TM 10-3930-675-10

TECHNICAL MANUAL

OPERATOR'S MANUAL

FOR

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

Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 2001

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Washington, D.C., 1 July 2001

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (*Recommended Changes to Equipment Technical Publications*), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or e-mail your letter, DA Form 2028 direct to: AMSTA-LC-CI/TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is: TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

Table of Contents

Table of Contents - Continued

HOW TO USE THIS MANUAL

INTRODUCTION

1. This manual is designed to help you operate the RT 240 Rough Terrain Container Handler (RTCH) and perform operator troubleshooting and maintenance on the equipment.

2. 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, Operating Instructions, Operator Troubleshooting, Operator 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 5^{th} and 6^{th} 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.

3. Scan thru this manual to become familiar with its organization and contents before attempting to operate or 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 operator 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, *Operating Instructions*, explains and illustrates all operator controls and indicators, and describes how to perform all operating procedures for the RTCH: *Operation Under Usual Conditions, Operation Under Unusual Conditions*, as well as *Preparation of Transport*.

5. Chapter 3 covers all *Operator Troubleshooting*. WP 0010 00 contains a *Troubleshooting Symptom Index*. If the RTCH malfunctions, this index should always be consulted to locate the appropriate troubleshooting procedure.

6. Chapter 4 deals with *Operator Maintenance*: Major areas covered are *Preventive Maintenance Checks and Services (PMCS)* and operator level maintenance tasks.

7. Chapter 5 includes *Supporting Information: References, Components of End Item (COEI) and Basic Issue Items (BII) Lists*; and *Expendable and Durable Items List*. Of particular interest is WP 0020 00, *Error Codes*. This contains an explanation of the error code display that is shown when the RTCH experiences a mechanical malfunction and provides a complete list and explanation of all error codes resident on the vehicle.

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: "If red band is showing, service air cleaner as soon as possible (WP 0014 00)", go to Work Package 0014 00 in this manual for instructions on servicing the air cleaner.
   b. If you are told: "Stow M1000 trailer loading ramps (TM 9-2330-381-14)", go to TM 9-2330-381-14, which is listed in the *References* Work Package, for complete information on stowing the M1000 loading ramps. Use the *Table of Contents* or alphabetical *Index* in TM 9-2330-381-14 to find procedures to use the M1000 loading ramps.
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 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 operating and performing operator 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.

LIST OF ABBREVIATIONS/ACRONYMS

NOTE

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

ABBREVIATION/ACRONYMS	DEFINITION
AAL	Additional Authorization List
BII	Basic Issue Items
C	Centigrade or Celsius
CAN-BUS	Controller Area Network-BUS
CID	Cubic Inch Displacement
cm	Centimeter
COEI	Components of End Item
ECM	Electronic Control Module
ECS	Electronic Control System
GCWR	Gross Combination Weight Rating
GVWR	Gross Vehicle Weight Rating
IAW	In Accordance With
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
LC	Load Center
lph	Liters per Hour
mm	Millimeter
NATO	North Atlantic Treaty Organization
Nm	Newton Meter
OALH	Overall Lowered Height
OEM	Original Equipment Manufacturer
PMCS	Preventive Maintenance Checks and Services
RTCH	Rough Terrain Container Handler
SPORT	Soldiers' 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 on each side.

      (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 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.

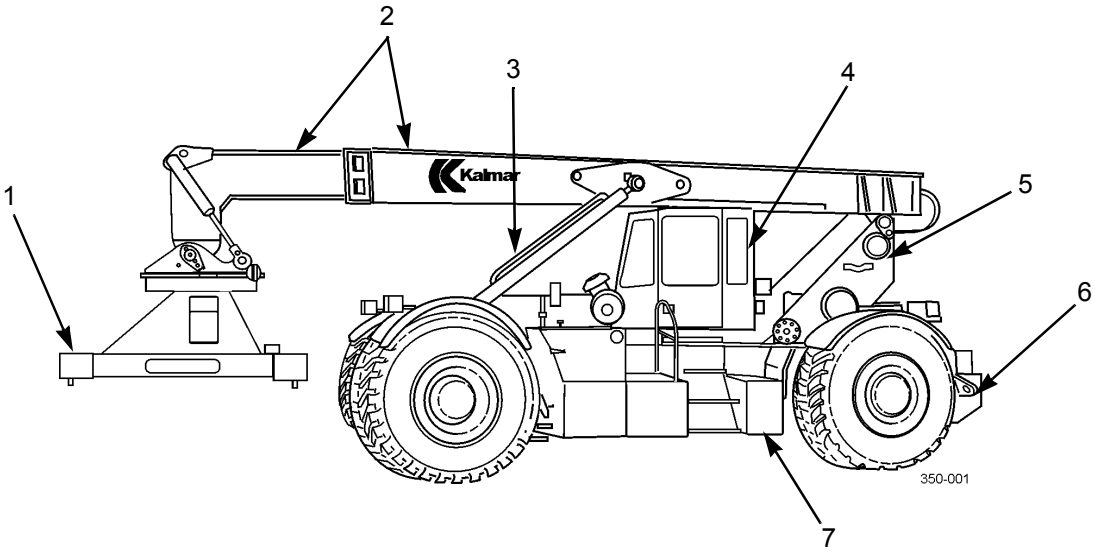
c. **Transport Modes.**

NOTE

Refer to WP 0007 00 for detailed instructions to prepare the RTCH for transport.

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

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.