

F. GANO CHANCE RESEARCH LABORATORY

Centralia, MO

TEST REPORT NO.: R180206-S1 **REPORT DATE: 02/19/2018**

SHEET 1 OF 5

MASTER TEST FILE: G2 DATE TESTED: 01/04/2018

TEST REQUEST NO: R18-02-06

Product Family: HPS/CHANCE Temporary Protective Grounding

Item Tested: HPS / Chance ASTM Grade 5H 3-Way Ball Stud Clamp

PSC6003626 3-Way Ball Stud Ground Clamps with 30mm Ball Studs

PSC6003491 30mm Ball Studs

(10') S3714 4/0 Copper Ground Cable 0

Type of Test: Momentary Current Test & Clamp Torque Test

Scope of Test: Verify Temporary Protective Ground meets ASTM F855 – Grade 5H & ASTM

F855 Clamp Torque Requirement

Applicable Stds: ASTM F855-15: Standard Specifications for Temporary Protective Grounds to

Be Used on De-energized Electric Power Lines and Equipment

Related Cat No: None

3rd Party Witness: **Powertech Laboratories**

The numbers in parenthesis are instrument control numbers. Refer to the record of performance for instrument details.

Reproduce this report in its entirety only.

Tested by: Powertech Labs Inc.

Report by: Larry Bereswill, Product Engineer Mgr

Approved by: Lang Consuill

Title: Product Engineering Mgr.

Date: 02/19/2018

Test data presented is within $\pm 3\%$ unless otherwise specified.

Sample identification was provided by the Customer Identified Above

This report applies only to the item(s) tested, as representatives of current product design.

All instruments and recording devices used in this testing program are within a valid calibration period.

All samples were new and in excellent condition when tested, except as otherwise noted in the "Item Tested:" section above.

Data from tests performed for HPS shall not be released to non-HPS personnel unless it has been reviewed, converted to an S1, signed by the Laboratory Manager and Engineering Manager of the subject product line.



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The HPS / Chance 3-Way Ball Stud Ground Clamp was tested as a single assembled ground set (Procedure 1) and as a single assembled ground set attached to the ball stud of a mounted 3-Way Ball Stud Clamp (Procedure 2).

Procedure 1:

Single-phase short circuit tests in accordance with ASTM Specification F855-15 for a Grade 5H (47kA) rated assembly were conducted on Chance assembled temporary protective safety ground sets. One PSC6003626 3-Way Ball Stud Ground Clamp was attached to a 1.5" diameter energized buss bar and the other 3-Way Ball Stud Ground Clamp was attached to a ground PSC6003491 30mm ball stud. The clamps were mounted with the ball stud between the clamp forks. All clamps were tightened to 300 inlbs. The test position of the cable was in a J-shape and the clamps facing directly away from one another as shown in ASTM F855, Figure 1. The test current was applied for a minimum of 250 ms (15 cycles @ 60 Hz) with the timing of fault initiation adjusted for maximum asymmetry for an ASTM Grade 5H ground set.



Photo 1: Single Setup

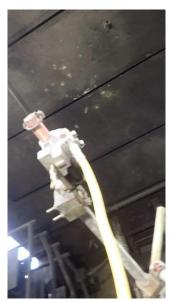


Photo 2: Energized Clamp



Photo 3: Ball Stud Ground



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Procedure 2:

Single-phase short circuit tests in accordance with ASTM Specification F855-15 for a Grade 5H (47kA) rated assembly were conducted on Chance assembled temporary protective safety ground sets. One PSC6003626 3-Way Ball Stud Ground Clamp with a 30mm ball stud was mounted to a 1.5" diameter energized buss bar. A ground set comprising of PSC6003626 3-Way Ball Stud Ground Clamps and 4/0 grounding cable was attached to the mounted clamps ball stud. The other ground set end was attached to another PSC6003626 3-Way Ball Stud Ground Clamp which was mounted to a ground PSC6003491 30mm ball stud. The clamps were mounted with the ball stud between the clamp forks. All clamps were tightened to 300 in-lbs. The test position of the cable was in a J-shape and the clamps facing directly away from one another as shown in ASTM F855, Figure 1. The test current was applied for a minimum of 250 ms (15 cycles @ 60 Hz) with the timing of fault initiation adjusted for maximum asymmetry for an ASTM Grade 5H ground set.



Photo 4: Double Setup



Photo 5: Double Energized Setup Photo 6: Double Ground Setup



Mechanical Clamp Torque Test:

A PSC6003626 3-Way Ball Stud Ground Clamp was attached to a 30mm Ball Stud and a 1.5" diameter buss bar. A measured torque was applied to the eyescrew until failure.



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Photo 7: Ball Stud Torque Setup



Photo 8: 1.5" Buss Bar Torque Setup

Electrical Short Circuit Results:



Photo 7: Single Final Result



Photo 8: Double Final Result



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	Cycle Current Peak Values (kA)														Duration - ms	I²t (Mega	
Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(Calc Cycles)	amps ² -s)
ASTM Grade 5H Requirement (Min)	127	116	108	99	93	88	84	81	78	76	74	73	72	71	70	250 (15)	728
Procedure 1-1	128	117	108	100	94	89	85	82	78	76	74	73	72	71	70	262 (15.7)	777
Procedure 1-2	130	118	109	101	95	90	86	82	79	77	75	74	72	71	71	263 (15.8)	794
Procedure 2-1	129	117	108	100	94	89	85	81	79	76	74	73	72	71	70	263 (15.8)	781
Procedure 2-2	130	119	110	102	95	90	86	82	79	77	75	74	73	72	71	262 (15.7)	800

Mechanical Torque Results:

Conductor Type	Yield (Min 330 in-lbf)	Ultimate (Min 400 in-lbf)	Results
30mm Ball Stud	No Damage	No Damage	Exceed 1.5X Rating
1.5" Buss Bar	No Damage	No Damage	Exceed 1.5X Rating

Conclusion:

HPS/Chance Catalog Number PSC6003626 3-Way Ball Stud Ground Clamp with 30mm Ball Studs meet or exceed the withstand ratings for ASTM F855-15 Grade 5H Temporary Protective Grounding.