

ASC-TR-95-1006

**QUIC-LIFT™ LADDER ACCESS SYSTEM
PRODUCT EVALUATION REPORT**

AD-A286 854



Aeronautical Systems Center
Weapons, Air Base and Range Product Support Office
ASC/VXO
314 W. Choctawhatchee Ave., Suite 104
Eglin AFB, FL 32542-5717

31 October 1995

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AERONAUTICAL SYSTEMS CENTER

Air Force Material Command ■ United States Air Force ■ Eglin Air Force Base

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FOR THE COMMANDER



WADE H. GRIMM
Program Manager

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13. ABSTRACT (Maximum 200 words) Final report of the commercial technology exploitation evaluation of an electrically powered add on ladderlift system produced by Ziamatic Corporation of Yardley, Pennsylvania. The evaluation was conducted by the 89 Support Group, Fire Protection Division at Andrews AFB, Maryland between 15 Aug 1994 and 9 Aug 1995. This evaluation was part of a continuing program to explore commercial off the shelf technology for application to Air Force firefighting requirements. The system met user requirements and has been recommended for addition to P-22 and P-24 existing inventory vehicles worldwide.				
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DEPARTMENT OF THE AIR FORCE

AERONAUTICAL SYSTEMS CENTER (AFMC)

EGLIN AIR FORCE BASE, FLORIDA

31 Oct 95

MEMORANDUM FOR HQ AFCESA/CEXF

FROM: ASC/VXO
314 Choctawhatchee Ave., Suite 104
Eglin AFB, FL 32542-5717

SUBJECT: QUIC-LIFT™ Ladder Access System Product Evaluation Report
(Ref: Test Plan, July 1994)

1. PURPOSE AND BACKGROUND. The purpose of this test was to assess the effectiveness and suitability of the ZICO QUIC-LIFT™ electrically actuated Ladder Access System manufactured by Ziamatic Corporation. The system tested is a pair of cast aluminum actuators that attach to the side of a first generation A/S32 P-22 structural firefighting vehicle. This unit is a standard option on the second generation P-22s currently being delivered to the Air Force. This evaluation will determine the feasibility of retrofitting the existing fleet of first generation P-22s in world wide firefighting duty. The QUIC-LIFT system is used to lower the side mounted aluminum ladders to a convenient height for safe and easy retrieval. The evaluation was managed by the 89 SG/CEF at Andrews AFB, Maryland between 15 Aug 94 and 9 Aug 95.
2. SYSTEM DESCRIPTION. The ZICO QUIC-LIFT™ System, is mounted on the horizontal surface above the side compartment of an A/S32 P-22 to provide convenient access to the standard side mounted ladders. The system consists of a pair of high-strength aluminum casting assemblies with Warner 12-volt linear actuators. The activation switch is mounted at ground level, where the operator can easily observe the entire operation. The actuators are powered by the vehicle's installed electrical system to raise and lower the ladders.
3. METHOD. New A/S32-P-22 pumper trucks are being delivered with an integrated ladder lift as standard equipment. The evaluation vehicle was an existing inventory first generation version of the P-22 that was modified by Kovatch Mobile Equipment (KME) to retrofit the ZICO QUIC-LIFT™ System for safe and convenient ladder access. The truck was then returned to service for evaluation on a daily basis.

4. OBJECTIVES AND RESULTS. The following objectives were used to assess operational effectiveness, compatibility, durability, stability, and suitability of the ZICO QUIC-LIFT™ system when employed on an A/S32 P-22 pumper truck.

a. Objective E-1. Assess the effectiveness of the ladder access system to provide easy retrieval of the standard aluminum ladders during training and emergency response scenarios. The measure of effectiveness is accessibility of the ladders and other equipment from the side storage compartments. The criteria is not established. **Results:** The ladder lift was used during routine vehicle check-outs, training exercises, and actual fire response situations. In all reported use the operation was smooth and trouble free. When the truck was parked on an incline, the lift allowed lowering to the exact height needed. No problems accessing other equipment in side storage compartments was reported.

b. Objective S-1. Assess the compatibility of the ZICO QUIC-LIFT™ system during installation on and operation of the P-22 under training and emergency response conditions. The measures of effectiveness are: no major vehicle modification to mount the system, and no hampering of normal operations. The criteria is not established. **Results:** The lift system was installed by KME using a diamondplate backing panel, eight bolts for each of the two lift mechanisms, and wiring the activation switch into the vehicle electrical system. The installation is relatively easy and could be accomplished from a kit at base level. The location on the right side of the P-22 will interfere at the lower limits with the auxiliary generator if it is extended as the ladder is lowered

c. Objective S-2. Assess the durability of the ZICO QUIC-LIFT™ to function without failure throughout the ninety day evaluation for a minimum of 100 evolutions. The measure of effectiveness is serviceability of the ZICO QUIC-LIFT™ System. The criterion is that there should be no electrical failures, remote control failures, or binding during system operation. **Results:** The lift mechanism was formally evaluated during a 51 day period where it was evaluated for 45 documented evolutions. After this time, a new vehicle was delivered and the evaluation vehicle was placed in a reserve status, with only occasional use. Over the following year, whenever the vehicle was used as a substitute for primary vehicles down for maintenance, the system has operated flawlessly. Eight fire vehicles at Ft Rucker, Alabama have had ladder lift systems in operation for nearly five years with no repairs or replacement parts required.

d. Objective S-3. Assess the durability of the P-22 structural integrity to support the ZICO QUIC-LIFT™ throughout the ninety day evaluation period. The measure of effectiveness is serviceability of the P-22. The criterion is that there should be no structural damage, loose rivets, cracks, or other indications of metal fatigue. **Results:** Since the evaluation began on 15 Aug 94, no structural fatigue or damage has been noted on the P-22 structure.

e. Objective S-4. Assess the stability of the ZICO QUIC-LIFT™ when employed during training and emergency scenarios. The measure of effectiveness is serviceability and security of the ZICO QUIC-LIFT™ System. The criterion is that the unit should not bend, brake, or loosen at mounting locations during training or emergency operations. **Results:** The installed location of the two lift mechanisms results in more of the ladder weight being lifted by the rear mechanism. This was not a problem, the only result is that the front of the ladder raises quicker than the rear portion.

f. Objective S-5. Assess the reliability, maintainability, and availability (RM&A) of the ZICO QUIC-LIFT™ system. The measure of effectiveness is serviceability of the system. The criterion is not established. **Results:** No maintenance has been required since the system was installed. The durability remarks under objective S-2 also apply to the reliability of the system, excellent.

g. Objective S-6. Assess the installation and maintenance procedures prepared by Kovatch Mobile Equipment (evaluation vehicle modification contractor). The measure of effectiveness is sufficiency of detail in the instructions/diagrams provided. The criterion is that (1) the system can be installed as a local base level modification and (2) the system can be maintained at the base level without additional training. **Results:** The installation was completed at the KME facilities and detailed procedures were not provided. Engineering drawings of the location and equipment have been reviewed. If a field modification kit is prepared, an evaluation of installation by Air Force vehicle maintenance technicians should be accomplished.

5. CONCLUSIONS. The ZICO QUIC-LIFT™ system is a simple installation which is reliable and trouble free. The location on the right side of the P-22 will interfere at the lower limits with the auxiliary generator if it is pulled out as the ladder is lowered. If the rear lift mechanism can be located further aft, it would result in a more even distribution of ladder weight between the two lift mechanisms. Especially in off road scenarios, the ability to lower the ladder allows safe and easy retrieval.

6. RECOMMENDATIONS. An installation kit evaluation should be performed by Air Force vehicle maintenance technicians on a first generation P-22 and P-24 to validate a kit that would then be made available for upgrading the existing inventory of older pumper vehicles.


WADE H. GRIMM
Program Manager

Attachment:

1. Product Illustration.
2. Distribution

1st Inrd to ASC/VXO QJIC LIFT Ladder Access System Product Evaluation Report

HQ AFCESA/CEXF

18 Dec 95

Concur/~~non-concur~~ with the recommendations in this report.


JAMES W. HOTELL
Chief, Fire Protection Division

QUIC-LIFT™ LADDER ACCESS SYSTEM

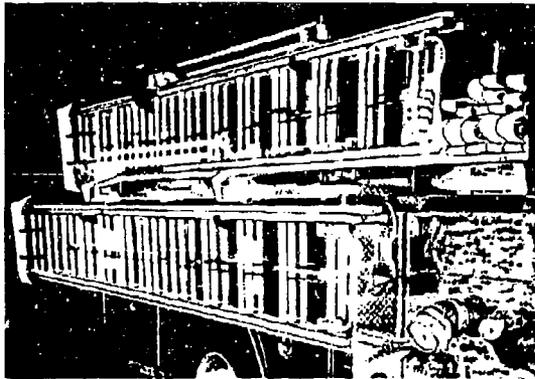
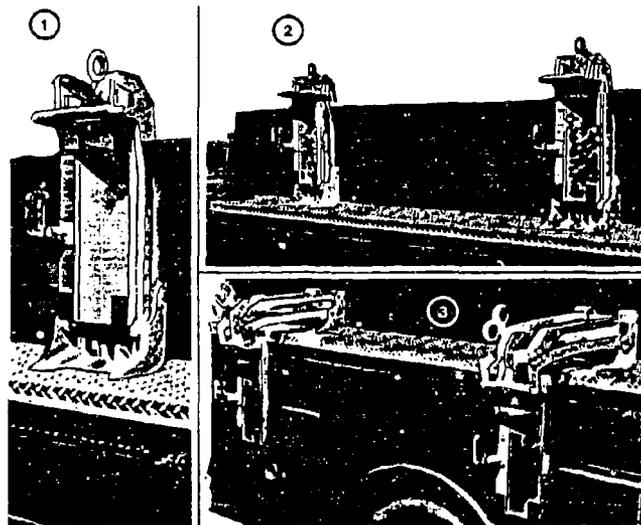
The QUIC-LIFT™ System At-A-Glance

(1) A close up view of one high-strength aluminum casting assembly. Assemblies come in sets of two.

(2) The system in the storage position.

(3) At the flick of a switch, the system lowers the ladder to a comfortable level for retrieval.

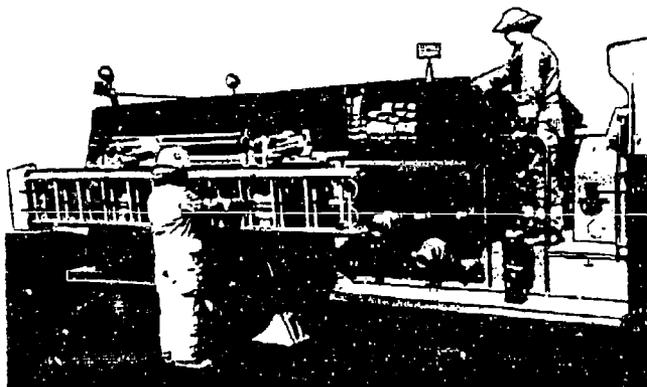
When in the storage position, ladders are out of the way, allowing essential storage space for other equipment.



The QUIC-LIFT™ Ladder Access System is an innovative concept in ladder storage and retrieval. At the flick of a control switch, the QUIC-LIFT™ system lowers any standard aluminum ladder to a convenient height for safe and easy retrieval. It minimizes the chance of back or shoulder injuries, while conserving the firefighter's energy for more critical tasks.

Comprised of two high-strength aluminum casting assemblies with Warner 12-volt linear actuators, the system is easy to install on the horizontal surface above the side compartment. Unlike other devices that extend far out from the apparatus, the QUIC-LIFT™ system remains close to apparatus when lowered.

The QUIC-LIFT™ system lowers ladders to a convenient position for retrieval, self-locking in any position. The switch operator can easily observe the entire operation.



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