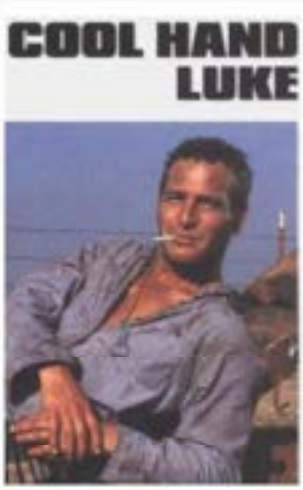
ARIEL Square Four

Thursday, 28 March 2013

Spend a night in the box...



Paul Newman

No man shall have worn mainshaft bearings. Any man found with worn mainshaft bearings spends a night in the box!

No man shall be missing his kickstart stop. Any man found missing his kickstart stop spends a night in the box!

No man shall forget his lubricant. Any man found forgetting his lubricant spends a night in the box!

One of my favourite films, Cool Hand Luke.

Talking of spending a night in the box, the engine is going to be ready next week and I need to have the gearbox out & cleaned because if I know myself at all I'm not going to want to tear Amelia apart anytime soon, when the bottom end is back in.

So, I've been looking at Mr. Waller's book and I need to record what I'm doing with the gearbox. There doesn't appear to be a manual for the BA, so perhaps we can write one.

Many machines used Burman gearboxes, going back to pre-war years including Ariel, AJS & Matchless, Panther & Vincent. Many of these manufacturers used the GB gearbox with the enclosed clutch arm, and there is some material out there on these boxes. This text is predominantly about the earlier BA box fitted to my Square Four, which shares much of it's internals with the GB, and indeed the GB was derived from it.

The gearbox which is the subject of this article is a 1951 BA from a Mk1 Ariel Square Four.

Getting Access - Removing the Gearbox

Remove the clutch cable by loosening the adjuster and disconnecting the cable nipple from the clutch operating arm on the gearbox outer cover. If you have the rubber boot fitted over the arm, draw this back over the arm to expose the nipple.

Just imagine how that would have been handled in a Carry-On film. You can almost hear Sid laugh.


Speedo Cable Screw - don't lose it!

The speedo cable is removed from the end of the gearbox by removing the screw on the outer casing beneath the cable. Put it back in once the cable is removed so you don't lose it.

Loosen the bolts securing the kick start lever and the gear lever. I leave the levers in place since it gives you something to hold when you remove the gearbox.

Remove the clutch cover, slacken and remove the spring screws and remove the plates. You now have access to the clutch centre tab washer which you can knock back, followed by the nut and the clutch centre. Next, drain the primary case and take out all the screws. Split the primary chain and put it in a bag to keep it clean. Now you can knock back the tab washer (in six places) securing the clutch basket screws. Remove the screws. When you lift the clutch basket away, arrange a plastic ping meal container underneath to catch the needle rollers within the centre bearing. Hopefully they won't all fall out. There are 12 of them.

Lastly, remove the rear chainguard and the rear half of the primary case. You can now see, and

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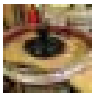
Spend a night in the box...
Paul Newman No man shall have worn mainshaft bearings. Any man found with worn mainshaft bearings spends a night in the box! No man ...


Making a number plate
It's getting around to the time the W/NG magneto should be back from refurbishment, so we might be able to ride it soon. Time to make a...


E3HM Dynamo
Well, the charging system is not working. Hardly surprising after an indeterminate period of laziness under the Italian sunshine, but the p...

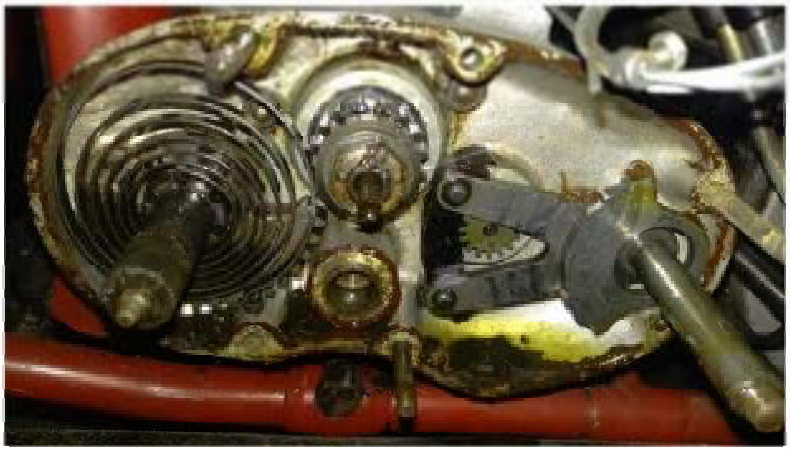

Wheels again...
Work on the engine has stalled for a moment whilst we wait for FW Thornton to see if they can help out with a ring problem. The bench is no...

Leak Test

hopefully you will clean the gearbox.
The gearbox is now ready to be removed from the frame and it is only (!) necessary to take off the oil tank and battery carrier to give greater accessibility to the top and bottom clamping and swivel bolts. Loosen all rear engine plate bolts and the gearbox adjuster and allow the plates sufficient slackness to enable the gearbox to be lifted out towards the offside. Have a rest. I know your pride & joy looks like a basket case again doesn't it!

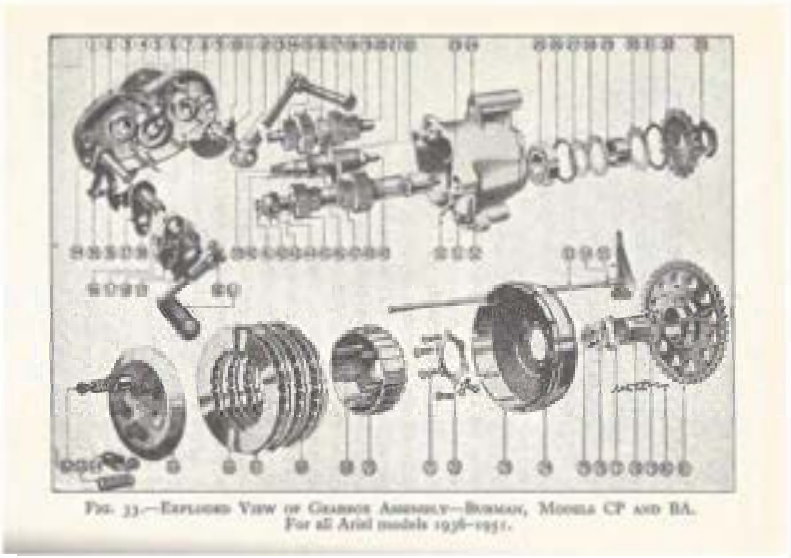
Complete, vice mounted Burman BA

Clamp the gearbox in a vice by way of the bottom swivel lug and remove the nuts securing the outer end-cover, which can then be pulled away complete with the kickstarter and foot-change mechanism. This is what you will see:



CP Gearboc Kickstart & Selector Mechanism

We'll look at these bits later, or you can skip to the bottom of the text and look at them now, which is what I did!



An exploded gearbox. I hope his book is out of copyright.
The gearbox is of course upside down...

Dismantling the Gearbox Internal Mechanism

This operation can begin by unscrewing the hexagon nut on the end of the mainshaft and taking off the kick-starter driving ratchet, ratchet pinion, distance sleeve and short coil spring.

These parts require checking for wear, together with the kick-starter quadrant which was removed with the outer end-cover. You need to make sure that the teeth on the ratchet nut (item 41) and the driving ratchet (item 42) are nice and sharp, and not worn. You'll see them in a picture somewhere hereabouts, looking nicely unworn.
The mainshaft nut is a bit mangled though, looks like it has been in a scrap with Mr. Chisel & Mr. Hammer.

If the first few teeth of the quadrant are "burred," these should be

As I may have mentioned I have a leak in the fuel tank. I found a product online called 'Seal-All' which purports to be suitable fo...

Carburetter

Well, while waiting for the Bantam engine rebuild to get moving (I'm waiting for the crankshaft to come back from Rex Caunt) I've b...

There's always something

Having got the magneto back on , and the bike up and running properly, I went for a little ride... and it was great. Back in the workshop...

Blog Archive

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My Favourite Links

- Acme Stainless
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- Boy Albie's Bantam Site
- BSA Bantam Club
- Classic Bike Tech
- Classic Dynamo & Regulator Conversions
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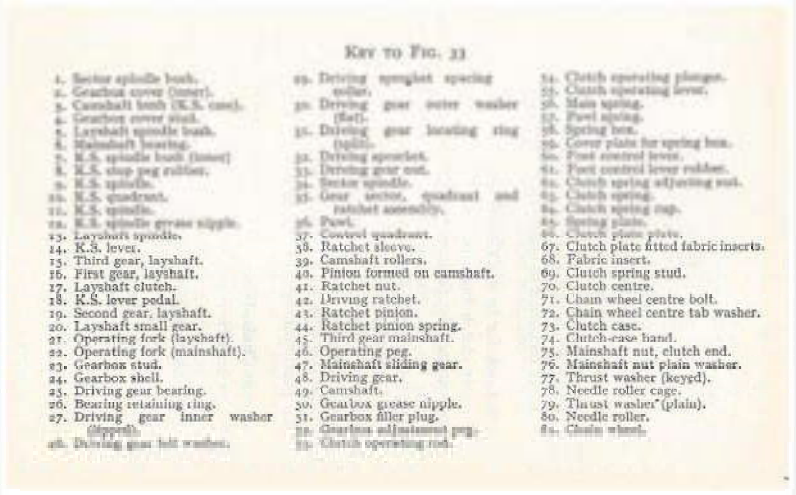


Key to Fig. 33

1. Sector spindle bush.
2. Gearbox cover (inner).
3. Camshaft bush (K.S. case).
4. Gearbox cover stud.
5. Layshaft spindle bush.
6. Mainshaft bearing.
7. K.S. spindle bush (inner)
8. K.S. stop peg rubber.
9. K.S. spindle.
10. K.S. quadrant.
11. K.S. spindle.
12. K.S. spindle grease nipple.
13. Layshaft spindle.
14. K.S. lever.
15. Third gear, layshaft.
16. First gear, layshaft.
17. Layshaft clutch.
18. K.S. lever pedal.
19. Second gear, layshaft.
20. Layshaft small gear.
21. Operating fork (layshaft).
22. Operating fork (mainshaft).
23. Gearbox stud.
24. Gearbox shell.
25. Driving gear bearing.
26. Bearing retaining ring.
27. Driving gear inner washer (flanged).
28. Driving gear felt washer.
29. Driving sprocket spacing roller.
30. Driving gear outer washer (flat).
31. Driving gear locating ring (split).
32. Driving sprocket.
33. Driving gear nut.
34. Sector spindle.
35. Gear sector, quadrant and ratchet assembly.
36. Pawl.
37. Control quadrant.
38. Ratchet sleeve.
39. Camshaft rollers.
40. Pinion formed on camshaft.
41. Ratchet nut.
42. Driving ratchet.
43. Ratchet pinion.
44. Ratchet pinion spring.
45. Third gear mainshaft.
46. Operating peg.
47. Mainshaft sliding gear.
48. Driving gear.
49. Camshaft.
50. Gearbox grease nipple.
51. Gearbox filler plug.
52. Gearbox adjustment peg.
53. Clutch operating rod.
54. Clutch operating plunger.
55. Clutch operating lever.
56. Main spring.
57. Pawl spring.
58. Spring box.
59. Cover plate for spring box.
60. Foot control lever.
61. Foot control lever rubber.
62. Clutch spring adjusting nut.
63. Clutch springs.
64. Clutch spring cup.
65. Spring plate.
66. Clutch plate plate.
67. Clutch plate fitted fabric inserts.
68. Fabric insert.
69. Clutch spring stud.
70. Clutch centre.
71. Chain wheel centre bolt.
72. Chain wheel centre tab washer.
73. Clutch case.
74. Clutch-case hand.
75. Mainshaft nut, clutch end.
76. Mainshaft nut plain washer.
77. Thrust washer (keyed).
78. Needle roller cage.
79. Thrust washer (plain).
80. Needle roller.
81. Chain wheel.

The, um, Key to Fig 33. Sorry Mr. Waller.

ground down to give a clean engaging action with the ratchet, but a new part is, of course, advisable. Note that the first 'tooth' is typically ground off, which enables engagement with the pinion in the first few degrees of movement.

The kickstart pinion ratchet & pinion

Remove the inner half gear-cover from the main casing, taking note of the twelve hardened rollers which form the bearing for the gearbox camshaft. Since 1941 many gearboxes have been fitted with a phosphor-bronze bush in place of the roller-type race (but not mine! 1951 and it still has the roller race for the camshaft). Next remove the slotted screwed plug at the base of the main casing and pull out the pawl spring. Pull out the mainshaft from the clutch side and then remove the layshaft with gears and operating forks as a complete assembly. This is not difficult, but to make it easier you can remove the mainshaft & layshaft third gears before you take the whole cluster out (items 15 and 45 in the exploded view). You can put them back separately too. Saves you dropping them on the floor and spending the rest of the evening in tears.

Kickstart quadrant. Perfect condition.

Inspecting Internals for Wear

The pinions and operating forks should be carefully examined, as should the layshaft and mainshaft. Check for wear on the fork operating faces and renew if at all grooved. Note the order of assembly on the camshaft and that the longer of the two forks is for operating the sliding gear clutch on the layshaft. Remove the split pins retaining the dowel in each fork and remove the dowel. Inspect the dowel for wear, which will appear as flats worn on the sides. Replace the dowel using new split pins, cutting them short & bending the legs outward. Grease the pins and the slots before you reassemble the camshaft.

Forks. Beautiful. Clean. Square. Lucky boy.

Burman gear pinions are not case-hardened, but being made from oil-toughened nickel-chrome steel, are hard enough to give strength and wearing quality without the risk of frequent fracture, which is more relative to gears which have been case-hardened and treated. Gear pinions very seldom call for replacement, unless through some reason a fractured tooth has occurred.

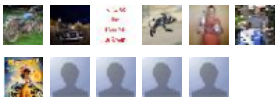
Of course, we are looking at gears that may have been in service for many more years than perhaps Mr. Waller might have imagined, so we might look more closely at our teeth. Always pays to take care of your teeth.

So what are we looking for? ISO 10825 lists a number of failure modes for gear teeth:

- surface distubances such as wear, corrosion or overheating
- scuffing, which is the transfer of material from one surface to another, under load
- permanent deformation - bending, rippling, indentation
- surface fatigue, such as pitting, spalling or flaking
- fissures & cracks
- tooth breakage

Fortunately, examination of the gears revealed no damage and very little wear. Machining marks were evident in some areas.

Follower (11)



Folgen

Keywords

If the gearbox has been long in service it is advisable to check both the layshaft and mainshaft spindles between lathe centres and using a clock-dial gauge.

If either shaft shows bending to have taken place and this to exceed 0.005 in., a renewal is advised. Test the shafts in their respective bearings or bushes and note that a clearance wear of 0.005 in. - 0.007 in. is permissible before renewal. The driving gear and sprocket, having been left in position in the gearbox shell, should be tested for clearance, both internally and externally, and if the centre bushes show a clearance exceeding 0.006 in. - 0.007 in. when tested with the mainshaft inserted, fit new ones.

George had poor teeth...

Driving-Gear Bushes

Two are fitted with a centre space for grease deposit between the two and are a tight press fit and require reaming after fitting to give a shaft clearance of at least 0.0015 in - 0.002 in.

The contents of my box

To remove the driving gear from the casing the sprocket large locknut must be unscrewed. Some models have a special lock-washer securing the nut, whilst others incorporate the system of punching the inner edge of the nut into one or more of the splines of the driving-gear shank. Knock out, pry out or drill out the elements of the lock washer that are retaining the nut, and proceed with removing the sprocket.

To remove the sprocket, Mr. Waller says:

To hold the gear and sprocket from turning, a very useful tool can be made up and used as follows. Obtain a scrap mainshaft and grind two flats on the thick end which carries the clutch race . Fix this shaft in the vice by gripping the flats. Take the mainshaft sliding gear and place on the splined shaft with the large pinion uppermost. Next invert the gearbox case over the shaft and engage the sliding-gear pinion with the driving gear.

That method is all well & good when there are a plentiful supply of old mainshafts knocking around, but I don't think today I or anyone else will be destroying precious spares in this cavalier fashion. My alternative starts with removing the mainshaft, and inverting the whole box so that the sprocket nut can be gripped in the jaws of your vice. Then, take a large Stillson wrench/Monkey wrench/pipe wrench, and open it up as wide as you can. Use the Stillson to grip opposing teeth on opposite sides of the sprocket and turn the whole sprocket, which the vice grips the nut. You might need a tube or something to increase leverage - it will be tight. It's a normal RH thread, so when it won't come undone don't think you are tightening it!

Undo it using this method until it is free to turn, but don't forget that the box is supported on that nut. As soon as the nut is undone the box will fall on the floor if you don't watch it! Take it out of the vice and finish removing the nut with the box safe on the bench. The driving gear can pushed into the case for removal, when you strip the internals out.

Shh don't tell anyone, but this is a Bantam clutch puller!

The sprocket can be stiff too. A puller will fix that easily.

Gearbox Sleeve Gear Oil Seal

Seals in situ

During the 1948 season, Burman introduced a self-adjusting oil-seal to be fitted next to the main driving-gear ball bearing. The idea was to convert the gearbox to "all oil" lubrication from the grease or grease/oil mix used previously; although the seal was effective in preventing leakage at the bearing end of the box, there was considerable "weepage" elsewhere.

With a seal fitted it is advisable to use a fifty-fifty mixture of oil and grease as a lubricant and "top up" with a grease gun filled with such a mixture.

The oil seal can be obtained and incorporated on any Burman four-speed gearbox, Type "BA" and Type "CP ". The seal fits with a thin steel gland washer on either side, immediately behind but after fitting the driving-gear bearing (see Part No. 25, Fig. 33). The seal components are shown in picture nearby.

Check the Main Ball Bearing and Bushes

The driving-gear ball bearing is easily pressed out of the housing after removal of the circlip and dust-cover, and the oil seal if it is fitted.

Wash out the bearing and check inner and outer races for pitting and wear. While you are at it, wash out the mainshaft ball bearing from the kickstart end and inspect that too

If bearing shows any signs of wear and "shake" renewal is advised. A worn bearing will cause gears jumping out as well as undue noise. Mine were both loose & showed a fair bit of play once clean - unwashed, they were just gritty & hard to move.

The layshaft spindle bush and camshaft bush fitted into the gearbox case should be examined. These bushes have a flanged-face fitting and are pressed into position.

All the tolerances, plus the actual dimensions of the bushes and shafts from my box are on the Engine & Gearbox Tolerances page within this blog. You'll notice that my bushes are all on the upper end of acceptable wear, but considering that this machine will doubtless be used for leisure pursuits we will not replace the bushes this time.

BA Gearbox Sleeve Gear Seal Components

If the camshaft bush flange is worn the shaft can take up a floating action due to excessive end-play, and as the operating forks are located on the shaft this float will readily cause the forks to over-travel with the sliding gears and disengage them whilst under load. A temporary repair can be effected by placing a hardened shim or washer on the end of the camshaft to compensate for the worn flange, taking care to leave at least 0.001 in. - 0.002 in. end-play.

After ensuring that all gear pinions and shafts are in good condition for further service, preparation should be made for reassembling the main gearbox. We will however review & inspect the gearchange & kickstart mechanisms first.

The Gearchange Mechanism

The foot gear-change mechanism is of the positive type and allows only one gear at a time to be engaged by one movement only of the pedal either way. Apart from accidental damage, the only parts requiring replacement due to wear and tear over a long period are the two main coil springs and the two pawl coil springs positioned in the alloy spring-box, and the ratchet and quadrant pawl.

The ratchet and pawl should be closely examined for any sign of wear at the engaging points and, although a temporary repair can be made by "stoning" up, these parts should be replaced if they appear to be unduly worn.

The coil springs and their housing

Check the tightness of the three rivets securing the ratchet and quadrant to the sector. Any slackness of this assembly will cause trouble in gear engagement and, resultant jumping out of mesh will occur. You'll see the three rivets in the adjacent picture - two round rivet heads on the arc with the gear teeth - the third is just visible as

Pawl and his teeth. Actually very good

a circular mark on the pawl ratchet. This rivet is countersunk this side.

Note that in the same shot you can see the timing mark on the arc with the gear teeth - the small punched 'O'.

Three rivets & a ratchet

The Kick-starter

Hopefully you remembered to inspect the kickstarter quadrant when you took it out - if not, clean it and do it now. When you have it clean, pay close attention to the splines for the kickstart lever. If these look worn (i.e. they are not distinct sharp splines with parallel sides) go and find a new shaft. The shaft can be pressed out of the quadrant if need be.

The quadrant and ratchet having been examined or replaced, attention should be given to the kick-starter lever return spring. Ensure that the spring is strong enough to return the lever and pedal to the vertical position after being depressed. A weak spring can have its tension increased by rewinding a further one or two turns, or you could seek out a new one, or, if you fancy playing with your Rothenberger Superfire 2 you could reharden & temper the old one. No guarantees though, this is tricky work!

Kickstart Quadrant Stop (top left)

When refitting, do not wind the spring up solid, but only sufficient to throw the lever and pedal sharply to the normal vertical position. The inner end of the spring fits into one of the slots on the kick-starter shaft immediately behind the quadrant, and the outer end to a peg provided in the gearbox cover. The correct way for fitting the spring is for it to be located on the shaft with the coils running clockwise from the centre. If fitted the reverse way, the pedal will be thrown to the lowest position instead of to the top of the stroke.

The gearbox is fitted with a stop for the kickstart quadrant, which is akin to a Metalastik bush (a steel ring with a rubber centre) fitted over a peg, which is in turn a press fit in the middle casing. AOMCC wisdom suggests that it's installation restricts the kickstart movement some 20-30 degrees.

Reassembling Gearbox

Assemble the cluster on the bench

This is really a reversal of the dismantling operation, said Mr Haynes. Before you start however, prepare all the parts. Make sure everything, including your bench, is really clean. Clean off all that nasty red hermetite the previous bodger smeared everywhere. Clean the oxide off the cases with a wire brush, make it nice and shiny with a dose of elbow grease and save yourself a trip to the blaster. Make any repairs you need to make to the alloy parts of the case - repair that broken clutch cable lug, replace the missing kick start stop.

Actually I cheated a bit here. I have never tried aluminium welding (though there is an excellent site at www.mig-welding.co.uk to help you), so to deal with the broken clutch cable lug I bought a new middle casing - but this one had no kickstart stop. You might remember it from this post. Now, normally these are a press fit in the middle case, but mine was missing and the hole mis-shapen. The best option I had was to recut the hole with a 1/2" tap, and the only one I had was 20TPI. I had intended to make a new stop peg from a 1/2" BSC bolt, but

since I couldn't find one I had to make a new one from 1/2" round bar, 1 1/2" long, and threaded 1/2" BSC for 1" of its length. I tapped the hole on the case, and cut a slot for a screwdriver in the threaded end of the stop to wind it in. I will secure it with Loctite when I have assembled the rest of the box.

New kickstart stop peg

Kickstart stop peg in place

Then replace any bushes that are too tired and ream them to size, not forgetting the tiny bush for the clutch arm. These like most bushes are a press fit in the clutch arm lug on the outer case. Remove them by pushing them out wit the new bush. with the aid of a small bolt (M5 fits neatly) drawing the old bush into a small socket. Clean out the shavings. Replace any missing Welch plugs from the drive sprocket end of the case. These are really easy to make from sheet steel, formed hot with a ball pein hammer in an old socket of a suitable size and deserve a post of their own, since I am running out of space for pictures here!

Lastly, fit the new ball bearings. This is made a lot easier if you leave the bearings in the freezer while you have your dinner. Make sure the seats for the bearings are spotless - you don't want any grit or swarf preventing the bearing from going into the proper position, otherwise they will not be supported properly and you won't get the oil seals in - there is not much space in the large bearing housing for the bearing, seal and the spacer discs. Heat each case with the trusty hot air gun and drop the cold bearings in, seating them with a suitable drift - don't touch the balls or the inner race with your drift, punch or hammer! A cold bearing in a hot case won't need much force, if any. Put a few drops of a bearing retainer (I use Loctite 603) around the outer race.

Now we can begin assembling the box.

Note the correct order of the driving-gear ball bearing, retaining rings, felt washer, etc. and assemble those parts. Grease the bearing as it goes in, and the oil seal if you have one and fit the spacer into it. Insert driving gear in the new bearing, fit the sprocket, the lock washer and do up the nut. You can tighten it but don't bend the lockwasher yet, until we are sure it doesn't need to come off again. I like to leave the nut loose until the box is fully assembled & tested, since it is a pain to tighten. You don't want to do it twice.

Knackered clutch arm bush

Make up the mainshaft gears, layshaft assembly, camshaft and operating forks into a complete sub-assembly, and insert this into the gearbox case, locating the layshaft and camshaft spindles in their respective bushings. It is easier if the camshaft pawl is off whilst replacing the cluster. Insert the mainshaft from the driving-side and pass it through the mainshaft sliding gear. Wiggle it a bit to get it through the splines.

Wiggle the cluster into the case

Fit the remaining third mainshaft gear on to the shaft end. Check the proper position of the camshaft pawl and refit it, followed by the pawl spring and plug. Leave the plug a bit loose until you have the end cover on - it makes it easier to test for each gear when you are rotating the camshaft by hand.

Fill the roller groove at the end of the camshaft with grease, and place the twelve camshaft hardened rollers (where fitted) in the groove, sticking them in the grease, and fit the gearbox inner cover.

Use Wellseal on the cover - there is no gasket. Nip up the 1/4" BSW nuts securely.

Refit kick-starter ratchet assembly and tighten mainshaft and nut. Turn the mainshaft to make certain it is free - I have nipped the kickstart pawl spring behind it's sleeve, which isn't obvious and puts a side load on both rolling bearings. Test mainshaft for end-play which should be l/64 in. - 1/32 in. If end-play is excessive, this can be reduced by fitting a slightly longer ratchet pinion steel bush on which the kick-starter pinion and small coil spring fit. Another method for reducing end-play is to countersink the inner face of the shaft nut to allow it to project over the shoulder on the shaft end and so push the ratchet further along the shaft.

Timing Must be Checked

Add the 3rd gear pinions

Before you go any further, make sure you can select all the gears. Turn the camshaft using the quadrant - it can be a little stiff, but turn the mainshaft to help it along. You don't want to finish assembling the box only to find something amiss. Tighten the pawl spring plug when you are done. Dave Pitt from the AOMCC says:

"Going anticlockwise the 0 on the cam gear is at about 2 o'clock in 4th, 11 o'clock in 3rd, 8 o'clock in 2nd, between 5 & 6 in detented neutral, and about 4 o'clock in 1st. You can find an undetented neutral between 2nd and 3rd, and 3rd and 4th. The 0's align in undetented neutral between 2nd and 3rd."

Note that when finally fitting the foot-change assembly the quadrant and small gear pinion on the camshaft must be correctly "timed" or meshed, otherwise incorrect positioning of gears will result. The quadrant and pinion are marked with distinctive timing dots (the stamped 'O's) and these must be intermeshed when the gears are in the neutral position before finally bolting up the outer gearbox end cover. As Dave Pitt says, note that the 'neutral' referred to here is a false neutral, not detented by the pawl, between 2nd & 3rd, and is not the true neutral. The true neutral is a detented position on the camshaft between 1st & 2nd.

CP Gearbox with stamped 'O's' aligned

Gear Indicator

Refit the end cover - use Wellseal again on the joint, there is no gasket. Whilst the gearbox is still in the vice, make sure you can get all the gears! Make sure the kickstart returns the lever smartly to the top of the stroke!

You can now tighten the sprocket nut - fit an old clutch centre, with a bar through the studs and you will be able to tighten the sprocket nut sufficiently. When you have finished heaving this about, you can refit the two gear indicator pointers and the clutch lever and it's adjusters.

Install the complete gearbox back in the frame. Fit the gear lever, kick start lever, and the clutch cable. Then check the engine plate nuts once more and fill the gearbox with grease/oil mix, enjoying the unprecedented access to the filler cap. The end cover as well as, of course, the main gearbox case should be nearly filled with any of the makers' recommended brands of grease mixed 50/50 with oil, or a self-levelling grease. Quantity required is about 600 ml. Do it up and re-fit the oil tank if you removed it. Fit the speedo cable.

Now you get to go around the other side and put the clutch back together!

A gearbox in a frame

Posted by CharlieCeng at 19:30

Labels: AJS, AOMCC Forum, Ariel, BA, Burman, cast aluminium, clutch, CP, Draganfly, GB, gearbox, Matchless, Panther, rothenberger, Square Four, superfire 2, Vincent

17 comments:

Sypoth 4 September 2013 at 02:59

Very nice, just found your blog and am interested in watching your restoration of your MK1, I am actually in the process of tearing down a 4G cast iron Ariel my father owns so it can be rebuilt. I've got a question for you though, on the top of the gear box there is a round hole that goes into the casing, it looks like there is supposed to be a stopper or dip stick for that hole but I can't find any information other than it's supposed to be there, not even a mention of what it's for, what it does, or what goes into or connects to it.

Reply

CharlieCeng 4 September 2013 at 07:47

Thanks for your comment.
I guess that you are referring to the hole in the kickstart casing, above the big nut and the speedo cable screw?
Have a look down it and turn the gearbox output shaft. You should see movement?
It's for the speedo cable!

Reply

Replies

Sypoth 4 September 2013 at 10:57

Ahh, I see, thanks very much for the information. This bike needs allot of work and is missing allot of parts as the previous owners modified it for drag racing. Front brake, Dynamo housing, headlight, tool box, battery bracket(not that it needs one) were all removed and the petrol tank is a small chopper tank modified to look stock, carburetor was replaced with a type 276 AMAL and attached with a custom fitting pipe that moves it right where the battery would be. I plan on restoring it properly over time but for now I'm just concentrating on getting it up and running so my dad can enjoy riding it once again. The parts I'm worried about are mostly the ones that can't be easily accessed later and since this is one of them I plan on getting a replacement. Another good question for you though, the distributor cap is beyond repair, other than Ebay have you come across any place where I may order a spare? Also, for the frame I am debating Between Paint, Powder coat, and enamel. I have found plenty of information on each but hardly a pro or con for which to use on the frame for best durability and protection of the metal, I want it to last a long time and be durable enough to withstand riding on gravel, so far stove enamel is the only one I've found that comes close, do you have any other suggestions or can supply me with more information on pros and cons of different paint options?

Reply

CharlieCeng 5 September 2013 at 22:04

Draganfly appear to have the distributor caps, PN 400135 - not cheap though! When you say it is beyond repair, have you seen my post on distributor caps?

On frame paint, I would probably go with powder coat or two pack. Powder coat is incredibly tough, but is very thick and disguises some detail; two pack won't disguise anything, but it is not so tough... I plan to use powder coat on the mudguards & frame, mudguard stays, stands etc. My tank & wheels are two pack.

Reply

Replies

Sypoth 9 September 2013 at 08:06

Actually I've read your entire blog, very fascinating stuff and I am looking forward to seeing your bike complete and running, it's not that far off from the last post, what I mean by beyond repair is that only one of the four screw int is intact, two of them are entirely missing, another has in the past broken and had the screw head epoxied in place, the final one is missing 2/3s of the threads with just a small post sticking up that still has threads left on it, inside the pin that delivers electricity to the rotor is jammed flush with the cap itself and would require drilling to remove. I may try to repair it later but much like the original rim where it has rusted entirely through in several places it is done for. The hub of the rim I just mentioned I plan on salvaging and repairing it has three cracks but I'm confident I can weld those back together once I've cleaned out the crack and bent the metal back into place. As I've said this bike is a mess, but then again being modified into a drag racer then being left out in the elements for 30 years waiting for work all the while my dad having given up on getting it fixed because he had such a hard time looking for parts and because it's sat for so long hasn't been kind to the old thing. His hopes are up though, thanks to the many resources I've found most of the parts we will need to get it up and running and even the materials necessary to guarantee him we can make what we don't have. Taking a multitude of pictures of each and every step of both the bike and the components in the stages of tear down also helps along with several of the diagrams you've posted, believe it or not the lubrication system image you posted was a big help. Sorry that my posts are a bit long winded, it's just so nice that you let me pick your brains on this. And just to confirm you recommend Powder Coat over Enamel, because I was seriously considering covering the bike with the same material on those porcelain signs from that era that has lasted without fading for a long period of time.

Wires Fabriks 6 December 2013 at 08:12

I agree with sypoth. This comment are really true and interesting, useful. thanks for sharing us.
Phosphor bronze mesh

Reply

CharlieCeng 9 September 2013 at 10:40

Feel free to keep asking questions! that's mostly what the blog is here for!

Reply

John 14 May 2014 at 12:22

A lot of very useful information. I've just bought a 1952 Ariel VH with a Burman BA gearbox. No chance of riding it yet as the kickstart has jammed. Got the front cover off. Kickstart quadrant OK but the ratchet pinion worn - Draganfly out of stock. Also noticed the speedo drive missing. Two questions if anybody can help. How do I remove the speedo cable from the casing? I have removed the screw that holds it in, but it still won't budge. I'm not sure whether to pull, twist or force. Which speedo drive is the correct one - part nos. 3150-31, 3150-47 or 3150-50? John

Reply

CharlieCeng 15 May 2014 at 16:07

Aha! The eBay one from Wissington in Norfolk perhaps?

The speedo cable, which has a special end fitting pushes into a carbon steel cylinder shrunk into the gearbox case. I will find you a picture. It's probably rusted - I'd try plus gas, and if that didn't work, heat. The speedo drive is probably the 3150-50 - that is the latest one and the one fitted to my 1951 SQ4. The dash number (-31, -47 etc.) is the year that part was first fitted.

Reply

Replies

John 15 May 2014 at 22:52

No. That eBay one is a 1951 model with plunger rear suspension. Mine, a tele/rigid, although dispatched in 1951 is a 1952 model as the manufacturing year began in the

previous September. The BA gearbox is stamped G107M51 (December 1951) - later 1952 bikes were fitted with the Burman GB box.
The previous owner had spent quite a bit of time, effort and money on restoration but for some reason never completely finished it off. The new wiring loom needs tidying and as well as not having a speedo drive there is no speedo (does anyone have a Smiths 120mph chronometric for sale?).
Thanks for the information - the end of the speedo cable is soaking in Plusgas, the ratchet pinion has been ordered with an ETA of 3 weeks and I have been given a price of over £70 + VAT for the speedo drive - ouch!

Reply

CharlieCeng 16 May 2014 at 09:58

Those speedos come up on eBay quite regularly, though depending on the depth of your wallet you could go to one of the specialists and get one built for you. You want a S467/3/L (assuming its mph that you want - are you in the UK?)

Reply

Replies

John 17 May 2014 at 11:46

Yes, north Lancashire. Unfortunately I can't post a photograph of the bike on this site. Another question please. To replace the ratchet pinion I need to remove the ratchet nut. With the box still in situ how do I stop the mainshaft from turning? I'm assuming its right hand thread.

Reply

CharlieCeng 21 May 2014 at 15:13

How you stop the mainshaft from turning depends on what is assembled... You can use the engine if you have the clutch assembled - there might be enough engine braking to stop the clutch turning; you might have the block off, in which case you can use the old 'screwdriver through the small end' trick or if you have the rear chain fitted you can put the bike in gear and use the rear brake. If the box is out, put the box in gear and grip the gearbox sprocket in the soft jaws of a large vice...

Reply

CharlieCeng 21 May 2014 at 15:17

Hope that helps a bit?

Reply

John 12 June 2014 at 20:37

Thanks for the help, kickstart no longer jams after new ratchet pinion and stop fitted. Sorry for not acknowledging earlier but I have just returned from motorcycling in the French / Spanish Pyrenees - no, not the Ariel, a modern Triumph.

Reply

CharlieCeng 12 June 2014 at 21:19

Excellent! Where did you get the stop?

Reply

John 13 June 2014 at 21:48

Draganfly. Stop peg, Part Number 3337-31, £2 +VAT. Kickstart stop rubber, Part Number 3338-33, £6.75 +VAT.

Reply

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About Me

CharlieCeng

I'm a mechanical engineer by profession, working these last 25 years in the oil & gas industry. I've been riding bikes since I was 16, and spend my time tinkering with classic cars & bikes when I'm not working or looking after the house. I'm married & have two great kids, who mostly share the passion!

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