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AD829986

SERVICE TEST

OF

PRODUCT IMPROVED COMPONENTS FOR SHERIDAN WEAPON SYSTEM (CLOSED BREECH SCAVENGER SYSTEM)

FIRST PARTIAL REPORT

BY

CAPTAIN VADEN K. WATSON

AND

SP4 TRUMAN E. SICKS
SCIENTIFIC AND ENGINEERING

26 MARCH 1968

DDC

US ARMY
ARMOR & ENGINEER BOARD
FORT KNOX, KENTUCKY

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DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND 21005

AMSTE-BB-S

3 APR 1968

SUBJECT: First Partial Report, Service Test of Product Improved Components for Sheridan Weapon System (Closed Breech Scavenger), USATECOM Project No. 1-4-2528-33

Project Manager, SHERIDAN
U.S Army Materiel Command
ATTN: AMCPM-SH
Rock Island Arsenal
Rock Island, Illinois 61202

1. The subject report covers a limited, expedited test which was conducted primarily for the purpose of evaluating the air compressor.

2. The report is approved and forwarded for information. Final analysis on suitability of the closed breech scavenger system will be made upon completion of the service, engineering and tropic tests.

FOR THE COMMANDER:

1 Incl
as (2 cys)

JOHN P. WHEELER, JR.
Colonel, GS
Dir, Arm Mat Test Dir

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DEPARTMENT OF THE ARMY CPT Watson/726-3300/4-4449
UNITED STATES ARMY ARMOR AND ENGINEER BOARD
Fort Knox, Kentucky 40121

26 MAR 1968

STEBB-AR-C

SUBJECT: First Partial Report of Service Test of Product Improved Components for Sheridan Weapon System (Closed Breech Scavenger System), USATECOM Project No 1-4-2528-33

TO: Commanding General
US Army Test and Evaluation Command
ATTN: AMSTE-BB-S
Aberdeen Proving Ground, Maryland 21005

1. REFERENCES

a. Msg, TEC 1276, AMSTE-BB-S, HQ USATECOM, 27 Feb 68, subject: Prefactory Evaluation of Air Compressor for M551 Scavenger System, USATECOM Project No 1-4-2528-33.

b. Ltr, AMSTE-BB-S, HQ USATECOM, 5 Mar 68, subject: Test Directive, Service Test of Product Improved Components for Sheridan Weapon System, USATECOM Project No. 1-4-2528-33, w 4 incl.

2. RESPONSIBILITIES. The Armor Division, US Army Armor and Engineer Board, Fort Knox, Kentucky, was responsible for preparing the test outline, test execution, and preparing the test report.

3. BACKGROUND. The Sheridan Weapon System has had continuing problems with the removal of residual propellant gas and residue resulting from the combustible cartridge case. Inadequate removal of the propellant gas results in high carbon monoxide concentration in the turret, an explosive gaseous mixture which upon ignition becomes a flareback, and smoke in the crew compartment. Residue from combustible cartridge case ammunition presents a safety hazard which may result in the ignition of the case of a subsequently loaded round. To alleviate these problems, an open breech CO_2 bore scavenger was developed. This type scavenger reduced the magnitude of the toxic gas concentration and flarebacks from conventional ammunition firing, but did not function for missile firing, nor at cold temperatures, and did not remove adequately hazardous cartridge case residue.

Subsequently, the Sheridan Project Manager has developed a scavenging system that introduces compressed air into the weapon prior to block opening. Engineer design tests of this Closed Breech Scavenger have been conducted and the engineering test is currently in progress at Aberdeen Proving Ground.

4. DESCRIPTION OF MATERIEL

a. The test item is a 4-stage air compressor, 4 cubic feet/minute, 3 HP electric motor with a cooling fan, and air drier. The compressed air reservoir is a 1,430-cubic inch cylinder at 3,200 PSIG. The low pressure outlet is 780 PSIG (STATIC) and 630 PSIG when purging. A solenoid valve opens for 1.7 seconds after firing, allowing an average of 12 cubic feet of compressed air into the tube to scavenge the tube and breech or aft cap of the missile.

b. The compressor automatically starts when the cylinder pressure drops below 2,800 PSIG and stops when it builds up to 3,200 PSIG. The scavenger will operate in the missile mode but the compressor is prevented from operating by design because the 150 ampere electrical drain of the compressor could recycle the missile.

5. TEST OBJECTIVES

a. To assess the capability of the compressor to withstand the vehicle environment.

b. To determine if the compressor, the remainder of the scavenger system, and the restowage of turret is compatible with crew functions.

c. To determine time required to recharge the compressed air bottle, and to assess the bottle capacity and compressor recharge rate with regard to its adequacy for firing missions.

d. To describe any residue not cleaned by the scavenger.

6. SUMMARY OF RESULTS. Testing of the Closed Breech Scavenger System was conducted by the Combat Vehicle Branch of the Armor Division of the US Army Armor and Engineer Board from 7 March until 16 March at Fort Knox, Kentucky, in accordance with the test directive (ref 1a and b). Results are based on operation of the compressor for 50 hours and the firing of 58 rounds. The system was subjected to vehicle operation over highway, secondary roads, and cross country for a total of 496 miles.

a. Preoperational Inspection and Physical Characteristics. The test item was subjected to a preoperational inspection and all electrical modifications examined. The compressor is approximately 22.5 inches long, 10 inches wide, 14 inches high, and weighs 50 pounds. (See incl 1.) The air reservoir cylinder is 29 inches high and 12 inches in diameter, and weighs 62 pounds.

b. Installation and Compatibility with Related Equipment.

(1) A modified shallow key gun/launcher tube was installed. The modified gun tube, without a bore evacuator, (incl 1) had a 1/4-inch hole drilled at the 7 o'clock position slanted to the rear of the breech. Modifications inside the turret required relocation of one ammunition rack, machine gun spare parts kit, asbestos mittens, fire extinguisher and M37 loader's periscope within the turret and relocation of one box of 7.62mm ammunition to the outside of the turret, and a reduction in the size of the oddment box under the loader's seat. (See incl 2 and 3 for compressor installed in vehicle and relocation of ammunition racks.) These modifications and the installation of the scavenger system required 88 man-hours. Removal of the standard gun-launcher tube and installation of the modified tube required 24 man-hours.

(2) The test system was found to be compatible with the vehicle and crew with the following exceptions.

(a) Manual purge valve. Located too far forward for convenient operation. (See para 2.1, incl 8, and photograph at incl 4.)

(b) Main compressor switch. Is so located that it can be turned on and off by the loader accidentally bumping the switch with his shoulder. (See para 2.2, incl 8, and photograph at incl 5.)

(c) Pressure gauge size and location. Both high and low pressure gauges are difficult to read because of the small scale and the high pressure gauge does not face the loader when he is in the loading position. (See para 2.3, incl 8.) Also, the high pressure gauge is red-lined at 600 PSIG when the recommended minimum pressure level is 1,000 PSIG.

(3) The test system had no effect on the communication capabilities of the vehicle with or without the compressor running.

c. Functioning Characteristics.

(1) Time recovery and pressure drop tests were conducted on the test system. (See incl 9 and 10 for pressure drops and recover times.) At the rate of fire of one round per minute, the system has a self-recovery characteristic. Due to the change in temperature, the system tends to return to ambient following the rapid drop induced by the pressure loss of each purge. This average recovery of 100 to 200 PSIG requires approximately 40 to 50 seconds. At the higher rates of fire, this recovery pressure is lost. This loss plus the shorter operating time of the compressor results in reaching the minimum purging pressure after fewer rounds. Firing at one round per minute, with the compressor operating, 10 or possibly 11 rounds can be fired before minimal purging pressure is reached. At this time, 3- to 4-minute buildup is necessary for each additional round. Ten rounds can be fired from the bottle without the compressor operating although the purging pressure of the last round will be marginal.

(2) The average time to recharge the bottle to full capacity from 0 PSIG is 45 minutes, from 1,000 PSIG is 30.5 minutes and from 2,000 PSIG is 12.2 minutes. The average time required to replenish the turret ammunition racks from hull stowage is 3.5 minutes. This time included traversing the turret, posting the loader and gunner outside the vehicle for security, transferring 10 rounds and locking them in racks, and then traversing back to a ready position. This reloading time will allow a buildup in pressure for one additional round.

(3) Tests on battery rundown times were conducted by operating the compressor, with master switch on, communication equipment on, and the vehicle engine off. After an average of 22 minutes, the compressor would begin to operate erratically and the instrument lights dim. At this time if the compressor was turned off the engine could still be started using the vehicle batteries.

(4) A total of 58 live rounds was fired with the test system in operation. Two rounds were not fired because of one misfire and one round being damaged when the breech closed. This damage was the result of improper loading or possibly a long round. No problems were encountered when 10 rounds were fired with a full bottle and the compressor off.

(a) Throughout the test, no burning residue was experienced. However, nonburning residue to some extent was evident in the breech cavity after each round was fired. After two or three

rounds had been fired, the residue accumulation was such that it could be scraped out of the breech cavity. (See incl 6.) Additional rounds did not increase this accumulation or did it ever completely burn itself off. This residue accumulation was found primarily at the base of the cylinder wall of the breech cavity in a 1/2-inch strip.

(b) A second type of residue was sometimes evident. This appeared as a thin film of molten residue sprayed around the walls of the gun chamber. Once during the test, when one round was fired, this molten residue was sprayed onto the gun tubes recess between 7 and 10 o'clock approximately 5 inches forward. (See incl 6.)

(c) On only one other occasion was there any residue observed in the gun tube itself and that was a small flake at 3 o'clock, 14 inches forward.

(5) An inspection of the system midway through the test revealed an appreciable amount of water in the bottle, hoses, and telescoping adapter. (See para 1.3, incl 8.) Also bubbles were found in one of the air hoses. (See para 1.2, incl 8.) The system was then dried out and the hose replaced. Two days later when the vehicle began operation at 0530 hours, the system was actuated 10 times to accumulate compressor operating time. After the bottle had been recharged, it was actuated once and approximately half the bottle was released before it automatically closed. Another attempt resulted in the expenditure of the rest of the bottle. The Fort Knox weather station gave the temperatures for that morning as: 26°F at 0530, 30°F at 0930, and 33°F at 1030. The system was recharged and 7 rounds fired at the range with no difficulties encountered. At 1000 hours, immediately after firing, the system was purged 10 times and it again emptied the bottle to 0 PSIG and air continued to escape from the tube. At this time, all of the fittings of the system had a heavy coating of frost and the compressor could only be stopped by turning off the master switch. Erratic action of the solenoid valve under these conditions suggests that moisture in the line may have frozen and thus impaired normal functioning.

d. Reliability

(1) A total of 496 miles of facility vehicle operation was accumulated on the test system. Most of the mileage was cross-country operation (350 miles). The remaining mileage was 93 miles on secondary roads and 53 miles on highway.

(2) During cross-country operation, a series of combat situations involving firing of the gun-launcher were simulated for simulated firing data. (See incl 11.)

(3) Three of the exercises were run using a total of 14 rounds of live ammunition. These exercises were conducted to accumulate realistic hours on the compressor.

(4) Five rounds of live ammunition were carried on the vehicle throughout all cross-country operation. These were the last rounds to be fired and no problems were encountered.

(5) After 40.1 hours of operation, the compressor continued to operate after the main compressor switch had been turned off. Investigation by the compressor manufacturer's technical representative revealed that a set of contact points in a relay had fuzed together making a closed circuit. (See para 1.1, incl 8, and photograph at incl 7.) Since this relay was a part of the compressor it was considered a compressor failure. The relay was replaced and the test continued. A total of 50 hours was accumulated on the compressor during the test.

e. Human Factors Engineering

(1) Noise level readings were taken inside the turret with and without the compressor operating. This noise level evaluation was conducted by the Experimental Psychology Division, US Army Medical Research Laboratory at Fort Knox, Kentucky. (See incl 12.) Their results showed that a danger to personnel would only exist during prolonged continuous operation with both the vehicle and compressor running.

(2) The heat generated by the compressor is rated by the manufacturer as 230 BTU per minute Heat dissipation presented no problems under the conditions of this testing although it may become critical during hot-weather operations.

(3) During the test, two rounds were fired without the benefit of any scavenging operation. After this firing, the crew reported that there was a high concentration of fumes inside the turret. The absence of the bore evacuator understandably would cause a higher concentration of gaseous fumes than is normally experienced in a vehicle which incorporates a bore evacuator.

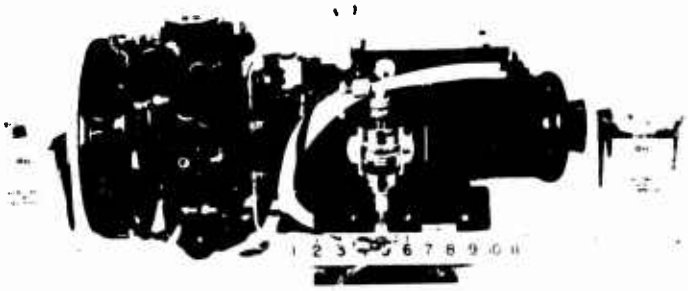
7. CONCLUSIONS. The US Army Armor and Engineer Board concludes that duration of the test was insufficient to determine suitability.

STEBB-AR-C
SUBJECT: First Partial Report of Service Test of Product Improved Components for Sheridan Weapon System (Closed Breech Scavenger System), USATECOM Project No 1-4-2528-33

8. RECOMMENDATIONS. The US Army Armor and Engineer Board recommends that additional testing be conducted on a system modified to correct all deficiencies and as many shortcomings as feasible noted at inclosure 8.

MARSHALL WALLACH
Colonel, Armor
President

13 Incl
1-7. Photographs
8. Deficiencies and Shortcomings
9-10. Pressure Drops and Recovery Time Data
11. Simulated Firing Data
12. US Army Medical Research Laboratory Report
13. Distribution List



US ARMY ARMOR AND ENGINEER BOARD	**USATECOM PROJ NO** 1-4-2528-33
FORT KNOX, KY	**PHOTO NO** 68-141 AND 68-176

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

UPPER: COMPRESSOR

LOWER: LEFT GUN TUBE WITH BORE EVACUATOR (M81)

RIGHT GUN TUBE WITHOUT BORE EVACUATOR THAT WAS INSTALLED FOR CBS TEST (M81E1)

INCL 1

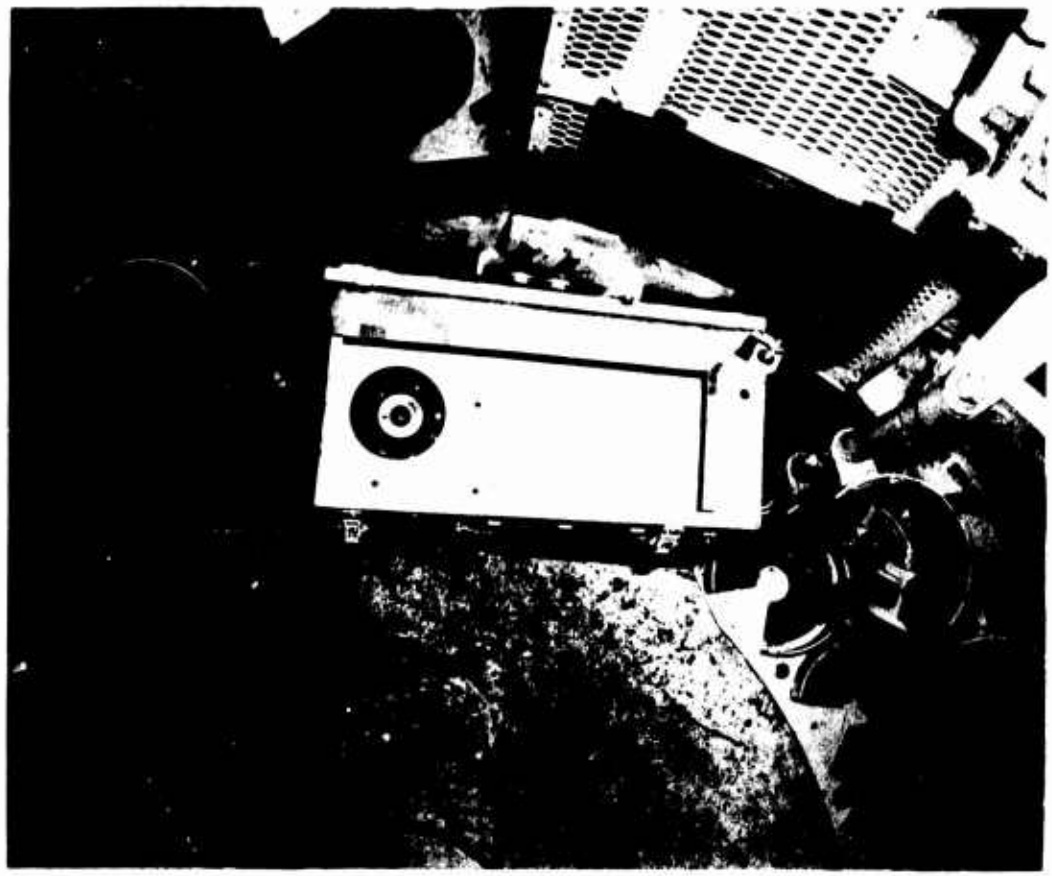
US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY	USATECOM PROJ NO 1-4-2528-33 PHOTO NO 68-177 AND 68-184

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

UPPER: COMPRESSOR INSTALLED IN VEHICLE WITH WIRE GUARD.

LOWER: VIEW FROM DRIVER'S COMPARTMENT OF COMPRESSOR AND TWO AMMUNITION RACKS.

INCL 2



US ARMY ARMOR AND ENGINEER BOARD	**USATECOM PROJ NO** 1-4-2528-33
FORT KNOX, KY	**PHOTO NO** 68-186

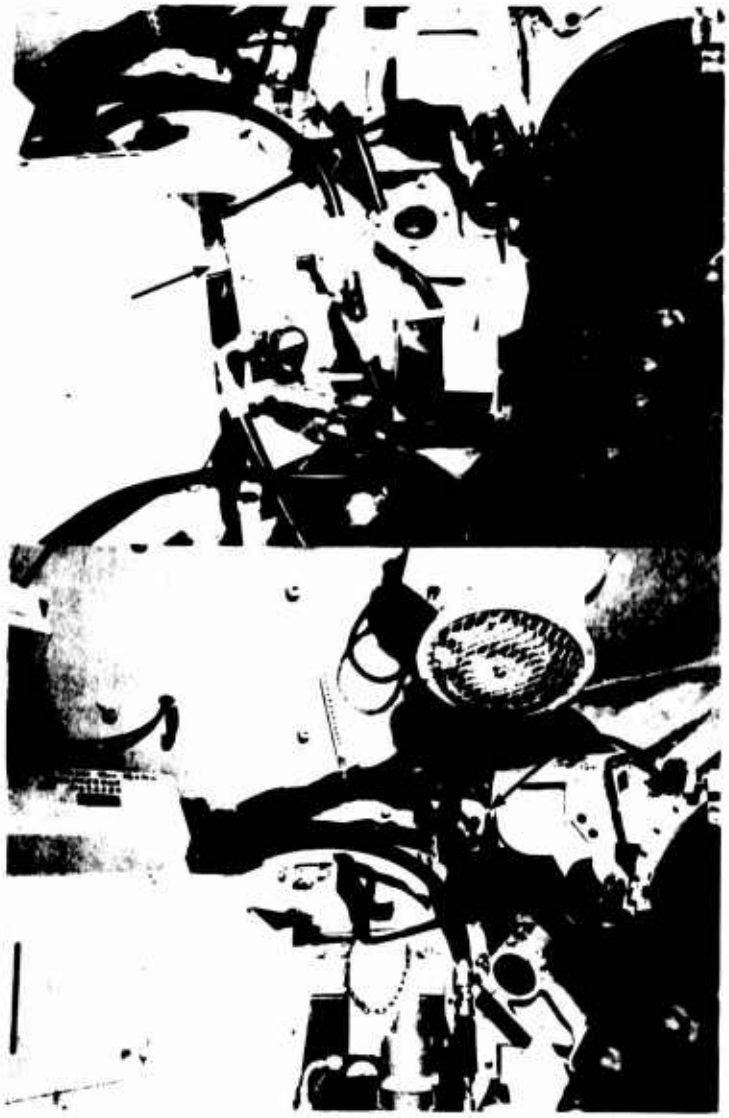
CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

VIEW FROM LOADER'S HATCH SHOWING COMPRESSOR INSTALLED UNDER ODDMENT BOX. THE LOADER'S SEAT AND TRAY COVER ARE IN UP POSITION AND COMPRESSOR AIR FILTER ACCESS PLATE REMOVED.

RIGHT SIDE (3 RACKS): THE COMPRESSOR INTAKE SIDE.

LEFT SIDE (2 RACKS): THE COMPRESSOR EXHAUST SIDE.

INCL 3



US ARMY ARMOR AND ENGINEER BOARD	**USATECOM PROJ NO** 1-4-2528-33
FORT KNOX, KY	**PHOTO NO** 68-172 AND 68-170

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

(COAXIAL MACHINE GUN NOT MOUNTED)

UPPER: SYSTEM INSTALLED WITH LOW AND HIGH PRESSURE GAUGES, QUICK DISCONNECT CHAIN, AND TELESCOPING ADAPTOR INTO GUN TUBE.

LOWER: ARROW INDICATES MANUAL PURGE VALVE HANDLE.

INCL 4

US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY	USATECOM PROJ NO 1-4-2528-33 PHOTO NO 68-171 AND 68-182

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

UPPER: MAIN COMPRESSOR SWITCH.

LOWER: COMPRESSED AIR CYLINDER INSTALLED.

INCL 5

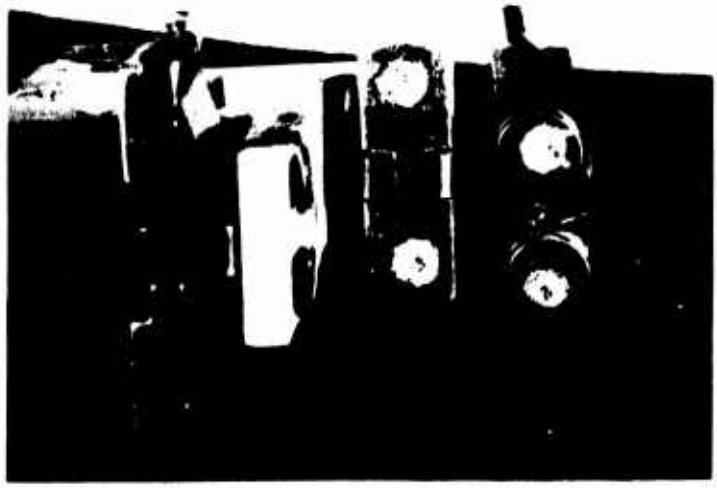
US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY	USATECOM PROJ NO 1-4-2528-33 PHOTO NO 68-191 AND 68-188A

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

UPPER: RESIDUE REMOVED FROM BREECH CAVITY AFTER FIRING THREE ROUNDS.

LOWER: ARROW INDICATES MOLTEN RESIDUESPRAYED ON WALL OF GUN TUBE AFTER ONE ROUND.

INCL 6



US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY	USATECOM PROJ NO 1-4-2528-33 PHOTO NO 68-207 AND 68-201

CLOSED BREECH SCAVENGER SYSTEM
FOR SHERIDAN WEAPONS SYSTEM

UPPER: CONTACT POINTS THAT HAD FUSED TOGETHER IN COMPRESSOR RELAY

LOWER: ARROW INDICATES BURST BUBBLE IN AIR HOSE

INCL 7

DEFICIENCIES AND SHORTCOMINGS

Equipment Performance Reports were not submitted to cover the system failures and other limitations noted.

1. DEFICIENCIES

	Deficiency	Suggested Corrective Action	Remarks
1.1	The compressor relay contact points fuzed together.	None	See para 6d(5).
1.2	Bubbles formed in the covering of a high pressure hose.	None	See para 6c(5).
1.3	Water was found in the system.	None	See para 6c(5).

2. SHORTCOMINGS

	Shortcoming	Suggested Corrective Action	Remarks
2.1	Manual purge valve is so located that it is not easily accessible.	None	See para 6b(2)(a).
2.2	Main compressor switch could be turned off accidentally.	None	See para 6b(2)(b).
2.3	Considerable difficulty in reading pressure gauges.	None	See para 6b(2)(c).

Incl 9

PRESSURE DROPS AND RECOVERY TIME
(Continuous Purging with Compressor Running)

Initial Cylinder Pressure 3050 PSIG.

Initial Regulator Pressure 760 PSIG.

	1 Rd/Min		2 Rd/Min		3 Rd/Min		4 Rd/Min	
Rounds	Pressure Drop (PSIG)	Self Recovery Pressure (PSIG)	Pressure Drop (PSIG)	Self Recovery Pressure (PSIG)	Pressure Drop (PSIG)	Self Recovery Pressure (PSIG)	Pressure Drop (PSIG)	Self Recovery Pressure (PSIG)
1	2600	2750	2600	0	2600	0	2600	0
2	2350	2500	2250	0	2100	0	2200	0
3	2100	2300	2050	0	2000	0	1950	0
4	1950	2100	1850	0	1750	0	1750	0
5	1700	1900	1600	0	1500	0	1500	0
6	1550	1750	1400	0	1350	0	1300	0
7	1400	1550	1200	0	1100	0	1100	0
8	1200	1350	1000	0	950	0	900	0
9	1050	1200	850	0	800	0	700	0
10	900	1000	700	0	650	0	600	0
11	700	850						

PRESSURE DROPS AND RECOVERY TIME
(With Compressor Running)

Initial Cylinder Pressure 3050 PSIG

Initial Regulator Pressure 760 PSIG (STATIC)

TWO ROUNDS PER MINUTE

Rounds	Pressure Drop (PSIG)	Recovery Time (Min)	Cut Off Pressure (PSIG)
1	2600	4.75	3050
2	2250	9.05	3050
3	2050	12.25	3050
4	1850	16.95	3050
5	1600	19.50	3050
6	1400	22.95	3050
7	1200	26.75	3050
8	1000	30.25	3050
9	850	33.95	3050
10	700	37.25	3050

FOUR ROUNDS PER MINUTE

Rounds	Pressure Drop (PSIG)	Recovery Time (Min)	Cut Off Pressure (PSIG)
1	2600	4.95	3050
2	2200	8.95	3050
3	1950	12.50	3050
4	1750	16.66	3050
5	1500	19.55	3050
6	1300	23.50	3050
7	1100	27.50	3050
8	900	32.25	3050
9	700	35.75	3050
10	600	39.50	3050

Incl 11

SIMULATED TACTICAL FIRING EXERCISE

A. Run 15 Min - Engage 1 Target with 3 Actuations; Run

B. Run 5 Min - Engage 2 Targets with 4 Actuations; Run 15 Min - Engage 1 Target with 2 Actuations; Run

C. Run 10 Min - Engage 2 Targets with 5 Actuations; Run 15 Min - Engage 1 Target with 4 Actuations; Run

D. Run 10 Min - Engage 3 Targets with 7 Actuations; Run 20 Min - Engage 1 Target with 2 Actuations; Run

E. Run 15 Min - Engage 1 Target with 3 Actuations; Run

F. Run 5 Min - Engage 3 Targets with 8 Actuations; Run 25 Min - Engage 1 Target with 4 Actuations; Run

G. Run 10 Min - Engage 3 Targets with 9 Actuations; Run 15 Min - Engage 1 Target with 2 Actuations; Run

H. Run 5 Min - Engage 4 Targets with 10 Actuations; Run

I. Engage 2 Targets with 6 Actuations; Run 15 Min - Engage 1 Target with 4 Actuations; Run

J. Run 15 Min - Engage 2 Targets with 8 Actuations; Run 10 Min - Engage 1 Target with 3 Actuations; Run

NOTE: At the completion of the last actuation in each exercise the vehicle continues operation for the remainder of the hour.

LETTER REPORT NO. 16

NOISE EVALUATION OF M-551 RECONNAISSANCE VEHICLE AND ASSOCIATED EQUIPMENT

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Otto J. Dilly
Michel Loeb, Ph. D.

Experimental Psychology Division
US ARMY MEDICAL RESEARCH LABORATORY
Fort Knox, Kentucky 40121

March 1968

Traumatic Origins of Hearing Loss
Work Unit No. 017
Army Aviation Medicine
Task No. 00
Army Aviation Medicine
DA Project No. 3A025601A819

Incl 12

NOISE EVALUATION OF M-551 RECONNAISSANCE VEHICLE AND ASSOCIATED EQUIPMENT

In response to a request by the U. S. Army Armor and Engineer Board, Ft. Knox, Ky., an evaluation of the noise characteristics of the M-551 Reconnaissance Vehicle and associated equipment was made. The noise produced by the vehicle while stationary was recorded on a 1525-A General Radio data recorder, employing a Type 1551-P1-25 microphone. These data were later analyzed in the laboratory on a 1558-AP General Radio octave band analyzer. (It was also played into a Brüel and Kjäer 1/3 octave band analyzer to determine whether any narrow band components were present. None were found.)

Readings were taken at four operating positions with the motor running and with the air compressor (Walter Kidde and Company) for the gun scavenging system both on and off. Overall levels and octave band levels are given in Table 1.

Insert Table 1 about here

DISCUSSION

Note that with the compressor off and the vehicle stationary, the octave band levels do not exceed 90 dB. Referred to the advisory standards for noise exposure, the obtained levels are slightly below these considered

hazardous (TB MED 251), with no ear protection. It does not follow, however, that hazardous noise will be absent with the vehicle moving; past experience with tracked vehicles suggests that the opposite may be true.

With the compressor on, the noise levels without ear protection must be considered excessive for the octave bands, centered at 125, 250, 500, 1,000, 2,000, and 4,000 Hz. The approximate protection afforded by the CVC helmet would be 5, 7, 7, 10, 17, and 25 dB (according to a U. S. Army QM Lab Rept. No. EP-181). If the helmet is worn, the exposure at 500 Hz would still be potentially hazardous at all four operating positions, and at 1 KHz it would be, at least marginally hazardous for three of the four positions. At 250 Hz the loader's exposure would also be considered hazardous.

If the compressor were run only briefly after each firing, however, the possibility of hazard would be minimized considerably, probably to the vanishing point.

RECOMMENDATIONS

1. There would appear to be no hazard to hearing when the vehicle is stationary with the engine running, and the compressor is <u>off.</u>

2. If the compressor is run continuously, acceptable ear protection (as described in TB MED 251) should be worn.

3. No assessment of hazard to hearing in the moving vehicle has been made.

REFERENCES

1. TB MED 251. Noise and Conservation of Hearing. HQ, DA, Washington, D. C., 1965.

2. Cohen, A. US Army QM Lab Rept. No. EP-151, Natick, Mass., 1961 (Now Pioneer Lab).

Table 1. Overall (OA) and Octave Band (OB) Levels at Different Operating Positions

		Compressor Off				Compressor On			
		Operating Position				Operating Position			
		Loader	Gunner	Tank Cmdr	Driver	Loader	Gunner	Tank Cmdr	Driver
	OA	93	93	91	42	107	102	99	100
	31.5 Hz	87	89	85	88	94	92	88	97
	63	86	87	79	83	98	88	95	88
	125	89	88	87	87	93	91	92	[illegible]
OB Cntr Freq	250	78	78	81	80	98	96	91	89
	500	81	81	78	80	103	96	94	98
	1,000	80	80	76	80	103	96	93	95
	2,000	72	73	70	70	93	90	88	89
	4,000	61	60	58	57	92	87	88	89
	8,000	49	50	46	44	88	85	82	80
	16,000	42	42	40	37	77	74	70	67

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First Partial Report

5. AUTHOR(S) *(Last name, first name, initial)*
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13. ABSTRACT

Test of Product Improved Components for Sheridan Weapons System (Closed Breech Scavenger System) was conducted by US Army Armor and Engineer Board (USAARENBD) at Fort Knox from 7-16 March 1968. Test objectives were: to assess the capability of the compressor to withstand the vehicle environment; to determine if the compressor, the remainder of the scavenger system, and the restowage of the turret is compatible with crew functions; to determine time required to recharge the compressed air bottle, and to assess the bottle capacity and compressor recharge rate with regard to its adequacy for firing missions, and to describe any residue not cleaned by the scavenger. Results are based on operation of the compressor for 50 hours, firing of 58 rounds, and movement over paved and unpaved roads and cross country for 496 miles. Restowage of the turret components was in general compatible with crew functions. Time required to recharge the air bottle from minimum firing pressure of 1,000 psi to maximum pressure was 31 minutes. No burning residue experienced in firing 58 rounds. Nonburning residue was evident in breech cavity after each round. Reliability deficiencies include hose failure, compressor contact point failure, water in system. USAARENBD concluded duration of test was insufficient to determine suitability. USAARENBD recommended additional testing be conducted on a system modified to correct all deficiencies and as many shortcomings as feasible.

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