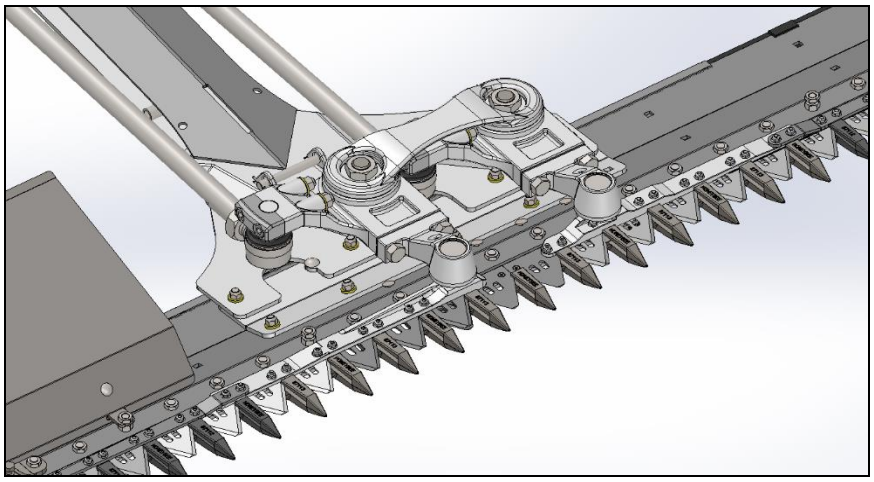
AirFLEX

200 Series

FLEX Header

Knife Drive (Front End)

Rebuild Instructions



Honey Bee

The proper assembly of the knife drive is important for reliability of the knife drive. The assembly and adjustment are not complicated but care must be taken in the adjustments.

The following are the steps that must be taken when installing the knives, gooseneck assemblies and bell crank bearings. It also details how to adjust the knife hold downs as well.

Please read through and follow every step of this document. Every step may not apply to what you are fixing on your header but is still good information to have on hand and valuable to inspect your knife drive.

Step 1: Check for Bell Crank Bearing Issues

- If possible put header on combine, lift header so the combine feeder safety stops can be installed. *Otherwise can be performed on transport cart but more difficult as it will not go into the flex mode. Can still drop all the way down while on Transport cart as long as skid shoes are removed.*
- Put in Flex mode.
- Lift Reel as high as possible and install safety cylinder locks. ***Note: Must be on the combine to do this. If performing on the cart the reel will remain down.***
- Turn off combine and remove the key.
- Remove feather plate over-top of knife head bearings.
- Make sure the knife is properly timed. This can be done by installing a ½" bolt on back side of knife drive to time the knives so they are parallel with each other. See (A) figure 1. For more information on this procedure see page 110 section 13.8.2 in the 2017 op manual or page 109 section 13..9.2 in 2018 manual.
- Clean all material around bell crank base and knife head. If using pressure washer do not direct spray directly onto bearing seals as the high-pressure water could damage them.
- Use at long pry bar and pry both RH and LH bell crank up, at (A) and (B) Figure 2, to check for "play" in bearing.

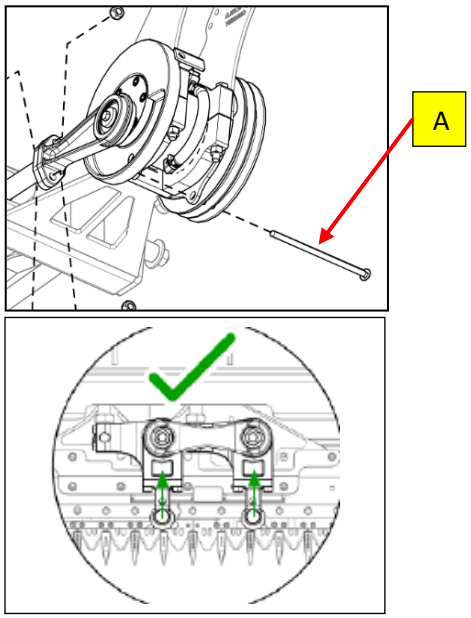


Figure 1

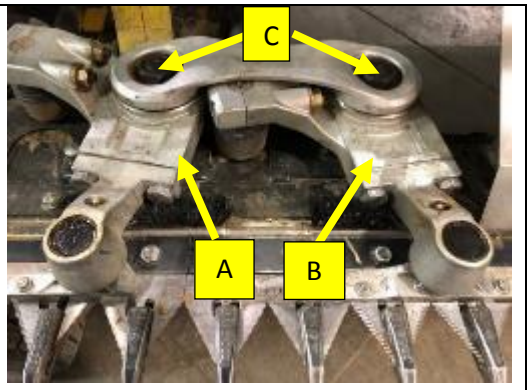


Figure 2

- If more than 1/8” of movement is found in any of the bell cranks check to make certain the bell crank mounting bolts are tight. The nuts, (C) Figure 2, should be torqued to **550 ft-lb (745 N-m)**.
- If there is more than 1/8” movement and the bell crank nuts are tight new bearings must be installed.

- **New Bearing installation**
  - If nut is tight and the bearing is loose then replacing the bearings is needed.
  - The new bearing will replace the bell crank bearings with a tapered roller bearing. The torque is also reduced on the new shorter nut. Tightening the nut to **550 Ft. Lbs**. (A) Figure 3
  - The greasing interval on the new tapered roller bearings will change to 1-2 shots of grease once a day (every 10 hours). The proper grease must be used in these new bell crank bearings to extend the life of the bearing. See below in step 4 for acceptable grease to use.
  - Follow the instructions in the bearing kit for replacement.

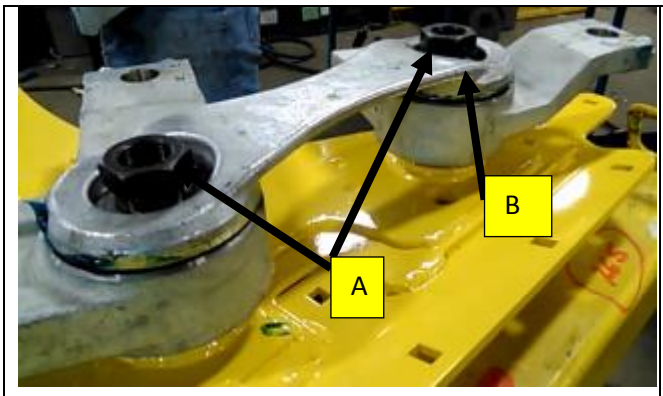


Figure 3

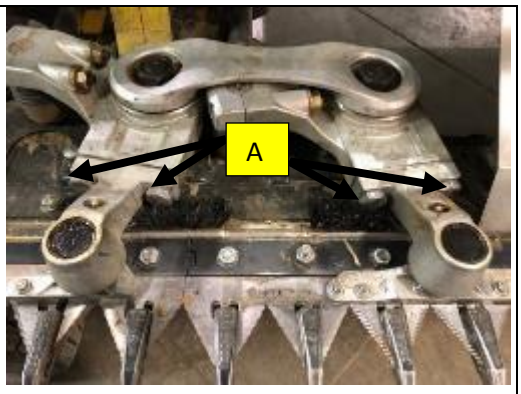


Figure 4

- The bearing should be installed in the bell cranks with the part numbers up. Figure 5.
- Also make sure the tapered nut (HB#203747) has a flat end. A pointed end nut will interfere with the bearing and therefore should not be used. Figure 6.

Figure 5

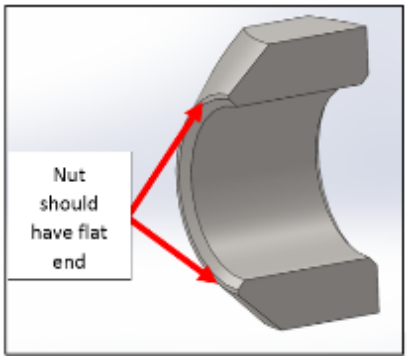


Figure 6

Step 2: Check the condition of the knife head/gooseneck bearing

- Remove the 2 mounting bolts that connect each gooseneck to the bell cranks, (A) Figure 4.
- Grab and spin gooseneck while the gooseneck is still on the knife head. Feel for any radial "play" or roughness in the bearing.
- If any significant "play" or roughness is felt remove grease zerk and gooseneck from knife head to inspect bearing rollers, knife head race, and seal. If there is wear on the knife head race the knife heads and gooseneck bearings should be replaced. Figure 7.
- If the grease is black or very dark this is an indication that dirt has gotten into the bearing and started to wear out the rollers then the bearings should be replaced.
- Replace the failed Gooseneck bearings and knife heads with:
  - Two 202748 gooseneck bearing assemblies,
  - One 203084 LH knife head assembly.
  - One 203083 RH knife head assembly.

Figure 7

- There may be 0, 1, or 2 shims between the gooseneck and the bell crank. Use the same number of shims and tighten the bolts. Follow step 3 for proper shimming and torque of the gooseneck bolts.
- **CRITICAL:** Make sure the gooseneck bearings are packed with acceptable grease prior to installing onto knifeheads. See step 5 below for acceptable grease to use.

Step 3: Shimming the gooseneck bearings to avoid any interference between the knife head or the guards.

- From the factory there may be 0, 1 or 2, 16 gauge (0.0598") thick shims installed between the gooseneck and bell crank to properly align the knife head in the cutting system.
- The shims from service parts are:
  - 16-gauge shim part number 202343
  - 10-gauge shim part number 202950.
  - 20-guage shim part number 202936
- With RH/LH knives installed in cutter bar and center guards installed it is time to properly shim the gooseneck off the bell crank.
- Ensure timing rod is installed in drive paddle pulleys so bell cranks are parallel to one another. Make certain that the grease fittings are removed from the gooseneck bearings. This will allow the bearing to be pushed on the knife head without trapping air.

- The following images showing how to start seal onto inner race and how to pop the seal onto the inner race. Figure 8.

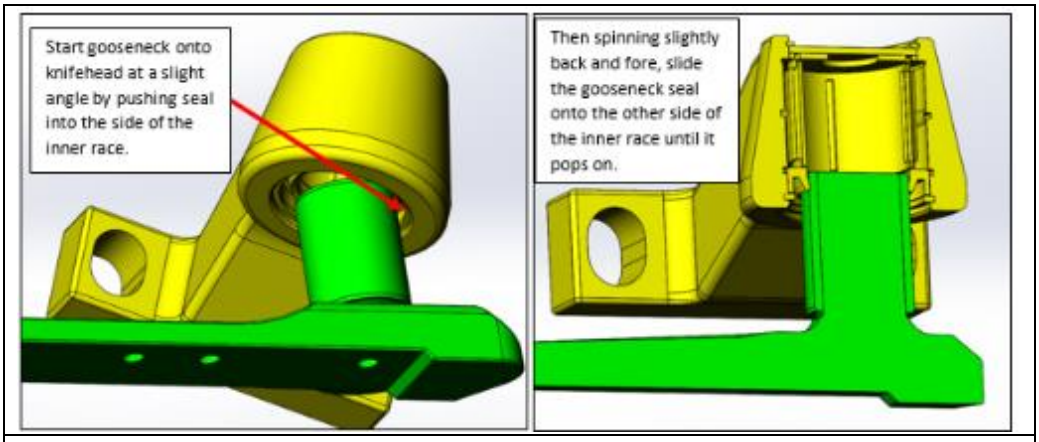


Figure 8

- **CRITICAL:** Make sure the seal is installed this way to make sure it is not damaged during installation. The gooseneck cannot be simply installed straight onto the knife-head without damaging the seal.
- At this point the seal is on inner race, push the gooseneck further onto the inner race by hand. At the same time, you are pushing down slightly rotate back and forth to get the rollers aligned onto the inner race.
- Also ensure the gooseneck is fully installed onto the knife head. The gooseneck should be able to be installed fully onto the knife head by hand (see Figure 9). **DO NOT** use a hammer or vise to install gooseneck onto knifehead. If cannot be installed by hand then something is wrong with the bearing (roller has fallen out) or the gooseneck bearing or knifehead inner race is too tight. Please contact HoneyBee service department if this is the case.
- Once the gooseneck is pressed on the knife head make certain that the gooseneck bearing turns freely on each knife head.

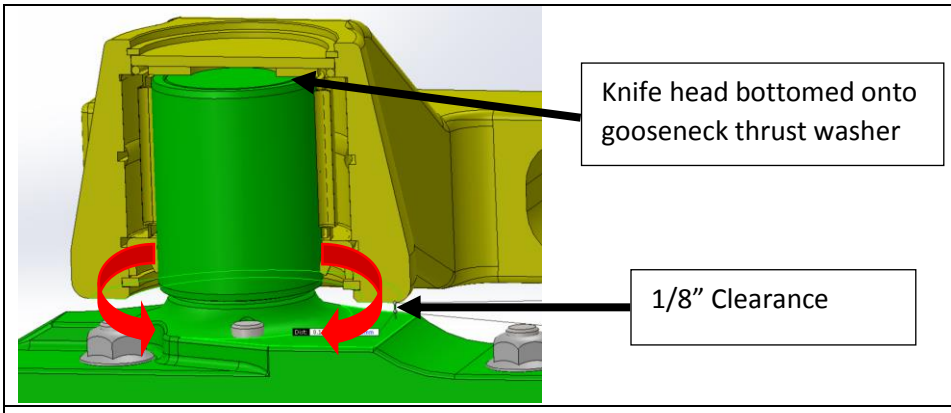


Figure 9

- Put Red Loctite on gooseneck mounting bolts and loosely connect gooseneck to bell crank. (A) Figure 10.

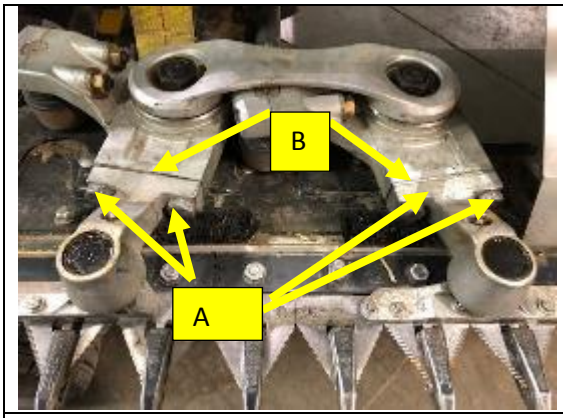


Figure 10

- Start installing shims between the gooseneck and bell crank, (B) Figure 10. Watch for clearance between the knife assembly (knife head on top and knife back on bottom). Install enough shims so that the clearance between the knife assembly (knife head on top and knife back on bottom) and the center guards (HB#87113) is roughly 1-16" to 1/8". Figure 11.

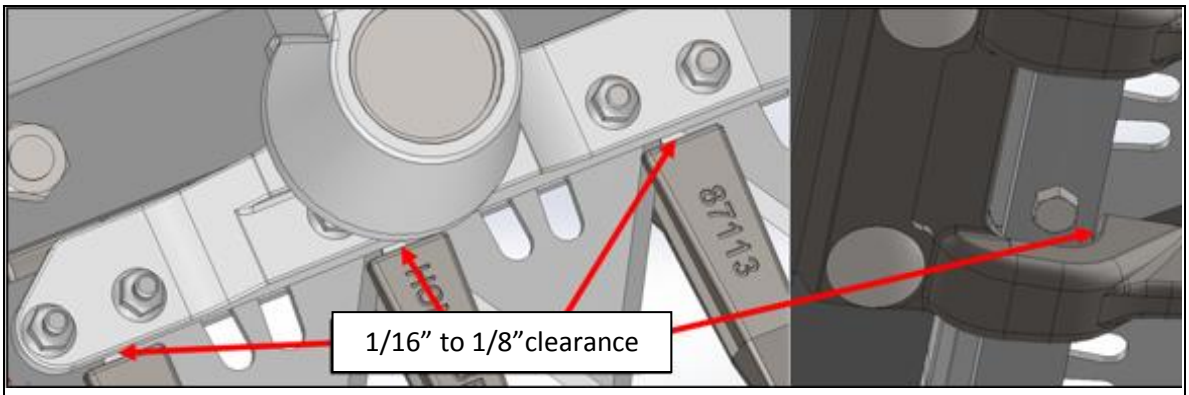


Figure 11

- Make sure to optimize clearance with shims for both RH and LH knife.
- Before the gooseneck mounting bolts are tightened we need to set the vertical position of both knives.
- Start with the LH knife and insert a 0.030" feeler gauge between the center guard (right in front of LH gooseneck) and the bottom of the sickle section. We install this shim in this area to make sure the LH knife does not have too much down pressure onto the guard. Figure 12.

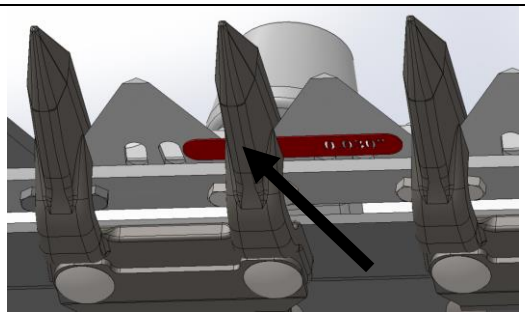


Figure 12

- With 0.030” feeler gauge installed, press with light hand pressure down onto top of LH gooseneck (will lightly pinch 0.030” feeler gauge between sickle section and guard) and tighten mounting bolts to **170 ft-lbs.** Remove feeler gauge after tightening.
- **NOTE:** This process may not work every time as when you tighten the two main mounting bolts it actually twists the gooseneck slightly downward onto the shim putting pressure between the sickle section and guard. There should not be too much down pressure of the LH knife down onto the center guards. So, if you need to set without a feeler gauge try to make sure there is hardly any down pressure of the LH knife down onto the center guards. This process can be confirmed by checking cutting system temperature in this area after running the header for 5-10 minutes.
- Install the RH gooseneck onto the bell crank. Take the 0.050” feeler gauge and place between LH knife and RH knife head. Figure 13.

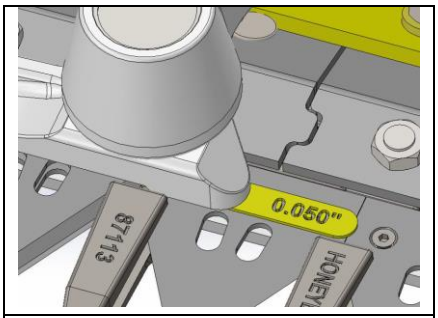


Figure 13

- With 0.050” feeler gauge installed, press with light hand pressure down onto top of RH gooseneck (will lightly pinch 0.050” feeler gauge between RH/LH knife assemblies) and tighten mounting bolts to **170 ft-lbs.** Remove gauge after tightening.
- Now with everything tightened, remove timing pin on knife drive pulleys and have someone stroke the knife by hand (pull on knife drive belt) and another person inspect the RH and LH knife for any tight spots.
    - Make sure the RH or LH knife is not interfering with the front/rear of the center guards. If significant interference is present check out the shimming.
    - Also make sure the top and bottom of the LH/RH sickle sections are not interfering with the center guards through the whole range of travel. If significant interference is present between the sickle sections recheck shimming. Also check for any bent up/down guards.
- Your last step is to install the grease zerks into the gooseneck assemblies. The grease zerk was left out in order to install gooseneck onto the knife head.
- Once you starting running the header after everything is installed, check guards and knifeheads for excessive heat build-up.

Step 4: Knife adjustment

- Look for overlap bolt contact with bottom of guard at the overlap joint of the knife. The bolts that are inserted down can contact the guards. Figure 14 and 15. The bolts can be shortened by cutting off excess threads sticking past end of nut or replace all 5 bolts with shorter bolt **HB#203429**.

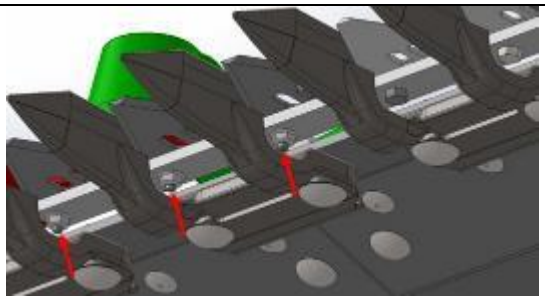


Figure 14

Figure 15

- Check the knife overlap area for any bent guards near the knife drive area. If any of these guards that are near the overlap area are bent it can put excessive loading/forces into the overlap section and can possibly make the knife head fail prematurely. Either bend the guards as straight as possible or replace them, see Figure 16.

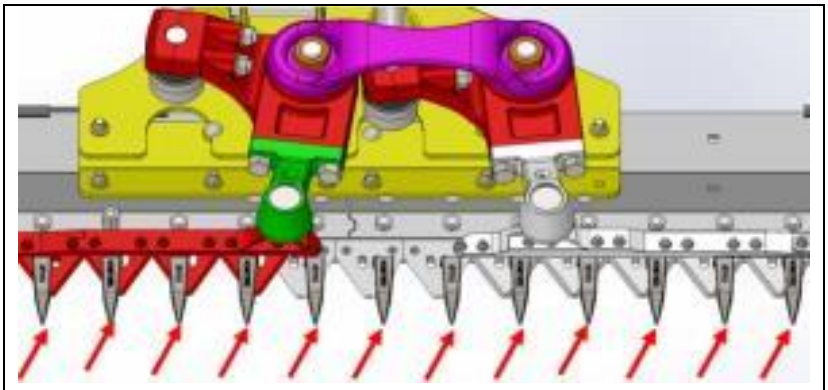


Figure 16

Knife Hold-down Adjustment

- Stroke the knife so that the sickle sections are directly underneath the hold-downs (A). Figure 17 and Figure 18.
- Push the knife sickle section (B) down against the guard and insert a 0.020” feeler gauge (C) between the sickle section (B) and the hold down (A). If the gap is larger than 0.020” or cannot insert the feeler gauge, then the hold down needs to be adjusted. When the hold down is properly adjusted the feeler gauge should be able to be inserted with light resistance while pushing down the sickle section against the guard.
- Adjust hold-down (A) by turning the hold down adjustment bolt (D) clockwise to lower the front of the hold-down and decrease clearance, or counter clockwise to raise the front of the hold down and increase clearance.

- **NOTE:** For larger adjustments, it may be necessary to loosen the hold down mounting nuts (E), turn adjuster bolt (D), and then retighten nuts (**49 ft. Lbs**)
- Recheck clearance and readjust each hold down as required.

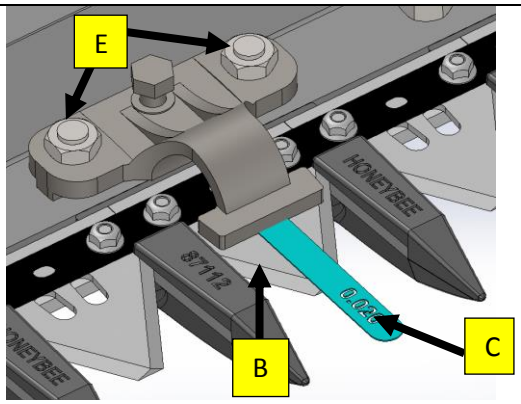


Figure 17

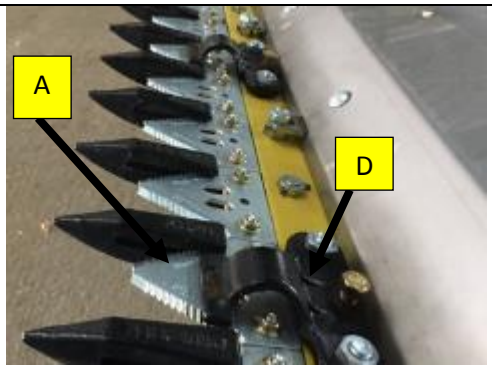


Figure 18

Step 5: Lubrication for new Bell Crank and Gooseneck bearings

- The new bell crank and gooseneck bearings will need to be lubricated after installed and then every 10 hours with 1-2 pumps of **extreme pressure grease**. Make certain the correct grease is used.
- Both must be lubricated with an extreme pressure lubricant grease with base of lithium 12-hydroxysterate soap, mineral oils of high viscosity (400 – 500 cSt @ 40ºC) index and quality. This lubricant gives extraordinary characteristics against wear out, impact charges and resistance to environmental contaminants such as dust, humidity and lubrication slips. This grease can be used on all locations of the header. The grease can be found at any location that sells good quality lubrication. The following are some samples of grease that can be used.
    - Mobil SCH XHP 462
    - Shell Gadus S3 V460D
    - 2 Castrol Contractor Special 2
    - Conoco Phillips 66 Megaplex XD3 or XD5 (both need to be NLGI 2 grade)
    - Lucas Oil Heavy Duty Mining & Construction Grease Product #10597, 10597, 10881 NLGI GC-LB
    - Petro Canada Precision XL3 Moly EP2
    - Cat Extreme Application Grease - Desert NLGI 2
    - MyStik JT-60 Hi-Temp Grease with Moly - Readily available at any Tractor and Supply in USA.
    - TOTAL CERAN XM 460 NLGI 2
    - MAPO MFE Syngis Grease CS-2/502-S
    - Eurol Grease CS-2/501
    - Castrol Spheerol LCX 6002
    - Castrol Castrol Spheerol EPLX
    - Castrol Molub-Alloy 860/460-2 ES
    - SKF LGEM 2
    - The following grease **does not** meet the specification and should not be used:
        - CNH 251H EP Grease
        - CNH GR-100 SSL Grease
        - John Deere Moly Grease EP Special Purpose

- Using the correct grease and following the lubrication schedule will extend the life of the bearings. Using the correct grease will extend the life of the bearing.

- ***Note: The use of a grease that does not meet the specification could void the warranty on the knife drive system.***

- The grease for the knife drive assemblies can be used on the rest of the header.