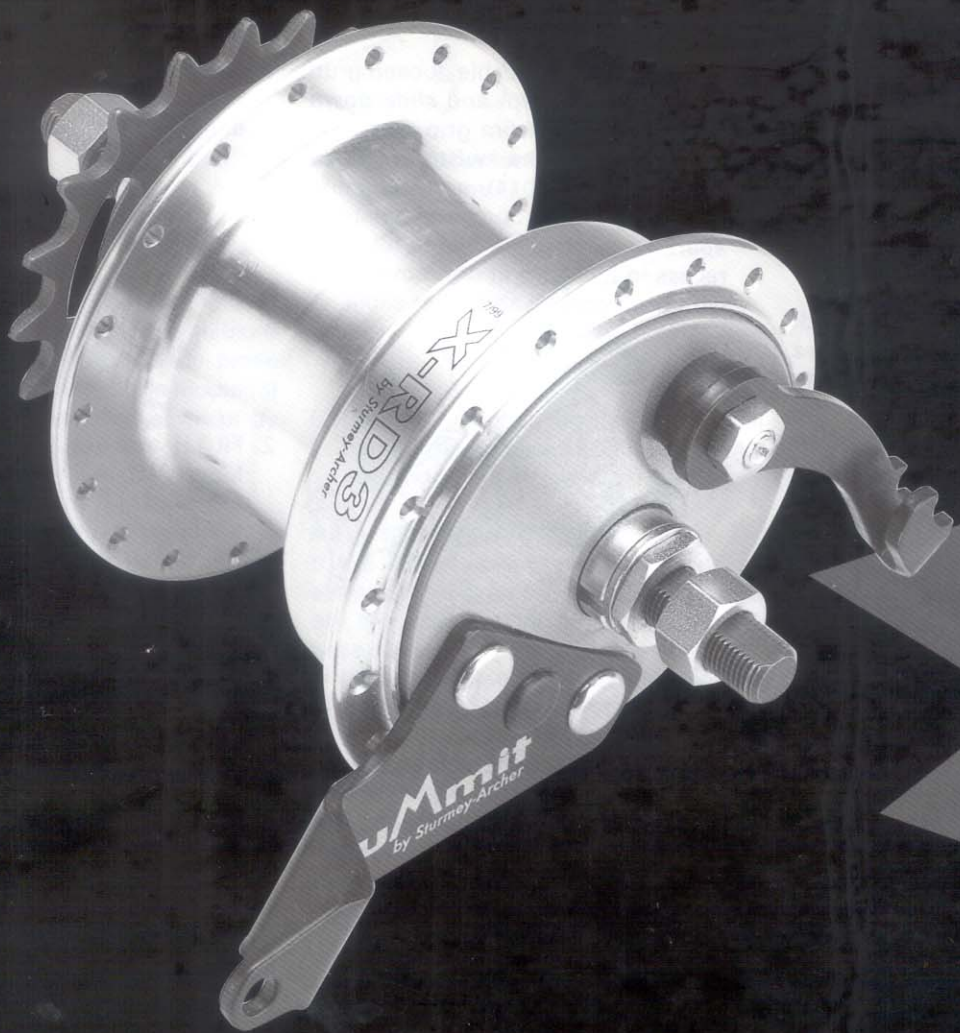
Summit X-RD3 Brake Hub



Technical Information and Parts List

Sturmey Archer

Summit

Technical Information - Summit X-RD3 Brake Hub

Part 1 GENERAL INFORMATION

1.1 SCOPE OF THIS LEAFLET

Congratulations upon your purchase of a Sturmey-Archer SUMMIT X-RD3 3-Speed Hub. To enjoy this hub at its best please follow these few simple instructions. Remember, during the first few miles the cable system will "bed-in", which may necessitate adjustment to ensure the hub is working to its maximum potential and to prevent possible hub damage **(See Part 4.)**.

This leaflet refers only to the X-RD3 Brake Hub which has a combined 70mm diameter DRUM BRAKE for safe progressive braking. Please contact your local approved dealer if any problems are experienced with this product.

1.2 LUBRICATION

No routine lubrication is required. During a major service the greases should be replenished to prolong the life of the gearbox. Please contact your approved dealer who is equipped to carry this out. The following types of greases meeting Sturmey-Archer Technical Standards should be used.

For Bearings - SA103B
For Internal Parts - SA103A

WARNING:- UNDER NO CIRCUMSTANCES SHOULD ANY LUBRICANT BE APPLIED TO THE BRAKE DRUM OR BRAKE SHOE, AS THIS MAY PREVENT THE BRAKE FROM FUNCTIONING.

Part 2 GEARS

2.1 GEAR CHANGING

Ease pedal backwards and select the gear required.

2.2 GEAR RATIOS

The Summit X-RD3 has the following ratios:-

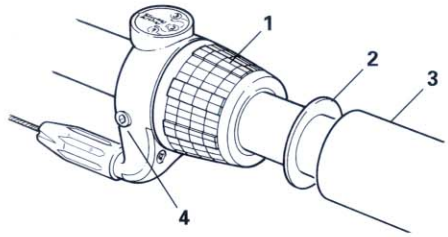
Distance travelled in metres (44T c/w. 22T Sprocket, 27" Wheel) with one revolution of the pedal.

1st gear - Decrease of 25% = 3.23 metres
2nd gear - Direct drive = 4.31 metres
3rd gear - Increase of 33.3% = 5.73 metres

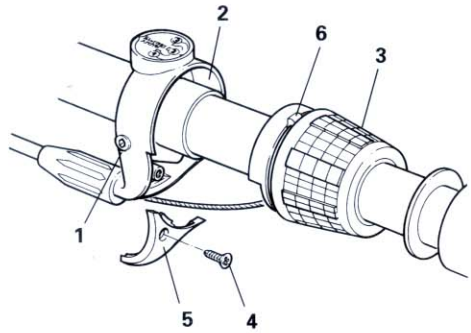
The overall distance travelled can be altered by changing the size of the rear sprocket. A range of sprockets from 14 to 22 tooth are available suitable for 1/2" pitch x 1/8" chain. Always maintain at least a 2:1 ratio between the numbers of teeth on the chainwheel and those of the sprocket.

2.3 TWISTGRIP CONTROL FITMENT

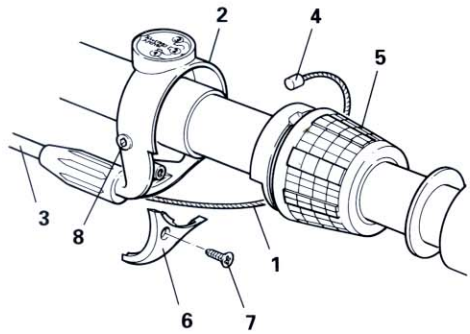
1. Slide control (1) onto handlebar followed by the washer (2) and the handlebar grip (3). Before securing control to handlebar ensure that the grip is pushed fully onto the handlebar. Now push control unit against the grip, rotate to the required position and tighten the grub screw (4) to 2Nm max.



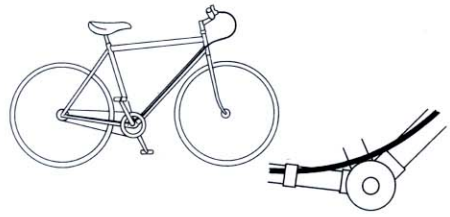
2. To remove the old cable, loosen grub screw (1) in control and slide down handlebar away from grip. Separate body (2) from the twistgrip (3) by removing screw (4) and retaining plate (5) and pull body and twistgrip apart. Remove cable nipple (6) from recess in twistgrip and remove inner wire from control and outer cable.



3. To fit the new cable, feed inner wire (1) into body (2) and outer cable (3) and locate nipple (4) into recess in twistgrip (5). Ensure that the inner wire wraps around the front of the twistgrip and is located in the groove. Push twistgrip (5) into body (2). Fit retaining plate (6) and secure with screw (7). Reposition control against grip and tighten grub screw (8) to 2Nm.



4. Ensure inner wire runs freely in control and outer cable and secure to frame.

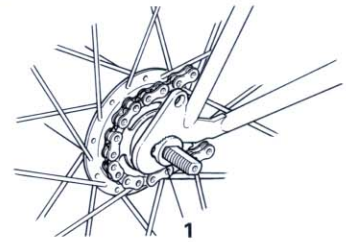


5. Fit cable anchorage and with control in gear 3 connect to indicator coupling.
6. Re-adjust gears.

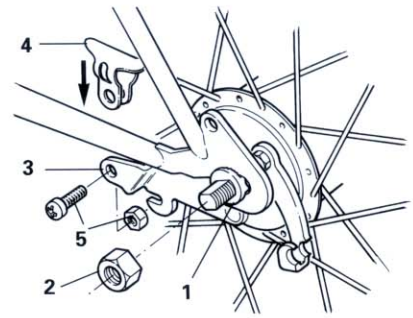
Part 3 WHEEL & CABLE FITMENT

The X-RD3 Hub has a 117mm overlocknut dimension.

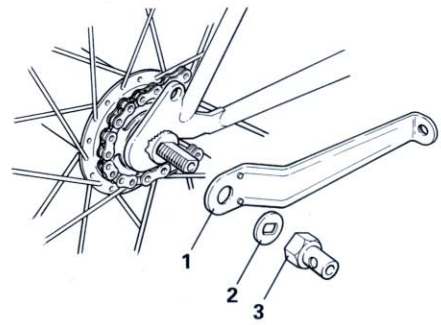
1. Fit the wheel - with chain tensioners, if fitted - into the bicycle frame and place the chain around the sprocket. Locate the anti-rotation washers (1) over both ends of the axle ensuring the lugs fit into the chainstay ends. Sturmey-Archer manufactures two sizes of anti-rotation washer (7.9mm and 9.5mm): ensure the correct one is fitted.



2. Fit LH axle nut (2) finger tight, and loosely fit brake arm (3) into brake arm clip (4) with nut & bolt (5). Do not tighten at this point.

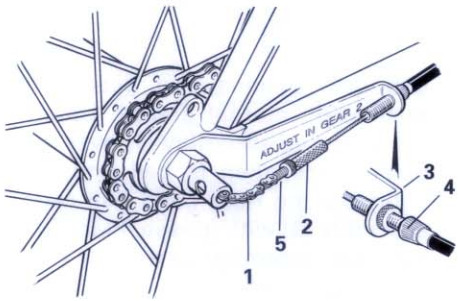


3. Locate fulcrum lever (1) over the axle, fit locking washer (2) and window axle nut (3). Align the wheel, tension chain and tighten the axle nuts to 30Nm. Ensure the fulcrum lever is level with the chainstay. Tighten the nut securing the brake arm clip to 7Nm. See Section 4 - Gear Adjustment for cable connection and adjustment.

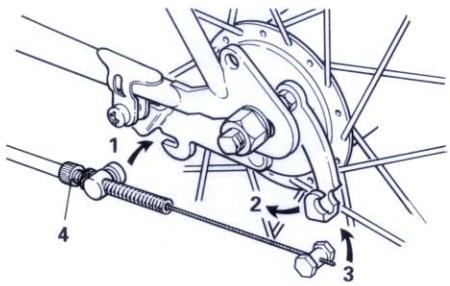


4. **Control Cable Fitment to Fulcrum Lever**
   Ensure the indicator (1) is screwed

firmly into the axle. Unscrew the indicator by up to half a turn if necessary to ensure easy fitment. Insert cable connector (2) through fulcrum lever (3) and screw cable adjuster (4) into fulcrum lever. Connect the indicator coupling (5) to the cable connector (2). Ensure that the axle end is visible in the right hand axle nut window.



5. **Brake Cable Fitment**
   After fitment of the brake cable to frame, locate the brake cable adjuster into brake arm (1). Rotate the brake lever (2). Locate brake cable nipple (3) into the brake lever. Adjust brake by rotating the adjuster (4).



6 Replace chainguard/gear case (if fitted) in accordance with cycle manufacturers instructions.

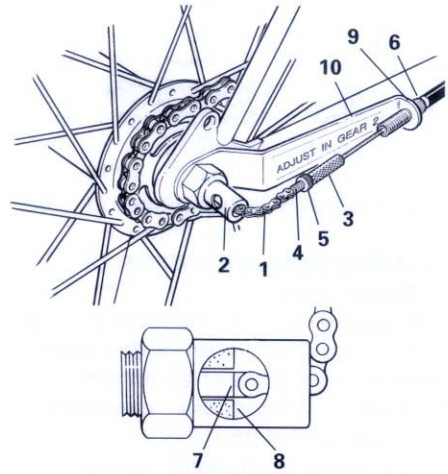
NB: Before use check and make necessary adjustments to brakes (See Part 4.2) and re-adjust gears (See Part 4.1).

Part 4 ADJUSTMENT

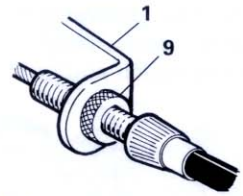
4.1 GEAR ADJUSTMENT

All types of cycle gear systems must not be ridden out of adjustment as this may damage the internal components and cause the gear to malfunction.

1. Check that the indicator chain (1) runs freely over the window axle nut (2).
2. Select 3rd gear on the control and screw the cable connector (3) until half way down the indicator coupling (4) and tighten locknut (5).
3. Select 2nd gear on the control and rotate the pedal crank to ensure the gear is engaged. Turn the cable adjuster (6) until the end of the indicator rod (7) is level with the end of the axle (8).



4. Tighten the locknut (9) against the fulcrum lever (10).



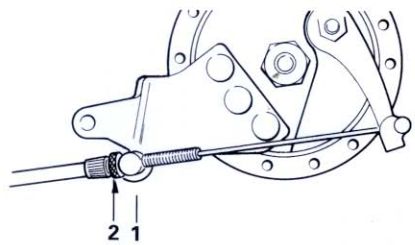
5. Select 3rd gear, rotate the pedal crank, change back to SECOND GEAR and check adjustment.

4.2 BRAKE ADJUSTMENT

If the wheel will not rotate freely or cannot be locked by a full application of the lever then adjustment is necessary.

1. Slacken the brake adjuster locknut (1). Turn the adjuster (2) until the brake is applied. Rotate the adjuster until the wheel just spins freely. Tighten the locknut.

NB: During the first few miles brake linings "bed-in" and may require adjustment. Should braking efficiency become impaired beyond adjustment, contact your local approved dealer who is equipped to replace the brake plate and shoe assembly.



Part 5 SERVICE - DEALER INSTRUCTIONS - ASSEMBLY/DISASSEMBLY

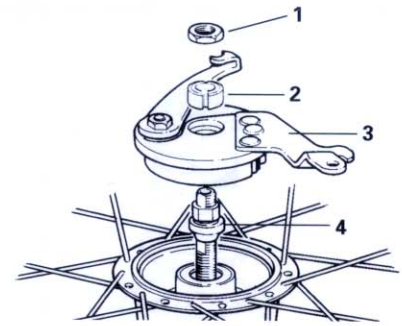
5.1 If service problems arise, they usually occur outside the hub. Check gear adjustment and fitment are correct before removing the wheel from the bicycle.

5.2 When service problems occur which cannot be corrected by attention to external maintenance, a close inspection of the working parts inside the hub will be necessary. This should be carried out by a trained bicycle mechanic.

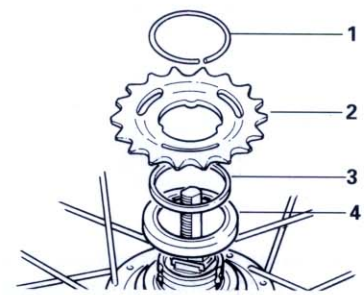
NB: The right hand end of the axle is the sprocket end. The axle should be clamped across the flats taking care not to damage the threads.

5.3 DISASSEMBLY

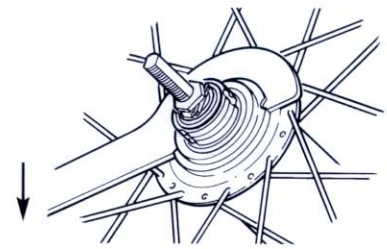
1. Remove the indicator, fulcrum lever, axle nuts, and washers from both ends of the axle.
2. Clamp R.H. (sprocket) end of axle in vice. Remove L.H. locknuts (1), cone adjuster (2) and brake plate (3) and cone (4). Note orientation of the brake arm and axle flats.



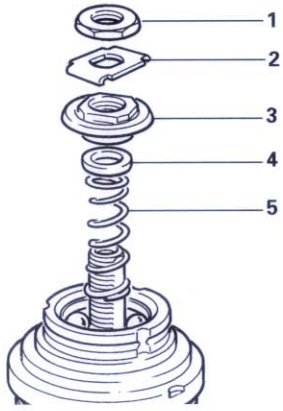
3. Remove hub from vice. Re-clamp L.H. end of axle in vice. Using a small screwdriver, remove the sprocket circlip (1), sprocket (2), spacing washer (3), & dustcover (4). To ensure the chain alignment is maintained, carefully note the order of removal and the dishing of the sprocket.



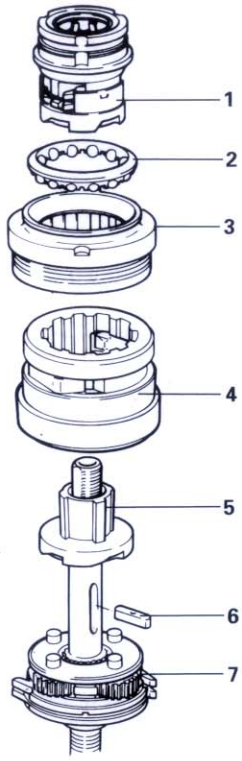
4. Remove from vice and, using a "C" spanner or hammer and punch, unscrew the internal from the hub shell anti clockwise.



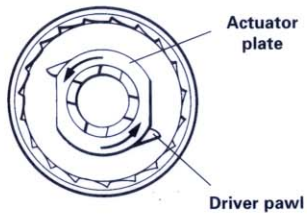
5. Clamp the left hand end of the axle in a vice and remove the right hand cone locknut (1), lockwasher (2), cone (3), clutch spring cap (4) and clutch spring (5).



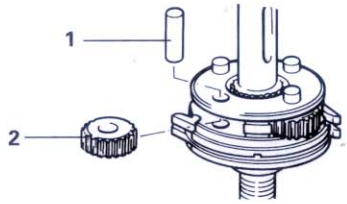
6. Remove driver assembly (1), ball ring (2), ball cage (3) and gear ring assembly (4). Remove clutch (5) and key (6) from axle. Remove planet cage assembly (7).



7. To separate driver assembly (1) and ball ring (2) rotate driver actuator plate anti-clockwise to disengage pawls and remove.



8. Remove pinion pins (1) and planet pinions (2).

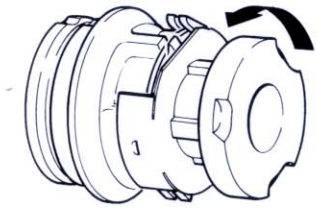


This completes disassembly.

5.4 INSPECTION AND REPAIR OF INTERNALS

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

1. Axle - straightness, condition of thread and slots.
2. Condition of all pawls, springs, ball, ball tracks, pinions and gear ring teeth and drive slots.
3. Check free movement of driver actuator and pawl action by inserting clutch and turn

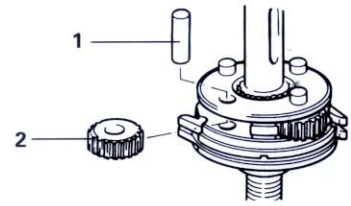


NB: It is recommended that this assembly is not dismantled but if necessary replace with a new assembly.

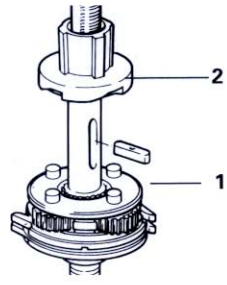
4. **Clutch** - squareness of drive corners.

5.5 ASSEMBLY

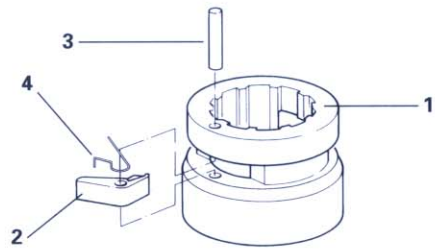
1. **See diagram 5.3.6 for assembly in reverse order.** Clamp axle in vice slot uppermost. Then fit the planet cage pawl end downwards.
2. Lubricate planet pinion pins (1) and fit planet pinions (2) and pins into planet cage ensuring free rotation of planet cage.



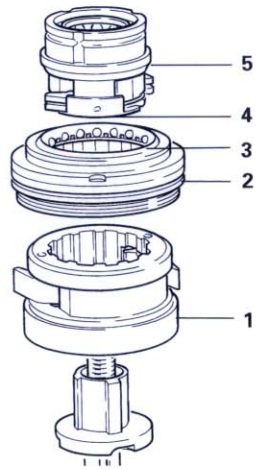
3. Fit axle key (1) into slot. Then fit clutch (2) ensuring it meshes with the top of the pinion pins.



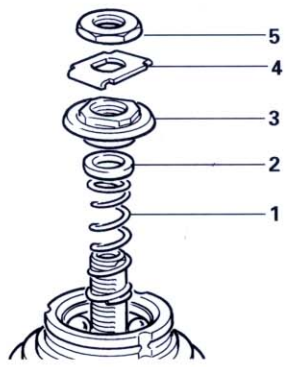
4. Take gear ring (1) and fit pawls (2), pawl pins (3) and springs (4), if required, as shown.



5. Lubricate pinions and gear ring teeth with internal grease. Locate the gear ring assembly (1) over the planet cage, then fit ball ring (2). Lubricate the right hand ball cage assembly (3) with grease. Place the ball cage assembly on the ball ring ensuring that the balls are positioned downwards. Rotate the actuator plate on the driver assembly (4) anti-clockwise to compress pawls. With the actuator in this position fit the driver assembly into the ball ring (2).



6. Locate the clutch spring (1) and spring cap (2), with its flat face uppermost, over the axle. Screw down the right hand cone (3) finger tight - slacken the cone off by half a turn and lock in position with the lockwasher (4) and locknut (5).



NB. Under no circumstances must the cone be unscrewed more the 5/8ths of a turn, as this could adversely effect gear adjustment.

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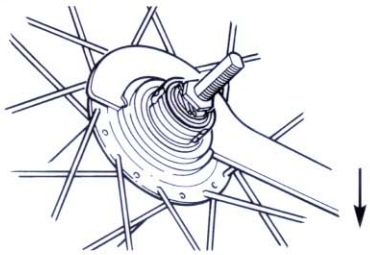
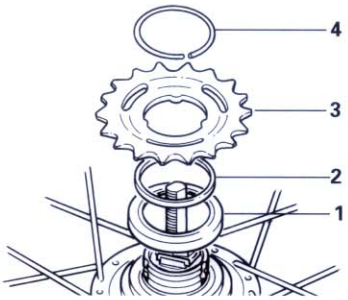
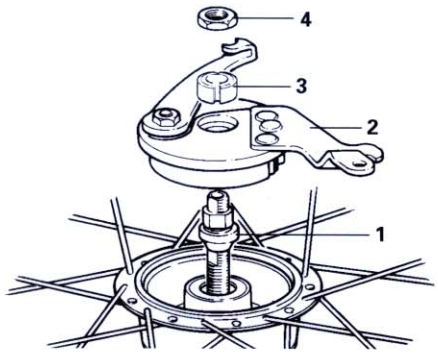
7. Ensure internal is lubricated. Insert internal into hub shell rotating anti-clockwise until pawls engage, then turn the ball ring clockwise to engage the thread and tighten with a "C" spanner or hammer and suitable punch.



8. Fit sprocket dustcover (1), spacer (2), sprocket (3) & sprocket circlip (4).

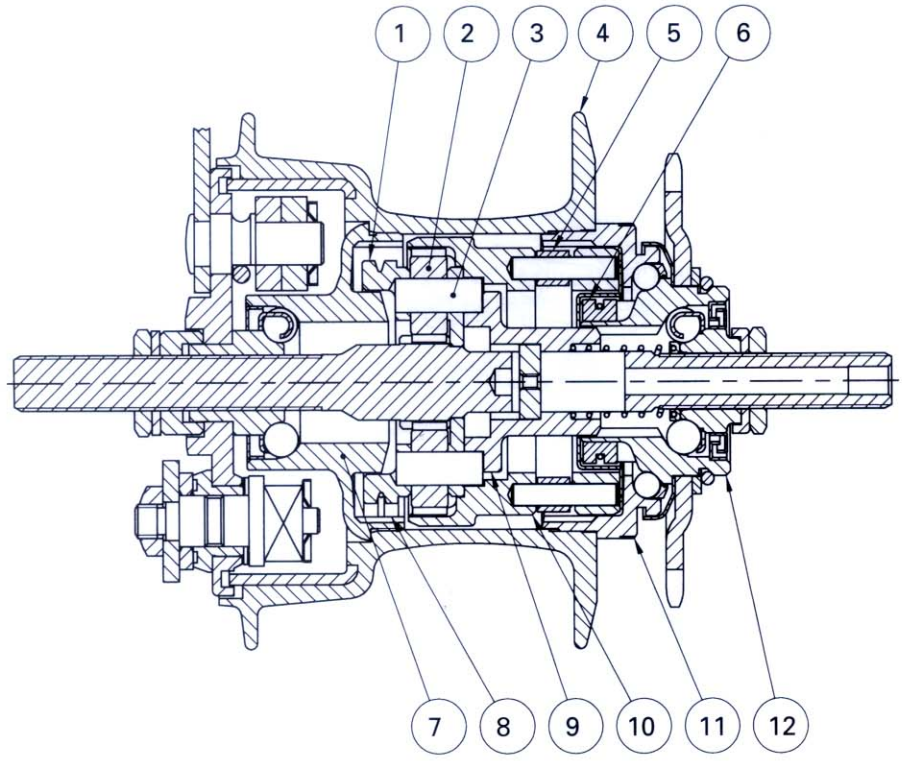


9. **Left Hand Cone Adjustment**
Clamp R.H. end of axle in vice, grease bearing and fit L.H. cone (1). Clean the brake drum using clean cloth, ensuring all dirt and grease is removed. Make sure the brake linings are clean (brake shoes should be replaced if contaminated with grease). Fit the brake assembly (2) into drum, ensuring orientation of torque arm & axle flats is correct. Fit cone adjuster (3) adjust L.H. cone until minimum play is felt at the wheel rim ensuring hub runs freely. Fit locknut (4). Apply the brake to centralise the brake shoes and tighten the locknut.



10. Assemble the wheel into the bicycle. Reconnect cables and adjust gear/brake as previously described in Parts 3 and 4. Test fully before using bicycle.

Part 6 - DRIVETRAIN CHART



Description

1. Planet Cage
2. Planet Pinion
3. Planet Pinion Pin
4. Hub Shell
5. Gear Ring Pawl
6. Driver Pawl
7. Left Hand Ball Cup
8. Planet Cage Pawl
9. Clutch
10. Gear Ring
11. Ball Ring
12. Driver

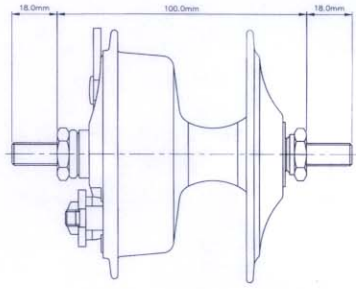
Drivertrain Sequence

Gear 1	12	6	10	2	3	1	8	7	4
Gear 2	12	6	10	5	11	4			
Gear 3	12	9	3	2	10	5	1	4	

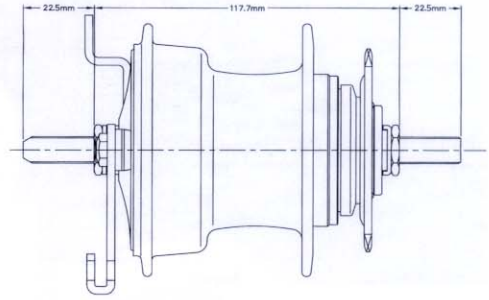
Technical Information - Summit X-RD3 Brake Hub

Part 7 - TECHNICAL SPECIFICATION

X-FD

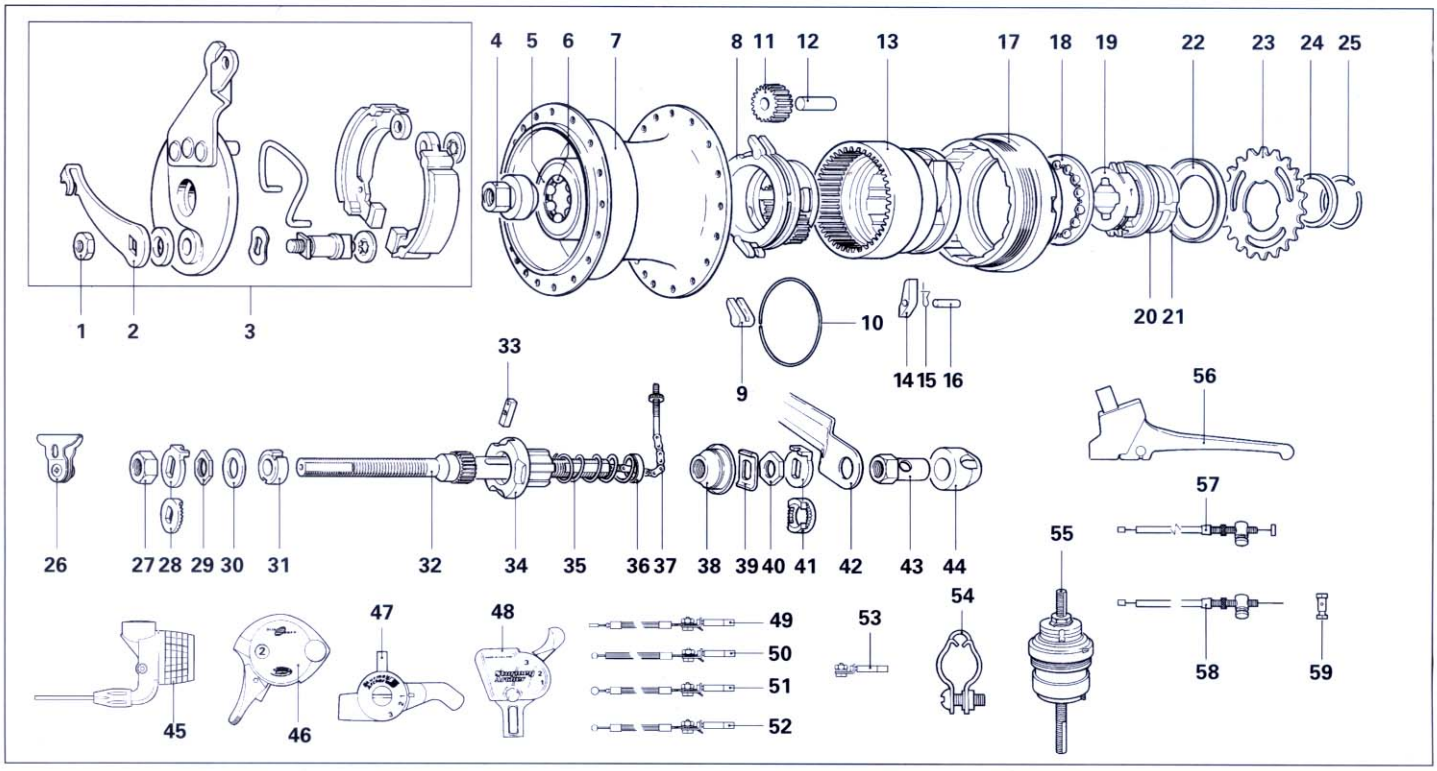


X-RD3



	Front Brake Hub (X-FD)	3 Speed Rear Brake Hub (X-RD3)		
Weight, complete with brake	**0.76 kg**	**1.35kg**		
Gear Ratios		Gear	Ratio	Distance travelled with one revolution of the front chainwheel
Front chainwheel: 44T		1	-25%	3.23 metre
Rear Sprocket: 22T		2	1:1	4.31 metre
Wheel Ø: 27 inch		3	+33%	5.73 metre
		Overall Range	178.0%	
Standard overlocknut dimension	**100mm**	**117.7mm**		
Controls	-	**HSJ 901 Twistgrip**		
		HSJ 865 Orion Control		
		HSJ 823 Nimbus Control		
		HSJ 762 Standard Trigger Control		
Total axle length	**136mm**	**162.7mm**		
Axle protrusion length	**R: 18mm, L: 18mm**	**R: 22.5mm, L: 22.5mm**		
Spoke hole diameter	**Suitable for 14g, 13g spokes**	**Suitable for 14g, 13g spokes**		
Sprocket range	-	**14T - 22T**		
Pitch circle diameter	**Ø 89.8mm**	**Ø 89.8mm**		

Parts List - Summit X-RD3 Brake Hub



Item No.	Sales No.	Description
1	HMN 139	Brake Lever Nut
2	HSB 406	Brake Lever
3	HSB 429	Brake Replacement Unit
		NB. Brake Replacement Unit includes 1 off Items 1 and 2
4	HSA 234	L.H. Cone
5	HSA 241	Cone Dustcover
6	HSA 284	Ball Cage Assembly - 6.4mm Ball
7	HSA 441	Hub Shell Assembly 36 holes N.B. - Hub Shell Assemblies include 1 off items 6and 7
8	HSA 434	Planet Cage Assembly (includes 2 off Item 9, 1 off Item 10)
9	HSA 573	Pawl for Planet Cage
10	HSA 435	Circlip
11	HSA 292	Planet Pinion
12	HSA 436	Pinion Pin
13	HSA 443	Gear Ring Assembly (includes 2 off Items 15, 16, 17)
14	HSA 119	Pawl for Gear Ring
15	HSA 120	Pawl Spring
16	HSA 415	Pawl Pin
17	HSA 437	Ball Ring
18	HSA 438	Ball Cage Assembly
19	HSA 439	Driver Assembly Complete (includes 1 off Items 21 and 22)
20	HSA 284	Ball Cage Assembly - R.H. 6.4 mm Ball
21	HSA 102	Outer Dust Cap
22	HSL 701	Sprocket Dust Cap
23	*HSL 714	Sprocket 14 Teeth
	*HSL 715	Sprocket 15 Teeth
	*HSL 716	Sprocket 16 Teeth
	*HSL 717	Sprocket 17 Teeth
	*HSL 718	Sprocket 18 Teeth
	*HSL 719	Sprocket 19 Teeth
	*HSL 720	Sprocket 20 Teeth
	*HSL 747	Sprocket 21 Teeth
	*HSL 722	Sprocket 22 Teeth
24	HMW 127	Sprocket Spacing Washer 1.6 mm
25	HSL 721	Sprocket Circlip
26	*HCB 101	Brake Arm Clip Assembly 15.9mm
	*HCB 103	Brake Arm Clip Assembly 18.3mm
	*HSL 767	Brake Arm Clip Assembly 15.5mm
	*HSL 768	Brake Arm Clip Assembly 15.9mm
27	HMN 128	Axle Nut L.H.
28	*HMW 155	Serrated Lockwasher 7.9 mm Slot
	*HMW 494	Serrated Lockwasher 9.5 mm Slot
	*HMW 515	K48 Lipwasher 9.5mm Slot
29	HMN 132	Cone Locknut
30	*HMW 146	Spacing Washer 1.6 mm
	*HMW 129	Spacing Washer 3.2 mm
	*HMW 483	Spacing Washer 4.8mm
	*HMW 484	Spacing Washer 6.4 mm
31	HSA 371	Cone Adjuster
32	HSA 440	Axle 162.7mm
33	HSA 295	Axle Key
34	HSA 536	Clutch
35	HSA 128	Clutch Spring
36	HSA 129	Cap for Clutch Spring
37	HSA 315	Gear Indicator (3 Mark)
38	HSA 101	R.H. Cone
39	HMW 147	Cone Lockwasher
40	HMN 132	Cone Locknut
41	*HMW 155	Serrated Lockwasher 7.9 mm Slot
	*HMW 494	Serrated Lockwasher 9.5 mm Slot
	*HMW 515	K48 Lipwasher 9.5mm Slot
42	HSJ 842	Fulcrum Lever
43	HMN 129	Axle Nut R.H.
44	*HSL 711	Indicator Guard
45	*HSJ 901	Twistgrip Control c/w inner wire
46	*HSJ 865	Orion Control
47	*HSJ 823	NIMBUS Control 22.2mm Clip
48	*HSJ 762	Black Trigger Control 22.2 mm Clip
49	*HSJ 101	Trigger Cable with Anchorage 530mm x 1520mm Black
	*HSJ 102	Trigger Cable with Anchorage 1420mm x 1570mm Black
50	*HSJ 884	NIMBUS Cable with Anchorage 1420mm x 1570mm Black
51	*HSJ 882	Twistgrip Cable with Anchorage 1420mm x 1570mm Black
52	*HSJ 883	Orion Cable with Anchorage 1420mm x 1570mm Black
53	*HSL 759	Cable Anchorage
54	*HSJ 607	Chainstay Fulcrum Clip 12.7 mm ø
	*HSJ 553	Chainstay Fulcrum Clip 15.9 mm ø
	*HSJ 548	Chainstay Fulcrum Clip 17.9 mm ø
	*HSJ 753	Chainstay Fulcrum Clip 19.1 mm ø
55	HSX 120	Gear Internal Assembly Complete
56	* PKL 205	DELRIN Brake Lever Assembly RH/LH 22.2mm Clip
57	HSK 713	Cable Complete Black - 1570mm c/end
58	*HSK 714	Cable Complete Black - 1600mm/1820mm o/end
59	*HSK 715	Pinch Bolt

* Optional Fitment

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

Persons Majestic Co.,
PO Box 370, 613 South Main Street, Huron, OHIO 44839, U.S.A
Tel: 419-433-9057 Fax: 419-433-0182

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