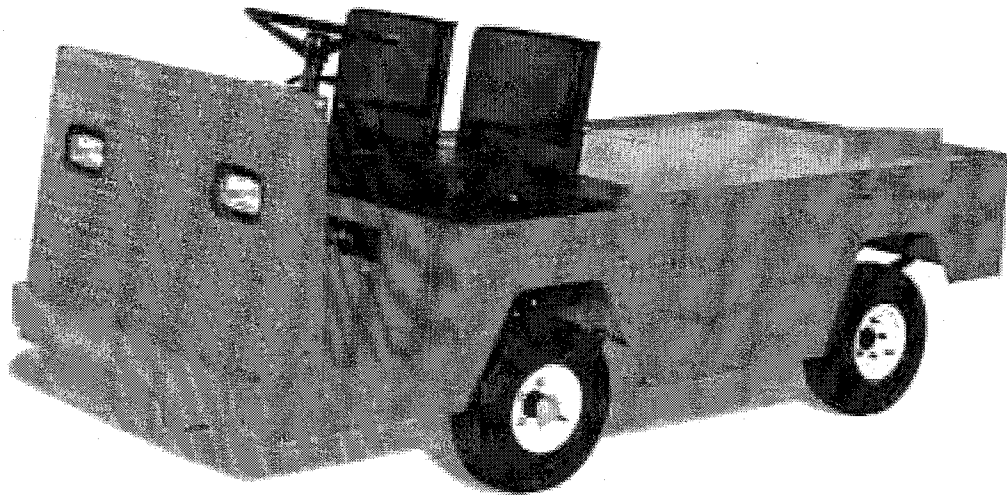


COLUMBIA

Industrial & Commercial Vehicles

Burden Carriers

BC3-21 to BC7-20XB



**Operation and Maintenance Manual
With Illustrated Parts List**

Issued: January 2001

Part No. 99486-00

FOREWORD

This service manual has been prepared with two purposes in mind. First, it will introduce the trained maintenance professional to the latest field-tested and factory-approved major repair methods. Secondly, it will acquaint the reader with the construction of Columbia Industrial & Commercial vehicles and assist him/her in performing basic maintenance and repair. We sincerely believe that this manual will make your association with Columbia Industrial & Commercial Vehicles more pleasant and profitable.

In addition to the information given in this Operation, Maintenance, Service and Parts Manual, Service Bulletins are issued to Columbia Industrial & Commercial Vehicle Dealers from time to time, which cover interim engineering changes and supplementary information. Service Bulletins should be consulted for complete information on the models covered by this manual.

To insure the safety of those servicing Columbia Industrial & Commercial Vehicles, and to protect the vehicles from possible damage resulting from improper service or maintenance, the procedures followed in this manual should always be followed exactly as outlined. Execution of the procedures and troubleshooting tips as outlined will ensure the best possible service from the vehicle(s). To reduce the chance of personal injury and/or property damage, carefully observe **NOTES, CAUTIONS, WARNINGS** and **DANGER** recommendations through out this manual. See chapter 1 for additional detail.

PREPARATION FOR SERVICE

Proper preparation is very important for efficient service work. A clean work area at the start of each job will allow you to perform the repair as easily and quickly as possible, and reduce the incidence of misplaced tools and parts. Columbia Industrial & Commercial Vehicles that are excessively dirty should be cleaned before work begins. Cleaning will occasionally uncover trouble sources. Tools, instruments and parts needed for the job should be gathered before work is started. Interrupting a job to locate tools or parts is a needless delay. Special tools required for a job are listed at the front of each section.

MODEL IDENTIFICATION

Always give the full vehicle identification number when ordering parts or making inquiries about your Columbia Industrial & Commercial vehicle.

Use of the full and complete vehicle identification number (VIN) information will assure your dealer or service provider is supplying you with the correct parts for your vehicle. See chapter 1 for vehicle identification information.

USE GENUINE REPLACEMENT PARTS



WARNING: When replacement parts are required, use only genuine Columbia Industrial & Commercial Vehicle parts or parts with equivalent characteristics including type, strength and material. Failure to do so may result in product malfunction and possible injury to the operator and/or passenger.

To ensure a satisfactory and lasting repair job, follow the service manual instructions carefully and use only genuine Columbia Industrial & Commercial Vehicle replacement parts. This is your insurance that the parts you are using will fit right, operate properly and last longer. When you use genuine Columbia Industrial & Commercial Vehicle parts, you use the best.

PRODUCT REFERENCES

When reference is made in this manual to a specific brand name product, tool or instrument, an equivalent product, tool or instrument may be used in place of the one mentioned.

Dear Owner,

Congratulations on your purchase of Columbia Industrial & Commercial Vehicle Model Burden Carrier. At Columbia Industrial & Commercial Vehicle, we pride ourselves on manufacturing electric personnel and burden carriers that are second to none in terms of designs, quality of materials, and workmanship. While our vehicles are designed and built for maximum efficiency, durability, performance and safety, proper maintenance and operator knowledge will nevertheless play a vital role in your long-term product satisfaction.

Thus, the information in this manual should be closely read, studied, and understood prior to operating your vehicle. If you do not clearly understand any portion of this manual, see your authorized Columbia Industrial & Commercial Vehicle Dealer for clarification. The manual contains the most current information available at the time of publication. However, as our Research and Engineering Department continually work to improve our products. It is possible that models produced subsequent to the publication of the manual may include improvements that are not referenced in this manual. Our Dealers can advise you of any updating of our recommended service and maintenance procedures that may have transpired subsequent to your purchase.

Should you have questions or encounter problems which our Dealer is unable to answer or resolve, we encourage you to contact us at the address below:

Columbia ParCar Corp.
350 N. Dewey Avenue * P.O. Box 30
Reedsburg, WI 53959
Phone: (608) 524-8888 * Fax: (608) 524-8380
(800) 222-4653 * Web: www.parcars.com
E-Mail: info@parcars.com

Your decision to invest in a Columbia Industrial & Commercial Vehicle is very gratifying to us and we wish you many years of satisfaction

CHAPTER 1 – INTRODUCTION

- Warnings & Dangers
- Vehicle Description & Specifications
- Upon Delivery of Your Vehicle
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- Lifting Instructions

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- Advanced Motor (69401-00)
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- Brakes, Hydraulic System
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 - Electrical System 1992 and Newer
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 - Battery Charger
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 - Cab Items

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- Battery Push-Pull Kit

CHAPTER 5 – APPENDICES

- Appendix E Troubleshooting Guide – 36 Volt Forward & Reverse Switch
- Appendix F Troubleshooting Guide PMC Solid State Speed Control

About this manual

This manual contains information to safely operate and maintain the Burden Carrier manufactured by Columbia Industrial & Commercial Vehicles. Only trained maintenance professionals should repair or service this vehicle. Persons doing even simple repairs or service should have working knowledge and experience in general electrical and mechanical repair. Follow all procedures exactly and observe all warnings and cautions stated in this manual. Use caution and common sense.

It is also necessary that every individual who will operate this vehicle receive adequate training that assures the safe operation and use of this particular vehicle. This manual contains the following major chapters:

Chapter 1 INTRODUCTION

Contains Warnings, cautions, a description of the Burden Carrier, important information about taking delivery of the vehicle and lifting instructions.

Chapter 2 OPERATOR INFORMATION

Provides safety rules and guidelines, describes the driver training program, explains the operation of each control, operating instructions and storage of the Burden Carrier.

Chapter 3 MAINTENANCE / SERVICE

Shows a scheduled maintenance checklist, lubrication instructions, minor maintenance procedures.

Chapter 4 ILLUSTRATED PARTS LIST

Includes an exploded view illustration and detailed parts list for each assembly or component group that has replaceable parts for the Burden Carrier.

Chapter 5 APPENDICES

Includes any additional information that we may receive from our vendors on the components of the Burden Carrier and/or troubleshooting flowcharts.

CHAPTER 1

Introduction	Page #
Warnings & Dangers	2
Vehicle Description & Specifications	5
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DANGERS, WARNINGS, CAUTIONS AND NOTES

Statements in this manual preceded by the words DANGER, WARNING, CAUTION or NOTE and printed in bold face are very important. We recommend you take special notice of these items.

It is important to note that some warnings against the use of specific service methods, which could damage the vehicle or render it unsafe, are stated in this service manual. However, please remember that these warnings are not all inclusive. Since Columbia Industrial Vehicle could not possibly know, evaluate and advise servicing personnel of all possible ways in which service might be done or of the possible hazardous consequences of each way, we have not undertaken any such broad evaluation. Accordingly, anyone who uses a service procedure or tool which is not recommended by Columbia Industrial Vehicle must first thoroughly satisfy himself that neither his nor the operator's safety will be jeopardized by the service methods selected.

! **DANGER:** Danger indicates an immediate hazard that will result in severe personal injury or death.

! **WARNING:** Warnings will indicate an immediate hazard, which could result in severe personal injury.

! **CAUTION:** Cautions indicate hazards or unsafe practices, which could result in minor personal injury, damage to the vehicle or to other property.

NOTE: Notes will provide key information to assure procedures are more easily understood or implemented.

It is Columbia Industrial Vehicle's specific recommendation that the following warnings must be observed at all times. Not all are repeated throughout this manual, but the recommendations included must be observed whenever these subjects (indoor vehicle operation hazards, gasoline and fuel system hazards, battery hazards, etc.) are encountered.

Be a safe operator. Electric Industrial vehicles are only as safe as the person who is at the controls. If accidents are to be prevented, and they most certainly can be prevented, operators must accept their full measure of responsibility. While the designer, the manufacturer and the safety engineer can help minimize the possibility of an accident, their combined efforts can be erased by a single careless act.

It is said, "The best kind of safety device is a careful operator." We ask you to be that kind of person.

! **CAUTION:** To prevent possible injury, always disconnect batteries before working on the vehicle. Remove both the positive and the negative battery cables as shown in Fig. 1 & 2.

DISCONNECT METHODS:

Operational Installation: Standard

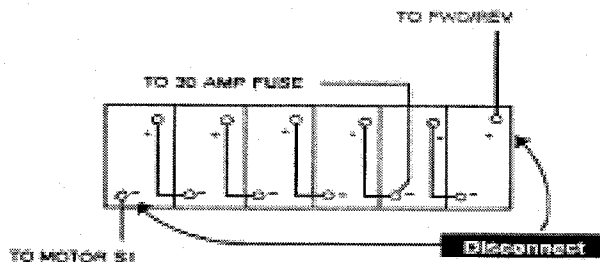


Figure 1 - Standard Installation

Optional Installation: Push Pull Battery Pack

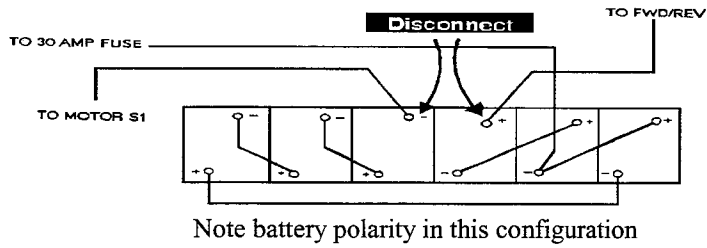


Figure 2a – Push-Pull Batteries

⚠ CAUTION: No modifications or additions, which affect the mechanical or electrical integrity and the safe operation of the unit, shall be made without the written approval of the manufacturer. If in doubt about any modification, contact your local Columbia Industrial & Commercial Dealer or Columbia ParCar Corp. Customer Service.

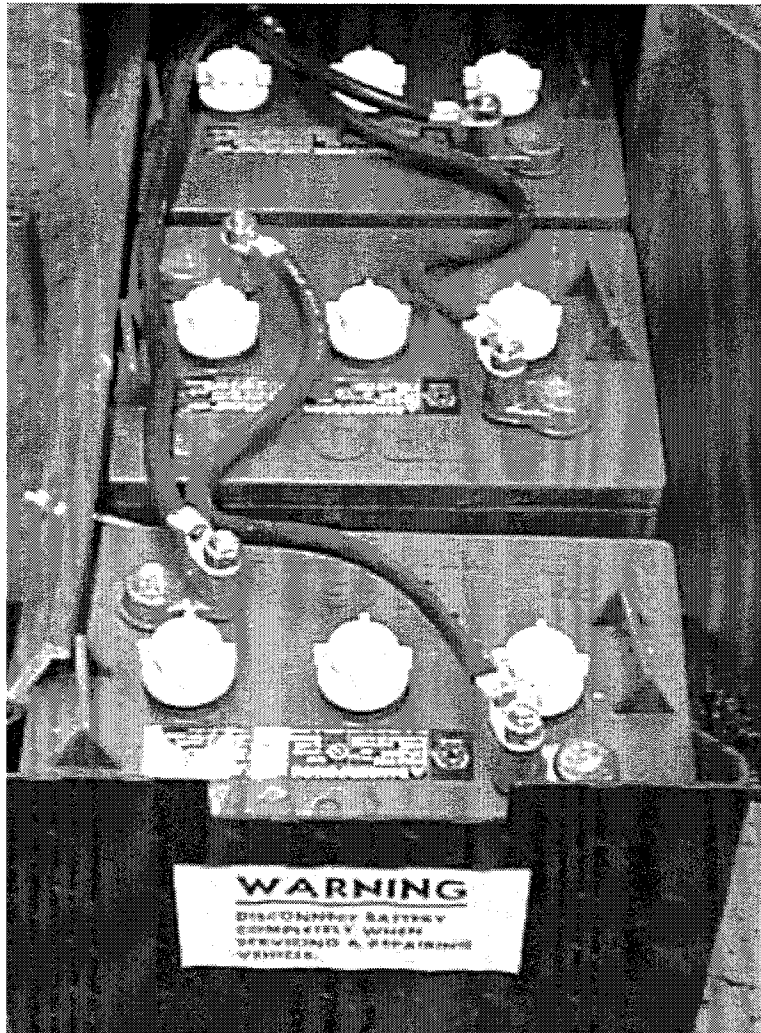




Figure 2b – Push-Pull Batteries Installed

ALL VEHICLES

 DANGER	<ul style="list-style-type: none"> ➤ Any modifications or changes to the vehicle that affect the stability or that results in increased speed beyond factory specifications could result in severe personal injury or death. ➤ Always remove key and disconnect the battery(s) before servicing or repairing your vehicle. See Batteries, chapter 3 for details ➤ All batteries used in gas or electric vehicles can explode! Always wear full-face shield when working on or near batteries. Hydrogen fumes are a natural byproduct of charging and discharging and are extremely explosive. Do not smoke. Keep sparks and flames away from batteries. Battery charging should only be done in a well-ventilated area. See Batteries, chapter 3 for details. ➤ When working around or servicing batteries use care to prevent an accidental arc which could cause an explosion. Use only approved insulated tools, remove jewelry such as rings, watches, chains etc. and place an insulating material (wood, plastic, rubber etc.) over all battery connections. ➤ BATTERY – Is poisonous! Contains acid! Causes severe burns. Avoid contact with skin, eyes, or clothing. <ul style="list-style-type: none"> ➤ Antidotes: ➤ EXTERNAL: Flush with water. Call a physician immediately. ➤ INTERNAL: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. call a physician immediately ➤ - EYES: Flush with water for fifteen minutes. call physician immediately ➤ If any problems are found during scheduled maintenance or inspections, DO NOT operate vehicle until repairs are made. Failure to make necessary repairs could result in fire, property damage, severe personal injury, or death.
 WARNING	<ul style="list-style-type: none"> ➤ Only trained maintenance professionals should repair or service this vehicle. Persons doing even simple repairs or service should have working knowledge and experience in general electrical and mechanical repair. Follow all procedures exactly and observe all warnings stated in this manual. Use caution and common sense ➤ Proper service and repair is important for the safe, reliable operation of all Columbia Industrial Vehicles. The service procedures recommended and described in this service manual are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose. These special tools should be used when and as recommended. ➤ Moving parts hazard! When operating any vehicle in a stationary position, avoid spinning clutches, belts and wheels which could snag clothing or cause sever injury to body parts. A running vehicle must be worked on with the greatest care. Use caution and common sense. ➤ Working on Columbia Industrial Vehicles without following proper procedures and using proper lifting equipment may result in vehicle damage or personal injury. See lifting instructions in chapter 1 for detailed instructions. ➤ Failure to maintain vehicle properly could result in decreased vehicle performance, reliability or causes severe personal injury.

