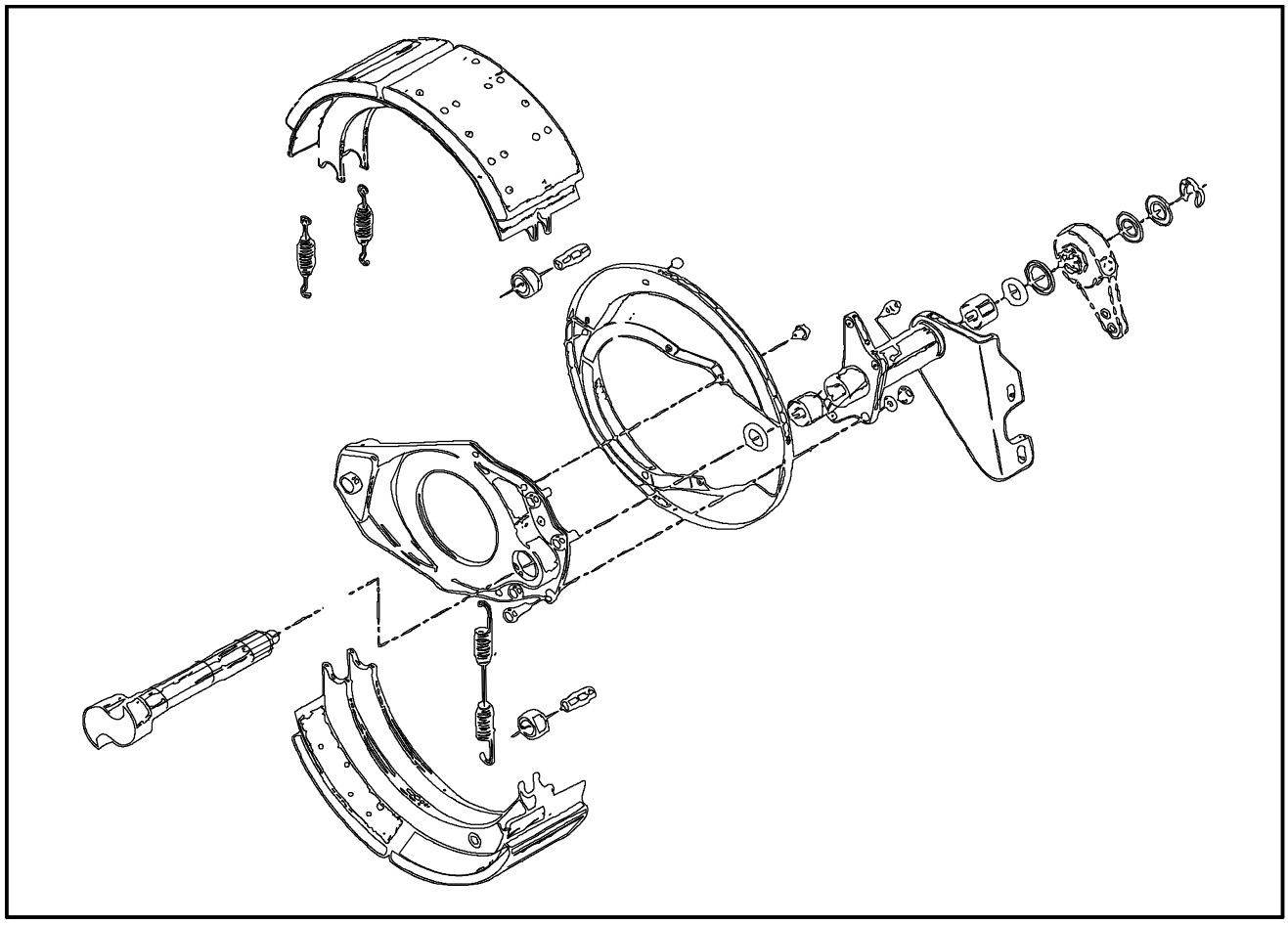


Brakes, Recondition

(Dana®/Spicer® EB & ES Models)

This procedure covers the recondition of the carrier wheel brakes.

The following pages are taken directly from the service literature produced by the axle manufacturer. Multiple brake models are covered by this information. Pay particular attention to Section 1 of this procedure to correctly identify the specific brake model being serviced. Proper identification of the brakes is crucial to obtain the correct information to follow from the charted specifications included in this procedure.

Based on the specific application of the brakes used on the axle, Link–Belt literature will supersede any discrepancies in operation, lubrication, maintenance, or service, implied by the brake manufacturer. Any concerns regarding such inconsistencies should be reviewed with a Link–Belt distributor.

If parts are hard to disassemble and assemble, do not use a hammer unless it has a soft face, do not force parts together, they must be free to operate and not bind.

It is a good practice when disassembling complex components to lay the parts out in the order that they were disassembled. Keeping the parts in this order during disassembly, cleaning, and inspection will aid in the assembly process.

⚠ WARNING

Solvents and cleaning solutions can be hazardous. Serious personal injury may result from misuse of these products. Read and follow all the manufacturer's recommendations concerning solvents and cleaning solutions.

Thoroughly clean the exterior surface of the axle, with an approved solvent, to prevent contamination from entering it before beginning the disassembly process.

SM01–003–010.00 0509 Service Manual

Table of Contents

List of Illustrations

List of Tables

Section 1: General Information

Foreword

This publication is intended to act as a source of maintenance information to those involved in servicing brakes.

How to Use this Manual

1. Arrangement. This manual is arranged in seven sections: General Information, Periodic Service, Removal/Disassembly, Inspection, Repair/Replacement, Installation/Assembly, and Specifications. General page layout, including section and paragraph headings, indention levels, and Figure and Table designator information, is shown on Pages 2 thru 4.
2. Table of Contents. The Table of Contents lists all section headings and primary paragraph headings in this publication.
3. Illustrations and Tables. Illustrations and tables are included to help make the text of this publication clear. See the List of Illustrations and List of Tables following the Table of Contents.
4. Specification Chart. A tabulation of all measurement specifications is provided at the back of this publication.

⚠ DANGER
AVOID CREATING DUST
POSSIBLE CANCER AND LUNG DISEASE HAZARD

CAUTIONARY INFORMATION

⚠ Danger

Brake Lining Fiber Warning

Older brake linings may contain asbestos fibers, a cancer and lung disease hazard. Brake linings manufactured today contain non–asbestos fibers, whose long–term effects to health are unknown. Use caution when handling either asbestos or non–asbestos materials used in brake linings. Refer to OSHA regulations for proper handling of these materials. Material Safety Data Sheets (MSDS) regarding brake lining materials can be obtained from your local distributor.

Lining Material Warning

While current manufacturers no longer offer asbestos brake linings, the long–term effects of some non–asbestos fibers have not been determined. Current OSHA Regulations cover exposure levels to some components of non–asbestos linings, but not all. The following precautions must be used when handling these materials.

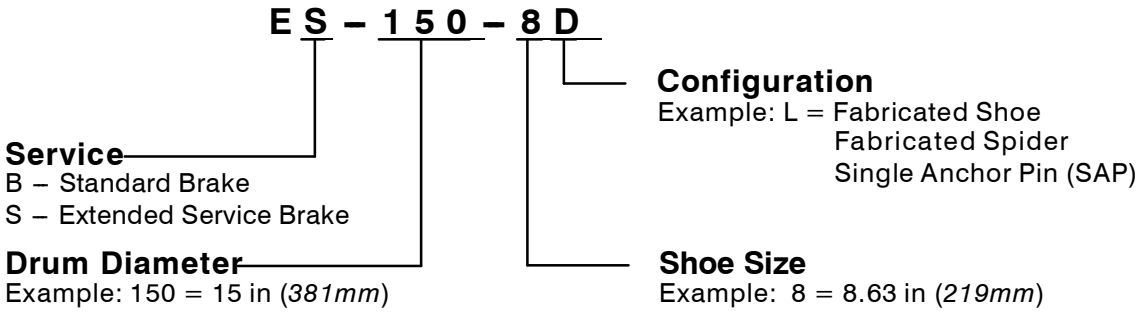
1. AVOID CREATING DUST. Compressed air or dry brushing must never be used for cleaning brake assemblies or the work area.
2. WORKERS DOING BRAKE WORK MUST TAKE STEPS TO MINIMIZE EXPOSURE TO AIRBORNE BRAKE LINING PARTICLES. Proper procedures to reduce exposure include working in a well ventilated area, segregation of areas where brakework is done, use of local filtered ventilation systems or use ofenclosed cells with filtered vacuums. Respirators approved by the Mine Safety and Health Administration (MSHA) or National Institutefor Occupational Safety and Health (NIOSH) should be worn at all times during brake servicing.
3. Workers must wash before eating, drinking or smoking; showerafter working, and should not wear work clothes home. Work clothes should be vacuumed and laundered separately without shaking.
4. OSHA Regulations regarding testing, disposal of waste and methods of reducing exposure for asbestos are set forth in 29Code of Federal Regulations §1910.001. These Regulations provide valuable information which can be utilized to reduce exposure to airborne particles.
5. Material safety data sheets on this product, as required by OSHA, are available from your distributor.

Model Coverage

The service procedures and specifications in this publication cover the brake models listed in Table 1. The basic instructions cover all 15, 16.5, and 18 inch brake types and sizes, unless specified otherwise. A breakdown of brake model identification is provided in Figure 1.

Model	Size		Configuration			Applications
	in.	*mm*	Shoe	Spider	Anchor	
EB–150–4L	15.0 x 4	*381 x 102*	Fabricated	Fabricated	SAP	Steer Axles
EB–165–5D	16.5 x 5	*419 x 127*	Fabricated	Cast	SAP	Steer or Drive Axles
EB–165–5L	16.5 x 5	*419 x 127*	Fabricated	Fabricated	SAP	Steer or Drive Axles
EB–165–6D	16.5 x 6	*419 x 152*	Fabricated	Cast	SAP	Steer or Drive Axles
EB–165–6L	16.5 x 6	*419 x 152*	Fabricated	Fabricated	SAP	Steer or Drive Axles
EB–165–7D	16.5 x 7	*419 x 178*	Fabricated	Cast	SAP	Steer or Drive Axles
EB–165–7F	16.5 x 7	*419 x 178*	Fabricated	Forged	SAP	Trailer Axles
EB–165–7L	16.5 x 7	*419 x 178*	Fabricated	Fabricated	SAP	Steer or Drive Axles
EB–165–8D	16.5 x 8.63	*419 x 219*	Fabricated	Cast	SAP	Drive Axles
EB–165–8L	16.5 x 8.63	*419 x 219*	Fabricated	Fabricated	SAP	Drive Axles
EB–180–7R	18.0 x 7	*457 x 178*	Cast	Heavy Cast	SAP	On/Off Hwy. Drive Axles
ES–150–4L	15.0 x 4	*381 x 102*	Fabricated	Fabricated	SAP	Steer Axles
ES–150–4D	15.0 x 4	*381 x 102*	Fabricated	Cast	SAP	Steer Axles
ES–150–6D	15.0 x 6	*381 x 152*	Fabricated	Cast	SAP	Steer or Drive Axles
ES–150–8D	15.0 x 8.63	*381 x 219*	Fabricated	Cast	SAP	Drive Axles
ES–150–8F	15.0 x 8.63	*381 x 219*	Fabricated	Forged	SAP	Trailer Axles
ES–165–5D	16.5 x 5	*419 x 127*	Fabricated	Cast	SAP	Steer or Drive Axles
ES–165–5L	16.5 x 5	*419 x 127*	Fabricated	Fabricated	SAP	Steer or Drive Axles
ES–165–6D	16.5 x 6	*419 x 152*	Fabricated	Cast	SAP	Steer or Drive Axles
ES–165–6L	16.5 x 6	*419 x 152*	Fabricated	Fabricated	SAP	Steer or Drive Axles
165 XL Cast	16.5 x 6	*419 x 152*	Cast	Cast	DAP	Steer Axle Transit
ES–165–7D	16.5 x 7	*419 x 178*	Fabricated	Cast	SAP	Steer or Drive Axles
ES–165–7F	16.5 x 7	*419 x 178*	Fabricated	Forged	SAP	Trailer Axles
ES–165–7H	16.5 x 7	*419 x 178*	Cast	Heavy Cast	DAP	On/Off Hwy. Drive Axles
ES–165–7L	16.5 x 7	*419 x 178*	Fabricated	Fabricated	SAP	Steer or Drive Axles
ES–165–7M	16.5 x 7	*419 x 178*	Fabricated	Heavy Cast	DAP	On/Off Hwy. Drive Axles
ES–165–8L	16.5 x 8.63	*419 x 219*	Fabricated	Fabricated	SAP	Drive Axles
ES–165–8D	16.5 x 8.63	*419 x 219*	Fabricated	Cast	SAP	Drive Axles
ES–165–8F	16.5 x 8.63	*419 x 219*	Fabricated	Forged	SAP	Trailer Axles
ES–165–8L	16.5 x 8.63	*419 x 219*	Fabricated	Forged	SAP	Trailer Axles
165 XL Cast	16.5 x 10	*419 x 254*	Cast	Cast	DAP	Drive Transit

Table 1 Brake Models And Specifications



Brake Options

Drum Diameter

150 = 15 in (*381mm*)
165 = 16.5 in (*419mm*)
180 = 18 in (*457 mm*)

Shoe Size

4 = 4 in (*102mm*)
5 = 5 in (*127mm*)
6 = 6 in (*152mm*)
7 = 7 in (*178mm*)
8 = 8.63 in (*219mm*)
10 =10 in (*254mm*)

Configuration

L = Fabricated Shoe / Fabricated Spider / SAP
D = Fabricated Shoe / Cast Spider / SAP
F = Fabricated Shoe / Forged Spider / SAP
M = Fabricated Shoe / Heavy Cast Spider / DAP
H = Cast Shoe / Heavy Cast Spider / DAP
R = Cast Shoe / Heavy Cast Spider / SAP

SAP = Single Anchor Pin
DAP = Double Anchor Pin

Figure 1
Brake Model Identification

Parts Nomenclature

General parts nomenclature for brake models are identified in Figure 2. Variations in shoe hold–down springs and guides are also identified. Specific parts nomenclature for specific brake models are provided in Figure 3 and Figure 4.

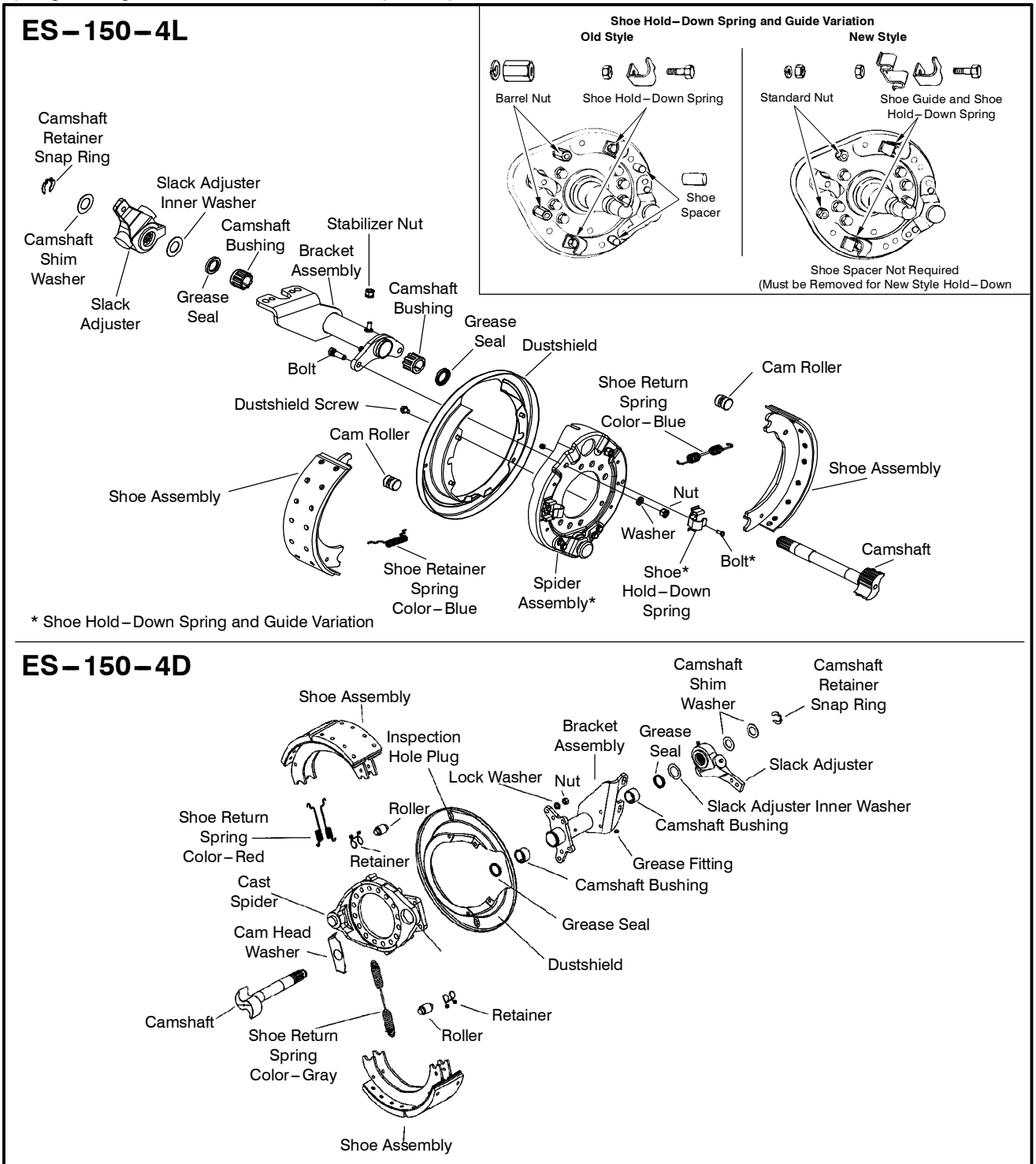
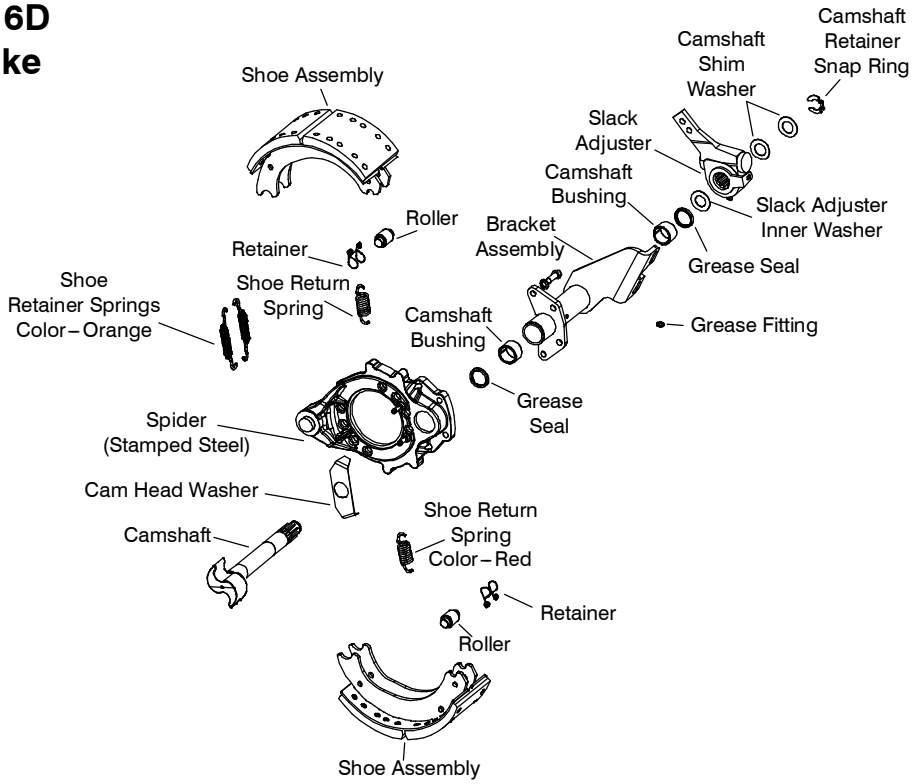


Figure 2
Brake Part Nomenclature, General

ES–150–6D Steer Brake



ES–150–8D and ES–150–8F Drive & Trailer Brake

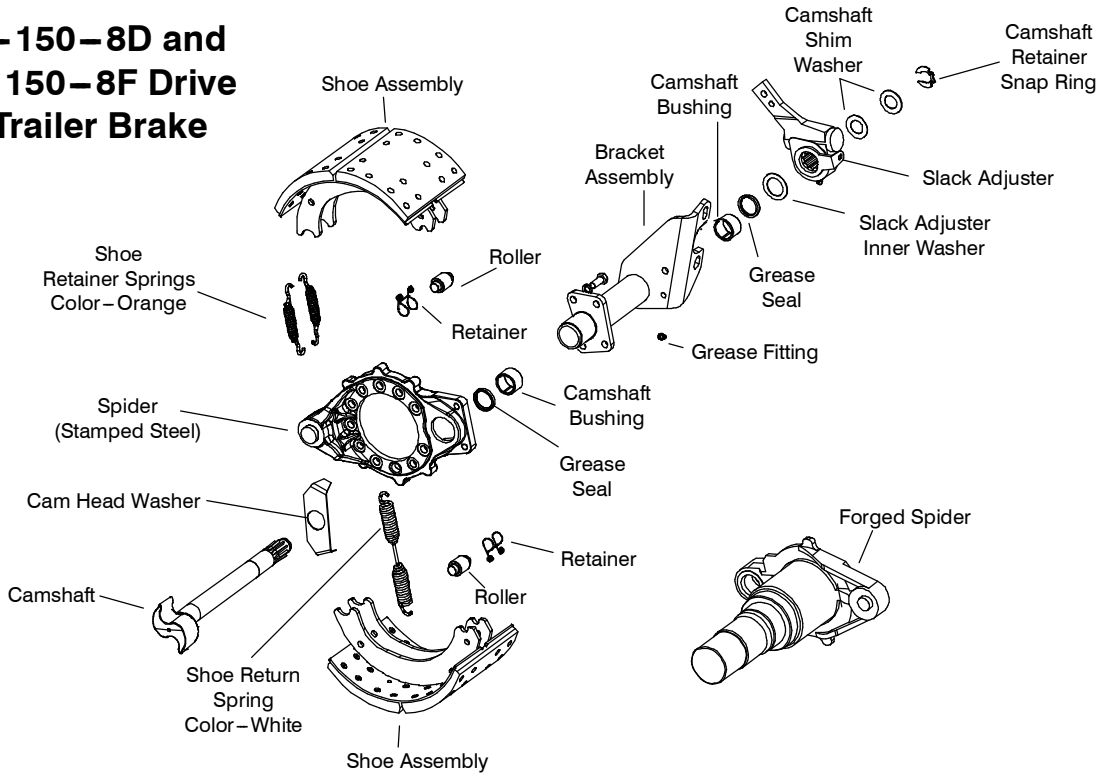
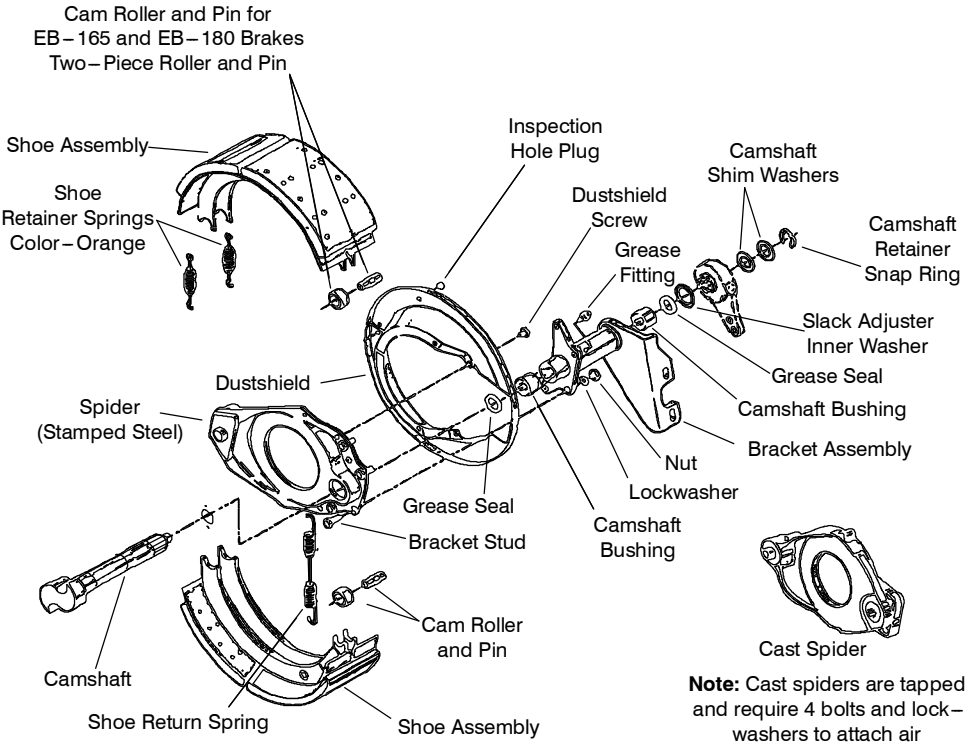


Figure 3
Brake Model Part Nomenclature

EB–165–5D
EB–165–5L
EB–165–6D
EB–165–6F
EB–165–7D
EB–165–7F
EB–165–7L



Note: Cast spiders are tapped and require 4 bolts and lock–washers to attach air chamber bracket assembly.

ES–165–5D
ES–165–5L
ES–165–6D
ES–165–6F
ES–165–7D
ES–165–7F
ES–165–7L

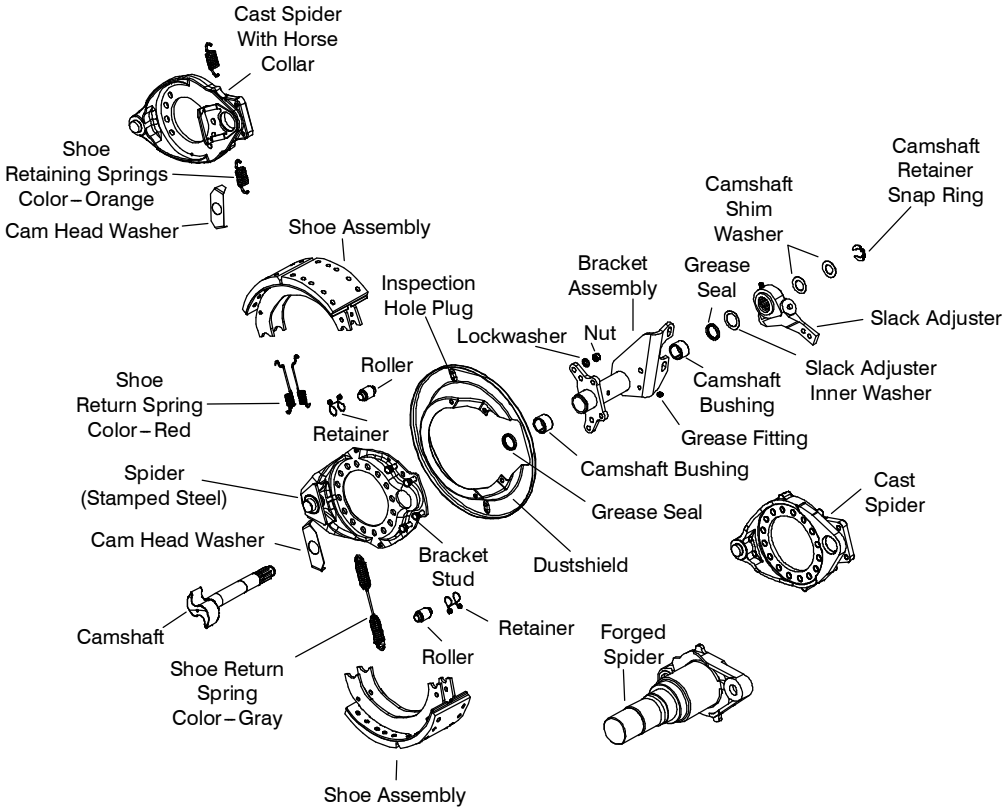
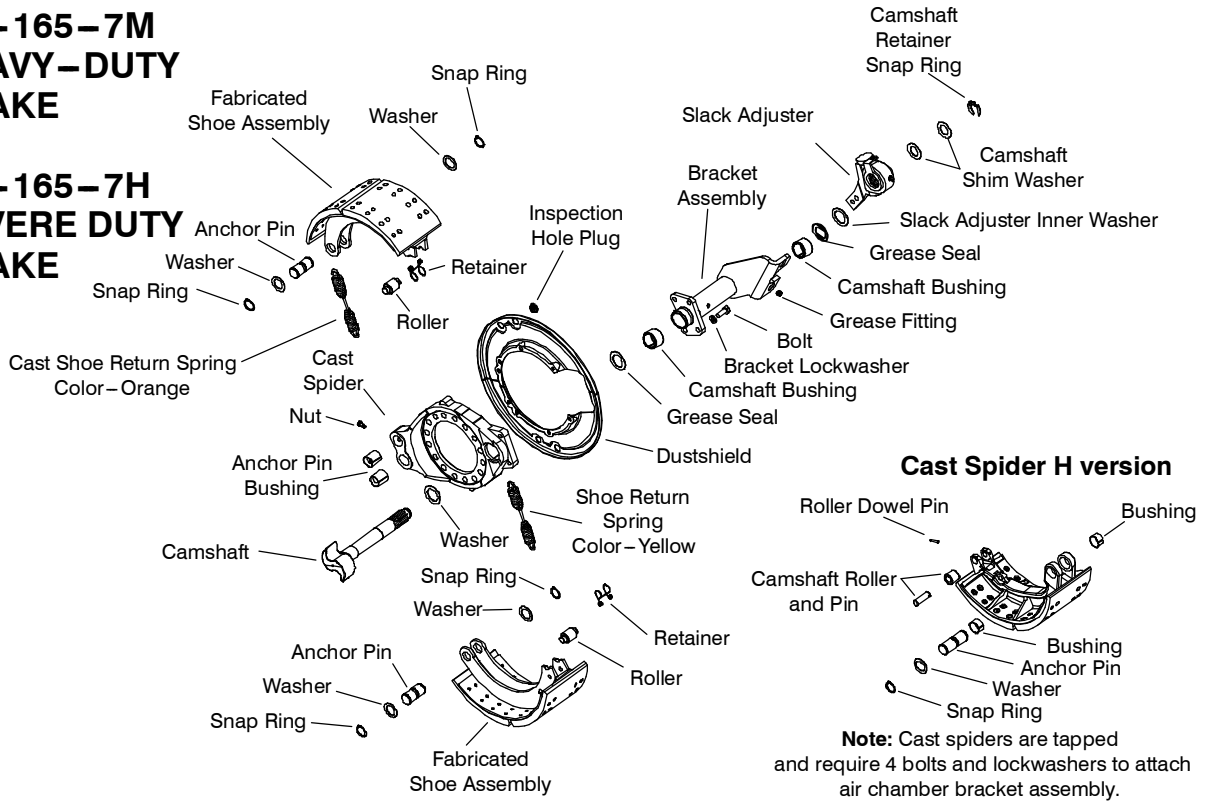


Figure 4
Brake Model Part Nomenclature, Continued

ES–165–7M HEAVY–DUTY BRAKE

ES–165–7H SEVERE DUTY BRAKE



ES–180–7R

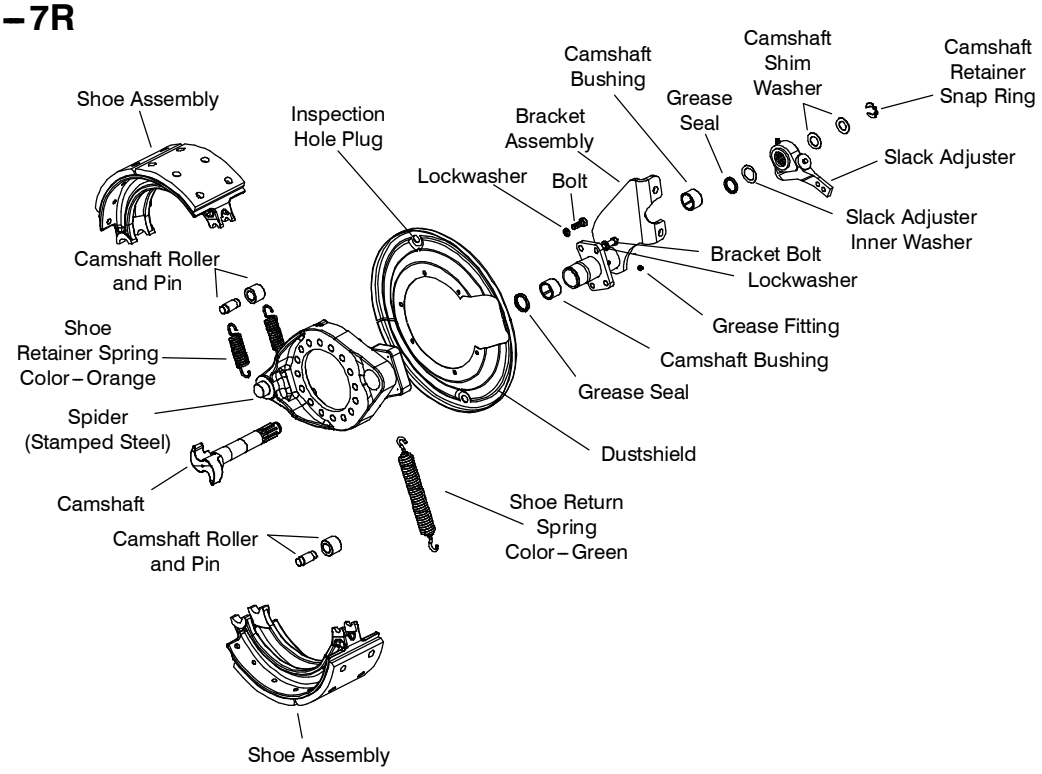


Figure 5
Brake Model Part Nomenclature, Continued

Model ES–165 and EB–165 Interchangeability

Brake parts for the Extended Service Brake (Model ES–165) are unique and must not be intermixed with Standard Brake parts (Model EB–165) unless otherwise instructed. These parts consist of the camshaft, camshaft washer, return spring, cam roller, and shoe/lining assembly. Any attempt to operate the brake with other than its intended parts may result in unsatisfactory performance.

"On–Road" Repair: If a crane should need "On–Road" repair and ES Brake hardware is not available, it is possible to retrofit the brake with Standard Brake parts in order to return the crane to service. These parts consist of the Standard shoe/lining assembly, cam roller, pin, and return spring. The retaining springs and camshaft with cam washer will work in this situation and do not need to be replaced.

EB Roller and ES CAM Interchangeability

EB Roller and ES Cam Interchangeability. The EB Roller and the ES Cam are compatible and can be used together. Figure 6 illustrates the proper fit of an EB Roller to an ES Cam. As shown, the contact pattern is at two points and the two parts will function satisfactorily with this fit.

Note: The ES Roller and EB Cam are not compatible and should not be used together.

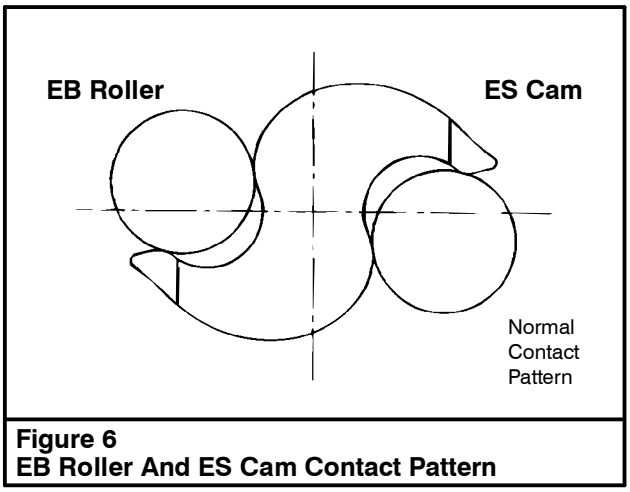
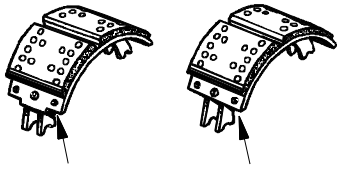


Figure 6
EB Roller And ES Cam Contact Pattern

Brake model parts identification for shoes, return springs, spiders, and camshafts are identified in Figure 7.

All EB–165 Models

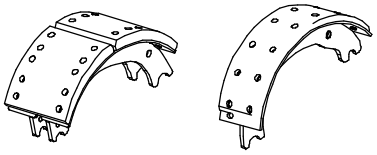


Shoe with Tab

Shoe without Tab

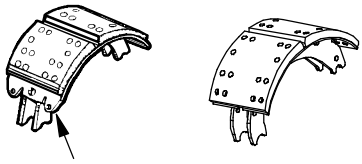
Note: Shoe with tab cannot be used on lightweight brakes

ES–150–D,F ES/EB–150–4L



ES–165–D,L,F

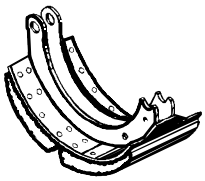
Old New



Shoe with Spring Attaching Lugs

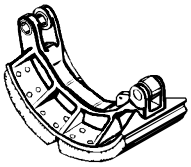
Shoe without Spring Attaching Lugs

ES–165–7M



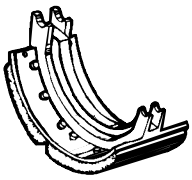
Double Anchor Pin

ES–165–7H



Double Anchor Pin With Cam Roller and Anchor Pin Bushings

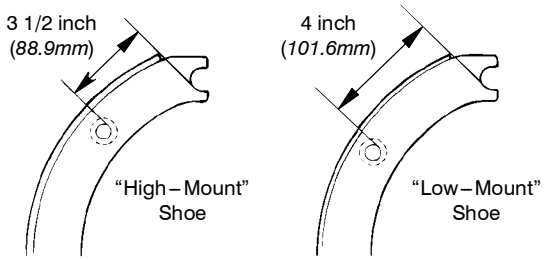
EB–180–7R



Single Anchor Pin

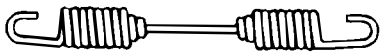
High And Low Mount Shoes

All EB–165 Models



Shoe Return Spring

Color–Coded By Application



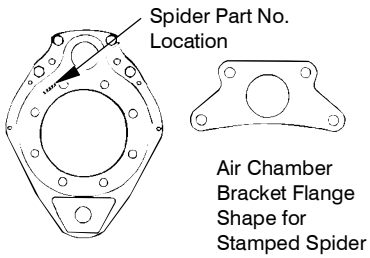
Blue ES–150–4L/EB–150–4L
White ES–150–8D,8F
Red . . . . . Use with "High–Mount" Shoes (All EB–165)
Black . . . . . Use with "Low–Mount" Shoes (All EB–165)
Grey ES–165–5D,5L,6D,6L 7D,7L,7F,8D,8L,8F
Yellow ES–165–7M
Orange . . . ES–165–7H
Green EB–180–7R

Red ES–150–6D
ES–165–5D,5L,6D,6L,7D,7L

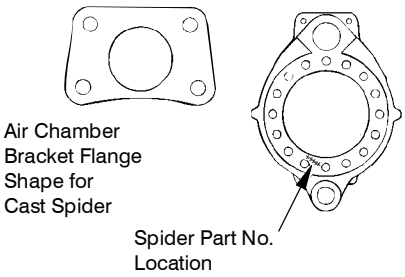
Figure 7
Parts Identification

Brake Spiders

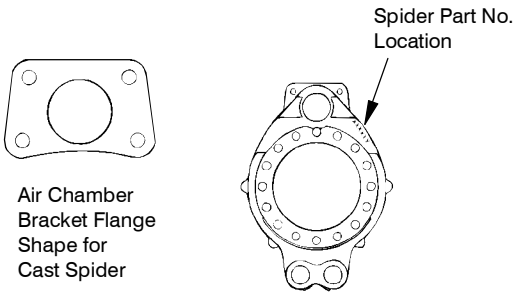
Lightweight Stamped Spider Single Anchor Pin



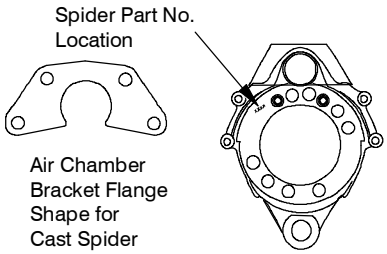
Cast Spider Single Anchor Pin



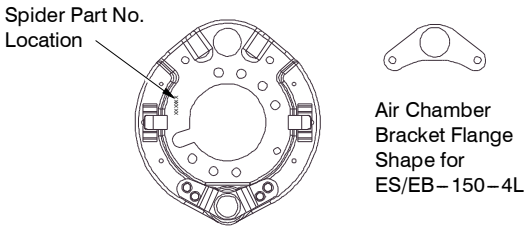
Cast Spider Double Anchor Pin



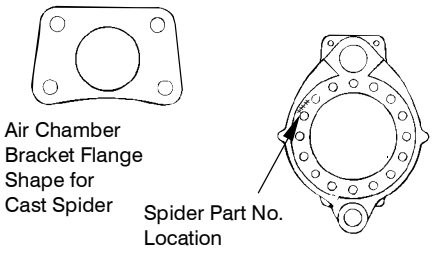
Reduced Envelope Steer Brake Cast Spider Single Anchor Pin



Stamped Spider ES/EB–150–4L



Reduced Envelope Drive Brake Cast Spider Single Anchor Pin



Camshafts

Cam Head for EB–165 and EB–180 Brakes

Cam Head for ES–165 and ES–150 Reduced Envelope Brakes

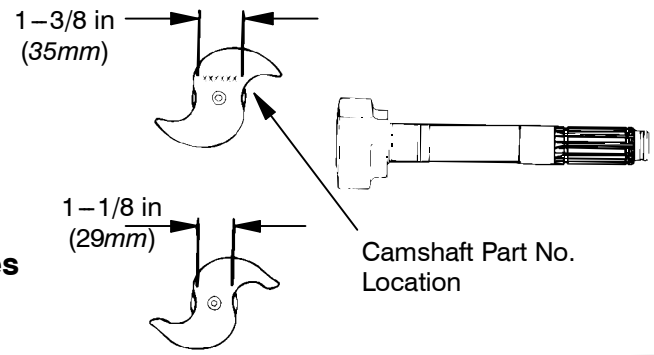


Figure 8
Parts Identification, Continued