

SCOPE

This test procedure covers the testing and maintenance of the GE IAC53 relay. Refer to IL GEH-1788 for testing support information and component level identification.

INTRODUCTION

The IAC family of overcurrent relays come in a variety of models that are designed to give different time characteristics, such as moderately inverse or extremely inverse, etc. The IAC53 is very inverse, the IAC77 is extremely inverse. The characteristic can be determined from the IL or from the nameplate.

The IL will also provide the range of current settings available for the relay style and the nameplate will give the range for the specific relay. Several taps are available for the induction disk time overcurrent pickup, and the instantaneous unit can be set using an adjustable pole piece in the winding core.

TOOLS, EQUIPMENT, AND MATERIALS

- Two variable ac current sources
- Variable dc current source and latch timer

INSPECTION

1. Take the cover off the relay, taking care to not shake or jar the relay or other relays around it.
2. Pull the relay connecting plugs to disable the trip circuit and remove the current inputs.
3. Lift the relay out of the case.
4. Visually check the relay for any obvious problems.
5. Clean the relay thoroughly.
6. Burnish the surfaces of all contacts, making sure to remove any tarnish.
7. Check that all relay connections are tight.

TESTING THE INDUCTION MINIMUM PICKUP

1. The TOC pickup is set by selecting the tap closest to the desired setting, then adjusting the notched spring tension ring as needed. (The spring adjustment shouldn't have to be "maxed out" in either direction.)
2. Set the Time Dial to the desired setting.
3. Connect a variable AC current source to terminals 5 and 6.
4. Monitor contact continuity at terminals 1 and 2.
5. Raise the current slowly until the disk just begins to turn. Let it turn until the contacts close. Back off the current slowly, noting the current level where the disk begins to reset. Once the contact is open, ramp the current slowly back up until it starts to close again, noting the current level again. Average the two current levels to get the TOC pickup.
6. Adjust the spiral spring tension by rotating the notched ring and retest as necessary to get the desired pickup.

NOTE: Increasing tension will increase pickup, decreasing tension will decrease pickup

NOTE: Some models of the IAC53 relays are designed so that the TOC and instantaneous windings can be tested independently, with terminal 4 being the common. See figures 1 – 2.

TESTING THE INDUCTION TIME CURRENT CHARACTERISTIC

1. With the pickup setting (tap) determined, select at least two multiples of that tap value that the test set can handle, usually 2-6 times tap.
2. Look on the characteristic time curve and locate the point where the vertical line for the tap multiple crosses the Time Dial curve. Follow horizontally to the left from that point to determine the expected time for contact closure.
3. Be certain that the disk is fully reset before running a timing test.
4. Run a test in which the multiple of tap current is applied and time monitored until the contact closes.

Example: If the TOC pickup is 2 and the test is to be at 2X tap, apply 4 amps. If the Time Dial is 2, both the IAC77 (extremely inverse) and the IAC54 (very inverse) should operate in about 2.75 seconds. If 10X tap is chosen (20 amps) the IAC77 will operate in about 0.14 seconds while the IAC53 will operate in about 0.29 seconds.
5. If the measured response time varies more than 5% (+/-) from the expected response time, adjust the drag magnet and time dial. Be sure the drag magnet is not touching the relay disk.

The drag magnet is used for coarse adjustment. Moving the magnet in (away from the front of the relay) decreases the response time. Moving the magnet out

(towards the front of the relay) increases the response time. The outer edge of the magnet should not extend beyond the cutout in the disk.

The time dial is used for fine adjustment. Increasing the time setting on the time dial increases response time; decreasing the time setting decreases response time.

TESTING THE INSTANTANEOUS UNIT

1. The element setting is determined by the threaded pole piece in the top of the instantaneous core. The indicator will give a “ballpark” estimate of the setting.
2. Connect a variable AC current source to terminals 5 and 6.
NOTE: Some models of the IAC53 relays are designed so that the TOC and instantaneous windings can be tested independently, with terminal 4 being the common. See figures 1 – 2.
3. Monitor contact continuity at terminals 1 and 3.
4. Ramp or pulse the current up until the hinged contacts close (indicated by the sensing device).
5. Adjust the pole piece and retest as necessary to set the element as desired.
NOTE: Moving the core screw in decreases pickup current; moving it out increases pickup current.

TESTING THE TARGET AND SEAL IN

1. Determine whether the relay is set for 0.2 amps or 2 amps by observing the tap block in the front of the target unit.
2. Close the induction disk contacts manually or by applying sufficient AC current to close.
3. Apply DC current to terminals 1-2 and ramp up until the target unit picks up.
4. For 0.2 amp setting, the result should be between 0.14 and 0.195 amps DC. For the 2.0 amp setting, it should be between 1.4 and 1.95 amps DC.
5. Open the induction disk contacts manually or by removing the AC current.
6. Verify that the target unit remains sealed in.
7. Determine the drop out by ramping the DC down until the seal-in contacts open. Drop out should be no lower than 30% of the seal-in tap (0.06 for the 0.2 setting, 0.6 for the 2.0 setting).

Figure 1
IAC53A

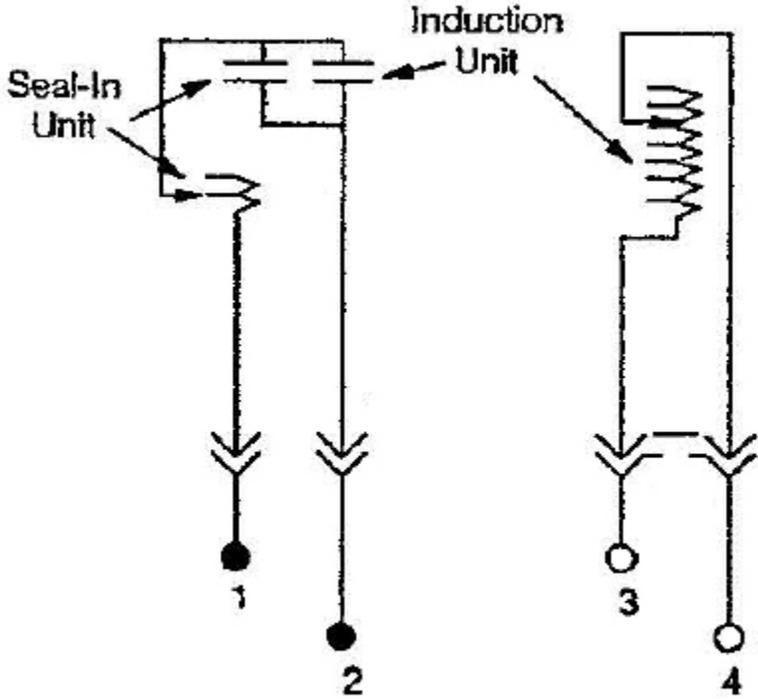
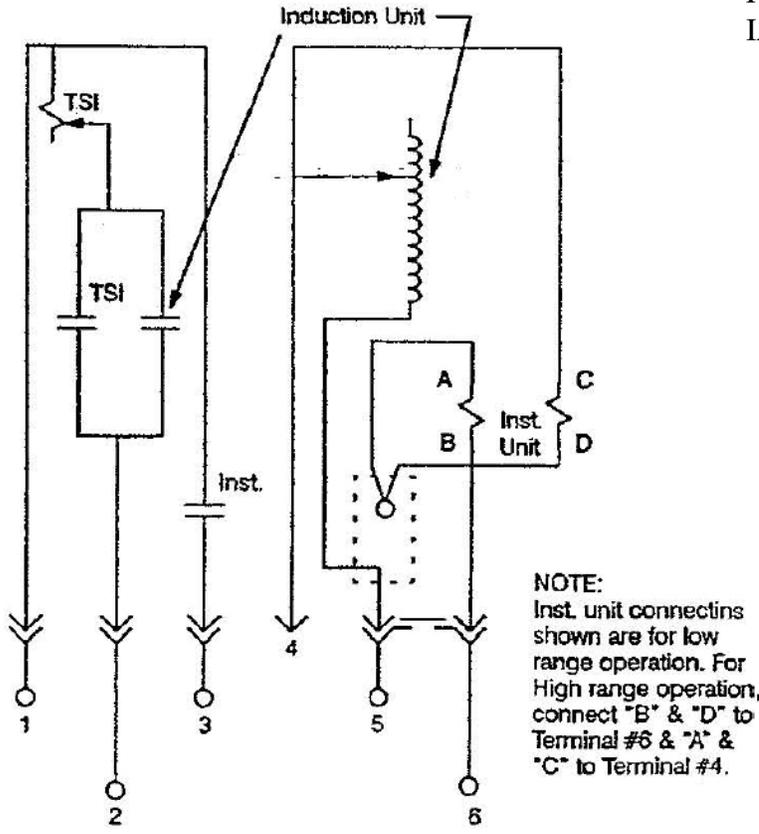


Figure 2
IAC53B



NOTE:
Inst. unit connectins
shown are for low
range operation. For
High range operation,
connect "B" & "D" to
Terminal #6 & "A" &
"C" to Terminal #4.