



# 21" Ram

**P/N: ART.021.900.1**

**Technical Report Number**

**70056773/50**

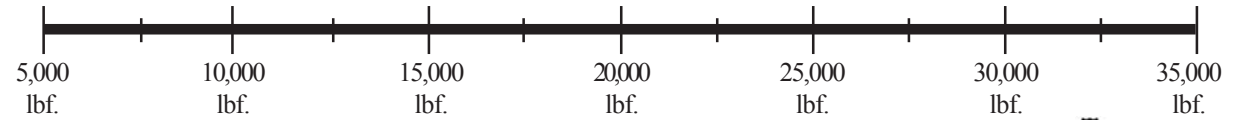
## Specifications

Length Closed(in/mm)	16.4/416
Width (in/mm)	4.0/101
Depth (in/mm)	10.4/265
Weight (lbs/kgs)	26.1/11.9
Length Open (in/mm)	23.4/594
Max. Spreading Force (lbs/kN)	32,300/143.7
Max. Pulling Force (lbs/kN)	10,300/45.8
Operating Pressure (psi/bar)	10,500/720
NFPA Compliant	Yes
HSF (lbs/kN)	32,300/143.7
LSF (lbs/kN)	32,300/143.7
HPF (lbs/kN)	10,300/45.8
LPF (lbs/kN)	10,300/45.8
Travel Distance (in/mm)	7.0/178
Opening Time (sec)	5.5
Closing Time (sec)	2.6

**HSF**  
Highest  
Spreading  
Force



**LSF**  
Lowest  
Spreading  
Force



**HPF**  
Highest  
Pulling  
Force



**LPF**  
Lowest  
Pulling  
Force



**Independently Tested  
and Certified to  
NFPA 1936 by:**



**PRODUCT SERVICE**

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# The Added Value of NFPA 1936 Compliance

When purchasing a new rescue tool system you are making a ten year commitment to your department. The system you choose will be in use for at least ten years. Certainly our tools will last much longer than ten years, but after this period of time new advances make these tools obsolete. Over this ten year period you will use your rescue system hundreds, if not thousands of times. Each time you go out on a call you need to know your rescue tool system is going to perform as well as it did when it was first purchased.

## The Intent of NFPA 1936

After seven years of work, on August 13, 1999, the NFPA issued *NFPA 1936 Standard on Powered Rescue Tool Systems, 1999 Edition*. This standard was designed to ensure fire & rescue departments a better way to compare rescue tool systems and to guarantee the quality of compliant systems. To be compliant a tool must undergo rigorous testing. The following are a few of the tests our rams had to endure to receive NFPA 1936 compliance.

## Spreading and Pulling Performance Test

This test was devised in order to bring uniformity to spreading tool specifications. These tests provide your department with legitimate means of comparing compliant tools. The forces are measured for spreading as HSF (highest spreading force) and LSF (lowest spreading force). For pulling they are measured as HPF (highest pulling force) and LPF (lowest pulling force).

In this test the ram's spreading force is measured at the end of the attachment at 3 uniformly spaced points, ranging from the closed position to 95% of the maximum opening. The value of the highest point is referred to as the highest spreading force (HSF) and the lowest point as the lowest spreading force (LSF). A similar test is performed to determine the pulling force. This is done by measuring the pulling force at 3 uniformly spaced points, ranging from the full open to 95% of the closed position. The value for the highest point is referred to as the highest pulling force (HPF) and the lowest point as the lowest pulling force (LPF). This gives a very precise way to measure these forces and a meaningful way of comparing them.

## Endurance Test

This test is designed to prove the integrity of the deadman control. The tool is subjected to 5000 cycles at no-load. A cycle is defined as the activation of the control for opening and closing the tool and its release, allowing the control to return to the neutral position.

## Overload Test

To ensure user safety and proof of proper design, the ram is put through an overload test. This test is done in the spreading and pulling direction of the tool. To test the spreading direction a load of 150 % of the HSF is applied to the ends of the tool for 1 minute. After that a pulling test is performed. A load of 150% of the HPF is applied for 1 minute. After this test the tool is operated and checked for leaks or other defects.

## Dynamic Endurance Test

This test is designed to prove the integrity and longevity of the tool. In this test the tool undergoes 1000 continuous operation cycles while under a spreading load equal to 80% of the LSF and while under a pulling load equal to 80% of the LPF. After this test the tool is subjected to a load equal to 110% of the HSF in the spreading direction, then a force equal to 110% of the HPF in the pulling direction. At this time the tool is disconnected from the power unit to simulate a sudden power loss. Any creep of the tool will be measured. The control valve will be operated in all three positions (open, neutral and close) for 3 minutes each. If there is over 5 mm of creep the tool fails the test.

## Ram Bend Test

This test is designed to determine how resistant the ram is to bending. An external off-center load equal to 125% of the spreading force measured at 95% of its full extension is applied to the ram while the ram is extended 95% of its stroke. The load is applied at a point not more than 1/2" from the farthest edge of the pushing surfaces and in the same radial plane.

Applying a load this way tests the integrity of the piston rod. After this load is applied the tool is tested to see if it can reach its highest spreading force (HSF) and/or highest pulling force (HPF). If it can still produce these forces, not leak, and show no visible signs of damage; then the ram passes the test.

## Overpressurization Relief Device

According to the NFPA 1936 standard, only tools with an extension area of the activating piston rod assembly that is greater than 1.5 times the retract area of the piston rod assembly, is required to have an overpressurization relief device. In general what this means is that usually only hydraulic rams will need this device. As an added feature all Genesis rescue tools come with an overpressurization relief device built into the control assembly. At American Rescue Technology we believe that this relief device is essential to all rescue tools. This device protects the rescuer against catastrophic failures of the tool and personal injury.

It is a requirement of NFPA 1936 that the manufacturer publish the performance specifications of each tool in accordance with the standard, therefore if you're considering purchasing new rescue tools be sure to request the NFPA performance specifications of each tool. If they cannot supply you this information rest assured those tools are not NFPA compliant. You should require all rescue tool companies to give detailed performance specifications, printed by the manufacturer, that conform to NFPA 1936. If their tools are not compliant ask why. NFPA 1936 was issued to stop companies from providing misleading performance figures, and help departments purchasing rescue equipment to get a high quality rescue system that performs as specified, from the first day it is put into service until the day it is replaced. This standard was written for you, use it and feel assured that you have purchased a high quality rescue tool system.



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