

E) Timing Test Procedure with Inverse Time Delay and Two Phases Required

- Determine which output the 59-element operates and connect the test-set-timing input to the relay output contact.
- Pick the first test point from manufacturer's curve. (Typically in percent of pickup) Set the AØ and BØ fault voltage at the test point. The first test for our example at 110% pickup would be performed at 83.8V ($V_{\text{Rated}} * \text{Pickup} * 1.10 = 69.28\text{V} * 1.1 * 1.10$). Set your test-set to stop when the timing input operates and to record the time delay from test start to stop.
- Apply rated voltage. Apply test voltage, ensure timing input operates, and note the time on your test sheet. Compare the test time to the 59-element settings to ensure timing is correct.
- Review relay targets to ensure the correct element and phases operated.
- Perform second test at another point on the manufacturer's timing curve. (E.g. 120%= $120\text{V} * 1.1 * 1.2 = 158.4\text{V}$)
- Review relay targets to ensure the correct element and phases operated.
- Repeat the steps above for BØ & CØ, and CØ & AØ.

F) Timing Test Procedure with Inverse Time Delay and Any Phases Required

- Determine which output the 59-element operates and connect the test-set-timing input to the relay output contact.
- Pick the first test point from manufacturer's curve. (Typically in percent of pickup) Set the AØ fault voltage at the test point. The first test for our example at 110% pickup would be performed at 145.2V ($V_{\text{Rated}} * \text{Pickup} * 1.10 = 120\text{V} * 1.1 * 1.10$). Set your test-set to stop when the timing input operates and to record the time delay from test start to stop.
- Apply rated voltage. Apply test voltage, ensure timing input operates, and note the time on your test sheet. Compare the test time to the 59-element settings to ensure timing is correct.
- Review relay targets to ensure the correct element and phases operated.
- Perform second test at another point on the manufacturer's timing curve. (E.g. 120%= $120\text{V} * 1.1 * 1.2 = 158.4\text{V}$)
- Review relay targets to ensure the correct element and phases operated.
- Repeat the steps above for BØ and CØ.