

Approved Code of Practice – Training for Personnel who Influence, Maintain or Overhaul Axle Bearings

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Synopsis

This document provides recommendations for the training and competence assessments of personnel and supervisors who influence, maintain or overhaul axle bearings.

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**Published by:
Railway Safety
Evergreen House
160 Euston Road
London NW1 2DX**

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Part A

A1 Issue Record

Issue	Date	Comments
One	December 1995	Original Document
Two	5 October 2002	Replaces GM/RC2516 Issue One

This document will be updated when necessary by distribution of a complete replacement.

Changes to this issue of the standard from the previous issue have not been highlighted in the side margin because the document has been significantly restructured.

A2 Implementation of this document

The publication date of this document is 5 October 2002.

This document supersedes the following Railway Approved Codes of Practice, either in whole or in part as indicated:

Railway Safety Approved Code of Practice	Issue No.	Title	RACOP sections superseded by this document	Date(s) as of which sections are superseded
GM/RC2516	1	Code of Practice for the Training Requirements for Personnel who Undertake Maintenance and Overhaul of Axle Bearings	Whole Document	Issue 1 of the standard will be fully withdrawn as of 4 October 2003

This document quotes, verbatim and boxed, the mandatory sections of [GM/RT2030](#) and, following each portion of quoted text, gives relevant recommendations and guidance in italics.

A3 Scope of Railway Group Standards

The overall scope of Railway Group Standards is set out in Appendix A of GA/RT6001. The specific scope of this document is set out in Part B2.

A4 Responsibilities

Railway Safety Approved Codes of Practice are non-mandatory documents, providing a recommended method of meeting the requirements of a Railway Group Standard, either in whole or in part.

* The Railway Group comprises Railtrack PLC, Railway Safety, and the train and station operators who hold railway safety cases for operation on or related to infrastructure controlled by Railtrack PLC.

Railtrack PLC is known as Railtrack.

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A5 Health and safety responsibilities

In issuing this document, Railway Safety makes no warranties, express or implied, that compliance with all or any documents published by Railway Safety is sufficient on its own to ensure safe systems of work or operation. Each user is reminded of its own responsibilities to ensure health and safety at work and its individual duties under health and safety legislation.

A6 Technical content

The technical content of this document has been approved by:

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Enquiries should be directed to Railway Safety – Tel: 020 7904 7518.

A7 Supply

Controlled and uncontrolled copies of this document may be obtained from the Industry Safety Liaison Dept, Railway Safety, Evergreen House, 160 Euston Road, London NW1 2DX.

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Part B

B1 Purpose

This document provides recommendations for the training and competence assessments of personnel and supervisors who influence, maintain or overhaul axle bearings.

B2 Application of this document

B2.1 To whom the recommendations apply

This document contains recommendations that are applicable to duty holders of the train operator company category of Railway Safety Case.

B2.2 Documents supported by this Approved Code of Practice

[GM/RT2030](#) – Axle Bearing Maintenance.

B3 Definitions

[GM/RT2030](#) Section B3: Definitions

Competence assessor

Person with relevant occupational skills, knowledge, experience and ability, who is qualified to assess competence as defined by the requirements of this standard ([GM/RT2030](#)).

Axle bearings

For the purposes of this document, axle bearings are those bearings, either roller or plain which are mounted on the axle and carry the mass of the vehicle.

Maintenance

- a) actions which disturb or change any part of the axle bearing, the grease used in the axle bearing, the assembly on the axle and the parts used to retain or seal the assembly.
- b) in respect of a maintenance policy, all aspects including overhaul.

Overhaul

All actions carried out on the axle bearing at completion of a service period to assess if it is in, and returned to an acceptable condition for further use. This will include disassembly, examination, re-assembly, re-greasing and where applicable, removal and re-fitting the assembly on the axle.

Competent trainer

A person who has the relevant specialist knowledge in the subject to be covered and is proficient in communicating information and techniques.

Competent person

A person who has been assessed as competent to undertake specific tasks.

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Part C – General requirements

GM/RT2030 Section C1: General requirements

C1.1 Compliance with GM/RT2004

In order to meet the requirements of GM/RT2004, a train operator shall have an axle bearing maintenance policy and axle bearings shall be maintained and overhauled in accordance with that policy.

C1.2 Third party axle bearing maintenance and overhaul

Where the maintenance and/or overhaul of axle bearings is contracted to a third party, the train operator shall ensure that they are qualified suppliers. The requirements for qualification of third-party suppliers are set out in GM/RT2450. Axle bearings are safety-critical equipment. Incorrect maintenance and overhaul can introduce faults which have the potential to cause wheelset seizure and possible derailment.

GM/RT2030 Section C2: Axle bearing maintenance policy requirements

C2.1 Train operator's axle bearing maintenance policy

The purpose of the axle bearing maintenance policy is to assure that the axle bearings remain in a safe and reliable operating condition at all times whilst in service use. The requirements to ensure this condition shall be identified by means of a structured process and shall be stated in the policy document. The policy shall also define each of the following and state how it is to be implemented:

- a) objectives and targets for the safety performance of all axle bearings fitted to all rail vehicles used by the train operator, in accordance with the requirements set out in GE/RT8250. These shall be developed from a safety assessment of the vehicles and axle bearings used by the train operator
- b) a procedure defining how the safety performance of the axle bearings shall be monitored. This shall identify:
 - i) the information that is to be recorded and kept, including the information which defines the performance of the assembly in service and the condition of the axle bearing parts at overhaul
 - ii) how the information is to be processed and analysed
 - iii) the actions to be taken if the axle bearings fail to operate within the target levels set
- c) the policy for determining and reviewing:
 - i) the criteria (bearing age, mileage or distance) at which the axle bearings shall be scrapped
 - ii) the periodicity of maintenance attention
 - iii) the periodicity of overhaul
- d) the procedures for assuring continued safe operation of vehicles fitted with axle bearings which are condition monitored by vehicle mounted equipment, where applicable
- e) the involvement of any third parties carrying out work associated with axle bearing maintenance activities covered by the policy and how they are qualified and controlled
- f) measures to maintain the axle bearings in a safe condition if they are stored unfitted, or are fitted to a wheelset which is unused for an extended period of time.

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C2.2 Review of axle bearing maintenance policy

The axle bearing maintenance policy shall also:

- a) state the maximum time before the policy is reviewed and updated and any specific circumstances which will trigger an early review
- b) the basis on which the review will be undertaken
- c) identify the maintenance plan for each type or family of axle bearings covered by the policy
- d) identify the procedure for review and updating the plan(s)
- e) state the maximum time before the plan(s) are normally reviewed and updated and any specific circumstances which will trigger an early review.

C2.3 Axle bearing maintenance policy development and implementation

The axle bearing maintenance policy shall:

- a) be produced by competent personnel
- b) identify the manager(s) or representative responsible for executing the policy.

GM/RT2030 Section C3: Rail vehicle maintenance plan requirements

C3.1 Axle bearing maintenance and overhaul requirements within rail vehicle maintenance plans

Rail vehicle maintenance plans, approved in accordance with the requirements set out in GM/RT2004, shall contain specific axle bearing maintenance and overhaul requirements applicable to each individual type or family of bearings used by the train operator. The purpose is to state all the actions and standards that are necessary to meet the requirements of the policy, for that type of bearing fitted to a particular rail vehicle type.

Each rail vehicle maintenance plan shall identify the following:

- a) the maximum time or distance between visual examinations of the complete assembly on the wheelset
- b) the maximum time or distance between rotational and end float checks, where applicable
- c) the method to be used and the maximum time or distance between re-greasing by the addition of a measured quantity of new grease, where applicable
- d) the maximum time or distance at which the bearings shall be overhauled
- e) the grease type to be used
- f) the criteria (if any) at which the bearings shall be scrapped
- g) the documents specifying the relevant standards for examination and acceptance at overhaul
- h) the documents specifying the working instructions for each action in the plan, as applicable
- i) the minimum engineering maintenance facilities required for the specified maintenance and overhaul
- j) the minimum level of competence for staff engaged in the execution of the specified maintenance and overhaul.

No specific recommendations are made on these sections of the Railway Group Standard.

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C1 Categories of training

GM/RT2030 section C4: Competence requirements (part)

C4.1 Levels of competence

With respect to axle bearing maintenance or overhaul, persons shall be competent for the duties for which they are employed. in accordance with the following Appendices (of GM/RT2030):

Level 1	Competence requirements for personnel and supervisors responsible for the overhaul of axle bearings. (Appendix 1)
Level 2	Competence requirements for personnel and supervisors responsible for the maintenance of axle bearings or any activities which may disturb the axlebox/axle bearing assembly. (Appendix 2)
Level 3	Competence requirements for personnel and supervisors responsible for work activities which may influence axle bearings. (Appendix 3)

C1.1 Appropriate training requirements

To provide appropriate training to those who influence, maintain or overhaul axle bearings and to cover all needs, it is recommended that the persons covered by this document are identified against the most appropriate category shown below and receive the training recommended at that level.

C2 Training - general

C2.1 Matching training requirements

Classroom and workshop training modules should be developed which are appropriate to the tasks to be performed. The content and duration of the training may be scaled to match the competence requirements and the specific needs of individual candidates. The training need includes, as a minimum, only those bearing type(s) and manufacturer(s) which are part of the work carried out.

Competence gained in this way will be limited to the bearing type(s) and manufacturer(s) for which there has been training and assessment. Persons should only be permitted to work on the bearing type(s) and manufacturer(s) for which they are competent, except as part of further training.

C2.2 Scope of Level 1 and Level 2 training

Level 1 and Level 2 training should:

- be split into classroom and workshop sessions
- be in modules to cover each bearing type and level of attention
- give both general and specific instructions.

C2.3 Practical training

Practical training may be carried out between classroom sessions, if appropriate.

C2.4 Training by competent trainer.

All classroom and workshop training should be given by a competent trainer.

C2.5 Training aids

Level 1 and Level 2 classroom training should be made effective by use of the following aids and teaching techniques, where appropriate:

- bearing models and specimens
- films and video.
- visual aids

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- d) *question and answer sessions*
- e) *expert descriptions of bearing topics.*

C2.6 Supervision competency

It is assumed that supervisors are already competent in the supervision of workshop personnel and it is not the purpose of this document to cover training for those general aspects

C3 Extent and duration of training

C3.1 Level 1 – Axle bearing overhaul

C3.1.1

Level 1 personnel and their supervisors should be given:

- a) *technical/classroom training. A minimum duration of eight hours is recommended*
- b) *practical demonstration in the workshop. The competent trainer should demonstrate the correct practices for all the activities to be undertaken.*

For Level 1 supervisors, no further training is required.

C3.1.2

For other Level 1 personnel, a period of monitored workshop activity is required to complete the training. For the first bearing type, this should include:

- a) *one week, minimum, under direct supervision*
- b) *three weeks where the quality of the trainees work is monitored*
- c) *two months under occasional supervision with quality checks on work performed, as appropriate.*

C3.1.3

For subsequent bearing types, the training may be of reduced duration, as set out in Appendix 1. The three periods above may be reduced on a pro-rata basis.

C3.1.4

A period of not less than three months training experience is recommended before competence assessment.

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C3.2 Level 2 – Axle bearing maintenance

C3.2.1

Level 2 personnel and their supervisors should be given:

- a) *technical/classroom training. A minimum duration of four hours is recommended*
- b) *practical demonstration in the workshop. The competent trainer should demonstrate the correct practices for all the activities to be undertaken.*

For Level 2 supervisors, no further training is required.

C3.2.2

For Level 2 personnel, a period of monitored practice should be included to complete the training. During this time, the trainee should undertake all the activities to be carried out until competence in each activity can be demonstrated.

It is recommended that the initial performance of each activity should be under the direct supervision of a competent person. For repetitions of each activity, the level of supervision should be appropriate to the risks involved.

C3.3 Level 3 – Other work associated with axle bearings

C3.3.1

Level 3 activities are those which will cause contamination or physical damage if incorrectly carried out near to the bearing or bearing parts. The list below identifies some of the activities that may produce this risk. This list is not exhaustive and the risks of any other operations should be considered based on knowledge of damage/failure mechanisms:

- a) *use of pressurised water sprays*
- b) *processes producing dust / debris near to bearings that are not fully sealed*
- c) *handling/transportation of bearing parts, assembled bearings or wheelsets*
- d) *storage of bearing parts, assembled bearings or wheelsets*
- e) *welding operations.*

C3.3.2

For Level 3 personnel and supervisors, relevant technical instruction/training should be given at the workplace during a short briefing.

For Level 3 supervisors, no further training is required.

C3.3.3

For Level 3 personnel, a period of monitored practice is required to complete the training. During this time, the trainee should undertake all the activities to be carried out, until competence in each activity can be demonstrated.

It is recommended that the initial performance of each activity should be under the direct supervision of a competent person. For repetitions of each activity, the level of supervision should be appropriate to the risks involved.

C4 Level 1 and Level 2 classroom training

C4.1 Level 1 and 2 classroom training

Level 1 and Level 2 classroom training should include:

- a) *a common module for both levels of training*
- b) *separate modules for roller bearings and plain bearings.*

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The roller or plain bearing module may be deleted, as appropriate, if not applicable to the work being carried out.

C4.2 Training modules

The classroom modules should incorporate the topics given below and should be structured such that the recipients can understand all the information imparted without any specialist knowledge.

C4.3 Common module

Level 1 candidates should receive instruction to cover at least items c) to m).

Level 2 candidates should receive instruction to cover at least items a) to k).

- a) *risks if vehicle is moved whilst the axle end cap is not in place*
- b) *protection of bearings during welding operations*
- c) *protection of bearings on the assembled wheelsets*
- d) *bearing nomenclature*
- e) *principles of bearing operation*
- f) *description of bearing types*
- g) *bearing failure mechanisms, their causes and consequences*
- h) *cleanliness requirements*
- i) *handling and storage of bearings*
- j) *bearing contamination*
- k) *electrical damage*
- l) *defect records*
- m) *bearing defects and rejection criteria.*

C4.4 Roller bearing module

Level 1 candidates only overhauling bearings which have been fully removed from the axle should, as a minimum, receive instruction to cover items a) to c).

Level 1 candidates overhauling bearings which are not fully removed from the axle should receive instruction to cover all items.

Level 2 candidates should receive instruction to cover all items.

- a) *bearing lubrication*
- b) *bearing assembly checks*
- c) *method and importance of bearing sealing*
- d) *location and securement of the bearing*
- e) *bearing and journal examination.*

C4.5 Plain bearing module

Level 1 candidates should receive instruction to cover all items.

Level 2 candidates should receive instruction to cover at least items a) to d).

- a) *bearing lubrication*

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- b) *bearing assembly checks*
- c) *method and importance of bearing sealing*
- d) *location and securement of the bearing*
- e) *pad examination*
- f) *bearing and journal examination*
- g) *surface finish requirements.*

C5 Level 1 and Level 2 workshop training

C5.1 Workshop training facilities

The workshop training can be in the actual workplace, or alternatively may be carried out in a training facility which has been constructed and equipped to duplicate the range of tasks and facilities present in the actual workplace.

C5.2 Workshop roller bearing module

The workshop roller bearing module should demonstrate the correct maintenance techniques on the following bearing types, as applicable:

- a) *axlebox tapered roller bearings*
- b) *cartridge tapered roller bearings*
- c) *axlebox cylindrical roller bearings*
- d) *axlebox spherical roller bearings.*

C5.3 Scope of workshop modules

Appropriate workshop modules should be produced to include the activities shown below. The training should include practical demonstrations of the correct maintenance/overhaul techniques required for each activity.

C5.3.1 Level 1 - Roller bearing module

- a) *axlebox fitting and removal*
- b) *bearing fitting and removal from wheelset*
- c) *bearing dismantling*
- d) *bearing cleaning*
- e) *inspection of axle journal and bearing components*
- f) *criteria for acceptance/rejection of axle journal and bearing components*
- g) *bearing assembly*
- h) *assembled bearing checks*
- i) *bearing lubrication.*

C5.3.2 Level 1 – Plain bearing module

- a) *axlebox fitting and removal*
- b) *bearing dismantling*
- c) *bearing manufacture and machining*
- d) *inspection of axle journal and bearing components*

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- e) *criteria for acceptance/rejection of axle journal and bearing components*
- f) *bearing assembly*
- g) *assembled bearing checks*
- h) *bearing lubrication.*

C5.3.3 Level 2 - Roller bearing module

- a) *external examination*
- b) *identifying bearings in distress*
- c) *hand rotation check*
- d) *end float check*
- e) *lubrication*
- f) *removal and refitting of bearings*
- g) *removal and refitting of axle end cap*
- h) *prevention of risks due to handling and storage*
- i) *prevention of risks from water jets or other fluids used near the bearings.*

C5.3.4 Level 2 - Plain bearing module

- a) *general examination of the axlebox and journal*
- b) *correct location of bearing*
- c) *examination of the lubrication pad*
- d) *lubrication*
- e) *permitted wear of bearings and journals*
- f) *removal and refitting of bearings*
- g) *wheelset handling and storage*
- h) *prevention of risks from water jets or other fluids used near the bearings.*

C6 Level 3 training

C6.1 Training by briefing

For Level 3 training, a briefing by the supervisor responsible for the relevant activities will be sufficient in most cases. The training will vary according to the activities but in all cases should:

- a) *identify the recommended best practices and ensure that these can be correctly carried out by the trainee*
- b) *explain the risks and consequences involved and show how these can be avoided by use of the recommended best practices.*

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C7 Assessment of competence

GM/RT2030 section C4: Competence requirements

C4.2 Assessment following training

Following training, the trainees shall be assessed by a competence assessor to establish that the required competence standard is achieved.

Personnel covered by Levels 1 to 3 training, as defined in this document, should be assessed by a competence assessor in accordance with the methods laid down in GO/RT3260 and supporting Code of Practice GO/RC3560.

The competence assessor should collect sufficient evidence to enable competence to be assessed against all the criteria covered in this document for the appropriate competence levels and the scope of the candidate's application. This should include:

- a) *performance evidence obtained by observance of the candidate's performance in a normal work situation undertaking prescribed tasks*
- b) *inspection of the finished work*
- c) *evidence of the candidate's knowledge, obtained by either oral or written questions, addressing aspects not covered by the performance evidence.*

Items a) and b) should be supplemented by historical evidence of the candidate's performance, witness testimony from the candidate's superior or other authorised staff and personal accounts by the candidate, either oral or written.

GM/RT2030 section C4: Competence requirements

C4.3 Direct supervision

Any person failing to achieve the required standards of competence shall only work on axle bearings under direct supervision, as part of a training programme aimed at achieving the appropriate competence standard.

When a candidate fails to demonstrate appropriate competence, the competence assessor should inform the candidate's employer, giving the reasons for failure and the recommendations for further training.

Candidates should not undertake any work on axle bearings until competent, except as part of further training.

C8 Maintaining competence

GM/RT2030 section C4: Competence requirements

C4.4 Maintaining competence

Systems shall be in place to ensure that the person's competence is maintained.

The competence for all persons covered by this document shall become invalid in either of the following circumstances, until refresher training and reassessment has been successfully completed to regain the competence.

- a) after a period of two years maximum, for Levels 1 to 3
- b) after a period of six months maximum, for Levels 1 and 2, if none of the duties for which competence is held have been carried out in that time
- c) after a period of one year maximum, for Level 3, if none of the duties for which competence is held have been carried out in that time.

All personnel covered by Levels 1 to 3 training, as defined in this document, should undertake refresher training and reassessment by a competence

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assessor, as required, in accordance with the methods laid down in [GO/RT3260](#) and supporting Approved Code of Practice [GO/RC3560](#).

Refresher training and reassessment applies only to those areas for which competence has been previously held. If any new areas of competence are introduced, relevant training from sections C1 to C7 of this document should be used.

For all Level 1 and 2 personnel it is recommended that approximately one hour classroom training and one hour workshop demonstrations should be given. The refresher training needs to be structured using items C1, C2 and C4 to C7 of this document in accordance with the level of competence previously held. No period of monitored workshop practice is required to complete Level 1 and 2 refresher training.

For Level 3 refresher training, a briefing by the supervisor responsible for the relevant activities will generally be sufficient. The training will vary according to need but should aim to emphasise the risks involved and to ensure that the candidate is aware of, and can carry out, the best practices to avoid the risks.

C9 Records

GM/RT2030 section C5: Records

C5.1 Competence records

For each person working on the overhaul and maintenance of axle bearings covered by this document, there shall be an auditable record of competence in accordance with the requirements set out in [GO/RT3260](#). The record shall:

- a) be available for inspection at all reasonable times
- b) clearly identify the types of axle bearings and/or vehicles on which the person has achieved the necessary competence level
- c) be kept up-to-date and show the current position for each person, reflecting the evidence collected during the training and assessment process and the continued competence of on-the-job experience
- d) be retained:
 - i) at all times that the person is working in areas covered by this document, and
 - ii) for a period of two years beyond the date when the person ceases to work in those areas.

Details in respect of each person working at Levels 1 to 3 should be kept in a work log, which should include:

- a) name and training category for each person
- b) facility where the work, training or assessment was undertaken
- c) date when work, training or assessment was undertaken
- d) details of classroom training completed
- e) details of workshop training completed
- f) results of competence assessment(s)
- g) details of the axle bearing type(s) axle bearing manufacturer(s) and/or vehicle types on which the person is competent, where this is relevant

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- h) *the start/finish dates and the duties undertaken for all time spent working as a competent person on axle bearing maintenance.*

GM/RT2030 Section C5: Records

C5.2 Access to information

The Railway Group member shall ensure that persons be issued with, or have access to, all the publications and equipment necessary for them to undertake their duties.

GM/RT2030 Section C6: Competence assessors

C6.1 Requirements for competence assessors

Competence assessors shall:

- a) have the relevant occupational skills, knowledge and experience to assess the categories of work competence defined in this document
- b) be qualified in accordance with the requirements of [GO/RT3260](#)
- c) compile the criteria to be used for competence assessment against the requirements of this document
- d) assess competence against the requirements set out in this document

No specific recommendations are made on these sections of the Railway Group Standard.

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Appendix 1

Multiple training modules table

<i>Bearing type</i>	<i>First module duration</i>	<i>Second module duration</i>	<i>Each subsequent module duration</i>
<i>Axlebox cylindrical roller bearings</i>	<i>3 months</i>	<i>1 month</i>	<i>2 weeks</i>
<i>Axlebox tapered roller bearings</i>	<i>3 months</i>	<i>1 month</i>	<i>2 weeks</i>
<i>Axlebox spherical roller bearings</i>	<i>3 months</i>	<i>1 month</i>	<i>2 weeks</i>
<i>Cartridge tapered roller bearings</i>	<i>3 months</i>	<i>1 month</i>	<i>2 weeks</i>

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Appendix 2 Quoted Appendices from [GM/RT2030](#)

[GM/RT2030](#) - Appendix 1

Competence requirements for personnel and supervisors responsible for the overhaul of axle bearings

(The content of this Appendix is mandatory.)

1.1 Technical knowledge required for personnel and supervisors

The train operator shall ensure that personnel and supervisors responsible for the overhaul of axle bearings have demonstrated that they have knowledge in the following areas:

- a) the principles of axle bearing operation
- b) axle bearing failure mechanisms and their causes
- c) the importance of achieving correct fit of the bearing on the axle journal and in the axlebox bore
- d) the nomenclature used for axle bearings and their overhaul
- e) identification/designation of different bearing types
- f) the requirements for corrosion protection
- g) the importance of using matched components for bearing assembly
- h) the importance of effective seals at the front and rear of the axlebox
- i) the importance of the correct grease type, quantity and method of application
- j) the importance of cleanliness during the overhaul of axle bearings and the consequences of dirt or liquid contamination
- k) the importance of axle end and journal condition
- l) the importance of the security of the axle end cap
- m) the consequences of axle bearing failure
- n) knowledge of the documentation covering axle bearing overhaul and its location at the workplace.

1.2 Practical skills required for personnel carrying out the work activities

The train operator shall ensure that personnel who overhaul axle bearings have demonstrated that they have the skills to carry out the following operations, according to documented procedures:

- a) overhaul of *
 - i) cartridge roller bearings
 - ii) non-cartridge roller bearings
 - iii) plain axle bearings.

* One or more of these bearing types may be excluded from the assessment if not relevant to the overhaul work carried out. In all cases, the competence record shall be marked in accordance with section C5.1b)
- b) use of any special equipment necessary to carry out the overhaul
- c) examination of axle bearing components, to identify any damage present

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and determine if parts are fit for re-use or need to be scrapped

- d) re-assembly of axle bearings, maintaining acceptable standards of cleanliness and handling
- e) applying the appropriate quantity and quality of bearing lubricant
- f) reporting any bearing damage or defects which are present
- g) maintaining good quality records
- h) handling, storing and protecting the assembled axle bearings
- i) carrying out end float and other assembly checks
- j) removal and refitting of axle bearing assemblies onto axles.

1.3 Axle bearing management requirements for supervisors

The train operator shall ensure that supervisors who are responsible for the overhaul of axle bearings have demonstrated that they have sufficient knowledge of the following requirements:

- a) the resources and equipment required
- b) control and calibration of the measuring equipment
- c) the skill requirements of the tasks
- d) control of the workplace to ensure axle bearings are correctly overhauled
- e) management of quality records
- f) management of a reporting system covering the nature and cause of rejection of scrapped axle bearings
- g) provision of the documentation to cover axle bearing overhaul and the systems for its updating.

No specific recommendations are made on these sections of the Railway Group Standard.

GM/RT2030 - Appendix 2

Competence requirements for personnel and supervisors responsible for the maintenance of axle bearings or any activities which may disturb the axlebox/axle bearing assembly

(The content of this Appendix is mandatory.)

2.1 Technical knowledge required for personnel and supervisors

The train operator shall ensure that personnel and supervisors whose duties are within the scope of Appendix 2 have demonstrated that they have knowledge in the following areas:

- a) the principles of axle bearing operation
- b) axle bearing failure mechanisms and their causes
- c) axle bearing examination and defects which can be identified with the bearing in-situ
- d) axle end condition and importance of correct security of the axle end cap
- e) axle bearing lubrication
- f) axle bearing assembly checks

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- g) identification of the different bearing types
- h) the requirements for stringent cleanliness
- i) handling and storage of bearings and assembled wheelsets (GM/RT2020)
- j) the nomenclature used for axle bearings
- k) the importance of effective seals at the front and rear of the axlebox
- l) the consequences and restrictions of moving a vehicle with the axle end caps removed
- m) knowledge of the documentation covering the activities to be carried out and its location at the workplace.

2.2 Practical skills required for personnel carrying out the work activities

The train operator shall ensure that personnel whose duties are within the scope of Appendix 2 have demonstrated that they have the skills to perform all tasks for which they are responsible.

2.3 Axle bearing management requirements for supervisors

The train operator shall ensure that supervisors whose duties are within the scope of Appendix 2 have demonstrated that they have sufficient knowledge of the following requirements:

- a) the resources and equipment required for the activities being supervised
- b) the skill requirements of the tasks
- c) management of quality records
- d) provision of the documentation to cover the activities being supervised and the systems for its updating.

No specific recommendations are made on these sections of the Railway Group Standard.

GM/RT2030 - Appendix 3

Competence requirements for personnel and supervisors responsible for work activities which may influence axle bearings

(The content of this Appendix is mandatory.)

3.1 Technical knowledge required for personnel and supervisors

The train operator shall ensure that personnel and supervisors whose duties are within the scope of Appendix 3 have demonstrated that they are aware of the potential risks to axle bearings which may arise from the duties carried out. They shall demonstrate that they have knowledge in the following areas:

- a) the basic principles of axle bearing operation
- b) an appreciation of the relevant axle bearing failure mechanisms and their causes
- c) the requirements for stringent cleanliness
- d) the correct storage and handling of assembled wheelsets (GM/RT2020)
- e) the correct storage and handling of partially or fully assembled axle bearings
- f) the correct practices for using water jets or other fluids near axle bearings
- g) knowledge of the documentation covering the activities to be carried out and its location at the workplace.

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3.2 Practical skills required for personnel carrying out the work activities

The train operator shall ensure that personnel whose work activities have the potential to influence the performance of axle bearings, or who are required to handle parts of the bearing or its assembly, have demonstrated that they have the skills to perform all tasks for which they are responsible.

3.3 Axle bearing management requirements for supervisors

Train operators shall ensure that supervisors whose duties are within the scope of Appendix 3 have demonstrated that they have sufficient knowledge of the following requirements:

- a) the resources and equipment required for the activities being supervised
- b) the skill requirements of the tasks
- c) the correct handling and storage of axle bearings
- d) control of the workplace to ensure that axle bearings are not subjected to handling, contamination or other risks which may cause damage
- e) provision of the documentation to cover the activities being supervised and the systems for its updating.

No specific recommendations are made on these sections of the Railway Group Standard.

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References

Railway Group Standards and Other Railway Group Documents

- GA/RT6001** Railway Group Standards Change Procedures
- GM/RT2030** Axle Bearing Maintenance
- GO/RC3560** Code of Practice: Competence Assessment (replacement RACOP GE/RC8531 was being drafted at the time of publication)
- GO/RT3260** Competence Management for Safety Critical Work (replacement standard GE/RT8031 was being drafted at the time of publication)

The Catalogue of Railway Group Standards and the Railway Group Standards CD-ROM give the current issue number and status of documents published by Railway Safety.