

g GE Canada
Electronic Products Repair
3070 Mainway Drive; Unit 23A Rear
Burlington, Ontario L7M 3X1
(905) 332-2431

Test Instructions for

0471L0536

Device Number

NON REVERSING REGULATOR AND CO-ORDINATION

Description of Device

Originated By: Carmine Sebastiani
Typed Name

Date: July 12, 1996
mm/dd/yy

Approved By: _____
Signature

Approval Date: _____
mm/dd/yy

TEST INSTRUCTIONS PREVIOUS REVISION SHEET

0471L0536

Device Number

Non Reversing Regulator and Co-ordination

Description of Device

Originated By	Date mm/dd/yy	Description of change
FJ Olson	Mar 03, 1970	Created test instructions for Non Reversing Regulator Card (471L0536) using test jig (TL#225462)
Scott Andrus	Mar 29, 1996	Created cover and revision sheets and modified test instructions for use without jig
Carmine Sebastiani	Jul. 12, 1996	Added hand written notes to this instruction
Steve Pharris	May 9, 2013	Corrected procedure for use in Louisville

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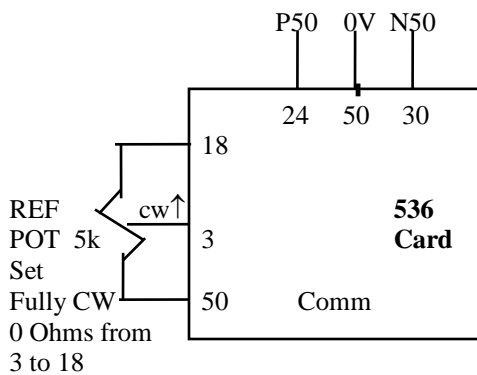
Non Reversing Regulator and Co-ordination

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1. PURPOSE: Testing of a Non Reversing Regulator and Co-ordination Card (ML0471L0536)
2. ELEMENTARY: S & C Data Book 1188 section 536 Drawing 217A2427.
3. EQUIPMENT:
 - A) $\pm 50\text{VDC}$ Reg. Power Supply.
 - B) 15VDC Variable Power Supply.
 - C) Fluke DMM or Equivalent.
 - D) $5\text{k}\Omega$ Variable resistor
 - E) 24V relay
 - F) IC3600 Connector Box
 - G) Oscilloscope
 - H) Signal generator
 - I) 10K Ohm Resistor
4. SET UP:



- A) Connect the circuit as per this circuit.
- B) Adjust R6 Fully CW
- C) Power up the power supply.

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5. TESTS:

A) Rate Reference

- 1) Turn reference pot as illustrated above CW (pin 3 to pin 18 = 0 Ohms)
- 2) Connect voltmeter to pin 3
- 3) R1 (on card):
 - turn CCW and voltmeter should read $19\text{v} \pm 2\text{v}$
 - turn CW and voltmeter should read $30\text{v} \pm 2\text{v}$
 - set to give $25\text{v} \pm .5\text{v}$
- 4) Turn external REF Pot CCW and R2 and R3 on card CW
- 5) Momentarily touch pin 20 to ground (Pin 50)
- 6) Connect 10Kohm resistor from Pin 26 to Pin 50
- 7) Connect voltmeter to REF Output (pin 26). Should be $\leq +1\text{vdc}$
- 8) Quickly turn REF pot CW and note that time taken to ramp up to $+20\text{v} \pm 2\text{v}$ is $30\text{ sec} \pm 5\text{s}$
- 9) Quickly turn REF pot CCW and note that time taken to ramp down to $\leq 1\text{v}$ is $30\text{ sec} \pm 5\text{sec}$
- 10) Turn R2 and R3 CCW
- 11) Quickly turn REF pot CW and note that time taken to ramp up to $20\text{v} \pm 3\text{v}$ is $3\text{sec} \pm 2\text{sec}$
- 12) Tie pin 20 to +50 volt and note that voltage drops to $\leq .5\text{v}$ in less than .5sec
- 13) Remove pin 20 from 50v and note that voltage ramps up to $20\text{v} \pm 2\text{v}$ in $3\text{sec} \pm 2\text{sec}$
- 14) Quickly turn REF pot CCW and note that voltage ramps down to $\leq 1\text{v}$ in $3\text{sec} \pm 2\text{sec}$
- 15) Set R2 and R3 in mid position (10turns CW)
- 16) Remove 10K Ohm Resistor from pin26 and pin50

B) Regulator Tests

- 1) Connect pin 26 to 6
- 2) Connect voltmeter to REG OUTPUT (pin 28)
- 3) Turn REF pot CCW
- 4) Adjust R7 until voltage reduces to $\leq +.5\text{v}$ ($\pm .050\text{ volts}$). (Do not turn R7 further CCW from this setting otherwise a dead band will be created)
- 5) Connect voltmeter to REF OUTPUT (pin 26) and turn REF pot CW slowly until meter reads $+1.25\text{v}$
- 6) REG OUTPUT (pin 28) must be $\geq +15\text{v}$ at this point
- 7) Turn REF pot CW until saturation occurs at pin 28 (ie. at $45.5\text{v} \pm 1\text{v}$)

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C) Current Limit Setting

- 1) Leave conditions same as in step 7) above.
- 2) Connect variable supply to CURR FB (pin 14) and set to 0 volts
- 3) Apply following conditions (in table A) and observe regulated output at pin 28

TABLE A

PIN 20	R4	Variable Supply	REGULATED OUTPUT
--	CW	4v	Remains at $\approx +45v$
--	CW	Increase to $7.5v \pm .5v$	Drops to $\leq 1.0v$
--	CCW	.5v	At $\approx +45v$
--	CCW	1.5v	Drops to $\leq 1.0v$
--	--	$4.5v \pm 1v$	Adjust R4 to set REG. O/P at $+15v \pm 2v$
Tie High (+50v)	--	Remove	Drops to $\leq .5v$
Release	--	Remove	Rises to original value($\approx 45v$)

D) IR Comp Test

- 1) Reconnect variable supply (set at 4.5v) to pin 14
- 2) Take DMM from REG.O/P and connect it to IR COMP (pin 13)
- 3) Turn R5 CCW to CW and voltage should rise from 0v to +4.5v
- 4) Set R5 to give $+2.25v \pm .25v$ at IR COMP

E) Suppression Test

- 1) Connect 24v relay between pin23(+ve) and pin40(-ve)
- 2) Connect pins 45 to 46 and pins 44 to 49
- 3) Move DMM from IR COMP and move it to BIAS O/P (pin 48)
- 4) Remove $\pm 50v$ supplies and then reapply them simultaneously
- 5) The voltmeter should read -50v for 3 to 6 sec. (L2 on card also on) then rise to $-15v \pm 2v$ (L2 now goes out)
- 6) Set variable supply (at pin 14) to $12v \pm 1v$. Turn R6 CCW slowly until BIAS O/P drops to -50v and relay picks up and L1(in PB) and L2 light up.
- 8) Reduce variable supply to $6v \pm .5v$ and push red reset button. L1 and L2 should go out and relay drops out and BIAS O/P returns to -15v approx.
- 9) Momentarily tie pin 20 high (+50v) , L2 should glow and BIAS O/P returns to -50v
- 10) Remove jumper from pin 20 and connect variable supply to pin 4 and increase to +15v to see relay picks up and L1(in PB) and L2 light up.
- 11) Reduce voltage to 6v at pin4

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12) Push and release reset PB and all conditions return to previous state

13) Tie pin 47 to ground and BIAS O/P goes to -50v and L2 glows

F) Bridge Test

1) Connect scope leads to pins 31 and 36

2) Connect signal generator leads to pins 32 and 34 and set for 1khz 10V RMS

3) Observe with scope a 14vdc ± 1 v signal with $< .5$ vac ripple

G) Ohm meter tests

1) Measure the following pins for the specified resistances:

pins 10 to 5	\Rightarrow	47k Ω	$\pm 5\%$
10 to 6	\Rightarrow	27.4k Ω	$\pm 1\%$
10 to 8	\Rightarrow	20k Ω	$\pm 1\%$
10 to 12	\Rightarrow	27.4k Ω	$\pm 1\%$
22 to 24	\Rightarrow	333 Ω	5%
14 to 16	\Rightarrow	1k Ω	$\pm 5\%$
41 to 40	\Rightarrow	0 Ω	
7 to Right side of saddle clamp	\Rightarrow	0 Ω	
36 to L.S of S.C.	\Rightarrow	20k Ω	$\pm 1\%$

H) Seal pots R4, R5, R6, R7

6. END.