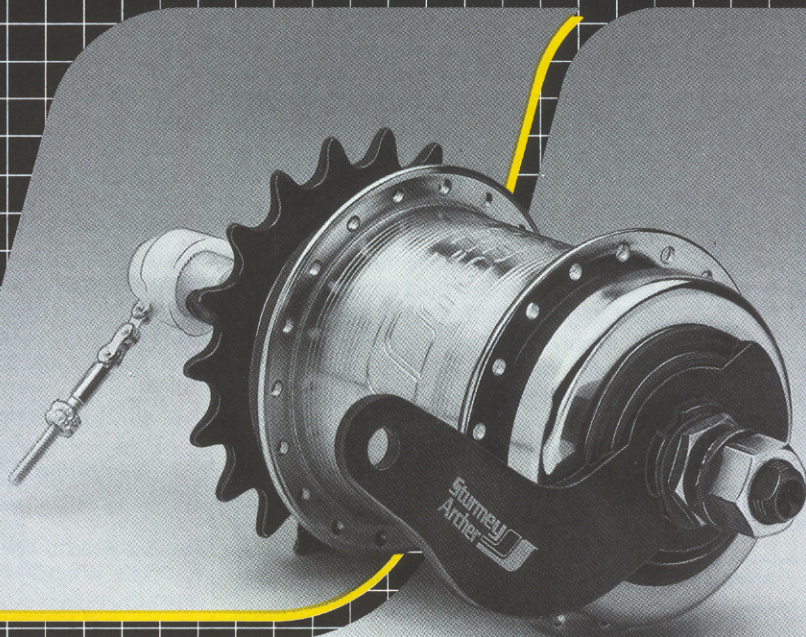


# ***Sturmey Archer***

Technical Information  
and Parts List

Three Speed Hub  
with Coaster Brake

Type AWC



## Part 1 GENERAL INFORMATION

Sturmey-Archer's AWC 3 Speed Coaster Brake Hub combines over 80 years experience of 3 speed gear hub design with state-of-the-art manufacturing technology. Correct attention to the small amount of routine adjustment and maintenance will ensure many years of trouble free service.

### 1.1 Gear Changing

Gear changing is simple and smooth with the proven Sturmey-Archer indexed control system. Continue pedalling, but ease pressure on the pedals, and select the gear required. If stationary, simply select gear required.

### 1.2 Gear Ratios

The AWC hub has three gears:

- 1st gear - Decrease of 25%
- 2nd gear - Direct drive
- 3rd gear - Increase of 33.3%

The overall drive ratio can be altered by changing the size of the sprocket. Sturmey-Archer supply a range of sprockets, from 14 to 22 teeth, suitable for 1/2" pitch X 1/8" chain.

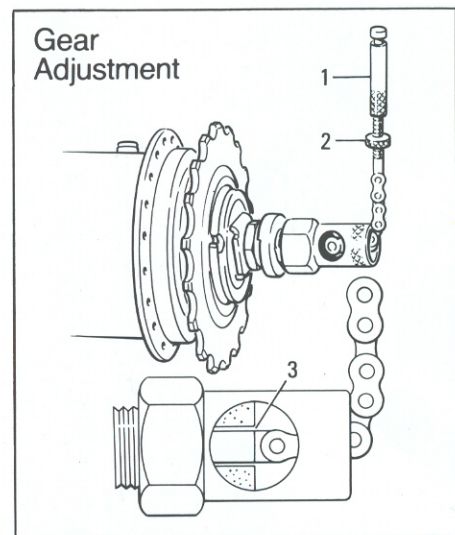
### 1.3 Braking

The Sturmey-Archer coaster brake stops the bicycle safely, smoothly and quickly. To apply maximum braking effort, ensure the pedals are horizontal. The remarkable brake efficiency results from the unique Sturmey-Archer design whereby the braking effort is enhanced by the mechanical advantage of the gears, regardless of which gear is selected.

## Part 2 ROUTINE MAINTENANCE

### 2.1 Lubrication

Under normal conditions of use, no routine lubrication is required.



### 2.2 Gear Adjustment

1. Check that the fulcrum clip is secured tightly to the frame tube, and that the indicator rod is screwed correctly into the axle.
2. Screw the cable adjuster (1) onto the indicator coupling.

3. Select the 2nd gear position on the gear control and turn the cable adjuster until the end of the indicator rod is exactly level with the end of the axle. This can be seen through the round window in the right hand axle nut (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.

### 2.3 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 brake arm nut until very slight side play can be felt at the rim, and none at the 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 in the first instance. Problems can usually be corrected by the routine external maintenance described in Part 2. If the problem persists a close inspection of the working parts inside the hub will be necessary.

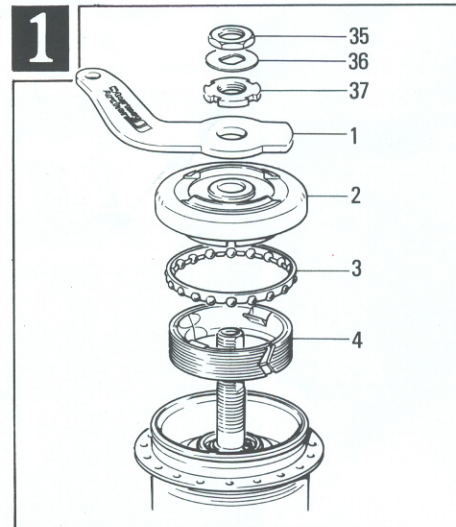
### 3.1 Disassembly

**NB:** Item numbers in illustration refer to exploded view overleaf.

1. Remove the indicator rod, axle nuts and spacing washer from both ends of the axle.
2. Use a screwdriver to release the sprocket circlip from the driver, then remove the spacing washers (if any), sprocket and outer dustcap (note the order of these parts to facilitate reassembly).
3. (See Fig. 1). Clamp right hand end of axle in a vice and unscrew the left hand cone locknut, spacing washer, and brake arm nut. Remove the brake arm, left hand cone and dust cap assembly, ball cage assembly, and brake band assembly. Remove hub from vice.
4. Loosen the right hand ball ring and dustcap assembly with a C-spanner (or hammer and punch) and unscrew the ball ring to release the internal assembly from the hub shell. Remove the brake actuator assembly by turning anti-clockwise.

**NB:** If a replacement gear internal assembly complete (Item 57 on exploded view) is to be fitted, no further disassembly is required.

5. (See Fig. 2). Clamp left hand end of axle in a vice and remove right hand cone locknut, spacers (if any), lockwasher, cone and spring with cap. Lift off ball ring and dustcap assembly, together with driver assembly. Separate driver



assembly from ball ring by compressing pawls and extracting driver assembly through ball ring.

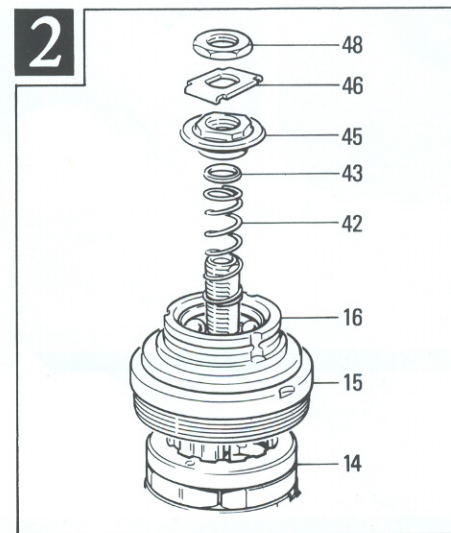
6. (See Fig. 3). Lift off gear ring assembly, clutch and axle key. Remove planet pinion pins and pinions. Remove axle from vice.
7. Clamp right hand end of axle in vice and remove and discard circlip using circlip pliers. Remove planet cage from axle and remove axle from vice.

### 3.2 Inspection and Repair of Internal Parts

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

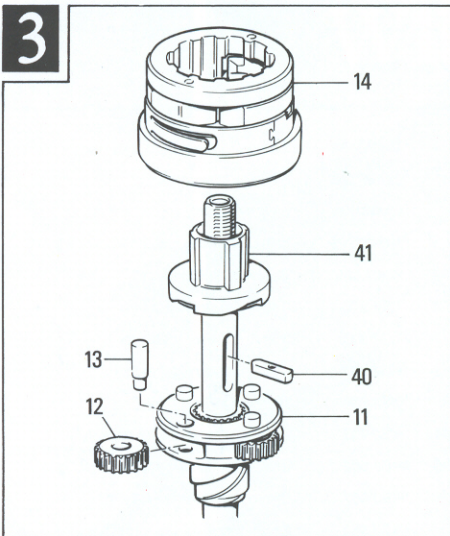
1. Axle: Straightness, condition of threads, condition of gear teeth.
2. Pinions: Condition of teeth.
3. Pinion Pins: Squareness of ends, wear.
4. Gear ring assembly: Condition of splines and gear teeth, worn or chipped parts, free movement of drag spring, condition of drag spring, pawls and pawl springs.

**NB:** It is recommended that this assembly is not dismantled but if



necessary replaced with a factory fitted assembly.

5. Ball ring assembly: Condition of ratchet teeth, condition of balls and ball track, correct number of balls (24 if loose balls and dustcap, 14 if integral ballcage and dustcap seal).
  6. Clutch: Squareness of corners, condition of splines, must slide easily in the driver assembly.
  7. Driver assembly: Condition of splines and ball track, worn or chipped parts, free movement of pawl actuator, condition of pawl actuator, condition of and correct number (7) of balls.
- NB:** It is recommended that this assembly is not dismantled, but if necessary replaced with a factory fitted assembly.
- NB:** If hub shell is marked 88-8 or earlier, both clutch and driver assembly must be replaced at the same time.
8. Hub shell: Condition of threads, LH balltrack, ratchet and braking surface.



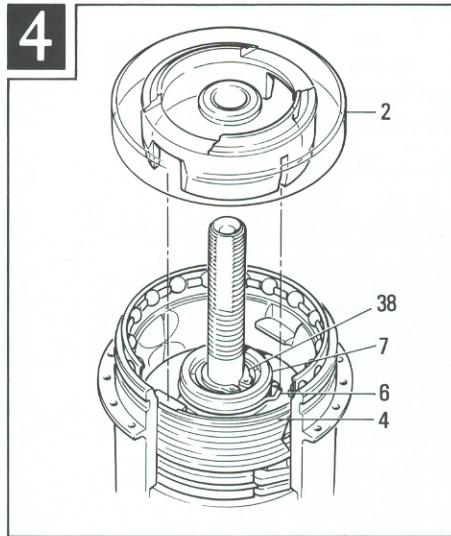
9. Brake actuator assembly: Condition of pawls and pawl spring. Brake actuator spring should be able to turn clockwise readily, but have high resistance to turning anti-clockwise.
10. Brake band assembly: Replace if worn.
11. Left hand cone: Condition of ball track.
12. Brake arm: Replace if damaged.

### 3.3 Assembly

**NB:** All bearings must be grease packed during assembly with Castrol LMX or equivalent high performance lithium complex grease (NLGI No.2).

All other internal parts to be lubricated during assembly with Castrol TR Light or equivalent semi-fluid, lime based grease (NLGI No.00).

If a replacement gear internal assembly complete (Item 57 on exploded view) is to



be fitted, assembly commences at point 5 below.

1. Locate planet cage over the axle with spiral spline facing away from axle slot. Take a new circlip and locate it in the circlip groove.
2. (See Fig. 3). Clamp left hand end of axle in vice and fit the planet pinions and pins with the small diameter downwards. Fit axle key (ensuring threaded hole is vertical), clutch and gear ring assembly.
3. (See Fig. 2). Fit ball ring assembly then driver assembly compressing pawls to ensure driver ball track seats correctly on ball ring. Fit spring with cap.
4. Screw down the right-hand cone finger tight. Unscrew the cone by half a turn. Fit the cone lockwasher. If the washer

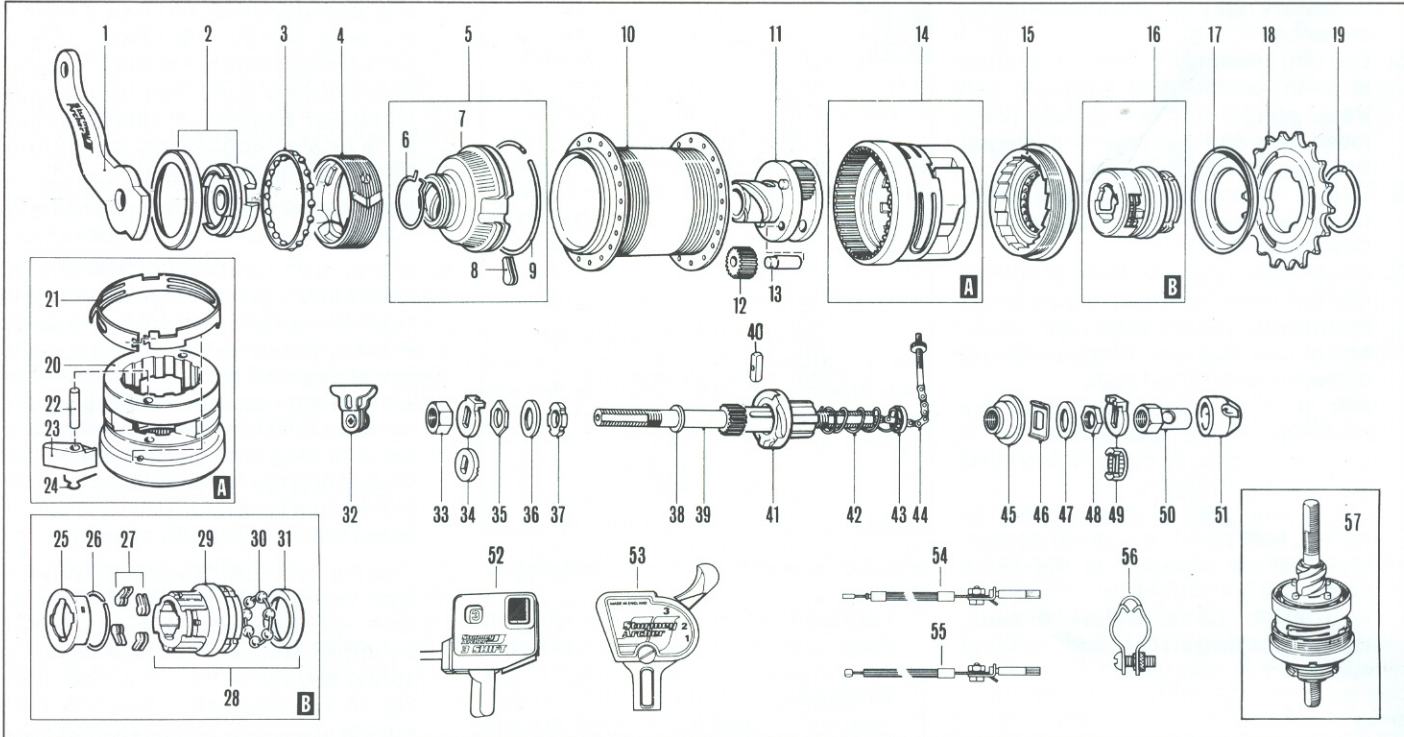
will not engage with the cone, unscrew the cone slightly. **NB:** Under no circumstances must the right hand cone be unscrewed more than  $\frac{1}{8}$ " of a turn. Fit spacer washers (if required) then cone locknut and tighten to 7-10 Nm torque. Remove from vice.

5. Insert hub assembly into hub shell and tighten ball ring with C-spanner.
6. Clamp right hand end of axle in vice and fit brake actuator assembly to left hand end of axle, turning clockwise to ensure spiral spline engages with planet cage. Fit brake band assembly with the inner band projections uppermost, and at 90 degrees to the tag of the actuator drag spring (see Fig. 4). If the drag spring has been replaced, ensure that the tag faces upwards. Ensure all brake parts are liberally greased.
7. (See Fig. 1). Fit ball cage assembly, with balls facing down, and left hand cone, rotating cone to ensure that the brake band projections and brake actuator spring engage in the cone slots (see Fig. 4). Fit brake arm, brake arm nut, washer and locknut. Adjust hub as described in Part 2.
8. Assemble dustcap, sprocket and circlip in reverse order to disassembly.
9. Assemble the wheel into the bicycle and fit serrated washers and axle nuts. Fit brake arm clip to chain stay and locate brake arm into clip. Tighten axle nuts to 24-26 Nm torque and nut on brake arm clip to 7-10 Nm torque. Check correct indicator is fitted and adjust gears as described in Part 2.

### Part 4 FAULT DIAGNOSIS CHART

**NB:** Always check gear adjustment, condition of indicator, cable, control and tightness of fulcrum stop before referring to this chart.

SYMPTOM	FAULT	REMEDY
1. Difficult to change gear	- Damaged indicator - Damaged cable - Damaged control - Loose fulcrum stop - Worn/damaged clutch spring	Replace Replace Replace Tighten Replace
2. Different gear engaged to gear selected	- Gear adjustment  - Bearing adjustment - Wrong indicator - Worn clutch spring - Worn gear ring drag spring - Worn gear ring pawls	Adjust  Adjust Replace Replace Replace gear ring assembly Replace gear ring assembly
3. Drive jolts/slips in first gear only	- Worn brake actuator pawls	Replace pawls
4. Drive jolts/slips in first and second gear only	- Worn drive pawls in driver	Replace driver assembly
5. Drive jolts/slips in second and top gear	- Worn gear ring pawls	Replace gear ring assembly
6. Drive jolts/slips in top gear only	- Worn clutch - Worn planet pinion pins	Replace Replace
7. Harsh braking action	- Lack of lubrication	Grease all brake parts and surfaces
8. No brake	- Worn brake pawls in driver - Worn or incorrectly fitted brake actuator drag spring	Replace driver assembly Replace



Item No.	Sales No.	Description	Item No.	Sales No.	Description	Item No.	Sales No.	Description
1	HSB 471	Brake Arm	28	HSA 411	Driver with Balls & Ball Cup (1 off items 29, 30, 31)		*HMW 483	Spacing Washer 4.8 mm (3/16")
2	HSB 472	Cone & Dustcap Assembly L.H.	29	HSA 412	Driver	48	HMN 132	Spacing Washer 6.4 mm (1/4")
3	HSA 164	Ball Cage Assembly L.H.	30	HSA 284	Driver	49	*HMW 155	Cone Locknut
4	HSB 448	Brake Band Assembly	31	HSA 102	Ball Cage Assembly R.H.		*HMW 494	Serrated Lockwasher 7.9 mm (5/16") Slot
5	HSB 473	Brake Actuator Assembly (includes 2 off item 9 and 1 off items 7, 8, 10)	32	*HSL 767	Outer Dust Cap		*HMW 515	Serrated Lockwasher 9.5 mm (3/8") Slot
6	HSB 407	Brake Actuator Drag Spring		*HCB 101	Brake Arm Clip Assy. with Integral Pad 15.5 mm			K48 Lockwasher 9.5 mm (3/8") Slot
7	HSB 476	Brake Actuator		*HCB 103	Brake Arm Clip Assembly 15.9 mm (5/8")	50	HMN 129	Axle Nut R.H.
8	HSB 474	Brake Actuator Pawl			Brake Arm Clip Assembly 18.3 mm (23/32")	51	HSL 711	Indicator Guard
9	HSB 475	Brake Actuator Pawl Spring	33	HMN 128	Axle Nut L.H.	52	*HSJ 800	3 Shift Control 22.2 mm (7/8") Clip
10	HSA 400	Hub Shell & Ball Cup Assembly — 36 hole	34	*HMW 155	Serrated Lockwasher 7.9 mm (5/16") Slot		*HSJ 801	3 Shift Control 23.8 mm (15/16") Clip
11	HSA 402	Planet Cage		*HMW 494	Serrated Lockwasher 9.5 mm (3/8") Slot	53	*HSJ 762	Trigger Control 22.2 mm (7/8") Clip
12	HSA 292	Planet Pinion		*HMW 515	K48 Lockwasher 9.5 mm (3/8") Slot		*HSJ 765	Trigger Control 23.8 mm (15/16") Clip
13	HSA 401	Pinion Pin	35	HMN 132	Cone Locknut	54	HSJ 102	Trigger Cable with Anchorage 1370 mm x 1520 mm - Black
14	HSA 403	Gear Ring Assembly complete (includes 1 off items 20, 21 and 2 off items 22, 23, 24)	36	*HMW 129	Spacing Washer 3.2 mm (1/8")	55	HSJ 802	3 Shift Cable with Anchorage 1370 mm x 1520 mm - Black
15	HSA 308	Ball Ring and Dust Cap Assembly	37	HMN 344	Spacing Washer 1.6 mm (1/16")	56	*HSJ 607	Chainstay Fulcrum Clip 12.7 mm (1/2") Ø
16	HSA 407	Driver Assembly complete (includes 1 off items 25, 26, 29, 30, 31 and 4 off item 27)	38	HSL 729	Spacing Washer 4.8 mm (3/16")		*HSJ 553	Chainstay Fulcrum Clip 15.9 mm (5/8") Ø
17	HSL 701	Sprocket Dustcap	39	*HSA 405	Spacing Washer 6.4 mm (1/4")		*HSJ 548	Chainstay Fulcrum Clip 17.9 mm (45/64") Ø
18	*HSL 714	Sprocket 14 Teeth	40	HSA 295	Spacing Washer 3.2 mm (1/8")		*HSJ 753	Chainstay Fulcrum Clip 19.1 mm (3/4") Ø
	*HSL 715	Sprocket 15 Teeth	41	HSA 418	Brake Arm Nut		*HSJ 547	Chainstay Fulcrum Clip 18.7 mm (47/64") Ø
	*HSL 716	Sprocket 16 Teeth	42	HSA 128	Brake Arm Nut	57	*HSX 116	Gear Internal Assembly complete - Axle 152mm (6") (includes items 11-16, 38-43, 45-48)
	*HSL 717	Sprocket 17 Teeth	43	HSA 129	Brake Arm Nut		*HSX 117	Gear Internal Assembly complete - Axle 159mm (6 1/4") (includes items 11-16, 38-43, 45-48)
	*HSL 718	Sprocket 18 Teeth	44	*HSA 126	Brake Arm Nut		*HSX 118	Gear Internal Assembly complete - Axle 163mm (includes items 11-16, 38-43, 45-48)
	*HSL 719	Sprocket 19 Teeth			Brake Arm Nut			
	*HSL 720	Sprocket 20 Teeth	45	HSA 101	Brake Arm Nut			
	*HSL 747	Sprocket 21 Teeth	46	HMW 147	Brake Arm Nut			
	*HSL 722	Sprocket 22 Teeth	47	*HMW 129	Brake Arm Nut			
19	HSL 721	Sprocket Circlip		*HMW 146	Brake Arm Nut			
20	HSA 413	Gear Ring			Brake Arm Nut			
21	HSA 414	Gear Ring Drag Spring			Brake Arm Nut			
22	HSA 415	Pawl Pin			Brake Arm Nut			
23	HSA 416	Gear Ring Pawl			Brake Arm Nut			
24	HSA 417	Gear Ring Pawl Spring			Brake Arm Nut			
25	HSA 408	Driver Pawl Actuator			Brake Arm Nut			
26	HSA 409	Driver Pawl Spring			Brake Arm Nut			
27	HSA 410	Driver Pawl			Brake Arm Nut			

**Sturmey-Archer Ltd.,**  
Nottingham NG7 2GL, England. Tel. (0602) 420800.  
Fax (0602) 420801. Telex 378221 TISAL G.

**Sturmey-Archer of America Inc.,**  
1014 Carolina Drive, West Chicago, IL60185.  
Tel. 312/231-5150. Toll Free Order Line 1-800-323-9194.  
Fax. 312/231-5925.

**Sturmey-Archer (Europa) B.V.,**  
Johann Siegerstraat 6, NL - 1096 BH Amsterdam.  
Tel. 020-937503. Fax. 020-927351.  
Telex 13026 SAEUR NL.

REPRESENTED THROUGHOUT THE WORLD

