APTA STANDARDS PROGRAM

RECOMMENDED PRACTICE

APTA BTS-BC-RP-008-20, Rev. 1

First Published: February 4, 2020

First Revision: August 27, 2025, 2025

Bus Brake and Chassis System Working Group

Transit Bus Brake Valve Treadle Assembly Maintenance

Abstract: This recommended practice provides guidelines for maintaining, rebuilding and replacing transit bus brake valve treadle assemblies.

Keywords: barium lube, brake valve, pivot pin, roller, treadle, treadle plate

Summary: This document establishes a recommended practice for brake valve treadle maintenance and rebuild procedures. Individual operating agencies may modify these guidelines to accommodate their specific equipment and mode of operation. This recommended practice is to be used in conjunction with the original vehicle equipment manufacturer and brake valve manufacturer service manuals.

Foreword

The American Public Transportation Association is a standards development organization in North America. The process of developing standards is managed by the APTA Standards Program's Standards Development Oversight Council (SDOC). These activities are carried out through several standards policy and planning committees that have been established to address specific transportation modes, safety and security requirements, interoperability, and other topics.

APTA used a consensus-based process to develop this document and its continued maintenance, which is detailed in the manual for the APTA Standards Program. This document was drafted in accordance with the approval criteria and editorial policy as described. Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

This document was prepared by the Bus Brake and Chassis System Working Group as directed by the Bus Systems Standards Policy and Planning Committee.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any recommended practices or guidelines contained herein is voluntary. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit agency's operations. In cases where there is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal adviser to determine which document takes precedence.

This document supersedes APTA BTS-BC-RP-008-19, which has been revised. Below is a summary of changes from the previous document version:

- Document formatted to a new APTA standard style.
- Made minor changes to spelling, capitalization and grammar.
- Sections have been renumbered and moved.
- Foreword, including "Scope and purpose," added to document.
  Scope and purpose: Added the following language: "This recommended practice provides guidelines for transit brake valve treadle maintenance, rebuilding and replacement. This document addresses common transit bus brake valve treadle assemblies installed on many different manufacturers' transit vehicles. The tables and examples in this document are for commonly used transit applications. Not all transit bus brake valve treadle assemblies are included. The purpose of this recommended practice is to provide a uniform method for transit bus brake valve treadle maintenance. Proper transit bus brake valve treadle maintenance can help ensure a safe braking system and maximize brake friction material life"
- Section 4- Added additional language and photos added
- Section 5- Added additional language and photos added
- Section 6- Added additional language and photos added
- Section 7- Added additional language and photos added
- Section 8- language removed

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Introduction

This introduction is not part of APTA BTS-BC-RP-008-20, "Transit Bus Brake Valve Treadle Assembly Maintenance."

This recommended practice reflects the consensus of the APTA Bus Standards Program members on the items, methods and procedures that have provided the best practice based on the experiences of those present

and participating in meetings of the program task forces and working groups. Recommended practices are voluntary, industry-developed and consensus-based practices that assist equipment suppliers, vehicle and component manufacturers, and maintenance personnel in the construction, assembly, operation and maintenance of transit bus vehicles. Recommended practices may include test methodologies and informational documents. Recommended practices are non-exclusive and voluntary; they are intended to neither endorse nor discourage the use of any product or procedure. All areas and items included herein are subject to manufacturers' supplemental or superseding recommendations.

This recommended practice provides guidelines for transit bus brake valve treadle maintenance. APTA recommends the use of this document by:

- individuals or organizations that operate transit systems;
- individuals or organizations that contract with others for the operation of transit systems; and
- individuals or organizations that influence how transit systems are operated (including but not limited to consultants, designers and contractors).

Scope and purpose

This recommended practice provides guidelines for transit brake valve treadle maintenance, rebuilding and replacement. This document addresses common transit bus brake valve treadle assemblies installed on many different manufacturers' transit vehicles. The tables and examples in this document are for commonly used transit applications. Not all transit bus brake valve treadle assemblies are included. The purpose of this recommended practice is to provide a uniform method for transit bus brake valve treadle maintenance. Proper transit bus brake valve treadle maintenance can help ensure a safe braking system and maximize brake friction material life.

Transit Bus Brake Valve Treadle Assembly Maintenance

1. Safety provisions

> **WARNING:** Failure to comply with the safety provisions in this section can result in personal injury or death.

1.1 Personal protective equipment

Personal protective equipment should be worn at all times during the maintenance process as required by the operating agency.

1.2 Training

The operating agency and/or its maintenance contractors should develop and execute training programs that provide employees with the knowledge and skills necessary to perform the tasks outlined in this recommended practice safely and effectively.

1.3 Tools

The following tools are recommended for the procedures in this document:

- basic mechanics tools
- additional tools as recommended by the OEM or as used by the transit industry
- wheel chocks

2. Securing vehicle

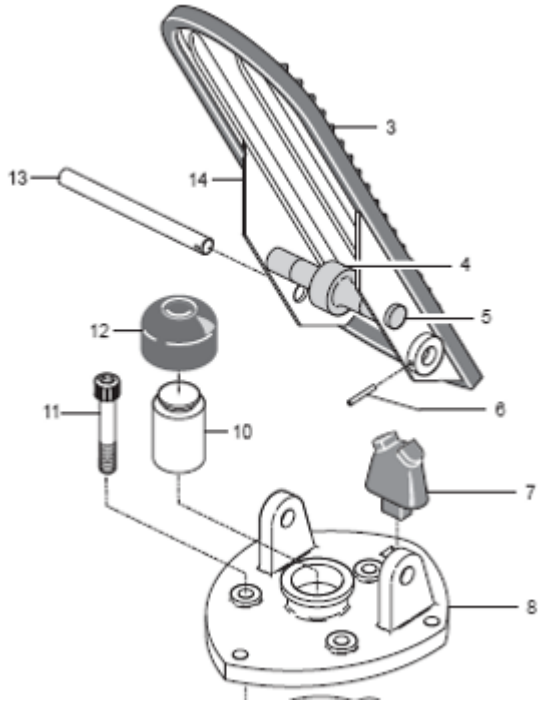
Follow the operating agency's recommendations or standard operating procedures for securing any vehicle for service operations.

3. Cleaning

Every three months, 25,000 miles or 900 operating hours:

- clean any accumulated dirt, gravel or foreign material away from the heel of the treadle, plunger boot and mounting plate; and
- if needed, use a shop vacuum to clean the area under and around the throttle and brake treadles.

FIGURE 1
Typical Brake Treadle



4. Inspection

1. Disassemble brake treadle and clean all metal parts.
    - Remove roll pin.
    - Remove pivot pin and inspect for evidence of damage and/or corrosion.

FIGURE 2
Pivot Pin Wear

2. Remove and inspect rubber boot for cracks, tears, holes, elongation and deterioration.

FIGURE 3
Rubber Boot Wear

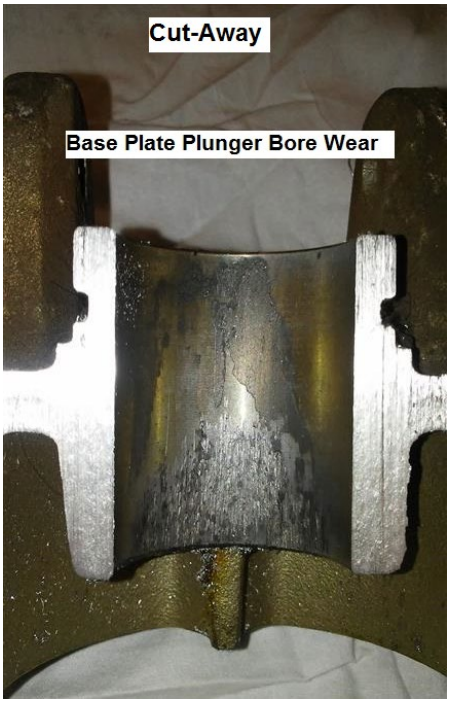
3. Inspect plunger for excessive wear corrosion and scoring.

FIGURE 4
Plunger Wear

4. Clean and inspect the treadle base:
   - Use compressed air to remove any loose debris from bore. Make sure to wear safety glasses while using compressed air.
   - Wipe the bore out using denatured alcohol and lint-free wipe.
   - Inspect plunger bore for pitting, scoring or excessive wear.

NOTE: Do not use wire wheel to clean surfaces, and avoid removing any plating from surfaces.

FIGURE 5
Base Plate Plunger Bore Wear



5. Check pivot pin bore holes for excessive wear.

FIGURE 6
Pivot Pin Bore Hole Wear

6. Check for excessive wear on pin bores on the pedal.

FIGURE 7
Pedal Pin Bore Wear

7. Check roller and pin for corrosion, wear and signs of the roller frozen to the pin.

FIGURE 8
Roller and Pin Wear

8. Check the rubber treadle cover for excessive wear. Make sure there are no flat spots or holes on the treadle cover. Replace as necessary.

FIGURE 9
Treadle Cover Wear

9. Inspect rubber pedal stop button for wear.

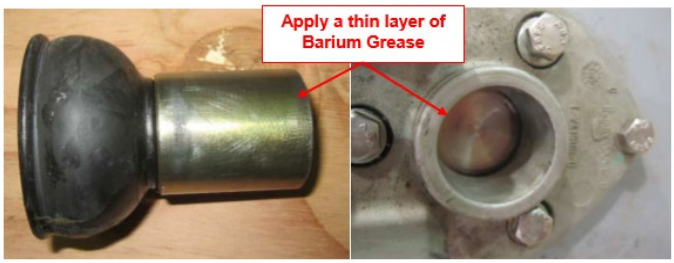
FIGURE 10
Pedal Stop Button Wear

5. Parts replacement as needed

- Brake treadle pedal
- Roller, pin and cotter pin
- Pivot pin and roll pin
- Plunger and boot
- Base plate

6. Lubrication

FIGURE 11
Lubrication

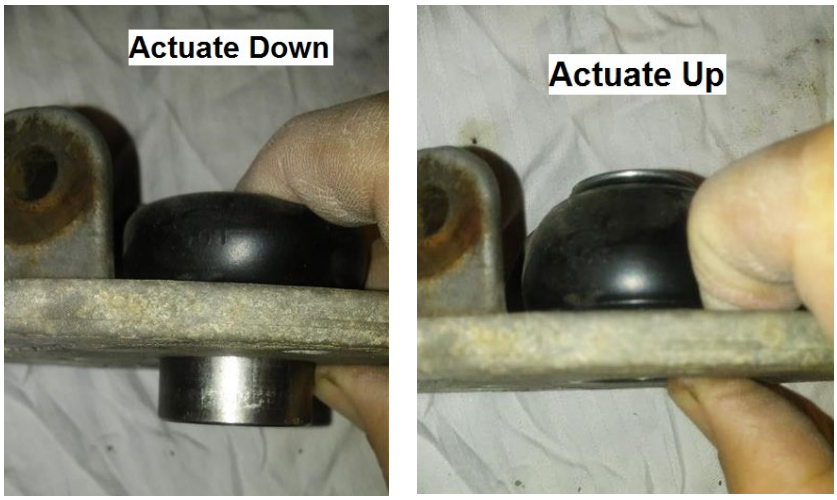


1. All the parts use barium lubricants as recommended by the manufacturer.
2. Apply a light film of lubricant to the pivot pin, roller pin, plunger and plunger bore.
    - Use nitrile gloves while handling the barium grease.
    - Apply a light film of lubricant on the parts. Make sure not to over-lubricate.

7. Final assembly

1. Put the boot on the plunger.
2. Insert the plunger into the bore hole on the base plate. Make sure the boot snaps onto the baseplate retaining ridge.
3. Manually actuate the plunger to ensure proper boot installation.

FIGURE 12
Actuating the Plunger



4. Insert stop button onto the base plate.
5. Assemble the pedal.
    - Insert lubricated roller pin and roller into the pedal.
    - Insert the cotter pin and bend the ends.

FIGURE 13
Cotter Pin Installation

6. Install pedal onto the base plate.
    - Insert lubricated pivot pin.
    - Insert roll pin.

FIGURE 14
Roll Pin Insertion

8. Final inspection

1. Build vehicle pressure to governor cutout.
2. Depress and hold the brake valve treadle.
    - Make sure there are no air leaks at the pedal.
3. Make sure the pedal moves freely.
4. Make sure the pedal returns to normal (released) position.

Definition

treadle: The brake pedal valve.

Abbreviations and acronyms

OEM original equipment manufacturer

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	CEO Approval	Policy & Planning Approval	Publish Date
First published	Feb. 14, 2019	June 30, 2019	October 18, 2019	January 31, 2020	February 4, 2020
First revision	June 24, 2025	July 31, 2025	August 25, 2025	August 27, 2025	August 27, 2025