

Determination

Fatal Accident Inquiry following on death of **Harry McKenzie**, late of 27 Rowan Avenue, Kirriemuir DD8 4TB

Forfar, 30th December 2008.

The Sheriff, having resumed consideration of the whole cause, determines: -

Determination

(One) Harry McKenzie, Heavy Goods Vehicle Driver, of 27 Rowan Avenue, Kirriemuir, Angus, whilst driving in the course of his employment, died at about 12.10 p.m. on 20th March 2007 on the A90 Dundee to Aberdeen Road, at or about the junction of said Road with the road leading to Petterden, as a result of

- (a) multiple injuries
- (b) blunt force trauma and
- (c) vehicular collision (lorry driver).

Circumstances surrounding the accident resulting in Mr. McKenzie's death

(Two) At the time of his death, Mr. McKenzie was employed as a Heavy Goods' Vehicle (HGV) driver by C & G Brewster Haulage, Orchardbank, Forfar. He was, on 20th March 2007, driving a 3-axle Scania towing unit and 3-axle curtain-sided semi-trailer. Although that vehicle was fitted with a driver seatbelt, Mr. McKenzie was not wearing the seatbelt at the time of the accident leading to his death.

(Three) The seatbelt fitted within the lorry was in good working condition at the time of the accident.

(Four) On 20th March 2007, Mr. McKenzie was driving his lorry in a northbound direction on the main A90 Dundee to Aberdeen road near to the turnoff to Tinkletap Farm, and immediately prior to the right turning to Petterden, Angus. He was alone in his motor lorry.

(Five) Ahead of Mr. McKenzie's lorry was a DAF 2-axle rigid lorry, (yellow in colour), registration number SY06 BZS, the property of Alba Traffic Management. Said lorry SY06 BZS was being driven by Keith George Sneddon, of Whitburn, West Lothian. This vehicle weighs 24 tonnes, and is a "protection" vehicle, fitted with

special equipment. It is more commonly termed as the “crash cushion vehicle”. This vehicle was carrying over one ton’s weight of equipment, required in connection with traffic management.

(Six) Immediately following the DAF 2-axle rigid lorry, and being driven directly behind it, was a Ford Transit Van registration number SH05 YMR, also the property of Alba Traffic Management. Said Ford Transit van SH05 YMR was being driven by Allan Martinous Aldridge, of Denny, Stirlingshire.

(Seven) The two vehicles belonging to Alba Traffic Management are part of a fleet of vehicles based at premises at Inveralmond Industrial Estate in Perth. On 20th March 2007, these two vehicles above mentioned were being driven to a location near Laurencekirk, Kincardineshire.

(Eight) The Alba Traffic Management vehicles were required in connection with the placing and moving of road signs and road cones for road closures and road works. (A lane closure was being moved by some 2 miles, and the equipment on these vehicles, together with the physical directions of the occupants of the 2 Alba Traffic Management vehicles, was to facilitate that road adjustment.)

(Nine) On 20th March 2007, as the two vehicles above mentioned and the lorry driven by Mr. McKenzie were being driven northwards on the A90 near Tinkletap Farm and the turnoff to Petterden, they were – as earlier narrated - travelling one behind each other. The Crash Cushion Vehicle, being at the front, was proceeding at a low speed as it went on its journey, since it could not achieve a high speed.

(Ten) The three vehicles were all travelling in the same direction and in proximity to each other. Neither the driver of the second Alba Traffic Management vehicle nor the late Mr. McKenzie, the driver of the articulated lorry behind the second Alba vehicle had any reason to suspect that the leading Alba vehicle, (the Crash Cushion Vehicle), would come to a sudden halt.

(Eleven) The two Alba Management Vehicles were travelling in close proximity to each other – as they had done since departing from the depot in Inveralmond

Industrial Estate in Perth. The leading Alba Traffic Management vehicle does not have the capability of travelling at a high speed. The Ford Transit van was always being driven behind the Crash Cushion Vehicle.

(Twelve) Shortly before the accident herein referred to, the Scania articulated lorry being driven by Mr. McKenzie was directly behind the second of the Alba Traffic Management vehicles.

(Thirteen) As a result of the leading Alba Traffic Management vehicle, (the “Crash Cushion Vehicle”), slowing and coming to an unanticipated halt whilst proceeding uphill on the A90 near to the junction leading to Petterden, Angus, the second Alba Traffic Management vehicle, (the Ford Transit van) – which did not have sufficient time to come to a stop - collided with the rear of the Crash Cushion Vehicle. In addition, the Scania articulated vehicle, being driven by Mr. McKenzie - whilst attempting to avoid colliding with the rear of the Ford Transit van – veered acutely to the right. In carrying out that manoeuvre, the Scania articulated vehicle clipped the rear of the Alba Ford transit van before toppling on its side in the area of the central reservation near the Petterden turn-off, resulting in the death of Mr. McKenzie.

(Fourteen) When the Crash Cushion Vehicle did suddenly start to come to its sudden and unanticipated halt, the driver of the second Alba vehicle could not avoid colliding with the rear of the Crash Cushion Vehicle.

(Fifteen) As set out in Paragraph **(Thirteen)** of this determination, Mr. McKenzie, who was driving the Scania articulated lorry directly behind the second Alba vehicle, took immediate steps to avoid colliding with the rear of that vehicle. Trying not to collide with the rear of the second Alba vehicle, he steered his lorry acutely to the right. In so doing, he ensured that a major collision of his articulated lorry with the rear of the second Alba vehicle was avoided. However, in carrying out that manoeuvre precipitately – as the then circumstances so dictated – the Scania lorry toppled on its side, and came to rest in the central reservation area.

(Sixteen) The second of the two Alba Traffic Management vehicles, (the Ford Transit van), - whilst earlier travelling on the A90, on an incline prior to the locus where Mr.

McKenzie's vehicle toppled, and in a totally unrelated traffic incident – had a minor skirmish with a lorry driven by Roy Arthur Lowe, of Hucknall, Nottingham. Whilst Mr. Lowe's vehicle was in the offside lane and overtaking the two slow moving Alba Traffic Management vehicles, the Ford Transit van, (the second vehicle), veered from the nearside to the offside lane and, in so doing, clipped the wing mirror of the lorry that Mr. Lowe was driving.

(Seventeen) There is no direct connection between the incident referred to in paragraph **(Sixteen)** above referred to and the accident which resulted in Mr. McKenzie's death.

Equipment on the Crash Cushion vehicle

(Eighteen) There was fitted to DAF lorry registration number SY06 BZS, (the Crash Cushion Vehicle), an Automatic Impact Brake System, (AIB), the principal components of which are: -

- the Cab Box and the C300 Relay, (C300);
- the Down Limit Switch; and
- the Autobrake Control Unit, (ACU), and
- the Crash Cushion at the rear of the vehicle.

(Nineteen) If the Automatic Impact Brake System is operating correctly, and as originally fitted by the manufacturers and remains in good working order and repair, it is unable to operate, unless it is in the Standby Mode, with power going from the Autobrake Control Unit via the Cab Box and C300 Relay. In the event of the Crash Cushion at the rear of the vehicle sustaining an impact, the AIB will be forthwith activated and the Crash Cushion Vehicle's brakes immediately applied.

(Twenty) The Cab Box, which is located in the driver's cabin of the Crash Cushion Vehicle, contains a variety of switches, including the On/Off switch, Up and Down Switches, the Body Work Light and Beacon Lights Switches, and the Emergency Stop Button. The Cab Box also houses the C300.

(Twenty one) The On/Off Switch is a double pole switch, which switches on the AIB. A double pole switch also has “on” and “off” markings or indicators and turns an appliance on and off from one location. A double pole switch, having four brass terminals instead of the usual two terminals, allows the switching of two separate 24V circuits by the one operation.

(Twenty two) The effect of the Off/On Switch in the Cab Box being turned on is: -

- (a) to make a connection between the ignition power supply and the C300, thus providing a power supply to the C300; and
- (b) to route the output of the Down Limit Switch to the C300. This enables a trigger signal, (when such is applied), to run from the Down Limit Switch to the C300.

(Twenty three) The switching on of the ignition power supply using the On/Off Switch provides power to the C300. This power is only released from the C300 to the ACU once a trigger signal is received from the Down Limit Switch.

(Twenty four) If the mechanism and related electrical equipment has been properly installed and maintained, and is also operating properly and accurately in accordance with the manufacturer’s specification, there will be no power going to the C300 unless: -

- (a) the ignition supply is switched on; and
- (b) the On/Off Switch is switched on.

(Twenty five) The Up and Down Switches operate the motors which move the crash cushion situated at the rear of that vehicle up and down. When the AIB is not in use, the crash cushion is stored in an upright position. On 20th March 2007 and for the whole of the journey prior to the accident before mentioned, the crash cushion had been constantly in the upright position.

(Twenty six) If the mechanism and related electrical equipment has been correctly installed and maintained, and is operating properly and accurately in accordance with the manufacturer’s specification, the crash cushion ought not to move from its upright

position unless and until the Up and Down switches have been activated from within the driver's cab of the crash cushion vehicle.

(Twenty seven) There is also within the driver's cab of the Crash Cushion Vehicle an Emergency Stop Button. This button controls the hydraulics of the crash cushion. It is independent of, and does not affect, the operation of electrical circuits of the AIB.

(Twenty eight) The C300 is a plug-in unit with a plastic enclosure containing a discrete electronic circuit comprising two transistors connected in a latching configuration.

(Twenty nine) A trigger signal is provided to the C300 from the Down Limit Switch when the Down Limit Switch is closed. This causes the C300 to trigger (or "latch on") thereby connecting 24V DC from the input terminal to its output terminal.

(Thirty) The Down Limit Switch closes when it is pushed down by the operation of the crash cushion as it is lowered. The Down Limit Switch is a simple electro-mechanical switch circuit. When the crash cushion is lowered, the switch closes, sending a trigger signal from the Down Limit Switch to the C300.

(Thirty one) Once the C300 has been triggered by the closing of the Down Limit Switch, it remains on until it is de-energised. De-energisation may be effected in three different ways: -

- (a) by depressing the Up Switch, so as to raise the crash cushion;
- (b) by turning off the AIB system using the On/Off Switch; or
- (c) by turning off the ignition.

(Thirty two) The 24V DC from the output terminal of the C300 provides the power supply to the ACU.

(Thirty three) The AIB system will be in standby mode, once there is power going to the ACU. When the AIB is in standby mode, under normal operation - and provided that its installation has been completed in accordance with manufacturers'

specifications, is operating properly and has been appropriately maintained - the LED situated beside the On/Off Switch on the Cab Box will be flashing to reflect this.

(Thirty four) The ACU houses a pressure switch. Before the pressure switch will operate, power has to be transmitted to the ACU.

(Thirty five) A rear impact to a vehicle fitted with the AIB is detected by a sensor which is fitted to the crash cushion and air pipe, which are in turn connected to a pressure switch. The ACU is triggered when the pressure switch closes when the crash cushion is impacted. The closing of the pressure switch activates an electrical BASV (Brake Activating Solenoid Valve) which applies the vehicle's brakes.

Examination of Crash Cushion Vehicle post-accident

(Thirty six) Following this accident, the Crash Cushion Vehicle was subjected to a "post incident examination". Said examination concluded that there was no defect in the On/Off Switch in the Cab Box. Thus, it was not possible for the AIB to go into standby mode and operate the brakes itself, unless the On/Off Switch was switched on, as there would be no power supply going to the C300. When the AIB is switched on, the electrical components which control the application of the vehicle's brakes are the C300 and the ACU.

(Thirty seven) Said examination revealed no fault with the pressure switch in the ACU. It is therefore improbable that the ACU would have been triggered by a fault emanating from the pressure switch.

(Thirty eight) If the crash cushion on the lead vehicle was in the upright and stowed position in the course of the journey from Inveralmond Industrial Estate, Perth, no trigger signal should have emanated from the Down Limit Switch. If, however, there was a fault on the Down Limit Switch, a false electrical signal may have been sent to the C300, thereby triggering (or latching) the C300.

(Thirty nine) Examination of the Down Limit Switch after the accident revealed that it may have been inoperative at the time of the incident. The Down Limit Switch was noted to contain water to a level above the switch contacts, and one of the connecting

wires was not connected with its conductor, showing instead signs of corrosion. Tests disclosed that water and corrosion products within the Down Limit Switch could have effectively “closed” the switch, by virtue of their conductive characteristics, notwithstanding that the switch contacts were not closed. In consequence, even if the Down Limit Switch had been inoperative, (due to the condition of the Down Limit Switch), the C300 could have triggered each time the On/Off switch was switched on. (This scenario is predicated on the broken wire having been connected at the time of the incident and becoming disconnected during the actual incident.) Consequently, the Down Limit Switch may have emitted a false electrical signal, causing the C300 to trigger.

(Forty) Electrical noise, (i.e. voltage transients or voltage “spikes”, which are fast, short duration electrical transients in voltage in an electrical capacity, typically caused by power outages, short circuits or power transitions in other large equipment on the same power line), or electrical interference may cause abnormal operation of electrical circuits or spurious triggering or latching. In automotive systems, this interference may be generated by any one of a number of sources, including the switching of inductive loads, (such as relays or solenoids), and the operation of any mechanical switch within the system.

(Forty one) Both the ACU and C300 are susceptible to conducted electrical noise on their power supply terminals. The ACU, having a much larger capacitor than the C300, (a capacitor being a device that builds and stores electrical charges), has a better immunity than the C300, and will not necessarily trigger at the same time as the C300 would trigger, when electrical noise is applied.

(Forty two) False latching of the C300 may occur when it is subjected to electrical noise consequent upon the “normal” switching of the automotive relays for the Body Work Light and the Beacon Light Switches.

(Forty three) The noise level required to trigger the ACU is above that produced by the normal switching of the particular relays. A test, carried out subsequent to the 20th March 2007 and which applied a series of switch actions, did cause the ACU to latch. In consequence, it is believed that the ACU is susceptible to this type of interference,

provided that the power burst is of sufficient duration. Interference from normal switch operation would not appear to readily produce latching of the ACU.

(Forty four) Electrical noise arising from the operation of other more powerful vehicle electric systems could potentially trigger the ACU.

(Forty five) Electrical noise, which could cause the ACU to trigger, could come from, inter alia, any one of the following sources namely: -

- poorly suppressed high power loads, (such as motors);
- switched inductive loads, (such as relay coils in camera and spotlight systems)
- a faulty switch of a spotlight of a spotlight or camera system repeatedly pulsing a relay coil.

(Forty six) The electrical supply to the Cab Box of the Crash Cushion Vehicle was derived in the lower enclosure which was also the location of the Body Work Light and Beacon Light relays. The cables connecting the Body Work Light switch to the Body Work Light relay, and the Beacon Light switch to the Beacon Light relay, run close and parallel to the Power Conductor of the Cab Box, for a distance of some 12 metres. Running cables carrying power in that manner, (i.e. parallel to each other), provides a coupling mechanism allowing the transient pulses produced by any arcing at the switch contacts to be transferred to the power conductors. The longer the distance that the cables run parallel to each other, the greater will be the available mechanism for transient coupling. If the AIB had been wired up so as to take its power from the ignition supply, the cables would have run parallel to each other over a route that was shorter by 1 metre, which would have in turn produced a reduced coupling mechanism.

(Forty seven) The AIB was originally tested for Croft Backstop Limited, in accordance with the requirements of the European Automotive EMC Directive 95/54/EC. Subsequent to 20th March 2007, the AIB has been re-tested by Intertek Testing & Certification Limited, (on the instructions of Highway Care Limited), to ensure ongoing compliance with the transient immunity specification ISO 7637-2 (2nd Edition – Electrical disturbances from conduction and coupling – Part 2:

Electrical transient conduction along power lines only), in accordance with the European Automotive EMC Directive 2004/104/EC.

(Forty eight) The purpose of the testing is to ensure that automotive components and sub-systems, (such as those comprising the AIB), have adequate immunity to conducted emissions emanating from other sources on the vehicle to which they are fitted, to prevent abnormal operation or spurious triggering thereof.

(Forty nine) The six different voltage transient pulses as prescribed by ISO7637-2, (above referred to in paragraph **(Forty three)**), were applied along the supply line to the AIB as a whole and also to the C300 independently. On doing so, neither the AIB nor the C300 on its own, were triggered, and appeared to be immune to pulses. These tests showed that the AIB complied with the Council Directive.

(Fifty) Voltage transient pulses, applied to ensure that the AIB complied with the ISO 7637-2, are less than those which could have been readily reproduced on a vehicle fitted with the AIB, (due to the presence of the relays contained in the automotive systems such as spotlights and cameras, both in terms of the level of voltage and the duration for which the pulses are applied along the supply line).

(Fifty one) The safe operation of the AIB is seriously compromised when the voltage transient pulses get into, and impacts upon, the electric circuits of the AIB.

(Fifty two) Such safer operation of the AIB would be achieved by: -

- (a) the installation of decoupling capacitors across any power line close to the C300;
- (b) the fitting of a Metal Oxide Variator (MOV) across the power supply to the ACU;
- or
- (c) the fitting of flywheel diodes across the relay coils, this preventing the creation of the voltage transients at source.

(Fifty three) A decoupling capacitor is a capacitor used to decouple one part of an electrical circuit from another. The voltage transient pulses caused by another circuit, such as the switching of the relays in the Body Work Lights and Beacon Lights

circuits, are shunted through the decoupling capacitor, thereby reducing the effect the pulses caused by the switching have on the rest of the circuit.

(Fifty four) A Metal Oxide Variator (MOV) is an electronic component, which is commonly used to divert excessive current to the ground and/or neutral lines away from another component, such as the ACU.

Examination of driver's seat belt on lorry registration number SG02 UKY

(Fifty five) The articulated lorry registration number SG02 UKY – and driven by Mr. McKenzie was fitted with a driver seat belt. Subsequent examination of that seat belt found it to be in good working order. If Mr. McKenzie had been wearing his seatbelt at the time of the collision, he would probably have survived.

(Fifty six) At the time of the accident, Mr. McKenzie was not wearing that seat belt, or any other sort of restraint. The Scania articulated lorry that he was driving that day was, as narrated supra, fitted with a seat belt. Since 2001, it has been mandatory to wear a seat belt. It is also mandatory that seat belts be fitted to vehicles over 3 ½ tonnes, to comply with EU Regulations.

(Fifty seven) Following the accident, police investigators examined the Crash Cushion Vehicle. So far as the actual vehicle was concerned, nothing of significance was found. Examination cast doubt on the efficient operation of the Automotive Impact Brakes, which were subsequently examined by the Health and Safety Executive. The results of that examination are detailed in Findings numbers **(Thirty six)** to **(Thirty nine)**. During the course of their examination of the Crash Cushion Vehicle, the police officers noted the presence of water in the Down Limit Switch.

Reasonable precautions whereby the death and accident causing Mr. McKenzie's death might have been avoided

(Fifty eight) A reasonable precaution, whereby the death of Mr. McKenzie might have been avoided, would have been the wearing of the seatbelt by himself, as the driver of the lorry concerned. To comply with this precaution would only require the driver of the lorry to use the seatbelt already fitted within the lorry. Accordingly,

notwithstanding current practice, HGV Drivers - such as Mr. McKenzie - should wear seatbelts at all times.

Defects, if any, in any system of working which may have contributed to the accident, and any other facts which are relevant to the whole circumstances of the case

(Fifty nine) Defects did exist in the AIB of the Crash Cushion Vehicle. These defects may have contributed to the series of events that collectively formed the single accident that claimed Mr. McKenzie's life.

(Sixty) The ongoing use of AIB's on Crash Cushion Vehicles requires that all operatives driving and having responsibility for such vehicles should be properly trained and required to take refresher courses at periodic intervals to ensure that they are kept up-to-date with the operation of these vehicles and attached AIB's. Such operatives should, on a daily basis, examine the vehicle for which they will have responsibility that day prior to any operation involving that vehicle commencing. A log-book should be kept by the employers, and initialled each day by operatives to record that the daily check has in fact been made. Drivers ought also to be made aware of the normal operation of the system, and be required to report forthwith any deviations from the norm, so that immediate remedial action may be taken. In particular, the daily inspections should include

- a check that the warning and telltale lights in the Cab Box are responding correctly,
- a visual inspection of the Down Limit Switch on the Crash Cushion, (to detect any corrosion and that the arm and wheel thereon move smoothly, and then dry and treat with dampness inhibitor or replace as required).

(Sixty one) In-depth periodic checks should be carried out on the whole system of operation of AIB's and related equipment to identify faults. Such periodic checks, the frequency of which should be determined by recommendation from the Health and Safety Inspectorate, should be carried out at the depot where the vehicle is "based", and by appropriately qualified engineers. A written record should be kept of such inspections.

(Sixty two) All users and operators of Crash Cushion vehicles with AIB components should be informed - in writing and at regular intervals after the commencement of their operation of such vehicles with AIBs - of correct installation, maintenance and periodic test procedures, with particular reference to the procedures related to the Down Limit Switch, the correct connection to the electrical supply, and related functions matters, as recommended by the manufacturers and VOSA.

(Sixty three) The manufacturers and the Regulator, (VOSA), ought to explore means whereby Voltage Transient Pulses can be prevented from interfering with the electrical circuits of the Automatic Impact Braking System. In particular, the introduction of decoupling capacitors and MOV's – with a view to protecting the C300 and ACU components from spurious triggering – should be actively considered.

(Sixty four) Consideration ought also to be given to ensuring that that water does not enter the Down Limit Switch, and that any corrosion of equipment within the Down Load switch is readily identified, with immediate restorative action being taken.

(Sixty five) Consideration ought also, as a matter of high priority, to be given to immediately alerting the driver of the Crash Cushion Vehicle on all occasions that the AIB is in the “Armed” state. In this connection, drivers of vehicles with AIB systems should ensure that the AIB system is turned off at all times when the crash cushion is not deployed,

(Sixty six) As set out supra, the AIB has an important safety related function. Thus, it would be reasonable – in light of what happened in this accident – that a full analysis of its failure modes be undertaken by the manufacturer, in association with the Regulator and the Health and Safety Executive. Such analysis should be very comprehensive, and would incorporate inter alia a Failure Mode and Effects Analysis, and a probability of brake operation analysis.

(Sixty seven) Installers of AIB systems on vehicles should : -

- not modify in any way the AIB system as supplied by the manufacturers.

- ensure that the power supply for the AIB system is taken from the ignition supply, and
- otherwise avoid running the power cables for the AIB system parallel to other power cables.

Note

[1] This Fatal Accident Inquiry arises out of the death of Harry McKenzie, an HGV driver, who died as a result of an accident on 20th March 2007.

[2] Apart from the Procurator Fiscal, there also appeared a solicitor in behalf of Highway Care Limited, (the suppliers of the Crash Cushion and AIB system for the Crash Cushion vehicle). That vehicle was operated and owned by Alba Traffic Management, (that firm not being represented at this enquiry). There was also present a solicitor on behalf of Croft Backstop Limited, (the manufacturers of the C300 relay, which forms part of the auto brake control unit which was fitted to the leading Alba Traffic Management vehicle, the DAF lorry registration number SY06 BZS). In addition, I must also record that, even although they were not formally represented, Mr. McKenzie's widow and his family sat very attentively throughout the whole of the proceedings. As I stated in open court at the end of the Inquiry, that whilst the whole proceedings may appear to have been very impersonal and cold, all of us who were in any way involved were appreciative of the fact that we were dealing with the life of another human being, who had been part of a close and loving family. I would not want the formality of these proceedings to give Mrs. McKenzie and her family the impression that any of the participants were blind to the human tragedy that has befallen their family. I also express the hope that what may have come out in evidence and discussion in the course of his Inquiry, will assist the family in coming to terms with what happened on that day in March of 2007.

- [2] In the course of the Inquiry, evidence was given by
- (a) Keith G. Sneddon, of Whitburn, West Lothian, the driver of the Crash Cushion Vehicle.
 - (b) Robin C.C. Aldridge, the passenger in the Crash Cushion Vehicle.

- (c) Allan M. Aldridge, (the brother of the previous witness), and the driver of the Transit van.
- (d) Steven Aldridge, (another brother), who was the passenger in the Transit van.
- (e) Roy A. Lowe, of Hucknall, Nottingham, the driver of the lorry mentioned in Paragraph (Twelve).
- (f) Peter Ritchie, paramedic with Scottish Ambulance Services, who arrived on the scene very quickly indeed, and confirmed the death of Mr. McKenzie
- (g) PC Michael Fullerton, of Tayside Police, who examined and analysed the tachograph records of the Crash Cushion Vehicle, in particular. (His evidence was that that vehicle was travelling at 59 kilometres (37 miles per hour) immediately prior to that vehicle either executing an emergency stop or coming to a sudden halt in some 3 seconds).
- (h) Howard Rose, a very experienced member of the Road Policing Unit of Tayside Police, Eastern Division.
- (i) Paul Ainley, who is also a very experienced member of the Road Policing Unit, and is for all purposes a Road Traffic Accident Investigator.
- (j) Alick Williams, Vehicle Examiner, with the Vehicle & Operator Service Agency, based in Arran Road, North Muirton Industrial Estate, Perth. He examined the Crash Cushion Vehicle.
- (k) Thereafter, there was lodged a Statement of Agreed Evidence from Highway Care Limited, Croft Backstop Limited and the Procurator Fiscal, which related to the Automatic Impact Brake System fitted to the Crash Cushion Vehicle. (I express my gratitude to all parties for the drafting and lodging of that document, which has made my task altogether less difficult.)

[3] The facts of this tragic accident are set out at some length in the foregoing determination, and I do not feel it necessary to repeat them at length in this Note. Suffice it to say, however, that Mr. McKenzie was driving his lorry northwards on the A90 near to its junction leading to Petterden. He was behind slow moving two Alba Traffic Management vehicles when the leading vehicle, a Crash Cushion Vehicle, without any warning came to a sudden and unanticipated stop.

[4] It appears that all three vehicles were travelling in fairly close proximity to each other. (The driver of any vehicle should always remember to keep a safe distance from the vehicle immediately in front, so that he can quickly pull up, if circumstances so dictate).

[5] The damage sustained by the Alba Traffic Management vehicles points to there being an impact, whereby the second such vehicle, (the Ford Transit van), collided with the rear of the Crash Cushion vehicle. Mr. McKenzie - clearly realising that if he did not take some sort of avoiding action, there would be a major impact with his lorry impacting the rear of the Transit van and there being ensuing fatalities – took what could only be described as immediate avoiding action, by steering his lorry acutely to the right, in the hope of either avoiding or minimising any such impact. In carrying out that manoeuvre, Mr. McKenzie's lorry clipped the rear of the Alba Management Ford Transit van, before his vehicle toppled over at the central reservation area of the A90, resulting in his almost instantaneous death.

[6] But for that selfless action on the part of Mr. McKenzie, there can be little doubt that the two occupants of the Ford Transit van could also have been killed.

[7] From the evidence led at the enquiry, it is my opinion that the “shunt” involving the two Alba Traffic Management vehicles and Mr. McKenzie's lorry are in truth all part of one single accident.

[8] Why the Crash Cushion Vehicle came to its sudden and unanticipated halt may never be properly ascertained. However, it was that sudden halt which was the catalyst both for the second Alba vehicle, (the Ford Transit van), driving into the rear of the Crash Cushion Vehicle, and also for Mr. McKenzie having to take immediate avoiding action to prevent his lorry colliding with the back of the Transit van. To minimise the effect and strength of any collision that may have ensued between the lorry that he was driving and the Ford Transit van, it is now clear that Mr. McKenzie's actions - in steering his lorry sharply to the right – had the consequence that he wished. (He had succeeded in reducing the extent of the impact of his heavier vehicle when it collided with the rear of the smaller Ford Transit van.) However, in so

doing, he had put his own life at grave risk, and he in fact died almost instantaneously when his vehicle toppled over.

[9] I have set out in Paragraph (Sixteen) the circumstances of a separate unrelated incident involving the Ford Transit van, and another lorry in the minutes leading up to the accident at the Petterden turnoff. This was a minor incident but, as evidence relating to this separate matter as put before the court, I felt that I ought to allude to this in my judgement.

[10] Quite clearly, and following the most basic advice set out in the Highway Code, any driver should drive at such distance behind the vehicle immediately in front so that, in the event of an emergency arising, an emergency stop can be utilised to bring his vehicle under control without colliding with the vehicle in front. No evidence was adduced which would have enabled me to make any finding - one way or the other – as to how close the three vehicles were being driven to each other at about the time of the accident. In this connection, (the proximity of the vehicles to each other), I would add that I do not consider it appropriate to make any recommendation as to requiring the driver of a vehicle at all times to drive “at a safe distance” behind the vehicle in front. That premise is starkly set out in the Highway Code, and should be within the active knowledge of each and every driver on the public road, whether he be the driver of a goods vehicle of whatever size or a saloon car. There is no need whatsoever for any such recommendation within the parameters of a Fatal Accident Inquiry.

[11] There was no evidence led to suggest any mechanical or electrical fault in either of the Ford Transit van or the Scania Articulated lorry which Mr. McKenzie was driving at the time of the accident.

[12] The evidence at the actual enquiry therefore focussed largely on why the Crash Cushion Vehicle may have come to a sudden and unanticipated stop. No compelling or certain explanation for that vehicle coming to a sudden stop was given to the court. A number of different scenarios could be considered. Some of these are set out in Paragraphs (Thirty nine) to (Forty five). It is also possible that one of the operatives in the Crash Cushion Vehicle may have inadvertently touched a switch,

thus triggering an operation by the Crash Cushion. In addition, it may be possible that the driver of the Ford Transit van inadvertently collided with the rear of the leading vehicle. Alternatively, the driver of the Ford Transit van may have simply responded in a desperate fashion to the unexpected stopping of the leading vehicle. Again, I have to repeat that, within the parameters of a Fatal Accident Inquiry, there is no requirement to make any certain or definite finding in this regard. All I can hold is that the lead vehicle came to an unexplained and unanticipated halt in the course of its journey on the A90, near to the turnoff for Petterden.

[13] It is re-assuring to note, as is set out in the Statement of Agreed Evidence, that Highway Care Limited have commissioned further and detailed testing of the AIB, while simultaneously working on a method of rendering the latching relay invulnerable to transients. The Vehicle and Operator Services Agency have rightly been kept apprised of progress in this regard. Whilst such testing is ongoing, all customers of Highway Care Limited have been informed that it would be “prudent to bypass the C300 to reduce the potential risk of abnormal operation. (The letters and instructions were despatched to customers on 27th February 2008 and 20th August 2008.)

[14] Importantly, it has to be recorded that, with the aim of reducing the potential for an operative inadvertently leaving the AIB switched on whilst the crash cushion is not in use, Highway Care Limited have devised a further indicator as to the state of that switch. Comprising a large red LED that is positioned directly in the line-of-sight of the driver, it will remain illuminated whenever the On/Off Switch is switched on. Their customers have also been reminded that equipment supplied by them should not be modified without first consulting Highway Care Limited. Mirroring the recommendation in paragraph (Sixty three), Highway Care Limited have already commenced consideration of matters alluded to in the second sentence of that paragraph.

[15] Finally, I would stress that this enquiry was not sought to establish responsibility on the part of any person or party for the untimely death of the late Mr. McKenzie. That is not the purpose of a Fatal Accident Inquiry. The procurator fiscal is under a statutory duty to enquire into any death at work, whether or not as the result

of an accident. Mr. McKenzie's death occurred in the course of his employment. The evidence has now been led, and various matters have been brought into the open. However, the single most important question of why the Crash Cushion Vehicle came to a sudden stop on 20th March 2007 has not been explained in the course of this Inquiry. All that can be definitively stated is that that vehicle did come to an unanticipated halt for whatever reason, and that Mr. McKenzie sadly died after taking avoiding action so that his much heavier vehicle did not plough into the altogether smaller Ford Transit van immediately in front of his lorry.