TEST PLAN & REPORT

#495-L Collapsible Rescue Basket With Lowered Lifting Eyes Load Test

Prepared by: _____ 01/16/2013

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Reviewed by: _____ 01/16/2013

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Purpose

The purpose of this plan is to define the procedures & reporting requirements for the load testing of LSC #495-L Collapsible Rescue Basket with Lowered Lifting Eyes in accordance with US Army Aviation Engineering Directorate (AED) load test requirements. Successful completion will confirm the #495-L satisfies the load test requirements defined by US Army AED and further demonstrate the suitability and safety of the #495-L for the intended application of helicopter hoist operations, including the deployment and recovery of both equipment and persons (Human External Cargo).

Inspection/Testing

Testing and inspection will be performed at Lifesaving Systems Corporation's (LSC) manufacturing facility located in Apollo Beach, Florida by LSC personnel. US Army AED representatives will be present to observe and verify the test results.

One #495-L Collapsible Rescue Basket with Lowered Lifting Eyes will be submitted for inspection/testing and will undergo the following:

Visual Examination
10X Visual Inspection of Critical Areas/Welds
Load Test

Test Equipment

The primary testing equipment consists of the following items:

1. Force Application: Physical weights consisting of lead shot in fabric bags and/or lead bars.

2. Force Measurement: 10,000 lbs S-beam load cell (transducer) with one (1) each 0-10,000 lbs digital gauge. Calibration conducted by Omegadyn, Calibration sticker dated 01/11/2013, valid thru 01/12/2015. A commercial grade shipping scale will be used to independently verify the weight of each physical specimen added to the basket for force application.

3. Fixtures: Shackles, pins, and custom fixtures as required to suspend the basket with physical weights.

4. Miscellaneous Measurement Instruments: Rulers, tape measures, calipers & 10X magnifying glass as required for supplemental measurement information.

Photographic Documentation

Pictures will be taken as needed before, during, and after the test.

Visual Inspection/Examination

Unaided and 10X visual inspection/examination to be performed as specified in the table below.

Success Criteria: Basket must pass the noted inspection criteria.

Test Specimen: LSC #495-L Collapsible Rescue Basket w/ Lowered Lifting Eyes
DOM: 01/2011
S/N: 044

Visual Inspection/Examination:

Inspection Criteria	Sample Pass / Fail	Notes & Observations
Conformance to LSC product description.	**PASS**	**No deficiency observed.**
Surface - unclean, rough, fractured, malformed or containing cracks, nicks or other flaws (cosmetic only defects allowed).	**PASS**	**No deficiency observed.**
Any component missing, fractured, malformed, or otherwise damaged	**PASS**	**No deficiency observed.**
Any component loose or otherwise not securely retained	**PASS**	**No deficiency observed.**
Incorrect assembly or improper positioning of components	**PASS**	**No deficiency observed.**
Any functioning part that works with difficulty	**PASS**	**No deficiency observed.**
Faulty workmanship that would materially reduce performance, reliability, or durability	**PASS**	**No deficiency observed.**
Record initial Key Characteristic Dimensions (Appendix A) prior to load test. Unloaded condition.	**N/A**	**Ref. Appendix A.**
Inspection of all critical area welds with 10X magnifying glass prior to Load Test.	**PASS**	**10X visual inspection by Marshall Young, no deficiency or imperfection observed.**
Inspection of all critical area welds with 10X magnifying glass while under load at 600 lbs (WLL) Load Test.	**PASS**	**10X visual inspection by Marshall Young, no deficiency or imperfection observed.**
Record Key Characteristic Dimensions (Appendix A) after 600 lbs Load Test. Unloaded condition.	**N/A**	**Ref. Appendix A.**
Inspection of all critical area welds with 10X magnifying glass while under load at 2700 lbs Load Test.	**PASS**	**10X visual inspection by Marshall Young, no deficiency or imperfection observed.**

Load/Strength Test

For each of the target loads listed in the table below, the #495 Collapsible Rescue Basket with Lowered Lifting Eyes shall be placed on the ground or other support surface for the addition of physical weights. Once weights have been added according to the target load the basket will be lifted from the ground/support by the basket's lifting eyes and suspended for a minimum of 5 minutes. This will be repeated for each target load specified. The basket shall support a minimum load of 2700 lbs for 5 minutes as specified by US Army AED without failure (bending and deformation allowed).

Success Criteria:
(1) Basket after being subjected to the Working load limit of 600 lbs for 5 minutes must exhibit no permanent deformation or other damage (bending, cracks, etc.). Key characteristic dimensions per Appendix A will be recorded before and after the 600 lbs load test.
(2) Basket must pass the noted load test criteria of 2700 lbs for 5 minutes in accordance with Army Aviation Engineering Directorate SER-70534, Appendix E, Rev. 2.

Test Specimen: LSC #495-L Collapsible Rescue Basket w/ Lowered Lifting Eyes
DOM: 01/2011
S/N: 044
Weight of Basket: 36.8 lbs

Load/Strength Test:

Target Load (lbs)	Scale Weight (lbs)	Load Cell Weight (lbs)	Success Criteria Pass/Fail	Notes & Observations
600	**600**	**637**	**PASS**	* Working Load Limit (WLL) for most Hoist Systems. * Success Criteria Note 1 applicable. **Observation: Test load supported for 5 minutes. No permanent deformation.**
1700	**1700**	**1739**	**N/A**	* Observation only data point. **Observation: Test load supported. No failure other than deformation (permanent).**
2700	**2700**	**2741**	**PASS**	* US Army AED specified load test criteria. * Success Criteria Note 2 applicable. **Observation: Test load supported for 5 minutes. No anomalies or failure of any component including welds, side net, net rivets, side supports, liner and tubular frame. Significant permanent deformation to tubular frame.**
3300	**3300**	**3351**	**N/A**	* Supplemental data point, 3300 lbs is the breaking strength of typical 3/16" stainless steel hoist cable. **Observation: Test load supported. No failure of any component including welds, side net, net rivets, side supports, liner and tubular frame. Further permanent deformation to tubular frame.**

Results

The #495-L Collapsible Rescue Basket was visually examined/inspected and load tested in accordance with requirements listed above and found to pass all criteria. To summarize the Basket successfully supported the specified working load limit (WLL) of 600 lbs for five (5) minutes without permanent damage or deformation. The Basket was further subjected to the AED specified load test of 2700 lbs. Although permanent deformation occurred, the Basket successfully supported the 2700 lbs for five (5) minutes without failure to any component other than the observed deformation. An ultimate load test of 3300 lbs was also performed. Again the basket supported the noted load without failure. Test load was securely retained by the basket at both the 2700 lbs and 3300 lbs load tests.

Based on the results of the inspection and test as defined in this plan, Lifesaving Systems Corp. p/n #495-L Collapsible Rescue Basket with Lowered Lifting Eyes has successfully completed the load test requirement defined by US Army Aviation Engineering Directorate. AWR approval requirements will be verified by the US Army Aviation Engineering Directorate upon review of the Test Report Associated with this subject test plan.

Jason Glazer, Engineer
Lifesaving Systems Corp.

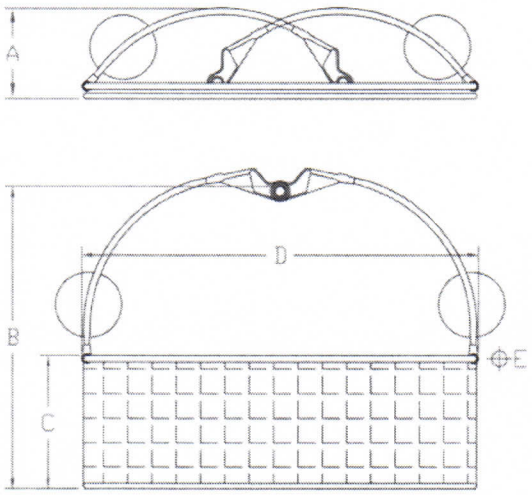
01/16/2013

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Utility Helicopters Project Office
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Appendix A - Key Characteristic Dimensions

The dimensions as shown in the figure below shall be measured and recorded before and after the 600 lbs (WLL) load test. All measurements obtained in the unloaded condition.



	Dimension Prior to 600 lbs Load Test	Dimension After 600 lbs Load Test
Feature A	10-15/16"	10-15/16"
Feature B	33-1/2"	33-1/2"
Feature C (All four corners)	14-3/4" (all four corners)	14-3/4" (all four corners)
Feature D	44-7/8"	44-7/8"
Feature E*	17-7/8" (side 1) 17-15/16" (side 2)	17-7/8" (side 1) 17-15/16" (side 2)

* Feature E defined as spread between lifting bail arms.

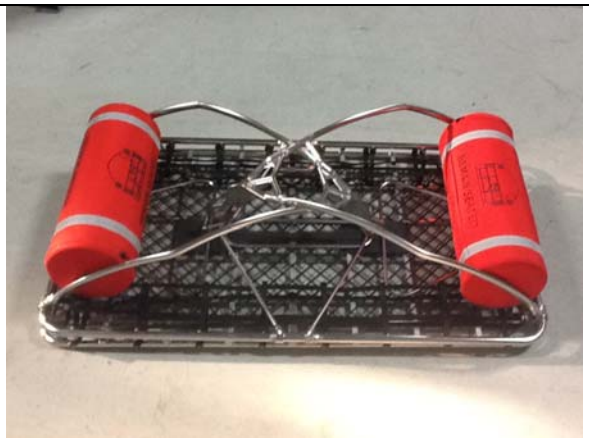
Measurement Comments:

- Basket was marked at two locations (left bail assembly and 1 corner) with tape to ensure before and after dimensions were measured in the same order and manner.
- Feature B dimension measured from bottom of basket (sitting on floor surface) to bottom of lifting eye.

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Appendix B - Photographic Documentation of Examination/Load Tests



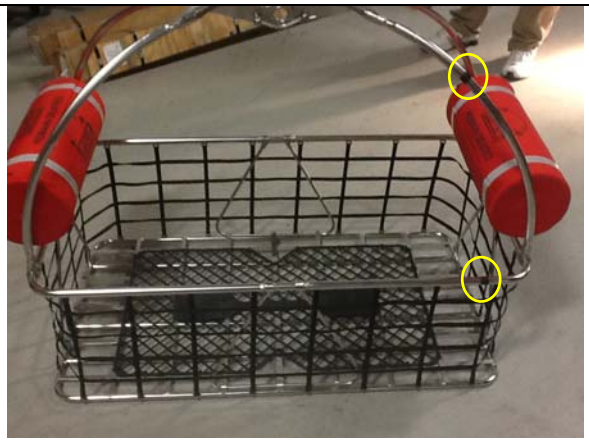
(1) Visual/Functional Inspection (Basket, stowed condition)



(2) Visual/Functional Inspection (Basket, erect condition)



(3) Visual Inspection (Magnifying Glasses, 10X)



(3) Visual Inspection (Reference Markings)



(5) Load Test (Load Cell and Shackle connection)



(6) Load Test Dead Weight (lead shot) Verification



(7) Load Test Fixture w/ Basket



(8) Load Cell Gauge, Reporting 36.8 lbs (basket only)



(9) Load Test - 600 lbs



(10) Load Cell Gauge, Reporting 637 lbs (Basket + 600 lbs load)



(11) Dimension Check (Feature A, after 600 lbs load test)



(12) Load Test - 1700 lbs



(13) Load Cell Gauge, Reporting 1739 lbs (Basket + 1700 lbs load)



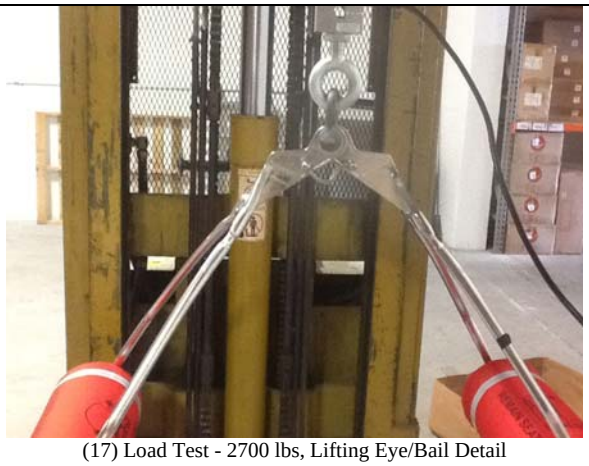
(14) Basket filled with 2700 lbs (resting on skid supports)



(15) Load Test - 2700 lbs



(16) Load Cell Gauge, Reporting 2741 lbs (Basket + 2700 lbs load)



(17) Load Test - 2700 lbs, Lifting Eye/Bail Detail



(18) Load Test - 2700 lbs, Frame Detail



(19) Basket filled with 3300 lbs (resting on skid supports)



(20) Load Test - 3300 lbs



(21) Load Cell Gauge, Reporting 3351 lbs (Basket + 3300 lbs load)



(22) Test Specimen After Completion of All Testing
* Note, highlighted rear frame deformation caused by Fork Lift on lowering of basket