



Technical Information
and Parts List

Hub Brakes (90mm)

AB/C - BF/C



Part 1 GENERAL INFORMATION

The information contained in this manual relates specifically to the full service and maintenance of the BF/C 90mm front brake hub and the AB/C three speed 90mm rear brake hubs (manufactured from 10.95). Please contact your local approved dealer if you experience any problems with this product. For earlier models please refer to leaflet LTE 119/2.

1.1 Lubrication

No routine lubrication is required. However, during assembly/disassembly the hub greases should be replenished. Grease types meeting the following Sturmey-Archer Technical Standards should be used:
For bearings - SA103B
For all other internal parts - SA103A

WARNING: Under no circumstances should any lubricant be applied to the Brake Drum or Brake Shoes as this may prevent the brake from functioning.

1.2 Gear Changing

Continue pedalling, but ease pressure on the pedals, and select the gear required. If stationary, simply select gear required.

1.3 Gear Ratios

The three gears are as follows:
1st gear - Decrease of 25%
2nd gear - Direct drive
3rd gear - Increase of 33.3%

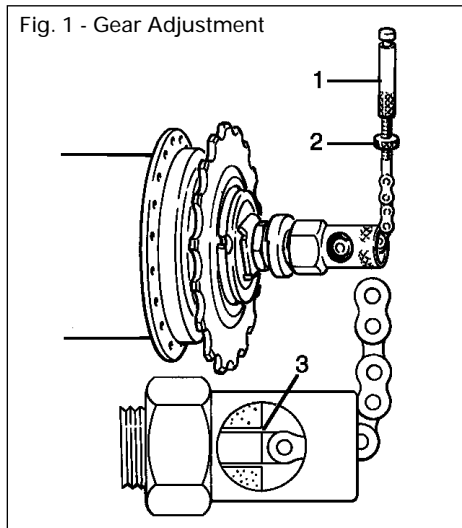
1.4 Sprockets

The overall drive ratio can be altered by changing the size of the sprocket. A range of sprockets from 14 to 22 teeth is available, suitable for 1/2" x 1/8" chain.
NB. Always maintain at least a 2:1 ratio between the numbers of teeth on the chainwheel and those of the sprocket.

Part 2 ROUTINE MAINTENANCE

2.1 Gear Adjustment (Fig. 1)

1. Check that the fulcrum clip, if fitted, is secured tightly to the frame tube, and



- that the indicator rod is screwed correctly into the axle.
2. Select third gear position at the control and loosely connect the cable adjuster (1) to the indicator coupling.
3. Select second gear. Looking through the 'window' in the right hand nut, turn the cable adjuster until the end of the indicator rod is exactly level with the end of the axle (3).
4. Tighten the locknut (2) against the adjuster. If correct adjustment cannot be achieved, the fulcrum clip must be moved in the appropriate direction along the frame tube. Re-tighten the clip and adjust as described above.

WARNING: The hub must not be ridden out of adjustment as this may damage the internal parts and cause the hub to malfunction.

2.2 Hub Bearing Adjustment

The right hand cone is preset at the Sturmey-Archer factory and should only be disturbed during a major service. The left-hand cone only is used for normal bearing adjustment.

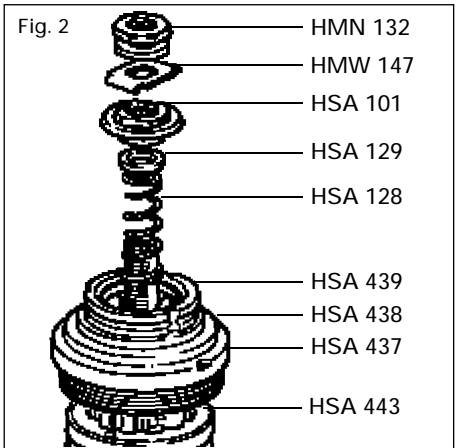
1. Loosen left-hand cone locknut.
2. Adjust the cone by using the slotted cone adjuster until very slight side play can be felt at the wheel rim and none at the hub, giving a free running hub.
3. Tighten the cone locknut (Torque 7-10 Nm)

Part 3 ASSEMBLY/DISASSEMBLY INSTRUCTIONS

If any service problems occur always refer to the fault diagnosis chart. Problems are usually corrected by routine external maintenance described in Part 2. If the problem persists a close inspection of the working parts inside the hub will be necessary.

3.1 Disassembly

1. Remove the indicator rod, axle nuts and spacing washers from both ends of the axle. Remove wheel from the bicycle.
2. Use a screwdriver to release the sprocket circlip from the driver, then remove the sprocket, sprocket spacer, washer and outer dustcap (note the order of these parts to facilitate reassembly).
3. Clamp right hand end of axle in a vice. Unscrew the left hand cone locknut. Remove the spacing washer (if fitted) and cone adjuster.
4. Remove the brake plate assembly.
5. Unscrew the left hand cone. Remove the hub from vice.
6. Loosen the right hand ball ring with a C-spanner (R.H. thread) or hammer and suitable punch and unscrew the ball ring to release the internal assembly from the hub shell.
NB: If a replacement gear internal assembly is to be fitted, no further disassembly is required.
7. (See Fig. 2.) Clamp the left hand end of the axle in a vice and remove the right



SALES NO.	DESCRIPTION
HMN 132	Cone Locknut
HMW 147	Cone Lockwasher
HSA 101	R.H. Cone
HSA 129	Clutch Spring Cap
HSA 128	Clutch Spring
HSA 439	Driver Assembly
HSA 438	Ball Cage Assembly
HSA 437	Ball Ring
HSA 443	Gear Ring Assembly

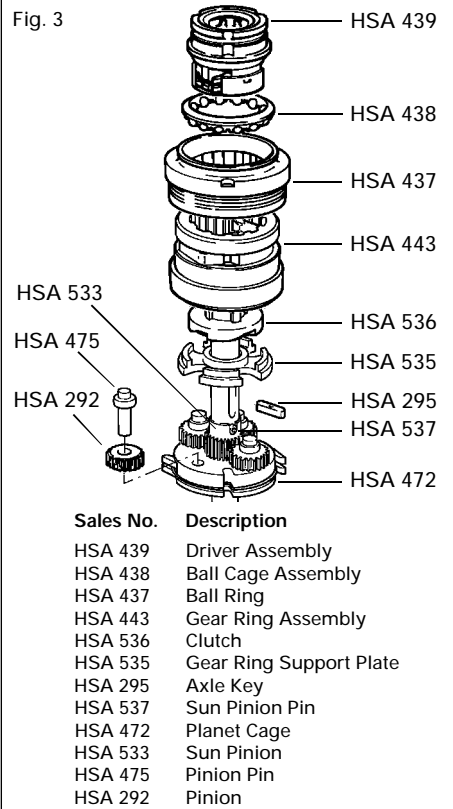
hand cone locknut, lockwasher, cone and spring with cap. Lift off the ball cage assembly and ball ring together with the driver assembly. Separate driver assembly from the ball ring by compressing pawls and extracting the driver assembly through ball ring.

8. (See Fig. 3.) Lift off the gear ring assembly, clutch and remove the axle key. Remove the gear ring support plate, pinion pins and pinions from planet cage. Slide out the sun pinion pin and remove the axle and planet cage assembly from the vice. Reclamp right hand end of the axle, remove circlip using circlip pliers and discard. Slide off the planet cage and then the sun pinion from the axle.

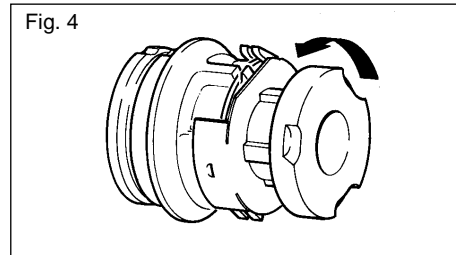
3.2 Inspection and Repair of Internal Parts

Thoroughly clean all the parts and replace any which are damaged or worn. Specific items to be checked are:

1. Axle: Straightness and condition of threads.
2. Pinions: Condition of teeth.
3. Pinion Pins: Squareness of ends, wear.
4. Planet Cage Assembly: Condition of pawls.
5. Gear Ring Assembly: Condition of splines and gear teeth. Condition of pawls and pawl springs.
6. Clutch: Squareness of corners, condition of splines. The clutch must slide easily in the driver assembly and along the axle.
7. Driver Assembly: Worn or chipped pawls, free movement of pawl actuator. Condition of pawl actuator. Condition and correct number (7) of balls.
NB: It is recommended that this assembly is not dismantled, but if necessary replaced with a factory assembled replacement unit.
8. Hub Shell: Condition of threads and



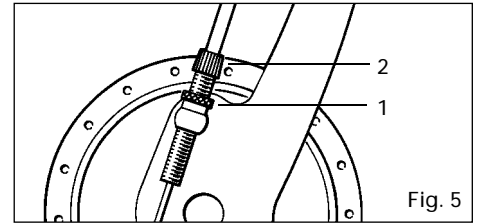
3. Locate the clutch onto the heads of the pinion pins, then locate the gear ring assembly over the pinions. Fit the ball ring by compressing the planet cage pawls.
4. Place the ball cage assembly on the ball ring - ensuring that the balls face downwards.
5. Rotate the actuator to compress driver pawls. (See Fig. 4).



6. With actuator held in this position, fit the driver assembly, rotating to ensure that the driver engages with the clutch splines.
7. Fit clutch spring and cap (with flat uppermost).
8. Screw down the right-hand cone finger tight. Unscrew the cone by half a turn. Fit the cone lockwasher. If the washer will not engage with the cone, unscrew the cone slightly. Fit locknut and tighten to 7Nm.
9. Insert gear internal assembly into hub shell, turning anti-clockwise initially to ensure that the planet cage pawls engage in the ball cup teeth. Tighten the ball ring with a C-spanner or hammer and punch.
10. Clamp right hand end of axle in vice. Fit the left hand cone, brake plate assembly, cone adjuster, spacing washer (if fitted) and locknut. Adjust hub as described in Part 2.2.
11. Assemble dustcap, spacer, sprocket and circlip in reverse order to disassembly.

Part 4 HUB/FRAME ASSEMBLY

1. Fit the hub into the front or rear forkends and position the wheel centrally in the frame.
2. Fit axle nuts and washers on the AB/C. These must include the correct size anti-rotation washers, ensuring lugs engage in chainstay slots. DO NOT tighten the axle nuts at this stage or misalignment of the brake plate may occur. (N.B. Both the BF/C and AB/C should be assembled with the brake on the left hand (non chain) side of the bicycle.)
3. **AB/C**
Select a suitable brake arm clip to clamp the brake arm loosely to the bicycle frame. With the wheel centralised and the chain tensioned correctly, tighten the axle nuts to a torque of 30 Nm
- BF/C**
Select a suitable brake arm clip to clamp the brake arm loosely to the



front fork. With the wheel centralised, tighten the axle nuts to a torque of 22 Nm

4. Tighten the brake arm clip firmly in this position to either 7Nm - 10Nm torque for the AB/C or 2 Nm torque for the BF/C.

Brake Cable Fitting

1. Attach the cable to the handlebar brake lever.
2. Locate the cable adjuster in the slot on the AB/C brake arm or the cable wire guide on the BF/C brake plate as appropriate.
3. Fit the cable nipple into the semi-circular seating of the hub brake lever assembly. **N.B.** To maintain maximum braking efficiency avoid sharp bends and kinks in the cable.

Brake Adjustment (See Fig. 5)

1. Slacken the brake adjuster locknut (1).
2. Turn the adjuster (2) until the brake is applied.
3. Slacken the adjuster until the wheel can just be turned freely.
4. Tighten the locknut (1).

Part 5 BRAKE SHOE SERVICE

The asbestos free linings in Sturmey Archer hub brakes are long lasting and should only need replacement at major service intervals. A complete brake replacement unit is available for this purpose. Before replacing this unit, check for mal-adjustment and excessive cable stretch.

5.1 Brake Unit Removal

1. Remove the brake cable, (and gear cable on AB/C), brake arm clip and axle nuts from the hub and take the wheel out of the bicycle.
2. Take off the brake plate locknut, washer(s) and cone adjusting washer to release the brake plate assembly.

5.2 Brake Unit Replacement

1. Wipe the inside of the brake drum surface to remove grease and dirt.
2. Fit the replacement unit into the hub over the left hand cone and re-assemble the cone adjuster, washer(s) and locknut.
3. Apply the brake lever to centralise the shoes and tighten the locknut to 7Nm max. Assemble the wheel in the bicycle following the instructions given in Part 4. **NB:** For cone adjustment refer to Section 2.2.

L.H. balltrack. Check braking surface for ingress of dirt.

9. Brake Shoes: Check for wear.

NB: It is recommended that the brake shoe assembly is not dismantled, but if necessary replaced with a factory assembled replacement unit.

3.3 Assembly

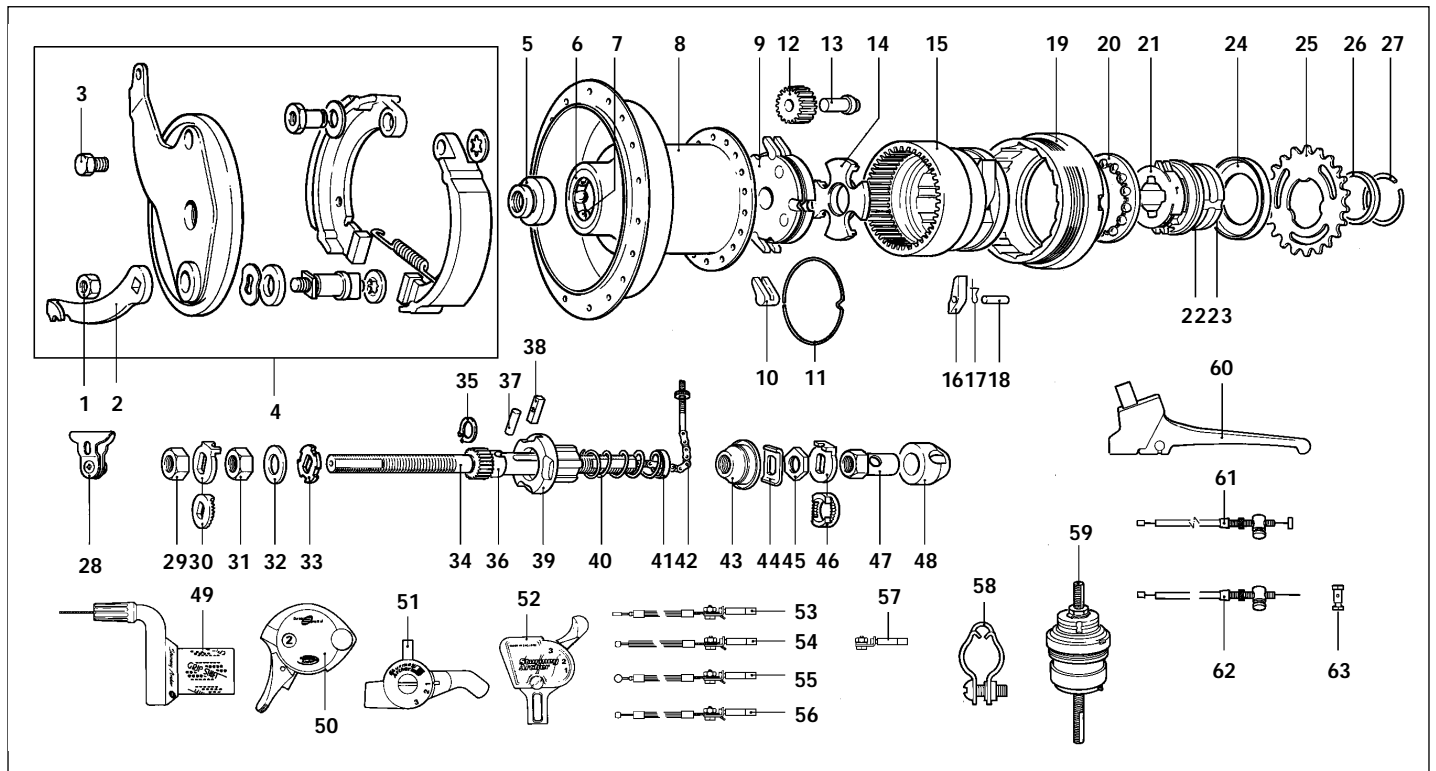
NB: The greases must be replenished during assembly using lubricants to the following Sturmey-Archer Technical Standards:

For bearings - SA103B

For all other internal parts - SA103A

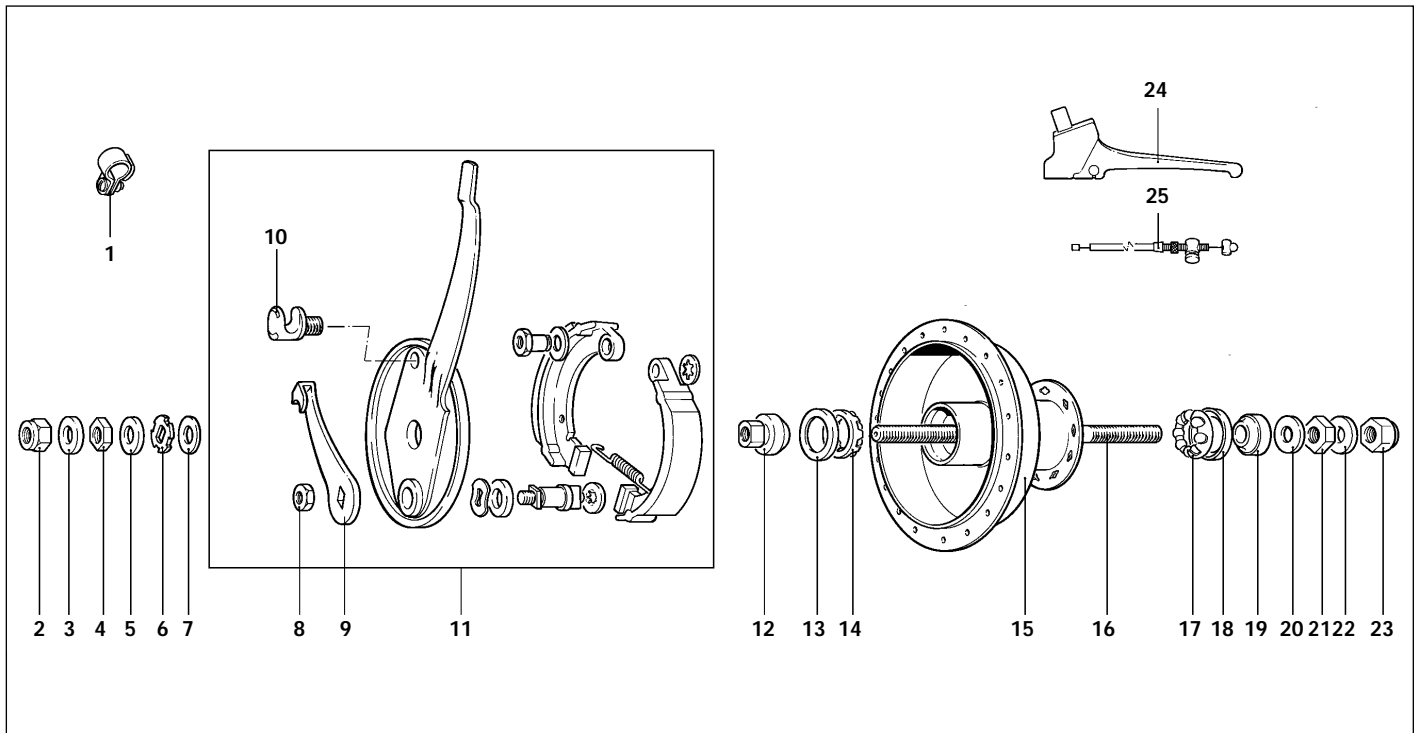
If a complete replacement gear internal assembly is to be fitted, assembly commences at point 9 below.

1. Clamp the right hand end of the axle in the vice, circlip groove uppermost. Locate the sun pinion over the axle with the slot facing downwards. Locate the planet cage over the axle pawls uppermost and pointing anti-clockwise. Fit a new circlip and locate it in the circlip groove, ensuring sharp corners are uppermost.
NB. Take care not to overstress the circlip.
2. Remove the axle from the vice and re-clamp left hand end of the axle in the vice, fit the sun pinion pin into the axle, locking the sun pinion. Fit the planet pinions and pinion pins (See Fig. 3) and then the gear ring support plate with the flat face downwards. Ensure the plate fits over the sun pinion and the large head diameter of the planet pinion pins. Fit the axle key such that the threaded hole runs vertically. Locate the key centrally in the axle slot with a spot of SA103A grease.



Item No.	Sales No.	Description	Item No.	Sales No.	Description	Item No.	Sales No.	Description
1	HMN 139	Brake Lever Nut	25	*HSL 717	Sprocket 17 Teeth	48	*HSL 711	Indicator Guard
2	HSB 220	Brake Lever		*HSL 718	Sprocket 18 Teeth	49	*HSJ 880	Twistgrip Control c/w inner wire
3	HMB 418	Pivot Bolt		*HSL 719	Sprocket 19 Teeth	50	*HSJ 865A	Orion Control
4	HSB 315	Brake Replacement Unit NB. Brake Replacement Unit includes 1 off Items 1 and 2		*HSL 720	Sprocket 20 Teeth	51	*HSJ 823	NIMBUS Control 22.2mm Clip
5	HSA 391	L.H. Cone	26	*HSL 747	Sprocket 21 Teeth	52	*HSJ 762	Trigger Control 22.2mm Clip
6	HSA 241	Cone Dustcover	27	*HSL 722	Sprocket 22 Teeth		*HSJ 765	Trigger Control 23.8mm Clip
7	HSA 284	Ball Cage Assembly - 6.4mm Ball	28	*HSL 768	Brake Arm Clip Assembly 15.9mm	53	*HSJ 101	Trigger Cable with Anchorage 530mm x 1520mm Black
8	*HSA 491	Hub Shell Assembly 36 holes N.B. - Hub Shell Assemblies include 1 off items 6 and 7	29	HMN 128	Brake Arm Clip Assembly 18.3mm	54	*HSJ 884	Trigger Cable with Anchorage 1420mm x 1570mm Black
9	HSA 472	Planet Cage Assembly (includes 2 off Item 10, 1 off Item 11)	30	*HSL 761	Brake Arm Clip Assembly 19.1mm	55	*HSJ 882	Twistgrip Cable with Anchorage 1420mm x 1570mm Black
10	HSH 482	Pawl for Planet Cage	31	*HSL 767	Brake Arm Clip Assembly 15.5mm	56	*HSJ 883	Orion Cable with Anchorage 1420mm x 1570mm Black
11	HSA 450	Pawl Spring	32	*HSL 768	Brake Arm Clip Assembly 15.9mm	57	*HSL 759	Cable Anchorage
12	HSA 292	Planet Pinion	33	HMN 128	Axle Nut L.H.	58	*HSJ 607	Chainstay Fulcrum Clip 12.7 mm ø
13	HSA 475	Pinion Pin	34	*HMW 155	Serrated Lockwasher 7.9 mm Slot		*HSJ 553	Chainstay Fulcrum Clip 15.9 mm ø
14	HSA 535	Gear Ring Support Plate	35	*HMW 494	K48 Lipwasher 9.5mm Slot		*HSJ 548	Chainstay Fulcrum Clip 17.9 mm ø
15	HSA 443	Gear Ring Assembly (includes 2 off Items 16, 17, 18)	36	*HMW 515	Serrated Lockwasher 9.5 mm Slot	59	*HSJ 753	Chainstay Fulcrum Clip 19.1 mm ø
16	HSA 119	Pawl for Gear Ring	37	HMN 128	Cone Locknut		*HSX 135	Gear Internal Assembly Complete
17	HSA 120	Pawl Spring	38	HSA 533	Sun Pinion	60	*PKL 205	DELIRIN Brake Lever Assembly RH/LH 22.2mm Clip
18	HSA 415	Pawl Pin	39	HSA 537	Sun Pinion Pin		*PKL 206	DELIRIN Brake Lever Assembly RH/LH 23.8mm Clip
19	HSA 437	Ball Ring	40	HSA 295	Axle Key	61	HSK 713	Cable Complete Black - 1570mm c/end
20	HSA 438	Ball Cage Assembly	41	HSA 536	Clutch	62	*HSK 714	Cable Complete Black - 1600mm/1820mm o/end
21	HSA 439	Driver Assembly Complete (includes 1 off Items 22 and 23)	42	HSA 128	Clutch Spring	63	HSK 715	Pinch Bolt
22	HSA 284	Ball Cage Assembly - R.H. 6.4 mm Ball	43	HSA 129	Cap for Clutch Spring			
23	HSA 102	Outer Dust Cap	44	HSA 315	Gear Indicator (3 Mark)			
24	HSL 701	Sprocket Dust Cap	45	HSA 101	R.H. Cone			
25	*HSL 714	Sprocket 14 Teeth	46	HMW 147	Cone Lockwasher			
	*HSL 715	Sprocket 15 Teeth	47	HMN 132	Cone Locknut			
	*HSL 716	Sprocket 16 Teeth		*HMW 155	Serrated Lockwasher 7.9 mm Slot			
				*HMW 494	Serrated Lockwasher 9.5 mm Slot			
				*HMW 515	K48 Lipwasher 9.5mm Slot			
				HMN 129	Axle Nut R.H.			

* Optional Fitment



Item No.	Sales No.	Description	Item No.	Sales No.	Description	Item No.	Sales No.	Description
1	*HSL 702	Brake Arm Clip 17.4mm	12	HSA 236	L.H. Cone	23	HMN 118	Axle Nut
	*HSL 703	Brake Arm Clip 18.3mm	13	HSA 241	Dustcap	24	*PKL 205	DELRIN Brake Lever Assembly RH/LH 22.2mm Clip
2	HMN 118	Axle Nut	14	HSA 284	Ball Cage Assembly L.H. 6.4mm Ball		*PKL 206	DELRIN Brake Lever Assembly RH/LH 23.8mm Clip
3	*HMW 129	Axle Washer 3.2mm (As Item 5)	15	HSB 306	Hub Shell Assy. - 36H (Includes Items 13 and 14)	25	*HSK 695	Cable Complete for DELRIN Brake Lever- Black 900mm
4	HMN 137	Cone Locknut	16	HSB 303	Axle 136.5mm			
5	*HMW 146	Spacing Washer 1.6mm	17	HSA 284	Ball Cage Assembly R.H. 6.4mm Ball			
	*HMW 129	Spacing Washer 3.2mm	18	HSA 241	Cone Dust Cover			
	*HMW 483	Spacing Washer 4.8mm	19	HSA 237	R.H. Cone			
	*HMW 484	Spacing Washer 6.4mm	20	*HMW 146	Spacing Washer 1.6mm			
6	HMN 151	Cone Adjusting Washer		*HMW 129	Spacing Washer 3.2mm			
7	*HMW 153	Spacing Washer 1.6mm		*HMW 483	Spacing Washer 4.8mm			
8	HMN 139	Brake Lever Nut		*HMW 484	Spacing Washer 6.4mm			
9	HSB 205	Brake Lever	21	HMN 137	Cone Locknut			
10	HSB 226	Cable Wire Guide	22	*HMW 129	Axle Washer 3.2mm (As Item 20)			
11	HSB 314	Brake Replacement Unit (includes Items 8, 9 & 10)						* Optional Fitment



Part 6 FAULT DIAGNOSIS CHART

NB: Always check gear adjustment, condition of indicator, cable, control and tightness of fulcrum clip before referring to this chart.		
SYMPTOM	FAULT	REMEDY
1. Difficult to change gear	- Damaged indicator - Damaged cable - Damaged control - Worn/damaged clutch spring - Wrong Indicator	Replace Replace Replace Replace Replace
2. Different gear engaged to that selected	- Gear adjustment - Bearing adjustment - Wrong indicator - Worn clutch spring - Worn gear ring pawls	Adjust Adjust Replace Replace Replace pawls and spring
3. Drive jolts/slips in first gear	- Worn pawls in driver - Worn pawls in planet cage	Replace driver assembly Replace pawls and spring
4. Drive jolts/slips in second gear	- Worn pawls in driver - Worn gear ring pawls	Replace driver assembly Replace pawls and spring
5. Drive jolts/slips in top gear	- Worn clutch - Worn planet pinion pins - Worn gear ring pawls	Replace Replace Replace pawls and spring
6. Inefficient braking	- Worn brake shoes	Fit brake replacement unit (See Section 5)

NOTE: The information in this leaflet refers only to BF/C Front Hub and AB/C Three Speed Rear Hub For earlier models, please refer to following leaflets:

AB/C - Technical Information Parts List - 90mm Hub Brakes (LTE 115), (LTE 119/2), (LTE 124).

Sturmey-Archer Ltd.,
Triumph Road, NOTTINGHAM NG7 2GL, ENGLAND, U.K.
Tel: (0115) 942 0800 Fax: (0115) 942 0801
Email: sales@sturmey-archer.com

REPRESENTED THROUGHOUT THE WORLD

LTE 145