

## Maintenance & Servicing Information

### Advice for Spreadlever Brake Shoes, Hubs, Bearings & Bowden Cables

(For additional guidance and reference documents visit our website or scan the QR code below)

#### ! Precautions

The correct assembly and adjustment of all equipment is critical to the safe operation of the trailer. Therefore the procedures must only be carried out by competent persons. If you have any doubts about your ability to complete the procedure, we recommend this task is performed by your local service centre.

You are advised to wear suitable protective equipment such as safety glasses, gloves and face mask. In addition, be aware of the hazards associated with handling workshop materials such as chemicals, oils and greases, which may be flammable and can prove to be irritants.

It is recommended that the opportunity is taken to inspect associated items for wear or damage and replace if necessary. They can be obtained through your local stockist.

All procedures should be carried out with the trailer on level ground with either the parking brake applied or wheel chocks front and rear. In addition, the drawbar should be supported with the trailer horizontal. Where required consult your trailer handbook for the recommended jacking points and positions for stands.

The components are used in a wide variety of trailers and reference to the trailer manufacturer's manual must always be made for procedures and data relevant to the particular unit.

These instructions relate to:

- Spreadlever brakes 160 x 35, 200 x 50, 203.2 x 40, 250 x 40, 300 x 60
- Knott axles to 3500kg

The text includes guidance to assist in the safe execution of the procedures:

- **WARNING!** Risk of Injury.
- **CAUTION!** Risk of damage to equipment.
- **NOTE.** Safety requirement.

We have used "Plain English" descriptions throughout this text. If you are unsure of the meaning, if the procedure is unclear or you require any further information, please use the following contact details:-

Europa House, Second Avenue, Centrum 100, Burton Upon Trent, Staffs, DE14 2WF  
 ☎ +44 (0) 1283 531541  
 ✉ sales@knottuk.com



Spelter Site, Caerau, Maesteg, Mid Glamorgan, CF34 0AQ  
 ☎ +44 (0) 1656 739111  
 ✉ maestegsales@knottuk.com

## Spreadlever Brakes

### Replacing Brake Assembly Complete

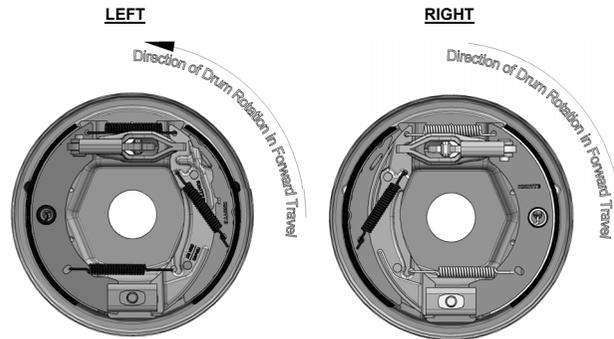
Brake assemblies and brake shoes must be replaced in axle sets.

1. Follow the procedure for REPLACING BRAKE SHOES items (1) to (7) inclusive, taking due note of the introductory warnings.
2. The brake assemblies are handed, check the new assembly against the one fitted noting the position of the brake cable attachment. Remove the four bolts securing the backplate to the axle, remove the old assembly and fit the new one in accordance with the torque figures specified in the trailer manufacturer's handbook.
3. Continue with the procedure for REPLACING BRAKE SHOES, commencing at item (18).
4. Follow the ADJUSTMENT procedure.

### Replacing Brake Shoes

Place the trailer on stands with all wheels free. **WARNING!** The handbrake should be released and the handbrake locking bolt fitted. Most couplings do not have provision for the locking bolt. In this case or if a bolt cannot be used the handbrake lever should be secured in the off position to prevent the handbrake lever operating. It is recommended that the brake shoes are replaced in axle sets.

1. Remove the wheels.
2. Remove the hub cap.
3. Slacken off the brake adjuster bolt until free. Some brake assemblies have a ratchet accessible through an aperture in the backplate instead of the bolt.
4. Remove the axle nut, this may be a castellated nut retained with a split pin or alternatively it may be a locknut.
5. Remove the brake drum (hub puller may be required) taking care not to displace the bearings. Do not use an airline to clean the drum. Carefully remove the dust using a small brush. **WARNING!** Avoid inhaling brake dust.
6. Check the condition of the brake drum, replace the drum if deep score-marks are visible or if drum wear is excessive. The maximum drum wear acceptable when fitting new brake shoes is +1.5mm on nominal diameter.
7. Undo the locknut on the brake rod (front to rear) adjacent to the compensator. Slacken the second nut on the brake rod. Remove the half shell from the backplate and detach brake cable.
8. **NOTE.** Record the orientation of the brake shoes and springs on the backplates to ensure that the new shoes and springs are replaced in the same position as the old.



9. With care and using a suitable lever, lift sliding shoe carrier away from expander. Extract expander and retain. **NOTE.** Auto adjust assemblies are supplied complete.
10. Remove brake shoe retaining spring taking care to retain the spring. Keep plate or pin at the rear of the backplate where fitted.
11. Lift off whole brake shoe assembly from backplate. Take care not to lose the two adjuster wedges.

12. Examine the components and springs, replace any damaged parts. Clean the mechanism and ensure that all parts are free to move. **NOTE.** Do not lubricate.
13. Re-fit springs to new shoes. Note the orientation arrow on the sliding shoe - this should be facing the direction of rotation when going forward.
14. Locate shoes onto the backplate and position onto the adjuster wedges or cam block.
15. Re-fit retaining springs.
16. Locate expander into position on fixed shoe.
17. With care, and using a suitable lever, position the expander between the shoes and release the lever.
18. Attach brake cable and refit the half shell. **NOTE.** Always replace the brake cables if they show sign of wear, stiffness, damage or fraying.
19. Re-fit the drum and bearing. **CAUTION!** Refer to the axle manufacturer or trailer manufacturer's instruction. Replace the split pin or lock nut dependent on which type of nut is used. Generally speaking if a split pin and castellated nut is fitted, the axle nut must be adjusted to allow the correct bearing clearance. When the locknut is used, it is normally tightened to a pre-determined torque.
20. Refit the hub cap.
21. Repeat the procedure on the other drum(s).
22. Replace wheels securing wheel nuts, as specified in the trailer manufacturer's handbook.
23. Follow the ADJUSTMENT procedure below.

### Adjustment

**NOTE.** When adjusting the brake drum only turn the wheel in the direction of forward rotation.

This procedure applies to the initial setting of both manual and auto adjust brakes and to regular adjustment of manual adjust brakes.

Ensure that the coupling drawtube is fully extended and that there is no tension in the brake rod or cables. Ensure free movement of the overrun lever (brake rod clevis).

1. Turn each wheel in the direction of forward rotation. Turn the brake adjuster bolt clockwise until some resistance is felt as the brake shoes begin to grip the drum, then slowly turn the brake adjuster bolt anticlockwise until the wheel begins to rotate freely again. Alternatively, advance the adjuster using a screwdriver through the backplate hole until resistance is felt, then turn back by a few clicks until the wheel begins to rotate freely again.
2. Turn the nut on the brake rod until the nut is in contact with the compensator. **CAUTION!** Do not over-tighten as this will cause the brakes to drag and overheat.
3. **WARNING!** Double check that everything has been re-assembled with all fasteners secure. Remove the handbrake locking bolt and operate the handbrake several times to ensure that the compensators are seated. Check the travel of the individual brake cables. This should be 2-5mm. If not re-adjust the brake as appropriate.
4. With the handbrake engaged, turn each wheel in the reverse direction. They should turn a little and then lock as the auto-reverse mechanism operates. **NOTE.** As each wheel is turned there will be a rearward movement of the handbrake lever as the energy store operates. This action should occur once on the rearward turn of each wheel. If any wheel fails to lock there is too much slack in the system. Observe free movement of the handbrake lever.
5. Check the compensators are at 90° to the brake rod with the brakes applied in forward and reverse. Misalignment can be corrected through adjustment of the cable locking nuts. This is particularly important if a new cable has been fitted.
6. Operate handbrake and leave on. Lower the trailer to the floor and recheck the torque of the wheel nuts.
7. Please note the brakes will not be 100% effective until the new linings have bedded in.
8. The brake adjustment should be rechecked after a short journey. **WARNING!** The drums may be hot.
9. It is not necessary to make any adjustments, simply rotate the coupling/eye to its limits to ensure that the natural position of the bellows is with the head horizontal.



## Hubs & Bearings

These instructions refer to the Knott bearing arrangements, although others are similar. Always refer to the trailer manufacturer's handbook.

There are many varieties of hub bearing / seal arrangement, usually specific to each manufacturer. However, these fall into two types; separate bearings (taper roller or angular contact ball races) which are assembled with some clearance and unitised bearings which are a single bearing and are assembled using a high torque locking nut.

**WARNING!** Be aware that a bearing failure in service results in a catastrophic failure with a high possibility of the wheel becoming detached from the stub with obvious potential consequences. Always err on the safe side and replace suspect components.

Place the trailer on stands with all wheels free. The handbrake should be released and in the fully open position.

### Hub / Drum Removal

1. Assess the condition of the bearing by rocking the road wheel to see if there is play in the bearing, then spin the wheel rapidly and listen for a rumbling sound which indicates pitting of the races.
2. Remove the wheels and hub cap. Slacken off the brake adjuster if needed.
3. Remove the grease cap by carefully prying progressively around the flange of the cap.
4. For installations with a castellated nut and split pin, remove the pin, nut and, where fitted, washer.
5. For installations with a high torque nut unscrew the nut. **WARNING!** High forces are needed; ensure that the trailer is stable.
6. Remove the brake drum (hub puller may be required and adjustment may require slackening) taking care not to displace the bearings.
7. Once the linings are exposed take extreme care to avoid contaminating them and the friction face of the drum with grease as this will impair braking performance.

### Bearing Inspection

#### Hubs with separate bearings:-

1. Wash grease and oil from the bearing with a suitable solvent; inspect each roller, inner and outer races. If any pitting, damage or corrosion is present then the bearing must be replaced. **NOTE.** If any one part shows damage or wear we always recommend replacing all bearings in the hub and fitting a new oil seal.
2. Using a brass drift carefully drive out the outer races working around the circumference. **WARNING!** Be sure to wear safety glasses when removing or installing force fitted parts. Failure to comply may result in eye injury.
3. Clean the hub and carefully tap in the new bearing outer races with a brass drift. Be sure they are seated against the shoulders.
4. Grease the bearings and fit with a new seal. Force grease into the bearing between each roller; apply a light coat of grease to the bearing races. Refer to the trailer manual for grease specification. **CAUTION!** Do not fill the cavity between the bearings, this is not necessary and can lead to grease leaking from the seals onto the brake linings.

Recommended grease is Shell Retinax EP2. Bearings should be lubricated every 12 months or 12,000 miles.

#### Hubs with unitised bearings:-

1. Unitised bearings used in Knott hubs are a single non-adjustable lubricated for life assembly with integral seals. If the check in (1) above indicated excess play in the bearing then the bearing should be pressed/drifted out having removed the circlip and replaced.
2. The new bearing should be pressed/gently drifted into place ensuring that it remains square to the bore and seats against the shoulder, the circlip is then re-fitted.

### Seal Inspection & Replacement

1. Installations with separate bearings have a seal on the inside end to retain grease.
2. Whenever the hub is removed inspect the seal to ensure that it is not nicked or torn and is still capable of properly sealing the bearing cavity. If there is any question that it may be in poor condition, replace the seal.
3. To replace the seal, pry the seal out of the hub with a screwdriver. **WARNING!** Never drive the seal out with the inner bearing as you may damage the bearing.
4. Tap the new seal into place using a clean wood block. Very lightly lubricate the seal face with grease.
5. Unitised bearings have an integral seal which is less prone to damage and is not replaceable. If failure is suspected, the whole bearing must be replaced.

### Drum Inspection

1. Check the condition of the brake drum.
2. Replace the drum and bearing if deep score marks are visible.
3. Do not use a compressed air line to clean the drum. Carefully remove the dust using a small brush or brake cleaner. **WARNING!** Avoid inhaling brake dust.

### Bearing Adjustment & Hub Replacement

#### Refitting taper roller hubs with castellated nut and split pin:-

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. (69Nm).
2. 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. **NOTE.** Always use new 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.

#### Refitting unitised bearing hubs with high torque nut:-

1. Fit the drum to the axle shaft and tighten the nut to the correct torque (280 Nm as specified inside the dust cap for Knott-Avonride hubs). **WARNING!** Other manufacturers' figures differ; refer to the trailer manufacturer's handbook if there is any uncertainty. **NOTE.** The nut may only be used twice, therefore, if the history is not known it must be replaced.
2. Refit the hub cap and replace wheels securing wheel nuts as specified in the trailer manufacturer's handbook. Confirm that there is no excessive play at the wheel rim.

After the first 1000km wheel bearings should be checked for excessive end float.

### Wheel Studs

1. Remove hub, as detailed above.
2. Place hub on flat surface with studs showing up, and gently tap out studs.
3. Invert hub on raised surface, allowing room for new studs to be knocked through.
4. Align ribs on new wheel studs with grooves in stud holes.
5. Gently tap in studs using brass drift to protect studs.

### Wheel Nuts

1. Replace worn wheel nuts as necessary.
2. **NOTE.** Tighten up to wheel manufacturer's recommended torque (if in doubt consult supplier).
3. We recommend that once the hubs have been refitted that the brakes are adjusted – please refer to the ADJUSTMENT section of this document.

## Bowden Cable

### Removal & Replacement

Place the trailer on stands with all wheels free.

**WARNING!** The handbrake should be released and the handbrake locking bolt fitted. Some couplings do not have provision for the locking bolt. In this case or if a bolt cannot be used the handbrake lever should be secured in the off position to prevent the handbrake lever operating.

1. Undo the locknut on the brake rod (front to rear) adjacent to the compensator. Slacken the second nut on the brake rod.
2. Remove the nut from the cable inner and the nut retaining the outer to the bracket. Take note of any washers and orientation of domed nuts. Remove the half shell from the backplate and detach brake cable. Withdraw the cable assembly.
3. Attach the new brake cable to the expander in the hub and refit the half shell.
4. Thread the new cable into position, secure the outer with its nut and thread the nut on the inner to approximately the position noted on the old cable.

**NOTE.** This procedure covers just the replacement of the Bowden cable. We would always recommend that a full brake adjustment is carried out including hub adjustment.

## Wheel Nut / Bolt Torque Settings

Wheel Nuts, Bolts and Flat Collar Type					
Seating	Thread Size	Grade	Radius/Angle	Torque (Nm)	A/F (mm)
Spherical	M12x1.5	8.8	R12	90	19
Spherical	M12x1.5	8.8	R14	90	19
Conical	M12x1.5	8.8	60°	90	19
Spherical	M12x1.5	10.9	R12	120	19
Spherical	M12x1.5	10.9	R14	120	19
Conical	M12x1.5	10.9	60°	130	19
Spherical	M14x1.5	8.8	R12	200	19
Spherical	M14x1.5	8.8	R14	170	19
Conical	M14x1.5	8.8	60°	160	19
Spherical	M14x1.5	10.9	R12	280	19
Spherical	M14x1.5	10.9	R14	240	19
Conical	M14x1.5	10.9	60°	220	19
Conical	M16x1.5	8	60°	190	27
Flat Collar/Washer	M18x1.5	8	R16	260	24