



Q26000-002 ORION SCHEMATIC

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FOR LATEST DESIGN FILES INCLUDING BILL OF MATERIAL:
 Go to: (<http://tennantengineering.com>)
 Click on "QPL Documentation"
 Click on "Bills of Materials"
 Click on "1069632-.....Orion"
 Enter password under "to download/view files"
 Click "List Filenames"
CLICK ON "BOM1069632rev_.xls"

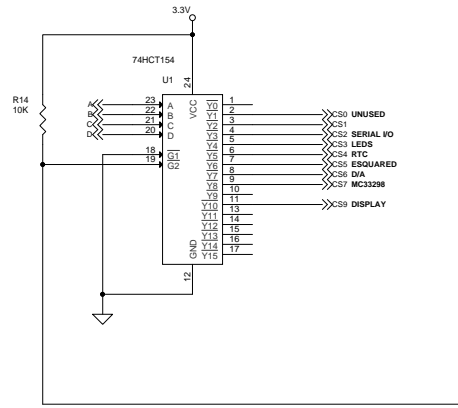
**CHANGES FROM REV Q26000-001
 --UPDATE NOTES ON SHEET 1**

**DESIGN FILES PART NUMBERS:
 (REFERENCE ONLY)**
BOM: 1069632
PCA: 1069632
PCB: Q25034-002
GERBERS: Q25034-002
SCHEMATIC: Q26000-002

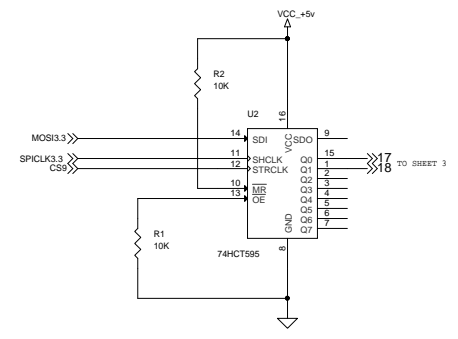
- BOM PARTS**
- HDWE1 CONFORMAL COATING
 - REF1 PCB
 - X_U7 FIRMWARE
 - SCH REFERENCE

| | | | | | | | |
|--|------------------|-----------|---------------------------------------|--|----------|---|--|
| MATERIAL SPECIFICATIONS | | SEE NOTES | | PROPRIETARY INFORMATION | | DKW/ 08-14-2012 | |
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| SCALE: N/A | DO NOT SCALE DWG | DATE | TOLERANCES UNLESS OTHERWISE SPECIFIED | | | | |
| DWN: XXXXXX XXXXXXXX | XX-XXX-XXXX | | METRIC TOLERANCES | INCH EQUIVALENT | | | |
| MDR: XXXXXX XXXXXXXX | XX-XXX-XXXX | | LINEAR | +/- X.XX | +/- X.XX | | |
| DES: XXXXXX XXXXXXXX | XX-XXX-XXXX | | SLOT WIDTH | N/A | N/A | GENERAL NOTES | |
| PART NAME: PCB CIRCUITBOARD [T7 BURNISHER] | | | HOLE DIA | N/A | N/A | DIMENSIONS WITHOUT BRACKETS ARE METRIC. DIMENSIONS WITH BRACKETS ARE INCH UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE AFTER TREATMENTS AND FINISHES. | |
| | | | ANGULAR | N/A | N/A | DNG D SIZE | |
| | | | MACH SURFACES | N/A | N/A | PART NUMBER Q26000-002 | |
| SHEET 1 OF 8 | | | | | | OrCAD Center TENNANT | |

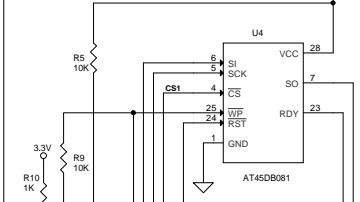
CHIP SELECT DECODER



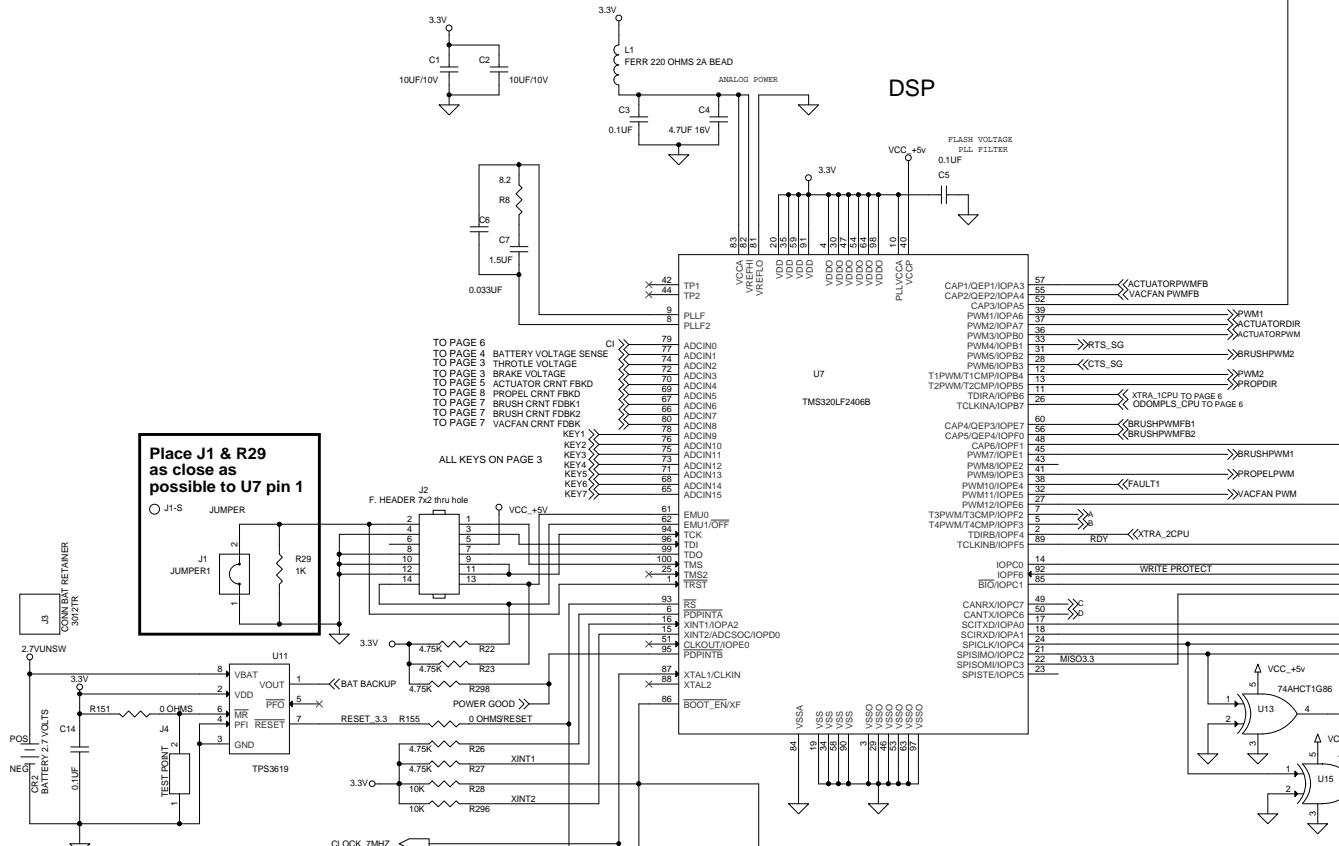
DISPLAY



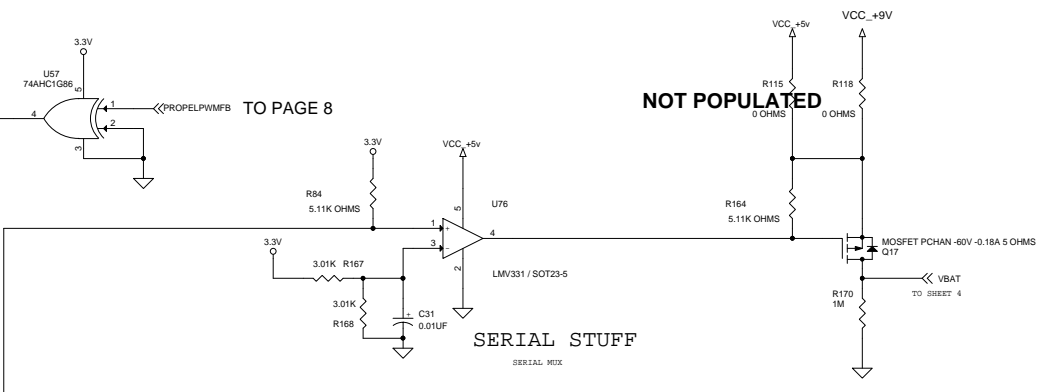
FLASH MEMORY



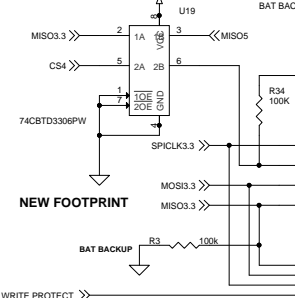
DSP



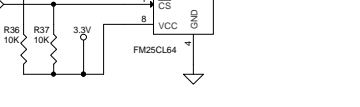
SERIAL STUFF



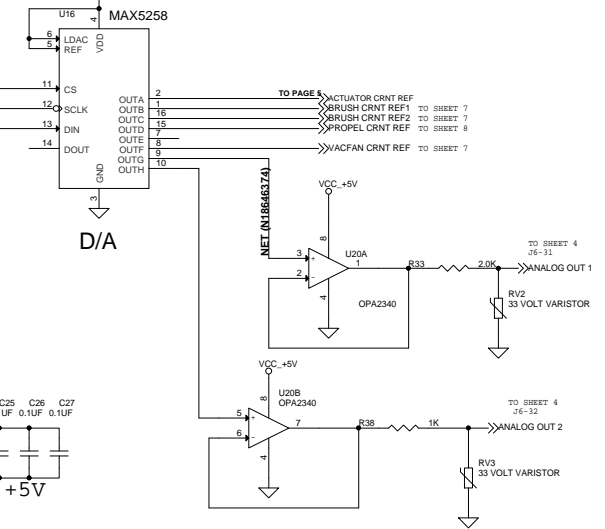
LEVEL TRANSLATION



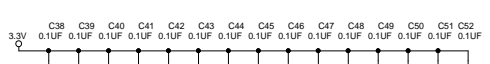
FRAM



D/A



DECOUPLING, +5V



DECOUPLING, +3.3V



Place J1 & R29 as close as possible to U7 pin 1

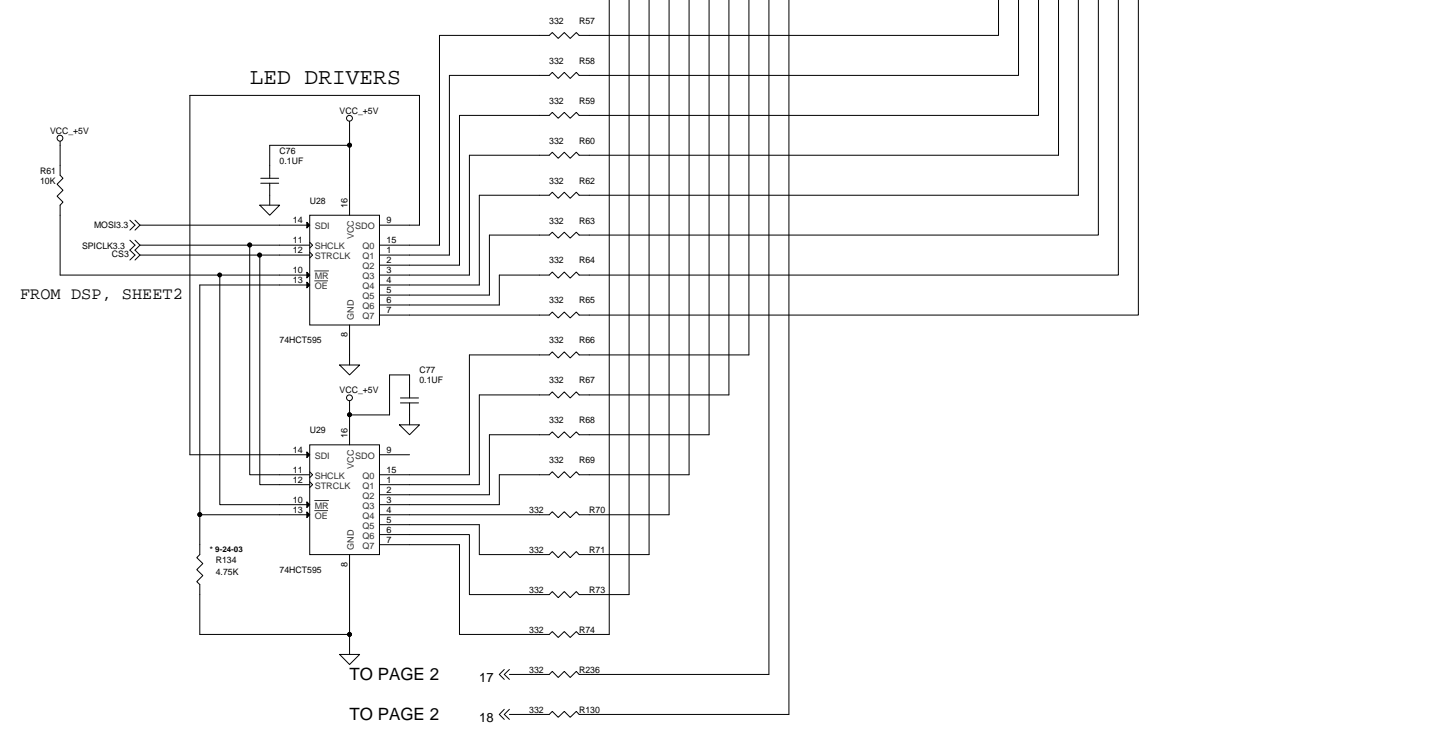
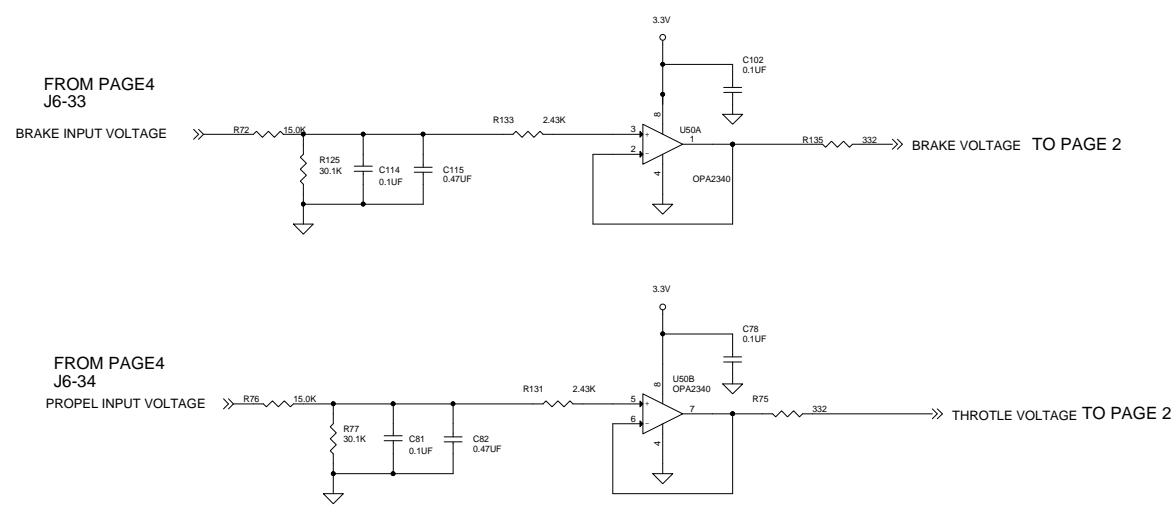
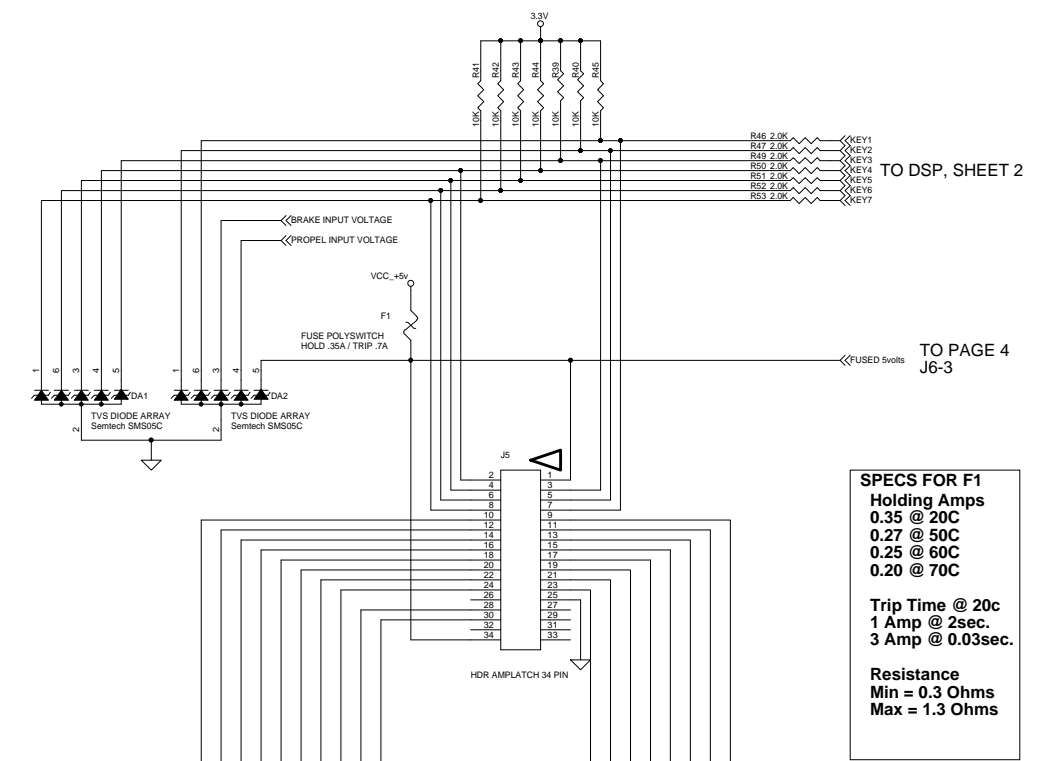
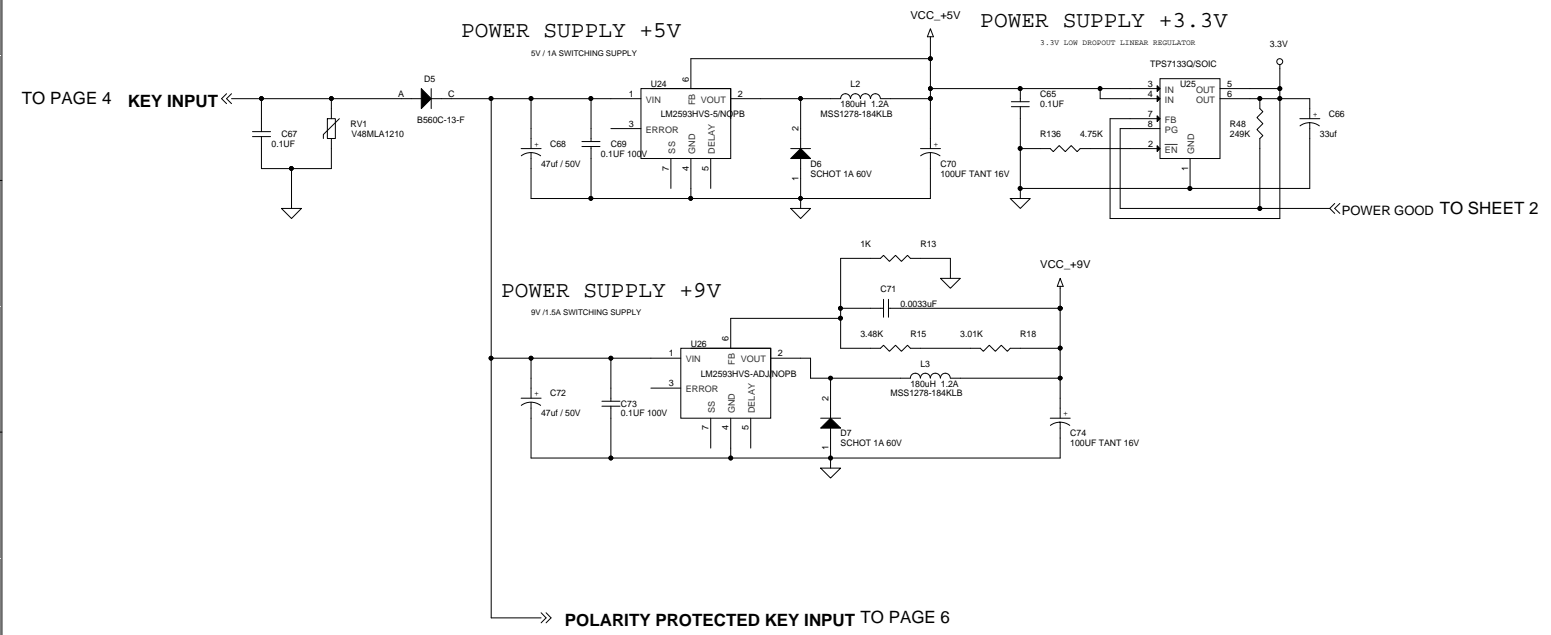
Combine J8 and J16 ?

HEARTBEAT LED component side PLACE D4 as shown

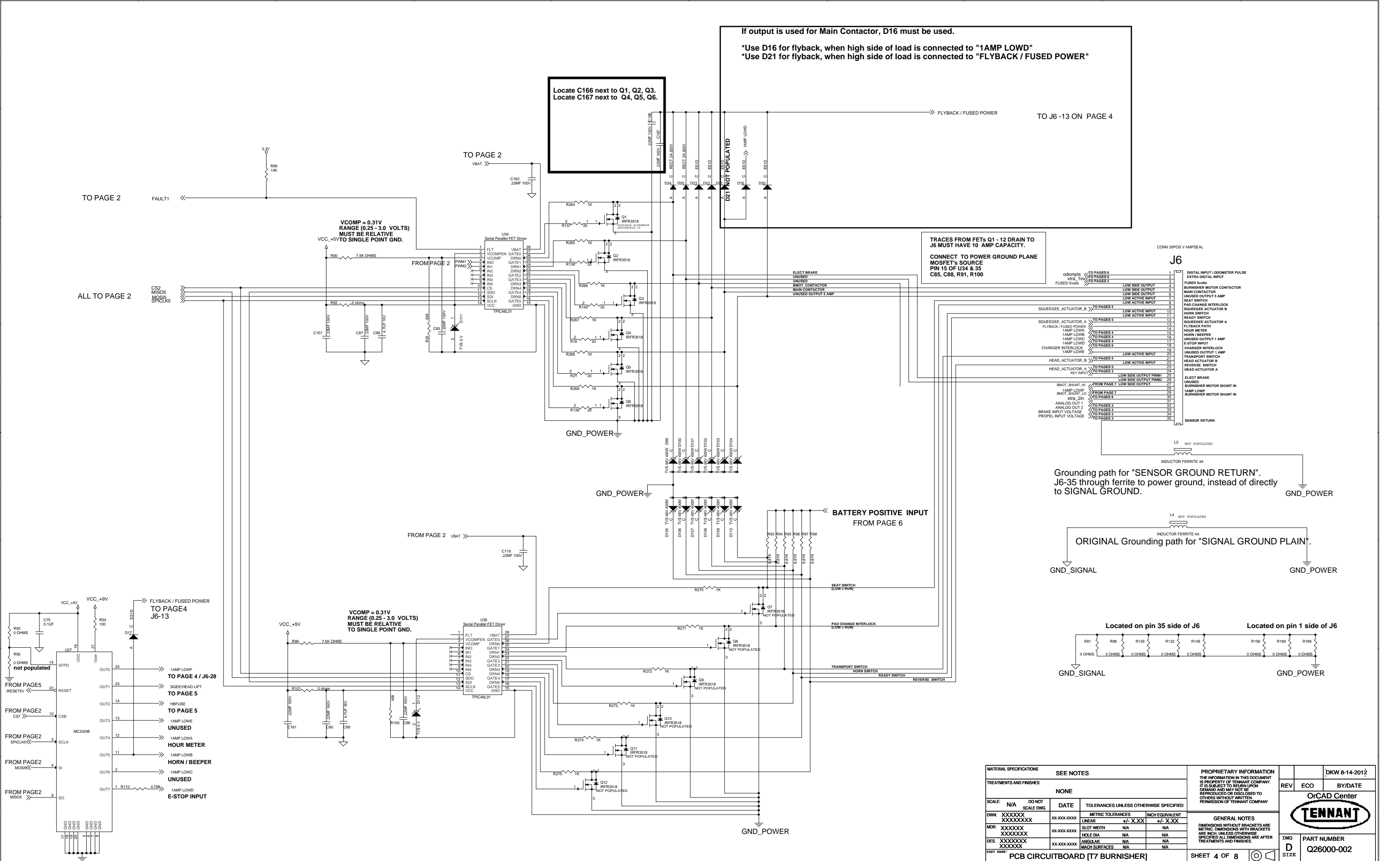
"T5" Machine places a potentiometer of 5K ohms across outputs; Analog Out 1 and Analog Out 2. Potentiometer varies from 5K to 0 ohms.

OUTPUTS ARE SHORT CIRCUIT PROTECT EACH OUTPUT LIMITED TO APROX. 45mA

| MATERIAL SPECIFICATIONS | | SEE NOTES | | PROPRIETARY INFORMATION | | DKW 8-14-2012 | |
|---------------------------------|------------------|------------|---------------------------------------|---|--|---------------|---------|
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| SCALE: N/A | DO NOT SCALE DWG | DATE | TOLERANCES UNLESS OTHERWISE SPECIFIED | GENERAL NOTES | | OrCAD Center | |
| DWN: XXXXXX | XXXXXXX | XX-XX-XXXX | METRIC TOLERANCES | DIMENSIONS WITHOUT BRACKETS ARE METRIC. DIMENSIONS WITH BRACKETS ARE INCH. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE AFTER TREATMENTS AND FINISHES. | | TENNANT | |
| MDR: XXXXXX | XXXXXXX | XX-XX-XXXX | LINEAR | SLOT WIDTH | | PART NUMBER | |
| DES: XXXXXX | XXXXXXX | XX-XX-XXXX | HOLE DIA | ANNULAR | | Q26000-002 | |
| PCB CIRCUITBOARD [T7 BURNISHER] | | | | SHEET 2 OF 8 | | DWG D ST2E | |



| | | | | | | | |
|---------------------------------|------------------|-------------|---------------------------------------|--|--|-----------------|--|
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| MDR: XXXXXX | XXXXXXXX | XX-XXX-XXXX | LINEAR | SPECIFIED ALL DIMENSIONS ARE AFTER TREATMENTS AND FINISHES. | | PART NUMBER | |
| DES: XXXXXX | XXXXXXXX | XX-XXX-XXXX | SLOT WIDTH | MACH SURFACES | | Q26000-002 | |
| PCB CIRCUITBOARD [T7 BURNISHER] | | | | SHEET 3 OF 8 | | DWG D ST2E | |



If output is used for Main Contactor, D16 must be used.
 *Use D16 for flyback, when high side of load is connected to "1AMP LOWD"
 *Use D21 for flyback, when high side of load is connected to "FLYBACK / FUSED POWER"

Locate C166 next to Q1, Q2, Q3.
 Locate C167 next to Q4, Q5, Q6.

TRACES FROM FETs Q1 - 12 DRAIN TO J6 MUST HAVE 10 AMP CAPACITY.
 CONNECT TO POWER GROUND PLANE MOSFET's SOURCE PIN 15 OF U34 & 35 C85, C88, R91, R100

VCOMP = 0.31V RANGE (0.25 - 3.0 VOLTS) MUST BE RELATIVE TO SINGLE POINT GND.

VCOMP = 0.31V RANGE (0.25 - 3.0 VOLTS) MUST BE RELATIVE TO SINGLE POINT GND.

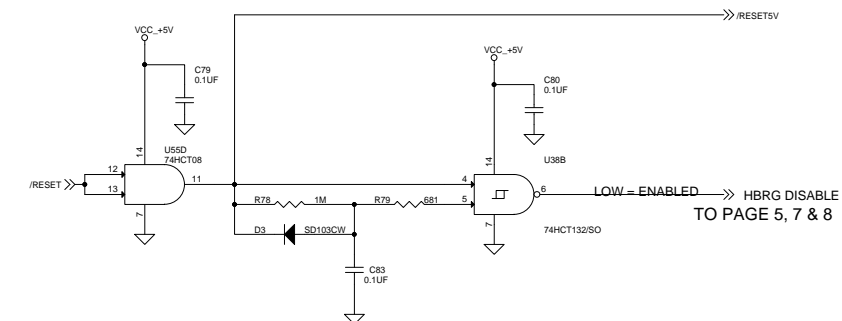
Grounding path for "SENSOR GROUND RETURN". J6-35 through ferrite to power ground, instead of directly to SIGNAL GROUND.

ORIGINAL Grounding path for "SIGNAL GROUND PLAIN".

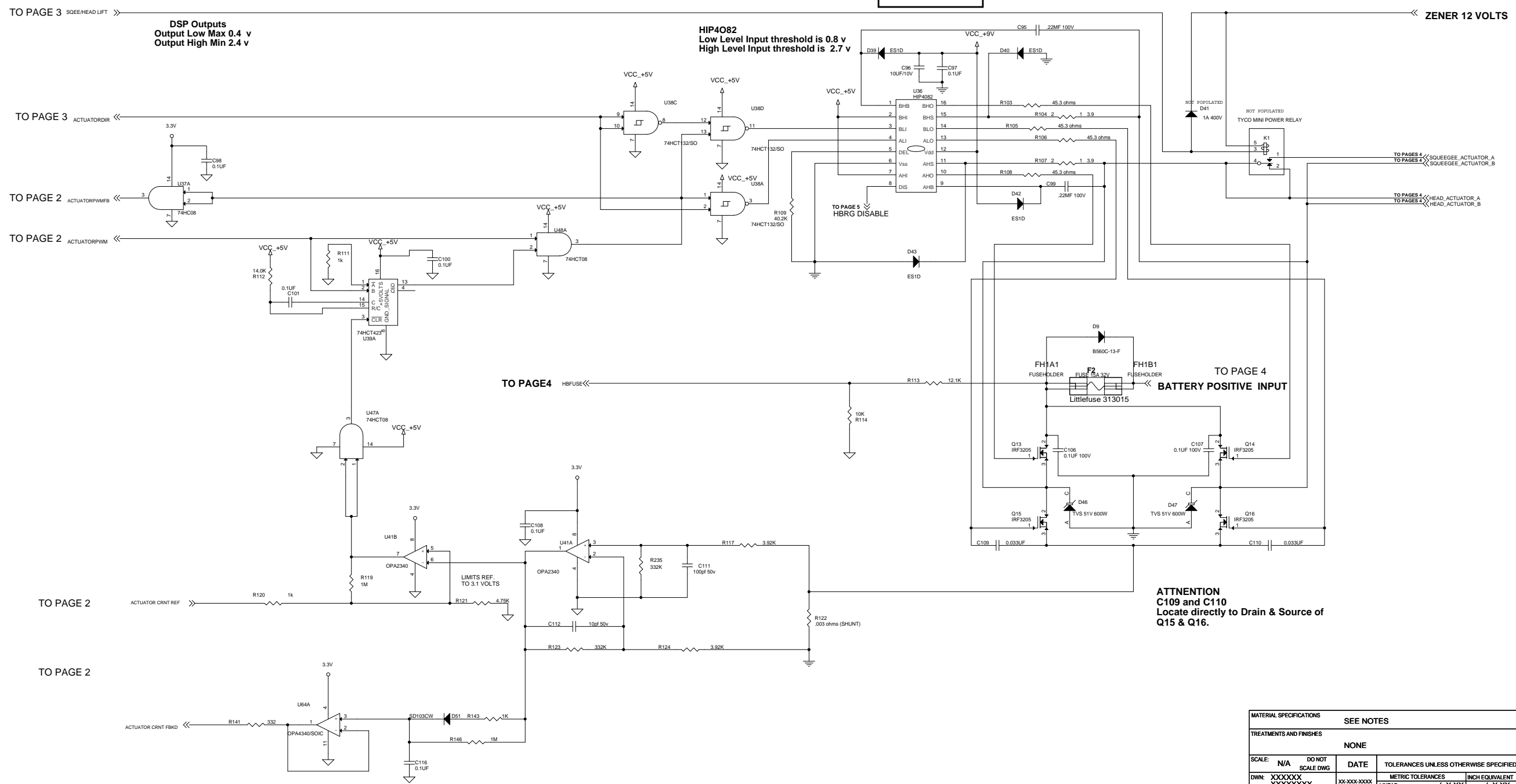
Located on pin 35 side of J6 Located on pin 1 side of J6

| | | | | | | | | | |
|---------------------------------|------------------|-------------|---------------------------------------|--|--|------------------------|--|-----------------|-----------|
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| DWN: XXXXXX | XXXXXXXXXX | XX-XXX-XXXX | METRIC TOLERANCES | | | | | INCH EQUIVALENT | |
| MDR: XXXXXX | XXXXXXXXXX | XX-XXX-XXXX | LINEAR | | | | | +/- X.XXX | +/- X.XXX |
| DES: XXXXXX | XXXXXXXXXX | XX-XXX-XXXX | SLOT WIDTH | | | | | N/A | N/A |
| | | | HOLE DIA | | | | | N/A | N/A |
| PCB CIRCUITBOARD [T7 BURNISHER] | | | | SHEET 4 OF 8 | | PART NUMBER Q26000-002 | | | |

5V RESET & H-BRIGE DISABLE



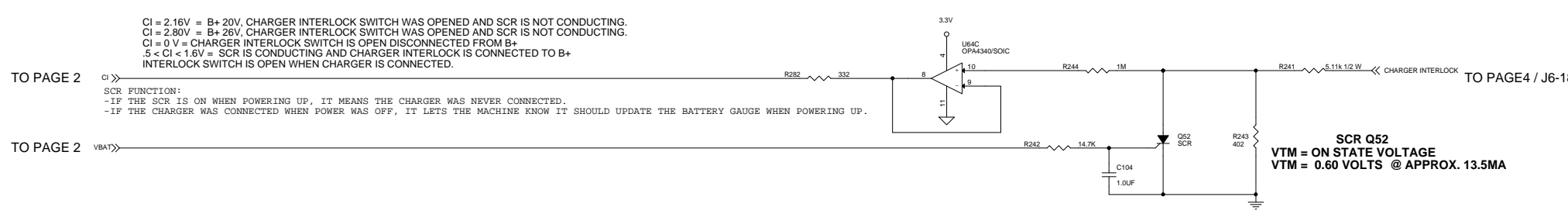
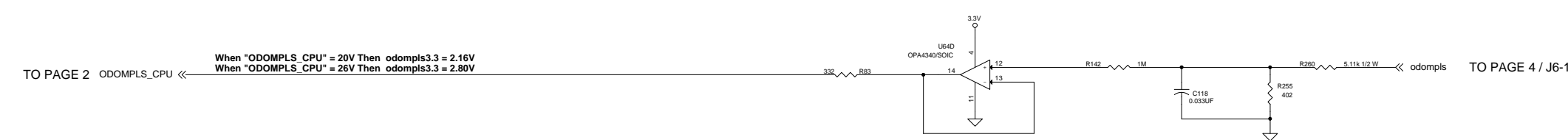
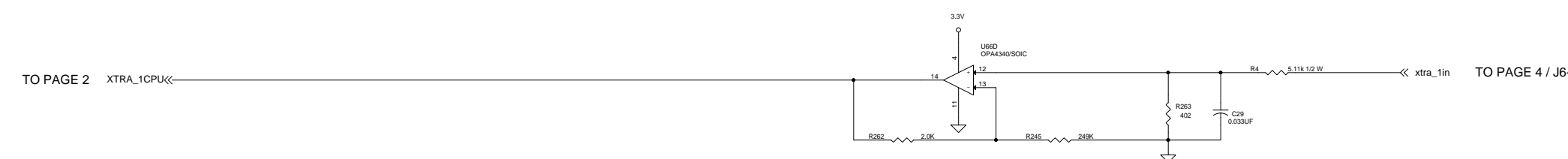
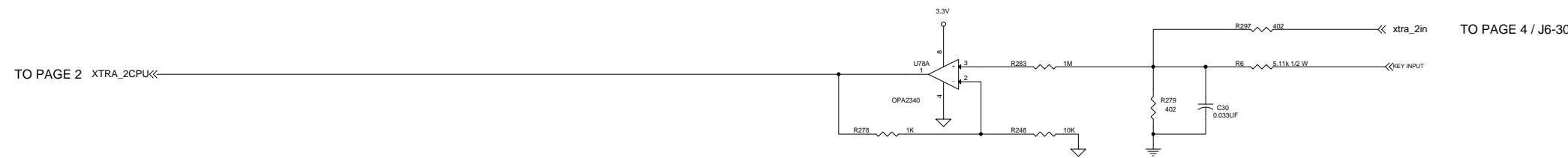
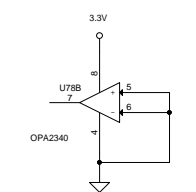
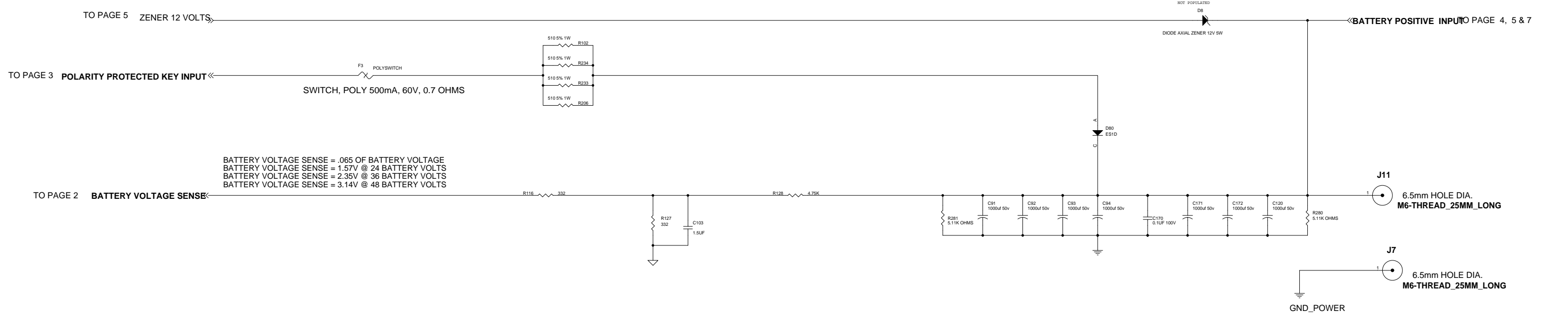
LOCATE C96 & C97 CLOSE TO PINS 6 & 12. ALSO CONNECT DIRECTLY TO PINS 6 & 12.



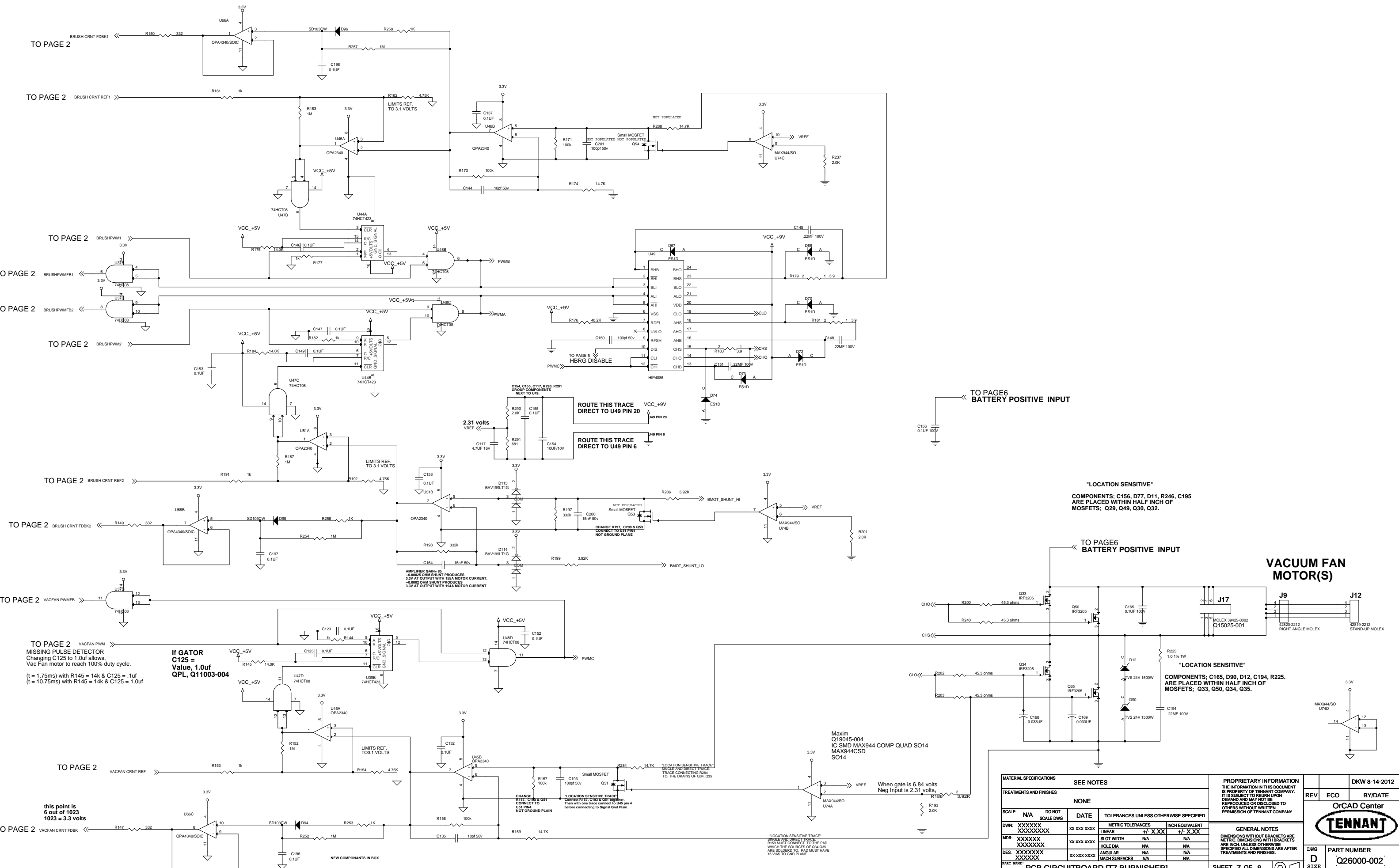
ACTUATOR LIFT

ATTENTION
C109 and C110
Locate directly to Drain & Source of
Q15 & Q16.

| | | | | | | | | | |
|--|------------------|------------|---------------------------------------|--|-----|-----------------|--|-----------------|----------|
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| DWN: XXXXXX | XXXXXXXXXX | XX-XX-XXXX | METRIC TOLERANCES | | | | | INCH EQUIVALENT | |
| MDR: XXXXXX | XXXXXXXXXX | XX-XX-XXXX | LINEAR | | | | | +/- X.XX | +/- X.XX |
| DES: XXXXXX | XXXXXXXXXX | XX-XX-XXXX | SLOT WIDTH | | | | | N/A | N/A |
| PART NAME: PCB CIRCUITBOARD [T7 BURNISHER] | | | HOLE DIA | | | | | N/A | N/A |
| | | | ANGULAR | N/A | N/A | | | | |
| | | | MACH SURFACES | N/A | N/A | | | | |
| SHEET 5 OF 8 | | | | OrCAD Center TENNANT PART NUMBER: Q26000-002 | | | | | |



| | | | | | | | |
|--|------------------|--------------|---------------------------------------|--|--------------|---|--|
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| DWN: XXXXXX | XX-XXX-XXXX | | METRIC TOLERANCES | INCH EQUIVALENT | TENNANT | | |
| MDR: XXXXXX | XX-XXX-XXXX | | LINEAR | +/- X.XX | +/- X.XX | GENERAL NOTES | |
| DES: XXXXXX | XX-XXX-XXXX | | SLOT WIDTH | N/A | N/A | DIMENSIONS WITHOUT BRACKETS ARE METRIC. DIMENSIONS WITH BRACKETS ARE INCH. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE AFTER TREATMENTS AND FINISHES. | |
| PART NAME: PCB CIRCUITBOARD [T7 BURNISHER] | | SHEET 6 OF 8 | | DWG D SIZE | | PART NUMBER Q26000-002 | |



TO PAGE 6
BATTERY POSITIVE INPUT

"LOCATION SENSITIVE"
COMPONENTS: C156, D77, D11, R246, C195
ARE PLACED WITHIN HALF INCH OF
MOSFETS; Q29, Q49, Q30, Q32.

TO PAGE 6
BATTERY POSITIVE INPUT

**VACUUM FAN
MOTOR(S)**

"LOCATION SENSITIVE"
COMPONENTS: C165, D90, D12, C194, R225.
ARE PLACED WITHIN HALF INCH OF
MOSFETS; Q33, Q50, Q34, Q35.

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| DWN: XXXXXX | XXXXXXXX | XX-XX-XXXX | METRIC TOLERANCES | ECO | BY/DATE | |
| MDR: XXXXXX | XXXXXXXX | XX-XX-XXXX | LINEAR | TENNANT GENERAL NOTES DIMENSIONS WITHOUT BRACKETS ARE METRIC. DIMENSIONS WITH BRACKETS ARE INCH. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE AFTER TREATMENTS AND FINISHES. | | |
| DES: XXXXXX | XXXXXXXX | XX-XX-XXXX | SLOT WIDTH | | | DWG |
| | | | HOLE DIA | | | D |
| | | | ANGULAR | | | ST.2E |
| PART NAME: PCB CIRCUITBOARD [T7 BURNISHER] | | | | PART NUMBER: Q26000-002 | | |
| SHEET 7 OF 8 | | | | | | |

