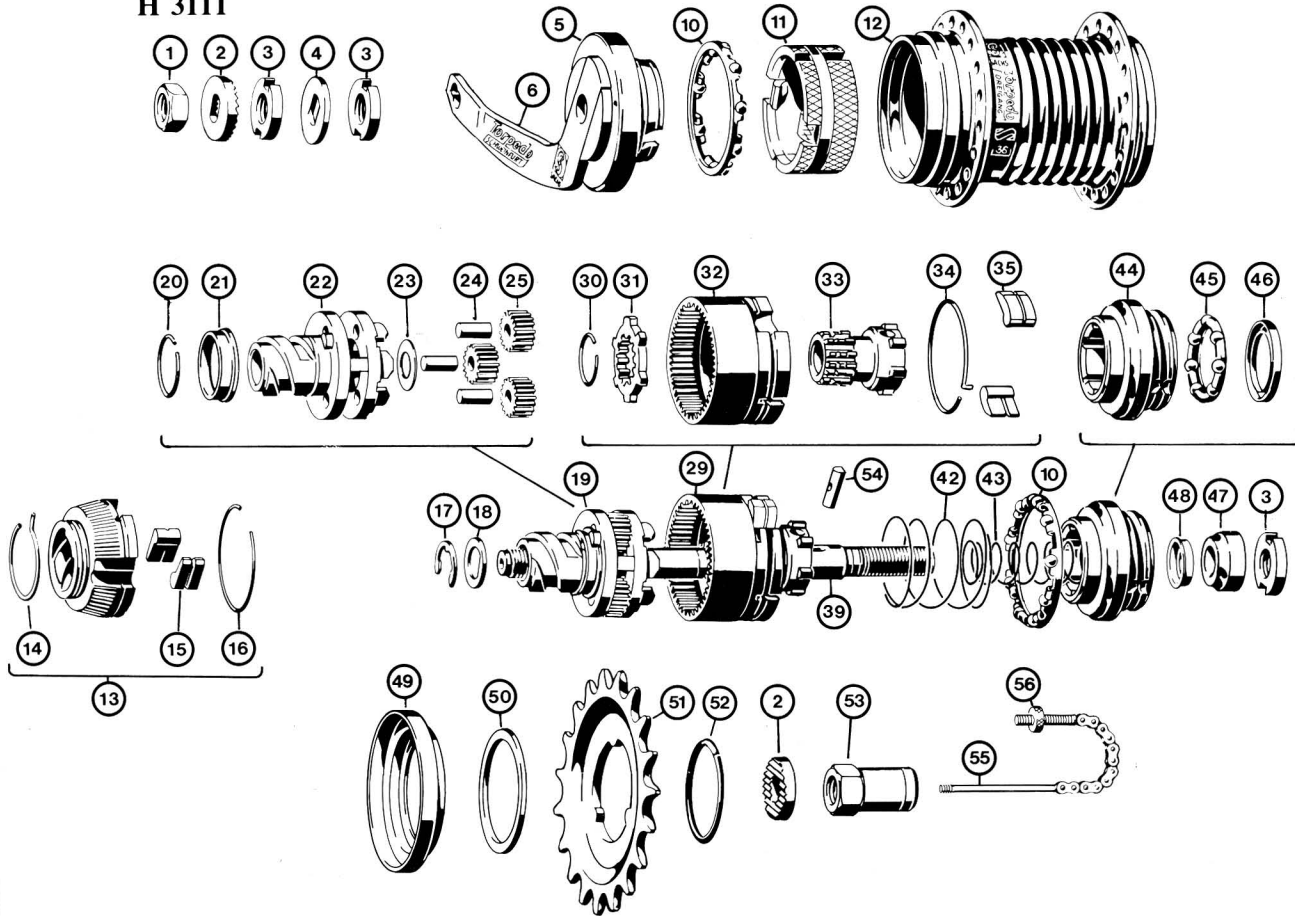


# HUBS

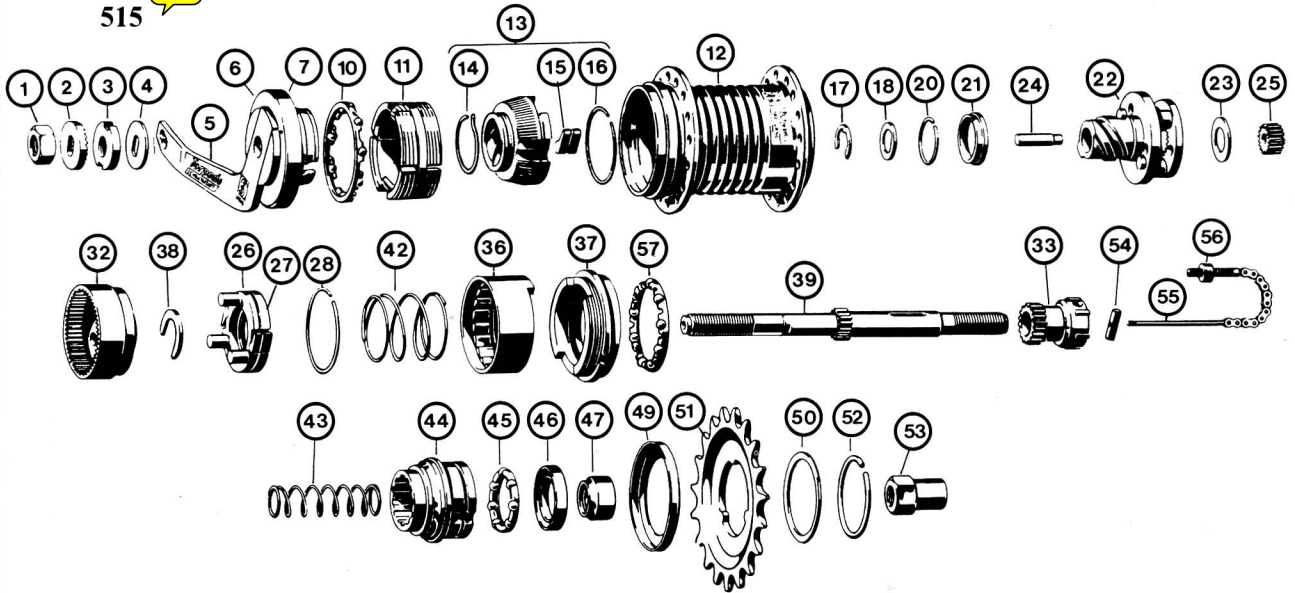
## SACHS (F & S) TORPEDO 3-SPEED HUBS WITH COASTER BRAKE



H 3111



515



Vertical line between numbers indicates parts are not interchangeable.

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

<sup>1</sup> Interchanges with Duomatic 102 and 101.

<sup>2</sup> Interchanges with Automatic R 2110.

<sup>3</sup> Interchanges with Duomatic A 2110.

<sup>4</sup> See Sprocket Interchangeability at beginning of Hub section.



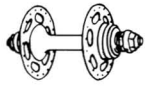
# SACHS 3-SPEED HUB PARTS INTERCHANGEABILITY

Blue lines indicate different or same part numbers not shown in print edition. Some differences may be only cosmetic.

Red lines indicate differences which were shown on page 31. This page now covers everything which was on page 31, which is now omitted.

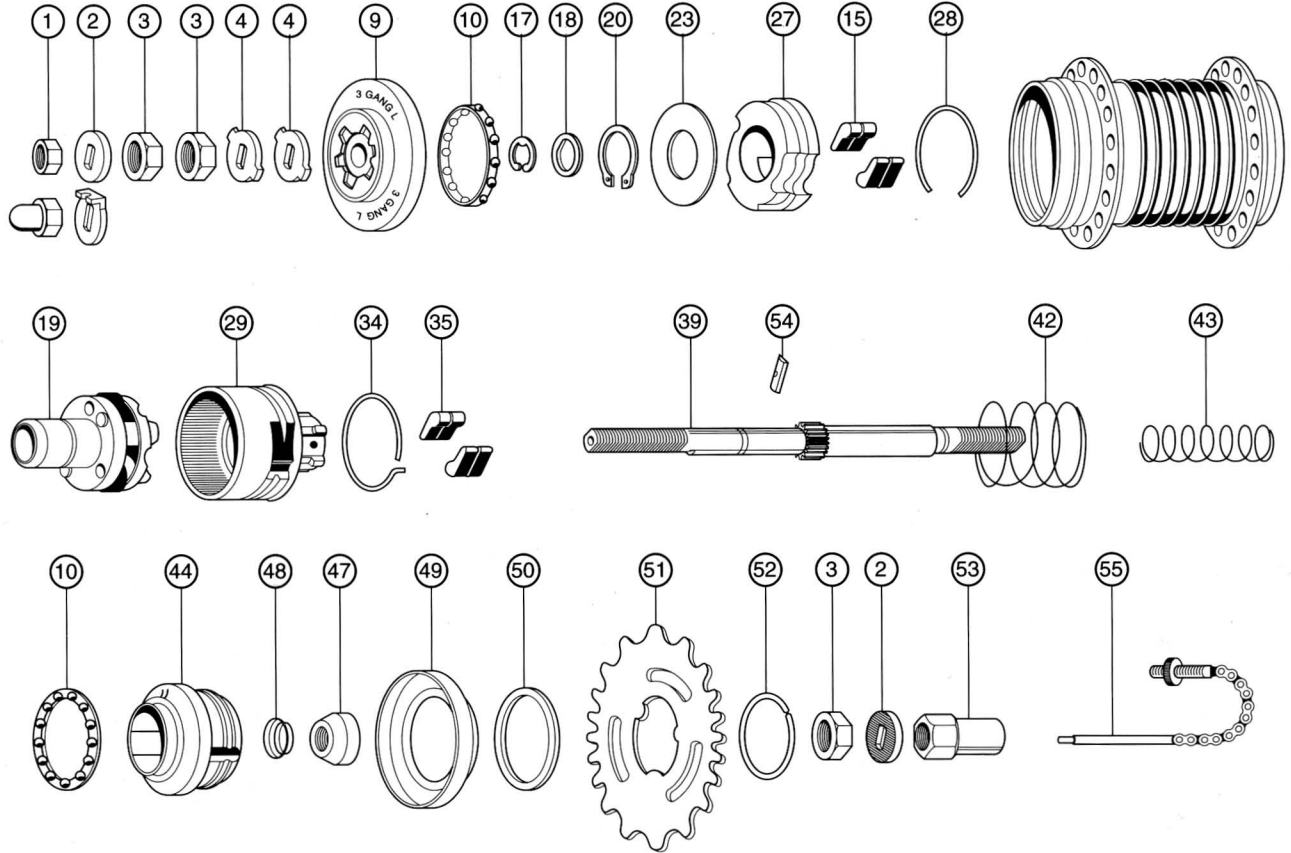
SUTHERLAND'S HANDBOOK OF COASTER BRAKES AND INTERNALLY-GEARED HUBS

Item #		Type 415 without coaster brake	Type 515	Type H 3111	Type H 3102 without coaster brake illustration page 5-30
1.	Hex Nut (10.5 mm Ø)	0516 003 000'	0516 003 000'	0516 003 000'	0516 003 000'
2.	Fixing Plate	0517 102 000'	0517 102 000'	0517 102 000'	0517 102 000'
3.	Locknut (10.5mm Ø)	0516 001 300'	0516 001 300'	0516 001 300'	0516 111 000
4.	Lock Washer	0517 003 000'	0517 003 000'	0517 003 000'	0517 005 000'
5.	Lever Cone Assembly		0574 107 100	0574 110 000	
6.	Brake Lever		0519 014 300	0519 014 300	
7.	Dust Cap		0521 103 100	0521 103 100	
8.	Adjusting Nut	0516 023 000'			
9.	Adjusting Cone	0574 108 100			0574 112 100
10.	Ball Cage	0576 104 100'	0576 104 100'	0576 104 100'	0576 104 200
11.	Brake Shell (Brake Cylinder)		0573 103 000	0573 103 100	
12.	Hub Shell 36 holes	0501 108 200	0501 105 200	0501 118 000	
	28 holes	0501 108 203	0501 105 202	0501 118 001	
13.	Brake Cone Assembly		0574 106 000'	0574 106 000'	
14.	Friction Spring		0513 102 000'	0513 102 000'	
15.	Pawls	0536 104 100 <sup>23</sup>	0536 104 000 <sup>23</sup>	0536 104 100 <sup>23</sup>	0536 104 100 <sup>23</sup>
16.	Circlip	0512 102 100 <sup>23</sup>	0512 102 000 <sup>23</sup>	0512 102 100 <sup>23</sup>	
17.	Axle Circlip	0517 002 000'	0517 002 000'	0517 002 000'	0517 002 000'
18.	Thrust Washer	0518 103 000	0518 103 000	0518 103 000	0518 103 000
19.	Planet Gear Carrier Assembly	0572 108 200	0572 105 200	0572 119 000	0572 120 100
20.	Circlip	0512 104 000	0512 104 000	0512 104 000	2512 007 000
21.	Locating Sleeve	0534 103 000	0534 103 000	0534 103 000	
22.	Planet Gear Carrier	0572 107 200	0572 104 200	0502 112 000	
23.	Thrust Washer	0518 106 000'	0518 106 000'	0518 106 000'	0518 111 000'
24.	Pivot Pins (Trunnions)	0514 102 200	0514 103 000	0114 101 000 <sup>23</sup>	
25.	Planet Gear	0533 103 000 <sup>123</sup>	0533 103 000 <sup>123</sup>	0533 103 000 <sup>123</sup>	
26.	Pawl Carrier Assembly	0572 106 000	0572 106 000		
27.	Pawl Carrier	0504 101 000	0504 101 000		0504 102 100
28.	Circlip	0512 103 000	0512 103 000		0512 102 100
29.	Gear Ring Assembly			0581 104 001	0581 104 101
30.	Circlip			0312 003 000	
31.	Dog Washer			0518 109 000	
32.	Gear Ring	0533 105 100	0533 105 200	0581 104 000	
33.	Clutch Gear	0533 104 000	0533 104 000	0533 111 000	
34.	Circlip			0512 115 000	0512 115 200
35.	Pawl			0536 109 000	0536 109 100
36.	Dog Ring		0501 107 200		
37.	Bearing Bush		0501 106 200		
38.	Gear Change Plate	0518 104 000	0518 104 000		
39.	Axle 146 mm	0509 106 200			0509 111 000
	152 mm		0509 104 200	0509 111 000	
	154 mm				
	159 mm	0509 107 200			0509 112 000
	164 mm				
	167 mm		0509 105 200	0509 112 000	
40.	Ball Cup	0501 109 100			
<del>41.</del>	<del>Ball Retainer</del>	<del>0576 103 100</del>	<del>0576 102 100</del>		
42.	Pressure Spring (large diameter)	0525 104 100	0525 104 100	0525 104 100	0525 104 100
43.	Pressure Spring (small diameter)	0525 013 200	0525 013 200	0525 013 200	0525 013 200
44.	Driver Assembly	0572 103 200	0572 103 200	0572 118 000	0572 118 000
45.	Ball Cage	0576 102 000	0576 102 000	0576 102 000	
46.	Dust Cap	0121 108 000	0121 108 000	0121 108 000	
47.	Fixed cone	0508 102 100	0508 102 100	0508 105 000	0508 105 100
48.	Cap			0521 108 000	0521 108 000
49.	Dust Cap (sprocket)	0521 104 000	0521 104 000	0121 109 000	0121 109 000
50.	Spacer Washer <sup>†</sup>	0518 018 000	0518 018 000	0518 018 000	0518 018 000
51.	Sprockets <sup>†</sup>				
52.	Circlip <sup>†</sup>	0512 011 000	0512 011 000	0512 011 000	0512 011 000
53.	Chain Guide Nut	0579 100 000	0579 100 000	0579 100 000	0516 100 102
54.	Axle Key (sliding block)	0527 100 100	0527 100 100	0527 100 100	0527 100 200
55.	Small Pull Rod	0587 100 101	0587 100 101	0587 100 101	0587 102 000
56.	Knurled Nut	0516 027 000	0516 027 000	0516 027 000	
57.	Ball Cage Adjuster Sleeve Assembly	0576 103 100	0576 103 100		0570 117 000



# HUBS

## TYPE H 3102



Vertical line between numbers indicates parts are not interchangeable.

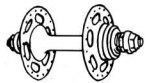
Parts are interchangeable only if they are on the same line and they do not have a vertical line between them.

<sup>1</sup> Interchanges with Duomatic 102 and 101.

<sup>2</sup> Interchanges with Automatic R 2110.

<sup>3</sup> Interchanges with Duomatic A 2110.

<sup>4</sup> See Sprocket Interchangeability at beginning of Hub section.

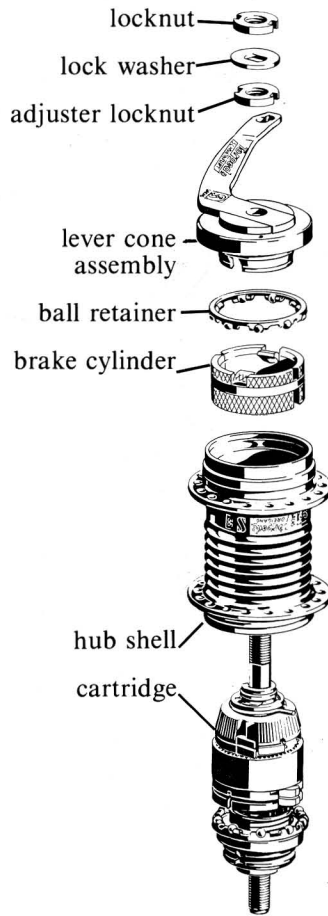


# HUBS

## SACHS (F & S) TORPEDO H 3111 3-SPEED COASTER BRAKE DISASSEMBLY AND ASSEMBLY

### 1 DISASSEMBLY

Remove left-hand locknut, lock washer and second locknut. Remove lever cone assembly. The brake lever, lever cone and dust cap are press fit together and should not be forced apart. Lift out ball retainer and brake cylinder. Lift hub shell off cartridge.



Install ball retainer *flat side up*. Install lever cone assembly. If the brake arm, lever cone and dust cap were forcibly separated, they may have been damaged and should be replaced. If serviceable, press together with brand name on brake arm facing out. Slots in lever cone engage tabs on brake cylinder. Install adjuster locknut, lock washer and locknut. Adjust bearing, locking the first nut in place with the second.

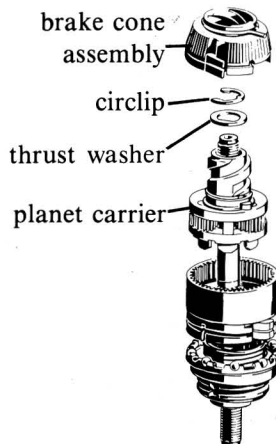
Position hub shell with *long end up*. Slip hub shell over assembly. Install brake cylinder with tabs up. Rotate until one of the narrow slots in the brake cylinder engages hooked end of friction spring.

### ASSEMBLY 3

Next Step

### 2 DISASSEMBLY

Rotate brake cone assembly counter-clockwise and remove. Remove circlip and thrust ring. Lift off planet carrier.



Invert assembly. Install planet carrier and thrust washer (washer flat must be started on *long axle flat*). Push down and rotate carrier to expose circlip groove. Install axle circlip. Install brake cone assembly *wide end down*.

### ASSEMBLY 2

Next Step  
Next Page



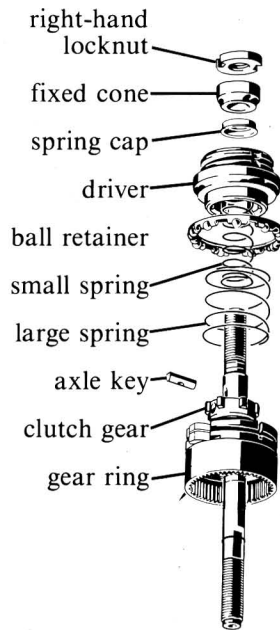
**SACHS (F & S) TORPEDO H 3111  
3-SPEED COASTER BRAKE  
DISASSEMBLY AND ASSEMBLY (cont.)**

**HUBS** 

**3 DISASSEMBLY**

Invert assembly. Remove right-hand locknut, fixed cone, small diameter spring and spring cap. Remove driver, ball retainer and large diameter spring.

Rotate clutch gear until horizontal holes line up with axle keyway. Push axle key out large hole. Lift off gear-ring/clutch-gear assembly.



Position axle assembly vertically with right (hollow) end up. Slip gear-ring/clutch-gear assembly over axle with gear ring facing down.

Rotate clutch gear until horizontal holes line up with axle keyway. Insert sliding key *rounded side down* through large hole. When key is fully inserted, clutch gear and gear ring rotate freely. Slip both springs over axle, install spring cap on small spring. Slip retainer *flat side up* and driver over axle. Install fixed cone and start locknut. While tightening locknut hold driver down against gear ring. Tighten locknut until cone bottoms on axle shoulder.

**ASSEMBLY 1**

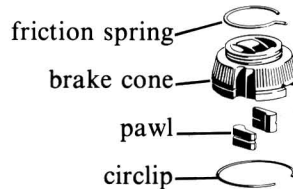
**SUBASSEMBLIES**

**DISASSEMBLY**

**Brake Cone**

Remove friction spring only if it is to be replaced. Ease spring out of groove with a thin-bladed screw driver.

To remove pawls, pull outward until end of circlip clears groove, then ease circlip off the end of brake cone.



**Brake Cone**

Install friction spring *with hooked end clockwise from gap*. Incorrect installation will cause excess drag, wear and possible brake failure.

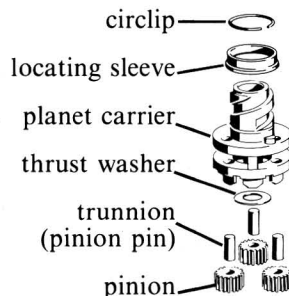
Install pawls under straight-ended circlip. Position ends of circlip near indentations that close circlip groove. *Viewed as shown, pawls must point counter-clockwise.*

**ASSEMBLY**

**DISASSEMBLY**

**Planet Carrier**

Remove circlip and locating sleeve. Push out trunnions (pinion pins) and remove pinions. Extract thrust washer from inside planet carrier.



**Planet Carrier**

Install thrust washer, planet pinions and trunnions (pinion pins). *Install locating sleeve flange down*. Install circlip.

**ASSEMBLY**



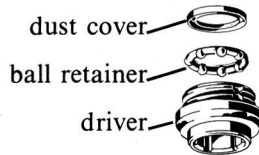
# HUBS

## SACHS (F & S) TORPEDO H 3111 3-SPEED COASTER BRAKE DISASSEMBLY AND ASSEMBLY (cont.) SUBASSEMBLIES (cont.)

### DISASSEMBLY

#### Driver

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



#### Driver

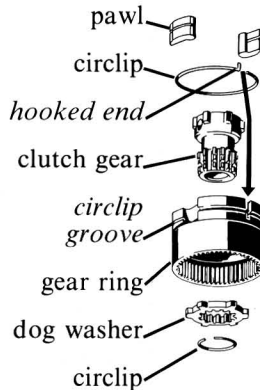
Install ball retainer flat side up. Start dust cover straight and tap home with a soft hammer.

### ASSEMBLY

### DISASSEMBLY

#### Gear-Ring/Clutch-Gear

To remove pawls, pry straight end of circlip out of groove and ease over end of gear ring. To separate clutch gear and gear ring use an awl to remove circlip. Remove dog washer and clutch gear.



#### Gear-Ring/Clutch-Gear

Install clutch gear and dog washer; lock in place with circlip. Position assembly with gear ring teeth down. Install pawls under hooked circlip. *Pawls must point clockwise when viewed from above.* Hooked end of circlip should lie in the slot that intersects circlip groove.

### ASSEMBLY

### CLEANING

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

### POINTS TO CHECK

Numbers in parenthesis refer to parts chart and exploded drawing.

1. Pawls (15, 35) and ratchets for rounding or chipping
2. Gear teeth in gear ring (32), on planet pinions (25) and on axle (39) for worn or chipped teeth
3. Planet carrier (22), gear ring (32), dog ring (36), clutch gear (33) and driver (44) for worn or rounded teeth
4. Bearing surfaces of lever cone (5), hub shell (12), ball cup (40), driver (44), fixed cone (47) and pinion pins (24) for wear or pitting
5. Brake cylinder (11) and hub shell (12) for wear or glazing
6. Brake cone (13) for worn serrations

7. Friction spring (14), pressure springs (42, 43), circlips (16, 34) for size and tension (manufacturer recommends replacing circlips at overhaul)
8. Axle (39) for straightness
9. Dust caps (7, 46, 49), bearing retainers (10, 41) for straightness
10. All threaded parts for worn or damaged threads
11. Axle key (54) for stripped threads

### LUBRICATION

Lubricate ball bearings by filling the spaces between balls with grease. Be careful not to grease pawls. Lubricate hub shell, brake cylinder and friction spring liberally with a high-temperature grease for *steel* brake shoes. Oil, never grease, brake cone and gear ring with a *good* cycle oil. (WD-40 is too light for lasting lubrication, 3-in-1 Oil gums up with age.)