

MAXIMUM LOAD TESTING of RAIL TRUCK RACK

Cargo carrying truck racks are usually tested through static load testing. A commonly accepted industry-wide standard is any pickup rack should be able to withstand a static load that is at least 3 times the rated load they are assigned. This provides a 3 to 1 safety margin.

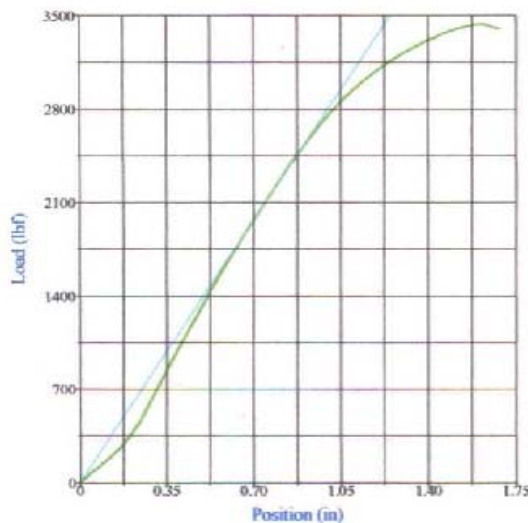
U.S. Rack pickup truck racks well exceed this standard and are tested at the Hayward, California facilities of Anamet, Inc. a respected independent materials testing laboratory. Each pickup rack is tested in a machine that simultaneously measures vertical load applied to the rack as well as material deflection (bending). Since all materials bend a tiny amount when even the slightest load is applied, it is possible to measure the maximum strength of materials by measuring load and deflection. In the graph below, the curved line represents the actual deflection of the rack as the load is increased. The straight line represents the theoretical deflection of the material. The upper point where the straight line and curved lines diverge is called the "limit of elastic deflection".

Beyond this point the material will fail and the rack will be permanently bent. Anamet labs provided the below data.

RAIL TRUCK RACK, (OLDER STYLE)*manufactured by U.S. Rack:

Load Rating for one section of this rack is **200 lbs.**

Actual tested material failure point was about **2,700 lbs.**, more than a 13 to 1 safety margin.



Test Results	
Load at Peak Load:	3436.0000 lbf
Position at Peak Load:	1.6086 in
Position at Break:	1.6812 in
Load at Break:	3402.0000 lbf
Young's Modulus:	2801.6760 lbf / in
Load at Offset:	1869.8000 lbf

Test Summary

Counter:	9962
Elapsed Time:	00:03:22
Anamet Job Number:	5004.1089
Specimen Identification:	Rail Rack 62" #8
Operator:	cafbck
Comments:	distributed load
Procedure Name:	Compression Load
Start Date:	12/17/2007
Start Time:	11:42:56 AM
End Date:	12/17/2007

WARNING: This data is provided for information only. DO NOT ASSUME BECAUSE LABORATORY TEST RESULTS INDICATE THIS PRODUCT WILL CARRY MORE THAN THE LOAD LIMIT THAT YOU CAN SAFELY EXCEED THIS LIMIT IN ACTUAL USE. STATIC LOADS ARE NOT THE SAME AS THE DYNAMIC LOADS OCCURRING DURING USE. OTHER FACTORS, INCLUDING ADDITIONAL LOADING CAUSED BY BRAKING, ACCELERATING, TURNING AND TRAVELING ON SLOPED OR BUMPY SURFACES AMPLIFY FORCES IN ALL DIRECTIONS AND CAN LEAD TO MATERIAL FATIGUE OR FAILURE OF THE RACK OR THE TRUCK BED IF PUBLISHED LOAD LIMITS ARE EXCEEDED. DO NOT EXCEED LOAD RATING.



TEST APPARATUS WITH OLDER STYLE RAIL RACK DURING TEST



OLDER STYLE RAIL RACK SHOWN AFTER TEST AT OVER 2,700 LBS.

NOTE: The configuration of the current model Rail Rack looks slightly different than the model tested. The newer model employs an inboard rather than outboard gusset as shown above and the adjustable crossbar of the newer model increases the thickness of the crossbar near the center. Updated test results for the new style are pending, but the new configuration is expected to significantly outperform the older style shown and tested above.