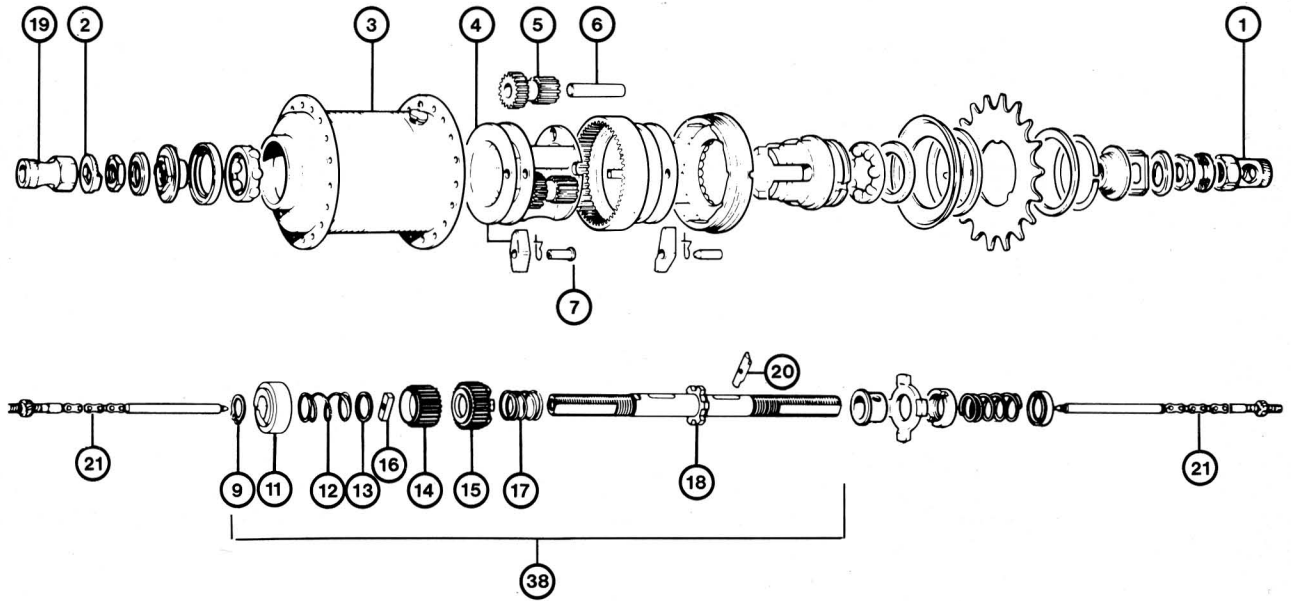
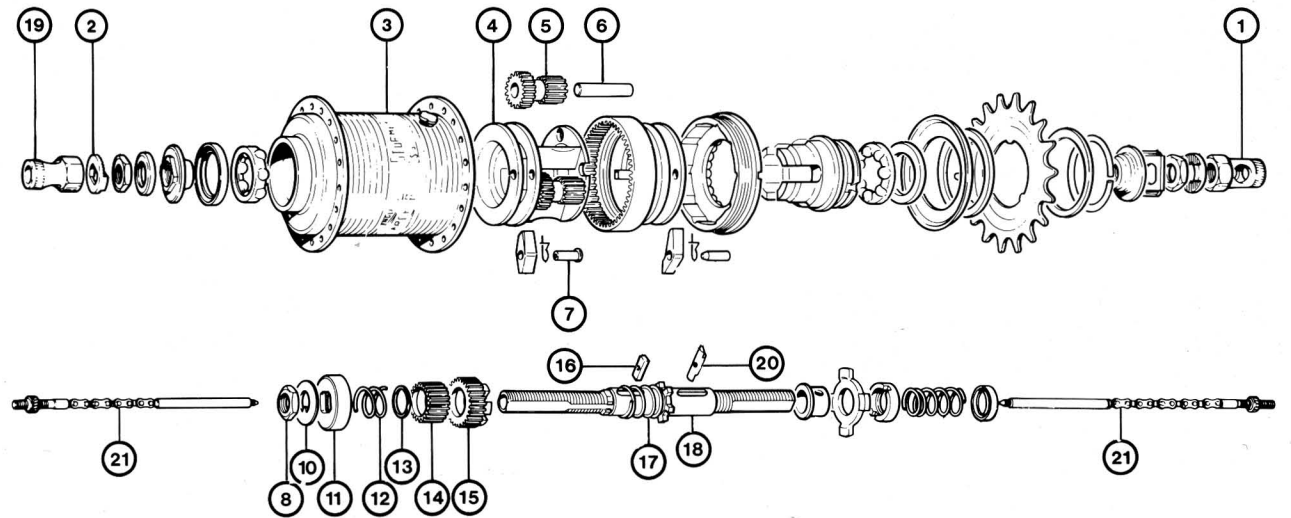


HUBS

STURMEY-ARCHER S5/2 5-SPEED HUB



STURMEY-ARCHER S5.1 5-SPEED HUB



Vertical line between numbers indicates parts are not interchangeable.

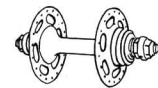
Parts are interchangeable only if they are on the same line and they do not have a vertical line between them.

→ Parts have one-way interchangeability only.

} Parts are interchangeable as a unit.

STURMEY-ARCHER 4- and 5-SPEED HUBS PARTS INTERCHANGEABILITY

HUBS



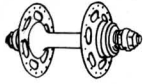
SUTHERLAND'S HANDBOOK OF COASTER BRAKES AND INTERNALLY-GEARED HUBS

	S5/2 and 5-speed alloy	S5.1 (indicator chain on left side)	S5 (bell crank on left side)	FW 4-speed
1. RH Axle Nut	HMN 129*	HMN 129*	HMN 129*	HMN 131
2. Axle Lockwasher (serrated)	HMN 155	HMW 155	HMN 145*	HMW 145*
3. Hub Shell† 36 holes	HSA 334	HSA 270	HSA 270	HSA 131
40 holes		HSA 271	HSA 130	
28 holes	HSA 333	HSA 290		
Alloy, 36 holes	HSA 337			
4. Planet Cage	HSA 354	HSA 132	HSA 132	HSA 132
5. Planet Pinion	HSA 134	HSA 134	HSA 134	HSA 134
6. Pinion Pin	HSA 135	HSA 135	HSA 135	HSA 135
7. Pawl Pin for Planet Cage	HSA 133	HSA 133	HSA 133	HSA 133
8. Locknut for Dog Ring		HMN 133	HMN 133	HMW 133
9. Circlip Retainer for Dog Ring	HSL 729			
10. Lockwasher for Dog Ring		HMW 149	HMW 149	HMW 149
11. Dog Ring	HSA 343	HSA 138	HSA 138	HSA 138
12. Pinion Return Spring	HSA 346	HSA 319		
13. Washer for Pinion Return Spring	HMW 488	HMW 488		
14. Secondary Sun Pinion	HSA 344	HSA 318	HSA 141	HSA 141
15. Primary Sun Pinion	HSA 345	HSA 317	HSA 269	HSA 142
16. Low Gear Axle Key	HSA 342	HSA 295	HSA 268	HSA 139
Pinion Sleeve (not shown)			HSA 140	HSA 140
17. Low Gear Spring	HSA 347	HSA 273	HSA 273	
Spring Set for 4-Speed (not shown)				HSA 183
Low Gear Spring				HSA 143
Compensator Spring				HSA 147
Clutch Spring				HSA 148
Compensator Spring Collar (not shown)				HSA 146
18. Axle 5 13/16" (148 mm) short		HSA 320		
6 1/16" (154 mm) medium		HSA 321		
6 5/16" (160 mm) long		HSA 322		
5 3/4" (146 mm) short				HSA 144
6" (152 mm) short			HSA 274	
6 1/4" (159 mm) long			HSA 145	HSA 145
5 7/8" (149 mm) short	HSA 339			
6 1/8" (156 mm) medium	HSA 340			
6 3/8" (162 mm) long	HSA 341			
19. LH Axle Nut	HMN 129*	HMN 129*	HMN 128	HMN 130
Gear Indicator LH for short axles	HSA 126*	HSA 126*		
Gear Indicator LH for medium axles	HSA 126*	HSA 126*		
Gear Indicator LH for long axles	HSA 316	HSA 316		
Gear Push Rod				
Threaded, no head				
For Short Axle			HSA 266	
For Long Axle			HSA 267	
Stamped Bellcrank			HSJ 608	
Unthreaded, head like a nail				
For Short Axle			HSA 287	
For Long Axle			HSA 288	
Machined Bellcrank			HSJ 679	
20. Axle Key	HSA 124*	HSA 124*	HSA 124*	HSA 163‡
21. Gear Indicator RH for short axles	HSA 125*	HSA 125*	HSA 126*	HSA 136
Gear Indicator RH for medium axles	HSA 126*	HSA 126*		
Gear Indicator RH for long axles	HSA 126*	HSA 126*	HSA 126*	HSA 137
Gear Indicator Coupling				HSA 149

*Same parts as for AW, p. 4-17.

†The S5 cartridge will fit into any AW 3-speed hub shell. The AW cartridge will fit S5 or FW hub shells but may not work properly without changing the left ball cup. A planet cage centering flange in the AW left ball cup keeps the pawls aligned and prevents the hub from slipping in low gear. Not all S5 ball cups lack this flange. Compare it to an AW left ball cup.

‡HSA 163 for 4-speed is drilled through and not threaded. HSA 124 is threaded.

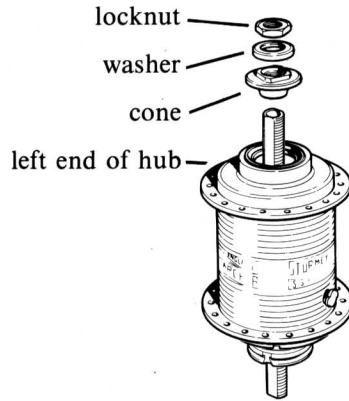


HUBS

STURMEY-ARCHER S5.1 5-SPEED HUB DISASSEMBLY AND ASSEMBLY

1 DISASSEMBLY

Remove left-hand locknut, washer and cone.



Install cone, lockwasher and locknut.
Adjust bearing.

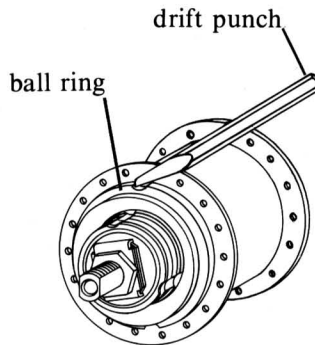
ASSEMBLY 6

Next Step



2 DISASSEMBLY

The right-hand ball ring may have a double start thread. If the ball ring is replaced in the opposite position, the wheel may need retruing. To facilitate proper reassembly, mark the ball ring at the point nearest lubricator.



When correctly oriented, tighten with a hammer and drift punch.

ASSEMBLY 5

Next Step



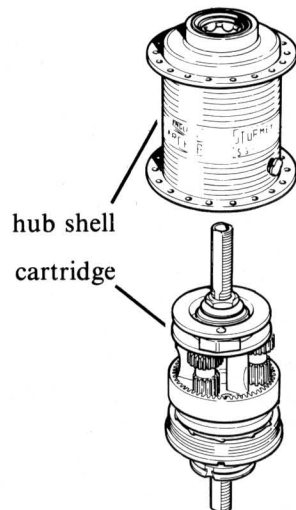
Place a drift punch as shown and loosen the ball ring by rapping the punch firmly with a hammer.

Next Step



3 DISASSEMBLY

Unscrew right-hand ball ring completely and remove the cartridge from the hub shell.



Thread cartridge finger tight into hub. If the mark made during disassembly is not next to the lubricator, remove and restart.

ASSEMBLY 4

Next Step



Next Step
Next Page

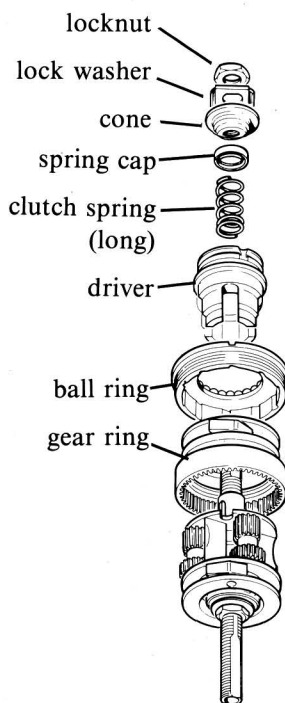


**STURMEY-ARCHER S5.1 5-SPEED HUB
DISASSEMBLY AND ASSEMBLY (cont.)**



4 DISASSEMBLY

Remove right-hand locknut, lockwasher and cone. Remove clutch spring, spring cap and driver.¹ Remove ball ring and gear ring.



Next Step
↑
Preceding Page

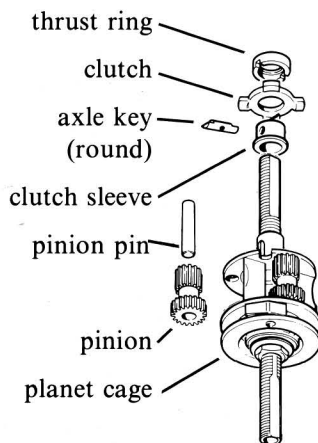
Install gear ring and ball ring. Install driver, clutch spring and spring cap.¹ Install cone, lockwasher and locknut. Adjust bearing. If bearing runs rough, check spring cap.¹

ASSEMBLY 3

Next Step
↓

5 DISASSEMBLY

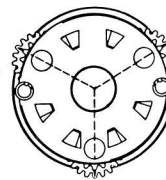
Remove thrust ring.² Push out axle key, remove clutch sleeve and sliding clutch. Remove pinion pins and pinions. Lift off planet cage.



Next Step
↑

Install clutch sleeve and clutch. Slide in round axle key with flats up. Install thrust ring² with slots seated on the axle key flats.

Pinion timing
marked teeth point
outward at once



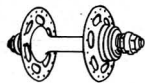
Slide planet cage over the long-slot end of axle. Note that each planet pinion has one marked tooth. Install pinions so that marked teeth point outward (see detail). *Do not let planet cage turn during pinion installation.*

Next Step
↓
Next Page

ASSEMBLY 2

¹Old model spring caps are too large to fit through the driver. On these hubs, the spring and cap are removed *after* and installed *before* the driver. Otherwise the spring cap will be compressed between the cone and the bearing with damage to both. Upon installation the driver must be held in place against the spring until the cone is installed.

²If thrust ring has top and bottom openings of *equal* diameter it must have a thrust washer on top of it.

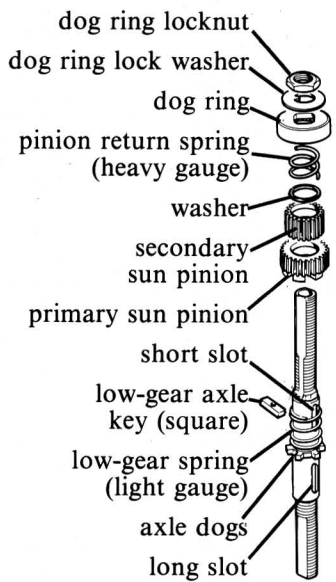


HUBS

STURMEY-ARCHER S5.1 5-SPEED HUB DISASSEMBLY AND ASSEMBLY (cont.) SUBASSEMBLIES

6 DISASSEMBLY

Position axle as shown. Flatten dog ring lockwasher. Remove dog ring locknut, lockwasher and dog ring. Remove pinion return spring and washer. Invert axle and tap gently to dislodge washer. With axle still inverted push the two sun pinions up until the larger one engages the axle dogs. The low-gear axle key should be visible in the bottom of its slot. Push out axle key. Remove the two sun pinions and low-gear spring.



Next Step
Preceding Page

Slide light gauge low-gear spring over short-slot end of axle. Install primary sun pinion smooth face up and secondary sun pinion smooth face down.

Push the two sun pinions along the axle so the larger engages axle dogs; invert assembly and slide in square low-gear axle key. Release the two sun pinions. If the hole in the axle key is not visible through the hollow axle, the key is not properly seated; remove and reseal.

Insert washer and pinion return spring. Install dog ring.

Install lock washer with key in axle keyway. Install *unplated* locknut *rounded side up*. Incorrect installation will cause shifting problems as this locknut has the threads relieved on one side. Push dog ring against spring until it seats over square-section part of axle and tighten locknut with a wrench. Bend up lockwasher to prevent nut from turning.

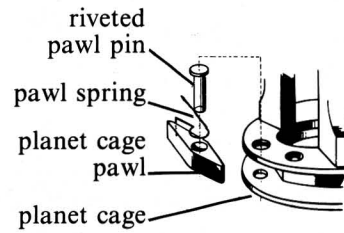
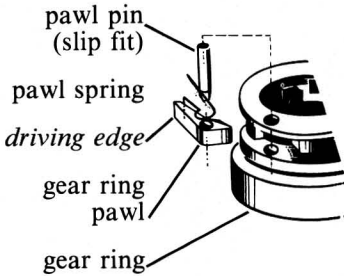
ASSEMBLY 1

DISASSEMBLY

Gear Ring and Planet Cage

Pawl springs can be removed with the pawls in place, although some deformation usually results. Ease the hooked end of the spring over the side or long end of pawl to the other side. Spread the ends of spring and slide out.

If pawls are to be removed, springs are best removed at that time. Riveted pawl pins can be removed only by drilling. Hollow pawl pins can be driven out with the correct size drift punch.



SUBASSEMBLIES

Gear Ring and Planet Cage

If only pawl springs have been removed, springs may be fitted with pawls in place. Holding spring by hooked end, hook straight end around pawl pin beside pawl. Ease hooked end over the side or long end of pawl. Straight end must come to bear on piece body and hooked end on pawl slightly behind driving edge.

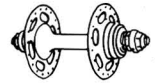
If pawls were removed, fit pawl, pawl spring and pin together. *Make sure pawls are oriented as shown.*

Gear ring pawl pins are slip fit, held in place by ball ring. Solid planet cage pawl pins must be lightly riveted over. Hollow planet cage pawl pins are driven in with a soft hammer.

ASSEMBLY

**STURMEY-ARCHER S5.1 5-SPEED HUB
DISASSEMBLY AND ASSEMBLY (cont.)
SUBASSEMBLIES**

HUBS

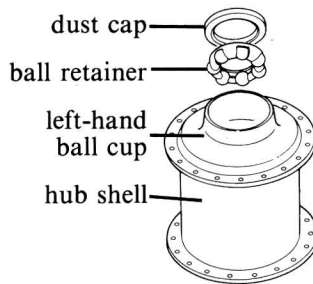
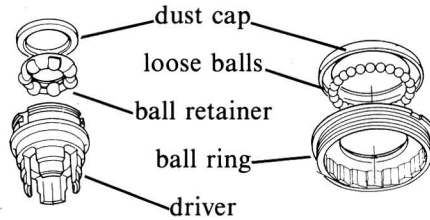


DISASSEMBLY

Driver, Hub Shell and Ball Ring

Remove dust cover with a thin-bladed screwdriver. Work slowly around cover to avoid deforming it. Lift out ball retainer.

Remove left-hand ball cup only if necessary. Cups with wrench flats are left-threaded, all others press fit. Support hub flange on two blocks of wood and pound out press fit cup with a third block and a hammer.



Driver, Hub Shell and Ball Ring

Install left-hand ball cup in hub shell if it was removed. Non-threaded cups can be pressed into threaded hub shells. Start cup straight and pound in with a soft hammer or a hammer and a block of wood.

Install balls or ball retainer. *Orient retainer as shown.* Start dust cover straight by hand and tap home with a soft hammer.

ASSEMBLY

CLEANING

Clean all parts, including outside of hub shell and axle bore, in a suitable solvent. Be very careful not to introduce dirt or grit after cleaning.

POINTS TO CHECK

Part numbers followed by * refer to AW parts chart, others to S5 parts chart.

1. Clutch¹ (18*), gear ring dogs¹ (20*), planet cage (15) dogs, axle (13) dogs and primary sun pinion (10) dogs for rounding or chipping
2. Pawls (12*) (21*), ball ring (22*) and left-hand ball cup (3) for worn or chipped corners
3. Sun pinions (9) (10), planet pinions (16), dog ring (6) and gear ring (20*) for worn or chipped teeth
4. Axle keys (11) (14) and indicators (19) for stripped threads, bent or damaged links or bent rod

5. Clutch spring (32*), pinion return spring (7) and low-gear spring (12) for length and tension (compare with new spring)
6. All threaded parts for stripped or damaged threads
7. Dustcaps and ball retainers for straightness
8. Axle (9) for straightness
9. Bearing surfaces of left ball cup (3), ball ring (22*), driver (25*), cones (5*) and pinion pins (17) for wear and pitting
10. Replace ball retainers, loose balls and pawl springs at overhaul

LUBRICATION

Lubricate ball bearings by filling the spaces between balls with grease. Be careful not to grease pawls. Lightly oil other parts with a *good* cycle oil. (WD-40 is too light for lasting lubrication, 3-in-1 Oil gums up with age.) Add about two teaspoons (8 ml) of oil when assembled.

¹ Rounding to a radius of so little as 1/64" at the corners can cause hub to slip out of gear