Service Bulletin

FILING INSTRUCTIONS	
Binder: AG EQUIPMENT BINDER	Page: 1 of 16
Binder Section: HARVESTING EQUIPMENT / COMBINES	Document No.: NHE SB 001.1 97
Mach Loc Code: 99043	Supersedes: NHE SB 001-97
Issued By: PRODUCT MANAGEMENT, EAST MOLINE, IL, USA	Date Issued: June 9, 1997

Family: SP Combines

Model: 1644, 1666, 1688, 2144, 2166, 2188

Subject: **Cleaning System Rebuild Procedure (Revisions are shaded)**

Background

A misaligned or incorrectly assembled component can result in a catastrophic, low hour failure of the entire cleaning system. Service Manual Section 9130 (RAC 7-67800) detailing the cleaning system rebuild procedure was released in January, 1997. *Please: 1.)destroy the original copy of this bulletin (NHE SB 001-97), 2.) refer to the following procedure noting the revisions, and 3.) update Section 9130 of the Service Manual accordingly.*

Service Information

The following should be used as a guide in the repair and rebuilding of the cleaning system on Axial-Flow combines. Use the following procedures as necessary. Throughout the text if there are specific critical issues or measurements they will be noted with a ♦.

SIEVE REMOVAL

1. Stop the combine. Stop the engine. Set the Parking Brake and remove the key.
2. Remove the straw spreaders.
3. With the necessary shielding removed from the right side of the machine, loosen the elevator drive belt the belt to be removed from the shaker shaft 25” driven pulley.. Remove the belt.
4. With the necessary shielding removed from the right side of the machine, loosen the straw spreader drive belt. Remove the belt.
5. Turn the 25” driven pulley by hand until the chaffer sieve is at the extreme rear position that it will travel. This will give maximum clearance for removal.
6. Disconnect the grain scan harness connector on the left hand side of the machine. Remove the clip that holds the grain scan harness to the side shield.
7. For machines equipped with the straw/chaff spreading attachment, remove the rear deflector plate and rubber strip.
8. Remove the rear axle shield. Open and lower the tailings auger trough door.
9. Remove the chaffer sieve mounting bolts and the support angle mounting bolt on each side of the support angles and the sieve.
10. Remove the chaffer sieve.
11. Loosely reinstall the chaffer rail bolts and nuts to hold the chaffer rail out of the way for extra clearance.
12. Remove the two nuts on each side of the shoe sieve. Remove the mounting bolts. OR Remove the two bolts holding the rear shoe rail plate on each side (if equipped). Place the plate on the shoe sieve.
13. Remove the shoe sieve.

♦ ***In the following steps, note the position of washers as the bolts are removed to aid in reassembly.***

14. Remove the 5/8" x 5 1/4" bolt from the chaffer drive front hanger lever lower bushing on the left and right sides of the machine.
15. Remove the 5/8" x 7" bolt from the rear of the left and right rear chaffer hanger assembly.
16. Remove the chaffer rail frame as an assembly from the combine.
17. Remove the 5/8" x 5" bolt from the front hanger shoe lever to shoe rail frame assembly on the left and right sides of the machine.
18. Remove the 5/8" x 6" bolt from the rear of the shoe rail frame assembly to the rear shoe control lever on the left and right sides of the machine.
19. Remove the shoe rail frame as an assembly from the combine.

♦ ***The following is a critical measurement procedure!***

20. Inside the separator side sheets, locate the left vertical angle channel near the rear of the chaffer rail. This will be used as one of the reference points for measurements taken in the following procedures. This point must permit a straight line measurement from the auger bed/shaker drive shaft and/or the front hanger support pivot shaft on each side of the machine. This point is used to minimize any structural distortion that may be present. **Do not use a reference point on the sheetmetal**!
21. *Mark a vertical line on the left vertical angle channel.* Carefully measure the distance from the centerline (or rear flat side) of *the left auger bed/shaker drive shaft to the vertical line just marked.* Record this measurement.
22. Loosen the auger bed right hand bearing clamp and move it toward the center of the machine.
23. *Now carefully measure and mark the* ***exact*** same distance (taken in step 21) from the centerline (or rear flat side) of the *right auger bed/shaker drive shaft to the area on the right vertical angle channel.* **This measurement is important! Due to manufacturing tolerances, the right hand reference mark may not be in the exact same position as the left.**

RIGHT HAND SIDE AUGER BED/SHAKER DRIVE SYSTEM DISASSEMBLY

1. Remove the bolts from the shaker shaft driven pulley. Remove the pulley.
2. Remove the shaker shaft spring shield.
3. Loosen and remove the shaker shaft slip clutch spring jam nuts, slip clutch retaining washer and spring.
4. Remove the shaker shaft drive slip clutch hub and ratchet assembly from the shaker shaft.
5. Remove the forward 5/8" x 4 3/4" bolt in the right hand pitman arm small end.

♦ ***Note the position of the washers for reassembly.***

6. Remove the right shaker shaft pitman arm assembly from the shaker shaft.

♦ ***Inspect the shaker shaft pitman arm drive cam. There must be two internal retaining rings and a flat washer in the hex shaft spline. They are used to position the drive cam and shaker shaft pitman arm to the end of the hex shaft.***

♦ ***Inspect the shaker shaft ball bearing for rough rotation, and/or looseness. Replace as required. There must be two large retaining rings positioning the bearing in the pitman arm.***

♦ ***Inspect the shaker shaft rubber bushing for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***

♦ ***If bushing replacement is required, note bushing positioning in the arm prior to removal so that replacement bushing is installed to the same depth. Press bushing through chamfer side only. Apply load to outer sleeve of bushing only. Reference figure 4 for proper bushing placement.***

9. Remove the Woodruff key from the shaker drive shaft.
10. If required, remove the right hand auger bed/shaker drive shaft bearing by removing the shaker shaft bearing retainer and bearing flange hardware.

    ♦ ***Do not remove the bearing retainer or bearing flange and/or shaft assembly with retaining plates unless needed. The bearing retainer and bearing flange locate the auger bed shaker shaft to the machine both vertically and horizontally which can effect pitman arm positioning.***

    ♦ ***If removal of a bearing retainer is necessary, perform the following additional steps before removal:***

    1. Scribe the original location of the retainer on the outside of the separator side sheet.

    2. Using the reference mark made earlier at the rear of the separator before, measure the distance from the center line (or rear flat side) of the auger shaft to the mark on the same separator side sheet. <u>Record this measurement.</u>

    ♦ ***Inspect the shaker shaft bearing for rough rotation, and/or looseness. There may be up to .006" clearance between the auger shaft OD and the bearing ID. This is normal. Replace as required.***

    ♦ ***Note the relationship of the stamped portion of the retainer to the separator side sheet to aid in reassembly.***

LEFT HAND SIDE AUGER BED/SHAKER DRIVE SYSTEM DISASSEMBLY

1. Remove the 5/8" x 4 3/4" bolt in the left hand pitman arm small end.

    ♦ ***Note the position of the washers for reassembly.***
2. Remove the 3/4" self-locking nut and washer on the end of the auger bed shaft.
3. Remove the left shaker shaft pitman arm assembly from the shaker shaft.

    ♦ ***Inspect the shaker shaft pitman arm drive cam. There must be two internal retaining rings and a flat washer in the hex shaft spline. They are used to position the drive cam and shaker shaft pitman arm to the end of the hex shaft.***

    ♦ ***Inspect the shaker shaft ball bearing for rough rotation, and/or looseness. Replace as required.***

    ♦ ***There must be two large retaining rings positioning the bearing in the pitman arm.***

    ♦ ***Inspect the shaker shaft rubber bushing for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***

    ♦ ***If replacement is required, note bushing positioning in the arm prior to removal so that replacement bushing is installed to the same depth. . Press bushing through chamfer side only. Apply load to outer sleeve of bushing only. Reference figure 4 for proper bushing placement.***
4. Remove the Woodruff key from the shaker drive shaft.
5. If required, remove the left hand auger bed/shaker shaft bearing by removing the shaker shaft bearing retainer and bearing flange hardware.

    ♦ ***Do not remove the bearing retainer or bearing flange and/or shaft assembly with retaining plates unless needed. The bearing retainer and bearing flange locate the auger bed shaker shaft to the machine both vertically and horizontally which can effect pitman arm positioning.***

    ♦ ***If removal of a bearing retainer is necessary, perform the following additional steps before removal:***

    1. Scribe the original location of the retainer on the outside of the separator side sheet.

    2. Using the reference bolt repositioned at the rear of the separator before, measure the distance from the centerline (or rear flat side) of the auger shaft to the mark on the same separator side sheet. <u>Record this measurement.</u>

♦ ***Inspect the shaker shaft bearing for rough rotation, and/or looseness. There may be up to .006" clearance between the auger shaft OD and the bearing ID. This is normal. Replace as required.***

♦ ***Note the relationship of the stamped portion of the retainer to the separator side sheet to aid in reassembly.***

AUGER BED/SHAKER DRIVE SHAFT AND/OR CENTER BEARING DISASSEMBLY

1. Loosen all auger bed drive gear clamps and the clamp on the inside of the right hand auger bed drive shaft bearing.
2. Loosen the center bearing flange and support hardware from the auger bed.
3. Remove the auger bed/shaker drive shaft. As you are removing the shaft, keep the auger bed drive gears with the respective shafts.

♦ ***Do not remove both the left and right shaker shaft bearing retainers unless necessary. The bearing retainers and bearing flanges locate the auger bed shaker shaft to the machine both vertically and horizontally which can effect pitman arm positioning. See right or left hand side auger bed/shaker shaft drive system disassembly for specific actions and measurements needed prior to removal!***

AUGER BED/SHAKER DRIVE SHAFT AND/OR CENTER BEARING ASSEMBLY

1. Loosely install the left and right bearing retainers, bearings and flanges on each side of the separator side sheet, if required.
2. Install the auger bed/shaker drive shaft through the left separator side sheet.
3. Loosely install the auger bed drive gears, drive gear clamps and center bearing into their original locations.
4. Loosely assemble the center bearing support to the combine.
5. Position and secure the left and right bearing retainers using the scribe marks on the separator side sheets made earlier, if removed.
6. Secure the left and right bearing flanges to the bearing retainers.

♦ ***The following is a critical measurement procedure! Read steps 7-10 <u>before proceeding!</u>***

7. Inside the separator side sheets, measure the distance from the center line (or flat side) of the auger bed drive shaft on the *left side to the mark made earlier at the back of the left separator sheet.* The measurement must be the same as originally recorded. Adjust the bearing flange position (or bearing retainer) as required until this measurement is the same.
   Inside the separator side sheets, measure the distance from the center line (or flat side) of the auger bed drive shaft on the *right side* to the mark made earlier at the back of the *right* separator sheet. The measurement must be the same as originally recorded. Adjust the bearing flange position (or bearing retainer) as required until this measurement is the same.
8. Now *carefully* measure from the center line (or flat side) of the auger bed drive shaft on the *left* side to the rear mark on the *right* separator side sheet. Record this measurement.
9. *Carefully* measure from the center line (or flat side) of the auger bed shaft on the *right* side to the mark above the repositioned bolt on the *left* separator side sheet. Verify that the right hand shaft clamp next to the bearing is positioned out of the way. Record this measurement.
10. The two measurements taken above form an "X" pattern.

♦ ***<u>The measurements taken in steps 9 and 10 must be identical!</u> If the measurements are not identical, the effective plane the pitman arms are working in will form a parallelogram in relationship to the sieves and sieve drive system. This will contribute to a repeat low hour failure if not corrected!***

11. Reposition one bearing flange at a time (starting with the left) until the measurements are identical.
12. When both dimensions are identical, torque all retainer and bearing flange hardware to 35-42 lb. ft. (47-57 Nm).

13. With the center bearing flange bolts torqued to the center bearing auger drive support, check for clearance between the support and the rear of the auger bed. Use washers if needed between the support and the auger bed to position the center bearing support so there is no side loading of the auger bed shaft.
14. Rotate the auger bed drive shaft so that the keyway is straight up.
15. Install the left side Woodruff key on to the auger shaft.
16. Align the keyway and install the left hand pitman arm assembly onto the auger bed drive shaft. Install the shaker cam washer and new self-locking nut. Torque to 100-125 lb. ft. (135-170 Nm).
17. Install the 1- 13/32" x 2- 1/4" x 7/64" flat washer on the right side auger shaft.
18. Install the right side Woodruff key on to the auger shaft.
19. Align the keyway on the drive cam with the key and install the right hand pitman arm assembly onto the auger drive shaft.
20. Install the shaker shaft ratchet clutch assembly onto the drive cam (aligning the drive tabs) and auger drive shaft.
21. Install the auger bed shaker shaft clutch ratchet hub onto the auger shaft, (aligning the drive tabs).
22. Install the auger bed shaker shaft drive slip clutch spring, and special slip clutch retaining washer.
23. Install and tighten the first jam nut until the slip clutch spring length is 89 mm. Secure the second jam nut against the first. Torque to 90-100 lb. ft (122-135 Nm).
24. Install the shaker drive shaft spring cover.
25. While pulling the shaker drive shaft to the left, slide the auger bed clamp for the right hand auger bed bearing against the right hand auger bed drive shaft bearing and tighten. Torque to 40-50 lb. ft. (54-68 Nm).
26. Move each auger bed drive gear into mesh with the auger bed driven gear.
27. Turn the drive gear back and forth. Adjust the clearance between the gears. Set the backlash at .060" - .230" (1.5 - 6.1 mm) when measured at the outside diameter of the grain bed auger flighting. This measurement must be within specifications when the bevel drive gear end play is .030" (0.8 mm). The auger bed shaft must turn freely after adjustment.
28. Tighten the auger drive gear clamp to the shaft. Torque to 40-50 lb. ft. (54-68 Nm). Repeat for the remaining gears.
29. Rotate the shaft and check for binding, etc. Correct as required.

FRONT HANGER "C" CHANNEL SUPPORT REMOVAL

- ***The following is a critical measurement procedure!***

1. On the outside of the right separator sheet, *carefully* measure the distance from the center of the hanger arm pivot shaft to the right front separator post. Record this measurement.
2. On the outside of the left separator sheet, *carefully* measure the distance from the center of the hanger arm pivot shaft to the left front separator post. Record this measurement.
3. Remove the right front hanger "C" support channel with chaffer front control lever attached from the separator side sheet.

   - ***Inspect the channel and the weld of the sleeve to the "C" channel for cracking. Replace as required.***

4. Remove the chaffer front control lever from the front hanger "C" support channel.
   - ***Inspect the needle bearings and seals in the sleeve for damage. Replace as required.***
   - ***Note position of washers as the shaft is removed to aid in reassembly.***
   - ***Inspect the lever rubber bushing for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***
   - ***If replacement is required, note bushing positioning in the lever prior to removal so that replacement bushing is installed to the same depth. Press bushing through chamfer side only. Apply load to outer sleeve of bushing only. Reference figure 5 for proper bushing placement.***
5. Reassemble the chaffer front control lever to the front hanger "C" support channel.
   - ***Install the washers in the same position as original removed.***
6. - ***Torque a new locknut to 100-125 lb. ft (135-170 Nm) on the hanger shaft.***
7. Reinstall the right front hanger "C" support channel assembly on to the separator side sheet.
   - ***Tighten the top bolts first, then the bolts on the side. Tighten the bolt, not the nut. Refer to figure 3.***
8. Repeat the above procedure (steps 3-6) for the left hand chaffer front control lever, hanger arm shaft and "C" channel.

   - ***The following is a critical measurement procedure! Read steps 9-13 before proceeding!***
9. On the outside of the right separator sheet, verify the distance from the center of the hanger arm pivot shaft to the right front separator post is the same the original measurement recorded.
10. On the outside of the left separator sheet, verify the distance from the center of the hanger arm pivot shaft to the left front separator post is the same the original measurement recorded.
11. Inside the separator, now *carefully* measure from the center line of the hanger arm pivot shaft on the *left* side to the rear mark on the *right* separator side sheet. Record this measurement.
12. *Carefully* measure from the center line of the hanger arm pivot shaft on the *right* side to the mark on the *left* separator side sheet. Record this measurement.
13. The two measurements taken above form an "X" pattern.
    - ***The measurements taken in steps 11 and 12 must be identical! If the measurements are not identical, the effective operational stroke the levers are working in will not be the same. This will form a parallelogram in relationship to the sieves and sieve drive system. This will contribute to a repeat low hour failure if not corrected! Correct as required before continuing! Redrilling of the mounting holes may be required.***
14. Position one front hanger "C" support channel at a time until the measurements are identical.
15. When both dimensions are identical, first torque the 1/2" bolts on top of the channel first to 80-96 lb. ft. (109-130 Nm). Then torque each front hanger "C" support 1/2" side bolts to 80-96 lb. ft. (109-130 Nm). Torque the 5/16" hardware to 17-21 lb. ft. (23-28 Nm).
    - ***Tighten the bolt, not the nut.***
    - ***This torque procedure insures the front hanger "C" channel is properly positioned to the separator side sheet.***
16. Repeat this procedure for the other front hanger "C" support channel.

CHAFFER REAR HANGER LEVER

1. Remove the 5/8" x 4" bolt from the right rear chaffer hanger lever to the separator side sheet on the right side of the machine.
   - ***Note position of washers as the bolt is removed to aid in reassembly.***
   - ***Inspect the lever rubber bushings for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***
   - ***If replacement is required, note bushing positioning in the lever prior to removal so that replacement bushings are installed to the same depth. Press bushing through chamfer side only. Apply load to outer sleeve of bushing only. Reference figure 7 for proper bushing placement.***
2. Reinstall the right rear chaffer hanger lever to the separator side sheet.
   - ***Insure that the washers are installed in their original position as noted earlier.***
   - ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. Do not torque the bushing at this time!***
3. Repeat the above procedure (steps 1-2) for the left rear chaffer hanger lever.

CHAFFER RAIL FRAME ASSEMBLY

1. Inspect the chaffer rail frame assembly.
   - ***Inspect the welding around the sleeve for the front and rear mounting bolt hole for damage on each chaffer rail. Replace as required.***
   - ***Inspect the rear cross brace for cracking or damage. Replace as required.***
   - ***Insure all chaffer rail frame hardware is present and properly torqued.***

   - ***The following is a critical measurement procedure!***
2. Using a suitable measuring device:
   - Measure the distance between *outside* of the front chaffer rail mounting bolt hole sleeves going through the sleeves, outside to outside. Record this measurement.
   - Measure the distance between *outside* of the rear chaffer rail mounting bolt hole sleeves going through the sleeves, outside to outside. Record this measurement.

SHOE FRONT HANGER LEVER ASSEMBLY

1. Remove the right shoe front hanger lever assembly from the separator side sheet.
   - ***Note position of washers as the carriage bolt is removed from the separator side sheet to aid in reassembly.***
   - ***Inspect the front hanger shoe lever rubber bushing for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***
   - ***If replacement is required, note bushing positioning in the lever prior to removal so that replacement bushings are installed to the same depth. Press bushing through chamfer side only. Apply load to outer sleeve of bushing only. Reference figure 6 for proper bushing placement.***
2. Reinstall the shoe front hanger lever to the separator side sheet.
   - ***Insure that the washers are installed in their original position as noted earlier.***
   - ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. Do not torque the bushing at this time!***
3. Repeat the above procedure (steps 1-2) for the left shoe front hanger lever assembly.

REAR SHOE CONTROL LEVER ASSEMBLY

1. Remove the right rear shoe control lever and connector link assembly from the separator side sheet.
   - ***Note position of washers as the lever and link is removed from the separator side sheet and disassembled to aid in reassembly.***
   - ***Inspect the rear shoe control lever and link rubber bushings for severe rips, tears, or pieces of rubber coming out. Small tears or rips in the bushing does not necessitate bushing replacement. However small pieces of rubber coming out is cause for bushing replacement.***
   - ***If replacement is required, note bushing positioning in the lever prior to removal so that replacement bushings are installed to the same depth. Reference figure 9 for proper bushing placement.***
2. Reinstall the right rear shoe control lever and connector link assembly to the separator side sheet. Tighten the lever mounting to separator sheet hardware
   - ***Insure that the washers are installed in their original position as noted earlier.***
   - ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. Do not torque the bushing at this time!***
3. Repeat the above procedure (steps 1-2) for the left rear shoe control lever and connector link assembly.

SHOE RAIL FRAME ASSEMBLY

1. Inspect the shoe rail frame assembly.
   - ***Inspect the welding around the sleeve for the front and rear mounting bolt hole for damage on each shoe rail. Replace as required.***
   - ***Inspect the shoe return pan for cracking or damage. Replace as required.***
   - ***Insure all shoe rail frame hardware is present and properly torqued.***
   - ***The following is a critical measurement procedure!***
2. Using a suitable measuring device:
   - Measure the distance between *outside* of the front shoe rail mounting bolt hole sleeves going through the sleeves, outside to outside. Record this measurement.
   - Measure the distance between *outside* of the rear shoe rail mounting bolt sleeves going through the sleeves, outside to outside. Record this measurement.

ASSEMBLY OF THE CLEANING SYSTEM

SHOE RAIL FRAME

- ***The following is a critical measurement procedure!***

1. Using a suitable measuring device, measure (inside the separator):
   - The distance between *inside edge* of the right front shoe hanger lever bushing sleeve to the *inside edge* of the left front shoe hanger lever bushing sleeve. Record this measurement.
   - ***The locknut should be tightened on the carriage bolt such that there is no looseness evident in the hanger assemblies before making this measurement.***
2. Compare this reading to the recorded measurement of the distance between the *outside* of the front shoe rail frame mounting bolt hole sleeves going through the sleeves, outside to outside.
   - ***The distance recorded in step 1 MUST BE greater than the distance measured in step 2.***
   - ***IF THE DISTANCE IN STEP 1 IS LESS THAN THE DISTANCE IN STEP 2, THE FRONT HANGER LEVER BUSHINGS WILL BE SIDE LOADED WHEN THE SHOE RAIL FRAME IS INSTALLED and will contribute to a repeat low hour failure! Correct by adding or removing the washers on the hanger arm shafts carriage bolts (as required) to obtain clearance. Hanger levers must be parallel to the separator side sheet. Add or remove washers evenly on both ends of the lever mounting.***

3. Repeat the above procedure for the rear shoe control levers.

4. Install the shoe rail frame into the machine.
5. Install the 5/8" x 5" bolts into the shoe front hanger levers on the right and left side.
   ♦ ***Insure that the washers are installed in their original position as noted during disassembly.***
   ♦ ***Once the shoe frame rail is positioned into the separator housing, reposition the washers as needed to center the shoe frame rails between the separator side sheets.***
   ♦ ***Install a <u>new</u> 5/8" locknut and <u>lightly</u> seat the locknut against the bushing. <u>Do not torque the bushing at this time!</u>***
6. Install the 5/8" x 6" bolts into the rear shoe hanger levers on the right and left side.
   ♦ ***Insure that the washers are installed in their original position as noted during disassembly.***
   ♦ ***Once the shoe frame rail is positioned into the separator housing, reposition or add washers as required to center the shoe frame rails between the separator side sheets.***
   ♦ ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. Do not torque the bushing at this time!***

CHAFFER RAIL FRAME

♦ ***The following is a critical measurement procedure!***

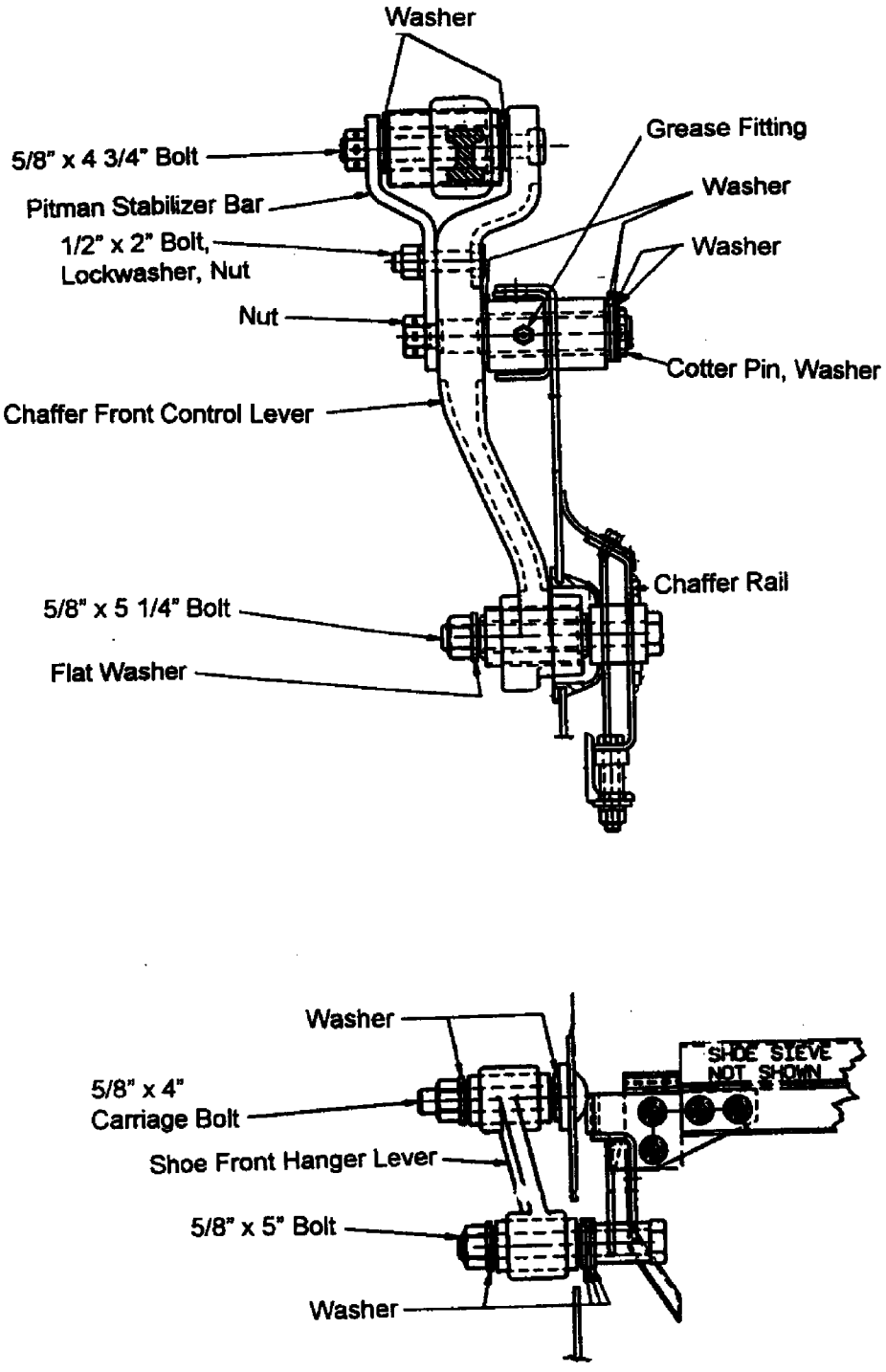
1. Using a suitable measuring device, measure (inside the separator):
   - The distance between *inside edge* of the right chaffer front control lever bushing sleeve to the *inside edge* of the left chaffer front control lever bushing sleeve. Record this measurement.
   ♦ ***The locknut should be torqued as indicated earlier and the cotter pin and washers installed such that there is no looseness evident in the hanger assemblies before making this measurement.***
2. Compare this reading to the recorded measurement of the distance between *outside* of the front chaffer rail frame mounting bolt hole sleeves going through the sleeves, outside to outside.
   ♦ ***The distance recorded in step 1 MUST BE greater than the distance measured in step 2.***
   ♦ ***IF THE DISTANCE IN STEP 1 IS LESS THAN THE DISTANCE IN STEP 2, THE FRONT HANGER LEVER BUSHINGS WILL BE SIDE LOADED WHEN THE CHAFFER RAIL FRAME IS INSTALLED and will contribute to a repeat low hour failure! Add or remove washers on the hanger arm pivot shafts (as required) to obtain clearance.***
3. Repeat the above procedure for the rear chaffer control levers.
4. Install the chaffer rail frame into the machine.
5. Install the 5/8" x 5 1/4" bolts into the front chaffer control levers on the right and left side.
   ♦ ***Insure that the washers are installed in their original position as noted during disassembly.***
   ♦ ***Once the chaffer rail frame is positioned into the separator housing, reposition the washers on the hanger arm pivot shafts as needed to center the chaffer frame rails between the separator side sheets.***
   ♦ ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. Do not torque the bushing at this time!***
6. Install the 5/8" x 7" bolts into the rear chaffer control levers on the right and left side.
   ♦ ***Insure that the washers are installed in their original position as noted during disassembly.***
   ♦ ***Once the chaffer frame rail is positioned into the separator housing, reposition the washers as required to center the chaffer frame rails between the separator side sheets.***
   ♦ ***Install a new 5/8" locknut and lightly seat the locknut against the bushing. If the chaffer rail deflects as the locknut is being tightened, remove the locknut and add sufficient washers to correct. Do not torque the bushing at this time!***

FINAL ASSEMBLY

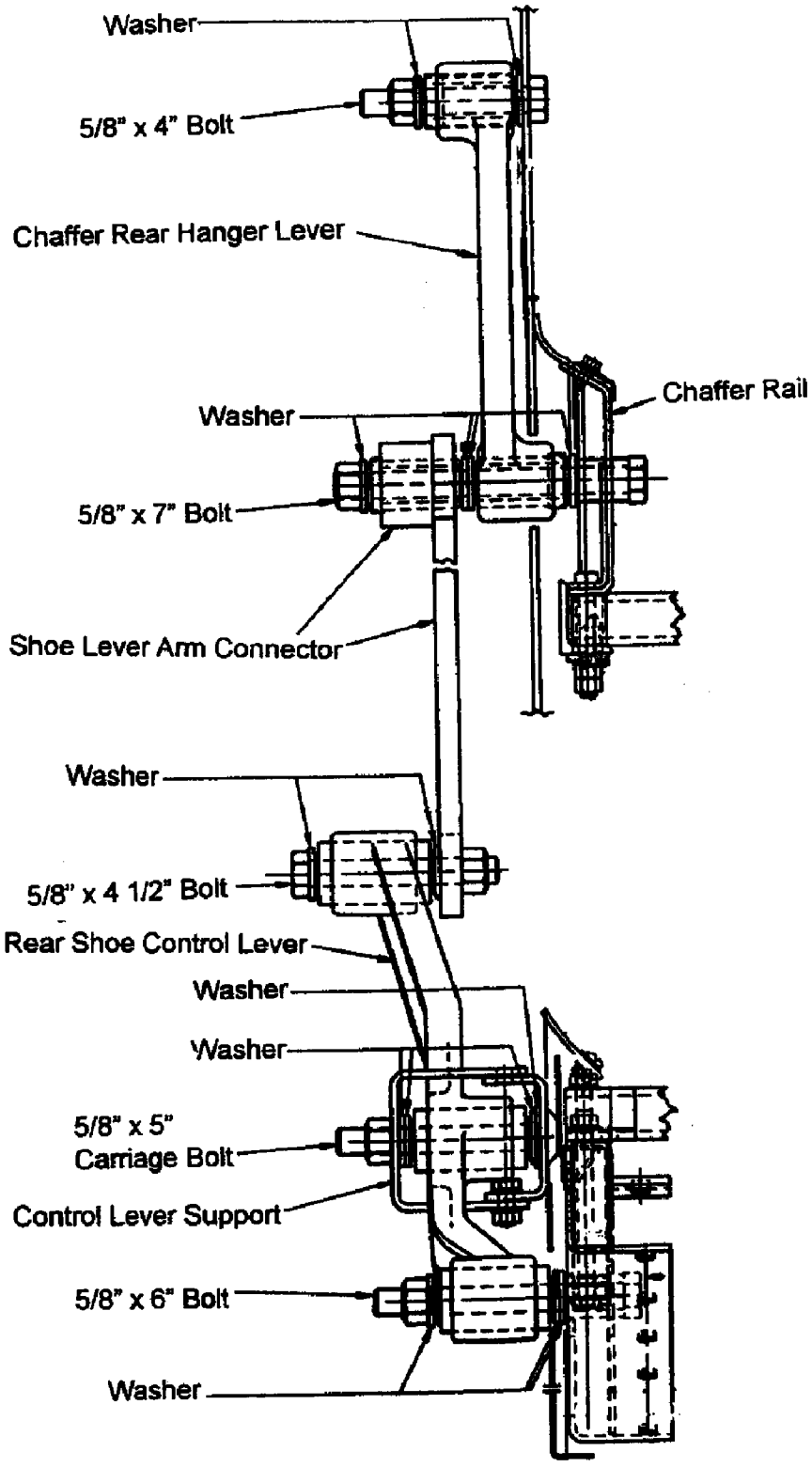
1. Align and lower the left pitman arm into the left chaffer front control lever.
   - ***DO NOT FORCE THE PITMAN ARM PAST THE CHAFFER LEVER! THIS WILL SIDE LOAD THE PITMAN ARM AND CHAFFER LEVER and will contribute to a repeat low hour failure! Correct by repositioning the washers on the hanger arm shaft bolt (as required) to obtain clearance. Holes for the pitman arm and lever must line up.***
   - ***Torque the 1/2 x 2" bolt for the pitman arm stabilizer bar to 52-59 lb. ft. (71-79 Nm). Position the washers for the pitman arm to chaffer lever bushing bolt as required to fill any remaining opening between the pitman arm, chaffer lever bushing and pitman stabilizer bar.***
3. Install the 5/8" x 4 1/4" pitman arm to chaffer lever bolt. Lightly snug the 5/8" nut for the bolt.
4. Repeat the above procedure (steps 1-3) for the right pitman arm.
5. Rotate the cleaning system until the system is at the end of a chaffer forward stroke.
   - ***Verify that none of the cleaning system bushings and/or levers contact the separator sheets at the end of the strokes.***
6. Using the lower rear side of the front chaffer control lever as a reference guide, mark the outside of the separator sheet.
7. Rotate the cleaning system until the system is at the end of a chaffer rearward stroke.
8. Using the lower rear side of the left hand front chaffer control lever as a reference guide, mark the outside of the separator sheet.
9. Identify and mark the center point of the cleaning system stroke.
   - ***This point may not be the center of the lever slot.***

   - ***The following is a critical measurement procedure!***
11. Rotate the cleaning system until the rear of the chaffer control lever is at the center mark. *Holding the cleaning system in this position,* torque all 5/8" hardware to 100- 125 lb. ft. (135-170 Nm) on each side of the machine.
    - ***DO NOT EXCEED THE TORQUE SPECIFICATION LISTED! Exceeding the torque specification will distort the inner bushing sleeve and will contribute to a repeat low hour failure!***
12. Manually rotate the cleaning system through several complete revolutions checking for any unusual binding. Identify and correct any issues.
    - ***Verify that none of the cleaning system bushings or levers contact the separator sheet slot at the end of the strokes. Modification of the separator sheets cleaning system lever slots may be required to correct contact issues.***
13. Inspect the shoe sieve. Replace as required.
14. Install the shoe sieve in to the shoe rail frame.
    - ***When installing the shoe sieve, it should not require unnecessary force!***
15. Install the mounting bolts. Install the two nuts on each side of the shoe sieve. OR Install the two bolts holding the shoe rail plate on each side.
16. Inspect the chaffer sieve. Replace as required.
17. Install the chaffer sieve in to the chaffer rail frame.
    - ***When installing the chaffer sieve, it should not require unnecessary force!***
18. Install the rear axle shield. Close the tailings auger trough door.
19. Install the chaffer sieve mounting bolt and the support angle mounting bolt on each side of the support angles and the sieve.
20. Connect the grain scan harness connector on the left hand side of the machine. Install the clip that holds the grain scan harness to the side shield.
21. Install the straw spreader rear deflector and rubber strip if equipped.
22. Install the straw spreaders.
23. Install the straw spreader drive belt.
24. Install the 25" pulley on the auger bed/shaker shaft.
25. Install the elevator drive belt.

26. Tension the straw spreader belt until the nuts on the tension rod are tight against the tube. Loosen the nuts just enough to permit the spacer to turn.
27. Tension the elevator drive belt until the nuts on the tension rod are tight against the tube. Loosen the nuts just enough to permit the spacer to turn.
28. Install the necessary shielding on the right side of the machine.
29. Operate the machine at *idle.* Carefully inspect ALL levers for being very close to/or contacting the end of the slot in the separator side sheet.
    - ***The levers cannot contact the slots or a repeat system failure will occur! If required, use a suitable tool to modify the ends of the slots to provide sufficient clearance for levers to operate inside the separator side sheets. Add washers to position levers outward for levers that can operate outside the separator side sheets.***
30. Operate the machine at *high idle*. Carefully inspect ALL levers for being very close to/or contacting the end of the slot in the separator side sheet.
    - ***The levers cannot contact the slots or a repeat system failure will occur! If required, use a suitable tool to modify the ends of the slots to provide sufficient clearance for levers to operate inside the separator side sheets. Add washers to position levers outward for levers that can operate outside the separator side sheets.***
31. Operate the machine at high idle. Using an ***known accurate*** tachometer, verify the speed of the auger bed/shaker drive shaft.
    - ***The speed of the shaft must not be greater than 280 rpm! Speeds in excess of 280 rpm will contribute to a repeat low hour failure!***



Front Cleaning Sytem Drives
Figure 1



Rear Cleaning System Drives
Figure 2

LEFT SIDE SHOWN

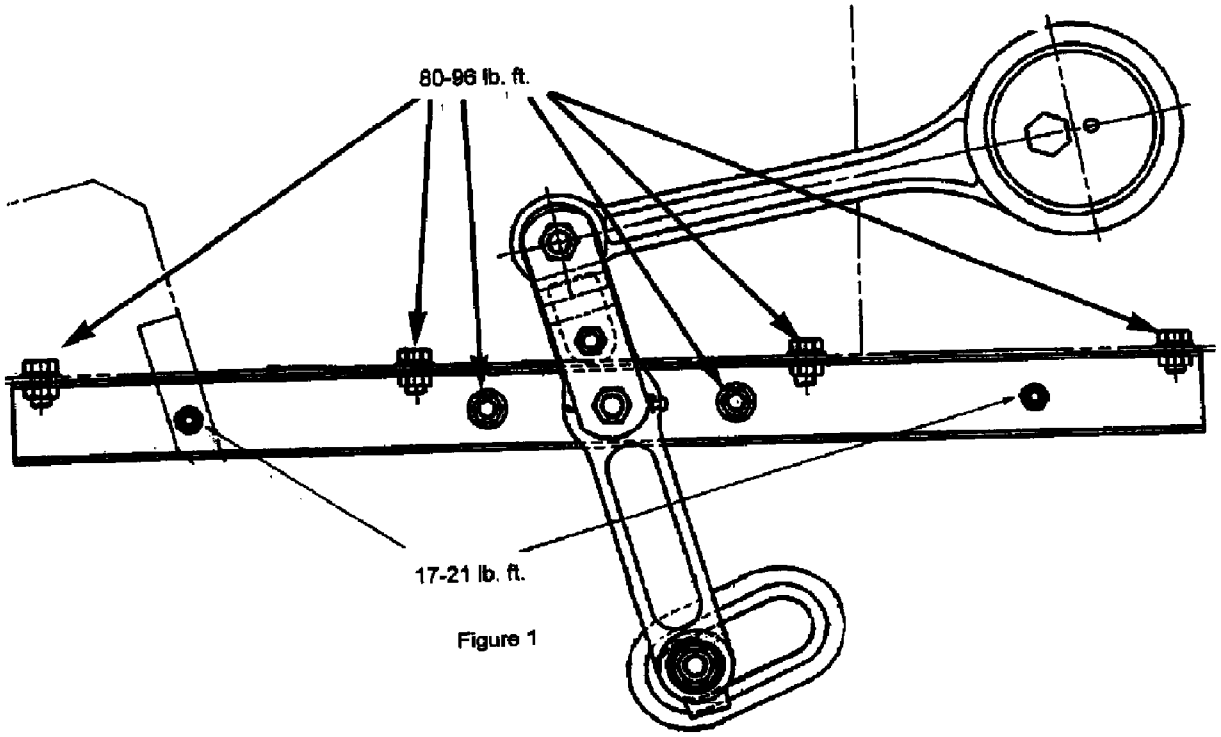


Figure 1

Front Hanger "C" Channel Support
Figure 3

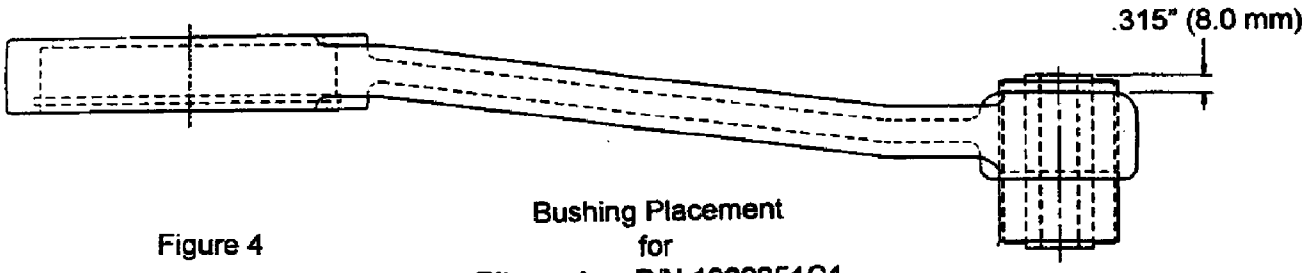


Figure 4 Bushing Placement
for
Pitman Arm P/N 1989251C1

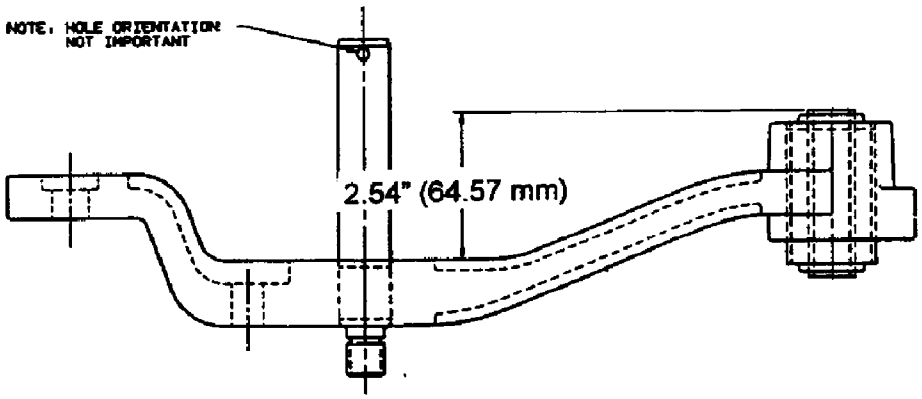


Figure 5

Bushing Placement
for
Chaffer Front Control Lever (P/N 1957467C3)

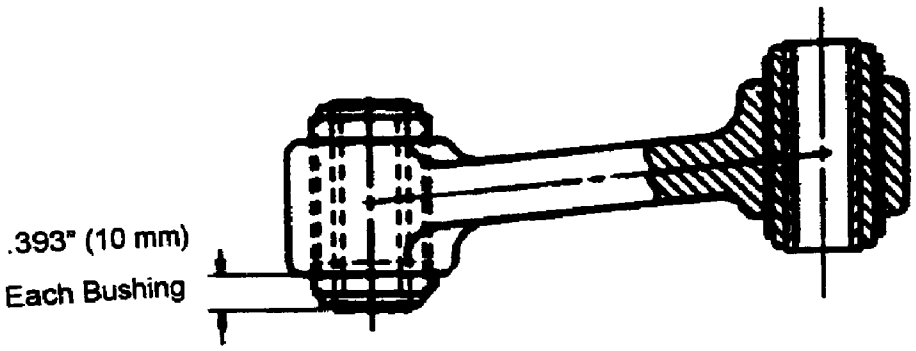


Figure 6 Bushing Placement
for
Shoe Front Hanger Lever (P/N 1957450C1)

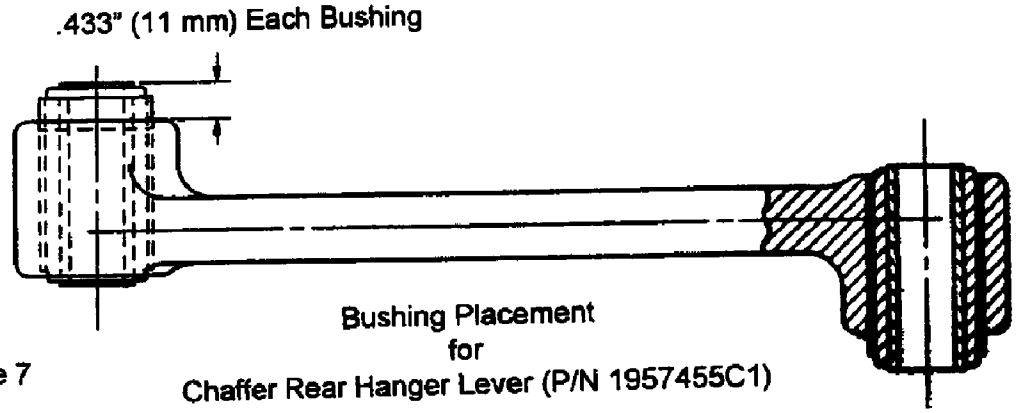


Figure 7 Bushing Placement for Chaffer Rear Hanger Lever (P/N 1957455C1)

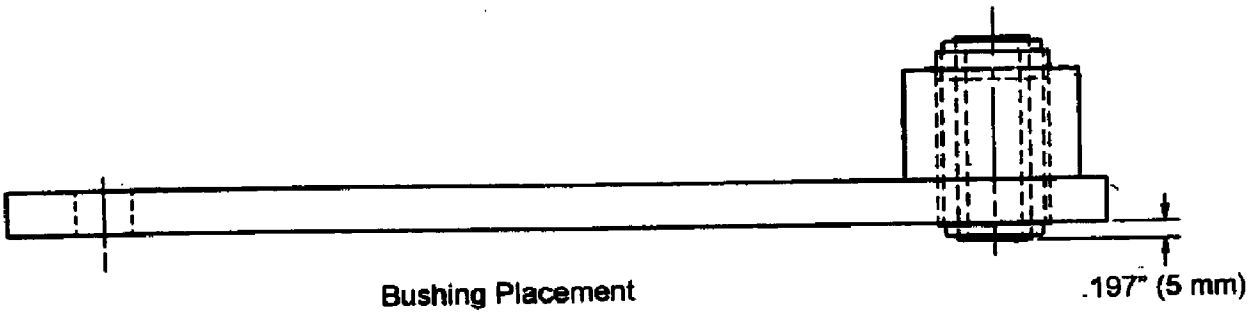


Figure 8 Bushing Placement for Shoe Lever Arm Connector (P/N 1330357C1)

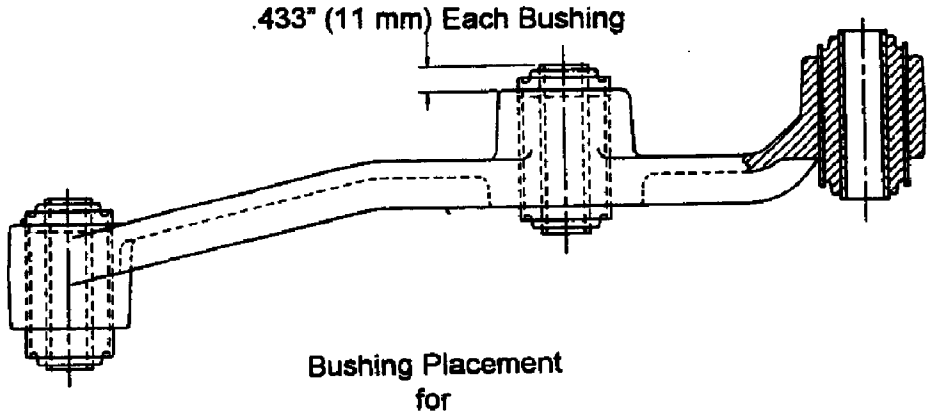


Figure 9 Bushing Placement for Rear Shoe Control Lever (P/N 1957460C2)