



MACLEAN POWER SYSTEMS  
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## Engineering Test Report

# NYLON CONDUIT WIREHOLDER: VALIDATION TESTING J0588Z

## Project M-616

Test ID: LR0127, LR0128

Testing performed at MacLean Power Systems, and at Kinectrics (Toronto, ON)

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Rev A (02/17/17) Initial release.

Rev B (12/01/17) Added 4. Flash Over Testing

Prepared by

Matthew Brizze

M-616- Validation Testing for J0588Z Wireholder



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## 1. Purpose

The testing detailed below is to validate the performance requirements of the J0588Z Nylon Conduit Wireholder. The tensile test will test the holding strength of the J0588Z Nylon Wireholder after installing into wood. The cantilever test will determine the strength of the J0588Z Nylon Wireholder when subjected to cantilever load of 600 lbs. without breaking or causing extensive deformation.

## 2. Tensile Test (LR-0127)

### 2.1 Test Procedure

2.1.1 A sample part of J0588Z Nylon Conduit Wireholder was installed with a hook in the tensile testing machine. Figure 1 shows the setup.

2.1.2 The Wireholder was then tensile loaded to failure on the tensile testing machine.

2.1.3 This test process was repeated twice more.

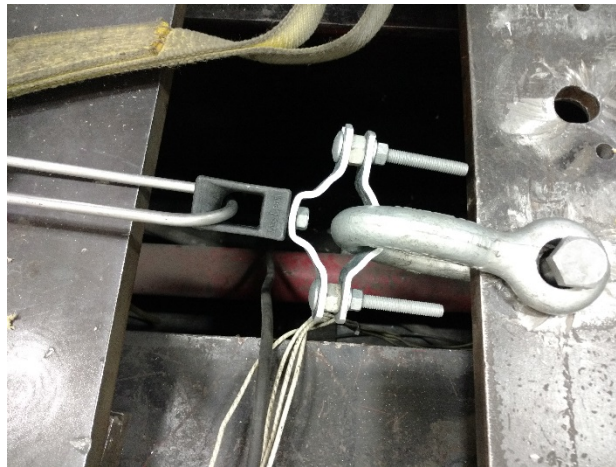


Figure 1: Tensile Test Setup

### 2.2 Test Results

All the samples fractured at the Nylon part of the Wireholder. Table 1 shows the data for the tensile test.

Table 1: Tensile Test Results

Sample	Load at Failure (lbs.)	Mode of Failure
1	3271	Fractured at Nylon
2	3418	Fractured at Nylon
3	3908	Fractured at Nylon

## 3. Cantilever Test (LR-0128)

### 3.1 Test Procedure

3.1.1 A sample part of J0588Z Nylon Conduit Wireholder was installed on a 1" thick steel plate. Figure 2 shows the test setup.

3.1.2 A proof load of 600 lbs. was placed on the Wireholder.

3.1.3 The part was then loaded to failure.

3.1.4 This test process was repeated twice more.



Figure 2: Cantilever Test Setup

## 4.2 Test Results

All three Wireholders passed the proof load of 600 lbs. Table 2 shows the results from the test.

Table 2: Cantilever Test Results

Sample	Load at Failure (lbs.)	Mode of Failure
1	2695	Fractured at Nylon
2	3307	Bolt Stripped from Nut
3	1543	Fractured at Nylon

## 4. Flash Over Testing

### 4.1 Test Procedure

4.1.1 The test program comprised dry and wet flashover tests of wire holders. For convenience, the test details are repeated below.

4.1.2 The individual parts were mounted on a simulated wooden cross arm. The ground lead was attached to the mounting lag screw, or to the mounting bracket and the high voltage lead was attached to a copper wire (size 6) that was terminated to the insulator body.

Table 3: Flash Over Test Conditions

Humidity, %RH	Pressure, kPa	Dry Bulb, °C	Wet Bulb, °C	Rain Rate, mm/min	Water Conductivity, $\mu\text{S/cm}$	Water Conductivity, $\Omega\cdot\text{m}$	Water Temperature, °C
11.2	103.7	22.8	9.7	5	56.1	178	19.7

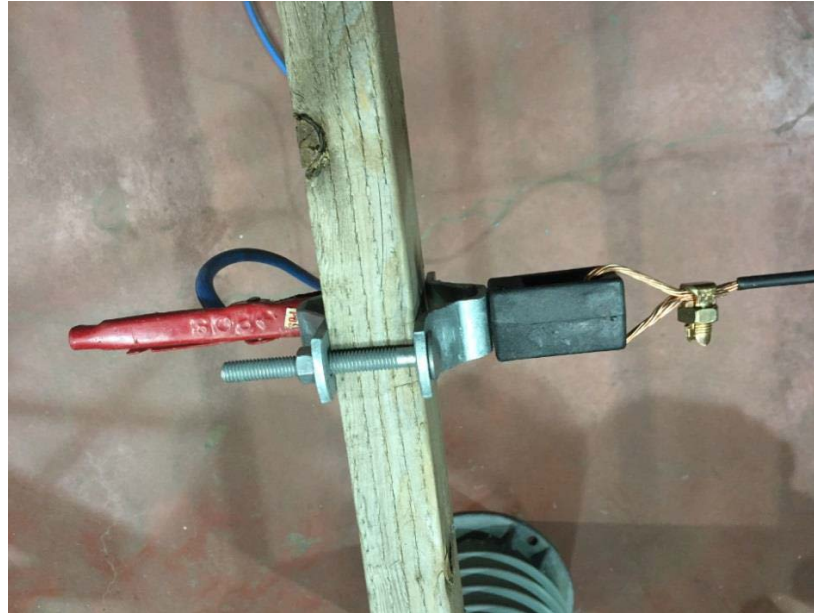


Figure 3: Flash Over Testing Setup

## 4.2 Test Results

The voltage was increased until flashover occurred. Each part number was subjected to five (5) individual flashovers and the reported value was the average value with atmospheric corrections for the dry flashover testing and without correction for the wet flashover testing. The wet tests precipitation conditions were as per the conventional procedure practice in the USA (vertical component of  $5\pm 0.5$  mm/min, resistivity of  $178\pm 0.5$   $\Omega\cdot m$ ).

Table 4: Flash Over Test Results

Sample ID	FOV AVG Dry	FOV AVG Wet
	kV	kV
J5088Z-1	28.8	12.7
J5088Z-2	29.7	12.1

## 5. Conclusion

The results from the tests show that the J0588Z Nylon Conduit Wireholder performs as expected. The tensile test shows that the holding strength for J0588Z is suitable for the applications it is used in. The cantilever test shows that the J0588Z can withstand a minimum cantilever load of 600 lbs. without damage. The flash over test shows that the J0588Z meets the requirements for dry and wet conditions.



## 6. Appendix

### Tensile Test Results



Sample after Tensile Test



Samples after Tensile Test



Samples after Tensile Test



Cantilever Test Results



Sample after Cantilever Test



Sample after Cantilever Test



Sample after Cantilever Test