

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

**ROUGH TERRAIN CONTAINER HANDLER (RTCH):
RT 240; 53,000 LB CAPACITY; 4 X 4
(NSN 3930-01-473-3998)**



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HEADQUARTERS, DEPARTMENT OF THE ARMY

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TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

FOR

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RT 240; 53,000 LB CAPACITY; 4 X 4
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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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HOW TO USE THIS MANUAL

INTRODUCTION

1. This manual is designed to help you perform Direct Support and General Support Maintenance on the RT 240 Rough Terrain Container Handler (RTCH).
2. The *Repair Parts and Special Tools List (RPSTL)*, TM 10-3930-675-24P, is to be used in conjunction with this manual, to locate and obtain the repair parts and special tools needed to maintain this equipment.
3. This manual is written in Work Package format:
 - a. Chapters divide the manual into major categories of information (e.g., *Introductory Information with Theory of Operation, Troubleshooting Procedures, Direct Support Maintenance Instructions, General Support Maintenance Instructions, and Supporting Information*).
 - b. Each Chapter is divided into Work Packages, which are identified by a 6-digit number (e.g. 0001 00, 0002 00, etc.) located on the upper right-hand corner of each page. The Work Package page number (e.g. 0001 00-1, 0001 00-2, etc.) is located centered at the bottom of each page.
 - c. If a Change Package is issued to this manual, added Work Packages use the 5th and 6th digits of their number to indicate new material. For instance, Work Packages inserted between WP 0001 00 and WP 0002 00 are numbered WP 0001 01, WP 0001 02, etc.
4. Scan thru this manual to become familiar with its organization and contents before attempting to maintain the equipment.

CONTENTS OF THIS MANUAL

1. A *Warning Summary* is located at the beginning of this manual. Become familiar with these warnings before operating or performing troubleshooting or maintenance on the vehicle.
2. A *Table of Contents*, located in the front of the manual, lists all Chapters and Work Packages in the publication.
 - a. The Table of Contents also provides *Reporting Errors and Recommending Improvements* information and DA Form 2028 addresses, for the submittal of corrections to this manual.
 - b. If you cannot find what you are looking for in the Table of Contents, refer to the alphabetical *Index* at the back of the manual.
3. Chapter 1, *Introductory Information with Theory of Information*, provides general information on the manual and the equipment.
4. Chapter 2, *Troubleshooting Procedures*, contains all applicable troubleshooting.
5. Chapter 3 covers all *Direct Support Maintenance Instructions*. Work Packages are organized in the same Functional Group Code (FGC) sequence as the Maintenance Allocation Chart (MAC) found in TM 10-3930-675-20-2.
6. Chapter 4 deals with *General Support Maintenance Instructions*. Work Packages are organized in the same Functional Group Code (FGC) sequence as the Maintenance Allocation Chart (MAC) found in TM 10-3930-675-20-2.
7. Chapter 5 includes *Supporting Information: References, Expendable and Durable Items List*, and the *Tool Identification List*.

FEATURES OF THIS MANUAL

1. WARNINGS, CAUTIONS, NOTES, subject headings, and other important information are highlighted in **BOLD** print as a visual aid.

WARNING

A WARNING indicates a hazard which may result in death or serious injury.

CAUTION

A CAUTION is a reminder of safety practices or directs attention to usage practices that may result in damage to equipment.

NOTE

A NOTE is a statement containing information that will make the procedures easier to perform.

2. Statements and words of particular interest may be printed in CAPITAL LETTERS to create emphasis.
3. Within a procedural step, reference may be made to another Work Package in this manual or to another manual. These references indicate where you should look for more complete information.
 - a. If you are told: "Install vibration damper (WP 0011 00)", go to the first page of Work Package 0011 00 in this manual for instructions on installing the vibration damper. Be sure to read the "Initial Setup" on page 1 of the Work Package, to determine contents of Work Package as well as information regarding tools and equipment, spare parts, and personnel required, etc.
 - b. If you are told: "Install engine cover (TM 10-3930-675-20)", go to TM 10-3930-675-20 for complete instructions on installing the engine cover. Use the *Table of Contents* or alphabetical *Index* in TM 10-3930-675-20 to find the engine cover replacement procedure.
4. Illustrations are placed after, and as close to, the procedural steps to which they apply. Callouts placed on the art may be text or numbers, or both; whichever method is easier for the soldier.
5. Numbers located at lower right corner of art (e.g. 350-001; 350-002, etc.) are art control numbers and are used for tracking purposes. Disregard these numbers.
6. Dashed leader lines used in illustrations indicate that called out items are not visible in the view depicted (i.e. they are located within or behind the structure).
7. Technical instructions include metric units as well as standard units. For your reference, a *Metric Conversion Chart* is located on the inside back cover of the manual.

NOTE

If at any time you are unsure how to use this manual or you cannot locate the information you need, notify your supervisor.

CHAPTER 1
INTRODUCTORY INFORMATION WITH
THEORY OF OPERATION

GENERAL INFORMATION

0001 00**SCOPE**

1. **Type of Manual.** This manual is for use in performing Direct Support and General Support Maintenance on the Rough Terrain Container Handler (RTCH), RT 240.
2. **Equipment Name and Model Number.** Rough Terrain Container Handler (RTCH): RT 240, 53,000 lb capacity, 4 X 4.
3. **Purpose of Equipment.** The RTCH-RT 240 is designed to lift and stack 20 and 40 ft International Standard Organization (ISO) containers, loaded to a gross weight of 53,000 lb (24,062 kg).

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for the equipment will be those prescribed by DA Pam 738-750, *Functional User's Manual for the Army Maintenance Management System (TAMMS)*, as contained in the Maintenance Management Update.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS)

If your truck 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 SF Form 368 (*Product Quality Deficiency Report*). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, Illinois 61299-7630. We'll send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

1. Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.
2. While corrosion is typically associated with 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 Form 368 (*Product Quality Deficiency Report*). Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA Pam 738-750.

OZONE DEPLETING SUBSTANCES

Listing to be provided by requiring activity.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

For destruction of Army materiel to prevent enemy use, refer to TM 750-244-6.

PREPARATION FOR STORAGE OR SHIPMENT

For preparation for storage or shipment procedures, refer to TM 10-3930-675-20.

WARRANTY INFORMATION

The vehicles are warranted by Kalmar RT in accordance with TB 10-3930-675-14. Warranty starts on the date found in block 23, DA Form 2408-9 in the logbook. Report all defects in material or workmanship to your supervisor, who will take appropriate action through your Organizational Maintenance shop.

GENERAL INFORMATION - CONTINUED

0001 00

LIST OF ABBREVIATIONS/ACRONYMS**NOTE**

Refer to ASME Y14.38-1999 for standard abbreviations.

ABBREVIATION/ACRONYMS**DEFINITION**

AOAP	Army Oil Analysis Program
C	Centigrade or Celsius
CAN-BUS	Controller Area Network-BUS
CID	Cubic Inch Displacement
cm	Centimeter
ECM	Electronic Control Module
ECS	Electronic Control System
F	Fahrenheit
GCWR	Gross Combination Weight Rating
GVWR	Gross Vehicle Weight Rating
IETM	Interactive Electronic Technical Manual
ISO	International Organization for Standardization
kg	Kilogram
km	Kilometer
kPa	Kilopascal
kph	Kilometers per Hour
kW	Kilowatt
l	Liter
lb-ft	Pound Foot
lph	Liters per Hour
mm	Millimeter
Nm	Newton Meter
OEM	Original Equipment Manufacturer
PMCS	Preventive Maintenance Checks and Services
PTO	Power Take-off
RTCH	Rough Terrain Container Handler
SPORT	Soldier's Portable On-System Repair Tool

EQUIPMENT DESCRIPTION AND DATA**0002 00*****EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES*****1. Characteristics.**

- a. The Rough Terrain Container Handler (RTCH)-RT 240 is designed to lift, move, stack or unstack 20 and 40 ft by 8 ft wide ISO containers.
- b. The RTCH-RT 240 has a lift capacity of 53,000 lb (24,062 kg) and operates on hard and/or unimproved surfaces, to include beach operations.
- c. The RTCH-RT 240 can be utilized as a forklift with an operator-installed forklift kit.

2. Capabilities and Features.**a. Capabilities.**

- (1) Container handling capabilities:
 - Stack or unstack 8 ft high ISO containers stacked three (3) high with a gross weight of 53,000 lb (24,062 kg) in the first row.
 - Stack or unstack 8 ft high ISO containers stacked three (3) high with a gross weight of 27,500 lb (12,485 kg) in the second row.
 - Stack or unstack 4.3 ft high ISO containers stacked seven (7) high.
 - Container tophandler adjusts to 20 ft or 40 ft ISO container lengths.
 - Container tophandler oscillates 7° left and right.
 - Container tophandler rotates 195° clockwise and 105° counterclockwise.
 - Container tophandler tilts 8° forward and 12° to the rear.
 - Container tophandler side shifts ± 15 in (± 400 mm) from the center.
- (2) Forklift kit is operator-installed and attaches to the tophandler. The fork tines are adjustable from 24 in (61 cm) center-to-center to 81.5 in (207 cm) center-to-center. Lift capacity is 44,000 lb (19,976 kg).
- (3) Maximum speed of RTCH is 23 mph (37 kph) on level ground with NO LOAD; maximum speed on level ground LOADED is 15 mph (24 kph).
- (4) Maximum fording depth is 60 in (1.52 m).
- (5) Operation in temperatures from -25°F (-32°C) to +125°F (+52°C), and to -40°F (-40°C) with arctic kit installed.

b. Features.

- (1) Electronically-controlled 400 hp, six-cylinder turbocharged engine.
- (2) Electronic semi-automatic shift controlled transmission with 4 ranges forward and 3 reverse. Operator selects range and ECM controls shift points.
- (3) The drive axles provide traction for two- or four-wheel drive.
- (4) Limited slip differentials and multi-disc-wet brakes are an integral part of the axle assemblies. Multi-disc-wet brakes are hydraulically cooled to prevent overheating. Accumulators store energy for the emergency braking system.
- (5) The steering system is capable of two-wheel, four-wheel, crab, and emergency modes of operation.
- (6) The parking brake is hydraulically released and spring-applied by disc brake assemblies mounted on the front and rear differentials.
- (7) The operator's cab has a fully adjustable operator's seat, fresh air (filtered) ventilation system, and heater/defroster/air conditioning systems.

EQUIPMENT DESCRIPTION AND DATA - CONTINUED

0002 00***EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES - CONTINUED***

- (8) Operator's controls include: adjustable steering wheel; accelerator and brake pedals; transmission range selector; steering mode selection rocker switches; and a single joystick control for all boom, tophandler, and forklift operations.
- c. **Transport Modes.**

NOTE

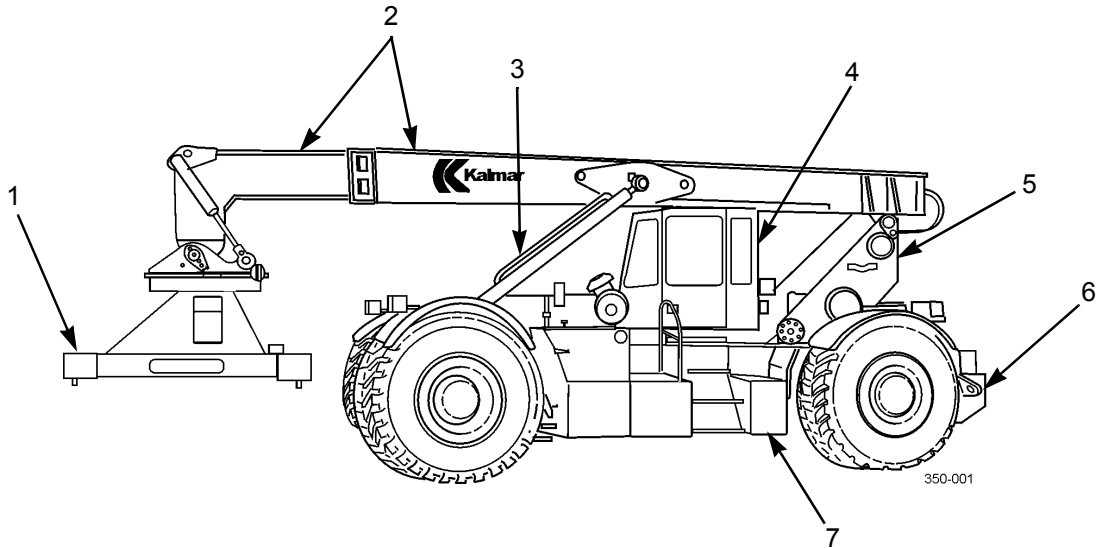
Refer to TM 10-3930-675-10 for detailed instructions to prepare the RTCH for transport.

- Self Deployment
- Highway Transport
- Rail Transport
- Marine Transport
- Air Transport

EQUIPMENT DESCRIPTION AND DATA - CONTINUED

0002 00

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



KEY	COMPONENT	DESCRIPTION
1	Tophandler	Electro-hydraulically operated 20-40 ft tophandler. Capable of sideshifting, rotation, forward/rear tilting, left/right tilting, and load position leveling and locking. Also interfaces with forklift attachment.
2	Boom Assembly	Electro-hydraulically operated heavy duty steel boom designed for moving, lifting, and stacking 20-40 ft ISO containers.
3	Boom Lift Cylinders	Electro-hydraulically operated cylinders raise, lower, and support the boom assembly.
4	Operator's Cab	Contains all driving and container handling controls as well as heating, air conditioning, and filtered ventilation system controls. During air transport operations the cab is moved to the left side of the chassis, then lowered and secured in place.
5	Boom Support	Rear support and pivot point for the boom to include an unlocking device that allows the boom assembly to be lowered into the transport position.
6	Frame	A heavy-duty steel construction with tie-downs, towing lugs, and pintle hook.
7	Remote Hydraulic Control Compartment	Location of selected hydraulic remote controls. Also access to hydraulic system test and AOAP sampling ports.