ESR 0221

A7/B7 LOCOMOTIVE BRAKE EQUIPMENT TEST

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Document control

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<th>Date</th>
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<td>(RSS 0221) 1.0</td>
<td>August 2007</td>
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Summary of changes from previous version

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<td>NOTE – If the final document is small enough for the ‘Contents’ and ‘Document control’ to fit on one page remove the page break between the existing pages 2 and 3. HOWEVER if the ‘Document control’ page carries over to a second page separate pages must be used for ‘Contents’ and ‘Document control’</td>
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1 Scope

This standard sets out the minimum requirements for the testing of the A7 and B7 automatic and independent brake on 48 class locomotives.

2 General

This instruction is to be followed when maintenance staff carry out automatic and independent brake tests during scheduled inspections. It is also to be used when rolling stock personnel are required to check locomotive brake equipment following any irregularity or incident where braking was, may have been or has been claimed to be a contributing factor.

When conducting this test the tick sheet on pages 10 and 11 of this standard should be filled out. However, where a maintenance area has another system to record brake tests, then that system may be used in place of the tick sheet.

This test is to be carried out in conjunction with ESR 0222 Testing of vigilance control equipment.

This instruction covers the following tests:

- Set up
- Check pressures
- Number 3 pipe leakage
- Number 4 pipe leakage
- Brake pipe leakage
- Minimum reduction - automatic brake
- Independent release
- Full Service - automatic brake
- Dynamic/regenerative brake test
- Full release - automatic brake
- Emergency - automatic brake
- Flowmeter
- Emergency cock
- Power knockout switch test

Notes:

- Ensure that the locomotive is secured before carrying out this test.
- Check all isolating cocks, switches and circuit breakers are in their correct position and the compressor is running.
- For part 6 the main engine will need to be running.
- Vigilance will have to be acknowledged.
When first charging the brake system, and when recharging the brake pipe after an emergency brake application, allow at least 2 minutes to ensure the control reservoir is fully charged to brake pipe pressure.

The independent brake valve is different for A7 and B7 equipment. Refer to diagrams 1 and 2 for the handle operating positions for A7 and B7 brake valves.

Figure 1 – A7 brake valve handle positions

Figure 2 – B7 brake valve handle positions
3 Safety first

Ensure spring parking brakes or handbrakes are applied and chock locomotive if necessary.

Ensure that there are no staff working in the vicinity of the locomotive as movement of the locomotive may occur.

4 Set up:

- Independent handle - Application position
- Automatic handle - Running
- Brake valve isolating cock - Open

Note: The vigilance control system will require acknowledging during the test.

Place the reverser in FORWARD or REVERSE to enable the vigilance control to be acknowledged.

5 Check pressures:

- Brake pipe - 500 kPa
- Equalising reservoir - 500 kPa
- Main reservoir
  - compressor cuts in at: - 750 kPa
  - and cuts out at: - 850 kPa
- Brake cylinder - 325 kPa

Note: Brake pipe and equalising reservoir standard pressure is 500 kPa and it is assumed that this is the set pressure for the following tests.

6 Number 3 pipe leakage

For A7-EL equipment

Move independent handle to LAP

For B7-EL equipment

Move independent handle quickly to HANDLE OUT

Check: Brake cylinder pressure - not to exceed 7 kPa/min leakage
7  Number 4 pipe leakage
   For A7-EL equipment
   Move independent handle to Full RELEASE (for at least 10 seconds)
   Move independent handle quickly to LAP – wait 60 to 60 seconds.)
   Move independent handle to RUNNING

   For B7-EL equipment
   Move independent handle to RELEASE
   Depress independent handle to INDEPENDENT RELEASE (for at least 10 sec.)
   Move independent handle quickly to HANDLE OUT - wait 30 to 60 seconds
   Move independent handle quickly to RELEASE

   Check: a blow of air from independent brake valve. This will indicate that the leakage rate of the No 4 pipe is satisfactory. If a blow of air cannot be heard repeat test but after the 30 to 60 seconds leave cab and open a No. 4 hose coupling cock checking for a blow of air.

8  Brake pipe leakage
   Close brake valve isolating cock
   Check: brake pipe leakage - not to exceed 15 kPa/min for a single locomotive
   Brake pipe buildup - none allowed
   Open brake valve isolating cock

9  Minimum reduction - automatic brake
   Move automatic handle to LAP
   Check pressures:
   Brake pipe - drops 50 kPa
   Equalising reservoir - drops 50 kPa
   Brake cylinder - rises 50 - 125 kPa & BC lamp illuminates
   Note: Once initially stabilised the pressures must not vary by more than 15 kPa/min.

10 Independent release
   For A7-EL equipment
   Hold independent handle in Full RELEASE (for 4 seconds)
For B7-EL equipment
Depress independent handle to operate INDEPENDENT RELEASE (for 4 seconds)

Check pressures:
- Brake pipe: no change
- Equalising reservoir: no change
- Brake cylinder: reduces to zero

Note: Ensure brake does not re-apply

Move automatic handle to RUNNING

11 Full Service - automatic brake
Move automatic handle to SERVICE and make a FULL SERVICE application (reduce ER and BP to about 325 kPa)

Check: Brake cylinder pressure - 350 kPa or above

Move automatic handle to LAP

12 Dynamic/regenerative brake test (where applicable)

Automatic brake interlock
Place: Reverser - FORWARD or REVERSE
- Generator field circuit breaker: OFF

Move dynamic/regenerative brake handle to BRAKING

Check:
- Diesel engine: speed increases
- Brake cylinder pressure: reduces to zero

Move independent handle to FULL APPLICATION

Check:
- Brake cylinder pressure: 325 kPa (Independent Brake must always be available)

Move Independent handle to RELEASE

Move automatic handle to SERVICE - reduce brake pipe pressure to below 250 kPa.

Check:
- Diesel engine: returns to idle
- Brake cylinder pressure: re-applies
Move dynamic/regenerative brake handle to OFF

13 Full release - automatic brake
Move automatic handle to FULL RELEASE
Check:
- Brake pipe - pressure increases
- Equalising reservoir - pressure increases
- Warning port - audible blow of air
- Brake cylinder - Releases at a retarded rate
Move automatic handle to RUNNING
Check:
- Brake cylinder - releases at a quicker rate

14 Emergency - automatic brake
Move automatic handle to EMERGENCY
Check pressures:
- Brake pipe - quickly reduces to zero
- Equalising reservoir - reduces to zero
- Brake cylinder - 350 kPa or above

15 Flowmeter
Move automatic handle to RUNNING
Check:
- Flowmeter - operates audibly and visually

16 Emergency cock
Move driver's brake valve isolating cock to EMERGENCY
Check:
- Brake pipe pressure - reduces quickly and substantially and the brakes apply
Return driver's brake valve emergency cock to the CUT IN position.

17 Power knockout switch test (PCS)
Ensure that generator field circuit breaker is still OFF
Move independent brake handle to APPLICATION
Move throttle to notch 3
Move automatic handle to SERVICE.

**Check:**
- When brake pipe pressure drops to 250 kPa.
- Engine speed returns to idle

Move automatic handle to RUNNING.

**Check:**
- When brake pipe pressure increases to 350 kPa.
- PCS is heard to operate.
- Engine speed remains at idle

Move throttle to OFF
Move throttle to notch 3

**Check:**
- Engine speed - revs up

Move independent brake handle to APPLICATION
Move throttle handle to OFF

**Test is complete**

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18 Referenced standards

18.1 RailCorp standards

ESR 0222 Testing of vigilance control system
**A7/B7 Locomotive brake equipment test - Tick sheet**

[Place a tick in the boxes provided if test passed; figures in brackets indicate correct values in kPa; Numbers "1" and "2" refer to the readings at each end of the locomotive]

1. **Locomotive number:** ___________  
   **Date:** ___________  
   **Name of tester:** __________________________

2. **Check pressures:**
   - **Brake pipe:**
     1. _______  
     2. _______ kPa (500)
   - **Equalising reservoir:**
     1. _______  
     2. _______ kPa (500)
   - **Main reservoir:**
     1. _______  
     2. _______ kPa (750-850)
   - **Brake cylinder:**
     1. _______  
     2. _______ kPa (325)

3. **Number 3 pipe leakage:**
   - **Brake cylinder leakage:**
     1. _______  
     2. _______ kPa/min
   (not to exceed 7 kPa/min)

4. **Number 4 pipe leakage:**
   - **Blow from independent brake valve:**
     1: ☐  
     2: ☐

5. **Brake pipe leakage:**
   - **Brake pipe leakage:**
     1. _______  
     2. _______ kPa/min
   (not to exceed 15 kPa/min)
   - **Brake pipe build-up (none allowed):**
     1. _______  
     2. _______ kPa/min

6. **Minimum reduction - automatic brake:**
   - **Equalising pressure drop:**
     1. _______  
     2. _______ kPa (50)
   - **Brake pipe pressure drop:**
     1. _______  
     2. _______ kPa (50)
   - **Brake cylinder rise:**
     1. _______  
     2. _______ kPa (50-125)
   - **Brake cylinder lamp working:**
     1: ☐  
     2: ☐

7. **Independent release:**
   - **Equalising pressure change:**
     1. _______  
     2. _______ kPa (500)
   - **Brake pipe pressure change:**
     1. _______  
     2. _______ kPa (500)
   - **Brake cylinder pressure:**
     1. _______  
     2. _______ kPa (0)

8. **Full service automatic brake:**
   - **Brake cylinder pressure:**
     1. _______  
     2. _______ kPa (350)
9 Dynamic /regenerative brake test:

a) Braking:
Diesel engine speed increases
1: □ 2: □
Brake cylinder pressure 1: _______ 2: _______ kPa (0)

b) Independent full application:
Brake cylinder pressure 1: _______ 2: _______ kPa (325)

c) Handle Off:
Diesel engine returns to idle 1: □ 2: □
Brake cylinder pressure (reapplied) 1: _______ 2: _______ kPa

10 Full release - automatic brake

Release:
Equalising reservoir pressure 1: _______ 2: _______ kPa
(pressure increased)
Brake pipe pressure 1: _______ 2: _______ kPa
(pressure increased)
Blow of air at warning port 1: □ 2: □
Brake cylinder retarded release 1: □ 2: □

Running:
Brake cylinder quickly released 1: □ 2: □

11 Emergency - automatic brake:

Equalising reservoir pressure 1: _______ 2: _______ kPa (0)
Brake pipe pressure 1: _______ 2: _______ kPa (0)
Brake cylinder 1: _______ 2: _______ kPa (350 - 400)

12 Flowmeter operation:
Audibly and visibly operating 1: □ 2: □

13 Emergency cock:
Brake pipe reduced quickly and applied brakes 1: □ 2: □

14 Power knockout switch (PCS) test:
Engine speed reduced to idle or loadmeter registers zero 1: □ 2: □

Signature of tester: ______________________ Date : _____________
A7/B7 Brake equipment - Fault finding guide

With the independent brake valve released and the automatic brake valve in lap (minimum reduction), the gauges should indicate the following:

- Equalising reservoir 450 kPa
- Brake pipe 450 kPa
- Brake cylinder 50 to 125 kPa

If gauge readings start to vary, refer to the following charts:

<table>
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<tr>
<th>Gauges</th>
<th>Defect</th>
<th>Action</th>
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<tbody>
<tr>
<td>Equalising</td>
<td>Brake pipe</td>
<td>Brake cylinder</td>
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<tr>
<td>reservoir</td>
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<td>Rising</td>
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A7/B7 Brake equipment - Fault finding guide

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<tr>
<th>Gauges</th>
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<tbody>
<tr>
<td>Equalising reservoir</td>
<td>Brake pipe Stable Stable Rising</td>
<td>Independent brake valve distributing valve regenerative interlock</td>
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<tr>
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<td>To determine which, disconnect the number three pipe from distributing valve (you will get a short blow of air from pipe which will stop after a few seconds.</td>
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<td>Check for blow of air from pipe or from distributing valve; if blow is from pipe, then one of the independent brake valves is defective.</td>
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<td>If blow is from the distributing valve, then distributing valve or regenerative interlock is defective.</td>
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<td>Note: If it is necessary to determine whether the defect is in distributing valve or regenerative interlock, then close main reservoir isolating cock to the distributing valve. Operate magnet valve to drain all main reservoir air from regenerative interlock. If blow from number three connection now stops, then the regen interlock is defective. If blow continues then distributing valve is defective.</td>
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Determine which and change independent brake valve.
# A7/B7 Brake equipment - Fault finding guide

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