Maintenance Manual,
Fixed Beam Cargo Suspension System

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Applicable Equipment Part Numbers

Onboard Systems: 200-296-00
232-188-01
232-189-01

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1.0 Introduction

1.1 **Scope.** This component maintenance manual contains instructions for inspection, maintenance and overhaul of the Fixed Beam Cargo Suspension System 200-296-00.

1.2 **Capability.** The instructions contained in this document are provided for the benefit of experienced aircraft maintenance personnel and facilities that are capable of carrying out the procedures.

1.3 **Safety Labels**. The following definitions apply to Safety Labels used in this manual.

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Draws the reader's attention to important or unusual information not directly related to safety.

Used to address practices not related to personal injury.

2.0 Referenced Documents

122-005-00 Component Maintenance Manual, Cargo Hook

3.0 Inspection

3.1 **Scheduled Check & Inspection**. The scheduled inspection intervals noted below are maximums and are not to be exceeded. If the Fixed Beam Cargo Suspension System is subjected to unusual circumstances, extreme environmental conditions, etc., it is the responsibility of the operator to perform the inspections more frequently to ensure proper operation.

Daily Check

1. Visually check for damage and/or corrosion on the exterior of the Cargo Hook (item 1) and suspension system components.
2. Move the Cargo Hook (item 1) and the Main Beam (item 3) throughout their ranges of motion and observe the Manual Release Cable (item 15) and Electrical Release Harness (item 16) to ensure that they have enough slack. The Manual Release Cable (item 15) and Electrical Release Harness (item 16) must not be the stops that prevent the Cargo Hook (item 1) or Main Beam (item 3) from moving freely in all directions.
3. Rotate the Main Beam (item 3) and Cargo Hook (item 1) about their pivot points to verify that they rotate freely.
4. Visually check the Manual Release Cable (item 15) and its connections for damage and security.
5. Visually check the Electrical Release Harness (item 16) and its connections for damage and security.

Annual Inspection

1. Visually inspect for damage and/or corrosion on the exterior of Cargo Hook (item 1) and suspension system components (refer to Table 5.1 for acceptable limits).
2. Move the Cargo Hook (item 1) and the Main Beam (item 3) throughout their ranges of motion and observe the Manual Release Cable (item 15) and Electrical Release Harness (item 16) to ensure that they have enough slack. The Manual Release Cable (item 15) and Electrical Release Harness (item 16) must not be the stops that prevent the Cargo Hook (item 1) or Main Beam (item 3) from moving freely in all directions.
3. Rotate the Main Beam (item 3) and Cargo Hook (item 1) about their pivot points to verify that they rotate freely.
4. Visually inspect the Manual Release Cable (item 15) and its connections for damage and security.
5. Visually inspect the Electrical Release Harness (item 16) and its connections for damage and security.

4.0 Maintenance

4.1 Lubrication of the Fixed Beam Cargo Suspension system is recommended every 200 hours of operation. To obtain maximum life under severe duty conditions such as logging or seismic work, it is recommended to lubricate every 100 hours.

4.2 To lubricate, remove the Trunnion Pins (item 4) and Cargo Hook Attach Bolt (item 14) and lubricate wear surfaces. Recommended lubricants are Mobilgrease 28 or AeroShell 17.

5.0 Overhaul Schedule

5.1 The suspension system shall be overhauled every 1000 hours of external load operations or 5 years, whichever comes first.

5.2 Hours of external load operations should be interpreted to be (1) anything is attached to the cargo hook (whether or not a useful load is being transported) and (2) the aircraft is flying. If these conditions are not met, time does not need to be tracked.

Failure to follow all equipment maintenance instructions and component inspection criteria may result in serious injury, death or immediate loss of flight safety.

6.0 Overhaul Instructions

Remove the suspension system from the helicopter per the following:

1. Disconnect the Electrical Release Harness (item 16) connector from its connection at the belly of the helicopter.
2. Remove the nut from Manual Release Cable (item 15) at the bracket on the belly of the belly of the helicopter and separate the inner cable ball end from the coupler at the bracket.
3. Remove the bolts that secure the Pillow Blocks (items 2 and 9) to the hard points and remove suspension system from the helicopter.

Disassemble the suspension system per the following instructions.

1. Loosen jam nut, remove the manual release cover from the cargo hook to disengage the inner cable from the cargo hook lever, and unthread the Manual Release Cable (item 15) from the Cargo Hook (item 1).
2. Disconnect the Electrical Release Harness (item 16) from the Cargo Hook (item 1).
3. See the instructions in the Illustrated Parts List section for disassembly procedures of the detail parts.

Inspect and repair the detail parts in accordance with the instructions in Table 6.1. Repair or replace parts as outlined. Refer to the Component Maintenance Manual 122-005-00 for instructions for the Cargo Hook.

Table 6.1, Suspension System Inspection Criteria

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Main Beam, P/N 290-852-01 Item 3	Dents, gouges, and scratches less than .030" deep outside lug areas of Zones A and B (see Figure 5.1). Dents, gouges, and scratches less than .010" deep around lugs in Zones A and B (see Figure 5.1).	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges and scratches greater than .060" deep outside lug areas of Zones A and B Dents, gouges, and scratches greater than .030" deep around lugs in Zones A and B Visual cracks.
Pillow Blocks P/N 290-853-01, P/N 290-883-01 Items 2.1, 9.1	Dents, gouges, and scratches less than .030" deep outside lug area of Zone A (see Figure 5.2).	Blend at 20:1 ratio, length to depth, to provide smooth transitions. Protect affected surfaces with MIL-PRF-23377 Type 1 epoxy primer or equivalent and MIL-PRF-85285 Type 1 polyurethane coating or equivalent.	Dents, gouges and scratches greater than .060" deep outside lug area of Zone A Dents, gouges, and scratches greater than .030 in. deep around lug in Zone A Visual cracks.
Trunnion Pin P/N 290-854-00 Item 4	Wear on outside diameter, diameter greater than .363".	None.	Wear on outside diameter, diameter less than .363". Visual cracks.
Thrust Bearing P/N 290-881-00 Item 8	Wear on ends of bearing, thickness greater than .125"	None.	Wear on ends of bearing, thickness less than .125"
Bushing P/N 290-364-00 Item 7	Wear on inside diameter, diameter less than .520".	None.	Wear on inside diameter, diameter greater than .520".
Shaft Bushing P/N 290-882-00 Items 2.3, 9.3	Wear on inside diameter, diameter less than .393".	None.	Wear on inside diameter, diameter greater than .393".

Table 6.1, Suspension System Inspection Criteria continued

Component	Damage Permitted without Repair	Repair	Maximum Damage which Causes Replacement
Attach Bolt, P/N 290-332-00 Item 14	Wear on outside diameter, diameter greater than .495”.	None.	Wear on outside diameter, diameter less than .495”. Cracks.
Bearing, P/N 517-012-00 Items 2.2, 9.2	None.	None.	Damage to Teflon liner. Binding or seizing.
Threaded fasteners	None.	None.	Replace threaded fasteners at overhaul except 290-332-00 (item 14).
Manual Release Cable P/N 268-031-00 Item 15	Dents, gouges, and scratches less than .020” deep on end fittings. Superficial scratches, nicks, and scrapes on outside of release cable conduit.	Blend at 20:1 ratio, length to depth, to provide smooth transitions.	Dents, gouges, and scratches greater than .060” deep on end fittings. Cracks, scratches, and nicks in the outer conduit, which expose the longitudinal wires underneath.
Electrical Release Harness P/N 270-130-01 Item 16	Superficial scratches, nicks, and scrapes on outside of electrical harness sleeving.	None.	Broken or missing pins on connectors.

Figure 6.1, Main Beam Inspection Zones

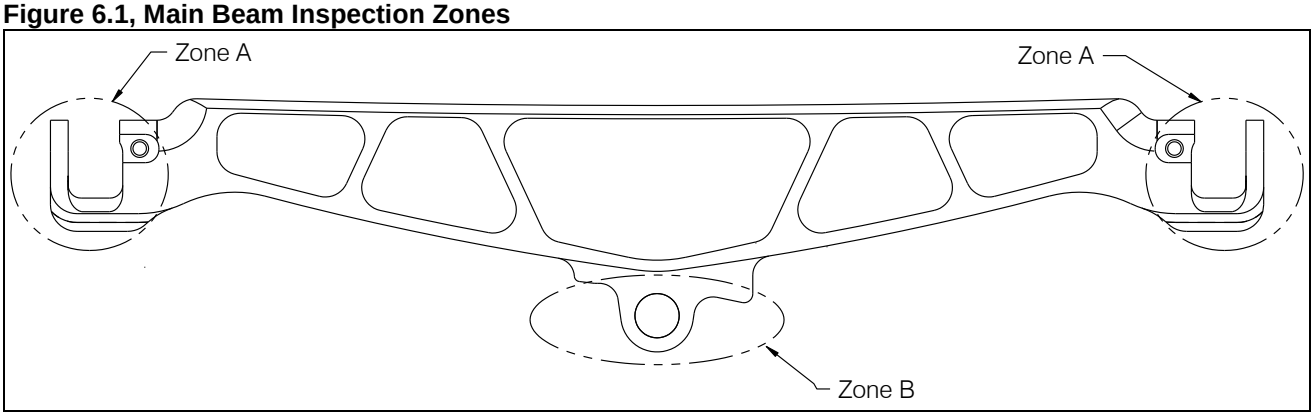
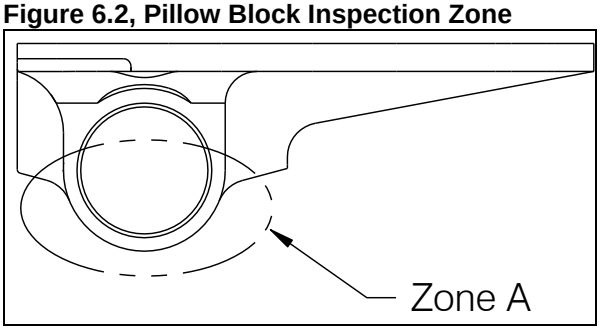


Figure 6.2, Pillow Block Inspection Zone



7.0 Disassembly & Re-assembly Instructions

7.1 The instructions following provide Illustrated Parts Lists, disassembly and re-assembly instructions.

Figure 7.1, Fixed Cargo Suspension System Parts

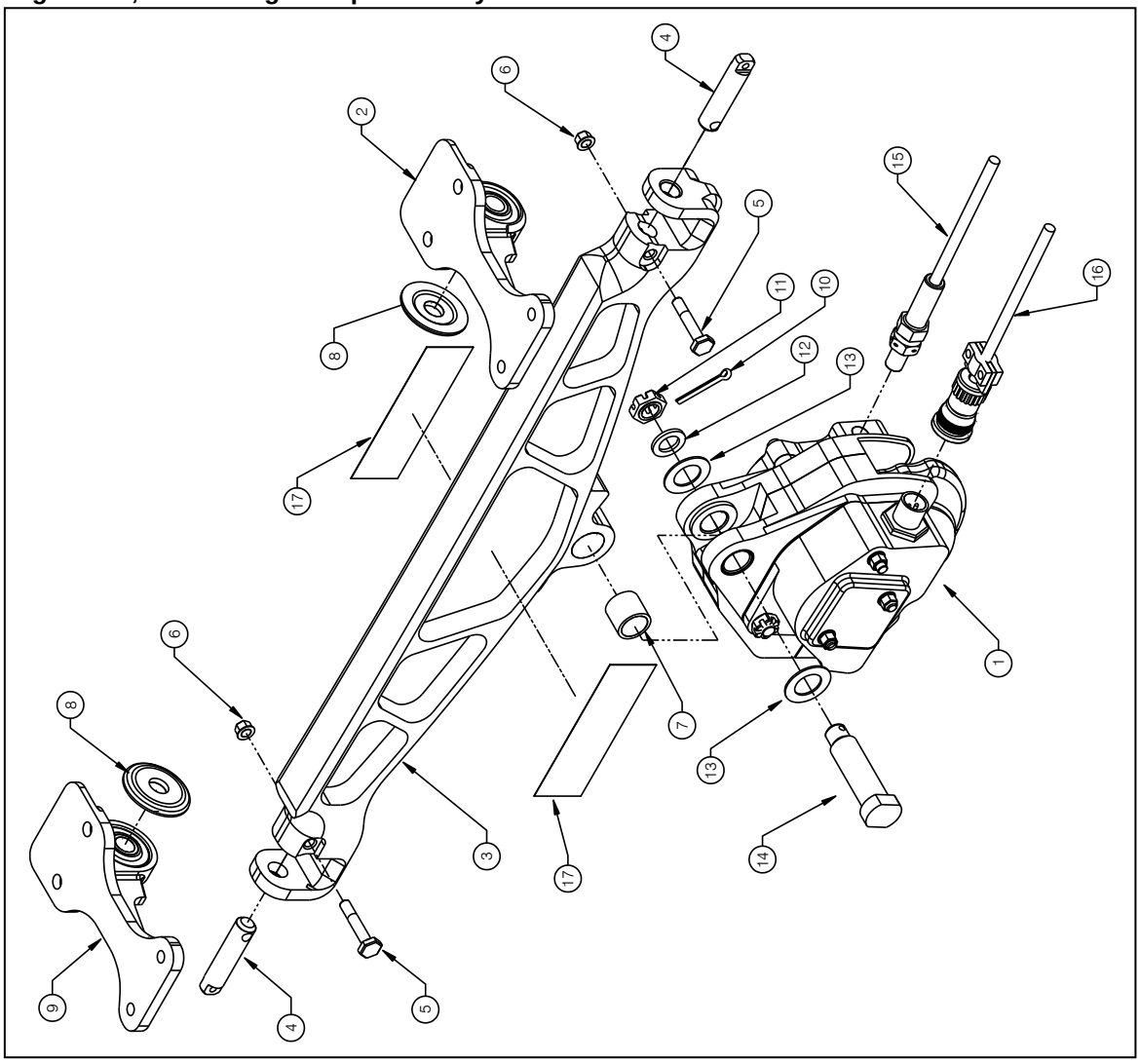


Table 7.1, Suspension System Parts (Refer to Figure 7.1)

Item	Part No.	Description	Qty	Notes
1	528-023-01	Cargo Hook	1	
2	232-188-01	Pillow Block Assembly, Left	1	See Figure 7.5
3	290-852-01	Main Beam	1	
4	290-854-00	Trunnion Pin	2	
5	510-523-00	Bolt	2	
6	510-500-00	Nut	2	
7	290-364-00	Bushing	1	
8	290-881-00	Thrust Bearing	2	
9	232-189-01	Pillow Block Assembly, Right	1	See Figure 7.6
10	510-178-00	Cotter Pin	1	
11	510-170-00	Nut	1	
12	510-174-00	Washer	1	
13	510-183-00	Washer	2	
14	290-332-00	Attach Bolt	1	
15	268-031-00	Manual Release Cable	1	
16	270-130-01	Electrical Release Harness	1	
17	31-054-64DFHF	Decal	2	Supplied by Bell

Disassembly

1. Remove Cotter Pin (item 10), Nut (item 11), Washers (items 12 and 13), and Attach Bolt (item 14) and remove cargo hook (item 1) from Main Beam (item 3). Refer to Figure 6.1 for item numbers.
2. Remove Nuts (item 6), Bolts (item 5), and Trunnion Pins (item 4) from each end of the Main Beam to remove the Pillow Block Assemblies (items 2 and 9) and Thrust Washers (item 8) from the Main Beam (item 3).
3. Press out Bushing (item 7) from Main Beam (item 3).

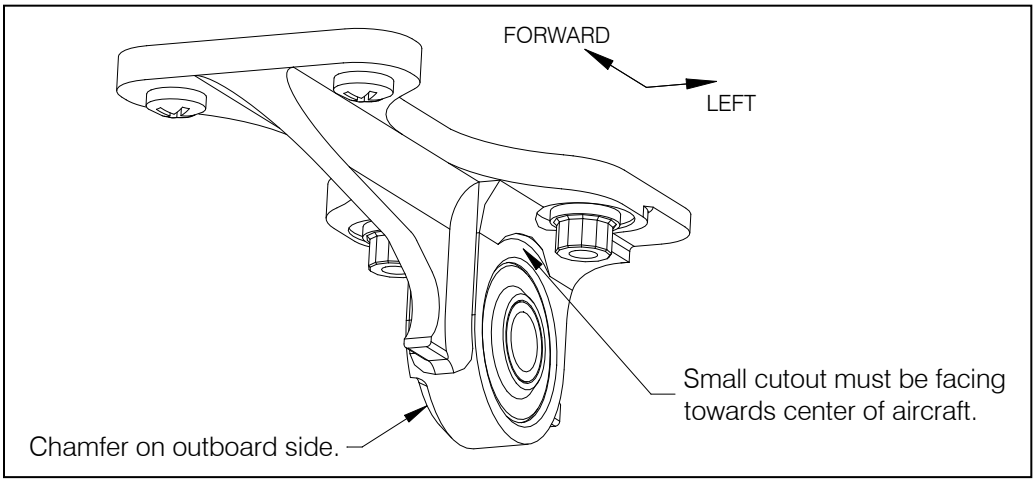
Assembly

1. Press Bushing (item 7) into Main Beam (item 3) with zinc chromate primer, TT-P-1757 or equivalent.
2. Install cargo hook (item 1) onto Main Beam (item 3) with Attach Bolt (item 14), Washers (items 13 and 12), and Nut (item 11). Tighten nut finger tight and rotate to next castellation to install Cotter Pin (10).
3. Install left and right Pillow Block Assemblies (items 2 and 9) onto aircraft hard points, see Figure 6.2. (Refer to Bell documentation for fastener part numbers and torque requirements).

NOTICE

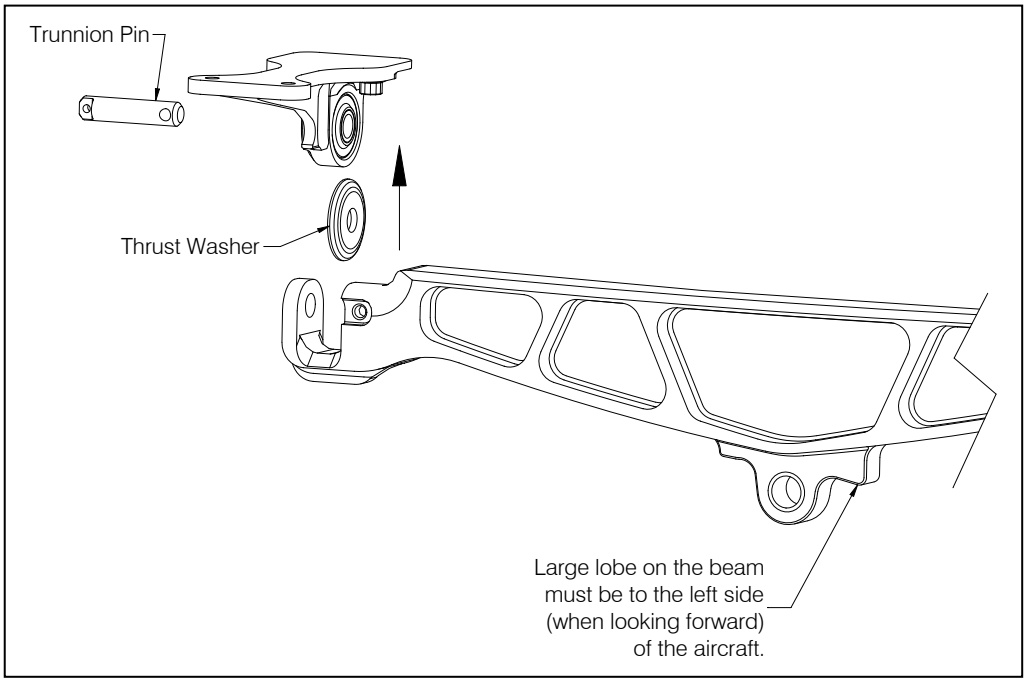
Note that the Pillow Block Assemblies (items 2 and 9) are sensitive to right and left. See Figure 6.2.

Figure 7.2, Pillow Block Orientation, RH Pillow Block Shown



4. Assemble Main Beam (item 3) and Cargo Hook (item 1) onto Pillow Block Assemblies (items 2 & 9) with Thrust Washer (item 8) and Trunnion Pins (item 4) as shown.

Figure 7.3, Trunnion Pin/Thrust Washer Assembly



5. Secure Trunnion Pin (item 4) with Bolt (item 5) as shown in Figure 6.4. Rotate the Trunnion Pin (item 4) to align the hole in the pin with the hole in the Main Beam (item 3). The Bolt (item 5) must pass through the hole in the Trunnion Pin (item 4) when installed.

NOTICE

For wrench clearances, the Bolt (item 5) can only be properly installed from one side of the Main Beam (item 3).

6. Install Nut (item 6) onto Bolt (item 5) and torque to 20-25 in-lbs.

Figure 7.4, Beam/Pillow Block Assembly

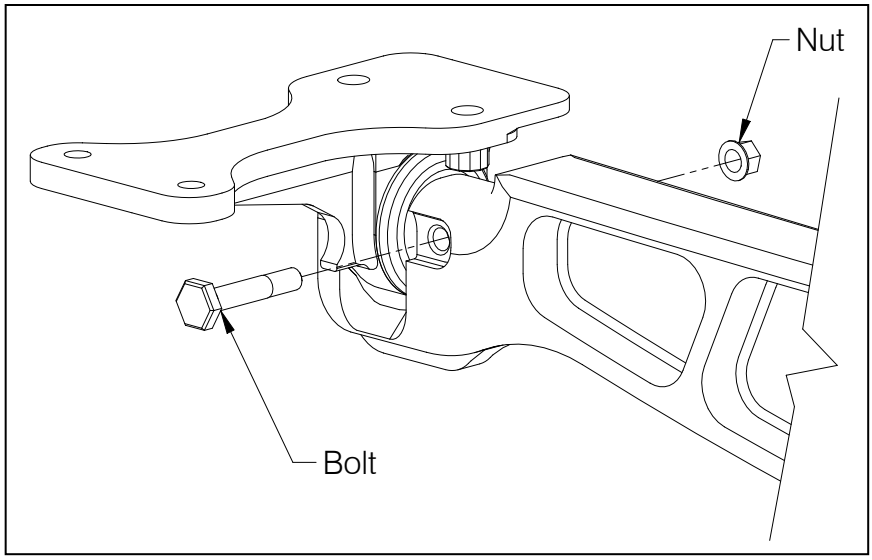
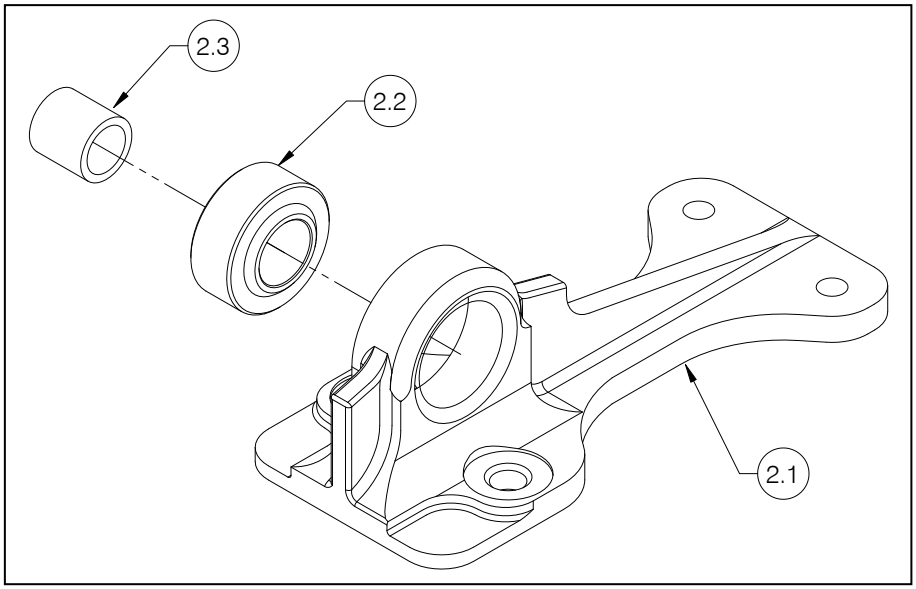


Figure 7.5, Pillow Block Assembly, Left



Item	Part No.	Description	Qty
2	232-188-01	Pillow Block Assembly, Left	1
2.1	290-853-01	Pillow Block, Left	1
2.2	517-012-00	Spherical Bearing	1
2.3	290-882-00	Shaft Bushing	1

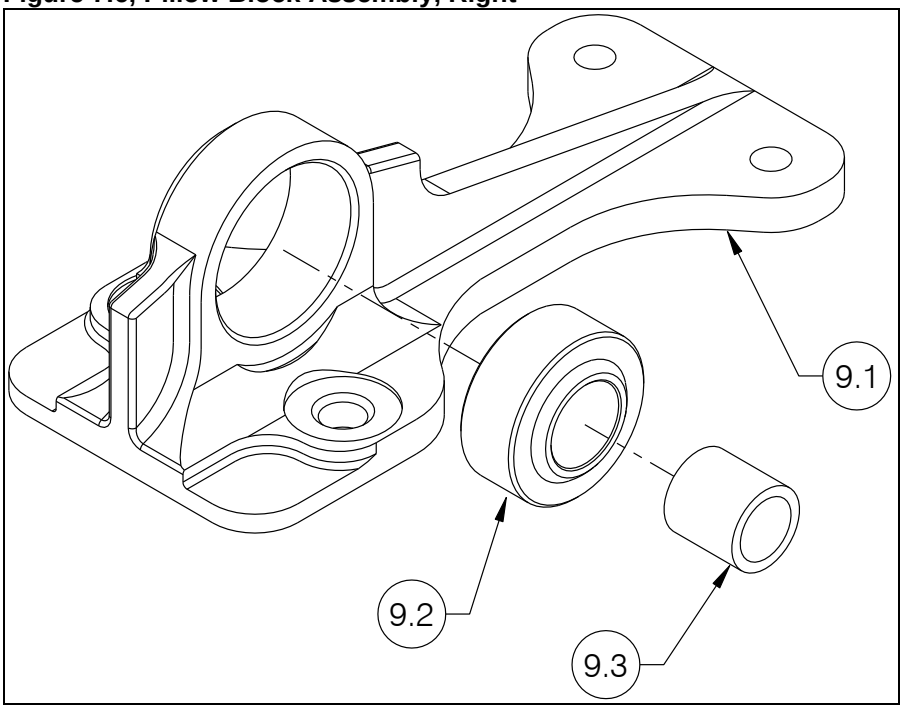
Disassembly

1. Press Spherical Bearing (item 2.2) out of Pillow Block (item 2.1).
2. Press Shaft Bushing (item 2.3) out of Spherical Bearing (item 2.2).

Assembly

1. Apply corrosion inhibiting compound, BMS 3-38 or equivalent, to OD of Shaft Bushing (item 2.3) and press into Spherical Bearing (item 2.2).
2. Apply zinc chromate primer, TT-P-1757 or equivalent, to OD of Spherical Bearing (item 2.2) and press into Pillow Block (item 2.1).

Figure 7.6, Pillow Block Assembly, Right



Item	Part No.	Description	Qty
9	232-189-01	Pillow Block Assembly, Right	1
9.1	290-883-01	Pillow Block, Right	1
9.2	517-012-00	Spherical Bearing	1
9.3	290-882-00	Shaft Bushing	1

Disassembly

1. Press Spherical Bearing (item 9.2) out of Pillow Block (item 9.1).
2. Press Shaft Bushing (item 9.3) out of Spherical Bearing (item 9.2).

Assembly

1. Apply corrosion inhibiting compound, BMS 3-38 or equivalent, to OD of Shaft Bushing (item 9.3) and press into Spherical Bearing (item 9.2).
2. Apply zinc chromate primer, TT-P-1757 or equivalent, to OD of Spherical Bearing (item 9.2) and press into Pillow Block (item 9.1).

APPENDIX A-1 Revision History

Revision Number	Date	Revised Section / Page	Description of Change
0	August 22, 2007	All	New Issue
1	August 28, 2007	All	Added item 17 to Figure 6.1 and Table 6.1. Corrected Document Number on pages 9 thru 16. Corrected assembly sequencing and figure references.
2	12/09/14	All	Removed NDT from overhaul instructions, updated definition for hours of external load operations and clarified suspension system requirement.