

# Heavy vehicle service and maintenance technician standard: Assessment Plan



**July 2016**

## Introduction

### Assessment plan for the heavy vehicle service and maintenance technician apprenticeship

This document sets out the requirements and process for end point assessment of the heavy vehicle service and maintenance technician apprenticeship standard. It is designed for employers, apprentices, education and training providers and assessment organisations. End point assessment occurs when the employer is satisfied the apprentice is working consistently at or above the standard set out in the heavy vehicle service and maintenance technician apprenticeship standard, which has been developed into an Employer Occupational Brief (EOB).

#### Index

SECTION	TITLE	PAGE
1.	Achieving full competence	3
2.	Readiness for end assessment	4
3.	Summary of independent end assessment activities	5
4.	End assessment organisation requirements	6
5.	Consistency, reliability and validity	8
6.	Annex A Competence expectations	10
7.	Annex B Requirements for an independent end assessor	11
8.	Annex C Requirements for examinations – MCQ	13
10.	Annex D Observation requirements	16
11.	Annex E Log of behaviours	21
12.	Annex F Professional discussion specification	22

#### Supporting documents

Employers, providers and assessment organisations must reference the employer occupational brief for a heavy vehicle service and maintenance technician. The document is available freely from both People 1<sup>st</sup> and the Society of Operations Engineers and can be accessed at both [www.people1st.co.uk](http://www.people1st.co.uk) and [www.soe.org.uk](http://www.soe.org.uk).

## 1. Achieving full competence

This document sets out the requirements for independent end assessment of the heavy vehicle service and maintenance technician standard. Employers, apprentices and training providers are able to define and develop their approach to the learning and development phase of the apprenticeship, however the trailblazer employers have made the following recommendation based upon examples of learning and development in practice across a number of organisations in the sector:

### 1.1 Who is involved in the learning and development and what will it involve?

The learning and development phase is where employers recruit an apprentice to work for them whilst completing their training towards the heavy vehicle service and maintenance technician standard. Employers will normally partner with an education and training provider to purchase learning and development. Whilst qualifications are not a mandatory requirement of the heavy vehicle service and maintenance technician standard some employers may choose to purchase these as part of the learning and development phase.

Employers should satisfy themselves that the qualifications selected are appropriate and relevant to the apprenticeship needs. This could include a selection of qualifications, for example level 2 Diploma in heavy vehicle maintenance and repair followed by level 3 Diploma in heavy vehicle maintenance and repair, ensuring appropriate units are selected. As the new standard is an overview, an Employer Occupational Brief (EOB) has been produced to expand on the knowledge, skills and behaviours for the role. Independent End Assessment has been designed in conjunction with the EOB to ensure the consistent assessment against the breadth and depth of the standard's requirements.

### 1.2 What facilities and resources will be required?

Facilities and resources may differ between employers and education and training providers. When defining the learning and development journey for the apprenticeship employers and education and training providers should ensure that up to date vehicles, systems and other resources can be utilised, ensuring the heavy vehicle service and maintenance technician is fully prepared for a modern workshop. Assessment centres must also ensure they have sufficient, valid vehicles and resources for independent end assessment. Employers must liaise with assessment organisations and collaboratively ensure that sufficient, appropriate vehicles are available for independent end assessment.

### 1.3 Gateway assessments

The heavy vehicle engineering apprenticeship will usually take three years to complete. During this time the employer, apprentice and education and training provider must regularly monitor and review progress, and assess on programme performance. These assessments are to satisfy the apprentice, employer and education and training provider of appropriate progress, they do not count towards the end assessment. Annex A provides an indicative expectation competence at each gateway.

## 1.4 Annual evaluations

As part of the independent end assessment apprentices will be required to participate in a professional discussion. During this discussion the behaviours of the apprentice throughout the apprenticeship will be examined, in line with the requirements of the standard. In order to accurately reflect on past performance it is strongly recommended apprentices complete regular evaluations throughout their learning and development journey, with input from their employer. These evaluations, which are completed at least annually will be referenced in the professional discussion as part of the independent end assessment.

## 2. Readiness for end assessment

The independent end assessment is synoptic and takes place at the end of the apprentice's learning and development after a minimum of twelve months (typically 3 years) 'on-programme' training and development, equating to a minimum of 20% of the apprenticeship as 'off job' training. The end assessment should only commence once the employer is confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard. The independent end assessment ensures that all successful apprentices have achieved the industry set professional standard for a heavy vehicle service and maintenance technician.

Once the apprentice has completed their training, development and on-programme assessment over a minimum twelve month (typically 3 year) period, demonstrated competence across the entire standard, a formal meeting will be held. This meeting must include the relevant people that have responsibility and accountability for the completion of the apprenticeship, for example: the line manager, continuous assessor and/or a senior manager as appropriate to the business. The purpose of this meeting is to confirm readiness for independent end assessment and plan the assessment activities. Prior to independent end assessment the English and maths components of the apprenticeship must be complete.

Once the employer is satisfied the independent end assessment can be arranged with an independent end assessment organisation<sup>1</sup>. End point assessment cannot be administered by the education and training provider who delivered the learning and development phase; however, it may be conducted on their premises if conducted by a separate assessment organisation. End point assessors must meet the criteria set out in Annex B.

Employers must work collaboratively to ensure that sufficient vehicles are available for independent end assessment.

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<sup>1</sup> Employers will select an assessment organisation from the Register of Apprenticeship Assessment Organisations

### 3. Summary of independent end assessment activities

There are three independent end assessment activities, each with several component parts. To achieve the apprenticeship all assessment activities must be completed to at least pass level. Assessment organisations must prepare the assessment materials for each assessment window holistically to ensure the scope of the standard is covered across the activities.

#### 3.1 Multiple Choice Examinations

There are two parts to the exam section of the independent end assessment, full details of which are set out in Annexe C. These are:

- a) 1 hour multiple choice exam on the engineering requirements of the standard
- b) 1 hour multiple choice exam on the wider requirements of the standard

#### 3.2 Practical task observations

There are five observed tasks an apprentice must complete during independent end assessment:

- a) A 30 minute 'walk and talk' around all vehicle systems EVERY apprentice should know about, regardless of the trade specific role. The apprentice is required to demonstrate understanding of how to complete a full visual safety check on the vehicle, describing which areas would be checked, how and why, in line with the requirements set out in Annex D covering:
  - i. General vehicle safety
  - ii. Basic mechanical systems
  - iii. Basic electrical systems
  - iv. Basic chassis systems
- b) Four tasks, one from each section of the engineering categories:
  - i. Chassis
  - ii. Driveline
  - iii. Engine
  - iv. Electrical

Three tasks must last 20-30 minutes, the fourth 60 minutes, to include a multi-stage diagnostic. Apprentices will write up a job card after each observation, which will be accompanied by two or three key questions about the process.

#### 3.3 Professional discussion and review of behaviours

Apprentices are required to keep a log of progression throughout their apprenticeship to evidence their journey. This must particularly evidence their development of knowledge, skills and behaviours and must include the records of an annual review between the employer and apprentice of progress and evaluation against gateway targets. The education and training provider may participate in this review if desired. Neither the reviews or the log of progression form any part of the on programme assessment. This evidence must be supplied to the assessment organisation two weeks prior to the assessment window opening and will form the basis of the professional discussion as detailed in Annexes F and G.

## 4. End assessment organisation requirements

### 4.1 Timing of assessments

Assessment organisations may offer independent end assessment at any time, but must publish dates in advance for employers to prepare. There is a 90 day assessment window, commencing on the day of the first assessment activity, in which all assessment activities must be completed.

Assessment organisations are free to determine which order in which an apprentice completes the assessment activities.

### 4.2 Grading assessment activities

Each assessment activity will be graded as follows:

Assessment activity	Expected grade boundaries	
MCQ exam (Engineering) Mandatory questions answered, plus overall:	0-79% 80-100%	Fail Pass
MCQ exam (Wider) Mandatory questions answered, plus overall:	0-79% 80-100%	Fail Pass
Observation A	Pass / Fail Ascertained through assessment criteria, articulated in Annex D	
Observation B(i)	Pass / Fail Ascertained through assessment criteria, articulated in Annex D	
Observation B(ii)	Pass / Fail Ascertained through assessment criteria, articulated in Annex D	
Observation B(iii)	Pass / Fail Ascertained through assessment criteria, articulated in Annex D	
Observation B(iv)	Pass / Fail Ascertained through assessment criteria, articulated in Annex D	
Observation write up	Enhance observation grades from pass to Pass / Merit / Distinction	
Professional discussion	Pass / Fail Ascertained through assessment criteria, articulated in Annex F	

### 4.3 Retakes

Apprentices who fail the multiple choice tests may reattempt them after one month. For any singular other assessment activity failed this must be taken after a period of further training and development within six months of receiving the results. If more than one assessment activity is failed, or if the singular activity is not retaken within six months the apprentice must undertake a period of further training and development, after which they must complete the whole independent end assessment again. An apprentice retaking any assessment activity must have different questions / practical scenarios to those on the first attempt. Retakes can only result in a pass / fail result, a maximum of three retakes on each assessment activity is permitted.

#### 4.4 Overall grade

The assessment for this apprenticeship will be graded Pass, Merit, Distinction or Fail. The grade will be decided by the performance on the job card write up as follows:

Assessment activity	Potential grade	Score
MCQ Engineering	Pass / Fail	Pass = 1
MCQ wider standard	Pass / Fail	Pass = 1
Observation A	Pass / Fail	Pass = 1
Observation B (i)	Pass / Fail	Pass = 1
Observation B (i)	Pass / Fail	Pass = 1
Observation B (i)	Pass / Fail	Pass = 1
Observation B (i)	Pass / Fail	Pass = 1
Job card write ups of observations	Pass / Merit / Distinction / Fail	Pass = 1 Merit = 2 Distinction = 3
Professional discussion	Pass / Fail	Pass = 1

Every assessment activity must be completed to at least pass level to pass overall. Once each assessment activity has been completed it will be allocated a score (as above).

Total score:	0-8 points	Fail
	9 points	Pass overall
	10 points	Merit overall
	11 points	Distinction overall

## 5. Consistency, reliability and validity

Independent end assessment is conducted by an independent end assessor appointed by an assessment organisation registered with the Skills Funding Agency (SFA). The assessment organisation is responsible for designing the tools and procedures for assessment and undertaking internal quality assurance and standardisation. The final decision on competence is made by the independent assessor, whose decisions are subject to moderation by the assessment organisation.

All assessment organisations are subject to external quality assurance to ensure consistent performance across all apprenticeship outcomes. Ofqual have been appointed to complete the external quality assurance of the standard. This means any organisation wishing to deliver end point assessment must register with Ofqual prior to applying to the RoAAO.

This flow of responsibility will ensure consistent, reliable and valid judgements across the industry. The assessment methods themselves are designed to produce apprenticeship outcomes that are consistent and reliable, ensuring fair and proper comparison between apprentices employed in different types and sizes of organisation. Consistent, secure standards will be achieved through:

- ✓ Strict requirement to plan the end point assessment, allowing planning of quality assurance by the assessment organisation
- ✓ Assessment tools and supporting materials designed by assessment specialists and quality assured by the assessment organisation to meet the requirements for fair, accurate and reliable assessment decisions against the heavy vehicle service and maintenance technician apprenticeship standard and ensure best practice in assessment
- ✓ The mandating of both technical and assessment competence and continuing professional development (CPD) for independent end assessors to ensure that they have not only the right tools, but the right qualifications, training and experience to make reliable judgements
- ✓ The quality assurance of individuals conducting independent end assessments and of independent end assessment outcomes and results, by an SFA registered apprentice assessment organisation
- ✓ Requirements for standardisation of independent end assessments across assessment organisations
  - All independent end assessors must take part in standardisation activities on a regular basis (at least annually, or as defined by the assessment organisation).
  - Moderation of results across assessors will be conducted by the assessment organisation to ensure consistent use of the assessment tools and validity and reliability of all assessments
- ✓ The use of written exams prepared specifically for each assessment block combined with two multiple choice exams ensuring a consistent approach regardless of the apprentice's workplace
- ✓ Clear structure for the combination of assessment methods

### Appeals

All assessment organisations are required to have a robust appeals procedure in line with the Ofqual General Conditions of Recognition.

### Reasonable adjustments and extenuating circumstances

Assessment organisations are required to have policies and procedures for reasonable adjustments and extenuating circumstances in line with the Ofqual General Conditions of Recognition.



All policies and procedures must be freely available from the assessment organisation to apprentices, tutors and employers.

### **Affordability and Implementation**

It is anticipated that the end point assessment will cost approximately 15-20% of the total available funding for the bus and coach engineering manager standard.

The trailblazer has worked closely with stakeholders who will potentially deliver the apprenticeships and an assessment organisation to ensure delivery partners are in place. It is recognised that development work is required to ensure effective implementation this plan, that is the development of assessment tools by assessment organisations and briefings to on-programme delivery providers, which the trailblazer employer group will activity support.

## Annex A – Competence expectations at gateways

There are three gateway competency points in the heavy vehicle service and maintenance technician apprenticeship. It is expected that an apprentice will have demonstrated competence as prescribed on the following pages, which is reviewed and agreed by the employer and education and training provider before progression to the next phase of learning and development.

## Annex B – Requirements for an Independent End Assessor

An independent end assessor assesses the observations, facilitates the professional discussion and may invigilate the multiple choice and extended answer tests required in the independent end assessment. They are appointed and approved for the purposes of conducting end-point assessment by an independent assessment organisation. This individual must be someone who has nothing to gain from the outcome of the assessment and must not have been involved in the training, on programme assessment or line management of the apprentice.

At any time the assessor is conducting independent end assessment they are acting on behalf of, and are subject to the procedures dictated by, the assessment organisation. To ensure consistent and reliable judgements are made, independent end assessors will be subject to rigorous quality assurance, proportionate to their experience and performance over time. Assessment organisations must develop a quality assurance model based around the White, Red, Amber, Green (WRAG) system to ensure new or poorly performing assessors have additional support and quality assurance checks, and those with a proven track record of high quality performance in assessment can be quality assured with a smaller sample of assessments. All assessors must take part in regular standardisation activities as laid out by the assessment organisation.

This section specifies the mandatory criteria for independent end assessors and includes:

- Assessment organisation will design and conduct training for independent end assessors. This will include requirements for current, appropriate vocational assessment qualifications, such as appropriate units of the Training Assessment Quality Assurance qualification
- Quality assurers must hold a relevant quality assurance qualification as prescribed by the assessment organisation, such as appropriate units of the Training Assessment Quality Assurance qualification
- Specific occupational competence of independent assessors, requirements for training and development including continuous professional development

### a) Occupational Expertise of Independent End Assessors

The requirements set out below relate to all heavy vehicle service and maintenance technician independent end assessors. Independent end assessors must:

- Have excellent knowledge and understanding of the apprenticeship standard as set out in the industry set employer occupational brief
- Has been trained in independent end assessment to the standard required by the assessment organisation
- Have relevant occupational expertise and knowledge, at the relevant level of the occupational area(s) they are assessing, which has been gained through 'hands on' experience in the industry
- Practice standardised assessment principles
- Have sufficient resources to carry out the role of independent end assessor i.e. time and budget
- Hold qualifications, or have undertaken training, that has legislative and technical relevance to the heavy vehicle service and maintenance technician standard
- Update their occupational expertise and industry knowledge in the areas being assessed through planned Continuous Professional Development

## b) Continuous Professional Development for Independent End Assessors

Independent end assessors also need to have occupational knowledge and skills, current and updated, to show they can understand up to date techniques and methods used in today's heavy vehicle engineering operations. In particular assessors must demonstrate their competence with emerging vehicle technologies.

It is necessary for independent end assessors to maintain a record of evidence of their continuous professional development (CPD). This is necessary to maintain currency of skills and understanding of the occupational area(s) being assessed, and can be achieved in a variety of ways. It should be a planned process, reviewed on an annual basis, for example as part of an individual's performance review.

Independent assessors should select CPD methods that are appropriate to meeting their development needs. The following provides an example of a variety of methods that can be utilised for CPD purposes.

### Updating occupational expertise

- Internal and external work placements to gain 'hands on' experience
- Work experience and shadowing External visits to other organisations
- Updated and new training and qualifications
- Training sessions to update skills, techniques and methods
- Visits to educational establishments
- Trade fairs

### Keeping up to date with sector developments and new legislation

- Relevant sector websites and twitter feeds
- Membership of professional bodies
- Papers and documents on legislative change
- Networking events
- Seminars, conferences, workshops, membership of committees/working parties
- Staff development days

### Standardising and best practice in assessment

- Regular standardisation meetings with colleagues
- Sharing best practice through internal meetings, news-letters, email circulars, social media
- Comparison of assessment and verification in other sectors

## Annex C – Requirements for examinations – Multiple choice

There are two elements to the exams contained within the heavy vehicle engineering independent end assessment. There are two multiple choice exams, the first of which has a 'hurdle' section where apprentices must achieve 100% on five safety critical questions. These will represent 25% of the exam marks available. The remainder of the questions must form a representative sample of the remainder of the criteria detailed below.

A question bank will be developed and piloted by assessment organisations in conjunction with employers and education and training providers. It is strongly recommended that in line with Ofqual mandatory requirements for vocational qualifications, questions are developed in consultation with a representative employer group. If an assessment organisation employs subject matter / technical experts, questions should still be consulted upon with a representative sample of employers to ensure they are up to date and fit for purpose for end assessment. The questions will include some which will be scenario based requiring the apprentice to demonstrate reasoning and joined up thinking and reaching an answer to a sequential problem.

It is expected that the pass mark will be set at 70% with an expected pass range of 70-89%. The pass mark must not be below 70%, but minor flexibility to increase the pass mark and adapt the grade range to allow for effective test design by assessment organisations is permitted. Evidence of employer consultation during question and grading design. The assessments will be an objective on demand test and will be in multiple-choice and 'drag and drop' or 'correctly label the diagram from these options' (to allow for automated marking). Some questions will require the apprentice to consider a course of action or solution to a situation / problem based on a 'real-life' workplace activity in line with the identified requirements of the standard.

Questions will be written using the language and tone expected for the level of standard. Apprentices taking the tests will be given a proportional sample of these questions which reflect general coverage of the standards to demonstrate competence within the given time constraints.

Each on demand test will last for 60 minutes. Apprentices will complete their tests on-screen unless individual assessment needs dictate a suitable alternative method, such as paper based, or extra time allowance, away from the day to day pressures of work and in a 'controlled' environment, which may be on or off the employers' premises, usually in an assessment centre. The definition of a 'controlled environment' will be clearly defined and explained by the independent end assessor in line with arrangements prescribed by the assessment organisation, prior to scheduling the test and will include environmental requirements such as lighting, space, privacy and the requirements for an invigilator.

Results should ideally be provided instantly when the test is taken online, and immediately upon reconnection if taken offline. Any tests taken in an alternative format should have results be provided within 21 working days.

Should an apprentice fail an exam they must be given a different set of questions upon retake.

## MCQ exam – Engineering

The assessment content for the MCQ – Engineering is as follows, from which a sample will be selected for the multiple choice test:

Section of MCQ exam	Question topics (please cross reference to NOS content in competence gateways)
<p><b>Mandatory criteria</b></p> <p>Questions based around each of the following, from system to diagnostic approach should be included in every exam:</p>	<ul style="list-style-type: none"> <li>• The importance of working within the health and safety and industry regulations and tolerances when diagnosing and maintaining:</li> <li>• Braking systems</li> <li>• Suspension</li> <li>• Fuel (including hybrid and gas)</li> <li>• Electrical systems</li> <li>• Common rail system</li> <li>• Steering</li> <li>• Safety of people in the workplace</li> <li>• </li> </ul>
<p>Each exam should include a representative sample of questions based around each of the following:</p>	<ul style="list-style-type: none"> <li>• Principles of chassis design, diagnosis and repair of faults</li> <li>• Principles of heavy vehicle design and configuration</li> <li>• Principles of exhaust system SCR/EGR and turbocharger design, diagnosis and repair of faults</li> <li>• The process and procedure for heavy vehicle inspection</li> <li>• Regulatory requirements for the inspection of heavy vehicles</li> <li>• Principles of design, diagnosis and repair of:</li> <li>• Transmission / drive line</li> <li>• Clutch</li> <li>• Final drive hub</li> <li>• Automatic transmissions</li> <li>• Wheels</li> <li>• Tyres</li> <li>• Steering and steering angles</li> <li>• Power assistance</li> <li>• Suspension systems (including air)</li> <li>• Electronic suspension control</li> <li>• Braking systems (including ABS / EBS)</li> <li>• Engine configurations and components</li> <li>• Engine testing</li> <li>• FI</li> <li>• Basic and advanced electrics, including CANBUS</li> <li>• Brake efficiencies</li> <li>• Principles and practice of diagnostic testing</li> <li>• Ohms Law related resistance, volts, amps</li> <li>• Simple circuits</li> <li>• Types of brake systems</li> <li>• Wheel security</li> <li>• Suspension types</li> <li>• Fuel system</li> <li>• Cooling system</li> <li>• Engine 4 stroke cycle</li> </ul>

- Battery and fuse connecting

## MCQ exam – Wider standard

The assessment content for the wider standard exam is as follows, from which a sample will be selected for the multiple choice test:

Section of MCQ exam	Question topics (please cross reference to NOS content in competence gateways)
<b>Mandatory criteria</b>  Questions based around each of the following should be included in every exam:	<ul style="list-style-type: none"> <li>• Hazard analysis and risk management</li> <li>• COSHH</li> <li>• Health and Safety at work</li> <li>• Fire extinguishers</li> <li>• Reasons for service and inspection</li> <li>• Warning signs</li> <li>• Tool identification</li> <li>• Use of a multimeter</li> <li>• Legal requirements relating to inspection and servicing</li> <li>• Effective working relationships with customers and team members</li> </ul>
Each exam should include a representative sample of questions based around each of the following:	<ul style="list-style-type: none"> <li>• Principles of health and safety in the workshop</li> <li>• Principles of customer service</li> <li>• Principles of business structure in the heavy vehicle industry</li> <li>• Principles of effective communication</li> <li>• Principles of using diagnostic tools</li> <li>• Principles of using measuring equipment</li> <li>• Safe lifting and manual handling techniques</li> <li>• Principles of inspection to regulated standard</li> <li>• Principles of effective servicing</li> </ul>



## Annex D – Observation requirements

There are five observations each apprentice must complete during their independent end assessment.

**Observation A** requires apprentices to walk around the vehicle with the assessor and describe how to perform a safety inspection. This activity will last thirty minutes and does NOT require any faults to be present on the vehicle.

**Observation B** requires each apprentice to inspect, diagnose and repair on one scenario from each of four areas of competence relevant to their trade specific role. Three of the four scenarios will last between 20 and 30 minutes, and one between 50 and 60 minutes, requiring the apprentice to demonstrate competence in a multi stage diagnostic process. A range of scenarios have been supplied below for each area of competence to ensure each apprentice is fully prepared for any eventuality.

After the observations B the apprentice will be required to write up a 'job card' detailing what they have undertaken. This will allow the apprentice to demonstrate their underpinning knowledge of the subject. In addition to the job card, two or three written questions will be set by the assessment organisation to further demonstrate the underpinning knowledge. The job card and questions will allow the apprentice to build on the pass form the observations to achieve a merit or distinction grade.

If multiple apprentices are being assessed on the same day at the same location assessment organisations must either:

- a) Provide secure, comfortable facilities for apprentices to wait prior to the test where they cannot become aware of the scenarios they will face, or
- b) Rotate scenarios around at random so an apprentice does not know which scenario they will face until they are attending the vehicle

Assessors from the education and training provider may act as observers and recorders for the observations under the watch of an independent end assessor from the assessment organisation. Each observer/recorder can only observe one apprentice at a time, but the independent end assessor can monitor three observers.

## Observation A

Observation A – Every apprentice must:	
<b>Task description</b>	<p>An observation of the apprentice conducting an inspection on a vehicle, including identifying loose, worn, damaged or dangerous components in each of the following areas:</p> <ol style="list-style-type: none"> <li>i. General vehicle safety</li> <li>ii. Basic mechanical systems</li> <li>iii. Basic electrical systems</li> <li>iv. Basic chassis systems, set up underneath a vehicle</li> </ol> <p>At the end of the inspection the apprentice must correctly declare whether the vehicle is roadworthy, highlighting any findings which would render the vehicle unroadworthy or ‘developing issues’ which may lead to further problems in the future.</p> <p>The inspection will last approximately 30 minutes.</p>
<b>In order to pass an apprentice will:</b>	<ul style="list-style-type: none"> <li>• The apprentice will complete the inspection within 45 minutes</li> <li>• Every element required on the inspection will be completed</li> <li>• Any current or potential issues are identified correctly</li> <li>• Complete all required documentation correctly and legibly</li> </ul>
<b>In order to achieve a distinction apprentices must, in addition to achieving all pass criteria:</b>	<ul style="list-style-type: none"> <li>• Inspect the vehicle logically, completing tasks in ‘groups’ to maximise time</li> </ul>

## Observations B

<b>Observation B(i) – Chassis</b> Apprentices must complete ONE of the following scenarios from section B(i)	
<b>20-30 minute Scenarios*</b>	<ul style="list-style-type: none"> <li>• ABS warning light activates on dashboard indicating fault on ABS system</li> <li>• Suspension warning light activates indicating fault on suspension system (could be mechanical or electrical)</li> <li>• No/reduced effort to front brakes diagnose problem</li> <li>• A brake test has found front and rear brakes not operating efficiently with incorrect predominance set between front and rear</li> </ul>
<b>50-60 minute Scenarios*</b>	<ul style="list-style-type: none"> <li>• ABS warning light activates on dashboard indicating fault on ABS system</li> <li>• Suspension warning light activates indicating fault on suspension system (could be mechanical or electrical)</li> <li>• No/reduced effort to front brakes diagnose problem</li> <li>• A brake test has found front and rear brakes not operating efficiently with incorrect predominance set between front and rear</li> <li>• Vehicle is pulling to the left. Diagnostics involving tracking</li> <li>• Air dryer fault. Not building up enough pressure</li> </ul>
<p>* Some symptoms are listed in both the short and long scenario sections as there may be multiple causes to the problem, assessment organisations must ensure that the fault leading to the symptoms, and time required to diagnose, fits into the appropriate time category</p>	
<b>Observation B(ii) – Driveline / Transmission</b> Apprentices must complete ONE of the following scenarios from section B(ii)	
<b>20-30 minute Scenarios*</b>	<ul style="list-style-type: none"> <li>• Switch will not engage the range change</li> <li>• Check the differential gears for backlash</li> <li>• Diff lock stuck in</li> <li>• PTO doesn't engage</li> <li>• PTO engaging but not confirming on dash: diagnose confirmation switch and circuit</li> <li>• Vibration when driving, suspect prop</li> <li>• Gear changing feels loose</li> </ul>
<b>50-60 minute Scenarios*</b>	<ul style="list-style-type: none"> <li>• Switch will not engage the range change</li> <li>• PTO doesn't engage</li> <li>• Clutch pedal flat to floor (likely to indicate internal/external leak)</li> </ul>
<b>Observation B(iii) – Electrical</b> Apprentices must complete ONE of the following scenarios from section B(iii)	
<b>20-30 minute Scenarios*</b>	<ul style="list-style-type: none"> <li>• No Brake lights-no live feed</li> <li>• Engine slow starting on turning the key</li> <li>• Conduct circuit test</li> <li>• Electrical starting/charging/battery related fault and check</li> </ul>

	<ul style="list-style-type: none"> <li>• Night Heater Fault – heater clicking and smoking but blowing cold air into cab</li> <li>• Auxiliary/retro fit lights inoperative, e.g. beacons or trailer lights</li> <li>• All marker lights on N/s of trailer inoperative. Wired in series, could involve systematically checking feed at each point</li> <li>• A multiple fault scenario such as a power supply fault, common power feeds indicating etc. showing a faulty relay or buzz bar</li> </ul>
50-60 minute Scenarios*	<ul style="list-style-type: none"> <li>• No Brake lights-no live feed</li> <li>• Conduct circuit test</li> <li>• Electrical starting/charging/battery related fault and check</li> <li>• Auxiliary/retro fit lights inoperative, e.g. beacons or trailer lights</li> </ul>
<b>Observation B(iv) – Engine</b> <b>Apprentices must complete ONE of the following scenarios from section B(iv)</b>	
20-30 minute Scenarios*	<ul style="list-style-type: none"> <li>• Excessive noise coming from an engine #</li> <li>• Engine reported as poor running possible injector fault</li> <li>• New injector requires fitting to an engine #</li> <li>• SCR warning light appears on dashboard carry out SCR health check</li> <li>• Engine management light is on. Customer reports new injector has been fitted by other dealer</li> <li>• Loosing water over time</li> <li>• EMS light on. Fault with Nox sensor</li> <li>• Black smoke and lack of power</li> </ul>
50-60 minute Scenarios*	<ul style="list-style-type: none"> <li>• Engine reported as poor running possible injector fault</li> <li>• Engine management light is on. Customer reports new injector has been fitted by other dealer (if no coded to vehicle system)</li> <li>• Compression test has shown fault on cylinder 1. Strip head and piston/liner to identify fault (sump already removed) #</li> <li>• Black smoke and lack of power</li> <li>• Oil pressure fault (check: viscosity / contamination of oil, oil pressure at tappets, manually check pressure with gauge to identify possible electrical fault, relief valves etc. Check to rely on manual mechanical work rather than diagnostic equipment</li> </ul>
<p>* Some symptoms are listed in both the short and long scenario sections as there may be multiple causes to the problem, assessment organisations must ensure that the fault leading to the symptoms, and time required to diagnose, fits into the appropriate time category</p> <p># Scenario may be run on a rig</p>	

## Grading observations

<b>Grading</b>	<p>Grading will be decided by the independent end assessor over the performance of the apprentice in each of the four observations. In each observation and subsequent write up the following grading approach must be taken. The apprentice must successfully complete each task to the required level to achieve the level overall</p> <p>(e.g. if two tasks are achieved at pass and two at merit, the apprentice will achieve a pass for the assessment activity).</p>
<b>In order to pass an apprentice will:</b>	Identify the fault using basic diagnostics, arriving at the cause of the fault without using correct diagnostics or procedures
<b>In order to achieve a merit apprentices must, in addition to achieving all pass criteria:</b>	Identify the fault using the correct diagnostic steps in a logical order. The apprentice has a basic understanding of the cause of the fault. (e.g. why a blocked air filter would cause black smoke)
<b>In order to achieve a distinction apprentices must, in addition to achieving all pass and merit criteria:</b>	Use a thorough diagnostic procedure in the most logical order. The apprentice is able to explain why they are carrying out each diagnostic step as well as what readings/measurements they would expect to see.

## Annex E – Log of behaviours

At each annual review the apprentice, on programme assessor and employer will discuss the apprentice's progress against their individual learning plan. As part of this review the behaviours must be evaluated.

During the professional discussion the apprentice will be required to revisit these reviews and demonstrate their behavioural performance over the course of the standard.

## Annex F – Professional discussion specification

The professional discussion is a structured discussion between the apprentice and their independent end assessor and an engineering manager<sup>2</sup> from another heavy vehicle workshop. The employer may be invited to the meeting to assist in contextualising the discussion if required. Wherever possible the independent end assessor should be the same person who conducted the observations. It allows the independent end assessor to ask the apprentice questions in relation to:

- ✓ Behaviours
- ✓ The period of learning, development and continuous assessment
- ✓ Coverage of the standard
- ✓ Personal development and reflection
- ✓ Continuous Professional Development
- ✓ Customer interaction

The apprentice will be informed of the requirements prior to the discussion, and will refer to any relevant work place evidence which they can provide, at least 10 days in advance, at the request of the independent end assessor. The discussion must be appropriately structured to draw out the best of the apprentice's energy, enthusiasm, competence and excellence. The first ten minutes of the professional discussion will focus on the evidence provided for the behaviours element of the standard as outlined in Annex E, the remaining 50 will focus on the whole standard, in relation to the assessment criteria set out below.

A standard template supplied by the assessment organisation which can be contextualised by the independent end assessor for each assessment will be used, to ensure that standards are secure but interviewers are able to focus on key areas for confirmation of performance and effective appraisal of the evidence base. This will ensure that consistent approaches are taken and that all key areas are appropriately explored. The professional discussion will be planned in advance to allow for quality assurance and the apprentice will be given the template in advance so they are able to prepare responses and additional evidence.

In order to achieve the professional discussion, the apprentice will demonstrate their competence against each of the assessment criteria below. The apprentice may explain how they have achieved these knowledge, skills and behaviours in their workplace, using supporting documentation as appropriate. Once the assessor is satisfied the apprentice knows, shows and lives these sections on a consistent basis they will conclude the discussion.

The professional discussion will last sixty minutes and will be scored by the independent assessor and the engineering manager using the standard template. The template will record full details of all marks applied (and evidence referenced) by the assessor. The professional discussion will be conducted in an assessment centre.

The professional discussion may be conducted over video link (such as Skype) as long as it is recorded for quality assurance purposes.

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<sup>2</sup> The employer panel member must currently, or have previously (within 5 years) been an engineering manager in a heavy vehicle operating environment. They must not have had any part in the learning and development or line management of the apprentice.

## Professional discussion assessment criteria

Assessment requirements for professional discussion	
<b>In order to pass an apprentice will:</b>	<ul style="list-style-type: none"> <li>• The maintenance schedules required to comply with your organisation's policies and procedures as well as legal requirements; these may include first use inspection, daily, weekly, monthly and annual service</li> <li>• How to source and interpret relevant information for planning and progressing your work</li> <li>• How to complete servicing activities, including the methods, materials and tests used</li> <li>• The range of activities relevant to heavy vehicle servicing</li> <li>• The timescales allocated for checks and servicing and the procedures for obtaining authorisation to change or modify the laid down service specification</li> <li>• The importance of and procedures required for recording service activities</li> <li>• The extent of your own responsibility and to whom you should report if you have problems that you cannot solve</li> <li>• the range of inspection techniques</li> <li>• use of organisational checklists</li> <li>• the critical tolerances, standards and specifications contained within relevant sources of information, including: <ul style="list-style-type: none"> <li>▪ the tester's manual</li> <li>▪ categorisation of defects manual</li> <li>▪ group or company engineering manual</li> <li>▪ DVSA guide to maintaining roadworthiness</li> <li>▪ manufacturers' workshop manuals</li> <li>▪ detailed engineering drawings</li> </ul> </li> <li>• how to source and use relevant information for planning and progressing your work</li> <li>• how to carry out of vehicle inspections for statutory inspection using efficient and safe methods</li> <li>• how inspection standards are maintained</li> <li>• the prohibition notices used by the police and the Vehicle Inspectorate</li> <li>• what is meant by prohibitions, exemptions, discretions and obstructions and how they are used</li> <li>• the actions and responsibilities required to maintain vehicle roadworthiness</li> <li>• how to calibrate specialised equipment prior to use</li> <li>• how to ensure that inspection tools, equipment and facilities are maintained and serviced prior to inspections</li> <li>• the measuring equipment available to verify the vehicle standard including brake tester, emissions tester and headlamp aligner</li> <li>• the visual and test operations to support the inspection activity</li> <li>• the importance of critical tolerances to pass/fail testable items</li> <li>• how to record inspection items</li> <li>• identify the knowledge, understanding and skills needed for your role and evaluate your own performance against these</li> <li>• identify relevant standards and competence frameworks and evaluate your performance</li> </ul>



- identify relevant organisational, legal and licensing requirements and evaluate your working practices in relation to them
- identify any gaps in your work skills and/or knowledge and understanding
- draw up a personal development plan, including goals and/or targets and timelines, for developing your knowledge, understanding, skills and behaviours
- set objectives for the ongoing development of your knowledge, skills and understanding
- keep up to date on industry issues and be able to recognise how changes in the industry affect you and the changes you need to make to carry out your role
- discuss and agree where relevant with the appropriate person in your organisation how you will receive the development you need and get feedback
- the knowledge, understanding and skills you need to carry out your role
- the standards relevant to your role e.g. National Occupational Standards
- how to evaluate your own performance
- how to obtain feedback on your performance including feedback from learners and other professionals
- how to record and evaluate professional development activities in a reflective log as part of ongoing professional development
- how gaps in your own skills and knowledge can affect your performance and your organisation
- how to set and prioritise realistic personal goals and/or targets
- how to set personal learning objectives to meet goals and/or targets
- the types of development opportunities that are available including formal and informal opportunities
- relevant and current sources of information on the industry and on other professional initiatives e.g. training, business
- how to evaluate potential development opportunities
- the benefits of training and other forms of development and how to evaluate their impact
- how to monitor your progress against your development plans
- the heavy vehicle industry at local and national level, relevant to your role