

Headquarters 1<sup>st</sup> 204<sup>th</sup> Regiment Armor  
Gowen Field  
Boise, Idaho 83642-8150

27 June 1997

Lou Ashley  
HQ AMC  
Attn: OB  
5001 Eisenhower Av.  
Alexandria, VA 22333-0001

Dear Mr. Ashley;

This statement is being made to provide verification of the testing of the True Lock retention system that was designed to solve the problem with loose wedge bolts on the M1-A1 T158 track. Two issues need to be made clear. First, there is a very real problem with wedge bolts coming loose on the T158 track and second, the True Lock system works. It keeps the wedge bolts tight and the end connectors secure.

#### Background

I have been associated with armor since 1969, involved in training since 1985, and been an Armor Qualified Training Instructor (19K40H) at the Gowen Field Training Center since 1990. I have taught the Military Occupational Specialty Qualification Course (MOSQ), Tank Commanders Course (TCC), and the Basic Non-commissioned Officers Course (BNOC) to all of the joint services in armor. I instruct in vehicle systems, driving, weapons, and maintenance. I am an end user in the truest sense of the word and I spend a large amount of time on the range in a tank. I walk track at the end of each and every class inspecting wedge bolts and end connectors.

#### Testing

The True Lock system was placed on a new set of T-158 track that was being installed on the tank that I instruct on, TC-30, on 26 May 1994. The track was installed according to specifications and the wedge bolts were tightened to 400 lbs. torque. The hardware of the True Lock system was then installed on every other wedge bolt of both tracks, on the inner and outer end connectors for a total of 160 systems. Although it took longer to install the track and then install the True Lock components, this additional time was not significant and would be eliminated if new track had the system preinstalled.

On 20 July 1994 the vehicle returned from the field and a visual inspection revealed that approximately 80% of the retaining plates of the True Lock system on the left side were either fractured or missing all together. None of the retainers on the right side of the vehicle were missing or damaged, and none of the snap rings on either side were missing. The wedge bolts on those end connectors that were missing retainers were found to be tighter than those bolts that never had the system installed. Further inspection revealed excessive wear on the left rear sprocket. New retainers made out of a stronger material (1074 spring steel versus 1018 cold rolled steel) were replaced on the left side and none of these retainers failed. None of the original retainers on the right side failed. None of the snap rings were ever lost or replaced, although the tips were often banged up or broken, but were still in good working order.

The track remained on tank TC-30 until it was replaced on 7 March 1997. The vehicle accumulated over 2,500 miles with the track installed, probably closer to 3,200 miles, but an exact figure is unavailable. The track was not completely worn when it was removed, but still had at least a couple hundred miles left on it. This 33 months of hard use clearly points out to me the advantages of the True Lock retaining system. I didn't loose any end connectors or have to retighten any wedge bolts in nearly 3 years with the True Lock system.

The Gowen Multipurpose Complex Range Heavy (MPCRH) is located in an area of high, mountain desert. The driving course is approximately 7 miles, with numerous turns and steep grades. The training area is demanding on the students and the vehicles, especially the track.

## Results

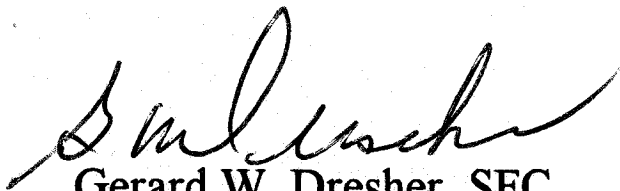
The benefits of the True Lock system were apparent from the very beginning. The wedge bolts with the system installed stayed tight while the bolts without it did not. It should be noted that the test was conducted on T-158 track, not T-156. The improvements made on the T-158 to keep the wedge bolts from coming loose are not as effective as the TACOM engineers would have you believe. .

Inspecting the track is considerably easier in that a visual inspection is made to see that the system components are still in place. The system actively prevents the bolt from loosening. Without the system a visual inspection only reveals if the bolt is still in place. The tightness of each bolt can only be determined using a torque wrench. Ironically, each bolt must be tightened to determine how tight it is. A thorough check of each and every wedge bolt on the vehicle is a very long and arduous process. While other instructors inspected their track by tightening and even replacing wedge bolts, I spent far less time even with the True Lock system on only half of the end connectors.

Another benefit of the True Lock system is improved wear on the end connectors. Inspection of the track revealed that the end connectors with the system had no wear on the inner part of the end connector and an even wear pattern on the outer areas. The end connectors without the system had noticeable wear on the inner part and uneven wear showing on the outer areas.

### Conclusion

The True Lock system is simple, straight forward, and effective. It greatly reduces the man-hours required to inspect the track and perform maintenance on it. The reliability of the track and the vehicle are improved and will improve safety and combat reliability.



Gerard W. Drescher, SFC

Armor Instructor

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