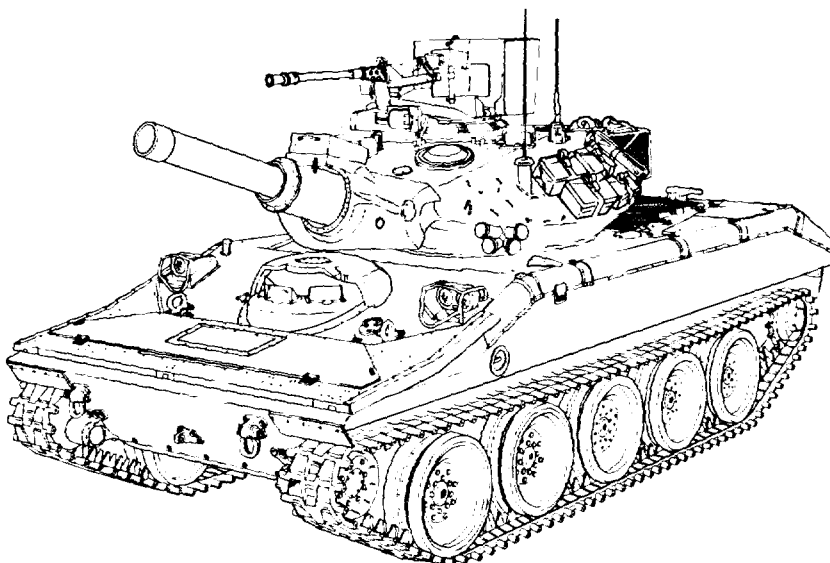


This copy is a reprint which includes current
pages from Changes I and 2. TM 9-2350-230-10

SUPERSEDES COPY DATED JUNE 1976

OPERATOR'S MANUAL



Armored Reconnaissance/ Airborne Assault Vehicle Full-Track 152-mm Gun/launcher M551A1 (NSN 2350-00-140-5151) M551 NTC (NSN 2350-01-115-1579)	OPERATOR'S CONTROLS AND INDICATORS	PAGE 2-1
	PREVENTIVE MAINTENANCE CHECKS AND SERVICES	PAGE 2-9
	OPERATION UNDER USUAL CONDITIONS	PAGE 2-77
	OPERATION UNDER UNUSUAL CONDITIONS	PAGE 2-272
	TROUBLESHOOTING PROCEDURES	PAGE 3-7
	MAINTENANCE PROCEDURES	PAGE 3-31
	AMMUNITION	PAGE 4-1

Approved for public release;,, distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1992

TECHNICAL MANUAL

NO. 9-2350-230-10

HEADQUARTERS
DEPARTMENT OF THE ARMY

Washington D. C., 11 May 1992

**OPERATOR'S MANUAL
ARMORED
RECONNAISSANCE/AIRBORNE
ASSAULT VEHICLE
FULL-TRACKED
152-MM GUN/LAUNCHER**

**M551 A1 (NSN 2350-00-140-5151)
M551 NTC (NSN 2350-01-115-1579)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

TABLE OF CONTENTS

	Page
HOW TO USE THIS MANUAL	iii
CHAPTER 1 INTRODUCTION	1-1
Section I. General Information	1-1
Section II. Equipment Description	1-6
Section III. Principles of Operation	1-14
CHAPTER 2 OPERATING INSTRUCTIONS	2-1
Section I. Description and Use of Operators Controls and Indicators.....	2-1

Approved for public release; distribution is unlimited.

*This manual supersedes TM 9-2350-230-10, dated June 1976, including all changes thereto.

	Page
Section II. PMCS	2-9
Section III. Operation Under Usual Conditions	2-77
Section IV. Operation Under Unusual Conditions	2-272
CHAPTER 3 MAINTENANCE INSTRUCTIONS	3-1
Section I. Lubrication Instructions	3-1
Section II. Troubleshooting Procedures	3-7
Section III. Maintenance Procedures	3-31
CHAPTER 4 AMMUNITION	4-1
APPENDIX A REFERENCES	A-1
APPENDIX B COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS	B-1
Section I. Introduction	B-1
Section II. COEI	B-3
Section III. BII	B-8
APPENDIX C ADDITIONAL AUTHORIZATION LIST (AAL)	C-1
Section I. Introduction	C-1
Section II. Additional Authorized Items List	C-2
APPENDIX D EXPENDABLE AND DURABLE ITEMS LIST	D-1
Section I. Introduction	D-1
Section II. Expendable and Durable Items List	D-2
APPENDIX E STOWAGE AND SIGN GUIDE	E-1
APPENDIX F ON-VEHICLE EQUIPMENT LOADING PLAN	F-1
INDEX	INDEX-1

HOW TO USE THIS MANUAL

GENERAL.

This manual contains operation and maintenance information for the M551A1/M551NTC Sheridan crew. It is divided into four chapters:

- CHAPTER 1-INTRODUCTION provides general information about the Sheridan, contains a list of abbreviations/acronyms and glossary, describes and identifies major components and systems, and provides principles of operation.
- CHAPTER 2-OPERATING INSTRUCTIONS describes and identifies the operating controls and indicators and explains how to use them. This chapter also covers Preventive Maintenance Checks and Services (PMCS), how to operate the Sheridan during usual and unusual conditions, and how to respond to some emergency conditions.
- CHAPTER 3-MAINTENANCE INSTRUCTIONS describes lubrication, troubleshooting, and maintenance procedures. The lubrication section provides information on lubricating and cleaning. The troubleshooting section provides information to help the crew solve problems through corrective action. The maintenance section provides information on repairs allowed at the crew level.
- CHAPTER 4-AMMUNITION identifies and describes the types of ammunition authorized for the Sheridan.

Each chapter begins on a right-hand page with the page number of 1. Pages are numbered after the chapter number. For example:

1-6 means Chapter 1, page 6.

COVER INDEX.

The front cover has an index for major divisions in this manual that are used most frequently by the operator. The first page of the associated major division has a black edge that lines up with the applicable cover boxed-in area.

WARNINGS, CAUTIONS, AND NOTES.

Warnings, cautions, and notes are provided throughout this manual in places which do not fit into a procedural step. A warning is provided where injury may occur to personnel on or near the Sheridan. Warnings are bolded and italicized with the word 'warning' boxed. For example:

WARNING

The obturator seal must be used with all types of ammo to prevent a fire hazard and gas wash.

TECHNICAL MANUAL

NO. 9-2350-230-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 11 May 1992

OPERATOR'S MANUAL
ARMORED
RECONNAISSANCE/AIRBORNE
ASSAULT VEHICLE
FULL-TRACKED
152-MM GUN/LAUNCHER
M551 A1 (NSN 2350-00-140-5151)
M551 NTC (NSN 2350-01-115-1579)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to Improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

TABLE OF CONTENTS

	Page
HOW TO USE THIS MANUAL	iii
CHAPTER 1 INTRODUCTION	1-1
Section I. General Information	1-1
Section II. Equipment Description.....	1-6
Section III. Principles of Operation	1-14
CHAPTER 2 OPERATING INSTRUCTIONS	2-1
Section I. Description and Use of Operators Controls and Indicators	2-1

Approved for public release; distribution is unlimited.

*This manual supersedes TM 9-2350-230-10, dated June 1976, including all changes thereto.

	Page
Section II. PMCS.....	2-9
Section III. Operation Under Usual Conditions.....	2-77
Section IV. Operation Under Unusual Conditions.....	2-272
CHAPTER 3 MAINTENANCE INSTRUCTIONS	3-1
Section I. Lubrication Instructions.....	3-1
Section II. Troubleshooting Procedures.....	3-7
Section III. Maintenance Procedures.....	3-31
CHAPTER 4 AMMUNITION	4-1
APPENDIX A REFERENCES	A-1
APPENDIX B COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS	B-1
Section I. Introduction	B-1
Section II. COEI	B-3
Section III. BII.....	B-8
APPENDIX C ADDITIONAL AUTHORIZATION LIST (AAL)	C-1
Section I. Introduction	C-1
Section II. Additional Authorized Items List.....	C-2
APPENDIX D EXPENDABLE AND DURABLE ITEMS LIST	D-1
Section I. Introduction	D-1
Section II. Expendable and Durable Items List.....	D-2
APPENDIX E STOWAGE AND SIGN GUIDE	E-1
APPENDIX F ON-VEHICLE EQUIPMENT LOADING PLAN	F-1
INDEX	INDEX-1

HOW TO USE THIS MANUAL

GENERAL.

This manual contains operation and maintenance information for the M551A1I/M551NTC Sheridan crew. It is divided into four chapters:

- CHAPTER 1-INTRODUCTION provides general information about the Sheridan, contains a list of abbreviations/acronyms and glossary, describes and identifies major components and systems, and provides principles of operation.
- CHAPTER 2-OPERATING INSTRUCTIONS describes and identifies the operating controls and indicators and explains how to use them. This chapter also covers Preventive Maintenance Checks and Services (PMCS), how to operate the Sheridan during usual and unusual conditions, and how to respond to some emergency conditions.
- CHAPTER 3-MAINTENANCE INSTRUCTIONS describes lubrication, troubleshooting, and maintenance procedures. The lubrication section provides information on lubricating and cleaning. The troubleshooting section provides information to help the crew solve problems through corrective action. The maintenance section provides information on repairs allowed at the crew level.
- CHAPTER 4-AMMUNITION identifies and describes the types of ammunition authorized for the Sheridan.

Each chapter begins on a right-hand page with the page number of 1. Pages are numbered after the chapter number. For example:

1-6 means Chapter 1, page 6.

COVER INDEX.

The front cover has an index for major divisions in this manual that are used most frequently by the operator. The first page of the associated major division has a black edge that lines up with the applicable cover boxed-in area.

WARNINGS, CAUTIONS, AND NOTES.

Warnings, cautions, and notes are provided throughout this manual in places which do not fit into a procedural step. A warning is provided where injury may occur to personnel on or near the Sheridan. Warnings are bolded and italicized with the word 'warning' boxed. For example:

WARNING

The obturator seal must be used with all types of ammo to prevent a fire hazard and gas wash.

WARNINGS, CAUTIONS, AND NOTES-Continued.

There are also general warnings that start on the first right-hand page immediately after the cover which should be read before operating the Sheridan.

A caution is provided where equipment may be damaged, but no injuries to personnel should result. Cautions are bolded and italicized with the word 'caution' underlined. For example:

CAUTION
Do not clean bore with abrasives.

A note provides information, but no personnel injury or equipment damage should result. A note is bolded and italicized. For example:

NOTE
Do not use steel wool

TASK TITLES.

Major task titles are bolded and capitalized, and appear before the first step of the task. For example:

3-2. SERVICE INTERVALS-UNUSUAL CONDITIONS.

When a major task has a number of sub-tasks, the titles of the sub-tasks appear as follows:

a. Daily. After completion of firing mission, clean the gun/launcher.

(1) Clearing 7.62-mm Machine Gun.

(a) Elevating/depressing gun/launcher.

INTERNAL REFERENCING.

In this manual, internal referencing is done by chapter, paragraph, section, and/or task. For example:

Gun/launcher cleaning and lubrication (see paragraph 3-3)

EXTERNAL REFERENCING.

Referencing outside this manual is done by the military publication number. For example:

For hull/vehicle lubrication, refer to LO 9-2350-230-12.

APPENDIXES.

There are six appendixes which provide additional information for the Sheridan:

CHAPTER 1 INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE. This operators manual is for your use in operating and maintaining the Armored Reconnaissance/Airborne Assault Vehicle (AR/ AAV), commonly known as the Sheridan M551A1/M551NTC. The purpose of the AR/MV M551A1/M551NTC is to provide forward reconnaissance, intelligence gathering, and airborne assault capabilities. This manual includes lists of References, Basic Issue Items (BII), Components of End Item (COEI), and Additional Authorization List (AAL). A Stowage and Sign Guide is also included in this manual.

The equipment/system described herein is non-metric and does not require metric common or special tools; therefore, metric units are not supplied. For the sake of clarity, tactical instructions are also non-metric.

1-2. MAINTENANCE FORMS AND PROCEDURES. Department of the Army Forms and Procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. CORROSION PREVENTION AND CONTROL (CPC). Primary responsibility for CPC lies with unit maintenance and will be handled at the depot level. Operators will notify unit maintenance of any excessive corrosion or wear that occurs with the M551A1/M551NTC.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. If captured, the M551A1/M551NTC and its equipment, ammunition, and fuel shall be destroyed in accordance with TM 750-244-6 to prevent their use by the enemy. If possible, attempt to salvage sighting and fire control equipment and short supply items prior to destruction. Destruction of vehicle shall be as total and extensive as the tactical situation permits.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs). If your M551A1/M551NTC needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Fill out SF Form 368 (Product Quality Deficiency Report) and mail it to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MC, Warren, MI 48397-5000. We will send you a reply.

1-6. LIST OF ABBREVIATIONS/ACRONYMS.

A or amp	amperes
AAL	Additional Authorization List
AC	hydrogen cyanide
ac	alternating current
ammo	ammunition
ANT FREQ	antenna frequency
approx	approximately
AR/AAV	Armored Reconnaissance/Airborne Assault Vehicle
ASP	Ammunition Supply Point
auto	automatic
AZ	azimuth
BATT-GEN	battery-generator (switch)
Bil	Basic Issue Items
BITE	Built-In Test Equipment
BO	blackout
°C	degrees Celsius or Centigrade
CAGEC	Commercial and Government Entity Code
cal	calibre
CARC	Chemical Agent Resistant Coating
CBSS	Closed Breech Scavenging System
CHAN SEL	channel selector
chg	charge
CK	cyanogen chloride
CKT BKR	circuit breaker
CLP	Cleaner/Lubricant/Preservation
cm	centimeter
CMR and CMDR	commander
CMR DSPL	commander's display
COAX	coaxial
COEI	Components of End Item
cont	continued
CONV	conventional (round)
CPC	Corrosion Prevention and Control
CPV	Cannon Pressure Vessel
CVC	Combat Vehicle Crewmember
dc	direct current
decon	decontamination
DMR	dimmer
DNV	Drivers Night Viewer
DOD	Department of Defense
DODAC	Department of Defense Ammunition Code
DODIC	Department of Defense Identification Code
DOT	Department of Transportation
DR	draining
dr	drive
DR Lamp	Draining Lamp
EFC	equivalent full charge
e.g	exempli gratia (for example)

EIR	Equipment Improvement Recommendation
EL	elevation
ELEV	elevate
EMER	emergency
ENG	engine
ENI	Electronic Null Indicator
EOD	Explosive Ordnance Disposal
EXT	external
F	degrees Fahrenheit
F	fire
FDA	Food and Drug Administration
FT	Firing Table
ft	foot or feet
FWD	forward
GAA	Grease, Automotive and Artillery
gal	gallon
GIA	Grease, Aircraft and Instrument
GO	Guidance and Control System Operation
gpm	gallons per minute
HC	smoke screening compound
hdl	handle
HEAT	High Explosive Anti-Tank
HEAT-T-MP	High Explosive Anti-Tank with Tracer, Multipurpose
HE-T	High Explosive with Tracer
hydr	hydraulic
Hz	hertz
IAW	in accordance with
ICC	Inventory Category Code
ICS	Intercommunication System
ID	inside diameter
i.e	id est (that is)
ILLUM	illuminate
in	inch
INT	internal
IR	infrared
JRTC	Joint Readiness Training Center (Fort Chaffee, Arkansas)
KC	kilohertz channel
kg	kilogram
lb	pound
LED	Light Emitting Diode
9	long
LO	Lubrication Order
LRF	Laser Range Finder
MAC	Maintenance Allocation Chart
MALF	malfunction
max	maximum
MC	megahertz channel
.....	machine gun
min	minimum

1-6. LIST OF ABBREVIATIONS/ACRONYMS-Continued.

mm	millimeter
MOD	modified
MODE	modulator
mph	miles per hour
MTOE	Modified Table of Organization and Equipment
N	neutral
NAR	narrow
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
No	number
norm	normal
NSN	National Stock Number
NTC	National Training Center (Fort Irwin, California)
O/A	overall
OPFORS	Opposing Forces
opng	opening
P	park
para	paragraph
PMCS	Preventive Maintenance Checks and Services
psi	pounds per square inch
psig	pounds per square inch gauge
pt	pint
PWR	power
qt	quart
R	reverse
RAD TRANS	radio transmitter
rpm	revolutions per minute
RTCL	reticle
S	safety
SDC	Signal Data Converter
sgl	single
SIG	signal
Signal Data CONV Lamp	Signal Data Converter Lamp
skt	socket
SPKR	speaker
sq	square
STAB	stabilizer
STBY	standby
std	standard
stl	steel
str	straight
SYS	system
SYS TEST	system test
TM	technical manual
TOE	Table of Organization and Equipment
TP-T	Target Practice with Tracer
TRAV	traverse

TSW	test switch
TTS	Tank Thermal Sight
tubr	tubular
V	volt
V dc	volts direct current
veh	vehicle
w/ M	with
w/o	without
wd	width
WP	white phosphorus
wt	weight
XMTR	transmitter

1-7. GLOSSARY.

Abrasive	Having a rough surface that wears away other surfaces by friction. An abrasive surface can damage a smooth, delicate surface, e.g., sandpaper on glass.
Ambient	Referring to the conditions of the surrounding environment, e.g., the ambient air temperature is the temperature of the surrounding air.
Burrs	Loose pieces of metal or irregularities on a smooth metal surface. Burrs can foul the operation of weapons and machinery.
Coaxial	Mounted on a common axis. The 7.62-mm machine gun and the 152-mm gun/launcher are coaxially mounted.
Condensation	Water that has formed from vapor into droplets.
Electrolyte	The active chemical in a battery that stores and conducts electricity.
Noxious	Injurious or harmful to health.
Ogive	The part of a missile that is cone shaped.
Parallax	An apparent change in the direction of an object, caused by a change in observational position that provides a new line of sight.
Polarity	As used in this TM, polarity refers to the contrast between light and dark. Reversing polarity makes light objects dark and dark objects light.

Section II. EQUIPMENT DESCRIPTION

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES. The AR/AAV M551A1/M551NTC is a lightweight, full-tracked, diesel-powered armored reconnaissance and assault vehicle. This vehicle is designed and equipped for amphibious operation and is capable of maneuvering in water. The M551 A1/M551 NTC can be air transported and air delivered by cargo aircraft.

The turret traverses full circle (3600).

A 152-mm gun/launcher that fires either conventional ammo or the Shillelagh missile is mounted on the turret. Residue and gases from firing are removed by the vehicle's Closed Breech Scavenging System (CBSS). Other armament consists of smoke grenade launchers (primarily used for laying a smoke screen), a 7.62-mm coaxial machine gun, a cal .50 machine gun, and a gunner's telescope (also mounted on the turret).

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. The components of the M551 A1/M551 NTC that are essential to the operation and maintenance of the vehicle are shown in figures 1-1 and 1-2.

1-10. DIFFERENCES BETWEEN MODELS. The hull, suspension, and miscellaneous hull components of the M551 A1 and M551 NTC are identical. The M551 became the M551A1 when equipped with the Laser Range Finder (LRF) ANNVG-1 and the Tank Thermal Sight (TTS) ANNSG-2B. The M551 became the M551 NTC when configured for use in training at the National Training Center (NTC) in Fort Irwin, California and the Joint Readiness Training Center (JRTC) in Fort Chaffee, Arkansas.

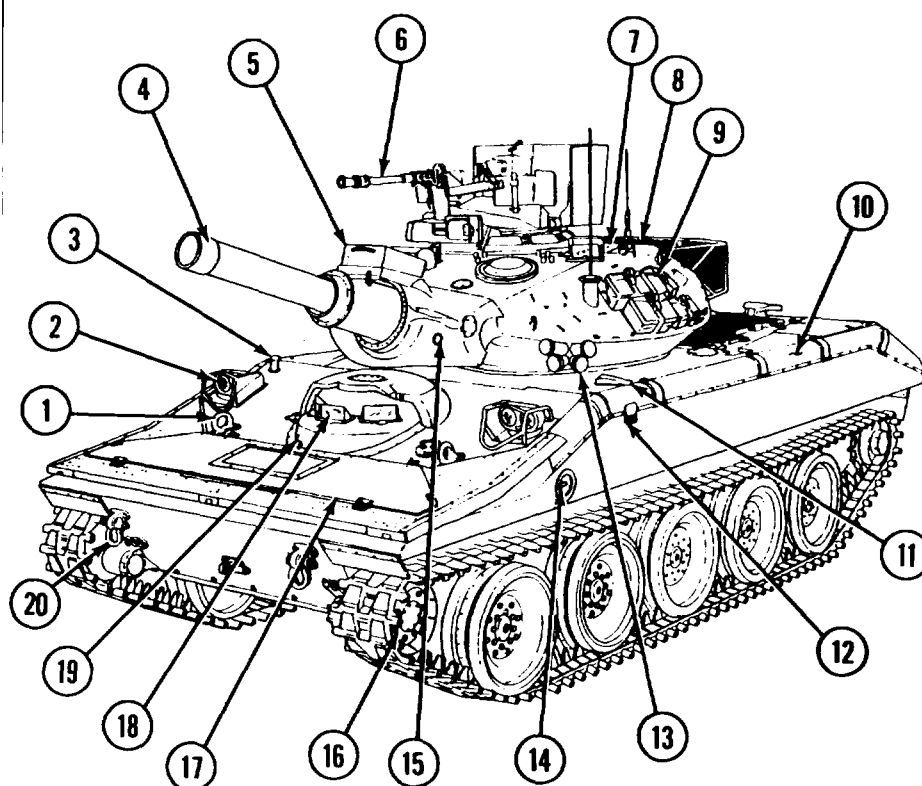
1-11. EQUIPMENT DATA.

a. General. The following are approximate weights and dimensions:

Weight classification.....	No. 20 (tons)
Combat loaded weight.....	36, 000 lb
Curb weight (less fuel, crew, and BII)	28, 525 lb
Overall length	20 ft 8 in.
Overall width.....	9 ft 2 in.
Overall height (over front ballistic shield plate).....	9 ft 8 in.
Ground clearance.....	19 in.

b. Performance.

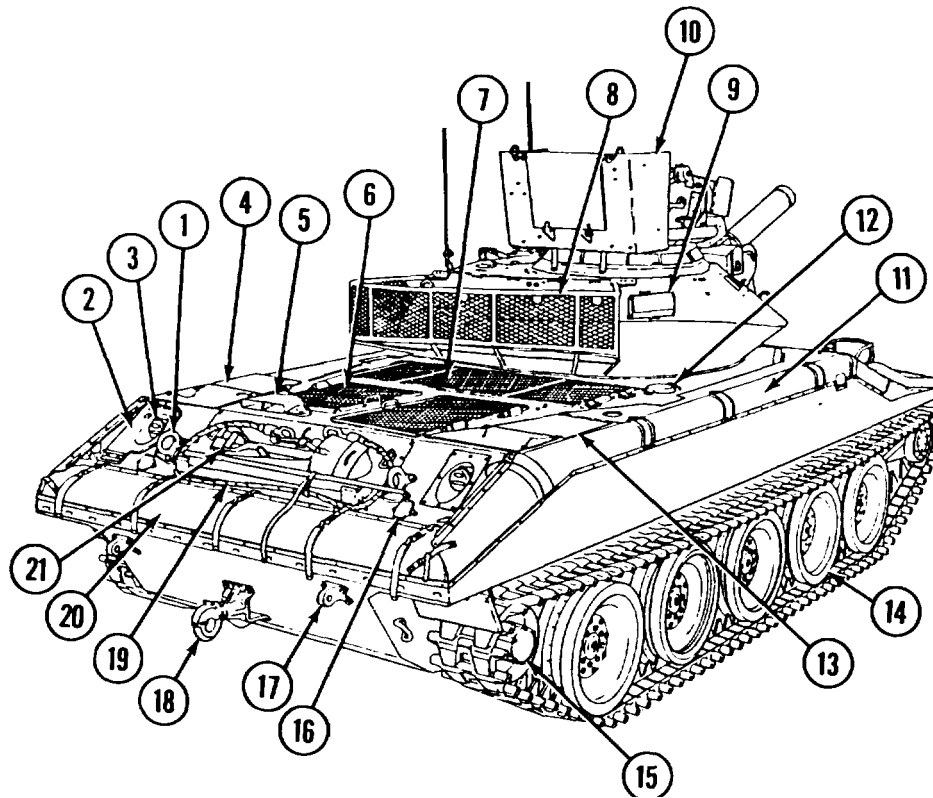
Maximum speed (fourth range)	43 mph
Maximum speed (reverse)	9 mph
Maximum grade (ascending or descending)	60%
Maximum trench crossing width	7 ft
Cruising range	373 miles
Maximum vertical height	33 in.
Minimum turning radius	Pivot



- | | |
|---|---|
| 1. Front lifting eye (2) | 12. Flotation barrier step (M551 AI) |
| 2. Front headlight (2) | 13. M243 grenade launcher |
| 3. 152-mm gun/launcher (M551A) | 14. Fixed fire extinguisher exterior actuator handle |
| 4. Personnel heater exhaust outlet | 15. 7.62-mm coaxial machine gun |
| 5. Missile subsystem transmitter door (M551 AI) | 16. Dual idler wheel (2) |
| 6. Cal .50 machine gun | 17. Flotation surfboard (M55A1) |
| 7. Loaders hatch cover | 18. M47 periscope (3) or M48 periscope/DNV AN/VVS-2V)3 (M551 AI) (in center for night vision) |
| 8. Water can | 19. Driver's rotatable hatch |
| 9. Cal .50 ammunition | 20. Front tow eye (2) |
| 10. Left side flotation barrier cover (M551A1) | |
| 11. Front bilge pump outlet | |

Figure 1-1. Armored Reconnaissance/Airborne Assault Vehicle (AR/AAV) M551A1/M551NTC-Left Front View

1-11. EQUIPMENT DATA-Continued.



- | | |
|--|---|
| 1. Rear lifting eye (2) | 11. Right-side flotation barrier cover (M551A1) |
| 2. Intercom access door | 12. Fuel filler cap cover (2) |
| 3. Rear taillight (2) | 13. Battery access door cover |
| 4. Engine air cleaner access door cover | 14. Dual road wheel (10) |
| 5. Engine exhaust outlet | 15. Dual drive sprocket wheel (2) |
| 6. Engine compartment exhaust grille (2) | 16. Engine compartment bilge pump outlet (2) |
| 7. Engine compartment air intake grille | 17. Rear towing eye (2) |
| 8. Turret stowage rack | 18. Towing pintle |
| 9. Cal .50 ammunition | 19. Tow cable(s) |
| 10. Commander's ballistic shield (M551 A1) | 20. Rear flotation barrier cover (M551 A1) |
| | 21. Pioneer tools |

Figure 1-2. AR/AAV M551A1/M551NTC-Right Rear View