AW 3 SPEED
WIDE RATIO GEAR

Sturmey-Archer – pioneers in bicycle hub gears, brakes and lighting equipment – lead the world with the famous AW 3 speed gear. This supreme example of Sturmey-Archer precision engineering has made cycling easier for over sixty million riders.

Discerning cyclists choose this modern ‘built-in’ hub gear. Fully enclosed in chrome plated shell with oil-bath protection from water and dirt – providing smooth running and easy gear change.

Acclaimed as the most popular 3 speed hub gear in use throughout the world today.

Built to withstand heavy all purpose riding under all weather and terrain conditions.

Suitable for all makes of bicycles.

Fully supported by worldwide service.

Modern Precision Gears
STURMEY-ARCHER GEARS LTD · NOTTINGHAM · ENGLAND · A COMPANY
GENERAL NOTES

1. GEAR RATIOS:-
The AW hub provides three gears – (1) Low Gear – decrease of 25%. (2) Normal Gear, i.e. direct drive. (3) High Gear – increase of 33⅓%.

2. SPROCKETS:– A range of sprockets from 14T to 20T, and also 22T, is available for this hub.

3. LUBRICATION:– A NEW HUB MUST BE OILED BEFORE USE (approx. 2 cc of oil) through the lubricator on the hub shell. Afterwards add a few drops of oil every month. USE ONLY STURMEY-ARCHER OIL – DO NOT use thick oil or grease.

PHOTO SALES DESCRIPTION
No. No.
1 HMN 128 L.H. Axle Nut
2 HMW 145 Axle Lock Washer
3 HMN 132 Lock Nut
4 HMW 129 Axle Washer, ⅛ (3.2 mm)
5 HSA 101 Cone with Dust Cap
6 HSA 102 Outer Dust Cap
7 HSA 284 Ball Cage (with Ball Bearings)
8 HSA 104 Shell-40 hole–and Ball Cup Combined
9 HSA 105 Shell-38 hole–and Ball Cup Combined
9A HSA 239 Shell-28 hole–and Ball Cup Combined
10 HSA 106 Lubricator
11 HSA 107 Axle - 5½” (146 mm)
12 HSA 108 Axle - 6½” (169 mm)
15 HSA 111 Low Gear Pawl
16 HSA 112 Pawl Pin
17 HSA 113 Planet Cage
18 HSA 115 Planet Pinion
19 HSA 114 Pinion Pin
20 HSA 116 Clutch Sleeve
21 HSA 117 Clutch
22 HSA 118 Gear Ring

PHOTO SALES DESCRIPTION
No. No.
23 HSA 119 Gear Ring Pawl
24 HSA 120 Pawl Spring
25 HSA 121 R.H. Ball Ring
26 HSA 122 Inner Dust Cap
27 HSA 123 Driver
28 HSL 701 Sprocket Dust Cap
29 HSL 714/1
29 HSL 720 > Sprocket, 14–20T and 22T
29 HSL 722
30 HMW 127 Sprocket Spacing Washer
31 HSL 721 Sprocket Circlip
32 HMW 147 Cone Lockwasher
33 HMN 129 R.H. Axle Nut
34 HSA 124 Axle Key
35 HSA 125 Indicator Coupling–5½” (146mm) Axle
36 HSA 126 Indicator Coupling–6½” (159mm) Axle
37 HSA 283 Thrust Ring
39 HSA 128 Clutch Spring
40 HSA 119 Clutch Spring Cap
41 HSA 134 Indicator Coupling Connection Lock Nut
TO DIS-ASSEMBLE THE AW HUB (See exploded view)

1. Remove left-hand locknuts 1 and 3, washers 2 and 4 and cone 5.
2. Unscrew right-hand ball ring 25 from hub shell 9 (use hammer and punch) and withdraw gear unit.
3. Detach the low gear pawls 15, pins 16 and springs 24. Take off the right-hand locknut 33 and 3, washers 2 and 32, cone 5.
4. Lift off driver 27, ball ring 25, and gear ring 22, clutch spring cap 40, and spring 39.
6. Remove thrust ring 37, unscrew indicator rod 36.
7. Push out axle key 34, take off sliding clutch 21 and sleeve 20.
8. Lift off planet cage 17, remove planet pinions 18 and pins 19.

POINTS TO CHECK

1. Freedom of clutch in driver. This should slide up and down easily.
2. Axle between centres for straightness.
3. All gear teeth for wear or chipping.
4. All races for wear.
5. Pinion pins, sliding clutch and gear ring dogs for rounding of engagement points.
6. Pawls and pawl ratchets for wear.

TO ASSEMBLE THE AW HUB. (See Exploded View)

1. Hold axle 11 in a vice (slot for axle key above the sun pinion) fit the planet cage 17.
2. Add the planet pinions and pins 18 and 19 - small end outwards.
3. Fit sleeve 20, clutch 21, axle key 34, and screw in the indicator rod 36.
4. Locate thrust ring 37 over axle key 34.
5. Slide clutch spring 39 and cap 40 over the axle.
6. Place pawls 23, pins 16 and springs 24 into gear ring 22. See Fig. 'A', and fit this over planet cage 17.
7. Position the right-hand ball ring 25 over gear ring 22.
8. Add the driver 27 complete with fittings. See Fig. 'B'. Hold driver down to engage the clutch fully and screw on the right-hand cone 5 finger-tight. Then slacken it half a turn and lock in that position with lock washer 32 and locknut 3.
NOTE: Cone must not be unscrewed more than 3/8 of a turn as that will throw the gear mechanism out of adjustment.
9. Fit the planet cage pawls 15, pins and springs 23 and 24. See Fig. 'C'.
10. Screw the gear unit into the hub shell and tighten ball ring 25.
11. Screw on left-hand cone 5, and add washers 4 and 2 and locknut 3 and adjust the hub bearings.

Fig. A

Fig. B

Fig. C

BEARING ADJUSTMENT.

Right side cone adjustment. Screw cone down finger-tight, then slacken half a turn and lock in this position. NOTE: Turning it back more than 3/8 of a turn will throw the gear mechanism out of adjustment. On the left side loosen locknut and adjust the cone until the wheel has a trace of side play at the rim. None at the hub, then tighten locknut.
GEAR ADJUSTMENT. See Fig. 'D'
Place the gear control in No. 2 position. Screw the cable connection (3) until the end of the indicator rod is exactly level with the extreme end of the axle. This can be seen through 'window' in the right-hand nut (see 1). Now tighten locknut (2).
ALL GEARS ARE NOW SET.

GEAR CORRECTION GUIDE (AW GEAR).
NOTE. The major cause of trouble is faulty gear adjustment. Check to see that the end of the indicator rod is level with end of axle when gear control is in No. 2 position.
If the complaint is sluggish gear change or stiffness this may point to lack of oil.

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>FAULT</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-changing gear action between 1st gear and 2nd gear.</td>
<td>1. Worn gear ring pawls.</td>
<td>1. Replace.</td>
</tr>
<tr>
<td>Slipping in normal gear (2nd).</td>
<td>1. Gear ring dogs and/or clutch worn.</td>
<td>1. Replace.</td>
</tr>
<tr>
<td>Slipping in top gear (3).</td>
<td>1. Pinion pins and/or clutch worn. 2. Weak or distorted axle spring. 3. Incorrect R.H. cone adjustment. 4. Grit between clutch sleeve and axle</td>
<td>1. Replace. 2. Fit new spring. 3. Re-adjust. 4. Clean.</td>
</tr>
<tr>
<td>Sluggish gear change.</td>
<td>1. Distorted axle spring. 2. Bent axle. 3. Worn indicator chain link. 4. Lack of oil or frayed wire.</td>
<td>1. Replace. 2. Replace. 3. Replace. 4. Oil or replace.</td>
</tr>
</tbody>
</table>

GEAR CHANGING
The gear change is quick and easy and should be made smartly. Continue pedalling, but ease pressure on pedals whilst changing gear.

GEAR CONTROLS
Sturmey Archer offer a choice of three different gear controls —
* Trigger Control — handlebar fitting with reliable simplicity.
* Auto Twistgrip — consistently controlled adjustment and 'slick' gear change.
* Sportshift — the latest 'shift' control for 'fun' cycling.

All these features are provided to ensure the modern cyclist enjoys trouble free precision gear change.
S3C COASTER HUB BRAKE
COMBINED WITH
AW 3 SPEED GEAR

This newcomer to the Sturmey-Archer range provides in one hub shell the most
efficient combination of gears with a coaster brake. Speedy gear change — smooth
stopping power by a reverse turn of the pedals.
The brake action is entirely independent of gear adjustment and completely
positive at all times.
No other hub offers all these unique advantages —
* The world famous AW wide ratio 3 speed gear
* Completely positive back-pedal brake
* Wide range of gear controls — trigger, auto-twist grip, sportshifts — to suit all
models of bicycles.
* Fully enclosed — weather proof — oilbath lubrication.

The gear that makes cycling easier—
The brake that makes cycling safe!

STURMEY ARCHER GEARS LTD · NOTTINGHAM · ENGLAND · A COMPANY
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<td>3</td>
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<td>43</td>
<td>HSA 126</td>
<td>Gear Indicator Coupling – 6&quot; Axle (152 mm)</td>
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GENERAL NOTES

1. GEAR RATIOS: - The S3C hub provides three gears – (1) Low Gear – decrease of 25%, (2) Normal Gear, i.e. direct drive. (3) High Gear – increase 331/3%.

2. SPROCKETS: - A range of sprockets from 14T to 20T, and also 22T, is available for this hub.

3. LUBRICATION: - A NEW HUB MUST BE OILED BEFORE USE (approx. 2 cc of oil) through the lubricator on the hub shell. Afterwards add a few drops of oil every month. USE ONLY STURMEY-ARCHER OIL – DO NOT use thick oil or grease.

4. It is important that the axle should be prevented from rotating in the chainstay slots and the flats on the axle are provided for this purpose. If the chainstay ends are too wide for the axle, special lock washers are supplied.

GEAR CHANGING

The gear change is quick and easy and should be made smartly. Continue pedalling, but ease pressure on pedals whilst changing gear.

TO DIS-ASSEMBLE THE S3C HUB  (See exploded view)

1. Remove wheel nuts 26 and 42. Hold sprocket end of axle in a vice. Remove left-hand locknut 27, lockwasher 28 and adjuster nut 29. Lift off brake arm and cone assembly 4. Take out ball retainer 8 and brake band 10 from hub shell.

2. Unscrew right hand ball ring 20 (use hammer and punch). Remove unit from vice and withdraw gear from hub shell.

3. Remove the brake thrust plate 12 and planet cage pawl ring 13.

4. Hold left hand end of axle in a vice and remove cone locknut 41. Lock washer 40 and unscrew cone 39.

5. Lift off driver assembly 21, ball ring 20, ratchet ring 19, gear ring pawl ring 18 and gear ring 17, clutch spring cap 36, spring 35.

6. Unscrew gear indicator coupling 43, lift off clutch 34 and remove axle key 33.

7. Take out planet pinion pins 15 and remove planet pinions 14.

8. Remove axle from vice, push off circlip 30 from left end of axle and lift off planet cage 16.

POINTS TO CHECK

1. Axle for straightness.

2. All gear teeth for wear.

3. All races for wear.

4. All pawls and ratchets for wear.

5. Pinion pins, sliding clutch, driver edges and gear ring splines for wear.

6. Check cam surface areas of brake thrust plate and planet cage. Also circular grooves in brake band for wear.

7. Eliminate all movement of brake arm in its recess in left hand cone – if either component is damaged (i.e. chipped) replace with new part. NOTE – The brake arm is a press-in fit and must remain tight in cone recess.

8. All dust caps for damage in – left and right hand cones – right hand ball ring and driver.

9. Pawl springs and brake actuator spring for loss of tension.
TO ASSEMBLE THE S3C HUB  (See exploded view)

Prepare in advance the following sub-assemblies:

1. **GEAR RING ASSEMBLY***
   - Fit gear ring pawl springs. As shown in Fig. 18.
   - See Fig. 18.

2. **DRIVER ASSEMBLY***
   - Fit brake operating pawl springs. As shown in Fig. 21.
   - Assemble sprocket dust cap, spacing washers and sprocket in arrangement noted when dismantling the hub, and add circlip. Fit the ball retainer 37 into the driver 21 – (The ring of retainer facing outwards) and fit dust cap 38 – fill dust cap with Shell Alvania No. 3 grease.
   - See Fig. 21.

3. **PLANET CAGE ASSEMBLY***
   - Fit planet cage pawl springs. As shown in Fig. 13.
   - See Fig. 13.

4. **BALL RING ASSEMBLY***
   - Fit 24 (\(\frac{3}{16}\)" diam) ball bearings in ball race of right hand ball ring 20. Fill the ball track with Shell Alvania No. 3 grease and press in the inner dust cap. Make sure the bearings revolve freely after dust cap has been fitted.
   - Place dust cap 6 over left hand cone 7, and press brake arm 5, tightly into cone slots.
   - NOTE – “Sturmey Archer” name must face outwards.
   - Smear grease - use Shell Alvania No.3 – in the ball track of the left hand cone – (inside the hub shell).
   - See Fig. 13.

*In these assemblies, pawls and pins cannot be replaced separately. Complete units only will be supplied. Pawl springs only are available as service replacements.

1. Hold the right-hand end of the axle in a vice – the slot for the axle key below the sun pinion – and fit the planet cage 16 – actuator thread uppermost – and push circlip 30 into axle groove. Reverse axle in vice, add the planet pinions 14, and pins 15, making sure that the D shaped ends of the pins are facing downwards.

2. Fit axle key 33 into axle slot (with the hole of the key facing upwards), slide clutch 34 over axle and key, and screw gear indicator rod 43 into key.

3. Slide the clutch spring 35 over the axle and fit spring cap 36.

4. Fit the gear ring 17 and the previously prepared gear ring pawl ring (sub-assembly 18).

5. Insert the ratchet ring 19 into the right hand ball ring 20 and place these over the gear ring assembly. (Ratchet ring dogs MUST engage gear ring).

6. Fit the previously prepared driver (sub-assembly 21). Hold driver down to fully engage clutch and screw the right-hand cone 39 onto axle (finger-tight), then slacken half a turn (180°) and lock in position with the washer 40 and locknut 41.

**N.B.** Do not unscrew cone more than \(\frac{3}{8}\) of a turn, as that would throw the gear mechanism out of adjustment.
ASSEMBLY CONTINUED

7. Reverse the assembled mechanism in the vice. Locate planet cage pawl-ring (sub-assembly 13) over the flats on the pinion pins.

8. Fit the brake thrust plate 12 – IMPORTANT – ensure leg of brake actuating spring 11 faces outwards, also the thrust plate must ENGAGE FULLY the dogs on planet cage pawl ring 13.

9. Fit the brake band 10 – (the inner band projections must face uppermost) over brake thrust plate 12.

10. Remove the assembled mechanism from the vice. Hold the cycle wheel horizontally – insert the assembled mechanism into hub shell from below and screw in the right hand ball ring 20. (Use hammer and punch to tighten ball ring).

11. Fit ball retainer (with balls down) in left hand ball race. Fit the left-hand cone and brake arm assembly 4. NOTE – Make sure that the brake band projections and actuating spring leg fit into their respective slots in the cone – i.e. spring leg in narrow slot at 90° to large slot.

12. Screw the adjuster nut 29 on to axle (finger tight). Fit the lockwasher 28 and locknut 27 – (Adjust the hub bearing).

A correctly adjusted wheel has a trace of side-play at the rim – none at the hub.

N.B. Secure adjuster nut 29 after adjustment – centre punch lockwasher 28 over the slot in adjuster nut 29. Tighten locknut 27.

13. Replace the wheel in the cycle frame. Secure FIRMLY, the brake arm clip 2 on left-hand chainstay of cycle. (N.B. Strengthening Pad 1 is fitted on top of chainstay – Sports Machines). Do not twist the brake arm sideways when tightening clip. Adjust the gears.

GEAR ADJUSTMENT

Place the gear control in No. 2 position. Screw the cable connection 3, until the end of the indicator rod is exactly level with the extreme end of the axle. This can be seen through ‘window’ in the right-hand nut (see 1). Now tighten locknut 2. ALL GEARS ARE NOW SET.

NOTE – When the brake is applied in No. 3 (High) gear only – the gear indicator coupling will move outwards – slightly. This is caused by the clutch – to which the indicator is keyed – sliding backwards over the ramps on the planet cage. Immediately the brake is released, the clutch moves down the ramp again to drive forward.

BRAKE CORRECTION GUIDE

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<tr>
<th>SYMPTOM</th>
<th>FAULT</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noisy or juddering brake.</td>
<td>1. Loose brake arm clip.</td>
<td>1. Tighten clip nuts.</td>
</tr>
<tr>
<td>Brake snatching or too fierce.</td>
<td>1. LACK OF OIL.</td>
<td>1. LUBRICATE HUB through oiler in Hub Shell – use Sturmey Archer Oil</td>
</tr>
</tbody>
</table>
## GEAR CORRECTION GUIDE

*NOTE* – The major cause of trouble is faulty gear adjustment. Check to see that the end of the indicator rod is level with the end of the right hand end of the axle when gear control lever is in No. 2 gear position. If the complaint is sluggish gear change or stiffness, this may point to LACK OF OIL. Hub and control should be oiled and re-tested before going further. If the fault persists, the following chart should locate the trouble.

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<tr>
<th>SYMPTOM</th>
<th>FAULT</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>No low gear (1st)</td>
<td>1. Distorted axle spring.</td>
<td>1. Fit new axle spring.</td>
</tr>
<tr>
<td>Slipping in low gear (1st)</td>
<td>1. Sliding clutch, worn or chipped at corners. 2. Indicator not screwed in fully in axle key. 3. R.H. cone wrongly adjusted. 4. Kinks in gear control wire. 5. Gear indicator coupling twisted by over-tightening.</td>
<td>1. Fit new sliding clutch. 2. Screw in indicator fully. 3. Re-adjust R.H. cone. 4. Fit new control cable. 5. Replace or refit as required.</td>
</tr>
<tr>
<td>Fluctuating between low gear (1st) and normal gear (2nd)</td>
<td>1. Faulty or worn gear ring pawls.</td>
<td>1. Change gear ring, Pawl Ring Assembly</td>
</tr>
<tr>
<td>Slipping in normal gear (2nd)</td>
<td>1. Gear ring dogs and/or sliding clutch chipped, due to incorrect gear adjustment or gear changing. 2. Indicator not screwed in fully in axle key.</td>
<td>1. Fit new gear ring and/or sliding clutch. 2. Screw in indicator fully.</td>
</tr>
<tr>
<td>Slipping in top gear (3rd)</td>
<td>1. Pinion pins or sliding clutch badly worn due to bad adjustment. 2. Weak or distorted axle spring. 3. Incorrect R.H. cone adjustment.</td>
<td>1. Fit new parts. 2. Fit new spring. 3. Re-adjust.</td>
</tr>
<tr>
<td>Hub runs stiffly. Drag on pedals when free wheeling.</td>
<td>1. Too many balls in ball ring. 2. Cones excessively tight. 3. Chainstay ends not parallel. 4. Corrosion due to inferior oil or LACK OF LUBRICATION. 5. Distorted dust caps.</td>
<td>1. 24 balls only should be fitted. 2. Re-adjust cones. 3. Correct chainstay ends. It is essential that the ends are parallel, otherwise the axle will be strained when the nuts are tightened and gear internals may be seriously affected. 4. Clean hub thoroughly and oil. Approx. 2 cc of Sturmey-Archer oil. 5. Replace damaged caps.</td>
</tr>
<tr>
<td>Sluggish gear change.</td>
<td>1. Distorted clutch spring. 2. Bent axle. 3. Worn chain links in gear indicator coupling. 4. Cable guide pulley out of line. 5. Lack of lubrication of gear cable.</td>
<td>1. Replace spring. 2. Replace axle. 3. Replace indicator and chain. 4. Correct alignment of cable and pulley on cycle frame. 5. Lubricate, or replace cable.</td>
</tr>
</tbody>
</table>
AB/C REAR INTERNAL EXPANDING HUB BRAKE COMBINED WITH AW 3 SPEED GEAR

An ideal combination - braking power plus speed with ease by Sturmey Archer. Internal expanding brake and the world famous AW 3 speed wide ratio gear in one compact unit - saves weight and cost.

The AB/C hub - chosen by leading Cycle manufacturers in world markets - offers the advantages of speed with ease and stopping power to spare - completely enclosed in one clean-line chromium plated shell to provide entire protection from weather - positive braking under all conditions.

Suitable for Sports and Roadster Cycles with a choice of brake and gear controls:

**BRAKE CONTROL**
*ABC - light flexible, power tested cable - black or white.
*AB - strong steel rod transmission - chromium plated
 - both with full chrome brake lever - braking power at your finger tip!

**GEAR CONTROL**
*Trigger Control - quick 'flick' action handlebar fitting.
*Auto-Twist Grip - automatically ensures correct gear adjustment at all times.
*Sportshift - racy shift through the gears - frame mounted for 'fun-bikes'.

The Sturmey-Archer AB/C Hub provides braking & gear change at their best.
GENERAL NOTES

1. GEAR RATIOS:
   The AB hub provides three gears. The direct drive is in Normal Gear. Top Gear provides an increase of 33.33% and Low Gear a decrease of 28% from Normal.

2. SPROCKETS:
   A range of sprockets from 14T to 22T is available for this hub.

3. It is important that the axle should be prevented from rotating in the chainstay slots and the flats on the axle are provided for this purpose. If the chainstay ends are too wide for the axle, special washers are supplied.

4. LUBRICATION:
   A NEW HUB MUST BE OILED BEFORE USE (approx. 2 cc of oil). Lubrication of the bearings is made through lubricator in hub shell. USE ONLY STURMEY-ARCHER OIL.
   Applying a few drops once a month. The brakes are designed to run dry. No oil must be allowed to reach the brake linings.
TO DIS-ASSEMBLE THE HUB. (See exploded view).
1. Remove axle nuts 9, and 51, and lockwashers 10.
2. Remove left-hand locknut 8, washer 11, notched adjusting washer 7 and spacing washer 20.
3. Lift off the brake unit – care should be taken not to lose the inner spacing washers 19 and 20, on the left-hand cone.
4. Unscrew left-hand cone 22.
5. Unscrew right-hand ball ring 41, (use hammer and punch) from shell and withdraw gear unit.
6. Remove from the planet cage the low gear pawls 32, pins 31 and springs 33.
7. Place the left-hand end of the axle in a vice and remove the right-hand cone locknut 8, washers if any, cone lock washer 50, and cone 45.
8. Lift off, in the following order – the clutch spring 55, cap 56, driver assembly 43, right-hand ball ring 41, and the gear ring 39.
9. Push out the gear ring pawl pins 31, from the gear ring 39, to release the pawls 40 and springs 33.
10. Remove the thrust ring 53, and unscrew the indicator coupling 57 or 58.
11. Push out the axle key 52, and remove the sliding clutch 38, and sleeve 37.
12. Lift off the planet cage complete 34.
13. Take out the pinion pins 36, and remove the pinions 35, from the planet cage 34.
14. If it is necessary to remove the brake shoes 18, and linings 17, from the brake plate 13, unscrew the cam lever nut 6, and pull the cam lever 12 from the squared end of the cam. Then remove the nut 6, and shakeproof washer 5, securing the fulcrum pin 14, and lift off the brake shoes 18.

POINTS TO CHECK.

GEAR
1. Freedom of clutch in driver. This should slide up and down easily.
2. Axle between centres for straightness.
3. All gear teeth for wear or chipping.
4. All races for wear or pitting.
5. Pinion pins, clutch and gear ring dogs for rounding off on engagement points.
6. Pawls and pawl ratchets for wear.

BRAKE
1. Make sure the leading edge of each brake lining is tapered off for the first quarter of an inch. (If they are not, the ends may lift and cause a squealing noise).
2. All rivets must be below the surface of the brake linings 17.
3. The linings for signs of wear or oil.

BRAKE SHOE ASSEMBLY
The diagram illustrates the correct assembling of the brake shoes, but the following points should be specially noted:--

It is important that brake shoes are re-assembled with the side of the brake cam with the largest flat area on the inside -- towards the axle. (See letter 'A' below).
To allow both brake shoes to be applied evenly the cam is slightly offset, and if not fitted correctly will allow one shoe only to operate with consequent loss of braking efficiency. It is also important to ensure that the flange which carries the brake springs fits next to the brake arm plate.

![Diagram of Brake Shoe Assembly]
TO ASSEMBLE THE HUB.

(See exploded view)

1. Prepare the following sub-assemblies:-
   a. Fit the ball-cage 23 into the driver 43, with the ring of the ball-cage facing outwards and press in the dust cap 44, with the recess facing outwards (see Fig. A). If a new ball cage is fitted, the dust-cap should also be new. If the sprocket has been removed, fit the dust-cap 46, washers 48, and sprocket 47 — in the same order noted on dismantling — and fix in position with circlip 49.
   b. Fit the balls (24 only) and the inner dust-cap 42, into the right-hand ball-ring 41, making sure that the balls can revolve freely with the dust cap in position.
   c. Fit the gear-ring pawls 40, pins 31, and springs 33, into the gear-ring 39, (see Fig. B).
   d. Smear grease in the channel of the dust-cap 46, (use Shell Alvania No 3.)
2. Hold the axle 27/28, in a vice (with slot for axle key 52, above the sun pinion) and fit the planet cage 34.
3. Add the planet pinions 35, and pins 36, (the small ends of the pins protrude).
4. Fit the clutch sleeve 37, (flange first), clutch 38, with the recess over the flange of the sleeve, axle key 52, with the flats facing upwards and screw in the indicator coupling 57 or 58.
5. Locate thrust-ring 53, over flats of axle key 52.
6. Fit gear-ring 39, (sub-assembly B) over planet cage 34.
8. Add the driver 43, complete with fittings (sub-assembly A).
9. Slide clutch spring 55, and cap 56, over the axle.
10. Screw on the right-hand cone 45, finger tight, then slacken half a turn — and lock in this position with the lock washer 50, and lock nut 8.
   NOTE — CONE MUST NOT BE UNSCREWED MORE THAN ½ OF A TURN AS THAT WOULD THROW THE GEAR MECHANISM OUT OF ADJUSTMENT.
11. Fit the low gear pawls 32, pins 31, and springs 33, into planet-cage 34, (see Fig. C).
12. Screw the gear unit into the hub shell 24, or 25, and tighten ball-ring 41.
13. Screw on left-hand cone 22, and fit spacing washers 19 and 20.
14. Replace the brake plate, 13, complete with shoes 18.
   Note — If the brake shoes have been removed, make sure that they are replaced as described — (see brake shoe assembly notes)
15. Fit spacing washer 20, notched cone adjusting washer 7, spacing washer 11, and left-hand cone locknut 8, (loosely). ADJUST THE HUB BEARING TO ENSURE NO PLAY AT THE HUB BUT A TRACE OF SIDE PLAY AT THE RIM, then lock the cone in position with locknut 8.
16. Fit wheel in bicycle frame and add axle washers 10, and axle nuts 9 and 51 — Adjust gear.
GEAR ADJUSTMENT.
(See Fig. 'D').
First place the gear control in No. 2 position. Then screw the cable connector (3) until the end of the indicator rod is exactly level with the extreme end of the axle. This can be seen through 'window' in the right-hand nut, see (1) – Now tighten locknut (2). All Gears are now set.

Fig. D

BEARING ADJUSTMENT.
(See Fig. 'E').
The right hand cone is set – (before adjusting the left hand cone.) Screw in cone "Finger tight" only, then unscrew half a turn and lock in this position with Locknut 8.
NOTE: Cone must not be unscrewed more than ½ of a turn as that would throw the gear mechanism out of adjustment.
Adjustment is made by left hand cone, which projects through the brake plate.
Loosen axle nut 9 and cone Locknut 8, use slotted cone adjuster 7 to screw in cone "Finger tight" – then adjust the hub bearing until there is no play at the hub, but a trace of side play at the wheel rim.

Fig. E

ADJUSTMENT OF CABLE OPERATED BRAKES (See Fig. 'E')
To adjust, slacken locknut and tighten adjuster so that the brake linings are just in contact with the brake drum, then slacken adjuster until the wheel spins freely. Tighten locknut. Occasionally check brake arm clip for tightness.

ADJUSTMENT OF ROD OPERATED BRAKES
The principle of adjustment is exactly as described for cable brakes. The adjustment is controlled by special knurled adjuster nut at end of brake rod.
GEAR CORRECTION GUIDE

NOTE – The major cause of trouble is faulty gear adjustment. Check to see that the end of the indicator rod is level with the end of axle when gear control is in No. 2 position. If the complaint is sluggish gear change or stiffness, this may point to lack of oil.

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>FAULT</th>
<th>REMEDY</th>
</tr>
</thead>
</table>
| Slipping in low gear (1). | 1. Sliding clutch worn.  
2. Indicator not screwed in fully.  
3. R.H. cone wrongly adjusted.  
5. Twisted indicator chain. | 1. Replace.  
2. Re-adjust.  
3. Re-adjust.  
4. Replace.  
5. Replace. |
| Self-changing gear action between 1st gear and 2nd gear. | 1. Worn gear ring pawls.  
Worn ends of clutch. | 1. Replace. |
| Slipping in normal gear (2nd). | 1. Gear ring dogs and/or clutch worn. | 1. Replace. |
| Slipping in top gear (3rd). | 1. Pinion pins and/or clutch worn.  
2. Weak or distorted axle spring.  
3. Incorrect R.H. cone adjustment.  
2. Fit new spring.  
3. Re-adjust.  
| Hub runs stiffly.  
Drag on pedals. | 1. Too many ball bearings in ball-ring.  
2. Cones too tight.  
3. Chainstay ends not parallel.  
5. Distorted dust caps. | 1. Fit 24 only.  
2. Re-adjust.  
3. Correct.  
4. Clean and use S.A. oil.  
5. Replace. |
| Sluggish gear change. | 1. Distorted axle spring.  
2. Bent axle.  
3. Worn indicator chain link.  
4. Lack of oil or frayed wire. | 1. Replace.  
2. Replace.  
3. Replace.  
4. Oil or replace. |

BRAKE CORRECTION GUIDE.

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>FAULT</th>
<th>REMEDY</th>
</tr>
</thead>
</table>
| Inefficient brake. | 1. Oil-soaked or Greasy linings.  
2. Incorrect adjustment.  
2. Re-adjust.  
3. Fit new linings. |
| Squealing brake. | 1. Loose brake-arm clip.  
2. Linings not tapered off at front edge causing vibration.  
2. Fit linings correctly.  
| Brake action irregular. | 1. Hub drum pulled out of shape during wheel building. | 1. Re-true wheel or rebuild as necessary. |
| Knocking or clicking noise. | 1. Loose hub shell rivets.  
2. Scored brake drum surface. | 1. Fit new hub shell.  
2. Fit new hub shell. |
BF/C FRONT INTERNAL EXPANDING HUB BRAKE

Sturmey Archer Internal Expanding Hub Brakes are designed to provide positive braking under all weather conditions.

The precision engineered brake shoe mechanism is enclosed in a full chromium plated shell to give complete protection against mud, rain and damage – thus ensuring maximum efficiency at all times.

A choice of either Rod Brake Controls (BF) or Cable Controls (BFC) is available to suit all bicycles.

For safer cycling-
choose Sturmey-Archer
BEARING ADJUSTMENT

First loosen left-hand cone, then turn the notched washer (which fits over the adjusting cone) in the required direction until there is perceptible movement at the wheel rim but no play at the hub — tighten the locknut. This adjusts both bearings simultaneously.

LUBRICATION

The hub bearings are packed with grease — Shell Alvania No. 3. Under normal riding conditions no further lubrication should be necessary. If the hub has been dismantled, re-pack the bearings with Shell Alvania No. 3 grease, or an equivalent good quality ball-race grease.

GENERAL NOTES

BRAKE ADJUSTMENT

CABLE OPERATED BRAKES: To adjust, slacken locknut, and tighten adjuster so that the brake linings are just in contact with the brake drums, then slacken adjuster until the wheel spins freely. Tighten locknut. Occasionally check brake arm clip for tightness.

ROD OPERATED BRAKES: The principle of adjustment is exactly as described for cable brakes. The adjustment is controlled by special knurled adjuster nut at the end of brake rod.
TO DIS-ASSEMBLE THE BF.BF/C HUB
(See exploded view)
1. Remove axle nuts (8), unscrew the left-hand locknut (10 or 11) take off washer (12), the notched cone adjusting washer (13) and washer (14 or 15).
2. Remove the brake plate and lever complete with shoes (18).
3. Remove the (left-hand) cone (16).
4. Lift out the ball cage (17).
5. The axle may now be pulled out from the other side. If the right-hand cone bearing surface is in good condition and the axle threads are sound, there is no need to remove the right-hand locknut and cone.
6. The channel-section dust cap in the right-hand hub cup is a pressed-in fit and can be prised out with a wide screwdriver. The ball-cage (17) may be lifted out for examination of the hub bearing surface. If a new ball retainer and balls have to be fitted, also fit a new dust cap. Both hub cups are part of the hub shell, and if either is worn a new hub shell must be fitted.
7. If the brake shoes (28) have to be removed from the brake arm, unscrew the nut (21) which secures the cam lever and pull off lever from the cam (27). Then remove the fulcrum nut (21) and lock washer (20). The shoes, complete with the fulcrum pin or sleeve and the cam can now be lifted off.

POINTS TO CHECK
When the hub has been dismantled and the parts cleaned, check the following details:
1. That the leading edge of each brake lining is tapered off for the first quarter of an inch. If not, the ends may lift and cause a squealing noise.
2. That all rivets are below the lining surface and cannot touch the hub drum.
3. If the linings show signs of wear or they are oil impregnated – new linings will be required.
4. Examine cone and hub shell cup races for rust, wear or pitting. Also the ball cages and balls.
5. Examine axle threads for wear. Also inside axle nuts and cones.

TO ASSEMBLE THE BF.BF/C HUB
(See exploded view)
1. Fit the ball-cage (17) into the right hand hub cup with the ring of the ball-retainer facing outwards.
2. Press in the channel-section dust cap, (36) with the recess facing outwards and gently hammer it home.
3. If the right-hand cone (37) has been removed, replace and screw it up tightly against the shoulder of the axle.
4. Fit the right-hand spacing washers (9) and cone locknut (10 or 11).
5. Pass the axle through the hub shell (33) from the right-hand side.
6. Fit the ball-cage (17) into the left-hand hub cup, with the ring of the ball-retainer facing outwards.
7. Fit the (left-hand) cone (16) and spacing washers (15 & 14).
8. Replace the brake plate and lever (18 or 19) complete with shoes, over the end of the left-hand cone. (N.B. If the brake shoes have been removed, make sure – when replacing them – that the side of the cam with the largest flat area faces towards the hub axle, otherwise one brake shoe only will be brought into action when the brake is operated).
9. Fit the notched cone-adjusting washer (13) over the flat sides of the left-hand cone (16) and screw the washer up "Finger Tight" then slacken until hub runs freely with a trace of side play at wheel rim – none at the hub.
10. Fit the washer (12) and the left-hand cone locknut (10 or 11).
NOTE – Front brake arm must be a tight fit in its clip. Also the clip must be tight on the Front fork blade.
BRAKE SHOE ASSEMBLY

The diagram illustrates the correct assembling of the brake shoes, but the following points should be specially noted:—It is important that brake shoes are re-assembled with the side of the brake cam with the largest flat area on the inside—towards the axle. See letter 'A'.

To allow both brake shoes to be applied evenly the cam is slightly offset and if not fitted correctly will allow one shoe only to operate, with consequent loss of braking efficiency. It is also important to ensure that the flange which carries the brake springs fits next to the brake arm plate.

Brake shoe assemblies consist of the shoes with fulcrum and springs. As two different types of fulcrum are in use, a sales number for each assembly is provided to ensure that they are correctly supplied.

1. HSB 211. Brake shoe assembly with pin-type fulcrum. For all brake hubs (except BFC). (See Fig. 'B').
2. HSB 210. Brake shoe assembly with sleeve-type fulcrum threaded internally. For BFC hubs only. (See Fig. 'C').
The appropriate sales number must be quoted when ordering.

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<td>2. Scored brake drum surface.</td>
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BR/C REAR INTERNAL EXPANDING HUB BRAKE

Sturmey-Archer Rear Hub Brakes are available to suit all makes of Bicycles.
Screw threaded to take standard free wheel drive rear sprockets, they are complementary to the popular BF & BFC Front Brake Hubs.
All are designed and built to give years of reliable and trouble-free service under the severest cycling conditions.
A choice of either Rod Brake Controls (BR) or Cable Controls (BRC).

cycle safely—
with Sturmey-Archer

STURMEY ARCHER GEARS LTD · NOTTINGHAM · ENGLAND · A COMPANY

73
**BEARING ADJUSTMENT**

First loosen left-hand cone, then turn the notched washer (which fits over the adjusting cone) in the required direction until there is perceptible movement at the wheel rim but no play at the hub – tighten the locknut. This adjusts both bearings simultaneously.

**LUBRICATION**

The hub bearings are packed with grease – Shell Alvania No. 3. Under normal riding conditions no further lubrication should be necessary. If the hub has been dismantled, re-pack the bearings with Shell Alvania No. 3 grease, or an equivalent good quality ball-race grease.

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**GENERAL NOTES**

**BRAKE ADJUSTMENT**

**CABLE OPERATED BRAKES:** - To adjust, slacken locknut, and tighten adjuster so that the brake linings are just in contact with the brake drums. Then slacken adjuster until the wheel spins freely. Tighten locknut. Occasionally check brake arm clip for tightness.

**ROD OPERATED BRAKES:** - The principle of adjustment is exactly as described for cable brakes. The adjustment is controlled by special knurled adjuster nut at the end of brake rod.

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**BEARING ADJUSTMENT**

First loosen left-hand cone, then turn the notched washer (which fits over the adjusting cone) in the required direction until there is perceptible movement at the wheel rim but no play at the hub – tighten the locknut. This adjusts both bearings simultaneously.

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The hub bearings are packed with grease – Shell Alvania No. 3. Under normal riding conditions no further lubrication should be necessary. If the hub has been dismantled, re-pack the bearings with Shell Alvania No. 3 grease, or an equivalent good quality ball-race grease.
TO DIS-ASSEMBLE THE BR.BR/C HUB
(See exploded view)

1. Remove axle nuts (18), washer (19), unscrew the left-hand locknut (20 or 21), take off washer (22), the notched cone adjusting washer (23) and plain washer (24).
2. Remove the brake plate and arm complete with shoes (7 or 8).
3. Remove the inner spacing washer (25) and the (left-hand) cone (26).
4. Lift out the ball cage (27).
5. The axle may now be pulled out from the other side. If the right-hand cone bearing surface is in good condition and the axle threads are sound, there is no need to remove the right-hand locknut and cone.
6. The channel-section dust cap in the right-hand hub cup is a pressed-in fit and can be prised out with a wide screwdriver. The ball cage (27) may be lifted out for examination of the hub bearing surface. If a new ball retainer and balls have to be fitted, also fit a new dust cap. Both hub cups are part of the hub shell, and if either is worn a new hub shell must be fitted.
7. If the shoes (13) have to be removed from the brake arm, unscrew the nut (6) which secures the cam lever and pull off lever from the cam. Then remove the fulcrum nut (6) and lock washer (5). The shoes, complete with the fulcrum pin and the cam can now be lifted off.

POINTS TO CHECK
When the hub has been dismantled and the parts cleaned, check the following details:
1. That the leading edge of each brake lining is tapered off for the first quarter of an inch. If not, the ends may lift and cause a squealing noise.
2. That all rivets are below the lining surface and cannot touch the hub drum.
3. If the linings show signs of wear or they are oil impregnated – new linings will be required.
4. Examine cone and hub shell cup races for rust, wear or pitting. Also the ball cages and balls.
5. Examine axle threads for wear. Also inside axle nuts and cones.

TO ASSEMBLE THE BR.BR/C HUB
(See exploded view)

1. Fit the ball cage (27) into the right-hand cup with the ring of the ball-retainer facing outwards.
2. Press in the channel-section dust cap (30), with the recess facing outwards, and gently hammer it home.
3. If the right-hand cone (31) has been removed, replace and screw it up tightly against the shoulder of the axle.
4. Fit the right-hand spacing washer(s) (19) and cone locknut (20 or 21).
5. Pass the axle through the hub shell (16) from the right-hand side.
6. Fit the ball cage (27) into the left-hand hub cup, with the ring of the ball-retainer facing outwards.
7. Fit the (left-hand) cone (26) and spacing washers (25 and 24).
8. Replace the brake plate and lever (7 or 8) complete with shoes, over the end of the left-hand cone. (N.B. If the brake shoes have been removed, make sure – when replacing them – that the side of the cam with the largest flat area faces towards the hub axle, otherwise one shoe only will be brought into action when the brake is operated).
9. Fit the notched cone-adjusting washer (23) over the flats of the left-hand cone (26). Screw it up “Finger-tight” and then slacken until hub runs freely with a trace of side play at wheel rim – none at the hub.
10. Fit the washer (22) and the left-hand cone locknut (20 or 21).

NOTE – Rear brake arm must be a good fit in its clip. Also the clip must be tight on the chainstay.
**BRAKE SHOE ASSEMBLY**

The diagram illustrates the correct assembling of the brake shoes, but the following points should be specially noted:— It is important that brake shoes are re-assembled with the side of the brake cam with the largest flat area on the inside — towards the axle. See letter 'A'. To allow both brake shoes to be applied evenly the cam is slightly offset and if not fitted correctly will allow one shoe only to operate, with consequent loss of braking efficiency. It is also important to ensure that the flange which carries the brake springs fits next to the brake arm plate.

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</tr>
<tr>
<td>SALES No.</td>
<td>DESCRIPTION</td>
<td>(LENGTH BETWEEN CENTRES)</td>
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<td>------------------------------------</td>
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<tr>
<td>RJA 103</td>
<td>Brake Tube Assembly</td>
<td>3 1/4&quot; (85.7 mm.)</td>
</tr>
<tr>
<td>RJA 104</td>
<td>Brake Tube Assembly</td>
<td>4 1/2&quot; (111.1 mm.)</td>
</tr>
<tr>
<td>RJA 105</td>
<td>Brake Tube Assembly</td>
<td>5 1/2&quot; (136.5 mm.)</td>
</tr>
<tr>
<td>RJA 106</td>
<td>Brake Tube Assembly</td>
<td>6 1/2&quot; (161.9 mm.)</td>
</tr>
<tr>
<td>RJA 107</td>
<td>Brake Tube Assembly</td>
<td>8 1/2&quot; (212.7 mm.)</td>
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<tr>
<td>HSK 622</td>
<td>Stirrup</td>
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<td>HSK 664</td>
<td>Clip Assembly (For Oval and 'D'</td>
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<td></td>
<td>Fork Blade)</td>
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<tr>
<td>HSK 665</td>
<td>Clip Assembly (For Duplex Fork</td>
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<td></td>
<td>Blade)</td>
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<tr>
<td>HSK 651</td>
<td>Rod Assembly</td>
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<tr>
<td>HMP 107</td>
<td>Connector Screw Complete</td>
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<tr>
<td>HSK 603</td>
<td>Swivel Pin</td>
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<tr>
<td>HMN 145</td>
<td>Adjuster Nut</td>
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</table>

**BF FRONT ROD BRAKE CONTROL**

**BFC FRONT CABLE BRAKE CONTROL**

<table>
<thead>
<tr>
<th>SALES No.</th>
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<td>Front Cable Complete – Black</td>
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<tr>
<td>HSK 608</td>
<td>Front Cable Complete – Silver</td>
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<td>HSK 649</td>
<td>Front Cable Complete – White</td>
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<tr>
<td>HSK 611</td>
<td>Lever Complete</td>
</tr>
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<td>HSK 612</td>
<td>Lever Fulcrum</td>
</tr>
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<td>HSK 613</td>
<td>Fulcrum Clip</td>
</tr>
<tr>
<td>HMP 121</td>
<td>Fulcrum Bolt and Nut</td>
</tr>
<tr>
<td>HMP 122</td>
<td>Clip Bolt and Nut</td>
</tr>
</tbody>
</table>

**CONNECTOR SCREW AND NUT HMP 107**

**STIRRUP HSK 622**

**ROD ASSEMBLY HSK 651**

**SWIVEL PIN HSK 663**

**ADJUSTER NUT HMN 145**
BRC & ABC REAR CABLE BRAKE CONTROL

BR & AB REAR ROD BRAKE CONTROL

<table>
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<th>(LENGTH BETWEEN CENTRES)</th>
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<td>Brake Tube Assembly</td>
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<td>RJA 106</td>
<td>Brake Tube Assembly</td>
<td>6&quot; (161.9 mm.)</td>
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<td>RJA 107</td>
<td>Brake Tube Assembly</td>
<td>8 1/4&quot; (212.7 mm.)</td>
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<td>RJT 101</td>
<td>Top Bell-Crank Assembly</td>
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<td>RJL 112</td>
<td>Down Rod Assembly</td>
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<td>RJT 114</td>
<td>Bottom Bell-Crank Assembly</td>
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<td>HSK 647</td>
<td>Bottom Rod Assembly</td>
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SALES No. | DESCRIPTION
-----------|-------------------
HSK 606    | Rear Cable Complete – Black       |
HSK 610    | Rear Cable Complete – Silver      |
HSK 650    | Rear Cable Complete – White       |
HSK 611    | Lever Complete                  |
HSK 612    | Lever Fulcrum                   |
HSK 613    | Fulcrum Clip                     |
HMP 121    | Fulcrum Bolt and Nut             |
HMP 122    | Clip Bolt and Nut                |

STURMEY ARCHER
HUB BRAKE CONTROLS
SC SINGLE SPEED COASTER HUB BRAKE

The STURMEY ARCHER S.C. Coaster Hub offers the advantages of a positive single speed drive with a built-in, robust and highly efficient brake in a small compact unit.
No extra brake controls — Instant braking smoothly applied by a slight reverse turn of the pedals!
This rugged hub — expertly engineered by STURMEY-ARCHER — with over 70 years of skill and experience in quality manufacture — is adaptable to both Junior and Adult models in the Sports and Roadster ranges of bicycles produced by the world's leading manufacturers.
Around town or across country — the STURMEY-ARCHER S.C. Single Speed Coaster is positively at your service for a lifetime of use.

For safer cycling— choose Sturmey-Archer

STURMEY ARCHER GEARS LTD · NOTTINGHAM · ENGLAND · A COMPANY
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<tr>
<th>PHOTO No.</th>
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<td>HMW 365</td>
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<td>L.H. Brake Arm Nut</td>
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<td>HSH 434</td>
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<td>HMW 366</td>
<td>Plain Washer</td>
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<td>Brake Cone Assembly</td>
<td>18</td>
<td>HSH 433</td>
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<td>HSH 419</td>
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<td>HSH 428</td>
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<td>HSH 441</td>
<td>R.H. Fixed Cone</td>
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<td>28</td>
<td>HMN 118</td>
<td>Axle Nut (2 off)</td>
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</table>

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GENERAL NOTES

1. **SPROCKETS**: A range of sprockets from 14T – 20T and 22T is available for this hub.
2. **ADJUSTMENT**: The hub bearings can be adjusted without removing the wheel from the bicycle:
   1. Loosen the two axle nuts.
   2. Loosen the locknut on the left-hand side of the wheel.
   3. Place the special spanner on the square end of the axle; turn it clockwise to tighten the bearings or anti-clockwise to loosen them.
4. Re-tighten the locknut and axle nuts leaving the wheel with just a trace of side-play at the rim.
   If for any reason it is necessary to remove the rear wheel from the bicycle it is most important that the brake arm clip is TIGHTENED SECURELY when the wheel is refitted.
3. **LUBRICATION**: A new hub should be oiled liberally before use with the specially prepared STURMEY-ARCHER OIL. Recommended lubrication every 14 days.

TO DIS-ASSEMBLE THE HUB
(See Exploded View)

1. Remove axle nuts 28, and washers 29 and 30 from both ends of axle.
2. Hold axle in a vice at fixed cone 36 end.
3. Unscrew brake arm nut 31 and remove lockwasher 32.
4. Lift off torque arm assembly 3.
5. Withdraw hub shell from remaining brake assembly.
6. Take off brake band 13, actuator assembly 14, roller retainer 21, driver rollers 22, ball cage 8 and driver 23.
7. Remove from driver 23, the circlip 27, washers 25, sprocket 26, dust cover 24, small dust cover and ball cage.

POINTS TO CHECK

1. All ball races – if rusty or pitted – replace.
2. Actuator and driver roller retainer cam surfaces for wear and chipping – if worn or damaged – replace.
3. Axle threads for damage and axle for straightness – if necessary – replace.
5. The open ends of actuator roller retainer protrude slightly from main circumference.

TO ASSEMBLE THE HUB
(See Exploded View)

1. First build sub-assemblies:
   (a) Fit (large) ball cage 8 into hub shell and press in dust cover 7.
   (b) Assemble torque arm 4, to cone 5, and press into dust cover 6.
   (c) Assemble – in order – dust cover 24, spacers 25 and sprocket 26 to driver 23 and fix with circlip 27. Insert (small) ball cage into driver and press in dust cover.
2. Hold axle 33 in vice (at fixed cone end) and fit driver assembly (sub-assembly (c) above) on to cone 36.
3. Fit large ball cage 8 over driver (balls must face uppermost).
4. Add driver rollers 22 to driver – (use good quality grease to hold rollers in position).
5. Place driver roller retainer 21 over the rollers 22.
6. Fit actuator assembly (14) on to axle.
7. Fit brake band 13 – lugs upwards over actuator.
8. Place hub shell (sub-assembly (a) above) over internal parts.
9. Screw on to axle, torque arm assembly (sub-assembly (b) above) engaging cone slots over the brake band lugs.
11. Fit wheel in bicycle frame and add washers 30 and 29 and axle nuts 28.
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AG REAR 6 VOLT DYNOHUB LIGHTING UNIT COMBINED WITH AW 3 SPEED GEAR

The AG lighting unit combines the unique features of the GH6 'Dynohub' with the world famous AW 3-speed wide ratio gear – in a compact weight saving rear hub.

The dynamo and gear are protected, within the hub shell, from adverse weather conditions. Electric power is always available at a 'flick' of the headlamp switch.

High grade plastic head and tail lamps of modern design are supplied complete with wiring.

Gear controls – trigger; twist grip and sportshift – are available to suit all types of bicycles.

Easy riding by day and night

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<table>
<thead>
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<th>PHOTO No.</th>
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TO DIS-ASSEMBLE THE HUB
(See exploded view)

1. Unscrew the gear indicator coupling 49 from the axle 41.
2. Remove axle nuts 1 and 40, also washers 2 from each side of hub.
3. From the dynamo side - unscrew cone locknut 3 and take off washers 4 and 5 also cone adjuster 6 and spacing washer 7.
4. TO REMOVE DYNAMO UNIT:- Unscrew magnet fixing nuts 21, detach lockwashers 20 and magnet fixing screws 8. Hold the wheel, (with the dynamo downwards) above the workbench. A few light taps with a mallet on the end of the axle will release the dynamo unit from the hub.
5. Lift out the magnet spacing ring 15 from the hub shell 17.
6. Unscrew left-hand (adjusting cone 14 and lift out ball cage 16.
7. Unscrew right-hand ball ring 30 from hub shell (use hammer and punch) and withdraw gear unit.
8. Remove the low gear paws 23, pins 22 and springs 24.
9. Place the left-hand end of the axle in a vice and remove the right-hand locknut 3, cone lock-washer 39 and cone 38.
10. Lift off clutch spring 46 and cap 47, the driver 32 complete with fittings, right-hand ball ring 30 and the gear ring 28.
11. Remove the gear ring paws 29, pins 22 and springs 24.
12. Pull off the thrust-ring 45.
13. Push out the axle key 48 and remove the sliding clutch 44 and sleeve 43.
14. Lift off the planet cage assembly 25 and take out the pinions pins 27 and remove the pinions 26.

POINTS TO CHECK

GEAR
1. Freedom of clutch in driver. This should slide up and down easily.
2. Axle between centres for straightness, also threads for wear.
3. All gear teeth for wear or chipping.
4. All races for wear (6 in all).
5. Pinion pins, sliding clutch and gear ring dogs for rounding off on engagement points.
6. Pawls and pawl ratchets for wear.

DYNAMO
7. Magnet cover plate, armature and magnet segments for grit and rust.
8. Continuity of armature winding.

NOTE - Unless it is essential, the armature and magnet should never be separated. If they are to be separated, a keeper ring is absolutely necessary, (an old armature will serve as a keeper ring). The magnet will lose its magnetism without a keeper. A moment's separation will cause loss of magnetism. (A spanner placed across the magnet is useless as a substitute for a keeper ring).

TO SEPARATE ARMATURE FROM MAGNET AND COVER PLATE
Hold the dynamo unit (terminal plate down) in the palm of the hand. Place a keeper over the armature - grip the edge of magnet with fingers and tap the keeper lightly - the magnet cover will slide off the magnet at the same time as the keeper replaces the armature.

ARMATURE CONTINUITY TEST
A battery and bulb should be connected as shown in the diagram 'A'. If the bulb does not light, a break in the armature winding is indicated.
A second test is to disconnect the lead from one of the armature terminals and touch the outer edges of the armature with a bare lead. If the bulb lights, this indicates a short circuit, and a new armature must be fitted.

TO REPLACE THE ARMATURE IN MAGNET AND FIT MAGNET COVER PLATE
Hold the magnet and keeper unit in the palm of the hand, place armature - terminals down - over the keeper and press the armature into the magnet. The keeper ring will slide out easily.
Fit the card disc inside the cover plate - locate the notches in disc opposite grooves in magnet.
Push magnet unit inside cover plate - chamfered edge of the magnet inside the cover plate.
TO ASSEMBLE THE HUB  
(See Exploded View)

Prepare the following sub-assemblies:-

SEE FIG. A

Fit the ball cage 16 into the driver 12 with the ring of the ball-cage facing outwards and press in the dust cap 33, with the recess facing outwards. (If a new ball cage is fitted, the dust cap should also be new).

If the sprocket has been removed, fit the dust-cap 34, washers 36 and sprocket 35 (in the same order noted on dis-assembling) and fix in position with circlip 37.

SEE FIG. B

Fit the gear-ring pawls 29, pins 22 and springs 24, into the gear ring 28. Fit the balls (24 only) and the inner dust-cap 31 into the right-hand ball-ring 30 (ensure that the balls revolve freely with the dust cap in position).

1. Hold the axle 41 in a vice (with slot for axle key 48, above the sun pinion) and fit the planet cage 25.
2. Add the planet pinions 26 and pins 27 (the small ends of the pins protrude).
3. Fit the clutch sleeve 43 (flange first), clutch 44, (with the recess over the flange of the sleeve) axle key 48 (with the flats facing upwards) and screw in the indicator coupling 49.
4. Fit gear-ring 28 (sub-assembly B) over planet cage 25.
6. Add the driver 32 complete with fittings (sub-assembly A).
7. Slide clutch spring 46 and cap 47 over the axle.
8. Screw on the right-hand cone 38, finger tight, then slacken — half a turn — and lock in this position with the lock washer 39, and lock nut 3.

**NOTE** — CONE MUST NOT BE UNSCREWED MORE THAN 1/2 OF A TURN AS THAT WOULD THROW THE GEAR MECHANISM OUT OF ADJUSTMENT.

9. Fit the low gear pawls 23, pins 22 and springs 24 into planet cage 25 (See Fig. C).
10. Screw the gear unit into the hub shell 17 and tighten ball-ring 30.
11. Invert the assembly in the vice and screw up the left hand cone 14 (finger tight).
12. Fit the card disc 10 inside the cover plate 9.
13. Fit the cover plate 9 over the magnet 13 (chamfer inwards), making sure that the four holes in the cover plate are in line with the notches in the card and the magnet.
14. Fit the metal spacing ring 15 into the hub shell 17.
15. Push the complete dynamo unit into the hub shell, making sure that the holes in the cover plate are in line with those in the hub shell.
16. Fit the magnet fixing screws 8, washers 20 and tighten gently nuts 21.
17. Centralise armature in magnet, fit spacing washer 7, cone adjuster 6, washers 5 and 4, locknut 3.
18. Adjust hub bearings until there is slight play at the wheel rim — no play at the hub. Tighten locknut.
19. Adjust gears.
20. Adjust gears.
**GEAR CORRECTION GUIDE**

**NOTE** – The major cause of trouble is faulty gear adjustment. Check to see that the end of the gear indicator rod is level with the end of axle when gear control is in No. 2 position. If the complaint is sluggish gear change or stiffness, this may point to lack of oil.

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<th>REMEDY</th>
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<td>Slipping in low gear (1st)</td>
<td>1. Sliding clutch worn.</td>
<td>1. Replace.</td>
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<tr>
<td></td>
<td>2. Indicator not screwed in fully.</td>
<td>2. Re-adjust.</td>
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<tr>
<td></td>
<td>4. Kinks in control wire.</td>
<td>4. Replace.</td>
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<tr>
<td></td>
<td>5. Twisted indicator chain.</td>
<td>5. Replace.</td>
</tr>
<tr>
<td>Self-changing gear action between 1st gear and 2nd gear.</td>
<td>1. Worn gear ring pawls.</td>
<td>1. Replace.</td>
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<tr>
<td>Slipping in normal gear (2nd).</td>
<td>1. Gear ring dogs and/or clutch worn.</td>
<td>1. Replace.</td>
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<tr>
<td>Slipping in top gear (3rd).</td>
<td>1. Pinion pins and/or clutch worn.</td>
<td>1. Replace.</td>
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<tr>
<td></td>
<td>2. Weak or distorted axle spring.</td>
<td>2. Fit new spring.</td>
</tr>
<tr>
<td>Hub runs stiffly. Drag on Pedals.</td>
<td>1. Too many ball bearings in ball-ring.</td>
<td>1. 'Fit 24 only.</td>
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<tr>
<td></td>
<td>2. Cones too tight.</td>
<td>2. Re-adjust.</td>
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<tr>
<td></td>
<td>3. Chainstay ends not parallel.</td>
<td>3. Correct.</td>
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<td></td>
<td>5. Distorted dust caps.</td>
<td>5. Replace.</td>
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<tr>
<td>Sluggish gear change.</td>
<td>1. Distorted axle spring.</td>
<td>1. Replace.</td>
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<tr>
<td></td>
<td>2. Bent axle.</td>
<td>2. Replace.</td>
</tr>
<tr>
<td></td>
<td>3. Damaged gear indicator chain.</td>
<td>3. Replace.</td>
</tr>
<tr>
<td></td>
<td>4. Lack of oil, or frayed or rusty control wire.</td>
<td>4. Oil or replace.</td>
</tr>
</tbody>
</table>

**BEARING ADJUSTMENT**

Right side cone adjustment. Screw cone down finger-tight, then slacken half a turn and lock in this position. **NOTE**. Turning it back more than 1/2 of a turn will affect the gear adjustment.

On the left (Dynamo) – side loosen locknut and adjust the cone suitably then re-tighten locknut. A **CORRECTLY ADJUSTED WHEEL HAS A TRACE OF SIDE PLAY AT THE RIM. NO PLAY AT THE HUB.**

**GEAR ADJUSTMENT (See Fig A)**

First place the gear control in No. 2 position. Then screw the cable connector (3) until the end of the indicator rod is exactly level with the extreme end of the axle. This can be seen through 'window' in the right-hand nut, see (1) – Now tighten locknut (2). All Gears are now set.
**'DYNOHUB' CORRECTION GUIDE**

To test if 'Dynohub' is generating, remove wires from armature terminals, re-tighten terminal nuts and connect a bulb (known to be in good condition) across the armature terminals. Spin wheel smartly, – if bulb does not light satisfactorily, the armature may be faulty.

### ELECTRICAL

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### MECHANICAL

**SYMPTOM**

Rubbing Noise

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<td>4. The omission of the card packing disc which must be fitted between magnet and cover plate</td>
<td>4. Fit card disc</td>
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### GENERAL NOTES

1. **GEAR RATIOS:** The AG hub provides three gears –
   - (1) Low Gear – decrease of 25%.
   - (2) Normal Gear, i.e. direct drive.
   - (3) High Gear – increase of 33½%.

2. **SPROCKETS:** A range of sprockets from 14T to 20T, and also 22T, is available for this hub.

3. **LUBRICATION:** A new hub must be oiled before use (approx. 2 cc of oil) through the lubricator on the hub shell. Afterwards add a few drops of oil at least once a month. USE ONLY STURMEY-ARCHER OIL. DO NOT use thick oil or grease.

4. It is important that the axle should be prevented from rotating in the chainstay slots and the flats on the axle are provided for this purpose. If the chainstay ends are too wide for the axle, special lock washers are supplied.
'Dynohub' lighting is bicycle lighting at its best. Each lighting set consists of a hub generator, headlamp, rear lamp and connecting flexes. The generator has no mechanical loss and electrically is highly efficient. Other than the normal wheel bearings it is entirely without mechanical friction or wearing parts and the effort to propel is negligible. It is silent and its position within the hub protects it completely from damage. Attractive durable head and tail lamps provide high lighting efficiency.

Cycle lighting with a difference!
Exploded view.

1. First remove axle nuts 1 and washers 2 from both ends of axle then unscrew right-hand (dynamo) side locknut 3, and take off washers 2, and spacing cup 4.
2. Unscrew (magnet-fixing) nuts 20, detach lock washers 19 and the magnet-fixing screws 5.
3. Hold the wheel, with the dynamo downwards (above the workbench). A few light taps with a mallet on the end of the axle will release the dynamo unit from the hub.

4. Lift out the magnet spacing ring 11 from the hub shell 16.
5. Remove the left-hand (adjusting) cone locknut 3, and unscrew the adjusting cone 22. Ease out (from the hub shell) the channel-section dust cap 21 (use a wide screw-driver). Lift out the ball cage 15.
6. Pull out the axle 13, (from the dynamo side) together with the right hand cone 12 and ball cage 15.

TO DIS-ASSEMBLE THE HUB (See exploded view)
POINTS TO CHECK
1. Bearing races and cones – for pitting and signs of wear.
2. Axle for straightness and damage to threads.
3. Magnet cover plate and between armature and magnet segments for grit and rust.
4. Continuity of armature winding.

NOTE – Unless it is essential, the armature and magnet should never be separated. If they
are to be separated, a keeper ring is absolutely necessary, (an old armature will serve as
a keeper ring). The magnet will lose its magnetism without a keeper. A moment's
separation will cause loss of magnetism. (A spanner placed across the magnet is
useless as a substitute for a keeper ring).

TO SEPARATE ARMATURE FROM MAGNET AND COVER PLATE
Hold the dynamo unit (terminal plate down) in the palm of the hand. Place a keeper over
the armature – grip the edge of magnet with fingers and tap the keeper lightly – the magnet
cover will slide off the magnet at the same time as the keeper replaces the armature.

ARMATURE CONTINUITY TEST
A battery and bulb should be connected as shown in the diagram 'A'. If the bulb
does not light, a break in the armature winding is indicated.
A second test is to disconnect the lead from one of the armature terminals and
touch the outer edges of the armature with a bare lead. If the bulb lights, this
indicates a short circuit, and a new armature must be fitted.

TO REPLACE THE ARMATURE IN MAGNET AND FIT MAGNET
COVER PLATE
Hold the magnet and keeper unit in the palm of the hand, place armature – terminals down –
over the keeper and press the armature into the magnet. The keeper ring will slide out easily.
Fit the card disc inside the cover plate – locate the notches in disc opposite grooves in
magnet. Push magnet unit inside cover plate – chamfered edge of the magnet inside the
cover plate.

TO ASSEMBLE THE HUB
(See Exploded View)
1. Fit the ball cage 15 (with the
ball-retainer ring facing outwards)
into the left-hand (the smaller)
end of the hub shell 16. Press the dust cap
21 (channel facing outwards) into
hub shell. (If a new ball cage is fitted, the
dust cap also should be new).
2. Fit the ball cage 15 (with the
ball-retainer ring facing outwards)
into the cup inside the hub shell. If the
right-hand cone 12 (on the dynamo
side) has been removed from the axle
13, replace cone and screw it
TIGHTLY against the shoulder on the
axle.
3. Insert a shoulder on the axle 13 into the hub shell
from the dynamo-side.
4. Screw on the left-hand (adjusting)
cone 22 and adjust the hub bearings.
(A correctly adjusted wheel must
have slight play at the rim – No play
at the hub).
Fit washer 23 and cone locknut 3 and
screw it tightly against the left-hand
cone 22.
5. Fit the card disc 7 inside the cover plate 6. Locate notches in card over
holes in hub shell.
6. Fit the cover plate 6 over the magnet
10 (chamfer inwards), making sure
that the four holes in the cover plate
are in line with the notches in the card
and the magnet.
7. Fit the metal spacing ring 11 into the
hub shell 16.
8. Push the complete dynamo unit into
the hub shell, making sure that the
holes in the cover plate are in line with
those in the hub shell.
9. Fit the magnet fixing screws 5,
washers 19 and tighten gently nuts 20.
10. Centralise armature in magnet then fit
the spacing cup 4, washer 2 and
dynamo cone locknut 3 and tighten
to lock spacing cup. Fit axle washers
2 and nuts 1.
**‘DYNOHUB’ CORRECTION GUIDE**

To test if ‘Dynohub’ is generating, remove wires from armature terminals, re-tighten terminal nuts and connect a bulb (known to be in good condition) across the armature terminals. Spin wheel smartly — if bulb does not light satisfactorily, the armature may be faulty.

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**LUBRICATION**

GH6 bearings are packed with grease — Shell Alvania No. 3. Under normal riding conditions no further lubrication should be necessary. When hub has been dis-assembled re-pack the bearings with Shell Alvania No. 3 grease or an equivalent good quality ball-race grease.

**BEARING ADJUSTMENT**

Left hand side (smaller end) of hub: loosen cone locknut and adjust cone suitably and tighten locknut. A CORRECTLY ADJUSTED WHEEL HAS A TRACE OF SIDE PLAY AT THE WHEEL RIM — NO PLAY AT THE HUB.
HEAD LAMP

Modern, clean line, sharp styled. Lamp body manufactured from durable resilient plastic to withstand impact and vibration, body top in high quality chromium plated finish. Strong clear Lens, Alluminised high efficiency plastic reflector, positive contact terminals, crimped-on wires, pre-focus 'capless' bulb with simple push-in fit.

HSD 443 – Head Lamp with Bracket – 6v·2 amp Bulb.
Suitable for large wheel models i.e. 24" and over.

BULBS
Pre-focus 'Capless' Type:

<table>
<thead>
<tr>
<th>SALES No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD 328</td>
<td>Steel Headlamp – with bulb. 6v·2amp M.E.S.</td>
</tr>
<tr>
<td>HSD 332</td>
<td>Bulb—screw in type. 6v·2amp M.E.S.</td>
</tr>
</tbody>
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REAR LAMP

Produced to British Standard 3648. Moisture and dust resistant, body in hardwearing silver-grey plastic, safe steel clamp, pre-focus 'capless' bulb, no separate earthing required, supplied complete with wires.

HSD 441 – Rear Lamp (½" Diam. Round Clip) with twin flex wires 57" silver – 6v·1 amp Bulb.
HSD 442 – Rear Lamp (¾" Diam. Oval Clip) with twin flex wires 57" silver – 6v·1 amp Bulb.
**DRY BATTERY UNIT (D.B.U.)**

A neat 'stand-by' battery unit wired into the circuit of the 'Dynohub' lighting system - provides light for both lamps when the bicycle is stationary or at walking pace - operated from the headlamp switch.

HSD 312 - Dry Battery Unit (with Clips).
HSD 315 - Clip Assembly.

**AUTOMATIC FILTER SWITCH (F.S.U.)**

Similar to the standard dry battery unit plus the unique advantage of a built-in automatic switch to ensure constant light output at all speeds - also when stationary.

HSD 365 - Automatic Filter Switch Unit (with Clips).
HSD 315 - Clip Assembly.

---

**WIRING DIAGRAMS**

**STEEL HEADLAMP**

- G.H.6 FRONT & A.G. REAR DYNOHUB
- G.H.6 FRONT DYNOHUB WITH DRY BATTERY UNIT
- A.G. REAR DYNOHUB WITH DRY BATTERY UNIT
- A.G. REAR DYNOHUB WITH FILTER SWITCH UNIT

**PLASTIC HEADLAMP**

- G.H.6 FRONT & A.G. REAR DYNOHUB
- G.H.6 FRONT DYNOHUB WITH DRY BATTERY UNIT
- A.G. REAR DYNOHUB WITH DRY BATTERY UNIT
- A.G. REAR DYNOHUB WITH FILTER SWITCH UNIT

**SWITCH POSITIONS**

For ALL sets - the 'Dynamo' is ON with switch in the forward position. The battery is ON with switch in the backward position. The central position is OFF.

With FILTER SWITCH UNIT the Battery and 'Dynohub' are switched on together in the forward position. The battery operates until the dynamo takes over when the bicycle is in motion.

**IMPORTANT** I REMEMBER TO SWITCH OFF WHEN NOT IN USE TO SAVE YOUR BATTERIES - PARTICULARLY WITH FILTER SWITCH UNIT.
TRIGGER CONTROL

The most widely used 3 speed hub gear control in the world — of long proven reliability. A quick 'flick' action handlebar fitting control — neat, simple, efficient and trouble free. Universally acceptable for all makes of bicycles.

<table>
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<tr>
<th>Part Code</th>
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<tr>
<td>HSJ.505</td>
<td>Trigger unit complete with 1/8&quot; (22.2 m.m.) clip.</td>
</tr>
<tr>
<td>HSJ.507</td>
<td>Trigger unit complete with 3/16&quot; (24 m.m.) clip.</td>
</tr>
</tbody>
</table>

TO FIT TRIGGER CONTROL

1. Open clip and place control approximately 2" from end of handlebar grip and secure fixing screw.
2. Pass cable inner wire through fulcrum clip and into clip slot—(then over pulley wheel, if fitted).
3. Push outer cable up to fulcrum slot. Fit cable anchorage — at hub end— Push gear lever forward, tighten inner wire and secure anchorage nut firmly.
4. Connect control cable to gear indicator coupling at hub.
5. Slide fulcrum clip to take up any slackness in cable and tighten clip screw.
6. Adjust gears.

TO REMOVE THE CONTROL WIRE

It is not necessary to remove control from handlebar if the lever can be pulled back far enough to allow cable nipple to pass between pawl and ratchet plate. Procedure is: Detach the inner wire from indicator chain at hub, and outer casing from fulcrum clip. Pull cable ferrule (F) downward to remove from slot (B). Pull lever right back beyond bottom gear position to stop (A), push inner wire through to detach nipple (D) from ratchet plate then pull wire out between pawl and ratchet at (C) and finally through slotted hole (B).

TO FIT CONTROL WIRE

Pull lever right back beyond bottom gear position to stop (A) and insert wire through hole (B) and between pawl and ratchet plate at (C). Wire nipple (D) is then fitted into notch (E) and cable ferrule (F) slotted into (B). Keeping tension on wire, push lever forward into top gear position. Control is then ready for re-connection.
AUTO-TWIST GRIP

The only 3 speed Twist Grip control with patent auto adjustment. Provides positive gear change and automatically ensures correct gear adjustment at all times. Supplied with matching handlebar grip.

HSJ.583 Auto-twist grip complete with left-hand grip 60° x 54° (1,524 x 1,372 m.m.) cable with anchorage.

TO FIT TWIST GRIP CONTROL

IMPORTANT - THE GRIP MUST NOT BE TWISTED UNTIL FITTED TO THE BICYCLE AND THE CABLE CONNECTED TO THE GEAR INDICATOR ROD AT THE HUB.
1. Slide control on to handlebar as far as possible, adjust grip to required position. Tighten - EVENLY - fixing screws.
2. Pass cable inner wire through fulcrum clip and into clip slot - (then over pulley wheel, if fitted).
3. Push outer cable up to fulcrum slot. Fit cable anchorage at hub end - Twist the grip forward - tighten inner wire and secure anchorage nut firmly.
4. Connect control cable to gear indicator coupling at hub.
5. Slide fulcrum clip to take up any slackness in cable and tighten clip screw.
6. Adjust gears.

ALL THREE GEARS ARE NOW AUTOMATICALLY IN ADJUSTMENT.

NOTE - When all the cable adjustment has been taken up the twist grip must be dismantled and the gear locating spring refitted: See Assembly Notes.

TO RESET GEAR LOCATING SPRING AND ASSEMBLE TWIST GRIP MECHANISM

1. First fit detent spring and the $\frac{1}{8}$-dia. ball into recess in operating sleeve - (use grease to hold spring and ball in position).
2. Fit cable nipple into slotted recess of operating sleeve.
3. Fit cable inner wire into slot of gear locating spring, and position spring over operating sleeve. (Check $\frac{1}{8}$-dia. ball is positioned in elongated hole of locating spring).
4. Keeping thumb of right hand over ball and spring feed inner wire into cable slot of bottom half of casing. Now press locating spring into casing - until spring is right down into its groove.
5. Fit top half of casing over operating sleeve. Holding two halves of casing together, fit clamp screws.
6. Refit Twist Grip on to Handlebar, and take up all slackness in Control Cable. Set gears as described.
CONSOLE SPORTSHIFT
(STANDARD MODEL 70D)

A 'new look' at gear change console design. Elegant, practical, robust, positive, built for safety. Chrome plated console and T bar lever. Suitable for conventional and high rise 3 speed bicycles – single or twin top-tubes.

| HSJ.706 | Console Sportshift complete with 36° x 30° (914 x 762 m.m.) cable with anchorage (clip for ⅝ / 1") (22.2/25.4 m.m.) dia. tube.

DE LUXE CONSOLE SPORTSHIFT (MODEL 70E)

Acclaimed the most outstanding Console Sportshift of the year – a leap forward in space age design. No other console unit offers all these outstanding features – ultra-modern design – superb quality chrome plated finish – ‘fine blanked’ lever – mechanical ‘window’ gear indication – precision die-cast mechanism – positive ‘click’ gear change – safety gear selection – universal frame fitment. Without doubt – a significant de-luxe feature for Sturmey-Archer equipped 3 speed bicycles.

| HSJ.709 | Console Sportshift de luxe complete with 36° x 30° (914 x 762 m.m.) cable with anchorage (clip for ⅝ / 1") (22.2/25.4 m.m.) dia. tube.
| HSJ.710 | As above but with twin tube clips.
**SPORTSHIFT** (Model 72R)

Supplied for use on Chopper Model.

<table>
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<tr>
<th>Item</th>
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<tr>
<td>HSJ 741</td>
<td>Chopper Sportshift Model 72R De-luxe Mechanical Indication (Complete with cable)</td>
</tr>
<tr>
<td>HSJ 669</td>
<td>Knob Assembly (Red)</td>
</tr>
<tr>
<td>HJS 568</td>
<td>Cover</td>
</tr>
<tr>
<td>HSJ 742</td>
<td>Cable – BLACK 32” x 29”</td>
</tr>
<tr>
<td>HSJ 570</td>
<td>Lever and Piston Assembly</td>
</tr>
</tbody>
</table>

**TO FIT SPORTSHIFT GEAR CONTROL (Models 70D, 70E and 72R)**

**SINGLE CLIP MODEL**
1. Place control on top tube of bicycle frame (approximately 5” from steering column).
2. Locate undrilled end of each half clip in slots in base of unit. Fit half clips to each side of frame tube and secure with fixing bolt and nut.

**TWO CLIP MODEL**
*NOTE:* When two clips are used, ensure that the 'U' shaped captive nuts are fitted over the holes at each end of control unit – then fit self tapping screws through universal clips and tighten.
3. Fit fulcrum clip to bicycle frame backstay.
4. Pass cable inner wire through fulcrum clip and fit wire into clip slot. Push outer cable up to fulcrum slot and tighten clip screw. Fit cable anchorage. Push gear lever forward and tighten inner wire then secure anchorage nut firmly.
5. Screw cable connector to gear indicator coupling.
6. Set gears.

**TO REMOVE CABLE**
1. Detach control unit from bicycle. Unscrew cable connector from gear indicator coupling – at hub end.
2. Remove cover fixing screws. Lift up plastic cover of control and prise cable ferrule from its recess.  
*N.B.* If your “Sportshift” has gear indication with a mechanical linkage and cursor plate, gently ease plastic cursor plate from its retaining pegs and swing to one side to reveal cable ferrule. From underside of base plate, use a small screwdriver to push cable nipple from recess.

**TO FIT NEW CABLE**
3. Fit inner wire nipple and outer cable ferrule into its housing. *(Note: Refit cursor plate onto its securing pegs, the domed end of inner wire nipple must face upwards).*
4. Replace plastic cover and secure fixing screws – Refit unit to bicycle.
5. Pass inner wire through fulcrum clip — on rear frame tube — and fit wire into clip slot.
6. Connect cable to hub
7. Set gears.
MINI-SPORTSHIFT
(MODEL 70A)

an exciting newcomer to the 3 speed range – of elegant design with ‘fine blanked’ lever in high quality chrome – positive gear action – designed for safety. Standard model No. 70A – suitable for single top-tube bicycles.

MINI-SPORTSHIFT
DE LUXE
(MODEL 70B)

– the choice of the discerning cyclist – a top quality 3 speed gear change with beautifully styled chrome housing – for fitting to single top-tube bicycles. Combination of the world famous AW 3 speed gear and the Mini-Sportshift De-Luxe means quality cycling.

| HSJ.705 | Mini-Sportshift complete with 36" x 30" (914 x 762 mm.) cable with anchorage (clip for ½” dia. tube) (22.2/25.4 mm.) |
| HSJ.706 | Mini-Sportshift de luxe complete with 36" x 30" (914 x 762 mm.) cable with anchorage (clip for ½” dia. tube) (22.2/25.4 mm.) |
SPORTSHIFT
(MODEL 70C)

A stylish semi-console in the three-speed range — with 'fine blanked' lever in high quality chrome — positive gear selection. Ideal for single top tube sports and touring bicycles.

TO FIT CONTROL (Models 70A, 70B and 70C)
1. Open control clip and place control on top tube of bicycle approximately 5° from steering column — secure clamp bolt.
2. Push outer cable up to fulcrum stop and fit cable anchorage — at hub end.
3. Push control lever forward — tighten inner wire and secure anchorage nut firmly.
4. Adjust gears.

TO REMOVE CABLE
1. Loosen cable anchorage nut — push inner wire forward to form a loop at lever.
2. Push out cable ferrule from lever — ease cable from groove at base of lever and lift out cable nipple and detach complete cable.

TO FIT CABLE
1. Insert cable ferrule into its housing at rear of control lever and slot inner wire into groove in base of lever.
2. Push wire forward to form a loop and insert nipple into its slot. Push outer cable up to ferrule and fit cable anchorage at hub end — push gear lever forward. Tighten cable and secure anchorage nut.
3. Adjust gears.

| HSJ.754 | Sportshift complete with 36" x 30" (914 x 762 m.m.) cable with anchorage (clip for 1\(\frac{1}{8}\)/8"/1"
          | (27/28.4 m.m.) dia. tube. |
### Cables with Anchorage

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<td>HSJ 102</td>
<td>Trigger Control</td>
<td>60&quot; x 54&quot; (1,524 x 1,372 mm)</td>
</tr>
<tr>
<td>HSJ 106</td>
<td>Automatic Twist Grip</td>
<td>60&quot; x 21&quot; (1,524 x 533 mm)</td>
</tr>
<tr>
<td>HSJ 106</td>
<td>Automatic Twist Grip</td>
<td>60&quot; x 54&quot; (1,524 x 1,372 mm)</td>
</tr>
<tr>
<td>HSJ 720</td>
<td>Sportshift (Models 70A &amp; 70B)</td>
<td>36&quot; x 30&quot; (914 x 762 mm)</td>
</tr>
<tr>
<td>HSJ 720</td>
<td>Sportshift (Model 70C)</td>
<td></td>
</tr>
<tr>
<td>HSJ 115</td>
<td>Sportshift (Model 72R)</td>
<td></td>
</tr>
<tr>
<td>HSJ 115</td>
<td>Sportshift (Models 70D &amp; 70E)</td>
<td>36&quot; x 30&quot; (914 x 762 mm)</td>
</tr>
<tr>
<td>HSL 759</td>
<td>Cable Anchorage</td>
<td></td>
</tr>
</tbody>
</table>

### Frame Clip - For Sportshift Units

<table>
<thead>
<tr>
<th>Sales No.</th>
<th>Description</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMM 239</td>
<td>Sportshift Models D &amp; E. 3 1/8 / 1&quot; (22.2 mm / 25.4 mm) – Single tube</td>
<td></td>
</tr>
<tr>
<td>HSL 759</td>
<td>Sportshift-Twin tubes</td>
<td></td>
</tr>
<tr>
<td>HSJ 737</td>
<td>1 1/2&quot; (38.1 mm.)</td>
<td></td>
</tr>
<tr>
<td>HSJ 738</td>
<td>1 1/2&quot; (47.6 mm.)</td>
<td></td>
</tr>
<tr>
<td>HSJ 739</td>
<td>Sportshift Models D &amp; E. 3 1/8 / 1&quot; (22.2 mm / 25.4 mm) – Single tube</td>
<td></td>
</tr>
</tbody>
</table>

### Covers - For Control Units

<table>
<thead>
<tr>
<th>Sales No.</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HSJ 718</td>
<td>Mini Sportshift Model 70B</td>
<td></td>
</tr>
<tr>
<td>HSJ 755</td>
<td>Console Sportshift Model 70C</td>
<td></td>
</tr>
<tr>
<td>HSJ 717</td>
<td>Console Sportshift Model 70D</td>
<td></td>
</tr>
<tr>
<td>HSJ 716</td>
<td>Console Sportshift Model 70E</td>
<td></td>
</tr>
</tbody>
</table>

### Cable Clips

<table>
<thead>
<tr>
<th>Sales No.</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMM 160</td>
<td>1&quot;</td>
<td>Round, top tube (Gear/brake)</td>
</tr>
<tr>
<td>HSL 743</td>
<td>1 1/8&quot;</td>
<td>Round, top tube (Gear/brake)</td>
</tr>
<tr>
<td>RMM 184</td>
<td>1 1/2&quot;</td>
<td>Round, down tube (Gear/brake)</td>
</tr>
<tr>
<td>RMM 191</td>
<td>1 1/8&quot;</td>
<td>Round, backstay (Gear)</td>
</tr>
<tr>
<td>RMM 208</td>
<td>1 1/4&quot;</td>
<td>Round, backstay (Gear)</td>
</tr>
<tr>
<td>RMM 181</td>
<td>1 1/4&quot;</td>
<td>Oval, backstay (Gear)</td>
</tr>
<tr>
<td>RMM 173</td>
<td>1 1/8&quot;</td>
<td>Round, chainstay (Gear/brake)</td>
</tr>
</tbody>
</table>

### Knob Assemblies - For Control Units

<table>
<thead>
<tr>
<th>Sales No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSJ 675</td>
<td>Sportshift 70D-70E</td>
</tr>
<tr>
<td>HSJ 740</td>
<td>Mini Sportshift 70A-70B &amp; 70C</td>
</tr>
<tr>
<td>HSJ 569</td>
<td>Sportshift - Red Knob 72R</td>
</tr>
</tbody>
</table>
FULCRUM CLIPS – CHAINSTAY/BACKSTAY

<table>
<thead>
<tr>
<th>SALES No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSJ 607</td>
<td>$\frac{5}{6}$ (12.7mm) Backstay</td>
</tr>
<tr>
<td>HSJ 547</td>
<td>$\frac{4}{5}$ (18.6mm) Chainstay Roadster</td>
</tr>
<tr>
<td>HSJ 753</td>
<td>$\frac{3}{4}$ (19mm) Roadster</td>
</tr>
<tr>
<td>HSJ 513</td>
<td>$\frac{1}{2}$ (22.2mm) Top tube</td>
</tr>
<tr>
<td>HSJ 512</td>
<td>$\frac{1}{2}$ (25.4mm) Top tube</td>
</tr>
<tr>
<td>HSJ 514</td>
<td>$\frac{7}{8}$ (28.6mm) Top tube</td>
</tr>
<tr>
<td>HSJ 548</td>
<td>$\frac{5}{8}$ (17.8mm) Sports</td>
</tr>
<tr>
<td>HSJ 553</td>
<td>$\frac{9}{8}$ (15.8mm) RSW</td>
</tr>
<tr>
<td>HSJ 516</td>
<td>Plastic Sleeve for Fulcrum Clip</td>
</tr>
</tbody>
</table>

FULCRUM CLIPS – TOP TUBE

(ACTUAL SIZES)

FULCRUM SLEEVE

<table>
<thead>
<tr>
<th>SALES No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSJ 513</td>
<td>$\frac{5}{6}$ Ø</td>
</tr>
<tr>
<td>HSJ 512</td>
<td>1&quot; Ø</td>
</tr>
<tr>
<td>HSJ 514</td>
<td>1\frac{1}{8}&quot; Ø</td>
</tr>
</tbody>
</table>

PULLEY ASSEMBLIES (ACTUAL SIZE)

<table>
<thead>
<tr>
<th>SALES No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSJ 520</td>
<td>1&quot; (25.4 mm) Top tube</td>
</tr>
<tr>
<td>HSJ 521</td>
<td>1\frac{1}{8}&quot; (28.6 mm) Down tube</td>
</tr>
</tbody>
</table>