g GE Energy	**Functional Testing Specification**
Inspection & Repair Services ***Louisville, KY***	**LOU–GEF** **AC200 HS Servo**

Test Procedure for AC200 High Speed Servo Drive

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	C. Wade	06/03/2005
B			
C			

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DATE	**DATE**	**DATE**	**DATE**
06/03/2005			6/3/2005

Functional test procedure for AC200 High Speed Servo Drive

1. SCOPE

1.1 This is a functional test procedure for testing a AC200 75 Amp High Speed Servo Drive. The process applies only to 75-amp drives model numbers 44A963384-G03.

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.

3.2 **GEK-83477** **Instruction Book for AC200 Instruction Manual**
GEK-25393 **Instruction Book for AC200 Application Manual**

4. ENGINEERING REQUIREMENTS

4.1 Description

4.1.1 The AC200 servo and spindle drives are multi-axis high performance velocity controller to power an ac squirrel cage induction motor. The servo induction motor combination is often used as a position controller in which a position error discriminator supplies the velocity command. The spindle drive can stand alone or used in combination with one or more servo drives. Combination systems using up to four AC200 drives may be mounted in one rack and operated simultaneously from one power supply.

4.2 Equipment Cleaning

4.2.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to the local documented procedures for cleaning guidelines.

4.3 Equipment Inspection

4.3.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.3.1.1 Wires broken or cracked
4.3.1.2 Terminal strips / connectors broken or cracked
4.3.1.3 Loose wires
4.3.1.4 Components visually damaged
4.3.1.5 Capacitors leaking
4.3.1.6 Solder joints damaged or cold
4.3.1.7 Circuit board burned or de-laminated
4.3.1.8 Printed wire runs burned or damaged

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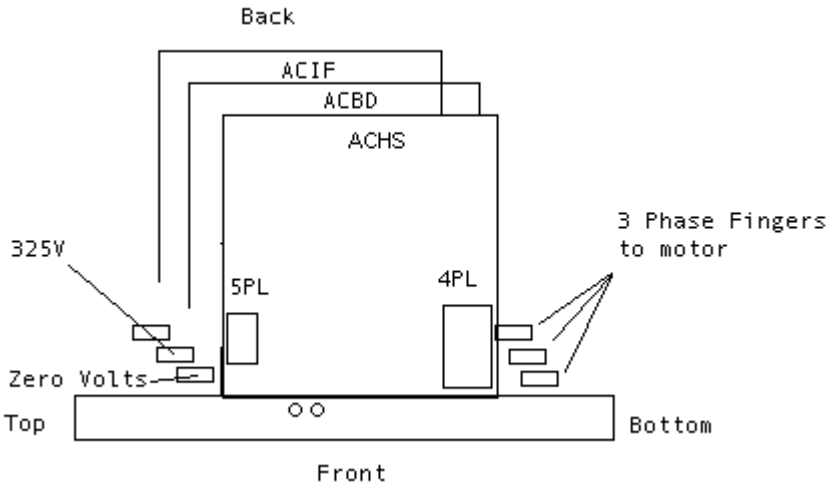
5. EQUIPMENT REQUIRED

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	AC200 Manual Servo Drive Test Stand	Test Fixture
2	Digital Volt Meter	Multimeter
1	Oscilloscope	Oscilloscope

5.2 Static Test

5.2.1 Check all 3-power modules on servo drive for shorts. If a power module is shorted replaced module and check for damage on ACBD2 Bd. The list below shows approximate values that will help identify shorted power modules.



5.2.2 This is a typical check to catch any shorted power modules. These checks were made with a Fluke meter (Fluke 77, using the diode scale) across the finger contacts of the drive.

		Approximate Value
Red Lead on 0 volts	Black Lead on Phase 1	**.38**
	Black Lead on Phase 2	**.38**
	Black Lead on Phase 2	**.38**
Red Lead on 325V	Black Lead on Phase 1	**Open**
	Black Lead on Phase 2	**Open**
	Black Lead on Phase 2	**Open**
Black Lead on 0 volts	Red Lead on Phase 1	**Open**
	Red Lead on Phase 2	**Open**
	Red Lead on Phase 3	**Open**

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Black Lead on 325V	Red Lead on Phase 1	.**38**
	Red Lead on Phase 2	.**38**
	Red Lead on Phase 3	.**38**
Red lead to 0 volts	Black lead to 325 volts,	.**65**
Black lead to 0 volts	Red lead to 325 volts	**Open**

5.3 Manual Tester 75 Amp High Speed Servo Drive

5.3.1 Connect only 4PL and 5PL to drive.

5.3.2 Install personality module 44A963085-G30

5.3.3 Verify jumpers JP-11 & JP-10 are (1-2) and JP-6 is (2-3).

5.4 Power Up on manual tester

5.4.1 Turn power on. All LEDs should be on. Verify the following voltages.

3PLA-5 + 5 volts	3PLA-6 -5 volts	3PLA-8 +11 volts

5.4.2 Remove **JP2** and check pin 2, should be zero volts. Put scope lead on **TP13** (VCO). Null VCO by using **P4**. Set to **-.22vdc** after verifying sawtooth wave is present. Install **JP2**.

5.4.3 Enable the drive. Do this by toggling the 40-frame switch on right side of tester. Look at current command on **TP16**, should be a sine wave. Verify that positive and negative enables work properly. For this to work velocity command must not be zero. Place velocity command of at least +1vdc or –1vdc. Verify that drive **does not foldback**.

5.4.4 Verify current limit setting, (right side of R210), should be **2.22vdc**. Resistor is near 4PL.

5.4.5 Verify field flux setting at **TP2**, should be **.229vdc**. Drive has to be enabled.

5.4.6 Verify torque command at **TP8**, should be **2.11vdc**. Check both directions, positive and negative. When finished, power down.

5.5 Balance current sensors with drive inhibited

5.5.1 Remove **JP2** jumper. Jumper the following on the ACCB1 board, Pin 2 of **JP2** to ground, **TP2** to ground, left side of **R17** to ground (located near 4PL). There is a cable with four leads we normally use for this.

5.5.2 Turn on power, inhibit the drive, and allow it to warm up for at least three minutes minimum. You will need a scope to check **3PL-2**, **3PL-3**, & **3PL-4**. Set scope to 2 volts per division & 20 micro sec. per division. Go to uncalibrate mode on scope and get one wave across the screen.

5.5.3 With the motor turning adjust **P5**, **P6**, & **P7** so the offset is centered on the centerline of the scope. Manually turn the motor by hand or foot whatever is easier. 3PL-2 is adjusted by **P5**, 3PL-3 is adjusted by **P6**, and 3PL-4 is adjusted by **P7**. The current sensors are slightly temperature sensitive. Allow

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some time for the current sensors to stabilize before balancing. After balancing the current sensors, power down and remove all jumper leads. Install berg jumper **JP2** to position 2&3.
Special Note: This offset has a direct effect on the DC level of the current to the motor. The greater the motor speed the more critical this offset balance becomes to the performance of the motor.

5.5.4 Connect servo drive to 40-frame motor slot.

5.5.5 Connect motor and +325vdc buss to drive with wire jumper plugs, turn power on, enable the drive, and balance the motor using **P2**. Apply a small velocity command, the motor should run smoothly. The motor should run clockwise for a minus velocity command and counter clockwise for a plus velocity command.

5.5.6 Set velocity command to –5vdc; adjust motor RPM's to 2000, (**P3**). Then set velocity command to +5vdc, adjust motor RPM's to 2000, (**P8**). Set velocity command to –10vdc, motor RPM's should be 4000. While motor is running at top speed switch from 0 volts velocity command to top speed several times (10 times very quickly) and verify that no fault occurs. This is the speed at which the drive is to be shipped.

5.5.7 Verify with a scope drive OK, **4PL-28** is at **24vdc**. Verify dynamic brake driver output works properly. To test D/B pull 5-PL cord off. Power down.

5.5.8 ***TEST COMPLETE ***

6. NOTES

Be sure all capacitors on the ACBD2 board are changed, new, or in good shape. Any bad connector on any of the boards should also be changed. This unit is prone to faults when interconnects are dirty or corroded, when doubt change it out. Check stand offs (T1 thru T6) on ACHS1 card for cold solder joints as well as the daughter board (clock). When shipping unit back to customer be sure to include the AC200 Check Sheet.

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