Justification:
Safety Instruction

(Maintenance)

Private Owner Circular Letter 654 Issue 3

Title

Checking the correct functioning of Haldex/SAB AA1 Automatic Brake Slack Adjusters

AUTHORISATION

Authorised by:

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1. INTRODUCTION

NIR 2612 (Complete) identified that three wagons ran away and derailed because the handbrake failed. The handbrakes were cable operated and the wagons were fitted with three-piece bogies (Gloucester and Davies & Lloyd) equipped with SAB disc braked units Type 36 and AA1 automatic slack adjusters. Upon investigation it was found that the handbrakes did not apply the required disc pad load.

Following the issue of RAIB Report 07/2011, dated March 2011 'Runaway and derailment of wagons at Ashburys on 4th May 2010', the instruction was amended to fully address Recommendations 3 and 5.

POCL 654, Issue 3 has been produced to make it clear that the instruction applies to all wagons equipped with Haldex/SAB AA1 automatic slack adjusters i.e. both bogie and two-axle wagons with handbrakes operated by either a cable or mechanical linkage.

2. INSTRUCTION

All wagons equipped with Haldex/SAB AA1 automatic slack adjusters shall be checked at the handbrake end at PPM and VIBT as follows:

a). Wagons with SAB disc braked units Type 36 and AA1 automatic slack adjusters.
Either tighten the handbrake manual adjuster screw down to its minimum size to give a gap of 76mm (3") between the head of the screw and the abutment plate or remove the adjuster screw completely as this ensures a gap of 76mm. Ensure that all the associated mechanical linkages and handbrake cable (where fitted) are free (Figures 1 and 2).

b). All wagons with AA1 automatic slack adjusters
Examine the slack adjuster and check that the plastic grommet in the anchor bracket is in place, is not worn or damaged (Figure 3) and that the anchor bolt is not worn. Further checks of the slack adjuster are contained in the VOSA Guide (VOSA/PSP/1111/March 05) 'A guide to the maintenance and assessment of automatic slack adjusters'. Appendix A is an extract from this document that shows the additional checks (applicable to rail wagons) that shall be carried out on each slack adjuster.

Carry out an air brake test to ascertain that any Haldex/SAB AA1 slack adjuster at the handbrake end is working correctly (i.e. taking up any excess brake block/pad clearance) and that each slack adjuster anchor bracket is securely held in position by the anchor bolt.

Check that the brake block/pad gap (as specified in the Maintenance Plan) is correct.

Apply and then release the handbrake to ensure that the number of handbrake turns is correct (as specified in the Maintenance Plan), the handbrake indicator is functioning correctly and that the brake blocks/pads are firmly applied.

If there is any indication that the brake blocks/pads are not being firmly applied or there is any suspicion that the handbrake is not effective then further investigations shall be carried out to rectify any defects in the brake system or the brake slack adjuster renewed.

3. SCOPE

This document applies to all wagons fitted with Haldex/SAB AA1 automatic slack adjusters.

4. IMPLEMENTATION

This document shall be implemented immediately and the incorporated into the relevant Maintenance Plans.

In the event of any query arising or clarification required, please contact:

Senior PWRA Engineer
PWRA Management Group
Room 203 Derwent House
rtc Business Park
London Road
Derby
DE24 8UP

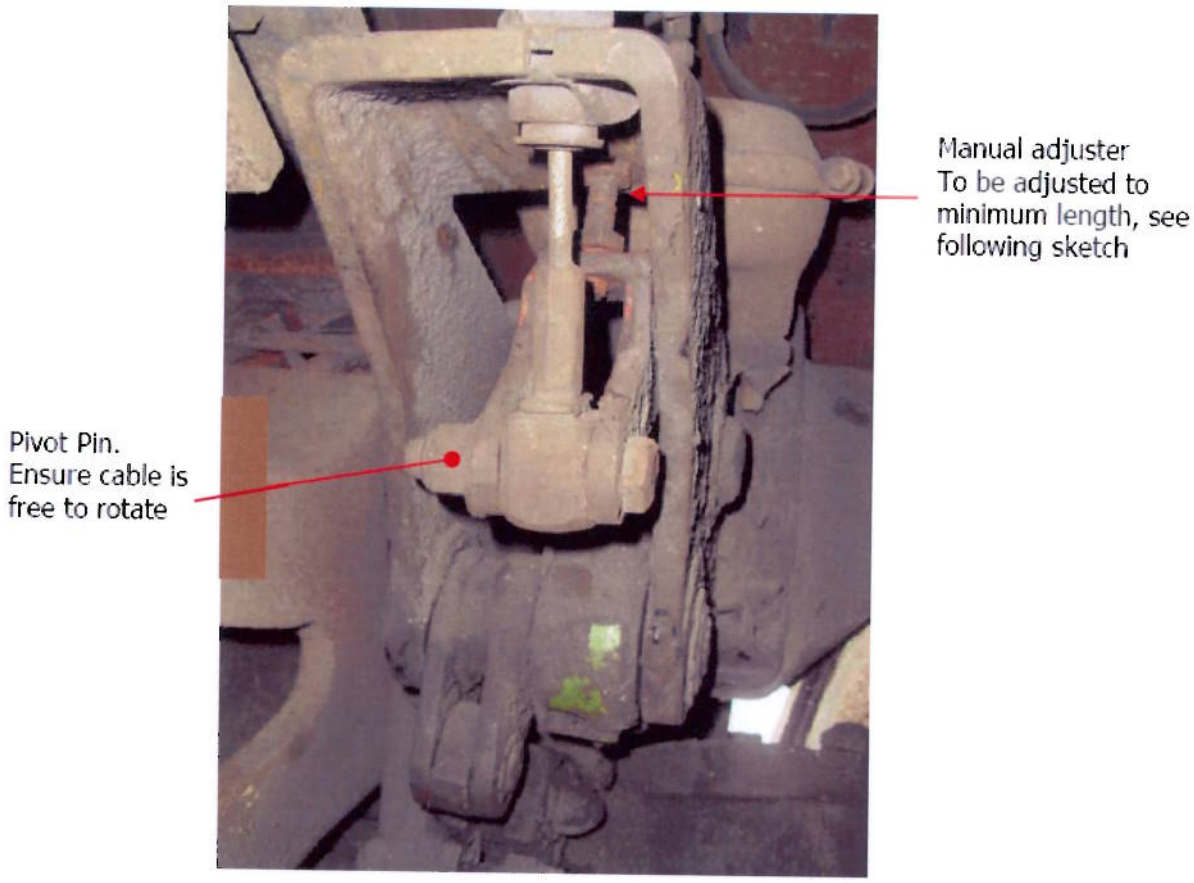


Figure 1 Cable operated handbrake mechanism and manual adjuster

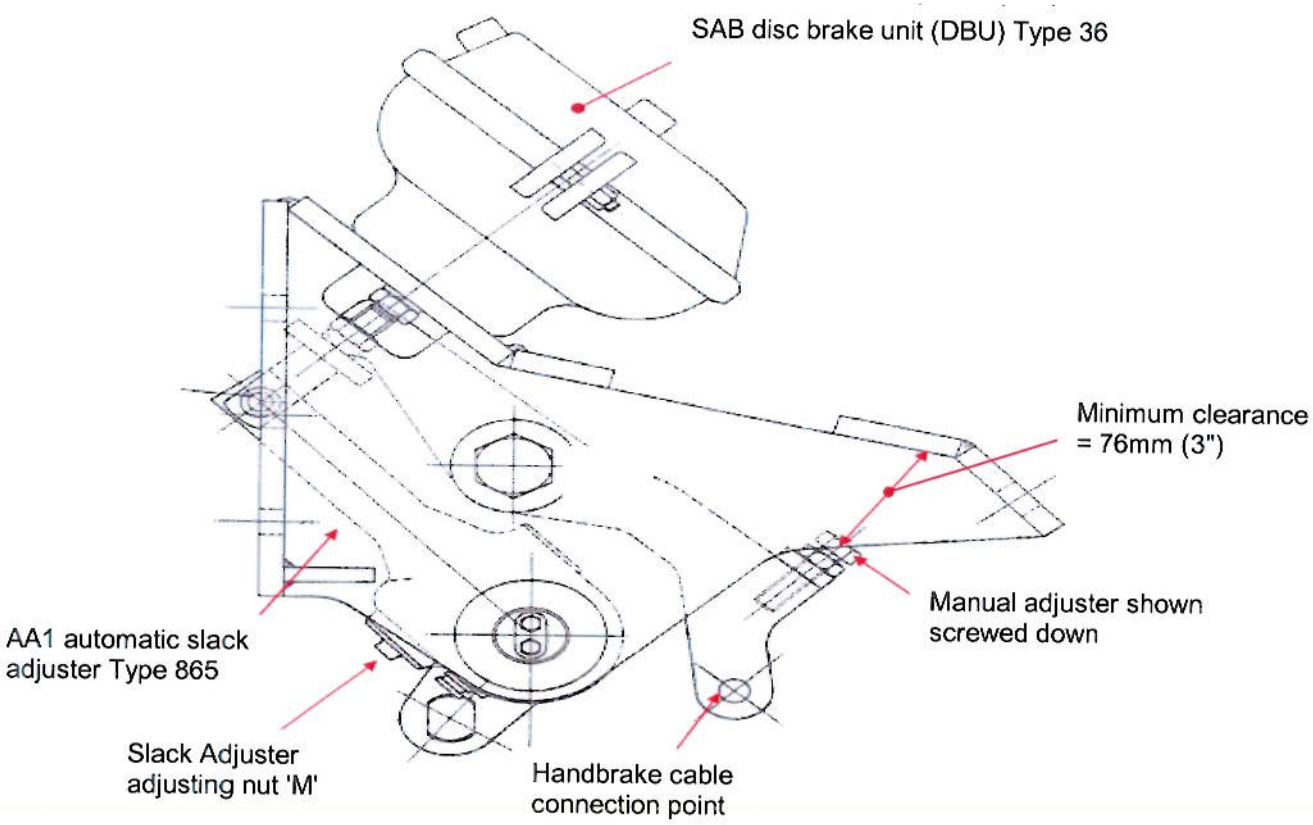


Figure 2 Diagram of SAB disc brake unit mounting and Haldex/SAB automatic slack adjuster

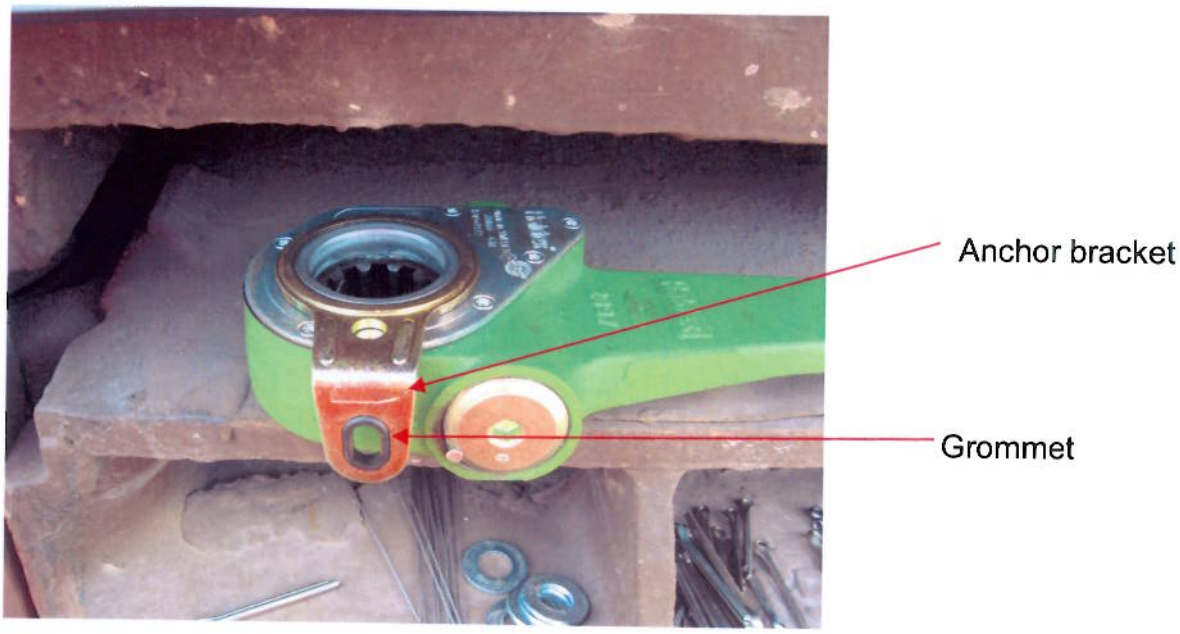


Figure 3 Slack adjuster anchor bracket and grommet

Appendix A

Additional checks for Haldex/SAB AA1 automatic slack adjusters

1). Check the control arm bracket and yokes for cracks or bending as well as broken bolts. Such defects indicate that the adjuster has either been incorrectly fitted or the camshaft bearing is worn.

2). Check that the adjuster returns fully without any fouling.

3). Once a year, slacken off the hexagon screw on the end with a torque wrench. If the required torque to achieve this is below 18Nm (or no clicking is heard) the unit shall be replaced.

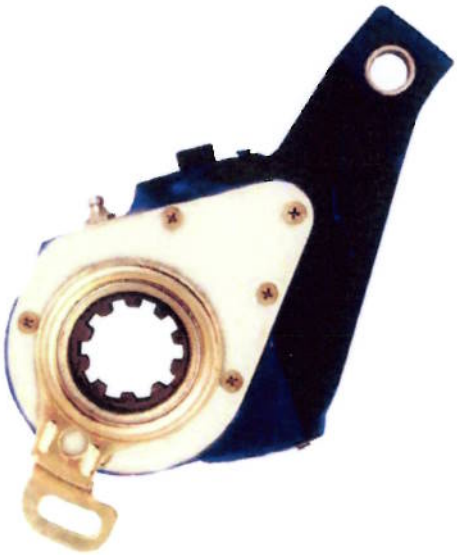
4). Leave a spanner on the unit and either apply the brakes, or move the adjuster manually five times and observe the clockwise movement of the 12mm spanner with each further stroke until no further adjustment takes place.

5). Remove the spanner.

Note: Haldex/SAB AA1 automatic slack adjusters should never need to be manually adjusted in service.

VOSA
Vehicle & Operator Services Agency

A guide to the maintenance and assessment of Automatic Slack Adjusters



Automatic Slack Adjusters (ASA's) come in two basic types:

- **Clearance Sensing** (Haldex, Knorr Bremse and ArvinMeritor/ ROR)
- **Stroke Sensing** (BPW and Wabco)

It is important to be able to recognise the type and also to know when the unit should be replaced. It is a requirement that all HGV's, Trailers & PSV's over 3.5T from 1995 are fitted with ASA's and that they are working correctly. If they only work through regular manual adjustment, they are not functioning as automatic slack adjusters and therefore are not complying with the requirement. They are subject to wear and will need regular assessment and replacement as necessary.

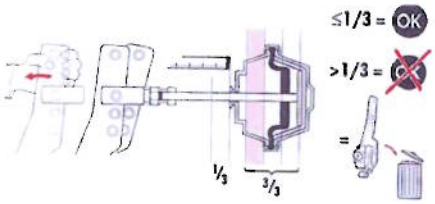
Haldex Clearance Sensing Automatic Slack Adjuster

The following is a guide to best practice, if in doubt contact the manufacturer for more information. It is particularly important to follow manufacturer's instructions on installing.

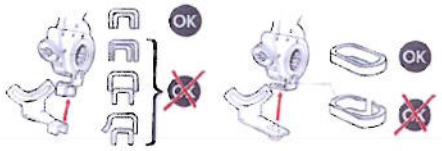
Clearance Sensing

In addition to greasing, there are some simple checks that can be carried out.

- The stroke 'Free Travel' should not be more that 1/3 of the total chamber travel but there must be some, to permit automatic adjustment.

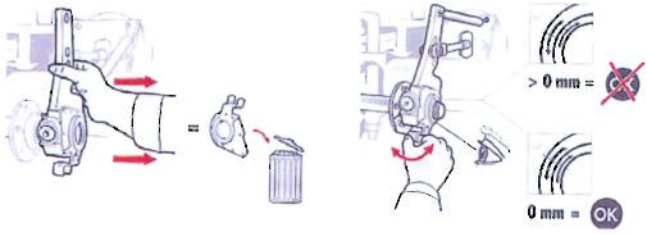


- Check the control arm bracket and yokes (if fitted) for cracks or bending as well as broken bolts. (This indicates that the adjuster has either been incorrectly fitted or the camshaft bearing is worn).

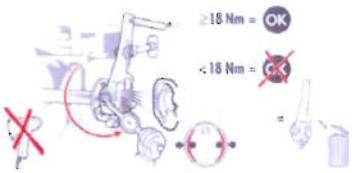


- Check also that the adjuster returns fully without any fouling.

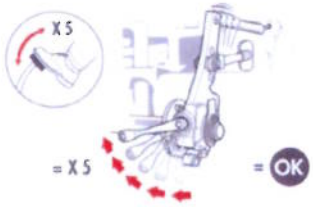
- Check for 'end float' and for cam shaft bearing wear: they should both be minimal.



- Once per year, slacken off the hexagon screw on the end with a torque wrench. If the required torque to achieve this is below 18 Nm, or no clicking is heard the unit should be replaced.



- Leave a spanner on the unit and either apply the brakes, or move the adjuster manually (x5), observe the clockwise movement of the 12mm spanner with each further stroke until no further adjustment takes place.



- The stroke should be equal on both sides of any axle. (If they require regular adjustment, they need replacing). Adjusters that 'over-stroke' should also be replaced.

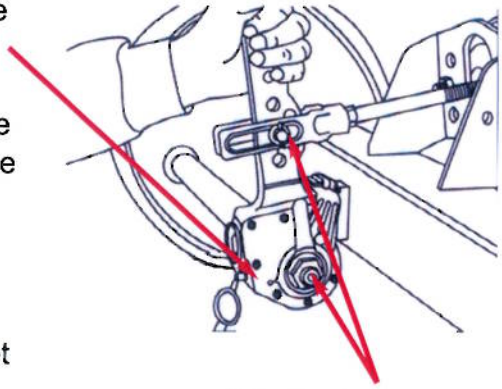
Automatic Slack Adjusters should never need to be manually adjusted in service.

Stroke Sensing

(Mainly BPW and Wabco at present but other manufacturers have previously used this principal.)

BPW Stroke Sensing Automatic Slack Adjuster

- With brake off, check that the pin aligns with the reaction bracket pointer.
- Check that there is some free play, at least 10% of 'Effective Lever Length'.
- Check that there is no excessive movement.
- As with 'Clearance Sensed', check the control arm bracket and yokes for cracks or bending as well as the camshaft bearings for excessive wear.



'Effective Lever Length'

- Check also that the adjuster returns fully without any fouling (there should normally be an auxiliary, external return spring fitted – not shown).
- Periodically, slack off the adjusting bolt 3/4 of a turn. This should now result in at least 50mm of free play. Manually operate the push rod and observe the adjusting bolt taking up the clearance. Reset minimum clearence to 10% of 'effective lever length'.
- Check for obvious over-stroking at full application. (i.e. pushrod strokes of 60 - 70mm).
- The stroke should be equal on both sides of any axle. (If they require regular adjustment, they need replacing). Adjusters that 'over-stroke' should also be replaced.

Automatic Slack Adjusters should never need to be manually adjusted in service.

The above is a guide to best practice, if in doubt contact the manufacturer for more information. It is also important to follow the manufacture's instructions when installing.

For additional information contact: www.vosa.gov.uk

VOSA acknowledges the kind co-operation and assistance in producing this leaflet (and the provision of photographs) from the following: Haldex, Knorr Bremse, ArvinMeritor, BPW Ltd, WABCO, Crane Freuhauf Trailers, VOLVO and Dennis.

An executive agency of the Department for **Transport**

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