



**Service Manual  
& Spare Parts List**  
for Avonride Axles  
& Couplings

**AVONRIDE**  
Axle Suspension Systems

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As far as we are aware, at the time of going to press the information in this booklet was accurate, but no legal liability can be accepted for any errors.

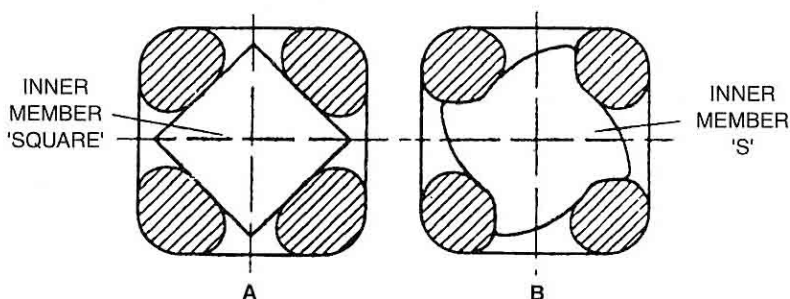
## TECHNICAL INFORMATION

# THE AXLE

Avonride Limited produce two types of rubber suspension axle. "Avonride" and "Avonride 'S'".

The construction of both axles is similar in that each consists of four pre-compressed rubbers around a preformed solid inner member held in position by the specially shaped axle tube.

The solid inner member is a simple square section in "Avonride" 'Square' and a formed involute cam section in "Avonride 'S'".



As load increases on the axle, which is attached to the torsion arm and inner member, the resistance to movement increases. Upon recession of the rotary force the rubber rollers push the inner member back to its original position – due to the rolling motion of the rubber rollers, the reverse action produces a slower ascent eliminating the need for separate shock absorbers.

The principle of the system is not merely to compress the rubber, but roll it around the precise radius in the corner of the tube. This plus feature of Avonride is of great importance and explains the exceptional durability of the product.

Diagram (A) shows the position of the rubber elements and inner member. (Avonride axle – 'Square').

Diagram (B) shows the position of the rubber elements and inner member with (Avonride axle – 'S').

Due to the almost total absence of the tension in the peripheral "layers" of the rubber, they are unaffected by dirt, sand and water, so that the elements may be left unprotected at the ends and require no maintenance.

# METHOD OF REPLACING WORN BEARINGS AND OIL SEAL IN AVONRIDE HUBS

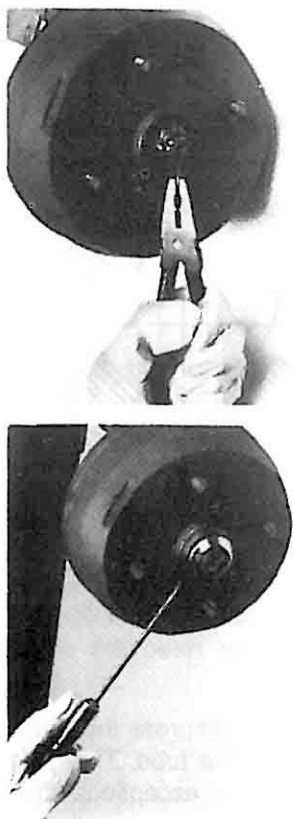


Figure 1



Figure 3

Figure 2

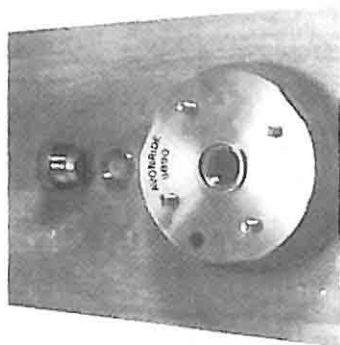


Figure 4

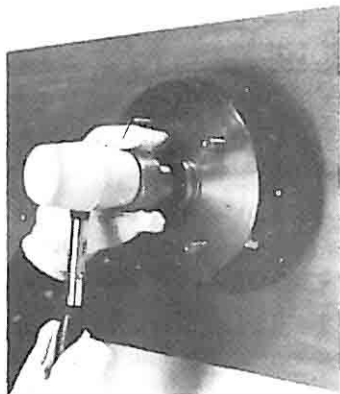


Figure 5

# ADJUSTMENT AND MAINTENANCE

## Hubs / Drums / Bearings

### Hub Removal

Whenever the hub equipment on your axle must be removed for inspection or maintenance the following procedure should be utilized.

1. Elevate and support the trailer unit per manufacturers' instructions.
2. Remove the wheel.
3. Remove the grease cap by carefully prying progressively around the flange of the cap – see fig. 1.
4. Remove the split pin from the axle nut – see fig. 2.
5. Unscrew the axle nut (counterclockwise) and remove the axle washer (when fitted).
6. Remove the hub from the axle, being careful not to allow the outer bearing cone to fall out. The inner bearing cone will be retained by the seal.

### Brake Drum Inspection

#### Hardware

Check all hardware. Check shoe return spring, hold down springs, and adjuster for wear. Replace as required. Service kits are available.

#### Drums

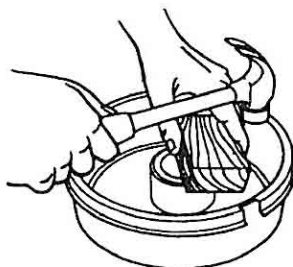
Check drums for scoring, cracking, or uneven wear.  
(Replace as necessary).

### Seal Inspection and Replacement

Whenever the hub is removed, inspect the seal to assure that it is not nicked or torn and is still capable of properly sealing the bearing cavity. If there is any question of condition, replace the seal. Use only the seals specified in the Seal Replacement Chart.

To replace the seal:

1. Pry the seal out of the hub with a screwdriver. Never drive the seal out with the inner bearing as you may damage the bearing.



Tap the new seal into place using a clean wood block.

## ***Bearing Inspection***

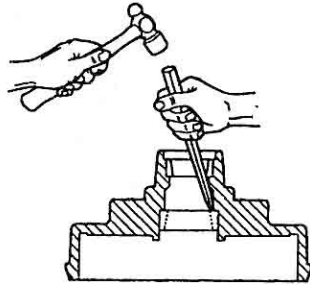
Wash all grease and oil from the bearing cone using a suitable solvent. Dry the bearing with a clean, lint-free cloth and inspect each roller completely. If any pitting, spalling, or corrosion is present, then the bearing must be replaced. The bearing cup inside the hub must be inspected.

### ***IMPORTANT:***

*Bearings must always be replaced in sets of a cone and a cup.*

When replacing the bearing cup proceed as follows (see figs. 3, 4 & 5) see page 2.

1. Place the hub on a flat work surface with the cup to be replaced on the bottom side.
2. Using a brass drift punch, carefully tap around the small diameter end of the cup to drive out.
3. After cleaning the hub bore area, replace the cup by tapping in with the brass drift punch. *Be sure the cup is seated all the way up against the retaining shoulder in the hub.*



*Bearing removal technique.*

Replace only with bearings as specified in the accompanying Bearing Replacement Chart.



### **CAUTION:**

*Be sure to wear safety glasses when removing or installing force fitted parts. Failure to comply may result in serious eye injury.*

*Make certain that the wheel bearing cavities are clean and free of contamination before reinstalling bearing and seals. The presence of these contaminants will cause premature wheel bearing failure.*



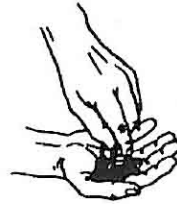
## ***Bearing Adjustment and Hub Replacement***

If the hub has been removed or bearing adjustment is required, the following adjustment procedure must be followed:

1. After placing the hub, bearings, washers, and spindle nut back on the axle spindle in reverse order as detailed in the previous section on hub removal, rotate the hub assembly slowly while tightening the axle nut to approximately 50lbs.-ft. (69 Nm).
2. Then loosen the axle nut to remove the torque. *Do not rotate the hub.*
3. Finger tighten the axle nut until just snug.
4. Back the axle nut out slightly until the first castellation lines up with the split pin hole and insert the split pin.
5. Bend over the split pin legs to secure the nut.
6. Nut should be free to move with only restraint being the split pin.

## ***Bearing Lubrication***

Along with bearing adjustment, proper lubrication is essential to the current function and reliability of your trailer axle. Bearings should be lubricated every 12 months or 12,000 miles. The method to repack bearing cones is as follows:



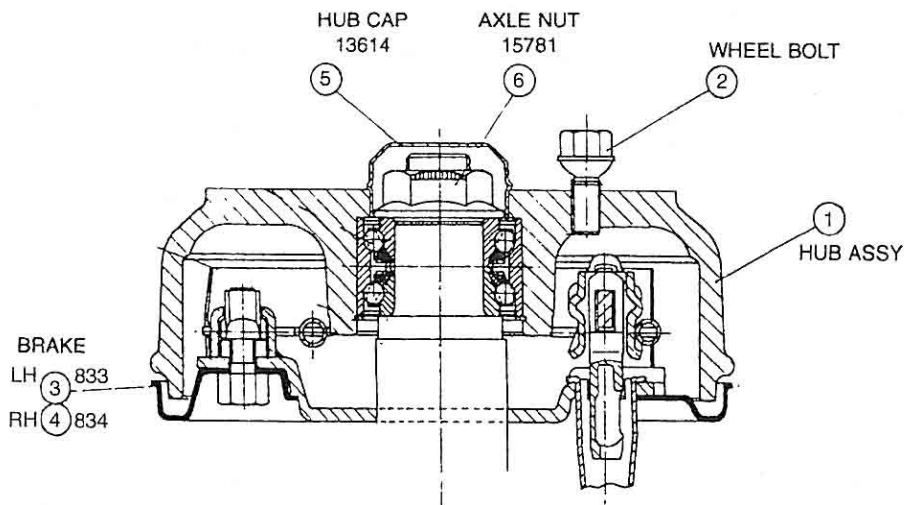
1. Place a quantity of grease into the palm of your hand.
2. Press a section of the widest end of the bearing into the outer edge of the grease pile closest to the thumb forcing grease into the interior of the bearing.
3. Repeat this while rotating the bearing from roller to roller.
4. Continue this process until you have the entire bearing completely filled with grease.
5. Before reinstalling, apply a light coat of grease on the bearing cup.

## ***Recommended Wheel Bearing Lubrication Specifications***

### **Grease:**

Thickener Type .....	Lithium Complex
Dropping Point .....	230°C (446°F) minimum
Consistency .....	NLGI No. 2
Additives .....	EP, Corrosion & Oxidation Inhibitors
Base Oil .....	Solvent Refined Petroleum Oil
Base Oil Viscosity .....	@ 40°C (104°F) 150cSt(695 SUS) Min.
Viscosity Index .....	80 Minimum
Pour Point .....	-10°C (14°F) Minimum

# 'X' SERIES HUB WITH SEALED BEARINGS



## HUB PARTS LIST

Hub Description	Item 1 Hub Assy	Item 2 Bolt	Item 3/4 Brake L/RH
203 x 40	5/112 16254 4/5 $\frac{1}{2}$ 16280	17220 17221	871/872
200 x 50	5/112 16249 4/100 17397 4/5 $\frac{1}{2}$ 16250	17220 17221	833/834

## USER NOTES FOR GUIDANCE

The hub is fitted with a double row linear-contact bearing, grease sealed for "life".

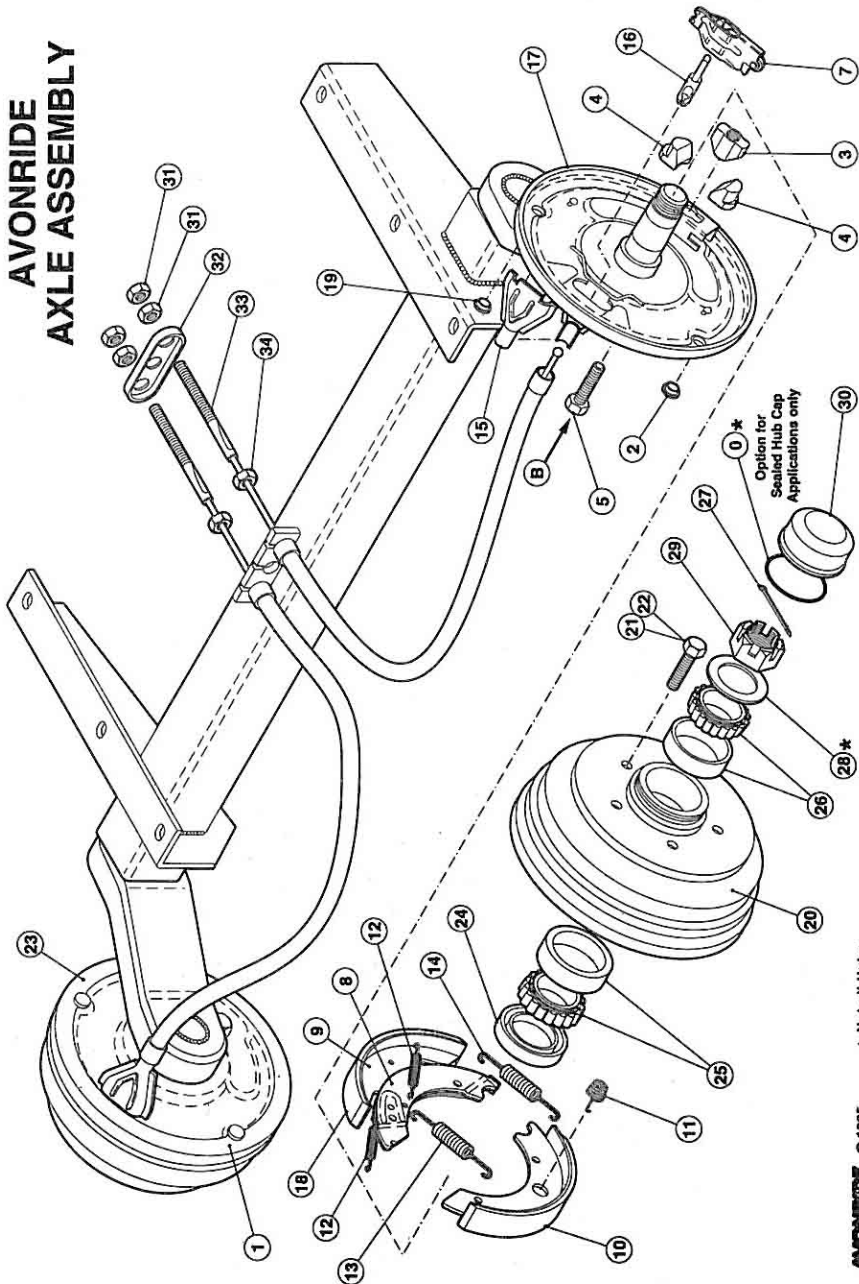
When removing the hub for maintenance of the brake, care must be taken not to allow the bearing assembly to separate.

If for any reason the bearings require replacement then a complete hub\* assembly should be used with the bearing already fitted.

**IMPORTANT:** Whenever Hubs are removed from the Axle a NEW Self Locking Axle Nut must be obtained and fitted (15781) tighten to torque 280nm (200ft.lbs).



# AVONRIDE AXLE ASSEMBLY



Option for  
Sealed Hub Cap  
Applications only

AVONRIDE © 1995 \* Not all Hubs.

# SPARES LISTS FOR AVONRIDE HUBS & BRAKES

V Series		T Series				R Series		N Series		K Series			J Series			E Series			C Series		
250 x 40		250 x 40				203 x 40		none		200 x 50		203 x 40		300 x 60			none			160 x 35	
5/112	5/140	5/6 1/2	5/140	4/5 1/2	5/160	5/112	4/4"	4/700	5/112	5/112	5/112	5/15	6/205	6/205	5/112	4/98	4/100	4/100	5/112	4/4"	4/700
14665	14668	14666	14665	14666	14668	16527	13647	13649	14165	14492	14491	13039	15141	12911	12910	12754	12851	13613	13815	12349	13565
11953	11956	05442	11953	11956	05458	11953	05575	11953	11953	11953	11953	11953	16851	12985	05442	05575	11953	11953	11953	05575	05704
	14507	12042	11956	11956	14507		05704	11956	11956	11956	11956	16387	14888	12042	05458	05704	16936	11956	11956	11956	05704
805 & 806		805 & 806				871/872		N/A		833/834		871/872		856 & 857			N/A			850 & 851	
854		854				869		N/A		868		869		858			N/A			837	
		1217				1225		N/A				1125		1229			1215				
		2835				2850		2838				2850		2860			2836				
		2850				2836		2837				2849		2850			2849				
		8				8		8				8		30			8				
		665				633		629				N/A		N/A			N/A				
		11822				12404		173				12404		12913			12404				
		12906				05695		13614				12438		12906			12438				

# SPARES LIST FOR KNOTT AUTO-REVERSE BRAKES

BRAKE SIZE		160 x 35		203 x 40		200 x 50		250 x 40		300 x 60	
ITEM	DESCRIPTION	QTY.	PT. N°	QTY.	PT. N°	QTY.	PT. N°	QTY.	PT. N°	QTY.	PT. N°
1	BLACK PLATE LH	1	AK17	1	AK21	1	AK36	1	AK37	1	AK97
2	BLANKING PLUG	2	AK14	2	AK14	2	AK14	2	AK14	2	AK14
3	ADJUSTING WEDGE NUT	1	AK10	1	AK10	1	AK10	1	AK77	1	AK66
4	SIDE WEDGE	2	AK80	2	AK80	2	AK80	2	AK81	2	AK82
5	BOLT	1	AK84	1	AK84	1	AK84	1	AK85	1	AK86
6	RETAINING CAP	1	AK18	1	AK18	1	AK18	1	AK18	1	AK51
7	EXPANDER ASSY	1	AK9	1	AK21	1	AK21	1	AK21	1	AK52
8	SHOE CARRIER	1	AK3	1	AK22	1	AK38	1	AK50	1	AK53
9	REVERSING SHOE	1	AK1	1	AK31	1	AK33	1	AK39	1	AK54
10	STANDARD SHOE	1	AK2	1	AK24	1	AK34	1	AK40	1	AK55
11	RETAINING SPRING	1	AK6	1	AK32	1	AK41	1	AK32	1	AK69
12	REVERSING SHOE SPRING	2	AK4	2	AK25	2	AK25	2	AK42	2	AK57
13	TOP SPRING	1	AK8	1	AK26	1	AK26	1	AK47	1	AK58
14	BOTTOM SPRING	1	AK5	1	AK27	1	AK27	1	AK48	1	AK60
15	CABLE BRACKET TOP HALF	1	AK19	1	AK30	1	AK30	1	AK30	1	AK61
16	EYELET	1	AK20	1	AK29	1	AK29	1	AK29	1	AK62
17	BACK PLATE RH	1	AK17	1	AK21	1	AK36	1	AK45	1	AK63
18	REVERSING SHOE ASSY	/	AK23	/	AK78	/	AK35	/	AK46	/	AK64
19	BLANKING PLUG	/	/	/	/	/	/	/	/	2	AK65

For reference see diagram on page 7

F Series	A Series									
none	200 x 50					203 x 40				
4/100	4/4"	4/5 1/8"	5/6"	5/112	4/5 1/8"	4/100	5/6 1/8"	5/112	4/5 1/8"	4/100
17005	16855	12495	17491	11897	17484	11893	17492	13802	17485	12924
	11953	12101	12101	11953	11956	12101	11909	11953	11956	05704
	11956	12042	12042	11956	11956	12042	11909	11956	11956	05704
	N/A	833 & 834	871 & 872	869	868	869	868	869	868	869
	N/A	868	869	869	868	869	868	869	868	869
		1225	1225	1211	2834	2834	2834	2834	2834	2834
		2850	2849	2834	2834	2834	2834	2834	2834	2834
		8	8	25	25	25	25	25	25	25
		N/A	N/A	16136	16136	16136	16136	16136	16136	16136
		12404	12404	15082	15082	15082	15082	15082	15082	15082
		12438	12438	15829	15829	15829	15829	15829	15829	15829

AV/5	AV/5/200	AV/5/8
none	200 x 50	203 x 40
4/5 1/8"	4/5 1/8"	4/5 1/8"
16127	16124	16123
16915	16124	05442
11953	16124	05458
11956	16124	05458
N/A	833/834	871/872
N/A	868	869
	1211	
	2834	
	2834	
	25	
	16136	
	15082	
	15829	

No. 4						HUB TYPE
none	300 x 60	325 x 80	6/205			WHEEL SIZE
16103	16104	16103	16103	16104	16103	HUB
16104	16104	16103	16103	16104	16103	WHEEL STUD
16104	16104	16103	16103	16104	16103	WHEEL NUT
N/A	856 & 857	N/A	N/A	N/A	N/A	BRAKE AUTO LH/RH
N/A	858	892	892	892	892	BRAKE STD.
	1253					OILSEAL
	2845					INNER BEARING
	2844					OUTER BEARING
	30					SPLIT PIN
	16136					WASHER
	12913					AXLE NUT
	05567					HUB CAP

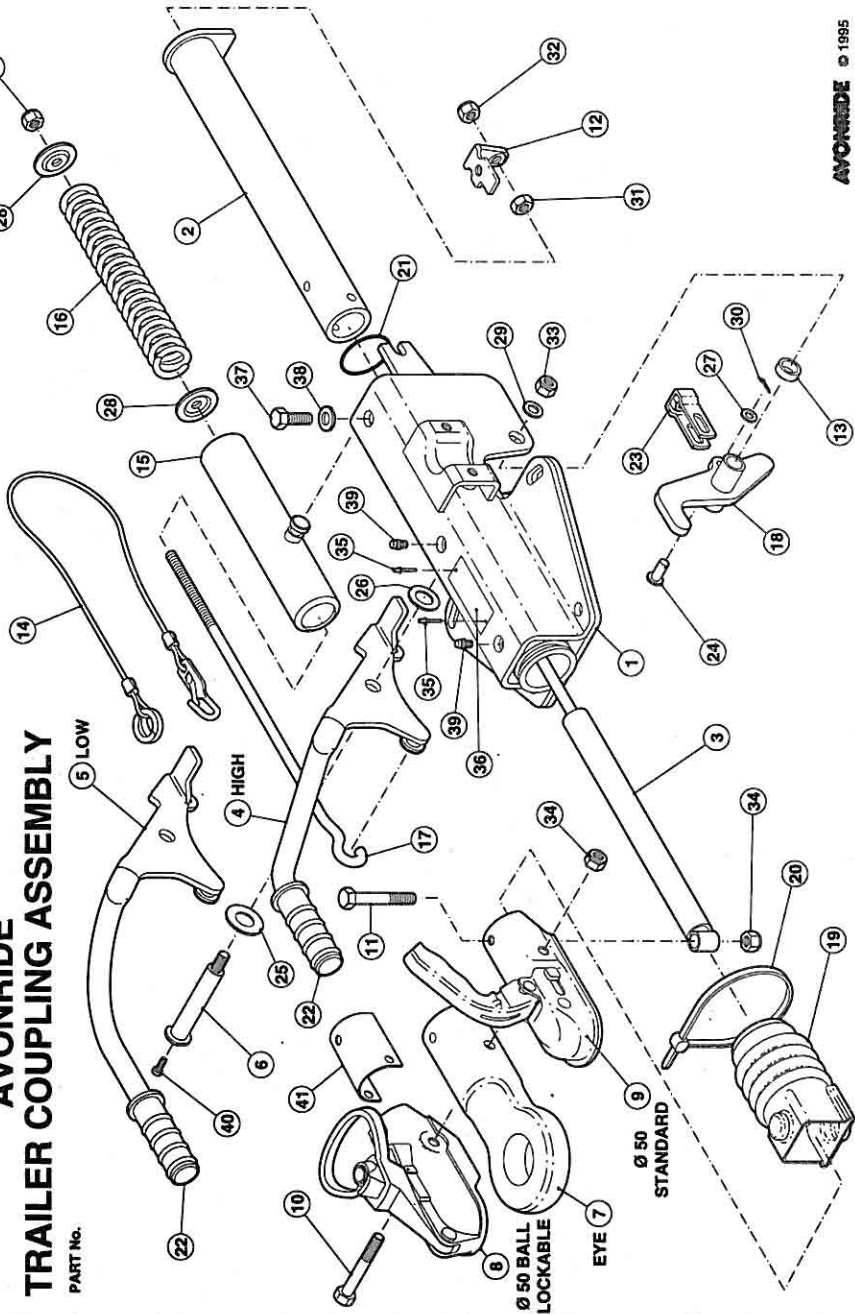
16149	16286	16148	16147	16433	16146	BRAKE DRUM
				16597	N/A	POLE WHEEL
				308		SCREW LONG
				335		SCREW SHORT
				145		NUT
				649		WASHER
				425	N/A	COUNTERSUNK SREW

ITEMS NOT SHOWN ON EXPLODED VIEW

31	LOCKING NUTS DOMED WASHER
32	BALANCE BAR
33	CABLE (STATE LENGTH BLACK OUTER)
34	CABLE LOCK NUTS

# AVONRIDE TRAILER COUPLING ASSEMBLY

PART No.



## **SPARES LIST COUPLING TYPE RANGE AV**

Refer to exploded drawing – Quote Coupling Serial No. (stamped on label) & order required component as itemised.

1. Body Assembly
2. Tube
3. Damper
4. High Handbrake Lever
5. Low Handbrake Lever
6. Pivot Bolt
7. Eye Version
8. Avonride Head
9. Standard Head
10. Head Fixing Bolt
11. Bolt
12. Damper Bracket
13. Spacer
14. Safety Cable
15. Energy Store Tube
16. Power Spring
17. Rod
18. Power Lever
19. Gaiter
20. Gaiter Strap
21. Rubber Buffer

22. Grip
23. Clevis
24. Clevis Pin
25. Washer
26. Nylon Washer
27. Washer
28. Spring Pack Washer
29. Spring Washer
30. Split Pin
31. Nut
32. Locknut
33. Locknut
34. Locknut
35. Rivet
36. Label
37. Damper Bolt
38. Lockwasher
39. Grease Nipple
40. Safety Screw 'X'
41. Spacer

## **ADJUSTMENT AND MAINTENANCE**

### **OVERRUNNING HITCH**

1. After approx 3000 miles (5000 km) at least once a year the system should be greased using a light duty grease to BS100V/10.
2. Reaction test, pull the handbrake lever as far as possible. Push the ball coupling as far back into the overrunning hitch as it will go. It should then push itself out due to the gas filled shock absorber.
3. Grease the ball coupling using light duty grease.

### ***Test for Brake Adjustment:-***

1. Apply handbrake with the trailer uncoupled from the towing vehicle.
2. With a steady force, push coupling head backwards into the coupling body – check distance moved, before meeting stop – if this distance exceeds 25mm or 1" then the wheel brakes should be adjusted. (If it moves back with little or no resistance the damper has failed.)

**NOTE:-** It is important to maintain brakes and carry out adjustment at regular mileage intervals – failure to do so could result in poor braking and damage to the coupling damper.

*\*Check control rods and cables under trailer move freely.*

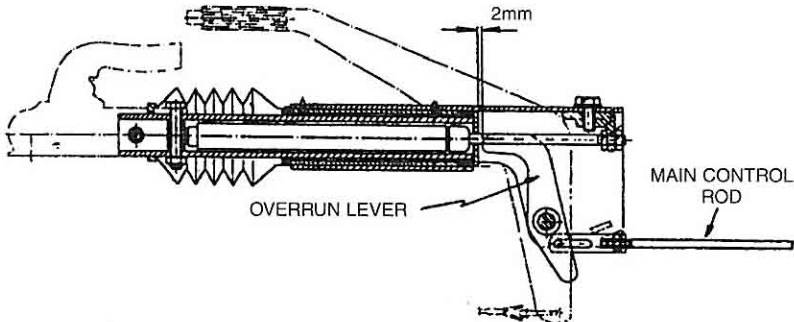
## **SETTING UP THE BRAKING SYSTEM USING A.V. TYPE COUPLINGS**

### ***Adjustment of Wheel Brakes***

Brake and coupling adjustment (to be carried out on level ground). Ensure handbrake is in the fully OFF position.

1. Jack wheels clear of ground.
2. Rotate wheels in forward direction (clockwise on right hand of trailer, anti-clockwise on left hand of trailer when used in the U.K.), and tighten adjustment nut (B) in a clockwise direction until hubs will no longer rotate. (see page 7).
3. Slacken adjustment nut until very slight resistance is felt between brakes and brake drum.
4. When adjusting the brakes, ensure that the shoes only just *touch* the inside of the brake drums. In order for the system to work correctly in the reverse mode, the brake drums must rotate in reverse sufficiently to disconnect and collapse the auto reverse shoe. The moving tube inside the coupling must continue to stroke fully and rest on a "stop" without re-applying the brakes. If the brakes are adjusted too tightly to the drums, then the coupling will again apply the brakes and prevent further reverse movement.

## Setting Over-Run System



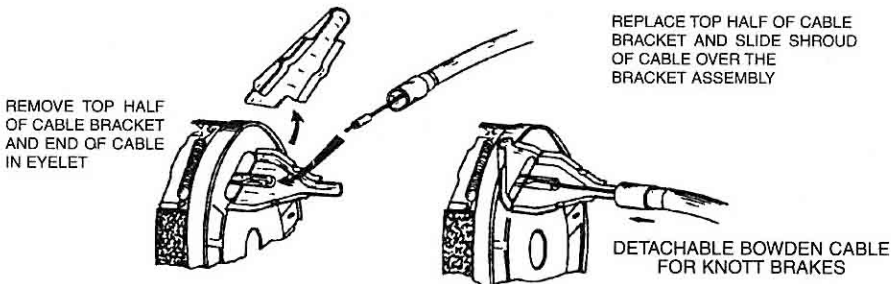
1. Ensure handbrake is in fully off position.
2. Adjust tension of brake cables and main control rod until a 2mm gap exists between the overrun lever and coupling drawbar as shown. Test run trailer for braking performance and reverse trailer to ensure brakes operate satisfactorily in 'Auto Reverse'.

## CHANGING WORN OR DAMAGED BRAKE CABLES

Changing brake cables on axles fitted with Knott or Lockheed brakes.

1. Check brake cable where it enters brake, if it ends in a collar that fits over the cable entry tube then the cables are of the detachable type.
2. To change the cable, remove the control mechanism at the centre of the axle, slacken and drop cable end from the centre axle bracket, detach cables as shown in diagram below.
3. To refit, reverse the procedure.

To change cables on the old type non-detachable brake, requires removal of the hubs to gain access to the cable ends. We would recommend returning the vehicle to the dealer or distributor in order to carry out the repair.





# TRAILER RUNNING GEAR FAULT DIAGNOSIS AND REMEDIES

## IDENTIFY POSSIBLE CAUSE, THEN REFER TO FAULT/REMEDY TABLE

★ LIKELY CAUSE ● MOST LIKELY CAUSE

SYMPTOM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Brakes over-heating	●	★		★	★	★		★			★	★				
Trailer failing to auto reverse	★	★	★		●	★		★	★			★	★		★	
Hand brake not working efficiently		★	★	★	●	★							★			
Brakes not working efficiently	★	★	★	●	★	★					★		★		★	
Brakes snatching	★	★	★	★	★	★				●			★		★	
Trailer "snaking"	★	★				★						●	★		★	
Trailer swerving to one side		★	★				★	★					★		●	★
Brakes remaining on after hand brake release	★	★	★				●	★					★			
Trailer failing to tow easily (resistance)	●	★		★	★	★			★				★			
Trailer brakes "jerkily"		★	★	★	★	★	★			●	★	★	★			

<b>FAULT</b>	<b>REMEDY</b>
<b>A</b> Brake Shoes – Adjusted too Tight, wheels difficult to rotate.	Reset brakes according to reset procedure.
<b>B</b> Brake Cable – Sticking, dirty, trapped or corroded.	Remove cables, clean, re-grease, fit to reset procedure.
<b>C</b> Brake Spring – Broken or dislodged.	Remove hubs, clean brakes and drums, refit new springs and brake shoes.
<b>D</b> Brake Shoes – Worn	Remove hubs, clean brakes and drums, replace brake shoes.
<b>E</b> Hitch – Incorrectly adjusted.	Follow adjustment procedure, as laid down.
<b>F</b> Cable linkage system incorrectly adjusted, sticking.	Remove linkages, cables, rods clean, refit, re-adjust linkage system.
<b>G</b> Cable System insufficiently supported or supports broken.	Re-fit flexible supports under trailer to reduce friction in system.
<b>H</b> Reversing Vehicle on slippery surface.	Use manual stop on over-run coupling if fitted.
<b>I</b> Hand brake left "on" or "partially on".	Ensure hand brake fully off – if vehicle has been driven extensively with hand brake on, remove hubs, check brakes and hub bearing – replace if damaged.
<b>J</b> Damper failure in coupling.	Return coupling to supplier for damper replacement.
<b>K</b> Coupling shaft jammed or damaged/Rusty.	Return coupling to supplier for repair/ replacement.
<b>L</b> Incorrect nose weight on trailer coupling.	Adjust load to give between 50 - 100 Kilos. "Nose-weight" on trailer coupling.
<b>M</b> Rust formation or hub grease in brake drum.	Remove hubs/drums – clean away rust, oil, refit. <i>Take care to avoid breathing brake-lining dust.</i>
<b>N</b> Brake shoe carrier rollers rusty, damaged/worn.	Remove hubs and brakes, clean carrier shoe with wire brush. Grease rollers with "copperslip" or similar material, refit and adjust.
<b>O</b> Brakes not equally adjusted on all wheels.	Jack up trailer – adjust.
<b>P</b> Wrong tyre pressures.	Check tyre pressures and correctly inflate to trailer manufacturer's recommendations.

# ***TYRE PRESSURES***

PRESSURE		TYRE SIZE	PRESSURE		TYRE SIZE	PRESSURE		TYRE SIZE
BARS	PSI		BARS	PSI		BARS	PSI	
2.3	33	5.20 - 10 4PR	3.25	47	7.50 - 14c 6PR	3.51	51	7.50 - 16c 6PR
2.4	35	145 SR 10	4.25	62	7.50 - 14c 8PR	4.00	58	7.50 - 16c 8PR
4.5	65	145 R 10c 8PR	3.75	54	165 R 14c6 PR	4.75	69	7.50 - 16c 10PR
2.3	33	5.20 - 13 4PR	3.75	54	175 R 14c 6PR	6.3	91	7.50 - 16 12PR
2.3	33	5.60 - 13 4PR	4.5	65	175 R 14c 8PR	4.00	58	7.50 R 16c 6PR
2.3	33	5.90 - 13 4PR	4.5	65	185 R 14c 8PR	4.50	65	7.50 R 16c 8PR
2.3	33	6.40 - 13 4PR	3.75	54	195 R 14c 6PR	6.3	91	7.50 R 16 12PR
3.25	47	6.70 - 13c 6PR	4.50	65	185 R 14c 8PR	6	87	4.00 x 8 - 8PR
2.4	35	145 R13	4.50	65	205 R 14c 8PR	3.5	50	5.00 x 10 - 6PR
2.4	35	155 R13	3.25	47	6.70 - 15c 6PR	4.5	65	145R 10C 8PR
2.5	36	165 R13	3.6	52	6.00 - 16c 6PR	6,2	90	180/70 R8
2.5	36	175 R13	3.25	47	6.50 - 16c 6PR	6,2	90	155/70 R12
2.9	42	155 R13 REIN	4.25	62	6.50 - 16c 8PR	8.25	120	6.00 x 9 - 12PR
3.75	54	175 R13c 6PR	5.00	73	6.50 - 16c 10PR	8.0	116	6.00 x 9 RAD
3.75	54	185 R13c 6PR	3.00	44	7.00 - 16c 6PR	8.0	116	225/75R 10 RAD
3.25	47	7.00 - 14c 6PR	4.00	58	7.00 - 16c 8PR	6.0	87	185/70R 13 RAD

# ***TRAILER RUNNING GEAR DETAILS***

Trailer Model	
Serial Number	
Year of Manufacture	
Hitch Number	
Brake Type	
Axle Number	
Axle Number	

We reserve the right to change specifications in the light of product improvements and/or changes in regulations.

# AVONRIDE



Certificate No. Q 6353  
Quality Approved to ISO 9002

TRAILER MANUFACTURER / AGENT