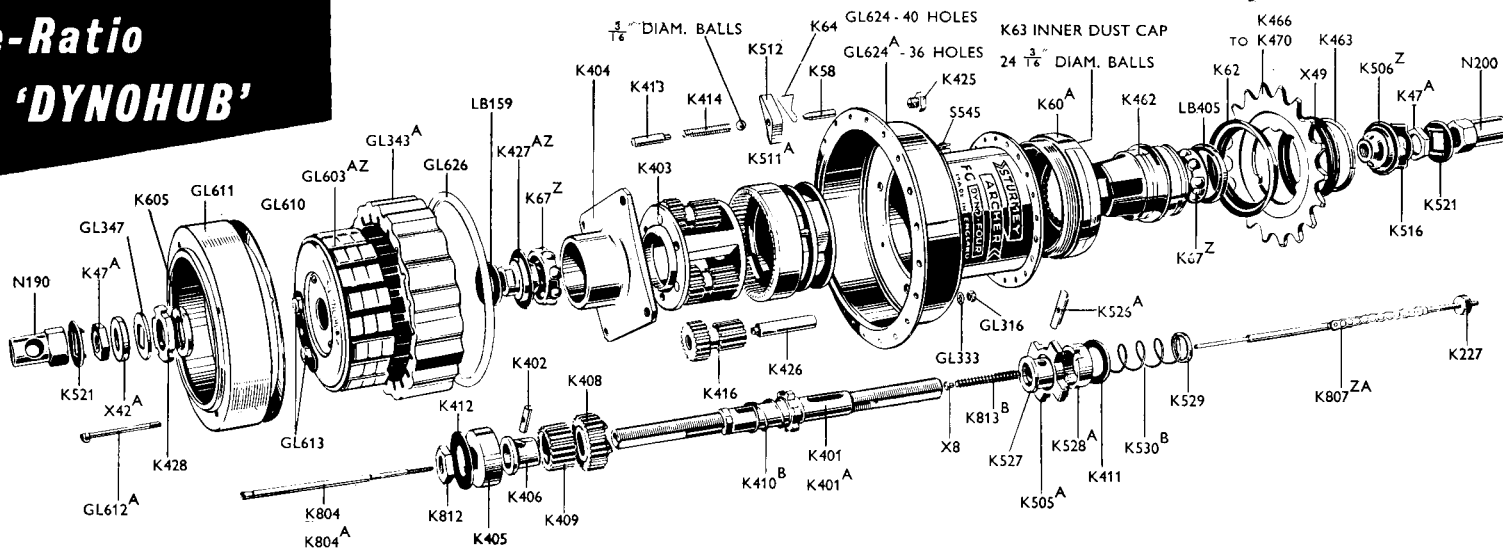


FG Wide-Ratio 4-SPEED 'DYNOHUB'



CODE No.

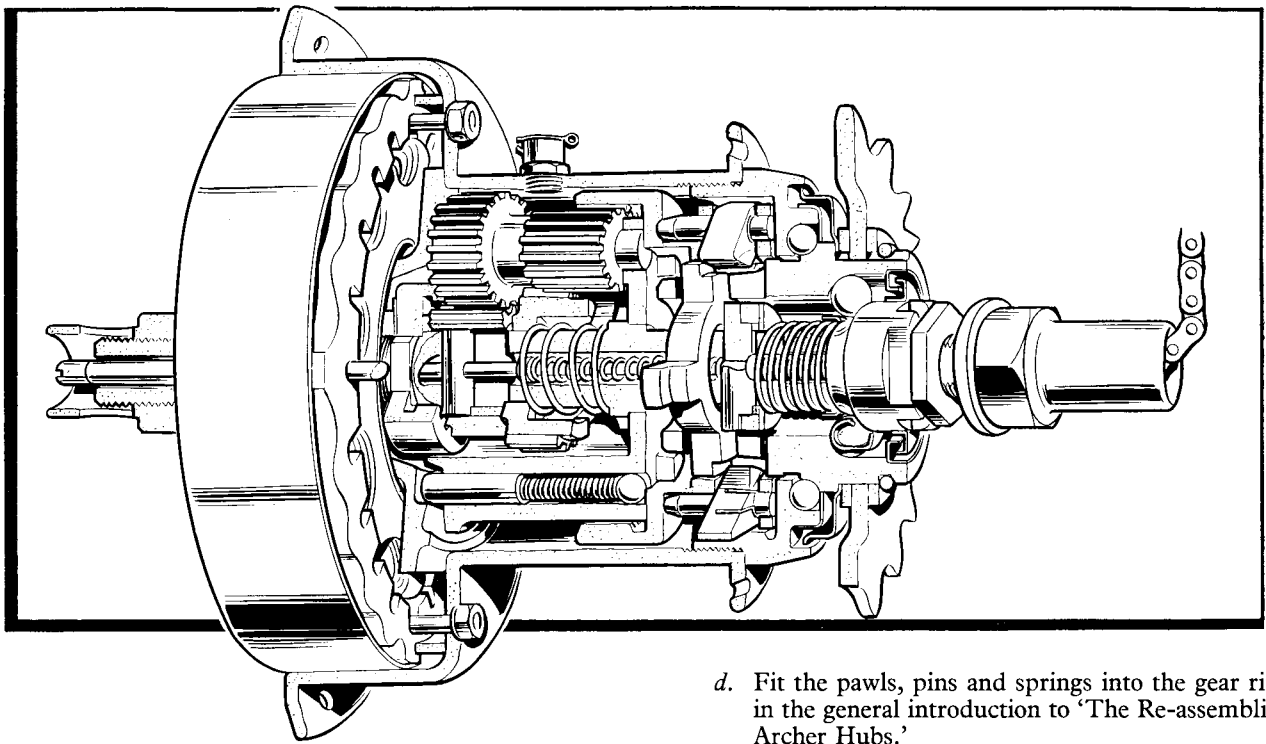
DESCRIPTION

K401A	Axle, 6 $\frac{1}{4}$ " long
K401	Axle, 5 $\frac{3}{4}$ " long
K410B	Low Gear Spring
K408	Primary Sun Pinion
K409	Secondary Sun Pinion
K406	Pinion Sleeve
K402	Low Gear Key
K405	Dog Ring
K412	Locking Washer
K812	Locknut
K403	Planet Cage
K416	Planet Pinion
K426	Pinion Pin
K813B	Compensator Spring
X8	Collar for Compensator Spring
K527	Clutch Sleeve
K505A	Sliding Clutch
K526A	Axle Key
K804A	Indicator for long axle
K804	Indicator for short axle
K807ZA	Coupling complete
K227	Connection Locknut
K511A	Gear Ring
K512	Gear Ring Pawl
K64	Pawl Spring
K58	Pawl Pin
K60A	R.H. Ball Ring
329	Ball Bearings $\frac{3}{8}$ " diam. (per set of 24)
K63	Inner Dust Cap
K528A	Thrust Ring
K411	Thrust Washer
K530B	Clutch Spring
K529	Spring Cap
K462	Driver
K67Z	Ball Cage with 8 $\frac{1}{4}$ " balls
LB405	Outer Dust Cap

CODE No.

DESCRIPTION

K506Z	R.H. Cone with Dust Cap
K516	R.H. Cone Locking Washer
GL624	Shell, 40 holes
GL624A	Shell, 36 holes
S545	Lubricator
SET OF THREE	$\frac{3}{8}$ " diam. ball bearings for K403 Planet Cage
K414	Low Gear Pawl Spring
K413	Low Gear Pawl
K404	L.H. Ball Cup
K425	Ball Cup Fixing Screws
K427AZ	L.H. Cone with Dust Cap
LB159	Packing Washer
GL603AZ	Armature complete
GL613	Terminal Nut
GL343A	Magnet
GL626	Magnet Spacing Ring
GL610	Patent Number Disc
GL611	Magnet Cover Plate
GL612A	Magnet Fixing Screw
GL316	Nut for Magnet Fixing Screw
GL333	Lock Washer
K605	Spacing Washer
K428	Notched Cone Adjuster
GL347	Locking Washer
K47A	Cone Locknut
K521	Axle Locking Washer
N190	L.H. Axle Nut
N200	R.H. Axle Nut
K62	Sprocket Dust Cap
K466	Sprocket, 16 teeth
K467	Sprocket, 17 teeth
K468	Sprocket, 18 teeth
K469	Sprocket, 19 teeth
K470	Sprocket, 20 teeth
X49	Sprocket Spacing Washer
K463	Circlip



TO RE-ASSEMBLE THE FG HUB

Proceed as follows:

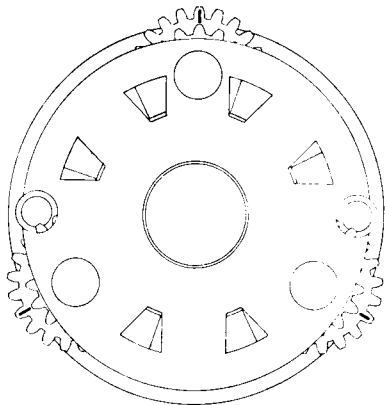
1. If the left-hand ball cup has been removed from the hub shell replace it and screw up tight the four hexagonal-headed screws, which are inserted into the drum wall from the outside and screw into the square flange of the ball cup.
2. Prepare the following preliminary sub-assemblies:
 - a. Fit the ball cage into the left-hand ball cup, with the ring of the retainer facing outwards.
 - b. Fit the ball cage into the driver, with the ring of the ball-retainer facing outwards and the recess in the dust cap also facing outwards. If a new ball-retainer is being fitted, the dust cap also should be new. If the sprocket has been removed see No. 29 on next page.
 - c. Fit the balls (only 24) and the inner dust cap to the right-hand ball ring, making sure that the balls can revolve freely with the dust cap in place.

- d. Fit the pawls, pins and springs into the gear ring as described in the general introduction to 'The Re-assembling of Sturmeier-Archer Hubs.'
- e. Smear grease in the channel of the dust cap of the driver and in the recess of the right-hand ball ring. *Do not use grease anywhere else.*
3. Working always from the left-hand (short slot) side of the axle, slide the low-gear spring, the primary sun pinion, and the secondary sun pinion and sleeve on to the axle in that order, and push them along until the dogs engage. (The low-gear spring, the compensator spring, and the clutch spring of a four-speed hub must be of the same series. If one has been replaced the other two must be.)
4. Holding the pinions in position, withdraw the secondary sun pinion sleeve until the low-gear key hole is exposed, and insert the low-gear key, making sure that the hole through the key is in line with the bore of the axle.
Release the pinions so that they can spring back and secure the key. Use the indicator rod to check that the hole in the low-gear key is still in line with the axle bore.
5. Fit the dog ring so that it engages on the axle square, and secure it with the washer and nut, spanner-tight. Then turn down the edge of the lock washer over two opposite sides of the locknut, to secure it. (Earlier models of this hub may not be fitted with tab lock washers.)

Drop the indicator rod down the axle to check that the end of the indicator rod comes level with the end of the axle.

6. Remove indicator rod and hold the axle vertically in a vice by the flats at the left-hand end and put the planet cage in place.

7. Add the double planet pinions and pins so that they engage with the two sun pinions. The marked teeth must in each case point radially outwards, as shown in the drawing, or the hub will not be correctly timed. (Notice also that three teeth on the small end of each planet pinion are visible over the end of the planet cage.) To check the timing, engage the gear ring with the pinions and rotate several times. It should rotate quite freely. Remove the gear ring after testing.



8. Drop the compensator spring down the axle, collar first.

9. Fit the clutch sleeve (flange first), the sliding clutch with recess over the flange of the sleeve, the key and the thrust ring. The notches on the thrust collar must engage with the flats on the key.

10. Remove the axle from the vice and insert the indicator chain and coupling into the right-hand end, threading it through the main key and the compensator spring. Insert indicator rod in left-hand end of axle, threading it through low-gear key and compensator spring collar.

11. Press the left-hand end of the axle and indicator rod against a solid surface while holding the assembled mechanism vertically and pressing down on the sliding clutch so that the indicator coupling can be screwed to the indicator rod. When the chain is felt to be fully screwed home insert a *small* screwdriver into the slot of the indicator rod and exert a slight extra (rotatory) pressure on the chain to make sure that the indicator rod is tight, taking care not to twist off the small threaded end. Make sure that the sliding clutch is free to move along the axle when the indicator chain is moved up and down.

12. Fit the gear ring, the right-hand ball ring, the driver, the clutch spring, and the clutch-spring cap, in that order.

13. Fit the right-hand cone and screw it up *finger-tight*. Then slacken it back half a turn and lock it in that position with the special locking washer and locknut. On no account must the cone be unscrewed more than half a turn, as that would throw the gear

mechanism out of adjustment.

14. Hold the assembled mechanism with the planet cage uppermost and pour about two teaspoonfuls of a good quality thin oil into the cage.

15. Drop a $\frac{3}{16}$ " ball bearing down each of the three pawl-pin holes in the planet cage. Then drop one coil-type pawl spring, followed by one plunger-type pawl, down each hole. (The inner end of each pawl is shaped to fit inside the pawl spring.)

16. Hold the cycle wheel in the left hand, with the open (right-hand) end of the hub shell facing downwards, and insert the assembled mechanism carefully from below, to prevent the pawls from falling out of position. Screw the right-hand ball ring finger-tight only.

17. Make sure that the position marks put on the ball ring and the hub flange before dismantling will register properly, and then screw up tightly.

18. Fit the left-hand cone.

19. If the magnet and armature have been separated, take the magnet and keeper ring in the left hand and, with the right hand, lay the armature alongside it.

20. While holding the magnet with the chamfer facing outwards, push the armature and the keeper through so that the magnet slides from the keeper on to the armature.

21. Fit the card disc (carrying patent numbers) inside the cover plate, with its notches opposite the magnet notches.

22. Fit the cover plate over the magnet, chamfer inwards, making sure that the four holes in the cover plate are in line with the notches in the card and the magnet.

23. Fit the metal spacing ring into the hub shell.

24. Fit the shim washer on the cone.

25. Push the complete dynamo unit into the hub shell, making sure that the holes in the cover plate are in line with those in the hub shell.

26. Fit the magnet fixing screws, washers and nuts.

27. Fit the spacing washers, adjusting washer and dynamo cone locknut in the arrangement noted when dismantling.

28. Adjust the hub bearing as described in 'The Fitting and Adjustment of Sturmey-Archer Hubs.' (A correctly adjusted wheel must have a slight trace of play at the rim. The pull of the magnet disguises the wheel adjustment, and if this point is not watched, the ball races may be damaged through over-tightening.)

29. If the sprocket has been removed from the driver, fit the outer dust cap over the driver, making sure that it is properly centred on the flange of the driver. Replace the sprocket and washers in the arrangement noted when dismantling, and add the circlip.

30. Replace the wheel in the cycle frame and adjust the gear as described in 'The Fitting and Adjustment of Sturmey-Archer Hubs.'