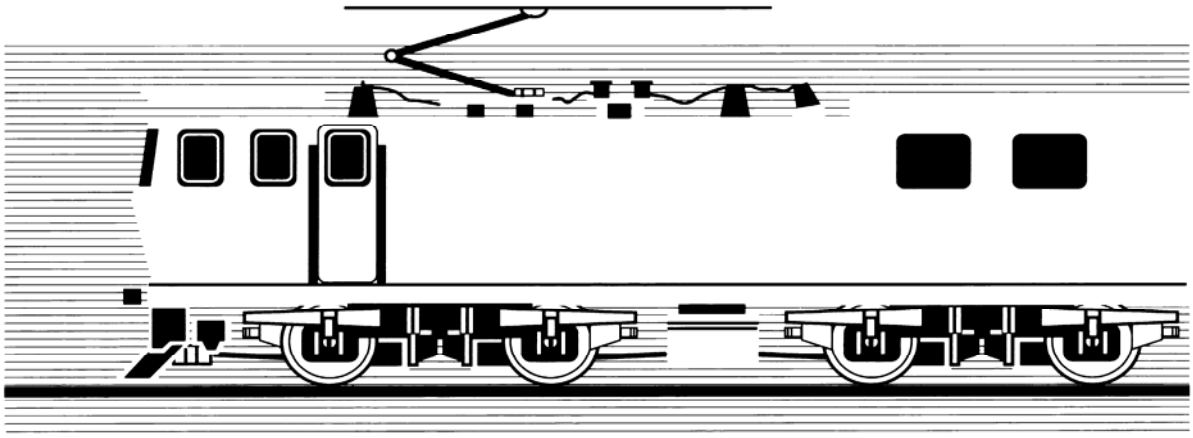
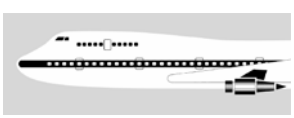
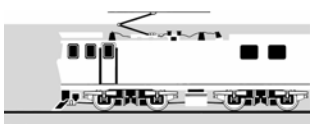


RAILWAY OCCURRENCE REPORT

05-115 **empty passenger Train 2100, train parting and improper door opening, Ranui** **1 April 2005**


TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

Report 05-115

empty passenger Train 2100

train parting and improper door opening

Ranui

1 April 2005

Abstract

On Friday 1 April 2005, Train 2100 was a scheduled empty passenger service being positioned to Waitakere to start passenger operations for the day. At 0627, soon after the train had passed through Ranui station, the coupling between the locomotive and the guard's van parted. As a result of the parting, the automatic brake system lost all air pressure and brought the train to a stop.

Two cable connections were severed and loose wiring short-circuited the electrical door control trainline, resulting in the doors on the passenger cars opening and closing while the train was coming to a stop.

The safety issues identified included:

- the door opening/closing circuitry
- the return of a rail vehicle to passenger train service with out-of-code drawgear height.

One safety recommendation has been made to the Chief Executive of Toll NZ Consolidated Limited to address these issues.

Contents

Abbreviations ii

Abbreviations ii

Data Summary iii

1 Factual Information 1

1.1 Narrative 1

1.2 Site and operating information 1

Site information 1

Operating information 2

1.3 Train 2100 2

Consist and coupling arrangements 2

Jumper and trainline cable arrangements 4

1.4 Standards and inspection of drawgear 4

1.5 Previous train parting incidents 6

1.6 Locomotive event recorder 6

1.7 Personnel 6

Locomotive engineer 6

Train manager 7

Commissioning engineer 7

2 Analysis 8

Train parting 8

Drawbar height on AG 55 9

3 Findings 9

4 Safety Actions 10

5 Safety Recommendation 10

Figures

Figure 1 Track in the vicinity of the train parting location 1

Figure 2 Plan of Train 2100 consist showing the coupling arrangements (not to scale) 2

Figure 3 Fixed solid drawbar coupling between 2 SA carriages 2

Figure 4 Automatic coupler on AG 55 with knuckle on the left, closed and on the right, open 3

Figure 5 Coupling arrangement between AG 55 and SA 3171 3

Figure 6 Coupling and cable arrangements between DC 4375, left and AG 55, right 4

Figure 7 New drawbar wear plate being installed on AG 55 5

Figure 8 Locked automatic couplers between DC 4375, left and AG 55, right showing height difference 7

Abbreviations

Alstom	Alstom Transport New Zealand Limited
Connex	Connex Auckland Limited
km	kilometre(s)
km/h	kilometre(s) per hour
m	metre(s)
mm	millimetre(s)
NAL	North Auckland Line
Toll Rail	Toll NZ Consolidated Limited
UTC	coordinated universal time

Data Summary

Train type and number:	empty passenger Train 2100
Date and time:	1 April 2005 at 0627[1]
Location:	30.30 km between Ranui and Swanson, North Auckland Line (NAL)
Persons on board:	crew: 2 passengers: nil
Injuries:	nil
Damage:	severed jumper and trainline cables
Operator:	Connex Auckland Limited (Connex)
Investigator-in-charge:	Vernon Hoey

[1] All times in this report are New Zealand Standard Time (UTC+12) and are expressed in the 24-hour mode.

1 Factual Information

1.1 Narrative

1.1.1 On Friday 1 April 2005, Train 2100 was a scheduled Connex diesel-hauled empty passenger service from Westfield to Waitakere, and was being positioned to start passenger operations for the day.

1.1.2 Train 2100 consisted of a lead locomotive, a guard's van, 3 passenger carriages and a locomotive at the rear. The train departed Westfield at 0531 and was crewed by a locomotive engineer and a train manager.

1.1.3 When Train 2100 was about 100 metre(s) beyond Ranui station, the coupling between the lead locomotive, DC 4375 and the guard's van, AG 55 parted. As a result of the parting, the air hose separated and the brake system automatically applied. The doors on the left side of the passenger carriages opened and closed, followed by those of the right side, which opened and remained so. When the 2 portions of the train had stopped, there was a gap of about 10 m between DC 4375 and AG 55.

1.1.4 The crew recoupled DC 4375 to AG 55 and continued cautiously to Waitakere where Alstom Transport New Zealand Limited[2] (Alstom) mechanical staff effected temporary repairs. When repairs were complete, the service returned without passengers at reduced speed to the passenger vehicle depot at Westfield.

1.2 Site and operating information

Site information

1.2.1 The parting occurred at about 30.00 km on the NAL. At this position the track alignment was on a 1600 m radius left-hand curve transitioning from near level to a slightly descending gradient of 1 in 174. During its most recent run through the area on 18 November 2004, the track evaluation car[3] had identified no track outside maintenance tolerances. However, the track in the area did have a wavy top (see Figure 1).

Figure 1
Track in the vicinity of the train parting location

[2] Alstom was contracted to undertake the inspection and maintenance of rolling stock to standards set by Toll Rail.
[3] The track evaluation car measured and recorded track geometry and identified track conditions beyond tolerance.

Operating information

1.2.2 Train movements on the NAL were controlled from the national train control centre in Wellington.

1.2.3 The maximum speed for passenger trains between Westfield and Waitakere was 80 kilometres per hour (km/h).

1.3 Train 2100

Consist and coupling arrangements

1.3.1 The Connex SA passenger train consists were made up of the requisite vehicles and generally remained made up as a unit. The vehicles on Train 2100 were connected with either automatic or fixed solid drawgear couplers (see Figure 2).

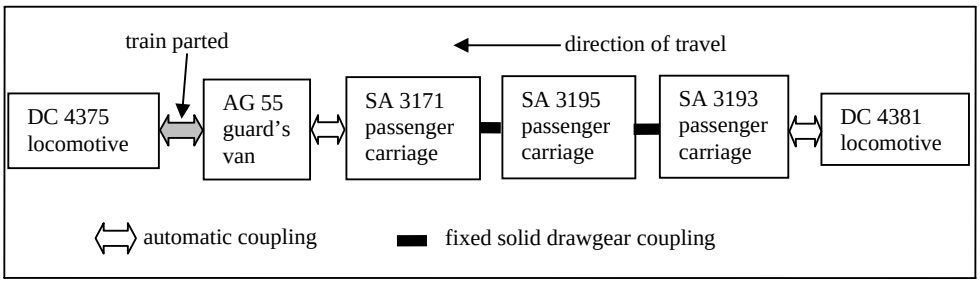


Figure 2
Plan of Train 2100 consist showing the coupling arrangements (not to scale)

1.3.2 Fixed solid drawgear was formed of a drawbar only and provided a secure connection between 2 SA carriages (see Figure 3). Special arrangements were required to uncouple vehicles fitted with this type of drawgear.

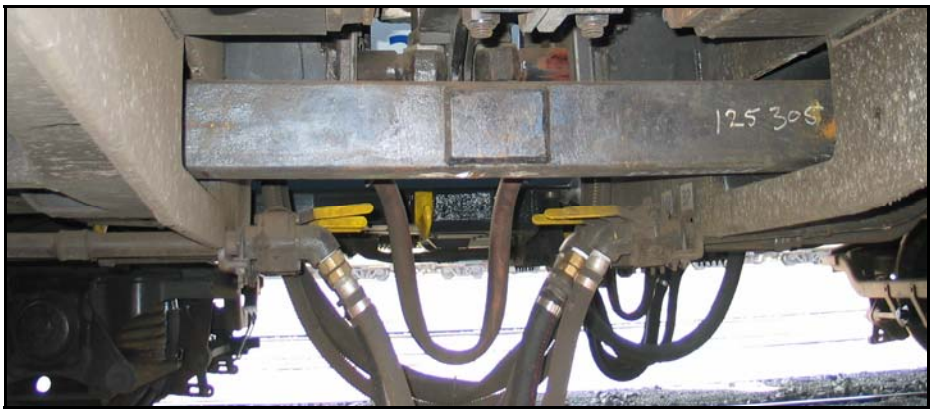


Figure 3
Fixed solid drawbar coupling between 2 SA carriages

1.3.3 AG 55 had been temporarily assigned to the train consist on 22 July 2004 because it was equipped with a generator unit to provide auxiliary power until the commissioning of a dedicated SD driving carriage to complete the fixed push/pull consist. When commissioned, the SD driving carriage was to be coupled with automatic couplers to SA 3171 and DC 4375 would have been permanently removed at that time.

1.3.4 The automatic couplers between DC 4375 and AG 55 were alliance-type automatic couplers, each fitted with a positive lock assembly but with no safeguards to prevent them parting. The knuckle on each coupler was 229 millimetres (mm) high. No gouge marks were visible on the topside or underside of either of the couplers. To facilitate a coupling or uncoupling of an alliance coupler, the knuckle on at least one vehicle must be unlocked and opened (see Figure 4).

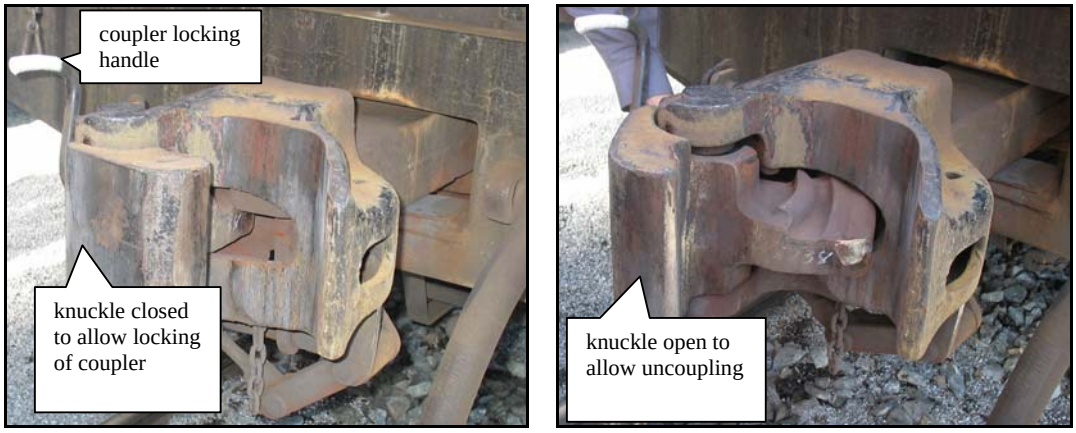


Figure 4
Automatic coupler on AG 55 with knuckle on the left, closed and on the right, open

1.3.5 The automatic couplers on the outer ends of SA 3171 and SA 3193 were specially equipped to prevent overriding, a precursor to a parting. They were fitted with a lower shelf and with the bottom edge of the concertina striker plate situated above, which limited any vertical movement so that the couplers could not part (see Figure 5).

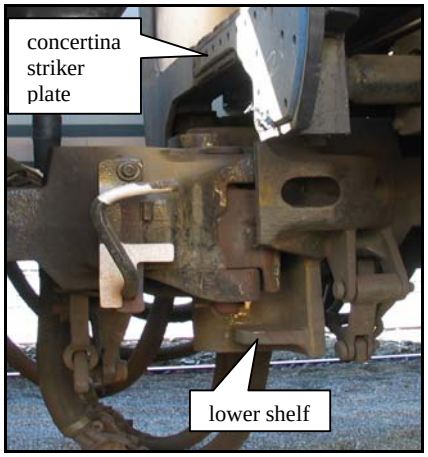


Figure 5
Coupling arrangement between AG 55 and SA 3171

Jumper and trainline cable arrangements

1.3.6 A jumper cable connection extended the length of the train, enabling the locomotive engineer to operate the locomotives at each end of the train in multiple (see Figure 6).

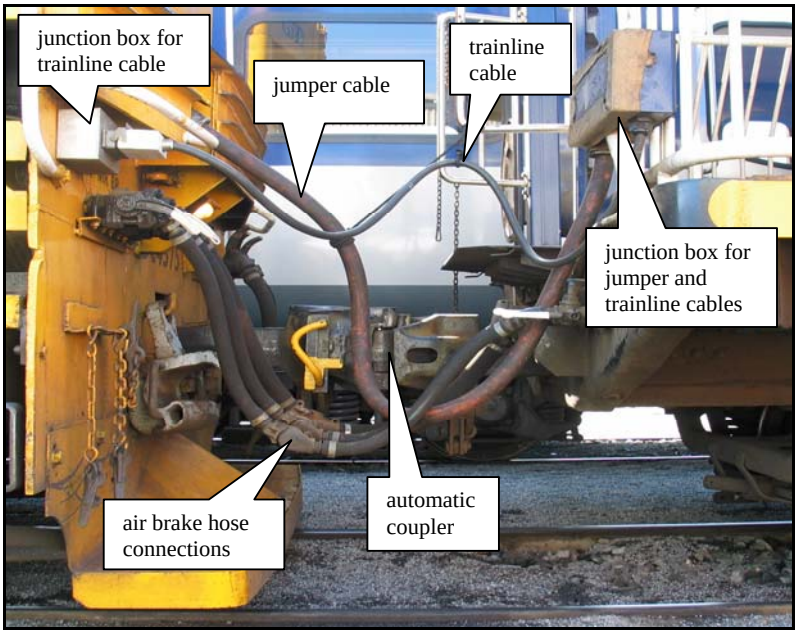


Figure 6
Coupling and cable arrangements between DC 4375, left and AG 55, right

1.3.7 A trainline cable enabled the locomotive engineer and the train manager to signal electronic instructions to each other to release, open and close the carriage doors and start the train after completion of passenger work at stations. Within the trainline there were 2 wires that carried the timestamps of the door opening and closing occurrences to the locomotive event recorder, where the events were logged to assist with operational diagnostics and incident investigation.

1.3.8 Within Train 2100, the trainline wiring in SA 3171 was specially arranged as it would eventually be coupled to an SD driving carriage. All the wires from SA 3171, including those for the locomotive event recorder, were connected through AG 55 to DC 4375. At the other end of the train, only selected wires ran from SA 3193 to DC 4381.

1.3.9 Tests immediately following the incident found that it was not necessary for all the wires that were connected to the locomotive event recorder on DC 4375 to be so connected. To prevent a reoccurrence that could again result in a short circuit in the trainline sending incorrect commands to the carriages to open and close the doors, Toll NZ Consolidated Limited (Toll Rail) mechanical engineers arranged for the relevant 2 wires to be disconnected between SA 3171 and AG 55.

1.4 Standards and inspection of drawgear

1.4.1 The Engineering Interoperability Standards section 11.1 Drawbar[4] Height, of the National Rail System's Standards dated 9 July 2004, specified in part that:

> Drawbars required to directly couple to standard rail vehicles operating on the National Rail System must not be visibly bent and the distance from the centre line of the drawbar to rail level shall be within the following dimensions in the tare condition:

[4] The drawbar was a steel shank behind the coupler and went through a slot in the buffer beam.

Class	Minimum height at tare	Maximum height at tare
All locomotives	710 mm	760 mm
Cars, vans and wagons running on passenger services	735 mm	767 mm

1.4.2 Checking of drawbar heights on locomotives was performed every 8 months during the B check cycle. AG vans, together with passenger carriages, were checked every 12 months during the C check cycle. Additional checks were required to be performed when vans returned from wheel lathe attention and by visual examination when vehicles were coupled together.

1.4.3 Between June 2004 and April 2005, the following measurements were recorded during planned and special inspections of the drawbar height on DC 4375 (long hood end) and AG 55 (handbrake end):

Date	DC 4375	Within code	Date	AG 55	Within code
2 June 2004 new buffer fitted	750	yes	23 June 2004 wheeling check at Alstom Hutt workshops	744	yes
12 March 2005 B check	740	yes			
1 April 2005 post incident by Alstom	720	yes	1 April 2005 post incident by Alstom	720	**no**
5 April 2005 by Toll Rail	740	yes	5 April 2005 by Toll Rail	705	**no**

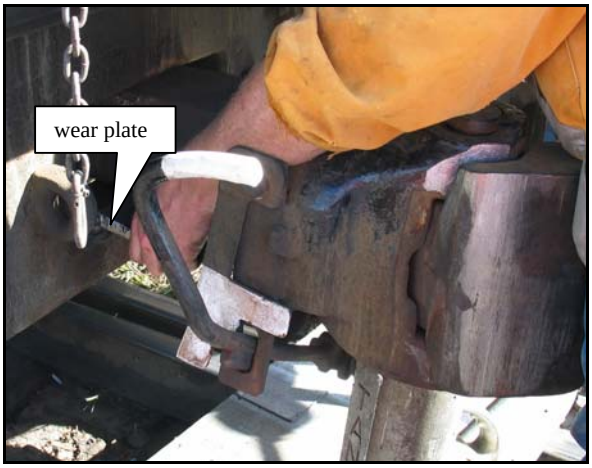


Figure 7
New drawbar wear plate being installed on AG 55

1.4.4 The buffer wear plate on AG 55 was replaced following the recordings taken on 5 April 2005. This raised the drawbar height to 730 mm (see Figure 7). Additionally, the knuckles on AG 55 and DC 4375 met code standards at that time.

1.4.5 A field modification instruction dated March 2000 required all couplers on AG vans to be replaced with AL-type alliance couplers when the original drop hook-type coupler was worn out. No additional measures were in place to prevent over riding and partings because maintaining drawbar height to normal code tolerances would cover this.

1.4.6 Locomotive(s) remained attached to the SA consists during fuelling and servicing, and were only removed if they had sustained a failure, the nature or complexity of which required them to be detached.

1.4.7 The coupling between vehicles was far more critical when passenger vehicles were involved. For this reason passenger car couplings were tightly controlled, whilst for other vehicles the height was a compromise of coupling security, design and the practicality of maintaining drawbar height in the field.

1.4.8 Prior to the departure of Train 2100 from Westfield on the day of the incident, Alstom maintenance personnel performed a pre-trip inspection. There was no requirement to check the drawbar height on the train during this inspection.

1.4.9 AG 55 was decommissioned from the consist on 18 April 2005. With the commissioning of additional SD driving carriages, there was no further requirement for AG vans to run on Connex services. There were no contingency plans to retain AG vans on standby in the Auckland area for temporary placement in an SA/SD train consist from that time.

1.5 Previous train parting incidents

1.5.1 In the 12 years leading up to this incident, there had been 4 recorded incidents of partings between the DC class locomotives and the first carriage in passenger train consists equipped with alliance couplers. None of these incidents was investigated by the Commission.

1.6 Locomotive event recorder

1.6.1 The locomotive event recorder data from DC 4375 was downloaded and supplied for analysis and showed the following:

Time	Speed km/h	Throttle setting	Brake pipe pressure
06.27:05	72	4	550
06.27:09	75	4	50
06.27:10	73	2	0
06.27:34	0	idle	0

1.6.2 The distance travelled by the locomotive after the parting was 297 m.

1.7 Personnel

Locomotive engineer

1.7.1 The locomotive engineer had been employed by Toll Rail and its predecessors for almost 40 years and held a current operating certificate. He had been a certified Grade 1 locomotive engineer for about 20 years.

1.7.2 His roster contained a high proportion of time driving railcars and diesel-hauled passenger trains under contractual arrangements between Toll Rail and Connex. He said that he had received special instructions to drive fixed consist passenger trains that had either locomotives positioned at each end of the consist or, one locomotive and an SD driving carriage at the other end of the consist.

1.7.3 He said that after booking on in Westfield, he checked the control settings in both locomotives before he departed on the train manager's instructions. He said the journey north was uneventful, and approaching Ranui station he reduced power to slow for a 40 km/h speed restriction ahead.

1.7.4 He said that at the time, he thought the reason for the loss of air was that a brake hose had burst somewhere on the train consist.

1.7.5 When the train stopped, the locomotive engineer alighted and closed the air taps on the locomotive. He noted that the locomotive knuckle on the automatic coupler was closed and locked. After conferring with the train manager, they reattached the train and, when air pressure was restored, departed at reduced speed for Waitakere.

1.7.6 On arrival at Waitakere, the locomotive engineer examined the area between DC 4375 and AG 55 in more detail. He found that all components of the jumper cable were missing, except for some bare wires hanging from the junction box on AG 55. He disconnected the jumper cable between DC 4381 and SA 3193 to enable him to drive the train from that end. He arranged for a certified Alstom member to travel in DC 4375 for the return journey to Westfield, so that he could apply the brakes on that locomotive should the train part again.

1.7.7 On the return journey, the locomotive engineer slowed the train in the area of the parting, but he could see no sign of the missing jumper cable and concluded that it probably had been flung off into some trackside bushes. The remains of the jumper cable were never found.

Train manager

1.7.8 The train manager had about 28 years' experience in the rail industry, most of which had involved working on passenger trains. The train manager said that on the day of the incident he carried out a pre-departure check of the train to assure himself that all handbrakes were released and air hoses were connected to both locomotives. He then performed an internal inspection to ensure the door controls, lighting and air conditioning systems were functioning.

1.7.9 En route to Waitakere he got himself ready to accept passengers. He said that he did not know why the train was making an unusual stop, but he saw the doors opening and closing while the train was in motion and concluded that something was seriously wrong.

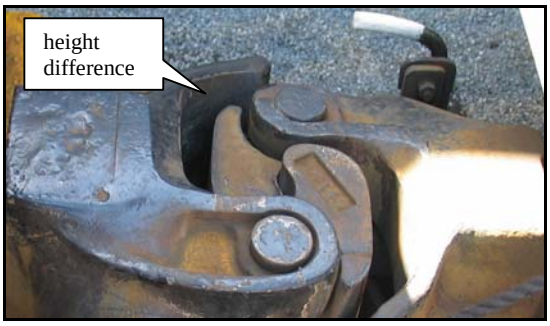


Figure 8
Locked automatic couplers between DC 4375, left and AG 55, right showing height difference

1.7.10 When the train stopped, the train manager went through to AG 55, alighted and later said that he had to open the coupler on AG 55 to enable the train to be reattached. He could not recollect if the coupler was locked. When this was done, he noted that the coupler on DC 4375 was sitting higher that the coupler on AG 55 (see Figure 8).

1.7.11 The train manager then recoupled the air brake hoses and saw that the trainline cable had been torn away from the junction box on DC 4375. He saw bare wires hanging from where the cable entered the bottom of the junction box.

Commissioning engineer

1.7.12 The Toll Rail commissioning engineer was based at Westfield and had more than 30 years' experience in locomotive maintenance and engineering. He had worked in several roles including front line and regional management of the locomotive maintenance facilities at Westfield.

1.7.13 Since February 2004, the commissioning engineer had been responsible for the commissioning of the diesel-hauled SA consists. The work involved the inspection of the carriages during their final phases of construction, road testing and certifying the consists for service.

1.7.14 The commissioning engineer said that he was not present when the set was examined and repaired at Westfield after the incident on 1 April 2005, but was present 4 days later when he arranged for the drawbar to be raised on AG 55 by installing a replacement wear plate.

2 Analysis

Train parting

2.1 Between Westfield and Ranui, Train 2100 had travelled over several short, steep gradients and negotiated several track junctions and at no stage did any one of these features cause the train to part. Additionally, the consist of Train 2100 had probably remained intact for a lengthy period of time before this incident with no change to the coupling arrangement between DC 4375 and AG 55. Although train partings between DC locomotives and the first carriages on passenger trains were not common, they were not unknown. DC locomotives had a tendency to pitch when travelling at speed because of their shorter bogie-centre wheelbase.

2.2 The coupler on AG 55 possibly became unlocked and opened. Had this happened, it would be expected that the train manager would have found the knuckle open. However, he found the knuckle closed but as he could not recall if it was locked, this possibility could not be ruled out. The knuckle may have closed in the movement associated with the parting.

2.3 Another possibility was that the differing pitch and bounce between DC 4375 and AG 55 was enough that the coupler on AG 55, with its out-of-code height, slipped under the coupler on DC 4375. The height difference between the 2 drawbars was 35 mm which, when deducted from the depth of the knuckle on AG 55, meant that the amount of knuckle-to-knuckle contact between the 2 vehicles was 194 mm. Therefore, for the closed and locked knuckles to override one another, the knuckle on DC 4375 would have had to lift and the knuckle on AG 55 to drop by the combined amount of 194 mm. However, similar measurements were not taken at the knuckles to gauge the height difference at the extremity of the couplers. Because the drawbar of AG 55 would have been at a slight downward angle caused by the worn wear plate, the difference at the knuckles would have been greater and therefore the knuckle-to-knuckle contact less. Nevertheless, neither the locomotive engineer nor the train manager reported any unusual riding sensations before the train parting occurred.

2.4 Although the track gauge, cant and top, when last measured by the track evaluation car in this area, were within ONTRACK's tolerance limits, there was some cyclic wavy top in the vicinity of the train parting. The wavy top may have contributed to the train parting, but it was unlikely to have caused significant movement on its own and cause the knuckles of DC 4375 and AG 55 to ride over each other, but may have caused the locomotive and guard's van to have pitched sufficiently differently to contribute to the parting.

2.5 Irrespective of the cause of the parting, the automatic application of the air brake system initiated by the separation of the brake hose couplings was a designed failsafe outcome. The release of the air pressure was designed to apply the brakes throughout both portions of a parted consist. The severing of the jumper cable would have throttled off the trailing locomotive to prevent it continuing to apply power when the brakes applied.

2.6 The severing of the trainline cable resulting in a short circuit sending commands to the carriage doors was a scenario that probably had not been considered in its design. If the consist had been conveying a full complement of passengers in this instance, any passengers standing next to the doors could have been at serious risk. Post incident tests showed that wiring arrangements had been unknowingly connected when the set had been assembled. The disconnection of the 2 wires removed the possibility of doors opening in any future train parting incident while in this particular configuration.

Drawbar height on AG 55

2.7 The reason for the 15 mm difference in measurements of the drawbar height taken 4 days apart by Alstom and Toll Rail could not be explained. However, the drawbar height on AG 55 had reduced in the 8-month period between the van being added to the consist and the train parting incident. AG vans were not designed as part of SA train consists, but the inclusion of AG 55 enabled this set to be placed into service for an interim period while waiting for the commissioning of an SD driving carriage. It was unlikely that DC 4375 had been uncoupled from the consist during that time, and if so, probably only infrequently. Therefore the opportunity to check the drawbar height visually was minimal.

2.8 The programmed checking of drawbar heights on locomotives and, carriages and vans occurred at different frequencies, 8 months versus 12 months respectively. The reason for the differing frequencies was not clear. When AG 55 was removed from the consist and DC 4375 coupled directly to SA 3171, the coupling safeguard enhancements provided by the lower shelf and concertina striker plate on SA 3171 were brought into use. These added safeguards significantly reduced the possibility of a future train parting.

2.9 Apart from the established frequency of checks on locomotives and carriages, and the requirement for personnel to examine drawbar heights visually during coupling and uncoupling operations, there were no other planned occasions when drawbar heights were checked. Fixed train consists required only infrequent vehicle separation so could remain coupled together for lengthy periods of time. The practicality of a regular visual examination was therefore greatly diminished and the checking of drawbar heights might only occur at the 8-month check.

2.10 With AG 55 coupled to DC 4375 for long periods, it was likely that the drawbar height on AG 55 had not been examined in the 8-month period since its last height measurement during the wheeling check at Hutt workshops on 23 June 2004.

2.11 The train manager noted the coupling height difference when he recoupled the train after the incident. This height difference should have been obvious to dedicated mechanical personnel when the consist returned for repairs at Westfield on the day of the incident. Nevertheless, after being checked at Westfield, AG 55 was reinstated to passenger operations with a drawbar height that was out of code. Although the addition of the replacement wear plate on 5 April 2005 lifted the drawbar height to 730 mm, it was still outside code requirements when returned to service.

2.12 The gradual degradation of the drawgear height on AG 55 went undetected for a lengthy period of time and there were insufficient procedures to monitor such a critical component on a fixed passenger train consist on a more frequent basis. A safety recommendation has been made to the Chief Executive of Toll Rail to address this issue.

3 Findings

Findings are listed in order of development and not in order of priority.

3.1 The cause of the parting could not be conclusively determined, but was likely to be either the coupling knuckle on AG 55 opening, or the couplings on DC 4375 and AG 55 separating vertically.

3.2 After the parting, the knuckle on DC 4375 was found closed and locked whereas the knuckle on AG 55 was found closed but may not have been locked. There was no evidence to suggest how or why the knuckle may have become unlocked.

3.3 The amount of vertical movement to allow the knuckle on DC 4375 and AG 55 to separate was up to 194 mm, which is about 85% of the knuckle height. Sufficient movement may possibly have been induced on Train 2100 when it travelled over the wavy track top, causing the locomotive and guard's van to pitch differently. There was no evidence of forceful separation on the knuckles.

3.4 The train's air brake system applied automatically and brought the train to a stop when the locomotive's air hoses separated as a result of the parting.

3.5 When the trainline cable severed, short circuits sent commands to open the doors on the passenger carriages as the train was stopping.

3.6 Procedures to monitor drawbar height were insufficient to detect the development of out-of-code drawgear height on AG 55 when operating in a fixed train consist.

3.7 AG 55 was twice returned to passenger train operations after the drawbar was measured and found to have out-of-code heights.

3.8 The actions of the locomotive engineer and train manager did not contribute to the incident.

4 Safety Action

4.1 On 31 May 2005, the Chief Executive of Toll Rail advised in part that:

> Note that the reason that all door control trainlines were trainlined through to the locomotive was to allow these signals to be recorded on the locomotive event recorder. On 6 April 2005 (after the incident) the door open trainlines (wires 3 and 4) were disconnected from the SA car at the AG end of the train. This eliminated the possibility of the doors opening if the cable was damaged as a result of another parting between the locomotive and the AG van.

5 Safety Recommendation

5.1 On 9 June 2006 the Commission recommended to the Chief Executive of Toll Rail that he:

> with the trend towards fixed passenger train consists, investigate compliance with, and the robustness of, present procedures for the checking of coupled drawgear heights with a view to reinforcing existing procedures, and if need be, introducing additional or changed processes to further reduce the likelihood of passenger carrying vehicles operating in service with an out-of-code drawbar height (101/05).

5.2 On 30 June 2006, the Chief Executive of Toll Rail replied in part:

> Toll NZ accept this recommendation and will be reviewing our procedures to ensure that the intent of this recommendation is applied.

Approved on 15 June 2006 for publication

Hon W P Jeffries
Chief Commissioner

Recent railway occurrence reports published by the Transport Accident Investigation Commission (most recent at top of list)

05-119	Runaway wagons from Waingawa and subsequent collision with motor vehicle, Hodders Road level crossing, 74.35 km between Carterton and Dalefield, 29 July 2005
05-118	Express freight Train 245, derailment, Ohingaiti, 27 July 2005
05-115	Empty passenger Train 2100, train parting and improper door opening, Ranui, 1 April 2005
05-108	Diesel multiple unit passenger Train 3334, fire, Auckland, 23 February 2005
05-126	Express freight Train 246, derailment, South Junction, 30 October 2005
05-103	Express freight Train 237, derailment, 206.246km Hunterville, 20 January 2005
05-121	Express freight Train 354, near collision with school bus, Caverhill Road level crossing, Awakaponga, 2 Septmeber 2005
05-112	Hi-rail vehicle passenger express Train 200, track occupancy incident, near Taumarunui, 7 March 2005
05-111	Express freight Train 312, school bus struck by descending barrier arm, Norton Road level crossing, Hamilton, 16 February 2005
05-109	Passenger Train “Linx” and “Snake”, derailments, Driving Creek Railway, Coromandel, 20 February 2005 - 3 March 2005
05-107	Diesel multiple unit passenger Train 3037, wrong routing, signal passed at danger and unauthorised wrong line travel, Westfield, 14 February 2005
05-105	Express freight Train 829, track occupation irregularity, Kokiri, 3 February 2005
05-102	Track warrant irregularity, Woodville and Otane, 18 January 2005
04-130	Express freight Train 237, derailment, between Kakahi and Owhango, 5 November 2004
04-103	Shunting service Train P40, derailment, 43.55 km near Oringi, 16 February 2004
04-116	Passenger express Train 1605, fire in generator car, Carterton, 28 June 2004
04-127	Express freight Train 952 and stock truck and trailer, collision, Browns Road level crossing, Dunsandel, 19 October 2004

Transport Accident Investigation Commission
P O Box 10-323, Wellington, New Zealand
Phone +64 4 473 3112 Fax +64 4 499 1510
E-mail: reports@taic.org.nz Website: www.taic.org.nz

Price $20.00 ISSN 1172-8280