

TECHNICAL MANUAL

**OPERATOR'S, UNIT, AND DIRECT SUPPORT
MAINTENANCE MANUAL**

**TAMPER, BACKFILL: GASOLINE ENGINE
DRIVEN, HAND-OPERATED,
RAM-TYPE (CCE)**

**MODEL VR11C (NSN 3895-01-151-2749)
MODEL VR11 (NSN 3895-01-013-4328)**

● This manual supersedes TM5-3895-360-14, 15 June 1985; also, this manual and TM5-3895-360-24P, 20 April 1993 supersede TM5-3895-345-14&p, 30 January 1981 and all changes

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HEADQUARTERS, DEPARTMENT OF THE ARMY

TECHNICAL MANUAL

TM 5-3895-360-13

HEADQUARTERS
DEPARTMENT OF THE ARMY
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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.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

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1-1. SCOPE.

- a. This manual describes the operation and Unit and Direct Support Maintenance for:
 - Tamper, Backfill: Gasoline Engine Driven, Hand-operated, Ram Type, VR11C.
 - Tamper, Backfill: Gasoline Engine Driven, Hand-operated, Ram Type, VR11.
- b. This manual is divided into chapters and sections. Each chapter covers a major component or operating system. Each section within a chapter covers Operator Maintenance, Unit Maintenance, or Direct Support Maintenance procedures for the tamper.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Form 738-750, *The Army Maintenance Management System (TAMMS)*.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

For destruction of Army materiel to prevent enemy use, refer to TM 750-244-3.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your tamper 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. Put it on an SF Form 388 (*Product Quality Deficiency Report*). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MP Warren, MI 48397-5000. We will send you a reply.

1-5. SAFETY CARE, AND HANDLING.

- a. This paragraph contains safety regulations which must be followed when operating or maintaining the VR11C and VR11 tampers. Personnel who fail to follow these regulations endanger the mission, equipment, and safety of themselves and other personnel.

1-5. SAFETY, CARE, AND HANDLING (Con't).

- b. Read and become familiar with all WARNINGS in the Warning Summary at the front of this manual.
- c. Throughout this manual, WARNINGS are placed as they pertain to specific operational or maintenance procedures. Read these warnings and follow them exactly.
- d. The following are safety regulations which must be followed when operating or maintaining the tampers:
 - (1) Read through this manual and become familiar with its contents before operating or performing any maintenance on the tamper.
 - (2) Before performing any maintenance on the tamper, ensure that the engine is shut down and spark plug cable is disconnected,
 - (3) Never operate the tamper in an explosive atmosphere, near combustible materials, or where ventilation is not sufficient to carry away exhaust fumes.
 - (4) Ensure that all safety guards are in proper position and secure. Keep hands, feet, and clothing away from moving parts when starting and operating the tamper.
 - (5) Never leave the tamper running unattended.
 - (6) Do not operate the tamper on any surface where it can tip or become out of control.
 - (7) Keep work area free of all bystanders.

Section II. EQUIPMENT DESCRIPTION AND DATA

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1-6. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

- a. The VR11C and VR11 tampers are intended for use in construction missions where compacting of confined areas such as footings, abutments, trenches, and concrete slab bases is required. The tampers are designed to compact a variety of soil substances such as clay lumps, silt, loam, and all granular materials.
- b. The VR11C is equipped with:
- (1) A 4 in. (10 cm) and a 6 in. (15 cm) accessory tamper shoe with 14 in. (36 cm) extensions for use in tamping shallow trenches.
 - (2) A carrying case for storage of the tamper and accessory tamper shoes.
- c. The VR11C and VR11 are equipped with:
- (1) An 11 in. (28 cm) general purpose tamper shoe that is used for any type surface large enough to accommodate the tamper shoe dimension.
 - (2) A throttle control used to manually control engine rpm.
 - (3) A hand-operated, automatic rewind starter.
 - (4) A two-cycle engine which consists of a cylinder, piston, rod, crankshaft, and crankcase.
 - (5) A shorting switch mounted on the fan housing which, when pushed, shorts out the ignition system and stops the engine from running.

NOTE

● Refer to Figure 1-1, Locating Major Components (VR11C), for location of major components.

● Refer to Figure 1-2, Locating Major Components (VR11), for location of major components.

1-7. LOCATION OF MAJOR COMPONENTS.

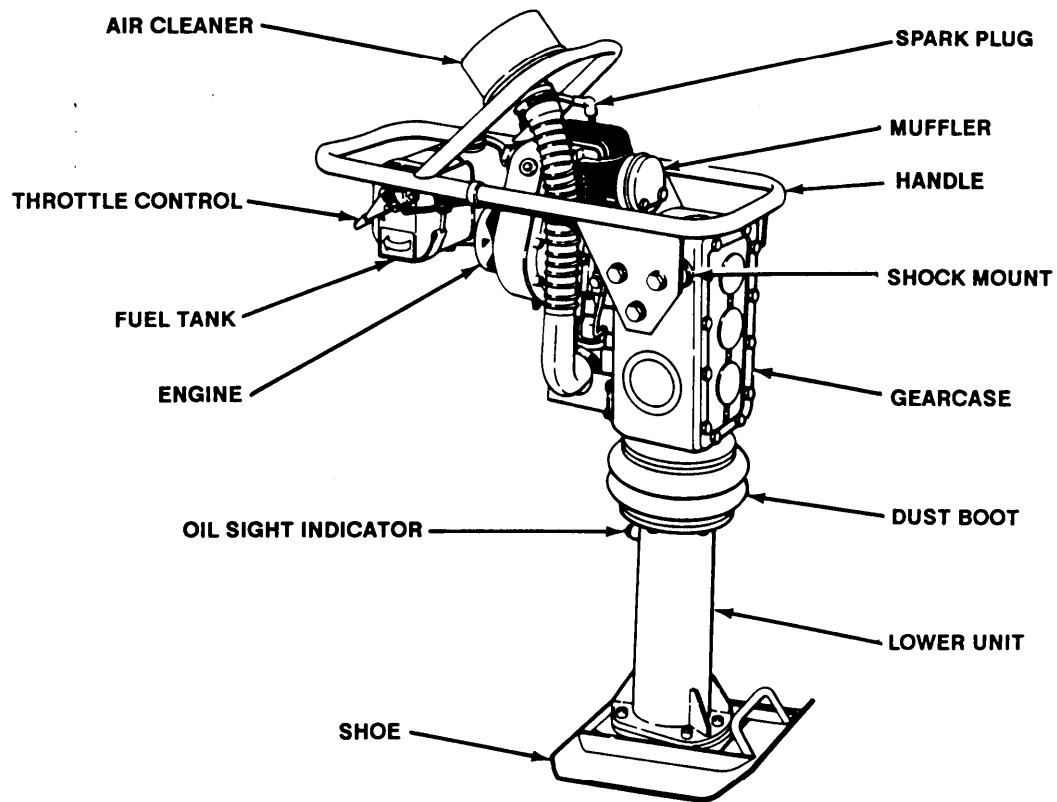


Figure 1-1. Location of Major Components (VR11C).

1-7. LOCATION OF MAJOR COMPONENTS (Con't).

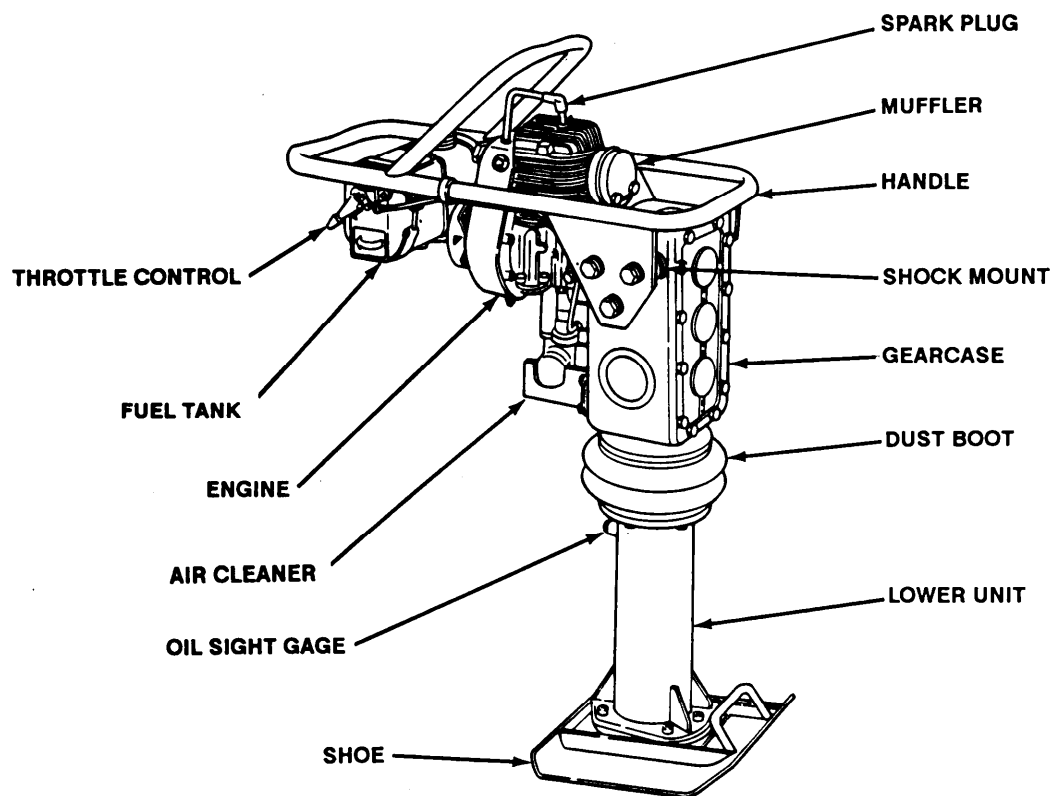


Figure 1-2. Location of Major Components (VR11).

1-8. EQUIPMENT DATA.

<u>Common Components</u>	
Manufacturer	Stone Construction Equipment Inc.
Type	Gasoline Engine Driven, Hand-operated, Ram Type
Capacity:	
Fuel Tank	0.62 gl (2.35 l)
Engine:	
Manufacturer	Chrysler Marine Corp,
Model	58037
Displacement	5.80 cu in. (95.06 cu cm)
Horsepower	4.0 at 5500 rpm
Type	2-cycle, Air-Cooled, Cross-scavenged
<u>VR11C</u>	
Weight and DImensions:	
Weight	120 lb (54 kg)
Length	26.5 in. (67.3 cm)
width	11 in. (28 cm)
Height	42.5 in. (108 cm)
Capacity:	
Lower Unit Oil	7 qt (6.6 l)
Performance:	
Impact Force	2200 lb (999 kg)
Compact Frequency	700 Cycles/Minute

Section III. TECHNICAL PRINCIPLES OF OPERATION

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1-9. GENERAL.

- a. The tamper is hand-operated and controlled and can be operated by one operator.
- b. The tamper is driven by a 2-cycle, air-cooled, gaso-line engine.
- c. Compact frequency is 700 cycles per minute at an impact force of 2200 lb (999 kg).

fuel and air mixture to enter the combustion chamber. When the piston approaches Top Dead Center (TDC), the fuel and air mixture is compressed in the combustion chamber. A spark plug then ignites the fuel and air mixture. The resulting explosion forces the piston down and rotates the crankshaft. As the piston moves down, it uncovers the exhaust ports. This allows the exhaust to escape and the pressure in the combustion chamber to fall.

1-10. TAMPER.

A tamping shoe is mounted at the lower end of a cylindrical spring housing. A piston, installed between large opposing springs inside the spring housing, is put into action by a connecting rod and crank assembly through a gear train and centrifugal clutch. The piston alternately loads and unloads the springs resulting in a rapid lifting and dropping action of the tamping shoe. This action compacts the underlying material.

A fresh supply of fuel and air mixture is compressed in the crankcase by the downstroke of the piston. As the piston nears the bottom of this stroke, it uncovers the intake ports. The fuel and air mixture rushes into the combustion chamber equalizing the pressure between the crankcase and combustion chamber. The fuel and air mixture flows up and around the baffles, then down and out the exhaust ports. This pushes the burned exhaust gases from the cylinder.

The compression stroke now begins with the intake ports and exhaust ports covered by the rising piston. As pressure increases in the combustion chamber, it decreases in the crankcase allowing a new fuel and air mixture from the carburetor to enter through the reed valve, preparing for the next cylinder charge.

1-11. ENGINE ASSEMBLY

When the engine is started, the crankshaft turns and the piston rises, uncovering the intake ports. This allows a

1-12. STARTER.

The starter rope is wound around a pulley. As the rope is pulled, the pulley is turned clockwise. The dog retainer and spring holding the dogs in the cutouts of the pulley hub allow the dogs to move out of the retracted position. The sharp edges of the dogs dig into the side of the starter cup. The flywheel turns, providing the starting force. As the rope is released, the dogs retract, allowing the rope to automatically rewind on the pulley.

1-13. FUEL SYSTEM.

The fuel system is operated by crankcase pressure and vacuum pulses from the engine crankcase. The pulses are transferred to the fuel pump diaphragm causing fuel to be pulled through the inlet flipper of the pump and then through the outlet flipper of the pump.

The carburetor is a demand-type carburetor. No fuel flows to the engine until the engine is cranked or operating. Lower pressure in the throttle bore, or venturi, causes the main metering diaphragm to depress the inlet liner. This allows the inlet needle to unseat and permits fuel to fill the fuel chamber. Fuel flows through the calibrated holes for low speed or the nozzle for high speed, based on engine demand and throttle shutter opening. The fuel pump aids fuel flow by furnishing larger quantities of fuel to the engine than would be possible without a fuel pump. The fuel pump cannot move fuel unless the fuel tank is vented.

Fuel flow through supply openings depends partly on main (high) or idle (low) adjustment needle settings. Fuel flow through discharge ports varies with the position of the throttle shutter. The throttle shutter blocks off or exposes ports to the engine demand and determines the mode of operation. Fuel flow is enhanced by the throttle bore, or venturi, a narrowing in opening that causes air to flow faster and a drop in pressure.

- a. **Starting Choke Operation.** During starting choke operation, the choke shutter is closed and the throttle shutter is open. The fuel passes through main, primary idle, and secondary idle fuel discharge ports.
- b. **Idle Operation.** During idle operation, the choke shutter is open and the throttle shutter is slightly open. This prevents fuel from passing through the secondary idle discharge port.

- c. **Intermediate Operation.** During intermediate operation, the choke shutter is open and the throttle shutter is open approximately halfway. Engine speed and air flow increase as the throttle shutter opens. The amount of fuel delivered increases as the throttle shutter uncovers the secondary discharge port, exposing it to engine suction.
- d. **High Speed Operation.** During high speed operation, the choke shutter and the throttle shutter are open. The amount of fuel delivered reaches a maximum when the throttle is fully open. All discharge ports are fully exposed to engine demand and to venturi effect.

1-14. REED VALVE ASSEMBLY

The reed valve is between the carburetor and the crankcase of the engine. It times the injection of the fuel and air mixture from the carburetor into the crankcase. The reed valve opens only when pressure in the crankcase drops to a predetermined point on the compression stroke. The reed valve maintains contact with the reed plate until pressure changes in the crankcase. Reed valve travel away from the plate is limited by the reed stop. When crankcase pressure increases, the built-in spring action of the reed valve returns and holds it against the plate.

1-15. IGNITION SYSTEM.

The ignition system consists of six major components: the flywheel, condenser, coil, breaker points, ignition or shorting switch, and spark plug.

The rotation of magnets along the outer edge of the flywheel creates a rotating magnetic field that cuts through the coil winding, building a very strong magnetic field. As the magnets pass the coil, the magnetic field collapses, sending a high voltage charge to the spark plug.