the number of pulses from the proximity switch into the number of bushels. This value is different for every model of dryer. This value must be equal to 1 if the counter is used as a batch counter.

## CHANGING THE SCALING NUMBER

1. Press the Mode button until the letters PS appear in the middle to left portion of the display.
2. Compare the value displayed to the Scaling Number Chart. If the value is incorrect for your model dryer, use the 1 through 6 keys to change the value.
3. Press the Display key to return to the main operating display.

## SCALING NUMBERS

		4" Meter-roll	7" Meter-roll
Model	Length	Scaling #	Scaling #
CFAB-150	8	1.071	2.159
CFAB-190	10	1.339	2.699
CFAB-270	12	1.607	3.239
CFAB-320	14	1.875	3.779
CFAB-400	18	2.411	4.858
CFAB-460	20	2.679	5.398
CFAB-510	22	2.946	5.938
CFAB-600	26	3.482	7.017
CFSA-320	14	1.875	3.779
CFSA-410	18	2.411	4.858
C2120A	14	1.875	3.779
C2125A	18	2.411	4.858
C2130A	20	2.679	5.398
C2140A	26	3.482	7.017
500H	20	2.679	5.398
750H	20	2.679	5.398
850H	20	2.679	5.398
1000H	20	2.679	5.398
1500H	20	2.679	5.398
650M	26	3.482	7.017
1300M	26	3.482	7.017
2000M	26	3.482	7.017
C2130B	20	2.679	5.398
C2140B	26	3.482	7.017
C2160B	34	4.554	9.177
C2175B	34	4.554	9.177
C21100B	38	5.089	10.256
CMS-320J	14	1.875	3.779
CMS-420J	18	2.411	4.858

## **CHANGING THE DECIMAL POINT LOCATION**

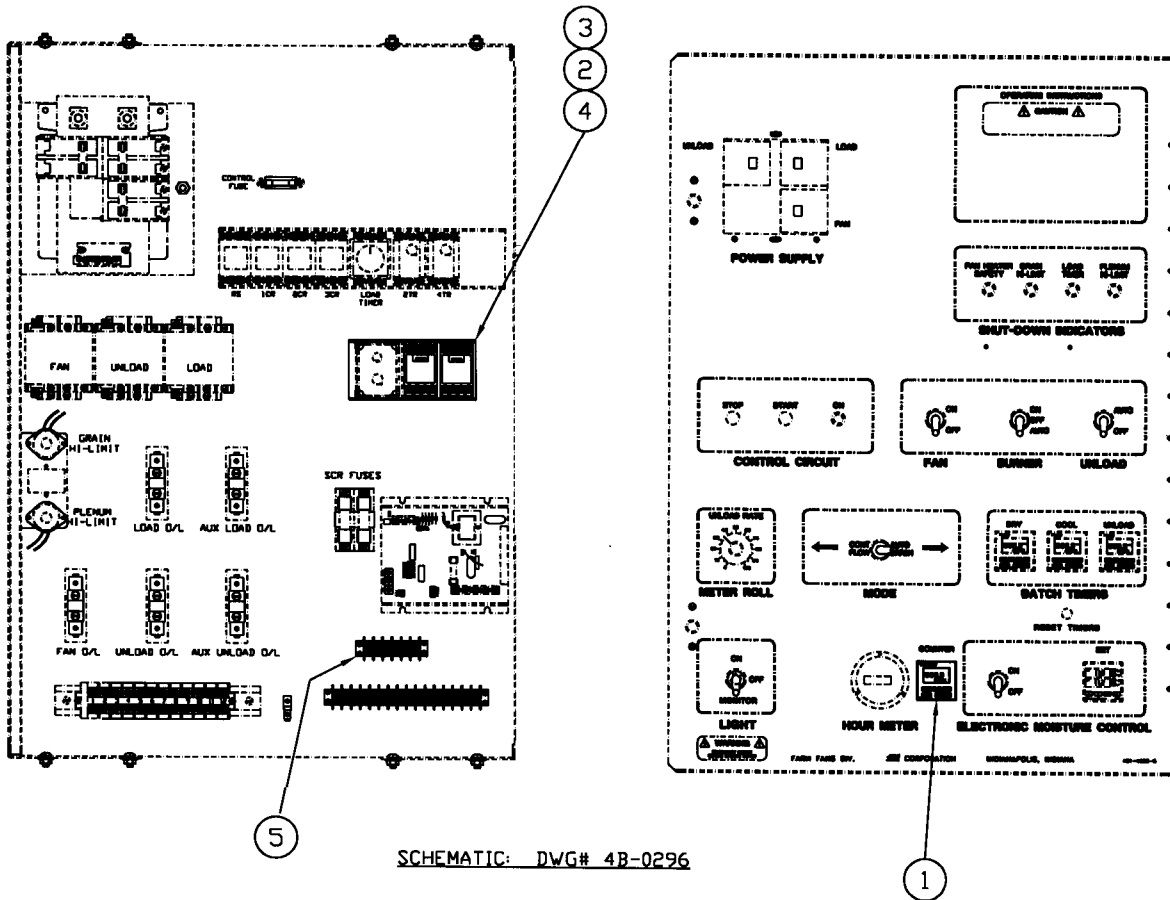
It is recommended that one digit should be displayed to the right of the decimal point. However, the number of digits displayed to the right of the decimal point can be changed if desired.

To change the decimal point location:

1. Press the Mode button until dashes appear in the display.
2. Press key 1 to move the decimal point. Each time the key is depressed will move the decimal point one place to the left.

## **CONVERTING TO A BATCH COUNTER**

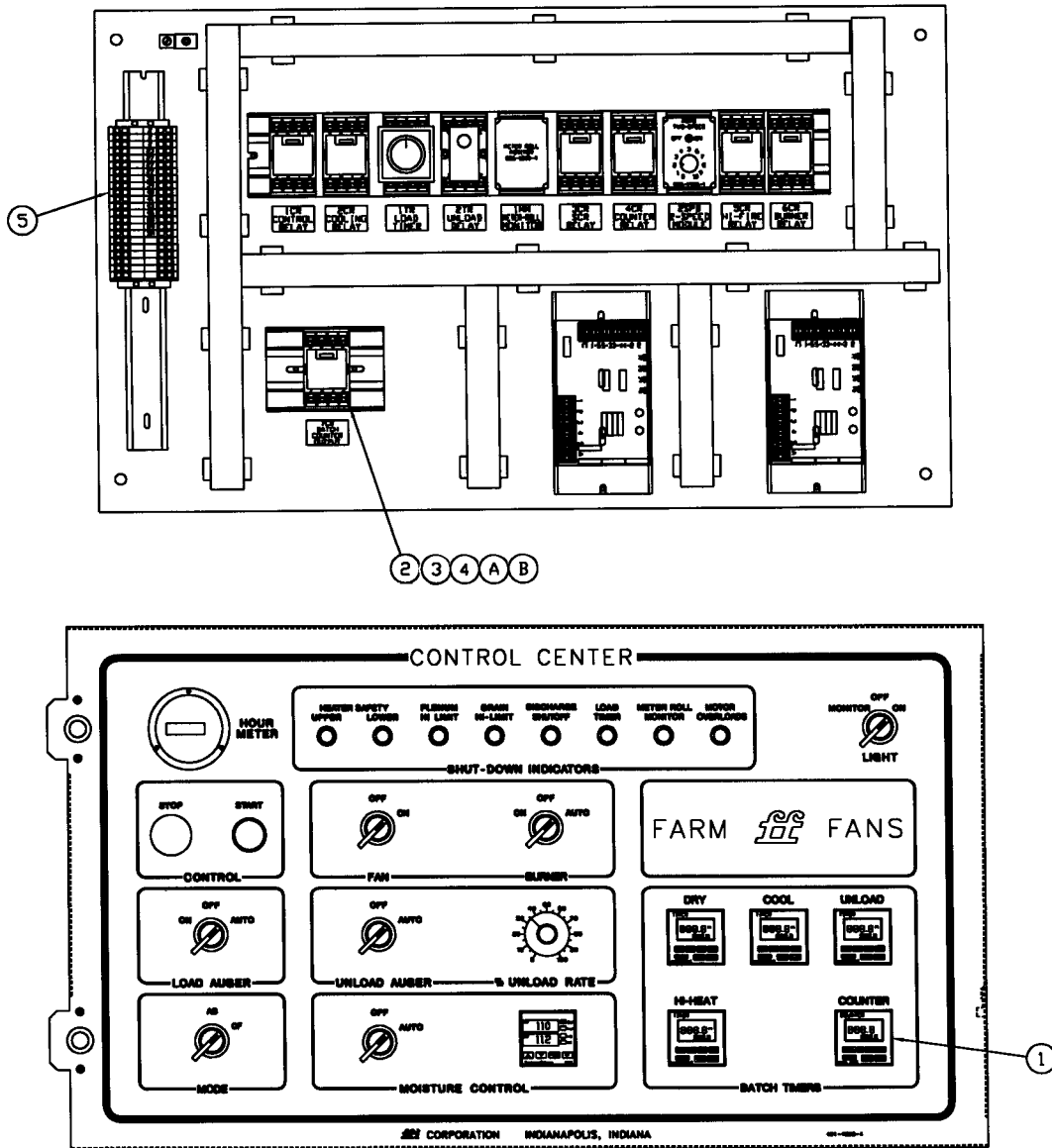
It may be desired on some dryer models to use the counter as a means for counting batches. This conversion will require the control circuit to be changed. See the appropriate control schematic ahead for the necessary changes. The counter scaling value of the counter must be set to 1. See the previous heading, "Bushel Counter Scaling Values" for instructions.



PART NO.	DESCRIPTION		ASSEMBLY	
DGCTR-CFABS-CC			X	
DGCTR-CFABS-FC			X	
DGCTR-CFABS-FLD			X	
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY
1	415-4033-7	3B-0170	DIGITAL COUNTER W/OUTPUT CTRL	1 1 1 -
2	021-1057-5	D72-018	MOUNTING TRACK, RELAY 6	1 1 1 -
3	055-1019-3		SOCKET BASE 8-PIN	1 2 1 -
4	044-1018-9		RELAY 115V 5A 8-PIN	1 2 1 -
5	045-1017-8		TERMINAL STRIP ASSY. 6POS	1 1 1 -
6	056-1865-7	PART ID	PROXIMITY SWITCH	1 1 1 -
7	069-1126-7	PART ID	SILICON SEALANT	A R - -
8	067-1042-0	3C-005B	CONNECTOR MALE, 3/8"	2 2 2 -
9	067-1042-0	3C-005B	CONDUIT, FLEX 3/8" X 30"	1 1 1 -

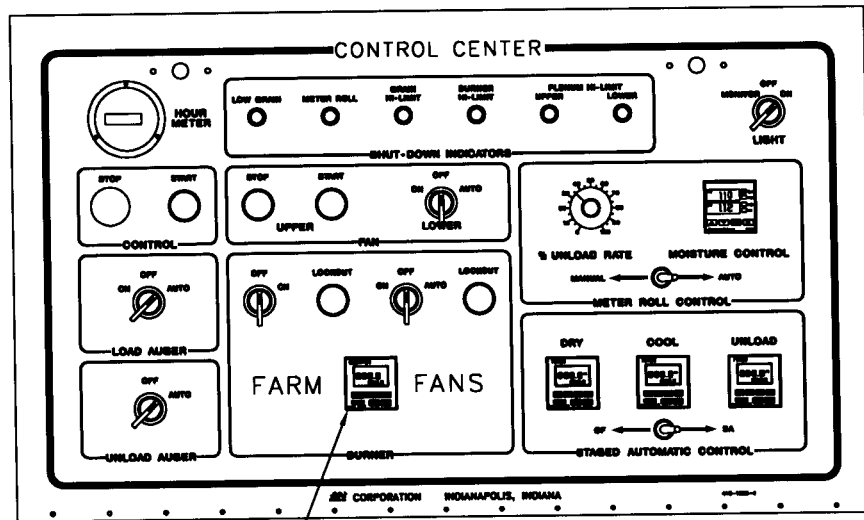
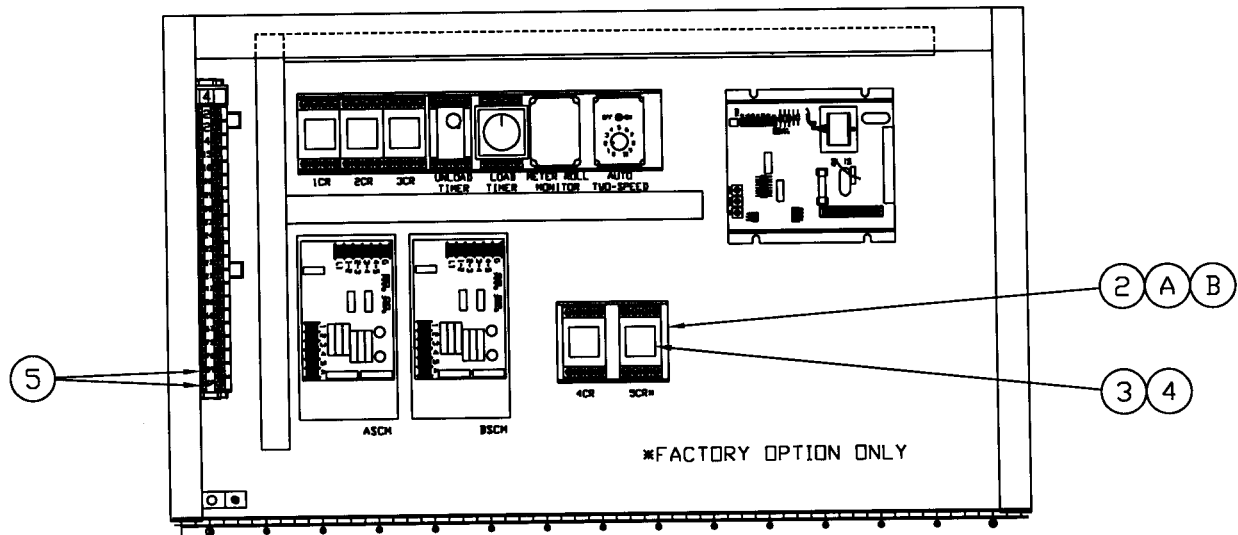
3D0485  
CFAB150-320

Fig. 2 Counter option, CF/AB-150 to 320 model dryers



PART NO.		DESCRIPTION		ASSEMBLY
DGCTR-CFABL-FCT		OPTION - DIGITAL COUNTER CF/AB400-600		X
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY
1	415-4033-7	3B-0170	DIGITAL COUNTER W/OUTPUT CTRL	1
2	055-1019-3		SOCKET BASE 8-PIN	1
3	044-1018-9		RELAY 115V 5A 8-PIN	1
4	021-1054-2	D72-018	MOUNTING TRACK, RELAY 4"	1
5	006-1303-4		TERMINAL	2
	038-2067-7		WIRE SET CF/AB-400 & 460	1
	038-2068-5		WIRE SET CF/AB-510 & 600	1
A	090-1193-3		PHST #8x3/8	2
B	092-1003-0		WASHER, FLAT #8	2

Fig. 3 Counter option, CF/AB-400 to 600 model dryers



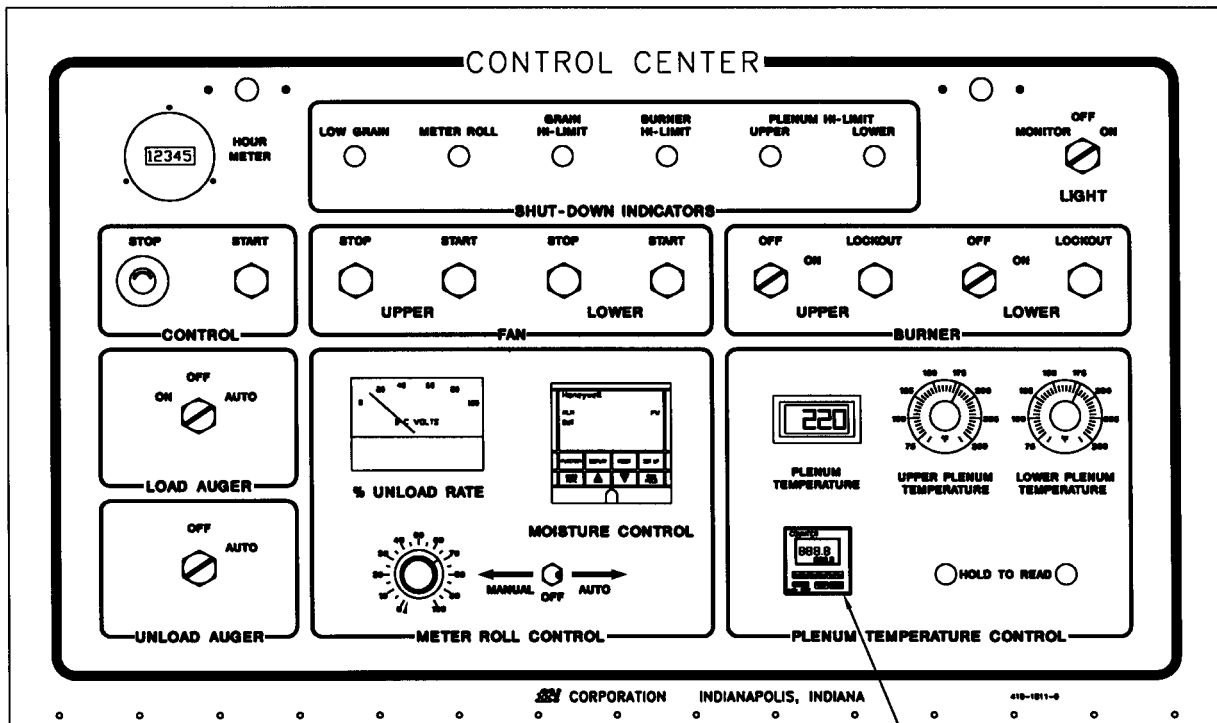
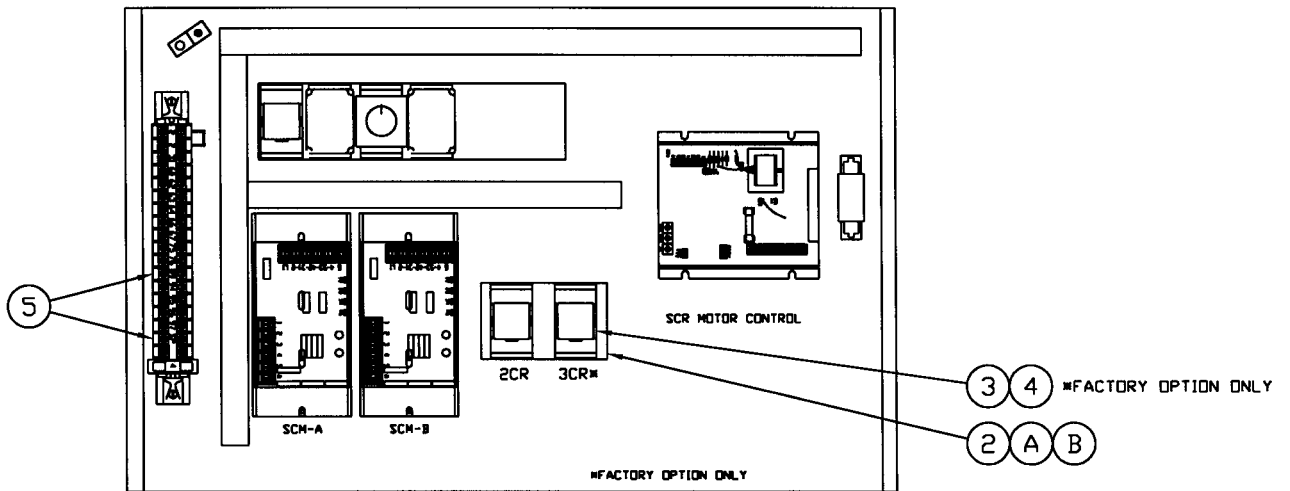
SCHMATIC: DWG# 4B-0443

PART NO.	DESCRIPTION	ASSEMBLY
DGCTR-FCT	DIGITAL COUNTER OPTION (FACTORY INSTALL)	X
DGCTR-FLD	DIGITAL COUNTER OPTION (FIELD INSTALL)	X
DGCTR-CC		X

ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY
1	056-2142-0		DGTL COUNTER 3/OUTPUT CTRL	1 1 -
1	056-2133-9		DIGITAL COUNTER WITH DISPLAY	- 1 -
2	021-1054-2		MOUNTING TRACK, RELAY BASE 4"	1 1 1
3	055-1019-3		BASE 8 PIN SOCKET-SYRELEC	2 1 1
4	044-1018-9		RELAY 115V 5A 8PIN	2 1 1
5	056-1831-9		TERMINAL BLOCK	2 2 -
A	090-1193-3		PHST #9 X 3/8 B	2 2 2
B	092-1003-0		WASHER, FLAT #2	2 2 2

Fig. 4 Counter option, CF/SA model dryers



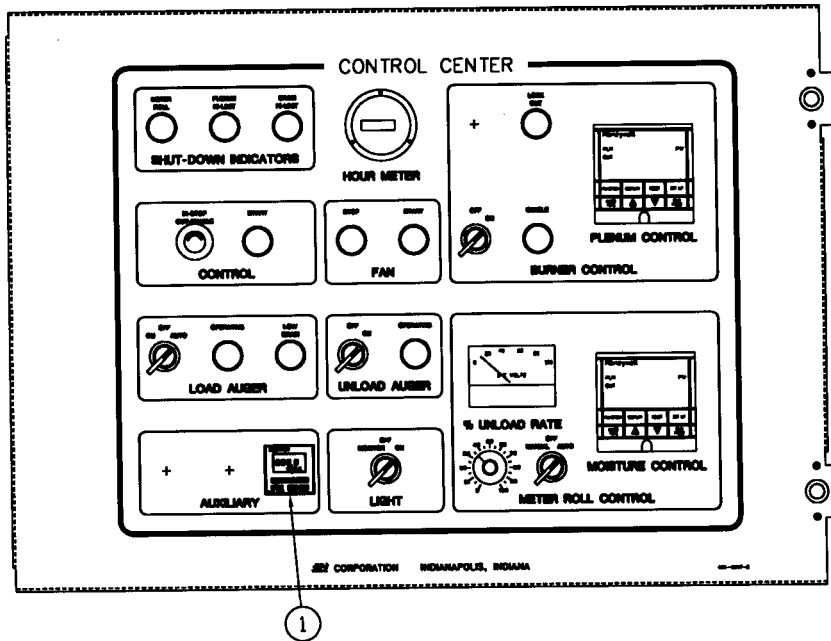
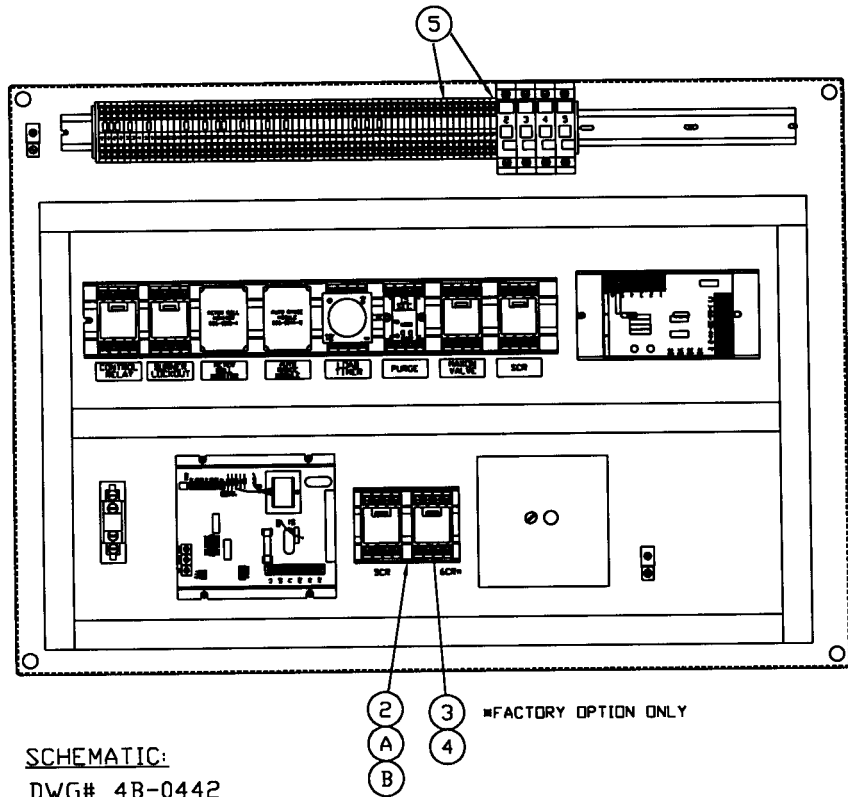
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY
	PART NO.		DESCRIPTION	ASSEMBLY
	DGCTR-FCT		DIGITAL COUNTER OPTION (FACTORY INSTALL)	X
	DGCTR-FLD		DIGITAL COUNTER OPTION (FIELD INSTALL)	X
	DGCTR-CC			X
1	056-2142-0		DGTL COUNTER 3/OUTPUT CTRL	1 1 - -
1	056-2133-9		DIGITAL COUNTER WITH DISPLAY	- - 1 -
2	021-1054-2		MOUNTING TRACK, RELAY BASE 4"	1 1 1 -
3	055-1019-3		BASE 8 PIN SOCKET-SYRELEC	2 1 1 -
4	044-1018-9		RELAY 115V 5A 8PIN	2 1 1 -
5	056-1831-9		TERMINAL BLOCK	2 2 - -
A	090-1193-3		PHST #9 X 3/8 B	2 2 2 -
B	092-1003-0		WASHER, FLAT #2	2 2 2 -

SCHEMATIC: DWG# 4B-0439

NOT DRAWN TO SCALE

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C-21A

Fig. 5 Counter option, C-2100A model dryers

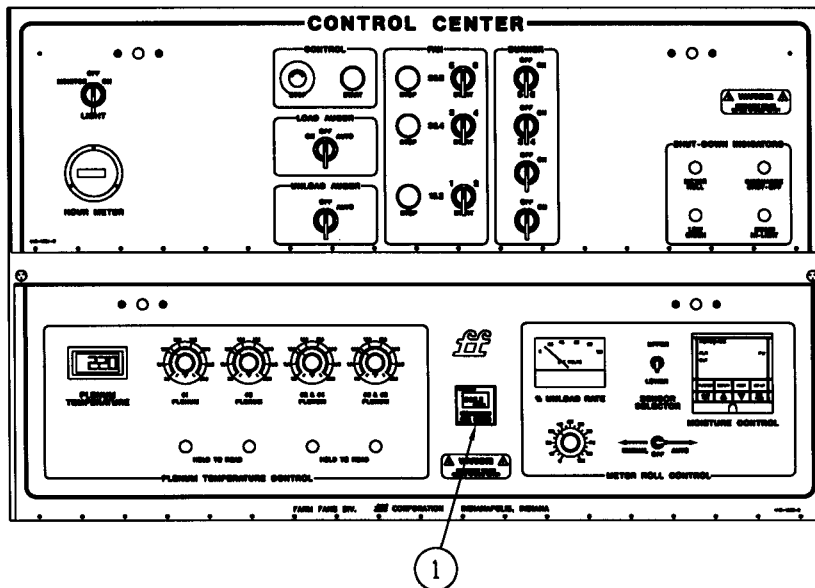
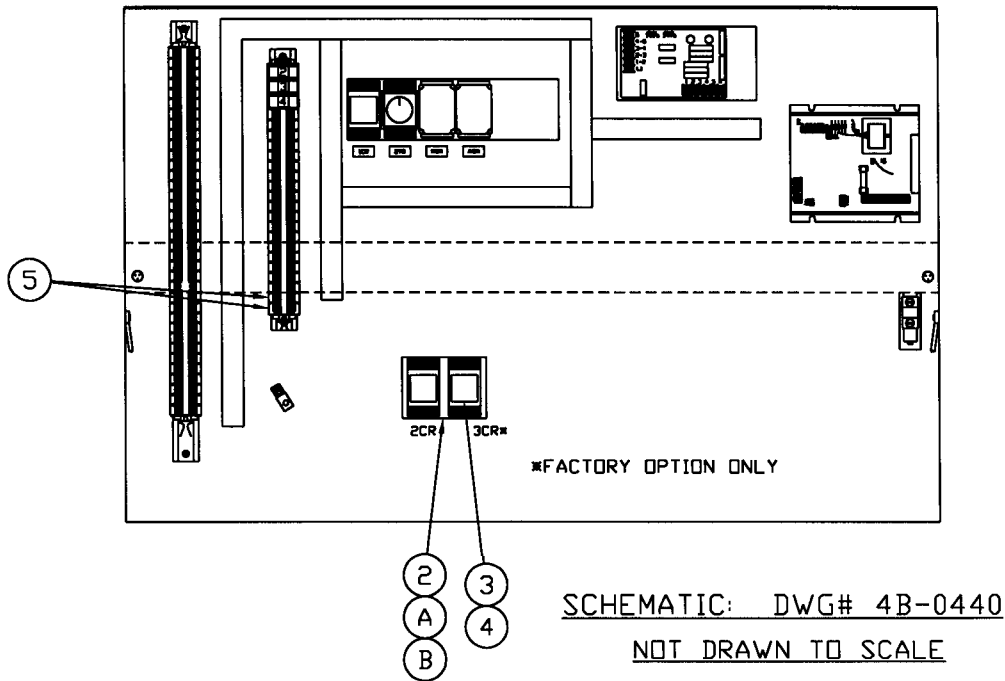


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21B

PART NO.		DESCRIPTION		ASSEMBLY
DGCTR-FCT		DIGITAL COUNTER OPTION (FACTORY INSTALL)		X
DGCTR-FLD		DIGITAL COUNTER OPTION (FIELD INSTALL)		X
DGCTR-CC				X
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY
1	056-2142-0		DGTL COUNTER 3/OUTPUT CTRL	1 1 1 - -
1	056-2133-9		DIGITAL COUNTER WITH DISPLAY	- - 1 - -
2	021-1054-2		MOUNTING TRACK, RELAY BASE 4"	1 1 1 - -
3	055-1019-3		BASE B PIN SOCKET-SYRELEC	2 1 1 - -
4	044-1018-9		RELAY 115V 5A 8PIN	2 1 1 - -
5	056-1831-9		TERMINAL BLOCK	2 2 - - -
A	090-1193-3		PHST #9 X 3/8 B	2 2 2 - -
B	092-1003-0		WASHER, FLAT #2	2 2 2 - -

Fig. 6 Counter option, C-2100B model dryers

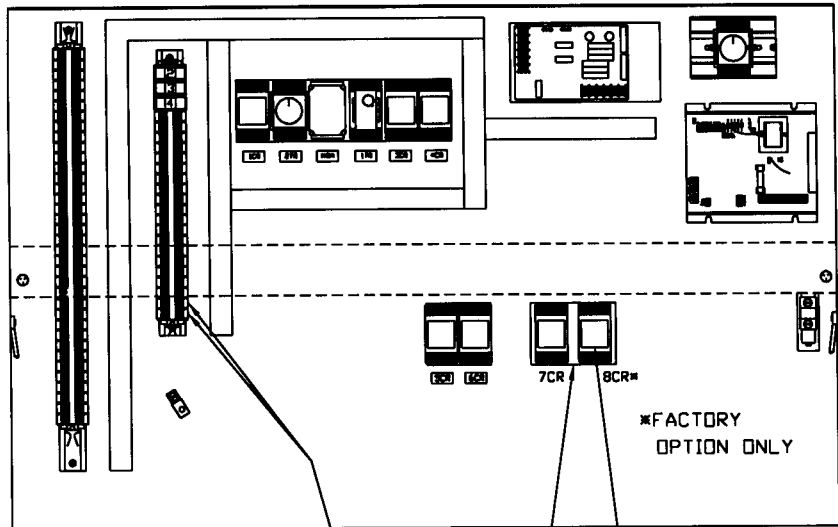




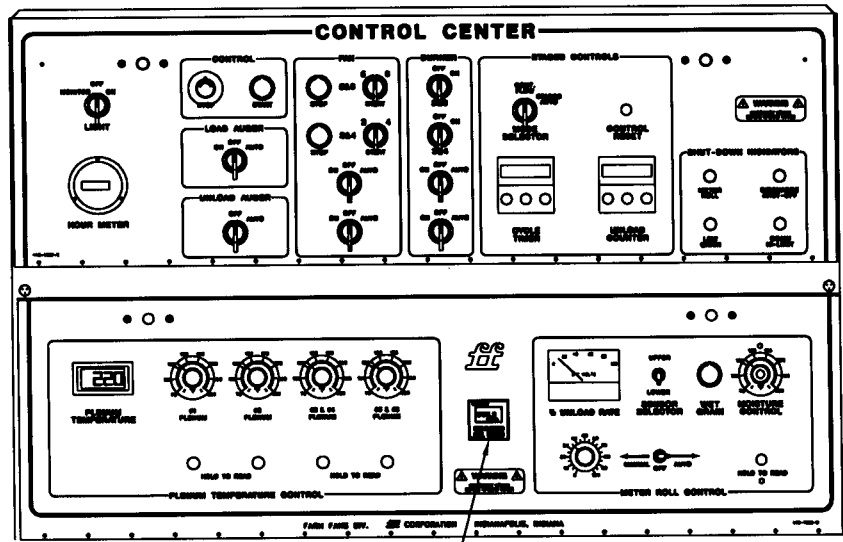
PART NO.	DESCRIPTION		ASSEMBLY			
DGCTR-FCT	DIGITAL COUNTER OPTION (FACTORY INSTALL)			X		
DGCTR-FLD	DIGITAL COUNTER OPTION (FIELD INSTALL)			X		
DGCTR-CC					X	
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY		
1	056-2142-0		DGTL COUNTER 3/OUTPUT CTRL	1	1	-
1	056-2133-9		DIGITAL COUNTER WITH DISPLAY	-	1	-
2	021-1054-2		MOUNTING TRACK, RELAY BASE 4"	1	1	1
3	055-1019-3		BASE 8 PIN SOCKET-SYRELEC	2	1	1
4	044-1018-9		RELAY 115V 5A 8PIN	2	1	1
5	056-1831-9		TERMINAL BLOCK	2	2	-
A	090-1193-3		PHST #9 X 3/8 B	2	2	2
B	092-1003-0		WASHER, FLAT #2	2	2	2

4D-0192B  
CF H/M

Fig. 7 Counter option, CF-H & M model dryers



SCHEMATIC: DWG# 4B-0441



4D0192C  
CMS H/M

PART NO.		DESCRIPTION		ASSEMBLY	
DGCTR-FCT		DIGITAL COUNTER OPTION (FACTORY INSTALL)		X	
DGCTR-FLD		DIGITAL COUNTER OPTION (FIELD INSTALL)			X
DGCTR-CC					X
ITEM	PART NO.	DWG. NO.	DESCRIPTION	QUANTITY	
1	056-2142-0		DGTL COUNTER 3/OUTPUT CTRL	1	1 - -
1	056-2133-9		DIGITAL COUNTER WITH DISPLAY	-	- 1 -
2	021-1054-2		MOUNTING TRACK, RELAY BASE 4"	1	1 1 -
3	055-1019-3		BASE 8 PIN SOCKET-SYRELEC	2	1 1 -
4	044-1018-9		RELAY 115V 5A 8PIN	2	1 1 -
5	056-1831-9		TERMINAL BLOCK	2	2 - -
A	090-1193-3		PHST #9 X 3/8 B	2	2 2 -
B	092-1003-0		WASHER, FLAT #2	2	2 2 -

Fig. 8 Counter option, CMS-H & M model dryers

# WIRING DIAGRAMS

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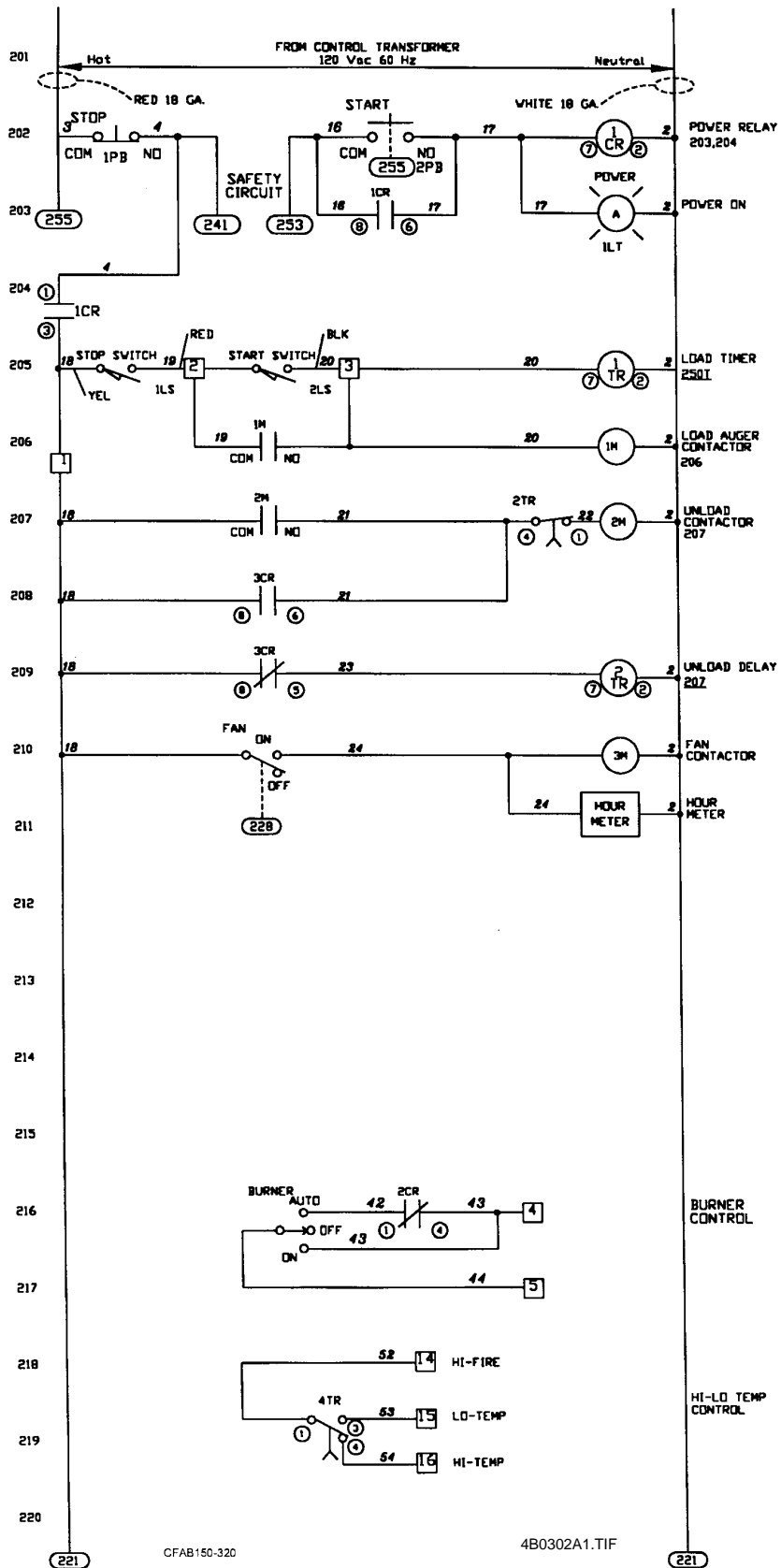


Fig. 9 CF/AB-150 to 320 control circuit, prior to 1999. p. 1 of 6



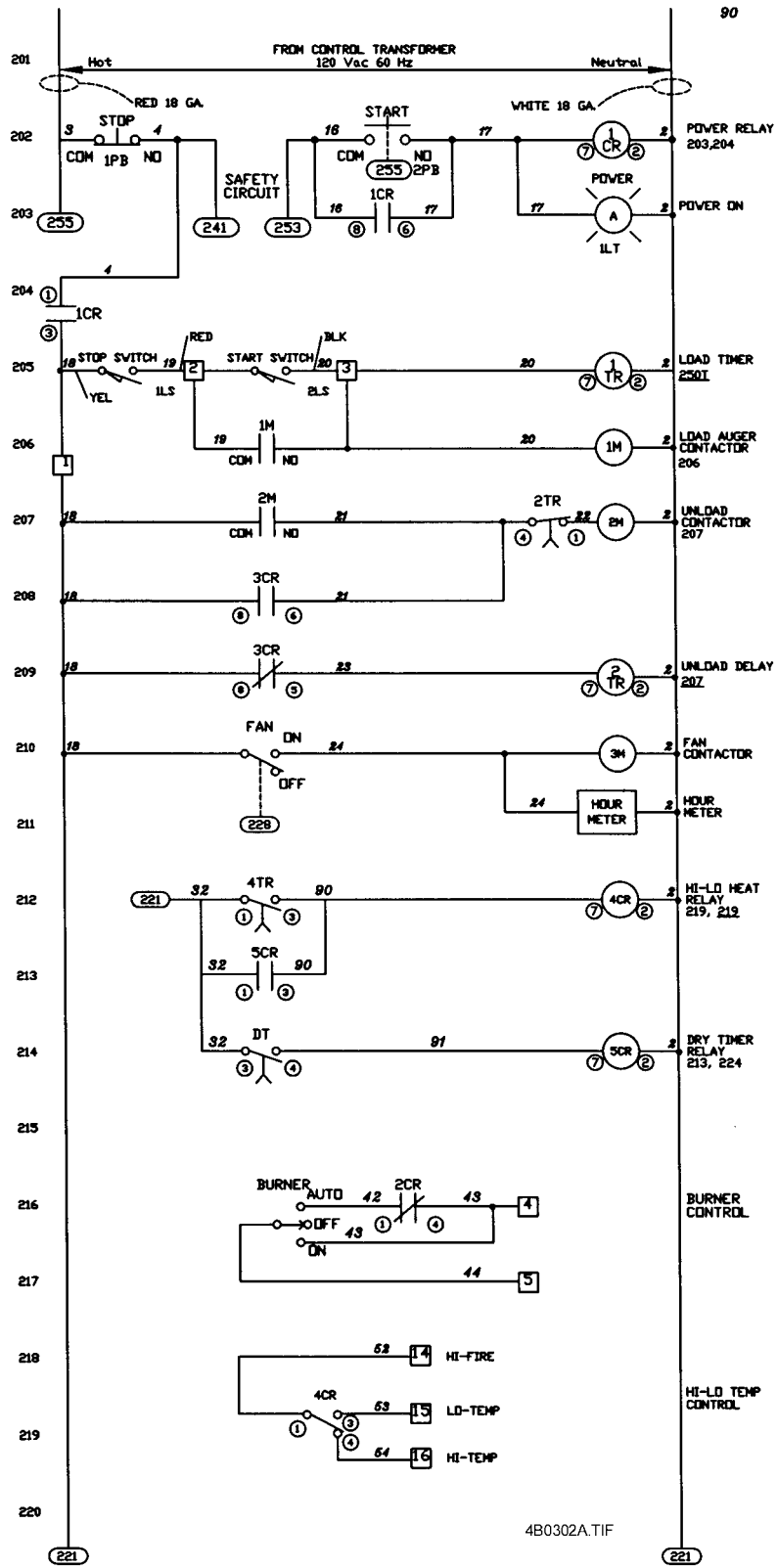


Fig. 9 CF/AB-150 to 320 control circuit, 1999 and later. p. 3 of 6

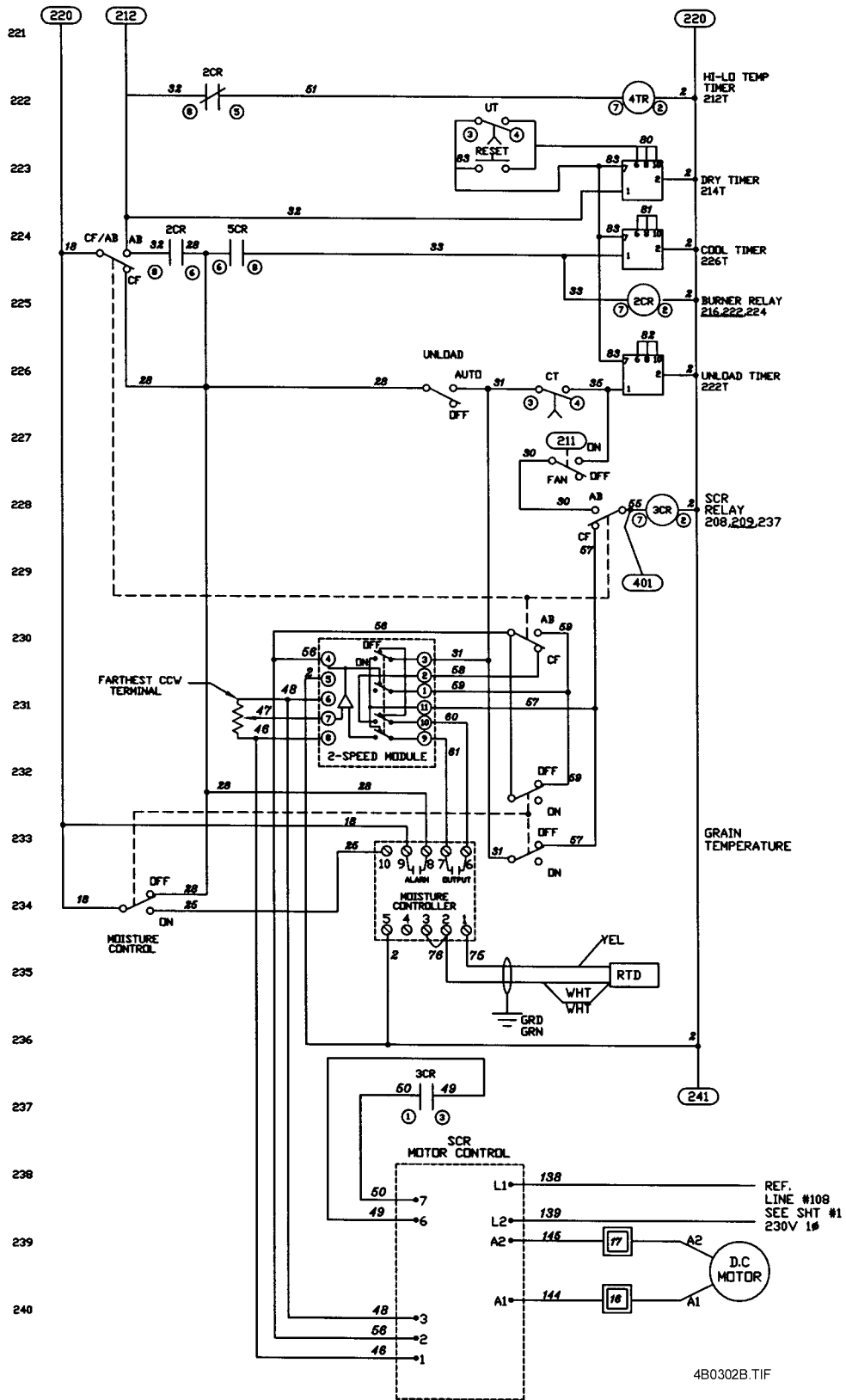
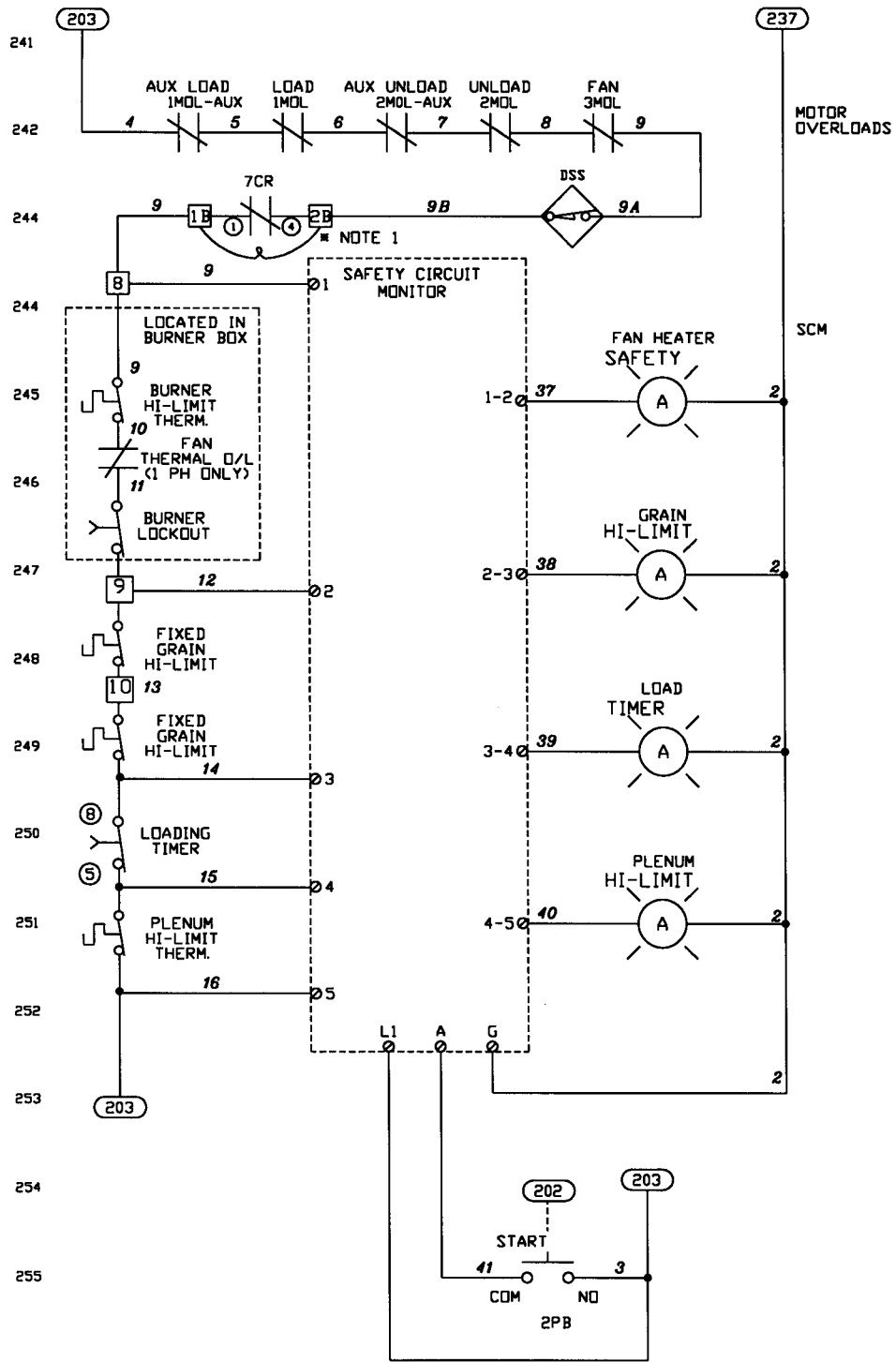


Fig. 9 CF/AB-150 to 320 control circuit, 1999 and later. p. 4 of 6



NOTE:  
 \*1 FACTORY INSTALLED DIGITAL  
 COUNTER OPTION, SHIPPED WITH  
 JUMPER INSTALLED.

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Fig. 9 CF/AB-150 to 320 control circuit, p. 5 of 6



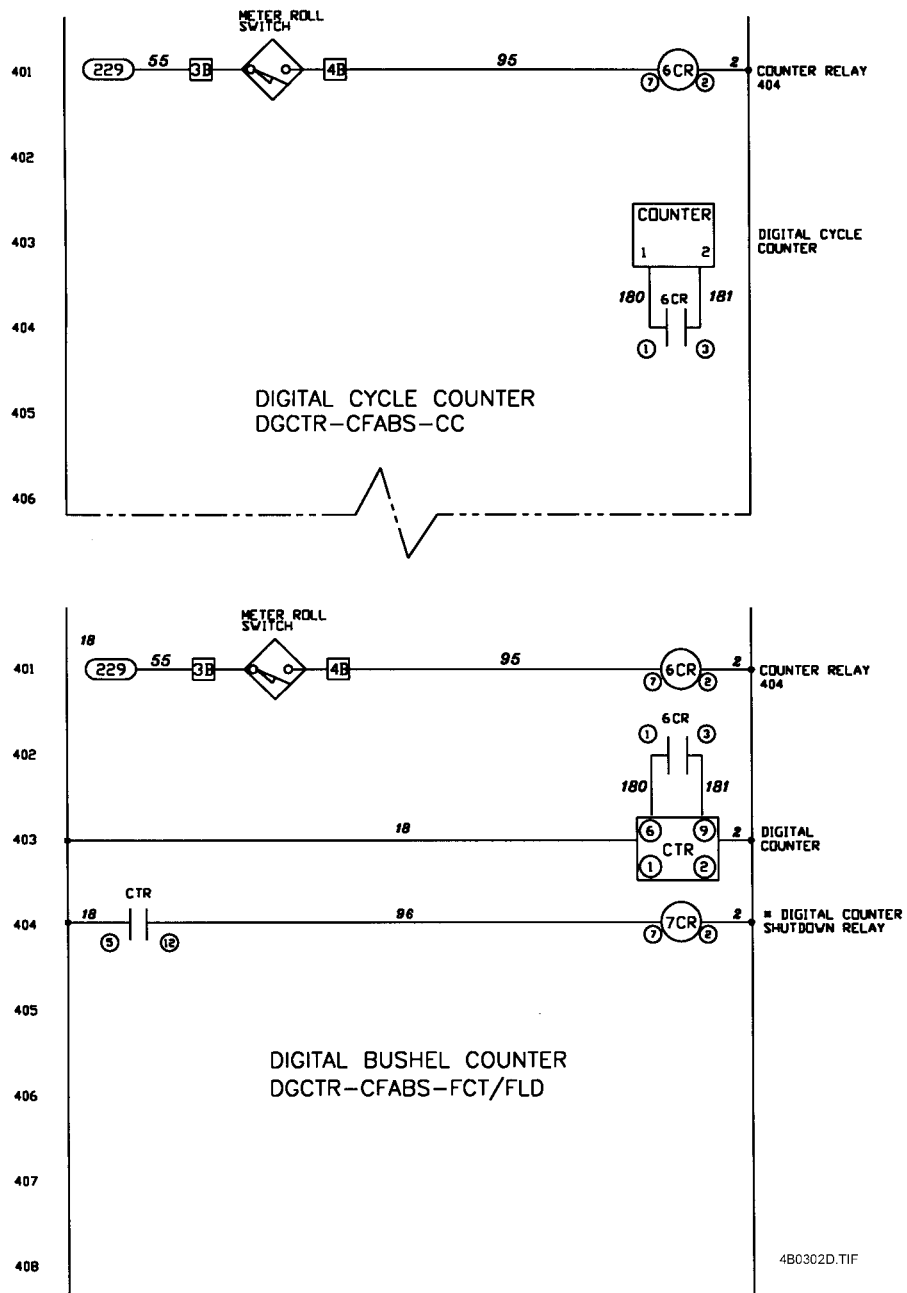


Fig. 9 CF/AB-150 to 320 control circuit, p. 6 of 6

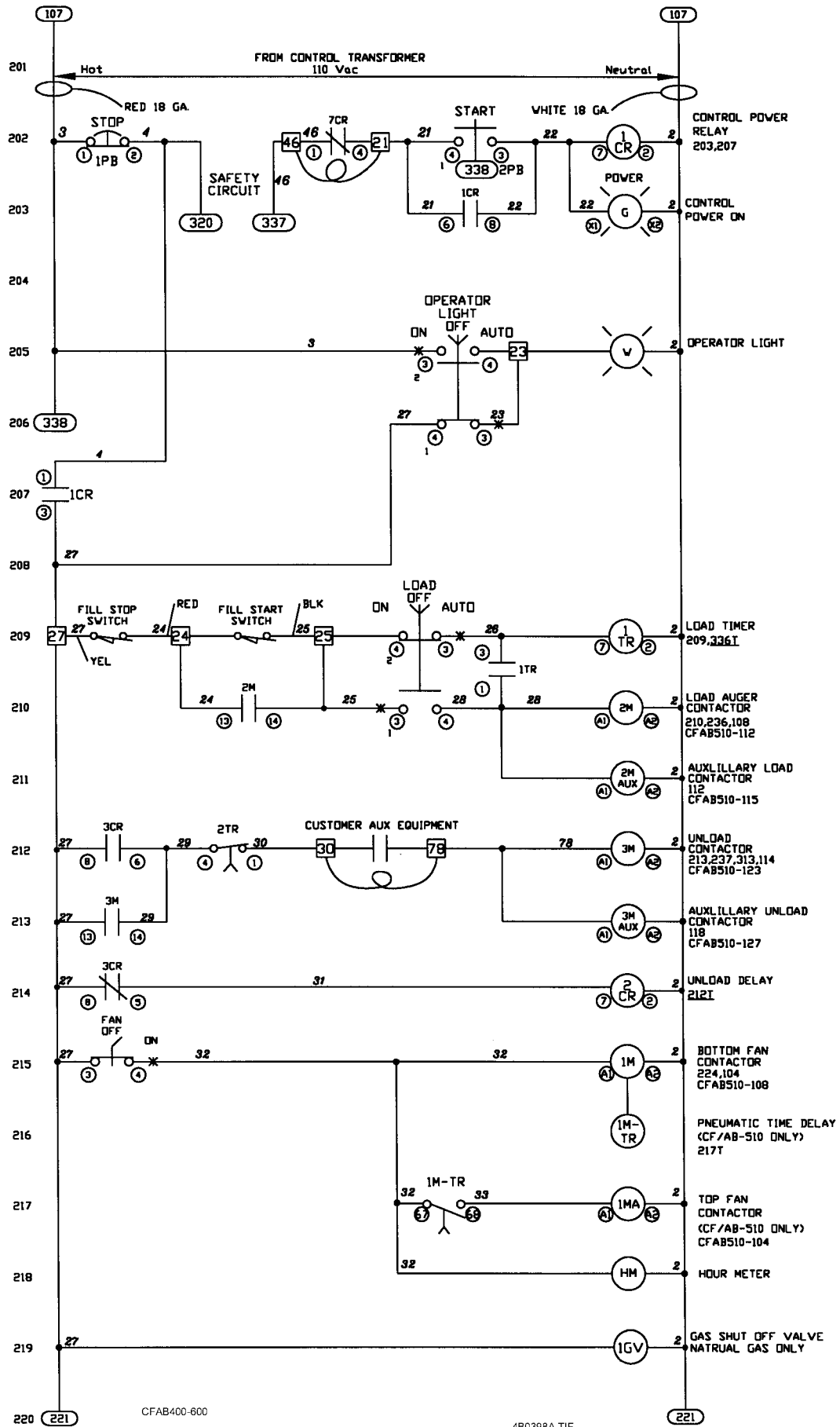


Fig. 10 CF/AB-400 to 600 control circuit, p. 1 of 3

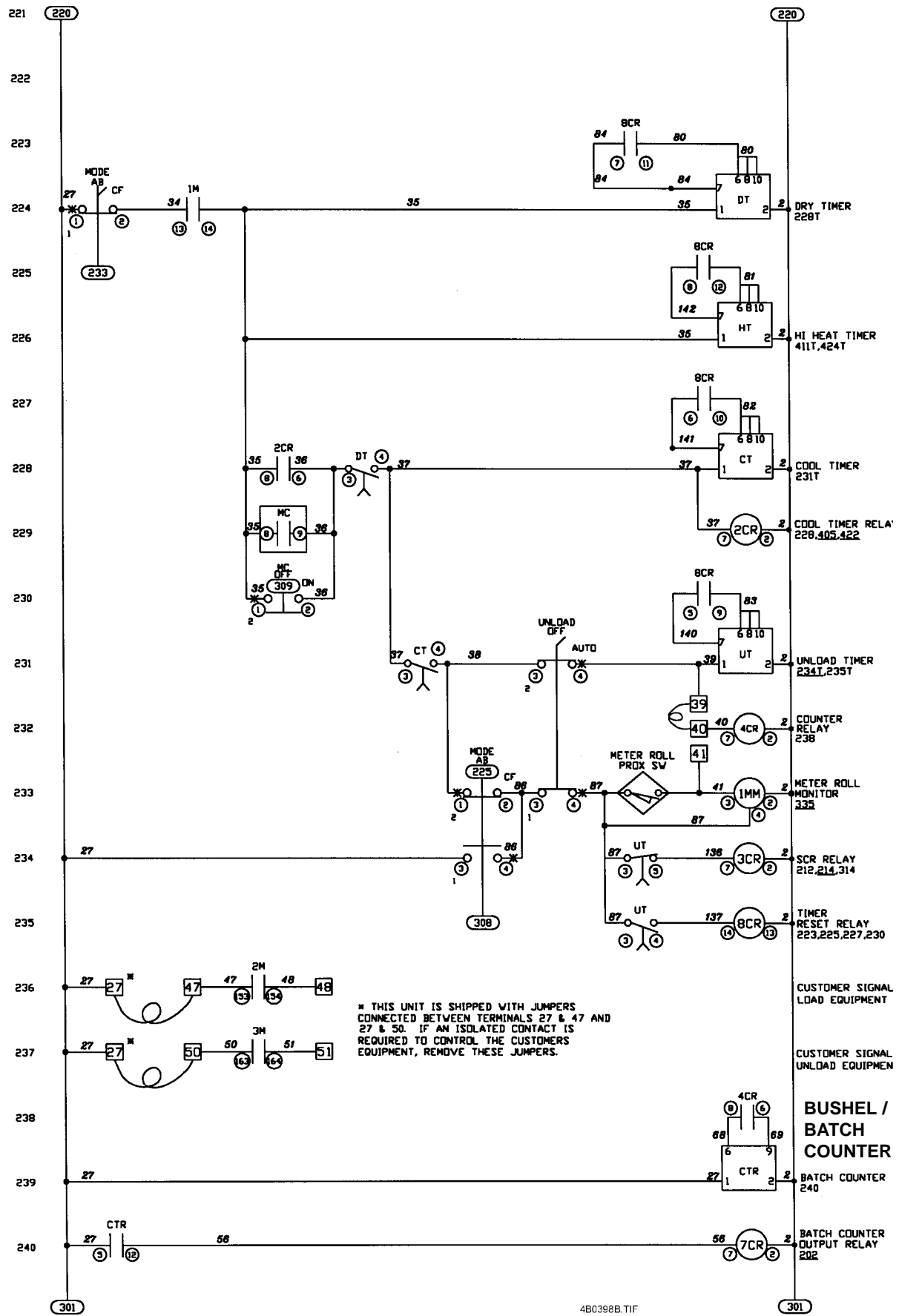


Fig. 10 CF/AB-400 to 600 control circuit, p. 2 of 3

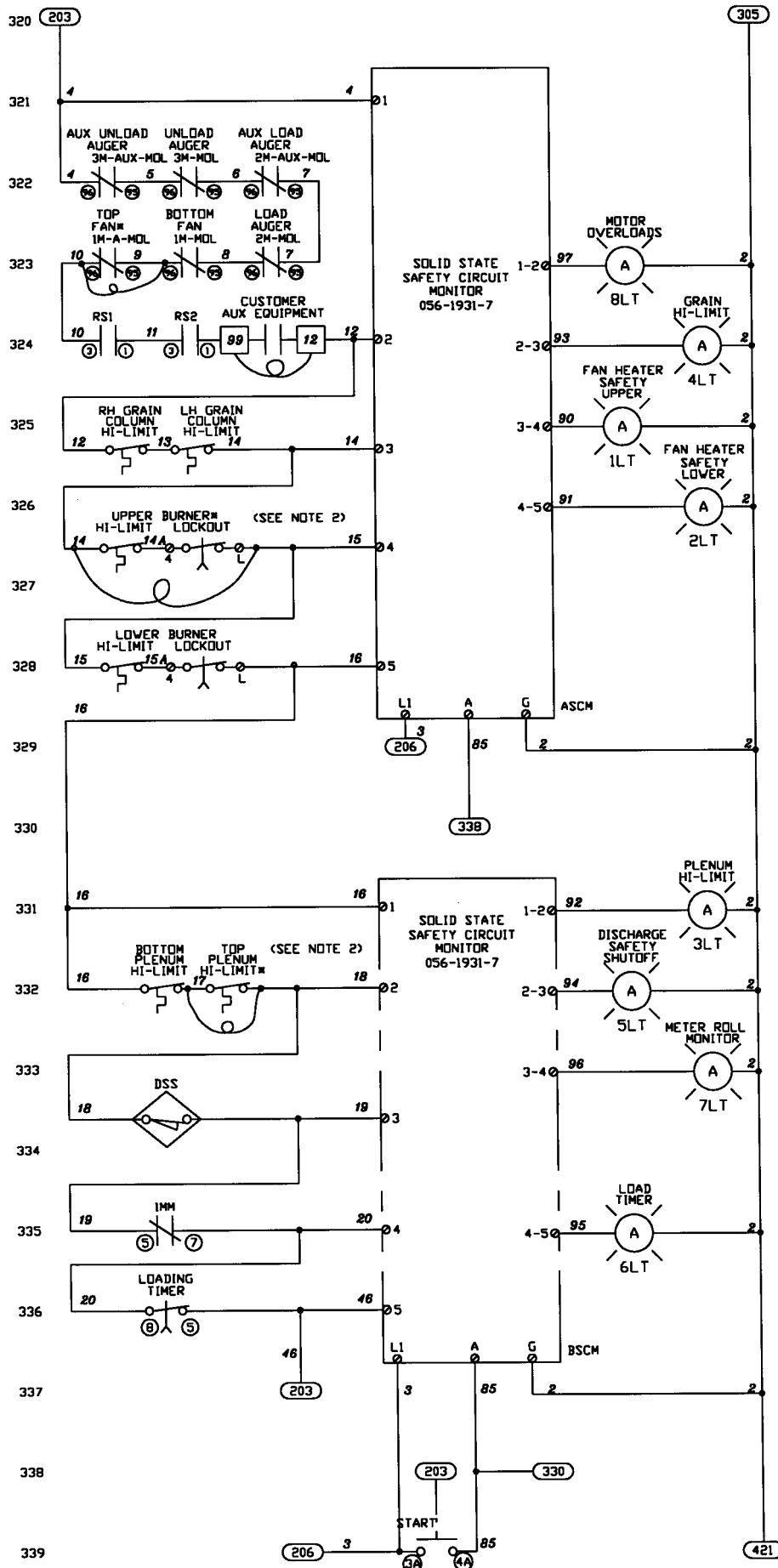


Fig. 10 CF/AB-400 to 600 control circuit, p. 3 of 3

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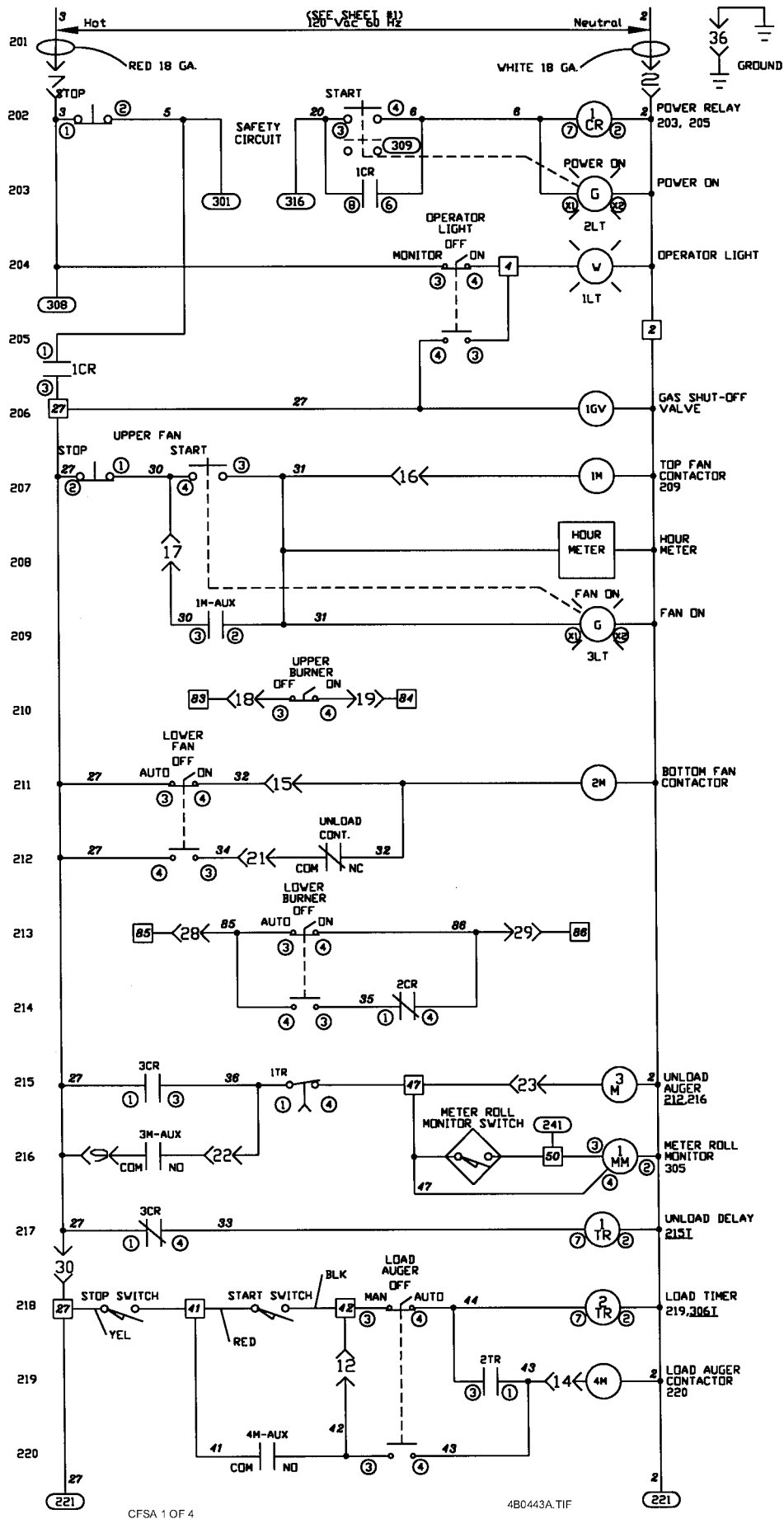
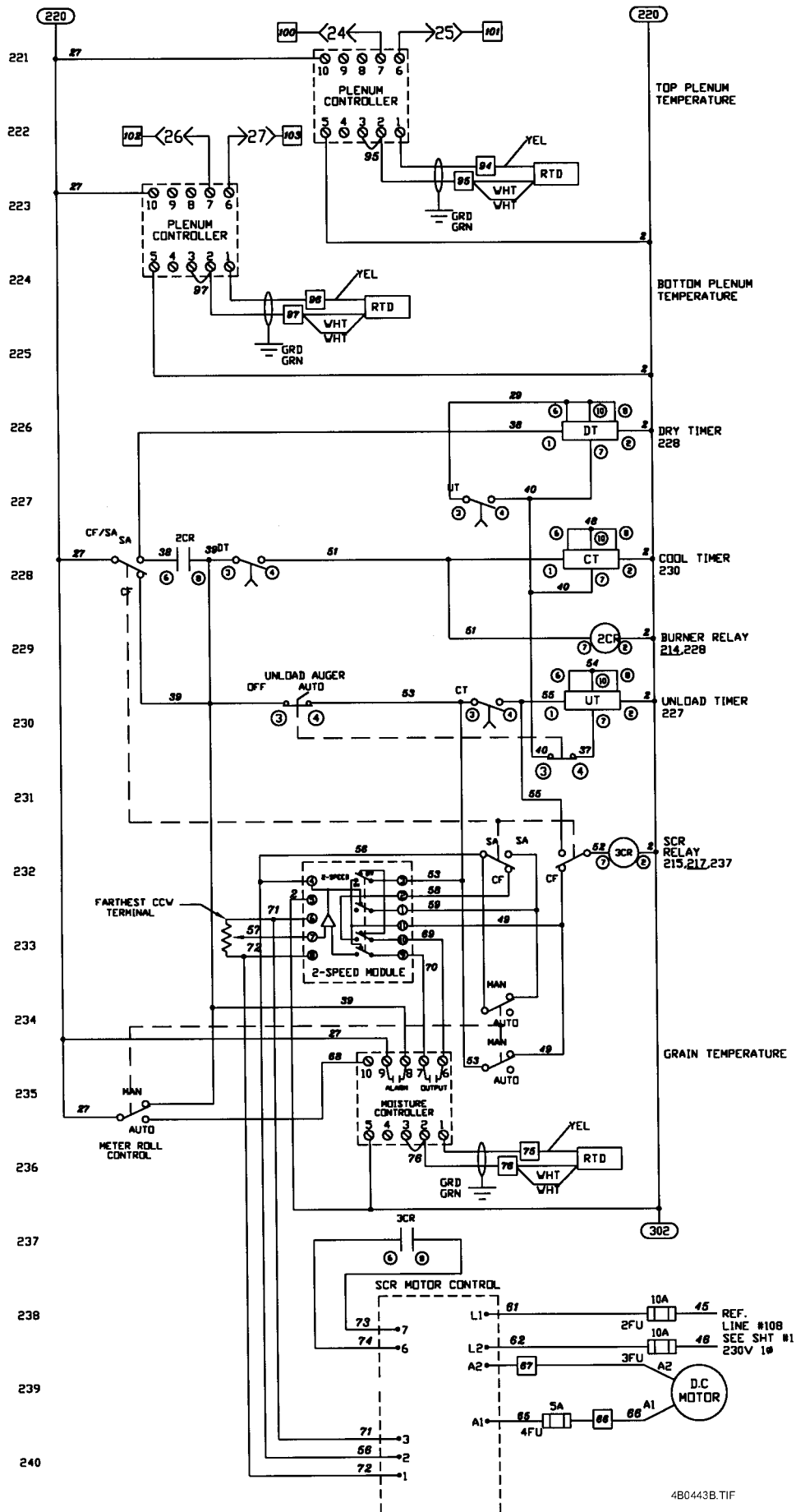
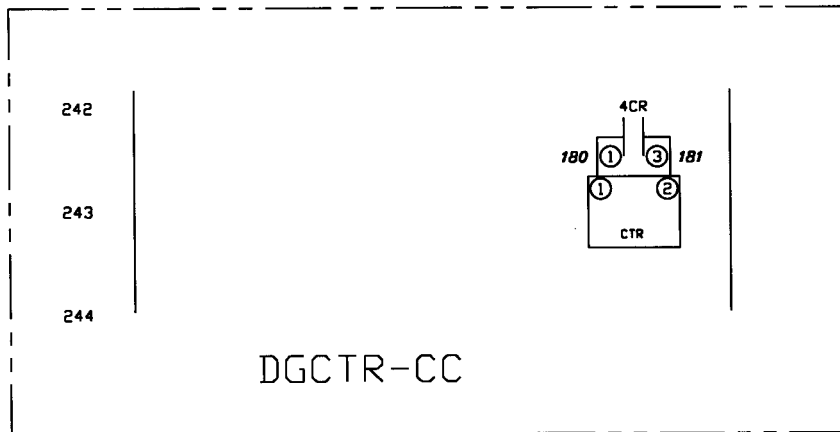
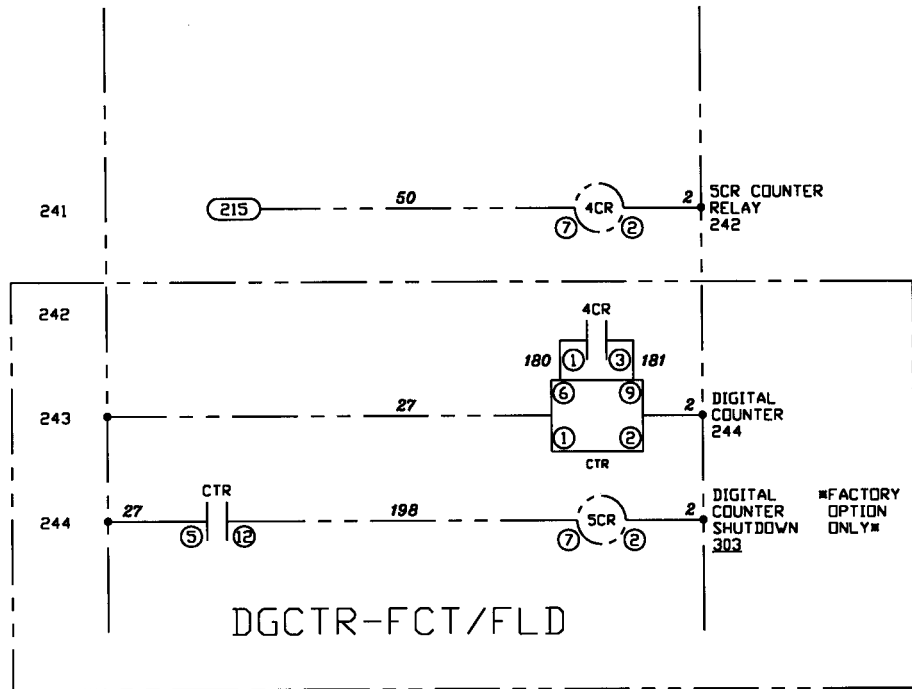


Fig. 11 CF/SA control circuit, p. 1 of 4



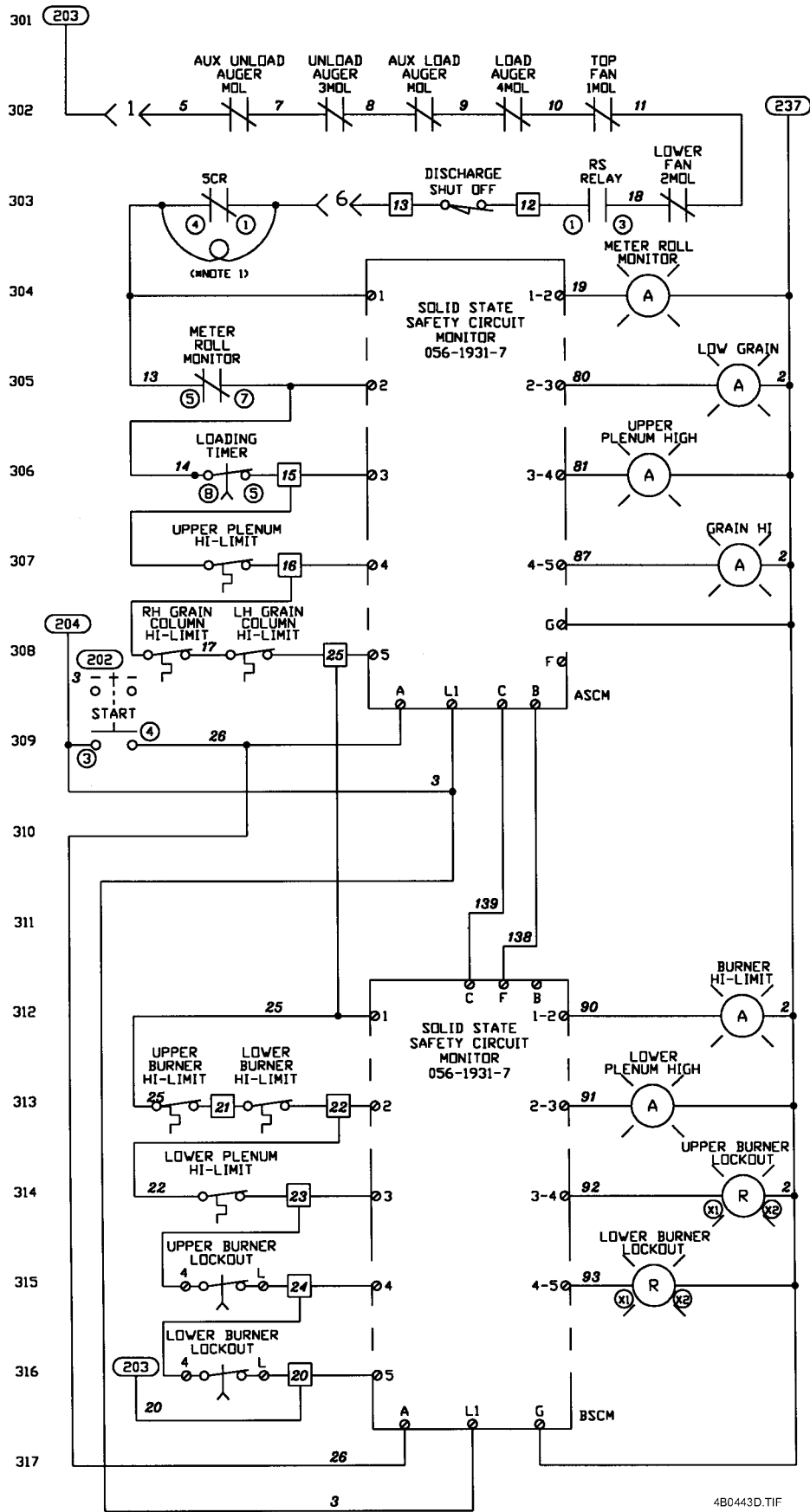
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Fig. 11 CF/SA control circuit, p. 2 of 4



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Fig. 11 CF/SA control circuit, p. 3 of 4



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Fig. 11 CF/SA control circuit, p. 4 of 4



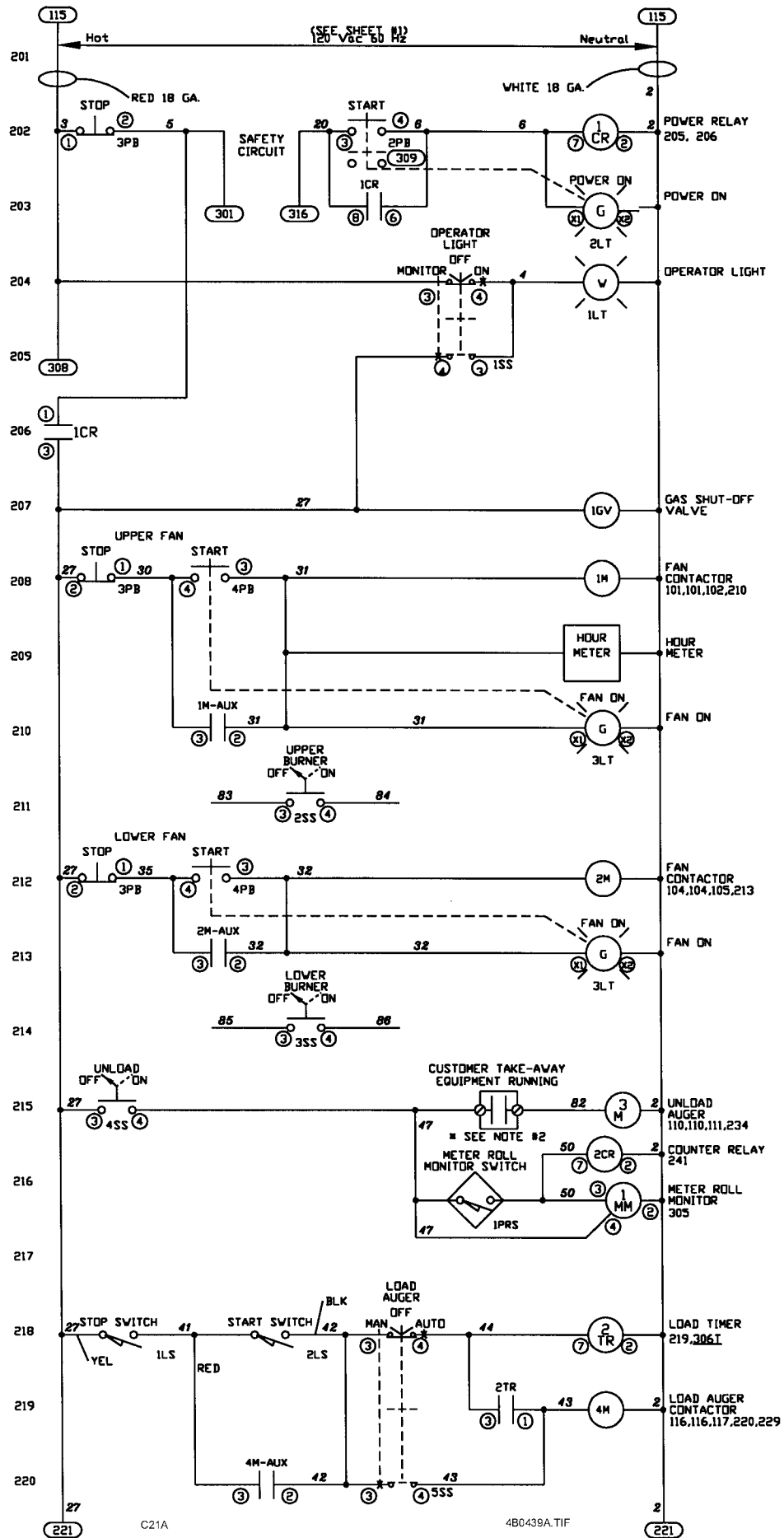
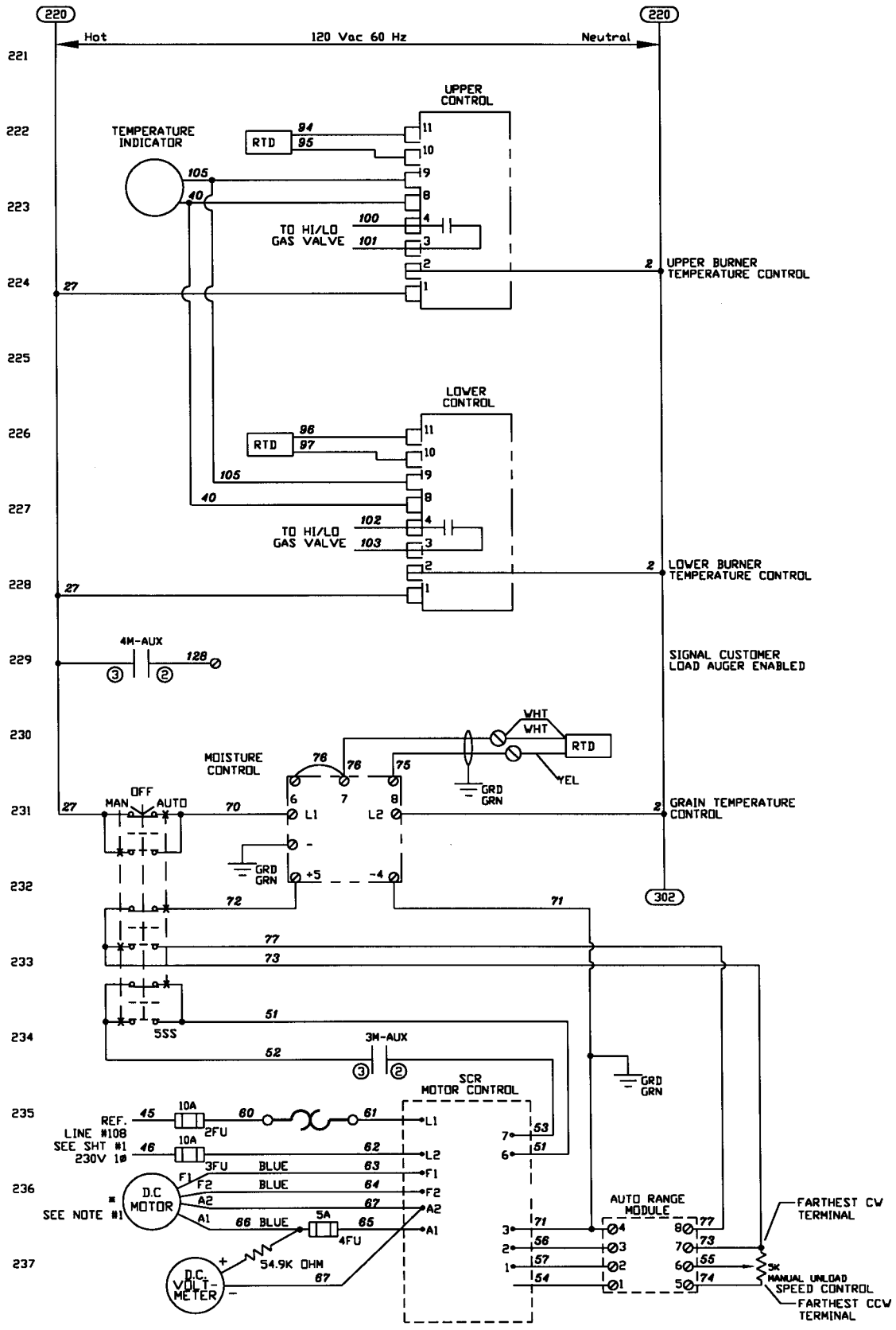


Fig. 12 C-2100A control circuit, p. 1 of 4



NOTES:

1. ON DUAL VOLTAGE MOTORS WITH (4) FIELD LEADS CONNECT  
 F1 TO LINE #63  
 F4 TO LINE #64  
 F2 AND F3 TOGETHER
2. REMOVE SHIPPING JUMPER AND INSTALL AUXILIARY CONTACTS FROM TAKE-AWAY EQUIPMENT

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Fig. 12 C-2100A control circuit, p. 2 of 4

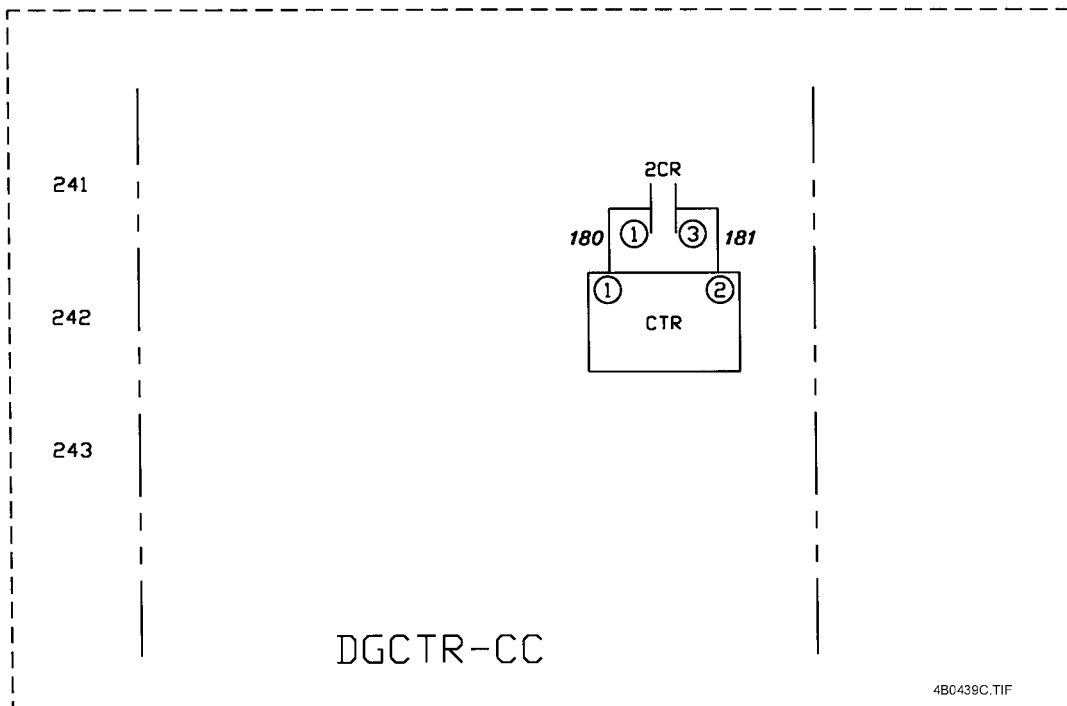
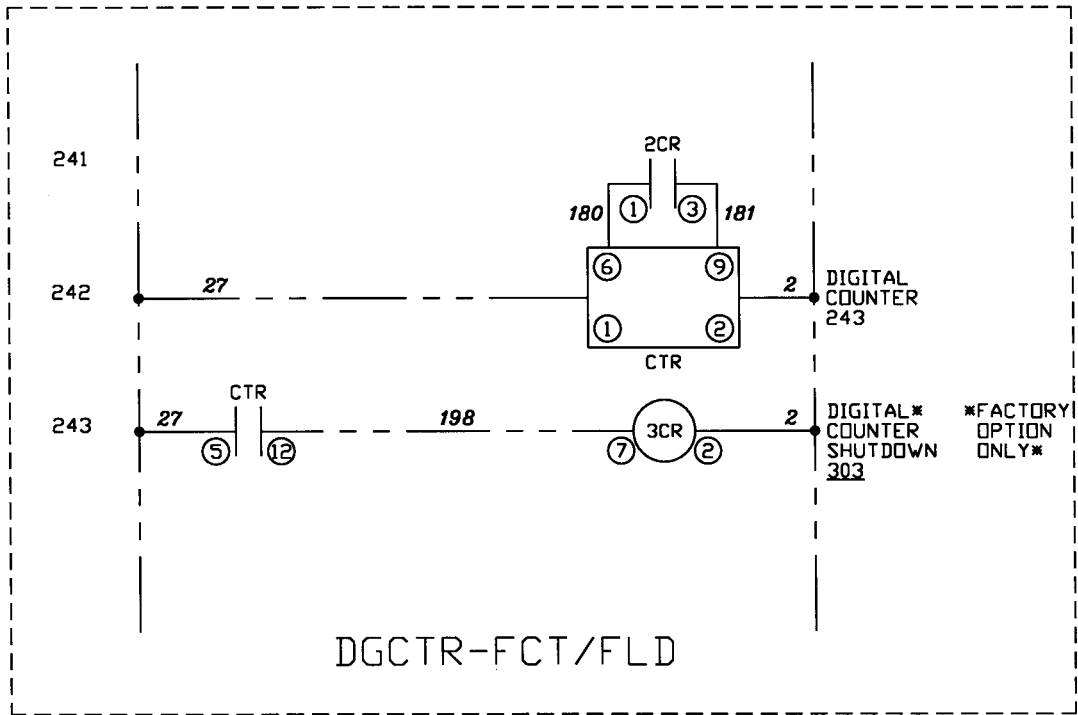
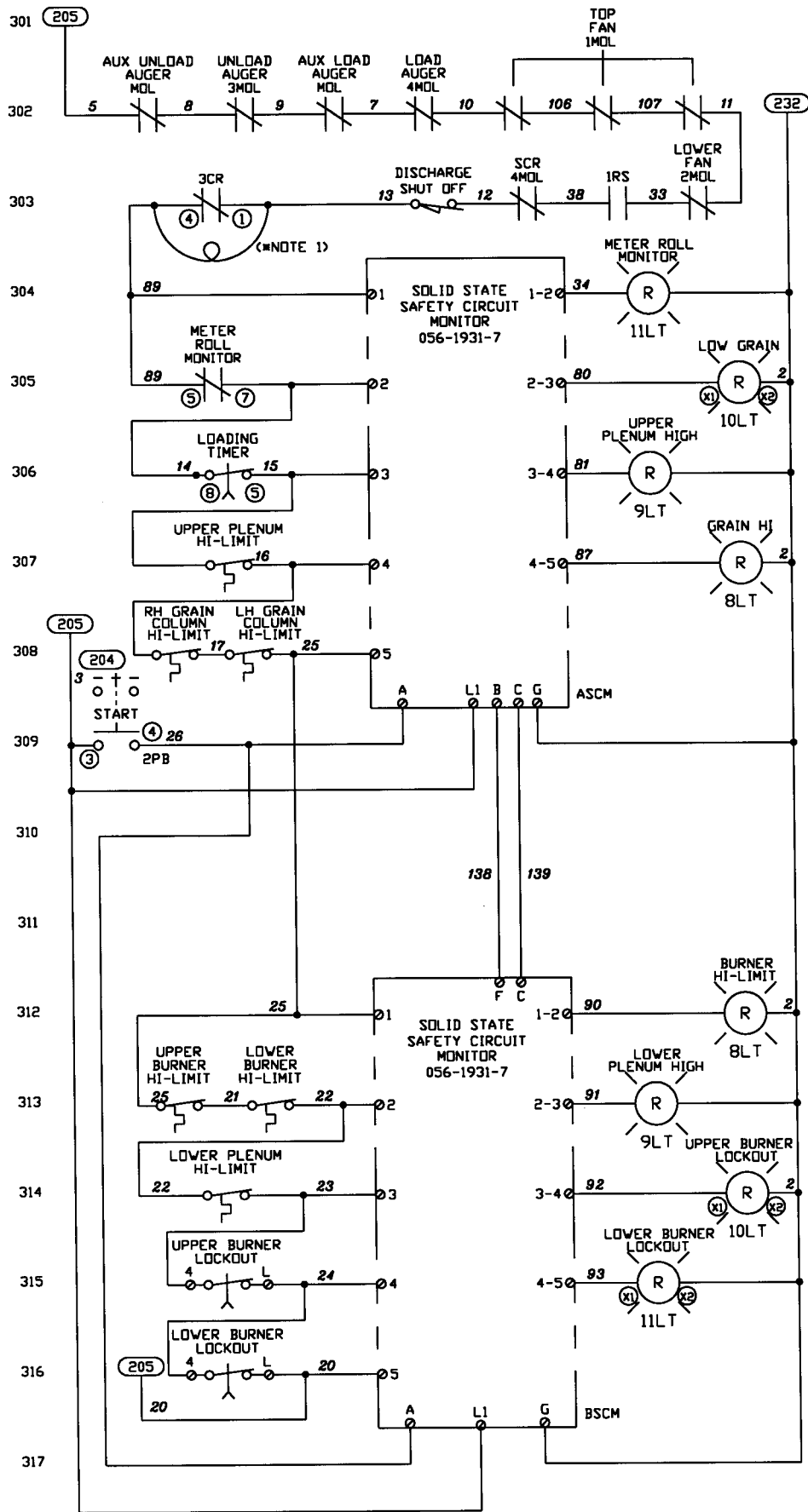


Fig. 12 C-2100A control circuit, p. 3 of 4



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Fig. 12 C-2100A control circuit, p. 4 of 4

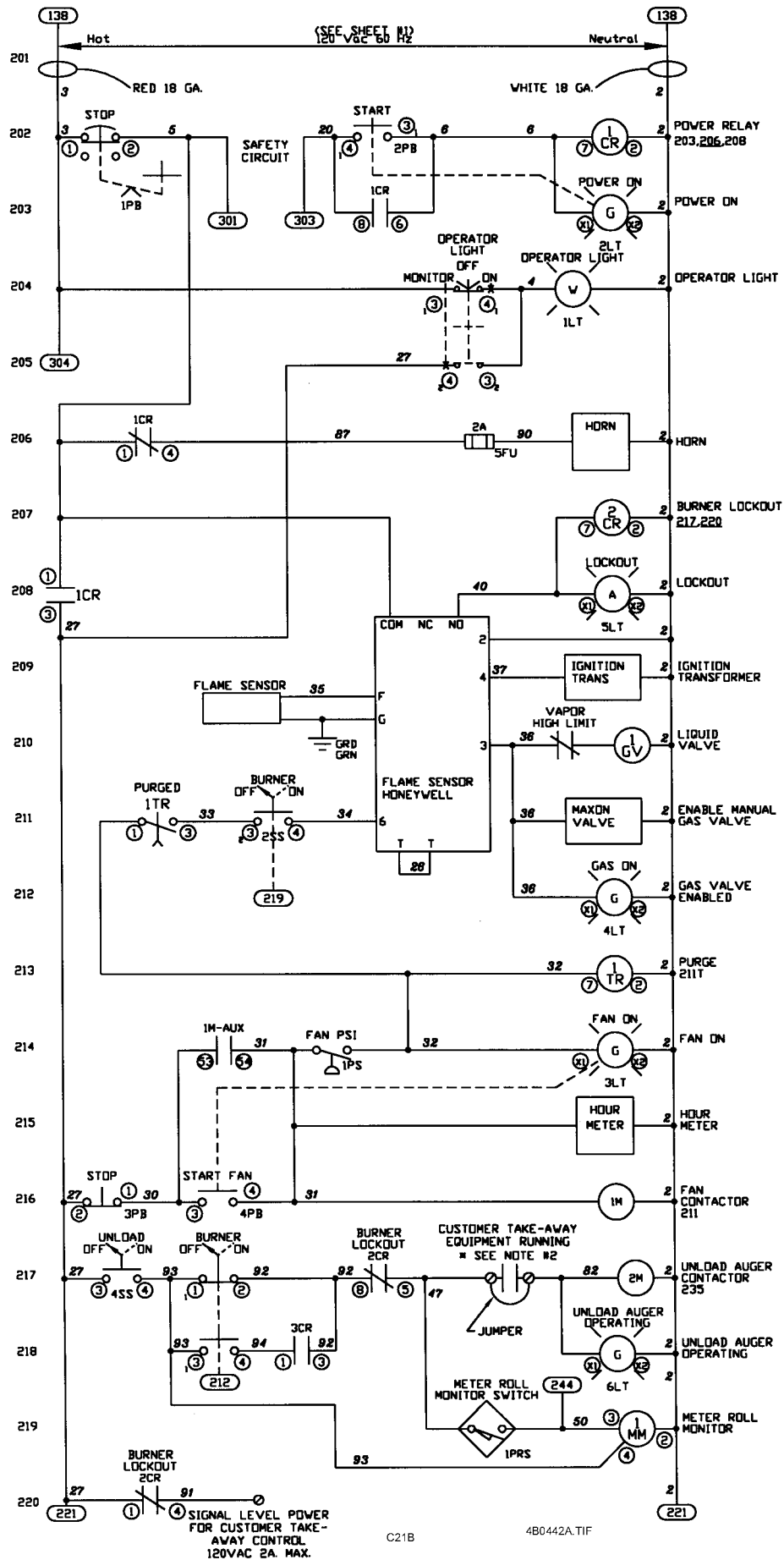
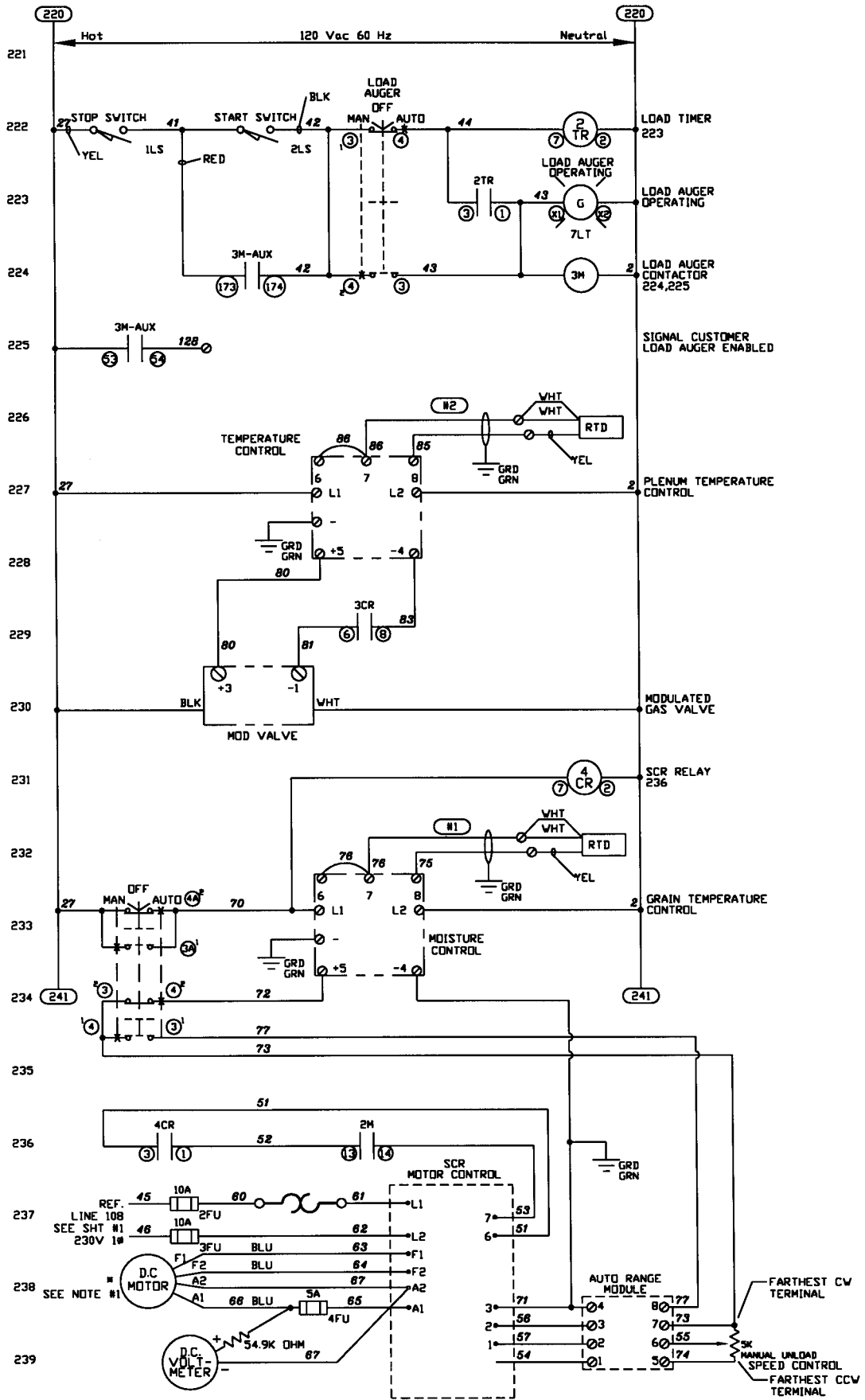
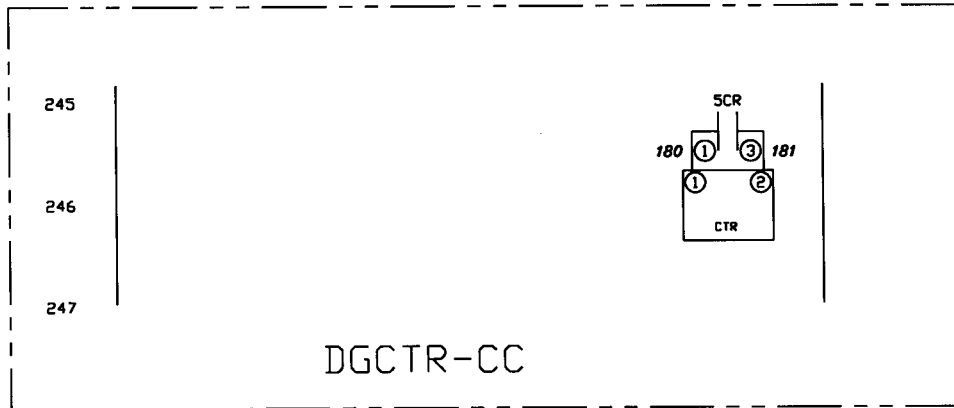
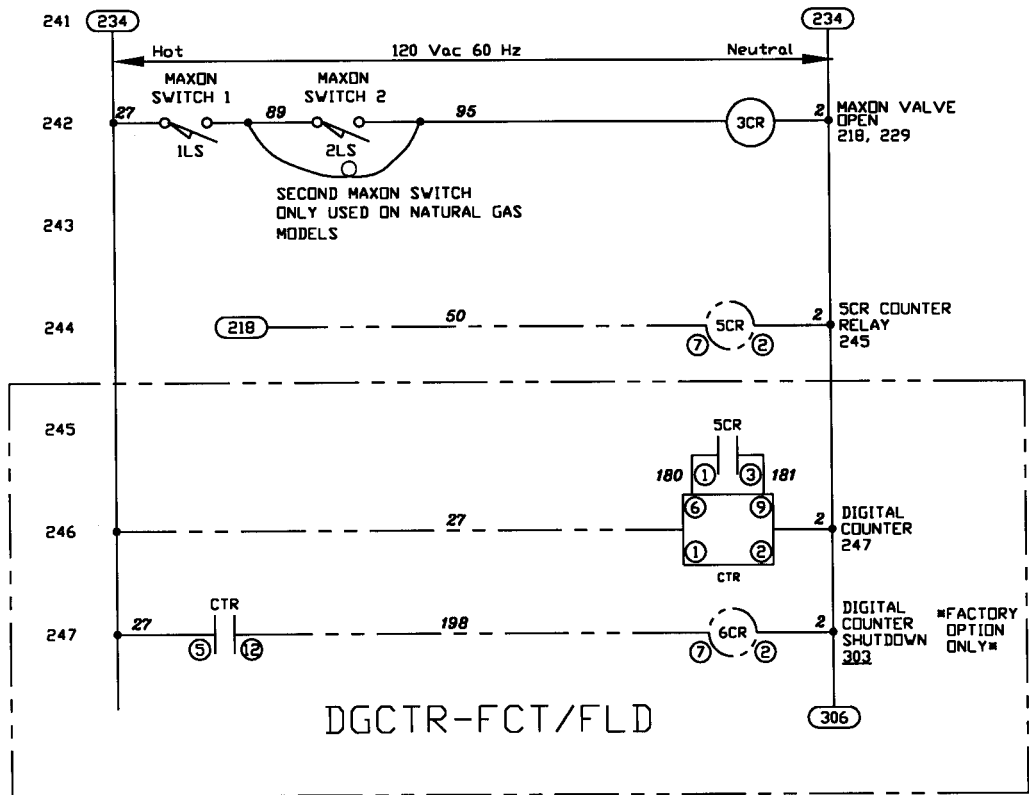


Fig. 13 C-2100B control circuit, p. 1 of 4



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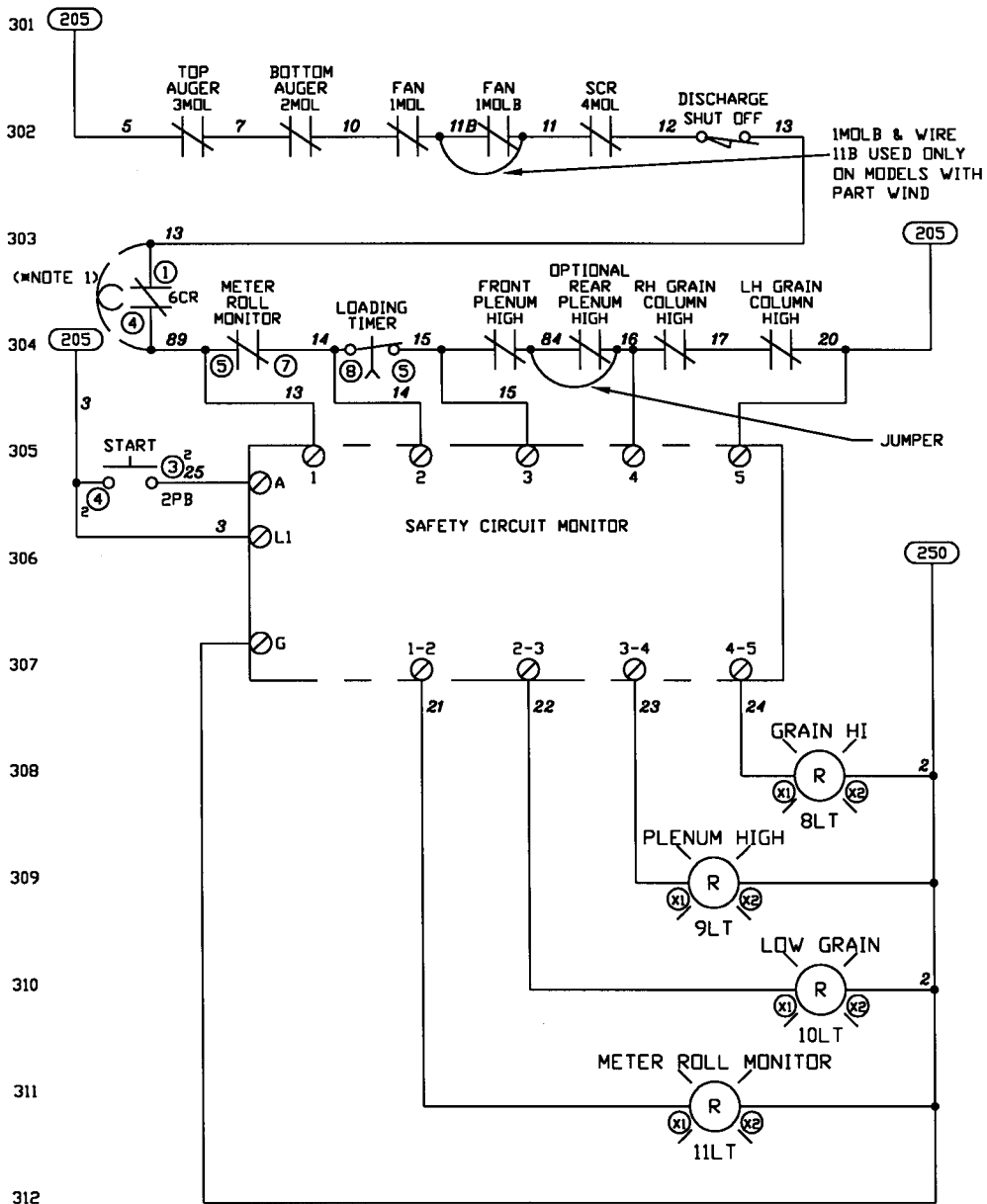
Fig. 13 C-2100B control circuit, p. 2 of 4



- NOTES:
- ON DUAL VOLTAGE MOTORS WITH (4) FIELD LEADS CONNECT F1 TO LINE #63 F4 TO LINE #64 F2 AND F3 TOGETHER
  - REMOVE SHIPPING JUMPER AND INSTALL AUXILIARY CONTACTS FROM TAKE-AWAY EQUIPMENT

4B0442C.TIF

Fig. 13 C-2100B control circuit, p. 3 of 4



4B0442D.TIF

Fig. 13 C-2100B control circuit, p. 4 of 4



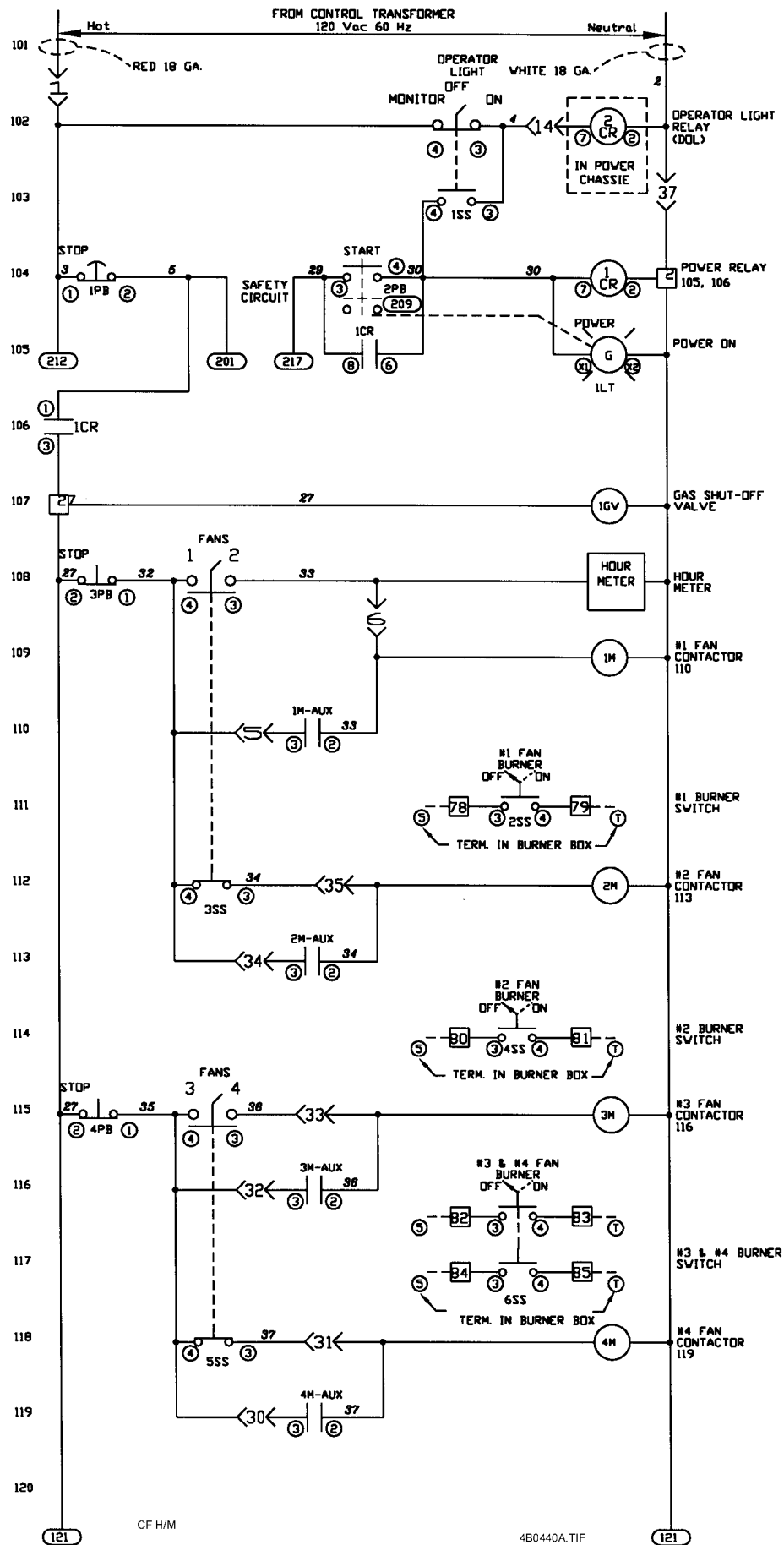


Fig. 14 CF-H and CF-M control circuit, p. 1 of 4

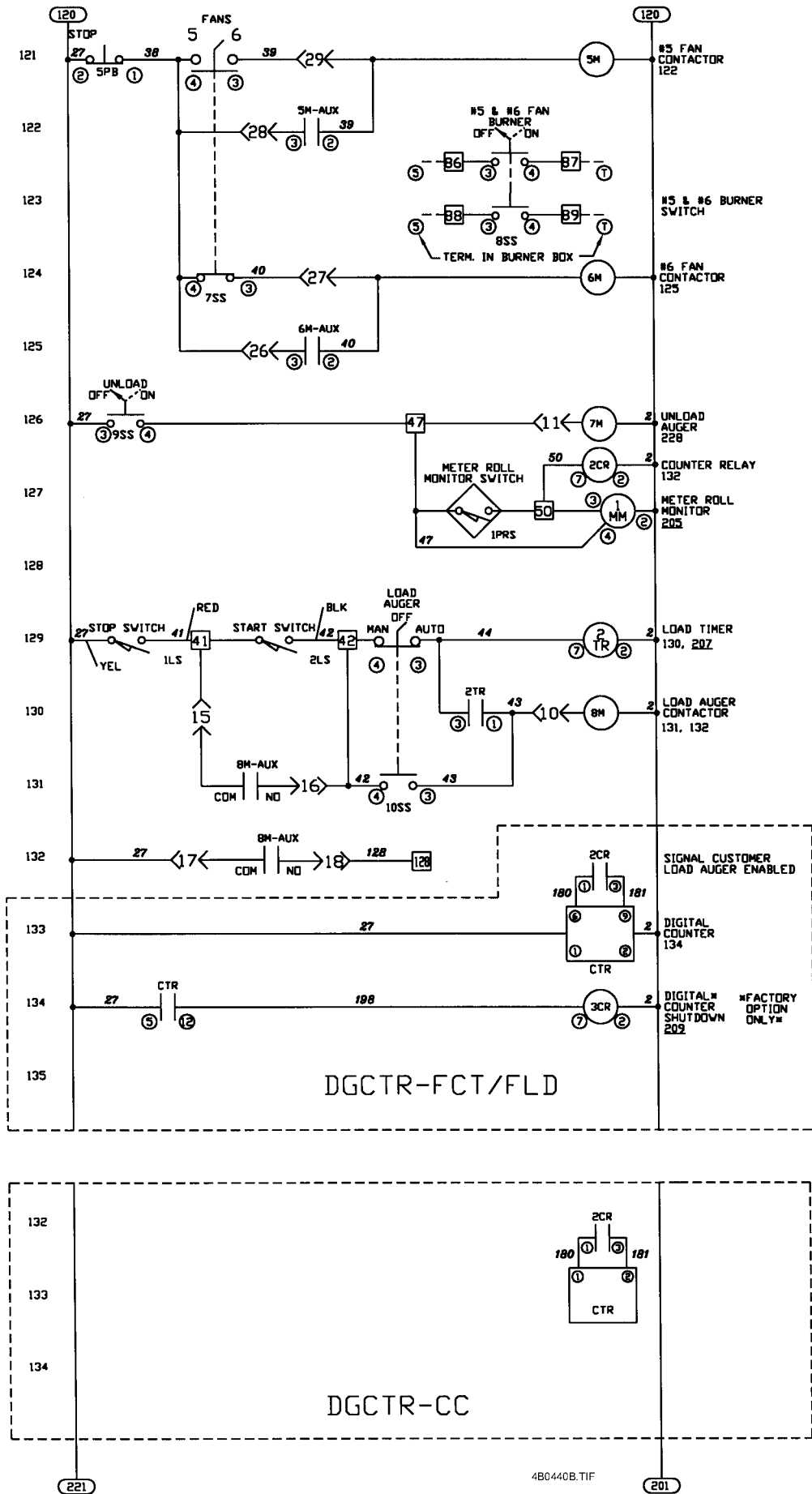


Fig. 14 CF-H and CF-M control circuit, p. 2 of 4

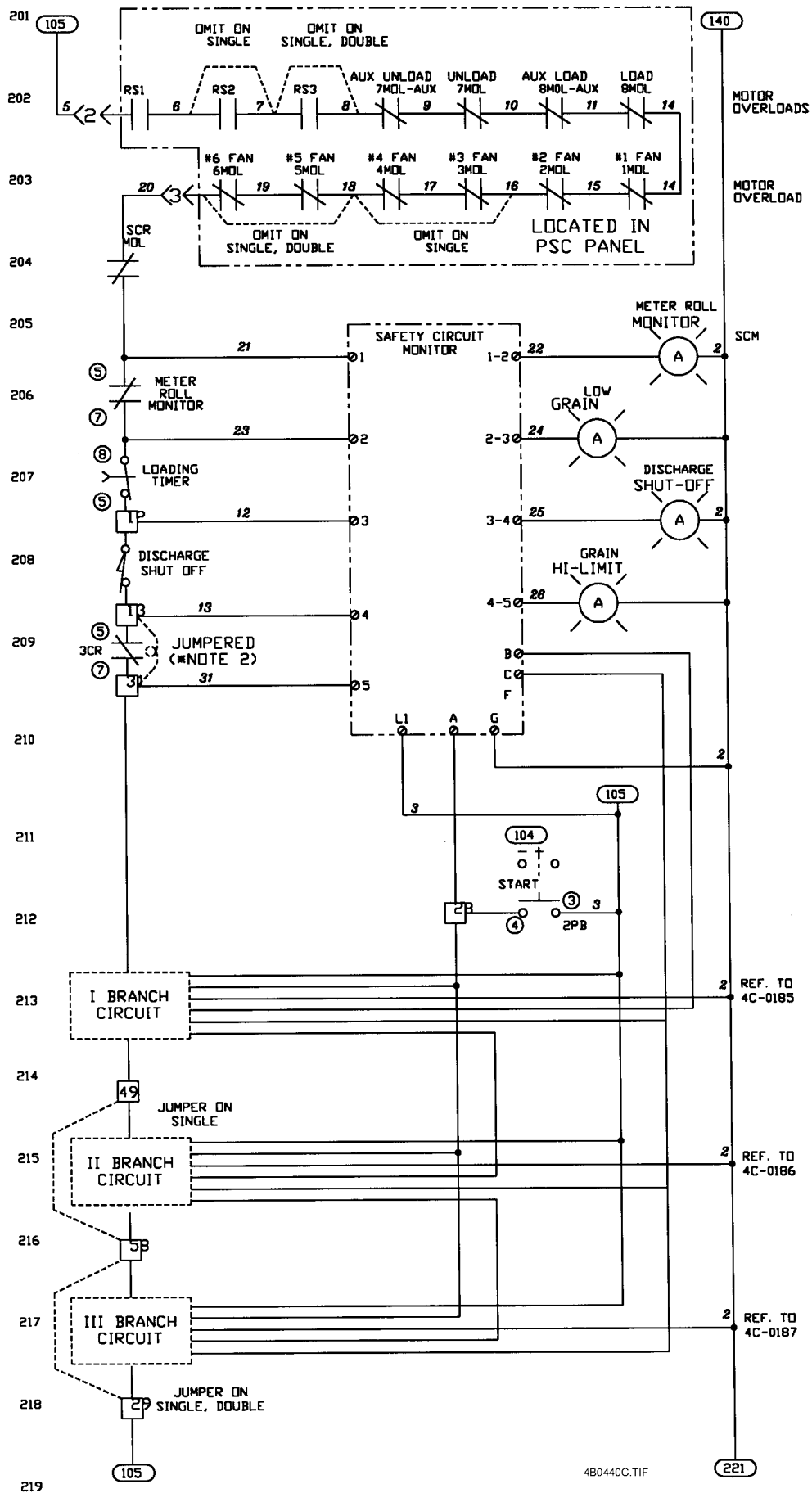
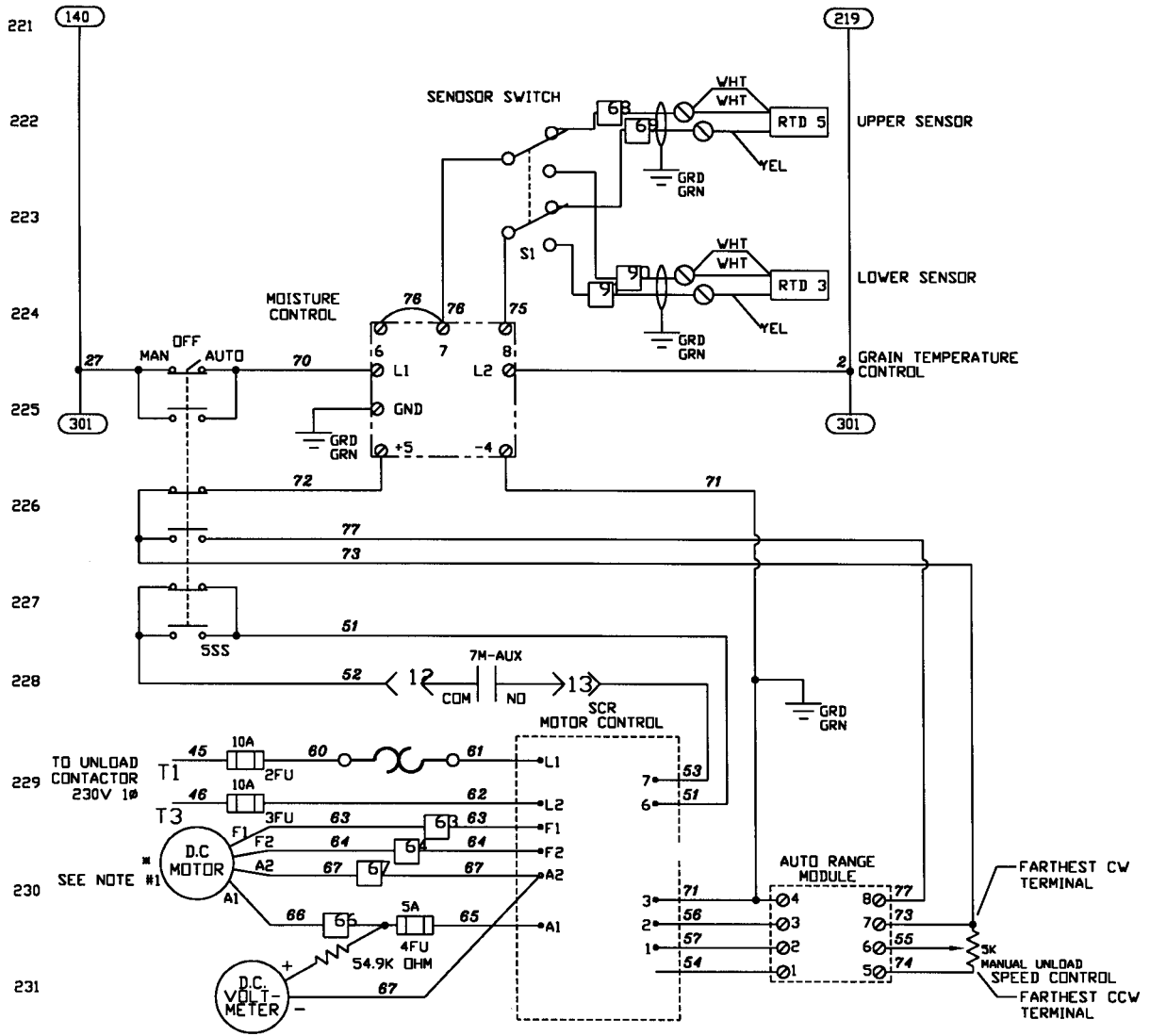


Fig. 14 CF-H and CF-M control circuit, p. 3 of 4



NOTES:

1. ON DUAL VOLTAGE MOTORS WITH (4) FIELD LEADS CONNECT F1 TO LINE #63 F4 TO LINE #64 TIE F2 AND F3 TOGETHER
- \*2. FACTORY INSTALLED DIGITAL COUNTER OPTION. SHIPPED WITH JUMPER INSTALLED.

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Fig. 14 CF-H and CF-M control circuit, p. 4 of 4

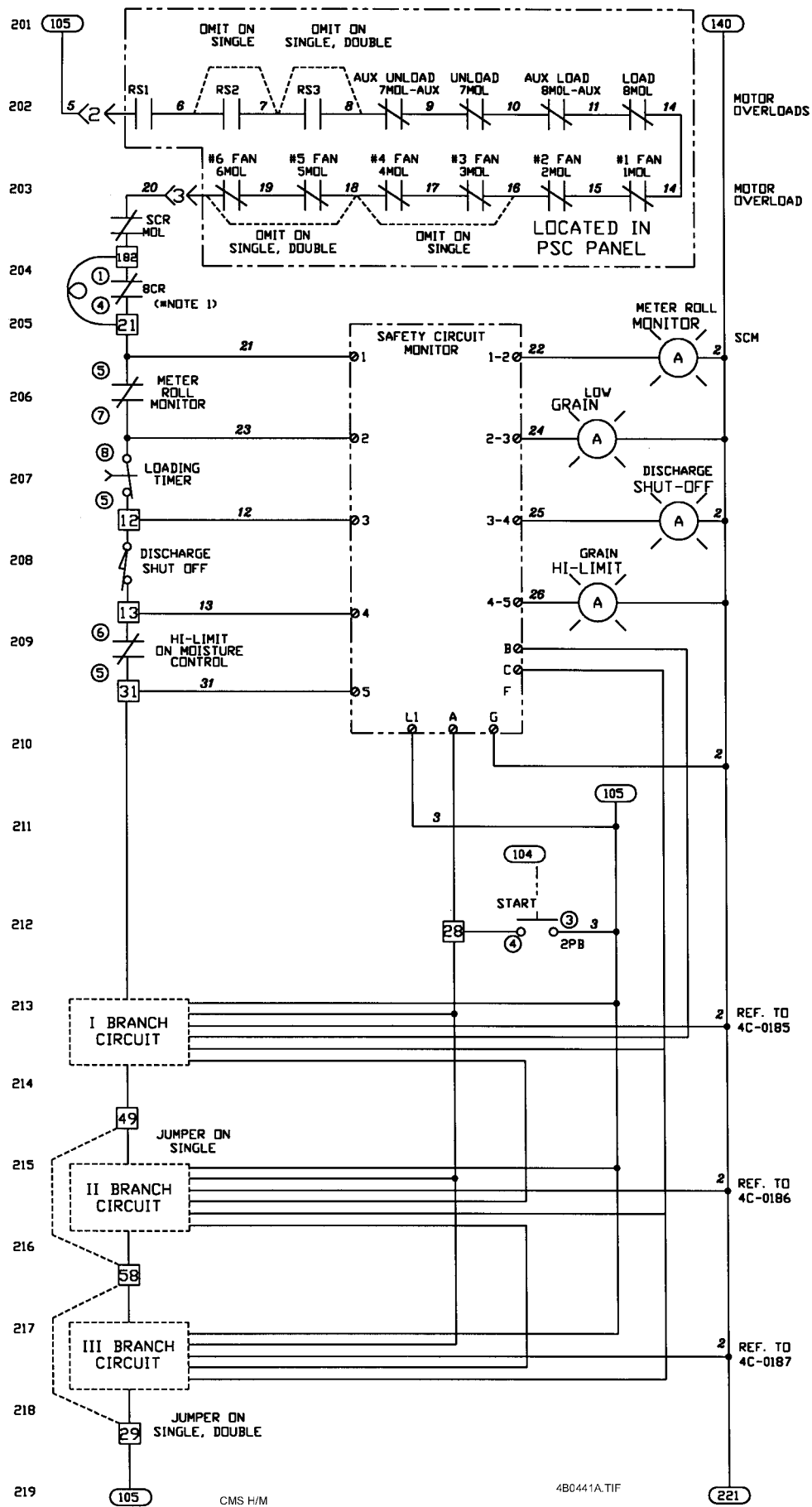
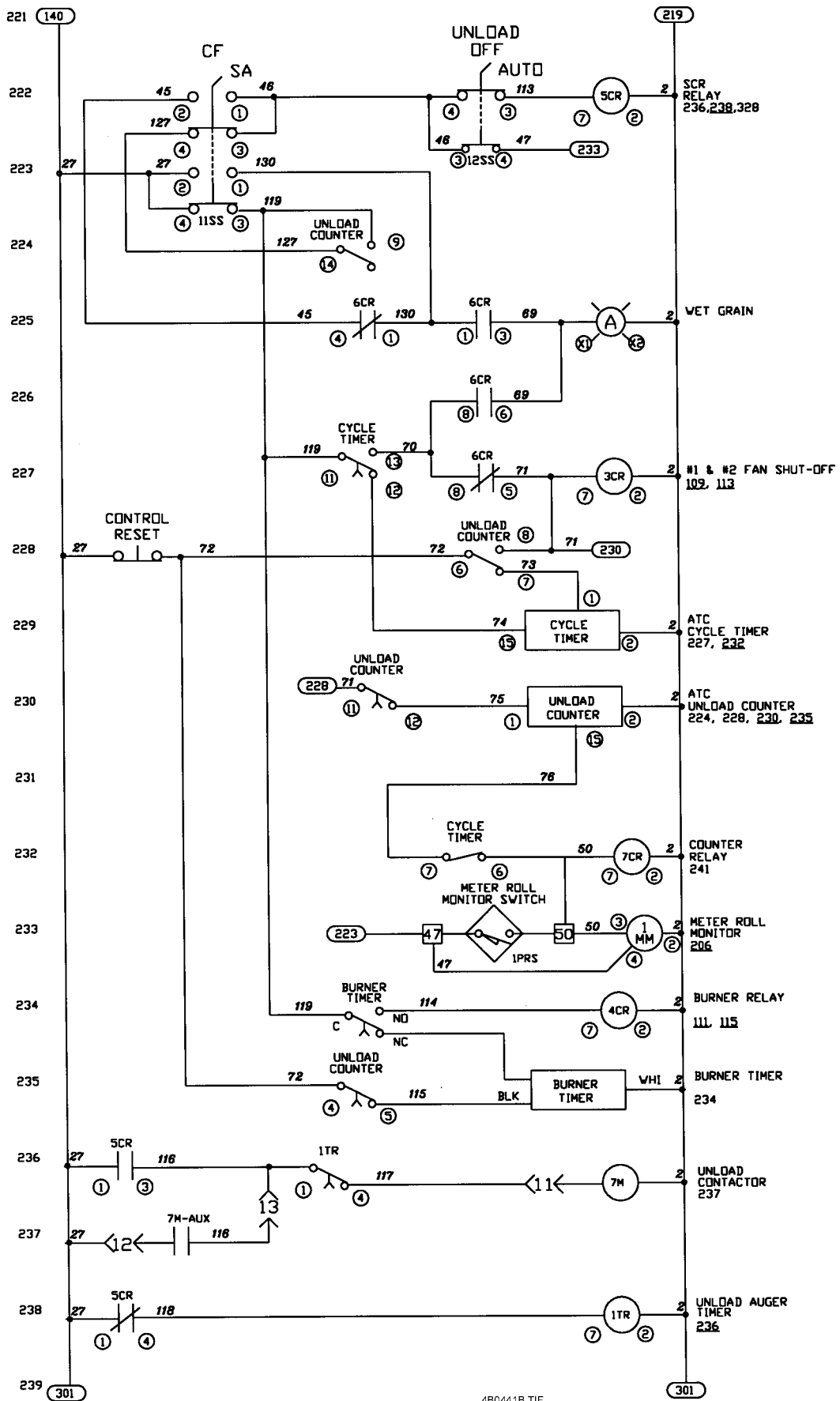
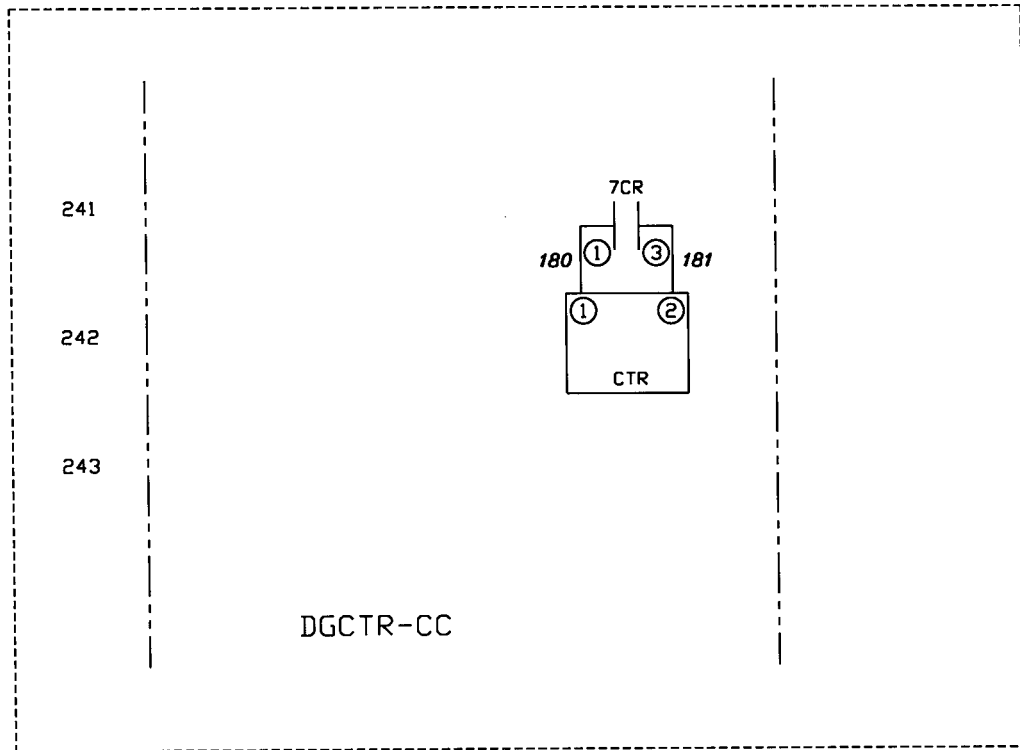
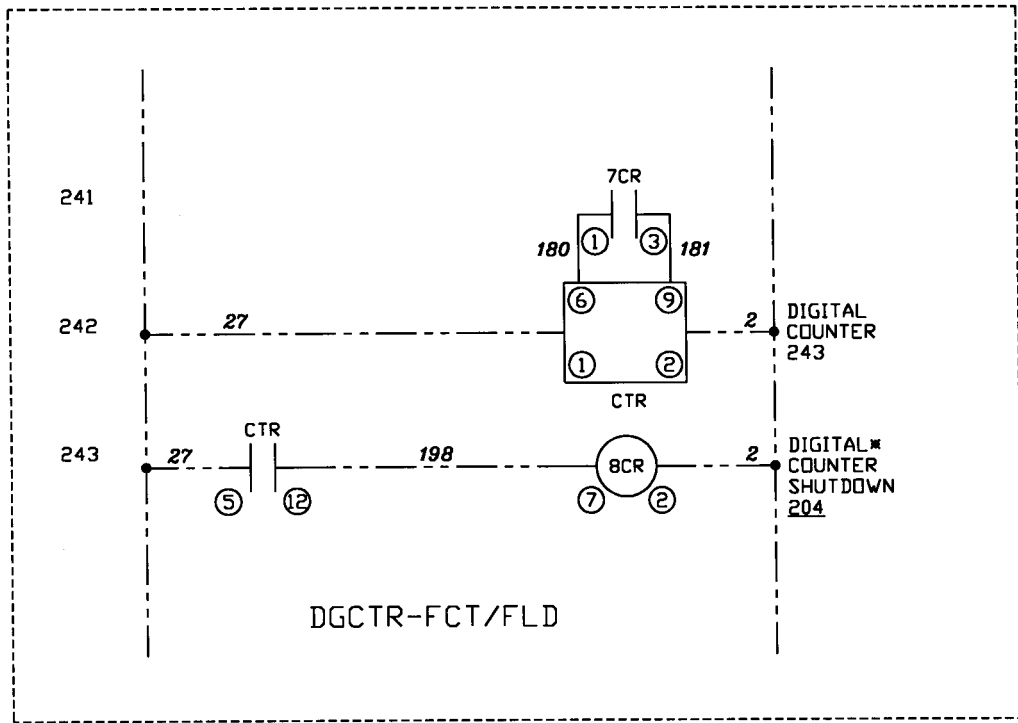


Fig. 15 CMS-H and CMS-M control circuit, p. 1 of 3



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Fig. 15 CMS-H and CMS-M control circuit, p. 2 of 3



NOTE:

\*1. FACTORY INSTALLED DIGITAL COUNTER OPTION. SHIPPED WITH JUMPER INSTALLED.

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Fig. 15 CMS-H and CMS-M control circuit, p. 3 of 3

