

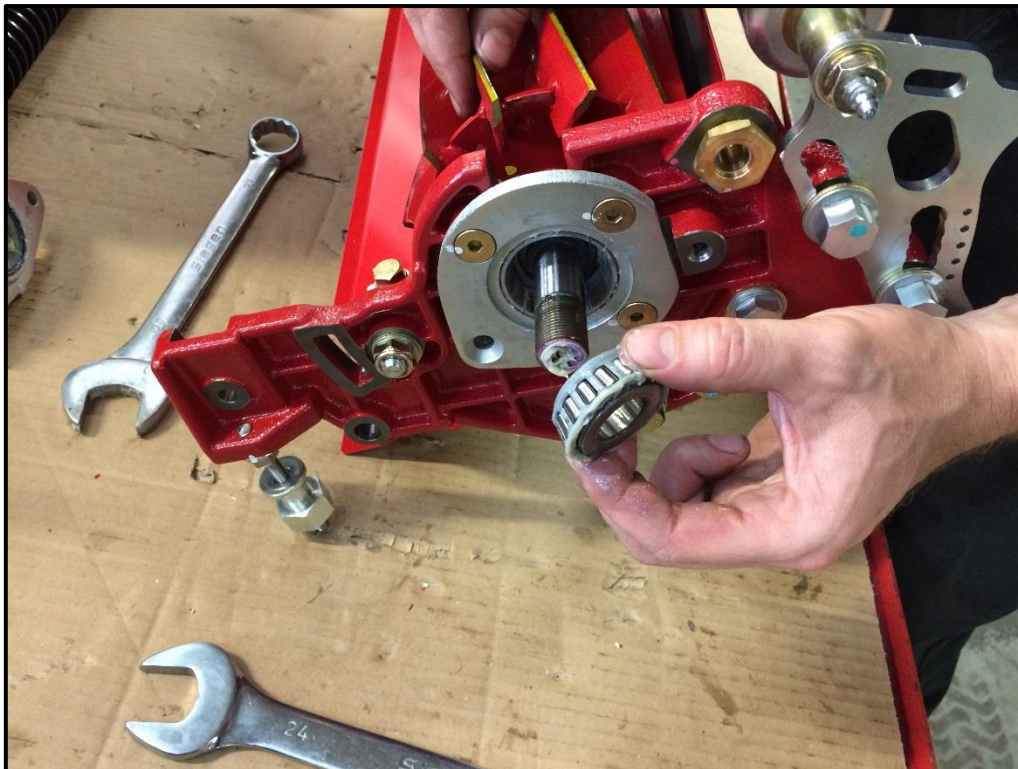
# **BARRONESS**

Quality on Demand

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## **Technical Information Leaflet**

**TIL: 039**



### **LM315GC Triplex Mower**

**Removing and Refitting a Bedknife Assembly**

**Removing and Refitting a Cutting Reel**

**Cutting Reel Bearing Maintenance**

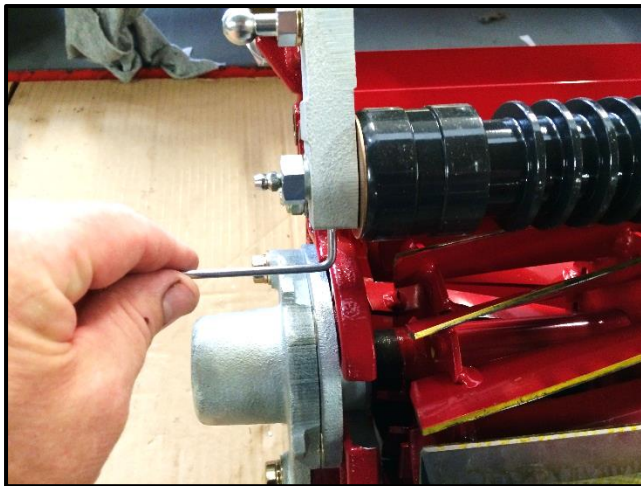
*This Technical Information leaflet is a supplement to be used in conjunction with the LM315GC Service Manual.*

## IMPORTANT

***Baroness would recommend that the LM315GC cutting units are overhauled annually if optimum performance is to be maintained.***

***Failure to maintain the reel bearings as described could result in premature wear issues.***

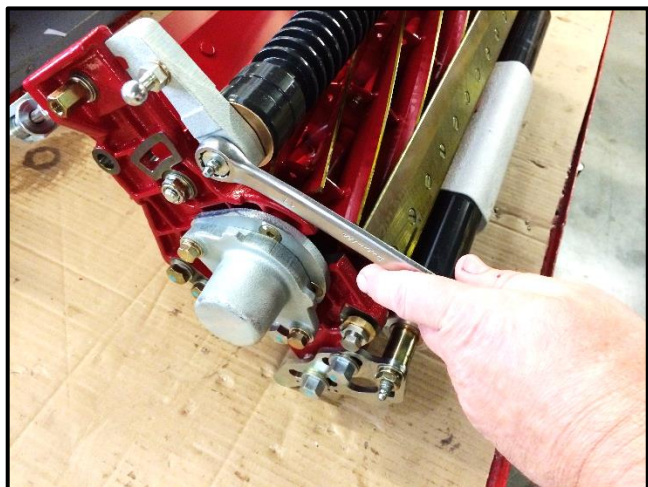
## Front Roller Removal

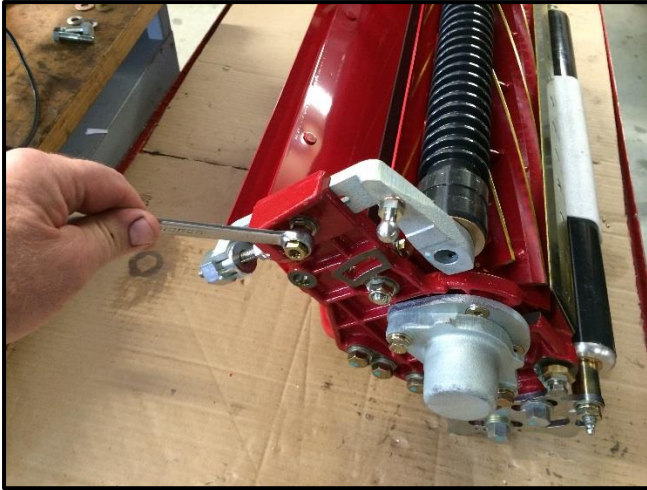


Locate the roller bracket with the shouldered roller bolt going through it.

Slacken off the grub-screw that locks to the shouldered bolt using a 3mm hexagon key.

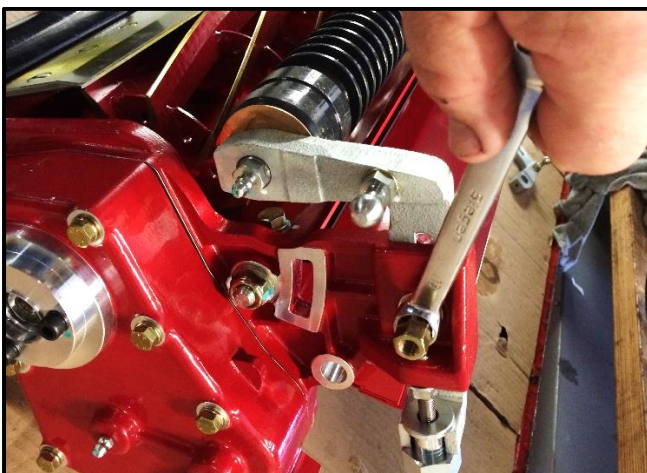
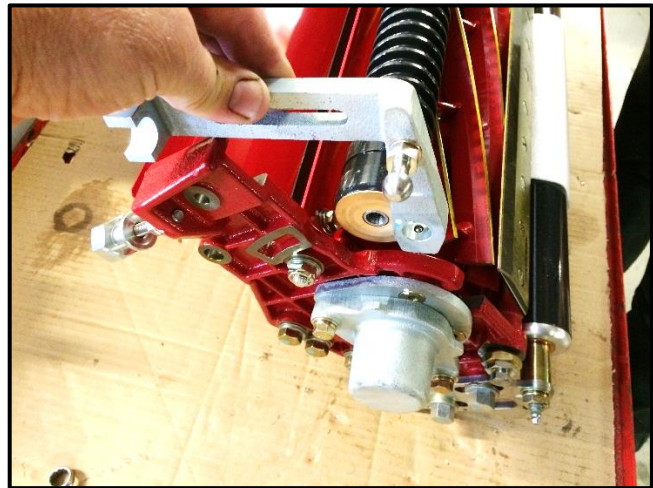
Remove the roller shouldered bolt using a 17mm spanner.



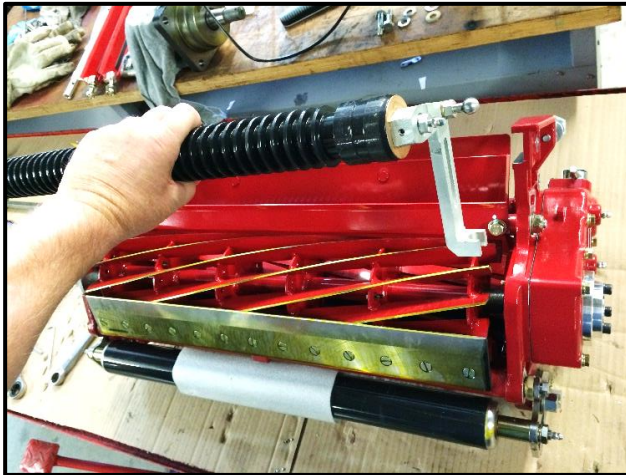


Remove the roller bracket locking nut, bolt and washers from the same side using a 13mm spanner.

Remove the roller bracket and the brass thrust washer from the dismantled side as shown.



Remove the roller bracket locking nut, bolt and washers from the opposite end of the roller.



Remove the entire roller assembly as shown.

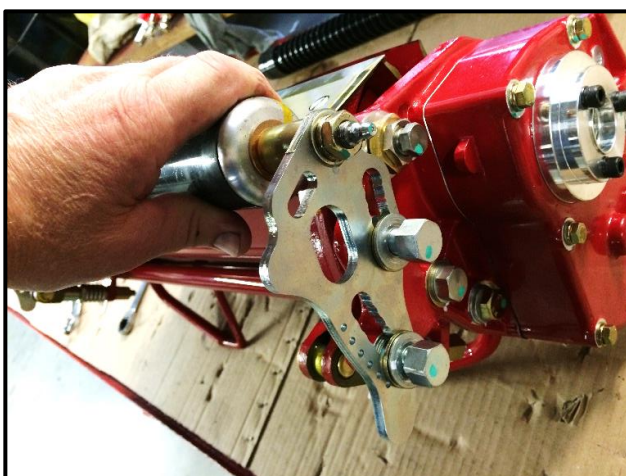
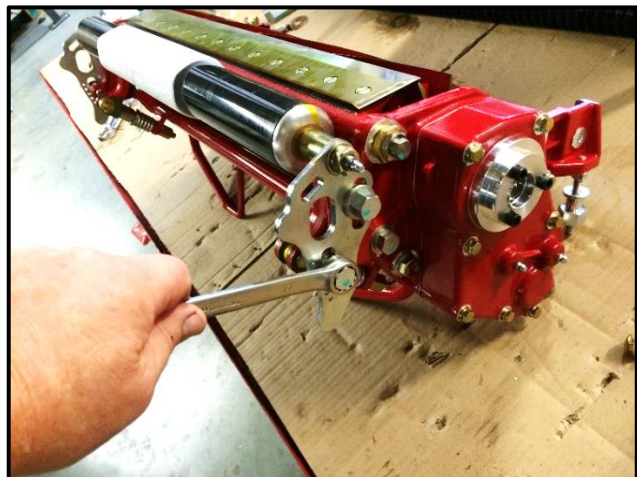
## Removing the Bedknife Assembly

Loosen all 4 rear roller bracket locking bolts.

Undo them until the shoulder of the bolt is clear of the roller bracket.

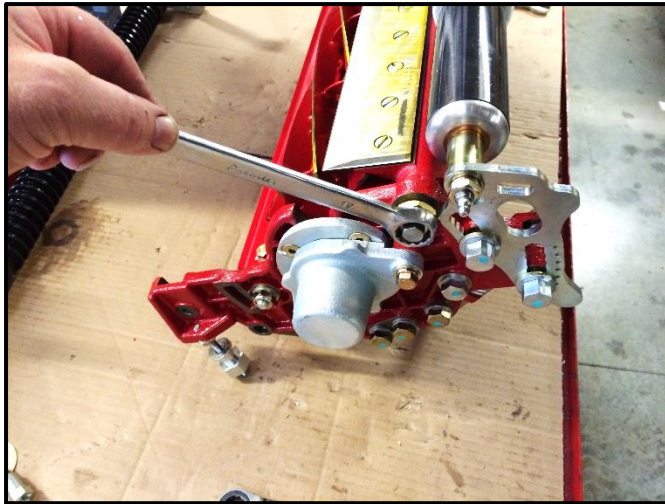
Do not remove them completely.

**Note:** Be aware that if you remove them completely that there are shims between the roller bracket and the frame that could fall out.



Lift the rear roller so that it is as far away from the bedknife area as possible.

**Note:** As the cutting unit will probably be upside down on a bench then you need to lift the roller but what you are actually doing is lowering the roller to its lowest position.



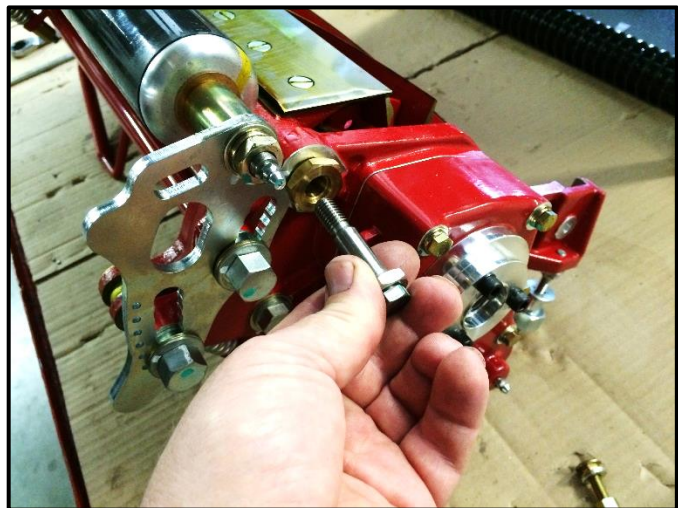
Locate the pivot pins that secure the bedknife carrier into position.

Undo the pivot pin locking nuts using a 19mm spanner as shown.

Note: The locking nut is the large silver nut that locks against the brass cam bush.

Loosen the pivot pins on both sides of the bedknife carrier using a 13mm spanner.

Remove both pivot pins together with the attached locking nuts.



Slacken off and remove the bedknife adjuster nuts from both sides of the cutting unit as shown.



Remove the bedknife assembly from the cutting unit as shown.

Be careful that all of the adjuster mechanism does not fall off of the adjuster rod. Hold in place by replacing the adjuster nut.

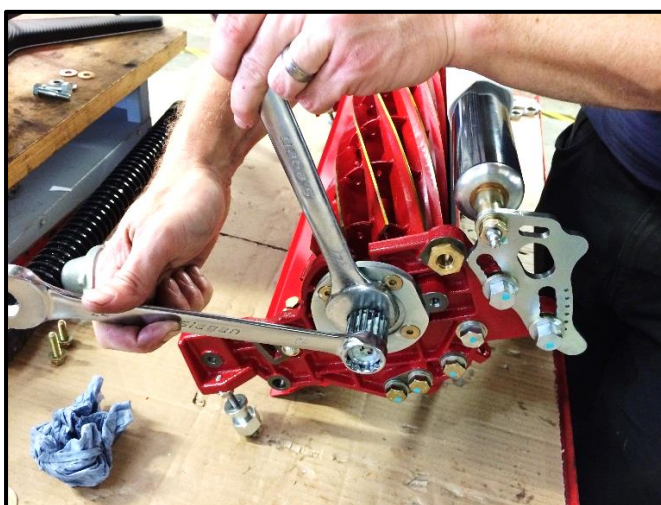
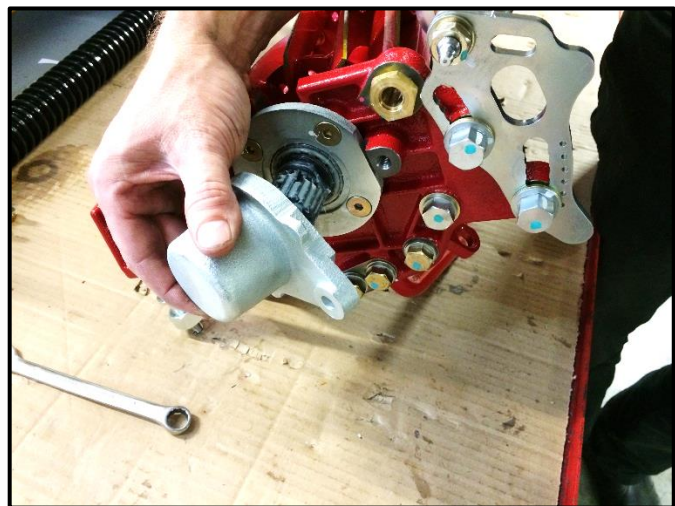
**Note:** The blades can be very sharp so make sure you use gloves that will provide adequate protection.

## Removing the Cutting Reel and Reel Bearings

Remove the two bolts that hold the reel gear cover in place using a 13mm spanner.

Remove the cover to expose the drive gear.

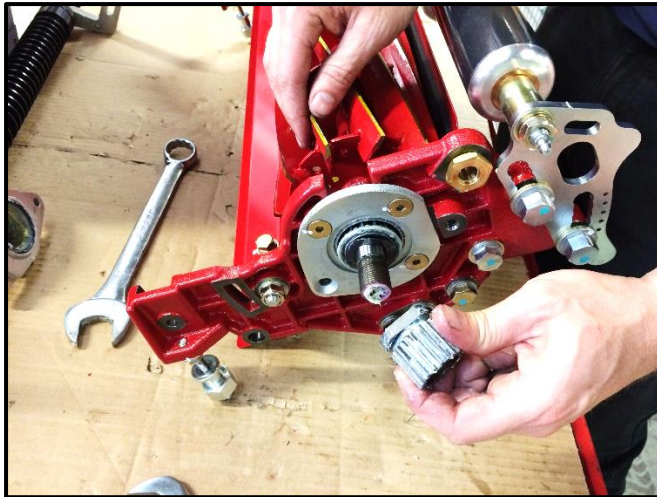
**Note:** If a groomer attachment is fitted then this will need to be removed in order to expose the gear.



Hold the gear into position to stop it rotating using a 27mm open ended spanner on the flats found on the inside end of the gear.

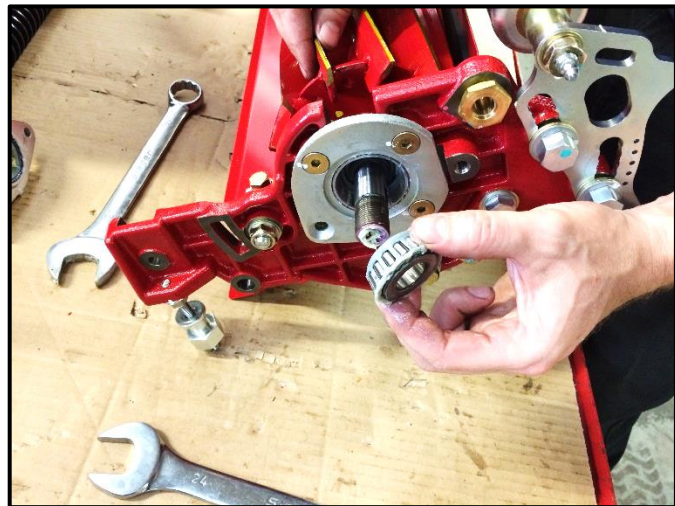
Then using a 24mm spanner, undo the locking nut that screws into the end of the gear as shown.

**Note:** This is a standard right hand thread.

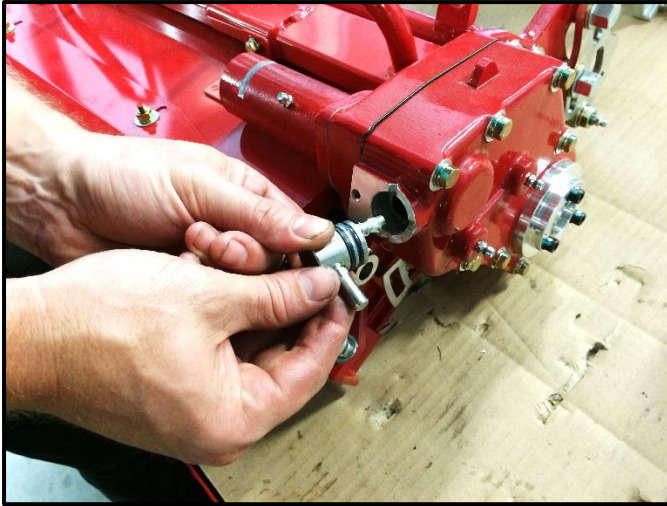


Remove the locking nut and the gear from the reel shaft as shown.

Remove the 'wave' spring washer and the cutting reel bearing from the reel shaft as shown.

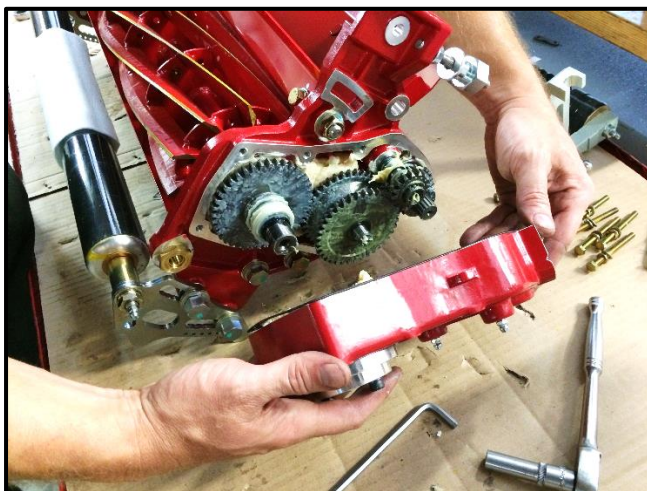
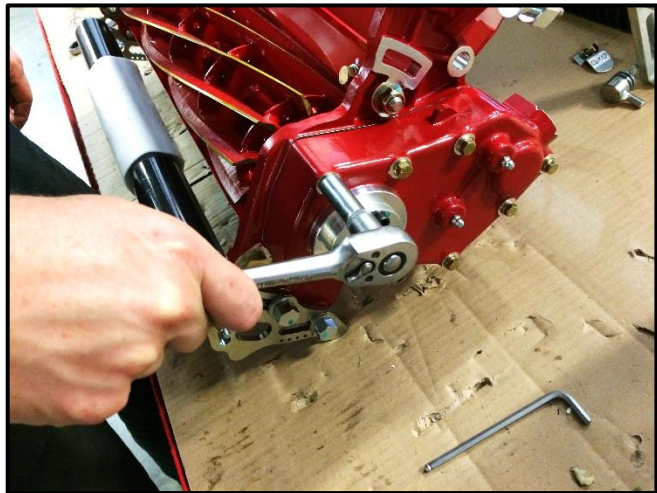


Remove the bolt that holds the reel direction selector retaining spring into position as shown.



Remove the reel direction selector lever with a firm pull.

Remove all gearbox retaining bolts using a 10mm socket/spanner as shown.



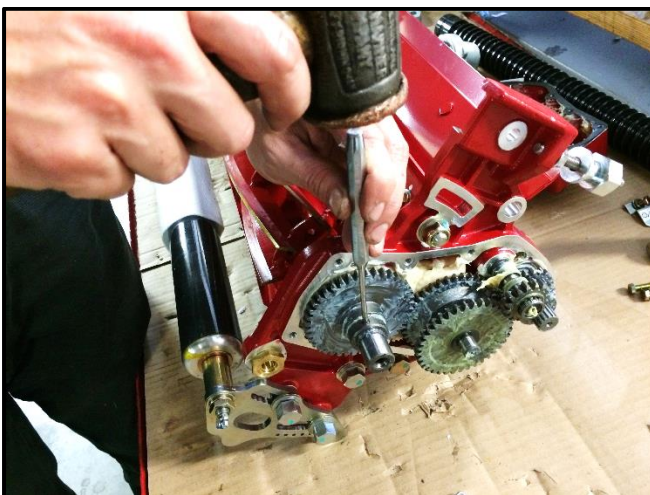
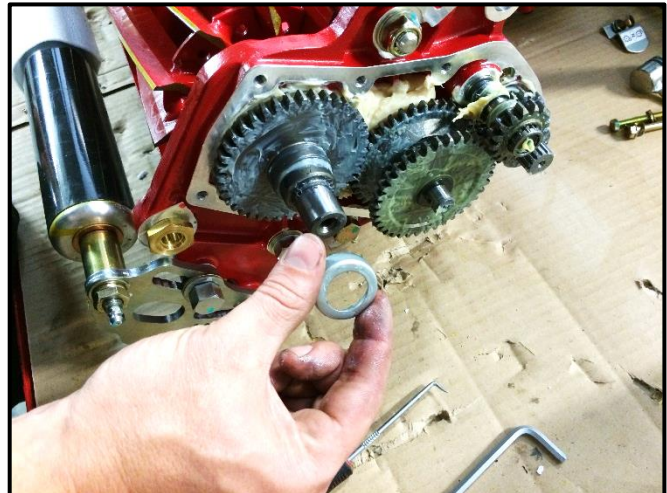
Remove the gearbox cover as shown being careful not to damage the gasket and to make a note of the location of the gear shaft thrust washers.





Very carefully using a pointed but blunt tool, remove the cover retaining 'O' ring from the reel shaft as shown.

Remove the gear pin retaining cap from the cutting reel shaft.



Using a small punch and hammer, remove the drive gear securing pin as shown.



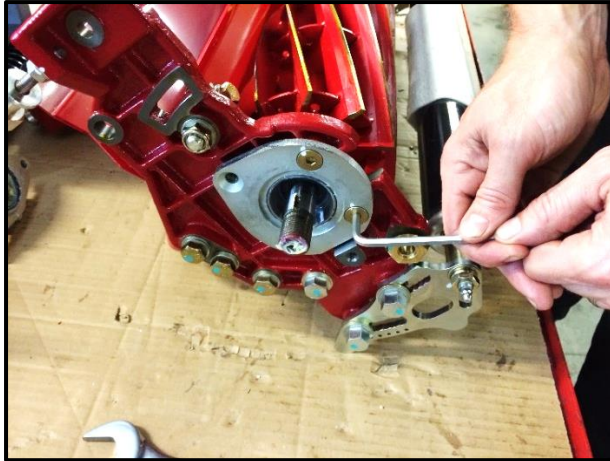
Remove the drive gear from the end of the reel shaft.



Remove the key from the reel shaft.



Remove the reel bearing.



At the other end of the cutting unit, undo the 3 x M8 countersunk screws using a 5mm hexagon key.

Remove the aluminium bearing housing from the end of the cutting unit.

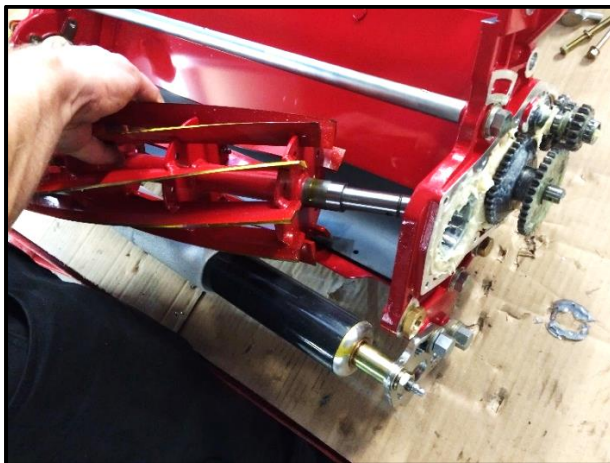
**Note:** If a groomer attachment is fitted there will be 4 of these screws to remove.

Remove the cutting reel being careful not to damage the reel shaft oil seal.

**Warning:** Blades can be very sharp so please make sure you use a suitable glove before handling the blades.



## Refitting the Cutting Reel & Reel Bearings



Check the condition of the oil seal and replace if necessary

Apply a liberal smear of grease around the oil seal lip.

**Note:** A good quality EP grease with a No:2 thickness should be used.

Insert the cutting reel into the cutting unit, gearbox end first.

Be careful not to damage the reel shaft oil seal when doing so.



Inspect the condition of the reel bearing and replace if necessary.

Thoroughly pack the bearing with liberal amounts of new clean grease.

Note: It is important to use an EP Grease with a No: 2 thickness.

Insert the bearing over the reel shaft and into its housing.



Check the condition of the oil seal located in the aluminium bearing housing and replace if necessary.

Apply a liberal smear of grease to the oil seal lip.

Apply a coating of 'Copper-Slip' to the back surface of the aluminium bearing housing.

Refit the aluminium bearing housing as shown.

Secure into position using the 3 x M8 countersunk screws leaving the hole shown in the photograph blank as this is used for securing the gear cover later.

**Note:** If a groomer is fitted then a 4<sup>th</sup> screw needs to be fitted into this hole.





Check the condition of the reel bearing and replace if necessary.

Apply liberal amounts of grease to the bearing, working the grease well into all areas.

Refit the bearing into the bearing housing.

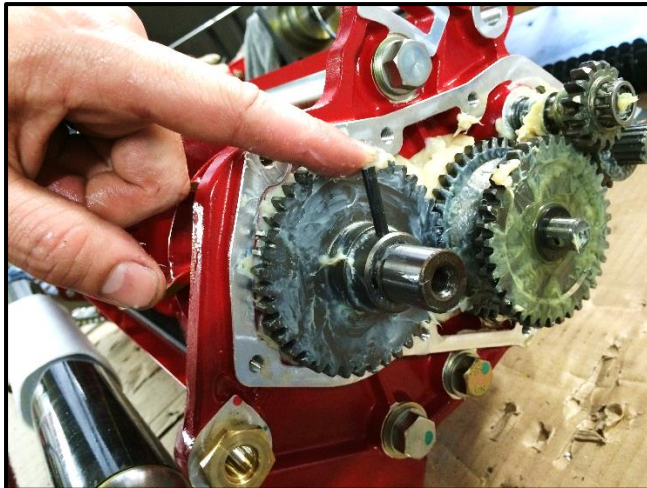
**Note:** Use a good quality No: 2 thickness EP Grease.

Refit the gear drive key into the cutting reel shaft.

Gently tap home if necessary but be careful not to damage the key.

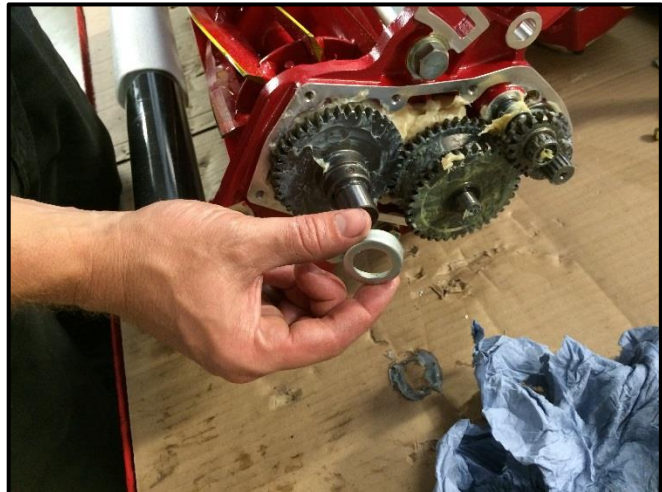


Refit the gear over the cutting reel shaft so that it locates over the drive key.



Insert the locating pin through the hole in the drive gear, gently tapping home if necessary.

Refit the pin retaining cap over the cutting reel shaft.



Refit the cap retaining 'O' ring over the cutting reel shaft, making sure that it is seated within its intended groove.





Refit the thrust washers over the gear shafts in the same order that they were removed.

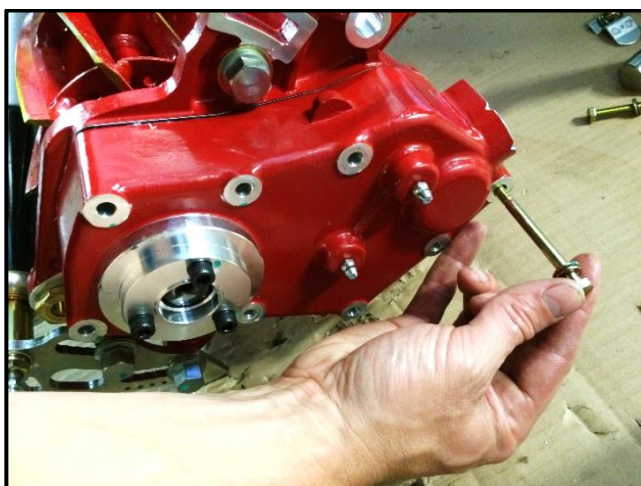
**Note:** Over the big gear shaft you should place: 1 bronze followed by 1 steel followed by another bronze.

Over the small gear shaft, you should place one bronze followed by 1 steel.

Refit the gear casing.

Gently tap the case to locate it into its correct position.

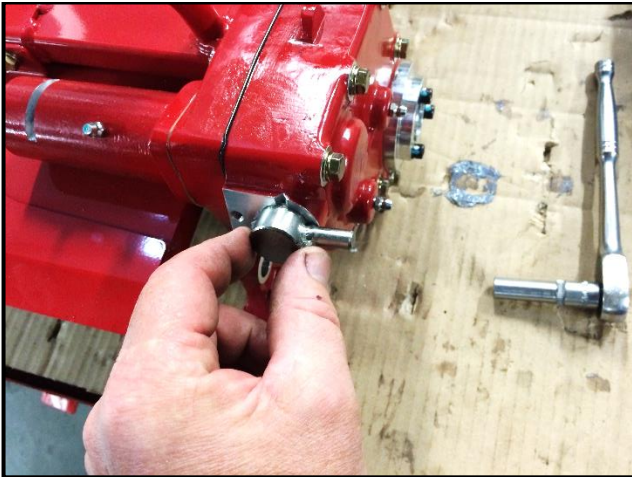
**Note:** If the case does not go on fairly easily do not be tempted to hit it hard, or pull it into position using its securing bolts. If the case will not go on easily then something is out of position and the alignment of all shafts etc. need to be checked or the case could be damaged.



Refit all securing screws and tighten.

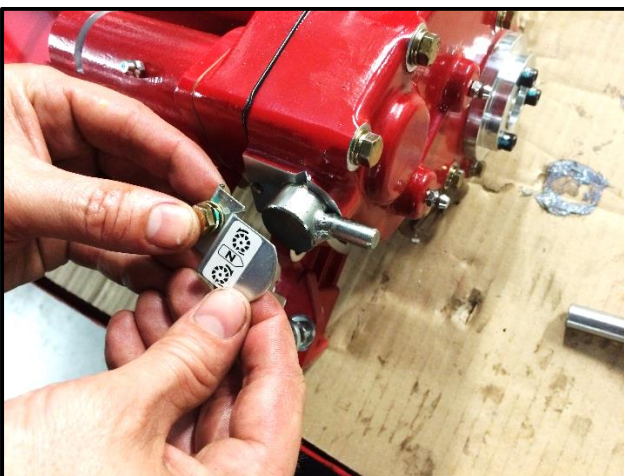
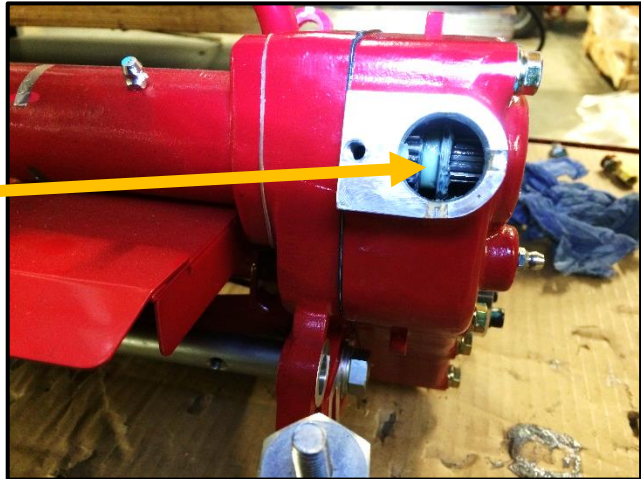
Fit the longest screw into the position shown.

**Note:** do not over tighten these screws as this can compress the gasket and cause incorrect tolerances.



Refit the drive selector into the gearbox.

When inserting the drive selector lever into the gearbox, make sure that the selector pin locates into the groove of the selector gear shown.



Fit the selector lever retaining spring and secure using the M6 screw.

**Note:** Do not overtighten this screw as it would be easy to strip the fine threads in the soft aluminium.

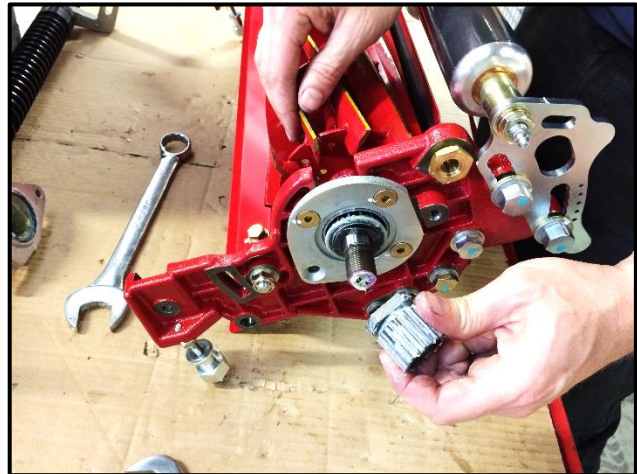




Fit the 'wave' spring washer over the cutting reel shaft so that it rests against the bearing.

Screw the attachment drive gear onto the reel shaft by hand only and do not tighten.

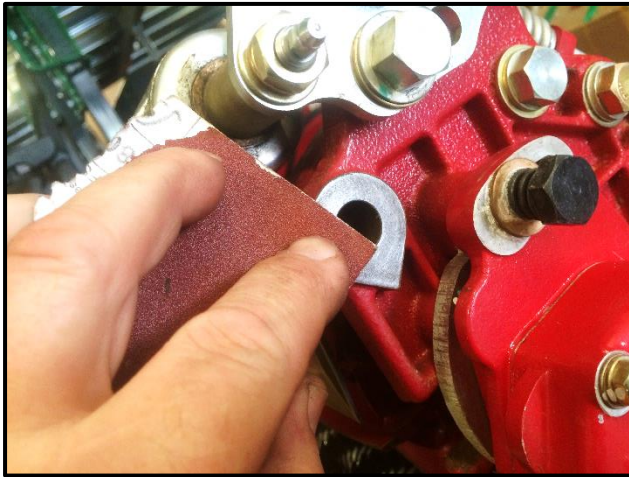
Note: Tightening the gear now could cause the side frames of the mower unit to be pulled in which would then make it difficult to refit the bedknife carrier assembly later on.



## **Re-fitting the Bedknife Assembly**

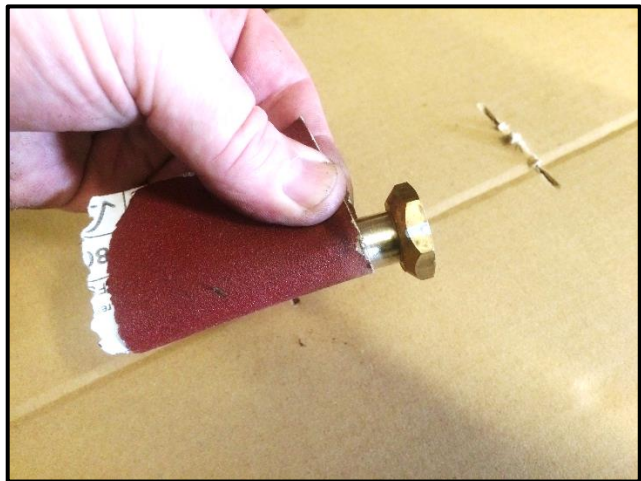


Thoroughly clean the frame inside the hole where the bronze cam bushes locate using some abrasive paper as shown.



Thoroughly clean the inside and outside surfaces of both ends of the cutting frame where the bedknife carrier locates with abrasive paper as shown.

Thoroughly clean the inside and outside surfaces of the bronze cam bush using abrasive paper as shown



Insert the un-lubricated bronze bush into the cutting unit frame to see that it rotates freely.

If it does not rotate freely clean it some more with abrasive paper until it does.

Check that the pivot pin rotates freely inside the bronze cam bush.

If it does not rotate freely then clean the inside of the bush some more with abrasive paper until it does.

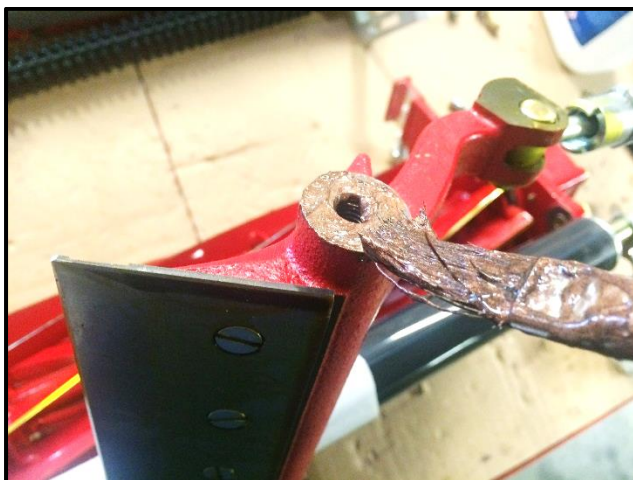
Re-insert the bronze cam bushes so that the marker dot aligns with the pointer on the mower frame.





Insert the bronze cam bushes so that the marker dot on the bush aligns with the pointer on the mower frame as shown.

Apply a layer of 'Copper-slip' to the insides of both ends of the cutting unit frame where the bedknife carrier locates and pivots as shown.



Clean up both ends of the bedknife carrier at the pivot point with abrasive paper to leave the surface clean.

Apply a thin layer of 'Copper-Slip' to this area as shown.



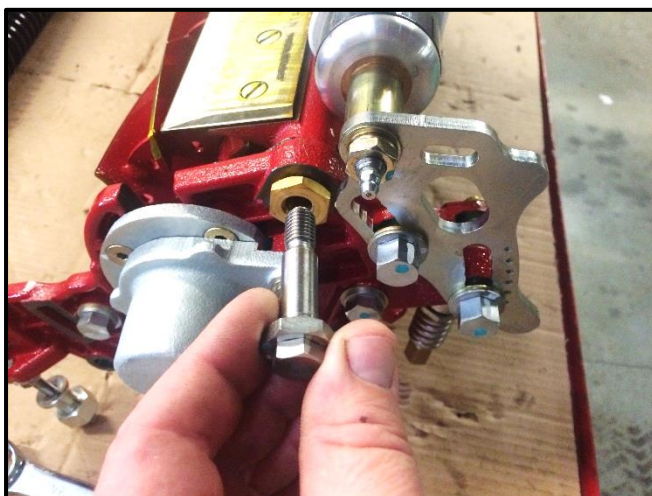
Fit the bedknife carrier assembly into position as shown.

The fit between the ends of the cutting unit frame is a little tight so try to lower the bedknife carrier symmetrically.

A little tap with a mallet on the carrier frame might be necessary in order to locate it correctly but be very careful not to hit the bedknife itself.

When fitting the bedknife carrier into the cutting unit frame do not locate the blade adjusters into their correct location.

At this stage just leave them dangling down as shown.



Insert the non-lubricated pivot pins through the bronze cam bush at both ends of the cutting unit.

Then screw them into the bedknife carrier frame.

It is not necessary to tighten them, at this stage finger tight is sufficient.

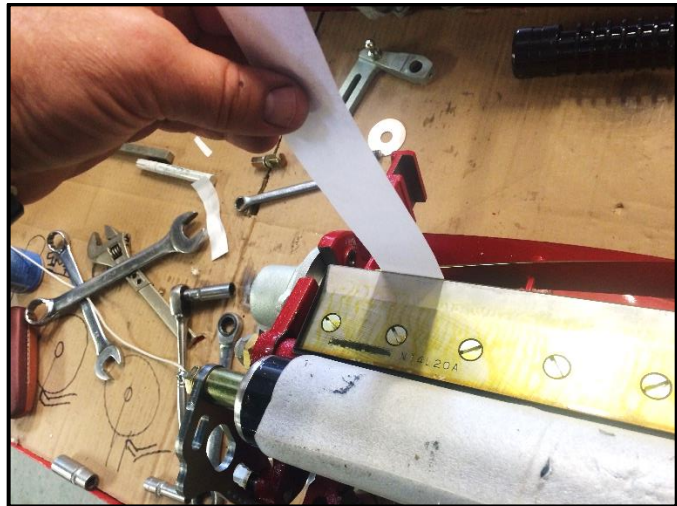


We now need to ensure that the bedknife is running parallel to the cutting reel.

To do this we firstly need to apply a gentle downward pressure onto the centre of the bedknife as shown.

Then whilst holding this gentle pressure down onto the bedknife we need to rotate the reel very slowly by hand, checking the cut at both ends of the bedknife using a strip of paper.

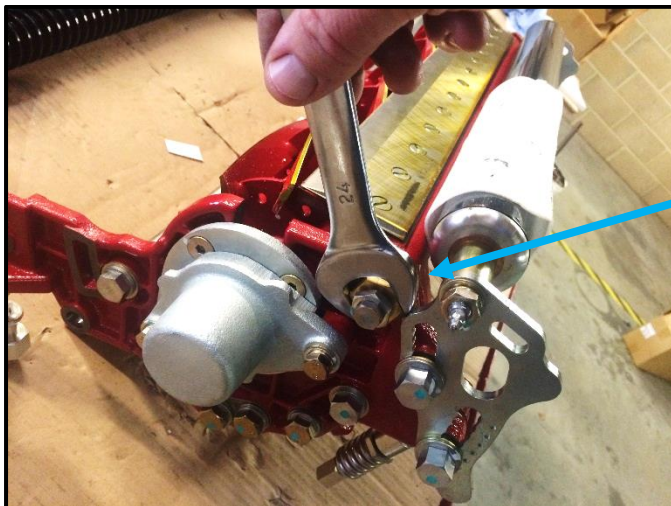
The strip of paper needs to be held square to the bedknife as shown and not flat along it.



If the paper is cut at one end of the bedknife but not at the other, then we need to rotate the bronze cam bushes to achieve an even cut.

To do this place a 24mm spanner on the bronze cam bush at the end that is not cutting.

Then with the cutting unit upside down, turn this cam bush forwards a little towards the front of the cutting unit.





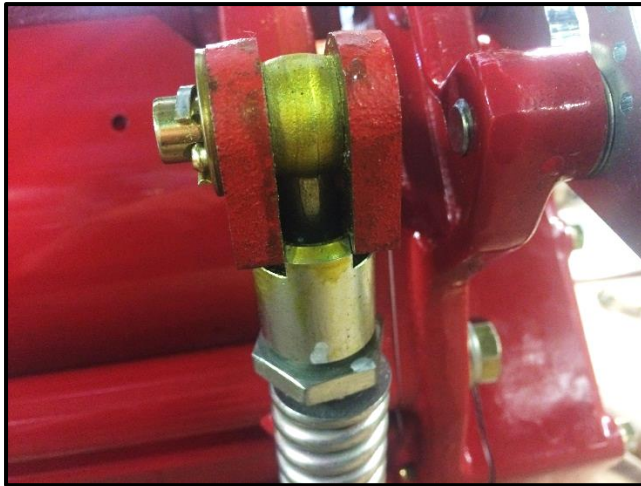
Keep adjusting the bronze cams slightly until the paper is cut cleanly on both sides of the bedknife.

Once this is achieved, mark the position of the bronze cam against the reel frame as shown.

Remove the pivot pins and the bronze cam bushes from both sides of the cutting unit frame.



Gently move the bedknife carrier a little until you are able to get the adjuster rods to locate inside their correct frame locating hole.



Make sure that the lugs of the spring tension collar are located within the slot of the frame as shown.

With the lugs of the spring tension collar located within the slot of the cutting unit frame, tighten up the blade adjuster nuts on both side of the cutting unit until the springs are fully compressed.



Apply a thin layer of 'Copper-Slip' to the outside surface of the bronze cam bush as shown.

Also apply a thin layer of 'Copper-Slip' to the surface of both pivot pins.



Insert the lubricated pivot pins inside of the lubricated bronze cam bushes.

Align the bedknife carrier as well as possible with the hole in the cutting unit frame.

Place the pivot pins through the hole in the frame and screw them into the bedknife carrier pulling in the bushes.

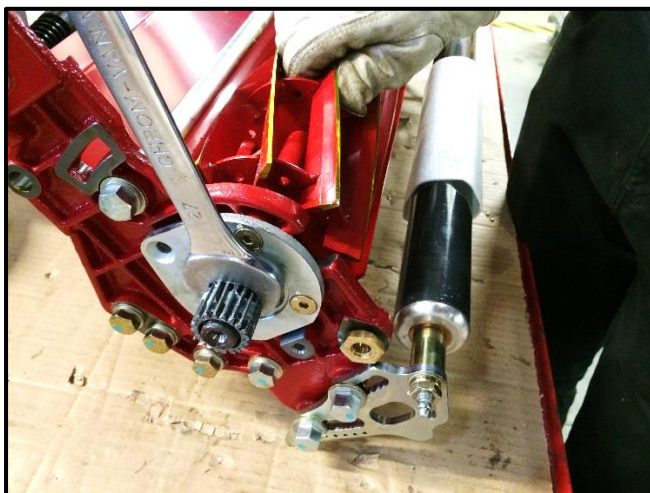
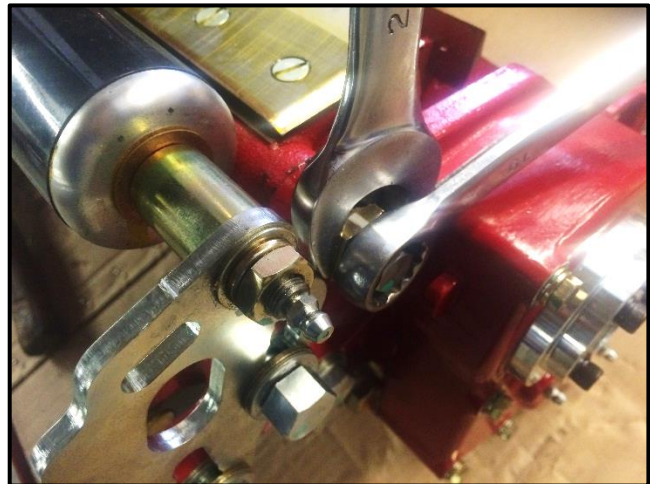
Rotate the bronze bush slightly whilst tightening the pivot pin will aid alignment.

Screw the pivot pins all of the way in and nip them up lightly.

Align the previous made marks on the bronze cam bush with the ones that you put on the frame.

Then holding the bronze cam bush with the marks lined up, nip up the pivot pin locking nut using a 19mm spanner.

**Note:** Do not overtighten the locking nut as this can cause the bronze bush to close up, locking the pivot pin to it.



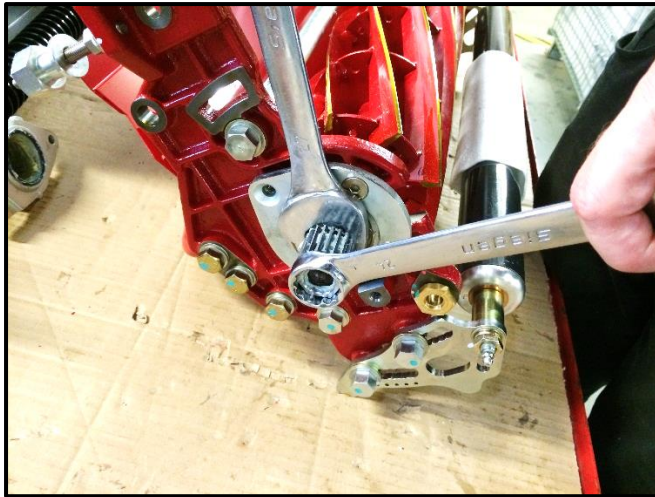
Using a 27mm spanner, tighten the attachment drive gear fully up to locate the bearings.

Spin the reel assembly a couple of times to seat the bearings.

Loosen the gear  $\frac{1}{2}$  to  $\frac{3}{4}$  of a turn until the 'wave' spring washer just starts to open.

Check that the cutting reel spins freely and if necessary readjust the bearing pre-load.





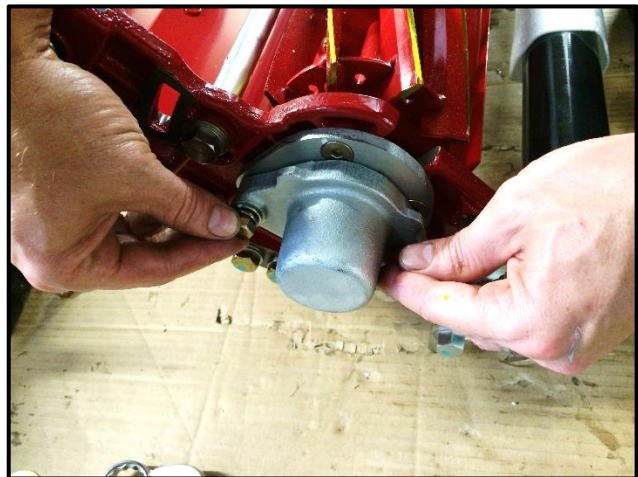
Screw the gear locking nut on to the end of the reel shaft until it touches the gear.

Hold the gear with a 27mm spanner so that its position does not move on the cutting reel shaft, then tighten the locknut to the gear using a 24mm spanner.

Spin the reel to make sure it rotates without excess resistance and if necessary re-adjust the bearing load.

Re-fit the aluminium gear cover using the 2 x M8 bolts as shown.

**Note:** If a groomer is used then this step can be missed out with the groomer being refitted at the end of the process.



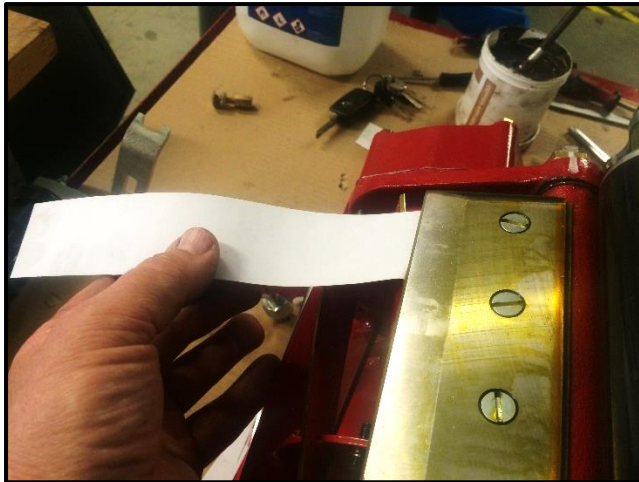
## Adjusting the Blades/Cut



Using a piece of paper held square to the bedknife, rotate the cutting cylinder slowly whilst checking to see if the paper is being cut.

If the paper is not cut cleanly on both sides, undo the blade adjuster nuts a little at a time until this is achieved.

**Note:** This procedure will need to be repeated several times until the correct adjustment is achieved.



Once you have the paper cutting across the entire length of the blades you need to check that the adjustment is not too tight.

To do this, lay the paper flat under the bedknife and then rotate the cutting reel slowly again.

This time it should not cut the paper but leave just a compression line in it as shown below.

If the paper is cut when it is held flat across the bedknife then slacken the contact off a little by turning the blade adjuster nut clock-wise.

The blades are set correctly when the paper is cut when it is held square to the blade but just leaves an indentation in the paper when it is laid flat across the bedknife.

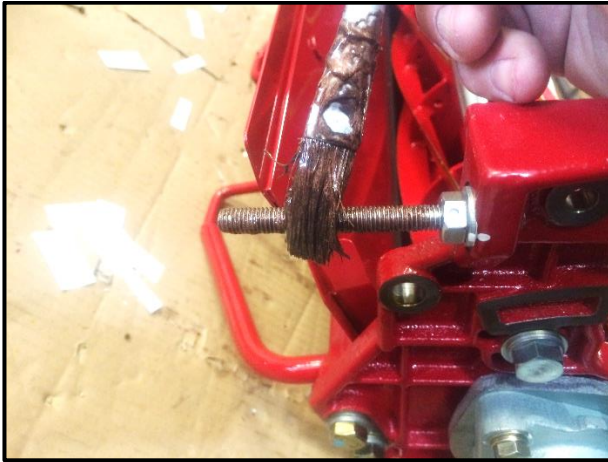


Re-set the rear roller to its desired level of aggression using the provided guidance chart.

Generally, this will be position 5 for mid aggression and position 4 for high aggression.

Only tighten the locking bolts by hand to start with to make sure that they are correctly aligned with the detent in the roller bracket.

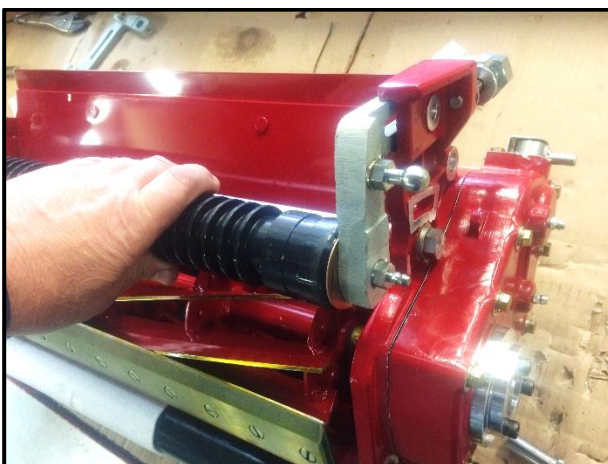
## Re-fitting the Front Roller Assembly



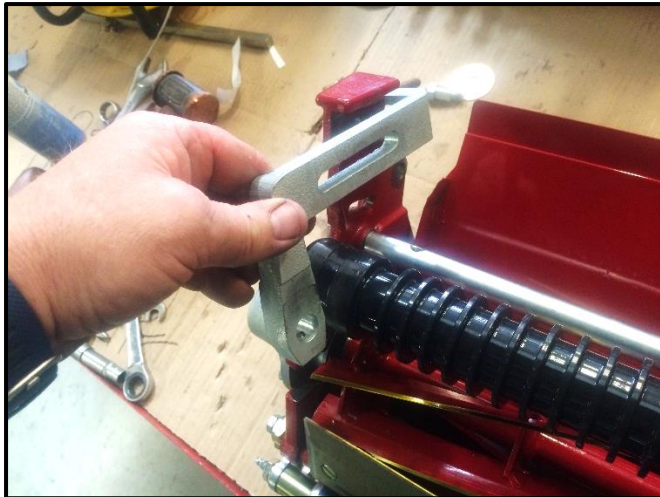
Clean the front roller adjuster threaded rods with a wire brush and then apply a thin coating of 'Copper-Slip' to them.

Clean the front roller bracket channel on both sides of the cutting frame with an abrasive paper.

Apply a thin layer of 'Copper-Slip' to both roller bracket channels as shown.



Fit the front roller onto the cutting unit on one side and secure with the coach-bolt, washers and nut.

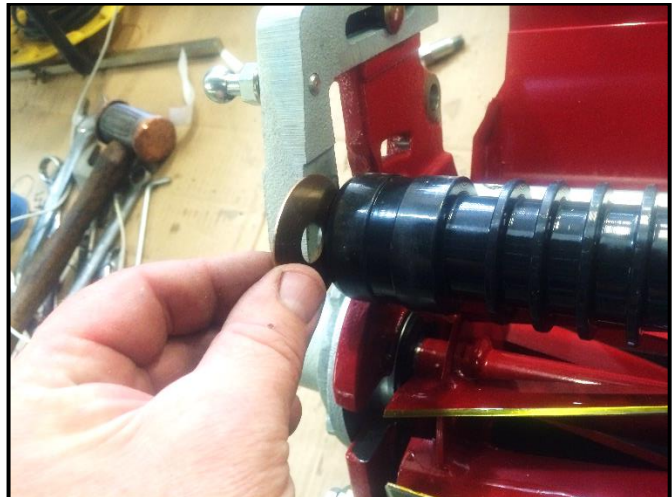


Fit the roller bracket to the other end of the cutting unit and hold it in place loosely with its securing coach-bolt, washers and nut.

**Note:** Do not tighten it fully until the next stages are completed.

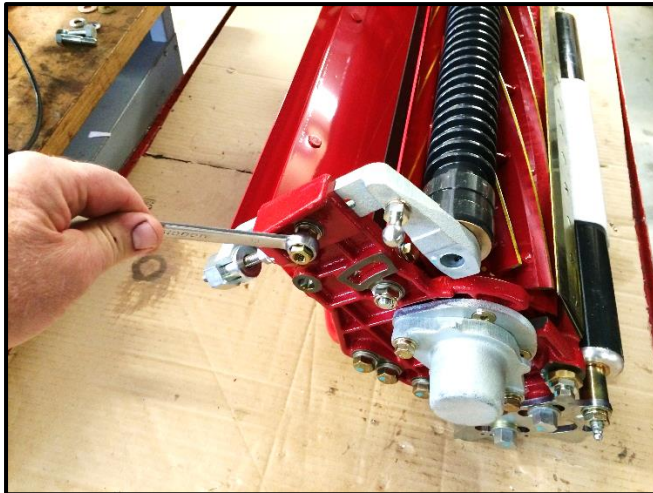
Insert the brass washer into position between the roller and the roller bracket as shown.

Locate the hole in the brass washer over the shaft of the roller.



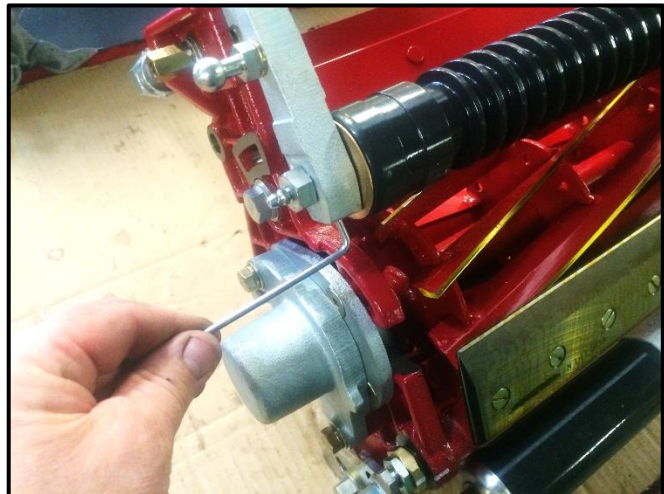
Screw in the shouldered roller bolt as shown and tighten with a 17mm spanner.

**Note:** When tightening this shouldered bolt be careful not to pinch the brass washer. When tightening, rotate the washer to ensure that the bolts shoulder passes centrally through the hole without pinching it.

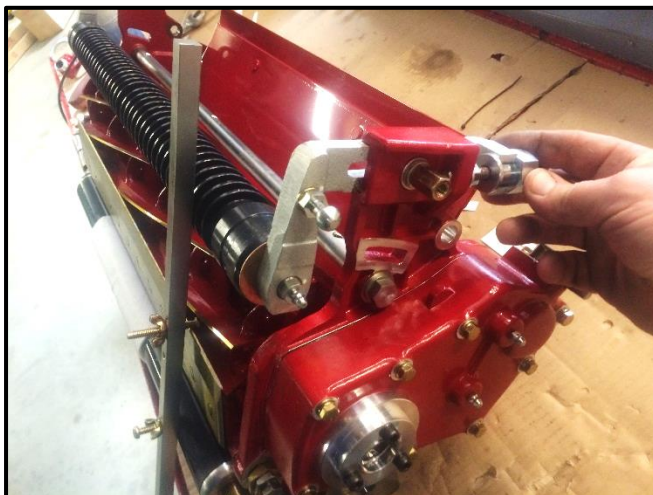


Tighten both roller bracket securing nuts as shown.

Tighten the grub-screw in the roller bracket against the shouldered bolt to lock the roller position.



Adjust the height of cut to the customers desired setting.





The required height of cut needs to be set between the underside of the setting screw head and the setting bar.

The front roller then needs to be adjusted so that when the setting bar is touching both the front and rear rollers, the underside of the setting screw head slides over the bedknife cutting edge with a nice snug contact.