Case Nos: 4DN01219
4DN01217
4DN01212

IN THE LEEDS COUNTY COURT

Leeds Combined Court
The Courthouse
1 Oxford Row
Leeds LS1 3BG

Date: 11th March 2008

Before :

His Honour Judge S P GRENFELL

- -

Between :

STEPHEN CHARLES MAXFIELD (1)
DUNCAN SMITH (2)
JONATHAN WALES (3) **Claimants**
- and -
ATS NORTH EASTERN LIMITED **Defendant**

- -
- -

Mr Simon Mallett (instructed by **Beresfords LLP**) for the claimants
Mr Charles Feeny (instructed by **Berrymans Lace Mawer**) for the defendant

Hearing dates : 7th to 11th and 18th January 2008

- -

Approved Judgment

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

.....

His Honour Judge S P Grenfell

His Honour Judge Grenfell:

1. Vibrating tools have for some time been known to cause Hand Arm Vibration Syndrome ("HAVS") which can manifest itself in the well known condition, vibration white finger. There has already been substantial litigation concerning liability for, and causation of, HAVS in respect of large employers such as the Coal Mining and Rail employers. The cases before me, which represent a sample, concern the national tyre fitting company, ATS, although these claims are brought against ATS Northern Limited. ATS is part of the Michelin Group of companies.

2. These claims have concentrated on the tools used for commercial tyre fitting. Those used for domestic tyre fitting, it is common ground, are not considered to represent a risk of developing HAVS injury. Pneumatic impact wrenches were introduced by ATS in the early 1980s.

3. I heard 3 such claims together in January and in March I am due to hear more. In the event, one claimant withdrew his claim after giving his evidence, because it became clear it was bound to fail; another, it transpired, plainly had a condition of the hand and wrist that needed further investigation before his claim could be progressed further. That left just the claim of Maxfield, which I now consider.

4. There are, however, within consideration of this individual claim certain generic issues that may well affect other similar claims. I should say that I have been greatly assisted by a large measure of agreement between the parties and their respective experts and by the co-operation of counsel.

5. The first such issue is to determine the date of knowledge of the common employer, ATS. This is not strictly applicable to the claimant Maxfield's case, since it is common ground that by the time under consideration for his exposure (1996 on) ATS had knowledge of the risk of developing HAVS from the use of impact wrenches. Nevertheless, because I have heard generic evidence in this respect, it is important that I should make findings that may assist other cases.

6. It is common ground that HAVS was known in the 1970s to result from exposure to vibration tools. However, it is clear that it was not until the early 1980s that ATS introduced the impact wrenches or air guns as they are also known. Mr Feeny, counsel for ATS, accepts that that the coming into force of the Management of Health & Safety at Work Regulations 1992 and the Provision & Use of Work Equipment Regulations 1992[1] on 1 January 1993 would in effect create a date of knowledge by that date at the latest. The suggestion that ATS did not have actual knowledge of the risk until 1998, when Mr Lowe complained about HAVS, is now shown to be incorrect. There is reference to HAVS in the ATS' Health and Safety policy dated August 1996. It is reasonable to suppose, therefore, that they had actual knowledge some time before then.

[1] The effect of Regulation 8 and Regulation 9 of the Provision & Use of Work Equipment Regulations 1992 was to require a warning as to the risk of vibration induced injury from the relevant tools.

7. Mr Feeny submits that there is no reason to suppose that ATS ought to have been aware of 'Draft for Development – Guide to the evaluation of exposure of the human hand-arm system to vibration' ("DD43") in 1975 on which the claimants rely and to which Mr Glendenning, the claimants' expert engineer, refers. It is correct that ATS were not using vibratory tools at this stage. Mr Mallett, counsel for the claimants, however, invites me to look wider than ATS as part of the much larger Michelin group of companies, which, he submits, ought to have picked up the 'trigger'[2] of DD43.

8. I am not prepared to fix ATS with constructive knowledge by looking at the wider corporate structure, given that I am satisfied that ATS operated as a discrete and specialist operation of tyre fitting and, for all practical purposes, a separate employer.

9. Mr Feeny submits that there is no reason to suppose on the evidence that ATS ought to have been aware of BS6842: 1987, the 'British Standard Guide to the Measurement and evaluation of human exposure to vibration transmitted to the hand', the next significant and possible 'trigger'. This is the basis for Mr Glendenning's adoption of this as the latest date by which ATS should be fixed with constructive if not actual knowledge of the risks associated with hand held vibratory tools.

10. I am satisfied that BS6842 was indeed such a trigger. Up to then, from the evidence I have heard, they were relatively early days of using impact wrenches. There needed to be either actual knowledge of employees complaining of HAVS or the publication of the kind of information that was capable of bringing the employer up to date with the latest developments in knowledge of working hazards. In the words of Swanwick J in *Stokes v GKN (Bolts and Nuts) Limited* [1968] 1 WLR 1976,

> "Where there is developing knowledge, [the employer] must keep reasonably abreast of it and not be too slow to apply it."

11. In fact the prescription of vibration white finger as a prescribed disease in 1985, following the publication of the Industrial Injuries Advisory Council report in 1981, included percussive metal working tools. I agree with Mr Mallett that the proper approach can be seen from the analogous case of *Brookes v South Yorkshire Passenger Executive* 2005 WL 1104143, [2005] EWCA Civ 452. Whilst Janet Smith LJ cautioned against this being a decision to be followed blindly, it seems to me that on the evidence I have heard there is no practical distinction to be drawn; that there is no reason why my approach should be inconsistent with the approach in that case and every reason why it should be consistent; that it would have been reasonable to suppose that it would have taken some two years from the publication of BS6842 before it could be said that an employer was negligent in respect of having sufficient knowledge.

[2] The practical test for determining constructive knowledge of HAVS set by *Doherty v Rugby Joinery* [2004] I.C.R. 1272

12. I find that the date of knowledge on the part of ATS, therefore, of the risks of employee's developing HAVS is to be taken as from 1989.

13. The engineers agree that the risk of a person exposed to hand arm vibration developing HAVS depends on the magnitude of the vibration and the duration of the vibration exposure. The daily vibration dose referred to as the A(8) value is calculated to indicate the relative risk of developing HAVS. There are other factors such the method of working, the operator's skills, the ambient temperature, grip force, the length and frequency of exposure and spells of non exposure.

14. It has long been recognised that the appropriate method of measuring vibration exposure is to take an average daily exposure (A(8)) measured in metres per second per second. It has further been established and is common ground between the parties in this case and between their respective engineers that an A(8) of 2.8 metres / sec^2 or more, the Health and Safety Executive 1994 'action level', gives rise to a significant risk of injury and requires that an employer should take active steps to reduce the risk of HAVS. It is equally recognised that at the lower level an A(8) of 1 metre / sec^2 gives rise at least to a foreseeable risk of injury from vibration; that such a level of exposure does not require the employer to take active preventative measures, other than warning its employees of the risk of developing HAVS and of taking active steps once it becomes aware of employees' suffering from HAVS. This is subject to the employer's general duty to take reasonable steps to prevent foreseeable injury to its employee.

15. The first engineering issue that arises concerns the degree of vibration magnitude in the operation of the impact wrenches being used by ATS at the relevant times.

16. In my view, the adoption of a 1 inch impact wrench as the norm is entirely appropriate. Within the parameters of the expert engineering issues, I have not heard anything that persuades me that such a tool was not considered an appropriate tool for commercial tyre fitting.

17. There is a measure of agreement between the engineers that the vibration exposure magnitude will vary considerably according to the model of tool being used, the working pressure and the grip forces of the individual. As a result of carrying out a joint site inspection in relation to other claims being brought against ATS in respect of HAVS, the engineers were able to narrow their area of difference when considering a 1 inch drive impact wrench as between 9.4 metres / sec^2 (Mr Glendenning) and 8.7 metres / sec^2 (Mr Garner the engineer relied on by ATS). In the course of the evidence, however, it emerged that Mr Garner had reported to Michelin and had used 10 m/s2 as "representative of values likely to be encountered in the field" (para 2.4 March 2003 Michelin report).

18. Mr Garner was criticised for not disclosing what had been said in that Report for the purposes of this litigation. I take Mr Feeny's correct point that an engineer is under no duty of disclosure. However, I am surprised, in the circumstances, that he had made no reference to his earlier findings for that report. As a result, he has given the impression of 'running hot and cold' on this issue.

19. In the event, it seems to me that there is support for Mr Glendenning's figure of 9.4 metres / sec^2 or even 10 metres / sec^2. The figure of 10 metres / sec^2 is consistent with the manufacturer's data for a 1 inch impact wrench of the type being used by ATS, the Marsh Risk Consulting report to ATS in April 2006, the AV Technologies' tests conducted at ATS' Buxton depot in October 2005 (Table 8 of the Marsh Report, referred to by its maker, Mr Williamson, in his witness statement) and the Health and Safety Laboratory report in January 2004.

20. Mr Garner relies more on the evidence gleaned from the joint site inspection. It is common ground that what can be seen on the DVD taken at that inspection is broadly representative of the work that the claimants Maxfield and Smith carried out regularly. Nevertheless, it seems to me for the reasons I have given, that Mr Glendenning's figure of 9.4 metres / sec^2 is more likely to be representative of the vibration magnitude relevant to these claims and I so find.

21. The experts agree that the most accurate method of estimating vibration exposure duration is to consider the numbers of sets of wheel nuts removed and replaced and the time taken to remove and to replace a set of nuts. It is equally recognised that the amount of time during which an individual is exposed to vibration is generally over-estimated, simply because the individual does not analyse the time during which he is removing a wheel specifically into times when he is actually exposed to vibration, the so called 'anger time'.

22. A reasonable summary of the claimant Maxfield's evidence is that his average number of tyre changes was up to 12 wheels a day with 20 a day being both exceptional and largely when working on site. He could work on 4 or 5 difficult wheels a day. If a fitter changed 20 good wheels a day, then the evidence from the inspection indicated that his exposure would be 2.9 metres / sec^2. If he changed 12 wheels a day it would be 2.2 metres / sec^2. If there were 5 difficult wheels in a day, it would be about 2.3 metres / sec^2.

23. From the evidence I have heard, there has emerged a consensus that 12 wheels in a shift represents a reasonable estimate in the sense that such would be a normal day's work. The claimant Maxfield accepted this. On all the evidence, I am satisfied that this is the right figure to adopt. There would need to be compelling evidence to displace this in any other individual's case. I prefer to look at it in this way rather than as a mathematical average.

24. The claimant Maxfield joined ATS as a domestic tyre fitter in 1995, having had no prior vibration exposure, as I find. It is common ground that the use of a domestic vehicle pneumatic wrench would not result in the kind of exposure from which HAVS would be foreseeable. In 1996, however, he moved to the commercial department and has continued to work as a commercial tyre fitter ever since.

25. I found the claimant Maxfield to be an honest witness, in particular, careful to answer the questions put to him as accurately as possible. Mr Feeny does not submit otherwise – indeed he is broadly in agreement with this assessment.

26. The claimant Maxfield's method of working would be to attack each nut first with the "air gun" and to keep trying until it removed the nut. Obviously the vibration would be at its greatest until the nut gave way. He maintains that he was never told that he should first use the manual wheel brace to 'crack' the nut before applying the impact wrench. In fact the evidence is that it has been ATS company policy for some considerable time that wheel nuts on commercial vehicles should be 'cracked' manually first. This is hardly surprising since the engineers in their generic joint statement agreed:

> "Manually loosening wheel nuts prior to use of impact wrenches results in reduced exposure to vibration in comparison to removal of nuts using impact wrenches only."

27. The clear impression I derive from the witnesses who have themselves worked regularly as commercial tyre fitters, including Mr Squires, currently the centre manager at ATS' Doncaster truck centre, is that there has plainly been a difference between company policy and practice by the technician. Mr Squires is clear that the 'first port of call' is the impact wrench and that the L bar will only come in if the wrench cannot shift the nut. Further, he said "things have changed quite dramatically in recent years; everybody's now health and safety focused; when I started it was very limited."

28. The practical difficulty that I recognise is that it is probably more convenient to see if the nut will come off easily by giving it a "couple of bursts" on the impact wrench, in which event it may not be necessary manually to crack the nut. Only if the bursts do not cause the nut to yield, would it be necessary to do so. On the other hand, it is clear to me from a technical point of view, that the impact wrench is not necessarily designed to test for a difficult nut; that use in such a way will increase unnecessarily the vibration exposure of the fitter using the tool. This is the conclusion I derive from the combination of the experts' agreement and the ATS company policy. In my judgment, this could well explain why there have been the instances of vibration induced injury, particularly stemming from the days when there would have been more difficult nuts to remove than there are today.

29. Overall, whilst on exceptional occasions a tyre fitter would have been exposed to an average dose of vibration in excess of the A(8) action level of $2.8m/s^2$, I am satisfied that in general the average daily dose exceeded 1 metre / sec^2 but was less than 2.8 metres / sec^2.

30. It follows that it was reasonably foreseeable that any commercial tyre fitter working at an ATS depot was at risk of developing HAVS as a result of vibration exposure as from the introduction of the impact wrenches in the early 1980s.

31. The question arises as to whether the employer's duty towards its employees varied in proportion to the amount of measurable exposure that exceeded 1 metre / sec^2 but fell short of the action level of $2.8m/s^2$. Mr Glendenning suggests that, for example, an A(8) exposure of between 1 and 2.8 metres / sec^2 should require the employer to take

more preventative measures than simply warning its workforce of the risk of injury from exposure or awaiting reports of symptoms: in other words, the employer should take reasonable steps to address the foreseeable risk of injury, which amongst others would include enforcing the company standing orders of manually cracking the nuts. For reasons which will become apparent, I see no reason to depart from the conclusions reached by the engineers in their joint statement which distinguishes the degree of risk as between that below and that above the action level.

32. Mr Feeny makes the point that the percentage of the ATS workforce reporting symptoms of HAVS is well below the average that could be expected in a workforce regularly using hand held vibrating tools. He makes the point in support of his submission that the absence of such reported symptoms indicates that there was in fact a low incidence of HAVS from vibration exposure and, therefore, a low risk of it occurring in commercial tyre fitters. Mr Mallett, however, submits that, in the absence of any system of monitoring or surveillance, it is difficult if not impossible, for ATS to maintain that submission.

33. I regard these submissions as broadly neutral. It seems to me that I can only go on the evidence that I have heard and read.

34. ATS' employees were exposed to vibration in excess of 1 metre / sec^2. The experts agreed that ATS should have assessed their employees' vibration exposure from their date of knowledge. I accept Mr Mallett's submission that in those circumstances commercial tyre fitters should have been provided with warnings about the risk of injury and instructed to report symptoms. I should add that a warning to be an effective warning needed to be a properly reasoned warning.

35. It is well established that a simple written instruction, even if one had been given in this case, without more is insufficient. For example, it is no use warning a workman that he should use barrier cream or wear goggles, if he is not told the reason, which in those instances is to reduce the risk of dermatitis or eye injury. So here, in my judgment, simply to have a standing instruction for the manual cracking of wheel nuts, which in any event, everyone, including the managers, appeared to be ignoring, was insufficient, unless the work force was properly warned of the risks of vibration exposure in terms that made it clear that they would be reducing that risk if they followed the instruction. Similarly, it was important to issue an instruction to report symptoms as part of the provision of information as to, and properly reasoned warning of, the risk of injury associated with vibration exposure. A simple instruction to report symptoms would have been insufficient.

36. It seems to me that any properly instructed employee would have reported symptoms. There would be no reason not to, if the risk of further injury had been properly communicated. The claimant Maxfield specifically said he would have reported symptoms in those circumstances.

37. Against this Mr Feeny observes that the claimant Maxfield has not yet officially reported his symptoms. That is a powerful point, but having heard the claimant's evidence, I am satisfied that the reason he did not do so was because he did not fully appreciate the risk. Indeed, I am not sure that even now that he does so, such is the familiarity that the tyre fitters have with their impact wrenches.

38. The evidence suggests that threaded wheel mounted nuts (DIN nuts) were on the way out by 1993 and in recent years the preponderance of nuts has been 80% to 90% Spigot. It is common ground that the former were particularly difficult to remove and that the latter are substantially easier to remove. Further, it is clear than in recent years the general standard of maintenance of commercial trailers and tractor units has improved. The practical effect is that wheels tend to be changed more frequently so that the nuts release more easily. Interestingly, the claimant Maxfield made the point that he often encountered difficulty with Polypipe trailers: he surmised this was because the loads would have been relatively light, putting less strain on the trailers and less wear on the tyres, so that there was less need to change the wheels routinely.

39. 'Nyloc' nuts, it is common ground, were the most difficult to remove, but were rarely encountered after the 1980's.

40. I agree with Mr Feeny that, it follows that the worst cases of exposure may well have occurred in the 1980's and early 1990s. It also follows that this may well have been a factor in the formation of ATS company policy of manually cracking wheel nuts before applying the impact wrench. Since HAVS is a divisible industrial disease, this raises interesting questions in respect of periods of exposure that pre-date and those that post-date ATS' date of knowledge, albeit that such arguments are not applicable in the claimant Maxfield's case.

41. The claimant, Maxfield, said in evidence, which I accept, that he encountered two to three difficult wheels per week when he started tyre work in the mid-1990's but now they are rare.

42. On the evidence I have heard, that is the claimant Maxfield's, the various witnesses' and the engineers', I am satisfied that over his years of employment as a commercial tyre fitter from 1996 he was exposed regularly to a daily average vibration exposure which exceeded 1 metre / sec^2, on rare occasions exceeded 2.8 metres / sec^2, but in general was probably more in the region of 2 metres / sec^2 in the late 1990s and early 2000s. His current daily exposure is probably under 2 metres / sec^2. This could go to explain his evidence that to his mind there was a 'plateau' of signs in his hands by about 2003 to 2004, subject, of course to the medical evidence in his case which is controversial and to which I shall come.

43. Turning now to the issue of whether there was a breach of duty, I examine in turn Mr Mallett's submissions as to the "reasonably practicable steps" ATS could have taken to reduce their employees' vibration exposure. He takes the expression "reasonably

practicable steps" direct from the joint statement of the engineers in the following context, to which I shall refer.

44. Using lower vibration impact wrenches:

45. I am not convinced that this necessarily would have been the answer. From what I have heard it seems to me that possibly fitters would simply have used them for longer periods and would have been even less likely to crack nuts manually. Further, as I have already indicated, I am not satisfied on the evidence that the 1 inch impact wrench was anything other than a reasonable tool to use for the job.

46. Manual 'cracking':

47. This brings me to the step of enforcing the loosening or 'cracking' of wheel nuts by manual use of a wheel brace. In fact this method, in my view, is best described as 'cracking', because, as I understand it the bar is simply used to overcome the first resistance, rather than being used completely to loosen the nut. That is done by the impact wrench. In my judgment, the manual cracking seems to me to have been the most effective way of reducing unnecessary vibration exposure. Moreover, it was plainly even more effective, if it was used before even the fitter tried the nut with the impact wrench. It is of interest to remind myself that in his opening skeleton argument Mr Feeny wrote as follows at paragraph 5(b):

> "In considering to what extent vibration exposure could reasonably have been reduced, the most important issue relates to manual de-cracking of nuts since the site visit and other evidence shows that this could make an appreciable difference.
>
> "The Claimants' cases appear to be that no instructions to work in this way were given until recently. However, the Defendant's case, in particular Mr Bull … and Mr Squires … supported by documented working practices …, is that there were standing instructions to de-crack nuts manually first, not for reasons connected with vibration exposure but rather to reduce damage and distortion during the removal of nuts."

48. The oral evidence gives a clear impression that, although it was company policy to crack manually before applying an impact wrench, this was simply not enforced. Interestingly, as the claimant Maxfield said, it is now enforced, such that he regards it as a disciplinary offence not to do so. The argument, therefore, that the policy was relevant in the early days of pneumatic wrenches simply to protect the wheel nuts, tends to fall away, in particular, since it is now common ground that overall wheel nuts are easier to remove than they were in the 1980s and 1990s.

49. I have heard no evidence to suggest that there was anything other than habit that resulted in manual cracking not being used. In a sense it may be fractionally more convenient to give 2 short blasts on a wheel nut to see if it is going to move, than first

to apply an L bar and 'crack' the nut in all cases. However, Mr Feeny was right in his opening submission. That was the clear standing instruction. It is reasonable to assume that there was good reason for it. However, the habit of simply using the impact wrench to crack the nuts took over and was clearly and universally condoned.

50. It was also clear to me that where a difficult wheel was encountered, the impact wrench would in effect be used to slacken each of the nuts; that the fitter would apply the wrench for as long as he thought necessary first to crack, then to slacken and then to remove each nut. It is not hard to deduce that additional and unnecessary vibration is transmitted to the fitter, which would have been avoided had the fitter as a matter of course manually cracked each nut first.

51. The engineers both agreed that this was the one step that over the years would have reduced the daily exposure of commercial tyre fitters. I adopt that evidence as being entirely consistent with the evidence that I have heard.

52. I accept the evidence of the engineers that the manual cracking of the nuts in the way laid out would have reduced the vibration exposure by about 27% for DIN nuts and 19% for ISO nuts. It would have been higher for nyloc nuts. Nevertheless, it is clear to me that the reduction in daily vibration exposure would have been significantly reduced for each commercial tyre fitter.

53. I consider the further steps suggested by Mr Mallett.

54. Reducing the compressor pressure to 90 psi:

55. For similar reasons that I have given, I am not convinced that this would have been the answer.

56. Preventative maintenance of tools:

57. On the evidence I am not satisfied that any failure to maintain was a contributory factor in vibration exposure. In particular, this did not form part of the joint statement of engineers, presumably because it was not thought that maintenance was a significant factor. That remained my impression having heard them both give evidence.

58. Removing a particular employee from heavier exposure:

59. It is submitted that such an employee could be moved, for example, from commercial work or fleet work to lighter duties or domestic work; alternatively, that an individual's daily exposure could simply be reduced.

60. Having heard the evidence, in particular, from Sigrid Barnes I have to have regard to reality. ATS is an organisation which operates in small depots across the country. I am satisfied that there is little scope for providing lighter work within the organisation; that it would have been impracticable to reduce a commercial tyre fitter's daily exposure other than enforcing company policy on cracking nuts before applying the impact wrench or possibly, if he had reported symptoms, moving him to domestic tyre fitting. Ms Barnes made it clear that ATS is centred on manual work, but, if it was recommended by occupational health, they would consider a move to domestic fitting. The difficulty, I anticipate, is that such a working man is unlikely to give up well paid work easily and that in any event much would depend on the availability of jobs at a particular depot.

61. I am satisfied on the evidence I have heard, in particular, the generic evidence of tyre fitters and managers alike, including Ms Barnes, that, within these relatively small self contained units which were the depots, there was no scope for reducing an individual's daily exposure whilst retaining him on commercial tyre fitting work.

62. Providing advice on how to reduce the effect of exposure:

63. Such advice, it is submitted, would cover such matters as maintaining body temperature and the like; that this was necessary because exposure of 1 metre / sec2 and above created a foreseeable risk of HAVS. In my view, this would have formed part of a properly reasoned warning as would advice on applying the minimum necessary grip force, a factor on which the engineers were agreed.

64. Health surveillance:

65. I do not think that there was a sufficient basis for ATS to institute a full blown system of health surveillance. It seems to me that it is in this respect that the action level of 2.8m/s^2 assumes particular importance.

66. To a certain extent the answers to all these matters are to be found within the engineering evidence and the large measure of agreement between them in their joint statement. On the basis, as has been common ground, that only exceptionally would the claimant Maxfield, or indeed any other commercial tyre fitter, have been exposed to 2.8 metres / sec^2 A(8) or above, then the engineers agreed that, in the absence of symptoms in the individual or among workers carrying out similar work or of ways to reduce the exposure within the bounds of reasonable practicability, it would not have been necessary for ATS to take action to reduce his exposure. Correctly, they noted that whether or not there were symptoms in the workforce and the extent to which it was reasonably practicable to reduce exposure are matters for me to decide.

67. For the purpose of considering what amounted to the steps that were necessary for discharging the employer's duty to take reasonable care, it follows, that I am satisfied that commercial tyre fitters employed at ATS depots were to be regarded as generally exposed to less than 2.8 metres / sec^2 A(8), but more than 1 metre / sec^2. It follows,

on the engineers' basis of agreement, that in the absence of knowledge of symptoms in the workforce, then ATS was still under a duty to find "ways", that is to take steps, that were reasonably practicable to reduce exposure.

68. I am satisfied that the "ways" or steps "within the bounds of reasonable practicability", for the period within which these claims are concerned, were as follows. From the date of knowledge ATS should have provided for the workforce a properly reasoned warning as to the risk of suffering HAVS as a result of vibration exposure. This should have included, as the engineers agreed, information on the symptoms of HAVS; instruction to report any symptoms experienced; training on how exposure to vibration might be reduced. I am satisfied, having heard the evidence of both commercial tyre fitters and managers that none of these three elements occurred when the fitters were first employed in commercial work or during their employment with ATS. Without these elements, a bare warning would have been ineffective. Indeed, even now my impression is that the commercial tyre fitters and managers do not seem to have a sufficient understanding of the risk associated with vibration. The only other step which on the evidence would have been a reasonably practicable "way" of reducing vibration exposure, I am satisfied, was the enforcing of ATS' own system of manually cracking wheel nuts before applying the impact wrench.

69. The claimant Maxfield made it clear that he now cracked nuts as he considered it was a disciplinary offence not to do so. I am satisfied that, he would have done so, if the system had been enforced earlier; that as a result of not doing so over the years from 1996 until the system was enforced he was unnecessarily exposed to significantly higher daily vibration exposure. That was, as I find, some time during 2004 or 2005 on my assumption that this fits with his assessment that it was 2 years or so ago that this happened.

70. I understand the claimant Maxfield's case to be that, if there had been a properly reasoned warning about the risk associated with vibrating tools which had required him to report symptoms, then he would have reported his symptoms and been found work which no longer would have exposed him to work in excess of 1 metres / sec^2 on a daily basis, whether that be domestic tyre fitting or some other lighter duties.

71. Having heard his evidence, I am satisfied that in such circumstances he would have reported his symptoms by about 2000 on the basis that I accept his evidence that he first noticed pins and needles in about 1998, but thought little of it, but that during 1999 the symptoms became more obvious to the point that he described them to SchlumbergerSema in 2001.

72. I am not satisfied that there was in fact any sufficient reporting of symptoms to require the taking of additional steps such as medical surveillance. Otherwise, it would only have been required had daily exposure exceeded the action level of 2.8 metres / sec^2, which I have found it did not other than exceptionally.

73. This brings me to medical causation.

74. There is a clear issue between Mr Proud, whose evidence and opinion is that the claimant Maxfield suffers the sensorineural element only of HAVS, that is without the vascular element that causes vibration white finger, and Dr Cooke, whose evidence and opinion is that this claimant does not suffer any form of HAVS, but rather a minor circulatory, in other words, vascular disorder involving a feeling of cold and a significant temperature difference between the two hands.

75. ATS's case is as follows. If it is the case that symptoms are possibly or plausibly explained by some pathology other than HAVS, then, given the relatively low level of vibration exposure, the claimant Maxfield cannot establish a diagnosis of vibration induced injury.

76. The claimant Maxfield's case is as follows. On a balance of probabilities given the Claimants' vibration exposure, the timing of the onset of symptoms and the type and extent of symptoms, the probability is that they have been caused by exposure to vibration rather than some constitutional disposition to similar symptoms.

77. I remind myself that I found this claimant a reliable and honest witness. I find, therefore, that what he said to Mr Proud on examination was reliable information and that his performance in test was the best to his ability.

78. First, I am satisfied that his vibration exposure was such that it was more likely to have materially contributed to the onset of HAVS in the sense that with a reduced exposure there would have been no significant injury such as to merit a claim for damages.

79. The claimant Maxfield's primary case is that he should be compensated for all of his symptoms; that his initial symptoms were caused or materially contributed to by his negligent vibration exposure.

80. Alternatively, Mr Mallett submits that there is clear evidence of some deterioration in this claimant's symptoms after his onset. This was caused or materially contributed to by his subsequent negligent vibration exposure.

81. The arguments in support of a diagnosis of HAVS are as follows.

82. The claimant provides a classical presentation of HAVS.

83. The timing of the onset of symptoms is consistent with such a diagnosis. This claimant only began to suffer symptoms some 3 years after he began to be exposed to vibration. He did not experience any cold sensitivity before then.

84. The development of the symptoms is similarly consistent. His symptoms deteriorated with further vibration exposure and improved when the exposure reduced. There is a clear correlation with vibration exposure.

85. The progression of his symptoms was consistent with HAVS, namely initial intermittent tingling followed by permanent symptoms.

86. Cold sensitivity is part of the diagnosis of HAVS. It is part of the criteria when assessing sensorineural damage due to vibration damage in the miners' scheme.

87. Increased cold sensitivity is consistent with HAVS. It is expected that there will be more cold intolerance when sensorineural damage has occurred (see Sakakibara 'Pathophysiology and Pathogenesis of Circulatory, Neurological, and Musculoskeletal Disturbances in HAVS' p 45 'clinical signs and symptoms'). There is evidence that cold sensitivity can be caused by sensorineural damage (see Strömberg, Dahlin and Lundborg 'Hand Problems in 100 Vibration-Exposed Symptomatic Male Workers' under 'Discussion'). Alternatively cold sensitivity could be the early stage of vascular damage before full blanching occurs (caused by vibration damage).

88. The absence of cold symptoms in the feet suggests that there is no constitutional condition. Mr Proud indicated that it was unusual in such circumstances for there to be no symptoms in the feet.

89. The absence of any alternative identifiable cause of cold sensitivity (other than vibration exposure) (see the list at Table 3 Chapter 3 'Hand Arm Vibration' 'Clinical effects of hand-transmitted vibration'). None of these conditions has been suggested as a cause and there is no evidence of such a cause.

90. The Claimant's exposure to vibration was at a level where there was a foreseeable risk of injury from the exposure.

91. The absence of any statistical data or any published evidence suggesting that cold sensitivity was a common occurrence amongst men.

92. There is evidence of significant deterioration in this claimant's symptoms after their onset in 1998. This is apparent from the medical diagnosis in 2001 as compared to 2005 and from the history as reported by the claimant. He had some intermittent symptoms in 2001 and permanent numbness by 2005.

93. Mr Feeny relies on the follow contrary arguments.

94. Mr Proud, he submits, appeared to concede that the described presentation must at least have some vascular element as must be the case in particular with coldness to

touch observed by both Mr Proud and Dr Cooke but he nonetheless indicated that the diagnosis of the vascular element of hand/arm vibration syndrome could not be established. Mr Feeny submits that it is more scientific to consider that if there is a vascular effect that is responsible for all the symptoms unless there are some inconsistent with the vascular effect which does not appear to be the case.

95. Mr Feeny criticises Mr Proud's reliance, in particular, on Strömberg which showed that abnormal cold sensation was part of the hand/arm vibration syndrome. However, he submits, this literature appeared to relate to patients who in the majority of cases had had the condition diagnosed on other clinical grounds and whose complaint was of pain and coldness without blanching on exposure to a cool environment. On the contrary, he submits, the claimant Maxfield's presentation is constant, not episodic and is agreed not to represent a vascular effect of HAVS.

96. Mr Proud's approach to staging was problematical. Although he accepted that some of the test results were significantly inconsistent with the claimant's stated symptoms and clinical examination, he nonetheless took these test results into account in producing a grading which in effect represented an irrational blending of the evidence as opposed to a structured approach.

97. In my judgment, Mr Mallett's arguments prevail, because they support a positive case for the diagnosis. Dr Cooke's approach, although logical in the end was necessarily a negative approach. It seemed to me in the end there were ample reasons for Mr Proud to reach his diagnosis applying his considerable experience to the facts of this case, whereas Dr Cooke with his equally impressive experience was driven to concluding that there was some unspecific constitutionally based condition which was coincidental to his vibration exposure. I felt that Dr Cooke was too much influenced by the comparatively low levels of A(8) exposure regarding, for example, the level of 1 metre / sec^2 as "posing negligible risk" (see paragraph 6.6 of his Report). It is clear that the accepted foreseeability of injury is more than negligible. Further, I was surprised by his comment in evidence that is was coincidence that the claimant Maxfield's symptoms had stabilised with reduction of exposure.

98. I am satisfied that Mr Proud's diagnosis is to be preferred to that of Dr Cooke in this case for the reasons I have given. I accept that the clinical history is most important; that clinical examination is designed to exclude other causes; that to these factors are to be added the results of standardised tests. In my judgment, Mr Proud's diagnosis is supported by his application of these factors correctly.

99. I see no reason to disagree with Mr Proud's assessment of the claimant Maxfield's HAVS and am satisfied on his evidence that the appropriate stage is sensorineural stage 2. I agree with Mr Mallett that this is a reasonable assessment of the overall evidence. and that Dr Cooke took too little account of the standardised test results.

100. In conclusion, I am satisfied that there was a breach of duty which caused the claimant Maxfield to develop HAVS, in the sense that, if his exposure to vibration had been

significantly reduced as I have found it should have been, then he would have been more likely either to have remained symptom free or to have suffered no significant symptoms. In any event, I am satisfied that as from 2000, the time when, had he been properly warned, he would have reported his symptoms, steps would have been taken as a result of which there would have been no deterioration. As a result, the breach of duty in respect of failure to warn resulted in his not reporting his symptoms and caused an aggravation of the symptoms until such time as the deterioration ceased.

101. In all these circumstances, it is not necessary to consider in this case any relation between non negligent and negligent exposure.

102. For the sake of completeness, I should add that I do not think that the concepts apply which led to the decisions in *Fairchild v v Glenhaven Funeral Services Ltd* [2003] 1 AC 32 and *Barker v Corus* [2006] 2 A.C. 572 apply where it is possible to assess the material contribution that probably resulted in symptoms of HAVS. In other words, in my judgment, it is possible to decide this and, I anticipate, similar cases on ordinary principles of causation.

103. My overall impression of the claimant Maxfield's symptoms and the effect which they have had on him are that they fall at the low end of the Judicial Studies Board Guidelines moderate category of HAVS. I formed the impression that, given the reduction in vibration exposure which has occurred for the various reasons to which I have referred, he is unlikely to move his employment. Whilst I take Mr Proud's understandably cautionary note, my impression is that the claimant Maxfield will continue in his present work. In a sense this reinforces the view that he is unlikely to suffer further deterioration. I am satisfied that, even if with proper medical surveillance that is now due to him he has to move to lighter duties, it is likely that he will be found domestic tyre fitting work. On the evidence, however, there is a chance that such work might not be available and that he would be thrown on the open labour market. I do not regard this as a high chance at all and in my judgment, it can be valued at £7,500.

104. I assess general damages in the sum of £6,000.

105. There will be judgment accordingly. Consequential submissions may be in writing or by telephone.