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SUBJECT
TRENDS OF DEVELOPMENT
IN
VEHICLES AND TANKS

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ARMY GROUND FORCES BOARD NO. 2
Fort Knox, Kentucky

TRENDS OF DEVELOPMENT - VEHICLES AND TANKS

TIME: 1 HOUR

PART I

INTRODUCTION

A. PURPOSE: The purpose of this lecture is to inform you of the policy of the War Department in respect to research and development, how the Army Ground Forces are organized for the implementation of this program, and particularly of trends of development in the fields of tanks and other tracked or wheeled vehicles.

B. POLICY: The official policy for War Department research and development is that all research and development agencies will apply the results of scientific analysis and research to the development of the most advanced weapons, techniques, materiel and countermeasures, for the use of the Army and in the execution of the military policy of the United States.

C. FUNDS: It must be remembered that the extent of our progress in implementing this program will be in direct proportion to the amount of funds allocated by the Congress for this work. Therefore, to insure a steady and suitable rate of progress in research and development there will be required, during time of peace, sums of money without precedent in peace-time appropriations.

D. DEVELOPMENT SECTION ARMY GROUND FORCES: To implement this development program for ground units, Headquarters, Army Ground Forces, established its own Development Section on a general staff level. It is responsible for the following:

1. Determining the need for changes or improvement in existing materiel, the development of new materiel to perform a specific function, or to utilize new scientific discoveries;

2. The analysis of requests for revision of materiel or development of new materiel and the revision of previously specified military characteristics or preparation of new ones. For the detail work connected with military characteristics, the Section is assisted by the Army Ground Forces Boards;

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3. The maintenance of liaison with research and development installations of the technical services, the Army Air Forces, and the United States Navy, to assist in the prompt solution of the many minor problems involved in the production of pilot models of modified or new materiel and the engineering tests in connection therewith;

4. Assignment of projects and supervision of service tests by the Army Ground Forces Boards;

5. Evaluation of, and action upon, reports of tests made by Army Ground Forces Boards (this latter includes approval or disapproval of the materiel for standardization and decisions concerning the advisability of continuing research, development, and testing of each particular item);

6. Continuing study of materiel for possible use to Army Ground Forces being or having been developed by the Army Air Forces, the Navy Department or foreign armies (this includes the maintenance of liaison with the higher research and development echelons of the Army Air Forces and Navy Department, and the evaluation of all information on foreign equipment which may become available to the Section);

7. Constant study of scientific development which might lead to revision or replacement of present materiel.

E. ARMY GROUND FORCES BOARDS: The Army Ground Forces Boards function as the field agencies of Headquarters, Army Ground Forces. Prior to and during the past war, there existed in each Arm and Service a Board of Officers to whom was delegated the service testing of all items of equipment used in that Arm. Obviously there was considerable overlap and frequently insufficient personnel to cover adequately all classes of equipment. For reasons of economy and efficiency these branch boards were terminated on 1 October 1945 and in their stead were established three Army Ground Forces Boards. More recently a fourth Board was established. Board No. 1, at Fort Bragg, tests artillery, air support, electronic, and certain other equipment. Board No. 2 will be discussed in detail later. Board No. 3, at Fort Benning, tests light man-carried weapons with accessory fire control equipment, individual clothing and equipment, and ground Quartermaster and chemical warfare equipment. Board No. 4, at Fort Bliss, tests antiaircraft and guided missiles.

F. ARMY GROUND FORCES BOARD NO. 2:

1. ORGANIZATION. (Refer to Organization Chart, Exhibit A.) Board Headquarters is at Fort Knox, Kentucky. It has the necessary administrative personnel, Research, Test Analysis, Liaison Sections, and the Board Detachment. As test sections it has, the Automotive, Amphibious

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Medical, Maintenance and Supply, Engineer, and Weapons and Ammunition. The Field Test Branch of the Amphibious Section is at Fort Ord, California. The Engineer Section has a Field Branch at Fort Lewis, Washington. The Animal Equipment Test Section is at Fort Riley, Kansas.

2. RESPONSIBILITIES: Board No. 2 has jurisdiction over automotive equipment, heavy weapons and fire control equipment integral with armored fighting vehicles, amphibious equipment, ground engineer equipment, ground medical equipment, animal equipment, and maintenance equipment for the above.

Its responsibilities with respect to the equipment within its jurisdiction are as follows:

- a. The evaluation of all recommendations for the development of new or improvement of existing equipment.
- b. The review and study of foreign equipment.
- c. Preparation of military characteristics and recommendations for development.
- d. Assisting Headquarters, Army Ground Forces in maintaining contact with development agencies during all phases of development and engineering tests.
- e. Performing users' tests of equipment.
- f. It has the responsibility for recommending:
 - (1) Modifications in or standardization of items tested.
 - (2) Reclassification of standard items of materiel.
 - (3) Basis of issue of items to be standardized.
- g. It has the responsibility for assisting in the preparation of basic training literature on the drill and technical care of materiel tested.
- h. Recommending maintenance procedure, replacement parts, and equipment for items tested.
- i. Continued observation and review of reports of performance of standard items.


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3. DEVELOPMENT OF NEW EQUIPMENT: The Board studies After-Action Histories, Battlefield Reports, recommendations from troops and combat experienced personnel, et cetera, to determine the requirements of the ground forces within its field of responsibility. In addition it follows closely the developments in foreign countries through the reports of Liaison and Attache personnel. Having determined that a requirement exists or upon receipt of directives from Army Ground Forces, it makes a study and submits the military characteristics to Headquarters, Army Ground Forces for approval. After the item is approved and submitted to a development agency, the Board then follows its progress through liaison visits and reports of Army Ground Forces Liaison Officers with all the development facilities. An early pilot model is sent to the Board where it is given exhaustive field tests, often in comparison with other similar standard items.

As a result of these tests the Board recommends acceptance of improvements. Often Headquarters, Army Ground Forces, will direct an extensive field test by a troop unit; these are observed and supervised by the Board.

In 1944, a Board of combat-experienced officers was formed at Fort Knox for the purpose of reviewing all armored equipment. In 1945, Headquarters, Army Ground Forces appointed a Board which reviewed the report of the Armored Equipment Board and those of other Arms. Lastly in 1945, the War Department appointed a Board which reviewed the previous Arm and Service Board Reports and in addition, received testimony from a great number of battlewise personnel, as well as many of the best scientists and engineers in the country. This latter report is under continuous review by all the Boards, the Development agencies, and the interested headquarters with a view toward keeping it constantly up to date. With the great background of experience and profound consideration which lie behind the War Department Board, it is believed that the future development of equipment for the ground forces will be along the right lines.

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PART II

TRACKED VEHICLES

A. This portion will deal with tracked vehicles. They are divided into three categories--tanks, carriers, and special purpose vehicles. Obviously, the reason for tracked vehicles is to provide cross-country mobility under the most adverse conditions. To give you a perspective of tracked vehicles, each group is arbitrarily classified Past--meaning World War II; Present--those which are used today and would be used if we were to fight in the near future; and Future vehicles.

1. Tanks

First, tanks will be discussed. Some conceive a tank as more or less a battleship on land. It is a fighting unit which can be used for reconnaissance; for support of other ground troops; for a knock-down, drag-out fight against enemy armor; and for exploitation and pursuit. The following pictures and description will give you a brief review of past and present, and Army Ground Forces ideas on future trends. As you can well realize, the development of this type of equipment is a constant race between fire power and protection--fire power which will penetrate the maximum armor, and armor which will afford protection against the best antitank weapon.

a. Light Tanks

- (1) The Light Tank, M5 (Exhibit B). This tank was known as the General Stewart. The latter name being derived from its peppy performance and general handiness. This tank is the final form of the light tank or combat car developed by our Army just prior to the start of the war. It was used principally in North Africa by British and American troops. The 37mm gun proved ineffective against German armor but its radius of operation, speed, and reliability made it a very useful vehicle. It was used primarily for reconnaissance purposes. This particular model is powered by two commercial Cadillac engines and uses a hydraulic transmission. Note the suspension. The road wheels are sprung in pairs - 2 pairs to each side.

Weight: 16 tons

Speed: 36 MPH

Armor: 2 $\frac{1}{2}$ " maximum

Armament: One 37mm gun and three .30 Cal. machine guns

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- (2) The Light Tank, M24 (Exhibit C). This tank was known as the General Chaffee. This tank was developed after the start of the war and was issued to our units in the ETO as a replacement for the Light Tank, M5. This tank offered a considerable improvement over the previous light tank in that it mounts a 75mm gun. Note the suspension system on this tank. The larger road wheels are individually sprung on torsion bars giving an improved ride and better cross country maneuverability.

Weight: 20 tons

Speed: 35 MPH

Maximum Armor: 1"

Armament: One 75mm gun; one .50 Cal. AA machine gun and two .30 Cal. machine guns

- (3) The Light Tank, T37 (No Exhibit). This tank is now in the mock-up stage of development. This will be the first post war tank to be built by the Army. It will incorporate lessons learned in combat as well as advances in metallurgy and mechanical design. The main armament of this tank will be a 76mm high velocity gun capable of firing an excellent armor piercing projectile, as well as an effective HE round. The gun, sights, and coaxially mounted machine gun will be stabilized in a horizontal and vertical plane. A range finder and computing mechanism will be coupled so as to permit ranging and firing effectively by one man when the tank is moving or stationary. A recently designed tank engine with transmission attached will give this tank power and agility over and above any tank that we have developed in the past. Labor saving devices will be such that a four man crew will be sufficient.

b. Medium Tanks

- (1) The Medium Tank, M3 (Exhibit D) was frequently called the General Grant. Production was started on this tank just prior to our entry into the war. This tank was used by the British and American Troops in the North African campaign and by the Russians. The 75mm gun placed

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low in the right forward portion of the hull has very limited traverse. (Point to Exhibit D). This weakness was recognized in the original design and action was taken to produce a tank with a turret having all-around traverse. The original version of this tank had a riveted hull - others were built with welded and some with cast hulls. Several engines were used in these tanks: a radial gasoline engine, radial diesel, twin diesel, 30 cylinder multiple-bank Chrysler engine, and the Ford V8 tank engine. These differences in construction and in power plant were necessary to utilize all available industry and to produce an adequate number of tanks. Note that the suspension system is similar to that of the first light tank pictured except for the addition of another pair of road wheels.

Weight: 32 tons

Speed: 25 MPH

Armor: 2½" maximum

Armament: 75mm gun; 37mm gun; three .30 Cal. machine guns

- we fought the war primarily with this tank*
- (2) The Medium Tank, M4 (Exhibit E). This tank is known as the General Sherman. It is based on the Medium Tank, M3 chassis, the principal change being a longer 75mm gun mounted in a turret with all-around traverse. This picture illustrates the M4A3, the preferred version of this series with a Ford V8 tank engine. As in the case of the General Grant, a variety of hull constructions and engines were used. This tank was used in the Pacific and in the invasion of Europe and many of these vehicles were still in service when the war ended.

Weight: 34 tons

Speed: 26 MPH

Armor: 3" maximum

Armament: One 75mm gun; one .50 Cal. machine gun; two .30 Cal. machine guns.

- (3) The Medium Tank, M4A3E8 (Exhibit F). The complicated nomenclature just given will indicate

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to you that this is the M4 series tank upon which many improvements have been made. It is the last of this series and is the same as the M4 previously shown you except for the following major changes; the 75mm gun has been replaced with a 76mm high velocity gun, which, combined with improved sighting and vision equipment make this tank far superior to its forerunners; wider track with a changed suspension system increases the cross country maneuverability and reliability. This tank was issued to units in the ETO as rapidly as they could be made available. By the end of the war most of our forces in Europe were completely equipped with this version of the M4 series tank. A number of these tanks are now on hand. Its fighting ability and reliability are such that it is now issued our few remaining armored units.

Weight: 38 tons
Speed: 20 MPH
Armor: $3\frac{1}{2}$ " maximum

- (4) The Medium Tank, M26 (Exhibit G), better known as the General Pershing. This tank represents a complete departure from the M4 series type. A very limited number of these tanks were shipped to Europe during the latter part of the war. ~~Although they saw little service, this tank could stand up to the best the~~ Germans had to offer. The suspension system is similar to the General Chaffee. A rear drive sprocket and torqmatic transmission have been included in this vehicle. Greater armor protection has been provided and a much more powerful gun is placed in its all-around traverse turret. The weak points of this vehicle are its lack of power and restricted operating range.

Weight: 46 tons
Speed: 20 MPH
Armor: 4" maximum
Armament: 90mm gun; one .50 Cal. machine gun;
two .30 Cal. machine guns

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- (5) The Medium Tank, M45 (Exhibit H). This was developed late and did not see action in combat. During the last war the 105 howitzer was mounted in tanks in order to provide an assault gun for close cooperation with infantry and tank units. Here we see the 105 howitzer installed in the turret. Other characteristics are similar to those of the General Pershing.
- (6) This next picture (Exhibit J) is an artist's conception of a medium tank weighing approximately 45 tons. Note the sloping lines of both turret and hull. This is to provide sloped armor and give maximum protection for any given thickness plate used. Note the remote controlled machine guns. These are to provide greater automatic weapon fire. More power, better fire control equipment, better gun, complete stabilization and other features mentioned in discussing the new light tank, will all be incorporated in any new medium tank. Present test and design work is being directed toward the perfection of components that will permit the building of this tank.

c. Heavy Tanks - The following heavy tanks have been designed and built during and since the war and are also development tanks which saw no action in combat.

- (1) Heavy Tank, M6 (Exhibit K). The tank pictured here is the first attempt by our Army to build a heavy tank. There are four pairs of dual mounted road wheels on either side. Note that the suspension is protected by armor. A rear drive sprocket, hydraulic transmission and a 775 horse power radial, air-cooled engine have been used to drive this tank. This tank did not pass service test stage due to insufficient mechanical reliability.

Weight: 60 tons
Speed :: 25 MPH
Armor: 4" maximum
Armament: One high velocity 3" gun; 37mm gun; three .50 Cal. machine guns; one .30 Cal. machine gun.

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- (2) The tank shown here, the Heavy Tank, T29 (Exhibit L), is a result of further effort to produce a suitable heavy tank. This tank was completed after the end of hostilities. Note the suspension system is similar to that of the General Pershing. It is powered by a 750 horse power V12 engine, which drives through a cross drive transmission. This tank is armed with a high velocity 105mm gun. The power and maneuverability of this tank are such as to insure good cross country and tactical ability. Preliminary tests indicate that it will be a reliable tank mechanically. Its armament and armor are such as to make it an odds-on favorite against any known foreign tank.
- (3) Super Heavy Tank, T28 (Exhibit M). This tank was completed after the end of hostilities and was built for the purpose of acquiring engineer data in case we should need to build vehicles of such size. Total weight of this vehicle combat loaded is nearly 100 tons. It mounts a high velocity 105mm gun and has extremely heavy front armor. To carry this tremendous weight and to permit any degree of mobility, dual tracks have been provided. The tracks have been designed to permit removal of the outer half on each side. Cable, crane and other gear for this disassembly and assembly are provided with the vehicle. When removed, the outer tracks are coupled together and towed behind the tank. The operation of removing or installing the outer track sections requires about four hours by a trained crew. The vehicle is remarkably easy to drive but the lack of speed and power are serious shortcomings.

Weight: 95 tons
Speed: 8 MPH
Armor: 12" maximum
Armament: 105mm gun and .50 Cal. machine gun

2. Carriers

a. The tempo of battle has introduced a new problem - that of personnel carriers to keep pace with the tanks. Consequently, there is a requirement for fast moving mobile carriers. A new family of carriers is being developed. One of the older carriers which you will all recognize was:

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- (1) Half Track Personnel Carrier, MSAT (Exhibit N). These vehicles, half tracks, were used for a large variety of purposes such as carrying troops, general cargo carrying, prime movers, as a mount for guns, howitzers, mortars, and as command vehicles. The enemy was never sure whether one of them would be carrying infantrymen, cargo, a weapon, or any combination of the three.

The vehicle is based on a specially designed, commercial type, front and rear drive truck chassis with an armored hull and was used extensively in both the Pacific and European theaters. The endless-band track-laying rear drive permits its use over rough terrain, and it will cross ditches which are not sufficiently deep to cause the front or rear to become embedded. Some models are provided with a roller at the front to assist in climbing out of ditches.

Weight: 10 tons
Speed: 38 MPH
Armor: 1/4"
Armament: One .30 Caliber and one .50 Caliber machine gun.

- (2) Armored Utility Vehicle, M44 (Exhibit O). This is a new full track vehicle developed to satisfy the need of the Ground Forces for an armored carrier with excellent cross-country mobility, for transporting troops well forward in the zone of the advance. The vehicle is still in the development and experimental stage. It offers excellent all around armor protection for troops against light artillery fragments or small arms fire. It carries 25 fully equipped infantrymen. It has a torsion bar suspension. It may be used as an armored ambulance, a battlefield supply vehicle, a CP vehicle, and a prime mover.

Weight: 25 tons
Speed: 32 MPH
Armor: 5/8" maximum
Armament: One .50 caliber ring mounted and one .30 caliber ball-mounted machine gun.

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- (3) Armored Utility Vehicle, T18 (No Exhibit). This is a future development vehicle. It will have all around protection against small arms fire and light artillery fragments. It carries 12 fully equipped infantrymen and is expected to replace the half track. Design will permit employment of individual weapons and all-around vision for the squad leader. Torsion bar suspension will be used and the power plant will be a horizontally opposed air-cooled engine with cross-drive transmission.

Weight: Approx. 18 ton

Speed: " 32 MPH

Armor: " $\frac{1}{2}$ " maximum

Armament: Two independent .50 caliber machine guns that can be controlled from any of three positions.

- (4) Tractor, High Speed, M4 (Exhibit P). This vehicle used during the war provides a full track type prime mover for artillery loads of 18,000 to 30,000 pounds, and is capable of transporting personnel, ammunition, and accessories. It has a personnel compartment, accommodating eight men in two rows of seats and a cargo compartment, mounted on a high speed, full track-laying hull and suspension.

Power is supplied by a 210 horsepower Waukesha engine through a torque converter and a constant mesh transmission. It is provided with a 30,000 pound capacity winch and is equipped with air and electric brake controls for the towed loads.

Weight: 16 ton

Speed: 33 MPH with towed load

Armor: None

Armament: One .50 caliber machine gun on ring mount.

- (5) Cargo Tractor, M8 (Exhibit Q). This is a newly developed high speed full track vehicle. It is a companion vehicle to the Armored Utility Vehicle M4, and is based on the same components. It has a powerful 9-cylinder, air-cooled, radial gasoline engine and torqueomatic transmission. It is a full track carrier with large volume cargo capacity

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capable of towing loads of from 18,000 to 37,000 pounds while carrying a 5-ton pay load.

Weight: 23 ton (combat loaded)

Speed: 32 MPH

Armor: 3/8" maximum

Armament: One .50 caliber ring mounted machine gun and one 2.36" Rocket Launcher

- (6) Cargo Tractor, T43E1 (No Exhibit). Another item under development is a companion vehicle to the Armored Utility Vehicle, T18, known as the Cargo Tractor, T43E1. It will be the prime mover for the 155mm Howitzer and light artillery loads. Features will include full track laying and torsion bar type suspension similar to those of the companion vehicle.

Weight: 15 ton

Speed: 35 MPH

Armor: None

Armament: One .50 caliber machine gun in ring mount.

- (7) Carrier, Light Cargo, M29C (Exhibit R). The "Weasel" was developed for use over snow and ice. The M29C was adapted for amphibious operation. Water-tight cells are located at the front and rear for buoyancy. Twin rudders are provided at the rear, and side panels cover the upper half of the track. Propulsion of the vehicle in water is by means of the tracks. This vehicle is capable of operation on dry land, in swamps, in snow, or in still water.

Weight: 2 $\frac{1}{4}$ ton

Speed: Land, 36 MPH; water, 4 MPH

Armor: None

Armament: None

3. Special Purpose Vehicles

a. The system of track propulsion is recognized as that best adapted for cross-country operation. Consequently, still another family of tracked vehicles have been developed to keep pace with the development of tanks. These vehicles may be classified as mobile gun carriages, or tank destroyers, or self-propelled artillery. A few of them will be discussed.

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- (1) Gun Motor Carriage, M3 (Exhibit S). The first self-propelled mount standardized in World War II, this weapon provided high mobility carriage for the old World War I French 75 mm gun. The gun mount was a modified half-track designed primarily for antitank use. It was available to troops in time to aid in the rout of Marshall Rommel's troops in North Africa. A gunshield is provided to give protection against small arms fire and overhead protection against frontal attack by aircraft. The gunshield traverses with the gun.

Weight: 10 ton
Speed: 45 MPH
Armor: 5/8" maximum
Armament: One 75 mm gun

- (2) Carriage, Gun Motor, M10 (Exhibit T). This vehicle uses the components of the General Sherman tank except for a special transmission and thinner armor which permits greatly increased speed. This was the World War II tank destroyer. Special fittings are provided on the hull and turret for the purpose of bolting on auxiliary armor to permit its use as a tank. One of these vehicles with our troops in North Africa knocked out four German tanks, a number of other vehicles, and a German 88 mm antitank gun in 25 minutes of action.

Weight: 33 ton
Speed: 30 MPH
Armor: 2 1/2" maximum
Armament: One 3" gun and one .50 caliber machine gun.

- (3) Carriage, Gun Motor, M18 (Exhibit U). This is a highly mobile, low silhouette, lightly armored 76 mm gun motor carriage designed to supersede the Gun Motor Carriage, M10. It is a full track-laying type, using a torsion bar suspension system. Power is supplied by a 9-cylinder air-cooled gasoline engine through a hydraulic transmission.

Weight: 20 ton
Speed: 50 MPH
Armor: 1" maximum
Armament: One 76 mm gun and one .50 caliber machine gun.

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- (4) Carriage, Motor, 105 mm, Howitzer, T19 (Exhibit V).
This vehicle was designed to provide a 105 mm Howitzer on a self-propelled mount as an expedient weapon. It was used by our troops in the North African campaign. The chassis is the familiar half-track. It was superseded by the 105 mm Howitzer Motor Carriage, M7.

Weight: Approx. 10 ton

Speed: 45 MPH

Armor: 1/4"

Armament: One 105 mm Howitzer and one .50 caliber machine gun.

- (5) Carriage, Motor, 105 mm Howitzer, M7 (Exhibit W)
The pulpit-like appearance of the machine gun compartment has given this vehicle the nickname, "The Priest." It is a highly mobile weapon, and is credited with an important part in the German defeat in Libya. The vehicle is based on a medium tank chassis and is powered by a 9-cylinder, radial, gasoline engine. Provisions are made for towing an armored trailer for transporting additional ammunition.

Weight: 26 ton

Speed: 25 MPH

Armor: 2" maximum

Armament: 105 mm Howitzer and one ring mounted .50 caliber machine gun.

- (6) Carriage, Motor, 105 mm Howitzer, M37 (Exhibit X)
This vehicle was known as the "Preacher" and was developed to provide a lighter, more mobile self-propelled Howitzer for supporting rapidly moving armored vehicles, and as a replacement for 105 mm Howitzer Motor Carriage, M7, series. It is based on the General Chaffee chassis and thus has twin Cadillac engines, hydramatic transmissions, and torsion bar suspension.

Weight: 20 ton

Speed: 35 MPH

Armor: 1/2"

Armament: 105 mm Howitzer and one .50 caliber ring mounted machine gun.

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(7) Carriage, Motor, 240 mm Howitzer, 192 (Exhibit Y)

The pilot of this vehicle was barely completed prior to the end of the war, and is the largest self-propelled artillery weapon built to date. It has excellent mobility at slow speed for traversing cross-country terrain and remarkable stability during firing. It can be brought into action in the minimum of time to support rapidly moving situations.

Weight: 63 ton
Speed: 15 MPH
Armor: 12" maximum
Armament: 240 mm Howitzer.

- (8) A few of these vehicles have been shown as a matter of interest. Future development of self-propelled artillery is the responsibility of Army Ground Forces Board No. 1

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PART III

MOTOR TRANSPORT AND SPECIAL VEHICLES

A. Motor Transport - General

The next subject to be discussed is Motor Transport. In World War II, American motor transport in general was far superior to that of any other country, friendly or enemy. Our superiority was the result of having a well-established and highly developed automotive industry in this country.

As good as our vehicles were, the need for improvement became apparent when we were forced to rely almost entirely on wheeled transportation for supply. The vast quantities of material to be moved called for the maximum use of every vehicle. Furthermore, the conditions under which vehicles were required to operate had no counterpart in commercial practice. In spite of these difficulties, our trucks did a magnificent job, but we cannot afford to overlook the short-comings that were discovered.

The most important deficiency found in our motor transportation was lack of interchangeability of parts between vehicles of closely related types. As a result, we had far too many vehicles deadlined for lack of a certain item that was out of stock, when perhaps in the next bin there was an excess of similar items which could not be used because of slightly different dimensions. This problem is being attacked by establishing a series of standard components and accessories which will be applicable to all vehicles of a given class in the current development program.

Another short-coming consumed too much time in repair simply because not much thought had been given to providing means for quick removal and replacement of components. Studies presently being conducted indicate that, too often, far more time is spent in preparation for rather than in making the repair. By designing ease of maintenance into our vehicles we hope to materially reduce the total number of vehicles required to keep a given number on the road.

Of equal importance is the requirement for improved cross country mobility of wheeled vehicles. With the advent of guided missiles, and improved bombing technique, we may expect that hastily constructed by-passes around destroyed portions of a supply route will be the rule rather than the exception. It is possible that large sections of arterial routes may be denied to our use by enemy action. In this case we must be prepared to use alternate routes, cross country if necessary. Material improvement in cross country performance is promised in vehicles now under development.

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In order to reduce the number of different types of vehicles used by the Army, it was decided that all requirements could be met by eight basic types of chassis, with cargo and special purpose bodies as needed. These types are:

$\frac{1}{4}$ -ton, Truck, 4x4

$\frac{1}{4}$ -ton type, Truck, Lightly Armored

$\frac{3}{4}$ -ton, Truck, 4x4

$2\frac{1}{2}$ -ton, Truck, 6x6, with short and long wheel bases

5-ton, Truck, 6x6

8, 12 and 25-ton Chassis groups

1. Trucks, Medium

Probably the best way to illustrate the trend in wheeled vehicle development is to take a specific example with which we are all more or less familiar - the $2\frac{1}{2}$ -ton, 6x6, cargo truck. This vehicle was originally developed as a prime mover for light artillery, but its performance was so good, that prior to our entry into World War II, it was adopted as the standard cargo truck for tactical units. During the war it proved, without doubt, to be the best general purpose military truck ever made. Minor modifications were incorporated during this period but we finished the war with essentially the same vehicle as we had at the start. Like all trucks of conventional design the performance of the six-by-six in soft ground left much to be desired. This deficiency became more important as the war in the Pacific progressed, because to operate successfully in the rice-paddy country of Japan and China, a cargo truck with superior deep-mud performance would be required.

To meet this requirement, a special truck was designed (Exhibit Z). This vehicle was called the $2\frac{1}{2}$ -ton, Cargo Truck, 4x4, T-23. It has a ground clearance of 25 inches compared to 10 inches for the standard $2\frac{1}{2}$ -ton truck. This increase is obtained by the use of large low-pressure tires (over 5 feet in diameter) and by mounting the differentials in the frame rather than on the axles. Another feature of interest is the centrally controlled tire inflation system by which the driver can deflate or inflate tires while the vehicle is in motion. This permits the use of very low tire pressure to obtain increased flotation for operation in mud or sand, and quick re-inflation to normal pressure, without stopping, for operation on roads. The vehicle out-performed any other wheeled vehicle under the conditions for which it was designed but could not be considered satisfactory as a general purpose truck.

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Since the war the development of a new $2\frac{1}{2}$ -ton truck has been initiated to replace the present six-by-six in tactical units. It is called the Carrier, Cross country, $2\frac{1}{2}$ -ton, 6x6, T51 (Exhibit AA). Its design will use the experience gained in the design of the T-23 Truck just described, while retaining the good points of the present standard truck. It will incorporate the following features:

- a. High flotation tires with centrally controlled tire inflation system.
- b. Self-locking differentials to prevent total loss of mobility due to wheels slipping on one side.
- c. A transmission which permits gear shifting under full torque load. This will eliminate the momentary loss of power that occurs when changing gears with a conventional transmission, and which results in a tendency for the vehicle to stall or bog down under adverse conditions.
- d. Individual wheel suspension, for improved cross country ride.
- e. Air-cooled engine of improved design with increased horsepower.
- f. It will employ the maximum number of standardized components and will incorporate ease of maintenance features.

This vehicle therefore promises to be a definite improvement over our present $2\frac{1}{2}$ -ton truck. The importance of this development is that if it proves successful, these features can be incorporated in all military wheeled vehicles to obtain superior cross country performance. However, in obtaining this added performance, we cannot afford to sacrifice the stamina and reliability of the standard $2\frac{1}{2}$ -ton truck.

2. Trucks, Light

In the light truck class a vehicle to replace the present $3/4$ -ton truck, 4x4, is being developed concurrently with the improved $2\frac{1}{2}$ -ton vehicle. It is to be called the Carrier, Cross country, $3/4$ -ton, 4x4, T53 (Exhibit BB). The history of the development of this vehicle clearly indicates the emphasis that is being placed on the cross country mobility of tactical wheeled vehicles. The first vehicle in this class used by the Army was based on the chassis of a commercial $1/2$ -ton truck. Not having four-wheel drive, the vehicle had poor off-the-road performance and was replaced by a $1/2$ -ton, 4x4. This vehicle was an improvement but was not entirely satisfactory, so early in the last war we went to a $3/4$ -ton, 4x4, truck with larger tires and increased ground clearance. The chassis of this vehicle is used on our present standard $3/4$ -ton weapons carriers, command trucks, ambulances, emergency repair trucks and carryalls. The proposed vehicle will be used for the same purposes, but will provide better performance by incorporation of the features planned for the $2\frac{1}{2}$ -ton truck.

In the very light truck class similar improvements are planned. The new version of the very versatile $\frac{1}{4}$ -ton, truck, 4x4, popularly known as the jeep, will provide better flotation, easier ride characteristics and increased power. The general conception of the new vehicle is the same as the present one, and the improved model will perform the same missions as the present model.

In addition to the $\frac{1}{4}$ -ton truck, the need has been established for a light, wheeled, partially armored truck of the approximate size of the $\frac{1}{4}$ -ton truck, 4x4. It is to be used by reconnaissance elements, commanders, liaison officers, messengers, and others whose duties require them to be habitually mounted in exposed vehicles (Exhibit CC). This experimental model was built during the war but did not fully satisfy the requirement. Essentially, the chassis of the vehicle shown on the screen is that of $\frac{1}{4}$ -ton truck with an additional driving axle to carry the added weight of the armor. The conception of the proposed vehicle is much the same as this one but improved performance characteristics are required. It must be capable of seating four men, or three men if a medium range two-way radio set is to be carried. Armor protection against medium range small arms fire and medium artillery fragmentation is desired, and, of course, the cross country mobility must be superior. The gross weight of the vehicle, combat loaded, will be approximately 5000 pounds.

3. Trucks, Heavy

In the heavy truck class, 5-ton, 8-ton, 12-ton and 25-ton cargo capacity models are required. The 5-ton truck will be used to replace the present 4-ton to 6-ton trucks, wherever practicable. Cargo, wrecker, and dump bodies will be provided and it will be capable of use as a truck-tractor, when equipped with fifth wheel. This picture (Exhibit DD) shows an experimental 12-ton truck with 8x8 drive. It illustrates the trend of development in the 8, 12 and 25-ton chassis group. When equipped with cargo bodies these vehicles will provide means for transporting heavy equipment; when equipped as truck-tractors, they will provide motive power for semi-trailers to be used as vehicle transporters as well as for cargo. A 25-ton semi-trailer is planned for the 8-ton truck-tractor, one of 50-ton capacity for 12-ton truck-tractor and a third of 100-ton capacity for the 25-ton truck-tractor.

4. Recovery Vehicles and Wreckers

The following discussion will cover the more important special vehicles. In this class are recovery vehicles and wreckers. At the start of World War II, the Army Ground Forces were equipped with 4-ton and 10-ton wheeled wreckers which were capable of handling the vehicles of the Army on highways. However, it soon became apparent that this recovery vehicle lacked sufficient cross country ability to fulfill the mission of battlefield recovery (Exhibit EE). To meet this requirement a full tracked, armored recovery vehicle based on the medium tank was developed and

[REDACTED]

successfully employed in battlefield recovery of all types of armored vehicles. On the screen is shown the present standard tank recovery vehicle preparing to tow a light tank. With the arrival of the 46-ton Medium tank M26 during the final phase of the war it was evident that a recovery vehicle of greater power and capacity was needed. As a result, a series of recovery vehicles capable of handling battlefield recovery and highway wrecker duty for all types of Army Ground Forces equipment is under development. This program consists of two wrecker trucks and two full tracked recovery vehicles. The wreckers will be based on the proposed standard 5 and 12-ton truck chassis referred to previously; the recovery vehicles will be based on medium and heavy tank components.

5. Field Ambulances

The ambulance in use at the beginning of World War II was the ambulance, $\frac{1}{2}$ -ton, 4x4, cross country. This was found to be too light and was soon replaced with a $\frac{3}{4}$ -ton Ambulance of the same type. Later in the war, the old type body was replaced by a larger one capable of being collapsed and erected by field maintenance units. It is known as the "Knock-down" type and has the advantage of reducing shipping space, providing room for an attendant and of carrying six litter patients against four for the older type. This is the ambulance now authorized for field medical units. In order to reduce the distance for litter carry and to provide a more rapid means of evacuation for front line casualties, various means of using the Truck, $\frac{1}{4}$ -ton, 4x4, were improvised during combat. This vehicle proved so satisfactory that at present, plans are being made for the development of a light ambulance of the $\frac{1}{4}$ -ton type to carry two or three litter patients, utilizing the chassis of the proposed lightly armored $\frac{1}{4}$ -ton truck previously mentioned.

6. Amphibious Vehicles

The amphibious vehicles we know today were all developed during the last war. The island-hopping warfare of the Pacific and the invasions on the European continent expedited this development to such an extent that when hostilities ceased, we had in use both track-laying and wheeled amphibious cargo carriers, as well as a lightly armored amphibious tank.

The wheeled carrier is the $2\frac{1}{2}$ -ton amphibious truck known as the DUKW (Exhibit FF). Its primary mission is to receive cargo from ships anchored offshore and to deliver it to inland dumps. When waterborne, the vehicle is propeller-driven. It is equipped with a central tire inflation system, since it must use low tire pressure for traction in loose beach sand and resume normal pressure for road operation. In general, the present vehicle is satisfactory but new versions will incorporate devices to facilitate loading and unloading, and water performance will be improved.

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The amphibious tank developed during the war known as the LVT(A)5 (Exhibit GG) has a lightly armored hull and a turret-mounted, gyro-stabilized 75mm howitzer. It weighs nearly 40,000 pounds combat loaded with crew of six men. It was designed to provide close-in fire support to troops in the initial assault waves but its light armor makes it unsatisfactory for employment as a land tank. Development is continuing in effort to improve its capabilities for accomplishing tank missions. An experimental model (Exhibit HH) known as the amphibious 76mm Gun Motor Carriage, T87, has been tested and appears to be a step in the right direction, since it has considerably more fire power and better land performance. It is based on the tank destroyer 76mm Gun Motor Carriage, M18, previously described under tracked vehicles.

7. Armored Dozers and Engineer Armored Vehicle

A piece of equipment that proved most valuable in assisting the advance of armored columns is the Tank Dozer. The first models were battlefield expedients and consisted simply of hasty application of dozer blades to standard tanks. These crude improvisations were so effective in clearing rubble and breaking trail through rough terrain, that special dozer kits were designed and issued. This modification, while satisfactory for simple dozing tasks was by no means as efficient or as versatile as the engineer tractor-dozor. (Exhibit JJ). On the screen is a picture of the latest development in tank dozers. The war ended before this device could be employed in combat but service tests indicate it is far superior to previous models.

To bridge the gap between the comparatively inefficient tank dozer and the completely unarmored engineer tractor dozer, a lightly armored dozer is under development. It will be necessarily less efficient than the standard dozer but will be able to operate in areas where protection against small arms fire and artillery fragments is required.

An entirely new item of armored engineer equipment is now being developed and is tentatively known as the Engineer Armored Vehicle or Demolition Tank. It will be capable of carrying, in addition, to its operating crew, a two-man demolition detail with 2000 pounds of explosives in such form as to permit placement by hand, mechanical means, or projection device. The latter two methods will be controlled from within the tank. The demolition tank will also be capable of mounting alternatively a dozer blade, mine detection and clearing devices, and an assault bridge launching device. The vehicle will be based on components of the medium tank and will afford armor protection.

8. Armored Car

The last type of vehicle to be covered in this discussion is the Armored Car. (Exhibit KK). This is the Armored Car, M8. It was the only vehicle of its type that was used by our troops during the last

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war. It drives on all six-wheels and has a maximum speed of 56 MPH. It is armed with one 37mm Gun, one caliber .50 machine gun and one caliber .30 machine gun. Maximum armor thickness is 3/4-inch.

A later model was tested during the war and standardized as the Armored Car, M38. It provided some improved performance, but the other characteristics were so similar that it never went into production.

Further development is being considered for a vehicle of this type using components of the new 2½-ton cargo truck, and mounting main armament of approximately 75mm caliber.

PART IV

CONCLUSION

In conclusion we may summarize the status of tank and vehicular development by stating that the progress achieved during the war exploited conventional designs and methods so thoroughly that further work along these lines will not be remunerative. Instead, we must apply new methods and explore unconventional design if we are to make real progress in the future.

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SUGGESTIONS FOR PRESENTATION

1. Recommend that the Organization Chart of Army Ground Forces Board No. 2 be reproduced to a scale large enough to be easily read by the audience when mounted upon the speaker's platform. However, it may be presented as a slide if preferred.

2. The Operational Chart, Army Ground Forces Board No. 2, is furnished to provide the speaker with further details, if he desires to use them, in discussing the organization of the Board. It should not be presented to the audience.

3. Recommend that a chart showing the responsibilities of Board No. 2 be prepared and used in discussing paragraph F2 of Part I.

4. Recommend that slides be made from inclosed photographic prints. This method of presentation is preferred to the belloptican.

5. A characteristics sheet for each of the vehicles listed below, discussed in the lecture text, is inclosed. These sheets are for use of the speaker in answering questions which may be asked concerning points not stated in the text.

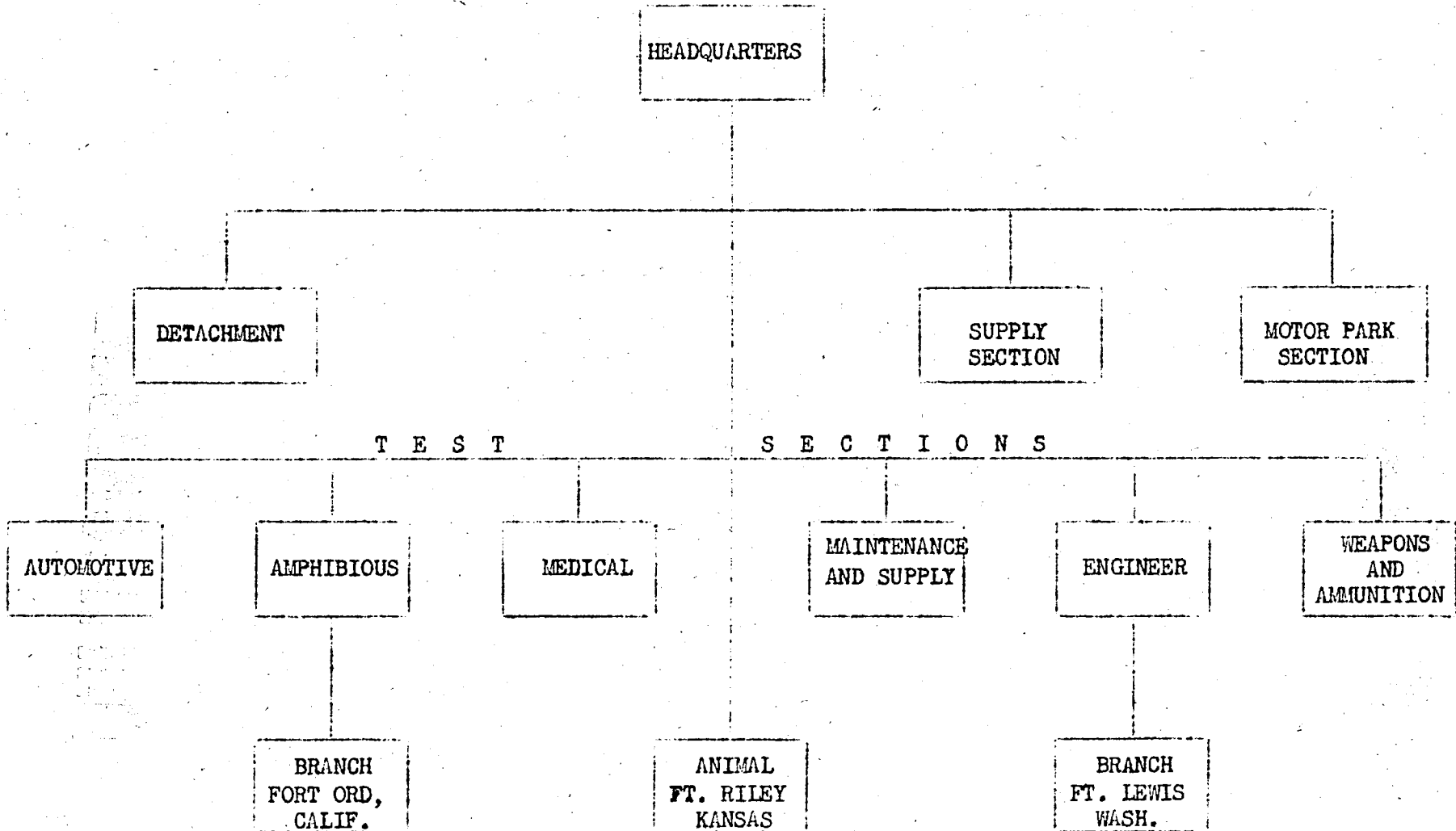
<u>Sheet Title</u>	<u>Photograph Exhibit to Which Applicable</u>
Tank, Light, M24	C
Tank, Medium, M4A3E8, with 76 mm Gun	F
Tank, Medium, M26	G
Tank, Medium, M45	H
Vehicle, Utility, Armored, M44	O
Tractor, High Speed, 18-Ton, M4	P
Tractor, Cargo, M8	Q
Carrier, Cargo, Amphibian, M29C	R
Carriage, Motor, 76 mm Gun, M18	U
Carriage, Motor, 105 mm Howitzer, M37	X
Carriage, Motor, 240 mm Howitzer, T92	Y

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<u>Sheet Title (Cont'd)</u>	<u>Photograph Exhibit to Which Applicable</u>
Truck, 2½-Ton, 6x6, LWB	None
Truck, 2½-Ton, Cargo, 4x4, T23	Z
Truck, 3/4-Ton, 4x4, Ambulance, (Knockdown)	None
Truck, ¼-Ton, 4x4, C & R	None
Vehicle, Tank Recovery, M32B3	EE
Truck, 2½-Ton, 6x6, Amphibian	FF
Landing Vehicle, Tracked, LVT (A) 5	GG
Car, Armored, Light, M8	KK

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ORGANIZATION CHART AGF BOARD NO. 2
FORT KNOX, KENTUCKY





U.S.A.
W-3043438

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PREPARED
BY L.T.D.
6/15/44



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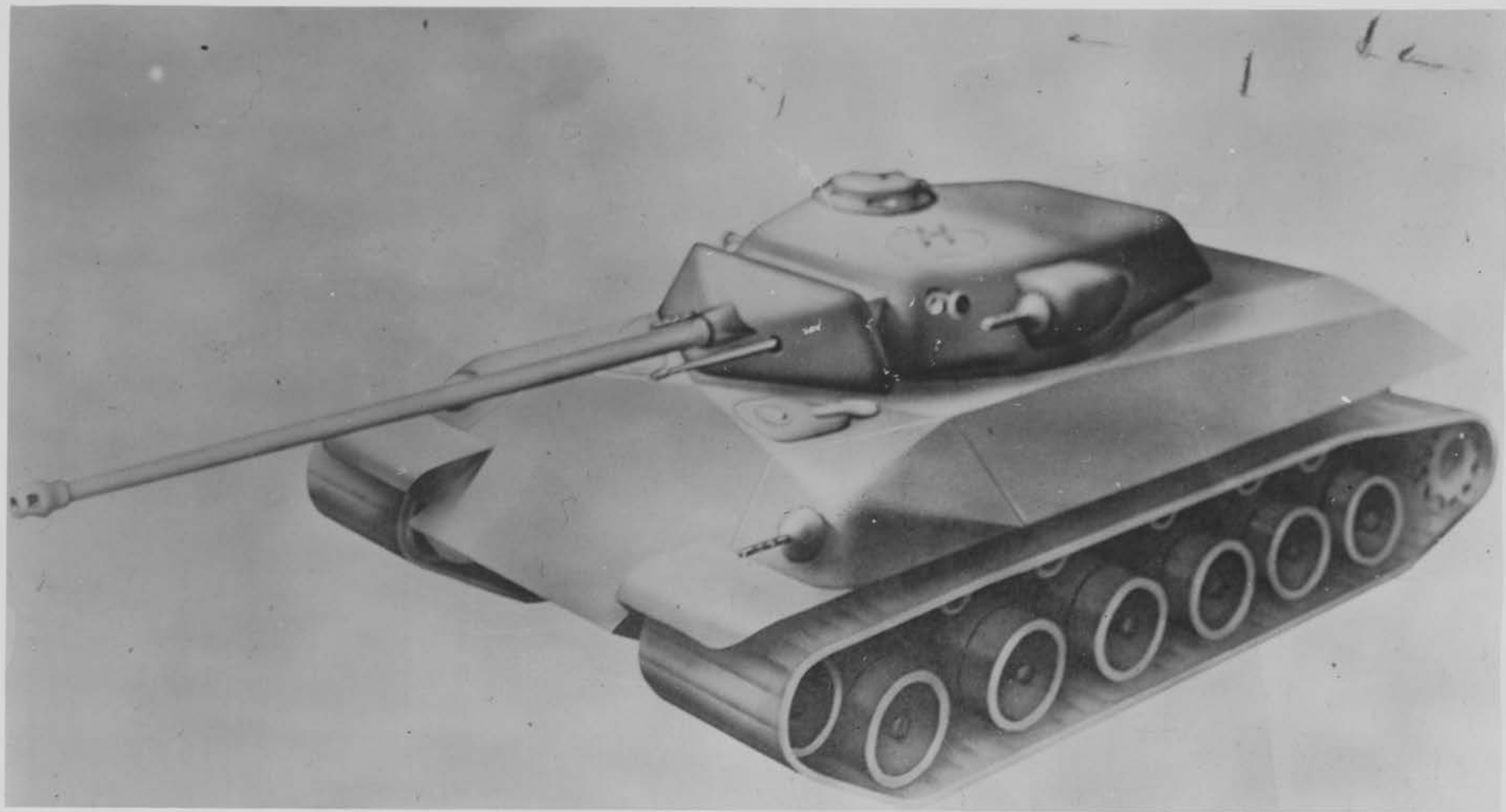


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46 3153



ARMORED FORCE BOARD
TEST OPERATION
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MURIEL

5/21



463 203

DESERT WARFARE BOARD
TEST OPERATION



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13487



R

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46-764



46-770





237 m



49-343



J. ROSS

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ARMORED BOARD
TEST OPERATION

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TOP BOARD 541

X

67-344



T92 2 240MM GUN MOTOR CARR.

U.S.A.
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RED LIMIT



401-311

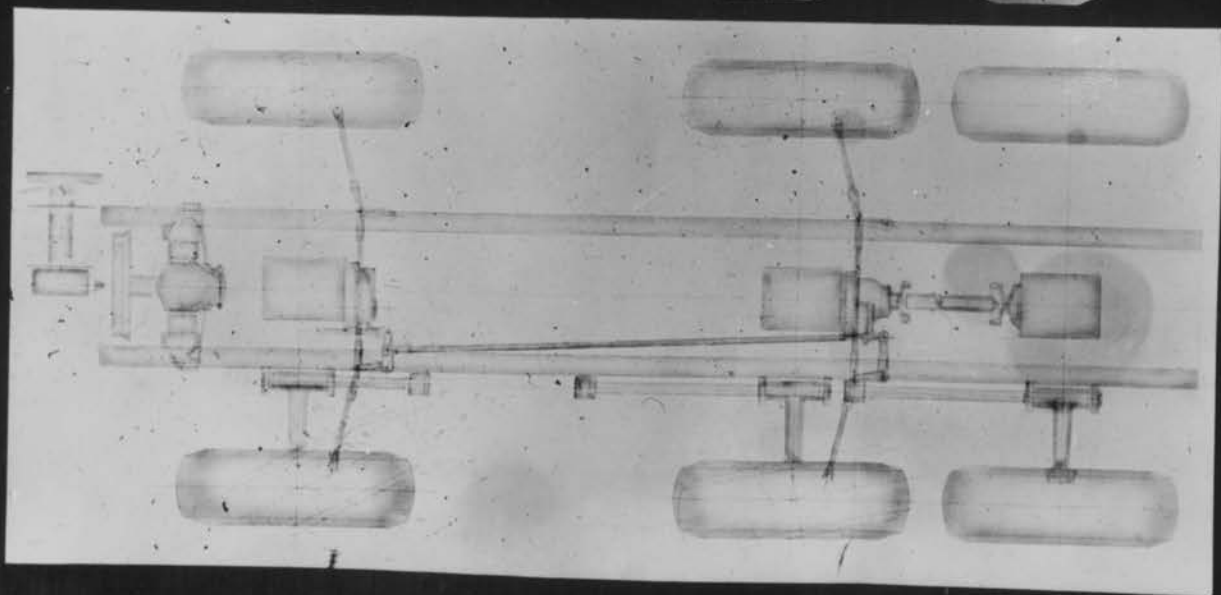
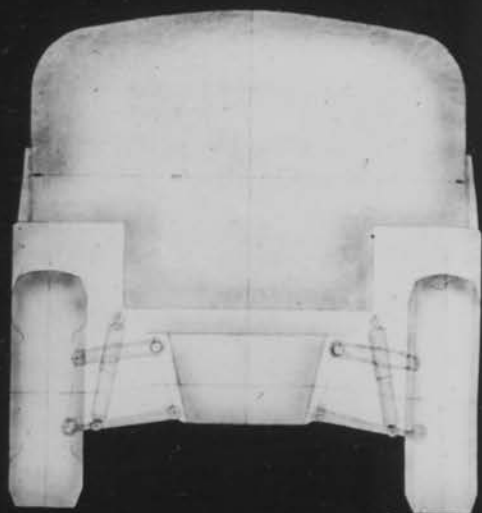
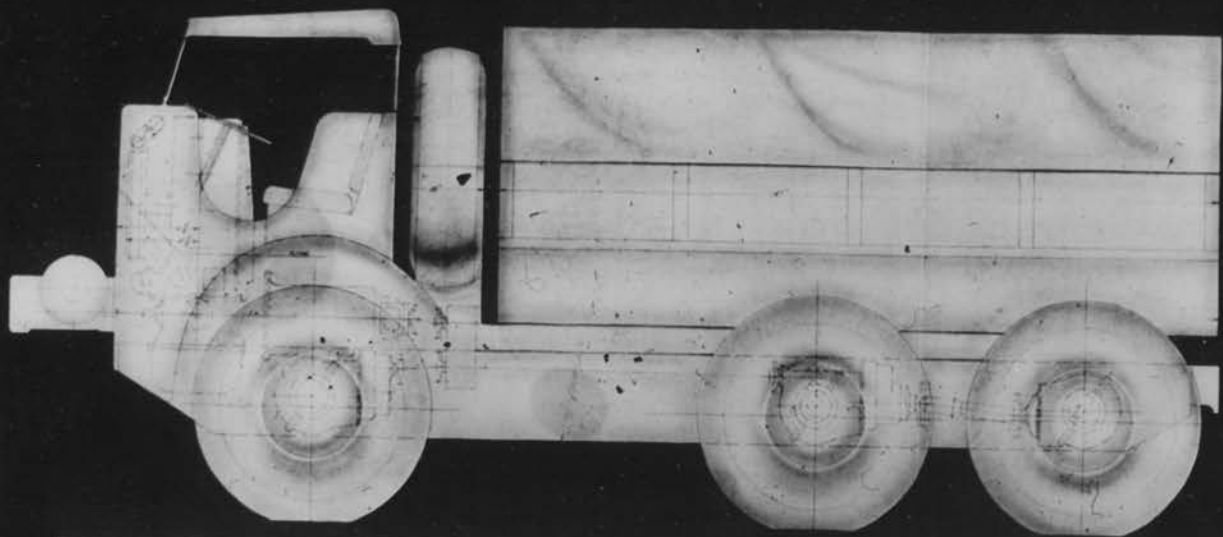




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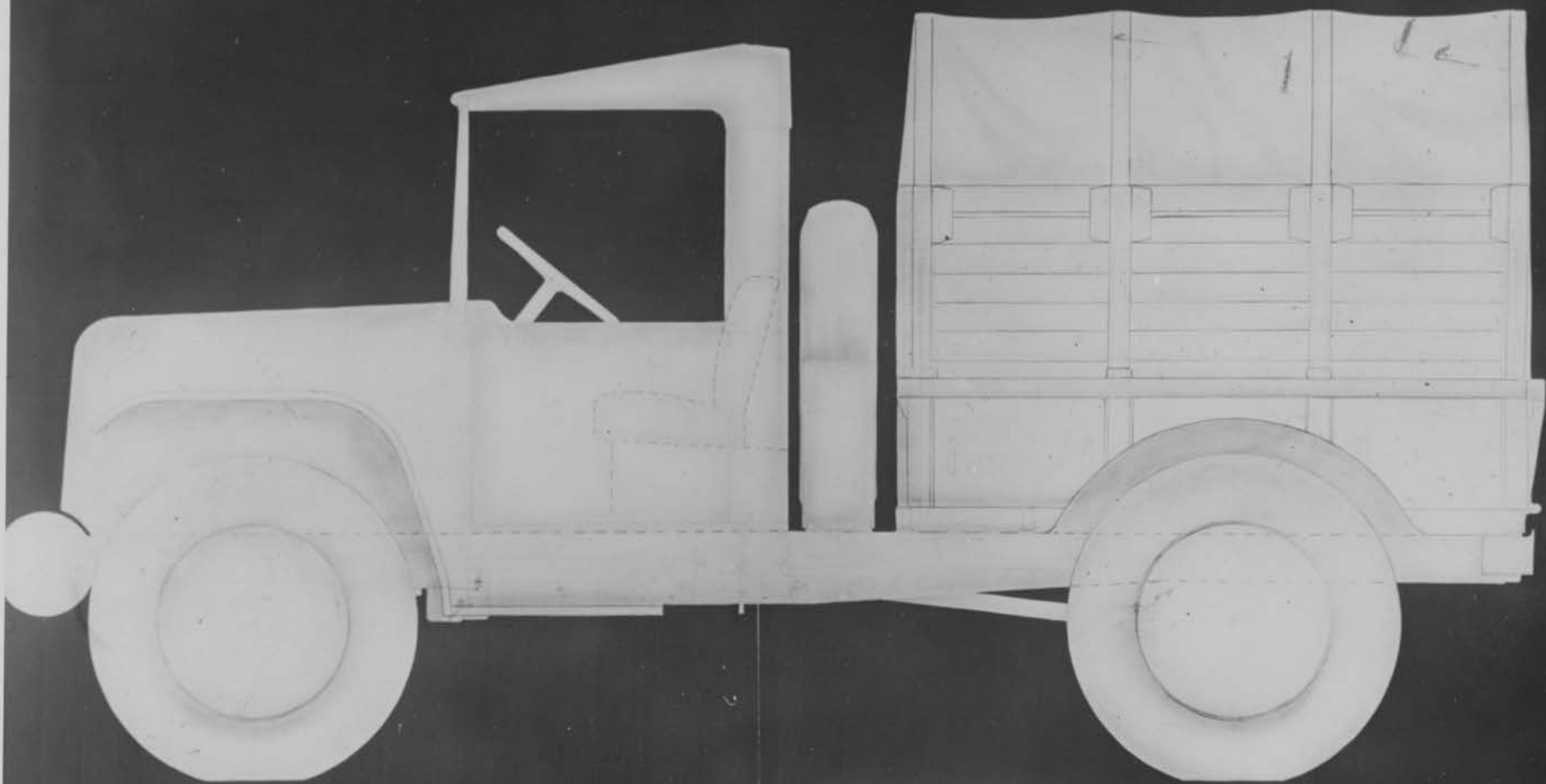


46-14747



DETROIT ARSENAL
REG. NO. 7890 DATE 12 NOV 1944 DEVELOPMENT & ENGINEERING
CARRIER, CROSS-COUNTRY, 2 1/2 TON, 6x6, W/WN

49-250



—DETROIT ARSENAL—
WED. NO. 1008 DATE 11 NOV 1944 DEVELOPMENT & ENGINEERING
Carrier, Cross-Country, 1/2 Ton, 4x4, W/M

47255



AFB - 4131



U.S.A.
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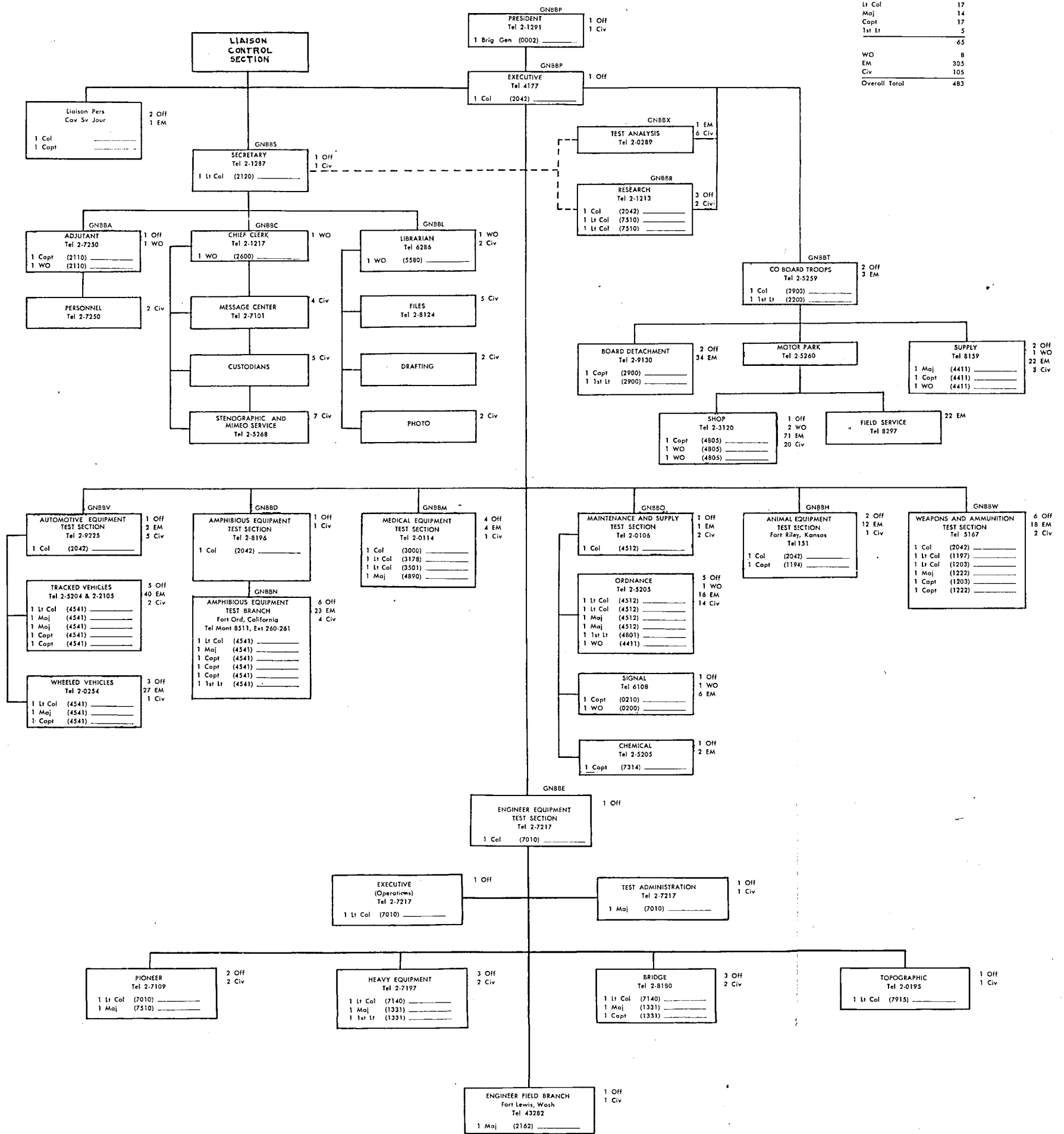


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OPERATIONAL CHART ARMY GROUND FORCES BOARD No. 2

PERSONNEL AUTHORIZED

Brig Gen	1
Col	11
Lt Col	17
Maj	14
Capt	17
1st Lt	5
<hr/>	
WO	8
EM	305
Civ	105
Overall Total	483



CHARACTERISTICS

- Tank, Light, M24

BRIEF DESCRIPTION:

Low silhouette, light tank mounting a .75mm gun.

GENERAL:

Make: Cadillac Motor Div., GMC

Type: Full Tracked, Armored, Combat Model: M24

Weight: (lbs.) Net 36,484 Fighting 40,090

Overall Dimensions: (in.) Length 216 Width 113½ Height 108½

Reducible to: (in.) Length Width Height

Tread: (in.) 96 Ground Clearance: (in.) 17-3/4

Computed Ground Pressure: 9.9 (PSI) Fighting Weight @ 1 in. Pen.

HP/Ton Fighting Weight: 11.0

Crew: 5

PERFORMANCE:

		<u>Rated Speed</u>	
		<u>High</u>	<u>Low</u>
Maximum Grade	60%	First Gear	
Maximum Vertical Wall	36 in.	Second Gear	
Maximum Trench	96 in.	Third Gear	
Maximum Fording Depth	40 in.	Fourth Gear	
Minimum Turning Circle (O.D.)	46 ft.	Reverse	
Towing Capacity	54,800 lbs.	Maximum Tractive Effort	
Angle of Approach			
Angle of Departure			
Cruising Range	150 mi.		
Gas Economy (Mi. per gal.)	.90 m.p.g. on highway;	.74 m.p.g. cross country	
Oil Economy (Mi. per qt.)	56.4		

ARMOR:

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front	1 in. @ 60°	1 in. @ 45°
Sides	1 in. @ 12°	3/4 in. @ 12°
Rear	3/4 in. @ 0°	3/4 in. @ 45°
Top		1/2 in.
Bottom		1/2 and 3/8 in.
Type Armor	Homogeneous	

ARMOR: (Cont'd)

Turret

Front 1 1/2 in. @ 25°

Sides 1 in. @ 25°

Gun Mantlet

Type Armor Homogeneous

Rear 1 in @ 0°

Top 1/2 in.

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 75mm Gun M6 or M17

Mount M64 (T90)

Caliber 75mm Length in Calibers 37.5 Total Length (in.) 116.4

Weight of Gun and Mount (lbs.) Est. Tube Life 3000 rds.

Out of Balance Balanced on its trunnions using a weighted recoil guard.

Breech Block Semi-auto.; Horizontal Sliding

Maximum Chamber Pressure 36,000 psi.

Maximum Range 15° Elevation 8875 yds w/Shell HE(SC)

Maximum On Carriage Range 8875 yds w/Shell HE(SC)

Ammunition Stowage 48 Rds. under turret floor. Total Rds. 48

Maximum Elevation 15° (267 mils) Maximum Depression 10°

Maximum Traverse 360° Turret Friction 183 Ft. lbs. Torque

Type Recoil Mechanism Concentric, Hydro-Spring w/replenisher

Type Oil Special

Maximum Recoil 13 in.

Normal Recoil 11 1/2 in.

Type Equilibrator None

Elevating Handwheel: Effort 12 in. lbs.

Mils per Turn 20

Hand Traverse Handwheel: Effort 12 in. lbs.

Mils per Turn 25

Power Traverse: Control Effort 14 in. lbs. Torque

Turret RPM 4

Secondary Weapons:

Gun, Mach., Cal. .30, M1919A4, Fixed

Mount M64 (T90)

Gun, Mach., Cal. .50, M2HB, Flex.

Mount D80029

Gun, Mach., Cal. .30, M1919A4, Flex.

Mount D76102

Gun, Sub-mach., Cal. .45, M3

Ammunition:

AMMUNITION	HE (SC)	APC	HVAP:	SMOKE	SMOKE
Model	M48	*	T45	WP M64	HC, BI M89
Wt. Projectile (lbs.)	14.6	14.96	8.4	15.25	6.61
Wt. Round (lbs.)	19.6	19.36	13.6	20.26	9.83
Wt. Propellant (lbs.)	2.0	2.00	2.2	2.00	0.219
Length Round (in.)	26.6	26.29	23.08	26.60	20.26
Fuze Model	M48, M48A2	*	None	M57	None
Muzzle Velocity (f/s)	1980	2030	2850	1980	850
Pene. Home. Plate @ 1000 yds. & @ 30° obliquity (in.)		2.3	3.6		

* M61, 61A1 w/Fuze B.D. M66A1 and Tracer; M61 w/Tracer

Fire Control:

Direct Fire Telescope, M71G	Mount M65 (T94)
Periscope, M10P	Mount M66
Periscope, M15	Mount Vision Cupola Rotor

Indirect Fire Quadrant, Elevation, M9
Indicator, Azimuth, M21

Vision Devices Vision Cupola	Location Commander's Hatch
Periscope, M13	Location Asst. Driver's Hatch
Periscope, M13	Location Driver's Hatch

Others Binoculars, M3; Quadrant, Gunner's, M1

POWER TRAIN:

Engine:

Make Cadillac Motor Div., GMC.	Model 44T24
Type Dual V-8, Gas, Liquid Fuel, Type	Gas, 80 plus Oct.
Cooling System Liquid	
No. Cylinders 8 (each)	Horsepower (Rated) 220 at 3400 (Total for 2 eng.) RPM
Displacement (cu. in.) 346	Bore (in.) 3.5 Stroke (in.) 4.5
Governed Speed (rpm) 3400	Compression Ratio 7.06:1

Clutch: None

Transmission:

Make Detroit Transmission Div., GMC	
Type Hydramatic	
No. of Speeds Forward 4	Reverse None**
Gear Ratios	
First 3.92:1	
Second 2.53:1	
Third 1.55:1	
Fourth 1:1	

Differential:

Make Buick Motor Div., GMC	Type Controlled
Gear Ratio 2.62:1	Steering Ratio 1.33:1 (Approx.)

Final Drive:

Make Buick Motor Div., GMC	Type Herringbone
Gear Ratio 2.57:1	

Transfer Case:

Gear Ratios	High 1.03:1	Low 2.34:1	Reverse 2.44:1 **
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TABLE OF CAPACITIES:

Fuel Tanks (2)	110 gals
Transmission	15 qts.
Differential	20 qts.
Final Drives	2 qts. (ea.)
Engine & Oil Filter	8 qts. (ea. engine)
Oil Bath Air Cleaners	3 qts. (ea.)
Cooling System	40 qts. (ea. engine)
Transfer Case	4 $\frac{1}{2}$ qts.

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type All Steel, Center Guide, Single Pin Model T72
All Rubber, Center Guide, Double Pin T85
Width (in.) 16 Pitch (in.) 5 $\frac{1}{2}$
Length of Ground Contact (in.) 126 @ 1 in. Pen.
Drive Front Sprocket Revolutions per Mi. 886 Shoes per Track 75

Wheels: Number 10 Dual Size (in.) 25 $\frac{1}{2}$ x 4 $\frac{1}{2}$

Tires: Cured on Wheels

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

Batteries	Number 4	Voltage 6
Main Generator	Number 2 (1 per engine)	Voltage 24 Amps 50
Auxiliary Generator	None	

COMMUNICATIONS:

Radios: Type SCR 506 (Command Vehicle Only) Location Ass't Driver Compartment.
SCR 508 or 528 Location Turret Bulge
AN/VRC-3 Location Turret in Front of Tank Commander

No. of Interphone Outlets: 5

FLAME PROTECTION: 1 10 lb. CO₂ Fixed 1 4 lb. CO₂ Portable

ADDITIONAL FEATURES:

** Transmission in combination with Transfer Unit gives 8 speeds forward and 4 in reverse.

Turret Traverse: Type Hydraulic Mfr. The Oil Gear Co.

Auxiliary Type: Manual Mfr. New Process Gear Co.

Gyrostabilizer: Yes

TK Med M43E8

CHARACTERISTICS

Tank, Medium, M43E8, with 76mm Gun

BRIEF DESCRIPTION:

The Tank, Medium, M43E8 with 76mm Gun, employs a 23 inch track and horizontal volute springs.

GENERAL:

Make: Chrysler Corp.

Type: Full Tracked, Armored, Combat Model: M43E8

Weight: (lbs.) Net 70,950 Fighting 75,590

Overall Dimensions: (in.) Length 246 (incl. gun) Width 117 $\frac{1}{4}$ Height 117 $\frac{1}{2}$

Reducible to: Length Chassis 228. Width Height

Tread: (in.) 101 Ground Clearance: (in.) Front 17 $\frac{1}{2}$; Rear 19 $\frac{1}{2}$

Computed Ground Pressure: 10.9 (PSI) Fighting Weight @ 1 in Pen

HP/Ton Fighting Weight: 13.2

Crew: 5

PERFORMANCE:

Rated Speed 26 mph max.

		<u>High</u>	<u>Low</u>
Maximum Grade	60%		None
Maximum Vertical Wall	24 in.	First Gear	
Maximum Trench	89 in.	Second Gear	
Maximum Fording Depth	36 in.	Third Gear	
Minimum Turning Circle (O.D.)	62 ft.	Fourth Gear	
Towing Capacity		Fifth Gear	
Angle of Approach	38 Deg.	Reverse	
Angle of Departure	25 Deg.		
Cruising Range	100 mi. highway		
Gas Economy (Mi. per gal.)	.55 mpg Highway; .47 mpg Cross-country		
Oil Economy (Mi. per qt.)	12.3 mpg Highway; 4.7 mpg Cross-country		

ARMOR:

Hull	Above Sponson Line	Below Sponson Line
Front	2 $\frac{1}{2}$ in. @ 47°	4 $\frac{1}{2}$ in. @ 56°
Sides	1 $\frac{1}{2}$ in. @ 0°	1 $\frac{1}{2}$ in. @ 0°
Rear		1 $\frac{1}{2}$ in. @ 22°
Top		3/4 in.
Bottom		1 in. & 1 $\frac{1}{2}$ in.
Type Armor	Homogeneous	

Fire Control:

Direct Fire Telescope, M71	Mount M57
Periscope, M10G	Mount T116
or Periscope M1A1	Mount
Periscope M15	Mount Vision Cupola Rotor

Indirect Fire Quadrant, Elevation, M9
Indicator, Azimuth, M20

Vision Devices	Vision Cupola	Location	Commander's Hatch
	Periscope, M13	Location	Driver's Hatch
	Periscope, M13	Location	Ass't; Driver's Hatch
	Periscope, M13	Location	Loader's Hatch (Vic.)

Others Binocular, M13; Quadrant, Gunner's, M1

POWER TRAIN:

Engine:

Make Ford Motor Co. Model GAA
Type V8, Gas, Liquid Cooled Fuel, Type Gas, 80 Oct. Cooling system Liquid
No. Cylinders 8 Horsepower (Rated) 500 at 2600 RPM
Displacement (cu.in.) 1100 Bore (in.) 5.4 Stroke (in.) 6
Governed Speed (rpm) 2600 (under load) Compression Ratio 7.5:1

Clutch:

Make Long Mfg. Co.
Type Dry, Multi-disc

Transmission:

Make Spicer Mfg. Corp.
Type Synchronesh
No. of Speeds Forward 5 Reverse 1
Gear Ratios
First 7.56:1
Second 3.11:1
Third 1.78:1
Fourth 1.11:1
Fifth .73:1
Reverse 5.65:1

Differential:

Make Buick Motor Division, GMC Type Controlled
Gear Ratio 3.53:1 Steering Ratio 1.515:1

Final Drive:

Make Buick Motor Division, GMC Type Herringbone
Gear Ratio 2.84:1

Transfer Case: None

TABLE OF CAPACITIES:

Fuel Tanks (4)	175 gals.
Transmission) 164 qts.
Differential	
Final Drives	
Engine & Oil Filter	32 qts.
Oil Bath Air Cleaners	3½ qts. (ea.)
Auxiliary Generator Power Plant	1 gal.
Cooling System	56 qts.

RUNNING GEAR:

Suspension: Type Horizontal Volute Spring

Track:

Type Steel, rubber backed, double pin, center guide Model T80
All rubber, double pin, center guide T84
Width (in.) 23 Pitch (in.) 6
Length of Ground Contact (in.) 151 @ 1 in Pen
Drive Front Sprocket Revolutions per Mi. 812 Shoes per Track 78

Wheels: Number 12 Dual Size (in.) 20½ x 6¼

Tires: Cured on wheel

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 12	
<u>Main Generator</u>	Number 1	Voltage 30	Amps 50
<u>Auxiliary Generator</u>	Make Homelite	Voltage 28½	Amps 50

COMMUNICATIONS:

<u>Radios:</u> Type SCR 506 (command vehicles only)	Location Rt. Sponson, Front
SCR 508 or 528	Location Turret Bulge
AN/VRC-3	Location Turret in front of Tank Commander.

No. of Interphone Outlets: 5

FIRE PROTECTION: 2 10 lb CO₂ Fixed 2 4 lb CO₂ Portable

ADDITIONAL FEATURES:

Turret Traverse: Type Hydraulic Mfgr. The Oil Gear Co.;
Auxiliary Type: Manual Mfgr. New Process Gear Co.
Gyrostabilizer: Yes

CHARACTERISTICS

Tank, Medium, M26

BRIEF DESCRIPTION:

Low silhouette medium tank mounting a 90mm gun, M3.

GENERAL:

Make: Fisher Body Division, GMC

Type: Full Tracked, Armored, Combat

Model: M26

Weight: (lbs.) Net 84,850

Fighting 92,355

Overall Dimensions: (in.) Length 349-3/8 Width 138-3/4 Height 109-3/8

Reducible to: (in.) Length Width Height

Tread: (in.) 110

Ground Clearance: (in.) 17-11/16

Computed Ground Pressure: 13.0

(PSI) Fighting Weight @ 1 in Pen

HP/Ton Fighting Weight: 10.8

Crew: 5

PERFORMANCE:

Rated Speed 30 mph max.,
25 mph sustained.
High Low

Maximum Grade	60%	
Maximum Vertical Wall	46 in.	
Maximum Trench	95 in.	First Gear 0-9 mph None
Maximum Fording Depth	48 in.	Second Gear 6-19
Minimum Turning Circle (O.D.)	63 ft.	Third Gear 12-30
Towing Capacity 60,000 lbs. ft.	Maximum Tractive Effort	Reverse 0-9

Angle of Approach

Angle of Departure

Cruising Range

90 mi. highway; 60 mi. cross-country

Gas Economy (Mi. per gal.)

Oil Economy (Mi. per qt.)

ARMOR:

Hull

Above Sponson Line

Below Sponson Line

Front

4 in. @ 46°

3 in. @ 53°

Sides

3 in. & 2 in. @ 0°

Rear

2 in. @ 10°

Top

7/8 in.

Bottom

1 in. & 1 1/2 in.

Type Armor

Homogeneous

Fire Control:

Direct Fire : Telescope, M83C Mount M72
Periscope, M10F Mount M73
Periscope, M15 Mount Vision Cupola Rotor

Indirect Fire: Quadrant, Elevation, M9
Indicator, Azimuth, M20

Vision Devices Vision Cupola Location Commander's Hatch
Periscope, M13 Location Loader's Hatch (Vicinity)
Periscope, M13 Location Driver's Hatch
Periscope, M13 Location Asst. Driver's Hatch

Others Binoculars, M13; Quadrant, Gunner's, M1

POWER TRAIN:

Engine:

Make Ford Motor Co. Model GAF
Type V-8, Liquid Cooled, Gas Fuel, Type Gas, 80 Oct. Cooling System Liquid
No. Cylinders 8 Horsepower (Rated) 500 at 2600 RPM
Displacement (cu. in.) 1100 Bore (in.) 5.4 Stroke (in.) 6
Governed Speed (rpm) 2600 (under load) Compression Ratio 7.5:1

Clutch: None

Transmission:

Make Detroit Transmission Div., GMC
Type Torqmatic
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 1:1
Second 1:2.337
Third 1:4.105
Reverse 1:1.322

Differential:

Make Buick Motor Div., GMC Type Controlled
Gear Ratio 3.53:1 Steering Ratio 1.79:1.00

Final Drive:

Make Buick Motor Div., GMC Type Herringbone
Gear Ratio 3.95:1

Transfer Case:

Gear Ratio 1.38:1

TABLE OF CAPACITIES:

Fuel Tanks (2)	183 gal.
Transmission	31 qts.
Differential	60 qts.
Final Drives	7 qts.
Engine & Oil Filter	32 qts.
Oil Bath Air Cleaners	3½ qts. (each)
Auxiliary Generator Power Plant	3 qts.
Cooling System	22 gal.
Transfer Case	Common with Transmission

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type Steel, rubber backed, double pin, center guide Model T80E1
All rubber, double pin, center guide T84E1
Width (in.) 23 Pitch (in.) 6
Length of Ground Contact (in.) 154 @ 1 in. Pen
Drive Rear Sprocket Revolutions per Mi. 812 Shoes per Track 82

Wheels: Number 12 Duals Size (in.) 26 x 6

Tires: Cured on Wheel

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 12	
<u>Main Generator</u>	Number 1	Voltage 24	Amps 150
<u>Auxiliary Generator</u>	None		

COMMUNICATIONS:

<u>Radios:</u> Type AN/VRC-3	Location Turret Bulge
SCR 508 or 528	Turret Bulge
<u>No. of Interphone Outlets:</u> 5	

FIRE PROTECTION: 2 10lb CO₂ Fixed 2 4lb CO₂ Portable

ADDITIONAL FEATURES:

Turret Traverse: Type Hydraulic Mfgr. The Oil Gear Co.
Auxiliary Type: Manual Mfgr. New Process Gear Co.
Gyrostabilizer: None
Main Generator: Driven by 4 cycle, Liquid Cooled, 13 H.P. Waukesha Engine in main engine compartment or by tank engine through two one-way pulleys on either end of generator.

CHARACTERISTICS

Tank, Medium, M45

BRIEF DESCRIPTION:

A 105mm Howitzer Assault Gun on the Tank, Medium, M26 chassis.

GENERAL:

Make: Fisher Body Div. & Chevrolet Central Office, GMC

Type: Full Tracked, Armored, Combat Model: M45

Weight: (lbs.) Net 86,000 Fighting 93,000

Overall Dimensions: (in.) Length 268-3/4 Width 138-3/4 Height 109-3/8

Reducible to: (in.) For Shipment Length Width 124 Height

Tread: (in.) 110 Ground Clearance: (in.) 17-11/16

Computed Ground Pressure: 13.1 (PSI) Fighting Weight @ 1 in. Pen.

HP/Ton Fighting Weight: 10.8

Crew: 5

PERFORMANCE:

Rated Speed 30 mph Max.

25 mph Sustained

Maximum Grade	60%	<u>High</u>	<u>Low</u>
Maximum Vertical Wall	46 in.		None
Maximum Trench	95 in.	First Gear	0-9 mph
Maximum Fording Depth	48 in.	Second Gear	6-19
Minimum Turning Circle (O.D.)	63 ft.	Third Gear	12-30
Towing Capacity	60,000 lbs. ft. Maximum	Reverse	0-9
	Tractive Effort		

Angle of Approach

Angle of Departure

Cruising Range 90 mi. Highway; 60 mi. cross-country

Gas Economy (Mi. per gal.)

Oil Economy (Mi. per qt.)

ARMOR:

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front	4 in. @ 46°	3 in. @ 53°
Sides		3 in. & 2 in. @ 0°
Rear		2 in. @ 10°
Top		7/8 in.
Bottom		1 in. & 1 1/2 in.
Type Armor	Homogeneous	

Tk med M45

ARMOR: (Cont'd)

Turret

Front	5 in. @ 0°	Rear	2½ in. @ 0°
Sides	5 in. - 3 in. @ 0°	Top	1 in.
Gun Mantlet	8 in. Basis,		
Type Armor	Homogeneous		

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 105mm Howitzer M4 Mount T117

Caliber 105mm Length in Calibers 22.5 (Bore) Total Length(in.) 101.3
 Weight of Gun and Mount (lbs.) Est. Tube Life 20,000 rds.
 Out of Balance None
 Breech Block Horizontal Sliding Wedge
 Maximum Chamber Pressure 28,000 psi.
 Maximum Range 15° Elevation 7318 yds.
 Maximum On Carriage Range 11722 yds.
 Ammunition Stowage 10 Rds. in Ready Rack; 64 Rds. Under Turret Floor.
 Total Rds. 74.
 Maximum Elevation 35° Maximum Depression 10°
 Maximum Traverse 360° Turret Friction 84 Ft. lbs. Torque
 Type Recoil Mechanism Hydro-spring Type Oil Special
 Maximum Recoil Normal Recoil 12-7/8 in.
 Type Equilibrator None
 Elevating Handwheel: Effort 92 in. lbs. Mils per Turn 25
 Hand Traverse Handwheel: Effort 3 in. lbs. Mils per Turn 22
 Power Traverse: Control Effort 46 in. lbs. Torque Turret RPM 3.3

Secondary Weapons:

Gun, Mach., Cal..50, HB, M2	Mount AA
Gun, Mach., Cal..30, M1919A4, Flex	Mount Bow
Gun, Mach., Cal..30, M1919A4, Fixed	Mount T117

Ammunition:

AMMUNITION	HE (NC)	SMOKE	SMOKE	HEAT
Model	M1	HC, BE M84	WP M60	M67
Wt. Projectile (lbs.)	33.00	32.87	34.70-35.21	29.22
Wt. Round (lbs.)	42.07	41.94	43.77-44.28	36.85
Wt. Propellant (lbs.)	3.04	3.04	3.04	1.60
Length Round (in.)	31.07	30.49	31.08	31.05
Fuze Model	*	M54	M57	M62
Muzzle Velocity (f/s)	1550(Max)	1550(Max)	1550(Max)	1250
Pene. Home. Plate @ 1000 yds. & @ 30° obliquity (in.)				5.5

* M48, M48A1, M54

Fire Control:

Direct Fire Telescope, M76G Mount T131
Periscope, M10D Mount T130
Periscope, M15 Mount Vision Cupola Rotor

Indirect Fire Unit, Sight, M29A1 Mount Holder, T3
Indicator, Azimuth, M20
Quadrant, Elevation, M9

Vision Devices Vision Cupola Location Commander's Hatch
Periscope, M13 Location Driver's Hatch
Periscope, M13 Location Asst. Driver's Hatch
Periscope, M13 Location Loader's Hatch (Vic.)

Others Binoculars, M13; Quadrant, Gunner's, M1

POWER TRAIN:

Engine:

Make Ford Motor Co. Model GAF
Type V-8, Gas, Liquid Cooled Fuel, Type Gas, 80 Oct.
Cooling System Liquid
No. Cylinders 8 Horsepower (Rated) 500 at 2600 RPM
Displacement (cu.in.) 1100 Bore (in.) 5.4 Stroke (in.) 6
Governed Speed (rpm) 2600 (Under Load) Compression Ratio 7.5:1

Clutch: None

Transmission:

Make Detroit Transmission Div., GMC.
Type Torqmatic
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 1:1.00
Second 1:2.337
Third 1:4.105
Reverse 1:1.322

Differential:

Make Buick Motor Div., GMC Type Controlled
Gear Ratio 3.53:1 Steering Ratio 1.79:1.00

Final Drive:

Make Buick Motor Div., GMC Type Herringbone
Gear Ratio 3.95:1

Transfer Case:

Gear Ratio 1.38:1

TABLE OF CAPACITIES:

Fuel Tanks (2)	183 gals.
Transmission	31 qts.
Differential	60 qts.
Final Drives	7 qts.
Engine & Oil Filter	32 qts.
Oil Bath Air Cleaners	3½ qts. (ea.)
Auxiliary Generator Power Plant	3 qts.
Cooling System	22 gals.
Transfer Case	Common with Transmission

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type Steel, rubber backed, double pin, center guide Model T80E1
All rubber, double pin, center guide T84E1
Width (in.) 23 Pitch (in.) 6
Length of Ground Contact (in.) 154 @ 1 in Pen
Drive Rear Sprocket Revolutions per Mi. 812 Shoes per Track 82

Wheels: Number 12 Dual Size (in.) 26 x 6

Tires: Cured on Wheel

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

Batteries	Number 2	Voltage 12		
Main Generator	Number 1	Voltage 24	Amps 150	
Auxiliary Generator	None	"	Ars	

COMMUNICATIONS:

Radios: Type SCR-508 or 528 Location Turret Bulge
AN/VRC-3 Location Turret Bulge

No. of Interphone Outlets: 5

FIRE PROTECTION: 2 10 lb CO₂ Fixed . 2 4 lb CO₂ Portable

ADDITIONAL FEATURES:

Turret Traverse: Type Hydraulic Mfgr. The Oil Gear Co.
Auxiliary Type: Manual Mfgr. New Process Gear Co.
Gyrostabilizer: Yes
Main generator driven by 4 cycle, liquid cooled, 13 H.P. Waukesha engine in main engine compartment or by tank engine through two one-way pulleys on either end of generator.

CHARACTERISTICS

Vehicle, Utility, Armored, M44

BRIEF DESCRIPTION:

A full tracked, highly mobile armored vehicle capable of use as an armored personnel or cargo carrier, litter carrier, reconnaissance vehicle or prime mover.

GENERAL:

Make: Cadillac Motor Div., GMC

Type: Full Tracked, Armored, Combat

Model: M44

Weight: (lbs.) Net 39,000

Fighting 49,000

Overall Dimensions: (in.) Length 256 $\frac{1}{4}$ Width 117 Height 111-5/8

Reducible to: (in.) Length Width Height

Cargo Space:

Cu. Ft.

Length (in.) 160

) Entire Space Not Available As

Width (in.) 114

) Space Must Be Available For Soldier

Height of Bed (in.) 52

) Manning Cal..50 MG, AA.

Loading Height: (in.) 42 $\frac{1}{4}$

Tread: (in.) 96

Ground Clearance: (in.) 18 $\frac{1}{4}$

Computed Ground Pressure: 7.8 (PSI) Fighting Weight @ 1 in Pen.

HP/Ton Fighting Weight: 19.8

Crew: 27

PERFORMANCE:

Maximum Grade 60%
Maximum Vertical Wall 30 in.
Maximum Fording Depth 40 in.
Minimum Turning Circle (O.D.) 44 ft.
Towing Capacity
Angle of Approach 26°
Angle of Departure 25° 45'
Cruising Range 180 mi.
Gas Economy (Mi. per gal.)
Oil Economy (Mi. per qt.)

First Gear
Second Gear
Third Gear
Reverse

Rated Speed 32 mph
High Low
None

AUV M44

Differential:

Make Buick Motor Div., GMC
Gear Ratio 3.14:1

Type Controlled
Steering Ratio 1.6:1

Final Drive:

Make Buick Motor Div., GMC
Gear Ratio 2.82:1

Type Spur Gear

Transfer Case:

Gear Ratio 1.29:1

TABLE OF CAPACITIES:

Fuel Tanks (2)	225 gals.
Transmission	48 qts. (Dry)
Differential	20 qts.
Final Drives	5 qts.
Engine & Oil Filter	44 qts.
Oil Bath Air Cleaners	4 qts. (ea.)
Auxiliary Generator Power Plant	5 gals. (ea.)
Cooling System	Air Cooled
Transfer Case	Common With Differential

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type All Steel, Center Guide, Single Pin	Model T86
Steel, Rubber Backed, Double Pin	T87
Width (in.) 21	Pitch (in.) 6.14
Length of Ground Contact (in.) 149 $\frac{1}{2}$ @ 1 in. Pen.	
Drive Front Sprocket Revolutions per Mi. 737	Shoes per Track 84

Wheels: Number 12 Dual Size (in.) 25 $\frac{1}{2}$ x 4 $\frac{1}{4}$

Tires: Cured On Wheel

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 12	
<u>Main Generator</u>	Number 1	Voltage 24	Amps 50
<u>Auxiliary Generator</u>	Make 2-Homelite	Voltage 24	Amps 60 (ea.)

COMMUNICATIONS:

Radios: Type SCR 506 (Command Vehicles Only) Location
SCR 508 or 510 or 608 Location Left rear of
AN/VRC 3 Location Rear of driving
personnel compartment.
compartment.

No. of Interphone Outlets: 4

FIRE PROTECTION: 3 10 lb CO₂ Fixed 2 4 lb CO₂ Portable

ADDITIONAL FEATURES:

- * Right Angle Drive From Engine into Transmission
- ** All Ratios in Transmission are Overdrive

CHARACTERISTICS

Tractor, High Speed, 18 Ton, M4

BRIEF DESCRIPTION:

A full tracked prime mover for towing heavy artillery over rough terrain.

GENERAL:

Make: Allis-Chalmers Mfg. Co.

Type: Full Tracked

Model: M4

Weight: (lbs.) Net 28,000 Gross 31,400 Payload 3400

Overall Dimensions: (in.) Length 203-Class A Width 97 Height 99
206-Class B

Reducible to: (in.) Length Width Height

Tread: (in.) 80

Ground Clearance: (in.) 20

Computed Ground Pressure: 7.6 (PSI) Towing 90mm Gun
8.75 (PSI) Towing 155mm

HP/Ton Gross Weight: : 13.4

Crew: 11 Cargo Space: Fitted with special cargo & ammunition carrying boxes.

PERFORMANCE:

Rated Speed 35 MPH

High Low
None

Maximum Grade 30%
Maximum Vertical Wall 29 in.
Maximum Trench 60 in.
Maximum Fording Depth 41 in.
Minimum Turning Circle (O.D.) 37 ft.
Towing Capacity 27,000 lbs. ft. Maximum
Tractive Effort

First Gear
Second Gear
Third Gear
Reverse

Angle of Approach 30 Deg.
Angle of Departure 30 Deg.
Cruising Range 180 mi.
Gas Economy (Mi. per gal.) 2 mpg w/towed load
Oil Economy (Mi. per qt.)

ARMOR: None

Hi Spd Tctr M4

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: Gun, Mach., Cal. .50, HB, M2 Flex. Mount M49C

Maximum Elevation 80°

Maximum Depression 20° (Full Depression not available to front and rear.)

Maximum Traverse 360°

Fire Control: None

POWER TRAIN:

Engine:

Make Waukesha Motor Co. Model 145 GZ
Type In Line, 4 Cycle Fuel, Type Gas, 70 Oct. Cooling system Liquid
No. Cylinders 6 Horsepower (Rated) 210 at 2100 RPM
Displacement (cu.in.) 817 Bore (in.) 6 Stroke (in.) 5-3/8
Governed Speed (rpm) 2100 Compression Ratio 5.95:1

Clutch:

Make
Type Dry Disc - Spring Loaded

Transmission:

Make
Type Selective
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 2.166:1
Second 1.555:1
Third 0.437:1
Reverse 1.822:1

Differential:

Make
Gear Ratio 2.666:1 Type Controlled
Steering Ratio 1.747:1

Final Drive:

Make
Gear Ratio 2.764:1 Type Herringbone

Transfer Case: None

TORQUE CONVERTER: Max. Ratio 1.372:1

TABLE OF CAPACITIES:

Fuel Tank (1)	125 gals.
Transmission & Differential	28 qts.
Torque Converter	34 qts.
Final Drives	10 qts.(ea.)
Engine & Oil Filter	20 qts.
Oil Bath Air Cleaners	
Cooling System	72 qts.
Winch	3 qts.

RUNNING GEAR:

Suspension: Type Horizontal Volute Spring

Track:

Type All rubber, double pin, outside end connectors Model T48, T51
Width (in.) 16 9/16 Pitch (in.) 6
Length of Ground Contact (in.) 124
Drive Front Sprocket Revolutions per Mi. 812 Shoes per Track 65

Wheels: Number 8 Size (in.) 20 x 9

Tires:

Number 8	Type Pressed On
Size (in.)	No. Plies Solid

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1	Voltage 12
<u>Main Generator</u>	Number 1	Voltage 12 Amps 25
<u>Auxiliary Generator</u>	None	

COMMUNICATIONS: None

FIRE PROTECTION: 1 4 lb. CO₂ Portable

CHARACTERISTICS

Tractor, Cargo, M8

BRIEF DESCRIPTION:

A full tracked vehicle based on the Tank, Light, M24, chassis, but with a R975D4 engine. The vehicle has a five ton cargo capacity.

GENERAL:

Make: Buick Motor Div., GMC

Type: Full Tracked, Unarmored Model: M8

Weight: (lbs.) Net 35,000 Gross 46,000 Payload 11,000

Overall Dimensions: (in.) Length 248 Width 117 Height 115 $\frac{1}{4}$

Reducible to: Length Width Height

Cargo Space:

Cu. Ft. Height of Bed (in.) 44 $\frac{1}{2}$
Length (in.) 152 Height of Bows above Floor (in.) 63-3/4
Width (in.) 110

Loading Height: (in.) 50 $\frac{1}{2}$

Tread: (in.) 96 Ground Clearance: (in.) 18 $\frac{1}{4}$

Computed Ground Pressure: 7.3 (PSI) Gross Load

HP/Ton Gross Weight: 21.1

Crew: 2

PERFORMANCE:

Maximum Grade 60%
Maximum Vertical Wall 30 in.
Maximum Trench 84 in.
Maximum Bording Depth 40 in.
Minimum Turning Circle (O.D.) 44 ft.
Towing Capacity 37,000 lbs.
Angle of Approach 24° 30'
Angle of Departure 23°
Cruising Range 200 mi.
Gas Economy (Mi. per gal.)
Oil Economy (Mi. per qt.)

Rated Speed 32 MPH
High Low
None

Crgs Tctr M8

ARMOR: For structural strength

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front		3/8 in. @ 0°
Sides		3/8 in. @ 0°
Rear		3/8 in. @ 45°
Top	None	
Bottom	5/16 in.	
Type Armor		
<u>Turret</u>	None	

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: Gun, Mach. Cal. .50, HB, M2, Flex. Mount T107

Maximum Elevation Maximum Depression
Maximum Traverse

Secondary Weapons: Launcher, Rocket, M1

Fire Control: None

POWER TRAIN:

Engine: *Mounted Horizontally

Make Continental Motors Corp. Model R975D4
Type Radial, 9 cyl. Fuel, Type Gas, 80 Oct Cooling System Air
No. Cylinders 9 Horsepower (Rated) 485 at 2400 RPM
Displacement (cu.in.) 973 Bore (in.) 5 Stroke (in.) 5.5
Governed Speed (rpm) 2400 (under load) Compression Ratio 5.7:1

Clutch: None

Transmission:

Make Detroit Transmission Div., GMC.
Type Torqmatic
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 1:1
Second 1:2.337
Third 1:4.105
Reverse 1:1.322

POWER TRAIN: (Cont'd)

Differential:

Make Buick Motor Div., GMC. Type Controlled
Gear Ratio 3.14:1 Steering Ratio 1.6:1

Final Drive:

Make Buick Motor Div., GMC. Type Spur Gear
Gear Ratio 3.82:1

Transfer Case:

Gear Ratio 1.29:1

TABLE OF CAPACITIES:

Fuel Tank (2)	250 gals.
Transmission	48 qts. Dry
Differential	20 qts.
Final Drives	5 qts. (ea.)
Engine & Oil Filter	44 qts.
Oil Bath Air Cleaners	8 qts. (Total 2)
Auxiliary Generator Power Plant	
Cooling System	Air Cooled
Transfer Case	Common with Transmission
Winch	

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type Steel, rubber backed, double pin	Model T87
All steel, center guide, single pin	T86
All rubber, double pin	T88

Width (in.) 21 Pitch (in.) 6

Length of Ground Contact (in.) 149-1/8

Drive Front Sprocket Revolutions per Mi. 754 Shoes per Track 84

Wheels: Number 12 Dual Size (in.) 25 1/2 x 4 1/2

Tires: Cured on wheel.

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number	2	Voltage	12	
<u>Main Generator</u>	Number	1	Voltage	24	Amps 50
<u>Auxiliary Generator</u>	Make		Voltage		Amps

COMMUNICATIONS:

Radios: Type SCR-510 or 610 or 619 Location Driver's Cab
No. of Interphone Outlets:

FIRE PROTECTION: 3 10 lb CO₂ Fixed 1 4 lb CO₂ Portable

ADDITIONAL FEATURES:

- * Right angle drive from engine into transmission.
- All ratios in transmission are overdrive.
- Vehicle equipped with 50,000 lb. winch.

CHARACTERISTICS

Carrier, Cargo, Amphibian, M29C

BRIEF DESCRIPTION:

The Carrier, Cargo, M29C is an Amphibian Cargo Carrier designed for operation on dry land, swamps, snow, or water.

GENERAL:

Make: Studebaker Corp.

Type: Amphibian, full Tracked, Unarmored Model: M29C

Weight: (lbs.) Net 4771 Gross 5971 Payload 1200

Overall Dimensions: (in.) Length 192-1/8 Width 67 1/2 Height 70-13/16

Reducible to: (in.) Length 173-11/16 Width Height 53-11/16

Tread: (in.) 45 Ground Clearance: (in.) 10 1/2

Computed Ground Pressure: 1.91 (PSI) Gross Load

HP/Ton Gross Weight: 21.7

Crew: 2 to 4 Cargo Space: Cu.Ft. Length Width Height

PERFORMANCE:

		Rated Speed	
		High	Low
Maximum Grade	100%		
Maximum Vertical Wall	10 in.		
Maximum Trench	36 in.		
Maximum Fording Depth	Amphibious	First Gear 12 mph	4 mph
Minimum Turning Circle (O.D.)	24 ft.	Second Gear 20	6.5
Towing Capacity	4200 lbs.	Third Gear 32	10
Angle of Approach	47 Deg.	Reverse	
Angle of Departure	36 Deg.		
Cruising Range	175 mi.		
Gas Economy (Mi. per gal.)	0.7-7		
Oil Economy (Mi. per qt.)			
Freeboard (@ Gross Weight)	Bow 10 1/2 in.; Stern 8 in.	Speed on water:	4
	land MPH; Fuel Consumption on water:		2.5 to 2.7 Gallons per Hour.

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL: None

POWER TRAIN:

Engine:

Make Studebaker Corp. Model 6-170 Champion
Type In line, 4 cycle, liquid cooled Fuel, Type Gas, 70-80 Oct.
Cooling System Liquid
No. of cylinders 6 Horsepower (Rated) 65 at 3600 RPM
Displacement (cu.in.) 169.6 Bore (in.) 3 Stroke (in.) 4
Governed Speed (rpm) Compression Ratio 7:1

Clutch:

Make Borg and Beck Div., Borg-Warner Corp.
Type Dry Disc

Transmission:

Make Warner Gear Div., Borg-Warner Corp.
Type Automotive-2nd & High Synchronized
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 2.66:1
Second 1.564:1
Third 1.00:1
Reverse 3.55:1

Differential:

Make Cincinnati Milling Machine Co. Type Controlled
Gear Ratio 4.87:1

Final Drive: Integral with Differential

Transfer Case: *

Gear Ratios High .866:1 Low 2.74:1

TABLE OF CAPACITIES:

Fuel Tank (1)	33 gals.
Transmission	1 qt.
Differential	6 qts.
Engine & Oil Filter	5 qts.
Oil Bath Air Cleaners	1/2 qt.
Auxiliary Generator Power Plant	
Cooling System	12-3/4 qts.
Transfer Case	Common with Differential
Capstan	1 qt.

RUNNING GEAR:

Suspension: Type Leaf. Springs (transverse)

Track:

Type Endless band Model T76E1
Width (in.) 20 Pitch (in.) $4\frac{1}{2}$
Length of Ground Contact (in.) 78- $\frac{1}{8}$
Drive Rear Sprocket Revolutions per Mi. 1568 Shoes per Track 56

Wheels: Number 16 Dual Size (in.) $1\frac{1}{4}$ x 8

Tires: Cured on Wheels

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 6		
<u>Main Generator</u>	Number 1	Voltage 12	Amps 40	
<u>Auxiliary Generator</u>	Make Autolite	Voltage 12	Amps 55	

COMMUNICATIONS:

Radios: Type SCR 510 or 610 or 694, 506 Location Cargo Compartment
or 508 or 510 or 628, 608 or 610 or 619 or 628 or 694

No. of Interphone Outlets: None

FIRE PROTECTION: 1 1 qt. Carbon Tetrachloride, Portable

ADDITIONAL FEATURES:

* Transfer case and differential combined.

CHARACTERISTICS

Carriage, Motor, 76mm Gun, M18

BRIEF DESCRIPTION:

A full track, armored, self-propelled Tank Destroyer.

GENERAL:

Make: Buick Motor Div., GMC

Type: Full Tracked, Armored, Combat Model: M18

Weight: (lbs.) Net 34,556 Fighting 37,557

Overall Dimensions: (in.) Length 207 $\frac{1}{2}$; 262 with Width 113 Height 101
gun for 'd.

Reducible to: (in.) Length Width Height 93 $\frac{1}{4}$

Tread: (in.) 9 $\frac{1}{2}$ -5/8 Ground Clearance: (in.) 14 $\frac{1}{4}$

Computed Ground Pressure: 13.4 (PSI) Fighting Weight @ 1 in. Pen.

HP/Ton Fighting Weight: 25.8

Crew: 5

PERFORMANCE:

		<u>Rated Speed 60 MPH</u>	
		<u>High</u>	<u>Low</u>
			<u>None</u>
Maximum Grade	60% @ 3 mph.		
Maximum Vertical Wall	36 in.	First Gear	0-16 mph
Maximum Trench	74 in.	Second Gear	12-34
Maximum Fording Depth	48 in.	Third Gear	30-60
Minimum Turning Circle (O.D.)	66 ft.	Reverse	0-20
Towing Capacity	26,500 lbs. Maximum		
	Tractive Effort		
Angle of Approach	28 Deg.		
Angle of Departure	26 $\frac{1}{2}$ Deg.		
Cruising Range	150 mi.		
Gas Economy (Mi. per gal.)	.776 mpg Highway; .481 mpg cross country		
Oil Economy (Mi. per qt.)			

ARMOR:

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front	$\frac{1}{2}$ in. @ 40°	$\frac{1}{2}$ in. @ 25°
	Bottom Front Plate $\frac{1}{2}$ in. @ 53°	
Sides	$\frac{1}{2}$ in. @ 23 $\frac{1}{2}$ °	$\frac{1}{2}$ in. @ 0°
Rear	$\frac{1}{2}$ in. @ 13 $\frac{1}{2}$ °	
Top	5/16 in.	
Bottom	3/16 in.	
Type Armor Rolled Homogeneous		

Mtr Crge M18

ARMOR: (Cont'd)

Turret
 Front 3/4-1 in. @ 23° Rear 1/2 in. @ 0°
 Sides 1/2 in. @ 20° Top None
 Gun Mantlet
 Type Armor Cast and Rolled Homogeneous

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 76mm M1A2 Mount M1

Caliber 76.2mm Length in Calibers 52 (Bore) Total Length(in.) 163-3/4
 Weight of Gun and Mount (lbs.) Est. Tube Life 2100 rds.
 Out of Balance Balanced on its trunnions using weighted recoil guard.
 Breech Block Vertical Sliding Wedge
 Maximum Chamber Pressure 13,000 psi
 Maximum Range 15° Elevation 10343 yds. w/Shell HE (NC)
 Maximum On Carriage Range 11677 yds. w/Shell HE (NC)
 Ammunition Stowage 18 Rds. in Each Sponson (Rt. & Left); 9 Rds. in
 Ready Rack. Total Rds. 45.
 Maximum Elevation 20° (356 mils). Maximum Depression 10°
 Maximum Traverse 360° Turret Friction
 Type Recoil Mechanism Hydro-spring Type Oil Special
 Maximum Recoil 14 in. Normal Recoil 11 5/8 in.
 Type Equilibrator None
 Elevating Handwheel: Effort Mils per Turn 25
 Hand Traverse Handwheel: Effort Mils per Turn 15
 Power Traverse: Control Effort Turret RPM

Secondary Weapons:

Gun, Mach, Cal .50, HB, M2, Flex Mount D 60258
 Cal .50 Subcaliber Mount Mount M10
 Carbines, Cal .30, M1

Ammunition:

Ammunition	HE (NC)	APC	HVAP	SMOKE
Model	*	**	M93	HC, BI M88
Wt. Projectile (lbs.)	12.87	15.44	9.5	7.38
Wt. Round (lbs.)	22.49	24.8	18.9	13.43
Wt. Propellant (lbs.)	3.75	3.75	3.97	0.219
Length Round (in.)	32.35	33.84	31.7	28.56
Fuze Model	*	**	None	None
Muzzle Velocity (f/s)	2700	2600	3400	900
Pene. Home. Plate @ 1000 yds. & @ 30° obliquity (in.)		3.6	5.2	

* M12A1 w/Fuze P.D. M18A1 or M18 or M18A2; M12A1, N.H., w/Fuze P.D. M18 or M18A1 or M18A2; M12 w/Fuze P. D. M18A1.

** M62 and M62A1 w/Fuze B.D. M66A1 and Tracer; M62, N.H., w/Fuze B.D. M66A1 and Tracer; M62 w/Tracer.

Fire Control:

Direct Fire Telescope, M76C Mount M55
Periscope, M4A1 w/tele., M47A2

Indirect Fire Quadrant, Elevation, M9
Indicator, Azimuth, M18

Vision Devices Periscope, M13 Location Driver's Hatch
Periscope, M13 Location Asst. Driver's Hatch

Others Binoculars, M3
Quadrant, Gunner's, M1

POWER TRAIN:

Engine:

Make Continental Motors Corp. Model R975C4
Type Radial, 9 cyl. Fuel, type Gas, 80 oct. Cooling System Air
No. Cylinders 9 Horsepower (Rated) 485 at 2400 RPM
Displacement (cu.in.) 973 Bore (in.) 5 Stroke (in.) 5.5
Governed Speed (rpm) 2400 (Under Load) Compression Ratio 5.7:1

Clutch: None

Transmission:

Make Detroit Transmission Division, GMC
Type Torqmatic
No. of Speeds Forward 3 Reverse 1
Gear Ratios
First 1:1.000
Second 1:2.337
Third 1:4.105
Reverse 1:1.322

Differential:

Make Buick Motor Div., GMC Type Controlled Spur Gear
Gear Ratio 3.133:1 Steering Ratio 1.6:1

Final Drive:

Make Buick Motor Div., GMC Type Spur Gear
Gear Ratio 2.176:1

Transfer Case:

Gear Ratio 1.29:1

TABLE OF CAPACITIES:

Fuel Tanks (2)	165 gals.
Transmission	48 qts. Dry
Differential	20 qts.
Final Drives	5 qts. (ea.)
Engine & Oil Filter	44 qts.
Oil Bath Air Cleaners	4 qts. (ea.)
Auxiliary Generator Power Plant	5 gals.
Cooling System	Air Cooled
Transfer Case	Common with differential

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type All Steel, Single Pin, Center Guide, Rubber Bushed. Model T69
Width (in.) 12 Effective Pitch (in.) 5-1/8
Length of Ground Contact (in.) 116 1/2 @ 1 in Pen.
Drive Front Sprocket Revolutions per Mi. 802 Shoes per Track 83

Wheels: Number 10 Dual Size (in.) 26 x 4 1/2

Tires: Cured on Wheel.

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 12		
<u>Main Generator</u>	Number 1	Voltage 26	Amps 50	
<u>Auxiliary Generator</u>	Make Homelite	Voltage 30	Amps 50	

COMMUNICATIONS:

Radios: Type SCR-610 Location Rear Turret Bulge
No. of Interphone Outlets: 5

FIRE PROTECTION: 2 10 lb. CO₂ Fixed 1 4 lb. CO₂ Portable

ADDITIONAL FEATURES:

Turret Traverse: Type Hydraulic Mfgr. The Oil Gear Co.
Auxiliary Type: Manual Mfgr. New Process Gear Co.
Gyro stabilizer: None

CHARACTERISTICS

Carriage, Motor, 105mm Howitzer, M37

BRIEF DESCRIPTION:

The Carriage, Motor, 105mm Howitzer, M37, is a full-tracked, armored artillery carriage designed to support rapid moving Tank-Infantry combat teams.

GENERAL:

Make: American Car and Foundry Co.

Type: Full Tracked Howitzer Carriage Model: M37

Weight: (lbs.) Net 36,000 Fighting 43,000

Overall Dimensions: (in.) Length 218 Width 119 Height 115

Reducible to: (in.)

Length Width Height 100 by removal of Cal..50 AA gun

Tread: (in.) 96. Ground Clearance: (in.) 17(effective)

Computed Ground Pressure: 10.9 (PSI) Fighting Weight

HP/Ton Fighting Weight: 10.2

Crew: 7

PERFORMANCE:

Rated Speed 28 MPH

High Low

Maximum Grade	60%	First Gear	12 mph	5 mph
Maximum Vertical Wall	40 in.	Second Gear		
Maximum Trench	84 in.	Third Gear		
Maximum Fording Depth	42 in.	Fourth Gear	30	13
Minimum Turning Circle (O.D.)	40 ft.	Reverse		
Towing Capacity	36,200 lbs. ft. Maximum Tractive Effort			

Angle of Approach

Angle of Departure

Cruising Range 150 mi.

Gas Economy (Mi. per gal.) 0.85

Oil Economy (Mi. per qt.) 150.5

ARMOR:

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front	$\frac{1}{2}$ in. @ 0° & 60°	$\frac{1}{2}$ in. @ 60°
Sides	$\frac{1}{2}$ in. @ 0° & 12°	$\frac{1}{2}$ in. @ 12°
Rear	$\frac{1}{2}$ in. @ 0°	$\frac{1}{2}$ in. @ 45°
Top	$\frac{1}{2}$ in. (Deck)	
Bottom	$\frac{1}{2}$ in. & 5/8 in.	
Type Armor	Rolled Homogeneous	

Mtr Crge M37

ARMOR: (Cont'd)

Turret None Barbette Mount

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 105mm Howitzer, M4 Mount Howitzer, M5

Caliber 105mm Length in Calibers 22 Total Length (in.) 101.3
 Weight of Gun and Mount (lbs.) Est. Tube Life 20,000 rds.
 Out of Balance None
 Breech Block Horizontal Sliding Wedge
 Maximum Chamber Pressure 28,000 psi
 Maximum Range 15° Elevation 7300 yds.
 Maximum On Carriage Range 12,180 yds.
 Ammunition Stowage 4 bins of 15 rds; 2 bins of 24 rds.; 6 rds. in
 Ready Rack. Total rds. 114.
 Maximum Elevation 745.1 mils Maximum Depression 173.7 mils
 Maximum Traverse 933 mils
 Type Recoil Mechanism Hydro-spring w/replenisher Type Oil Special
 Maximum Recoil Normal Recoil 12-7/8 in.
 Type Equilibrator None
 Elevating Handwheel: Effort 20 in. lbs. Mils per Turn 20
 Hand Traverse Handwheel: Effort 5.9 in. lbs. Mils per Turn 20
 Power Traverse: None

Secondary Weapons:

Gun, Mach, Cal .50, HB, M2, Flex. Mount M49C
 Carbines, Cal .30
 Gun, Sub-Mach, Cal .45, M3 or M3A1

Ammunition:

AMMUNITION	HE(NC)	SMOKE	SMOKE WP	HEAT
Model	M1	HC, BE M84	M60	M67
Wt. Projectile (lbs.)	33.00	32.87	34.70-35.21	29.22
Wt. Round (lbs.)	42.07	41.94	43.77-44.28	36.85
Wt. Propellant (lbs.)	3.04	3.04	3.04	1.60
Length Round (in.)	31.07	30.49	31.08	31.05
Fuse Model	*	M54	M57	M62
Muzzle Velocity (f/s)	1550(Max)	1550(Max)	1550(Max)	1250
Pene. Home. Plate @ 1000 yds. & @ 30° obliquity (in.)				5.5

* M48, M48A1, M54

Fire Control:

Direct Fire Telescope, M76G	Mount Telescope, T95
Indirect Fire Telescope, Panoramic, M12A2 Quadrant, Elevation, T15	Mount Telescope, M76
Vision Devices Periscope, M13	Location Driver's Hatch
Others Set; Aiming Posts, M1 Quadrant, Gunner's, M1 Setter, Fuze, M22	Binoculars, M17

POWER TRAIN:

Engine:

Make Cadillac Motor Div., GMC Model 3G Series
Type Dual V-8, Gas Fuel, Type 80 Oct. gas Cooling system Liquid
No. cylinders 8 (ea.) Horsepower (Rated) 220 at 3400 (Total for
2 engines) RPM
Displacement (cu.in.) 346 Bore (in.) $3\frac{1}{2}$ / Stroke (in.) $4\frac{1}{2}$
Governed Speed (rpm) 3400 Compression Ratio 7.06:1

Clutch: None

Transmission:

Make Detroit Transmission Division, GMC
Type Hydramatic
No. of Speeds Forward 4 Reverse None**
Gear Ratios
First 3.92:1
Second 2.53:1
Third 1.55:1
Fourth 1:1

Differential:

Make Buick Motor Division, GMC	Type Controlled
Gear Ratio 2.625:1	Steering Ratio 1.845:1

Final Drive:

Make Buick Motor Division, GMC	Type Herringbone Reduction
Gear Ratio 2.55:1	

Transfer Case:

Gear Ratios High 1.0:1 Low 2.34:1 Reverse 2.44:1**

TABLE OF CAPACITIES:

Fuel Tanks (2)	110 gals.
Transmission	15 qts.
Differential	20 qts.
Final Drives	2 qts. (ea.)
Engine & Oil Filter	8 qts. (ea. engine)
Oil Bath Air Cleaners	3 qts. (ea.)
Cooling System	40 qts. (ea. engine)
Transfer Case	4 $\frac{1}{2}$ qts.

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type All Steel; center guide, single pin Model T72
Width (in.) 16 Pitch (in.) 5 $\frac{1}{2}$
Length of Ground Contact (in.) 12 $\frac{1}{4}$
Drive Front Sprocket Revolutions per Mi. 88 $\frac{1}{2}$ Shoes per Track 88

Wheels: Number 10-Duals Size (in.) 25 x 4 $\frac{1}{2}$

Tires: Cured on wheel

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 12 (24 volts system)
<u>Main Generator</u>	Number 2	Voltage 24 Amps 125 (Total)
<u>Auxiliary Generator</u>	None	

COMMUNICATIONS:

Radios: Type SCR 510 Location Left Sponson, Front
No. of Interphone Outlets: 3

FIRE PROTECTION: 1 10 lb CO₂ Fixed 1 4 lb CO₂ Portable

ADDITIONAL FEATURES:

** Transmission in combination with Transfer Unit gives 8 speeds forward and 4 in reverse.

CHARACTERISTICS

Carriage, Motor, 240mm Howitzer, T92

BRIEF DESCRIPTION:

Self propelled Howitzer Carriage to provide Artillery Support for Heavy Combat Teams.

GENERAL:

Make: Chrysler Corp.

Type: Full Tracked Howitzer Carriage Model: T92

Weight: (lbs.) Net. 122,637 Fighting 125,500

Overall Dimensions: (in.) Length 376 Gun-overall Width 143 Height 126
Gun-overall

Reducible to: (in.) Length Width Height

Tread: (in.) 110 Ground Clearance: (in.) 18 1/2

Computed Ground Pressure: 15.0 (PSI) Fighting Weight 23 in. Track @ 1 in. Pen
12.3 (PSI) Fighting Weight 28 in. Track @ 1 in. Pen

HP/Ton Fighting Weight: 8.0

Crew: 4

PERFORMANCE:

Rated Speed 15 MPH
High Low
None

Maximum Grade 60%
Maximum Vertical Wall 46 in. First Gear
Maximum Trench 84 in. Second Gear
Maximum Fording Depth 36 in. Third Gear
Minimum Turning Circle (O.D.) 60 ft. Reverse
Towing Capacity 90,900 lbs. ft. Maximum Tractive Effort
Angle of Approach
Angle of Departure
Cruising Range 80 mi.
Gas Economy (Mi. per gal.)
Oil Economy (Mi. per qt.)

ARMOR:

Hull Above Sponson Line Below Sponson Line
Front 1 in. @ 61° 1 in.-2 in. @ 46°
Sides 1 in. @ 0° 1 in. @ 0°
Rear
Top 0.875 in.
Bottom 1 in.
Type Armor Homogeneous

ARMOR: (Cont'd)

Turret None

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 240mm Howitzer, M1 Mount T30

Caliber 240mm Length in Calibers 34 (Bore) Total Length (in.) 331
Weight of Gun and Mount (lbs.) Est. Tube Life 2000 rds.
Out of Balance.
Breech Block Interrupted Screw
Maximum Chamber Pressure 36,000 psi
Maximum Range 15° Elevation 8450 yds. (Min. Chg.)
Maximum On Carriage Range 25,225 yds.
Ammunition Stowage None
Maximum Elevation 65° Maximum Depression 0°
Maximum Traverse R-12°; L-12°
Type Recoil Mechanism Hydraulic Type Oil Special
Type Counterrecoil Mechanism Hydropneumatic
Maximum Recoil 60 in. Normal Recoil 54.2 to 58.8 in.
Type Equilibrator Hydropneumatic
Elevating Handwheel: Effort Mils per Turn
Hand Traverse Handwheel: Effort Mils per Turn
Power Traverse: None

Secondary Weapons:

Carbines, Cal 130, M1

Ammunition: Ammunition Carried in Accompanying Vehicle, Carrier, Cargo, T31.

AMMUNITION	HE (NC)
Model	*
Wt. Projectile (lbs.)	360
Wt. Round (lbs.)	Sep. Load.
Wt. Propellant (lbs.)	80
Length Round (in.)	Sep. Load.
Fuze Model	*
Muzzle Velocity (f/s)	2300
Pene. Home. Plate @ 1000 yds. & @ 30° obliquity (in.)	

* M114, M114 w/suppl. chg. w/Fuze PD M51, 51A1, 51A3, 51A4 or Fuze, Time, Mechanical, M67, 67A1, 67A2, 67A4 or Fuze, CP, M78; M114 adapted for Fuze, VT, T76E6.

Fire Control:

Direct Fire Telescope, Elbow, M16A1E1 Mount Tel., T152

Indirect Fire Telescope, Panoramic, M12 Mount Tel., M30
Quadrant, Gumer's, M1

Vision Devices	Vision Cupola	Location	Driver's Hatch
	Vision Cupola	Location	Ass't. Driver's Hatch

Others :

POWER TRAIN:

Engine:

Make Ford Motor Co. Model GAF
Type V-8, Gas, Liquid.Cooled Fuel, Type Gas, 80 plus Oct.
Cooling System Liquid
No. Cylinders 8 Horsepower (Rated) 500 at 2600 RPM
Displacement (cu.in.) 1100 Bore (in.) 5.4 Stroke (in.) 6
Governed Speed (rpm) 2600 (under load) Compression Ratio 7.5:1

Clutch: None.

Transmission:

Make Detroit Transmission Div., GMC
Type Torqmatic
No. of Speeds: Forward 3 Reverse 1
Gear Ratios
First 1:1
Second 1:2.337
Third 1:4.105
Reverse 1:1.322

Differential:

Make Buick Motor Div., GMC	Type Controlled
Gear Ratio 3.53:1	Steering Ratio 1.79:1

Final Drive:

Make Chrysler Corp.	Type Planetary
Gear Ratio 6.25:1	

Transfer Case:

Gear Ratio 1.38:1

TABLE OF CAPACITIES:

Fuel Tanks (2)	250 gals.
Transmission	31 qts.
Differential	60 qts.
Final Drives	12 qts.
Engine & Oil Filter	32 qts.
Oil Bath Air Cleaners	3 $\frac{1}{2}$ qts. (ea.)
Auxiliary Generator Power Plant	3 qts.
Cooling System	22 gals.
Transfer Case	Common with Transmission

RUNNING GEAR:

Suspension: Type Individual Torsion Bar

Track:

Type	All rubber, double pin, center guide	Model	T84E3
	Steel, rubber backed, double pin, center drive		T80E3
Width (in.)	23; w/extended end connector: 28	Pitch (in.)	6
Length of Ground Contact (in.)	182 @ 1 in Pen		
Drive	Front	Sprocket Revolutions per Mi.	812
		Shoes per Track	94

Wheels: Number 14 Duals Size (in.) 26 x 6

Tires: Cured on Wheels

Steering Mechanism: Type Controlled Differential

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage	12	
<u>Main Generator</u>	Number 1	Voltage	24	Amps 75
<u>Auxiliary Generator</u>	Make Homelite	Voltage	24	Amps 60

COMMUNICATIONS:

Radios: Type Location

No. of Interphone Outlets: 4

FIRE PROTECTION: 2 10 lb CO₂ Fixed 2 4 lb CO₂ Portable

CHARACTERISTICS

Truck, 2½-Ton, 6x6, LWB

BRIEF DESCRIPTION:

All wheel drive, medium cargo vehicle capable of cross-country operation.

GENERAL:

Make: General Motors Corporation

Type: 6x6 Cargo

Model: CCKW-353

<u>Weight:</u> (lbs.) Axle Make	<u>Net.</u>		<u>Gross</u>		<u>Payload</u>
	w/winch	w/o winch	w/winch	w/o winch	
Timken-Detroit Axle Co.	11,100	10,100	16,450	15,450	5,350 (Incl.
General Motors Corp.	11,230	10,230	16,580	15,580	5,350 350
					lbs. Pers. Wt.)

Weight Distribution: (lbs)

Axle Make	<u>Empty</u>	w/winch	w/o winch
Timken-Detroit Axle Co.	Front Axle Load		
General Motors Corporation			
Timken-Detroit Axle Co.	Rear Axle Load		
General Motors Corporation			

Loaded to Rated Load

Axle Make		w/winch	w/o winch
Timken-Detroit Axle Co.	Front Axle Load	5484	5150
General Motors Corporation		5527	5193
Timken-Detroit Axle Co.	Rear axle Load	10966	10300
General Motors Corporation		11053	10387

Overall Dimensions: (in.)

Length	w/winch 270	Width 88	Height 107
	w/o winch 256		
<u>Reducible to:</u> (in.)	Length	Width	Height 74½

Cargo Space:

Cu. Ft.			
Length (in.)	144-7/16	Height of Bed (in.)	14
Width (in.)	80	Height of Bows above Floor (in.)	61

Loading Weight: (lbs.) Wooden Body 48 Steel Body 47

Wheelbase: (in.) 164 Tread (in.) Front 62½ Rear 67-3/4

Ground Clearance: (in.) Front Axle 9-7/8 Rear Axle 9-3/8 Chassis 17½

Computed Ground Pressure: (PSI) Net Load
(PSI) Gross Load

HP/Ton Gross Weight: 12.6 w/winch ; 13.4 w/o winch

Crew: 2

PERFORMANCE:

Rated Speed 45 mph

Maximum Grade	65%		<u>High</u>	<u>Low</u>
Maximum Fording Depth		First Gear		
Minimum Turning Circle (O.D.)	64 ft.	Second Gear		
Towing Capacity	4500 lbs.	Third Gear		
Angle of Approach	31° w/winch; 54° w/o winch	Fourth Gear		
Angle of Departure	36°	Fifth Gear		
Cruising Range	300 mi.	Reverse		
Gas Economy (Mi. per gal.)	7.5			
Oil Economy (Mi. per qt.)				

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL: As provided in various T/O&E's, i.e. Gun, Mach., Cal. .50, HB, 12, Flex, Mounted in Ring Mount.

POWER TRAIN:

Engine:

Make	GMC	Model	270
Type	In Line, 4 Cycle, Gas	Fuel, Type	Gas, 70 Oct Cooling System Liquid
No. Cylinders	6	Horsepower (Rated)	104 at 3000 RPM
Displacement (cu.in)	270.5	Bore(in.)	3-25/32 Stroke(in.) 4
Governed Speed (rpm)	2750	Compression Ratio	6.75:1

Clutch:

Make Inland Mfg. Div., GMC, & Long Mfg. Co.
Type Press. Plate, Disc.

Transmission:

Make Clark Equip. Co.
Type Selective, Sliding, Overdrive
No. of Speeds Forward 5 Reverse 1

• Gear Ratios

First	6.06:1
Second	3.50:1
Third	1.80:1
Fourth	1.00:1
Fifth	0.80:1
Reverse	6.00:1

Front Axle:

Make Timken-Detroit Axle Co. Type High Traction
General Motors Corporation
Gear Ratio 6.60:1

Intermediate & Rear Axle:

Make Timken-Detroit Axle Co.
General Motors Corporation
Gear Ratio 6.60:1

Type Banjo or Split

Transfer Case:

Timken-Detroit Axle Co.	High	Low
General Motors Corporation	1.16:1	2.16:1
	1.16:1	2.163:1

TABLE OF CAPACITIES:

Fuel Tanks (1)	40 gals.
Transmission	5½ qts.
Differential	Front, Int. & Rear axles 6½ qts. each
Engine & Oil Filter	10 qts.
Oil Bath Air Cleaners	1 qt.
Cooling System	19 qts.
Transfer Case	2¼ qts.
Winch	1-7/8 qts.

RUNNING GEAR:

Suspension: Type Leaf Spring

Wheels: Number 10

Size (in.) 20

Tires:

Number 10; 1 Spare
Size (in.) 7.50 x 20
Rolling Radius 17½ in.

Type M&S
No. Plies 8
Revolutions Per Mile 576

Steering Mechanism: Type Mechanical

Brakes: Type Hydraulic

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1
<u>Main Generator</u>	Number 1

Voltage	6
Voltage	6
Amps	40

COMMUNICATIONS: None

FIRE PROTECTION: 1 1 qt. Carbon Tetrachloride.

CHARACTERISTICS

Truck, 2½-Ton, Cargo, 4x4, T23

BRIEF DESCRIPTION:

An entirely new type of cross country truck providing high ground clearance and flotation characteristics for negotiating swampy terrain previously considered impassable to standard military vehicles.

GENERAL:

Make: Chrysler Corp.

Model: T23

Type: 4x4, Cargo

Weight: (lbs.) Net 14,595

Gross 19,595 Payload 5000

Weight Distribution: (lbs)

Empty

Front Axle Load 9960

Rear Axle Load 4635

Loaded to Rated Load

Front Axle Load 10950

Rear Axle Load 8645

Overall Dimensions: (in.)

Length 231-5/8

Width 96

Height 111-5/8

Reducible to: (in.)

Length

Width

Height 89½

Cargo Space:

Cu. Ft.

Length(in.) 146

Width (in.) 80

Height of Bed (in.)

16½

Height of Bows above Floor (in.)

54¼

Loading Height: (in.) 52-1/8

Wheelbase: (in.) 124

Tread:(in.) Front 76-1/8 Rear 76-1/8

Ground Clearance: (in.)

Front and Rear 25; Amidships 37

Computed Ground Pressure:

(PSI) Net Load

(PSI) Gross Load

HP/Ton Gross Weight: 12.3

Crew: 2

Trk 2 1/2 T 4x4 T23

PERFORMANCE:

Rated Speed 42 mph

Maximum Grade	Hi: 31.9% Lo: 87.5%	<u>High</u>	<u>Low</u>
Maximum Vertical Wall			
Maximum Fording Depth	65 in.	First Gear	
Minimum Turning Circle (O.D.)	66 ft.	Second Gear	
Towing Capacity	4500 lbs.	Third Gear	
Angle of Approach	40°	Fourth Gear	
Angle of Departure	57°	Fifth Gear	
Cruising Range	300 Mi. Highway	Reverse	
Gas Economy (Mi. per gal.)			
Oil Economy (Mi. per qt.)			

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL: None

POWER TRAIN:

Engine:

Make	Chrysler Corp.	Model	
Type	In Line, 4 Cycle	Fuel, Type	Gas
No. Cylinders	6	Cooling system	Liquid
Displacement (cu.in)	331	Horsepower (Rated)	120 at 3200 RPM
Governed Speed (rpm)	2800	Bore(in.)	3-3/4
		Stroke(in.)	5
		Compression Ratio	6.35:1

Clutch:

Make Borg & Beck Div., Borg-Warner Corp.
 Type Single Plate

Transmission:

Make Clark Equipment Co.
 Type Selective Gear
 No. of Speeds Forward 5 Reverse 1
 Gear Ratios
 First 6.06:1
 Second 3.50:1
 Third 1.80:1
 Fourth 1.00:1
 Fifth .799:1
 Reverse 6.00:1

Front Axle:

Make Timken-Detroit Axle Co. Type Constant Velocity
 Gear Ratio 6.8:1

Rear Axle:

Make Timken-Detroit Axle Co.
Gear Ratio 6.8:1

Type Constant Velocity

Transfer Case:

Gear Ratios High 1:1 Low 2.18:1

TABLE OF CAPACITIES:

Fuel Tanks (1)	50 gals.
Transmission	5½ qts.
Axles	7 qts. ea. (Front and Rear Axles)
Engine & Oil Filter	8 qts.
Oil Bath Air Cleaners	1 qt.
Cooling System	32 qts.
Transfer Case	2 ¾ qts.
Winch	½ qt.
Air Compressor	½ qt.
Steering Gear	3 qts.

RUNNING GEAR:

Suspension: Type Leaf Spring

Wheels: Number 4 Size (in.) 26

Tires:

Number 4	Type Central Tire Inflation System
Size (in.) 18.00 x 26	No. Plies 10
Rolling Radius 31 in.	Revolutions Per Mile 325

Steering Mechanism: Type Mechanical, with Air Assist

Brakes: Type Hydraulic

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1	Voltage 12	
<u>Main Generator</u>	Number 1	Voltage 15	Amps 50

COMMUNICATIONS: None

FIRE PROTECTION: 1 1 qt. Carbon Tetrachloride

ADDITIONAL FEATURES:

WINCH CAPACITY: 10,000 lbs.

CHARACTERISTICS

Truck, 3/4 Ton, 4x4, Ambulance (Knockdown)

BRIEF DESCRIPTION:

All wheel drive field ambulance capable of cross country operations.

GENERAL:

Make: Dodge Division, Chrysler Corp.

Type: 4x4 Ambulance

Model: KG-77-2

Weight: (lbs.) Net 7140

Gross 8640

Payload 1500

Weight Distribution: (lbs.)

Empty

Front Axle Load 3120

Rear Axle Load 4020

Loaded to Rated Load

Front Axle Load 3200

Rear Axle Load 5440

Overall Dimensions: (in.)

Length 191-13/32

Width 84

Height 97-1/16

Reducible to: (in.)

Length

Width

Height

Cargo Space:

Cu. Ft. Fitted with Litters

Length (in.) 91-9/16

Width (in.) 79-9/16

Height of Bed (in.) 59

Height of Bows above Floor (in.) None

Loading Height: (in.) 31 1/2

Wheelbase: (in.) 121

Tread: (in.) 64-3/4

Ground Clearance: (in.) 10-5/8 Front & Rear Axle

16-3/16 Amidships

Computed Ground Pressure:

(PSI)

Net Load

(PSI)

Gross Load

HP/Ton Gross Weight: 21.3

Crew: 2

Ambul 3/4T 4x4

PERFORMANCE:

Rated Speed 54 mph
High Low

Maximum Grade- High 6%; Low 60%
Maximum Vertical Wall
Maximum Fording Depth 34 in. Approx.
Minimum Turning Circle (O.D.) Right 48 ft;
Left 52½ ft.
Towing Capacity 1000 lbs.
Angle of Approach 54°
Angle of Departure 26°
Cruising Range 240 mi. w/ Towed Load 210 mi.
Gas Economy (Mi. per gal.)
Oil Economy (Mi. per qt.)

Max Speed None
First Gear 9 mph
Second Gear 18
Third Gear 33
Fourth Gear 54
Reverse 7

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL: None

POWER TRAIN:

Engine:

Make Dodge Div., Chrysler Corp. Model T-214
Type In line, 4 cycle Fuel, Type Gas, 70 Oct. Cooling System Liquid
No. Cylinders 6 Horsepower (Rated) 92 at 3200 RPM
Displacement (cu. in) 230.2 Bore (in.) 3¼ Stroke (in.) 4-5/8
Governed Speed (rpm) 3200 Compression Ratio 6.7:1

Clutch:

Make Borg & Beck Div., Borg-Warner Corp.
Type Single Dry Plate

Transmission:

Make New Process Gear Co.
Type Selective, Sliding Gear
No. of Speeds Forward 4 Reverse 1
Gear Ratios
First 6.40:1
Second 3.09:1
Third 1.69:1
Fourth 1.00:1
Reverse 7.82:1

Front Axle:

Make Dodge Div., Chrysler Corp. Type Full Floating, Hypoid
Gear Ratio 5.83:1

Rear Axle:

Make Dodge Div., Chrysler Corp. Type Full Floating, Hypoid
Gear Ratio 5.83:1

Transfer Case:

Gear Ratio 1.00:1

TABLE OF CAPACITIES:

Fuel Tanks (1)	30 gals.
Transmission	2-3/4 qts.
Differential	3 qts.
Engine & Oil Filter	5 qts.
Oil Bath Air Cleaners	1 qt.
Cooling System	18 qts.
Transfer Case	1 1/2 qts.

RUNNING GEAR:

Suspension: Type Leaf Spring

Wheels: Number 4 Size (in.) 16

Tires:

Number	4; 1 spare	Type	M & S
Size (in.)	9.00 x 16	No. Plies	8
Rolling Radius	17 in.	Revolutions per Mile	593

Steering Mechanism: Type Mechanical

Brakes: Type Hydraulic

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1	Voltage 6	
<u>Main Generator</u>	Number 1	Voltage 6	Amps 40

COMMUNICATIONS: None

FIRE PROTECTION: 1 1 qt. Carbon Tetrachloride.

PERFORMANCE:

Rated Speed 60 mph

Maximum Grade	59.5%	<u>High</u>	<u>Low</u>
Maximum Fording Depth	21 in.	First Gear	
Minimum Turning Circle (O.D.)	35 ft.	Second Gear	
Towing Capacity	1000 lbs.	Third Gear	
Angle of Approach	45°	Reverse	
Angle of Departure	35°		
Cruising Range	260 mi.		
Gas Economy (Mi. per gal.)			
Oil Economy (Mi. per qt.)			

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL: None

POWER TRAIN:

Engine:

Make	Willys-Overland Motors Inc.	Model	MB		
	Ford Motor Co.		GPW		
Type	In Line, 4 Cycle	Fuel, Type	Gas, 68 Oct.	Cooling System	Liquid
No. Cylinders	4	Horsepower (Rated)	60	at	3800 RPM
Displacement (cu.in)	134.2	Bore(in.)	3.125	Stroke(in.)	4.375
Governed Speed (rpm)	None	Compression Ratio	6.48:1		

Clutch:

Make	Borg & Beck Div., Borg-Warner Corp.;	Atwood Vacuum Machine Co.
Type	Friction Driven Single Plate;	Pressure Plate

Transmission:

Make	Warner Gear Div., Borg-Warner Corp.;	Ford Motor Co.
Type	Synchromesh, 2nd & 3rd Synchronized	
No. of Speeds	Forward 3	Reverse 1
Gear Ratios		
First	2.67:1	
Second	1.56:1	
Third	1.00:1	
Reverse	3.55:1	

Front Axle:

Make	Spicer Mfg. Corp.;	Ford Motor Co.	Type	Full Floating
Gear Ratio	4.88:1			

Rear Axle:

Make Spicer Mfg. Corp.; Ford Motor Co. Type Hypoid
Gear Ratio 4.88:1

Transfer Case:

Gear Ratios High 1.00:1 Low 1.97:1

TABLE OF CAPACITIES:

Fuel Tanks(1)	15 gal.
Transmission	1 qt.
Differential	Front $1\frac{1}{4}$ qt.; Rear $1\frac{1}{4}$ qt.
Engine & Oil Filter	5 qts.
Oil Bath Air Cleaners	1 qt.
Cooling System	11 qts.
Transfer Case	$1\frac{1}{2}$ qts.

RUNNING GEAR:

Suspension: Type Leaf Spring

Wheels: Number 4 Size (in.) 16

Tires:

Number 4; 1 spare	Type Non-Directional M&S
Size (in.) 6.00 x 16	No. Plies 6
Rolling Radius 14 in.	Revolutions Per Mile 720

Steering Mechanism: Type Mechanical

Brakes: Type Hydraulic

ELECTRICAL SYSTEM:

Batteries	Number 1	Voltage 6	
Main Generator	Number 1	Voltage 6	Amps 40

COMMUNICATIONS:

<u>Radios:</u> Type SCR 510 or 610	Location Left Front Side of
<u>No. of Interphone Outlets:</u> None	Vehicle Behind Driver

FIRE PROTECTION: 1 x 1 qt. Carbon Tetrachloride

ADDITIONAL FEATURES:

Machine Guns and Mounts Installed by Troops per Tactical Conditions.

CHARACTERISTICS

Vehicle, Tank Recovery, M32B3

BRIEF DESCRIPTION:

A full tracked recovery vehicle for cross-country evacuation of armored vehicles.

GENERAL:

Make: Lima Locomotive Works Inc.

Type: Full Tracked

Model: M32B3

Weight: (lbs.) Net 58,000

Fighting 62,000

Overall Dimensions: (in.) Length 229 $\frac{1}{4}$ Width 103 Height 104-3/16

Reducible to: (in.) Length Width Height

Tread: (in.) 83

Ground Clearance: (in.) 17-1/8

Computed Ground Pressure: 12.7 (PSI) Fighting Weight 1 in. Pen.

HP/Ton Fighting Weight: 16.1

Crew: 6

PERFORMANCE:

Rated Speed 25 MPH

Maximum Grade 60%
 Maximum Vertical Wall 24 in.
 Maximum Trench 74 in.
 Maximum Fording Depth 48 in.
 Minimum Turning Circle (O.D.) 62 ft.
 Towing Capacity
 Angle of Approach
 Angle of Departure
 Cruising Range 120 mi.
 Gas Economy (Mi. per gal.)
 Oil Economy (Mi. per qt.)

	High	Low
First Gear		None
Second Gear		
Third Gear		
Fourth Gear		
Fifth Gear		
Reverse		

ARMOR:

Hull	Above Sponson Line	Below Sponson Line
Front	2.0 in. @ 55°	2 in. - 4.25 at 45°
Sides	1.5 in. @ 0°	1.5 in. @ 0°
Rear	1.5 in. @ 70°	1 in. @ 0°
Top		3/4 in.
Bottom		1/2 in.
Type Armer	Homogeneous	

Tk Rec Veh M32B3

ARMOR: (Cont'd)

Turret

Front	1½ in. @ 0°	Rear	1½ in. @ 30°
Sides	1½ in. @ 0°	Top	None
Gun Mantlet	None		
Type Armor	Homogeneous		

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: Gun, Mach., Cal. .50, HB, M2

Maximum Elevation	80°	Maximum Depression	10°
Maximum Traverse	360°		

Secondary Weapons:

Mortar, 81 mm
Gun, Mach., Cal. .30, M1919A4, Flex.

Fire Control:

Vision Devices	Periscope, M13	Location	Driver's Hatch
	Periscope, M13	Location	Asst. Driver's Hatch

POWER TRAIN:

Engine:

Make	Ford Motor Co.	Model	GAA		
Type	V-8, Gas, Liquid Cooled	Fuel, Type	Gas, 80 Oct.		
Cooling System	Liquid				
No. Cylinders	8	Horsepower (Rated)	500 at 2600 RPM		
Displacement (cu.in.)	1100	Bore (in.)	5.4	Stroke (in.)	6
Governed speed (rpm)	2600 (under load)	Compression Ratio	7.5:1		

Clutch:

Make Long Mfg. Co.
Type Dry, Multi-Disc

Transmission:

Make	Spicer Mfg. Corp.	
Type	Synchromesh	
No. of Speeds	Forward 5	Reverse 1
Gear Ratios		
First	7.56:1	
Second	3.11:1	
Third	1.78:1	
Fourth	1.11:1	
Fifth	.73:1	
Reverse	5.65:1	

POWER TRAIN: (Cont'd)

Differential:

Make Buick Motor Div., GMC. Type Controlled
Gear Ratio 3.53:1 Steering Ratio 1.515:1

Final Drive:

Make Buick Motor Div., GMC. Type Herringbone
Gear Ratio 2.84:1

Transfer Case: None

TABLE OF CAPACITIES:

Fuel Tanks (4)	175 gals.
Transmission) 164 qts.
Differential	
Final Drives	
Engine & Oil Filter	32 qts.
Oil Bath Air Cleaners	3 $\frac{1}{2}$ qts.
Cooling System	56 qts.
Winch	5 qts.

RUNNING GEAR:

Suspension: Type Vertical Volute Spring

Track:

Type All rubber, double pin Model T48
All steel, double pin T74
Width (in.) 16-9/16 Pitch (in.) 6
Length of Ground Contact (in.) 147 @ 1 in. Pen.
Drive Front Sprocket Revolutions per Mi. 812 Shoes per Track 79

Wheels: Number 12 Size (in.) 16 x 9

Tires:

Number 12 Type Pressed On
Size (in.) 20 x 9 No. Plies Solid

Steering Mechanism: Type Controlled Differential

Brakes: Type Mechanical

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number	2	Voltage	12	
<u>Main Generator</u>	Number	1	Voltage	24	Amps 60
<u>Auxiliary Generator</u>		None			

COMMUNICATIONS:

Radios: Type SCR-528 or 610 Location Rt Sponson

No. of Interphone Outlets: 4

FIRE PROTECTION: 2 10 lb CO₂ Fixed 2 4 lb CO₂ Portable

CHARACTERISTICS

Truck, 2 1/2 Ton, 6x6, Amphibian

BRIEF DESCRIPTION:

All wheel drive amphibian cargo or personnel carrier.

GENERAL:

Make: General Motors Corporation

Type: Amphibian, 6x6

Model: DUKW 353

Weight: (lbs.) Net 14,760 Gross 19,760 Payload 5,000

Weight Distribution:(lbs.)

Empty

Front Axle Load

Rear Axle Load

Loaded to Rated Load

Front Axle Load 5250

Rear Axle Load 14510

Overall Dimensions: (in.)

Length 372 Width 96 Height 110 1/4 w/ring mount
106 w/o ring mount

Reducible to: (in.)

Length Width 85-3/8 Height 104-3/4 w/ring mount
90 w/o ring mount

Loaded Waterline Length: (in.) 344

Loaded Freeboard: (in.)

At Coaming Front 29 Rear 29

At Deck Front 24 Rear 16

Loaded Draft: (in.)

At Front Wheels 42

At Rear Wheels 51

Cargo Space:

Cu. Ft. To Top of Coaming 196
Under Tarpaulin Bows 385

Length (in.) 148

Width (in.) 82

Height of Bed (in.) Front 28
Rear 27 1/2

Height of Bows above Floor (in.) Front 51
Rear 49

Loading Height: (in.)

Wheelbase: (in.) 164

Tread: (in.) Front 63-5/8 Rear 63-7/8

Trk 2 1/2 6x6

Ground Clearance: (in.) 11 $\frac{1}{2}$ All Axles; 18 Chassis

Computed Ground Pressure: (PSI) Net Load
(PSI) Gross Load

HP/Ton Gross Weights:

Crew: 2

PERFORMANCE:

	<u>Rated Speed 50 MPH</u>		
	<u>High</u>		<u>Low</u>
Maximum Grade	65%	Land MPH	
Maximum Vertical Wall	17 $\frac{1}{4}$ in.	On Smooth	
Maximum Fording Depth	Amphibious	Water	
Minimum Turning Circle (O.D.)	First Gear	7	3
Water	Second Gear	11	5
Land	Third Gear	22	10
Towing Capacity	Fourth Gear	40	18
Angle of Approach	Fifth Gear	50	22
Angle of Departure	Reverse	7	3
Cruising Range		2.5	
Land	240 mi.		
Water	Top Speed, 2nd Gear	30 mi.	
	Cruising Speed, 3rd Gear	50 mi.	
Gas Economy (Mi. per gal.)			
Oil Economy (Mi. per qt.)			

ARMOR: None

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: Gun, Mach., Cal., 50, HB, M2 FM Mount M36
Maximum Elevation
Maximum Traverse
Maximum Depression

POWER TRAIN:

Engine:

Make GMC Model 270
Type: Valve-in-Head, 6 cyl. Fuel, Type Gas, 75 Oct.
Cooling System Liquid
No. Cylinders 6 Horsepower (Rated) 104 at 3000 RPM
Displacement (cu. in.) 270.5 Bore (in.) 3-25/32 Stroke (in.) 4
Governed Speed (rpm) 2750 Compression Ratio 6.75:1

Clutch:

Make Inland Mfg. Div., GMC.
Type Dry, Single Plate, Disc

Transmission:

Make Clark Equipment Co.
Type 5 Speed Overdrive, Selective, Sliding Gear
No. of Speeds Forward 5 Reverse 1
Gear Ratios
First 6.06:1
Second 3.50:1
Third 1.80:1
Fourth 1.00:1
Fifth .799:1
Reverse 6.00:1

Front Axle:

Make General Motors Corporation Type Banjo Full Floating
Gear Ratio 6.6:1

Rear Axle:

Make General Motors Corporation Type Banjo or Split Full Floating
Gear Ratio 6.6:1

Transfer Case:

Gear Ratios High 1.16:1 Low 2.63:1

TABLE OF CAPACITIES:

Fuel Tanks (1)	40 gals
Transmission	5½ qts.
Differential	Front, Int., Rear Axles 6½ qts. ea
Engine & Oil Filter	10 qts.
Oil Bath Air Cleaners	1 qt.
Cooling System	20 qts.
Transfer Case	2¼ qts.
Winch	

RUNNING GEAR:

Suspension: Type Leaf Spring

Wheels: Number 10 Size (in.) 18

Tires:

Number 10	Type Military Desert, Flotation
Size (in.) 11.00x18	No. Plies 10
Rolling Radius 20 in.	Revolutions Per Mile 504

Steering Mechanism: Type Mechanical

Brakes: Type Hydraulic (Hydrovac)

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1	Voltage 6	
<u>Main Generator</u>	Number 1	Voltage 6	Maps 40

COMMUNICATIONS: None

ADDITIONAL FEATURES:

Life Preservers, Jacket Type 15; Life Ring 1; Winch Cap 10,000 lbs.
Central Tire Inflation System
Bilge Pumps: 1 60 gallon per minute Rotary Pump; 1 260 gallon per
minute Centrifugal Pump; 1 50 gallon per minute Hand Pump for
emergency use.
Equipped with anchor and shackle...

FIRE PROTECTION: 2 1 qt. Carbon Tetrachloride or 2 4 lbs. CO₂ Portable.

CHARACTERISTICS

Landing Vehicle, Tracked, LVT (A) 5

BRIEF DESCRIPTION:

A full tracked amphibious armored howitzer carriage.

GENERAL

Make: Food Machinery Corp.

Type: Full Tracked Amphibian

Model: LVT (A) 5

Weight: (lbs.) Net 33,200

Fighting: 39,460

Overall Dimensions: (in.) Length 313 Width 128 Height 122½

Reducible to: (in.) Length Width Height

Draft to Bottom of Grousers: (in.)

Tread: (in.) 113½

Ground Clearance: (in.) 18 Hard Ground
15½ Soft Ground

Computed Ground Pressure: 10.9 (PSI)

HP/Ton Gross Weight: 12.7

Crew: 6

PERFORMANCE:

Rated Speed Max land speed 21 mph.
Max water speed 6 mph.

Maximum Grade 60%

High Low

Maximum Vertical Wall 36 in.

First Gear None

Maximum Trench

Second Gear

Maximum Fording Depth Amphibious

Third Gear

Minimum Turning Circle (O.D.) 30 ft. on land

Fourth Gear

Towing Capacity

Fifth Gear

Angle of Approach 35°

Reverse

Angle of Departure 30°

Cruising Range

Gas Economy (Miles per gal.)

Oil Economy (Miles per qt.)

ARMOR:

<u>Hull</u>	<u>Above Sponson</u>		<u>Below Sponson</u>
Front		1/4 in.	
Sides		1/4 in.	
Rear		1/4 in.	
Top		1/4 in.	
Bottom		None	
Type Armor	Pin-on		

<u>Turret</u>			
Front	1 1/2 in.		Rear 1 in.
Sides	1 in.		Top None
Type Armor	Rolled Homogeneous		

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 75mm Howitzer, M3 Mount M7

Caliber 75mm Length in Calibers 15 cal. Total Length (in.) 54.18
 Weight of Gun and Mount (lbs.) Est. Tube Life 20,000 rds.

Out of Balance

Breech Block Horizontal Sliding Wedge

Maximum Chamber Pressure 29,000 psi

Maximum Range 15° Elevation 5631 yds.

Maximum On Carriage Range 9550 yds.

Ammunition Stowage 6 Rds. in Ready Racks 94 Rds. on Vehicle

Total Rds: 100

Maximum Elevation 40°

Maximum Depression 20°

Maximum Traverse 360°

Turret Friction

Type Recoil Mechanism Hydro-spring

Type Oil Special

Maximum Recoil

Normal Recoil 11.62 in.

Type Equilibrator None

Elevating Handwheel: Effort

Wils per Turn

Hand Traverse Handwheel: Effort

Wils per Turn

Power Traverse: Control Effort

Turret RPM

Secondary Weapons:

Gun, Mach, Cal .30

Mount Cab

Gun, Mach, Cal .30 or 50

Mount Turret Port Side

Gun, Mach, Cal .30 or 50

Mount Turret Starboard Side

Ammunition:

Ammunition	HE (NC)	HEAT	SMOKE	SMOKE
			FS	WP
Model	M48	M66	M64	M64
Wt. Projectile (lbs.)	14.60	13.10	15.41	15.25
Wt. Round (lbs.)	18.24	16.30	19.05	18.89
Wt. Propellant (lbs.)	1.06	1.04	1.04	1.04
Length Round (in.)	23.48	23.47	23.49	23.49
Fuze Model	*	**	P.D.M57	P.D.M57
Muzzle Velocity (f/s)	1250	1000	850	850
Pene.Home.Plate at 1000 yds and at 30° obliquity		3.625		

* P.D. M48A2, T50., M54

** B.D. M62 or M62A1

Fire Control:

Direct Fire Telescope, M70R

Indirect Fire Telescope, Panoramic, M12A5 Mount, M44

Vision Devices Vision Blocks

POWER TRAIN:

Engine:

Make Continental Motors Corp. Model W670-9A
Type Radial, 7 cyl. Fuel, Type 80 Oct. Cooling System Air
No. Cylinders 7 Horsepower (Rated) 250 at 2400 RPM
Displacement (cu.in.) 667.86 Bore(in.) 5-1/8 Stroke(in.) 4-5/8
Governed Speed (rpm) 2600. Compression Ratio 6.1:1

Clutch:

Make
Type Modified Rockford

Transmission: One Unit with Controlled Differential

Make Spicer Universal Joint Co.; Wisconsin Axle Co.
Type Synchronesh
No. of Speeds Forward 5 Reverse 1
Gear Ratios
First 5.37:1
Second 2.82:1
Third 1.72:1
Fourth 1.22:1
Fifth .872:1
Reverse 6.19:1

Differential: One Unit with Transmission

Make Spicer Universal Joint Co.; Wisconsin Axle Co. Type Controlled
Gear Ratio 2.62:1 Steering Ratio 1.845:1

Final Drive:

Make Type Herringbone
Gear Ratio 2.57:1

Transfer Case: None

TABLE OF CAPACITIES:

Fuel Tanks (2)	110 gals.
Transmission) 24 qts.
Differential	
Final Drives	3 qts. (ea.)
Engine & Oil Filter	23 qts.
Oil Bath Air Cleaners	
Auxiliary Generator Power Plant	12 gals.
Cooling System	Air Cooled

RUNNING GEAR:

Suspension: Type Torsional Shaft, Rubber Bearings

Track:

Type. All Steel
Width (in.) $14\frac{1}{4}$ Pitch (in.) 8 (Double Pitch)
Length of Ground Contact (in.) $126\frac{1}{2}$
Drive Front Sprocket Revolutions per mi. 960
Shoes per Track 73 (Double Pitch)

Wheels: Number 22 Size (in.) $8-5/8 \times 7\frac{1}{4}$

Tires:

Number 22 Type Pressed On
Size (in.) $12 \times 7\frac{1}{4}$ No. Plies Solid

Steering Mechanism: Type Controlled

Brakes: Type Steering

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 2	Voltage 6	
<u>Main Generator</u>	Number 1	Voltage 12	Amps 45
<u>Auxiliary Generator</u>	Make Delco (2)	Voltage 12	Amps 60

COMMUNICATIONS:

<u>Radios</u>	Type IC	Location
<u>No. of Interphone Outlets</u>	5	

FIRE PROTECTION: 2 10lb. CO₂ Fixed 1 4 lb. CO₂ Portable

ADDITIONAL FEATURES:

Turret Traverse: Type Hydraulic. Mfgr. The Oil Gear Co.
Auxiliary Type: Manual. Mfgr. New Process Gear Co.
Gyrostabilizer: Yes
Bilge Pumps: One 500 gallons per minute centrifugal Pump, One 40 gallons per minute hand-operated Diaphragm Pump for emergency use only.
Signalling Search Light Equipped

CHARACTERISTICS

Car, Armored, Light, M8

BRIEF DESCRIPTION:

All wheel drive armored reconnaissance car with cross country operating abilities.

GENERAL:

Make: Ford Motor Co.

Type: 6x6 Armored Car

Model: M8

Weight: (lbs.) Net 14,500

Fighting 17,200

Weight Distribution: (lbs.)

Empty

Front Axle Load

Second Axle Load

Rear Axle Load

Loaded to Rated Load

Front Axle Load 6360

Second Axle Load 5420

Rear Axle Load 5420

Overall Dimensions: (in.) Length 197 Width 100 Height 88 $\frac{1}{2}$

Reducible to: (in.) Length Width Height

Wheelbase: (in.) Front Axle to Center of Rear Engine 104

Front to Rear Axle 128

Front to Second Axle 80

Ground Clearance: (in.) 11 $\frac{1}{2}$ Tread: (in) 76

Computed Ground Pressure: 11.7 (PSI) Fighting Weight @ 4 in. Pen.

HP/Ton Gross Weight: 12.8

Crew: 4

PERFORMANCE:

Maximum Grade	60%		<u>Rated Speed</u> 56 mph
Maximum Vertical Wall	12 in.	First Gear	<u>High</u> 8 mph
Maximum Fording Depth	32 in.	Second Gear	<u>Low</u> 4 mph
Minimum Turning Circle (O.D.)	56 ft.	Third Gear	15
Towing Capacity		Fourth Gear	32
Angle of Approach	60°	Reverse	56
Angle of Departure	45°		8
Cruising Range	400 mi.		8
Gas Economy (Mi. per gal.)	7.5		
Oil Economy (Mi. per qt.)			

ARMOR:

<u>Hull</u>	<u>Above Sponson Line</u>	<u>Below Sponson Line</u>
Front	3/4 in. @ 45°	1/2 in. & 5/8 in. @ 60° & 30°
Sides	3/8 in. @ 22°	3/8 in. @ 22°
Rear		3/8 in. @ 0°
Top	1/4 in.	
Bottom	1/4 in.	
Type Armor	Homogeneous Plate	

<u>Turret</u>		
Front	3/4 in. @ 20°	Rear 3/4 in. @ 20°
Sides	3/4 in. @ 20°	Top 1/4 in.
Gun Mantlet		
Type Armor	Side-Cast Armor; Top-Homogeneous Plate	

WEAPONS, AMMUNITION AND FIRE CONTROL:

Primary Weapon: 57mm M6 Mount M23A1

Caliber 37mm Length in Calibers 53.5 (Bore) Total Length(in.) 82.50
Weight of Gun and Mount(lbs.) 262.5 Est. Tube Life 700 rds w/APC, M51
Out of Balance
Breech Block Semi-Auto, Vertical Sliding
Maximum Chamber Pressure
Maximum Range 15° Elevation 7200 w/Shell HE(NC)
Maximum On Carriage Range 7583 yds. w/Shell HE(NC)
Ammunition Stowage 16 Rds. in clips in turret; 64 Rds. in rack upper
sponson. Total Rds 80
Maximum Elevation 20° (355.6 mils) Maximum Depression 10°
Maximum Traverse 360° Turret Friction
Type Recoil Mechanism Hydro-spring Type Oil Special
Maximum Recoil 8 in. Normal Recoil 7 in.
Type Equilibrator None
Elevating Handwheel: Effort Mils per Turn
Hand Traverse Handwheel: Effort Mils per Turn
Power Traverse: None

Secondary Weapons:

Gun, Mach., Cal.50, HB, M2, Flex Mount D60258
Gun, Mach., Cal.30, M1919A4, Flex Mount M23A1
Carbines, Cal.30, M1

Transmission:

Make Warner Gear Div., Borg-Warner Corp.
Type Synchronized, Selective Gear
No. of Speeds Forward 4 Reverse 1
Gear Ratios
First 6.499:1
Second 3.543:1
Third 1.752:1
Fourth 1.000:1
Reverse 6.987:1

Front Axle:

Make Timken-Detroit Axle Co. Type Split-type Housing
Gear Ratio 6.66:1

Intermediate & Rear Axle:

Make Ford Motor Co. Type Full Floating Banjo
Gear Ratio 6.66:1

Transfer Case:

Gear Ratios High 1.00:1 Low 1.956:1

TABLE OF CAPACITIES:

Fuel Tanks (1)	59 gals.
Transmission	4 $\frac{1}{2}$ qts.
Differential	Front 2-3/4 qts.; Rear 2 $\frac{1}{4}$ qts.
Engine & Oil Filter	7 qts.
Oil Bath Air Cleaners	2 qts.
Cooling System	23 $\frac{1}{2}$ qts.
Transfer Case	2 $\frac{1}{4}$ qts.

RUNNING GEAR:

Suspension: Type Semi-Elliptic Leaf Springs

Track: None

Wheels: Number 6 Size (in.) 20

Tires:

Number	6	Type	Combat
Size (in.)	9.00 x 20	No. Plies	12
Rolling Radius	19 in.	Revolutions Per Mile	531

Steering Mechanism: Type Worm & Roller

Brakes: Type Hydraulic (Hydrovac)

ELECTRICAL SYSTEM:

<u>Batteries</u>	Number 1	Voltage 12	
<u>Main Generator</u>	Number 1	Voltage 12	Amps 60
<u>Auxiliary Generator</u>	None		

COMMUNICATIONS:

Radios: Type SCR 506 (Command Vehicle Only) Location Either Sponson
SCR 508 or 510 or 608 or 610 Location Either Sponson
No. of Interphone Outlets: 4

FIRE PROTECTION: 1 4 lb CO₂ Portable

ADDITIONAL FEATURES:

When two radios are installed, 64 rd. 37mm ammunition box is removed.

Turret Traverse: Type Two speed, Hand Mfgr. Ford Motor Co.

Gyrostabilizer: None

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