

Reconditioning the G-8C and G-8D Head

Scope

Reconditioning a G-8C or G-8D head requires the replacement of the following components

1. Bearings
2. Rubber buffer
3. All gaskets, seals and “O” rings

Repair or replacement of the following components may also be required after inspection

1. Head spindle
2. Head half coupling
3. Bearing housing
4. Ball seat
5. Oil scoop
6. Water scoop
7. Brake drum

Preparation

1. Remove the drain plug and drain the water from the brake drum
2. Remove the drain plug and drain the oil from the head
3. Remove the brake assembly from the head
4. Dismount the head assembly and set on a clean flat surface
5. Clean all components to remove sugar build up, scale, rust and corrosion

Inspection

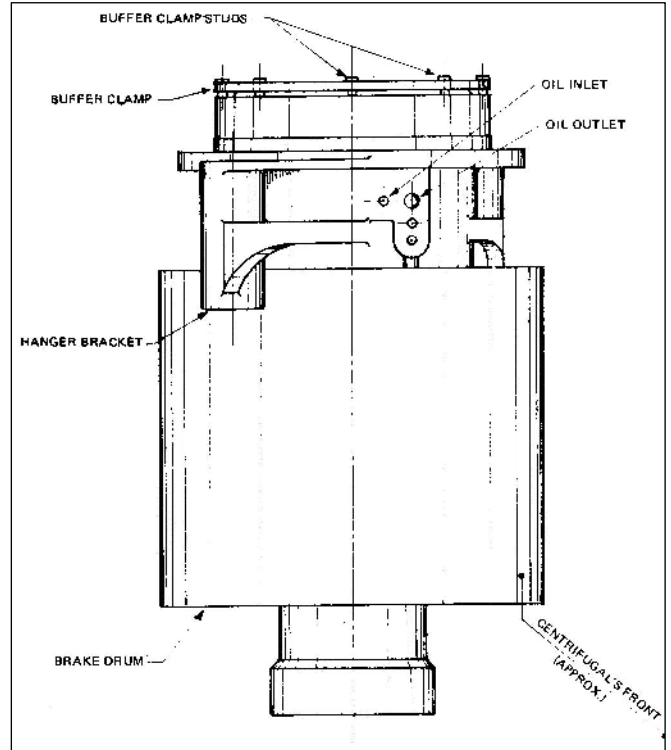
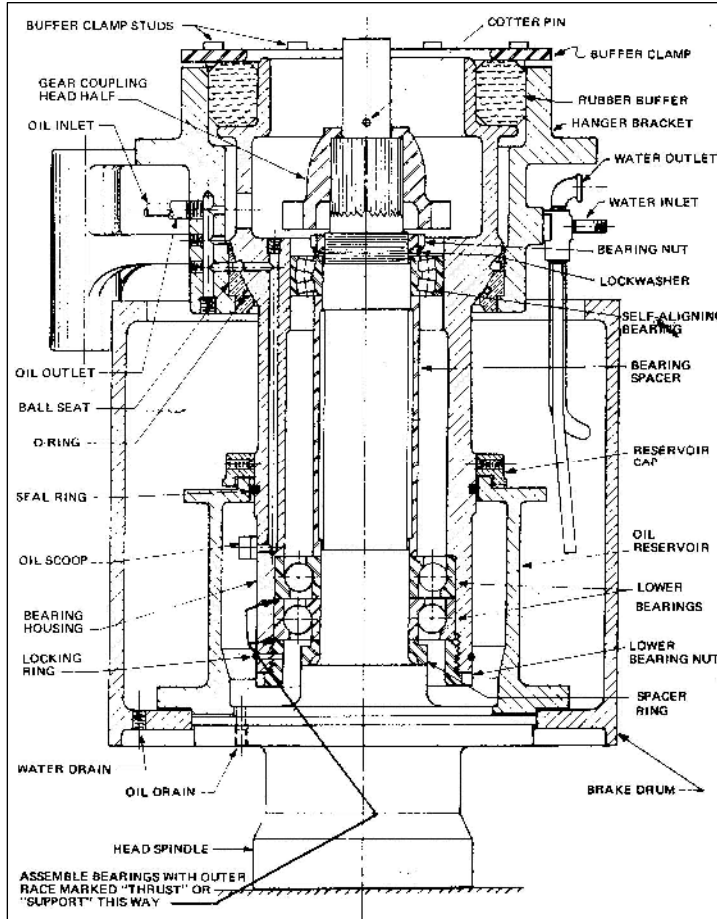
Inspection of the individual parts is done after disassembly.

1. Inspect the head spindle splines and head half coupling for wear.
2. Inspect the head spindle just below the splines for cracks
3. Inspect the ball and ball seat for wear.
4. Inspect the inside and outside of the brake drum for cracks, corrosion and wear.
5. Inspect the leading edge of the water scoop for wear.
6. Inspect the leading edge of the oil scoop for wear..

Disassembly By Steps

CAUTION: The head and its components are very heavy. Be sure to use properly sized supports and lifting equipment.

Figures below show the component part names and locations referred to in the disassembly steps. Other figures include numbers within circles. Circled numbers are referenced in the step by step instructions.



Step 1 (Figure 1)

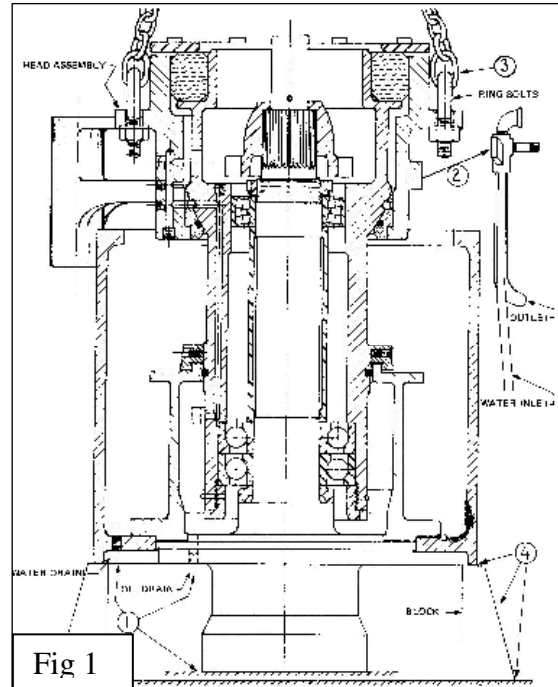
Set the head on a clean, level surface and drain the oil and water if not already drained. (1)

Step 2 (Figure 1)

Remove brake cooling water assembly (2) from the hanger bracket.

Step 3 (Figure 1)

Using ring bolts (3) placed through the hanger bracket mounting holes attach a chain hoist to the head assembly lift it high enough to allow access to the bottom of the brake drum. The brake drum is attached to the head assembly by eight nuts and lockwashers. Using an offset box-end wrench or deep socket remove all but an opposing pair of nuts.



Step 4 (Figure 1)

Lower the head assembly and rest the brake drum on two blocks (4) so that there is three or four inches clearance between the bottom flange and the work surface. Remove the remaining two nuts holding the brake drum.

Step 5 (Figure 2)

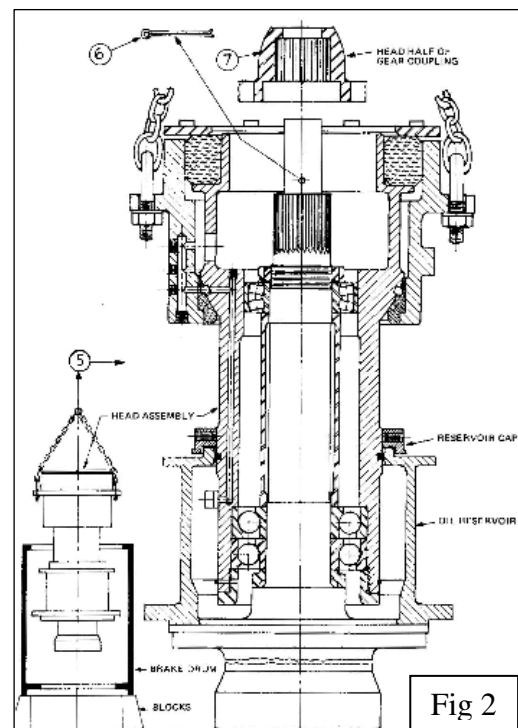
Lift the head assembly out and away from the brake drum (5) leaving the brake drum resting on the blocks. Set the head assembly down on the work surface. The oil reservoir and reservoir cap will now be exposed

Step 6 (Figure 2)

Looking at the top of the head spindle, locate and remove the cotter pin (6) which holds in place the head half coupling. (7)

Step 7 (Figure 2)

Remove the head half coupling. This is a press fit and will require a pulled to remove.



Step 8 (Figure 3)

The reservoir cap (8) is held in place by four socket head set screws located 90 degrees from each other. Loosen the set screws and slide the reservoir cap upward until it touches the bottom of the hanger assembly (12). Hold it there by tightening an opposite pair of set screws.

Step 9 (Figure 3)

The oil reservoir is held in place by eight cap screws which pass downward through holes drilled in the lower flange of the reservoir and fasten into the flange of the head spindle. Remove these screws, slide the reservoir free of the seal ring and raise the reservoir up to the reservoir cap. Secure the reservoir by wiring it to the hanger bracket (9).

Step 10 (Figure 3)

Remove the oil scoop (10) located under the lower flange of the raised oil reservoir. Pull the oil reservoir away from the spindle and remove the oil scoop.

NOTE: Be sure to notice in which direction the oil scoop faces. It is possible to reinstalled the oil scoop backward causing the oil system not to work..

Step 11 (Figure 3)

Remove the lower bearing locking spring (11).

CAUTION: Be careful not to break off the “hook” end of the locking spring.

Unscrew the lower bearing nut completely using special tool RL-560420.

Step 12 (Figure 3)

Lift the bearing housing and hanger bracket off of the head spindle assembly.

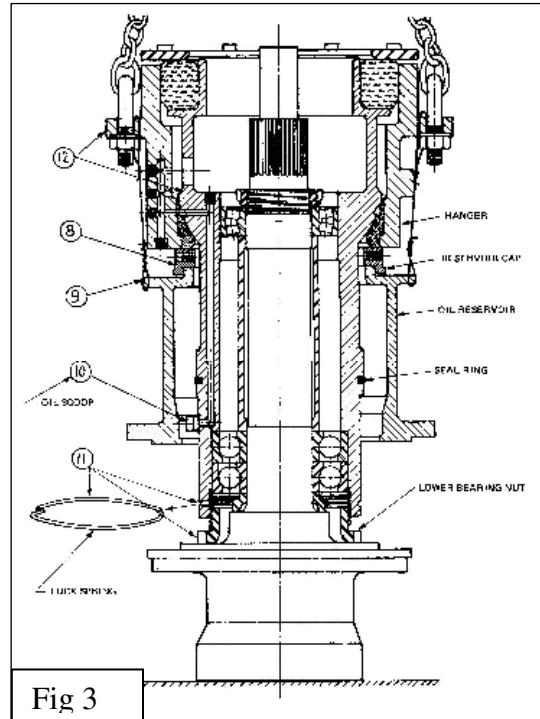


Fig 3

Step 13 (Figure 4)

Loosen the lock washer and remove the upper bearing nut (13).

Step 14 (Figure 4)

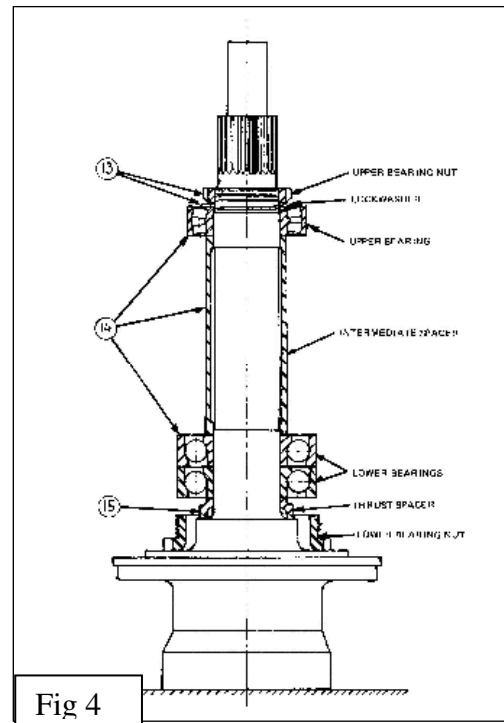
Remove the upper bearing, intermediate spacer and lower bearing (14).

Step 15 (Figure 4)

Remove the spacer under the thrust bearings (15).

Step 16 (Figure 5)

The buffer clamp (16) has eight studs welded to it which project downward through holes in the hanger bracket. The buffer clamp is held in place by eight self-locking nuts. Remove the nuts and lift the buffer clamp away from the assembly.

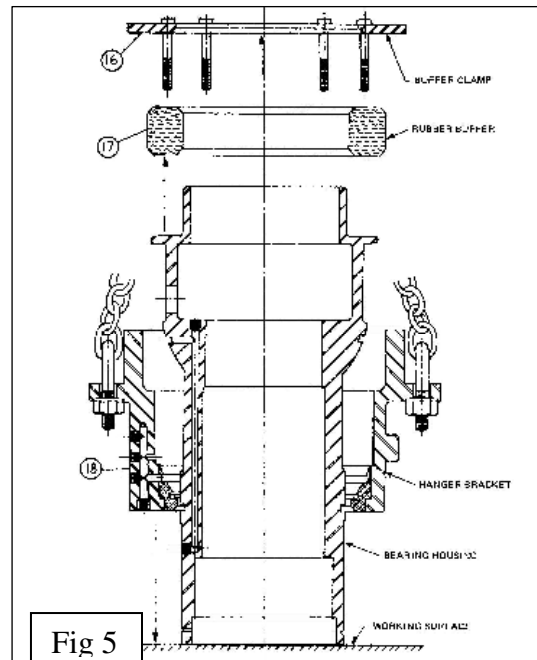


Step 17 (Figure 5)

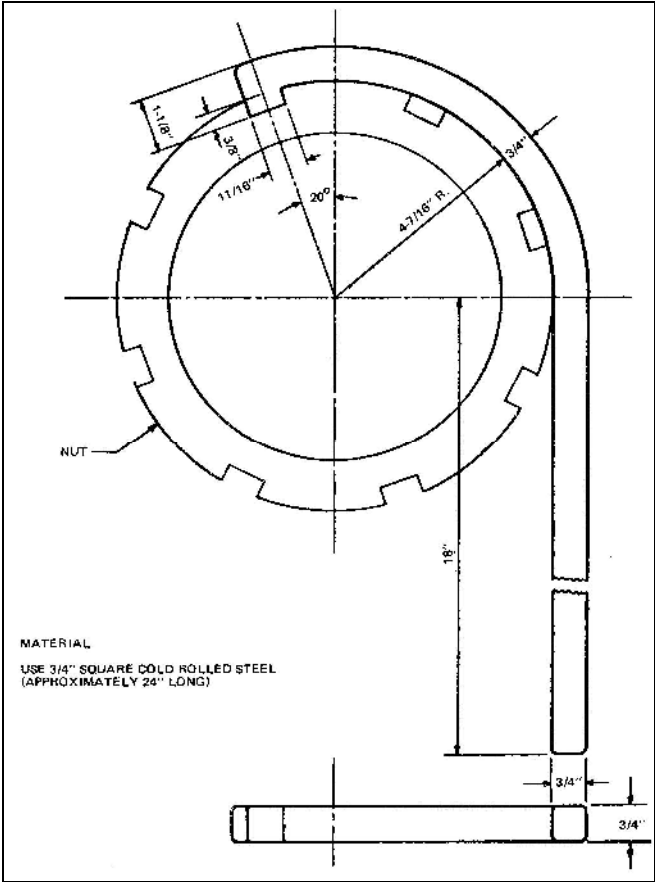
To remove the buffer (17) from the hanger bracket allow a small amount of slack in the hoist chain and press down on the hanger bracket. Repeat these steps until the bracket is clear of the buffer. Remove the buffer.

Step 18 (Figure 5)

Lower the hanger bracket carefully down the outside of the bearing housing until it rests on the working surface. The hoist may now be disconnected.



Special Tools



Special Tool RL-56042 1

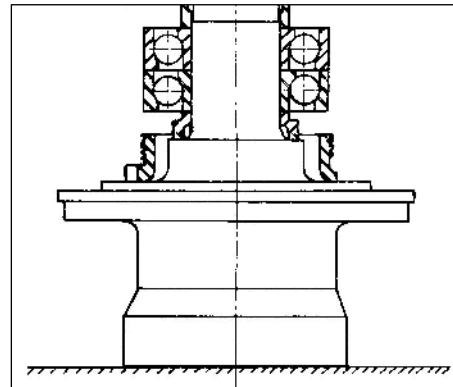
Reassembly Procedures and Practices

General

Reassembly is done in the reverse order of the above steps. Keep in mind once the head is completely assembled the bearings are still exposed. Cover the top of the hanger bracket to prevent foreign material entering the bearings. Inspect the individual components and take any corrective measures before reassembling

Replacing bearings

1. The lower two bearings are thrust bearings and are mounted in tandem. When mounting the thrust bearings, the wide inner flange must face up in order to accept the downward thrust. It is important that the adjoining faces of the races be flush ground. SKF bearings are flush ground both sides. Other bearings are ground on only one side so must be specified for tandem mounting when ordering. Bearing specifically ordered for tandem mounting must be installed in the same relative position as received from the manufacturer.
2. Inspect the bearing journals to be sure they are free of all nicks or burrs.
3. Heat the bearings to 250 to 300 degrees F using an oil bath or induction heater. Place them quickly onto the head spindle being sure they are completely seated.
4. Using a piece of tubing and a press, press the inner race to assure the bearings are firmly seated.



Replacing And Scraping In A Ball Seat

1. Installing the new ball seat
 - 1.1. Completely disassemble the head down to the bare ball of the bearing housing E-601, and the brake support bracket E-600 with the exception of the buffer clamp studs and nuts, and the nut E -613 on the bearing housing. These parts should be put back on for the protection of the threads.
 - 1.2. Be sure the bore in E-600 is clean before pressing seat into place.
 - 1.3. Press the new ball seat E-605 in the brake support bracket. The ball seat is brass and can be pushed out of round when installing. Use caution when pressing the new ball seat into the hanger bracket to make sure even pressure is applied. An old gate face plate can be placed over the ball seat and used to press it into the support bracket.

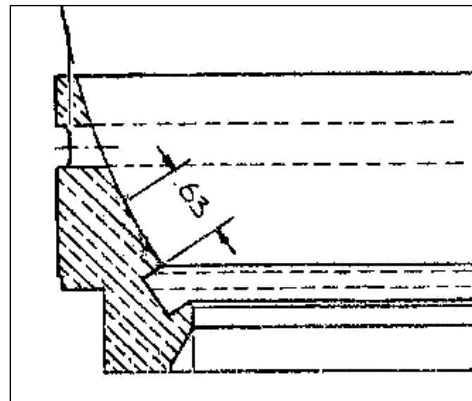
2. Truing up the bearing housing ball

- 2.1. Place bearing housing E-601 in a lathe, true up or polish ball of bearing housing. Be sure it is running true; check with an indicator.

3. Scraping in the new ball seat

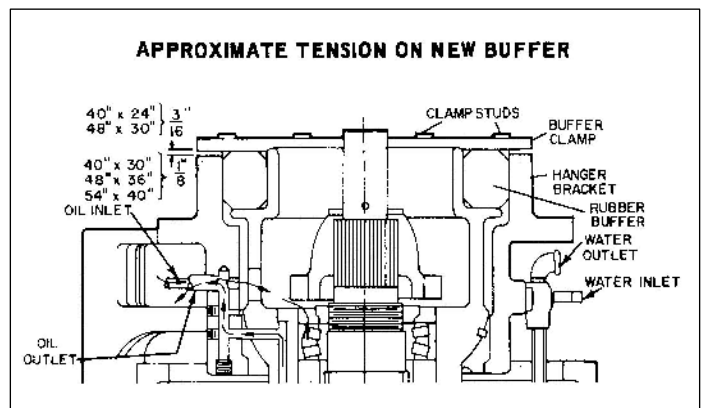
- 3.1. Place brake support -bracket E-600 on a pair of trestles in its normal position. Level up the brake support bracket. Locate trestles in a place where a chain fall or crane will be available.
- 3.2. Make a paste of oil and red lead powder. This will now be referred to as “red lead”.
- 3.3. Wipe the surface of the ball seat clean with a rag and then by hand.
- 3.4. After the ball seat surface has been thoroughly cleaned, a thin coating of “red lead” should be spread over the entire surface of the seat. This is best done by rubbing the “red lead” with a rag and then with the fingers. Be sure that it is evenly distributed in a very thin film and that there are no lumps anywhere.
- 3.5. The same thing as in 3.3 and 3.4 should be applied to the ball of the bearing housing except this time Prussian Blue is used instead of “red lead”
- 3.6. Lift up the bearing housing with a crane or chain fall. Have the hitch (a cable through the bore of the quill connected to a small bar or plate across the nut on the bottom) connected to the lifting device. Be sure your hitch does not damage any part and that it is safe.
- 3.7. Place the ball of the bearing housing very carefully into the ball seat (which is now in the brake support bracket) so the tap hole in the bearing housing is in line with the core hole in the brake support bracket. Screw the stud 5/8” x 1” socket head set screw loosely into the ball. Now take your hands and grasp the lower part of the bearing housing around the nut area. Move quill sideways and in a small circular motion. A few strokes only are necessary. A long continuance of the rubbing operation is unnecessary.
- 3.8. Remove 5/8” x 1” socket head set screw and lift the bearing housing carefully from the brake support bracket. When lifting, be careful to lift it straight up without a dragging motion.
- 3.9. Remove the blue spots from the ball seat, using a scraper (sword or sheep nose) or a small buffing wheel on an air motor. The manner in which these blue spots are distributed will determine the amount of scraping that will be necessary. Each spot should be carefully scraped or buffed, being sure that only a small amount of metal is removed and that each spot is scraped or buffed evenly until all the blue has been removed.

- 3.10. When all the blue spots have been scraped or buffed out, wipe the seat clean with a rag, then blow compressed air and wipe by hand, removing all dirt or chips that may have accumulated.
- 3.11. Repeat these operations 3.4 through 3.10 until the blue spots show that the surface of the seat is true and smooth. The finished surface should show a number of small spots close together and fairly evenly distributed over the lower surface of the ball seat. This is the surface below the horizontal oil groove. The surface above this horizontal oil groove should show no bearing at all. This is for oil clearance so oil can flow through.
- 3.12. When scraping or buffing always scrape or buff on a 45° to the perpendicular plane. Always crisscross the scraping or buffing; first 45° one way, then 45° the other way. This prevents holes being scraped or buffed into the ball seat surface.
- 3.13. The bearing on the ball seat should be a 1/16" above "O" ring groove to 1/16" below oil hole, and clearance from there up so oil will flow down into ball. A good check is to put the bearing housing into the ball seat and pour flushing oil around the top of the seat and see that the oil does not leak through.
- 3.14. If a buffing wheel is used, it is always best to finish scraping by hand. This removes any emery that has been left in the seat. (See Use Of Scrapers appendix)



Replacing the rubber buffer

1. The rubber buffer fits very tightly in the hanger bracket. DO NOT use any lubricant.
2. Note: The buffer for the G8-C and G8-D head is different. They are the same size but a different hardness. Be sure you have the proper buffer before installing
3. Make sure the buffer is completely seated in the hanger bracket.
4. Install the buffer clamp and self locking nuts
5. Buffer compression is different for different size baskets
 - 48" x 30" basket is 3/16"
 - 48" x 36" and 54" x 40" is 1/8"
6. Place properly sized key stock spacers evenly around the perimeter of the hanger bracket between the hanger bracket and buffer clamp.



7. Tighten the self locking nuts until the buffer clamp is drawn down evenly onto the spacers. Remove the spacers.

Installing the bearing housing

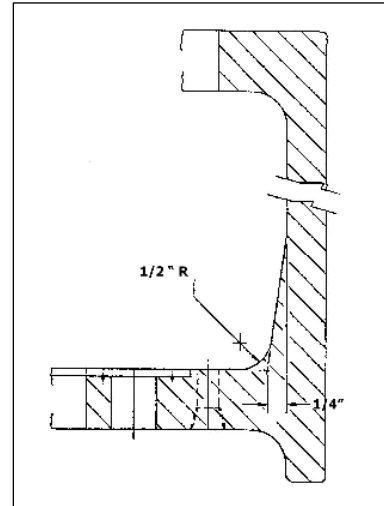
1. When lowering the bearing housing into the hanger bracket be sure alignment bolt is the recess in the hanger bracket.

Installing the oil reservoir and oil scoop

1. When installing the oil scoop be sure the opening of the oil scoop **faces the direction of rotation**.
2. It is important to understand the bearing housing to which the oil scoop is attached is **stationary** and the oil reservoir rotates so it is the oil that is moving. The scoop must face into the direction of rotation.
3. If the leading edge of the oil scoop is worn it should be replaced.
4. When setting the oil reservoir be sure the drain hole in the reservoir lines up with the drain hole in gasket and in the head spindle.

Installing the brake drum

1. Clean the inside of the brake drum to remove dirt and scale.
2. Inspect the brake drum for cracks
3. If the outside surface is damaged the brake drum can be put in a lathe and a light clean-up cut taken. Note the original wall thickness is 9/16" and **minimum** wall thickness is 1/2"
4. Inspect the inside wall for wear or damage. Especially important is the area where the brake drum bottom meets the wall. Note there is additional thickness at the bottom to allow for normal wear and tear.
5. If the inside wall is undercut at the bottom or wall thickness in any one area is less than 1/2" the brake drum must be replaced.



Installing the head half coupling

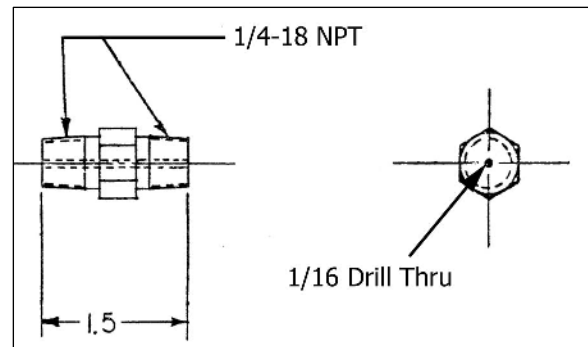
1. The fit between the head half coupling and head spindle is a **press** fit. If the coupling slips easily on and off the head spindle it is an indication of wear. The lead on the spline will allow the coupling to slip easily on for about 1/16" then it has to be pressed. Be sure it is completely seated against the shoulder of the spindle spline.
2. The head spindle splines are induction hardened so the head half coupling is the softer of the two parts and will wear first.
3. If a worn coupling is allowed to remain in service it will damage the spindle splines and the spindle will have to be replaced.

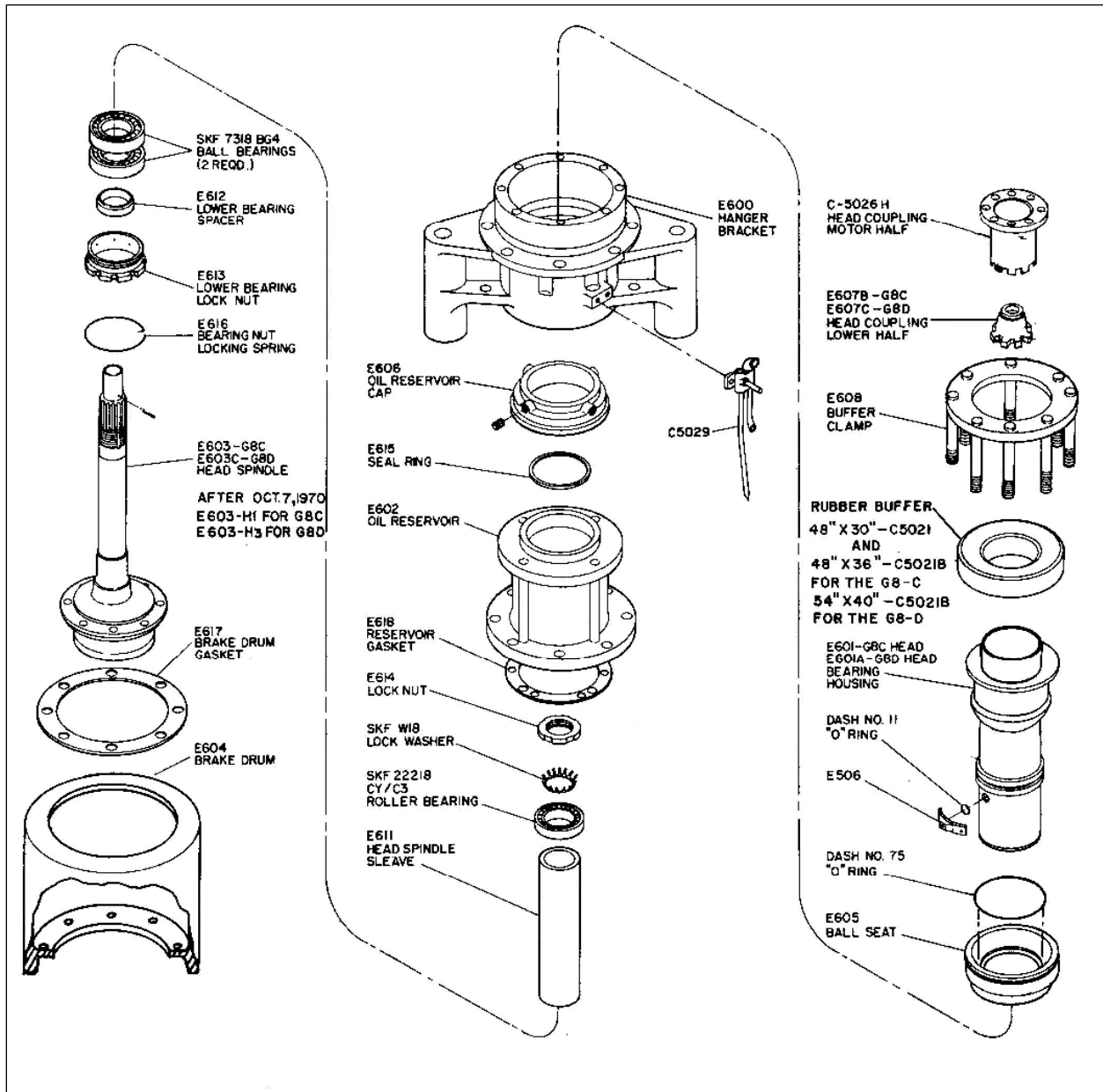
Installing the brake water assembly

1. If the leading edge of the water outlet pipe is damaged it should be filed back to a sharp edge.
2. Check the water inlet pipe for accumulated dirt and scale
3. After installation if water splashes out of the brake drum during operation it will be necessary to slightly adjust the water outlet pipe by bending.

Installing the oil inlet

1. The oil inlet is fitted with a restriction nipple which must be in place to prevent the head from flooding with oil..
2. Inspect the inlet restrictor for foreign material and be sure to reinstall it.
3. Do not modify the length or orifice size.





G8-C & G8-D Parts Reference

Use Of Scrapers

Scrapers are used for truing up stir faces that have been previously machined and that must be true. Castings frequently change shape after having been machined, therefore the surface must be scraped to bring it true. Also the variation in the texture of the metal together with the spring in the machine often leaves a surface that has been machined uneven and this must be corrected by scraping. It has also been found that large babbitted bearings give better service when scraped. There are a number of different forms and sizes of scrapers, each being made to fit some particular job. These different forms are shown in the accompanying illustrations.

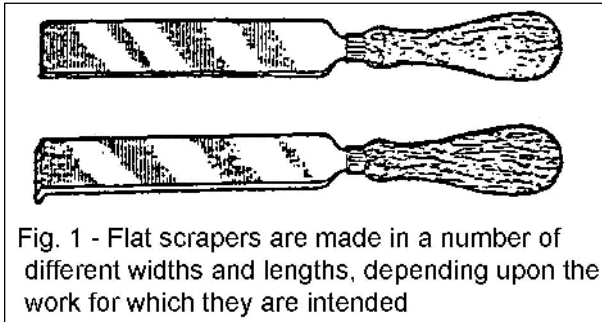


Fig. 1 - Flat scrapers are made in a number of different widths and lengths, depending upon the work for which they are intended

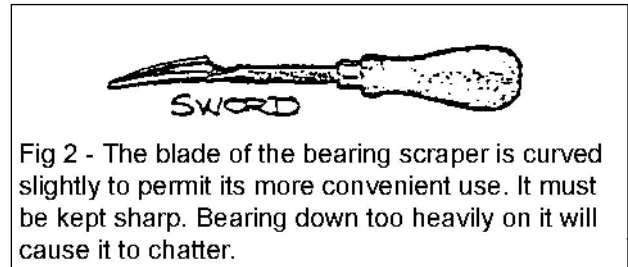


Fig 2 - The blade of the bearing scraper is curved slightly to permit its more convenient use. It must be kept sharp. Bearing down too heavily on it will cause it to chatter.

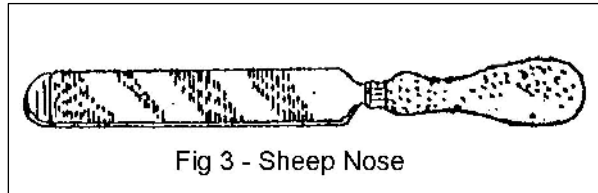


Fig 3 - Sheep Nose

A scraper must be kept sharp at all times or it will not leave a true surface and it will also require considerable strength on the part of the user. This sharpening is generally done on an oil stone. after the cutting edge of the scraper has been ground on an emery wheel. The stoning is necessary to remove the wire edge left by the emery wheel and also to give a finer edge. The method of stoning a straight scraper is shown in Fig. 4.

The straight scraper should be held as shown in Fig. 5, a slight amount of pressure being used to hold it against the work. The amount of this pressure is determined by the metal which is being scraped, the harder the metal the more the pressure required.

When scraping a surface which has holes, the scraper should. not be allowed to Cross the hole but should follow their circumference When scraping on the edge of a piece, It is always best to scrape either toward the edge or at an angle with it but not parallel with it.

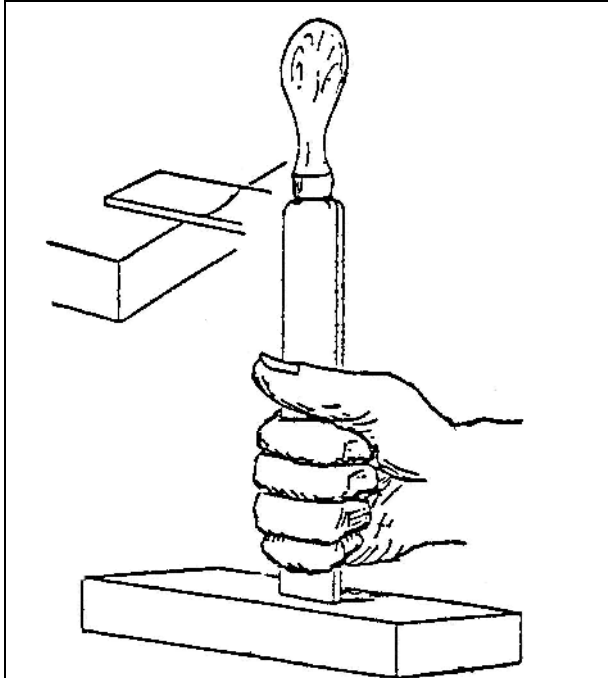


Fig 4 - Scrapers should be stoned frequently when in use. Hold the tool square with the face of the stone bearing down lightly. Too much pressure will scratch the stone and injure the cutting edge of the scraper.

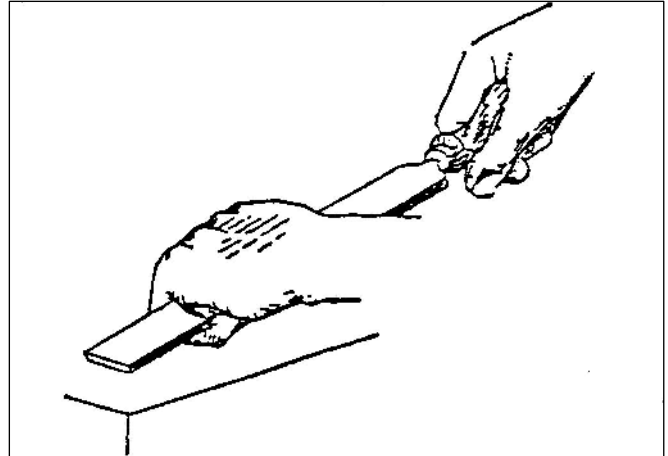


Fig 5 - The scraper cuts on the forward stroke. The pressure should therefore be relieved on the back stroke

The method of using a bearing scraper is shown in Fig. 6. This scraper is made for use on Babbitt metal and is therefore ground differently from those used on case iron or other metals. It has a cutting edge of about 75 degrees. Very little pressure is required when using it. If too much pressure is applied, the tool will chatter, and leave a rough uneven surface. A very small amount of metal should be removed at each stroke. When scraping a bearing, the direction of the stroke must always be crosswise and not lengthwise of the bearing.

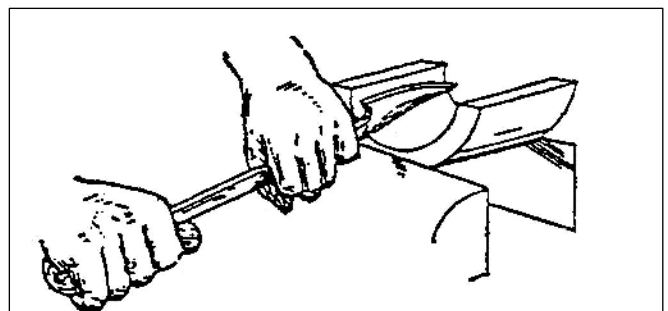


Fig 6 - Relieving a bearing is an important operation. The depth of the scraping should be even. It generally extends to about 30 degrees below the horizontal centerline.

Safety Precautions. When using a scraper of any kind, the following precautions must be observed:

1. Keep both hands clean of grease, oil or perspiration.
2. Hold the blade of the scraper firmly in one hand, using the other hand to push the scraper over the work.

3. Keep the hands high enough from the work to prevent striking the corner of the piece that is being scraped. These corners are often sharp and will cause a disagreeable and sometimes dangerous wound on the hand.
4. When scraping a bearing, keep the hands away from the cutting edges of the scraper.. As stated before, these edges are sharp and will readily cut the hand.