

How good does my vision have to be to drive this thing? Visual standards for various occupations

We can all picture that moment in clinic: you are about to tell someone that they're no longer legally able to drive, ready to deploy our 'breaking bad news' techniques. For some patients this may have been expected, or they may not drive in the first place. For others, driving is an integral part of their livelihood and may completely change their sense of independence. It's therefore of great importance that ophthalmologists are aware of these legal standards in order to give the right information to patients. Furthermore, a range of vehicles require minimum visual standards for driving, as summarised in Table 1.

The Driver and Vehicle Licensing Agency (DVLA) requires that car and motorcycle drivers are able to read a number plate at 20 metres, which is assessed at the start of the current practical driving test. Visual

acuity (VA) needs to be at least 6/12 (with correction if necessary) with both eyes, or with just one eye if monocular. Visual field deficits also need to be certified by an optician. This covers drivers until age 70, after which they will need to renew every three years, declaring that they meet the required visual standards [1].

Visual standards for Heavy Goods Vehicle (HGV) and bus drivers in the UK are more stringently set, and understandably so. Transporting many other people, dangerous chemicals or a much larger vehicle obviously increases the associated risks for the driver and those around them. Currently, the DVLA requires that lorry and bus drivers have a best corrected VA of 6/7.5 or better and that their worse eye is at least 6/60 with correction if required. HGV drivers are allowed any prescription of contact lens correction, however, with a maximum of eight dioptres of spectacle

correction. Once an HGV driver reaches the age of 45, they must prove their vision meets these requirements every five years and then annually once they reach 65 [1,2].

The minimum acceptable visual standards for many occupations and pastimes are borne from safety concerns. For example, a commercial pilot has an enormous responsibility when flying a vehicle that is carrying potentially hundreds of people, whereas an electrician needs to be able to safely distinguish between different coloured cables. Not only do pilots need to be able to see distant signals and potential dangers from their window, but also identify hundreds of controls and display units close by in the cockpit.

In the United Kingdom, the visual standards are set by the Joint Aviation Authorities (JAA). For commercial use, aeroplane and helicopter pilots must

Table 1: Occupational visual standards summary table. Best corrected visual acuity (BCVA).

Occupation	BCVA (Better eye)	BCVA (Other eye)	Unaided VA	Valid period	Extras
Standard driving licence	6/12	6/12 (monocular allowed)	-	Renew at age 70	-
HGV driving licence	6/7.5	6/60	-	>45: 5 years >65: 1 year	Max 8 dioptres spectacle correction
Pilot (commercial)	6/6	6/9 (See extras)	<40yrs: 12 months	≥40yrs: 6 months	Max +6/-5D unaided ametropia N5 at 30-50cm and N14 at 100cm Only one set of spectacles allowed
Pilot (private)	6/9	6/12	(See extras)	<40: 5 years 40-49: 24 months ≥50yrs: 12 month	Max +6/-5D unaided ametropia N5 at 30-50cm and N14 at 100cm Only one set of spectacles allowed
Train drivers	6/9	6/12	3/60	<55: 3 years >55: 1 year	Ishihara colour vision assessment
London Underground Train drivers	6/9	6/12	6/60	-	Ishihara colour vision assessment
Seafarers vision test	6/6	6/12	6/60	2 years	CAD colour vision assessment
Police	6/6	6/12	6/36	-	-

have a JAA Class 1 certificate with their distance vision at least 6/6 binocularly and 6/9 monocularly with correction if needed. The Class 1 certificate needs regular renewal at six months for those aged over 40, and every 12 months for those aged over 40. Without correction, refractive error cannot exceed +5.00 or -6.00 dioptres along the steepest meridian, an astigmatism must be no greater than two dioptres and anisometropia must be no greater than two dioptres. Pilots also have a near vision requirement of N5 at 30-50cm and N14 at 100cm [3]. An important point to note is that any correction must be achieved with only one set of spectacles available for immediate use, therefore multifocal lenses must be used if needed. Private pilots have a slightly less strict requirement for a Class 2 certificate with a VA of at least 6/9 binocularly and 6/12 in the worse eye, and this only needs to be renewed every five years if under 40, but up to every year if older than 40 [4].

Some occupations have a heavy reliance on colour vision. An electrician's visual requirements are dictated by the Institution of Electrical Engineers, who screen electrical and telecom engineers for colour abnormalities using a full set of Ishihara plates [5]. The use of colour coding for cables used by these engineers is essential for wiring connections safely and effectively.

Train drivers, like pilots, are responsible for large numbers of passengers. Similar visual standards are therefore required, as well as the ability to distinguish coloured signal lights. Their requirements are at least 6/9 corrected in the better eye, 6/12 in the worse seeing eye, and 3/60 in each eye unaided. Colour vision is assessed with a standard set of Ishihara plates. London Underground drivers must meet similar requirements, except their vision must be at least 6/60 in each eye unaided. These visual standards are tested at renewal for licences, and this is done every three years for those <55, and every year thereafter [6].

The Maritime and Coastguard Agency sets out the Seafarers vision test, which applies to sailors and all those working on deck on merchant navy ships and fishing vessels and needs renewal every two years [7,8]. Binocular visual acuity must be 6/6 with correction if necessary and no worse than 6/12 in the worse eye. Further to this, unaided binocular visual acuity must be at least 6/60. Seafarers who become 'monocular' require at least 6/60 unaided in the good eye and 6/6

with correction if needed. If they occlude one eye with a patch, they could officially call themselves a pirate. On a more serious note, these rules are tightened for those working on lifeboats, given the importance of spotting someone in peril at sea. Their uncorrected VA must be 6/24 in their better eye and 6/36 in their other eye. In fact, the Royal National Lifeboat Institution (RNLI) supplies its lifeboat workers with prescription spectacles which must be carried even if the employee usually wears contact lenses.

Given the differing demands of jobs requiring certain standards of vision and the resulting socio-economic importance, it is clear that a patient's social and occupational history is very relevant. Many of the professions outlined in this article set out a best corrected vision of 6/6. Some require an uncorrected visual acuity that would likely discount many ametropic patients from even applying. Ophthalmologists should of course be familiar with visual standards for driving a motor vehicle. However, we should also be aware that there are visual standards for a range of occupations and consider how a diagnosis in the eye clinic may impact a person's occupation and life.

References

1. GOV.UK. Driving eyesight rules. <https://www.gov.uk/driving-eyesight-rules>
2. Association of Optometrists - Driving and vision standards guide. <https://www.aop.org.uk/advice-and-support/for-patients/driving-and-vision-standards>
3. Civil Aviation Authority - Visual system guidance material GM. <https://www.caa.co.uk/aeromedical-examiners/medical-standards/pilots/conditions/visual/visual-system-guidance-material-gm/>
4. Civil Aviation Authority - Medical certificates for UK licences. <https://www.caa.co.uk/commercial-industry/pilot-licences/medical/uk-part-med-requirements/>
5. Health and Safety Executive (HSE) - Colour Vision Examination: A Guide for Employers. <https://www.hse.gov.uk/pubns/web03.pdf>
6. Bradshaw, S. Occupational Visual Standards - Royal College of Ophthalmologists: Ophthalmic Services Guidance <http://bmec.swbh.nhs.uk/wp-content/uploads/2013/03/OCCUPATIONAL-VISUAL-STANDARDS.pdf>
7. Maritime and Coastguard Agency. Seafarer Vision Test: Deck/Dual Career Personnel - Merchant Navy and Fishing Vessels - Southampton: Seafarer Health and Safety Branch. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/281990/msn1745.pdf
8. UKSA. All you need to know about your ENG1 medical certificate - UKSA. <https://uksa.org/what-is-an-eng1-medical-certificate/#:~:text=An%20ENG1%20can%20be%20valid,affects%20your%20ability%20to%20work.>

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