



## ENGINEERING TEST REPORT

AMPACT BAT Connector  
P/N 2377042-1 & 2377042-2

Report No.  
502-47536(I) Rev. A

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**Markham Energy/Utility  
Product Test Laboratory**

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## ENGINEERING Test Report

AMPACT BAT CONNECTOR (P/N 2377042-1 & 2377042-2)

### 1. Introduction

#### 1.1 Purpose

Testing was performed on the AMPACT BAT connector, P/N 2377042-1 & 2377042-2, to determine its compliance to Class AA (Extra Heavy Duty) current cycling test requirements of ANSI C119.4 – 2016, *Connectors for Use Between Aluminum to Aluminum and Aluminum to Copper Conductors Designed for Normal Operation at or Below 93°C and Copper to Copper Conductors Designed for Normal Operation at or Below 100°C* using 795 AAC to 795 ACSR conductor combination and 795 AAC to 500 Cu conductor combination.

#### 1.2 Scope

This report covers the results from the electrical performance of the AMPACT BAT Connector, P/N 2377042-1 & 2377042-2.

The testing was performed between 27<sup>th</sup> April, 2021 – 3<sup>rd</sup> August, 2021 at the Kinectrics Test Laboratory, Toronto, Canada.

#### 1.3 Conclusion

The AMPACT BAT Connector, P/N 2377042-1 & 2377042-2 complies with the electrical performance requirements of Class AA (Extra Heavy Duty) current cycling test requirements of ANSI C119.4 – 2016; *Connectors for Use Between Aluminum to Aluminum and Aluminum to Copper Conductors Designed for Normal Operation at or Below 93°C and Copper to Copper Conductors Designed for Normal Operation at or Below 100°C* using 795 AAC to 795 ACSR conductor combination and 795 AAC to 500 Cu conductor combination.

#### 1.4 Product Description

The AMPACT BAT Connectors are used for making connections between aluminum to aluminum or aluminum to copper conductors on bare overhead applications. This assembly provides a method of making tap connections on primary and secondary distribution lines. To accomplish the installation, the wedge is driven between two opposing conductors by tightening the hex bolt with a battery operated or pneumatic impact tool until the C-body is fully extended. This ensures the C-body develops high clamping force on the conductors and the wedge is locked in place to provide a secure and reliable connection.

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1.5 Test Sequence & Specimens

The test specimens were supplied by Energy R&D/Product Development Engineering.

Table 1

| <b>Test or Examination</b>    | <b>Group #</b> |          |
|-------------------------------|----------------|----------|
|                               | <b>1</b>       | <b>2</b> |
| <b>Examination of Product</b> | 1, 3           | 1, 3     |
| <b>Current Cycling Test</b>   | 2              | 2        |

Note 1: Number indicates the sequence in which tests were performed.

The following part number and quantities were used:

Table 2

| <b>Group</b> | <b>Connector P/N</b> | <b>Quantity</b> | <b>Run Conductor</b> | <b>Tap Conductor</b> |
|--------------|----------------------|-----------------|----------------------|----------------------|
| <b>1</b>     | 2377042-1            | 4               | 795 AAC              | 795 ACSR             |
| <b>2</b>     | 2377042-2            | 4               | 795 AAC              | 500 Cu               |

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## 2. Summary of Testing

### 2.1 Examination of Product

All Specimens were examined visually and functionally before and after tests and were considered to be in satisfactory condition.

### 2.2 Current Cycling Test, Class AA (Group 1 & 2)

There was no evidence of physical damage to the test specimens after 500±5 cycles. All specimens exhibited Thermal Stability between the 25<sup>th</sup> – 500<sup>th</sup> cycle & temperatures of the specimens did not exceed the temperature of the control conductor over the span of the 500 cycles.

Resistance values were stabilized between the 25<sup>th</sup> to 500<sup>th</sup> cycles. Stability was achieved when the change in connector resistance, measured between two equalizers, is no more than the ±5% of its average resistance. The stability factor “Si” did not exceed ±10 for each of the connector temperature measurements recorded at the specified intervals specified in ANSI C119.0 Table 9.

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### 3. Test Methods

#### 3.1 Examination of Product

The specimens were supplied for testing by Energy R&D/Product Development Engineering at TE Connectivity.

They were examined visually and functionally.

#### 3.2 Current Cycling Test, Class AA (Group 1)

The current cycling test was conducted on the AMPACT BAT Connectors, P/N 2377042-1 & 2377042-2 per ANSI C119.4-2016. Four (4) AMPACT BAT connectors were installed in a series circuit (Group 1) using 795 KCMIL AAC conductors and 795 KCMIL ACSR conductors. A separate series circuit (Group 2) with four (4) AMPACT BAT connectors were installed using 795 KCMIL ACSR and 500 Cu conductors. A second control of aluminum was included in this loop for thermal stability and this was used throughout the duration of the test, once the current level has been established by the copper control conductor.

The length of Aluminum conductor and Copper conductor from the connector to the equalizer were 24" and the control conductor was 48".

Prior to installation, conductors were wire brushed and directly installed into the connector.

Resistance was measured across each equalizer, see Fig's 3 and 4.

Thermocouples were placed on the connectors and control conductor.

The AMPACT BAT Connectors were subjected to a total of 500±5 Cycles. Each cycle consisted of 2 hours of "CURRENT ON" and 1.5 hours of "CURRENT OFF" periods. The current set-value for the loop (Group 1) using 795 KCMIL AAC and 795 KCMIL ACSR conductors is at 1260 A, and the loop (Group 2) using 795 KCMIL ACSR and 500 Cu conductors is at 1180 A.

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4. Validation

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 29/9/2021

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Fig. 1



Photograph of AMPACT BAT Connectors set-up, 795AAC – 795 ACSR, with all specimens during Current Cycling Test to ANSI C119.4-2016 Class AA (Group 1)

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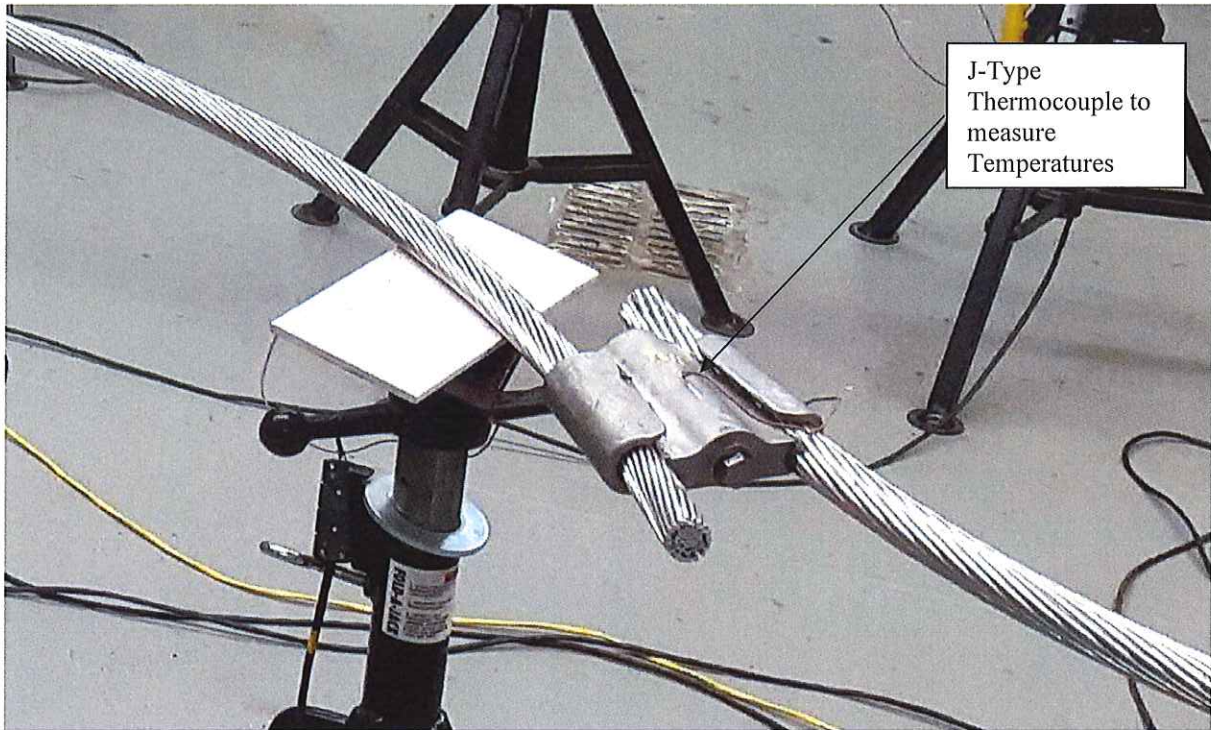
Fig. 2



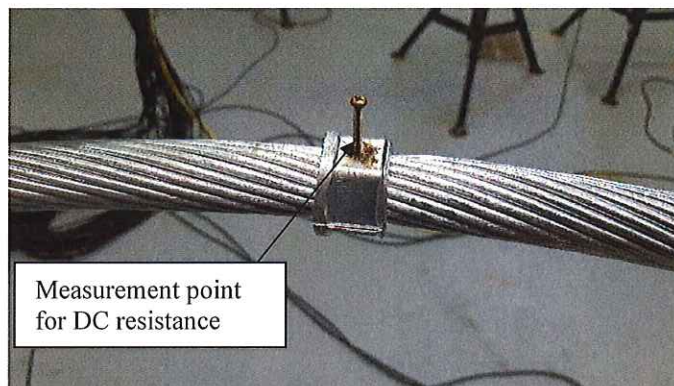
Photograph of AMPACT BAT Connectors set-up, 795AAC – 500 Cu, with all specimens during Current Cycling Test to ANSI C119.4-2016 Class AA (Group 2)

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Fig.3

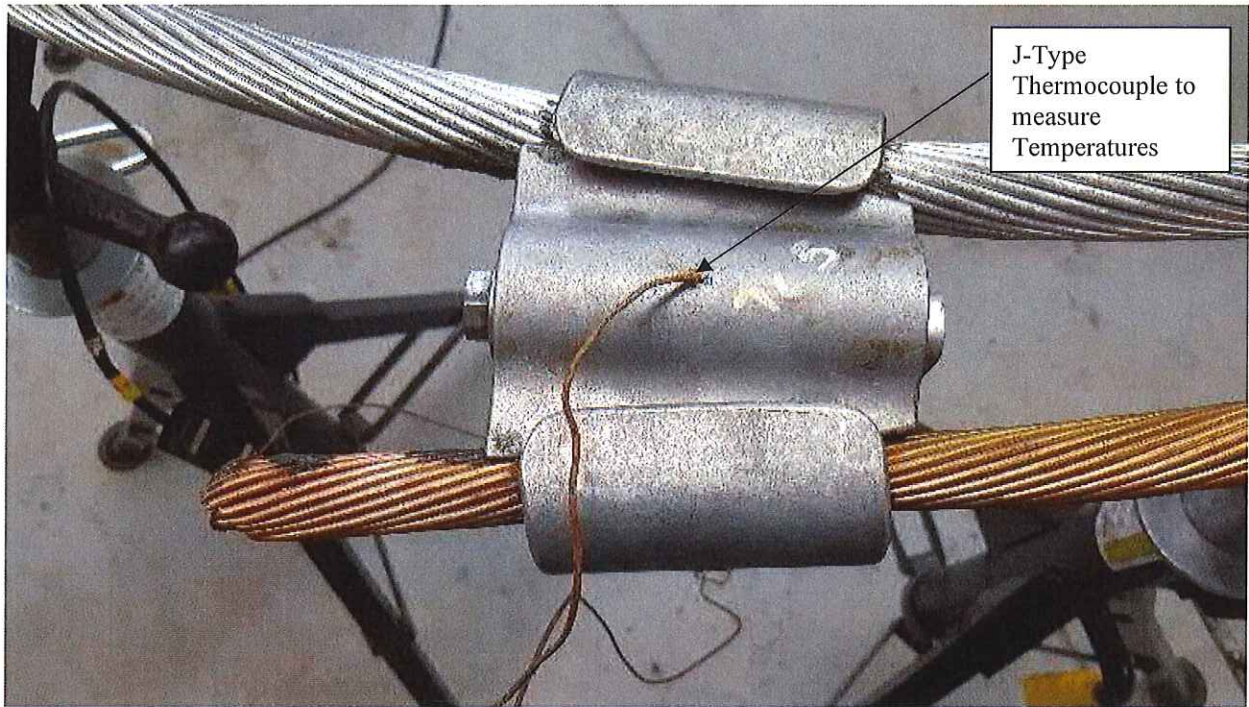


Representative close-up photograph of AMPACT BAT Connector set-up during Current Cycling Test to ANSI C119.4-2016 Class AA (Group 1)

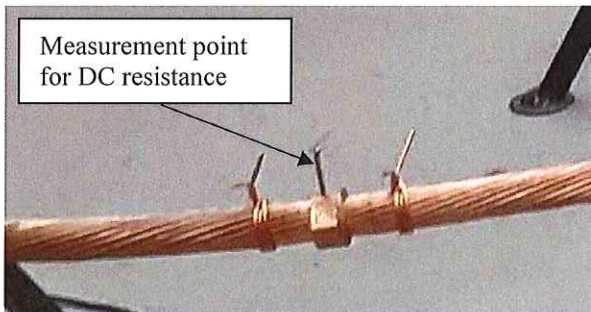


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Fig.4



Representative close-up photograph of AMPACT BAT Connector set-up during Current Cycling Test to ANSI C119.4-2016 Class AA (Group 2)



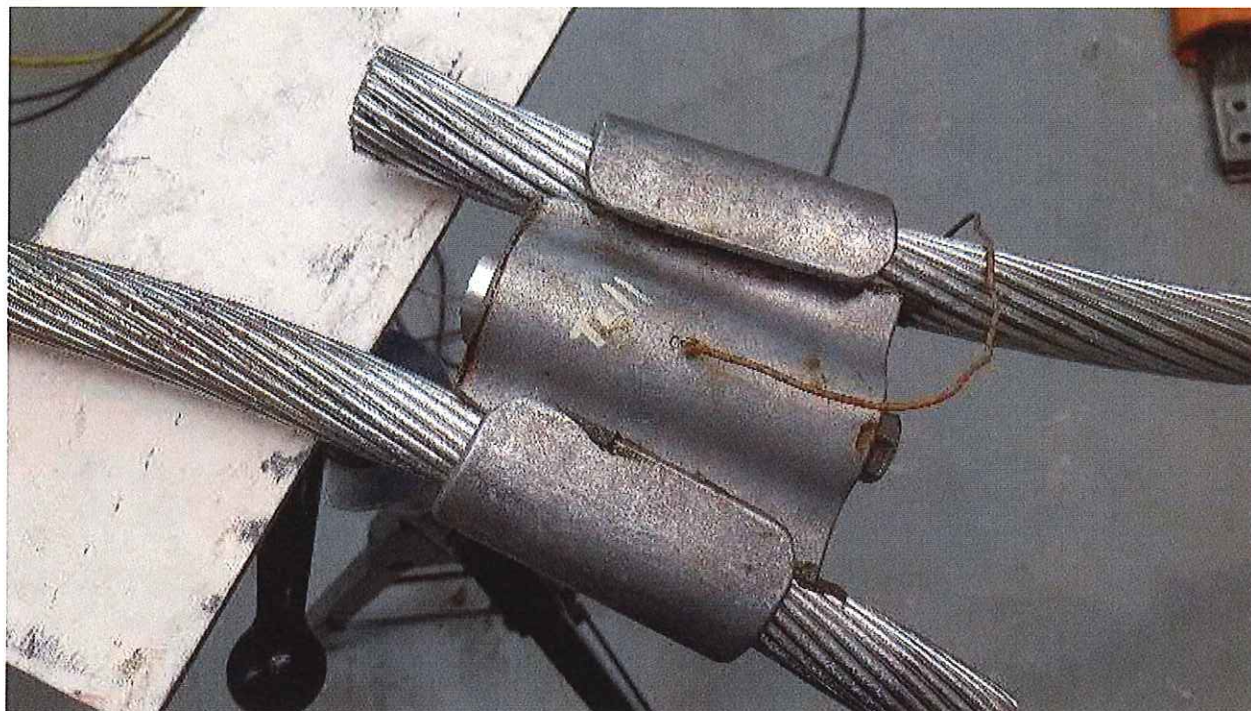
500 kcmil Copper Control Conductor



795 kcmil AAC Control Conductor

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Fig.5



Representative close-up photograph of AMPACT BAT Connector, 795 AAC – 795 ACSR, after Current Cycling Test to ANSI C119.4-2016 Class AA (Group 1)

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Fig.6



Representative close-up photograph of AMPACT BAT Connector, 795 AAC – 500 Cu, Current Cycling Test to ANSI C119.4-2016 Class AA (Group 2)

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