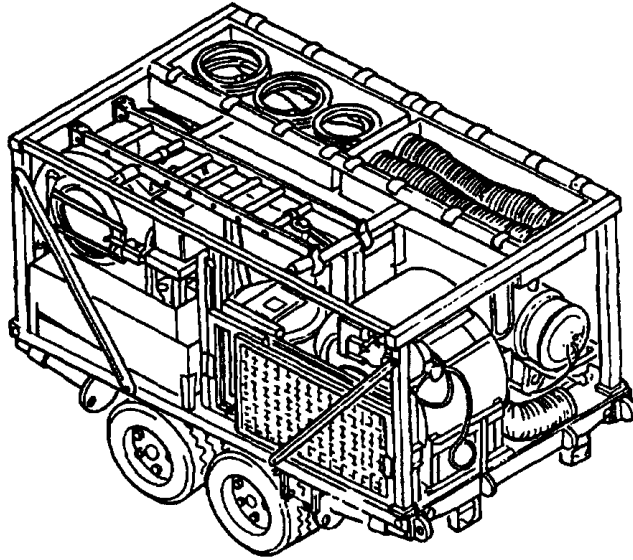


***TM 10-3510-222-10**

OPERATOR'S MANUAL



LAUNDRY UNIT, TRAILER MOUNTED

MODEL: M85-100 NSN 3510-01-291-8169 EIC: (2LF)

MODEL: M85-200 NSN 3510-01-365-5687 EIC: (2LG)

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

***This manual supercedes TM 10-3510-222-10, dated 30 April 1993, including all changes, and TM 10-3510-220-10, dated 20 April 1990, including all changes.**

**HEADQUARTERS, DEPARTMENT OF THE ARMY
31 OCTOBER 2003**

OPERATOR'S MANUAL

**LAUNDRY UNIT,
TRAILER MOUNTED
MODEL: M85-100 NSN 3510-01-291-8169
MODEL: M85-200 NSN 3510-01-365-5687**

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 together with DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual, directly to: Commander, U.S. Army Soldier and Biological Chemical Command, ATTN: AMSSB-RIM-L (N), Kansas Street, Natick, MA 01760-5052. You may also send in your recommended changes via electronic mail directly to amssbriml@natick.army.mil. A reply will be furnished to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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ALPHABETICAL INDEX.....INDEX 1

HOW TO USE THIS MANUAL

This manual contains General Information, Operating Instructions, Operator Preventive Maintenance Checks and Services (PMCS), Troubleshooting, and Maintenance/Repair instructions for the M85 Series Trailer Mounted Laundry.

Chapter 1 contains introductory information on the laundry and its associated equipment as well as a Theory of Operation. Chapter 2 includes operating instructions under usual and unusual conditions. Chapter 3 contents include operator troubleshooting, PMCS, and service procedures. Chapter 4 contains maintenance instructions. Chapter 5 contains references and other supporting information.

Manual Organization and Page Numbering System. The manual is divided into five major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Each page of a work package has a page number of the form XXXX YY-ZZ where XXXX is the work package number (e.g. 0010 is work package 10) and YY is the revision number for that work package and ZZ represents the number of the page within that work package. A page number such as 0010 00-1/2 blank means that page 1 contains information but page 2 of that work package has been intentionally left blank.

Finding Information. The Table of Contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The Table of Contents lists the topics contained within each chapter and the Work Package Sequence Number where it can be found.

Example: If the reader were looking for instructions on "Preventive Maintenance Checks and Services", which is an Operator Maintenance topic, the Table of Contents indicates that Operator Maintenance information can be found in Chapter 4. Scanning down the listings for Chapter 4, "Preventive Maintenance Checks and Services" information can be found in WP 0012 00 (i.e. Work Package 12).

An Alphabetical Index can be found at the back of the manual. It lists specific topics with the corresponding work package.

LAUNDRY UNIT, TRAILER MOUNTED, MODEL M85-100, M85-200
GENERAL INFORMATION

SCOPE.

This technical manual describes the operating procedures for the M85 Series Trailer Mounted Laundry Units. The information and procedures in this manual are applicable to all versions of the M85 Series Trailer Mounted Laundry, except where noted.

The Model M85 Series Trailer Mounted Laundries are usually found in support of field hospital and reconstitutive operations.

Type of Manual: Operator's

Model Number and Equipment Name: Laundry Unit, Trailer Mounted, Model M85-100 NSN 3510-01-291-8169, and M85-200, NSN 3510-01-365-5687 (Refer to Figure 1).

Purpose of Equipment: The M85 Series Trailer Mounted Laundry Units provide troop units and field hospitals with on-site laundry service for cotton, woolen, and durable press items. Each laundry unit has a washing and drying capacity of 120 lbs (54kg) of laundry per hour.

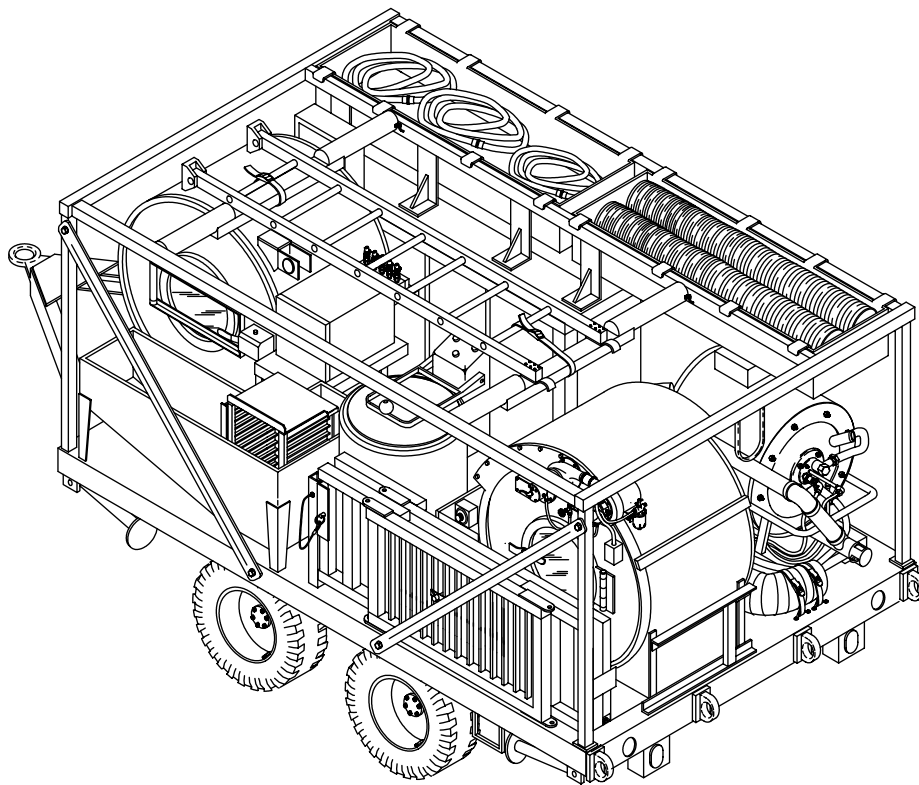


Figure 1. Laundry Unit, Trailer Mounted, Model M85-100 and M85-200

MAINTENANCE FORMS AND PROCEDURES.

Department of the Army forms and procedures for equipment maintenance will be those prescribed by DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS) (Maintenance Management Update).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your M85 Series Laundry 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. Put it on an SF368 (Product Quality Deficiency Report). Mail it to the address specified in DA PAM 738-750, or as specified by the contracting activity. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC).

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any problems with this item be reported so the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with the rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, (Product Quality Deficiency Report). Check the box to indicate that the problem may be corrosion-related. Using key words such as "rust", "deterioration" "pitting", or "cracking" or even including color photos of the corroded area will aid problem diagnosis and solution.

Submit completed SF 368 specifying a corrosion problem to the address specified in DA PAM 738-750.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Methods and procedures for destruction of Army materiel to prevent enemy use are covered in TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

PREPARATION FOR STORAGE OR MOVEMENT.

See Shutdown and Preparation for Movement (WP 0008) for procedures that insure safe storage or shipment of the heater.

WARRANTY

The laundry unit components are warranted by the manufacturer for a period of 12 months. The warranty starts on the date found in block 23 of DA Form 2408-9, in the logbook. Report defects in material or workmanship to your supervisor, who will take appropriate action through organizational maintenance.

NOMENCLATURE CROSS-REFERENCE LIST.

Common Name	Official Nomenclature
Air Compressor	Compressor Assembly, Air
Controller (Panel)	Control, Programmer (Washer)
Dryer	Dryer Assembly, Tumbler
Dryer Bin	Bin Assembly, Dryer
Extractor	Extractor Assembly
Generator	Generator Set, Diesel Engine Driven, Tactical Skid Mounted, 10 Kw, 3 Phase, 120/208 Volts (60 Hz)
Platform	Platform Assembly, Work
Trailer	Trailer, Flat-bed, Gen. Purpose 5 Ton, 4 Wheel, XM1061E1
Washer	Washing Machine, Laundry, Open-End Type Model 360 EW/ACJ, 3626 OEW/NAT, or 36260EW/EASIW2
Washer Formula Card	Uniform Nurse Timer Card
Water Pump	Water Pump and Motor Assembly
Water Heater	Heater, Water, Liquid Fuel: M-85
Wet Wash Bin	Bin Assembly Pre-extract
Water Tank	Tank, Fabric, Self-Supporting, 3000 Gallon

LIST OF ABBREVIATIONS/ACRONYMS.

AAL	Additional Authorization List	in	Inches
AC	Alternating Current	Kg	Kilogram
AR	As Required	kPa	Kilopascal(s)
BDU	Battle Dress Uniform	Lbs	Pounds
BII	Basic Issue Item	lt	Liter
COEI	Component of end item	m	Meter
CAGE	Commercial And Government Entity	MSDS	Material Safety Data Sheet
CPC	Corrosion Prevention Control	MTOE	Modified Table of Org and Equipment
CW	Clockwise	N/A	Not Applicable
CCW	Counterclockwise	NBC	Nuclear, Biological, Chemical
		NIIN	National Item Identification Number
CSSL	Containerized Self-service Laundry	POL	Petroleum, Oil and Lubricant
cm	Centimeter	QD	Quick Disconnect
°C	Degrees Celsius (Centigrade)	qt	Quart
°F	Degrees Fahrenheit	rpm	Revolutions per Minute
dia	Diameter	RPSTL	Repair Parts and Special Tools List
ea	Each	TMDE	Test, Measurement, and Diagnostic Equipment
EIR	Equipment Improvement Recommendation	TOE	Table of Organization and Equipment
ft	Foot	U/M	Unit of Measure
GFCI	Ground Fault Circuit Interrupt	UOC	Usable On Code
GPM	Gallons per Minute	UV	Ultra Violet
hr	Hour	VAC	Volt Alternating Current
Hz	Hertz	W	Watt(s)
IAW	In Accordance With	WP	Work Package
hp	Horsepower	wt	Weight

SAFETY, CARE AND HANDLING, WARNINGS, CAUTIONS AND NOTES.

Always pay attention to Warnings, Cautions and Notes appearing throughout the manual. They will appear prior to applicable procedures. Ensure you read and understand their content to prevent serious injury to yourself and others, or damage to equipment. A summary of Warnings appears at the front of this manual.

CHAPTER 1

**DESCRIPTION
AND
THEORY OF OPERATION
LAUNDRY UNIT, TRAILER MOUNTED**

LAUNDRY UNIT, TRAILER MOUNTED, MODEL M85-100, M85-200
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

CHARACTERISTICS	CAPABILITIES AND FEATURES
• Self-contained laundry center. • Can be operated with municipal water, or any approved natural source. • Suitable for unprotected operation in temperatures above 32⁰ F. • Requires protection for operation in sustained temperatures below 32⁰ F. • Trailer mounted, off-road mobility. • Requires JP-8 (diesel) fuel for operation. • Generator powered.	• Capable of washing and drying 120 pounds (54 kg) of cotton, woolen, and durable press items in one hour, with two operators. • Capable of variable temperature hot and cold water washing. • Can be used for the decontamination of clothing from chemical and bacteriological warfare agents and radioactive materials.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

1. **Washer.** The washer (1) on all models is an open-end loader, reversible cylinder type. It can be operated manually or automatically. The washer on the M85 model has an interlock switch mounted on the door hinge (2). On the M85-100 and -200 models, this switch is mounted to the front of the washer (3) to engage the door handle that is mounted to a bar frame (4).
2. **Washer Control Panel.** The M85-100 and -200 Washer control panel (5) controls the automatic operation of these washers, using washer formula cards. On the M 85-200 the cards and punch are located in the box on top of the control panel (5).
3. **Power Distribution Panel.** The power distribution panel (6) is located behind the control stand and contains one main and five subsystem circuit breakers.
4. **Dryer.** The dryer assembly (7) is an open-end loader, nonreversible cylinder type. The dryer dries the clothes after they are removed from the extractor.
5. **Tool Box.** The toolbox (8) is intended for storage of tools to be used on the laundry unit.
6. **Work Platform.** The work platform (9) supports personnel operating the washer, extractor, and dryer. It also provides access to other laundry unit components on the trailer bed.
7. **Dryer Bin.** The dryer bin (10) provides a holding place for the dry clothes after they are removed from the dryer. In the packed configuration the dryer bin is stored on the right-hand side of the trailer.
8. **Extractor.** The extractor (11) is a heavy-duty, top-loading, spinning cylinder that removes excess water from the clothes before they are placed in the dryer.
9. **Wet Wash Bin.** Wet clothes taken out of the washer are deposited in the wet wash bin (12) before they are placed in the extractor.
10. **Air Compressor.** The air compressor (13) provides air pressure for the operation of the water valves and washer air tank. It is mounted to the bottom of the controller stand.
11. **Washer Control Stand.** The washer control stand (14) houses the washer controller and supports the air compressor.
12. **Hose Basket.** The hose basket (15) provides storage for hoses, heater ducts, and other equipment.
13. **Fire Extinguisher.** The portable fire extinguisher (16) is provided for emergency use in case of fire.
14. **Water Pump.** The water pump (17) provides fresh water from the source to the laundry unit at the rate of 18-20 GPM (65.82 –73.14 liters). It requires priming when first used.
15. **Ladder.** The Ladder (18) provides personnel access to the hose baskets located atop the support frame.
16. **Sound Mitigation Panels.** The sound mitigation panels (19) are installed behind the generator and shield the operator from the noise produced by the generator motor.
17. **Generator.** The 10kw skid-mounted generator (20) provides electrical power to major components of the laundry unit.
18. **Water Heater.** The water heater (21) heats incoming water to the temperature required by the washer.

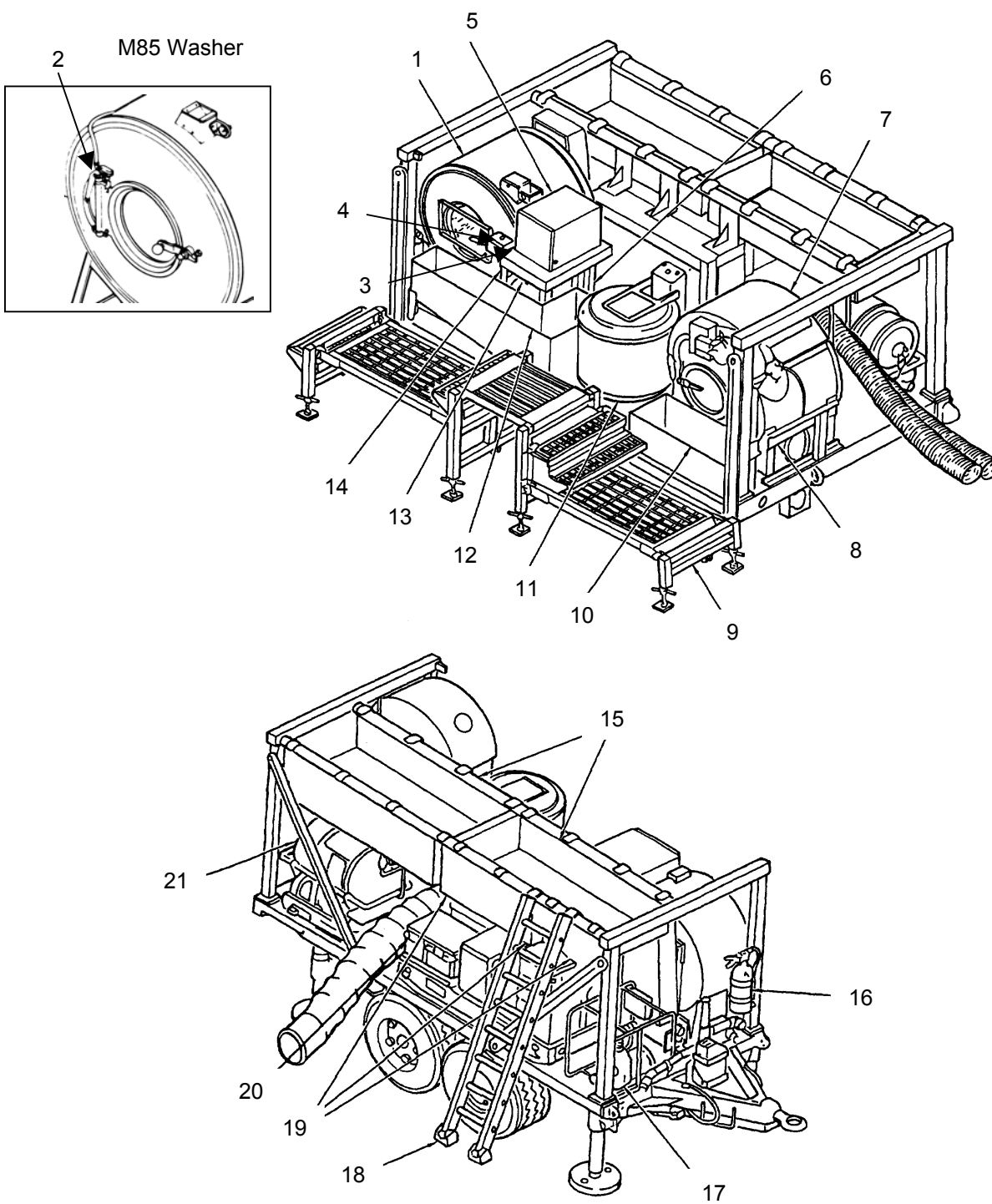


Figure 1. Location of Major Components

REFERENCES.

The following list contains publications necessary, or helpful, to support the M85 Series Laundry Units operation.

Item/Function	Technical Manual Title	TM Number
Heater, Water, Liquid Fuel: M-85	Operator's, Unit and Direct Support Maintenance Manual including RPSTL for Heater, Water, Liquid Fuel: M-80/M85	TM 10-4520-259-13&P
Generator Set, Diesel Engine Driven, Tactical Skid Mounted, 10 Kw, 3 Phase, 120/208 Volts (60 Hz)	Operator and Organizational Maintenance Manual for Generator Set, Diesel (60 Hz), Engine Driven, Tactical Skid MTD, 10Kw, 3 Phases, 120/208 Volts (60 Hz)	TM 5-6115-585-12
Trailer, Flat-bed, Gen. Purpose 5 Ton, 4 Wheel, XM1061E1	Operator, Unit, Intermediate, Direct Support and General Maintenance (including Repair Parts and Special Tools List), Trailer, Flatbed, 5-Ton, 4-Wheel, XMIO61E1	TM 9-2330-376-14&P
Water Tank, 3000 Gallon (Optional)	Operator's and Unit Maintenance Manual (Including RPSTL) Tank, Fabric, Self Supporting, 3000 Gallon Water	TM 5-5430-213-13&P
100 AMP, 50ft Power Supply Cable	Operator's, Unit and Direct Support Maintenance Manual for Distribution Illumination Systems, Electrical (DISE), and Power Distribution Illumination Systems, Electrical (PDISE) consisting of Electrical Feeder System M200, M200 A/P, M100, M100 A/P, M40, M40 A/P, M60, M60 A/P and Electrical Utility Assembly M46.	TM 9-6150-226-13

LAUNDRY UNIT, TRAILER MOUNTED, MODEL M85-100, M85-200
THEORY OF OPERATION

THEORY OF OPERATION

General. The M85 Series Field Laundries were designed for support of field hospital and reconstitutive operations. The design provides for the assembly of all necessary components needed for a batch laundry operation on an open 5-ton trailer that affords rough terrain transportability. The system operates on 208VAC, 3 Phase, 60 Hz power which is provided by an onboard 10kw generator. Hot water is provided by an M-85 Water Heater that is interconnected with the external water supply. The laundry operation includes a wash, extraction, and drying phase.

Washer. The front-loading washer is powered by an externally mounted motor and drive train. The washer can be controlled either automatically or manually and has a 60-pound (27 kg) capacity. In manual operation the wash time is variable up to 60 minutes. In the automatic mode two loads can be washed per hour. Automatic operation is accomplished by use of the washer control console that regulates all functions of the laundry cycle. The functions being controlled are the number of washes and rinses, water level, and the water temperature. Washer Formula Cards, used to operate the controller, are pre-punched with standard wash cycles. Blank Washer Formula Cards and a cardpunch provided can be used to program different washing cycles, as desired.

Extractor. The extractor uses centrifugal force to extract water from the wash load prior to the drying process. Its perforated drum spins at 1700 rpm and is powered by a 3-hp motor. The extractor control has a 10-minute variable timer and has a load capacity of 30 pounds (14 kg) dry weight.

Dryer. The front-loading dryer is powered by an externally mounted motor and drive train. The dryer has a capacity of 30 pounds (14 kg) per load. Operating controls provide for an adjustable running time of 15 minutes for each drying cycle. It can process approximately four loads per hour. The dryer uses a fuel fired air heater mounted onto the dryer to provide hot air for the drying operation. During operation, a flexible exhaust hose is attached to the dryer to channel away the hot air from the operators.

Water Heater. The M-85 Water Heater operation is explained in TM 10-4520-259-13&P. The washer can be operated using hot water provided by the water heater, or cold water, bypassing the water heater.

Water Pump. The portable, centrifugal-type water pump is mounted in a carrying frame. During use, it is placed near the water source and connected to M-85 Water Heater with a water hose and power cable. After the initial prime, the pump will deliver 18-20 gallons (63.82-73.14 liters) of water per minute at a 25-foot head loss. In the M85 transport configuration the pump is stored on the right front side of the trailer.

Air Compressor. The air compressor provides air pressure for the operation of the valves that control washer water intake, washer drain valves, and the water heater hot water supply. The adjustable range of compressed air is 20 to 100 psi (138 to 690 kPa).

Generator. The Laundry Unit operates on 60-Hertz, 3-phase, 208VAC power. This is supplied by a 10kw generator, mounted on the right-hand side of the trailer. The power supply is connected to a power distribution panel that distributes power to the components of the laundry unit. The panel includes the necessary circuit breakers for the safe operation of each major component of the laundry. Refer to TM 5-6115-585-12 for a general description and operating procedures for the generator.

Trailer. The trailer on which the M85 series laundries are mounted is a 5-ton, 4-wheel (tandem axle), flatbed type. Leveling jacks are on the four corners of the trailer to provide stability and level during operation of the Laundry Unit. Refer to TM 9-2330-376-14&P for general description and operating procedures.