

December 11, 2018

Mr. Chris Berry
Heaven's Trail, LLC
7845 Colony Road, Suite C4-261
Charlotte, NC 28226

Email: chris.berry@htoutdoor.com
Phone: 706-604-8260

Subject: **Report of Product Testing**
Product Designation: Hang Around Solo
TEC Project # 18-1471
TEC Lab No. 18-T121

Dear Mr. Berry:

Testing Engineering and Consulting Services, Inc. (TEC Services) is an independent testing laboratory with a quality system accredited by AASHTO R18, ANS/ISO/IEC 17025:2005, and the Army Corp of Engineers. TEC Services is pleased to present this report of our test results for the subject product received on August 22, 2018. The testing was performed at our Lawrenceville, Georgia facility in August of 2018. Our services were performed in accordance with the terms and conditions of our Service Agreement TEC PRO 18-1471. The test results presented only pertain to the product tested.

The purpose of our testing was to evaluate the mechanical properties of the submitted product in accordance with the most recent ASTM Standards. All testing was conducted on the one single submitted product (Photos 1). Product instructions were provided by the manufacturer. The product was assembled and mounted to a wooden pole, with a diameter of 10 ± 1 inches, in accordance with the provided instructions. It is our understanding that the submitted product is classified as a "Ladderstand" type treestand intended for single occupancy use and has maximum load rating of 400 lbs.

The provided instructions were reviewed for content in accordance with ASTM F2123. Warning labels were also checked to verify compliance with ASTM F2121. Checklists pertaining to the review of both the instructions and warning labels (Photo 2) are attached to this report. Testing was performed in accordance with the following ASTM standards.

- ASTM F2126-10 *Standard Test Method for Treestand Static Load Capacity*
- ASTM F2125-13 *Standard Test Method for Treestand Adherence and Static Stability*
- ASTM F2531-13 *Standard Test Method for the Load Capacity of Treestand Seats*
- ASTM F2128-13 *Standard Test Method for Repetitive Loading Capability*
- ASTM F2124-13 *Standard Practice for Testing Ladder Treestand, Tripod Stand, and Climbing Stick Load Capacity*
- ASTM F2123-13 *Standard Practice for Treestand Instructions*
- ASTM F2121-13 *Standard Practice for Treestand Labels*

ASTM F2126 – Treestand Static Load Capacity (Platform and Two Ladder Steps)

Static load testing was performed using a 10" x 10" x 0.5" steel plate which was placed in the center of the platform. Load was applied perpendicular to the plate by means of a dead load weight stack fitted with a length of U-Channel at the end of the steel cable which supported the weight stacks. Load was applied in increments of 150 lbs. until reaching 600 lbs. The platform was then un-loaded and observed for any signs of slipping or permanent deformation. The platform was then loaded and un-loaded in increments of 150 lbs until reaching (1200 lbs.) a load which surpasses 3.0 times the rated safety factor for single occupancy. This process was repeated on two ladder steps approximately 2/3 the height of the ladder (Steps 9 & 11) with the exception that each step was loaded to 2.0 times the single occupancy rating (800 lbs) and the load was applied to the center of the step over an area that was 3 inches in length and covered the full width of the step. Test results are reported in Table 1. Photos of the test configuration are shown in Photos 3-4.

ASTM F2125 – Treestand Adherence and, Stability

Adherence and stability testing was performed using a 5" x 10" x 0.5" steel plate. Load was applied perpendicular to the plate at each of the four corners of the platform using a dead load weight stack. A trial load of 80% of the rated load capacity for single occupancy (320 lbs) was applied to each corner then un-loaded and observed for signs of slippage or permanent deformation. Each of the four corners was then loaded to 100% of the rated load capacity for single occupancy (400 lbs). No signs of permanent deformation or slippage were observed. Test results are reported in Table 2. A photo of testing is shown in Photo 5.

ASTM F2531 – Treestand Seat Load Capacity

Static load testing was performed using a 10" x 10" x 0.5" steel plate which was placed in the center of the seat. Load was applied perpendicular to the loading plate by means of dead load weight stack. Load was applied in increments of 25% of the rated load capacity until reaching 100% (400 lbs.). The seat was then un-loaded and observed for signs of slippage or permanent deformation. The seat was then loaded and un-loaded in increments of 25% until reaching 1.5 times the rated load capacity (600 lbs). Test results are reported in Table 1. Photos of the test configurations are shown in photo 6 attached to this report.

ASTM F2128 - Repetitive Load Testing

For repetitive load testing a 5" x 5" x 0.5" steel plate was used to load one step on the ascending ladder. The step was located at a height of approximately 2/3 the total height of the ladder. The total number of steps on the ladder was multiplied by 500 cycles in order to obtain the total number of cycles needed for testing. The submitted product had a total of 15 steps which equates to 7,500 total cycles and the 10th step of the ladder was used for loading. A load of 400 lbs was applied perpendicular to the loading plate by means of a dead load weight stack incorporated into a cyclic test machine. The ladder step was loaded and un-loaded at a rate of 15 cycles per minute until achieving 1/3 (2,505 cycles) of the total number of cycles. The stand was then inspected for signs of shifting, cracks in the metal or permanent deformation. This sequence was repeated two more times until reaching a total of 7,515 cycles. No signs of shifting, cracks in the metal, or permanent deformation was observed during testing. Information pertaining to the cyclic testing is reported in Table 3. A photo of the repetitive load testing assembly is shown in Photo 7.

Table 1 – Results of Static Load Testing for Platform, Ladder Steps, and Seat

Test Method		ASTM F2126		ASTM F2126				ASTM F2531	
Area of Load Application		Platform		Ladder Step #9		Ladder Step #11		Seat	
% of Rated Load Capacity	Theoretical Load (lbs)	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail
25%	100	150	Pass	100	Pass	100	Pass	100	Pass
50%	200	300	Pass	200	Pass	200	Pass	200	Pass
75%	300	450	Pass	300	Pass	300	Pass	300	Pass
100%	400	600	Pass	400	Pass	400	Pass	400	Pass
125%	500	750	Pass	500	Pass	500	Pass	500	Pass
150%	600	900	Pass	600	Pass	600	Pass	600	Pass
175%	700	1050	Pass	700	Pass	700	Pass	NA	
200%	800	1200	Pass	800	Pass	800	Pass		

Table 2 – ASTM F2125 – Results of Stability and Adherence Testing

Area of Load Application		Front Right		Front Left		Rear Right		Rear Left	
% Rated Load Capacity	Theoretical Load (lbs)	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail	Actual Load (lbs)	Pass/Fail
80%	320	320	Pass	320	Pass	320	Pass	320	Pass
100%	400	400	Pass	400	Pass	400	Pass	400	Pass

Table 3 – ASTM F2128 - Information Pertaining to Repetitive Load Testing

Cycle Interval	Date	Start Time	End Time	Time (h:mm)	# of Cycles	Calc # of Cycles	7,500
1st Third	08/24/2018	7:10 PM	9:57 PM	2:47	2,505	Cycles per Minute	15
2nd Third	08/24/2018	9:57 PM	12:44 AM	2:47	2,505	Total # of Steps	15
Final Third	08/25/2018	12:44 AM	3:31 AM	2:47	2,505	Step # Tested	10
Total				8:21	7,515	Weight Load (lbs)	400

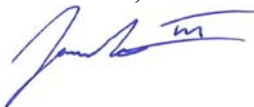
Summary

- Per ASTM F2126 the platform of the submitted product was able to support three times its rated load capacity for single person occupancy (1200 lbs) without permanent deformation. The factor of safety for the platform is calculated as 3.0
- Per ASTM F2126 the ladder steps which were loaded on the submitted product were able to support twice its rated load capacity for single occupancy (800 lbs) without permanent deformation. The factor of safety for the step is calculated as 2.0.
- Per ASTM F2125 the submitted product showed no signs of permanent deformation nor did it show signs of shifting after the load was removed.
- Per ASTM F2531 the seat of the submitted product was able to support 1.5 times the rated load capacity for single occupancy (600 lbs) and showed no signs of permanent deformation.
- Per ASTM F2128 the stand showed no signs of shifting, cracks in the metal or permanent deformation after being loaded and un-loaded for 7,515 cycles at 1.0 times the rated load capacity for single occupancy (400 lbs).
- The instructions supplied with the submitted product comply with the requirements of ASTM F2123.
- The warning labels for the submitted product comply with the requirements of ASTM F2121.

We appreciate the opportunity to provide our services to you on this project. Please do not hesitate to contact us at your convenience if you have any questions about this report or if we may be of further assistance.

Sincerely,

TESTING, ENGINEERING & CONSULTING SERVICES, INC.



James G. McCants III
Laboratory Manager, Chemist



Shawn P. McCormick
Laboratory Principal

Attachments: Photos 1-7
Instruction Checklist
Warning Label Checklist (Treestand)

Photo 1 – Parts Prior to Assembly



Photo 2 – Treestand Warning Label


Heaven's trail™

WARNING

Failure to follow all warnings listed could result in serious injury or death. Do not use this product without Full body Harness (Fall Arrest System) that meets ASTM Standards.

Read Instructions before use.
Model: Hang Around Solo
ASTM Rated Load Capacity: 400 lbs

DO NOT MODIFY THIS PRODUCT.
Proper maintenance and inspection is required

Control # 182000

Manufactured by HARCO Metal Products, 162 Jack Cooper Drive, Valley Head, Alabama 35989

Control # 182000

Photo 3 – Static Load of Ladder Step



Photo 4 – Static Load Testing of Platform



Photo 5 – Stability and Adherence Testing



Photo 6 – Seat Load Testing



Photo 7 – Cyclic Load Testing



Client: Heaven's Trail, LLC
 Project No.: TEC # 18-1471
 Project Name: Hang Around Solo
 Deer Stand Type: 1 Person Ladderstand
 Single Capacity: 400 lbs.

Laboratory ID: 18-T121
 Date Received: August 22, 2018
 Date Inspected: October 8, 2018
 Inspected By: Zack Mooney
 Reviewed By: Trey McCants

Initial Inspection Form - ASTM F2121 - Warning Label for Treestand

	Yes	No	Affidavit
1) Instructions included in packaging			Online
2) DVD included in packaging			Online
3) FAS Model Designation			N/A
a) Full Body Harness			N/A
b) Suspension Relief Device			N/A
c) Anchor Strap			N/A
4) All parts included in packaging	✓		
5) Warning Label Content			
a) "WARNING"	✓		
b) "Failure to follow all warnings could result in serious death or injury"	✓		
c) "Do not use without a Full Body Harness that meets ASTM Standards"	✓		
d) "Do not use before reading instructions"	✓		
e) Load Capacity and Weight Limit	✓		
f) Manufacturer's Name, Address, Phone Number	✓		
g) Any other safety specific information	✓		
6) Warning labels attached and placed properly	✓		
a) Location of Warning Label			
7) Date of Manufacture			
			Foot Platform
			2018



WARNING

Failure to follow all warnings listed could result in serious injury or death. Do not use this product without Full body Harness (Fall Arrest System) that meets ASTM Standards.

Read Instructions before use.

Model: Hang Around Solo

ASTM Rated Load Capacity: 400 lbs

DO NOT MODIFY THIS PRODUCT. Proper maintenance and inspection is required

Control # 182000

Manufactured by HARCO Metal Products, 162 Jack Cooper Drive, Valley Head, Alabama 35989

Control # 182000

ASTM F2123 Review Checklist of Provided Instructions (Ladderstand)

Client:	Heaven's Trail, LLC.	Laboratory ID:	18-T121
Project No.:	TEC # 18-1471	Date Received:	November 15, 2018
Project Name:	Hang Around Solo	Date Reviewed:	November 16, 2018
Deer Stand Type:	1 Man Ladderstand	Reviewed By:	Zack Mooney
Load Capacity:	400 lbs – Single N/A - Double	Project Manager:	Trey McCants

- √ Indicates the item is present in the instructions provided.
- X Indicates the item is not present in the instructions provided.
- NA Indicates the item is not applicable to the product being reviewed.

Start of Review

- All user instructions shall be in English, and included with each unit.
- In addition to model specific written instructions, a Digital Versatile Disc (DVD) or Video Home System (VHS) tape shall provide non - model specific video instructions and safety warnings with each treestand or treestand ladder.

General treestand safety topics/scenes.

- When hunting from a treestand falls can occur any time after leaving the ground causing injury or death.
- Always wear a fall arrest system (FAS) comprising a full body harness at all times after leaving the ground. You must stay connected at all times after leaving the ground while using climbing and hang - on treestands. Single safety belts and chest harnesses are no longer allowed and should never be used. If you are not wearing a full body harness properly attached to the tree that is protecting you from a fall, do not leave the ground.
- Read and understand all of the manufacturer's Warnings and Instructions and use all safety devices provided by the manufacturer. Contact the manufacturer for any questions. Failure to do so could result in injury or death.
- Never exceed the total weight limit of a treestand.
- Never use a treestand while taking drugs (even prescription drugs) or alcohol.
- Never use a treestand during inclement weather such as rain, lightning, windstorms or icy conditions and end your hunt and return to the ground if inclement conditions arise .
- Never use a treestand when feeling ill, nauseous or dizzy, or if you have a prior medical condition that could cause a problem i.e., heart condition, joints that lock - up, spinal fusions, etc. or if you are not well rested.
- Never use a treestand on a dead, leaning, diseased or loose barked tree or on a utility pole.
- Never rely on a tree branch for support.
- Never jump or bounce on a treestand to seat it to the tree.
- Pull up a bow, backpack, firearm or other equipment only after being secure in the treestand and a firearm must be pulled up with it unloaded, chamber open and muzzle down.
- Always inform someone of the hunting location, where the treestand will be located and the expected duration of the hunt.

- A signal device such a mobile phone, radio, whistle, signal flare or personal locator device (PLD) must be on your person and readily available at all times.
- Inspect the treestand and all safety devices each time before use and do not store a treestand outdoors when not in use.
- Never modify your stand in any way by making repairs, replacing parts, or altering adding or attaching anything to it except if explicitly authorized in writing by the manufacturer.
- Practice installing, adjusting and using your treestand at ground level prior to using it at elevated positions.
- Instructions (written and video) should be kept in a safe place and reviewed at least annually. It is the responsibility of the treestand owner to furnish the complete instructions to any person that who borrows or purchases the treestand.

Ladder treestand and tripod topics/ scenes.

- Use at least three people to install and/or take down a ladder treestand.
- The criss - cross straps and stabilization devices must be attached before climbing to the platform.
- When installing a ladder stand, always bounce on the first rung to set the ladder into the ground according to manufacturer's instructions before proceeding to climb any higher.
- Check every ladder section connection every time you use the stand before you leave the ground. If ladder sections are separating, do not use the stand.
- Check the ground under stand to make sure it is firm and level. Sloping ground or uneven surface (one side on a rock) can cause your ladder to tilt or shift of the tree as you climb.
- Maintain three points of contact when climbing a ladder treestand.
- Always lean forward as you climb and attach your harness to the tree before securing the platform to the tree and stepping onto the platform .

Fall Arrest System (FAS) and full body harness topics/scenes.

- Read and understand the manufacturer's Warnings , expiration date and instructions on how to use and how to properly adjust the harness.
- Practice the use of a full body harness at ground level in the presence of a responsible adult to experience the feeling of hanging suspended before using in a hunting environment.
- The length of the harness tether must be minimized at all times . It should be adjusted so that it is above the head with no slack (snug) in the sitting position and you should have the minimum amount of slack possible when climbing.
- Never allow the tether strap to get under your chin or around your neck.
- Failure to follow harness instructions could result in not being able to return to the stand and being suspended in a harness after a fall. If the hunting location is unknown by anyone and communication efforts are unsuccessful, you must have a personal plan for recovery/escape because prolonged suspension in a harness can be fatal. It is important to exercise the legs by pushing against the tree or doing other forms of continuous leg exercises to avoid blood pooling while being suspended. Hunters with varying degrees of physical fitness may require different plans to recover/escape the effects of prolonged suspension. Have a personal plan and practice it in the presence of a responsible adult before leaving the ground. No one escape/rescue plan will work for every hunter on every tree in every circumstance. Only you can determine the best recovery/escape plan for your hunting situation and you must have a recovery/escape plan for your situation before leaving the ground.
- A suspension relief device must be on your person and readily accessible while using a harness. These devices allow the user to relieve the load on the lower extremities if suspended in a harness and help maintain circulation in the legs, mitigate suspension trauma (blood pooling) or allow descent to the ground. Be sure to follow the manufacturers' directions on the safe use of any suspension relief device.
- Several optional products/systems are available that offer self-recovery or self extraction from a fall when suspended in a harness. Some systems automatically descend the user while others allow user

control. One of these products/systems could be considered for use as an additional safety precaution against prolonged suspension and suspension trauma. Be sure to follow the manufacturers' directions on the safe use of these products/systems.

- Hunt from the ground when self- recovery/escape ability is absent.
- There is time to make a correct decision on what action to take if a fall occurs while wearing a full body harness. It is important to remember, "DO NOT PANIC ." Remain calm and implement your practiced rescue, relief and recovery plan.

In addition to the content of Section 7.1, basic instructions shall include, but not be limited to, the following:

- The manufacturers name and address.
- The unit model identification.
- The unit weight limit.
- Clear identification of parts or devices mentioned in the instructions.
- A clear caution, notification or warning of any particular or special condition of assembly, adjustment, inspection or use of the unit that would not be reasonable and/or obvious to an inexperienced person.
- The instructions shall include information on the method of attaching the treestand to the tree . This shall include the use of photographs and/or diagrams to illustrate and further clarify written instructions. Any questions about instructions should be referred to the manufacturer.
- The minimum (and maximum where applicable) tree diameter for proper use shall be specified.
- A procedure for adjusting the unit to fit a given diameter tree shall be specified. This shall include the use of photographs and/or diagrams to illustrate and further clarify written instructions.

Instruction shall be given to inform the user of details specific to the unit such as, but not limited to, the following:

- NA For units with integral seats, the method and/or adjustments required to erect the seat (where applicable).
- For units with a balance bar, arm rest, gun rest, etc., the method and/or adjustments required to erect same (where applicable)
- For non- climbing (hang- on and ladder) treestands, the instructions shall include information about the method to install it to the tree. This shall include the use of photographs and/or diagrams to illustrate and further clarify written instructions.

Instructions shall include information on the proper care and maintenance of the unit. Information shall include, but not be limited to the following:

- Notice shall be given that inspection for defects from damage, rot, corrosion, cracks, freezing, excessive heat, etc before every use is required and not to use if damage is detected or suspected.
- Minor maintenance that the manufacturer deems reasonably appropriate for users should be recommended. Examples include, but are not limited to: re- tightening or replacement of hardware (specified and supplied by the manufacturer), replacement of rope, straps, cords, etc. (specified and supplied by the manufacturer), preserving or refinishing wood, touch- up painting, lubrication, etc.
- Storage and/or any conditions the unit should not be subjected to.

Additional Content

- Information on the method of securing applicable attachments.
- Information (not given above) about applicable user adjustments.
- Aids or helpful hints that are not obvious to the inexperienced user.

Conclusion of Review

