
PSV Condition 2010



PSV Fleet Condition Check 2010

Annexes

Final Report

**In House Analytical
Consultancy**

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Annex A: Terms of Reference

These terms of reference are split into work carried out in preparation for Fleet Compliance Checks (FCCs), and the analysis conducted after the checks are completed.

A.1 Setting up the survey prior to the roadside checks:

Activities performed In House Analytical Consultancy (IHAC) of the Department for Transport (DfT) included:

- Examining the information available on PSV operators, fleet sizes and distribution in order to determine the national profile;
- Informing VOSA Area Managers of the FCC and the number of checks in their Area
- Selecting a stratified random sample of operators from all PSV Operators matching the national profile;
- Finding out what data was available from the Mobile Compliance (MC) devices used by VOSA staff at the roadside, and designing a paper survey form to complement this data and enable it to be extracted from VOSA's data warehouse;
- Reviewing the instructions for vehicle examiners to ensure that they were clear - these instructions outlined the purpose of the FCC, detailed how to ensure a random selection of PSVs at operators premises and provided additional information to ensure unbiased results;
- Ensuring that the materials needed for the FCC were in place (i.e. list of PSV operators, survey forms, instructions, etc) and that sufficient copies were available.

A.2 Analysing the results:

IHAC's analysis involved:

- Collating paper returns from the areas;
- Designing a data entry database;
- Arranging for paper data to be entered into the electronic database;
- With assistance from VOSA, carrying out a data matching and data cleansing exercise to obtain a full, reliable dataset;
- Analysing the data from the survey to produce statistics on the roadworthiness of vehicles;
- Comparing the results from this year's PSV Fleet Compliance Checks with those conducted between 1997 and 2008;
- Producing a report for VOSA outlining the results of the FCC.

Annex B: Methodology

VOSA checks are normally targeted, both on the locations where offenders are most likely to be found and on the vehicles thought most likely to be offending, so figures emerging from normal VOSA checks do not necessarily provide an accurate picture of the level of traffic offences and roadworthiness defects that is representative of the fleet as a whole. A Fleet Compliance Check, using randomly selected locations and vehicles, is needed to give unbiased data.

B.1 Selection of Check Sites and the Sampling Framework

When surveying PSVs, the options available are limited by practical considerations. In particular, it was not practical to conduct this survey in the way in which HGV Fleet Compliance Checks are carried out, due to the inconvenience that roadside checks would cause to passengers. This means that the results in this survey will not be directly comparable with the results for HGVs in the above check.

Given that roadside checks are impractical for large numbers of PSVs, another method had to be developed. VOSA's day-to-day checks of PSVs are usually undertaken in bus stations or depots, either as spot checks on single vehicles or as checks of several vehicles in an operator's fleet. This method of checking vehicles was adopted for this survey, and for the previous PSV Fleet Condition surveys.

VOSA has a list of PSV operators, with the number of operators' discs that they possess. This formed the basis for the selection of vehicles for the survey.

VOSA are confident that there are very few PSVs being operated outside the operator licensing system. Therefore during the construction of the sample it was assumed there were none.

The list of PSV operators was used to select the operators whose vehicles were checked as part of this survey. There is wide variation in the number of vehicles operated by each operator, and this was taken into account when selecting the sample. Some of the larger operators had several vehicles checked whilst smaller operators may only have had one vehicle checked.

There are around 74,000 PSVs run by 9,700 different operators. The probability that one of an operator's vehicles would be checked was directly related to the number of vehicles they operate.

A method was decided upon to determine which vehicles should be checked if an operator had more vehicles available for inspection than the number which were due to be checked. It was important that subjective decisions by Vehicle Examiners (VEs) should be avoided when there was a choice of vehicles at a depot. The selection criteria used were based on the format and content of the vehicle's registration mark.

Where an operator had fewer vehicles available for inspection than the survey required, the VEs either returned later to check other vehicles, or checked vehicles from an operator on the reserve list.

Some operators have more vehicles than they have discs (this is legal provided that they do not have more vehicles on the road than they have discs, at any time), so for the purposes of this survey only vehicles which were currently in use were checked.

The checks were spread over a period between September and December 2010 to give VOSA areas sufficient time to carry out their allocated checks.

B.2 Sample Size Required

Depot checks can be treated as a random sample, with the sampling framework being such that each PSV on an operator's licence has an equal chance of being checked (however, see B.6 for details on sample accuracy).

The sample size needed for a given level of accuracy is determined by:

- the offence rate being measured (i.e. the proportion of vehicles with roadworthiness prohibitions, using the previous year's results as a guide to the current year's sample size);
- the size of the clusters (i.e. the number of checks conducted at each site);
- the intra-cluster correlation coefficient (which measures the degree of similarity between measurements made at the same site).

The sample size in the 2010 PSV FCC was 1,450. There were 658 'clusters'. The cluster sizes for vehicles ranged from one check to a maximum of 20 checks at one operator. Taking these into account, the 95% confidence intervals on the results are as shown in Table A.

Table A - Confidence intervals for different measures in the 2010 PSV FCC

	ρ	Result	Interval	Lower	Upper
All Defects	0.62	33.0%	$\pm 3.2\%$	29.8%	36.1%
All Prohibitions	0.77	6.9%	$\pm 1.8\%$	5.1%	8.7%
Immediate Prohibitions	0.76	3.4%	$\pm 1.3\%$	2.1%	4.7%

ρ is a measure of intra-cluster correlation, used as a design effect adjustment when calculating the accuracy of a cluster sample. It is to be stressed that these rates and confidence intervals assume a random sample of check sites, days and times, and random selection of vehicles at sites. The intra-cluster correlation coefficient for the different defect measures ranged between 0.62 and 0.77.

B.3 Measures of Offence Rates

There are four potential measures for compliance with regulations and roadworthiness:

- the proportion of operators with defective vehicles;
- the proportion of the fleet in which defects were found;
- the proportion of journeys made by vehicles which are defective;
- the proportion of miles travelled by vehicles with defects.

A case could be made for each of these distinct measures being thought of as providing the best picture. However there are practical problems in obtaining some of these measures, and the decision as to which measure to use must therefore take account of the practicalities of carrying out the check. It is also important to try to determine which measure best deals with issues such as upholding the law, fair competition, and road safety.

The proportion of the fleet in which defects are found was the measure that was selected. This is the measure which is given when each vehicle has an equal chance of being examined. The major advantage of this measure (apart from the practical considerations which preclude roadside checks) is that it corresponds most closely to VOSA's normal operations.

A disadvantage of using depot checks is that the results of this survey are not directly comparable with the results of the HGV Fleet Compliance Checks, which are based on roadside checks. These produce measures of defects and offences as a proportion of miles travelled on the roads. Additionally, compliance with traffic regulations cannot be fully measured in depot checks.

Vehicles in the depot at the time of the check may not be representative of the condition of vehicles in use by that operator on the day of the check.

B.4 Analysis of the Results

IHAC designed a data entry database and input the information from the paper forms. This data was matched with data extracted from VOSA's Mobile Compliance database. The combined data was analysed by IHAC to produce the report of the results.

For this year's PSV check, a new method (also adopted on the HGV Fleet Compliance check 2010) was used for most of the analysis. The chi-squared methodology used for all PSV analysis in previous years was used again in this analysis to compare different years. However, for most of the rest of the analysis, the multivariate logistic regression approach was used. This considered the effect of multiple variables together, rather than looking at each factor in isolation.

Many of the survey characteristics are related to each other. For example, only 2.5% of single deck coaches were between 0 and 1 years old, compared with 6.6% of all vehicles.

The analysis in this report takes into account these interrelationships between characteristics.

B.5 Data Problems

There were details of 1,499 vehicles entered onto paper forms. However, 49 vehicles could not be matched to electronic records, which left 1,450 vehicle checks to be used in the analysis.

Of the 1,450 vehicle checks with an electronic record, 1,409 had at least one of the FCC special returns codes (1,406 had the correct FCC_GB_PSV code and 3 had one of the other codes: either the LGV or HGV code). The remaining 41 vehicles would have been

excluded from the analysis if paper forms were not used and data was extracted only via the special returns flag.

If paper forms had not been used, bigger data inconsistencies would have been introduced by including too many vehicles rather than by excluding vehicles. An additional 66 electronic records used the PSV FCC codes over the period of the check, even though they were not part of the PSV check i.e. no corresponding paper forms. This can happen when an examiner turns on the special returns code for a series of FCC checks, but fails to turn it off for subsequent checks. If paper forms had not been used, these 66 vehicles would have been included in the analysis in error. This problem of including non-FCC vehicles is more serious than excluding real FCC vehicles as non-FCC vehicles would include targeted checks, which would be likely to artificially increase the prohibition / non-compliance rates.

B.6 Accuracy of the results

Comparisons were made between the actual and expected proportions of checks carried out on vehicles of different ages, different areas of the country and different sizes of operators. With the exception of vehicle age, these factors were used to design the sampling framework for the checks as it was thought that they may have an influence on prohibition rates. If this is the case, any significant difference between actual and expected distributions could affect the accuracy of the results.

It was necessary to compensate for these biases introduced by disproportionate sampling. A method was used that mimicked discarding extra vehicles from over-sampled groups and surveying extra vehicles from under-represented groups.

This adjustment produced a 95% confidence interval for an estimate of the prohibition rates and immediate prohibition rates for PSVs, given in Table B.

Table B – Prohibition rates

95% Limits	Prohibitions		Immediate		All Defects	
	Lower	Upper	Lower	Upper	Lower	Upper
Traffic Area	5.6%	8.2%	2.4%	4.3%	30.3%	35.1%
Fleet Size	5.7%	8.3%	2.6%	4.5%	30.8%	35.6%
Age	4.7%	7.2%	2.1%	3.8%	28.8%	33.6%
Observed Rates	6.9%		3.4%		33.0%	

There is no significant difference between the observed prohibition rates and a prohibition rate that was weighted to account for the proportion of checks carried out on vehicles in different traffic areas.

Whilst there are significant differences between the proportions of vehicles sampled and the proportions of vehicles in the fleet by fleet size and age, the results observed are still valid. The observed prohibition and defect rate falls within the confidence intervals after adjusting for sample bias.

It should be noted that the sample may not be wholly representative of the national PSV fleet. It is possible that operators use their best vehicles (i.e. most compliant) more regularly, leaving their other, possibly less compliant vehicles in the depot more of the time. If this is the case, then less compliant vehicles may have been sampled more than other vehicles, as the checks were conducted at operator's premises.

Annex C: PSV Fleet Condition Check Materials 2010

C.1 Check Form

Operator Details: PX0000000		Operator Address: AB1 2CD		Number of discs on licence: 7		
Operator Name:				Number of PSVs to check: 4		
Tel No: Operator Phone No				Disc category: 6 to 10 discs		
Ref	Date of Check	Vehicle Registration Mark	Vehicle Type (circle appropriate)			Year of first registration (if not apparent from VRM)
1558			Single Deck Bus	Single Deck Coach	Articulated	
			Double Deck Bus	Double Deck Coach	Mini Bus	
1558			Single Deck Bus	Single Deck Coach	Articulated	
			Double Deck Bus	Double Deck Coach	Mini Bus	
1558			Single Deck Bus	Single Deck Coach	Articulated	
			Double Deck Bus	Double Deck Coach	Mini Bus	
1558			Single Deck Bus	Single Deck Coach	Articulated	
			Double Deck Bus	Double Deck Coach	Mini Bus	

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C.2 Guidance Notes

PSV Fleet Condition Check 2010 Guidance Notes

The 2010 series of random PSV Fleet Condition Checks should be carried out before the end of November. There are no other restrictions on the timings of the checks.

Checks should be made at bus stations, bus depots, etc., or wherever vehicles are available to be checked. The checks are for roadworthiness only. The fullest possible inspection should be carried out, dependent on available equipment and location.

Step 1 - Operators to visit

A list of randomly selected Operators whose vehicles are to be checked has been supplied with these guidance notes (*Operator List* form). The list provides the following information:

- The OL number
- The number of discs (specified vehicles) on the Operator Licence, and the "disc category"
- The number of the Operator's vehicles that need to be checked
- The Operator's name, address and telephone number.

Visits to the Operator should be unannounced where possible, and checks should be carried out on a random selection of the Operator's PSVs. If there are insufficient PSVs at the Operator's premises at the time of the visit, the Vehicle Examiner should select an Operator from the Reserve List and check the remaining number of vehicles from their fleet. If there are no remaining Reserve Operators, the Vehicle Examiner should return to the same Operator another day and check the remaining PSVs.

A *Reserve List* of Operators has also been provided on a separate sheet, along with some blank forms to record details if you have visited a reserve operator. This should be used if an Operator on the initial list cannot be located, is unavailable or is no longer operating PSVs.

Operators should be replaced on a like for like basis in terms of fleet size, i.e. an Operator in disc category 3 (6-10 discs) should be replaced by an Operator from the Reserve List also in disc category 3. For the checks to give a true picture of the national level of PSV roadworthiness, it is important that large operators are not replaced with small operators or vice versa.

If you need additional randomly selected Reserve Operators, please contact the In House Analytical Consultancy (IHAC) in the Department for Transport (contact details overleaf).

Step 2 - Random selection of vehicles for checks

In order to create a random sample of PSVs, you need to ensure that there is no bias in your selection of vehicles to check when you get to the Operator's premises. Where there are more vehicles available than are needed please adopt the procedure below to select vehicles to check using the first letter of the 3-letter block.

Which letter to use?

The position of the letter you are looking for will depend on the type of registration mark. The 4 most common formats are shown below, with the letter to consider shown in underlined, bold type:

AAA 999A	eg: The letter to consider would be T in <u>I</u> FD 256Y
A999 <u>A</u> AA	eg: The letter to consider would be B in T748 <u>B</u> FR
AA08 <u>A</u> AA	eg: The letter to consider would be F in WF04 <u>F</u> HY
<u>A</u> AA 9999	eg: The letter to consider would be W in <u>W</u> IZ 8956

These letters are used as they are least likely to be linked with vehicle age or geographical location.

1. Establish an order for the available vehicles. For example this might be a list of registration marks, or a visual ordering, for instance a line of PSVs in a depot.
2. Take the first letter of the name of the Operator's name. For example, "F" for First Bus.
3. Start with the first vehicle in the order. Does it have an "F" at the start of the 3 letter block (see above). If so, check this vehicle, if not, continue searching through the other vehicle registration marks until you find a vehicle with this letter in this position.
4. If there is no vehicle with this letter, move to the next letter in the alphabet and cycle through the order of PSVs again (i.e. search for a vehicle with a "G" in the registration mark).

5. If you need to check more than one vehicle for an Operator, move to the next letter in the alphabet.
6. Repeat the steps until you have carried out the necessary number of checks. Restart at the beginning of the alphabet if necessary.

Step 3 - Recording the checks on the MCD system

Please ensure that all details of the encounter are recorded on your MCD, including clear inspections. You need to enter them as special returns (see box below and four-page guidance at the end of this document). Ensure that you enter the following information:

- OL number
- Vehicle Registration Mark
- Date of check
- Inspection type
- Prohibitions issued
- Immediate or delayed prohibition
- IM numbers for defects

The special returns box must be completed.

For encounters recorded as part of this PSV Fleet Condition Check you must complete the 'Special Return' section in the Mobile Compliance application for each encounter. Instructions on how to do this are attached at the back of these briefing notes, but if you have any questions then in the first instance please speak to your local MC expert user.

A Special Return category of FC_GB_PSV is being added to the selection list in the Special Return section on Mobile Compliance. For this check, there is no need to add a supplementary question, so once you have selected the Special Return code, please just tick 'Yes' that it is a FCC check.

You must ensure that your Laptop and MCD are fully up to date before commencing the Fleet Condition checks to ensure that the selection as listed in the instructions is available to you. Once it is available it should only be selected in encounters that are part of the PSV Fleet Condition check.

Ensure that the OL Number, VRM and date are entered correctly. These details are very important as they are needed to accurately extract the right data from the data warehouse.

Step 4 - Completing the Operator List form

In addition to the electronic information collected on the MCD system, information is required on the paper *Operator List* form. This should be completed for each VOSA Area and returned to the In House Analytical Consultancy.

The Operator List form contains pre-printed details for each Operator, and sufficient spaces to enter information for the vehicles checked for each Operator. The following information is required:

- Date of check
- Registration Mark
- Vehicle type
- Year of registration (where not apparent from VRM)

It is important that we receive all this information, as it will be used to obtain the matching data from the VOSA MCD system.

Step 5 - Returning the forms

Please return the completed Operator List form to IHAC, by Friday 17th December. We advise using special delivery, and taking a copy before posting. Please ensure all information on the checks has been entered on the MCD by Friday 17th December.

If you have any questions about these checks, or problems meeting the deadlines, please contact IHAC in DfT:

Annex D: Detailed Results

D.1 Tables

Severity of defects found

Severity of defects	Frequency	%
No defects	972	67.0%
Immediate prohibition	49	3.4%
Delayed prohibition	51	3.5%
Inspection notice	378	26.1%
Total	1450	100%

Number of vehicle defects per vehicle resulting in prohibitions

	All prohibitions	%	Immediate prohibitions	%	Delayed prohibitions	%
No defects	1350	93.1%	1401	96.6%	1394	96.1%
One defect	84	5.8%	45	3.1%	48	3.3%
Two defects	14	1.0%	4	0.3%	7	0.5%
Three defects	2	0.1%	0	0.0%	1	0.1%
Total	1450	100%	1450	100%	1450	100%

Type of prohibitions found

Number of Prohibitable Defects Found by Type				
IM No	Defect	Immediate	Delayed	Total
1	<i>Not Allocated</i>	0	0	0
2	<i>Not Allocated</i>	0	0	0
3	Seat Belts	0	19	19
4	<i>Not Allocated</i>	0	0	0
5	Exhaust Emissions	0	0	0
6	Road Wheels & Hubs	2	0	2
7	Size & Type of Tyres	0	0	0
8	Condition of Tyres	5	6	11
9	Bumper Bars	0	0	0
10	Spare Wheel Carrier	0	0	0
11	Vehicle To Trailer Coupling	0	0	0
12	<i>Not Allocated</i>	0	0	0
13	<i>Not Allocated</i>	0	0	0
14	Wings & Wheel Arches	1	0	1
15	<i>Not Allocated</i>	0	0	0
16	Passenger Doors, Driver Doors & Emergency Exits	11	2	13
17	Driver's Accommodation	0	0	0
18	Driver's Seat	0	0	0
19	Security of Body	0	0	0
20	Exterior of Body, including Luggage Compartments	2	0	2
21	Interior of Body, Passenger Entrance, Exit Steps &	8	1	9
22	Mirrors	0	0	0
23	Glass & View of Road	1	0	1
24	Accessibility Features	0	0	0
25	Windscreen Wipers & Washers	0	0	0
26	Speedometer and Tachograph	0	0	0
27	Audible Warning (Horn)	0	0	0
28	Driving Controls	0	0	0

Number of Prohibitable Defects Found by Type				
IM No	Defect	Immediate	Delayed	Total
29	<i>Not Allocated</i>	0	0	0
30	Steering Control	0	0	0
31	<i>Not Allocated</i>	0	0	0
32	<i>Not Allocated</i>	0	0	0
33	Speed Limiter	0	0	0
34	Pressure / Vacuum Warning & Build Up	0	0	0
35	<i>Not Allocated</i>	0	0	0
36	Hand Lever Operating Mechanical Brakes	0	0	0
37	Service Brake Pedal	0	0	0
38	Service Brake Operation	0	5	5
39	Hand Operated Brake Control Valves	0	1	1
40	<i>Not Allocated</i>	0	0	0
41	Condition of Chassis	0	0	0
42	Electrical Wiring & Equipment	2	0	2
43	Engine & Transmission Mountings	0	0	0
44	Oil Leaks & Waste	0	2	2
45	Fuel Tanks & Systems	1	1	2
46	Exhaust Systems	1	3	4
47	<i>Not Allocated</i>	0	0	0
48	Suspension	3	8	11
49	<i>Not Allocated</i>	0	0	0
50	<i>Not Allocated</i>	0	0	0
51	<i>Not Allocated</i>	0	0	0
52	<i>Not Allocated</i>	0	0	0
53	Axles, Stub Axles & Wheel Bearings	0	0	0
54	Steering Mechanism	2	5	7
55	<i>Not Allocated</i>	0	0	0
56	<i>Not Allocated</i>	0	0	0
57	Transmission	0	1	1
58	Additional Braking Devices (inc. Retarders)	0	0	0
59	Brake Systems & Components	4	10	14
60	<i>Not Allocated</i>	0	0	0
61	<i>Not Allocated</i>	0	0	0
62	Rear Markings & Reflectors	0	0	0
63	Lamps	3	0	3
64	<i>Not Allocated</i>	0	0	0
65	<i>Not Allocated</i>	0	0	0
66	Direction Indicators and Hazard Warning Lamps	2	0	2
67	Aim of Headlamps	0	0	0
68	<i>Not Allocated</i>	0	0	0
69	<i>Not Allocated</i>	0	0	0
70	<i>Not Allocated</i>	0	0	0
71	Service Brake Performance	1	0	1
72	Secondary Brake Performance	1	0	1
73	Parking Brake Performance	1	1	2
	Unknown	2	0	2
Total		53	65	118

Defects by year of check

Year	No Defects	Immediate Prohibition	Delayed Prohibition	Inspection Notice	Total	All Prohibitions
1997	947	61	90	367	1465	151
1998	901	53	42	371	1367	95
1999	1041	45	66	386	1538	111
2000	1021	49	88	400	1558	137
2001	771	37	67	298	1173	104
2002	857	48	58	299	1262	106
2003	1068	44	62	343	1517	106
2004	918	45	77	297*	1337	122
2005	962	33	52	349	1396	85
2008	1001	51	83	358	1493	134
2010	972	49	51	378	1450	100

* For 58 vehicles in the 2004 check it was not possible to determine whether an inspection notice had been given. Three scenarios were presented: either 268, 297 or 326 Inspection Notices.

Percentage of defects by year of check

Year	No Defects	Immediate Prohibition	Delayed Prohibition	Inspection Notice	Total	All Prohibitions
1997	64.6%	4.2%	6.1%	25.1%	100%	10.3%
1998	65.9%	3.9%	3.1%	27.1%	100%	6.9%
1999	67.7%	2.9%	4.3%	25.1%	100%	7.2%
2000	65.5%	3.1%	5.6%	25.7%	100%	8.8%
2001	65.7%	3.2%	5.7%	25.4%	100%	8.9%
2002	67.9%	3.8%	4.6%	23.7%	100%	8.4%
2003	70.4%	2.9%	4.1%	22.6%	100%	7.0%
2004	68.7%	3.4%	5.8%	22.2%*	100%	9.1%
2005	68.9%	2.4%	3.7%	25.0%	100%	6.1%
2008	67.0%	3.4%	5.6%	24.0%	100%	9.0%
2010	67.0%	3.4%	3.5%	26.1%	100%	6.9%

* For 58 vehicles in the 2004 check it was not possible to determine whether an inspection notice had been given. Three scenarios were presented: either 268 Inspection Notices (20.0%), or 297 (22.2%), or 326 (24.4%).

Number of checks by vehicle age

Vehicle Age	2010 PSV FCC Check		National PSV Fleet	
0-1 years	95	6.6%	12645	11.2%
2-3 years	159	11.1%	17125	15.2%
4-5 years	187	13.1%	15921	14.1%
6-7 years	205	14.3%	16182	14.4%
8-9 years	159	11.1%	13306	11.8%
10-11 years	156	10.9%	11938	10.6%
12-13 years	163	11.4%	9624	8.6%
14-15 years	121	8.5%	6051	5.4%
16-17 years	45	3.1%	2587	2.3%
18-19 years	38	2.7%	1607	1.4%
20-24 years	69	4.8%	3683	3.3%
25 years and older	32	2.2%	1892	1.7%
Total (excluding unknowns)	1429	100%	112561	100%
Unknown age	21			
Total	1450			

Defects by vehicle age

Vehicle Age	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
0-1 years	78	15	1	1	95
2-3 years	126	31	2	0	159
4-5 years	138	40	3	6	187
6-7 years	137	58	4	6	205
8-9 years	93	52	6	8	159
10-11 years	92	51	9	4	156
12-13 years	105	44	7	7	163
14-15 years	80	30	7	4	121
16-17 years	28	11	3	3	45
18-19 years	22	11	2	3	38
20-24 years	40	19	5	5	69
25 years and older	20	11	0	1	32
Unknown age	13	5	2	1	21
Total	972	378	51	49	1450

Percentage of defects by vehicle age

Vehicle Age	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
0-1 years	82.1%	15.8%	1.1%	1.1%	100%
2-3 years	79.2%	19.5%	1.3%	0.0%	100%
4-5 years	73.8%	21.4%	1.6%	3.2%	100%
6-7 years	66.8%	28.3%	2.0%	2.9%	100%
8-9 years	58.5%	32.7%	3.8%	5.0%	100%
10-11 years	59.0%	32.7%	5.8%	2.6%	100%
12-13 years	64.4%	27.0%	4.3%	4.3%	100%
14-15 years	66.1%	24.8%	5.8%	3.3%	100%
16-17 years	62.2%	24.4%	6.7%	6.7%	100%
18-19 years	57.9%	28.9%	5.3%	7.9%	100%
20-24 years	58.0%	27.5%	7.2%	7.2%	100%
25 years and older	62.5%	34.4%	0.0%	3.1%	100%
Unknown age	61.9%	23.8%	9.5%	4.8%	100%

Number of checks by size of operators' fleet

Vehicle on Licence	2010 PSV FCC Check		National PSV Fleet	
1 Disc	74	5.1%	2731	3.7%
2 to 5 Discs	177	12.2%	8564	11.6%
6 to 10 Discs	144	9.9%	7292	9.8%
11 to 20 Discs	134	9.2%	8489	11.5%
21 to 150 Discs	388	26.8%	19969	27.0%
151 to 500 Discs	331	22.8%	16609	22.4%
Over 500 Discs	201	13.9%	10422	14.1%
Total (excluding unknowns)	1449	100%	74076	100%
Unknown number of discs	1			
Total	1450			

Defects by size of operators' fleet

Fleet Size	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1 Disc	49	21	3	1	74
2 to 5 Discs	128	35	4	10	177
6 to 10 Discs	90	42	7	5	144
11 to 20 Discs	79	41	8	6	134
21 to 150 Discs	252	108	16	12	388
151 to 500 Discs	240	74	8	9	331
Over 500 Discs	133	57	5	6	201
Unknown number of discs	1	0	0	0	1
Total	972	378	51	49	1450

Percentage of defects by Size of Operators' Fleet

Fleet Size	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1 Disc	66.2%	28.4%	4.1%	1.4%	100%
2 to 5 Discs	72.3%	19.8%	2.3%	5.6%	100%
6 to 10 Discs	62.5%	29.2%	4.9%	3.5%	100%
11 to 20 Discs	59.0%	30.6%	6.0%	4.5%	100%
21 to 150 Discs	64.9%	27.8%	4.1%	3.1%	100%
151 to 500 Discs	72.5%	22.4%	2.4%	2.7%	100%
Over 500 Discs	66.2%	28.4%	2.5%	3.0%	100%
Unknown number of discs	100.0%	0.0%	0.0%	0.0%	100%

Number of checks by Traffic Area

Traffic Area		2010 PSV FCC Check		National PSV Fleet	
1	Scottish	174	12.0%	9277	12.5%
2	North Western	167	11.5%	9878	13.3%
3	West Midland	89	6.1%	4455	6.0%
4	Welsh	108	7.4%	5298	7.2%
5	Western	206	14.2%	9902	13.4%
6	South East and Metropolitan	279	19.2%	13694	18.5%
7	Eastern	209	14.4%	9981	13.5%
8	North Eastern	218	15.0%	11591	15.6%
	Total	1450	100%	74076	100%

Defects by Traffic Area

Traffic Area		No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1	Scottish	119	39	9	7	174
2	North Western	132	31	3	1	167
3	West Midland	54	25	5	5	89
4	Welsh	69	35	2	2	108
5	Western	125	62	12	7	206
6	South East and Metropolitan	185	73	7	14	279
7	Eastern	144	58	4	3	209
8	North Eastern	144	55	9	10	218
	Total	972	378	51	49	1450

Percentage of defects by Traffic Area

Traffic Area	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1 Scottish	68.4%	22.4%	5.2%	4.0%	100%
2 North Western	79.0%	18.6%	1.8%	0.6%	100%
3 West Midland	60.7%	28.1%	5.6%	5.6%	100%
4 Welsh	63.9%	32.4%	1.9%	1.9%	100%
5 Western	60.7%	30.1%	5.8%	3.4%	100%
6 South East and Metropolitan	66.3%	26.2%	2.5%	5.0%	100%
7 Eastern	68.9%	27.8%	1.9%	1.4%	100%
8 North Eastern	66.1%	25.2%	4.1%	4.6%	100%

Number of checks by VOSA Area

Traffic Area	2010 PSV FCC Check	National PSV Fleet
1 North Scotland	39	2.7%
2 West & Southwest Scotland	84	5.8%
3 Southeast Scotland	51	3.5%
4 Cumbria & Lancs	32	2.2%
5 Greater Manchester & Derbyshire	83	5.7%
6 Merseyside & Cheshire	55	3.8%
7 Staffs & Shropshire	48	3.3%
8 Central & Southwest Midlands	39	2.7%
9 Wales	108	7.4%
10 Bristol & Gloucester	65	4.5%
11 South West	88	6.1%
12 Wessex Area	51	3.5%
13 Southern Central	66	4.6%
14 South East	53	3.7%
15 Metropolitan	161	11.1%
16 Hertfordshire & Essex	47	3.2%
17 East Anglia	30	2.1%
18 East Midlands	94	6.5%
19 Lincolnshire & Cambridgeshire	43	3.0%
20 Nottinghamshire & South Yorkshire	52	3.6%
21 Humberside	22	1.5%
22 West & North Yorkshire	56	3.9%
23 Tyne & Tees	83	5.7%
Total	1450	100.0%

Defects by VOSA Area

	VOSA Area	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1	North Scotland	16	14	3	6	39
2	West & Southwest Scotland	67	15	2	0	84
3	Southeast Scotland	36	10	4	1	51
4	Cumbria & Lancs	24	7	1	0	32
5	Greater Manchester &	59	22	1	1	83
6	Merseyside & Cheshire	52	3	0	0	55
7	Staffs & Shropshire	27	13	4	4	48
8	Central & Southwest	26	12	1	0	39
9	Wales	69	35	2	2	108
10	Bristol & Gloucester	37	19	6	3	65
11	South West	56	29	1	2	88
12	Wessex Area	29	15	5	2	51
13	Southern Central	46	16	2	2	66
14	South East	40	9	1	3	53
15	Metropolitan	101	47	4	9	161
16	Hertfordshire & Essex	37	10	0	0	47
17	East Anglia	16	11	2	1	30
18	East Midlands	64	26	3	1	94
19	Lincolnshire &	30	11	0	2	43
	Nottinghamshire & South					
20	Yorkshire	34	11	6	1	52
21	Humberside	17	5	0	0	22
22	West & North Yorkshire	36	16	1	3	56
23	Tyne & Tees	53	22	2	6	83
	Total	972	378	51	49	1450

Percentage of defects by VOSA Area

	VOSA Area	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
1	North Scotland	41.0%	35.9%	7.7%	15.4%	100%
2	West & Southwest Scotland	79.8%	17.9%	2.4%	0.0%	100%
3	Southeast Scotland	70.6%	19.6%	7.8%	2.0%	100%
4	Cumbria & Lancs	75.0%	21.9%	3.1%	0.0%	100%
5	Greater Manchester &	71.1%	26.5%	1.2%	1.2%	100%
6	Merseyside & Cheshire	94.5%	5.5%	0.0%	0.0%	100%
7	Staffs & Shropshire	56.3%	27.1%	8.3%	8.3%	100%
8	Central & Southwest	66.7%	30.8%	2.6%	0.0%	100%
9	Wales	63.9%	32.4%	1.9%	1.9%	100%
10	Bristol & Gloucester	56.9%	29.2%	9.2%	4.6%	100%
11	South West	63.6%	33.0%	1.1%	2.3%	100%
12	Wessex Area	56.9%	29.4%	9.8%	3.9%	100%
13	Southern Central	69.7%	24.2%	3.0%	3.0%	100%
14	South East	75.5%	17.0%	1.9%	5.7%	100%
15	Metropolitan	62.7%	29.2%	2.5%	5.6%	100%
16	Hertfordshire & Essex	78.7%	21.3%	0.0%	0.0%	100%
17	East Anglia	53.3%	36.7%	6.7%	3.3%	100%
18	East Midlands	68.1%	27.7%	3.2%	1.1%	100%
19	Lincolnshire &	69.8%	25.6%	0.0%	4.7%	100%
	Nottinghamshire & South					
20	Yorkshire	65.4%	21.2%	11.5%	1.9%	100%
21	Humberside	77.3%	22.7%	0.0%	0.0%	100%
22	West & North Yorkshire	64.3%	28.6%	1.8%	5.4%	100%
23	Tyne & Tees	63.9%	26.5%	2.4%	7.2%	100%

Defects by registration type

Registration Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Normal	825	322	37	39	1223
GB Cherished	57	13	3	3	76
NI Cherished	90	43	11	7	151
Total	972	378	51	49	1450

Percentage of defects by registration type

Registration Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Normal	67.5%	26.3%	3.0%	3.2%	100%
GB Cherished	75.0%	17.1%	3.9%	3.9%	100%
NI Cherished	59.6%	28.5%	7.3%	4.6%	100%

Defects by PSV type

PSV Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Single Deck Bus	329	138	13	20	500
Single Deck Coach	238	86	17	13	354
Articulated	1	1	0	1	3
Double Deck Bus	234	81	8	7	330
Double Deck Coach	4	1	1	0	6
Minibus	125	53	10	6	194
Unknown	41	18	2	2	63
Total	972	378	51	49	1450

Percentage of defects by PSV type

PSV Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Single Deck Bus	65.8%	27.6%	2.6%	4.0%	100%
Single Deck Coach	67.2%	24.3%	4.8%	3.7%	100%
Articulated	33.3%	33.3%	0.0%	33.3%	100%
Double Deck Bus	70.9%	24.5%	2.4%	2.1%	100%
Double Deck Coach	66.7%	16.7%	16.7%	0.0%	100%
Minibus	64.4%	27.3%	5.2%	3.1%	100%
Unknown	65.1%	28.6%	3.2%	3.2%	100%

Defects by type of inspection

Inspection Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Full with Facilities (SPS)	135	93	11	6	245
Full (SPC)	655	227	35	35	952
Partial (SPP)	182	58	5	8	253
Total	972	378	51	49	1450

Percentage of defects by type of inspection

Inspection Type	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Full with Facilities (SPS)	55.1%	38.0%	4.5%	2.4%	100%
Full (SPC)	68.8%	23.8%	3.7%	3.7%	100%
Partial (SPP)	71.9%	22.9%	2.0%	3.2%	100%

Time Factors

The sample was not stratified by time factors; therefore very few checks were performed at the weekend and during the early morning and evening. More checks would be required to enable sound conclusions to be drawn.

Defects by day of week

Day of Week	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Monday	155	58	8	11	232
Tuesday	226	104	7	11	348
Wednesday	165	66	11	8	250
Thursday	222	94	13	10	339
Friday	189	51	10	5	255
Saturday	7	3	2	4	16
Sunday	8	2	0	0	10
Total	972	378	51	49	1450

Percentage of defects by day of week

Day of Week	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
Monday	66.8%	25.0%	3.4%	4.7%	100%
Tuesday	64.9%	29.9%	2.0%	3.2%	100%
Wednesday	66.0%	26.4%	4.4%	3.2%	100%
Thursday	65.5%	27.7%	3.8%	2.9%	100%
Friday	74.1%	20.0%	3.9%	2.0%	100%
Saturday	43.8%	18.8%	12.5%	25.0%	100%
Sunday	80.0%	20.0%	0.0%	0.0%	100%

Defects by time of day

Time Period	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
00:00-06:59	3	2	0	1	6
07:00-09:59	128	51	13	7	199
10:00-12:59	396	170	25	18	609
13:00-15:59	374	133	13	19	539
16:00-18:59	68	21	0	4	93
19:00-11:59	3	1	0	0	4
Total	972	378	51	49	1450

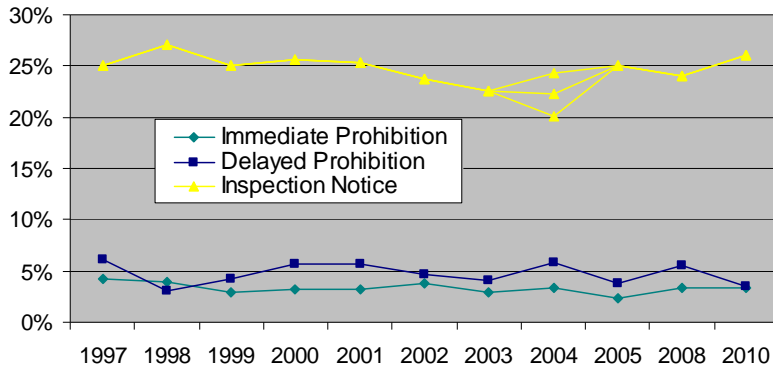
Percentage of defects by time of day

Time Period	No defects	Inspection notice	Delayed Prohibition	Immediate Prohibition	Total
00:00-06:59	50.0%	33.3%	0.0%	16.7%	100%
07:00-09:59	64.3%	25.6%	6.5%	3.5%	100%
10:00-12:59	65.0%	27.9%	4.1%	3.0%	100%
13:00-15:59	69.4%	24.7%	2.4%	3.5%	100%
16:00-18:59	73.1%	22.6%	0.0%	4.3%	100%
19:00-11:59	0.0%	0.0%	0.0%	0.0%	0%

D.2 Charts

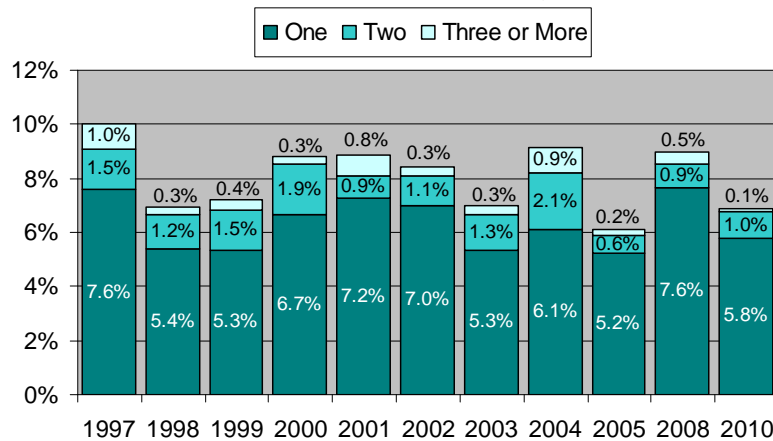
Vehicle defects by year of check

Defect Rates by Year



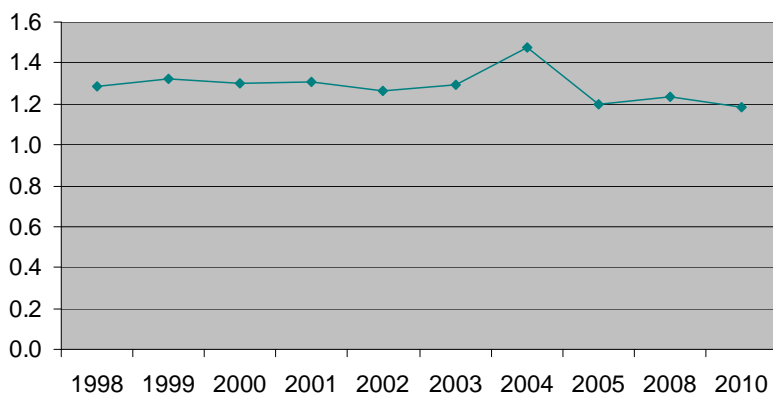
Number of defects by year

Number of Prohibitions by Year



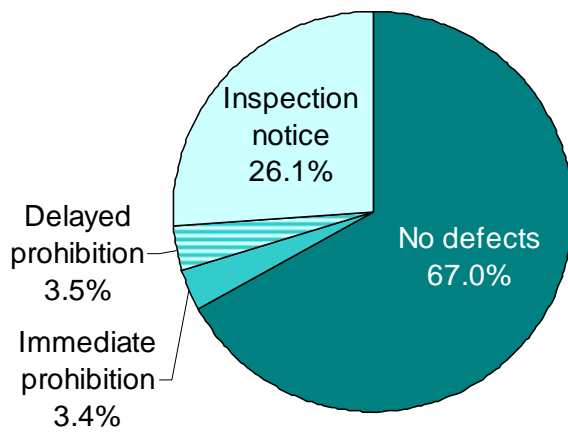
Average number of prohibitable vehicle defects by year of check

Average Number of Prohibitions per Prohibited Vehicle



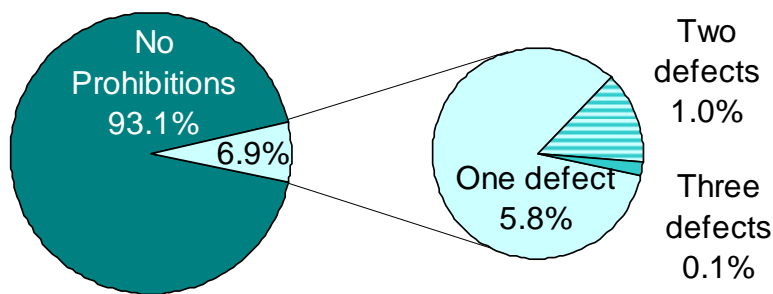
Proportion of vehicles with defects

Severity of Defects Found

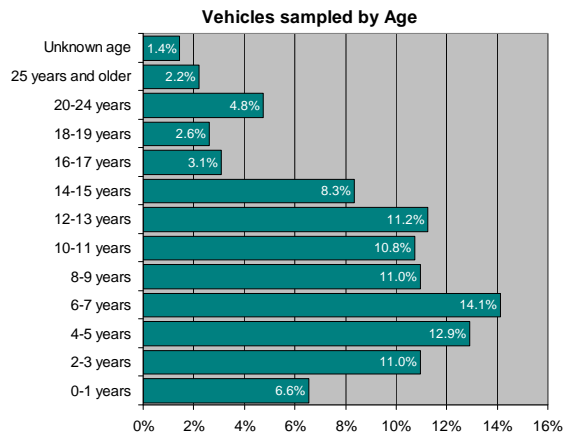


Percentage of vehicles by number of prohibitable defects

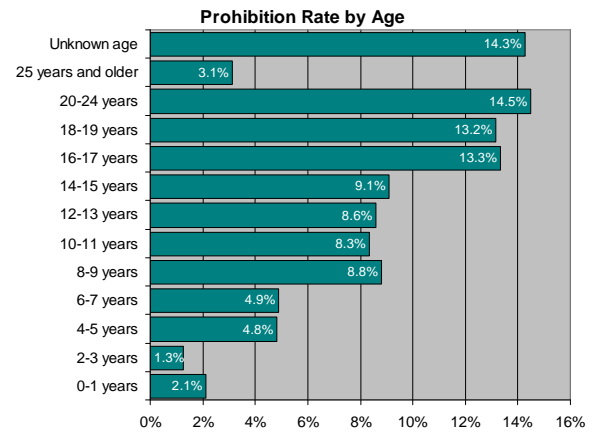
Number of Prohibitable Defects Found



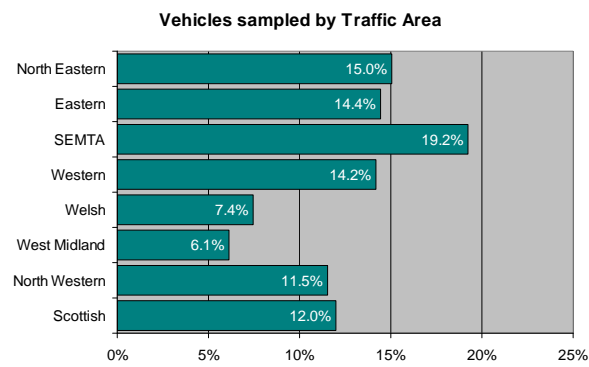
Percentage of checks by age of vehicle



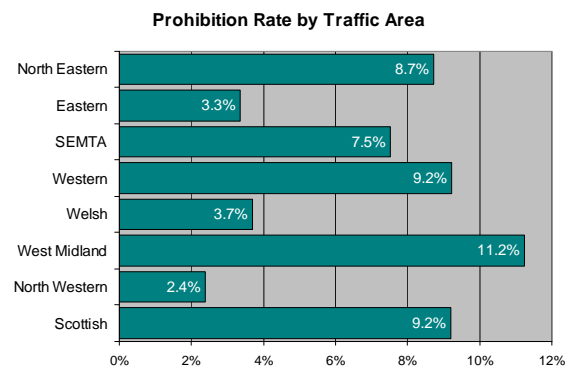
Total prohibitions by age of vehicle



Percentage of checks by Traffic Area



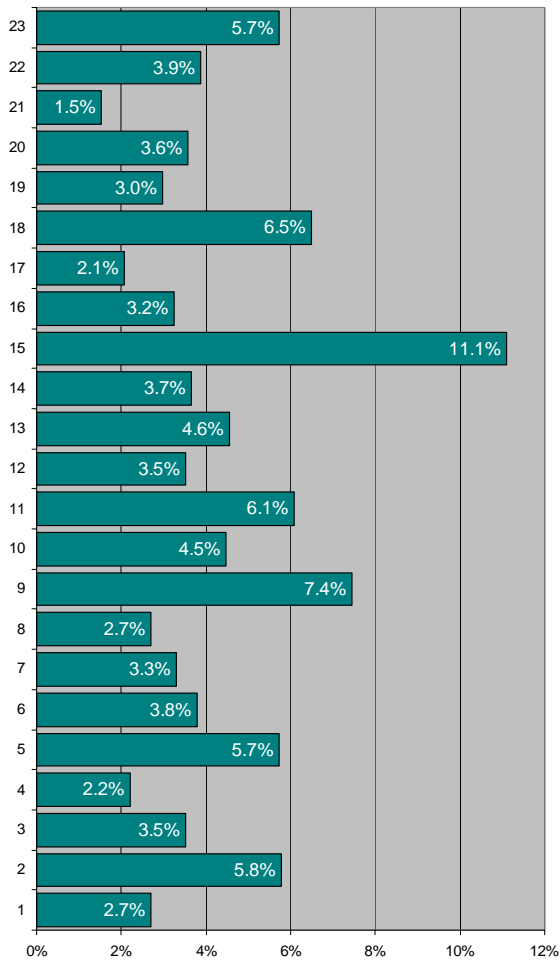
Total prohibitions by Traffic Area



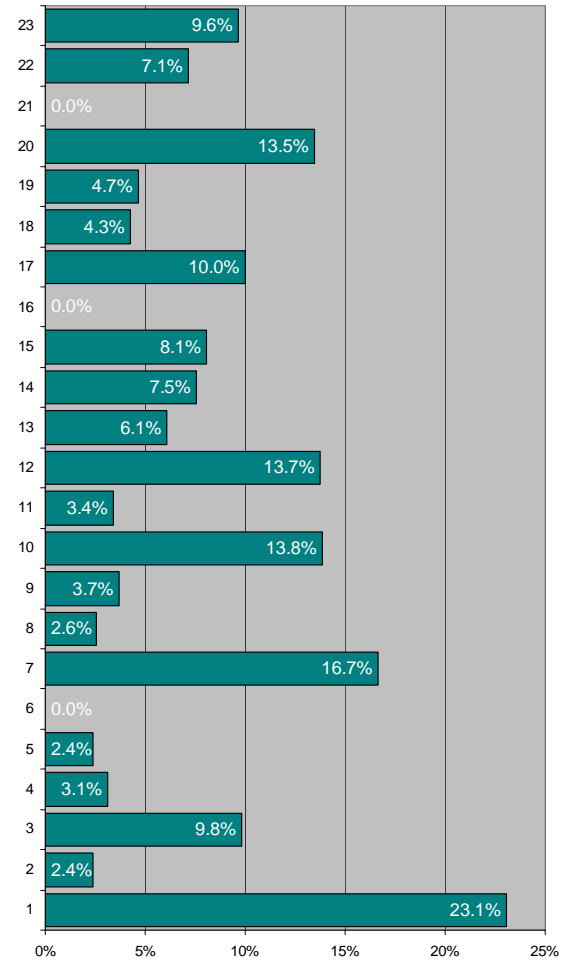
Percentage of vehicles checked by VOSA Area

Percentage of defects in vehicles by VOSA Area

Vehicles sampled by VOSA Area



Prohibition Rate by VOSA Area



VOSA Area codes

Area No	Area Name	Area No	Area Name
1	North Scotland	13	Southern Central
2	West & Southwest Scotland	14	South East
3	Southeast Scotland	15	Metropolitan
4	Cumbria & Lancs	16	Hertfordshire & Essex
5	Greater Manchester & Derbyshire	17	East Anglia
6	Merseyside & Cheshire	18	East Midlands
7	Staffs & Shropshire	19	Lincolnshire & Cambridgeshire
8	Central & Southwest Midlands	20	Nottinghamshire & South Yorkshire
9	Wales	21	Humberside
10	Bristol & Gloucester	22	West & North Yorkshire
11	South West	23	Tyne & Tees
12	Wessex Area		