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REPORT OF GOVERNMENT OPERATIONAL VERIFICATION TEST ON A/S32P-15--ETC(U)
JAN 77 B T PEASE, B L KUYKENDALL, M C CREECH

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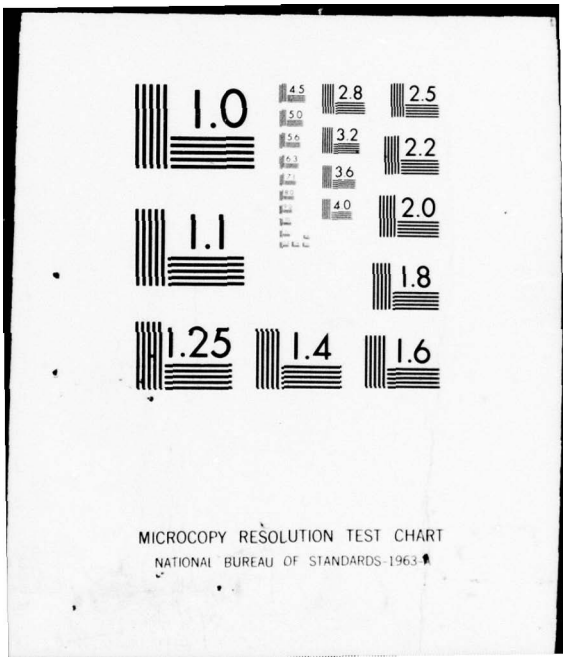
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AFCEC-TR-78-3

REPORT OF GOVERNMENTAL OPERATIONAL VERIFICATION TEST ON A/S 32 P-15 FIRE FIGHTING TRUCK

DIRECTORATE OF FIRE PROTECTION

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FEBRUARY 1978

Final Report: October 1977 - December 1977

Approved for Public Release; Distribution Unlimited.

AIR FORCE CIVIL ENGINEERING CENTER
(AIR FORCE ENGINEERING AND SERVICES AGENCY)
TYNDALL AIR FORCE BASE
FLORIDA 32403

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REPORT DOCUMENTATION PAGE

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7. AUTHOR(s): Major Birney T. Pease, SMS Bobby L. Kuykendall, MSgt Monta C. Creech, 305 CES/Grissom AFB, IN	8. CONTRACT OR GRANT NUMBER(s)
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Firefighting
Crash rescue
Crash firefighting
Fire truck
Crash fire rescue

→ A fifteen man test cadre conducted a government operational verification test on two fire trucks.

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The government operational verification test program was conducted from 13 Oct 77 to 19 Dec 77 at Tyndall AFB, FL, using two A/S32P-15 fire trucks furnished by OSHKOSH Truck Corporation. A fifteen man test cadre conducted the test with technical assistance provided by the same contractor. Thirteen tasks, including qualification tests, were performed to evaluate vehicle handling qualities, firefighting system performance, crew comfort provisions, vehicle reliability and maintainability. Vehicle employment concepts in conjunction with other firefighting apparatus were also evaluated. The A/S32-P15 provides

Block 20 (Cont) CONT. good fire suppression capability for aircraft type fires when using the drive-around firefighting procedures with or without other fire vehicles. A number of malfunctions occurred during the test program; however, only one of those encountered would have prevented the vehicle from responding and applying at least 1200 gallons per minute of agent on the fire. Component part reliability must be improved before the vehicle enters the Air Force inventory.

PREFACE

This report documents work performed during government operational verification testing of the A/S32P-15 Large Capacity Fire Truck during the period 13 Oct 77 to 19 Dec 77 at Tyndall AFB, Florida. Major Birney T. Pease, AFCEC/DOZ, managed the program for the Center. Senior Master Sergeant Bobby L. Kuykendall, AFCEC/DOZ, and Master Sergeant Monta C. Creech, 305 CES Grissom AFB IN, were the principal test conductors.

This report has been reviewed by the Information Office (AFCEC/OI) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nationals.

This technical report has been reviewed and is approved for publication.

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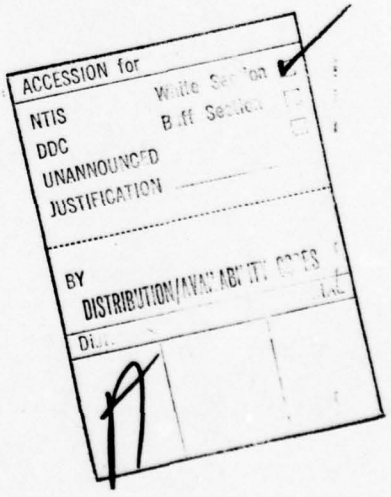

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1 REASON FOR TEST: The test was performed to ascertain the operational capability of the vehicle, and to refine the concept of operational employment.

2 DESCRIPTION OF VEHICLE:

2.1 Description of Test Vehicle.

2.1.1 The A/S32P-15 is a diesel powered, air transportable, all weather firefighting truck weighting approximately 130,000 (59 metric tons) pounds fully loaded, and capable of controlling large frame aircraft fires. The vehicle has a forward located closed cab and uses an 8X8 chassis. It is designed to operate over a wide range of surfaces, varying from paved roads to crosscountry terrain, including the ability to traverse poorly cultivated, medium fine sand.

2.1.2 The curb weight of the vehicle contract specifications required not to exceed a single axle load of 36,000 (16 metric tons) pounds and any tandem axle load of 25,000 (11 metric tons) pounds per axle when in the air transportable configuration.

2.1.3 The P-15 truck purchase specifications are:

Length - 542 inches (1376.68 CM)

Width - 120 inches (304.8 CM)

Height - 165 inches (419.1 CM) maximum at curb weight, reducible to 144 (365.76 CM) inches for air transport in C-5 aircraft.

Wheel Base - 304 inches (772.16 CM)

Ground Clearance - 15 inches (38.1 CM) under axle and 26 inches (66.04 CM) under midbody.

2.1.4 The truck will operate at up to 10 mph (16.09 KPH) on dry, level concrete while simultaneously discharging agent at maximum rated capacity through both turrets without interruption.

2.1.5 The P-15 truck will consist of the following major components and will incorporate the following features:

2.1.5.1 Powered by two, 8 cylinder, 430 hp diesel engines, each of which will meet all specified EPA requirements.

2.1.5.2 A power train incorporates two power dividers, each with modulated clutch for simultaneous pump and drive capability, and two torque converters combined with two speed hydraulic actuated transmissions coupled with two hydraulic actuated four speed transmissions with controls for seven speeds forward and two sets of tandem axles, both incorporating driver controlled differential lock outs.

2.1.5.3 Type 304L stainless steel agent tanks with the following minimum capacities:

a. Water - 6000 gallons (22,710L)

b. Foam concentrate - 500 gallons (1892.5L)

2.1.5.4 Two top-mounted (one fore and one aft), 1200 gpm (4542L/Min) turrets and a 100 gpm (378.5L/Min) handline nozzle with 150 feet (45.75M) of hose.

2.1.5.5 Two 1250 gpm (4731.25L/Min) at 250 psi (113.5 KG/SI) water pumps and two 90 gpm (340.65L/Min) at 275 psi (124.85 KG/SI) foam agent pumps. The system configuration permits operational flexibility with either engine capable of providing truck drive and pump capability through one turret at full capacity or both turrets at reduced capacity.

3 DISPOSITION OF TEST VEHICLES: Both test articles were returned to the control of the contractor, OSHKOSH Truck Corporation, at the conclusion of the test program.

4 NARRATIVE: ABSTRACTS, CONCLUSIONS AND RECOMMENDATIONS

4.1 Abstract. The government operational verification test program was conducted from 13 Oct 77 to 19 Dec 77 at Tyndall AFB FL, using two A/S32P-15 fire trucks furnished by OSHKOSH Truck Corporation. A fifteen man test cadre conducted the test with technical assistance provided by the same contractor. Thirteen tasks, including qualification tests, were performed to evaluate vehicle handling qualities, firefighting performance, crew comfort provisions, vehicle reliability and maintainability. Vehicle employment concepts in conjunction with other firefighting apparatus were also evaluated.

4.2 Conclusions. The A/S32-P15 provides good fire suppression capability for aircraft type fires when using the drive-around firefighting procedures with or without other fire vehicles. A number of malfunctions occurred during the test program; however, only one of those encountered would have prevented the vehicle from responding and applying at least 1200 gallons per minute (4542L/Min) of agent on the fire. Component part reliability must be improved before the vehicle enters the Air Force inventory.

4.3 Recommendations.

4.3.1 Technical manuals and data require some revision and additional information to make them complete and more comprehensive. Ref 7.1.1.1

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.1.1 36A12-8-16-1, Ref Appendix G		X	X	
4.3.1.2 36A2-8-16-2, Ref Appendix H		X	X	
4.3.1.3 36A12-8-16-4, Ref Appendix I		X	X	
4.3.1.4 Instructions, offload from trailer to be included with shipping notices or documents. Reference Appendix J.			X	
4.3.2 Quality, adequacy and serviceability of vehicle and fire-fighting equipment; overall good, but some changes are needed.				
4.3.2.1 Make the frame and mount bracket for the winch at least 50% stronger.	X		X	
4.3.2.2 The battery box frame mount for the winch must be much stronger and change the rivnuts to a threaded frame member or boss.	X		X	
4.3.2.3 The frame rollers for the winch cable must be made to roll easily and should be at least twice the present diameter with concave surfaces.	X		X	
4.3.2.4 Provide storage for the winch in a compartment and include a container with the block, cable loops and other possible attachments.	X			X
4.3.2.5 Power divider oil reservoir must be larger or provided with better air circulation. Ref 7.1.2.2 and 7.1.3.5	X			X
4.3.2.5.1 Power divider output shaft to transmission strength should be increased. Ref 7.1.2.2	X			X
4.3.2.5.2 Increase bearing size on power divider counter shaft. Ref 7.1.2.2	X			X

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.2.5.3 Slow the application of the water and foam pump clutches and use larger clutch for water pump. Ref 7.1.2.2	X			X
4.3.2.6 Improve the cables in the transmission shift linkage. Ref 7.1.2.4	X		X	
4.3.2.6.1 Anchor the top end of transmission fill tubes. Ref 7.1.2.4	X		X	
4.3.2.7 Redesign wheel hubs to better hold the grease seals and retainers. Ref 7.1.2.4	X		X	
4.3.2.8 Redesign both front axle torque rod anchor brackets to increase strength. Ref 7.1.2.4	X		X	
4.3.2.9 Allow more clearance for foam tank cover. Ref 7.1.2.8	X		X	
4.3.2.9.1 Improve foam tank cover safety chains and anchors. Ref 7.1.2.8	X		X	
4.3.2.10 Improve welds on compartment door frames and fender steps. Ref 7.1.2.8		X	X	
4.3.2.11 Improve handrail mounts and change from rivnuts. Ref 7.1.2.8 and Appendix B	X		X	
4.3.2.12 Reduce size of wiring bundle through rear turret column. Ref 7.1.2.9.1	X		X	
4.3.2.13 Relocate rear engine connector panel to some higher point. Ref 7.1.9.2	X		X	
4.3.2.14 Replace the gummed wire and hose number strips with something more permanent. Ref 7.1.2.9.3	X			X

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.2.15 Route tachometer wires outside of bundles and eliminate connectors. Ref 7.1.2.9.4	X		X	
4.3.2.16 Make sure wires are long enough to reduce tension on them. Ref 7.1.2.9.5	X		X	
4.3.2.17 Correct the tendency for one voltmeter not to work when both engines are running. Ref 7.1.2.9.7	X		X	
4.3.2.18 Change speedometer drive to output shaft.	X			X
4.3.2.19 Increase the size of main air tanks. Ref 7.1.3.2. and Appendix B	X		X	
4.3.2.19.1 Reverse the rear air tank; drain to rear. Ref 7.1.4.4		X		X
4.3.2.20 Relocate front turret foam valve and air cylinder to side or front of the pipe. Ref 7.1.2.11.1	X		X	
4.3.2.21 Insure that handles are correctly installed on all valves. Ref 7.1.4.4		X	X	
4.3.2.22 Insure that clevice pins and/or other brackets do not block any travel of valve linkages. Ref 7.1.2.12		X	X	
4.3.2.23 Hang handline nozzle to prevent kinking of hose. Ref 7.1.2.11	X			X
4.3.2.24 Redesign foam tank shutoff valve handle. Ref 7.1.2.11	X		X	
4.3.2.24.1 Insure that foam shutoff valve will completely close and hold liquid. Ref 7.1.2.11		X	X	
4.3.2.25 Redesign water tank shutoff valve handle. Ref 7.1.2.11	X		X	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.2.26 Provide access to agent system pressure pilot control valve for maintenance. Ref 7.1.2.11.2	X			X
4.3.2.27 Provide for more clearance between the 6 inch (15.24CM) water pipe to the rear turret and body framing. Ref 7.1.2.11.5	X		X	
4.3.2.28 Extend the water pump drain control handle to outside of panel. Ref 7.1.2.11.6	X			X
4.3.2.29 Improve top foam tank fill cutting blades. Ref 7.1.2.11	X		X	
4.3.2.30 Design turret rotation stops with adjustment range adequate to stop them short of pointing to other turret and bumpers inside that will not puncture the pistons. Ref 7.1.2.12 and Appendix B	X		X	
4.3.2.31 Remove electric turret hydraulic pumps and intergrate with steering. Ref 7.1.2.12	X		X	
4.3.2.32 Eliminate turret cage pivots and cage gate. Ref 7.1.2.12 and Appendix B	X		X	
4.3.2.33 Switch positions of communication and interrupt buttons. Ref 7.1.2.12	X		X	
4.3.2.34 Redesign turret control handle mounting bracket. Ref 7.1.2.12		X		X
4.3.2.35 Remove excess gauges from turret panels. Ref 7.1.2.12	X		X	
4.3.2.36 Install turret elevation angle indicator. Ref 7.1.2.12.1	X			X

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.2.37 Install hanger for helmet on the turret cage. Ref 7.1.2.12.2	X			X
4.3.2.38 Install a level indicator or dipstick on winterization tank. Ref 7.1.2.13	X		X	
4.3.2.39 Provide hangers for harness to winterization pump relays. Ref 7.1.2.13	X			X
4.3.2.40 Provide labels at all valves, particularily drains. Ref 7.1.2.15		X	X	
4.3.2.41 Redesign battery compartment door to open completely and the tray to pull out far enough to service all battery cells. Ref 7.1.2.15	X		X	
4.3.2.42 Replace the screw for the turret transport lock latching bar pivot with a clevis pin. Ref 7.1.2.16	X		X	
4.3.2.43 Install check valve between foam valve and proportioner for handline.	X		X	
4.3.2.44 Install a less slippery top deck grating. Ref Appendix B	X		X	
4.3.2.45 Remove the two small rear kick steps.	X			X
4.3.2.46 Lengthen cab seat belts six to eight inches (15.24CM to 20.32CM). Ref Appendix B	X		X	
4.3.2.47 Insure that windshields are well sealed.		X	X	
4.3.2.48 Position right side rear view mirror so crew will not block driver's use of it. Ref Appendix B	X		X	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.2.49 Install guards over engine cooling fans. Ref Appendix B	X		X	
4.3.2.50 Install right cab door grab handle at an angle somewhat off vertical for natural hand grip of person climbing the steps. Ref Appendix B	X		X	
4.3.2.51 Install guards over finned tube heaters where operation of any controls could cause cuts. Ref Appendix B	X		X	
4.3.2.52 Install a modulating clutch control valve that is less sensitive with a wider operating range.	X			X
4.3.2.53 Transport position of rear turret is pointing to rear due to rotation stops. Retain this position.	X		X	
4.3.3 Vehicle steering and suspension requires improvement.				
4.3.3.1 Correct tendency for left front to sag. Ref 7.1.3.4	X			X
4.3.3.2 Insure no defective ball studs in steering linkage. Ref 7.1.3.3		X	X	
4.3.3.3 Increase length of rear steering hydraulic return hose.	X		X	
4.3.3.4 Use unthreaded shank bolts in frame and cross members. Ref 7.1.3.8		X	X	
4.3.3.5 Increase strength of snubbing cables at four corner of each bogie assembly. Ref 4.3.3.4	X		X	
4.3.4 Leakage of agent system.				
4.3.4.1 Redesign water pump and foam pump packings. Ref 7.1.4.1	X		X	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.4.2. Redesign foam tank door to prevent spillage in rough terrain. Ref 7.1.4.2	X			X
4.3.4.3 Redesign water tank vents to reduce spillage.	X			X
4.3.5 Storage, removal and connection of firefighting hoses and equipment.				
4.3.5. Install two 9 lb (4.086 KG) Halon fire extinguishers. Ref 7.1.6.2	X			X
4.3.5.2 Relabel ladder compartment to storage compartment and install a floor and back wall. Ref 7.1.6.3 and Appendix B, Item 6	X			X
4.3.5.3 Change 4½ inch (11.43CM) water tank fill connection from female to male. Ref 7.1.16.3	X			X
4.3.6 Develop capability to suppress fires under various conditions, with either or both engines and with other vehicles.				
4.3.6.1 Remove handline assembly. Ref 7.1.7.5	X			X
4.3.7 Storage and operation				
4.3.7.1 Seal turret panel gauges to prevent condensation and water inside them. Ref 7.1.9.3	X		X	
4.3.8 Compatibility of base facilities.				
4.3.8.1 Combine indoor facilities for parking and maintenance Ref 7.1.11.1	X		X	
4.3.8.2 At each base evaluate capacity of streets and overhead obstructions. Ref 7.1.11.2	X		X	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.9 Lighting, controls, gauges, instruments, day/night operation.				
4.3.9.1 Reduce glare of high beam indicator light. Ref 7.1.14.1 and Appendix B	X		X	
4.3.9.2 Install two wide beam auxiliary lights on each side of vehicle. Ref 7.1.14.1 and Appendix B	X			X
4.3.9.3 Install guards over drive line disengage controls. Ref 7.1.14.2	X	X		
4.3.9.3.1 Move park brake control to the shift tower panel. Ref 7.1.14.2 and Appendix B	X		X	
4.3.9.4 Replace agent tank level gauges with indicator lights. Ref 7.1.14.3	X		X	
4.3.9.4.1 Replace transmission temperature gauges with easier to read and lower range gauges. Ref 7.1.14.3	X			X
4.3.9.5 Limit gauges on turret panel to pressure and agent level gauges or lights. Ref 7.1.14.4	X		X	
4.3.9.6 Provide foam pressure port for test gauge.	X			X
4.3.9.7 Install guards over turret panel pump engagement switches. Ref Appendix B	X		X	
4.3.10 Interphone communications, crash net interface during all phases of operation.				
4.3.10.1 Foot switch for driver to cut out intercom and switch on crash net system. Ref 7.1.15.1	X		X	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.10.2 Adequate suppression and quality connectors in radio system to reduce static to minimum. Ref 7.1.15.2	X		X	
4.3.10.2.1 Suppress intercom system to eliminate high pitch gain during radio transmission. Ref 7.1.15.3	X		X	
4.3.10.3 Install a power pack for communication system to provide reduction of 24 VDC to 12 VDC and wide amperage selection range. Ref 7.1.15.4	X			X
4.3.10.4 Provide headsets compatible with the firefighting hood. Ref 7.1.15.5	X		X	
4.3.11 Access and times for servicing, reservicing of fuel, lubricants and agent system, winterized and nonwinterized vehicles require the following:				
4.3.11.1 Vent fuel tank to outside. Ref 7.1.16.1 and Appendix B	X		X	
4.3.11.2 Provide handle to operate fuel tank drain. Ref 7.1.16.2	X			X
4.3.11.3 Seal fuel tank compartment floor drain. (Keep fuel out of insulation.)	X		X	
4.3.12 Skill level for operator no less than "5" level. Ref 7.1.17			x	
4.3.13 Skill level for mechanics, no less than "5" level. Ref 7.1.18			x	

	DESIGN	QUALITY CONTROL	ESSENTIAL	DESIRABLE
4.3.14 Daily operations checklist as per Appendix D				X
4.3.15 Towing/extraction no less than 5/8 (1.60CM) improved plow steel cable. Ref 7.1.20.2	X			X

5 TEST APPARATUS: No special apparatus was used for this program. Standard items such as stop watches and refractometers were used. Appendix C contains maps of the test area at Tyndall AFB, Florida.

6. TEST PROCEDURES: Thirteen tasks were performed for the test program by a 15-man cadre. (See Appendix A) Two vehicles, first article number 2, winterized version, and first article number 3, non-winterized version, were evaluated. All tasks were not performed by each vehicle. The tasks were:

a. Task 1 - Acceptance and Preliminary Operations*

b. Task 2 - Daily Checkout*

c. Task 3 - Vehicle Storage

d. Task 4 - Ingress and Egress Test

e. Task 5 - 100 Mile (160.9KM) Road Test*

f. Task 6 - Cross-Country Test*

g. Task 7 - Turret and Handline Systems Test

h. Task 8 - Foam and Pumping Test

i. Task 9 - Firefighting Test*

j. Task 10 - Towing Test

k. Task 11 - Air Transportability Demonstration

l. Task 12 - Reliability Testing*

m. Task 13 - Maintainability Testing*

*Indicates task performed by both vehicles.

For a full description of procedure, see A/S32P-15 Test Plan and Task Procedures. See Appendix C for maps of the test area.

7 RESULTS OF TESTS:

7.1 Twenty specific objectives were achieved during the test program. The following statements summarize the attainment of each objective.

7.1.1 Tech Manuals and Data. The technical orders applying to the vehicle are:

36A12-8-16-1, Operation and Operator Maintenance

36A12-8-16-2, Maintenance/Overhaul Instructions

36A12-8-16-4, Illustrated Parts Breakdown.

All three of these were preliminary copies provided to the test cadre, and were deficient in many areas. Corrections, additions, and deletions were made to Technical Order 36A12-8-16-1 with corrected copies being given to the OSHKOSH Truck Corp, ASD/AEGA, and WRALC/MMIRAB. Several mistakes and omissions in the 36A12-8-16-2 manual have been found during maintainability testing and review of other procedures. Recommended additions and corrections were forwarded to ASD/AEGA. The 36A12-8-16-4 manual was basically complete, but many changes are occurring due to changes to the vehicle components as they are identified. Some mistakes and omissions were found and corrections forwarded to ASD/AEGA.

7.1.1.2 In addition to the existing gear and speed selection recommendations in the dash one Tech Order, a special caution should be entered

which reads, "down shifting of transmission at excessive speeds may result in serious damage to the drive trains".

7.1.1.3 A procedure must be established and included in the 36A12-8-16-1 to check for flow of pumps and turret outputs. This procedure must be usable at field level.

7.1.2 Quality, adequacy of installation, adjustment of vehicle systems.

7.1.2.1 Engines, 92 series V8 Detroit Diesel, have proven reliable and provide adequate power to operate the truck and all systems.

7.1.2.2 Power divider (engine power takeoff). One countershaft bearing failed, causing damage to the housing which required replacement of the total assembly. It is doubtful whether the oil reservoir is large enough or whether the air flow around it is good enough for adequate cooling. The water and foam pump clutches are engaged suddenly, thereby inducing severe shock loads when starting the pumps. The relative shock tends to increase as the units get older because engine speeds tend to increase before engagement of the clutches.

7.1.2.3 The auxiliary transmission, 2-speed with a torque converter hydraulically controlled by Solenoid operated valves. This has proven reliable, except for one minor problem with a sticking valve on a chilly morning. This cleared up as the operating temperature was reached.

7.1.2.4 Main Transmission, 4-speed with reverse hydraulically controlled by cable and linkage operating the shift valves. The transmission has proven reliable. The only problems have been with the interconnecting shift linkage which has required three adjustments in six weeks to keep it snychronized. Fill tubes need to be redesigned to anchor them at

the top. They are so long that they can break due to vibration. Axles and drive shafts are adequate in size and strength. The tires and wheels provide excellent flotation and traction. Minor problems were experienced with three wheel seals working out of their sockets. The seal retainers should be redesigned to provide a tighter fit. A major problem was a bent frame bracket that anchored a front axle torque rod. Recommendation was made to design a stronger bracket for both of the front axle torque rods.

7.1.2.5 The suspension system has developed no serious problems. A minor problem to consider is a sagging left front spring on one vehicle. The heavy suspension springs and four axles arranged in two bogies causes the vehicle to bounce as speed increases from 28 to 38 mph (45.05KPH to 61.14KPH). Above 38 mph (61.14KPH), the bounce tends to subside. Flat spots on tires may contribute to the bounce.

7.1.2.6 The steering system has proven excellent and stable in operation. However, a serious potential safety hazard was discovered on one vehicle during testing. The threaded ends of both ball studs in the axle steering arms developed fatigue cracks and broke off when the nuts were being removed. One drag link ball stud was examined for cracks with no defects found. Possibilities and contributing factors are: defective studs, over torquing the nets, or both. Recommendations were made to the OSHKOSH Truck Corp to evaluate this failure and take necessary action to make sure these studs will not break. The return hose to the rear reservoir is about 10 inches (25.4CM) too short. The constant tension produced can part the connections and break reservoir mountings.

7.1.2.7 Brake systems, both service and parking, have proven adequate. No problems developed.

7.1.2.8 The cab and overall body developed no serious problems. Minor faults are: foam tank cover too close to catwalk, binding heavy enough to make it difficult to open and close the cover; the safety chain and anchors for the cover are much too small. They break easily, allowing the cover to fall back, causing personnel to lose their balance. Welds are developing cracks at door frames and the steps on the fenders. Foam tank handrail needs better securing. Handrail pulled off rivnuts.

7.1.2.9 The extensive and complex electric system will require highly trained personnel to maintain it. The system developed no serious problems during testing. Minor problems were encountered as follows:

7.1.2.9.1 Bundle too large and tight through the rear turret columns, causing wires to break.

7.1.2.9.2 Rear engine connector panel located too low on frame, making access very difficult. It is subject to oil and foam leaks, dirt, and corrosion.

7.1.2.9.3 Marking numbers are on gummed tape, allowing them to fall off too easily.

7.1.2.9.4 Tachometer wires, in the harnesses and through connectors. malfunction quite often due to any small corrosion and force fields of current flow through nearby wires.

7.1.2.9.5 Some wires too short or poorly routed, causing them to be under constant tension. Examples:

(1) Positive battery cable to rear engine starter.

(2) Wire to front transmission temperature sending unit.

(3) Some of the wires to the rear engine units.

7.1.2.9.6 One engagement relay failed; new one installed. No further problem of foam and water engagement relays.

7.1.2.9.7 Generator isolator and voltmeters problems exist. Example: when both engines are operating, one voltmeter will fail to function.

7.1.2.10 Air system is quite complex and extensive and requires highly trained personnel to service and maintain it. Almost all of the system is composed of nylon tube. The system has developed no serious problems. Minor problems encountered as follows:

(1) A cracked weld on drain boss of quick buildup tank.

(2) Alcohol injector collects moisture when not serviced with alcohol.

(3) Volume used when applying the brakes drops pressure up to 15 psi (6.81 KG/SI) on only one application. This indicates the reservoir volume may be inadequate.

7.1.2.11 Agent dispensing system is well arranged over all and is somewhat complex. Experienced personnel will be required to properly maintain it. Problems encountered as follows:

a. Foam valve to the front turret proportioner very difficult to reach for repair or adjustment.

b. Two foam valves not closing fully. Handles not correctly installed on ball shaft.

c. One flush valve not closing fully. Cotter pin left out of clevis pin, allowing it to protrude and catch on bracket stopping the the travel shot. Cylinder linkage adjusted too short.

d. Rear foam bypass valve not fully closing during flush. The bypass valve handle was bumping the foam pump valve bracket. Sawed off corner of the bracket to allow full travel of the bypass valve handle.

e. Handline nozzle poorly stored, causing a severe kink in the hose when on its hangers.

f. Foam tank and water tank shutoff valves are butterfly type and tend not to shut off completely. Some leakage during maintenance on the water system can be tolerated, but not on foam system.

h. The cutting blades in the foam tank top fill were found to bend and become useless.

i. Foam tank shutoff difficult due to access problems. Installation of a longer valve handle and removal of the handle extension would eliminate this. One water tank shutoff valve was installed upside down.

j. Access to pilot valve and winterization relays is difficult for maintenance purposes. Removable panels need to be installed in this area.

k. Dilution of the foam system can occur if the dispensing system is used and flushed several sucessive short periods because of the amount of water left in the foam return piping after flushing.

l. Dilution of the foam system could occur if the flush system is activated while the agent discharge system is in operation.

m. Dispensing system. Six inch (15.24CM) water pipe from pump to rear turret flexible coupling pulled too hard against body frame work when the coupling is adjusted to proper length. This could cause welds to fail prematurely because of the constant stress.

n. Water pump drain linkage needs an extension of the rod and handle through the control panel for access and leverage. Existing location makes this procedure difficult.

7.1.2.12 Turrets are adequate and dispense water and foam very well. Suggested changes and problems are listed below:

a. Rotation stops had to be installed as spacers because the turrets could spray each other. The manufacturer installed new adjustable stops which are not satisfactory. They do not have enough range and tend to leak hydraulic fluid.

b. Electric driven pump for turret movement depends too much on batteries. This could be changed to operate with the steering hydraulic system. The reservoir is too small and difficult to check and service.

c. Cages for turret operators are mounted on a weak pivot point allowing movement to pound the operator. Recommend the swivel point be eliminated by making this a solid mount and elimination of the cage entrance gate. The front of the cage should be widened by 4 inches (10.6CM) on each side of the turret to permit front entry. The weakness in construction may be eliminated when the slack is removed from the cage. (See Appendix B)

d. Safety belts are anchored to the cage which would allow the operator and cage to fall if the cage mount did break. The belts should be anchored to the turret assembly and be strong enough to support cage and operators.

e. Interrupt and interphone buttons need positions exchanged to avoid cross handed operation for other turret controls.

f. Engine gauges should be removed from rear turret panel because they are not actually needed there and will reduce size of bundle through the mounting. This will reduce the tendency of the wires and hoses in the bundle to break. Retain the water pressure gauge only on the turrets.

g. There is a tendency for the control handle support bracket mounting screws to work loose. There are three screws and one of them is very difficult to reach. Better means to keep them tight may be necessary. The bracket also breaks and must be redesigned.

h. Handline is very difficult to pull out and to rewind. Main problem is when about half the hose is out, it tends to keep the reel brake applied. Needs to be redesigned.

7.1.2.12.1 Recommend an indicator be installed on each turret that will give the operator an approximate reading on the angle of elevation of the turret from the horizontal position. The indicator should read from minus 30 degrees to 60 degrees with respect to the horizontal plane.

7.1.2.12.2 A hangar is needed to secure the firefighting hood in the exterior rail of the turret cage.

7.1.2.13 Winterization systems look well enough arranged, but some problems are as follows:

a. Reservoir location makes it difficult to determine correct fluid level.

b. Wires may work loose on control relays, and harness leading to them needs to be better supported.

7.1.2.14 All drain valves require labelling to insure all necessary areas are drained, especially during cold weather operations.

7.1.2.15 The design of the battery trays and compartment makes it practically impossible to completely check and service the batteries.

7.1.2.16 Pivot screw on the roof turret locking bar is too small and breaks easily. Use of a clevis washer and stainless steel pin would eliminate this.

7.1.3 Adequacy of brakes, steering suspension system and drive trains.

7.1.3.1 The performance of the braking systems, steering system, suspension components and drive train components was satisfactory even though failures of several systems occurred. Consideration must be given to the fact that the vehicle suffering the highest number of failures was the number two vehicle manufactured and has undergone extensive testing at the factory at Eglin AFB, and while assigned to Tyndall. The number three vehicle suffered much less in these areas.

7.1.3.2 Brakes are adequate and stop the vehicle quickly and smoothly, but sixteen diaphragm chambers tend to deplete the air reservoirs rather quickly. Larger air tanks may be required.

7.1.3.3 Steering is smooth and powerful. Two axle steering arm ball studs cracked at base of threads. Investigation found that the annealing process of the threaded end was omitted, allowing the hardened end to crack when tightening torque was applied. Defective ball studs were identified by the manufacturer and disposed of. No further problems are expected.

7.1.3.4 Suspension system seems well designed. One left front spring sagged slightly and bogie corner snubbing cables were too light, and should be replaced by chains.

7.1.3.5 Drive train from engine through axles excellent overall. Main problems are the power dividers. Reference para 7.1.2.2. This system may be inadequate for the P-15, especially for operation on one engine. It does have failures on the P-4 and the P-15 is much heavier. One engine operation must be held to the absolute minimum. Transmission interconnecting shift cable is very difficult to keep adjusted and tends to stretch and bunch up in the housing. This should be evaluated and redesigned.

7.1.3.6 Rear engine steering return hose and battery cable too short.

7.1.3.7 Rear engine connector panel on bottom of frame subject to deterioration caused by leaks of foam, water, oil, etc.

7.1.3.8 The bolts holding crossmembers to frame are completely threaded and have a tendency to compress and become loose. Unthreaded shank bolts would correct this problem.

7.1.4 Agent System Leakage

7.1.4.1 Agent system leakage has been limited to pump packing, both water and foam. Frequent adjustment has not been able to prevent this problem. Some transfer of water to foam tank due to faulty installation of valves.

7.1.4.2 Foam occassionally spilled from the top foam fill area during rough terrain operation.

7.1.4.3 When the vehicle reaches the field and the acceptance tests are performed, maintenance personnel should remove the relief valve pilot handle to insure accidental changes in pressure do not occur. Also safety wire the On-Off handle to the On position.

7.1.4.4 Access to the rear air tank drain valve is difficult. Mounting the air tank with the valve facing the rear of the vehicle would eliminate this problem.

7.1.5 Ingress and Egress

7.1.5.1 No problems were encountered with egress and ingress. Personnel wearing full protective clothing exited doors and windows with ease. Access to turret stations during day and night operations was satisfactory, with sufficient lighting to insure safety. Transport to and from fire scenes riding cab and turret stations was evaluated with no problems encountered. The height of doors will determine whether the crew will mount before station departure or after the vehicle pulls out.

7.1.6 Auxiliary Equipment Storage

7.1.6.1 The space provided is sufficient for the auxiliary equipment. The vehicle is designed for firefighting and would not normally be committed to other assignments; therefore, serious consideration should be given before placing non-essential auxiliary equipment. The auxiliary equipment listing, with the exception of the contractor furnished items, is normally available at operational locations. See Appenix E.

7.1.6.2 The two 9 lb (4.086KG) Halon extinguishers mounted in the vehicle (Appendix E) are for use in vehicle fires on the P-15.

7.1.6.3 Because a ladder is not to be placed on the vehicle, the compartment now designated as such must be changed to read, "storage compartment".

7.1.7 Firefighting

7.1.7.2 Under dual engine, dual pump configuration, the P-15 was highly effective in suppressing fires in short periods of time. Tests were performed on paved surfaces and in sandy, muddy terrain. The terrain features caused little or no degradation to the firefighting system or vehicle maneuverability.

7.1.7.3 The only difference between single engine, single pump and dual engine, dual pump operation was agent delivery being reduced to fifty percent and speed being less. These were expected and the amount of agent meets requirements.

7.1.7.4 While operating in conjunction with other firefighting equipment, no difficulties were experienced during the drive-around operation.

7.1.7.5 The handline was found to be of little value during firefighting operations. A study should be performed to determine the savings that would result from deleting the handline. The requirement for a handline should be revalidated. See Appendix F for Operational Employment. The handline nozzle proved to be unreliable due to malfunctions and by difficulties experienced on stream selection. Recommend a non-aspirating nozzle capable of producing a full fog pattern be utilized.

7.1.8 Foam Properties

7.1.8.1 The vehicle met or exceeded the requirements of discharging water and a proportioned solution of water/AFFF.

7.1.8.2 Foam expansion was 8.8 to 1 for the front turret with the 25% drain out time occurring at 7 minutes with a 6% concentration. Rear turret had 10.8 to 1 expansion, 25% drain out time occuring at 5 minutes, 15 seconds with a 6% concentration.

7.1.8.3 Firefighting and pumping operations were conducted under various field conditions and vehicle configurations. Turret operators were able to deliver agent to fires or targets regardless of terrain features.

7.1.9 Vehicle Storage

7.1.9.1 The vehicle's ability to operate under various environmental conditions was evaluated and proved satisfactory; however, a large facility is required for vehicle storage.

7.1.9.2 Both vehicles were stored outdoors during the entire testing period, except while undergoing maintenance. Temperatures ranges during the test period were between 31 degrees fahrenheit (-1C) and 85 degrees fahrenheit (29C). These variations had no effect on the vehicle's operations.

7.1.9.3 Several gauges accumulated moisture during the test period. This did not impair their initial operation, but it would probably cause a problem over a period of time.

7.1.9.4 Minimum stall dimensions for safety should be: Door 19 feet (5.80M) high, 14 feet (4.27M) wide, stall inside, 20 feet (6.1M) wide 55 feet long (16.775M).

7.1.10 Maintenance Under Actual Base Conditions.

7.1.10.1 No unusual problems performing service and repair under base conditions. The vehicle does not require special tools not found in tables of allowances. Due to size of components, the following items of equipment must be made available:

a. Wheel dolly large enough to handle a wheel and tire assembly six feet (1.83M) in diameter, weight about 1200 pounds (544.8KG).

b. A one inch (26MM) square drive impact wrench or a heavy manual wheel lug wrench with 36 inch (91.44CM) handle.

c. A tire bead breaker of adequate size or a portable hydraulic one designed for the tire and wheel, unless contract services are used.

7.1.11 Compatibility of Base Facilities.

7.1.11.1 Very few bases have vehicle maintenance facilities large enough to accept this vehicle. To allow for overall repair work inside a building, about 15 feet (4.575M) clearance is needed all around the vehicle and 20 feet (6.1M) of clearance above it. Vehicle dimensions about 45 feet (13.725M) long, 10 feet (13.05M) wide and 14 feet (4.27M) high. The necessity for various lifting devices for the engines, gear boxes, wheels, axles, etc. dictates a need for space to clear vehicle and building and insure safety while moving them. This is especially true for the northern bases.

7.1.11.2 No problems were encountered with pavements on the airfield or streets damaged by the P-15.

7.1.12 Vehicle Reliability

7.1.12.1 Vehicle reliability was below expectations as evidenced by numerous minor failures and several major problems. Maintainability is satisfactory. Special purpose vehicle mechanics, well trained in trouble shooting, and interpreting schematics, should have no problems with maintenance.

7.1.12.2 Between the two assigned vehicles, 9 class 1 failures occurred; three class 2; eight classs 3; nine class 4; and 120 class 5. The areas of major concern were the down time during failures of the power divider,

transmission shift linkage, rear wheel seals, twisted cross member which resulted in steering failure, broken turret support, and broken rear universal joint and shaft coupling.

7.1.12.3 If the corrections and improvements are made as listed in this report and the Aberdeen test report, the reliability of the vehicle should meet expectations.

7.1.13 Air Transportability

7.1.13.1 Preparation for air transportability can be accomplished according to the technical order. No special skills are required for disassembly or assembly. Disassembly for transport requires only 28 minutes and reconfiguration 22 minutes. By strapping the turret cages to the lower roof deck, all items of equipment will reach the destination together. If the vehicle is parked near a water source while being reconfigured for operations, simultaneous servicing of the vehicle can be performed.

7.1.14 Lighting, controls, guages, instruments, day and night operations.

7.1.14.1 Some lighting changes needed are a frosted high beam indicator light to eliminate glare, and two wide lights should be installed on each side of the vehicle for illumination during night operations.

7.1.14.2 Shields should be mounted over the drive disengage controls to eliminate the possibility of accidental disengagement. Parking brake valves should be moved to the shift tower.

7.1.14.3 Agent level gauges are inaccurate and engine gauges at rear turret position need to be eliminated, also transmission temperature gauges are difficult to read.

7.1.14.4 The following gauges are required at both turret stations.

a. Tank levels to be shown by lights indicating 1/4, 1/2, 3/4, and full levels.

b. Firefighting system pressure - this gauge must be illuminated.

7.1.15 Communications

7.1.15.1 The crew interphone communications need improvements and after an in-depth study of inter-facing this system with the crash radio net, it was decided that the driver will relay all pertinent information to the crew chief, leaving him free to concentrate on firefighting. The following recommendations are made.

a. Turret operators who receive and transmit on intercom should be provided capability for hot mike and push-to-talk.

b. Drivers who receive and transmit on intercom, crash net radio, and transmit on PA should:

(1) Wire crash net radio to PA speakers.

(2) Transmit through lip mike for crash net, intercom and PA.

(3) Receive intercom through ear receiver.

(4) Receive crash net through cab mounted speaker. Supply crash net speaker for cab.

(5) Be provided a capability for hot mike and push-to-talk. The driver should have a floor mounted, foot operated push-to-talk capability for the crash net.

c. Provide standard sirens.

d. Constraints:

(1) Driver needs hot mike for intercom.

(2) Driver does not need hot mike for crash net - push-to-talk.

7.1.15.2 On vehicle 2, excessive amounts of static on the intercom system caused some communication problems. A higher factory quality control could eliminate this.

7.1.15.3 Crash radio transmissions in vehicle 3 created a high frequency pitch in the intercom not found in vehicle 2.

7.1.15.4 Problems exist in power supplied for the radio. A factory installed power pack should provide a wide range of amperage draw, reducing 24V DC to 12-14V DC.

7.1.15.5 The head sets are not compatible with the existing firefighting hood. Because of the bulky size the hood cannot be worn during firefighting operations.

7.1.16 Servicing

7.1.16.1 Servicing of various systems was evaluated with two minor problems encountered:

a. Vehicle fuel tank should be vented to the outside to prevent fuel overflow in the compartment. This has been included in the recommended corrective actions.

b. The location of the filter cap for the winterization system makes visual check difficult. This was identified in recommended corrective actions.

7.1.16.2 Daily draining of the fuel tank is required and the access to the drain valve needs improvement. An extension rod attached to the petcock drain would suffice.

7.1.16.3 The 4½ inch (11.43CM) intakes must be changed to male ends and to prevent kinking the hose. It should be angled downward at 30 degrees.

7.1.17 Firefighter Skill Level Required

7.1.17.1 At least a five skill level, 57150, will be required to operate the three vehicle crew positions. Recommend only qualified firefighters be assigned to the three vehicle crew positons as listed below.

Crew Chief - SSgt - 57150

Driver - SSgt - 57150

Turret Operator - Sgt - 51750

7.1.18 Mechanic Skill Level Requirements

7.1.18.1 At least "5" level skill is required; AFSC 47251A, or greater. Prerequisites: Extensive experience in crash fire truck maintenance; ability to read and understand system schematics; skill in detecting operating malfunctions and analyzing causes and effects.

7.1.18.2 The systems on the vehicle are extensive and complicated. There are two of most of them, such as engines; power dividers; auxiliary transmissions; main transmission; steering; water pumps and foam pumps. The mechanic must be able to trouble shoot these systems separately and together, make quality repairs, and keep them synchornized and working equally. The electric, air, and hydraulic systems are extensive and complicated. He must be able to trouble shoot and repair them without guessing (trial and error), and check and test each circuit and component as necessary to make sure other possible causes of the failures are found and corrected.

7.1.19 A daily operator's guide was accomplished and will be included in Appendix D of the report.

7.1.20 Extraction and Towing

7.1.20.1 An evaluation of extraction procedures could not be made because the vehicle could not be stuck without driving it into swamp-land. In one instance, a trench 29 inches (73.66CM) in dept was dug and the vehicle showed no hesitation in moving through this terrain.

7.1.20.2 Towing was performed on a semi-improved road. The tow vehicle was a TD-20 bulldozer, using low range. Size of cable was a 5/8 (1.60CM) improved plow steel cable, 33,400 lbs (15 metric tons) capacity. The tech order states the rear muffler must be removed for tow. This however, was found to be unnecessary. Steering was no problem with one engine running to provide hydraulic pressure. No problems were experienced in towing the vehicle with the TD-20.

8 Test Data

8.1 Ingress to the turret stations with protective clothing and response requires 45 seconds, and 30 seconds without protective clothing.

8.1.1 Road testing of the two vehicles covered 264 miles (424.78KM). Average stopping distances with 100% load was 71 feet (21.655M) with 75% load 66 feet (20.13M). Panic stops require 41 feet (12.505M) with 100% load and 36 feet (10.98M) with 75% load. One-hundred and eighty degree turns can be made in 120 feet (36.6M) with no stops and in 47 feet (14.335M) with one backing operation. During single engine operation the air system loses 15 lbs (6.81KG) of air pressure then tends to hold steady.

8.1.2 Cross-country operations covered 209 miles (336.281KM) of rough terrain. Safe speed capability is 15 MPH (24.135KPH) during single engine operation. Normal stops average 88 feet (26.84M) at 20 MPH (32.18KPH) and 33 feet (10.065M) for full panic stops.

8.1.3 A total of 73 fires were fought each being 2,500 square feet (232.25M2) in area. 16,500 gallons (62,452.5L) of JP-4 was consumed. Two thousand, eight hundred and fifty gallons (10,787,25L) of foam were used in fighting the fires and a minimum of 17,000 gallons (64,345.0L) of water. Winds varied from calm to 24 kts with temperatures being from 31 degrees to 85 degrees fahrenheit (0C to 30C). Average time of extinguishment per fire was 20 seconds. Fires were fought using dual and single turret operation and dual and single operation.

8.1.4 Turret outputs were as follows: rear turret on 1200 GPM (4542L/MIN) mode was 1450 GPM (5488.25L/MIN), 600 GPM (2271L/MIN) mode was 625 GPM (2365.625L/MIN). Front turret on 1200 GPM (4542L/MIN) mode was 1300 GPM (5000 Liters), and on 600 GPM (2200 Liters) mode is 625 GPM (2300 Liters). Handline discharge was 92 GPM (348.22L/MIN). Distance of turret discharge is 195 feet (59.475M) at a 60 degree angle.

8.1.5 Foam output results on the front turret were 8.8 to 1 expansion ration, with a 7 minute and 15 second drain down time and a 6% concentration. Rear turret has a 10.8 and 1 expansion ratio with a 5 minute, 15 second drain down time and a 6% concentration. Reservicing of the vehicle requires 5 minutes, using a 4½ inch (11.43CM) hose.

8.1.6 Maintainability was determined by repair of malfunctions as they occurred and by removal and replacement of selected major assemblies, namely:

Rear Engine

Rear Toque Converter

Front Water Pump Transmission

Tire and Wheel Assembly

Time and number of mechanics used for the five units as follows:

Rear engine - total time 18 hours 15 minutes, 3 mechanics with a fourth approximately 50% of the time.

Front Water Pump Transmission - Total time 2 hours, 10 minutes; 2 mechanics.

Right Side Water Pump - Total tme 2 hours 55 minutes; 2 mechanics with a third helping approximately 45 minutes.

Tire and Wheel Assembly - Total time 63 minutes, 2 mechanics.

8.1.7 Air transport for the P-15 is the C-5 aircraft. The truck is prepared by draining the agent system and pivoting the turrets to the deck on their sides. Time required to pivot each turret about 28 minutes by two, five level operators and/or mechanics. The water tank can be drained during this time. The foam tank may require additional time if the foam is to be saved. Time required to pivot the turret to the operational position about 22 minutes.

NOTE: The foam tank may remain full during air transport.

8.1.8 Towing/extraction presented no serious problem. It was impossible to actually stick the vehicle, even in sand that left tracks 29 inches (73.66CM) deep; therefore, the situation was simulated. A "Y" yoke was fabricated of 5/8 inch (1.60CM) improved plow steel cable rated at 33,400 pounds (15,163.6KG) capacity. The two cables of the "Y" were 36 inches (91.44CM) long with three clamps to hold each loop. The standing cable was to be as long as necessary to reach the towing vehicle, each loop also had three clamps. Vehicle was towed from the rear IAW technical order procedure, which was found adequate; however, removal of engine muffler as specified is not necessary if the vehicle is fairly

level. An International full-track tractor, Model TD-20, was used. In low range, the towing vehicle moved the P-15 with no difficulty and, towed it one mile in 50 minutes (unimproved road). There are no steering problems if either engine is running.

8.1 9 Reliability of the vehicles approach was marginal based on the number of malfunctions during the testing period. Vehicles were driven a total of 777 miles (1250.19K). 77L-491, 17 Oct through 7 Dec 77, with 86 malfunctions. This unit also underwent extensive testing at the factory and at Eglin AFB, FL. 77L-492, 28 Oct through 8 Dec 77, with 63 malfunctions. No previous testing had been done. Total malfunctions by class for both vehicles were:

Class 1, Hazardous - 9

Class 2, Mission Loss - 3

Class 3, Mission Delay - 8

Class 4, Mission Degradation - 9

Class 5, Maintenance Event - 120

Reliability should be satisfactory if recommended improvements are accomplished.

APPENDIX A

TEST CADRE

NAME	RANK	ORG	INSTALLATION
Pease, Birney T.	Maj	AFCEC	Tyndall AFB, FL
Kuykendall, Bobby L.	SMS	AFCEC	Tyndall AFB, FL
Creech, Monta C.	MSgt	305 CES	Grissom AFB, IN
Crayton, Stanley B.	TSgt	379 Trans Sq	Wurtsmith AFB, MI
Hardie, Billie R.	TSgt	3342 Sch Sq	Chanute AFB, IL
Miranda, Sammy D.	TSgt	60 ABG/DEF	Travis AFB, CA
Williams, Kevin M.	TSgt	3341 Sch Sq	Chanute AFB, IL
Reynolds, Jerry T.	TSgt	AFCEC	Tyndall AFB, FL
Yates, Jimmie E.	TSgt	3342 Sch Sq	Chanute AFB, IL
McIntire, Herman R.	GS-9	3341 Sch Sq	Chanute AFB, IL
Lay, Troy H.	WG-10	2750 ABW	Wright-Patterson AFB, OH
Harper, Freddie L.	GS-6	2 CES	Barksdale AFB, LA
Mallamace, Ralph O.	GS-5	436 DEF	Dover AFB, DE
Newcomb, Russell W.	GS-5	4 CES	Seymour-Johnson NC
Thomas, Benny J.	GS-5	97 DEF	Blythville AFB, AR

APPENDIX B

APPENDIX B

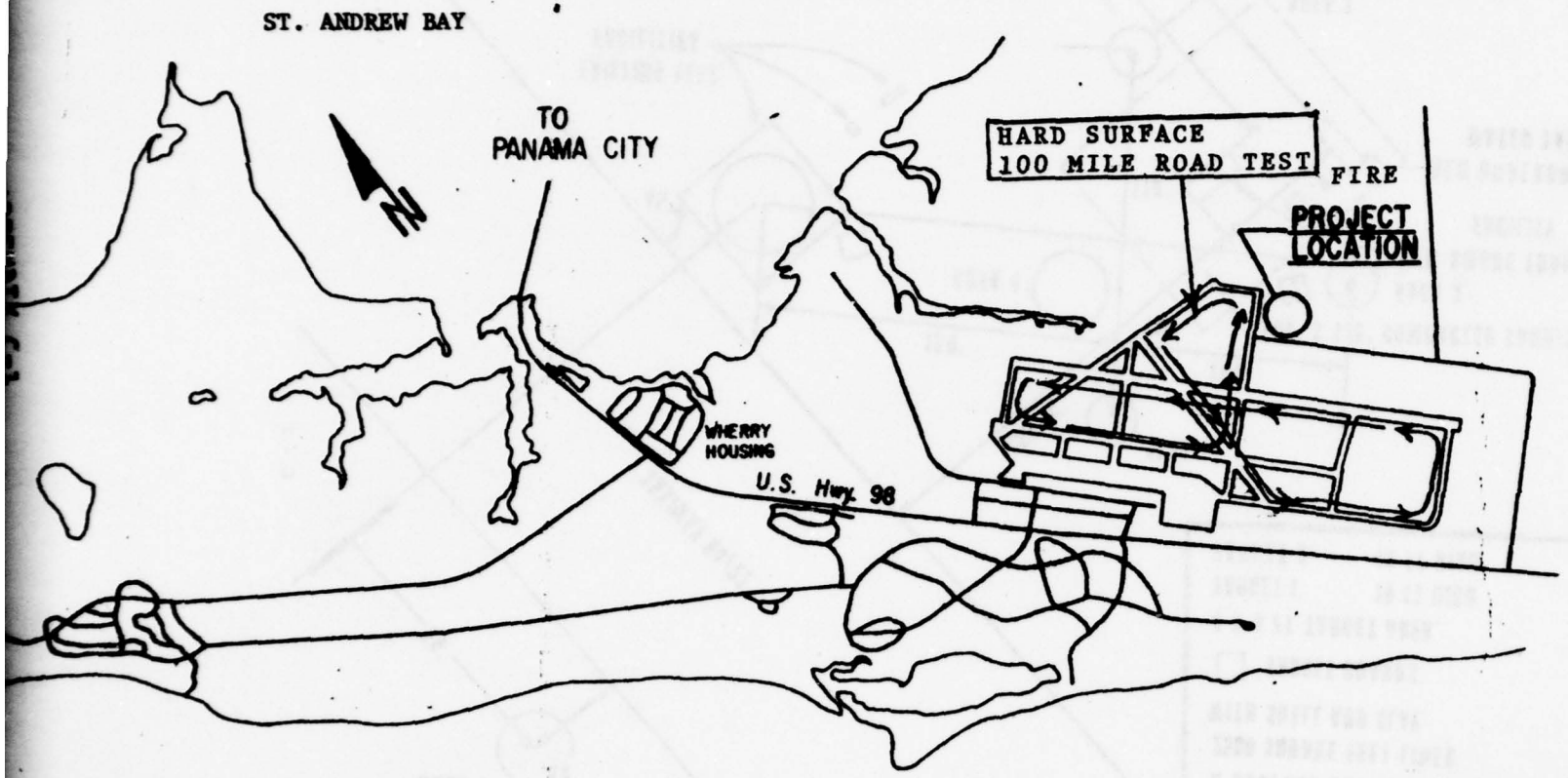
The following safety items were noted during the test program.

ITEM	RECOMMENDED CORRECTIVE ACTION
1. Engine fans need shrouds or guards around them.	Design and install guards.
2. Left rear engine compartment doors do not open the same distance, creating a bumping hazard.	Doors to be adjusted at factory to insure opening width is the same.
3. The grab rails have sharp edges.	Machine finish the welds and seams.
4. Drivers have no control over front floodlight adjustment.	Move controls to cab.
5. Spot lights (wide lights) are needed on the side of the vehicle for side visibility during night operation.	Install two additional wide lights per side of vehicle.
6. Shafts running through compartments are unguarded.	Install adequate guards.
7. Relief valve controls are in a position to be tampered with.	Safety wire or remove control handles at local level.
8. Finned tube heaters in compartments are unguarded, exposing sharp edges.	Design and install guards at the factory.
9. Shift linkage, if maladjusted, can cause vehicle to start while in reverse gear.	Install a safety switch to prevent future occurrences.
10. Fuel tank vent line vents inside compartment.	Replace line to outside compartment.
11. Emergency parking brake can be disengaged by bumping with a leg due to its location.	Reinstall controls to the side of the shifting tower.
12. Turret cages have excessive play and doors could come unlatched during operation. Cage hits operator in small of back.	Make cages stationary, widen front of cage for entry, and eliminate doors. Pad rear of turret cage. Install clip for securing headgear.

ITEM	RECOMMENDED CORRECTIVE ACTION
13. Cab seat belts too short.	Increase length by eight inches.
14. Air system does not recover fast enough when excessive braking is required.	Factory check of system and take whatever action is necessary.
15. Side mirror, right side, limits view with crew in cab.	Move mirrors forward on cab body and relocated spotter mirror.
16. High beam indicator light reflects in driver's eyes, causing vision problems.	Install a frosted or colored cover.
17. Turret stops permit the turret to rotate to a position where the other operator could be hit.	Improve turret stops and reduce the degree of rotation.
18. Turret control switches can be turned on or off accidently.	Install guards or change types of switches.
19. Insulation material used to winterize piping is highly combustible.	Replace with noncombustible type.
20. Expanded metal roof decking has poor traction lateral to expanded metal when wet.	Change ytpe of roof decking to provide good traction in all directions.
21. Vehicle can be started while maintenance personnel are working under vehicle.	Install locking cover that can be removed by maintenance personnel.
22. Grab handle on right cab door does not assist personnel entering or departing.	Change the positioning to a 45 degree angle.

APPENDIX C

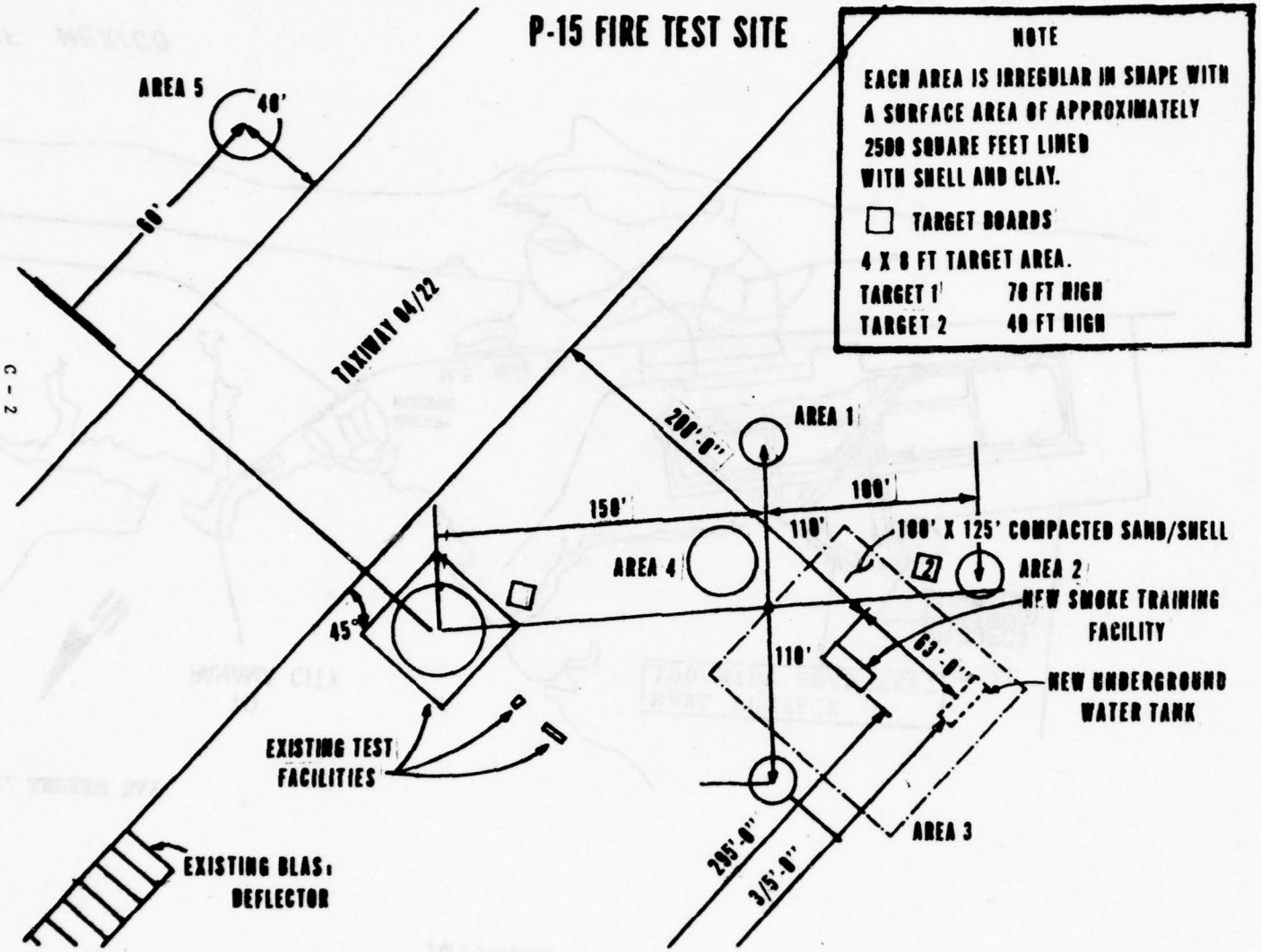
APPENDIX C

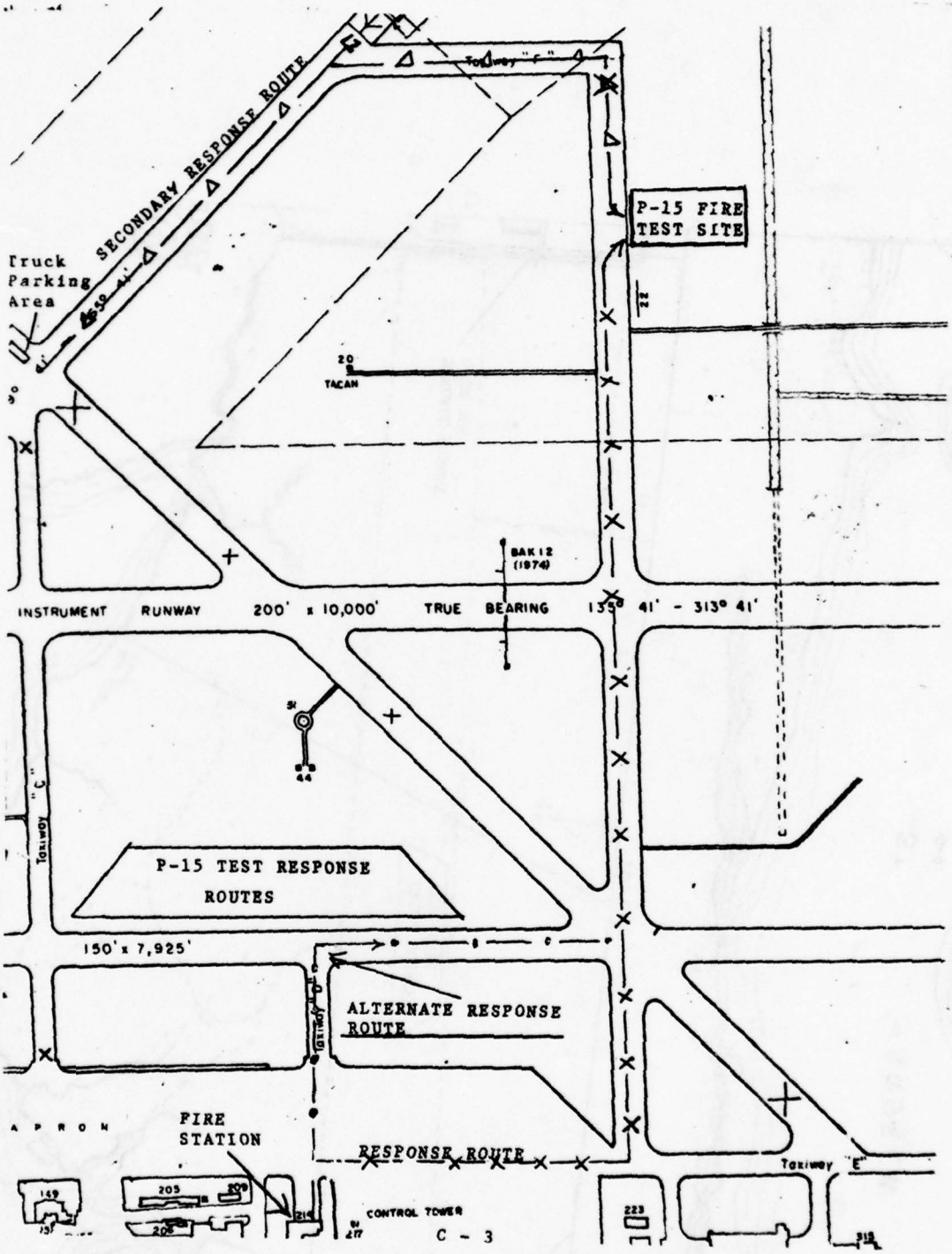


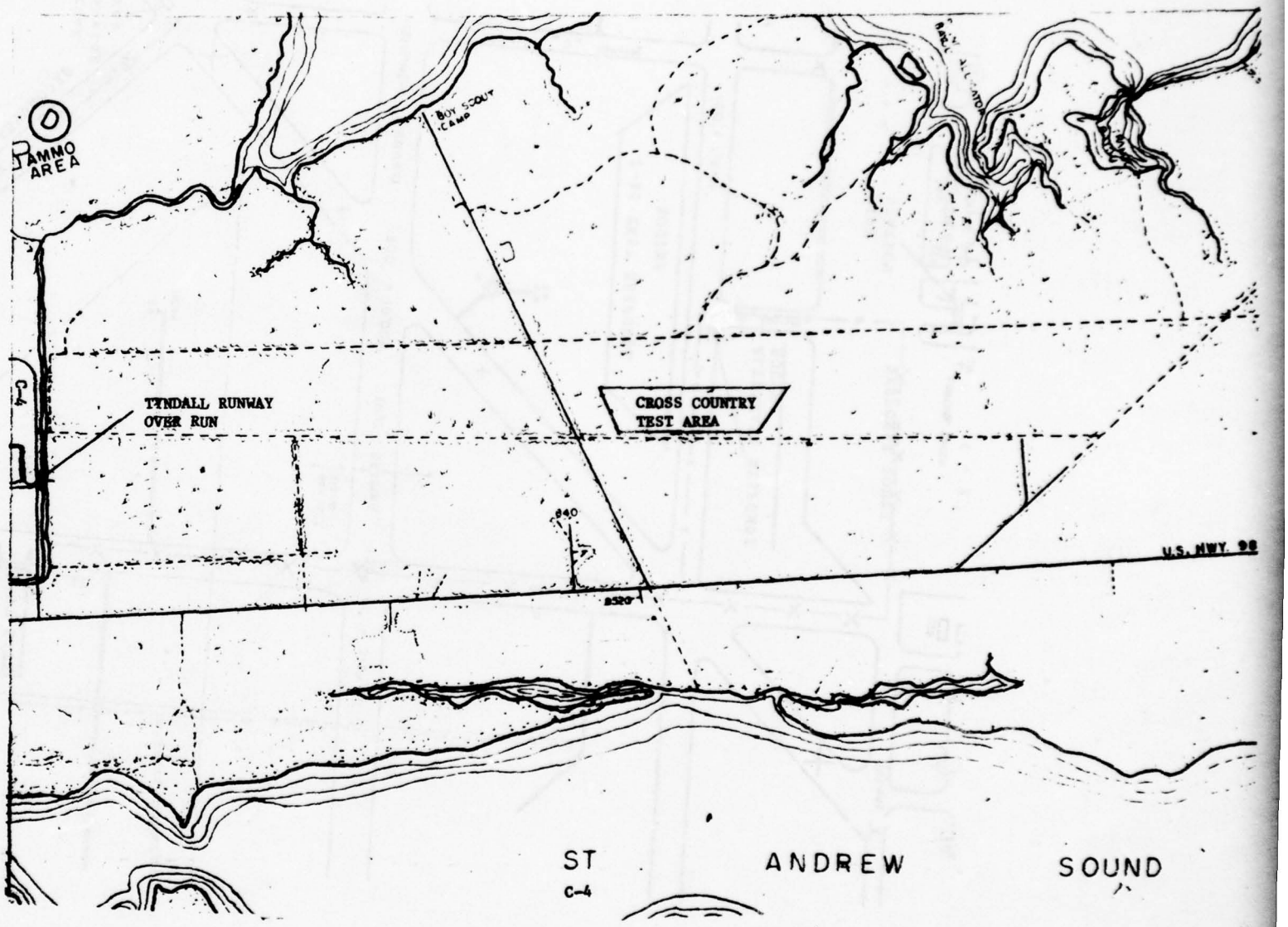
LOCATION PLAN

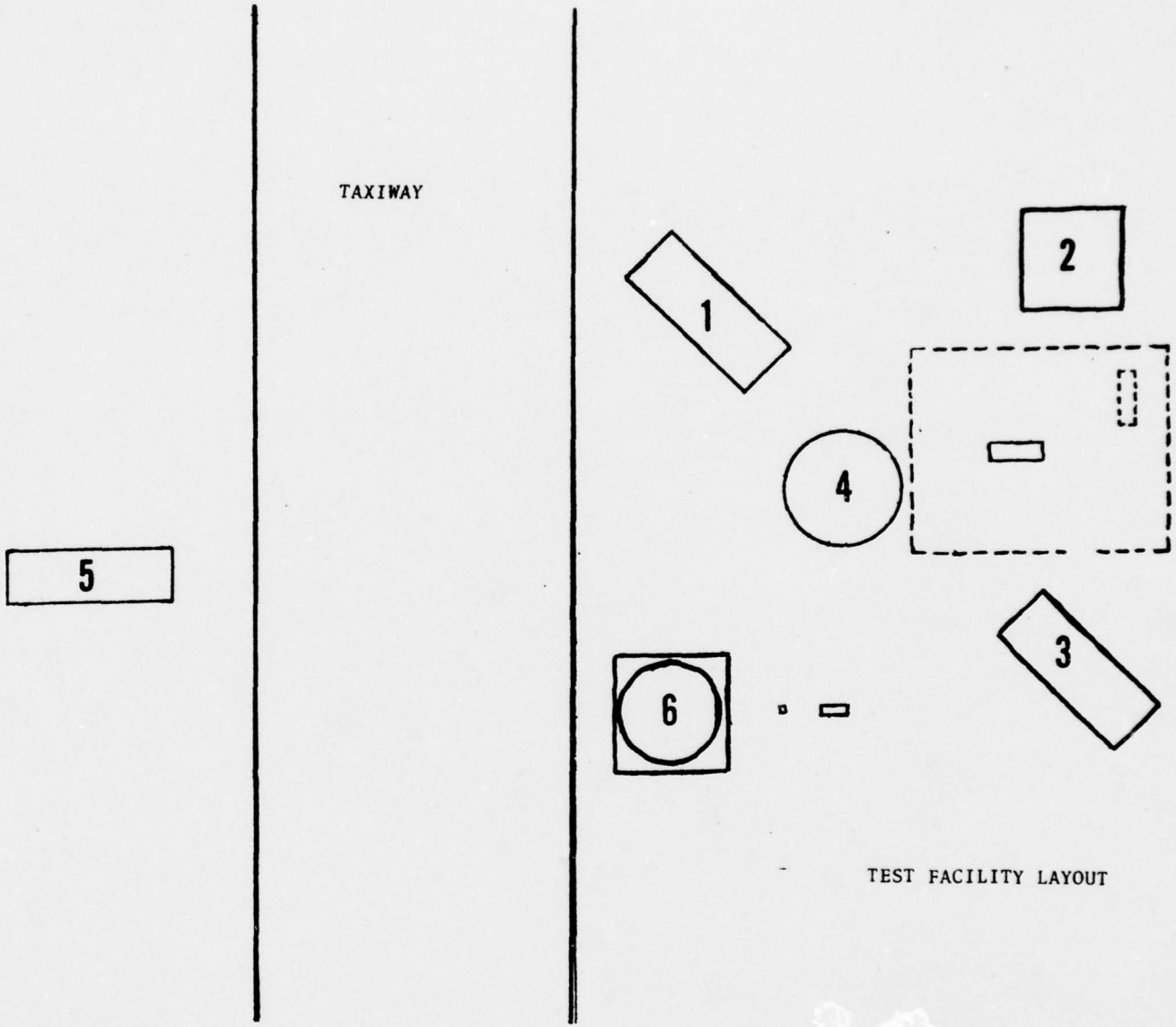
SCALE: NONE

P-15 FIRE TRUCK TEST FACILITIES,
TYNDALL AFB, FLORIDA


P-15 FIRE TEST SITE
NOTE
EACH AREA IS IRREGULAR IN SHAPE WITH A SURFACE AREA OF APPROXIMATELY 2500 SQUARE FEET LINED WITH SHELL AND CLAY.
TARGET BOARDS
4 X 8 FT TARGET AREA.
TARGET 1 70 FT HIGH
TARGET 2 40 FT HIGH
AREA 5
40'
80'
TAXIWAY 04/22
C - 2
200'-0"
AREA 1
150'
100'
110'
100' X 125' COMPACTED SAND/SHELL
AREA 4
2
AREA 2
NEW SMOKE TRAINING FACILITY
45°
110'
63'-0"
NEW UNDERGROUND WATER TANK
EXISTING TEST FACILITIES
AREA 3
205'-0"
315'-0"
EXISTING BLAST DEFLECTOR


SECONDARY RESPONSE ROUTE
Truck Parking Area
P-15 FIRE TEST SITE
TACAN
BAK 12 (1974)
INSTRUMENT RUNWAY 200' x 10,000' TRUE BEARING 133° 41' - 313° 41'
Taxiway "C"
P-15 TEST RESPONSE ROUTES
150' x 7,925'
ALTERNATE RESPONSE ROUTE
APRON
FIRE STATION
RESPONSE ROUTE
Taxiway "E"
CONTROL TOWER


AMMO AREA
BOY SCOUT CAMP
TYNDALL RUNWAY OVER RUN
CROSS COUNTRY TEST AREA
840
8520'
U.S. HWY. 98
ST ANDREW SOUND
C-4



TEST FACILITY LAYOUT

APPENDIX D

ITEMS TO BE CHECKED (CONT'D)	OPERATOR SIGNATURE	DAY
19. **INSTRUMENTS AND GAUGES** (during operation)		23
20. **UNUSUAL NOISES** (during operation)		24
21. **WINCH/TOWING CONNECTORS** (when installed)		25
22. **SHIFT TOWER & SWITCHES FOR PROPER OPERATION**		26
23. **ALL HYDRAULIC CYLINDERS FOR OPERATION**		27
24. PERFORM HOT CHECK/ENGINE/TRANSMISSION		28
		29
		30
25. **HAND LINE** /HOSE/REEL		31

26. **TURRETS** , HYDRAULIC & MANUAL

27. **PUMPS, PIPING AND VALVES FOR LEAKS AND CORROSION**

28. WINTERIZATION SYSTEM/CIRCULATING PUMPS

29. OPERATE ALL FIREFIGHTING DISPENSING SYSTEMS

30. SPARK CHECK

31. **SPARK CHECK** (Weekly and Scheduled Inspection Intervals)

TYPE INSPECTION (Weekly or Sched)	DATE DUE	DATE ACCOMP	OPERATOR OR MECHANIC SIGNATURE AND GRADE

☆ U.S. GOVERNMENT PRINTING OFFICE 1974 — 757-765

OPERATOR'S INSPECTION GUIDE AND TROUBLE REPORT
P-15 **FIREFIGHTING VEHICLE**

DATE (MO/YR)

VEHICLE TYPE	REGISTRATION NO.	
USING ORGANIZATION	LOCATION	PHONE NO.
VEHICLE CONTROL OFFICER NAME	GRADE	PHONE NO.

ITEMS TO BE CHECKED	OPERATOR SIGNATURE	DAY
1. **LUBRICATING OIL LEVELS**/ALCOHOL INJECTOR SYSTEM/LEVEL		1
2. **COOLANT, FUEL, AND HYDRAULIC LEVELS**		2
3. **FOR LEAKS** (Specify)		3
4. **CONDITION OF ALL DRIVE BELTS**/FAN CLUTCH		4
5. **TIRES, WHEELS, AND LUG BOLTS, FOR TIGHTNESS, PRESSURE AND DAMAGE**		5
6. **BATTERIES**/ISOLATOR		6
7. **CLEANLINESS, DAMAGE, MISSING ITEMS**		7
		8
		9
8. AIR FILTERS INTAKE/INDICATOR		10
9. **BRAKES, CLUTCHES** (Operation), **AIR TANKS** (Drain), **OPERATE PARKING BRAKE**		11
10. **STEERING**, STOPS SPRINGS & SHACKLES FOR DAMAGE		12
11. **SAFETY DEVICES** (warning lights, buzzers, fire extinguishers, seat belts)		13
		14
12. START ENGINE AND OBSERVE OPERATION OF ALL LIGHTS, SIRENS, RADIO, HORNS, MIRRORS		15
13. **WIRING/CIRCUIT BREAKERS** (visual only)		16
14. **SPECIAL EQUIPMENT**		17
		18
15. **FIREFIGHTING SYSTEM CORROSION/DAMAGE AND FOAM/WATER LEVELS**		19
16. EXHAUST SYSTEMS		20
17. **HEATER/DEFROSTER**		21
18. **WINDSHIELD/WIPERS/WASHERS** (condition and operation)		22

AFTO FORM 43X

VEHICLE/EQUIPMENT DISCREPANCY AND MAINTENANCE REPORT

OPERATOR REPORT			REPORTED TO MAINTENANCE				MAINTENANCE CONTROL REPORT			
ITEM NO.	DISCREPANCY	DATE DISC.	DATE	TIME	MILES/ HOURS	INIT.	WORK ORDER NUMBER	DATE	STATUS[1] CODE	INIT.

[1]STATUS CODES: C = Corrected; C–T by Temp Fix, C–P by Perm Fix; D = Deferred; D–P for Parts, D–M for Maint; D–O for Disposition; W = Waiver of Repairs. See Sec II, TO 00-20B-5

APPENDIX E

APPENDIX E

P-15 AUXILIARY EQUIPMENT

ITEM	QUANITY	LOCATION	SOURCE
Extinguisher, Halon, 91b (4.086 KG)	2	One in left storage Compartment.	Manufacturer
		One in cab	Manufacturer
Hose, Soft Suction, 16ft X 4½ inch (4.88M X 11.43CM)	1	Left storage compt	Using organization
Wrench, Hydrant 4½ inch (11.43CM)	1	Left storage compt	Using organization
Wrench, Spanner 4½ inch (11.43CM)	1	Left storage compt	Using organization
Cord, Extension, 115 Volt AC 100 ft (35M)	1	Right storage compt	Using organization

NOTE: An 80 GPM (302.8L/MIN) pump will be listed in TA 490 as an acceptable item for reservicing the foam system.

APPENDIX F

APPENDIX F

PREFACE

This paper delineates the concept of employment of the A/S32P-15 fire-fighting vehicle. The five main topics present a synopsis of the salient factors affecting the vehicle. This is a statement of Air Force intent regarding the employment of the P-15. Recommendation for change should be sent to AFCEC/DOZ.

GEORGE W. MORGAN
Director of Fire Protection

TABLE OF CONTENTS

APPENDIX F

1 PRIMARY OPERATIONAL EMPLOYMENT

1.1 The vehicle was designed to suppress fire in the ground environment on large frame aircraft using the drive-around firefighting concept. To this end, the vehicle carries 6,500 gallons (24,602.5L) of water and agent which can be applied at a rate of 1,200 gallons per minute (4,542L/MIN) through each of two turrets while the vehicle is moving at speeds up to 10 miles (16.09KM) per hour. The vehicle has good off-the-road mobility and is capable of responding to the scene of the fire at speeds up to 50 miles (80.45KM) per hour. During an aircraft crash, the fire scene can be scattered over a large area, thus requiring the vehicle to maneuver from one area to another while discharging agent to achieve fire control and protection of entrapped personnel. The P-15 will be used as part of an equipment package comprised of from three to five firefighting vehicles. It is not intended that the P-15 be the only vehicle used to combat aircraft fires. The intent is to use multiple vehicles at the fire in order to reduce firefighting time.

1.2 Two modes of primary employment are planned. Direct response will encompass the response from the fire station to the fire scene, including immediate application of agent. The prepositioned response will include actions taken during response from the fire station to an intermediate point, time delay at the intermediate point, and response from the intermediate point to the fire scene with immediate application of agent. The turret operators will ride to the scene of the accident at their duty stations in the turret cages with seat belts fastened during direct response. For a prepositioned response, the turret operators may ride in the cab depending on weather conditions or other operational factors.

2 FIREFIGHTING PROCEDURES AND TACTICS

2.1 The tactics for use of the P-15 for fire suppression situations will depend on many factors such as terrain restrictions, close ramp parking, and other unprogrammed or unforeseeable circumstances.

2.2 The basic concept for use of the P-15 is the drive-around method, in conjunction with other firefighting units. In instances where this concept cannot be employed, a fixed or semi-mobile concept will be used.

2.2.1 Drive-Around Concept

2.2.1.1 In the drive-around concept, the preferred method of manuevering is in a counterclockwise circle with the driver of the vehicle on the side of the fire.

2.2.1.2 The ideal method is to approach the upwind perimeter of the fire and turn so that the P-15 is broadside to the aircraft. This will allow the front turret operator to discharge agent when in range. As the P-15 approaches the broadside position and comes into range of the fire, the rear turret is charged and employed to the fire area. This procedure can be related to a quick knockdown and mop-up type attack. The same tactics are employed as the vehicle completes the drive-around concept until the fire is extinguished or agents are exhausted (approach in this manner will allow for partical extinguishment and reduction of heat and smoke as the vehicle reaches the downwind side of the fire.)

2.2.1.3 Adjustments to the above procedure would be made depending on whether the P-15 was first on the scene of if other units are already in operation. In this instance the drive-around concept would be used with the P-15 manuevering at the rear of already positioned vehicles.

2.2.2 Fixed or Semi-mobile

2.2.2.1 This procedure would be used in situations which would preclude the use of the drive-around concept such as terrain restrictions.

2.2.2.2 The P-15 should be positioned broadside to the fuselage with one turret on either side of the aircraft (splitting the fuselage). This will allow for maximum use of turret range to reach the tail of the aircraft, as well as the wing tips. Additional arriving units would alternate positions on the aircraft to effect a total fleet fire kill configuration.

2.2.3 Turret Employment

2.2.3.1 On initial approach the turrets should be elevated 30 degrees to achieve maximum range with stream selector indexed to straight stream. Turret operators should start discharging agent when they are close enough to reach the fire. As turrets approach the dispersed pattern range, approximately 75 feet (22.875M), turrets should be indexed to dispersed pattern and the flow selector repositioned as required. At this time turrets should be adjusted in elevation and oscillated back and forth to effect a rain drop pattern. If due to range the dispersed pattern is ineffective, turrets should be indexed to straight stream and the flow selector positioned for maximum fire knockdown. Turrets would continue to be elevated and oscillated to attempt formation of the umbrella effect.

3 SECONDARY EMPLOYMENT

3.1 The employment of the P-15 will normally be in the general flight line area. The capabilities of the P-15 may be employed in situations other than large aircraft crash accidents such as hangar, POL, ammunition and medium frame aircraft fires. For Multi-story or major

facility fires, the P-15 turrets could be substituted for master stream devices. Caution should be exercised in the use of the P-15 as a stationary turret platform due to the number of pumpers required to supply the P-15 at rated pump capacity by pumper using 3 inch (7.62CM) hose.

3.2 Another instance where the use of the high capacity vehicle would be beneficial is during ramp fires involving one or more aircraft of any size. Firefighter training with the vehicle and participation in disaster response exercises by the fire department are necessary to insure proper employment of the vehicle.

3.3 On the airfield the vehicle could be used to support other fire protection agencies under the purview of established mutual aid agreement.

3.4 The use of the vehicle for small frame aircraft emergencies, fuel spill washdowns and riot control and like operations is discouraged since other assigned firefighting vehicles are capable of performing these functions more satisfactorily. Secondary employment of the vehicle is subject to the constraints enumerated in Factors Affecting Vehicle Employment.

3.5 This vehicle will be kept on static alert as much as possible and will only be used to perform precautionary standbys under extraordinary circumstances. Rescue operations will be performed by firefighters from other vehicles. Therefore, rescue actions by the P-15 crew will be necessary only in most unusual circumstances.

3.6 The handline is provided for use in unusual circumstances such as a fire situation involving only the P-15 and no other vehicles with an operational handline. It will not be used in normal operations.

4 CREW REQUIREMENTS

4.1 Three people are required to operate the P-15; a driver and two turret operators. A select crew of qualified personnel will be assigned to the vehicle. The crew members must hold at least a five skill level and have received initial and recurring training on the vehicle. Crew members will be selected on the basis of demonstrated maturity, dependability and mission orientation.

4.2 The front turret operator will be the crew chief of the vehicle. The following crew chief's responsibilities are additional to those listed in AFR 92-1.

4.2.1 Inspection Responsibilities

(1) Performs overall inspection of vehicle.

(2) Directs crew during inspection of vehicle.

(3) Supervises crew during preventive maintenance.

(4) Supports vehicle maintenance during minor maintenance activities.

4.2.2 Emergency Response Responsibilities

(1) Respond to front turret position.

(2) Dons protective clothing.

(3) Dons headphones and directs communications check between crew.

(4) Verifies with driver communication between control center/senior fire official, etc.

(5) Directs driver to move vehicle to fire scene by most direct route and/or IAW department OIs/prefire plans.

(6) While enroute to the scene, the crew chief will size up the fire and select the required flow rate of 600 or 1200 GPM (2271L/M or 4542L/MIN).

(7) Approximately 500 feet (152.5M) from the fire the crew chief will engage the pump and direct the driver to proceed to the desired position. The driver will relay information from the senior fire officer to the crew chief.

(8) Upon completion of fire suppression, informs crew that fire-fighting system is being disengaged.

(9) Directs driver to reservice point via most direct route and/or IAW department OIs/prefire plans.

(10) Supervises and performs reservice and preventive maintenance procedures on the A/S32P-15 fire truck.

4.3 Crew Safety

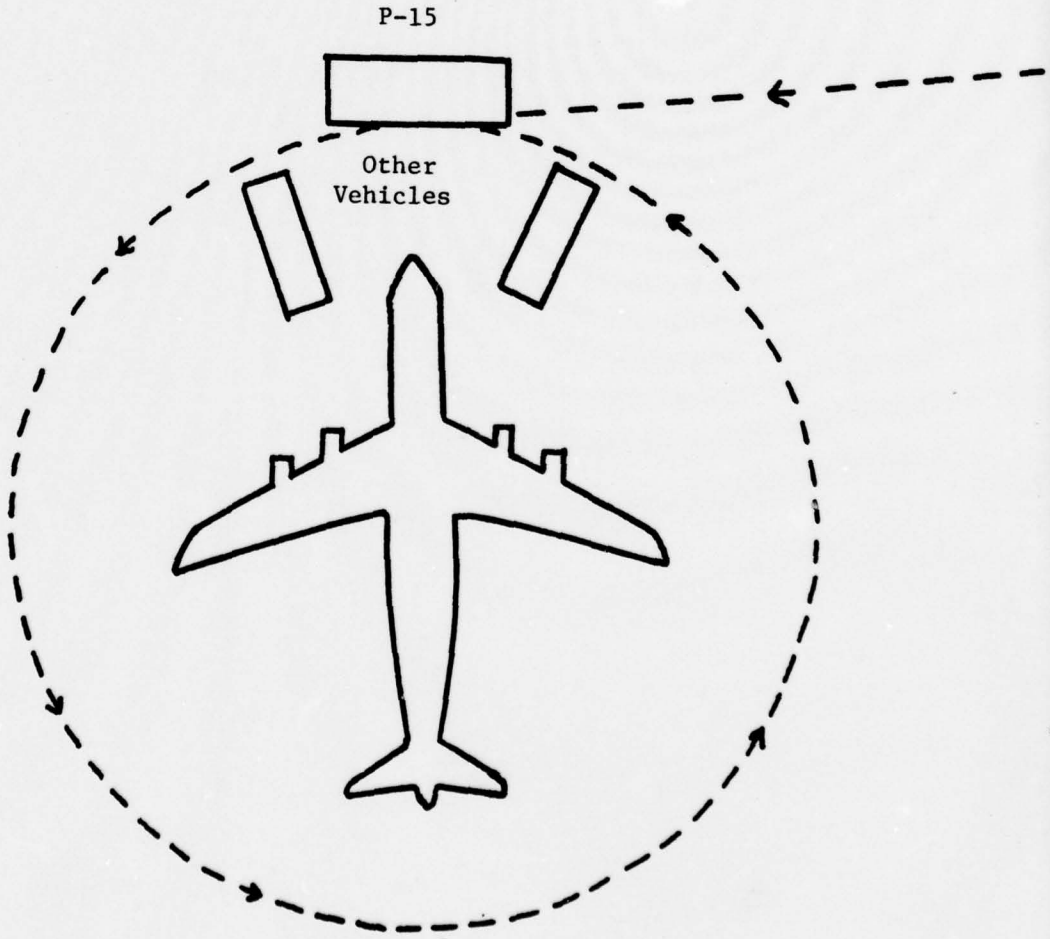
4.3.1 Personnel assigned to A/S32P-15 will comply with safety standards at all times. The crew chief will advise driver when to move vehicle out of station. When at the fire scene the senior fire official may assume command of the A/S32P-15 and direct the driver to the most advantageous point for fire suppression, but the crew chief is still responsible for safety compliance.

4.3.2. The crew chief will not back the A/S32P-15 at any time without a spotter. The spotter will have direct communications with the driver, utilizng headphones and vehicle communication system.

5 FACTS AFFECTING VEHICLE EMPLOYMENT

5.1 Several factors affecting the employment of the P-15 are its size, maneuverability, and crew proficiency. The size of the vehicle will constrain its use in narrow or confined spaces, as well as create a potential traffic hazard. Overhead power and telephone lines may restrict the routes available for response to the fire scene and for trips to vehicle maintenance facilities. The vehicle's 75 foot (22.875M) turning radius may restrict its use in POL and ammunition areas, in addition to limiting its use in mutual aid of other firefighting organizations. The dimensions of the fire station stall will preclude turret operators from assuming their firefighting positions before leaving the fire station. The proficiency of the crew will depend on proper training, adequate communication, and sound teamwork with other firefighting vehicles.

5.2 The base fire chief will consider the above factors when preparing prefire plans involving the use of the P-15.



IDEAL P-15 APPROACH TO FIRE

APPENDIX G

APPENDIX G

ADDITIONS OR DELETIONS, T.O. 36A12-8-16-1 FOLLOW:

Insure that lubrication chart indicates correct oil for the following assemblies:

Transmission
Axle Planetary Units
Steering Axle CUV Joints
Engines

In lube chart, alcohol injector not serviced in warm weather; empty it or will collect moisture.

Recommend it be serviced year around or make provisions for draining or bypassing it during warm weather.

Two legends for lube chart: Recommend the original one Fig 3-3, page 3-20 be deleted.

Engine air box drains not included in maintenance chart Fig 3-2. Recommend it be included.

Procedures for some services not included:

Recommend servicing procedures including locations be included for the following:

Engine oil level
Power divider oil level
Transmission oil level
Engine coolant level
Winterization tank fluid level
Alcohol injector
Draining air reservoirs
Lubricator, handline rewind motor
Steering hydraulic oil reservoir
Turret hydraulic oil reservoir (redesign may eliminate this item)

A caution added warning of damage to drive train if down shifting is performed.

APPENDIX H

APPENDIX H

T.O. 36A12-8-16-2 requires completion, additions, and corrections as follows:

Include an index in the Roman Numeral section.

Complete the list of illustrations.

Include easy to read system schematics to include:

Electric
Air
Agent Dispensing
Winterization
Fuel, Engine and Booster Heaters
Turret Hydraulic
Steering Hydraulic
Transmission Hydraulic
Alternator and Regulator
Booster Heater Internal Wiring
Power Divider Hydraulic

Figure 1-32 no longer correct; two inversion valves removed.

Figure 1-33 no longer correct; two inversion valves removed.

Figure 1-34 not correct; air throttle cylinder (1) completely changed. Pressure limit valve (3) and the No 2 inversion valve (4) have been removed.

Correct the narrative, para 1-14 as appropriate.

Figure 1-40 no longer correct plate #03592X.

In Table 1-1, specifications include the following:

Fire Pump Drive Transmission
Power Divider
Auxiliary Tranmission
Air System
Turret Hydraulic System

Change para 4-8,a, to read as follows: To adjust the clutch refer to Fig 5-136 and proceed as follows: Thread nuts (33) completely to the head of screws (34) and thread the screw completely into block (32). Place a bar into the box of clutch shaft (140) and manually engage and disengage the clutches. The clutch linkage on the bearing engaged with yoke (142) must be able to travel full length both ways with no stopping

it by any part of the air chamber (29) and bracket (35) assembly. If not, loosen screws (36) and position bracket (35) on the slotted holes to allow this. Retighten screws (36). It may also be necessary to loosen nuts (33) on push rods of air chambers (29) and adjust the push rods in block (32), then retighten nuts (33). With a bar in the box of clutch shaft (140), manually engage the clutch and hold some pressure on the release bearing and yoke (142). Back out screw (34) against bracket (35) right enough to just relieve the pressure being held on the bearing. Tighten nut (33) to lock screw (34) to block (32) in this position. Back out opposite screw (34) to allow 0.84 inch (21.34MM) gap between the screw head and the bracket (35), tighten nut (33) to hold the screw in this position. Disengage the clutch. Note this procedure applies to both the water and foam pump clutches.

Fig 4-4 shows Caterpillar engine; should show the V-8, 92GMC engine.

Para 5-13 requires revision. Add the following steps as appropriate:

a. Disconnect radiator fill neck drain hose.

b. Remove brackets for wiring on underside of platform.

c. Remove screws (23, Fig 5-131) lock washers (28) and washers (29) from engine air cleaner support bracket.

d. Remove three brackets for turret hydraulic oil reservoir drain hose from side radiator mount and ceiling.

e. Disconnect wiring connector from the converter lockup control box, rear turret only.

f. Disconnect turret heater hoses, winterized vehicles only.

g. Close water tank shut off valve.

Revise para 5-13,a,(10) to read as follows:

Attach a hoist of at east 1 ton (.90MT) capacity to the turret and platform.

Make the above corrections to the installation procedure as appropriate.

Para 5-79. Ref T.O. Fig 5-78 is incorrect, should be Fig 5-79.

Figure 5-99 no longer correct, bypass system control valve (34) removed.

Para 5-110 requires some revision. After para 5-110,b, add the following step:

a. Disconnect two vitaulic couplings (17, Fig 5-107) and (27) and remove the discharge pipe.

Revise para 5-100,b,(8) to read:

Disconnect the water pump discharge pipe at the water pump discharge flange (6).

Fig 5-116 no longer correct. There are now two flush valves instead of one.

Review figures 5-127 and 5-128 and make necessary corrections. Example: items 6,9, and 10 no longer on the vehicle as shown.

a. Remove four bolts from engine front mounting bracket. (Include the items in Fig 5-135 and make appropriate references.)

b. Remove screws (2, Fig 5-129) lockwashers (3) and remove the transmission cooler, disconnect and capt the hoses.

NOTE: Transmission oil does not have to be drained, level is below the cooler.

c. Disconnect cold start unit hose from the thermacloz (5 Fig 5-272).

d. Remove the power divider dipstick and tube, front (21, Fig 5-144); rear, (22, Fig 5-148).

e. Remove winterization tank, rear engine only, on winterized vehicles.

f. Remove foam tank shutoff valve handle; rear engine only. (Redesign may eliminate this step).

g. Remove foam pump drain valve handle.

Correct the subparagraphs to 5-136 as follows:

a,(4) should read: Disconnect air lines, fuel lines, steering lines, oil lines, wiring at connectors on panel and cooling hoses from engine and power divider.

a,(7) Figure reference should be, items 1, 4, 5, 6, and 7: Figure 5-134.

a,(10) Ref (2) cannot be found.

a,(11) Ref (3) cannot be found.

a,(13) Ref (4) cannot be found.

a,(14) Should read: Remove screws (61, Fig 5-135) nuts (62), plate (63) and mounting centers (64)

a,(15) Figure ref should be (49, Fig 5-127).

Make above corrections to the installation procedures as appropriate.

36A12-8-16-2 Para 5-127

Revise para 5-137,e, (36) to read as follows: Attach bracket (35) to housing (157) with screws (36), lockwashers (37), and washers (38).

T.O. 36A12-8-16-2 Para 5-137

Revise para 5-137,e,(38) to read as follows: Install one nut (33) onto push rods of clutch air chambers (29). Attach blocks (32) to the push rods with a second nut (33). Install one nut (33) onto screw (34) insert the screw into the blocks, with the screw head towards the clutch air chambers. This screw becomes a travel stop with locknut. Connect the block to the clutch shaft (140) with pin (28). Install washers (27) onto the pins and secure with cotter pins (26).

Then make reference to para 4-8 for adjustments.

Para 5-148, include testing procedures for the generator regulator.

Para 5-153, include an illustration and the procedure to lock the fan clutch in the event of air application failure.

Para 5-169 in subparagraph 3, reference Section IV.

Para 5-194,a. Reference to Fig 5-194 is incorrect, should be Fig 5-274.

Para 5-194,c. In the subparagraphs, the number (7) is used twice. The second one should be (8).

Para 5-194,c. Subparagraph (19) should follow (14) and be revised to read as follows: Adjust both axle tire rods to provide 0 to 0.12 inch (3.048MM) toe-in. Determine and mark the centers of the four hubs. Measurement between the centers, both sides, should be within 1/8 inch (3.30MM). If not readjust length of drag link (3).

NOTE: To find centers of the hubs, rotate them to place the screws (6, Fig 5-376) in horizontal position. Measure between the most narrow points of the vertical webs between the screws.

Para 5-194, c,(17). Is difficult to read and should be revised. Suggest the following: Axle steering stops (91, Fig 5-376) located at the tie rod arms are preset for the axle. There are also stops on the other side of the ball socket located at the hydraulic cylinder anchors. To

adjust these, first back off the Pitman arm stop screws (10), then adjust the left cylinder side anchor stop to make contact at same time right tie rod side stop does, then the right cylinder side anchor stop to make contact at same time left tie rod side stops does. The stops must insure a minimum clearance of one inch between tires and any point of truck frame or body. Delete the note after subparagraph (18). Figure 5-376 not completed. Stop screw and nut opposite items 91 and 92 not shown. An exploded view of item 90 for the opposite end would correct this. They could then be referenced in paragraph 5-194,c,(17).

Para 5-198. After subparagraph 2, add specifications and diagrams.

Fig 5-280 not correct. Items 7 and 8 shown in wrong relationship.

Fig 5-282 not correct. Items 11 and 15 are u-joint; not u-bolt. Items 3,4, and 8 could be better identified as u-joints.

Para 5-202 requires revision. Add the following steps:

a. Remove clevis from end of winch cable to thread it through the block.

b. Draw cable completely off of the drum and carefully rewind and lay the cable on the drum to avoid tangles and jerking under the weight of the unit. NOTE: Use leather gloves to handle cable to avoid injury to hands.

c. During actual lowering and raising of the heavy units, use a transmission jack in conjunction with the winch.

Fig 5-302 shows only one "E" clutch pressure switch. Truck electrical system schematic shows two.

Fig 5-303 shows P-4 controller. Item numbers incomplete and do not match the items.

Fig 5-304, items 14 through 18. An adapter unit on the vehicle between items 13 and 14 is not shown.

Fig 5-113, page 5-414 should be Fig 5-313.

Para 5-22 and Fig 5-361. The limiting valves have been eliminated from the system.

Para 5-232,c. Somewhere in paragraphs (6) through (9) include procedures and specifications to adjust the lockout linkage travel.

Para 5-33c. Somewhere in paragraph (8) through (11) include procedures and specifications to adjust the lockout linkage travel.

Para 5-236,b. After subparagraph (8), include procedures and specifications to adjust lockout linkage travel.

Para 5-238. An incorrect statement in the first paragraph, second sentence. Correct would be: air pressure operates against both sides of a diaphragm which engages and disengages a splined collar within the differential case.

Fig 5-399 incorrect. There is a threaded port instead of items 15, 16, and 17 .

Para 8-9,b(2). Operating temperature 185-230 degrees F (85C-110C) is different from -1. Change page index #20 which reads 120-200 degrees F (49C-93C).

APPENDIX I

T.O. 36A12-8-16-4 Requires completion, additions, corrections as follows:

Table of Contents not complete.

Section III, Numerical Index missing.

Include meaning of Q and R suffix letters to index number in the Introduction.

Include air system and components.

Electric system components not all inclusive.

Many blanks for figures referring to OTC drawings.

Fig 30. Item no longer used?

Fig 89. No longer correct, bypass of item 34 removed.

Fig 95 (Sheet 1 of 2). Drawing could be rearranged for easier reading and ghost in the foam pumps.

Fig 104. No longer correct; now two flush valves.

Fig 127. Include the bracket with the front engine that mounts the radiator.

Fig 128. Filler tube for the power divider is not shown.

Fig 186. Delete; no longer used.

Fig 188. Item 36 not installed on test vehicles, delete? Show another key, item 40, at the lever, item 37.

Fig 189. Items 3 and 4 and items 7 and 8 shown in wrong relationship.

Fig 213. Suggest that the neutral safety switch, the shift stand micro switch, and the "E" clutch pressure switch be indexed with a part number, or combine figures 213 and 214.

Fig 223 incorrect. Should be threaded port instead of items 14, 15 and 16.

Fig 238 incorrect. Now two each of item 28 and related parts.

Fig 243 incorrect. Threaded port instead of items 15, 16, and 17.

Fig 249 (Sheet 1 of 2). Item 1 has been changed.

APPENDIX J

APPENDIX J

INSTRUCTIONS, OFFLOAD FROM TRAILER

Use of equipment and following the procedures herein will facilitate unloading the A/S32P-15 fire truck from a trailer with maximum safety to personnel and equipment.

Requirements:

Personnel:

2 Crane Operators
3 Mechanics and/or Operators
1 Forklift Operator

Equipment:

2 Cranes, each at least 30 ton (27 metric tons) capacity.
1 Impact wrench, 1 inch square drive with 6 inch (15.24CM) extension and wheel lug nut socket, or manual wrench with 36 inch (91.44CM) handle.
1 Forklift, 4000 lb (1,816KG) capacity with pneumatic tires.

Preparation:

Area must be level, paved and large enough to accept a tractor trailer about 60 feet (18.3M) long and allow for movement of the cranes and forklift around it.

NOTE: Total weight of the tractor trailer with fire truck loaded can be 60,000 to 80,000 pounds (27,240KG to 36,320KG).

The eight tire and wheel assemblies with tires properly inflated must be in the unloading area and positioned for ease of approach and pickup by the forklift.

Procedures:

Position tractor trailer so it can drive out as soon as the fire truck is lifted.

Remove four covers (1, Fig 17) T.O.: 36A12-8-6-4, top deck of the fire truck to gain access to the lifting shackles.

Position the cranes at side of the trailer one at each end of the fire truck with boom in line with the lift shackles.

Attach slings to lift shackles and crane hooks, take up slack and center the lift points for balance and straight lift.

Remove all tiedowns from the fire truck to trailer.

Both cranes lift together until truck clears the trailer. Driver then moves the trailer from under the fire truck.

Both cranes now, slowly and together, lower the fire truck to the pavement, setting it on the walking beams (30, Fig 236) and (30, Fig 244) T.O.: 36A12-8-16-4.

Two steering hoses to front steering valve (11, Fig 188) T.O.: 36A12-8-16-4 which may be disconnected and tagged can now be connected.

Reposition the cranes one to front and one to rear of the fire truck, reconnect the slings to crane hooks and center the lift points for balance and straight lift.

Both cranes lifting together slowly raise vehcle to allow forklift to install the wheels. (Bottom of hubs approximately 30 inches (76.2CM) from ground.)

With forklift install the eight wheels each with four lug nuts spaced at 90 degrees and snugged.

Install balance of lug nuts on the wheels and properly torque them.

Lower vehicle to ground, remove slings and replace the four covers over the lift shackles.

APPENDIX K

APPENDIX K

LIMITED TECHNICAL INSPECTIONS AND MAINTENANCE WORK ORDERS

1. The limited technical inspections were prepared upon receipt of the vehicles.

2. The work orders record the services and repairs performed on the vehicles during the test program. Date in columns 21 and 22 indicate when completed. Column 23A and B lists parts or materials used and X in Column 23C indicates that a test report was prepared.

LIMITED TECHNICAL INSPECTION–MOTOR VEHICLE
(Bold type entries indicate major assemblies)

1. MANAGEMENT CODE:

2. FSN	3. VEHICLE REGISTRATION NO.	4. MILEAGE/HOURS	
4210-01-013-2825	~~A/S32P-15~~ 77-1191	387.1	Engines Front- 91.1 rear - 38.8

5. NOMENCLATURE	6. MANUFACTURER
Truck, Crash Fire	O.T.C.

7. MODEL	8. SERIAL NUMBER	9. ACCEPTANCE DATE	10. STANDARD PRICE	11. REPLACEMENT CODE
A/S32P-15	15842	17 Oct 77	$400,000	

12. TYPE INSPECTION: [X] ACCEPTANCE [ ] DISPOSITION [ ] ONE TIME REPAIR [ ] DEPOT REBUILD [ ] RECEIVING [ ] SHIPPING

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
13. FRAME	X		1.0		Weld front cross member
14. BODY	X				
15. GLASS					
16. PAINT					
17. UPHOLSTERY					
18. WIPER, MOTOR, ARMS, BLADES					
19. MIRRORS, HORN	X		1.0		Readjust
20. LIGHTS	X		1.0		RF Switch wrong
21. SIREN, BEACON RAY, FLOOD LIGHTS					
22. GAGES, INDICATORS, SENDING UNIT	X				Fuel - water and foam level
23. ENGINE					

Front 91.0 hrs — COMPRESSION TEST: N/A

CYLINDERS	1	2	3	4	5	6	7	8
DRY								
WET								

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
24. SPEEDOMETER, TACHOMETER, HOURMETER	X				Tachometer Frt eng
25. HEATER, AIR COND.					
26. BATTERY	X				Corrosion
27. CHARGING SYSTEM					
28. STARTING SYSTEM					
29. IGNITION SYSTEM					
30. FUEL SYSTEM					
31. COOLING SYSTEM	X		2.0		Hose clamps loose
32. EXHAUST SYSTEM					
33. EXHAUST EMISSION HOSES, VALVES					
34. SERVICE BRAKES					
35. PARK/ EMERG BRAKES					
36. CLUTCH					
37. TRANSMISSION	X		3.0		Dipstick/leaks
38. SUBTOTAL					

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
39. TRANSFER CASE(S)					N/A
40. POWER TAKE-OFF					
41. STEERING MANUAL/ POWER	X		0.5		Hose connectors leak
42. SUSPENSION SPRINGS/ SHOCKS					
43. DRIVE LINE U-JOINTS					
44. AXLES AND HOUSING ASSY		X	4.0		seal leaks
45. DIFFERENTIAL(S) FINAL DRIVE(S)	X		1.0		Leak has R/R
46. TIRES, RIMS, TRACKS					
47. BOGIES, TRUNIONS, TORQUE ARMS					
48. SPROCKETS, ROLLERS, IDLERS					N/A
49. AUX ENGINE					N/A

Rear 38.8 hrs — COMPRESSION TEST: N/A

CYLINDERS	1	2	3	4	5	6	7	8
DRY								
WET								

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
50. FIFTH WHEEL					N/A
51. HYDRAULIC SYSTEM					
52. HYDRAULIC CONTROLS					
53. TANK AND PIPING	X		2.0		Pump compt - unit coupling
54. LIQUID PUMP	X		2.0		Packing adjustment
55. HOSE REELS, HOSES, NOZZLES					
56. AUX GENERATOR					N/A
57. BOOM ASSY, SHEAVES, CABLES					N/A
58. SAFETY LIMIT DEVICES					
59. LANDING GEAR ASSY					N/A
60.					
61.					
62.					
63.					
64. SUBTOTAL					

AFTO FORM 91 MAY 72

REPLACES AFTO FORM 91, JUL 62, AND DD FORM 1361, DEC 61, WHICH ARE OBSOLETE.

AFLC–WPAFB–APR 73 405M

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
CRASH FIRE TRUCKS					
65. TURRET SYSTEM					
66. COOLANT SYSTEM HAND PUMPS					
67. BATTERY CHARGER					
68. REF. UNIT/ CO_2 SYS 0-6					
69. FOAM CB SYSTEM					
70.					
FUEL SERVICING UNIT					
71. DRAINS					
72. FILTERS					PRESSURE DIFFERENCE INLET ..... OUTLET ..... PSI
73. STATIC GROUND SYSTEM					
74. METERS/ PUMPING SYSTEM					
75. SEGRE-GATORS					
76. HOSE Reel ASSEMBLY					
77. AIR CYLINDER CONTROLS					
78. MANHOLE COVER AND VENTS					
79. VALVES, AUTOMATIC, MANUAL					
80.					
MATERIALS HANDLING EQUIPMENT					
81. CABLES, CHAINS, HOSES					
82. MOTORS, ELECTRIC, AIR, HYDRAULIC					
83. CONTROLS					
84. CARRIAGE, FORKS, MAST, CYLINDERS					
85.					
86.					
87. SUBTOTAL					

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
BASE MAINTENANCE EQUIPMENT					
88. AGITATOR					
89. BITS AND AUGERS					
90. BOILER, BURNER, AND BLOWERS					
91. CANTILEVER, YOKE ASSY.					
92. CONTROLS AND SWITCHES					
93. CONVEYORS					
94. DIPPER, CLAM, BACKHOE					
95. DRUMS					
96. FAIRLEADS					
97. GANTRY A-FRAME					
98. HEATERS, FLUES AND STACKS					
99. INTER-COOLERS, AFTER-COOLERS					
100. MOLDBOARD CIRCLE SCARIFIER					
101. SICKLE GUARDS AND PITMAN					
102. ROTOS AND PADDLES					
103. SPRAY BAR, PIPING CONNEC-TIONS					
104. TOGGLE PLATES					
105. PRESSURE REGULA-TORS					
106. APRON, BOWL, TAILGATE					
107. STEERING, BRAKES					
108.					
109.					
110.					
111. SUBTOTAL					

REPAIR SUMMARY

COST FACTORS			AMOUNT
112. LABOR	NO. HOURS	HOURLY RATE	
DIRECT			$
INDIRECT			$
113. MATERIAL			$
OTHER			$
114. TOTAL OF THESE REPAIRS			$
115. MAXIMUM ONE-TIME REPAIR ALLOWANCE			$
116. ESTIMATED ADDITIONAL SERVICE FROM VEHICLE IF REPAIRS ARE ACCOMPLISHED			MILES/MONTHS

117. LIST MOD/TCTO'S NOT ACCOMPLISHED (Give authorization)

118. INSTALLATION — 119. DATE

120. SIGNATURE AND TITLE OF INSPECTOR

121. CERTIFICATION

ENTRIES WERE TRUE AND CORRECT AS OF DATE SHOWN AT RIGHT. — AS OF DATE

TYPED NAME, GRADE AND TITLE OF CERTIFYING OFFICER

SIGNATURE OF CERTIFYING OFFICER

122. REMARKS

WORK ORDER

- ☐ ACCIDENT REPAIR
- ☐ CONTRACT MAINTENANCE
- ☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0001		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/C CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. STD HRS	22. MAN NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Rear trans - dipstick RS					X					
02				GL Reset circuit breaker (R/turret RS control panel)					X					
03				GL Oil pressure sw C R. Eng RS					X					
04				GL Turret Switch RS					X					
05				GL RS										
06				GL RS										
07				GL RS										
08				GL RS										
09				GL RS										
10				GL RS										

WORK ORDER

☐ ACCIDENT REPAIR
☐ CONTRACT MAINTENANCE
☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/O	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0002		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REC.	TIME
		M/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. COMPLETION DATE	22. MAN-HRS	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST XSX QQSD REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Repair screen agent sys relief										
				RS valve pilot	19 Oct 77		Temporary Repair							
02				GL Replace fitting: hose in	Complete									
				RS RR Eng compt agent flush sys	18 Oct 77			Fitting 1½ in						
03				GL Fabricate bracket in cab to	One in									
				RS hang headset	cab OK									
04				GL L.R. spotlight	Complete									
				RS	18 Oct 77									
05				GL Rear transmission oil add 2	Complete			Filter element						
				RS gal - change filter	18 Oct 77			oil 2 gal 7 5						
06				GL Front transmission oil add	Complete			Filter element						
				RS 1 gal - change filter	18 Oct 77			oil 1 gal						
07				GL Rear turret Hyd leak loose										
				RS fittings	19 Oct 77			Oil 1 gal						
08				GL Rear eng shutdown sol										
				RS loose lock nuts	19 Oct 77									
09				GL Oil temp gauges cab	OK									
				RS	25 Oct 77									
10				GL Rear eng hourmeter										
				RS	25 Oct 77			Hourmeter						

WORK ORDER

☐ ACCIDENT REPAIR
☐ CONTRACT MAINTENANCE
☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9 DATE RCVD	TIME
0003		77L 491				☐ INITIAL ☐ COMPLETE		19 Oct 77	

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL.	TIME
			☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. COMPLETION DATE	22. ~~CKD~~ IND.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST ~~XRX~~ ~~XSX~~ ~~6057~~ REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Repair winterization system RS	21 Oct 77									
02				GL Repair handles on 2½" RS discharge	21 Oct 77									
03				GL Replace light and sw. R.S. RS stowage compt				Light Assy switch						
04				GL Repair F eng tachometer RS in cab	20 Oct 77		Temporary rewire							
05				GL Fuel gauge incorrect RS	1 Nov 77									
06				GL Foam and water press gauges RS	OK 26 Oct 77		Procedure							
07				GL Gauges rear turret panel RS erratic	26 Oct 77			Press switch	X					
08				GL Oil dipstick rear engine RS	21 Oct 77		Procedure for check	cold						
09				GL Valve front turret disch closes RS manual not under press	1 Nov 77		OK; hydraulic not powerful enough	cylinder						
10				GL F/eng oil temp sending unit RS does not work	21 Oct 77		Bad Connector							

AFTO FORM APR 75 383 PREVIOUS EDITION WILL BE USED. **VEHICLE AND EQUIPMENT WORK ORDER** 2

WORK ORDER

☐ ACCIDENT REPAIR
☐ CONTRACT MAINTENANCE
☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0004		77L 491				☐ INITIAL ☐ COMPLETE		20 Oct 77	

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/C CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. COMPLETION DATE	22. [illegible] NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE/TIME	B. OFF DATE/TIME	C. TOTAL HRS
01				GL Neutral safety sw RS	OK 21 Oct 77		Procedure for shit to neutral							
02				GL Speedometer sticks on "0" RS	9 Nov 77		Procedure							
03				GL Air Leak rear vent quick RS release	26 Oct 77			Valve quick release						
04				GL Hyd line press manifold to RS panel leaking R turret	21 Oct 77				X					
05				GL F/Trans oil temp sending unit RS	OK 25 Oct 77			Send Unit						
06				GL Foam regulate valve leaks RS	21 Oct 77									
07				GL Front power divider filter RS leaking	21 Oct 77									
08				GL Adjust hyd pressure front RS turret	21 Oct 77									
09				GL Loose fitting rear trans suck RS line	21 Oct 77									
10				GL Agent water level gauge in RS cab	21 Oct 77		To be chg to lights	Power Unit						

AFTO FORM APR 75 383 PREVIOUS EDITION WILL BE USED. **VEHICLE AND EQUIPMENT WORK ORDER** 2

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0005		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY.	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/C CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. COMPLETION DATE	22. COMPLETION TIME	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE/TIME	B. OFF DATE/TIME	C. TOTAL HRS
01				GL Shorten hose boost heater RS to circ pump	21 Oct 77		Insulated the hose							
02				GL Both water pump packing leaks RS	21 Oct 77									
03				GL L.S. Booster heater RS Dosn't run	21 Oct 77									
04				GL Rear coolant pump RS Dosn't run	21 Oct 77									
05				GL Replace foam test tube RS line	27 Oct 77			3/8 nylon tube						
06				GL Vent tube leak R.H. RS foam valve	27 Oct 77			Fitting (replaced)						
07				GL Replace cotter key R.H. RS foam valve cyl mount	26 Oct 77									
08				GL Turret lock safety switch RS rear turret	2 Nov 77			Switch						
09				GL Check connections of of wires RS 654, 654A and 681	4 Nov 77		654 and 654A not used at handline control, 681 cycle sys for engineers.							
10				GL Metal support brackets top end RS of trans fill tubes	21 Nov 77				X					

WORK ORDER

- ☐ ACCIDENT REPAIR
- ☐ CONTRACT MAINTENANCE
- ☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0006		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/C CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. Completion DATE	22. TIME	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE / TIME	B. OFF DATE / TIME	C. TOTAL HRS
01				GL Lube chassis and "U" joints RS	1 Nov	77								
02				GL Both turret discharge valves RS won't open hyd	26 Oct	77			X					
03				GL Crash mode engagement RS Have to hold switch	27 Oct	77		Relay	X					
04				GL Repair welds both turret RS cage mounts	26 Oct	77			X					
05				GL R foam pump packing leak RS	27 Oct	77		Packing	X					
06				GL Rear engine shutdown RS Linkage binding	26 Oct	77								
07				GL Both water pump packing leak RS	27 Oct	77								
08				GL Both turret discharge interrupt RS button inoperative	27 Oct	77								
09				GL Both turrets turn too far - RS danger to operators	27 Oct	77			X					
10				GL Remount rear turret RS carriage lock to rear	27 Oct	77								

WORK ORDER

☐ ACCIDENT REPAIR
☐ CONTRACT MAINTENANCE
☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0007		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY.	9A. DATE REL.	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. Completion STD HRS	22. MAN NO	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE/TIME	B. OFF DATE/TIME	C. TOTAL HRS
01				GL Both trans not shift properly. RS Adjust linkage	27 Oct 77									
02				GL Rear turret not operating. RS Broken wire	27 Oct 77									
03				GL Adj both generator belts RS	31 Oct 77				X					
04				GL Water and foam pump packings RS Leak	31 Oct 77				X					
05				GL Water pump packings leak RS	31 Oct 77				X					
06				GL Rear turret hydraulic leak, RS line from manifold to discharge	1200 31 Oct 77									
07				GL Adjust stops on all engine RS compt doors	1 Nov 77									
08				GL Alchohol injectors full of RS water - fill w/alcohol	31 Oct 77									
09				GL Engine oil press group on (front) RS turret panel (reads low)	21 Nov 77		To be removed	Gauge	X					
10				GL Oil seal leak, both rear RS Axle, R.S. rear inter	8 Nov 77				X					

AFTO FORM APR 75 383 PREVIOUS EDITION WILL BE USED. **VEHICLE AND EQUIPMENT WORK ORDER**

WORK ORDER

☐ ACCIDENT REPAIR
☐ CONTRACT MAINTENANCE
☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0008		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL.	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. STD HRS	22. MAN NO	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. EST COST	D. BIN NO	E. QTY	24. VEH DEDLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Rear Engine Voltmeter RS	9 Nov 77		OK							
02				GL Cab Door Right Side RS Binds	9 Nov 77									
03				GL Front Engine Oil RS Filter Leaks	9 Nov 77									
04				GL F/Eng Power Divider RS Leaks	9 Nov 77									
05				GL Cab Front Engine Oil RS Press Gauge Not Steady	9 Nov 77		Loose Sender							
06				GL Front Engine Cab Oil RS Temp Gauge	21 Nov 77		Connector Pin & Socket							
07				GL Rear Power Divider RS Light	8 Nov 77		Adjust Switch							
08				GL Replace Elbow Fitting RS on Expello-Front Air Tank	9 Nov 77									
09				GL Repair Rear Power RS Divider	16 Nov 77			Power Divider						
10				GL Water Leaks into the RS Foam System	16 Nov 77									

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9 DATE RCVD	TIME
0009		77L 491				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ ACE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/C CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. STD HRS	22. MAR NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. EST COST	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Repair rear radiator overflow RS tube	21 Nov 77									
02				GL Front axle torque rod anchor RS bracket bent										
03				GL Ball studs on both steering RS arms broken at base of threads										
04				GL RS										
05				GL RS										
06				GL RS										
07				GL RS										
08				GL RS										
09				GL RS										
10				GL RS										

LIMITED TECHNICAL INSPECTION—MOTOR VEHICLE
(Bold type entries indicate major assemblies)

1. MANAGEMENT CODE:

2. FSN	3. VEHICLE REGISTRATION NO.	4. MILEAGE/HOURS
4210-01-013-2825	77L 492	216.31

5. NOMENCLATURE	6. MANUFACTURER
Truck, Crash Fire	Oshkosh

7. MODEL	8. SERIAL NUMBER	9. ACCEPTANCE DATE	10. STANDARD PRICE	11. REPLACEMENT CODE
A/S32P-15		28 Oct 77		

12. TYPE INSPECTION: [X] ACCEPTANCE [ ] DISPOSITION [ ] ONE TIME REPAIR [ ] DEPOT REBUILD [ ] RECEIVING [ ] SHIPPING

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
13. FRAME					
14. BODY	X				foam tank fill cover binds
15. GLASS					
16. PAINT					
17. UPHOLSTERY					
18. WIPER MOTOR, ARMS, BLADES					
19. MIRRORS, HORN					
20. LIGHTS	X		1.0		Bal valve compt Frt eng compt
21. SIREN, BEACON RAY, FLOOD LIGHTS					
22. GAGES, INDICATORS, SENDING UNIT	X				Front eng voltmeter
23. ENGINE	S		0.5		Front 6 qt oil Rear 2 qt oil
Front hrs 82.7 COMPRESSION TEST					N/A

CYLINDERS	1	2	3	4	5	6	7	8
DRY								
WET								

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
39. TRANSFER CASE(S)					
40. POWER TAKE-OFF	divider S		0.5		Low oil front
41. STEERING ~~GEARBOX~~ POWER	S		0.5		Low oil front and rear
42. SUSPENSION SPRINGS/ SHOCKS					
43. DRIVE LINE U-JOINTS					
44. AXLES AND HOUSING ASSY					
45. DIFFERENTIAL(S) FINAL DRIVE(S)					
46. TIRES, RIMS, TRACKS					
47. BOGIES, TRUNIONS, TORQUE ARMS					
48. SPROCKETS, ROLLERS, IDLERS					
49. AUX ENGINE					
Rear hrs 90.8 COMPRESSION TEST					N/A

CYLINDERS	1	2	3	4	5	6	7	8
DRY								
WET								

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
24. SPEEDOMETER, TACHOMETER, HOURMETER	X				500 RPM diff
25. HEATER, AIR COND					
26. BATTERY					
27. CHARGING SYSTEM					
28. STARTING SYSTEM	X		1.5		Belts Loose both gen
29. IGNITION SYSTEM					
30. FUEL SYSTEM					
31. COOLING SYSTEM					
32. EXHAUST SYSTEM					
33. EXHAUST EMISSION HOSES, VALVES					
34. SERVICE BRAKES					
35. PARK/ EMERG BRAKES					
36. CLUTCH					
37. TRANSMISSION	X				Converter lock up inoperative rear oil leak
38. SUBTOTAL					
50. FIFTH WHEEL					
51. HYDRAULIC SYSTEM					
52. HYDRAULIC CONTROLS					
53. TANK AND PIPING					
54. LIQUID PUMP					
55. HOSE REELS, HOSES, NOZZLES					
56. AUX GENERATOR					
57. BOOM ASSY, SHEAVES, CABLES					
58. SAFETY LIMIT DEVICES					
59. LANDING GEAR ASSY					
60. Water Pump Packings	X				Leaks
61. Air tank quick Buildup	X				Crack in drain valve boss
62.					
63.					
64. SUBTOTAL					

AFTO FORM MAY 78 91 — REPLACES AFTO FORM 91, JUL 68, AND DD FORM 1301, DEC 61, WHICH ARE OBSOLETE.

AFLC-WPAFB-APR 73 405M

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
CRASH FIRE TRUCKS					
65. TURRET SYSTEM					
66. COOLANT SYSTEM HAND PUMPS					
67. BATTERY CHARGER					
68. REF. UNIT/ CO_2 SYS 0-6					
69. FOAM CB SYSTEM					
70.					
FUEL SERVICING UNIT					
71. DRAINS					
72. FILTERS					PRESSURE DIFFERENCE INLET ..... OUTLET ..... PSI
73. STATIC GROUND SYSTEM					
74. METERS/ PUMPING SYSTEM					
75. SEGRE-GATORS					
76. HOSE REEL ASSEMBLY					
77. AIR CYLINDER CONTROLS					
78. MANHOLE COVER AND VENTS					
79. VALVES, AUTOMATIC, MANUAL					
80.					
MATERIALS HANDLING EQUIPMENT					
81. CABLES, CHAINS, HOSES					
82. MOTORS; ELECTRIC, AIR, HYDRAULIC					
83. CONTROLS					
84. CARRIAGE, FORKS, MAST, CYLINDERS					
85.					
86.					
87. SUBTOTAL					

ITEM	✓ ONE: REPAIR	✓ ONE: REPLACE	NO. MAN-HOURS LABOR	COST OF PARTS	REMARKS (Indicate item(s) requiring service. If part is replaced because original is missing, show as: Alternator (missing))
BASE MAINTENANCE EQUIPMENT					
88. AGITATOR					
89. BITS AND AUGERS					
90. BOILER, BURNER, AND BLOWERS					
91. CANTILEVER, YOKE ASSY.					
92. CONTROLS AND SWITCHES					
93. CONVEYORS					
94. DIPPER, CLAM, BACKHOE					
95. DRUMS					
96. FAIRLEADS					
97. GANTRY A-FRAME					
98. HEATERS, FLUES AND STACKS					
99. INTER-COOLERS, AFTER-COOLERS					
100. MOLDBOARD CIRCLE SCARIFIER					
101. SICKLE GUARDS AND PITMAN					
102. ROTOS AND PADDLES					
103. SPRAY BAR, PIPING CONNEC-TIONS					
104. TOGGLE PLATES					
105. PRESSURE REGULA-TORS					
106. APRON, BOWL, TAILGATE					
107. STEERING, BRAKES					
108.					
109.					
110.					
111. SUBTOTAL					

REPAIR SUMMARY

COST FACTORS			AMOUNT
112. LABOR	NO. HOURS	HOURLY RATE	
DIRECT			$
INDIRECT			$
113. MATERIAL			$
OTHER			$
114. TOTAL OF THESE REPAIRS			$
115. MAXIMUM ONE-TIME REPAIR ALLOWANCE			$
116. ESTIMATED ADDITIONAL SERVICE FROM VEHICLE IF REPAIRS ARE ACCOMPLISHED			MILES/MONTHS

117. LIST MOD/TCTO'S NOT ACCOMPLISHED (Give authorization)

118. INSTALLATION — 119. DATE

120. SIGNATURE AND TITLE OF INSPECTOR

121. CERTIFICATION

ENTRIES WERE TRUE AND CORRECT AS OF DATE SHOWN AT RIGHT. — AS OF DATE

TYPED NAME, GRADE AND TITLE OF CERTIFYING OFFICER

SIGNATURE OF CERTIFYING OFFICER

122. REMARKS

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0001		77L 492				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL.	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	F. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. STD HRS	22. MAN NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST ~~EST~~ REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Wire #711 cut at rear engine RS	Deleted									
02				GL One Decontrol knob missing RS on ea turret	3 Nov 77									
03				GL Rear engine oil fan felts RS loose	31 Oct 77									
04				GL Install metal brackets on both RS transmission fill tubes	21 Nov 77		For Engineering		X					
05				GL Secure drain handles in RS balance valve compt	31 Oct 77									
06				GL Secure compt light in RS balance valve compt	3 Nov 77									
07				GL Adjust generator belts RS	31 Oct 77				X					
08				GL RS										
09				GL RS										
10				GL RS										

AFTO FORM 383 APR 75 PREVIOUS EDITION WILL BE USED.

VEHICLE AND EQUIPMENT WORK ORDER

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0002		77L 492				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. DPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, L = ADJUST, R = REPLACE, S = SERVICE)	21. STD HRS	22. MAN NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST OR REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Oil leak, rear transmission RS	3 Nov 77									
02				GL Oil low both steering RS	31 Oct 77									
03				GL Engine oil low ft - 6 qt RS rear - 2 qt	31 Oct 77									
04				GL Turret Reservoir low Qt - Ft RS Rear	31 Oct 77									
05				GL Power Divider oil low Ft - Qt RS Rear -OK	31 Oct 77									
06				GL Front engine Compt - light RS inoperative	1 Nov 77									
07				GL Converter lockup inoperative RS										
08				GL RS										
09				GL RS										
10				GL RS										

AFTO FORM APR 75 383 PREVIOUS EDITION WILL BE USED.

VEHICLE AND EQUIPMENT WORK ORDER

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0003		77L 492				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL.	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. STD HRS	22. MAN NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST ~~CCC~~ ~~CRRX~~ REPORT	D. BIN NO	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Front Gen voltmeter inoperative RS	OK 2 Nov 77		Generator Out							
02				GL Both turrets rotate too far RS	4 Nov 77									
03				GL Check turret Hydraulic pressure RS Front 520 PSI - Rear 520 PSI	31 Oct 77									
04				GL Reinstall foam tank shutoff RS valve handle										
05				GL Alcohol injectors full of water RS fill with alcohol	31 Oct 77									
06				GL Adjust turret lock bracket switch RS front turret	31 Oct 77									
07				GL Front turret foam switch label RS Plate missing										
08				GL RS										
09				GL RS										
10				GL RS										

WORK ORDER

☐ ACCIDENT REPAIR

☐ CONTRACT MAINTENANCE

☐ OTHER GOVERNMENT AGENCY

1. WORK ORDER NO.	2. R/D	3. REGISTRATION NO.	4. MGT CODE	5. MILES/HRS.	6. WORK CENTER	7. WORK ORDER STATUS	8. USER PHONE	9. DATE RCVD	TIME
0004		77L-492				☐ INITIAL ☐ COMPLETE			

10. PRI	11. MFG	12. MODEL/TYPE	13. REPLACEMENT CODE CHANGE	14. CERTIFIED BY:	9A. DATE REL.	TIME
		A/S32P-15	☐ ONE TIME REPAIR ☐ AGE ☐ MILES			

15. USE FOR REPAIR ESTIMATES ONLY	A. MATERIAL COST	B. STANDARD HOURS	C. DIRECT LABOR COST	D. INDIRECT LABOR COST	E. TOTAL COST

16. JOB NO.	17. SYS CODE	18. OPER	19. M/CODE	20. JOB DESCRIPTION (G = REPAIR, R = REPLACE, L = ADJUST, S = SERVICE)	21. STD HRS	22. MAN NO.	23. MATERIAL DATA A. PART NO.	B. NOMENCLATURE	C. TEST REPORT	D. BIN NO.	E. QTY	24. VEH DEADLINED FOR PARTS (VDP) A. ON DATE TIME	B. OFF DATE TIME	C. TOTAL HRS
01				GL Both transmission low on oil RS F - OK R- 1 gal	31 Oct 77									
02				GL Change Hyd pressure gauge front RS turret	31 Oct 77									
03				GL Tachometers record 500 RPM RS differential	1 Nov 77		Tach's OK engines do not accelerate together							
04				GL Headlights inoperative RS	31 Oct 77									
05				GL All marker lights inoperative RS	31 Oct 77									
06				GL Left side - rear 2½ disch valve RS maxes past closed & leaks by	3 Nov 77									
07				GL Remount foam tank cover RS	21 Nov 77		For engineering							
08				GL Index handle on handline foam RS activating valve	3 Nov 77									
09				GL Pow divider rear filter plug RS missing	31 Oct 77									
10				GL All water pump packings leak RS	1 Nov 77									

AFTO FORM APR 75 383 PREVIOUS EDITION WILL BE USED. VEHICLE AND EQUIPMENT WORK ORDER