g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-IS200TSVC**

Test Procedure for a IS200TSVCH2 and H1 base card

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial Release	J. Francis	05/10/2012
B	Added IS200TSVCH1 to the test	Dan Waddy	01/06/2014
C	Corrected a few errors	Scott Cash	2-1-2019

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
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DATE	**DATE**	**DATE**	**DATE**
05/10/2012			5/10/2012

1. SCOPE

1.1 This is a functional testing procedure for an IS200TVSCH1 and H2A circuit boards.

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.
3.1.1 Check the board's electronic folder for more information.

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning
4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.
4.2 Equipment Inspection
4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:
4.2.1.1 Wires - broken, cracked, or loosely connected
4.2.1.2 Terminal strips / connectors - broken or cracked
4.2.1.3 Components - visually damaged
4.2.1.4 Capacitors - bloated or leaking
4.2.1.5 Solder joints - damaged or cold
4.2.1.6 Circuit board - burned or de-laminated
4.2.1.7 Printed wire runs / Traces - burned or damaged

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1		Fluke 87 DMM (or equivalent)
1		IS200TSVC Power Cables (Marked box on shelf)
1		Dual Channel O-Scope
2		Dual Output Power Supplies (0 – 30 VDC)
1		Frequency Generator

6. TESTING PROCESS

6.1 Setup

Note: If any step fails during testing, repair defective circuitry and continue testing.

6.1.1 Attach TSVC 28 VDC Power Cable from power supply (turned off but pre-adjusted for 28 VDC -/+ 1.0 VDC) to Connector J28 and pin 39 of JR1, JS1, and JT1. Nominal current draw is less than 100 mADC with all 3 power switches turned on good unit.

6.1.2 Attach TSVC 15 VDC Power Cable from power supply (turned off but pre-adjusted for +15 and -15 -/+ 1.0 VDC). Nominal current draw is less than 50 mADC on good unit.

6.1.3 Place Switches SW1, SW2, and SW3 in the "OFF" position.

6.1.4 Set the jumpers for JP1 through JP6 in the "10" position.

6.2 Testing

6.2.1 Power Distribution

6.2.1.1 Apply 28 VDC to unit. Status LEDs DS2 (T), DS4 (S), and DS6 (R) should illuminate as long as power is applied to unit.

6.2.1.2 "T" Power Distribution

6.2.1.2.1 Turn on Switch SW1. Status LED DS1 should illuminate.

6.2.1.2.2 Check for 24 VDC -/+ 1 VDC from TB2-45 (positive meter lead) to TB2-46 (negative meter lead).

6.2.1.2.3 Check for 24 VDC -/+ 1 VDC from TB2-41 (positive meter lead) to TB2-42 (negative meter lead).

6.2.1.2.4 Check for 28 -/+ 1 VDC from JT1-21 (positive meter lead) to JT1-20 (negative meter lead).

6.2.1.2.5 Check for 28 -/+ 1 VDC from JT1-42 (positive meter lead) to JT1-62 (negative meter lead).

6.2.1.2.6 Check for 28 -/+ 1 VDC from JT2-C3 (positive meter lead) to JT2-B3 (negative meter lead).

6.2.1.2.7 Check for 28 -/+ 1 VDC from JT2-C4 (positive meter lead) to JT2-B4 (negative meter lead).

6.2.1.2.8 Check for 28 -/+ 1 VDC from JT2-C5 (positive meter lead) to JT2-B5 (negative meter lead).

6.2.1.2.9 Check for 28 -/+ 1 VDC from JT2-C6 (positive meter lead) to JT2-B6 (negative meter lead).

6.2.1.2.10 Turn off Switch SW1. Status LED DS1 should go out.

6.2.1.3 "S" Power Distribution

6.2.1.3.1 Turn on Switch SW2. Status LED DS3 should illuminate.

6.2.1.3.2 Check for 24 VDC -/+ 1 VDC from TB2-45 (positive meter lead) to TB2-46 (negative meter lead).

6.2.1.3.3 Check for 24 VDC -/+ 1 VDC from TB2-41 (positive meter lead) to TB2-42 (negative meter lead).

6.2.1.3.4 Check for 28 -/+ 1 VDC from JS1-21 (positive meter lead) to JS1-20 (negative meter lead).

6.2.1.3.5 Check for 28 -/+ 1 VDC from JS1-42 (positive meter lead) to JS1-62 (negative meter lead).

6.2.1.3.6 Check for 28 -/+ 1 VDC from JS2-C3 (positive meter lead) to JS2-B3 (negative meter lead).

6.2.1.3.7 Check for 28 -/+ 1 VDC from JS2-C4 (positive meter lead) to JS2-B4 (negative meter lead).

6.2.1.3.8 Check for 28 -/+ 1 VDC from JS2-C5 (positive meter lead) to JS2-B5 (negative meter lead).

6.2.1.3.9 Check for 28 -/+ 1 VDC from JS2-C6 (positive meter lead) to JS2-B6 (negative meter lead).

6.2.1.3.10 Turn off Switch SW2. Status LED DS3 should go out.

6.2.1.4 "R" Power Distribution

6.2.1.4.1 Turn on Switch SW3. Status LED DS5 should illuminate.

6.2.1.4.2 Check for 24 VDC -/+ 1 VDC from TB2-45 (positive meter lead) to TB2-46 (negative meter lead).

6.2.1.4.3 Check for 24 VDC -/+ 1 VDC from TB2-41 (positive meter lead) to TB2-42 (negative meter lead).

6.2.1.4.4 Check for 28 -/+ 1 VDC from JR1-21 (positive meter lead) to JR1-20 (negative meter lead).

6.2.1.4.5 Check for 28 -/+ 1 VDC from JR1-42 (positive meter lead) to JR1-62 (negative meter lead).

6.2.1.4.6 Check for 28 -/+ 1 VDC from JR2-C3 (positive meter lead) to JR2-B3 (negative meter lead).

6.2.1.4.7 Check for 28 -/+ 1 VDC from JR2-C4 (positive meter lead) to JR2-B4 (negative meter lead).

6.2.1.4.8 Check for 28 -/+ 1 VDC from JR2-C5 (positive meter lead) to JR2-B5 (negative meter lead).

6.2.1.4.9 Check for 28 -/+ 1 VDC from JR2-C6 (positive meter lead) to JR12-B6 (negative meter lead).

6.2.1.4.10 Turn off Switch SW3. Status LED DS5 should go out.

6.2.2 Pulse Rate Input Conditioning

6.2.2.1 Pulse Rate 1

6.2.2.1.1 Using ohm meter, check resistance from JR1-22 to JR1-43. Should get a reading of 316 K-Ohms -/+ 1%.

6.2.2.1.2 Using ohm meter, check resistance from TB2-44 to TB2-39. Should get a reading of more than 1 M-Ohm.

6.2.2.1.3 Using ohm meter, check resistance from TB2-44 to TB2-43. Should get a reading of more than 1 M-Ohm.

6.2.2.1.4 Connect 1st O-Scope positive input to JR1-22 and connect O-Scope ground of same channel to JR1-43. This is the output for “R”.

6.2.2.1.5 Connect 2nd O-Scope positive input to TB2-43 and connect O-Scope ground of same channel to TB2-44. This is the input for Pulse Rate 1.

6.2.2.1.6 Connect Frequency Generator positive output to TB2-43 and connect Frequency Generator negative output to TB2-44.

6.2.2.1.7 Apply a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.1.8 Input a frequency of 100 KHz at an amplitude of 1 Vpp. Output on O-Scope should be same frequency but half the amplitude.

6.2.2.1.9 Input a frequency of 3 Hz at an amplitude of 1 Vpp. Input amplitude should be half the output amplitude, with the same frequency.

6.2.2.1.10 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.1.11 Connect 2nd O-Scope positive input to TB2-39 and connect O-Scope ground of same channel to TB2-44. This is the TTL1 input.

6.2.2.1.12 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.1.13 Connect 1st O-Scope positive input to JS1-22 and connect O-Scope ground of same channel to JS1-43. This is the output for “S”.

6.2.2.1.14 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.1.15 Connect 1st O-Scope positive input to JT1-22 and connect O-Scope ground of same channel to JT1-43. This is the output for "T".

6.2.2.1.16 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.2 Pulse Rate 2

6.2.2.2.1 Using ohm meter, check resistance from JR1-24 to JR1-45. Should get a reading of 316 K-Ohms -/+ 1%.

6.2.2.2.2 Using ohm meter, check resistance from TB2-48 to TB2-40. Should get a reading of more than 1 M-Ohm.

6.2.2.2.3 Using ohm meter, check resistance from TB2-48 to TB2-47. Should get a reading of more than 1 M-Ohm.

6.2.2.2.4 Connect 1st O-Scope positive input to JR1-24 and connect O-Scope ground of same channel to JR1-45. This is the output for "R".

6.2.2.2.5 Connect 2nd O-Scope positive input to TB2-47 and connect O-Scope ground of same channel to TB2-48. This is the input for Pulse Rate 2.

6.2.2.2.6 Connect Frequency Generator positive output to TB2-47 and connect Frequency Generator negative output to TB2-48.

6.2.2.2.7 Apply a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.2.8 Input a frequency of 100 KHz at an amplitude of 1 Vpp. Output on O-Scope should be same frequency but half the amplitude.

6.2.2.2.9 Input a frequency of 3 Hz at an amplitude of 1 Vpp. Input amplitude should be half the output amplitude, with the same frequency.

6.2.2.2.10 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.2.11 Connect 2nd O-Scope positive input to TB2-40 and connect O-Scope ground of same channel to TB2-48. This is the TTL2 input.

6.2.2.2.12 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.2.13 Connect 1st O-Scope positive input to JS1-24 and connect O-Scope ground of same channel to JS1-45. This is the output for "S".

6.2.2.2.14 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.2.2.15 Connect 1st O-Scope positive input to JT1-24 and connect O-Scope ground of same channel to JT1-48. This is the output for "T".

6.2.2.2.16 Input a frequency of 10 KHz at an amplitude of 1 Vpp. Output on O-Scope should match input.

6.2.3 Servo Circuits

6.2.3.1 "R" Servo 1 Circuit

6.2.3.1.1 Connect Ohm meter positive meter lead to JR2-C14.

6.2.3.1.2 Connect Ohm meter negative meter lead to pin JR2-C13.

6.2.3.1.3 Jumper TB2-26 to TB2-31. Ohm meter should read approximately 171 -/+ 2 Ohms.

6.2.3.1.4 Disconnect jumper from TB2-31. Ohm meter should read more than 1 M-Ohm.

6.2.3.1.5 Jumper TB2-26 to TB2-25. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-1 jumper is set for "10".

6.2.3.1.6 Turn on SW1

6.2.3.1.7 Connect JD1-1 to JD1-2. Ohm meter should read more than 1 M-Ohm.

6.2.3.1.8 Disconnect JD1-1 from JD1-2. Ohm meter should read 170 -/+ 2 Ohms.

6.2.3.1.9 Set jumper JP-1 to position "20". Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.1.10 Set jumper JP-1 to position "40". Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.1.11 Set jumper JP-1 to position "80". Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.1.12 Set jumper JP-1 to position "120A". Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.1.13 Set jumper JP-1 to position "120B". Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.1.14 Connect JD2-1 to JD2-2. Ohm meter should read more than 1 M-Ohm.

6.2.3.1.15 Disconnect JD2-1 from JD2-2.

6.2.3.1.16 Disconnect jumper from TB2-26 to TB2-25.

6.2.3.2 "R" Servo 2 Circuit

6.2.3.2.1 Connect Ohm meter positive meter lead to JR2-C12.

6.2.3.2.2 Connect Ohm meter negative meter lead to JR2-C11.

6.2.3.2.3 Jumper TB2-34 to TB2-32. Ohm meter should read approximately 171 -/+ 2 Ohms.

6.2.3.2.4 Disconnect jumper from TB2-32. Ohm meter should read more than 1 M-Ohm.

6.2.3.2.5 Jumper TB2-34 to TB2-33. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-2 jumper is set for "10".

6.2.3.2.6 Connect JD1-1 to JD1-2. Ohm meter should read more than 1 M-Ohm.

6.2.3.2.7 Disconnect JD1-1 from JD1-2.

6.2.3.2.8 Ohm meter should read 170 -/+ 2 Ohms.

6.2.3.2.9 Set jumper JP-2 to position "20". Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.2.10 Set jumper JP-2 to position "40". Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.2.11 Set jumper JP-2 to position "80". Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.2.12 Set jumper JP-2 to position "120A". Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.2.13 Set jumper JP-2 to position "120B". Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.2.14 Connect JD2-1 to JD2-2. Ohm meter should read more than 1 M-Ohm.

6.2.3.2.15 Disconnect JD2-1 from JD2-2.

6.2.3.2.16 Disconnect jumper from TB2-34 to TB2-32.

6.2.3.3 "S" Servo 1 Circuit

6.2.3.3.1 Connect Ohm meter positive meter lead to JS2-C14.

6.2.3.3.2 Connect Ohm meter negative meter lead to pin JS2-C13.

6.2.3.3.3 Jumper TB2-27 to TB2-28. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-3 jumper is set for "10".

6.2.3.3.4 Set jumper JP-3 to position "20". Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.3.5 Set jumper JP-3 to position "40". Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.3.6 Set jumper JP-3 to position "80". Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.3.7 Set jumper JP-3 to position "120A". Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.3.8 Set jumper JP-3 to position "120B". Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.3.9 Disconnect jumper from TB2-27 to TB2-28.

6.2.3.4 "S" Servo 2 Circuit

6.2.3.4.1 Connect Ohm meter positive meter lead to JS2-C12.

6.2.3.4.2 Connect Ohm meter negative meter lead to JS2-C11.

6.2.3.4.3 Jumper TB2-35 to TB2-36. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-4 jumper is set for "10".

6.2.3.4.4 Set jumper JP-4 to position “20”. Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.4.5 Set jumper JP-4 to position “40”. Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.4.6 Set jumper JP-4 to position “80”. Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.4.7 Set jumper JP-4 to position “120A”. Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.4.8 Set jumper JP-4 to position “120B”. Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.4.9 Disconnect jumper from TB2-35 to TB2-36.

6.2.3.5 “T” Servo 1 Circuit

6.2.3.5.1 Connect Ohm meter positive meter lead to pin C14 of JT2-C14.

6.2.3.5.2 Connect Ohm meter negative meter lead to JT2-C13.

6.2.3.5.3 Jumper TB2-29 to TB2-30. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-5 jumper is set for “10”.

6.2.3.5.4 Set jumper JP-5 to position “20”. Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.5.5 Set jumper JP-5 to position “40”. Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.5.6 Set jumper JP-5 to position “80”. Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.5.7 Set jumper JP-5 to position “120A”. Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.5.8 Set jumper JP-5 to position “120B”. Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.5.9 Disconnect jumper from TB2-29 to TB2-30.

6.2.3.6 “T” Servo 2 Circuit

6.2.3.6.1 Connect Ohm meter positive meter lead to JS2-C12.

6.2.3.6.2 Connect Ohm meter negative meter lead JS2-C11.

6.2.3.6.3 Jumper TB2-37 to TB2-38. Ohm meter should read approximately 170 -/+ 2 Ohms. Make sure the JP-6 jumper is set for “10”.

6.2.3.6.4 Set jumper JP-6 to position “20”. Ohm meter should read 432 -/+ 5 Ohms.

6.2.3.6.5 Set jumper JP-6 to position “40”. Ohm meter should read 186 -/+ 2 Ohms.

6.2.3.6.6 Set jumper JP-6 to position “80”. Ohm meter should read 105 -/+ 2 Ohms.

6.2.3.6.7 Set jumper JP-6 to position “120A”. Ohm meter should read 19 -/+ 2 Ohms.

6.2.3.6.8 Set jumper JP-6 to position “120B”. Ohm meter should read 2 -/+ 2 Ohms.

6.2.3.6.9 Disconnect jumper from TB2-37 to TB2-38.

6.2.3.6.10 Turn off SW1.

6.2.4 LVDT Excitation Circuits

6.2.4.1 "R1" LVDT Excitation and Monitoring Circuits

6.2.4.1.1 Connect Frequency Generator positive output to JR2-C10 and to positive input of 1st channel of O-Scope.

6.2.4.1.2 Connect Frequency Generator negative output to JR2-C9 and to ground of 1st channel of O-Scope.

6.2.4.1.3 Connect positive input of 2nd channel of O-Scope to JR1-14.

6.2.4.1.4 Connect ground of 2nd channel of O-Scope to JR1-56.

6.2.4.1.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.1.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.1.7 Disconnect 2nd channel of O-Scope.

6.2.4.1.8 Connect positive input of 2nd channel of O-Scope to TB1-17.

6.2.4.1.9 Connect ground of 2nd channel of O-Scope to TB1-18.

6.2.4.1.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.2 "R2" LVDT Excitation and Monitoring Circuits

6.2.4.2.1 Connect Frequency Generator positive output to JR2-C8 and to positive input of 1st channel of O-Scope.

6.2.4.2.2 Connect Frequency Generator negative output to JR2-C7 and to ground of 1st channel of O-Scope.

6.2.4.2.3 Connect positive input of 2nd channel of O-Scope to JR1-36.

6.2.4.2.4 Connect ground of 2nd channel of O-Scope to JR1-15.

6.2.4.2.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.2.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.2.7 Disconnect 2nd channel of O-Scope.

6.2.4.2.8 Connect positive input of 2nd channel of O-Scope to TB1-19.

6.2.4.2.9 Connect ground of 2nd channel of O-Scope to TB1-20.

6.2.4.2.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.3 "S1" LVDT Excitation and Monitoring Circuits

6.2.4.3.1 Connect Frequency Generator positive output to JS2-C10 and to positive input of 1st channel of O-Scope.

6.2.4.3.2 Connect Frequency Generator negative output to JS2-C9 and to ground of 1st channel of O-Scope.

6.2.4.3.3 Connect positive input of 2nd channel of O-Scope to JS1-14.

6.2.4.3.4 Connect ground of 2nd channel of O-Scope to JS1-56.

6.2.4.3.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.3.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.3.7 Disconnect 2nd channel of O-Scope.

6.2.4.3.8 Connect positive input of 2nd channel of O-Scope to TB1-21.

6.2.4.3.9 Connect ground of 2nd channel of O-Scope to TB1-22.

6.2.4.3.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.4 "S2" LVDT Excitation and Monitoring Circuits

6.2.4.4.1 Connect Frequency Generator positive output to JS2-C8 and to positive input of 1st channel of O-Scope.

6.2.4.4.2 Connect Frequency Generator negative output to JS2-C7 and to ground of 1st channel of O-Scope.

6.2.4.4.3 Connect positive input of 2nd channel of O-Scope to JS1-36.

6.2.4.4.4 Connect ground of 2nd channel of O-Scope to JS1-15.

6.2.4.4.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.4.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.4.7 Disconnect 2nd channel of O-Scope.

6.2.4.4.8 Connect positive input of 2nd channel of O-Scope to TB3-1.

6.2.4.4.9 Connect ground of 2nd channel of O-Scope to TB3-2.

6.2.4.4.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.5 "T1" LVDT Excitation and Monitoring Circuits

6.2.4.5.1 Connect Frequency Generator positive output to JT2-C10 and to positive input of 1st channel of O-Scope.

6.2.4.5.2 Connect Frequency Generator negative output to JT2-C9 and to ground of 1st channel of O-Scope.

6.2.4.5.3 Connect positive input of 2nd channel of O-Scope to JT1-14.

6.2.4.5.4 Connect ground of 2nd channel of O-Scope to JT1-56.

6.2.4.5.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.5.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.5.7 Disconnect 2nd channel of O-Scope.

6.2.4.5.8 Connect positive input of 2nd channel of O-Scope to TB1-23.

6.2.4.5.9 Connect ground of 2nd channel of O-Scope to TB1-24.

6.2.4.5.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.6 "T2" LVDT Excitation and Monitoring Circuits

6.2.4.6.1 Connect Frequency Generator positive output to pin JT2-C8 and to positive input of 1st channel of O-Scope.

6.2.4.6.2 Connect Frequency Generator negative output to JT2-C7 and to ground of 1st channel of O-Scope.

6.2.4.6.3 Connect positive input of 2nd channel of O-Scope to JT1-36.

6.2.4.6.4 Connect ground of 2nd channel of O-Scope to JT1-15.

6.2.4.6.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.4.6.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.4.6.7 Disconnect 2nd channel of O-Scope.

6.2.4.6.8 Connect positive input of 2nd channel of O-Scope to TB4-1.

6.2.4.6.9 Connect ground of 2nd channel of O-Scope to TB4-2.

6.2.4.6.10 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5 "LVDT" Input Circuits

6.2.5.1 Input 1

6.2.5.1.1 Connect Frequency Generator positive output to TB1-1.

6.2.5.1.2 Connect Frequency Generator negative output to TB1-2.

6.2.5.1.3 Connect positive input of 2nd channel of O-Scope to JR1-30.

6.2.5.1.4 Connect ground of 2nd channel of O-Scope to JR1-9.

6.2.5.1.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.1.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.1.7 Connect positive input of 2nd channel of O-Scope to JS1-30.

6.2.5.1.8 Connect ground of 2nd channel of O-Scope to JS1-9.

6.2.5.1.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.1.10 Connect positive input of 2nd channel of O-Scope to JT1-30.

6.2.5.1.11 Connect ground of 2nd channel of O-Scope to JT1-9.

6.2.5.1.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.2 Input 2

6.2.5.2.1 Connect Frequency Generator positive output to TB1-3.

6.2.5.2.2 Connect Frequency Generator negative output to TB1-4.

6.2.5.2.3 Connect positive input of 2nd channel of O-Scope to JR1-51.

6.2.5.2.4 Connect ground of 2nd channel of O-Scope to JR1-31.

6.2.5.2.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.2.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.2.7 Connect positive input of 2nd channel of O-Scope to JS1-51.

6.2.5.2.8 Connect ground of 2nd channel of O-Scope to JS1-31.

6.2.5.2.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.2.10 Connect positive input of 2nd channel of O-Scope to JT1-51.

6.2.5.2.11 Connect ground of 2nd channel of O-Scope to JT1-31.

6.2.5.2.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.3 Input 3

6.2.5.3.1 Connect Frequency Generator positive output to TB1-5.

6.2.5.3.2 Connect Frequency Generator negative output to TB1-6.

6.2.5.3.3 Connect positive input of 2nd channel of O-Scope to JR1-10.

6.2.5.3.4 Connect ground of 2nd channel of O-Scope to JR1-52.

6.2.5.3.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.3.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.3.7 Connect positive input of 2nd channel of O-Scope to JS1-10.

6.2.5.3.8 Connect ground of 2nd channel of O-Scope to JS1-52.

6.2.5.3.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.3.10 Connect positive input of 2nd channel of O-Scope to JT1-10.

6.2.5.3.11 Connect ground of 2nd channel of O-Scope to JT1-52.

6.2.5.3.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.4 Input 4

6.2.5.4.1 Connect Frequency Generator positive output to TB1-7.

6.2.5.4.2 Connect Frequency Generator negative output to TB1-8.

6.2.5.4.3 Connect positive input of 2nd channel of O-Scope to JR1-32.

6.2.5.4.4 Connect ground of 2nd channel of O-Scope to JR1-11.

6.2.5.4.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.4.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.4.7 Connect positive input of 2nd channel of O-Scope to JS1-32.

6.2.5.4.8 Connect ground of 2nd channel of O-Scope to JS1-11.

6.2.5.4.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.4.10 Connect positive input of 2nd channel of O-Scope to JT1-32.

6.2.5.4.11 Connect ground of 2nd channel of O-Scope to JT1-11.

6.2.5.4.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.5 Input 5

6.2.5.5.1 Connect Frequency Generator positive output to TB1-9.

6.2.5.5.2 Connect Frequency Generator negative output to TB1-10.

6.2.5.5.3 Connect positive input of 2nd channel of O-Scope to JR1-53.

6.2.5.5.4 Connect ground of 2nd channel of O-Scope to JR1-33.

6.2.5.5.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.5.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.5.7 Connect positive input of 2nd channel of O-Scope to JS1-53.

6.2.5.5.8 Connect ground of 2nd channel of O-Scope to JS1-33.

6.2.5.5.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.5.10 Connect positive input of 2nd channel of O-Scope to JT1-53.

6.2.5.5.11 Connect ground of 2nd channel of O-Scope to JT1-33.

6.2.5.5.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.6 Input 6

6.2.5.6.1 Connect Frequency Generator positive output to TB1-11.

6.2.5.6.2 Connect Frequency Generator negative output to TB1-12.

6.2.5.6.3 Connect positive input of 2nd channel of O-Scope to JR1-12.

6.2.5.6.4 Connect ground of 2nd channel of O-Scope to JR1-54.

6.2.5.6.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.6.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.6.7 Connect positive input of 2nd channel of O-Scope to JS1-12.

6.2.5.6.8 Connect ground of 2nd channel of O-Scope to JS1-54.

6.2.5.6.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.6.10 Connect positive input of 2nd channel of O-Scope to JT1-12.

6.2.5.6.11 Connect ground of 2nd channel of O-Scope to JT1-54.

6.2.5.6.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.7 Input 7

6.2.5.7.1 Connect Frequency Generator positive output to TB1-13.

6.2.5.7.2 Connect Frequency Generator negative output to TB1-14.

6.2.5.7.3 Connect positive input of 2nd channel of O-Scope to JR1-34.

6.2.5.7.4 Connect ground of 2nd channel of O-Scope to JR1-13.

6.2.5.7.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.7.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.7.7 Connect positive input of 2nd channel of O-Scope to JS1-34.

6.2.5.7.8 Connect ground of 2nd channel of O-Scope to JS1-13.

6.2.5.7.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.7.10 Connect positive input of 2nd channel of O-Scope to JT1-34.

6.2.5.7.11 Connect ground of 2nd channel of O-Scope to JT1-13.

6.2.5.7.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.8 Input 8

6.2.5.8.1 Connect Frequency Generator positive output to TB1-15.

6.2.5.8.2 Connect Frequency Generator negative output to TB1-16.

6.2.5.8.3 Connect positive input of 2nd channel of O-Scope to JR1-55.

6.2.5.8.4 Connect ground of 2nd channel of O-Scope to JR1-35.

6.2.5.8.5 Set Frequency Generator to output a 3.2 KHz @ 1 Vpp Sinewave.

6.2.5.8.6 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.8.7 Connect positive input of 2nd channel of O-Scope to JS1-55.

6.2.5.8.8 Connect ground of 2nd channel of O-Scope to JS1-35.

6.2.5.8.9 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.8.10 Connect positive input of 2nd channel of O-Scope to JT1-55.

6.2.5.8.11 Connect ground of 2nd channel of O-Scope to JT1-35.

6.2.5.8.12 Verify that both channels of O-Scope display the same frequency and amplitude signals.

6.2.5.9 Continuity Checks

6.2.5.9.1 Using Ohm meter verify continuity between points listed below:

From	To
JR2-A1	JR1-40
JR2-A2	JR1-40
JR2-A3	JR1-41
JR2-A3	D137 ANODE
JR2-A4	JR1-41
JR2-A4	D137 ANODE
JR2-A5	JR1-60
JR2-A6	JR1-60
JR2-A7	JR1-57
JR2-A8	JR1-29
JR2-A9	JR1-28
JR2-A10	JR1-48
JR2-A11	JR1-6
JR2-A12	JR1-5
JR2-A13	JR1-46
JR2-A14	JR1-25
JR2-A15	JR1-44
JR2-A16	JR1-23
JR2-B2	JR1-59
JR2-B7	JR1-37
JR2-B8	JR1-49
JR2-B9	JR1-7
JR2-B10	JR1-27
JR2-B11	JR1-47
JR2-B12	JR1-26
JR2-B13	JR1-4
JR2-B14	JR1-3
JR2-B15	JR1-2
JR2-B16	JR1-1
JR2-C1	D137 CATHODE
JR2-C2	D137 CATHODE

From	To
JR2-C16	D137 CATHODE
JR2-C15	D137 CATHODE
JR1-18	JR2-A5
JR1-19	JR2-A2
JS2-A1	JS1-40
JS2-A2	JS1-40
JS2-A3	JS1-41
JS2-A3	D136 ANODE
JS2-A4	JS1-41
JS2-A4	D136 ANODE
JS2-A5	JS1-60
JS2-A6	JS1-60
JS2-A7	JS1-57
JS2-A8	JS1-29
JS2-A9	JS1-28
JS2-A10	JS1-48
JS2-A11	JS1-6
JS2-A12	JS1-5
JS2-A13	JS1-46
JS2-A14	JS1-25
JS2-A15	JS1-44
JS2-A16	JS1-23
JS2-B2	JS1-59
JS2-B7	JS1-37
JS2-B8	JS1-49
JS2-B9	JS1-7
JS2-B10	JS1-27
JS2-B11	JS1-47
JS2-B12	JS1-26
JS2-B13	JS1-4
JS2-B14	JS1-3
JS2-B15	JS1-2
JS2-B16	JS1-1

JS2-C1	D136 CATHODE
JS2-C2	D136 CATHODE
From	To
JS2-C15	D136 CATHODE
JS2-C16	D136 CATHODE
JS1-18	JS2-A5
JS1-19	JS2-A2
JT2-A1	JT1-40
JT2-A2	JT1-40
JT2-A3	JT1-41
JT2-A3	D133 ANODE
JT2-A4	JT1-41
JT2-A4	D133 ANODE
JT2-A5	JT1-60
JT2-A6	JT1-60
JT2-A7	JT1-57
JT2-A8	JT1-29
JT2-A9	JT1-28
JT2-A10	JT1-48
JT2-A11	JT1-6
JT2-A12	JT1-5
JT2-A13	JT1-46
JT2-A14	JT1-25
JT2-A15	JT1-44
JT2-A16	JT1-23
JT2-B2	JT1-59
JT2-B7	JT1-37
JT2-B8	JT1-49
JT2-B9	JT1-7
JT2-B10	JT1-27
JT2-B11	JT1-47
JT2-B12	JT1-26
JT2-B13	JT1-4
JT2-B14	JT1-3

JT2-B15	JT1-2
JT2-B16	JT1-1
From	To
JT2-C1	D133 CATHODE
JT2-C2	D133 CATHODE
JT2-C15	D133 CATHODE
JT2-C16	D133 CATHODE
JT1-18	JT2-A5
JT1-19	JT2-A2
JR1-8	JS1-16
JR1-8	JT1-16
JR1-16	JS1-8
JR1-16	JT1-38
JR1-17	JS1-17
JR1-17	JT1-50
JR1-38	JS1-38
JR1-38	JT1-8
JR1-50	JS1-58
JR1-50	JT1-58
JR1-58	JT1-17
JR1-58	JS1-50

6.2.6 CHIP ID:

6.2.6.1 The ID chips need to be read to confirm that they have been programmed properly. The instances or blank or miss-programmed ID chips leaving the factory and seeing service out in the field is higher than you might think. This can cause some problems with equipment, maybe even hard failures, even when nothing else is wrong with the card depending on how the customer's software is set up. Simply take the card over to the CHIP ID pc located in the MARK VI area of the shop and select the correct revision of IS200TSVC from the menu and follow the instructions given to you by the pc. When selecting which IS200TSVC to use, you may see a 5G or 7G next to the number. This refers to the serial number and whether it has 5 or 7 digits in it. Select the proper one, as you will be expected to type this number into the system at a given point. When entering this data, be sure to use all

CAPITAL LETTERS as lower case might cause it not to agree with what's programmed in the chip. If the particular revision you need to select doesn't have a 5G or 7G next to it, get it added before proceeding.

6.2.6.2 A trick to remember about chip ID serial numbers: If for some reason your serial number is a 6 digit one, like the R###### numbers given out to units that arrive in our Receiving Dept. without serial number labels, you'll only need to type in some sort of gibberish to get the system to spit out an error when it compares it to what's in the chip, at which point it will tell you what serial number it found, then it'll ask you if you want to change it to the one you typed in. Your answer will be NO, to let it fail the test and quit programming. Be sure to jot down what the number was that it found in the chip and print off this number in a barcode label to place on the card along with the in-house serial number that receiving stuck on it. Then go back and re-try the test with the correct serial number. This trick works for boards with un-readable or marred up serial number labels, too.

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time.

8. ATTACHMENTS

8.1 None at this time.