

Project Number: 16136a

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Date: 11/21/16

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Report of Hitch Testing
Performed on a two **Ball Mount Designs**
in Accordance with SAE J684 Table 3
Class 4 (10,000 lbs. GVWR)
Model/Part No.: **PB2D & PB4D**

Prepared for:
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This report prepared by:

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Introduction:

This report presents the results of testing performed on two ball mount designs in accordance with the latest version of SAE J684 (Reaf. MAY2014), Table 3, and VESC V-5. This project was authorized by Joseph Herlihy of the HitchTek LLC under P.O. No. xxx (TSI #796). The product was received on November 10, 2016 with the work performed on November 15 through 21, 2016.

Summary of Results:

Specimen / Part Number	SAE J684 Table 3 as a Hitch Component, Rating Tested, GVWR	Comments
1 / PB2D	Class 4 (10,000 GVWR)	Complies (Total change in ball axis 1.3°)
1 / PB4D	Class 4 (10,000 GVWR)	Does Not Comply (Total change in ball axis 5.6°) Very likely because we used a test specimen previously overloaded to a higher rating



As Received

Test Procedure:

Per SAE J684, Table 3. The test specimens are placed in an essentially non-yielding receiver simulation according to the manufacturers recommended installation instructions. All forces are then applied through an essentially non-yielding, mating fixture with an onset rate of not more than 150 lbs./sec. A preload of 400 pounds is used for initial and final deformation measurements.

Instrumentation:

The verification of load cell accuracy used for this project is by an Instron Model 3385H, serial #3217 with an NIST traceable calibration due date of December 7, 2016.

Sample as Submitted:

Type of Device: Hitch Component, ball mounts for nominal 2" receivers.

Specimen Detail: #1 / PB2D

Insert (shank): Nominal 2.0"sq. O.D., 0.17" wall, 8.0" median length, with full butt-weld at 76° (± 1°) to ball support platform. The hole to accommodate a 0.63" lock-pin is centered 2.5" from the inserted end. **Permanent Marking:** (hand written) PB2D

Ball Platform: Nominal 0.75" x 2.5" x 10.7" long with a nominal 76° bend producing a 3.4" horizontal platform for ball. The hole accommodates a 1" shank ball. **Permanent Marking:** None Apparent

Offset/Extension: 1.9" drop and 1.0" rise with a 6.5" extension from anticipated location of the receiver lip to the ball centerline 9.0" from hole to hole).

Specimen Detail: #2 / PB4D

Insert (shank): Nominal 2.0"sq. O.D., 0.17" wall, 8.0" median length, with full butt-weld at 76° (± 1°) to ball support platform. The hole to accommodate a 0.63" lock-pin is centered 2.5" from the inserted end. **Permanent Marking:** (hand written) PB4D

Ball Platform: Nominal 0.75" x 2.5" x 10.8" long with a nominal 76° bend producing a 3.4" horizontal platform for ball. The hole accommodates a 1" shank ball. **Permanent Marking:** None Apparent

Offset/Extension: 4.0" drop and 2.5" rise with a 7.0" extension from anticipated location of the receiver lip to the ball centerline 9.5" from hole to hole).

TEST RESULTS:

Specimen No. / Model No.	SAE J684, Table 3, Required Proof Loads for a 10k GVWR, Lbs.					Overloaded in Step a. to a higher projected
	a. Downward Compressive 5,180 & 5,180	b. Tensile Downward 3,830 & 1,500	c. Compressive Downward 3,830 & 1,500	d. and e. Trans. 2,500	Complies (J684 6.3.2), Yes / No (° change)	
1 / PB2D (position)	1.3° at 20k values (drop)	0.4° (rise)	0.1° (drop)	No visible change	Yes (< 1.3°)	Loaded to 20k with a residual change of 1.3°, could pass at a projected 20k rating
2 / PB4D (position)	2.1° at 10k values (drop)	5.6° (rise)	0.3° (drop)	No visible change	Yes (5.6°)	Loaded to 10k with a residual change of 5.6°, could pass at a 9k rating

The final position of the ball axis **did not depart** more than 5° from the original, nominally vertical, position following the application of *the required* test loads. (5° permitted)



Set Up for Test – Typical



Following Overloads in Step a.– Some Bend in Tube and in Ball Platform

Sample Disposition:

Unless other arrangements are presented in writing, the test samples from this project will be disposed of 30 days from the date on this report. Return shipping arrangements are the responsibility of the client and are to be done on a “will call” basis within two weeks of the completion of the testing.

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