



# **Train Examination (Braking System) Addendum**

## **Mentor's Q&A**

***(Generic Version)***

### **Version 1**

June, 2011

## IMPORTANT NOTICE

This booklet is one of a series of generic training and assessment templates developed by the Association of Tourist & Heritage Rail Australia Inc (ATHRA) as guides for heritage railway operators seeking to develop or upgrade their local training and assessment resources.

This booklet and others in the series are not intended to be training resources in their own right but rather to be suitably customised, embellished and adapted by railway operators to match the specific context of their own railway, e.g. types of locomotives, rollingstock and associated equipment, the track layout and infrastructure, the local standard procedures and rules, the safety management and safeworking systems, the railway organisational structure, and the roles and functions of personnel in the railway, etc.

Railway operators seeking to use this booklet and others in the series should initially refer to the ***ATHRA Customisation Guidelines Booklet*** which provides important information on how the generic templates should be used.

### Disclaimer

The information contained herein is made available by the Association of Tourist & Heritage Rail Australia Inc (ATHRA) as part of a set of ***generic training and assessment templates*** for use by individual heritage railway operators.

It is intended that heritage railway operators will be able to create their own local training resources by suitably modifying, embellishing and customising the generic templates to meet their own requirements.

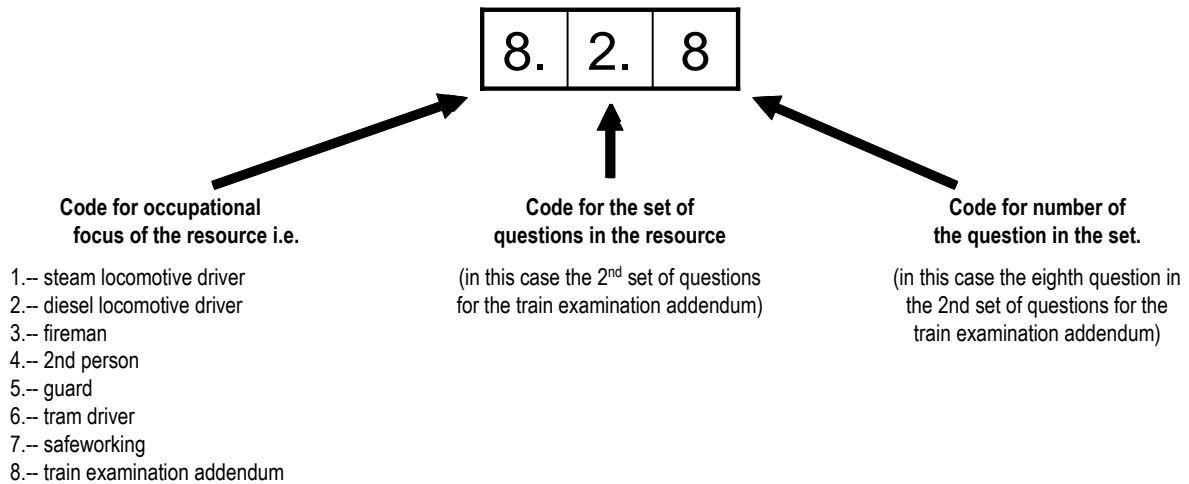
ATHRA does not assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information provided in these generic resources.

© Association of Tourist & Heritage Rail Australia Inc. 2011

# NOTES

## CODING SCHEME FOR THE ATHRA RESOURCES

The coding scheme for the ATHRA Resources is as follows:



## CUSTOMISATION OF QUESTIONS AND ANSWERS IN THE 'MENTOR'S Q&A'

As explained in the ATHRA Customisation Guidelines, the **Knowledge Checklist** and related **Mentors Q&A** are generic documents designed to be customized and adapted, if necessary, by local heritage railways to match their own railway configuration, equipment, procedures, safety management systems, etc. Questions in the booklet and related sample responses in the **Mentor's Q&A** may be modified by updating the content of the existing templates to incorporate appropriate information about the railway's own operating system, equipment, road, procedures, safety management system, etc. This may involve appropriate alteration to existing questions or the insertion of additional suitable questions.

To aid in the addition of questions, if needed, a blank row has been provided at the end of each set of questions in the generic checklist and Q&A. The following is a step-by-step process to incorporate any additional questions:

1. Using the mouse, select the blank row
2. In the 'TABLE' drop down menu at the top of the document select 'Insert'
3. Click on 'Insert rows below'
4. Repeat as many times as necessary until you have sufficient rows for the additional questions (including the original blank row in the generic document)
5. Insert the text for each of the additional questions
6. Insert the codes of the additional questions as per the coding scheme for the ATHRA training and assessment resources
7. Make sure there are matching questions and sample responses with the same code in both the **Knowledge Checklist** and the **Mentor's Q&A Booklet**

### Question Set 3.1 Role and responsibilities of a person conducting a train examination (braking system)

QUESTION	SAMPLE RESPONSE
Q3.1.1 Who conducts a train examination (braking system) in a heritage railway?	<ul style="list-style-type: none"> <li>This will vary from railway to railway. The candidate will describe the arrangements for who does train examinations in his/her railway.</li> </ul>
Q3.1.2 What are the two main functions involved in a train examination (braking system)?	<ul style="list-style-type: none"> <li>Mechanical examination of the locomotive – this is performed by the driver as part of the duties detailed in the applicable lesson plans</li> <li>Checking of the brakes by either the driver or the guard as per rail operator’s standard procedures</li> </ul>
Q3.1.3 What is the <b>braking system</b> used on heritage trains in your railway?	<ul style="list-style-type: none"> <li>Candidates will state the braking system used on their railway, i.e. either the Westinghouse Air Brake System or a Vacuum Brake System</li> </ul>
Q3.1.4 Briefly describe your main responsibilities when conducting a train examination (braking system)?	<ul style="list-style-type: none"> <li>Train examination (braking system) involves the checking of a train’s brakes.</li> <li>Persons conducting train examinations (braking system) must therefore be very familiar with the Occupational Health and Safety and rail safety requirements related to their work and all pertinent safeworking rules and requirements including trackside safety awareness procedures</li> </ul>
Q3.1.5 What are the potential consequences of not conducting a train examination (braking system) in accordance with the rail operator’s standard procedures?	<ul style="list-style-type: none"> <li>A serious accident possibly involving multiple fatalities</li> </ul>
Q3.1.6 What <b>action</b> must you take if you find a defect during a train examination (braking system)?	<ul style="list-style-type: none"> <li>Candidate should outline the rail operator’s standard procedures for the action, recording and reporting that needs to be undertaken in the event of an identified defect or during train examination (braking system).</li> </ul>
Q3.1.7 What <b>action</b> must you take if you are involved in a safety incident during a train examination (braking system)?	<ul style="list-style-type: none"> <li>Candidate should outline the rail operator’s standard procedures for the action, recording and reporting that needs to be undertaken in the event of a safety incident during train examination (braking system).</li> </ul>

<p>Q4.1.8 Give three examples of <b>hazards</b> that exist when carrying out a train examination (braking system).</p>	<p>Dependent on the railway concerned, examples of possible responses include:</p> <ul style="list-style-type: none"> <li>• Falling from heights</li> <li>• Working in confined spaces</li> <li>• Working under wires</li> <li>• Chemicals / fuel</li> <li>• Hot surfaces</li> <li>• Moving work platform</li> <li>• Dehydration and fatigue</li> <li>• Noise</li> <li>• Fire</li> <li>• Working with electric lights and equipment</li> </ul>
<p>Q4.1.9 Give two examples of <b>risk management strategies</b> to control hazards when carrying out train examination (braking system).</p>	<p>Dependent on the railway concerned, examples of possible responses include:</p> <ul style="list-style-type: none"> <li>• Ensuring public safety</li> <li>• Using personal protective equipment (PPE)</li> <li>• Following the railway's established risk management procedures</li> </ul>
<p>Q3.1.10 <i>Blank for additional question?</i></p>	<ul style="list-style-type: none"> <li>•</li> </ul>

**Question Set 3.2**

**Westinghouse air brake system check**

QUESTION	SAMPLE RESPONSE
<p>Q3.2.1</p> <p>What is the <b>initial step</b> in the conduct of a Westinghouse air brake system check performed by a person conducting a train examination (braking system)?</p>	<ul style="list-style-type: none"> <li>• With the auxiliary reservoirs charged to regulation pressure, the a train examiner or qualified person applies the brakes by a service reduction to the required pressure</li> </ul>
<p>Q3.2.2</p> <p>What <b>observations</b> does a person conducting a train examination (braking system) need to make when walking along the driver’s side of the train during a Westinghouse air brake system check?</p>	<ul style="list-style-type: none"> <li>• The examiner or qualified person notes the time then walks along the length of the train on the driver’s side where practical checking that:               <ul style="list-style-type: none"> <li>– the train is properly coupled,</li> <li>– where necessary all cables for electrical or public address systems are properly coupled,</li> <li>– any carriage to carriage safety bars or other equipment is in place,</li> <li>– all brakes blocks are fully applied to the wheels,</li> <li>– all air hoses are properly coupled,</li> <li>– brake pipe cocks are fully open (except at the extremities),</li> <li>– the brake piston travel is within prescribed limits,</li> <li>– any grade control handles or empty load devices are properly positioned and any load compensating handles correctly located,</li> <li>– there is no evidence of any defects.</li> </ul> </li> </ul>
<p>Q3.2.3</p> <p>What <b>action</b> must a person conducting a train examination (braking system) take on reaching the last vehicle of the train during a Westinghouse air brake system check?</p>	<ul style="list-style-type: none"> <li>• On reaching the last vehicle of the train, the examiner or qualified person signals to the driver to release the brake. The examiner observes that the brakes release on the last bogie on the consist then commences to walk back along the opposite side of the train.</li> </ul>
<p>Q3.2.4</p> <p>What <b>observations</b> does a person conducting a train examination (braking system) need to make when walking back along the opposite side of the train during a Westinghouse air brake system check?</p>	<ul style="list-style-type: none"> <li>• The examiner or qualified person commences to walk back along the opposite side of the train where practical checking that:               <ul style="list-style-type: none"> <li>– all brakes blocks are fully released,</li> <li>– hand brakes are off,</li> <li>– no sprags or chocks are located in or under the wheels,</li> <li>– all air brake equipment is in good order,</li> <li>– there is no evidence of any air leaks or defects.</li> </ul> </li> </ul>

<p>Q3.2.5</p> <p>What <b>action</b> must a person conducting a train examination (braking system) take on arriving back at the locomotive during a Westinghouse air brake system check?</p>	<ul style="list-style-type: none"> <li>• Notes the time</li> <li>• Ascertains if there is any train pipe leakage</li> <li>• If there is an excessive train pipe leakage the driver and guard must take joint action to find the leakage and correct the problem</li> <li>• If there is no train pipe leakage, the train examiner or qualified person completes the necessary records as required by the Railway's standard operating procedures</li> </ul>
<p>Q3.2.6</p> <p>What brake checks need to be made by the driver / guard if another vehicle is attached to the consist during the running of a train?</p>	<ul style="list-style-type: none"> <li>• If another vehicle is attached to the consist during the running of the train the guard will carry out a train examination (braking system) as detailed above on the wagon being attached to the consist</li> <li>• When the train has again been coupled and the air brake system coupled, the driver / guard moves to the last vehicle on the consist and signals for the driver / fireman / 2<sup>nd</sup> person to "apply brakes"</li> <li>• When the brakes are observed to have applied, the driver / guard signals to the driver / fireman / 2<sup>nd</sup> person to "release brakes" and observes that the brake blocks fully release on the bogie.</li> <li>• The driver / guard then signals the driver / fireman / 2<sup>nd</sup> person "all right" and completes any required record in accordance with the Railway's Standard Operating Procedures</li> </ul>
<p>Q3.2.7</p> <p>Describe what brake checks need to be made by the guard if the locomotive is detached from the train for any reason whatsoever?</p>	<ul style="list-style-type: none"> <li>• If the locomotive is detached from the train for any reason whatsoever such as running round at terminus, taking water, etc., when it is reattached to the consist and train pipe pressure is restored, the guard proceeds to the rear of the consist and signals the driver "apply brakes".</li> <li>• When the brake blocks are seen to apply to the wheels the guard signals to the driver to "release brakes".</li> <li>• When the brake blocks are seen to release the guard signals the driver "all right"</li> </ul>
<p>Q3.2.8</p> <p>What must a driver do if a defect or deficiency is found in the braking system during the conduct of a Westinghouse air brake system check?</p>	<ul style="list-style-type: none"> <li>• Should any evidence be identified of a defect or a deficiency in the braking system, the required action will be taken as per the railway's standard procedure to record and report the deficiency and to initiate appropriate action to rectify the problem.</li> </ul>
<p>Q3.2.9</p> <p><i>Blank for additional question?</i></p>	<ul style="list-style-type: none"> <li>•</li> </ul>

### Question Set 3.3 Vacuum brake system check

QUESTION	SAMPLE RESPONSE
<p>Q3.3.1</p> <p>What are the steps involved in the conduct of a vacuum brake test after a train has been marshalled prior to its departure?</p>	<ul style="list-style-type: none"> <li>• The candidate will describe the steps involved in the conduct of a vacuum brake test by a train examiner or qualified person after a train has been marshalled prior to its departure for the rail operator and train concerned.</li> <li>• For example:               <ul style="list-style-type: none"> <li>– When the train has been marshalled and the locomotive attached to the consist, the required vacuum must be created as quickly as possible.</li> <li>– The driver then makes a full service application of the brakes</li> <li>– The <b>train examiner</b> then commences at the locomotive and moves to the rear of the train ensuring that the brakes have applied on a vehicles and that the vacuum piston travel is within specified limits (minimum 50 mm to a maximum of 150 mm) and that all couplings have been made between vehicles</li> <li>– On arrival at the last vehicle on the consist, the <b>train examiner</b> must request the driver to release the brakes on the train.</li> <li>– The <b>train examiner</b> must check the vacuum registration gauge on the rear of the train to ensure that it has reached the required pressure</li> <li>– The <b>train examiner</b> then returns to the front of the train ensuring that the brakes have released on every vehicle and that the hand brakes are off</li> <li>– On arrival at the locomotive, the train examiner completes any required record in accordance with the Railway's Standard Operating Procedures</li> </ul> </li> </ul>



<p>Q3.3.2</p> <p>What are the steps involved in the conduct of a vacuum continuity brake test at terminal stations and at locations when vehicles have been added to the train?</p>	<ul style="list-style-type: none"> <li>• The candidate will describe the steps involved in the conduct of a vacuum continuity brake test at terminal stations and at locations when vehicles have been added to the train, for the rail operator and train concerned.</li> <li>• For example: <ul style="list-style-type: none"> <li>– A vacuum continuity test must be conducted at Terminal Stations and at locations when vehicles have been added to the train.</li> <li>– The vacuum continuity test is conducted by the driver and guard.</li> <li>– The guard ensures that an adaptor plate and vacuum gauge are installed on the last vehicle on the train</li> <li>– When the vacuum registration on the end of train gauge has reached the value specified in the <i>Brake Power Requirements</i> the driver must be advised. The driver must then make a full service brake application</li> <li>– When the vacuum registration on the end of train gauge falls to zero the guard checks that the brakes have applied on the last two bogie or four single vehicles and advises the driver.</li> <li>– The driver then re-creates the vacuum and the guard must check to ensure that the brakes have released on the last vehicles on the train.</li> <li>– When the registration on the end of train gauge reaches the value stipulated in the <i>Brake Power Requirements</i> the guard must advise the driver then remove the gauge. The adaptor plate remains in place on the last vehicle on the train.</li> <li>– When the foregoing procedures have been successfully concluded the train may proceed.</li> </ul> </li> </ul>
<p>Q3.3.3</p> <p>Describe what action must be taken if there are any difficulties involved in creating the required vacuum when a locomotive is attached to a train.</p>	<ul style="list-style-type: none"> <li>• When a locomotive is attached to a train, the required vacuum must be created as quickly as possible by increasing engine speed and making use of the vacuum quick release facility on the locomotive.</li> <li>• The time allowed to create the required amount of vacuum through a train is ten minutes for goods trains and one minute for passenger trains.</li> <li>• Should the time allowed be exceeded a report must be supplied giving full details of extra time allowed</li> </ul>
<p>Q3.3.4</p> <p>What must a driver do if a defect or deficiency is found in the braking system during the conduct of a vacuum brake system check?</p>	<ul style="list-style-type: none"> <li>• A driver and guard must report any irregularity in conjunction with the working of the vacuum brake and any defects in its action or other special circumstances</li> </ul>

Q3.3.5	What must a driver do if the vacuum brake fails and the defect can't be remedied in reasonable time	<ul style="list-style-type: none"> <li>• When the vacuum brake fails and the driver is unable to remedy the defect in a reasonable time, the driver must obtain a relief locomotive</li> </ul>
Q3.3.6	What action must be taken if it is necessary to isolate a vacuum cylinder in the vacuum brake system of a train?	<ul style="list-style-type: none"> <li>• When it is necessary to isolate a vacuum cylinder, the auxiliary hose must be removed from the branch pipe and the branch pipe plugged using a cork. The vacuum release must be operated to fully release the brakes. The auxiliary hose must be left disconnected and the vehicle green carded for attention</li> </ul>
Q3.3.7	<i>Blank for additional question?</i>	<ul style="list-style-type: none"> <li>•</li> </ul>