CORONERS ACT, 1975 AS AMENDED

SOUTH  *AUSTRALIA*

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 25th day of October, 5th day of November and the 21st day of November 2001, before Wayne Cromwell Chivell, a Coroner for the said State, concerning the death of Hayden Thomas Thatcher.

I, the said Coroner, find that, Hayden Thomas Thatcher aged 16 years, late of 48 Wireless Road East, Mount Gambier, South Australia, died at Riddoch Highway, 9kms south of Penola on the 2nd day of April 2000 as a result of traumatic rupture of the thoracic aorta. I find that the circumstances of the death were as follows:

1. Introduction

1.1. On 2 April 2000 Hayden Thomas Thatcher was a passenger in a Daewoo Espero motor vehicle being driven by his mother, Wendy Ann Thatcher, in a southerly direction along the Riddoch Highway near Penola in the South East of South Australia when it left the road and collided with trees on the western side.

1.2. As a result of the collision, Hayden Thatcher was killed instantly and Mrs Thatcher, and passengers Danielle Lee Climas aged 17 years and Olivia May Climas aged 10 months were injured.

1.3. Mrs Thatcher declined to answer questions about the accident put by the police investigators (see exhibit C7a), and was not called to give oral evidence at the inquest because the focus of the inquiry was the role of the seatbelt worn by Hayden Thatcher, rather than Mrs Thatcher's driving. It is necessary to examine the circumstances of the accident to some extent, however, to analyse the role of the seatbelt.

2. Circumstances of the accident

2.1. The only witness to the accident was Danielle Climas, who made the following statement:

> 'When we reached a point about 10-15Kms south of Penola I was looking to my left out of the left side passengers window of the car and I saw that we were moving off the road to the left and onto the gravel part of the roadway. I thought Wendy was pulling over. We were travelling at a normal speed, not slow yet not more than the speed limit of 110km/h. We continued for about 10-15 metres with the wheels of the car onto the gravel and then I looked to my right at Wendy to see what she was doing. She was looking partly towards me and seemed okay, but she was wearing sun glasses and I couldn't see her eyes. She immediately became alert to the fact that we were on the gravel and said 'Oh my God' and then I'm sure she applied the brakes of the car. The car was still fully on the gravel at this time and as a result the car front moved suddenly in an arc to the right and we travelled left side first back onto the bitumen road surface and across to the western side where we collided with some trees. The left side and front collided with the trees, I'm uncertain as to whether the impact was just one or a couple of impacts.'
>
> (Exhibit C8a, p2)

2.2. I heard evidence from Mr H S Aust, a consulting engineer with many years experience in analysing vehicular accidents in general, and the performance of seatbelts in collisions, in particular. Mr Aust gave the following brief description of the movements of the vehicle during the accident:

> 'When we are looking and considering what happened in this accident, and without going into enormous detail, initially we would have the impact on the right front which would tend to rotate the vehicle about - if you are looking from above, in a clockwise direction, which may have caused the left side of the vehicle to be advancing to the front where the two collisions with the trees - and I am not sure of the sequence of those collisions - clearly severe impacts on the left side of the vehicle. When you are considering what the seatbelt would have to deal with, there would be some sort of initial forward impact and then two impacts on the left side of the vehicle with the one at the rear being of very considerable severity. That means all the occupants would in general have been projected forward and then violently to the left. The seatbelt on Mr Thatcher would have sustained a loading forwards but then a major loading to the left, so that Mr Thatcher's body - the webbing would have been pulled such that he moved to the left of the vehicle.' (T11-12)

2.3. After the accident, Senior Constable Colbey of South East Highway Patrol at Mt Gambier found the rear right-side passenger seatbelt as follows:

> 'I inspected the vehicle and removed from the rear, the male component of the rear right side passenger seatbelt. This portion of the seatbelt which I have labelled "C" was intact

> and suitably affixed by bolts to the vehicle body. I also located the anchor bolt and lip fitted for the connection of the female component of the rear right side passenger seatbelt. Also affixed by this same bolt was the lip and male component of the centre passenger seatbelt. This whole coupling which I have labelled "B" was removed and taped. There was no female component of the rear right passenger seatbelt attached to the lip at the anchoring location.
>
> I located the female component of the rear right passenger seatbelt on the "parcel shelf" to the rear of the rear seat of the vehicle. This portion I have labelled "A".'
>
> (Exhibit C15c, p1-2)

2.4. Mr Aust demonstrated that the webbing on the buckle side of the seatbelt, what Constable Colbey called the 'female component', had separated from the anchor.

2.5. From markings on the components examined under the microscope, Mr Aust was able to confirm that Mr Thatcher was wearing his seatbelt at the time of the collision, since the belt had been subjected to load (T11).

2.6. Mr Aust explained that the buckle anchor for the rear right passenger and the anchor for the centre seatbelt were secured to the vehicle by the same bolt. The two anchors were of similar shape such that when Mr Thatcher's body was subjected to the lateral force to the left, the anchor rotated so that it moved across the other anchor creating a scissor effect, which sheared the webbing causing the seatbelt to fail (T12-14).

2.7. Mr Aust said that this problem appeared to be the result of the design of the two anchors. He said that this scissor effect could have been avoided by the insertion of a spacer between the two anchors to keep them apart (T14). He inspected a similar car, and also consulted the spare parts manual (T8), and there was no such spaces provided for.

3. Causation of injury

3.1. A post-mortem examination of the body of the deceased was performed by Mr R A James, Chief Forensic Pathologist, on 4 April 2000. Dr James found that the cause of death was:

> 'Traumatic rupture of the thoracic aorta.'
>
> (Exhibit C3a, p2)

3.2. Dr James noted the presence of parallel abrasions about 2cm apart on the top of the right shoulder which extended obliquely across the chest towards the left lower

ribcage, and similar abrasions across the lower abdomen. Both abrasions suggested that they had been caused by a lap/sash seat belt. (Exhibit C3a, p1).

3.3. I called Dr James to give evidence about these findings. He described them as 'classical' of a horizontal deceleration injury, such as is sustained in motor vehicle collisions. He told me that it is clear that Mr Thatcher's fatal injury was caused when his body was forcefully propelled against the seatbelt. He told me that there are several theories as to how the injury can occur:

> '1 The heart and aortic arch are mobile but the descending aorta is attached to surrounding bodies, so when the heart is propelled forward or to the side, a rupture occurs (the so-called 'pendulum effect');
>
> 2. The inner lining of the aorta is elastic, but at a point where a blood vessel called the ductus (the vessel which takes blood from the lungs while we are in utero) was attached to the aorta, there is scar tissue which is liable to rupture;
>
> 3. Applying pressure above and blow the rupture point (as the seatbelt does by the lap and sash) sets up pressure waves travelling in opposite directions which, if severe enough (3000mms of mercury or more) will rupture the vessel (the so-called 'hydraulic ram' theory). (T29-30)

3.4. Whichever of these theories is correct, and it may be that a combination of more than one was at work here, Dr James' evidence was clear that Hayden Thatcher sustained the fatal aortic rupture by the action of his body being subjected to very severe deceleration forces before the seatbelt failed. He suffered no other serious injuries in the accident (T35).

3.5. The conclusion is inescapable, therefore, that although it is clear that the seatbelt worn by Hayden Thatcher failed, and this is a situation of great concern, the failure occurred after his aorta was ruptured, and did not cause his fatal injuries.

4. Recommendations

4.1. Section 25(2) of the Coroner's Act states:

> 'A coroner may add to his or her finding any recommendation that might, in his or her opinion, prevent, or reduce the likelihood of, a recurrence of an event similar to the event that was the subject of the inquest.'

4.2. In light of the evidence I have heard, I do not feel able to make a formal recommendation concerning the design of the seatbelt anchorage points for rear seat passengers in Daewoo Espero motor vehicles, since the seatbelt failure in this case did

not cause Mr Thatcher's fatal injuries. However, I will cause the relevant parts of Mr Aust's evidence to be brought to the distributor's attention (they had notice of these proceedings, and cooperated with Mr Aust's investigations).

4.3. I am aware that the subject of motor vehicle injuries and the wearing of seatbelts has been, and continues to be, the subject of ongoing research at such institutions as Adelaide University's Road Accident Research Unit. I will bring this case to the attention of the appropriate authorities for further consideration.

Key Words: Motor Vehicle Accident; Seatbelts

In witness whereof the said Coroner has hereunto set and subscribed his hand and Seal the 21st day of November, 2001.

Coroner

Inq.No. 24/01 (0752/2000)