

CODE No.

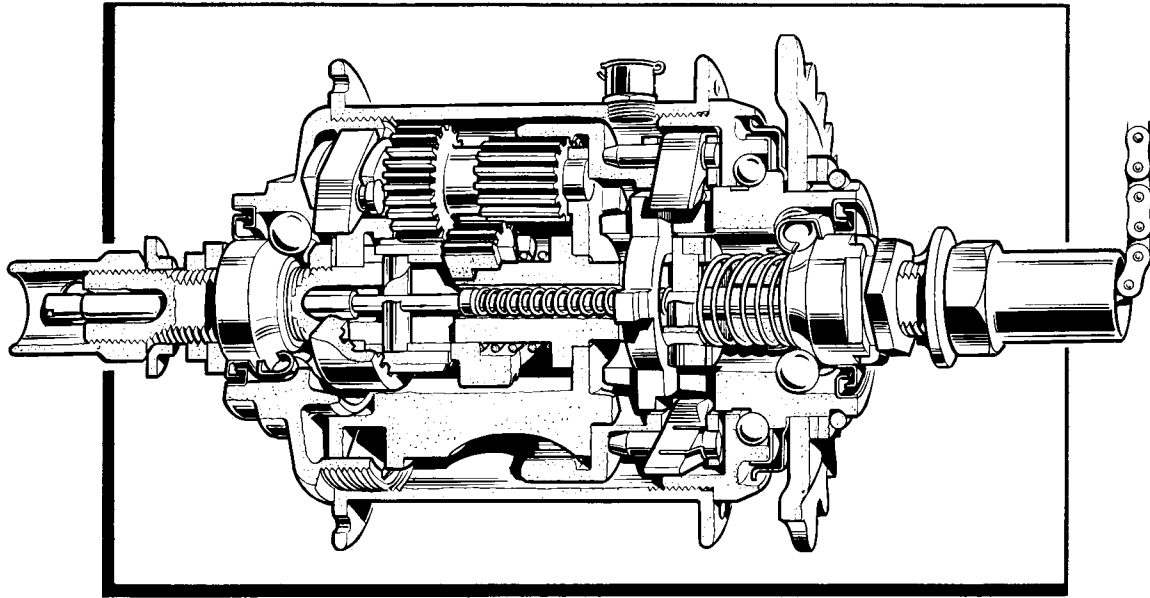
DESCRIPTION

K401	Axle, 5 $\frac{3}{4}$ " long
K401A	Axle, 6 $\frac{1}{4}$ " 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
K415	Planet Cage
K513	Low Gear Pawl
K707	Low Gear Pawl Pin
K64	Pawl Spring
K416	Planet Pinion
K417	Pinion Pin
K804	Indicator for short axle
K804A	Indicator for long axle
X8	Collar for Compensator Spring
K813B	Compensator Spring
K527	Clutch Sleeve
K505A	Sliding Clutch
K526A	Axle Key
K807ZA	Coupling complete
K227	Connection Locknut
K528A	Thrust Ring
K530B	Clutch Spring
K529	Spring Cap
K511A	Gear Ring

CODE No.

DESCRIPTION

K512	Gear Ring Pawl
K58	Pawl Pin
K60	R.H. Ball Ring
329	Ball Bearings, $\frac{3}{16}$ " diam. (per set of 24)
K63	Inner Dust Cap
K462	Driver
K67Z	Ball Cage with 8 $\frac{1}{4}$ " balls
LB405	Outer Dust Cap
K506Z	Axle Cone with Dust Cap
K516	R.H. Cone Locking Washer
K418	Shell, 40 holes
K418A	Shell, 36 holes
S545	Lubricator
K517	L.H. Ball Cup
K411	Thrust Washer
X42A	Axle Spacing Washer ($\frac{1}{8}$ " thick)
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 FW HUB

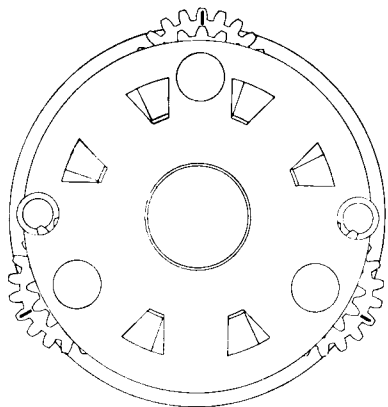
Proceed as follows:

1. If the left-hand ball cup has been removed from the hub shell, replace it by screwing anti-clockwise because it has a *left-hand thread*.
2. Prepare the following preliminary sub-assemblies:
 - a. Fit the ball cage into the left-hand ball cup, 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.
 - 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. 19 below.
 - 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 instructions to 'The Re-assembling of Sturmeier-Archer Hubs.'
 - e. Fit the pawls, pins and springs into the planet cage and rivet

the pins on the left-hand (ball cup) side as described in the general instructions to 'The Re-assembling of Sturmeier-Archer Hubs.'

- f. Smear grease in the channels of the dust caps of the left-hand ball cup and the driver and in the recess of the right-hand ball ring. *Do not use grease anywhere else.*
3. Working 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 compensating 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 keyhole 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 the indicator, then hold the axle vertically in a vice by the flats on 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 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 the recess over the flange of the sleeve, the key and the thrust ring and thrust washer. The notches on the thrust ring 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 collar.

11. Insert the indicator rod, and press the left-hand end of the axle and indicator rod against a solid surface while holding the assembled mechanism vertically and pressing downwards 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 (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. Insert the assembled mechanism into the hub shell and screw up the right-hand ball ring finger-tight only.
16. Make sure that the marks put on the ball ring and the hub flange before dismantling will register properly, and then screw up tightly.
17. Fit the left-hand cone, washer and locknut in the arrangement noted when dismantling, and adjust the hub bearing as described in 'The Fitting and Adjustment of SturmeY-ArchEr Hubs.'
18. Fit any special washers noted when dismantling the hub.
19. If the sprocket has been removed from the driver, fit the outer dust cap over the driver before replacing the sprocket, and see that the dust cap is properly centred on the flange of the driver. Fit the sprocket and spacing washers in the arrangement noted when dismantling and add the circlip.
20. Replace the wheel in the cycle frame and adjust the gear as described in 'The Fitting and Adjustment of SturmeY-ArchEr Hubs.'

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