

Investigation Summary Report Update 3

Date: 12 December 2017

Report writer: Tom Logan

Subjects

Inspecting Organisation name	PETER WASTNEY ENGINEERING LTD
Trading name	PETER WASTNEY ENGINEERING LTD
IO authority number:	PW
IO Address	222 WAKAPUAKA ROAD, R D 1, NELSON
VI name:	PETER LAWRENCE WASTNEY
Vehicle Inspector code	PW
VI authority number:	PW
Date of Birth	██████████
Address	222 WAKAPUAKA ROAD, R D 1, NELSON
Driver Licence Number	██████████
Classes	██████████

Introduction

This investigation is into the activities of heavy vehicle specialist certifier Peter Wastney and was initiated following a crash on 27 August 2017, where the catastrophic failure of a drawbeam on a truck JWN197 resulted in the detached trailer travelling a significant distance before coming to rest against a bank.

This update follows the update report provided to adjudicator Stew Guy on 25 October 2017. The investigating team believe that there is now sufficient evidence available to enable a final decision as to the fitness of Mr Wastney to remain a heavy vehicle specialist certifier to be made, and while there is additional historic information on file, that is unlikely to significantly affect the decision outcome and further resources ought not be invested into this investigation unless the final decision is challenged. It is also unlikely that further investigation will materially affect the outcome decision.

Mr Wastney admitted that the design of the JWN197 drawbeam that failed on 27 August 2017 was substandard and it should not have been certified, and that this certification was a one-off mistake. However the Transport Agency became aware of a second near identical design drawbeam that had been previously certified by Mr Wastney, and Mr Wastney has confirmed that he has certified this design on three vehicles, but that there are no vehicles with this design currently in operation.

Points of interest since 25 October 2017

On 2 November 2017 a summary of the Sandbox review of the 14 files uplifted on 18 October 2017 was sent to Mr Wastney with an invitation to reply. He replied on 23 November 2017 with some explanations which have been forwarded to Sandbox and Transport Agency heavy vehicle specialist certifier reviewer John Long for comment, as there are claims that need to be substantiated or refuted.

The Transport Agency has also been following up on the six certifications that were revoked due to issues with the certification file records, to understand if the revocation was supported in the physical components as well. Two drawbeams have been recertified with limited life, one has been removed and replaced with a new one, and the remainder are as yet still uncertified.

During the recertification activities, a previously failed drawbeam that had been certified by Peter Wastney was identified, and the certification file uplifted. The review of the SolidWorks file for this previously failed drawbeam established that the design was identical in all respects, apart from the mounting detail adapted to a different truck configuration, to the one that failed on JWN197, and at a similar time in service. Appendix section 7 contains the details of this.

Peter Wastney confirmed by email on 11 December 2017 that the same design drawbeam that failed on JWN197 had been certified for use on two other vehicles, but these have both been replaced. To be clear there was a new drawbeam of the JWN197 design certified to [REDACTED] it was then removed and fitted to [REDACTED] and has been subsequently replaced on that vehicle also.

Appendices:

Section 1	Investigation summary emails
Section 2	Investigation timeline
Section 3	JWN197 incident
Section 4	JWN197 replacement drawbeam
Section 5	14 additional certification files reviewed
Section 6	Recertification of revoked drawbeam certifications
Section 7	Previous failure of same drawbeam design from JWN197 incident

Released under the Official Information Act 1982

Tom Logan

From: Tom Logan
Sent: Friday, 8 December 2017 6:27 p.m.
To: Michael Beedell
Subject: Fwd: Peter Wastney Files uplifted 22 November 2017
Attachments: PW investigation timeline.xlsx

Hi Michael,

Please read the email trail below. We have spent a lot of time and money on this investigation and believe that we have sufficient evidence to enable a determination to be made. There is more historical information about Peter Wastney but I don't think it is likely to influence the outcome.

Can you please discuss this with me next week (Monday?)

Thanks
Tom.

----- Original message -----

From: Brian Sara <Brian.Sara@nzta.govt.nz>
Date: 8/12/17 17:38 (GMT+12:00)
To: Tom Logan <Tom.Logan@nzta.govt.nz>, Craig Basher <Craig.Basher@nzta.govt.nz>, Dave Whiteridge <Dave.Whiteridge@nzta.govt.nz>
Subject: FW: Peter Wastney Files uplifted 22 November 2017

Hello Tom

Thanks for this update.

I am concerned that the Immediate Suspension which has been applied to Peter Wastney in September was only for a period of 3 months and is about to expire.

This summary highlights to me that this certifier is a significant risk to road safety. The investigation has demonstrated that:

1. The drawbeam that catastrophically failed did not comply with NZS:5446 and should not have been certified.
2. A total of 16 further files for certifications carried out by Mr Wastney have been independently reviewed and in ALL CASES there is insufficient evidence in the files to justify a competent certification outcome.
3. In the case of 6 files, there was evidence in the files that the components were predicted to fail. This presented a safety risk that resulted in the revocation of those certifications and caused significant disruption to those vehicle operators.
4. In two cases the steel thickness recorded in the files that were predicted to fail, was recorded to be 10mm but was found to be 6mm in one case and 8mm in another. Clearly the drawbeams were not fabricated in accordance with the drawings and this raises a question about the final inspection prior to certification.
5. Given the catastrophic nature of the failure of the drawbeam on JWN197, Mr Wastney was formally asked if he had certified any other drawbeams to the same or a similar design, in order to identify any potential for the same failure to occur involving another vehicle. He stated very clearly that JWN197 was a one-off design. When it became clear that the design file used to certify JWN197 in 2016 had been compiled in 2014, this question was asked again and again Mr Wastney confirmed that JWN197 was a one-off design.

6. When later investigations discovered that there had previously been another incidence ([REDACTED]) where a drawbeam certified by Mr Wastney had failed, the files for that drawbeam were uplifted and investigated also. That investigation determined that the drawings for [REDACTED] and JWN179 were the same. This is in direct conflict with Mr Wastney's advice that JWN197 was a one-off design.

This investigation has clearly demonstrated that Mr Wastney has been issuing certifications for heavy motor vehicle components, not only without appropriate evidence that they complied but also in circumstances where the evidence predicted failure. In the case of JWN197, that failure occurred at less than 2% of the design life of a compliant component. This raises serious questions in relation to the competency of the certifier.

The recent revelation that there is a second vehicle that had a drawbeam fitted to it using the same design as JWN197, that it also had failed in service and been replaced with another drawbeam, also certified by Mr Wastney, despite him having advised the Transport Agency on 2 occasions (in writing) that JWN197 was a one-off design, raises serious questions about the ethics and integrity of the certifier.

As Manager Vehicles I feel obliged to highlight my concern about the activities of this certifier and believe the Transport Agency is now in a position where we have sufficient evidence to make a decision in relation to what action would be appropriate at the expiry of the current suspension notice, aligning with our focus areas of "Keeping people safe" and "Improving the customer experience".

Tom – can you please forward my concerns to your Manager for consideration.

Craig – as my manager, you need to be aware of my concerns in regards to this matter.

Dave – as certification inspections fall under the TAD area of responsibility as well as CDD, you also need to be aware of my concerns in regards to this matter.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines
NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Tom Logan
Sent: Friday, 8 December 2017 1:58 p.m.
To: Brian Sara
Subject: RE: PW Files uplifted 22 November 2017

Hi Brian,

A status summary of the Peter Wastney investigation as requested.

Following a vehicle crash on 27 August 2017 where trailer 9444I disconnected from towing vehicle JWN197 due to the failure of the drawbeam, the Transport Agency with contracted support from Sandbox Consulting Limited (Sandbox) inspected the damaged drawbeam and identified that it had failed catastrophically.

The Transport Agency requested and was provided the certification files for JWN197 from the heavy vehicle specialist certifier Peter Wastney. There was very little detail in the paperwork provided, however there were electronic records that the Transport Agency can't access as special software is required, specifically SolidWorks. For this reason the certification files were forwarded to Sandbox with a request for a report on the certification decision.

Sandbox determined that the certification file contained information that actually predicted early failure due to stress loading, and the certified drawbeam failed at less than 2% of the usual design life. It was also noted that the electronic drawing file was created in May 2014, but the certification was not completed until June 2016.

Peter Wastney, when presented with this evidence, confirmed that the drawbeam was not adequate, and that it had been mistakenly certified. The design was developed in 2014 but did not work, and was not used. In error he utilised this design in 2016 on JWN197, and has repeatedly confirmed that this was a one-off error and there are no similar drawbeams in service.

Peter Wastney was served an immediate suspension letter on 18 September 2017 based on the significant risk his certifications appear to have to land transport safety.

The Transport Agency requested a further 14 certification files from Peter Wastney for review. These were selected to both focus on drawbeams on similar trucks, as well as some random certifications of a different nature. This was so an understanding could be reached as to his certification capability for both towing connections and other categories. There was also concern that there were other similar drawbeams in service even though Peter Wastney had confirmed there were not. Again Sandbox was contracted to complete reports on these files as the Transport Agency does not have the specialist software required to access the information.

None of the 14 files provided contained sufficient information to base a certification decision on, and five of the certification files relating to drawbeams contained information that indicated stress levels were higher than the standard (NZS 5446) allowed, predicting early failure. These five certifications were revoked as a consequence, and the Transport Agency worked with the vehicle owners to ensure safety.

Of the five revoked certifications, one has had a new drawbeam fitted and certified, two have had the drawbeams re-certified with/without modifications and two are still in progress.

It was identified that Peter Wastney had certified a replacement drawbeam for the vehicle involved in the crash incident, JWN197, so that certification file was also requested and supplied. Based on a review of the file, this was also revoked.

Peter Wastney has replied to the Sandbox report on the 14 files, and I have asked Sandbox to answer a question around the SolidWorks files having "tabs" containing additional explanation information, I have also forwarded this to John Long as there are some claims around the reviews undertaken.

More recently a second failed drawbeam has been identified (it actually failed prior to the crash that initiated this investigation) and it has been confirmed that both of the failed certified drawbeams are identical except for the mounting detail (adjusted to the specific vehicle). This is even though Peter Wastney has confirmed on at least three separate occasions that the drawbeam on JWN197 is a one-off.

I have attached a timeline, and am finalising the supporting documentation into a straight forward sequence for a status update to Stew Guy.

Please let me know if you need further detail, I am back in Wellington on Monday and can go through the supporting information with you.

Regards,
Tom.

From: Brian Sara
Sent: Thursday, 7 December 2017 7:06 a.m.
To: Tom Logan
Cc: John Long
Subject: Fwd: PW Files uplifted 22 November 2017

Hello Tom

Can you please put together a summary report of this investigation for me, including this latest information from Sandbox Consulting.

Regards
Brian Sara
NZTA Manager Vehicles
DDI: 04 901 6712
Mbl: [REDACTED]

Begin forwarded message:

From: <david@thesandbox.co.nz>
Date: 6 December 2017 at 11:20:37 PM NZDT

To: 'Brian Sara' <Brian.Sara@nzta.govt.nz>, 'John Long' <John.Long@nzta.govt.nz>
Subject: RE: PW Files uplifted 22 November 2017

Hi Brian,

Please see the attached draft letter with initial findings relating to the Drawbeam design 17452.

Regards

David

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Tuesday, 5 December 2017 4:59 PM
To: david@thesandbox.co.nz, John Long <John.Long@nzta.govt.nz>
Cc: Tom Logan <Tom.Logan@nzta.govt.nz>
Subject: RE: PW Files uplifted 22 November 2017

Thanks David

I was just looking at the records for [REDACTED] with John and we noticed that. Funny that I came back to my desk and found your email.

This investigation seems to be one of those tasks that just keeps on giving.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines
NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: david@thesandbox.co.nz [<mailto:david@thesandbox.co.nz>]
Sent: Tuesday, 5 December 2017 4:23 p.m.
To: Brian Sara
Cc: Tom Logan
Subject: RE: PW Files uplifted 22 November 2017

Hi Brian, Tom,

Registration [REDACTED]

The drawbeam fitted to [REDACTED] was originally fitted to [REDACTED]. After the drawbeam was removed from [REDACTED], the vehicle was certified on the 07/07/2016 with a fifth wheel towing connection. This change of use from a rigid to a tractor requires a brake certification, which is not in the Landata records. The brake compliance of [REDACTED] as a tractor unit would be difficult to achieve given the age of the vehicle, and it is unlikely to have ABS or EBS.

Please refer to Memo 62a 14th of May 2010 bullet point 4 – similarly, where a brake coded heavy vehicle has a change of use, e.g., tractor to rigid....

Kind regards,

DAVID MANLEY BE, MEngSt, MEngNZ
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

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Peter Wastney - Timeline of investigation

Date	Activity	Appendix evidence
27/08/2017	Vehicle crash - Trailer separates from truck, apparent drawbeam failure. Police attend.	Section 3 - JWN197 incident
31/08/2017	NZTA (Neil McAlpine) and David Manley (Sandbox) inspect the crashed vehicles.	Section 3 - JWN197 incident
31/08/2017	Neil McAlpine serves Section 198 request for the certification files for the crashed truck to Peter Wastney, the responsible certifier. This ought to include LT400 554622 for the failed drawbeam.	Section 3 - JWN197 incident
31/08/2017	Peter Wastney supplies part of the information requested for JWN197, being only LT400 554622 for the drawbeam.	Section 3 - JWN197 incident
1/09/2017	Brian Sara emails Peter Wastney (certifier of failed drawbeam) requesting certification file under a Section 198 letter. Also asks if there are any other similar drawbeams in service.	Section 3 - JWN197 incident
1/09/2017	Peter Wastney supplies the balance of the certification files requested for JWN197.	Section 3 - JWN197 incident
1/09/2017	Brian Sara forwards certification file details for JWN197 to Sandbox requesting comments, in particular as the Transport Agency do not have the necessary software to access certain records.	Section 3 - JWN197 incident
4/09/2017	Sandbox identifies that the CAD model used on JWN197 was created in May 2014, the certification was completed on 16 June 2016.	Section 3 - JWN197 incident
5/09/2017	Brian Sara emails Peter Wastney asking again if there are any similar design drawbeams in service.	Section 3 - JWN197 incident
5/09/2017	Peter Wastney emails Brian Sara confirming that this is a one-off design.	Section 3 - JWN197 incident
5/09/2017	Brian Sara emails Peter Wastney again, this time referring to the CAD file dates, and asks again if there are any similar drawbeams in service.	Section 3 - JWN197 incident
6/09/2017	Peter Wastney confirms this is a one-off design, and explains that the CAD model created in 2014 was identified as being unfit, and was not used. However the CAD file was not overwritten, and was used in error in 2016 when it should not have.	Section 3 - JWN197 incident
14/09/2017	Sandbox supplies a report identifying several issues with the drawbeam design. Of note is that the bolts were not installed correctly, resulting in them becoming loose, the fabrication was not as per the design analysed. The failure was due to metal fatigue (indicated by some information in Peter Wastney's certification file) and the failure was at 2% of the design life.	Section 3 - JWN197 incident
18/09/2017	A Section 198 letter for a further 14 certification files, a mixture of drawbeam certifications (as there is concern that there are other similar designs in service) and other certification types to establish a general picture, is served on Peter Wastney. He provided the requested files. At the end of this visit an immediate suspension letter is served.	Section 5 - 14 additional certification files reviewed
19/09/2017	Brian Sara requests Sandbox reviews the 14 additional files uplifted, and report back whether they support the certification decisions.	Section 5 - 14 additional certification files reviewed
20/09/2017	Sandbox emails Brian Sara and Tom Logan indicating that there are several designs that are concerning, relating to geometry, stress raisers, stress levels and weld positions.	Section 5 - 14 additional certification files reviewed
22/09/2017	On 22 September 2017 Tom Logan forwards by email the Sandboxy report on JWN197 certification LT400 554622, supplied to the Transport Agency on 14 September 2017, to Peter Wastney requesting comments.	Section 3 - JWN197 incident
26/09/2017	Peter Wastney replies on 26 September 2017 by email to Tom Logan in response to the report on the failed drawbeam on JWN197 certification LT400 554622, agreeing with the report's findings and confirming that the drawbeam design was sub-standard and was used in error.	Section 3 - JWN197 incident

13/10/2017 David Manley presents the Transport Agency with his report on the 14 additional files uplifted from Peter Wastney on 18 September 2017. None of the 14 files supplied contain sufficient detail to support a certification decision. Five of the files contain evidence that indicates premature failure may occur. Section 5 - 14 additional certification files reviewed

19/10/2017 Tom Logan emails Peter Wastney advising him that the Transport Agency plans to revoke five of his drawbeam certifications. Section 5 - 14 additional certification files reviewed

20/10/2017 Brian Sara revokes five drawbeam certifications due to safety concerns. Section 5 - 14 additional certification files reviewed

20/10/2017 The Transport Agency makes a Section 198 request for the certification file LT400 607095 for the drawbeam that replaced the one which failed on 27/8 from Peter Wastney. Section 4 - JWN197 replacement drawbeam

20/10/2017 Peter Wastney provides the certification file LT400 607095. Section 4 - JWN197 replacement drawbeam

20/10/2017 Brian Sara requests David Manley review file 607095 uplifted, and report back whether it supports the certification decision. Section 4 - JWN197 replacement drawbeam

24/10/2017 David Manley advises Brian Sara the file for the replacement drawbeam is poor, and there is not sufficient evidence to support a certification decision. Section 4 - JWN197 replacement drawbeam

2/11/2017 Tom Logan emails a letter to Peter Wastney summarising the findings from David Manley on the 14 files reviewed, requesting any comments he would like to be taken into account in the investigation. Section 5 - 14 additional certification files reviewed

23/11/2017 Peter Wastney replies to the letter of 2 November 2017 with explanations. Section 5 - 14 additional certification files reviewed

27/11/2017 Tom Logan forwards explanations from Peter Wastney to David Manley for his comments. Section 5 - 14 additional certification files reviewed

1/12/2017 Tom Logan forwards explanations from Peter Wastney to John Long for his comments. Section 5 - 14 additional certification files reviewed

3/11/2017 The Transport Agency has a failed drawbeam from vehicle [REDACTED] LT400 538266, brought to its attention, it had been certified by Peter Wastney on 5 January 2016 and reported to have failed on 8 November 2016. This certification was for a re-mount of a drawbeam previously certified by Peter Wastney on 29 May 2014 for [REDACTED] LT400 468776. Section 8 - Previous failure of same drawbeam design

???

The Transport Agency attempted to secure the failed drawbeam, which had been stored in a workshop since the failure, however were told it had been disposed of in the few days between being reported and the request being made. Section 7 - Previous failure of same drawbeam design from JWN197 incident

6/12/2017 David Manley provides a short report on the drawbeam certification file for LT400 538266 comparing it to the file for LT400 554622 (the drawbeam that failed on 27 August 2017) - he identified that the two designs were identical in all respects except for the mounting detail, and that Peter Wastney had used the same CAD models for both certifications. Section 7 - Previous failure of same drawbeam design from JWN197 incident

11/12/2017 Tom Logan emails Peter Wastney asking for clarification that the failed drawbeam design used on JWN197 had been utilised on previous vehicles dating back to 2014. Section 7 - Previous failure of same drawbeam design from JWN197 incident

11/12/2017 Peter Wastney emails Tom Logan confirming that the failed drawbeam design used on JWN197 had been used on two other vehicles (new onto one, then relocated to the second) but that it has not been used on any other vehicles. Section 7 - Previous failure of same drawbeam design from JWN197 incident

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Tom Logan

From: Craig Basher
Sent: Wednesday, 30 August 2017 8:18 a.m.
To: Brian Sara
Cc: Don Hutchinson; John Long; Jim McDonald
Subject: RE: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17

Hi Brian

Thanks for the heads up (minus the attachments which is much appreciated). From our initial discussions it is important that we secure sufficient evidence to investigate this issue as it a significant issue and I understand not an isolated one.

Cheers
Craig b

From: Brian Sara
Sent: Tuesday, 29 August 2017 4:56 p.m.
To: Craig Basher
Cc: Don Hutchinson; John Long; Jim McDonald
Subject: RE: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17

Hello Craig

This time without the huge attachments.

As discussed, I am working with TAD and the vehicle owner (who is keen to cooperate with us) to arrange to have this vehicle inspected and the failed drawbeam assessed by a HVSC.

There will be some cost to the Agency, which I have not yet been able to quantify. I will seek an estimate from the HVSC to review the drawbeam and provide a report.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Tuesday, 29 August 2017 11:39 a.m.
To: Neil McAlpine; Brendon Graham
Cc: Don Hutchinson; Jim McDonald; John Long; Debbie Despard; Craig Basher
Subject: FW: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17

Hello Neil and Brendon

We have been notified of a drawbeam failure in the Nelson area which has resulted in a HPMV truck & trailer disconnecting (fortunately non injury). The drawbeam is relatively new (June 2016) and it has been suggested that its failure may be due to design issues.

In order for the Transport Agency to fully understand what has happened it would be necessary to carry out a significant investigation. Exactly how this would happen under the new structure is not clear at this stage but I imagine it would involve a team of teams approach involving TAD and CDD (Operational Standards & Guidelines) and may or may not evolve into a formal complaints process.

When a similar incident occurred recently we were able to utilise the services of Neil to carry out an initial investigation and to secure the failed components for further analysis.

Would it be possible for Neil to carry out an initial investigation of this incident also?

If so I am happy to meet with Neil to discuss the scope of an initial investigation and to agree the next steps. If we are to investigate this incident it would be prudent to secure components and design files etc quickly before any evidence is either lost or altered in any way.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Jim McDonald
Sent: Tuesday, 29 August 2017 10:49 a.m.
To: Brian Sara
Cc: John Long
Subject: FW: HVSPW: Aratuna Freighters JWN197 & 9444I; B JL-Jim McD 28 Aug-17

Hi Brian

Further to our discussion this morning attached photos and emails below – can you talk with Brendan and see if we can get Neil involved.

Thanks

Jim

Jim McDonald Chief Advisor
Project Implementation and HVSC QA
Operational Standards and Guidelines
Customer Design and Delivery
DDI 06 953 6983 Mobile [REDACTED]

E jim.mcdonald@nzta.govt.nz

Please consider the environment before printing this email



From: John Long
Sent: Monday, 28 August 2017 9:00 p.m.
To: Jim McDonald
Subject: HVSPW: Aratuna Freighters JWN197 & 9444I; B JL-Jim McD 28 Aug-17

Hello Jim

This failed drawbar occurred in the week end and the truck & parts are at [REDACTED]. I have spoken to [REDACTED] & [REDACTED] and left a message with the CVIU. [REDACTED] has also contacted the CVIU concerning this failure because he considers it a design fault. [REDACTED] considers that the rear mounted crane mounting is not stiff

enough and the drawbeam has been subject to a lot of wracking and failed at the welds. The drawbeam and crane mounting is only a little over twelve months old having been certified by Peter Wastney 16th June 2016!

Out of scope

I would like to go to Nelson on Thursday if travel can be arranged. It would be prudent to not let this get away. Can we catch up tomorrow and discuss? I have not contacted Aratuna Freighters but will try tomorrow.

Thank you

John.

B J (John) Long

Engineer – Heavy Vehicles

Access & Use Vehicles (National)

M [REDACTED]

E john.long@nzta.govt.nz / w nzta.govt.nz



S 6(c); s 9(2)(a)



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Tom Logan

From: Brian Sara
Sent: Friday, 1 September 2017 10:22 a.m.
To: Dave Schumacher
Subject: FW: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17
Attachments: 2017-08-28 15.29.48.jpg; 2017-08-28 15.50.19.jpg; 2017-08-28 15.29.48.jpg; 2017-08-28 15.30.33.jpg; 2017-08-28 17.07.52.jpg

FYI

Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Jim McDonald
Sent: Tuesday, 29 August 2017 10:49 a.m.
To: Brian Sara
Cc: John Long
Subject: FW: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17

Hi Brian

Further to our discussion this morning attached photos and emails below - can you talk with Brendan and see if we can get Neil involved.

Thanks

Jim

Jim McDonald Chief Advisor
Project Implementation and HVSC QA
Operational Standards and Guidelines
Customer Design and Delivery

DDI 06 953 6983 Mobile [REDACTED]

E jim.mcdonald@nzta.govt.nz

Please consider the environment before printing this email



From: John Long
Sent: Monday, 28 August 2017 9:00 p.m.
To: Jim McDonald
Subject: HVSPW: Aratuna Freighters JWN197 & 9444I; BJL-Jim McD 28 Aug-17

Hello Jim

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Out of scope

I would like to go to Nelson on Thursday if travel can be arranged. It would be prudent to not let this get away. Can we catch up tomorrow and discuss? I have not contacted Aratuna Freighters but will try tomorrow.

Thank you

John.

B J (John) Long

Engineer – Heavy Vehicles

Access & Use Vehicles (National)

M [REDACTED]

E john.long@nzta.govt.nz / w nzta.govt.nz



S 6(c); s 9(2)(a)

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Tom Logan

From: david@thesandbox.co.nz
Sent: Monday, 4 September 2017 3:56 p.m.
To: Brian Sara
Subject: Drawbeam Failure - Rego JWN197

Hello Brian,

I have completed an initial review of the drawbeam inspected on 31st of August.

The failure of the drawbeam after 80,000km of service indicates there is an issue with the fabrication, design or some other external contributor i.e. abuse, damage. The required service life of heavy towing connections is 2,000,000 design cycles (NZS 5446). It is estimated the towing connection, if used continuously, has only been exposed to 2 – 4% of its required design life.

The use of the drawbeam as an effective crossmember under the crane mounting has been raised as a possible contributor to the failure. I will require more time before commenting, however this is not an uncommon arrangement.

I have performed a finite element analysis of the drawbeam to NZS 5446 longitudinal loading requirement. The analysis shows the design is deficient, it does not comply with the standard. The stress in the drawbeam welds is significantly higher than any allowable stress and predicts the failure of the drawbeam well before its service life is met. This evidently has been proved in practice.

In my professional opinion the design is seriously deficient and drawbeams of similar design pose an immediate risk to the public.

Kind regards,

DAVID MANLEY *BE, MEngSt*
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

287 Park Road
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SANDBOX
CONSULTING

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Tom Logan

From: Brian Sara
Sent: Friday, 1 September 2017 12:52 p.m.
To: [REDACTED]
Subject: RE: 2016 Iveco Stralis Reg JWN197

Thanks [REDACTED]

Appreciate your response.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: [REDACTED] [mailto:[REDACTED]@aratuna.co.nz]
Sent: Friday, 1 September 2017 12:11 p.m.
To: Brian Sara
Subject: RE: 2016 Iveco Stralis Reg JWN197

Hi Brian

We do not have an issue for the drawbeam to go to Wellington for further testing

We do not have any other drawbeams of that design

Cheers

[REDACTED]
ARATUNA
FREIGHTERS LTD

Aratuna Freighters Ltd
PO Box 21
Greymouth 7840
Ph (03) 768 4038
Fax (03) 768 4102
M [REDACTED]

From: Brian Sara [mailto:Brian.Sara@nzta.govt.nz]
Sent: Thursday, 31 August 2017 3:58 p.m.
To: [REDACTED]
Subject: RE: 2016 Iveco Stralis Reg JWN197
Importance: High

Hello [REDACTED]

I have just heard from our people in Nelson that they have finished looking at your vehicle.

The remains of the drawbeam have been removed. They are keen to have the drawbeam freighted to Wellington for further analysis at our cost.

Can you please confirm if you are agreeable for this to happen? We will ensure that it is available should your insurers wish to inspect it.

Also, can you please advise if you have any other vehicles in your fleet that are of a similar design to this vehicle?

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Wednesday, 30 August 2017 3:17 p.m.
To: [REDACTED]
Cc: Neil McAlpine; david@thesandbox.co.nz
Subject: RE: 2016 Iveco Stralis Reg JWN197

Hello [REDACTED]

I have arranged for our Vehicle Specialist Neil McAlpine and also we have engaged Sandbox Consulting from Palmerston North to inspect the vehicle tomorrow in Nelson. Due to flight schedules they won't arrive until mid-morning and are scheduled to fly out on a 5:00pm flight. Once they have completed their inspection the vehicle will be yours to deal with.

We appreciate your co-operation in making the vehicle available to us and allowing us to carry out analysis of the failed drawbeam.

If you have any information relating to the installation of the crane and the drawbeam, its use since installation or any concerns that you have that may assist us with this investigation please let me know.

Can you please advise if you have any other vehicles in your fleet that are of a similar design to this vehicle.

Feel free to contact me with any questions.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Wednesday, 30 August 2017 9:09 a.m.
To: [REDACTED]
Cc: Neil McAlpine
Subject: RE: 2016 Iveco Stralis Reg JWN197

Thanks [REDACTED]

I will let you know how we get on. Hopefully we should be finished with the truck early on Thursday afternoon.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

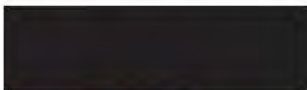
From: [REDACTED]
Sent: Wednesday, 30 August 2017 8:36 a.m.

To: Brian Sara
Subject: RE: 2016 Iveco Stralis Reg JWN197

Hi Brian

That's fine we would like the truck back as soon as possible so we can start on repairs and get it back into service

Cheers



Aratuna Freighters Ltd
PO Box 21
Greymouth 7840
Ph (03) 768 4038
Fax (03) 768 4102
M [REDACTED]

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Tuesday, 29 August 2017 5:20 p.m.
To: [REDACTED]
Cc: John Long
Subject: 2016 Iveco Stralis Reg JWN197

Hello [REDACTED]

Further to our telephone conversation earlier, can you please confirm that you agree to making your Iveco Stralis Reg No JWN197 available to the Transport Agency for inspection following the failure of its drawbeam?

I understand the vehicle is currently at [REDACTED] I am hoping to arrange for a NZTA Vehicle Specialist to inspect the vehicle in Nelson on Thursday 31 August. Following that inspection we will arrange for the drawbeam attachment flanges to be removed from the truck chassis so that the entire drawbeam can be assessed. This will be arranged and paid for by the Transport Agency.

I will confirm these arrangements once they have been finalised.

I appreciate you are keen to have the vehicle returned to you as quickly as possible and appreciate you cooperating with us.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St
Private Bag 6995, Wellington 6141, New Zealand



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Tom Logan

From: david@thesandbox.co.nz
Sent: Monday, 4 September 2017 6:11 p.m.
To: Brian Sara
Cc: Dave Schumacher; John Long
Subject: RE: Request for files - Urgent

Hi Brain,

FYI

As per my previous email I have successfully open the Solidworks model produced by the engineer.

The original file was created on the 29th of May 2014. The file shows at least 2 different bolt patterns. This may indicate the design was prepared for other clients as far back as 2014.

Summary Custom Configuration Specific

Author:
Keywords:
Comments:

Title:
Subject:

Statistics

Created:	Thursday, 29 May 2014 2:26:43 PM
Last Saved:	Monday, 4 September 2017 11:01:28 AM
Last Saved By:	Administrator
Last Saved With:	SOLIDWORKS 2009

OK Cancel Help

The CAD model also differs from the actual measured drawbeam.

Regards

David

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Monday, 4 September 2017 4:47 PM
To: david@thesandbox.co.nz
Cc: Dave Schumacher <Dave.Schumacher@nzta.govt.nz>; John Long <John.Long@nzta.govt.nz>
Subject: FW: Request for files - Urgent

As discussed.

Brian Sara
Manager Vehicles – NZ Transport Agency

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Monday, 4 September 2017 3:39 p.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Friday, 1 September 2017 5:44 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: Request for files - Urgent

Hello Peter

Further to our telephone discussion where we lost reception, attached is a copy of the letter that was delivered to your address today.

I want to confirm for clarity that in addition to original hard copies we want a full electronic copy of the drawing-analysis files in whatever the original format that it was produced, i.e AutoCAD, Solid Works, etc included. These are for the certification of the Drawbeam LT400 554622, Crane Mounting LT400 554623 & Load Anchors LT400 550344.

Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

I will arrange for somebody to call on Monday to pick these up. Can you please contact me by 10:00 am on Monday 4 September 2017 to confirm you have these available.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St
Private Bag 6995, Wellington 6141, New Zealand



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Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Tuesday, 5 September 2017 10:08 a.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

No, this was a one off only
Regards,
Peter Wastney

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Tuesday, 5 September 2017 9:04 a.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: FW: Request for files - Urgent
Importance: High

Hello Peter

Copied below is one of the questions that was included in the formal letter requesting files that was delivered to you on Friday 1 September 2017 and also raised in the email below:

Additionally: All documents pertaining to any other vehicles, irrespective of make and model that have been certified by you, involving the same or similar designs and specifications for drawbeams and/or crane mounting.

Email: Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

Can you please respond to this question urgently?

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Monday, 4 September 2017 4:49 p.m.
To: 'peter@pwe.co.nz'
Subject: RE: Request for files - Urgent

Hello Peter

Thanks for sending these through.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Monday, 4 September 2017 3:39 p.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Friday, 1 September 2017 5:44 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: Request for files - Urgent

Hello Peter

Further to our telephone discussion where we lost reception, attached is a copy of the letter that was delivered to your address today.

I want to confirm for clarity that in addition to original hard copies we want a full electronic copy of the drawing-analysis files in whatever the original format that it was produced, i.e AutoCAD, Solid Works, etc included. These are for the certification of the Drawbeam LT400 554622, Crane Mounting LT400 554623 & Load Anchors LT400 550344.

Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

I will arrange for somebody to call on Monday to pick these up. Can you please contact me by 10:00 am on Monday September 2017 to confirm you have these available.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

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Tom Logan

From: david@thesandbox.co.nz
Sent: Thursday, 14 September 2017 4:32 p.m.
To: Brian Sara
Subject: Drawbeam - DZ30005 Report Rev 1
Attachments: 1703-792 Drawbeam DZ30005 Rev1.pdf

Hi Brian,

Please see attached.

Kind regards,

DAVID MANLEY *BE, MEngSt*
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)

(*Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1*

287 Park Road
Hokowhitu
Palmerston North 4410

P 06 355 1777 **M** 021 829 435

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14th September 2017

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Palmerston North 4410

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Brian Sara
Customer Design & Delivery Group
NZ Transport Agency
Private Bag 6995
Wellington 6141
New Zealand

RE: Drawbeam failure – Registration JWN197

A truck trailer combination separated while travelling along the Kohatu-Kawatiri Highway to Nelson on the 27th of August 2017, just north of the Hope Saddle. The New Zealand Transport Agency (NZTA) engaged Sandbox Consulting to investigate the cause.

Inspection of the truck-trailer units and a visit to the accident scene took place on the 31st of August 2017.

Vehicle Details

Truck

Year 2016
Make IVECO
Model STRALIS AT500
Registration JWN197
1st NZ Reg 20/06/2016

Trailer

Year 1998
Make FACTORY BUILT
Model JACKENT 4 AXLE ST
Registration 9444I
1st NZ Reg 05/06/1998

Vehicle Inspection

Due to the separation event, the towing connection components between the truck and trailer were the primary focus of the inspection. The connection between a rigid truck full trailer combination is made up of two main components: the drawbeam and the drawbar. A brief preliminary inspection of the drawbeam affirmed this approach; measurements of the drawbeam, truck chassis, auxiliary crane frame, and general arrangement were recorded.

For naming conventions used in this report, refer Figure 1.

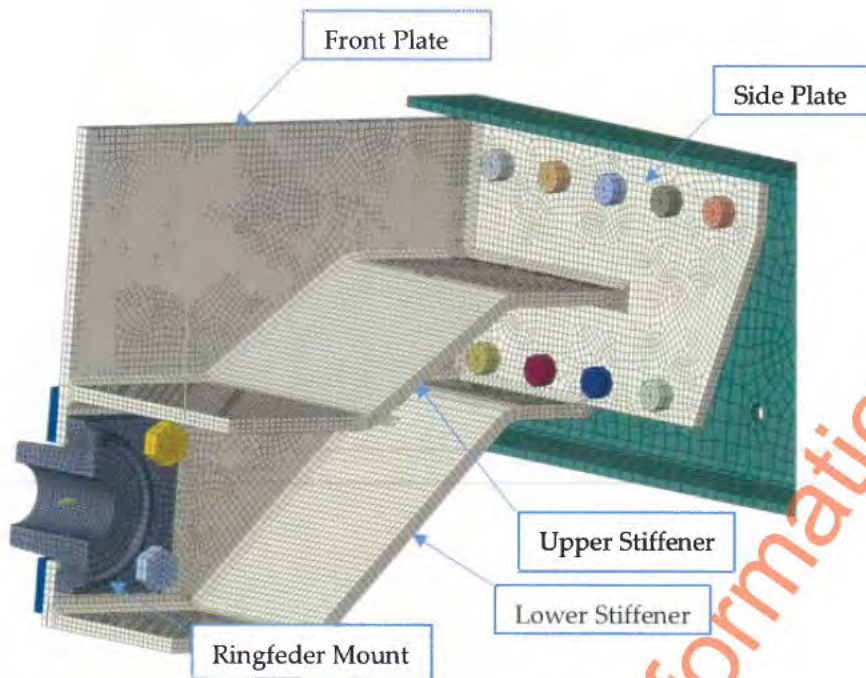


Figure 1 Drawbeam naming convention

Drawbeam and Truck Inspection

Inspection of the truck found that the drawbeam front weldment had separated from the side plates which affix the drawbeam to the chassis, Figure 2. The front weldment is made up of the front plate and upper and lower stiffeners, Figure 3.



Figure 2 Drawbeam side plates



Figure 3 Drawbeam front weldment

The drawbeam weldment was water blasted to remove soil and measured in detail. Inspection of the weldment found the separation in the drawbeam had occurred along the edges of the welded connections.



Figure 4 Drawbeam ready for detailed inspection



Figure 5 Drawbeam front section rear view, cracks below red line

In addition to the obvious fractures, there were cracks in the upper stiffener; left-hand side welded connection to the front plate, Figure 5 and Figure 6.



Figure 6 Cracks top stiffener to front plate

The side plates' bolts were recorded in place and then disconnected from the truck chassis under supervision.

The drawbeam coupling, a Ringfeder 5050, was examined and found to be functioning correctly. The bolt group between the coupling and drawbeam was unbolted and found to be in good order.



Figure 7 Ringfeder 5050 after removal

Welds

Visual examination of the welds showed the fabrication was reasonable and likely met the requirements of AS/NZS 1554:2014.1 Structural Steel Welding – Part 1 Welding of steel structures (Standards New Zealand, 2014). The fracture in the drawbeam did not propagate through the weld throat, but in the parent material adjacent to the weld. Destructive weld testing would be required to comment further.

Bolting

The drawbeam is fitted using nine class 8.8 M16 hex bolts per side. The bolts were secured using nyloc nuts and seated on hardened washers.

Several of the bolts in the drawbeam were seated incorrectly due to interference between the washers and welded connection, Figure 8.



Figure 8 Bolt seating interference

In a bearing type connection with snug tight bolts, the bearing surfaces should be seated on the bolt shoulder, not on the threaded portion, Figure 8. The bolts had insufficient shoulder length to achieve this outcome.

After removal of the bolts seated over the welds, the lower front bolts were found to be bent and showed thread damage, Figure 9.



Figure 9 Bend bolt with thread damage

The internal faces of the front lower side plate holes also show the thread bearing marks, Figure 10.



Figure 10 Thread bearing marks

The bearing marks due to interference between a washer and the weld are shown in Figure 11.



Figure 11 Washer bearing mark

The poor installation has caused the bend in the noted bolts; the bolts have bent to meet the angle of the washer seating. This problem should have been identified during the final inspection.

Lack of Deburring

Most holes on the inside face of the side plates had burrs on their edges, Figure 12 and Figure 13.

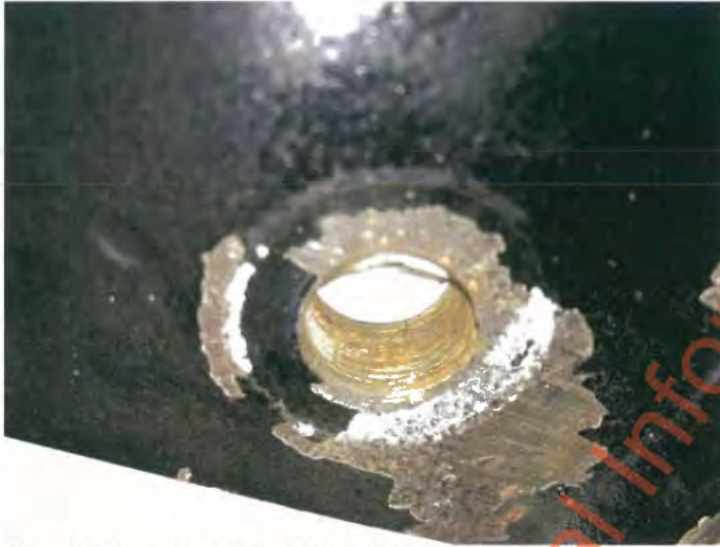


Figure 12 Burrs on right-hand side plate, top front bolt hole



Figure 13 Burrs, looking down the side plate

Snug Tight Bolt Holes

It is apparent the drawbeam, chassis and subframe attachment plates were drilled in situ to facilitate alignment. While this is reasonable practice, a significant amount of steel swarf

was left between the plates, Figure 14. This swarf would affect the ability to maintain torque in the bolt group. The swarf accumulation would be difficult to identify during the inspection but does speak to the competency of the fabricator.



Figure 14 Swarf between drawbeam and truck side plates

Bolt Seating

AS 3990:1993 states all defects on the surfaces of contact which prevent the solid seating of the bolt joint component shall be removed, clauses 10.3.4.3 and G1.2.1. This includes burrs, weld interference, and other defects such as swarf.

Minimum Edge Distance

AS 3990 specifies a minimum edge distance from the centre of the fastener to the edge of the plate, typically 1.5 times the nominal diameter of the fastener, clause 9.6.2. For an M16 bolt, this would mean a minimum edge distance of 24mm. Two lower rear bolt holes on both sides of the drawbeam fail to meet this criterion, Figure 15.



Figure 15 Bolts not meeting minimum edge distance

The certifying engineers drawing specifies that "Bolts to be no less than 20mm from the edge of mounting plates." It is not clear if this is from the bolt centre or the edge of the bolt hole. In any case, the holes do not comply.

Crane Mounting

The position of the drawbeam is directly below the mounting of a HIAB Loader Crane, Type 144 E-4 HIDUO. The drawbeam acted as the last cross member in the truck chassis.

The crane was certified by the same engineer as the drawbeam on the 16th of June 2016.

Truck Use

A review of the trucks road user charges (RUC) history and the vehicle hubometer established the kilometres travelled by the vehicle since entering service, Figure 16. The RUC history shows the use of the vehicle has been relatively constant. At the time of the accident, the truck had travelled approximately 80,000 km.

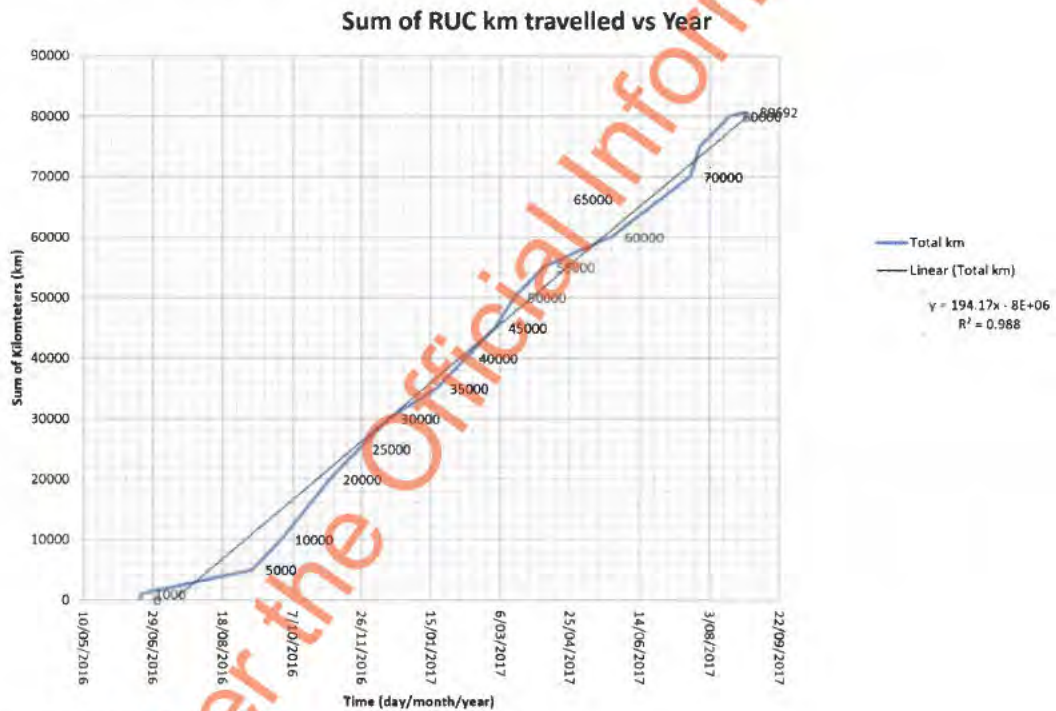


Figure 16 RUC history graph

COF

The truck passed a certificate of inspection on the 11th of May 2017 at VTNZ Greymouth.

Truck Damage

There was no other damage to the truck.

The truck obtained a temporary certificate of fitness after fitment of a replacement rear cross member, before being returned to the operator.

The drawbeam was retained by NZTA for further analysis if necessary.

Evidence of Fatigue Failure

Fatigue is the deterioration of a component caused by crack initiation and growth. A fatigue assessment is used to predict the service life of components subjected to fluctuating loads, such as drawbeams and drawbars. Fractures arising from fatigue are discernible by the appearance of the steel grain structure at the fracture. There are three notable stages (Shigley, Mischke, & Budynas, 2002):

- *Stage I* is the initiation of one or more microcracks due to cyclic plastic deformation followed by crystallographic propagation extending from two to five grains about the origin. Stage I cracks are not normally discernible to the naked eye.
- *Stage II* progresses from micro-cracks to macro-cracks forming parallel plateau-like fracture surfaces separated by longitudinal ridges. The plateaus are typically smooth and normal to the direction of maximum tensile stress. These surfaces can be wavy dark and light bands referred to as *beach marks* or *clamshell marks*.
- *Stage III* occurs during the final stress cycle when the remaining material cannot support the loads, resulting in a sudden, fast fracture. A stage III fracture can be brittle, ductile, or a combination of both. Often the beach marks (if they exist) and possible patterns in the stage III fracture (called *chevron lines*) point toward the origins of the initial cracks.

Evidence of fatigue in the drawbeam weldment was found (Figure 17). The fracture between the upper and lower stiffeners and side plate has occurred at the base of the weld toe in the parent metal; this is a typical area for crack initiation and propagation (Hobbacher, 2006). The crack initiation point seems to be located at the rear bottom stiffener plate, refer Figure 17 and Figure 18.

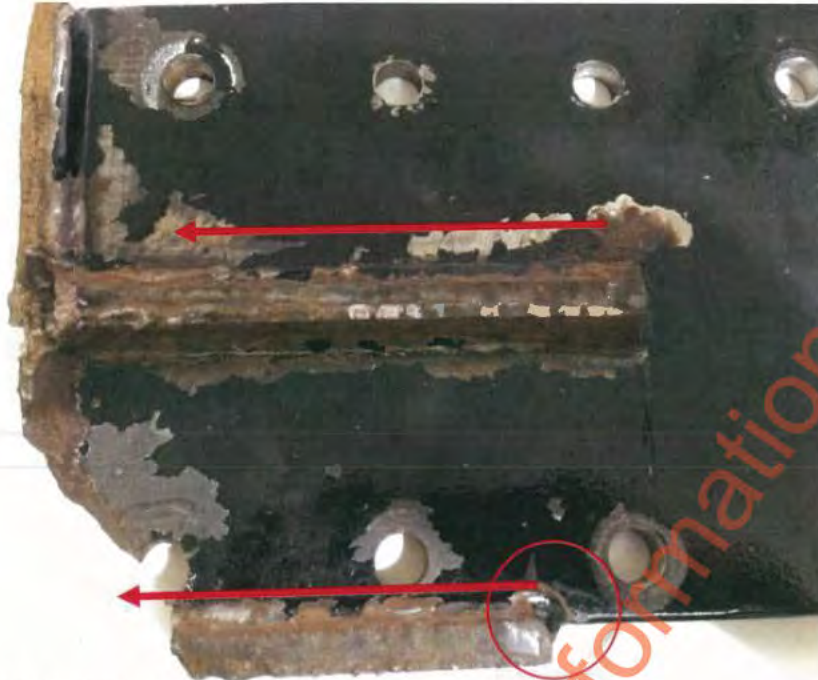


Figure 17 Side plate fatigue progression and initiation point (red circle)



Figure 18 Plate crack propagation, stage II

Stage 3 rupture indicators were on the front face of the drawbeam, Figure 19 and Figure 20.



Figure 19 Plate rupture markings, stage III



Figure 20 Plate rupture drawbeam face, stage III

Trailer Inspection

The trailer dolly, drawbar and hinge connection were examined and found to be in reasonable order given the accident. The drawbar tow-eye and trailer hinge attachments showed no evidence of failure.



The trailer braking system was tested using a brake roller tester. The results showed the vehicle brakes were deficient. Further investigation is ongoing.

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Accident Scene

Several photos provided that were taken before the vehicle recovery commenced, show the drawbar and front segment of the drawbeam still attached, Figure 21 and Figure 22.



Figure 21 Accident scene photo



Figure 22 Drawbeam front weldment still attached to drawbar

The road segment where the accident occurred is on an off-camber downhill gradient with a slight left-hand bend. The speed limit for a heavy vehicle is 90 km/hr.



Figure 23 Road section where accident occurred

At the location where the trailer is reported to have separated from the truck, a prominent groove was found in the centre of the road lane, Figure 23 and Figure 24.



Figure 24 Groove on road surface

The groove's direction projects to the impact point between the trailer and the right-hand embankment where the trailer came to rest, Figure 25.



Figure 25 Groove centre line to embankment impact point

The trailer skidded along the embankment for approximately 40 metres before coming to rest, Figure 26.



Figure 26 Embankment collision marks

No skid marks from the application of the trailer brakes were present.

Given information from the driver, the groove location in the lane, and the projected impact point, it is justifiable to suggest the groove marks the general area where separation occurred between the truck and trailer.

Accident Cause

Based on the following evidence:

- the damage to the drawbeam and evidence of fatigue failure,
- the soundness of the trailer and drawbar towing components,
- the drawbeam front section and Ringfeder coupling remaining intact,
- the truck coming to a safe stop,
- the lack of damage to the truck;

it is reasonable to conclude the failure of the drawbeam caused the separation between the truck and trailer and that the failure was due to metal fatigue.

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Possible Causes of Failure

Crane Mounting

The drawbeam acted not only as a towing connection but also as the rear chassis cross member.

The truck is constructed using a typical ladder frame chassis. It consists of two side rails running the length of the vehicle, with intermittent cross-members along its length. The side rails provide the main structural strength and the cross-members retain the relative position of the side rails and resist twisting due to offset loading. The cross-members also provide support for engine, transmission and suspension attachments (Wong, n.d.).

During operation, the crane induces significant torsional loading in the chassis. Also during normal road operation of the truck, the crane mass generates torsional loads from manoeuvring, lateral acceleration during cornering, road surface undulation and road noise.

Drawbeam Abuse or Modification

During the inspection of the drawbeam, attention was given to any evidence of abuse or modification to which the component may have been subjected.

There was no evidence of abuse or damage outside of that from the accident.

One area which may indicate some modification was a 10mm cut-out in the upper stiffener connection to the side plate. The cut-out is not identified in the drawing provided by the certifier, however, given the proximity between the upper stiffener and the crane attachment, it is likely this is as manufactured.



Figure 27 Cut-out in top stiffener



Figure 28 Cut-out in top stiffener, close-up.

Trailer Brakes

The trailer brakes were found to be deficient. Did this cause the trailer to apply excessive loads on the drawbeam, affecting its design life?

Compliance with NZS 5446

The drawbeam failure at such a low percentage of its design life asks the question of whether the component meets the requirements of NZS 5446. The purpose of the standard is to avoid these types of accident.

Is the standard suitable?

Substandard Steel Plate

Was the material substandard?

Drawbeam Design

A Heavy Vehicle Specialist Certifier (HVSC) must certify a drawbeam to NZS 5446 (Standards New Zealand, 2007). The scope of the standard is to set the certification criteria necessary to ensure that a secure connection can be maintained between towing vehicles and drawbar trailers, clause 1.1. The standard specifies four forces which the drawbeam must meet to comply: longitudinal force, longitudinal fatigue force range, side force and vertical force.

The allowable design stress in base metals, welds for both static and dynamic (fatigue considerations), are limited to allowable stresses given in: AS 3990 Mechanical equipment – Steelwork (Standards Australia, 1993), and BS 7608:1993 Code of practice for Fatigue design and assessment of steel structures (BSi, 1993).

Typically AS 3990 Appendix B is used for fatigue assessment due to its simplified approach (Standards Australia, 1993).

The recommended design life of a drawbeam is 2×10^6 load cycles. However, it is permitted to design for a lower or higher number of cycles. There are no notes on the certification document or reason to deviate from this recommendation.

Design Life Used

The standard states for most situations it is appropriate to assume one cycle per two kilometres. Given the kilometre history of the truck (refer Truck Use) and assuming the truck always tows a trailer, the drawbeam has been exposed to approximately 40,000 design cycles or 2% of its certified design life.

It is possible the truck does not tow a trailer on a regular basis – most vehicles fitted with cranes are only used to pull trailers on occasion. The drawbeam may have failed at significantly fewer cycles than the assumption suggests.

Drawbeam Analysis

Finite Element Analysis

Finite Element Analysis (FEA) is widely accepted for design validation and used extensively for nuclear, automotive and aerospace design.

The method is often used as an alternative to experimental testing. It is able to solve problems for which no exact solution, expressible in some mathematical form, is available. As such, it is a numerical method rather than an analytical method. Methods of this type are needed because analytical methods cannot cope with the real, complicated problems that are met within engineering (Modlen, 2010).

The technique is based on the premise that an approximate solution to any complex engineering problem can be reached by subdividing the structure/component into smaller more manageable (finite) elements. Load and constraints, as well as material property combinations, can be specified with much greater accuracy than that used in classical hand calculations (Mago & Hicks, 2012).

FEA is particularly suitable for (Mago & Hicks, 2012):

- Structural/mechanical design
- Improving the efficiency of existing design
- Failure analysis investigations

The use of a finite element model to design this style of drawbeam is appropriate, if not necessary, given the complex geometry of the drawbeam. The eccentricity between the towing connection load and the side plate connection, induces a bending, shear and torsional load in the stiffener connection which would be difficult to analyse using hand calculations.

Despite FEA's reputation for accurately pinpointing weak spots in designs, a few faulty assumptions and flaws may render analysis work unusable.

Finite Element Boundary Conditions

The simulation of boundary conditions and other forms of constraint in FEA modelling are probably the single most difficult part of accurate modelling of a structure (Shigley et al., 2002). Different constraint types significantly affect the predicted component stress.

Mesh Convergence Study

Mesh convergence refers to the size of the elements required in a model to ensure that the results of the analysis are not affected by changing the size of the mesh.

The formal method of establishing mesh convergence requires a curve of a critical result parameter (typically some kind of stress) in a specific location, to be plotted against some measure of mesh density. At least three convergence runs will be required to plot a curve which can then be used to indicate when convergence is achieved, or how far away the most refined mesh is from full convergence. However, if two runs of different mesh density

give the same result, convergence must already be achieved, and no convergence curve is necessary (NAFEMS, 2017b).

FEA Validation

Hand calculations should be used to validate FEA models where applicable (Hobbacher, 2006). While the geometry may be too complex in some areas, other simpler areas may be used to confirm the proper model behaviour. In the example of the drawbeam, the stress in the chassis section can be easily calculated; if the stresses are correct, this helps validate that the correct load and behaviour is represented in the model.

Drawbeam Analysis

A finite element analysis of the drawbeam was carried out using SIMULIA Abaqus 2017 to NZS 5446. The computer model is based on measurements of the actual component.

Given a certified maximum towed mass of 30,000kg, the longitudinal force and fatigue force range is 260kN and 220kN respectively, Figure 29.

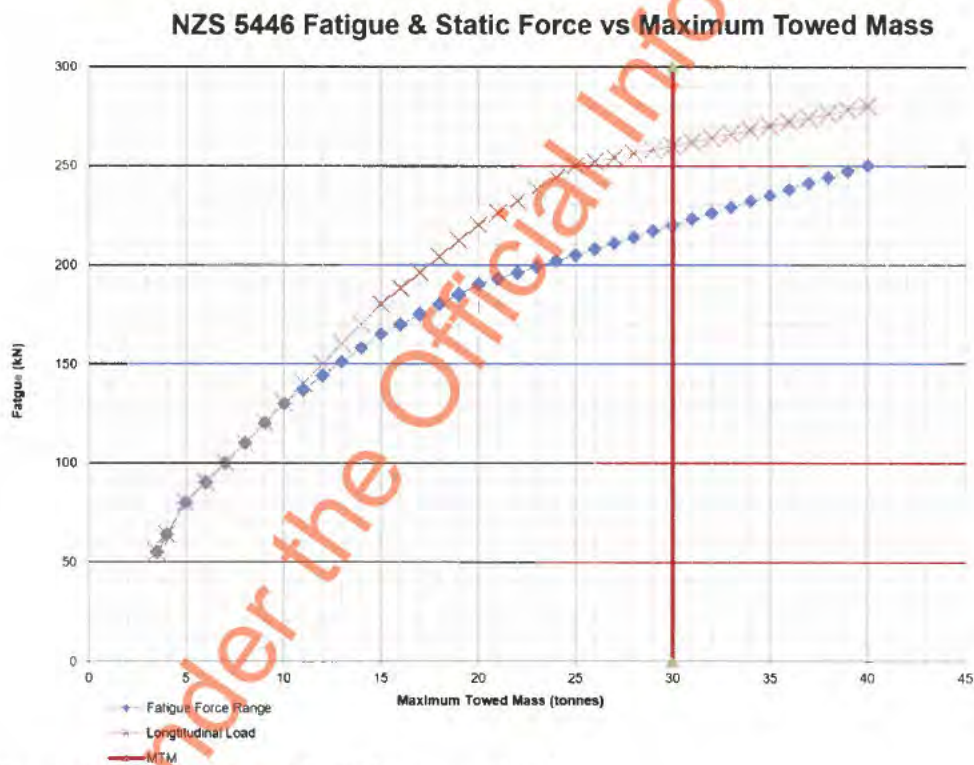


Figure 29 NZS 5446 Fatigue & Static Force versus MTM

Model Parameters

The model includes bolts, bolt pre-tensioning, component contact and a section of vehicle chassis. The detail connection and contact was undertaken to model the drawbeam support conditions accurately.

A nominal friction coefficient of 0.1 is applied to the contact surfaces; this is the lower value for painted steel (Pallett, Gorst, Clark, & J, 2003). As the bolted connections are snug tight holes, the shear load between the drawbeam and truck chassis is expected to be carried by bolt bearing. The pre-tensioning in the bolts was generated using 190Nm of torque for M16 class 8.8 bolts, and 372Nm for the Ringfeder M20 bolts.

In standard elastic FEA, the software materials are assumed to behave in a linear elastic manner even if the material has exceeded its yield stress. The linear elastic material definition is useful for modelling materials which undergo small deformations and which return to their original configuration upon removal of the load. This assumption is acceptable in general towing connection design as components are designed below yield stress. For a 250 MPa steel plate, AS 3990 specifies 0.6 times the yield strength may be used, for an allowable stress of 150 MPa.

In metals, significant permanent deformations occur when the stress reaches a critical property of the steel called the yield stress. Once the yield stress is exceeded the steel begins to deform plastically, resulting in the permanent deformation of the steel. Abaqus is able to model material plasticity (Dassault Systèmes Simulia, 2012).

A mixture of solid and continuum shell elements was used, with a *hex* and *tet* mesh as appropriate.

Material Properties

The drawbeam plate material properties are assumed to be equivalent to mild steel plate complying with AS/NZS 1594:2002 and AS/NZS 1365:1996, 250 MPa yield strength, 350 MPa tensile strength and an elongation percentage of 17%.

Bolts use class 8.8 material properties.

The modulus of elasticity for all steel used is 200 GPa.

FEA Results

Bolt Tension

The bolt pre-tensioning is applied in the initial step of all analysis, Figure 30. The bolt pretension was confirmed by measurement of von Mises stress in the bolt elements.

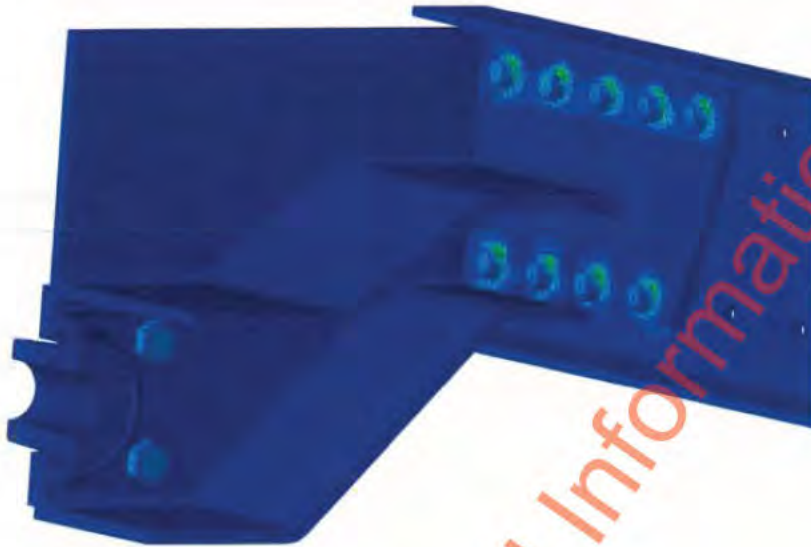


Figure 30 von Mises stress showing bolt pre-tension

The bolt model does not include any thread detail and is used to model the drawbeam boundary stiffness correctly.

Drawbeam Under Longitudinal Load

A 260kN load (for a 30,000kg MTM trailer) is applied to the Ringfeder attachment. The applied load caused large areas of the drawbeam to exceed the material yield stress, Figure 31.

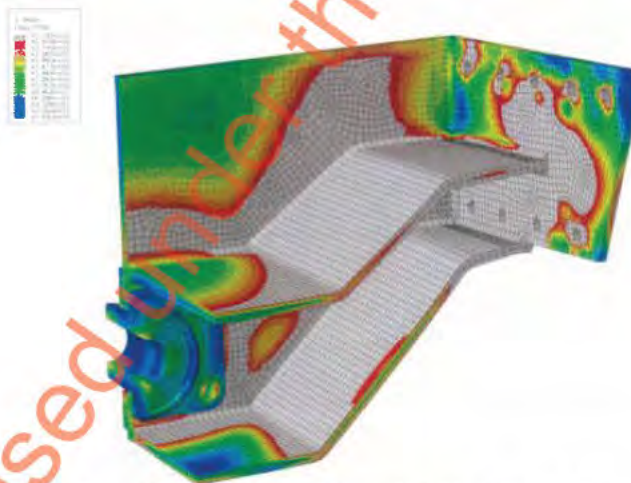


Figure 31 von Mises stress, drawbeam 260kN load, areas in grey exceed 250 MPa

Large areas also exceed the maximum permissible stress of 150 MPa, Figure 32.

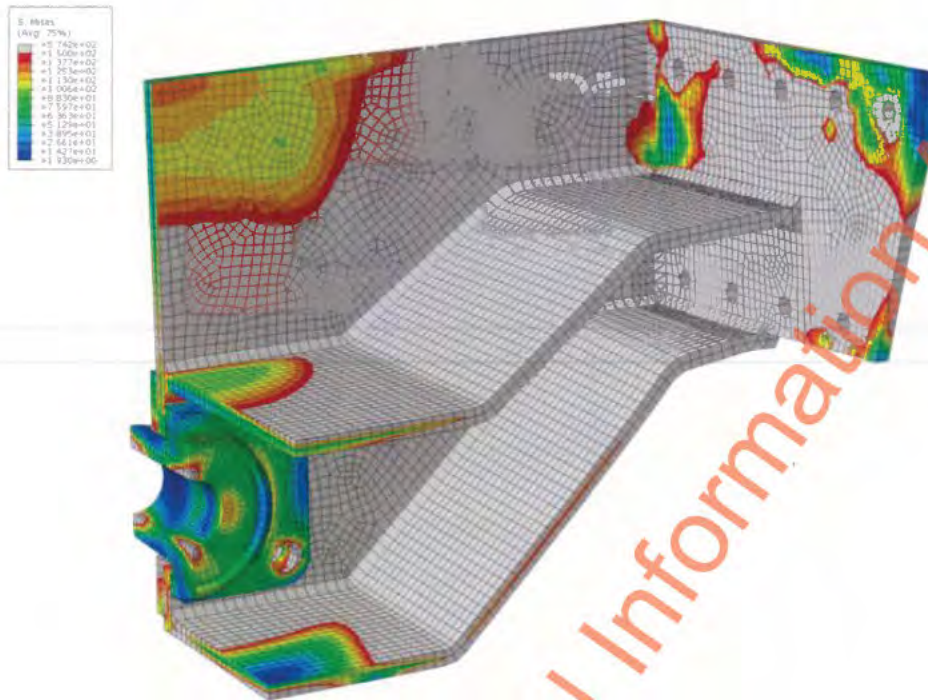


Figure 32 von Mises stress, drawbeam 260kN load, areas in grey exceed 150 MPa

After load removal, the finite element analysis showed areas of the drawbeam had permanent deformation (plastic yield).

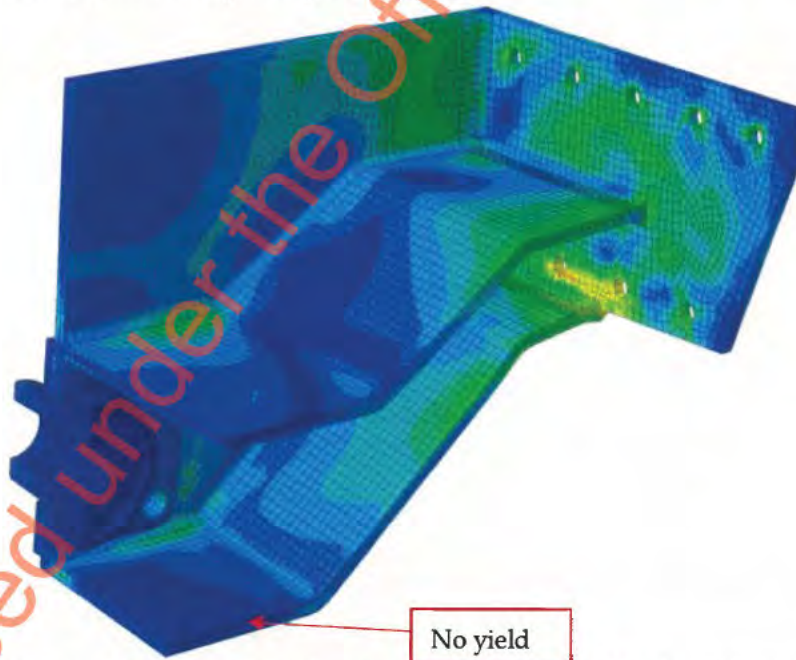


Figure 33 Areas showing plasticity after removal of load (colour other than indicator)

The drawbeam does not comply with the requirements of NZS 5446 for static longitudinal loading. The stress in the drawbeam should not exceed 150 MPa and or show any yielding (plasticity).

Drawbeam Under Longitudinal Fatigue Force Range

Fatigue Design

The AS 3990 standard uses the stress-life method for fatigue design assessment. This method is commonly used due to its simplicity and is reasonably accurate for high cycle fatigue. The permissible design stresses are based on design life and connection type, Appendix B.

The classification of loading condition is specified in Table B1. For 2×10^6 cycles, loading condition 3 is applicable.

TABLE B1
CLASSIFICATION OF LOADING CONDITIONS

Loading condition	Number of loading cycles	
	From	To
1	20 000*	100 000†
2	100 000	500 000‡
3	500 000	2 000 000§
4	Over 2 000 000	

Figure 34 AS 3990 Classification of loading conditions

The type and location of material are categorised for typical connection details, for example, base metal with rolled or clean surfaces is category A, Figure 35.

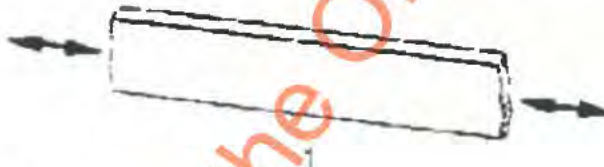


Figure 35 AS 3990 plain material

A weld connection which may approximate the connection between the drawbeam stiffeners and side plate is illustration 21 which is type F category.

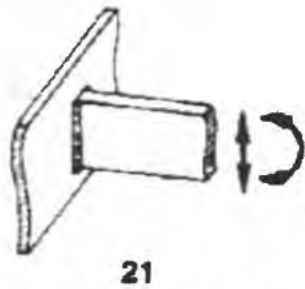


Figure 36 AS 3990 Category F

The standard states the material stress may not exceed the maximum permissible stress given in Table B3 for the loading condition and detail category, Figure 37.

TABLE B3
MAXIMUM PERMISSIBLE STRESS RANGE

Category (from Table B2)	Maximum permissible stress range			
	Loading condition 1 F_{u1}	Loading condition 2 F_{u2}	Loading condition 3 F_{u3}	Loading condition 4 F_{u4}
A	410	245	165	165
B	310	185	120	110
C	220	130	85	65
D	185	110	65	45
E	140	85	55	30
F	100	80	60	35

Figure 37 AS 3990 Table B3

In addition, the maximum stress shall not exceed the maximum permissible stress given elsewhere in the standard. The maximum permissible compressive stress may not exceed 0.6 times the yield strength of the material, clause 5.3. For 250 MPa plate, this is 150 MPa.

To meet AS 3990 (and hence NZS 5446), the base metal stress may not exceed 150 MPa and the stress adjacent to the welds category E or F, 55 or 60 MPa¹ respectively.

Nominal Versus FEA Stress

In most cases, the potential fatigue failure point is located in the material adjacent to a stress concentration, e.g. at a weld toe or bolt hole (BSi, 1993). The standard uses nominal or net section stress which ignores the effect of local stress concentrations; the peak stresses arising from them are accounted for in the permissible stress values. The nominal stress is intended to be relatively easily calculated for direct or bending stress, derived from the applied loads.

Although offering many advantages, one difficulty when using FEA is identifying a point or region in a continually varying predicted stress field where the stresses can be regarded as representing the nominal values required by the code (NAFEMS, 2017a). It is important that the FEA package can predict the material behaviour after yield to avoid inaccurate peak stresses, Abaqus and the material model used achieve this requirement.

¹ NZS 5446 states the allowable stress range for from AS 3990 Appendix B, for many details, is 55 MPa at 2×10^6 cycles (Standards New Zealand, 2007)(Standards Australia, 1993).

Provided the direction of the principal stress does not change significantly over the course of the stress cycle, the relevant cyclic stress should be taken as the maximum range through which any principal stress passes in the parent metal adjacent to the potential crack location, Figure 38. The same approach is taken in AS 3990. Tension stress is considered positive, and compression stresses negative.

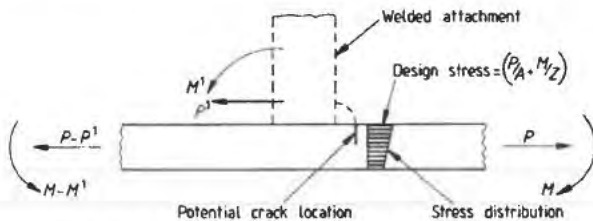


Figure 38 Reference stress in parent metal – BS 7608:1993

Drawbeam Fatigue Force Range

The 220kN longitudinal fatigue force was applied using a zero-based constant amplitude approximation, i.e. half the load in tensile and compression.

The stress in the drawbeam with the load in the forward direction, at the bottom flange to side plate rear connection, was 265 MPa of compressive stress, Figure 39.

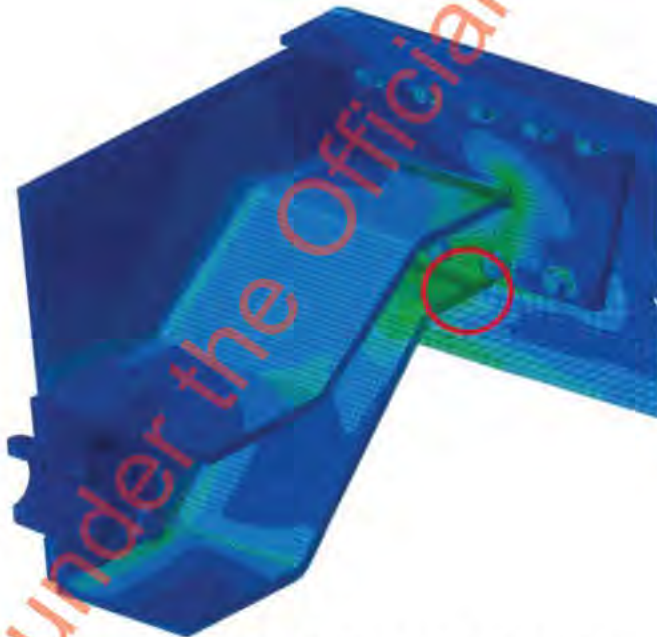


Figure 39 Forward (tension) direction 110kN load, 265 MPa red circle

After removal of the load, a permanent deformation was predicted. This can be seen in the residual stress, Figure 40.



Figure 40 Residual stress from 110kN load, red circle

Under compressive load, the connection of interest is under tension and has a developed stress of 274 MPa.

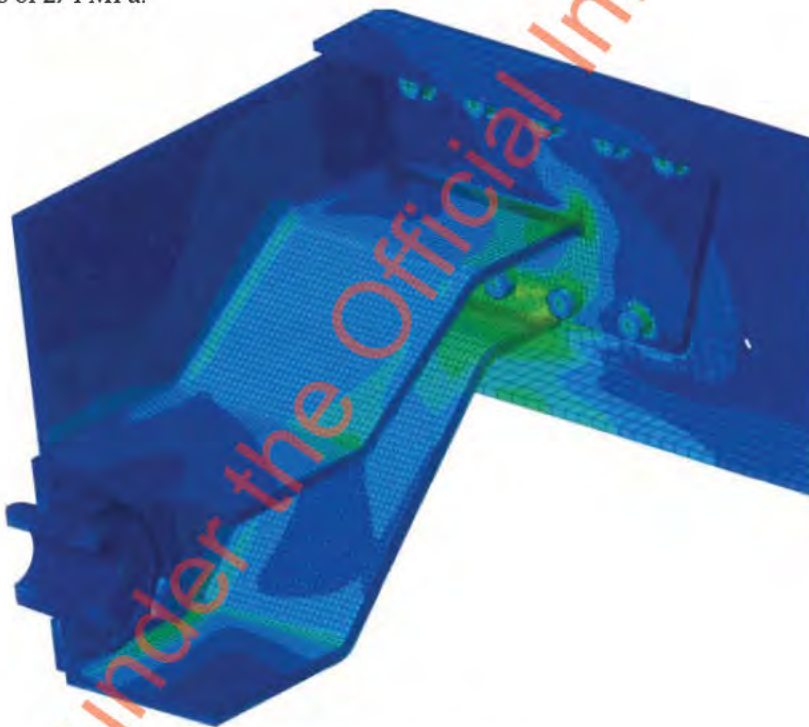


Figure 41 Rearward (compressive) 110kN load, 274 MPa

Given stress-life fatigue is calculated using nominal stress the stress concentration at the weld to parent interface is not used. Instead, as recommended by NAFEMS, the stress is taken in the parent metal adjacent to the weld, Figure 42 (NAFEMS, 2017a).

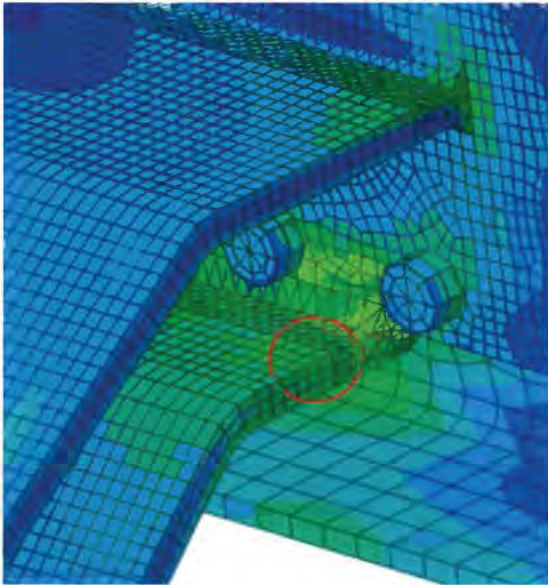


Figure 42 Stress measurement area

The total nominal stress range, $\Delta\sigma$, is calculated using the equation (Hobbacher, 2006);

$$\Delta\sigma = \sigma_{max} - \sigma_{min}$$

The total stress range for the drawbeam is 539 MPa; this exceeds the allowable stress of 55-60 MPa. **The FEA predicts the drawbeam will fail well before its required design life.**

Correct Loading

The towed mass is likely to be less than the 30,000kg to which the drawbeam is certified. Given the required maximum truck to trailer mass ratio of 1.5 from the Vehicle Dimension and Mass Rule and the maximum gross combination mass of 44,000kg, the maximum legal trailer mass would be 26,400kg (NZTA, 2002). In practice the mass is often more evenly distributed assuming a slight imbalance towards the trailer, putting the actual operating gross tow mass closer to 24,000kg for the trailer. The fatigue force range drops to 196kN, putting the approximate nominal stress range closer to 480 MPa, Figure 29. Even after this type of adjustment, the drawbeam life doesn't meet the requirements of NZS 5446.

The FEA result shows the drawbeam is significantly under-designed.

Certifiers Drawbeam Analysis

Sandbox Consulting ran the certifiers FEA model using Solidworks 2017 simulation.

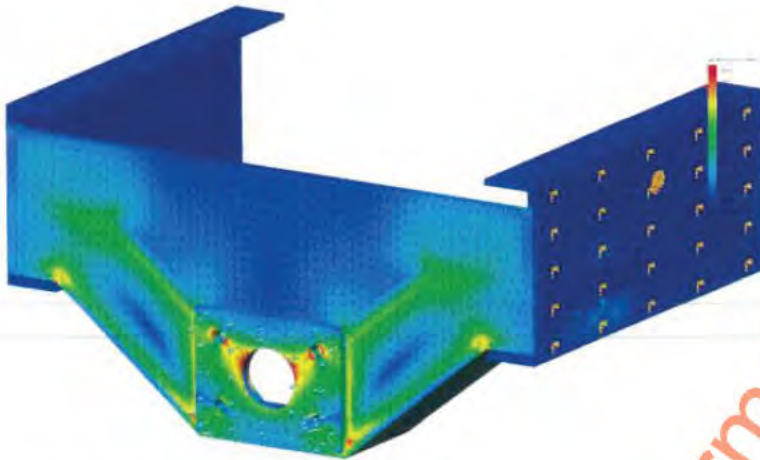


Figure 43 Certifiers drawbeam analysis - 220kN

Refinement of the finite element mesh was carried out in order to improve the accuracy of the results; this is good practice. Mesh improvement and convergence studies are an important part of validating FEA.

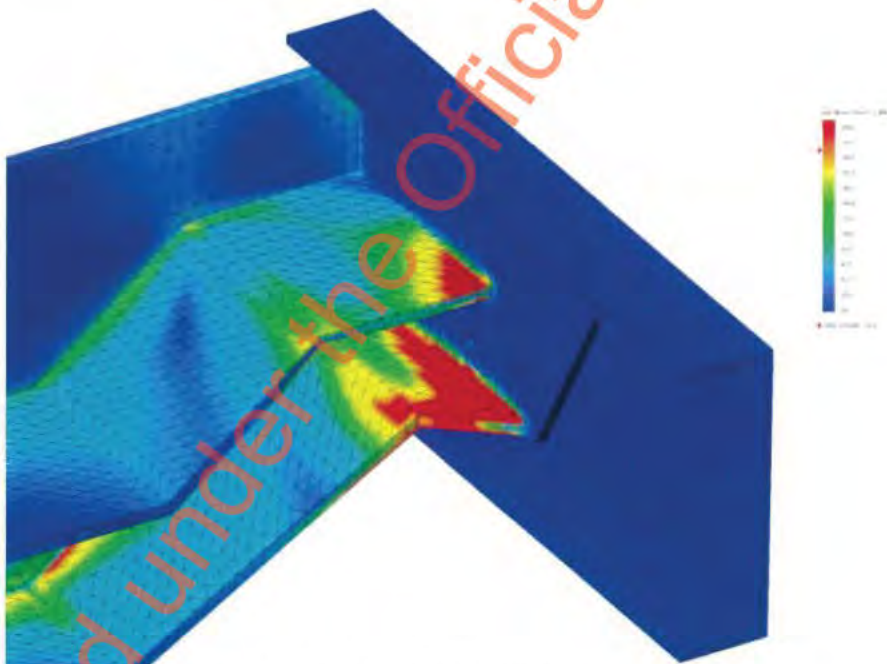


Figure 44 Certifiers drawbeam analysis - 220kN, rear view

Drawbeam Stiffeners

The certifiers model has a different lower stiffener with extended rear gussets than the inspected drawbeam, Figure 45.



Figure 45 Certifiers drawbeam, rear view

Boundary Conditions

Review of the certifiers boundary conditions shows a fixed geometry constraint was used to model the drawbeam side plate, chassis supports. This assumption is equivalent to a built-in or rigid end support. In practice, this type of constraint is not justified as the chassis cannot provide sufficient support. The simply supported or encastre assumption affects both the hand calculations and FEA analysis. Accurate FEA analysis of the drawbeam connection and chassis shows the drawbeam is closer to a simply supported assumption. The rigid constraint effectively increases the drawbeams capacity and under-predicts the developed stress. The simply supported assumption is both more accurate and conservative.

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Drawbeam Fails NZS 5446

It is notable that the certifiers FEA results show stress levels which significantly exceed the material yield stress. The certifiers model shows the drawbeam does not comply.

The certifiers model has the following deficiencies:

- The certifiers analysis differs from the fabricated drawbeam. The actual drawbeam lacks the extended rear gussets.
- The boundary conditions used in the model are incorrect and artificially support the drawbeam.
- The side plates are bonded to the chassis as one solid body; this effectively makes the drawbeam side plate twice as thick.
- The front Ringfeder mount plate is also bonded to the front of the drawbeam plate; this leads to artificial stiffening of the mount.
- The mesh used by default is too coarse to yield accurate results.
- The standard Solidworks software is unable to deal with nonlinear material behaviour (plasticity).
- No hand calculation validation.

Even with the noted deficiencies which lead to under prediction of the drawbeam stresses, the analysis does not support the certification of the drawbeam to NZS 5446 for the rated MTM.

NZS 5446 Robustness – Trailers Brakes

The New Zealand standard NZS 5446 has been in use since 1987. During this time on road testing carried out by the Land Transport Safety Authority (LTSA) in 1998 found that 50% of 1064 trucks and trailers tested had defective braking systems and did not comply with braking requirements (OAG, 2005). In April 2003, a smaller survey of heavy vehicles found 65% of heavy vehicles failed the minimum brake performance (OAG, 2005). This led to the Heavy Vehicle Brake rule 2006 aimed at reducing truck crashes caused by brake defects (NZTA, 2006).

Unfortunately, it is not unusual for vehicle braking systems to not comply with New Zealand braking requirements. While this may have improved since the implementation of the Heavy Vehicle Brake rule 2006, large numbers of drawbars and drawbeams complying with NZS 5446 have been exposed to loads from truck trailers combination with poor braking compatibility and performance without fail. It would be fair to say it is not unusual for truck trailer combinations to move throughout its service life over a range of performance, dependent on component wear. Since its implementation, NZS 5446 has (in the industry's experience) greatly decreased the failures of towing connections.

How long have the trailer brakes been in this poor condition? Review of the land transport records shows the trailer passed a COF on the 26th of May 2017. At that time it had 132,232 km on the hubometer. Based on the hubometer reading of 150,395 km at inspection, the vehicle has travelled 18,163 km.

Material/Weld Issues

In May NZTA issued an alert about added boron in steel, this followed a Heavy Engineering Association (HERA) advisory note: Welding to AS/NZS 1554.1 of boron containing steel in 2016 and an update on the 2nd of May 2017.

Traditionally New Zealand and Australian steels have been made without boron additions. The welding requirements in AS/NZS 1554 do not include the effect of boron as an alloying element.

The advisory states only minor percentages of boron may be necessary to increase the hardness significantly, and to degrade ductility and toughness of the heated effect zone of the welded steel.

Although the mechanical properties of the boron alloyed steel may comply with the required steel standard, they do not address issues of weldability relating to boron.

The boron may affect the fatigue resistance of welded steel structures. Material testing to the recommended requirements in the advisory would be required before further comment.

Even while speculating that the steel's boron content might have contributed to the failure, the significant underlying design faults still dominate the causality of the failure (as shown by the FEA results). A compliant design would be significantly more resistant to fatigue damage, whilst any material/weld issues would only exacerbate the issue.

Review of Certifiers Files

NZTA provided the certifiers documents to Sandbox Consulting Ltd for use in the analysis of the drawbeam. The files were found to be lacking detail and information to be able to determine compliance properly, specifically:

- Crane certification
 - No crane data sheet
 - No free body diagram to determine reaction loads
 - No calculations for crane/chassis stresses.
 - No calculation of drawbeam for use as cross member
- Drawbeam certification
 - The drawbeam analysis and drawing did not match the actual certified component.
 - The bolt calculation does not represent the actual bolt group used to install the drawbeam.
 - Lack of bolt details, length and shoulder detail

The records for this type of certification lack the rigour required.

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Review of Faults Found During Inspection

Drawbeam

- Fracture, rupture and separation of front weldment section.
- Evidence of fatigue damage.
- Incorrect seating of bolts due to:
 - burrs,
 - weld interference,
 - swarf.
- Bolts bent due to incorrect seating.
- Bolt shoulder length insufficient, bearing on the thread.
- Bolt minimum edge distance does not comply.
- Does not match the certifiers drawing.

Conclusions

- The drawbeam was significantly under designed and did not meet the requirements of NZS 5446.
- The fatigue analysis using AS 3990 shows the design life cannot be achieved and predicts early failure.
- The separation between the truck and trailer was caused by the process of fatigue and catastrophic rupture of the drawbeam.
- The certifiers FEA model is substandard and does not meet good practice, never the less still showed a design fault.
- The crane mounting and use of the drawbeam as a cross member would (in my professional opinion) increase the stresses to which the drawbeam was exposed to. Sandbox Consulting has not completed sufficient work to clarify the extent of this interaction. However, the significant underlying design issues meant failure would have still occurred, irrespective of whether a crane was fitted. In addition, the certifier also was responsible for the crane certification.
- While the trailer brakes didn't meet the brake requirements, it is not uncommon. The NZS 5446 standard has been proven to be robust enough to deal with all types of braking performance and truck trailer compatibility situations.

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Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Tuesday, 26 September 2017 3:11 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

Follow Up Flag: Follow up
Flag Status: Flagged

Background

In 2014, a drawbeam model was developed for an application, mounting inside the Chassis rails in a very compact situation. It is mandatory to save the model before carrying out stress analysis, if the model is unsaved, then an arbitrary saved file is created by the programme. If analysis shows a weakness in design, the model is modified, and the analysis is re run. In this particular case, it was decided that the model could not be modified to meet required loading, so an alternative design was made up from scratch. In such cases, the saved file is overwritten, but for some reason this was not done in this case, an unsatisfactory design remained on file, together with analysis to match the loading of a 30 Tonne towing connection.

inspections.

I was in Greymouth on 12th May, 2016, when the deck framework had been built. The photos in the subsequent Load Anchorage certificate were taken at this time. Aratuna Freighters expressed a desire for a drawbeam that would fit inside the Chassis rails for this vehicle, and as a result I sent details of several different models from my files. Without realising it, I forwarded the failed design amongst these, I did not examine the stress analysis at that time.

I was next in Greymouth on 1st June, 2016, at this time crane mount and drawbeam were incomplete.

Drawbeam and Crane mount certificates were issued on 16th June 2016, the photos used in those certificates were taken at 5:30 pm on 15th June, I was not in Greymouth that day.

I was next in Greymouth for final inspection on 23rd June, 2016, and would have inspected this vehicle in the yard of Aratuna freighters. I did not notice the cut-out or missing extended gussets, these would have been obscured by the chassis spacers over the crane bolts at that time. I did not notice the incorrectly seated washers, they would have been hard up inside the lower drawbeam member. The specification for the hole spacing referred to the distance from the chassis flange, rather than the mounting plate. In particular, the 12mm diameter hole would have been a factory hole in the chassis that was picked up because it was there. These factors may have hastened the catastrophic failure of this drawbeam, but did not cause it. The cause was in faulty design.

FEA Analysis

If the requirement for analytical analysis was replaced by a requirement to conduct a laboratory test, then a means of restraint would need to be spelled out. For example, it would need to be stated that the chassis be attached to a cradle, supported at its suspension mounts, and load applied to the drawbeam. Similar restraints are needed for analytical analysis, but NZS 5446 is silent on how these are to be selected. Obviously different assumptions are going to give different results, but I contend that either allowing flexure of the Chassis rails, or taking these as rigid has and can provide robust Drawbeam designs for New Zealand conditions.

Mesh size was chosen as default by the programme for high quality meshing, I would only use draft quality as preliminary analysis. I could have manually selected a smaller mesh size, but generally when this is done, results are very similar.

The only way a design difference between model and drawing can occur is if the drawing was prepared and printed with subsequent modification of the model. If the drawing was opened subsequent to change in the model, it would reflect these changes.

When the analysis was run for this particular drawbeam, they were re run from the earlier file, without the critical evaluation of the results that were warranted. Earlier analysis showed that this design failed to meet the requirements of the standard, the same should have been picked up at this analysis, but was not.

The Motochek data for Nissan [REDACTED] was for a completely different job, and was misfiled



Peter Wastney

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [mailto:Tom.Logan@nzta.govt.nz]
Sent: Friday, 22 September 2017 2:01 p.m.
To: Peter Wastney (PWE)
Subject: LT400 554622 questions

Hi Peter,

We have received the attached report on your certification LT400 number 554622 (your file reference 5775-18877) - a drawbeam certification on an Iveco truck. I would appreciate any explanation or comments on the findings of this report, by the end of business on the 6th of October 2017 at the latest, so that we can take those into consideration for our investigation.

In particular I would appreciate comments on the following points raised in the report and/or noted from your certification file provided:

- Did you carry out a final inspection with the drawbeam installed, and if so
 - why you certified the drawbeam when there were washers not seating correctly due to interference on the weld
 - Why you certified the drawbeam when mounting holes were closer to the edge than specified
 - Why you certified the drawbeam when the design was different to the one analysed, eg a 10mm cut-out and no extended rear gussets
- With regards to your FEA analysis,
 - what was the basis of the boundary conditions chosen and how does that correlate to the real-world situation
 - what was the basis for your choice of mesh size for the analysis
 - why is there a design difference between the drawing and FEA model in your certification file
 - why, when the material yield strength is identified as 220.6MPa, you have certified the drawbeam showing areas of stress over 280MPa
- Why is there Motochek information for a 2008 Nissan truck, license plate number [REDACTED], included in your certification file for an Iveco truck license number JWN197

Regards,
Tom.

Tom Logan / Senior Advisor

Technical Services

E tom.logan@nzta.govt.nz / W nzta.govt.nz


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Tom Logan

From: Brian Sara
Sent: Friday, 20 October 2017 2:17 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Cc: Tom Logan
Subject: Further request for files
Attachments: Section 198 Letter - P Wastney - JWN197 - Replacement 20 Oct 2017.pdf

Hello Peter

Further to our telephone conversation a few minutes ago, attached is a document requesting a copy of a further set of files.

Given you have advised that you expect to be home around 4:00 pm today and will be able to access these, I have requested these be provided within 4 hours of the time of this message.

I appreciate your assistance with this matter.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St
Private Bag 6995, Wellington 6141, New Zealand



20 October 2017

Mr P L Wastney

Peter Wastney Engineering Ltd
222 Wakapuaka Road
RD1
NELSON

Dear Mr Wastney

HEAVY VEHICLE SPECIALIST CERTIFICATION: SECTION 198 LAND TRANSPORT ACT 1998

In accordance with the provisions of section 198 of the Land Transport Act 1998 and sections 3.1(2) & (3) of the Vehicles Standards Compliance 2002 Rule 35001/1, you are advised of my intention to conduct an inspection of records associated with your approval.

Certifier ID: PW
Approval name: Peter Lawrence Wastney

The following records are to be provided to me upon receipt of this demand by email within 4 hours, or if there are reasons why this is not achievable as soon as possible as agreed with me. Records requested are to include LT400, and/or Statements of Design Compliance (SODC), and all supporting documentation including any electronic files for the following vehicle:

JWN197 607095 14/09/2017


Pursuant to Section 51(1) of the Land Transport Act 1998, you are advised that a person commits an offence if the person, without reasonable excuse, fails or refuses to comply with a requirement made under section 198 in relation to an audit or inspection. The maximum penalty on conviction for an offence against section 51(1) is a fine not exceeding \$5,000.00.

I have enclosed copies of the relevant legislation for your information:

Section 198 of the Land Transport Act 1998
Sections 3.1(2) & (3) Vehicles Standards Compliance 2002 Rule 35001/1
Section 51 of the Land Transport Act 1998.

Should you have any queries, please contact me, on email, Brian.Sara@nzta.govt.nz or phone 04 901 6712.

Yours sincerely


Brian Sara
Manager Vehicles

Land Transport Act 1998

198

Inspections and audits

(1)

The [Agency] may in writing require any person who holds a land transport document that authorises the provision of a service in the land transport system to undergo such inspections and audits as the [Agency] reasonably considers necessary in the interests of land transport safety (including inspections and audits of vehicles operated by such persons).

(2)

The [Agency] may carry out such inspections and audits as the [Agency] reasonably considers necessary in the interests of land transport safety.

(3)

For the purposes of any inspection or audit carried out in respect of any person under this section, the [Agency] may in writing require that person to provide such information as the [Agency] reasonably considers relevant to the inspection or audit.

(4)

A person to whom a requirement is made under this section must comply with that requirement.

Land Transport Act 1998

51

Contravention of section 198(4)

(1)

A person commits an offence if the person, without reasonable excuse, fails or refuses to comply with a requirement made under section 198 in relation to an audit or inspection.

(2)

The maximum penalty on conviction for an offence against subsection (1) is a fine not exceeding \$5,000.



the Director must disclose that information to the applicant and give the applicant a reasonable opportunity to refute or comment on it.

2.6(3) Nothing in 2.6(2) requires the Director to disclose any information if such disclosure would be likely to endanger the safety of any person.

2.6(4) If the Director does not disclose information in accordance with 2.6(3), the Director must inform the applicant:

- (a) of the fact of non-disclosure; and
- (b) that they may seek a review of the non-disclosure by the Privacy Commissioner under the *Privacy Act 1993* or by the Ombudsman under the *Official Information Act 1982*.

Section 3 Monitoring and reviewing of performance, and suspension and revocation of appointments

3.1 Procedures for monitoring and reviewing performance

3.1(1) The Director may monitor and review the performance of a vehicle Inspector or inspecting organisation in complying with the requirements and conditions imposed by the Director under 2.3, including the performance of inspection and certification activities at individual sites.

3.1(2) In monitoring and reviewing performance under 3.1(1), the Director may require a vehicle inspector or inspecting organisation to undergo such monitoring and review, and to provide such information as the Director reasonably considers relevant.



- 3.1(3) A vehicle inspector or inspecting organisation must comply with a requirement from the Director under 3.1(2).
- 3.1(4) A vehicle inspector or inspecting organisation must bear the costs of the monitoring and reviewing of their performance in accordance with any prescribed fee.
- 3.2 Action following failure to comply with conditions of appointment or with this rule.
- 3.2(1) If the Director has reason to believe that a vehicle inspector or inspecting organisation has failed to comply with any of the conditions of their appointment, or has failed to comply with this rule, the Director may require the inspector or organisation to undergo such an investigation and to provide such information as the Director reasonably considers appropriate.
- 3.2(2) Subject to 3.2(3), if, following an investigation under 3.2(1), the Director is satisfied that a vehicle inspector or inspecting organisation has failed to comply with any of the conditions of their appointment, or failed to comply with this rule, the Director may do one or more of the following:
- (a) require that remedial action, such as training, be undertaken by the inspector or organisation;
 - (b) suspend the whole or any part of the appointment of the inspector or organisation for a specified period or until specified conditions are met;
 - (c) revoke the whole or any part of the appointment of the inspector or organisation.
- 3.2(3) Subject to 3.3, before carrying out an action under 3.2(2)(b) or (c), the Director must notify the vehicle inspector or inspecting organisation in writing of:



Tom Logan

From: Brian Sara
Sent: Friday, 20 October 2017 4:53 p.m.
To: Tom Logan
Subject: FW: Further request for files
Attachments: img006.pdf; Part.19887.SLDDRW; Part.18584.SLDPRT

Importance: High

Copy FYI

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Friday, 20 October 2017 4:49 p.m.
To: david@thesandbox.co.nz
Subject: FW: Further request for files
Importance: High

Hello David

Can you please have a look at the Solid Works files in this attachment and let me know if there is sufficient detail included to support certification to NZS:5446?

There is no sign of any calculations, bolting details or even photos in the PDF file but I cannot open the SW files.

I don't need a full analysis at this stage – only an initial response but may require further details depending on what is in the files.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Friday, 20 October 2017 4:34 p.m.
To: Brian Sara
Subject: RE: Further request for files

Attached, I think this is all!

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Friday, 20 October 2017 2:17 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Cc: Tom Logan
Subject: Further request for files

Hello Peter

Further to our telephone conversation a few minutes ago, attached is a document requesting a copy of a further set of files.

Given you have advised that you expect to be home around 4:00 pm today and will be able to access these, I have requested these be provided within 4 hours of the time of this message.

I appreciate your assistance with this matter.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

☎ JDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St
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PW

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

- Component being certified:
- Chassis
 - Towing connection
 - PSV stability
 - PBS
 - Load anchorage
 - Brakes
 - PSV rollover
 - Long bolsters
 - SRT
 - Swept path

Manufacturer of part: New Power Beam by [REDACTED]

Code/standard/rule certified to: N25 5446

Component load rating(s): 30,000 kg MTA

General drawing number(s): 5775-19887

Supporting documents: None

Special conditions (optional): None

Certification expiry date (if applicable): 14-9-2027

or Hubodometer reading (whichever comes first):

Declaration

I the undersigned, declare that I am the heavy vehicle specialist inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my appointment. To the best of my knowledge the information contained in the certificate is true and correct.

Designer's ID (if different from inspector below): PW

Inspector's signature: [REDACTED]

Inspector's name (PRINT IN CAPS): PETER WASTNE ID number: [REDACTED]

Date: 14-9-17

Number: 607095

CoF vehicle inspector ID: [REDACTED]

CoF vehicle inspector signature: [REDACTED]

Date: [REDACTED]

All fields are mandatory unless otherwise stated.

Released under the Official Information Act 1982

**Peter Wastney Engineering PDS - Certification
ID PW**

Operating from 224 Main Road, Wakapuaka, R. D. 1, Nelson

Job Number 5775- 19887
Vehicle details 6F2SKAT00G D2 30005
Identity of Owner Aratuna Freight

Measurements, and other factors relevant to the Certification

Per sketch

Factors to be taken into account in the design.

Long + NZS

Relevant Standards and guidelines

NZS 5446

Assumptions and Calculations

Per Computer

Design and detailed Drawings 5775- 19887

Materials and fabrication methods

Welded N/S

Critical matters assessed during inspection

Weld joints

Inspection Dates

14/9/17

Reasons for refusing to certify

When the vehicle is certified, that that is certified is within safe tolerance of the relevant specifications

Time taken to inspect and complete process 2h

Signed

[Redacted Signature]

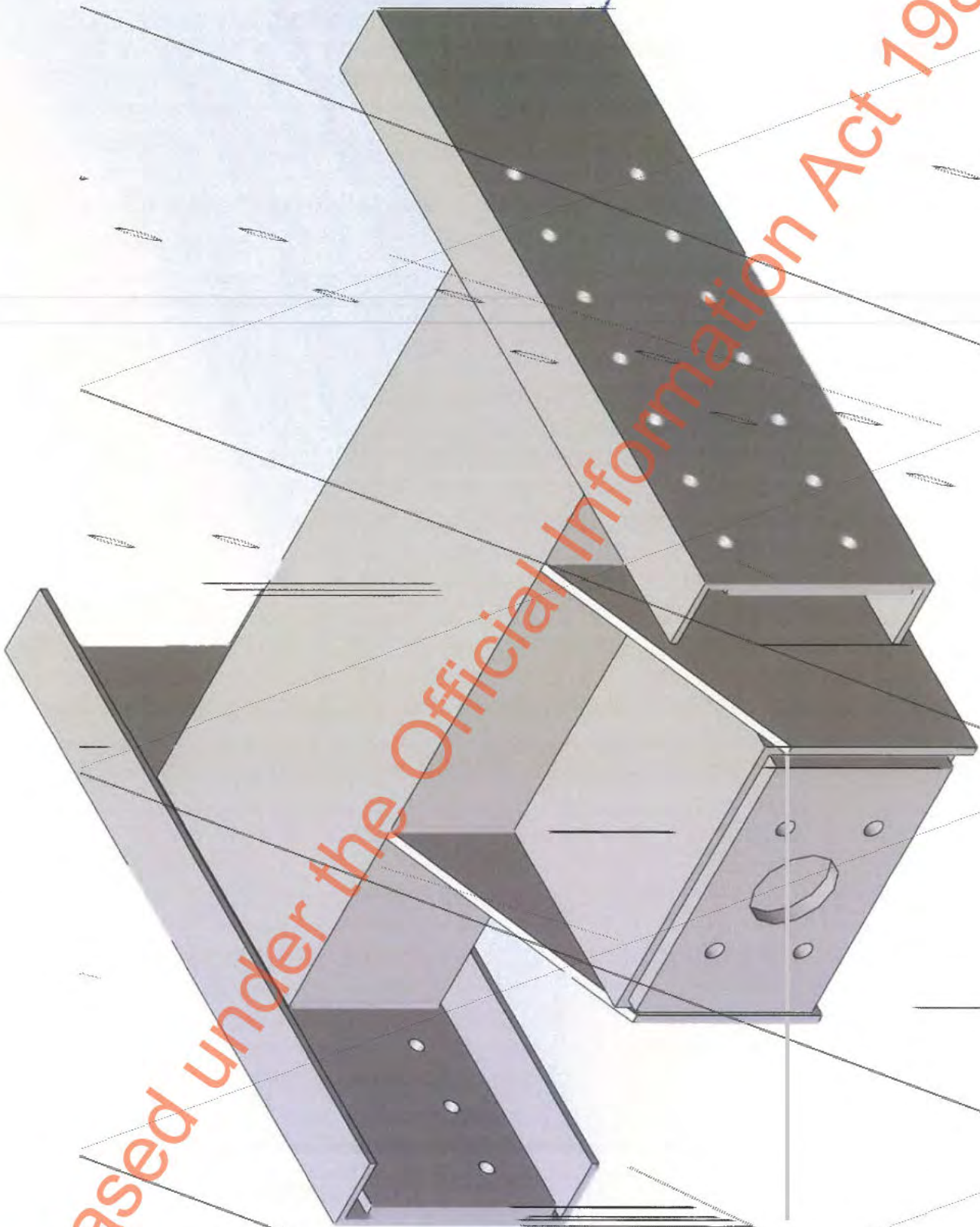
Date

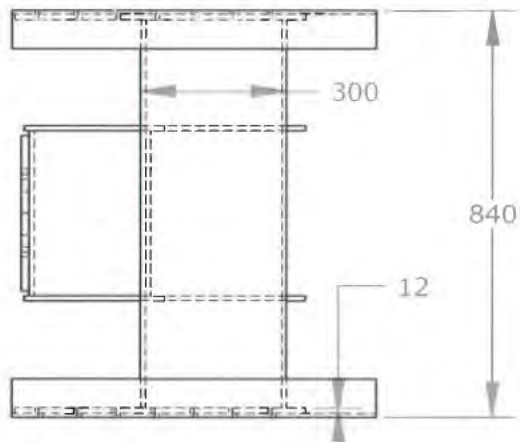
18-9-17

"I declare that I am a Heavy Vehicle Specialist Certifier - Engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 1998; my Deed of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct."

Released under the Official Information Act 1982

Released under the Official Information Act 1982

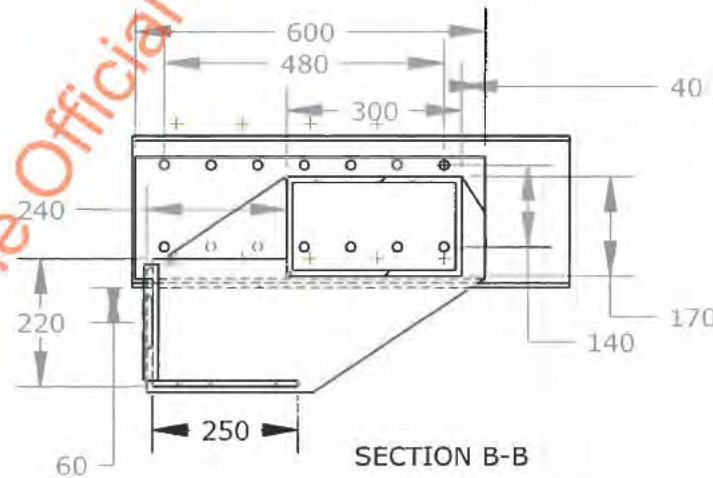
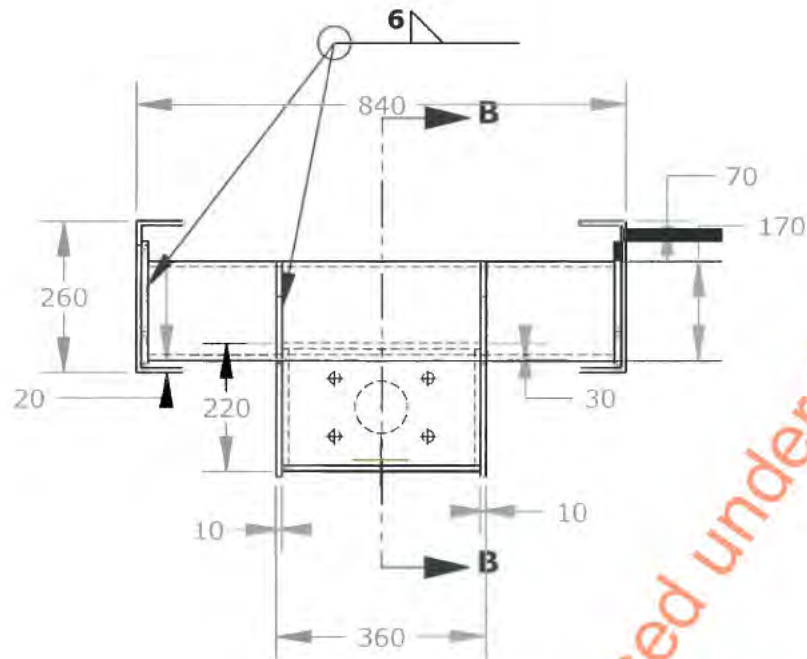
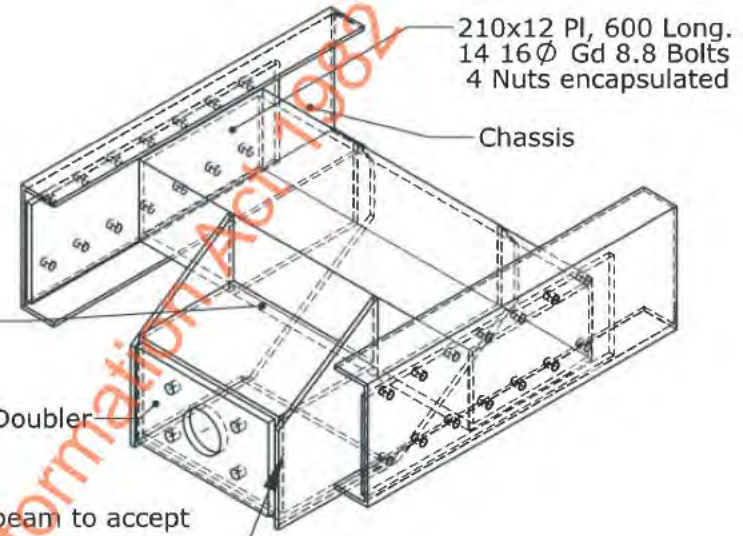




Folded 10 Pl.
to 300x170 section

320x 180x10 Pl Doubler

Fabricated Drawbeam to accept
137 kN D Value
Coupling



Welds to Category SP of AS/NZS 1554. Chassis web bolts to be in centre 66% of chassis rail depth



PETER WASTNEY ENGINEERING LTD
222 Wakapuaka Rd
RD 1, Nelson
www.pwe.co.nz

Job 5775 - 19887
Drawbeam - Aratuna
Iveco Crane truck JWN 197
30,000kg MTM Rating

Scale

1:10

Checked/Date :

Drawn by
PLW

Date
Aug 2017

Approved/Date :

Sheet
1 of 1

Draft

Design

As Built

Released under the Official Information Act 1987

Tom Logan

From: david@thesandbox.co.nz
Sent: Tuesday, 24 October 2017 5:02 p.m.
To: Brian Sara
Subject: RE: Further request for files
Attachments: 1703-792 Job Review Draft 1 - JWN197.pdf

Hi Brian,

Please see attached review document.

Unfortunately, this is a very poor job file. There are some questionable details in the CAD model, and there is no evidence the drawbeam has been inspected before certification.

Kind regards,

DAVID MANLEY BE, MEngSt, MEngNZ
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

287 Park Road
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Palmerston North 4410

P 06 355 1777 M 021 829 435

www.thesandbox.co.nz

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From: Brian Sara [mailto:Brian.Sara@nzta.govt.nz]
Sent: Friday, 20 October 2017 4:49 PM
To: david@thesandbox.co.nz
Subject: FW: Further request for files
Importance: High

Hello David

Can you please have a look at the Solid Works files in this attachment and let me know if there is sufficient detail included to support certification to NZS:5446?

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Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

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Sent: Friday, 20 October 2017 4:34 p.m.
To: Brian Sara
Subject: RE: Further request for files

Attached, I think this is all!

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

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Sent: Friday, 20 October 2017 2:17 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Cc: Tom Logan
Subject: Further request for files

Hello Peter

Further to our telephone conversation a few minutes ago, attached is a document requesting a copy of a further set of files.

Given you have advised that you expect to be home around 4:00 pm today and will be able to access these, I have requested these be provided within 4 hours of the time of this message.

I appreciate your assistance with this matter.

Regards,
Brian Sara / Manager Vehicles
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DDI 64 4 901 6712 M [REDACTED]
E brian.sara@nzta.govt.nz / W nzta.govt.nz
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Released under the Official Information Act 1982

Component	LT400	Comments
Registration JWN197 – Job No 19887		
Drawbeam	607095 14/9/17	<p>Files Provided</p> <ul style="list-style-type: none"> • LT400 Certificate • PWE PDS • Solidworks CAD/FEA model • Solidworks drawing file <p>Comments Design has questionable elements – fabrication of main box section? Gusset connection points.</p> <p>Certification Documentation No detailed photos of fabricated drawbeam No detailed photos of drawbeam fitted to vehicle – bolted connections or welds. No confirmation that the correct bolts/washers were used. No chassis calculations. No drawbeam calculations No vehicle layout drawing – to confirm legal position. No FEA validation calculations/justification. No loading data – NZS 5446. No bolt load analysis. No weld analysis.</p> <p>FEA analysis include systemic faults found in original report</p> <ul style="list-style-type: none"> • Inappropriate boundary conditions. • Poor mesh. • Artificial reinforcing of plates. • Insufficient detailing to allow weld analysis from FEA results. • Fatigue analysis not included in provided CAD file. • No static longitudinal load in FEA file. <p>PRS Ratings</p> <p><i>Technical Decisions – 0</i> Little proof of thorough inspection to determine compliance.</p> <p><i>Technical Competence – 0</i> Little to no competence in the technical aspects relating to drawbeam design shown.</p> <p>Conclusion Level of competence likely to compromise the safety of vehicle occupants or other road users.</p>

Tom Logan

From: Brian Sara
Sent: Wednesday, 25 October 2017 2:55 p.m.
To: Tom Logan
Cc: Don Hutchinson
Subject: FW: Drawbeam Review JWN197 Part 2
Attachments: SBX-19887-JWN197 Draft 1.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hello Tom

Attached is an updated document from Sandbox Consulting relating to the replacement drawbeam fitted to JWN197.

I have discussed this with David Manley this afternoon. There is clearly insufficient evidence in the certification file provided by Peter Wastney to permit certification in accordance with NZS:5446.

While in this situation, we don't have an FEA report that predicts failure, we don't have an FEA report that predicts anything at all. There is a concern relating to the requirement for encapsulated nuts to secure the drawbeam, along with the folding of 10mm plate to form a box and questions in regards to the suitability of the side plates.

Based on these concerns and the lack of information in the files, we have no option but to revoke the LT400 for this drawbeam.

Can you please prepare the appropriate documents for me?

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: david@thesandbox.co.nz [<mailto:david@thesandbox.co.nz>]
Sent: Wednesday, 25 October 2017 1:59 p.m.
To: Brian Sara
Subject: Drawbeam Review JWN197 Part 2

Hi Brian,

Please see attached:

SBX-19887-JWN197

Kind regards,

DAVID MANLEY *BE, MEngSt, MEngNZ*
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

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Component	LT400	Comments
Registration JWN197 – Job No 19887		
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Tom Logan

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Sent: Wednesday, 25 October 2017 1:59 p.m.
To: Brian Sara
Subject: Drawbeam Review JWN197 Part 2
Attachments: SBX-19887-JWN197 Draft 1.pdf

Hi Brian,

Please see attached:

SBX-19887-JWN197

Kind regards,

DAVID MANLEY BE, MEngSt, MEngNZ
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

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Released under the Official Information Act 1982

Vehicle registration number: [] PW

Component being certified: [] Chassis [] Load anchorage [] Towing connection [] Brakes [] PSV stability [] PSV rollover [] PBS [] Long booms [] SRT [] Swept path

Description of work: New slow beam by [redacted]

Code/standard/rule certified to: NZS 5446 Component load rating(s): 30,000 kg MTD

General drawing number(s): 5775-19887

Supporting documents: None

Special conditions (optional): None

Certification expiry date (if applicable): 14-9-2027 or Hubodometer reading (whichever comes first): [] [] [] [] [] [] [] []

Declaration

I the undersigned, declare that I am the heavy vehicle specialist inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my appointment. To the best of my knowledge the information contained in the certificate is true and correct.

Designer's ID (if different from inspector below): PW

Inspector's signature: [redacted]

Inspector's name (PRINT IN CAPS): PETER WASTNE ID number: [] [] [] []

Date: 14-9-17 Number: 607095

CoF vehicle inspector ID: [] CoF vehicle inspector signature: [] Date: []

All fields are mandatory unless otherwise stated.

**Peter Wastney Engineering PDS - Certification
ID PW**

Operating from 224 Main Road, Wakapuaka, R. D. 1, Nelson

Job Number 5775- 19887

Vehicle details

6F2SKAT00G D2 30005

Identity of Owner

Aratuna Freight

Measurements, and other factors relevant to the Certification

Per sketch

Factors to be taken into account in the design.

Length & NZS

Relevant Standards and guidelines

NZS 5446

Assumptions and Calculations

Per Computations

Design and detailed Drawings 5775-

19887

Materials and fabrication methods

Welded N/S

Critical matters assessed during inspection

Weld joints

Inspection Dates

14/9/17

Reasons for refusing to certify

When the vehicle is certified, that that is certified is within safe tolerance of the relevant specifications

Time taken to inspect and complete process

2h

Signed

[Redacted Signature]

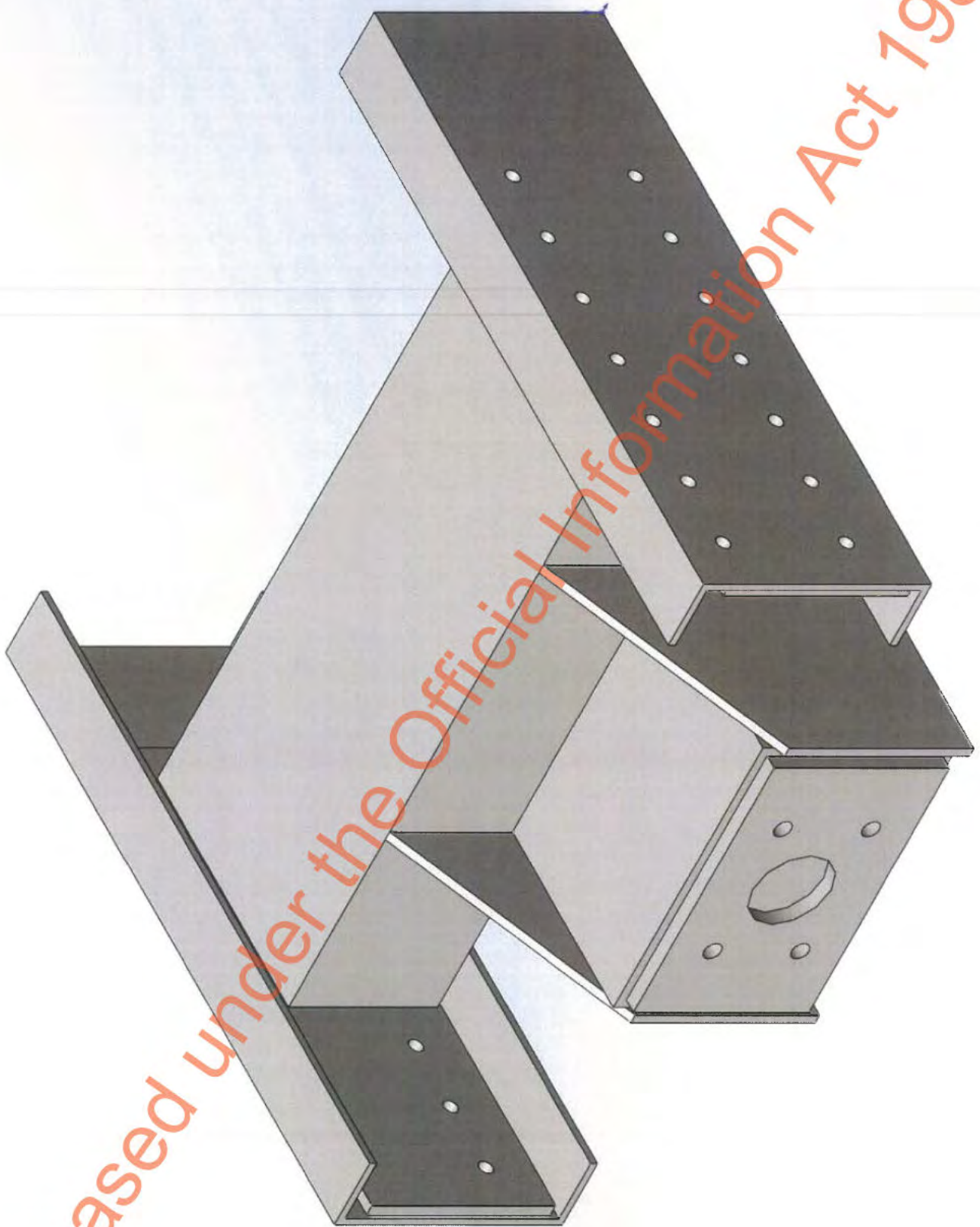
Date

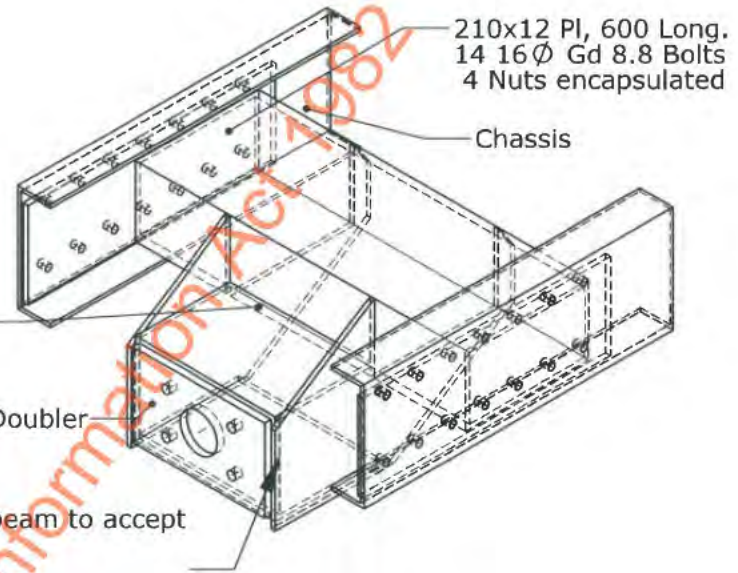
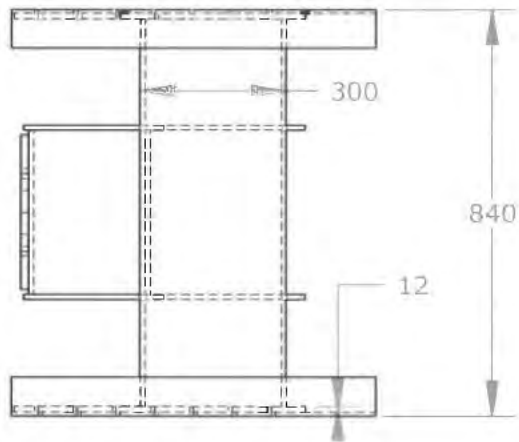
14-9-17

"I declare that I am a Heavy Vehicle Specialist Certifier - Engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 1998; my Deed of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct."

Released under the Official Information Act 1982

Released under the Official Information Act 1982

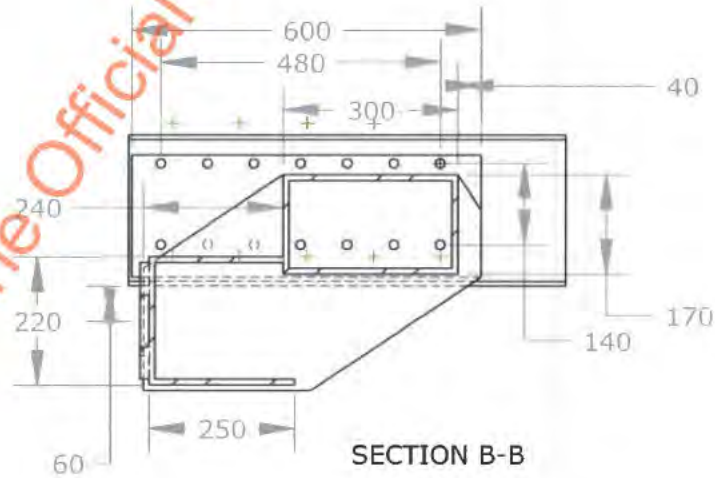
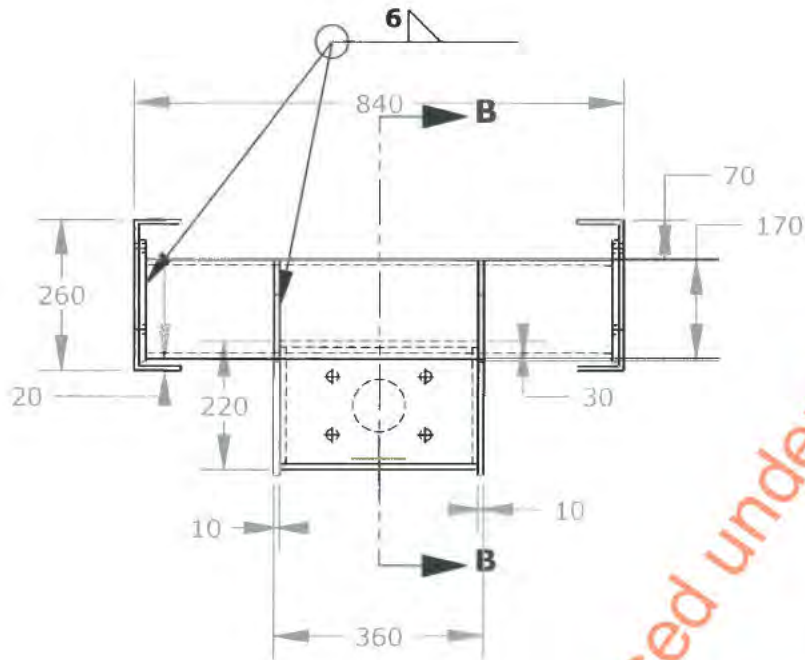




Folded 10 PI.
to 300x170 section

320x 180x10 PI Doubler

Fabricated Drawbeam to accept
137 kN D Value
Coupling



Welds to Category SP of AS/NZS 1554. Chassis web bolts to be in centre 66% of chassis rail depth



PETER WASTNEY ENGINEERING LTD
222 Wakapuaka Rd
RD 1, Nelson
www.pwe.co.nz

Draft Design As Built

Job 5775 - 19887
Drawbeam - Aratuna
Iveco Crane truck JWN 197
30,000kg MTM Rating

Scale	Checked/Date :	Approved/Date :
1:10	Drawn by PLW	Date Aug 2017
		Sheet 1 of 1

Tom Logan

From: Brian Sara
Sent: Wednesday, 25 October 2017 6:37 p.m.
To: David Manley
Cc: Tom Logan
Subject: Fwd: Certification investigation update
Attachments: image001.jpg; image002.jpg; image003.jpg; image004.jpg; image005.jpg; part.18584-fatigue 19887-results-stress1.jpg; part.18584-fatigue 19887-results-factor of safety1.jpg; part.18584-sideload 19887-results-stress1.jpg

Hello David

We revoked the certification for JWN197 today and advised Mr Wastney of our action. Subsequently he has supplied further information. Can you please provide comment on the further information.

Regards

Brian Sara

(IZTA Manager Vehicles

DDI: 04 901 6712

Mbl: [REDACTED]

Begin forwarded message:

From: Tom Logan <Tom.Logan@nzta.govt.nz>
Date: 25 October 2017 at 6:22:55 PM NZDT
To: Brian Sara <Brian.Sara@nzta.govt.nz>
Subject: Fwd: Certification investigation update

I believe that we should ask David Manley to comment on this.

----- Original message -----

(**From:** "Peter Wastney (PWE)" <peter@pwe.co.nz>
Date: 25/10/17 16:50 (GMT+12:00)
To: Tom Logan <Tom.Logan@nzta.govt.nz>
Subject: RE: Certification investigation update

These are plots for JWN 197 derived from the analysis forwarded to you!

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Wednesday, 25 October 2017 3:53 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Subject: FW: Certification investigation update

Hi Peter,

For your information and records, I have attached copies of letters sent to vehicle owners advising them of the revocation of six of your drawbeam certifications.

Regards,
Tom.

From: Tom Logan
Sent: Thursday, 19 October 2017 2:48 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Certification investigation update

Hi Peter,

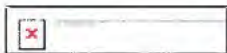
I am emailing to advise you of the status of our investigation into your certification activities.

We have now reviewed the 14 certification files you provided to us on 18 September 2017, which included having someone access the SolidWorks files on our behalf. We have determined that none of the 14 files you provided contained sufficient detail to enable a certification decision to be made, and five of them had FEA information that predicted failure and do not comply with requirements (stress past the yield point).

We plan to revoke five of these certifications, as indicated on the attached summary, and will write to the vehicle owners advising them of this. We are still considering what action we need to take for the remainder, it is likely at this stage we will need to revoke them as well. We are also considering what further investigation we need to take in respect to any other certifications you have made.

Regards,
Tom.

Tom Logan / Senior Advisor
Intervention Surety
E tom.logan@nzta.govt.nz / W nzta.govt.nz
National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand



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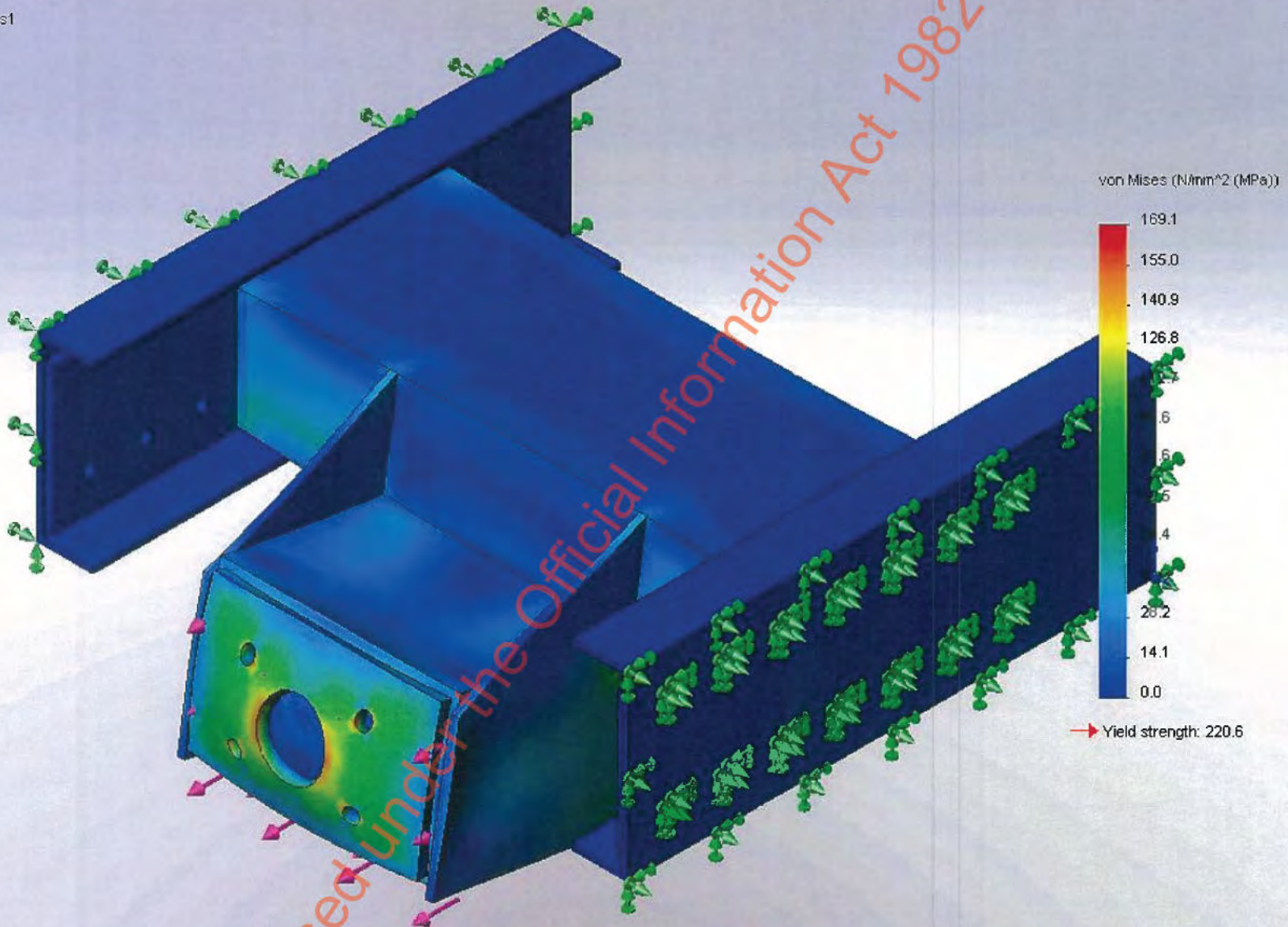


Virus-free. www.avast.com



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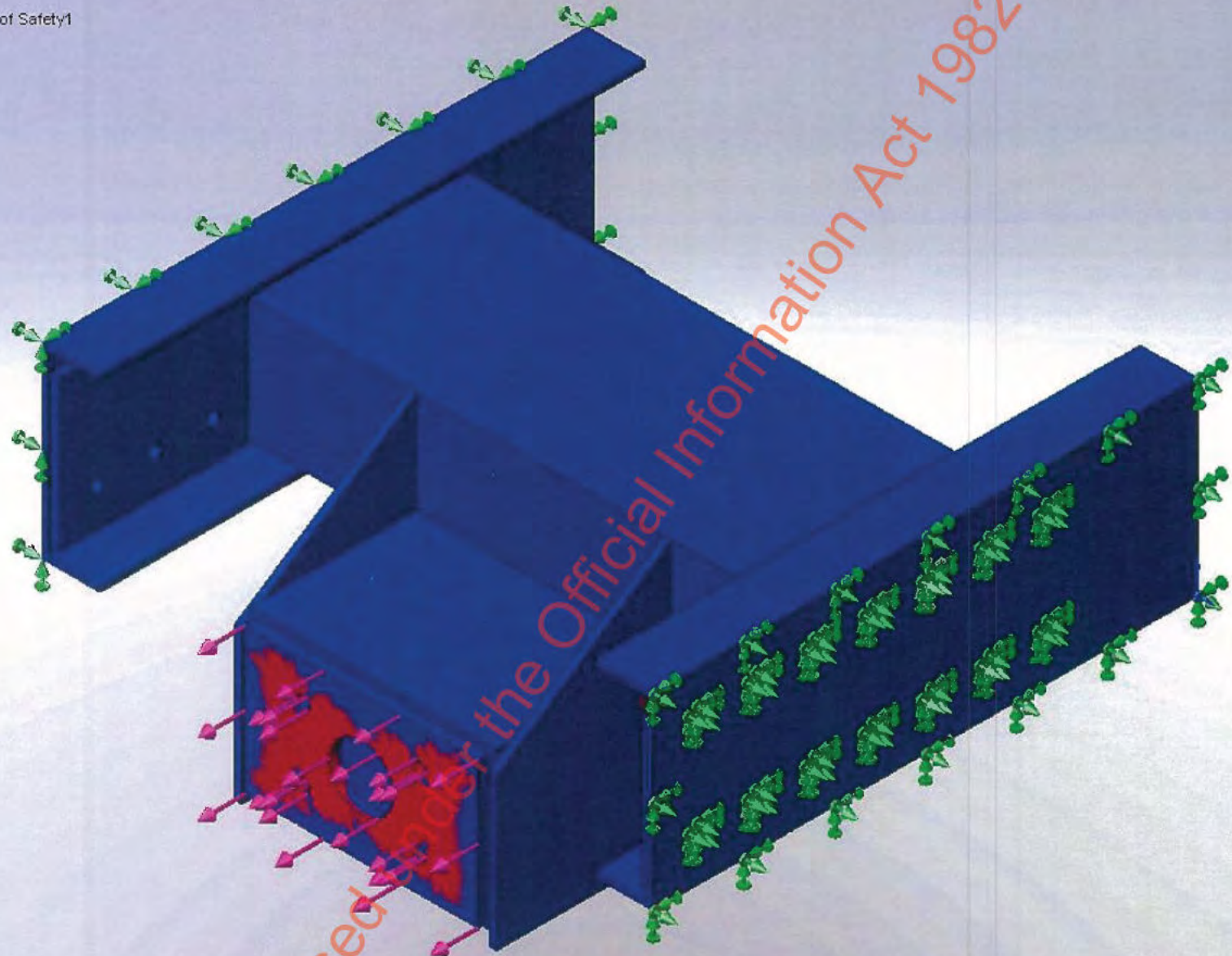
Model name: Part.18584
Study name: Fatigue 19887
Plot type: Static nodal stress Stress1
Deformation scale: 178.768



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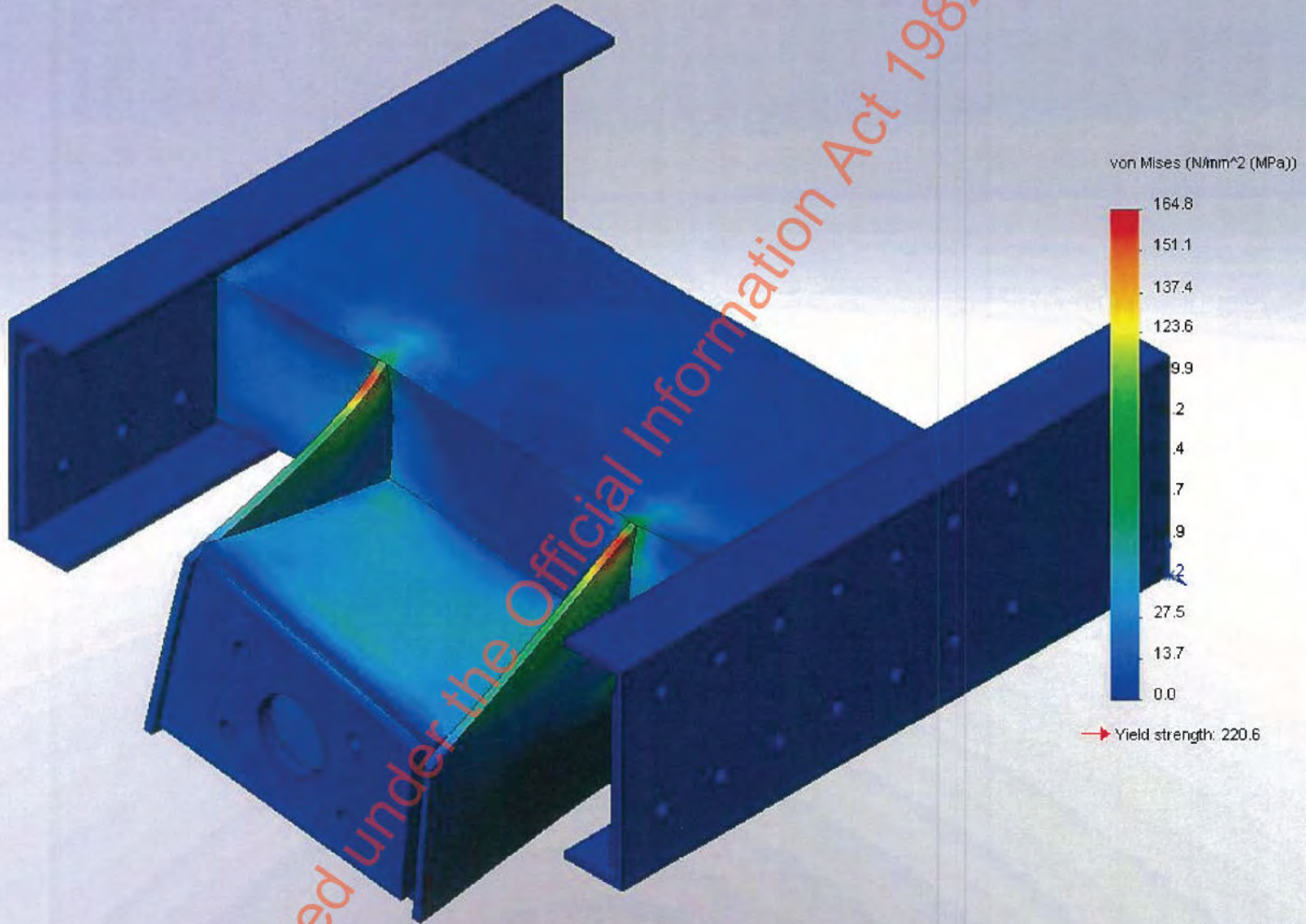
Model name: Part.18584
Study name: Fatigue 19887
Plot type: Factor of Safety Factor of Safety1
Criterion : Automatic
Red < FOS = 4 < Blue



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Model name: Part.16584
Study name: sideload 19887
Plot type: Static nodal stress Stress1
Deformation scale: 180.148



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Tom Logan

From: David Manley <david@thesandbox.co.nz>
Sent: Wednesday, 20 September 2017 10:30 a.m.
To: Tom Logan
Cc: Brian Sara
Subject: Re: P Wastney Files

Hi Brian, Tom

I managed to download the files. There are several designs which are concerning due to:

- Geometry
- Stress raisers
- Model outputs - stress levels
- Weld positions

Regards
David

Sent from my iPhone

On 19/09/2017, at 11:53 AM, Tom Logan <Tom.Logan@nzta.govt.nz> wrote:

Hi David, attached are the electronic files provided by Peter yesterday.

On his LT400 there is a drawing number reference, that seems to be like a job number and is what links the file.

Tom.

From: Brian Sara
Sent: Tuesday, 19 September 2017 1:26 p.m.
To: david@thesandbox.co.nz
Cc: Tom Logan
Subject: P Wastney Files

Hello David

Yesterday we issued a suspension notice to Peter Wastney and uplifted a further 14 files relating to 10 vehicles to be assessed as part of this investigation. We have had a look at the hard copies of the files and they have similar content to the drawbeam file you reviewed for us. We also have some electronic files which we would like you to review and let us know the following details:

1. Is there sufficient documentation available in the files (hard copy & electronic) to be considered a complete certification file?
2. Is there anything that suggests (without fully analysing the files) that the certification is unlikely to comply with the appropriate standard.

Once we have a preliminary overview, we will assess the next steps.

I will get Tom Logan who is assisting with this investigation to forward copies of the files to you for your assessment.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St

Private Bag 6995, Wellington 6141, New Zealand

<image001.jpg>

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<19770.xlsx>

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<Part.18381.SLDPRT>

<Part.19467.SLDDRW>

<Part.19501.SLDDRW>

<Part.19770.SLDDRW>

<Part.19770.SLDPRT>

<Part.19772.SLDDRW>

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<Part.19848.SLDDRW>

<Stability19770.SLDDRW>

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Tom Logan

From: david@thesandbox.co.nz
Sent: Thursday, 26 October 2017 9:47 a.m.
To: Brian Sara
Cc: Tom Logan
Subject: RE: Certification investigation update

Hi Brian, Tom,

Garbage in garbage out

The engineer did not supply these FEA printouts with the job files. However I reviewed the Solidworks FEA file, and the statements made in the PRS review include the FEA results. We did not generate FEA screenshots because we are reviewing the presented job file, not building it for the engineer.

FEA analysis include systemic faults found in original report

- Inappropriate boundary conditions.
- Poor mesh.
- Artificial reinforcing of plates.
- Insufficient detailing to allow weld analysis from FEA results.
- ~~Fatigue analysis not included in provided CAD file.~~ Pictures now provided, but the result is built on the incorrect material model and noted FEA faults.
- ~~No static longitudinal load in FEA file.~~ Pictures now provided, but show above noted systemic faults.

The engineer has not demonstrated any inspection was carried out on the Drawbeam; there is not one photo provided to show the drawing represents the fabricated item.

Please note the PRS review is not a statement of whether the drawbeam is or is not compliant with NZS5446; it is an assessment of whether the engineer has made the:

- Correct technical decision, by thoroughly inspecting the certified item,
- Correct technical competence - is their suitable detail in the design to support compliance
- Correct technical equipment

Kind regards,

DAVID MANLEY BE, MEngSt, MEngNZ
SENIOR CONSULTING ENGINEER

Heavy Vehicle Specialist Certifier (ID DMM)
Certification Categories: HVEA, HVEC, HVEK, HVEL, HVET, HVS1, HVS2, HVP1

287 Park Road
Hokowhitu
Palmerston North 4410

P 06 355 1777 M 021 829 435

www.thesandbox.co.nz

SANDBOX
CONSULTING



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From: Brian Sara [mailto:Brian.Sara@nzta.govt.nz]
Sent: Wednesday, 25 October 2017 6:37 PM
To: David Manley <david@thesandbox.co.nz>
Cc: Tom Logan <Tom.Logan@nzta.govt.nz>
Subject: Fwd: Certification investigation update

Hello David

We revoked the certification for JWN197 today and advised Mr Wastney of our action. Subsequently he has supplied further information. Can you please provide comment on the further information.

Regards
Brian Sara
NZTA Manager Vehicles
DDI: 04 901 6712
Mbl: [REDACTED]

Begin forwarded message:

From: Tom Logan <Tom.Logan@nzta.govt.nz>
Date: 25 October 2017 at 6:22:55 PM NZDT
To: Brian Sara <Brian.Sara@nzta.govt.nz>
Subject: Fwd: Certification investigation update

I believe that we should ask David Manley to comment on this.

----- Original message -----

From: "Peter Wastney (PWE)" <peter@pwe.co.nz>
Date: 25/10/17 16:50 (GMT+12:00)
To: Tom Logan <Tom.Logan@nzta.govt.nz>
Subject: RE: Certification investigation update

These are plots for JWN 197 derived from the analysis forwarded to you!

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Wednesday, 25 October 2017 3:53 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Subject: FW: Certification investigation update

Hi Peter,

For your information and records, I have attached copies of letters sent to vehicle owners advising them of the revocation of six of your drawbeam certifications.

Regards,
Tom.

From: Tom Logan
Sent: Thursday, 19 October 2017 2:48 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Certification investigation update

Hi Peter,

I am emailing to advise you of the status of our investigation into your certification activities.

We have now reviewed the 14 certification files you provided to us on 18 September 2017, which included having someone access the SolidWorks files on our behalf. We have determined that none of the 14 files you provided contained sufficient detail to enable a certification decision to be made, and five of them had FEA information that predicted failure and do not comply with requirements (stress past the yield point).

We plan to revoke five of these certifications, as indicated on the attached summary, and will write to the vehicle owners advising them of this. We are still considering what action we need to take for the remainder; it is likely at this stage we will need to revoke them as well. We are also considering what further investigation we need to take in respect to any other certifications you have made.


Regards,
Tom.

Tom Logan / Senior Advisor
Intervention Surety
E tom.logan@nzta.govt.nz / www.nzta.govt.nz
National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand



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Tom Logan

From: Tom Logan
Sent: Wednesday, 25 October 2017 3:51 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: RE: Certification investigation update
Attachments: Letter_HVSC_Revocation_Aratuna Freighters 25OCT2017.pdf;
Letter_HVSC_Revocation_Aratuna Freighters 20OCT2017.pdf;
Letter_HVSC_Revocation_Renwick Transport 20OCT2017.pdf

Hi Peter,

For your information and records, I have attached copies of letters sent to vehicle owners advising them of the revocation of six of your drawbeam certifications.

Regards,
Tom.

From: Tom Logan
Sent: Thursday, 19 October 2017 2:48 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Certification investigation update

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Regards,
Tom.

Tom Logan / Senior Advisor

Intervention Surety

E tom.logan@nzta.govt.nz / W nzta.govt.nz

National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand



 NZ TRANSPORT AGENCY
Wellington



25 October 2017

Aratuna Freighters Limited
PO Box 21,
Greymouth 7805

Dear [REDACTED]

Advice of revocation of heavy vehicle specialist certification

Following a review of the certification file relating to the certification in the table below, the NZ Transport Agency has determined that there was insufficient evidence within the certification file to support a certification decision.

Land Transport Rule: Heavy Vehicles 2004

4.4 Drawbeams and towbars

4.4(1) A drawbeam fitted to a vehicle used in a combination must, unless 4.2, 4.3 or 4.4(2) applies, comply with NZS 5446.

NZS 5446 requires that the stresses in the drawbeam structure do not exceed 60% of material's yield strength, however there is no evidence in the file that stress has been calculated.

LT400	Registration Number	Certification	VIN
607095	JWN197	Drawbeam	6F2SKAT00GDZ30005

Consequently, under delegated authority of Section 11.3(1)(b), Land Transport Rule: Vehicle Standards Compliance 2002 and in conjunction with Section 8.6(3), Land Transport Rule: Heavy Vehicles 2004, the Agency is hereby revoking the Heavy Vehicle Specialist Certification (LT400) for your vehicle.

Land Transport Rule: Vehicle Standards Compliance 2002

11.3 Revocation of evidence of vehicle inspection, conditional permits, certificates of loading, and records of determination

11.3(1) The Agency may revoke, by giving written notice to a vehicle's operator, evidence of vehicle inspection or a conditional permit or a record of determination issued under this rule if the Agency is satisfied, on reasonable grounds, that:

- (b) the evidence of vehicle inspection or permit or record of determination was issued on the basis of an incorrect determination.

Land Transport Rule: Heavy Vehicles 2004

8.6 Functions and powers of the Agency

8.6(3) The Agency may, by giving written notice, revoke a record of determination that a specific aspect of a vehicle complies with applicable requirements, if the Agency is satisfied on reasonable grounds that the specific aspect does not comply with applicable requirements.

If your vehicle is to resume towing operation, it is likely that it will need to be modified to comply with the Heavy Vehicles Rule's requirements regarding drawbeams. As the owner of the vehicles, any work required to bring the vehicle back to compliance will need to be managed by you.

A copy of this notification will also be sent to the certifier, Peter Wastney of Peter Wastney Engineering Ltd., Nelson. If you have any questions, please feel free to contact me

Yours sincerely

[REDACTED]
Brian Sara
Manager Vehicles

NATIONAL OFFICE
50 Victoria Street
Private Bag 6995
Wellington 6141
New Zealand
T 64 4 894 5400
F 64 4 894 6100
www.nzta.govt.nz

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20 October 2017

██████████
Aratuna Freighters Limited
PO Box 21,
Greymouth 7805

NATIONAL OFFICE
50 Victoria Street
Private Bag 6995
Wellington 6141
New Zealand
T 64 4 894 5400
F 64 4 894 6100
www.nzta.govt.nz

Dear ██████████

Advice of revocation of heavy vehicle specialist certifications

Following a review of the certification files relating to the certifications in the table below, the NZ Transport Agency has determined that there was evidence within those certification files that if accurate suggests the drawbeams do not in fact meet the required standard.

Land Transport Rule: Heavy Vehicles 2004

4.4 Drawbeams and towbars

4.4(1) A drawbeam fitted to a vehicle used in a combination must, unless 4.2, 4.3 or 4.4(2) applies, comply with NZS 5446.

NZS 5446 requires that the stresses in the drawbeam structure do not exceed 60% of material's yield strength, and in each of the files there was evidence that this yield strength was exceeded.

LT400	Registration Number	Certification	VIN
348824	██████████	Drawbeam	██████████
476767	██████████	Drawbeam	██████████
524109	██████████	Drawbeam	██████████
580066	██████████	Drawbeam	██████████

Consequently, under delegated authority of Section 11.3(1)(b), Land Transport Rule: Vehicle Standards Compliance 2002 and in conjunction with Section 8.6(3), Land Transport Rule: Heavy Vehicles 2004, the Agency is hereby revoking the Heavy Vehicle Specialist Certification (LT400) for your vehicles.

Land Transport Rule: Vehicle Standards Compliance 2002

11.3 Revocation of evidence of vehicle inspection, conditional permits, certificates of loading, and records of determination

11.3(1) The Agency may revoke, by giving written notice to a vehicle's operator, evidence of vehicle inspection or a conditional permit or a record of determination issued under this rule if the Agency is satisfied, on reasonable grounds, that:

- (b) the evidence of vehicle inspection or permit or record of determination was issued on the basis of an incorrect determination.

Land Transport Rule: Heavy Vehicles 2004

8.6 Functions and powers of the Agency

8.6(3) The Agency may, by giving written notice, revoke a record of determination that a specific aspect of a vehicle complies with applicable requirements, if the Agency is satisfied on reasonable grounds that the specific aspect does not comply with applicable requirements.

If your vehicles are to resume towing operation, it is likely that they will need to be modified to comply with the Heavy Vehicles Rule's requirements regarding drawbeams. As the owner of the vehicles, any work required to bring the vehicle back to compliance will need to be managed by you.

A copy of this notification will also be sent to the certifier, Peter Wastney of Peter Wastney Engineering Ltd., Nelson. If you have any questions, please feel free to contact me.

Yours sincerely

██████████
Brian Sara
Manager Vehicles

20 October 2017

NATIONAL OFFICE
50 Victoria Street
Private Bag 6995
Wellington 6141
New Zealand
T 64 4 894 5400
F 64 4 894 6100
www.nzta.govt.nz

██████████
Renwick Transport Limited
PO Box 48216
Renwick 7243

Dear ██████████

Advice of revocation of heavy vehicle specialist certifications

Following a review of the certification file relating to the certification in the table below, the NZ Transport Agency has determined that there was evidence within that certification file that if accurate suggests the drawbeam does not in fact meet the required standard.

Land Transport Rule: Heavy Vehicles 2004

4.4 Drawbeams and towbars

4.4(1) A drawbeam fitted to a vehicle used in a combination must, unless 4.2, 4.3 or 4.4(2) applies, comply with NZS 5446.

NZS 5446 requires that the stresses in the drawbeam structure do not exceed 60% of material's yield strength, and in the file there was evidence that this yield strength was exceeded.

LT400	Registration Number	Certification	VIN
602651	██████████	Drawbeam	██████████

Consequently, under delegated authority of Section 11.3(1)(b), Land Transport Rule: Vehicle Standards Compliance 2002 and in conjunction with Section 8.6(3), Land Transport Rule: Heavy Vehicles 2004, the Agency is hereby revoking the Heavy Vehicle Specialist Certification (LT400) for your vehicle.

Land Transport Rule: Vehicle Standards Compliance 2002

11.3 Revocation of evidence of vehicle inspection, conditional permits, certificates of loading, and records of determination

11.3(1) The Agency may revoke, by giving written notice to a vehicle's operator, evidence of vehicle inspection or a conditional permit or a record of determination issued under this rule if the Agency is satisfied, on reasonable grounds, that:

- (b) the evidence of vehicle inspection or permit or record of determination was issued on the basis of an incorrect determination.

Land Transport Rule: Heavy Vehicles 2004

8.6 Functions and powers of the Agency

8.6(3) The Agency may, by giving written notice, revoke a record of determination that a specific aspect of a vehicle complies with applicable requirements, if the Agency is satisfied on reasonable grounds that the specific aspect does not comply with applicable requirements.

If your vehicle is to resume towing operation, it is likely that it will need to be modified to comply with the Heavy Vehicles Rule's requirements regarding drawbeams. As the owner of the vehicle, any work required to bring the vehicle back to compliance will need to be managed by you.

A copy of this notification will also be sent to the certifier, Peter Wastney of Peter Wastney Engineering Ltd., Nelson. If you have any questions, please feel free to contact me.

Yours sincerely

██████████
Brian Sara
Manager Vehicles

Tom Logan

From: Tom Logan
Sent: Thursday, 2 November 2017 12:17 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Request for your comments regarding certification file issues identified
Attachments: Letter - P Wastney - request for explanation - 2 Nov - 2017.pdf

Tracking:	Recipient	Delivery	Read
	Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)		
	Brian Sara	Delivered: 2/11/2017 12:17 p.m.	Read: 2/11/2017 12:46 p.m.

Hi Peter,

Attached is a letter requesting your comments as part of our investigation into your heavy vehicle specialist certification activities.

As per the letter, please reply by 27 November 2017 at the latest so that your comments can be taken into account.

Regards,
Tom.

Tom Logan / Senior Advisor

Intervention Surety

P 04 894 5083

E tom.logan@nzta.govt.nz / W nzta.govt.nz

National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand



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2 November 2017

Mr P L Wastney

Peter Wastney Engineering Ltd
222 Wakapuaka Road
RD1
NELSON

Dear Mr Wastney

HEAVY VEHICLE SPECIALIST CERTIFICATION: Request for comment

Thank you for providing to the NZ Transport Agency your full certification files including the LT400, and/or Statements of Design Compliance (SODC), and all supporting documentation including any electronic files, as requested under various Section 198 letters to you from Brian Sara, Manager Vehicles.

You have previously advised, in an email dated 26 September 2017, that LT400 554622 was issued in error to a non-compliant vehicle. Partly based on this, a Senior Adjudicator made the decision to immediately suspend you as a heavy vehicle specialist certifier while a further investigation into your certification activities could be completed. As part of this investigation we have reviewed the other 15 certification files provided to determine if the error was a one-off mistake, or potentially a systematic failure in your certification process.

The 16 certification files reviewed to date are the following, as supplied by you to the Transport Agency:

LT400	Registration Number
348824	████████
413739	████████
476767	████████
524109	████████
543749	████████
550345	████████
554622	JWN197
580066	████████
580090	████████
599489	████████
599490	████████
599491	████████
599495	████████
602651	████████
602682	████████
607095	JWN197

The certification files requested for review were selected to focus on drawbeams, but also to cover a wider selection of certification categories. This was specifically done to establish if there were any issues across other categories within your certification files.

These reviews confirm that none of the certification files you provided are sufficient to base a valid certification decision on. Some seem to predict failure and yet you have proceeded to certify the vehicle anyway. This letter is a request for you to provide comment on these findings, in case we have misinterpreted your files.

Systematic certification file issues:

There appear to be some systematic shortfalls in all 16 of the certification files provided, which we have summarised below and would like general responses to.

- Lack of detail photos (component or installation)
- Lack of fabrication / installation instructions
- Lack of calculations
 - Drawbeam calculations
 - Chassis / drawbeam calculations
 - Towbar calculations
 - Fifth wheel calculations
- Lack of bolt load analysis
- Lack of weld analysis
- No drawing of Fifth wheel fitment detail or specification of fitment
- Lack of welder ID and qualifications
- Lack of loading data - NZS 5446
- Lack of vehicle layout drawings
- FEA analysis
 - Inappropriate boundary conditions.
 - Poor mesh.
 - Artificial reinforcing of plates.
 - Insufficient detailing to allow weld analysis from FEA results.
 - Fatigue analysis not included in provided CAD file.

Specific certification file issues:

Below are some specific certifications and documentation that concern us, and we would like your comments on these in detail.

LT400 543749 - Registration number [REDACTED]

In this certification file there is an email dated 26 April 2016 from Haley Bill to you with certain details about a Fifth wheel installation, requesting that you send a LT400 to "[REDACTED]" at VTNZ asap". There were three photos attached to this email. Your LT400 is dated 26 April 2016. Your letter of certification to Aratuna Freighters, also dated 26 April 2016, has three photos in it.

It appears to us that you were sent photos and details of installation of this Fifth wheel, which you have then used to complete the record of determination (LT400 543749) perhaps without carrying out a vehicle inspection. Can you clarify this situation please.

LT400 348824 - Registration number [REDACTED]

Files Provided

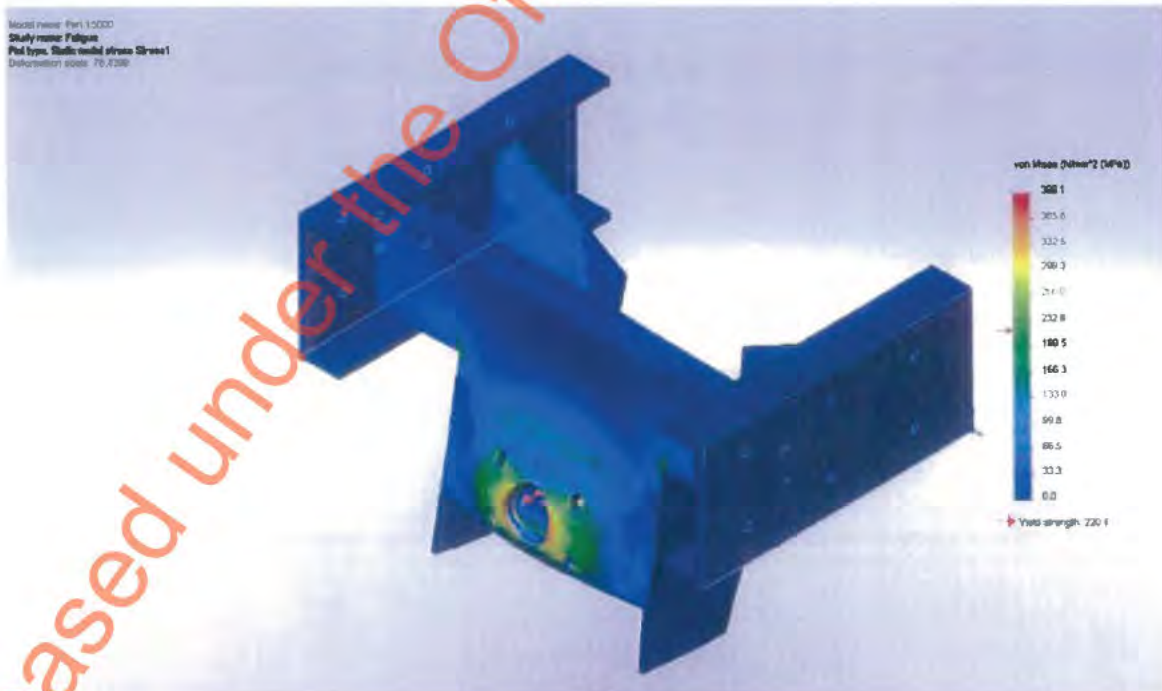
- Solidworks drawing file - no CAD file
- Drawbeam LT400 Certificate
- PWE PDS Sheet
- FEA/Fatigue photos

Certification Documentation inadequacies

- No photos of drawbeam fitted to vehicle - bolted connections or welds.
- No confirmation that the correct bolts/washers were used.
- No drawbeam calculations.
- No vehicle layout drawing - to confirm legal position.
- No FEA validation calculations/justification.
- No loading data - NZS 5446.
- No bolt load analysis.
- No weld analysis.

The information provided to support your certification decision is inadequate; on what basis did you determine that the drawbeam meets NZS 5446?

In particular the image below is from your certification file for LT400 348824. For fatigue compliance stress should be no more than 60% of yield strength according to AS 3990, however the FEA image shows stress levels above yield. Is this correct, and if so why did you proceed to certify the drawbeam?



LT400 476767 - Registration number [REDACTED]

Files Provided

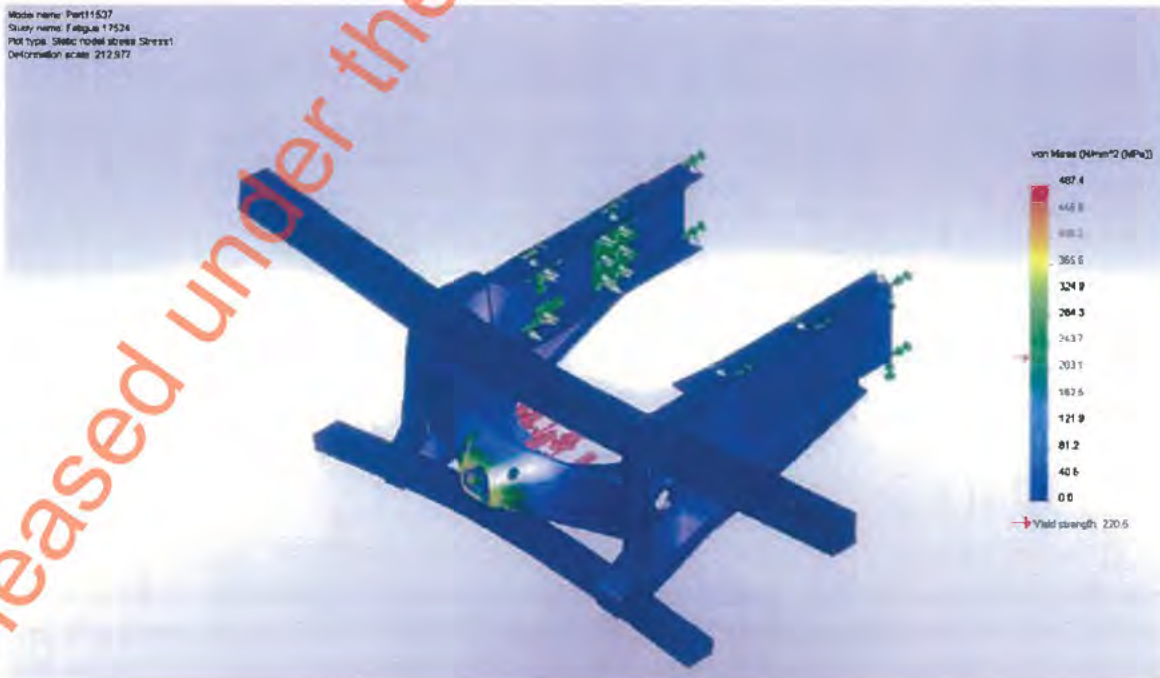
- Fax of hubometer history
- Drawbeam certificate 5775-17524
- LT400 Certificate
- PWE PDS
- Drawings
- FEA pictures

Certification Documentation

- No detailed photos of fabricated drawbeam.
- No detailed photos of drawbeam fitted to vehicle - bolted connections or welds.
- No confirmation that the correct bolts/washers were used.
- No chassis calculations.
- No drawbeam calculations.
- No vehicle layout drawing - to confirm legal position.
- Minimal FEA data.
- No FEA validation calculations/justification.
- No loading data - NZS 5446.
- No bolt load analysis.
- No weld analysis.

The information provided to support your certification decision is inadequate; on what basis did you determine that the drawbeam meets NZS 5446?

In particular the image below is from your certification file for LT400 476767. According to AS 3990, for fatigue compliance stress should be no more than 60% of yield strength, however the FEA image shows stress levels above yield. Is this correct, and if so why did you proceed to certify the drawbeam?



LT400 602682 - Registration number [REDACTED]

Files Provided

- LT400 Certificate
- PWE PDS
- Landata output
- Solidworks drawing file - no CAD file

Certification Documentation

- No detailed photos of fabricated drawbeam.
- No detailed photos of drawbeam fitted to vehicle - bolted connections or welds.
- No confirmation that the correct bolts/washers were used.
- No chassis calculations.
- No drawbeam calculations.
- No vehicle layout drawing - to confirm legal position.
- No FEA data.
- No FEA validation calculations/justification.
- No loading data - NZS 5446.
- No bolt load analysis.
- No weld analysis.

The information provided to support your certification decision is inadequate, in particular you have not included any FEA files or analysis; on what basis did you determine that the drawbeam meets NZS 5446?

LT400 607095 - Registration number JWN197 (Replacement drawbeam following failure)

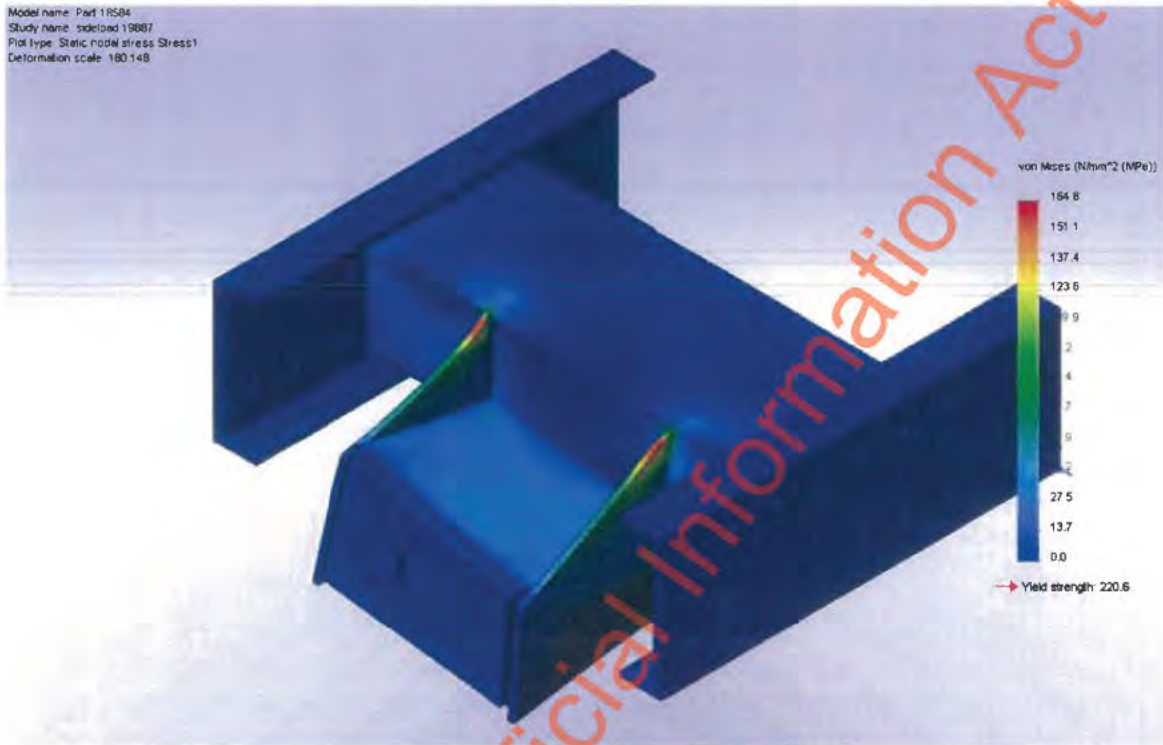
Files Provided

- LT400 Certificate
- PWE PDS
- Solidworks CAD/FEA model
- Solidworks drawing file
- FEA pictures (supplied later, not part of certification file provided following request)

Certification Documentation

- No photos of drawbeam fitted to vehicle - bolted connections or welds.
- No confirmation that correct bolts/washers were used.
- No drawbeam calculations.
- No vehicle layout drawing - to confirm legal position.
- No FEA validation calculations/justification.
- No loading data - NZS 5446.
- No bolt load analysis.
- No weld analysis.
- FEA analysis
 - Inappropriate boundary conditions.
 - Poor mesh.
 - Artificial reinforcing of plates.
 - Insufficient detailing to allow weld analysis from FEA results.
 - Fatigue analysis not included in provided CAD file, pictures provided later
 - No static longitudinal load in FEA file initially provided, pictures provided later

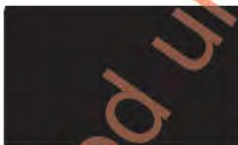
In particular the image below is from your certification file for LT400 607095. For fatigue compliance stress should be no more than 60% of yield strength according to AS 3990. For a yield strength of 220MPa that would be 132MPa, however the FEA image shows stress levels above this – in the region of 150MPa. Is this correct, and if so why did you proceed to certify the drawbeam?



Please reply by the 27th of November 2017 at the latest so that your comments can be taken into account as part of this investigation, and my progress update to the Senior Adjudicator.

If you have any queries about this letter, please email me at tom.logan@nzta.govt.nz, or phone me on 04 894 5083.

Yours sincerely



Tom Logan
Senior Advisor Complaints

Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Thursday, 23 November 2017 9:09 p.m.
To: Tom Logan
Subject: RE: Request for your comments regarding certification file issues identified
Attachments: LTNZ Reply.doc; 19848.xls; 15000.xls

Follow Up Flag: FollowUp
Flag Status: Flagged

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Thursday, 2 November 2017 12:17 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Request for your comments regarding certification file issues identified

Hi Peter,

Attached is a letter requesting your comments as part of our investigation into your heavy vehicle specialist certification activities.

As per the letter, please reply by 27 November 2017 at the latest so that your comments can be taken into account.

Regards,
Tom.

Tom Logan / Senior Advisor


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Tom Logan

From: Tom Logan
Sent: Monday, 27 November 2017 12:35 p.m.
To: david@thesandbox.co.nz
Cc: Brian Sara
Subject: FW: Request for your comments regarding certification file issues identified
Attachments: LTNZ Reply.doc; 19848.xls; 15000.xls

Hi David,

I have received this reply from Mr Wastney and have started to read through it, but would appreciate your comments as well - particularly around the claim that there are full analysis files supplied (with the SolidWorks files provided).

Thanks and regards,
Tom.

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Thursday, 23 November 2017 9:09 p.m.
To: Tom Logan
Subject: RE: Request for your comments regarding certification file issues identified

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Thursday, 2 November 2017 12:17 p.m.
To: Peter Wastney (PWE) <peter@pwe.co.nz> (peter@pwe.co.nz)
Cc: Brian Sara
Subject: Request for your comments regarding certification file issues identified

Hi Peter,

Attached is a letter requesting your comments as part of our investigation into your heavy vehicle specialist certification activities.

As per the letter, please reply by 27 November 2017 at the latest so that your comments can be taken into account.

Regards,
Tom.

Tom Logan / Senior Advisor

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7/12/2017

Land Transport Agency,
Private Bag 6995,
Wellington 6141

Re Heavy Vehicle Specialist Certification – Request for Comment
Systematic Certification File Issues

Lack of Detail Photos

I have considered that appropriate photos have been included where necessary. I have had many reviews with John Long, and always followed his direction in this regard.

Lack of Fabrication /Installation instructions.

I have considered that appropriate detail has been included where necessary. I have had many reviews with John Long, and always followed his direction in this regard.

Lack of Calculations.

Drawbeam Calculations.

Drawbeam Calculations have been carried out by Cosworks running under Solidworks, the files being saved under the model file that was forwarded to you. I do not understand why you cannot read these files, I have no difficulty on my computer. Snapshot plots are also saved under Coswork files, these seem to be what you are referring to in comments, but you had full analysis files supplied.

Chassis/ Drawbeam Calculations.

Chassis calculations are carried out by Excel Files, and stored separately to the main certification documentation, with only results data included in the latter file. I believe that all files requested were supplied. Again, these have been regularly reviewed by John Long over many years, and his direction has been followed. Comment re Drawbeam Calculation is as above.

Towbar Calculations.

Towbar Calculations have been carried out by Cosworks running under Solidworks, the files being saved under the model file that was forwarded to you. I do not understand why you cannot read these files, I have no difficulty on my computer. Snapshot plots are also saved under Coswork files, these seem to be what you are referring to in comments, but you had full analysis files supplied. Neil McAlpine called for two further files on 22nd November, files were copied in the same way, and in Neil's presence, analysis files were opened from his removable storage device

Fifth Wheel Calculations.

Calculations as required by NZS 5450 have been included in the documentation supplied.

Lack of Bolt Load Analysis

Bolt Analysis is retained on all jobs as a separate Exel file, and not included in the main certification file. I apologise for not including these with your request for data, but I can assure you that they are all available, and have been regularly reviewed by John Long at Audit.

Lack of Weld Analysis.

Weld Calculations have been carried out by Cosworks running under Solidworks, the files being saved under the model file that was forwarded to you. I do not understand why you cannot read these files, I have no difficulty on my computer. Snapshot plots are also saved under Coswork files, these seem to be what you are referring to in comments, but you had full analysis files supplied. Neil McAlpine called for two further files on 22nd November, files were copied in the same way, and in Neil's presence, analysis files were opened from his removable storage device

No Drawing of Fifth Wheel Fitment detail or Specification of Fitment.

Detail is included in documentation supplied. This has been reviewed over many years by John Long at Audit, and his direction has always been followed.

Lack of Welder ID and qualifications.

Welder Qualification is retained on all jobs as a separate file, and not included in the main certification file. I apologise for not including these with your request for data, but I can assure you that they are all available, and have been regularly reviewed by John Long at Audit.

Lack of Loading Data NZS 5446

The Cosmos analysis data supplied includes the loading as required from NZS 5446.

FEA Analysis

Inappropriate boundary conditions.

NZS 5446 is silent on appropriate boundary conditions, whether by analytical or FEA Analysis. I believe the conditions employed were appropriate, this has been reviewed many times by John Long at Audit, and I have always followed his direction.

Poor Mesh

Mesh has generally been at programme default settings. Programme supplier has issued me with comparative data between their analysis on this basis with classical analytical solutions, with very high correspondence of results.

Artificial reinforcing of plates.

This occurs where adjacent plates are touching, but otherwise not connected. The analysis assumes such contact to be a bonding. Special attention is required in evaluating the analysis where this occurs.

Insufficient detailing to allow weld analysis from FEA Results.

I cannot understand why you cannot obtain this, as I believe complete files were forwarded.

Fatigue analysis not included in provided CAD Files.

I cannot understand why you cannot access these, as I believe all files were included.

LT 400 543749 Registration [REDACTED].

LT 400 was issued on the 26th April, 2016, based on the photos supplied by Aratuna Freighters. From my dairy notes, I inspected this vehicle when in Greymouth on 20th April, and discussed with Aratuna how the new turntable could mount directly onto the Existing Mounts. I was again in Greymouth on 11th May 2016 when I carried out final inspection, confirming mounting as recorded.

LT400 348824 Registration No. [REDACTED]

No photos of drawbeam fitted to vehicle, bolted connections or welds.

These were all contained in field sketches.

No confirmation that the correct bolts/washers were used.

These were unchanged from original manufacture and certification by Mills Tui.

No drawbeam calculations

I believed all these were included in supply to you. They are attached to this reply.

No vehicle layout drawing – to confirm legal position

This was unchanged from original certification by Mills Tui.

No FEA validation calculations/ justification.

I believed these were all included in information supplied. Details are attached. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No Loading data – NZS 5446

Loading data as analysed is included in the attached file, which I believed was supplied to you.

No Bolt Load Analysis.

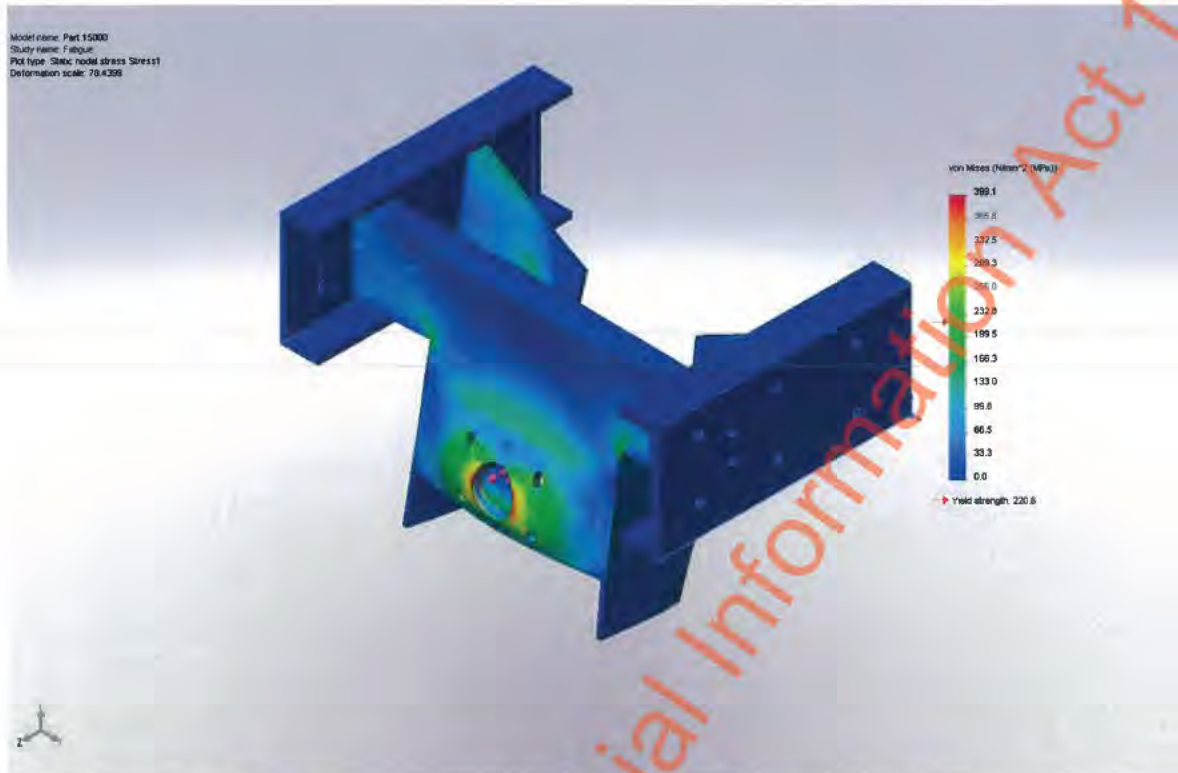
Bolt Load analysis is held on a separate Excel file to the main certification documents supplied to you, and was not included. This analysis is now attached.

No weld analysis.

Weld analysis was included in attached data, which was believed to be supplied.

You included the following screen plot from analysis, and query stress levels being higher than 60% of yield.

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This plot shows the loading as prescribed by NZS 5446 applied to the area bounded by the towing coupling flanges. This is not quite correct, as this area is clamped by the flanges. A more representative result would be obtained by applying this load as a rigidly applied load, or by modelling the actual coupling onto the drawbeam. However, both of these methods have drawbacks. It can be shown that so long as the section being bolted through is at least 16mm thick, there is no problem in the section of the drawbeam contained within the coupling flange meeting NZS 5446 loading. In analysing this plot, therefore, the stresses bounded by the coupling flange may be ignored. In this case, it can be seen that drawbeam stresses are actually within the 60% threshold of Yield Stress. If you have concerns about the strength of this drawbeam, perhaps you should also check Mills Tui File 197607, as the drawbeam was unchanged from this original certification.

LT 400 476767 Registration number [REDACTED]

No photos of drawbeam fitted to vehicle, bolted connections or welds.

These were all contained in field sketches.

No confirmation that the correct bolts/washers were used.

These were new and confirmed to be as drawn.

No drawbeam calculations

I believed all these were included in supply to you. They are attached to this reply. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No vehicle layout drawing – to confirm legal position

This was inspected and confirmed as complying

No FEA validation calculations/ justification.

I believed these were all included in information supplied. Details are attached.

No Loading data – NZS 5446

Loading data as analysed is included in the attached file, which I believed was supplied to you.

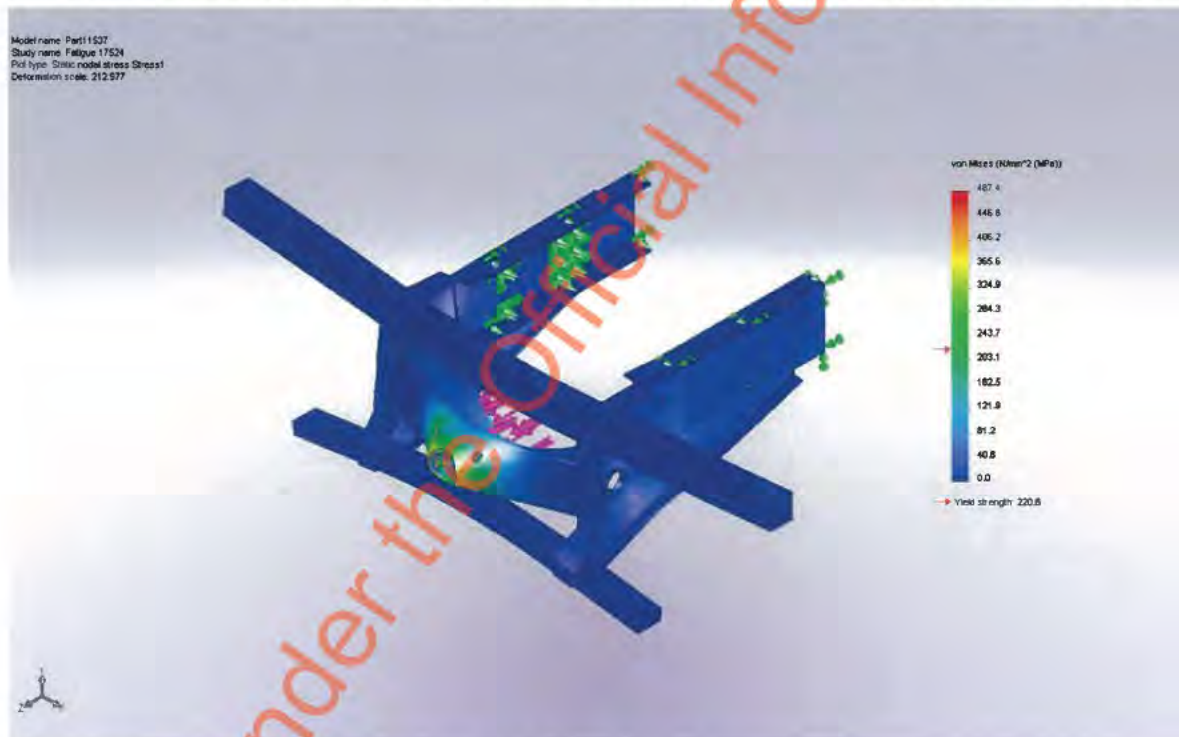
No Bolt Load Analysis.

Bolt Load analysis was overlooked for this mounting, but with 12 pair of 16⁺ bolts over a 644mm x 130mm pattern is known to be well within requirements..

No weld analysis.

Weld analysis was included in attached data, which was believed to be supplied.

You included the following screen plot from analysis, and query stress levels being higher than 60% of yield.



This plot shows the loading as prescribed by NZS 5446 applied to the area bounded by the towing coupling flanges. This is not quite correct, as this area is clamped by the flanges. A more representative result would be obtained by applying this load as a rigidly applied load, or by modelling the actual coupling onto the drawbeam. However, both of these methods have drawbacks. It can be shown that so long as the section being bolted through is at least 16mm thick, there is no problem in the section of the drawbeam contained within the coupling flange meeting NZS 5446 loading. In analysing this plot, therefore, the stresses bounded by the coupling flange may be ignored. In this case, it can be seen that drawbeam stresses are actually within the 60% threshold of Yield Stress.

No photos of drawbeam fitted to vehicle, bolted connections or welds.

These were all contained in field sketches.

No confirmation that the correct bolts/washers were used.

These were unchanged from original manufacture by [REDACTED] Engineering, where correct bolts were fitted.

No drawbeam calculations

I believed all these were included in supply to you. They are attached to this reply. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No vehicle layout drawing – to confirm legal position

This was unchanged from original certification after manufacture by [REDACTED]

No FEA validation calculations/ justification.

I believed these were all included in information supplied. Details are attached. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No Loading data – NZS 5446

Loading data as analysed is included in the attached file, which I believed was supplied to you.

No Bolt Load Analysis.

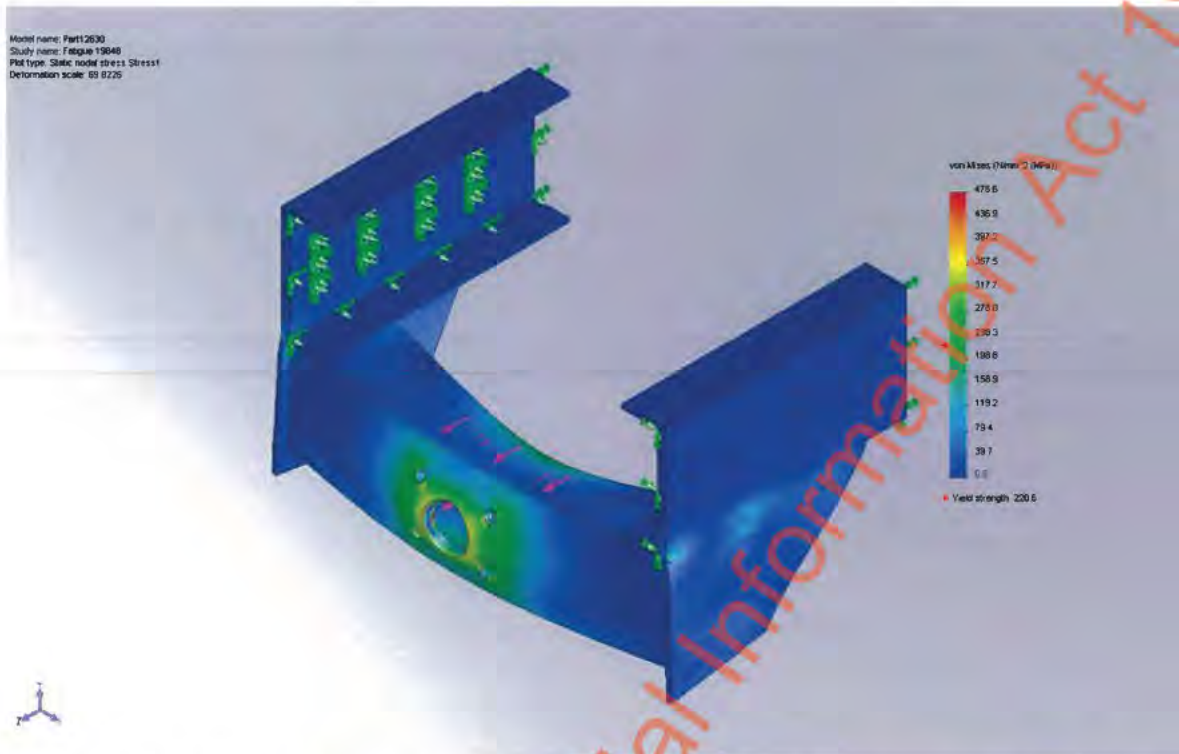
Bolt Load analysis is held on a separate Excel file to the main certification documents supplied to you, and was not included. This analysis is now attached.

No weld analysis.

Weld analysis was included in attached data, which was believed to be supplied.

You did not include the following screen plot from analysis, but again stress levels being higher than 60% of yield.

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This plot shows the loading as prescribed by NZS 5446 applied to the area bounded by the towing coupling flanges. This is not quite correct, as this area is clamped by the flanges. A more representative result would be obtained by applying this load as a rigidly applied load, or by modelling the actual coupling onto the drawbeam. However, both of these methods have drawbacks. It can be shown that so long as the section being bolted through is at least 16mm thick, there is no problem in the section of the drawbeam contained within the coupling flange meeting NZS 5446 loading. In analysing this plot, therefore, the stresses bounded by the coupling flange may be ignored. In this case, it can be seen that drawbeam stresses are actually within the 60% threshold of Yield Stress.

LT400 607095- Registration No JWN197 (Replacement Drawbeam following Failure)

No photos of drawbeam fitted to vehicle, bolted connections or welds.

These were all contained in field sketches.

No confirmation that the correct bolts/washers were used.

These were unchanged from original manufacture by [REDACTED] Engineering, where correct bolts were fitted.

No drawbeam calculations

I believed all these were included in supply to you. They are attached to this reply. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No vehicle layout drawing – to confirm legal position

This was unchanged from original certification after manufacture by [REDACTED]

No FEA validation calculations/ justification.

I believed these were all included in information supplied. Details are attached. It seems incongruous that you claim no analysis was forwarded, yet comment on Inappropriate boundary conditions, Poor mesh, Artificial reinforcing Plates, Insufficient detailing to allow weld analysis from FEA results under systematic certification file issues.

No Loading data – NZS 5446

Loading data as analysed is included in the attached file, which I believed was supplied to you.

No Bolt Load Analysis.

Bolt Load analysis is held on a separate Excel file to the main certification documents supplied to you, and was not included. This analysis is now attached.

No weld analysis.

Weld analysis was included in attached data, which was believed to be supplied.

FEA Analysis

Inappropriate boundary conditions.

NZS 5446 is silent on appropriate boundary conditions, whether by analytical or FEA Analysis. I believe the conditions employed were appropriate, this has been reviewed many times by John Long at Audit, and I have always followed his direction.

Poor Mesh

Mesh has generally been at programme default settings. Programme supplier has issued me with comparative data between their analysis on this basis with classical analytical solutions, with very high correspondence of results.

Artificial reinforcing of plates.

This occurs where adjacent plates are touching, but otherwise not connected. The analysis assumes such contact to be a bonding. Special attention is required in evaluating the analysis where this occurs.

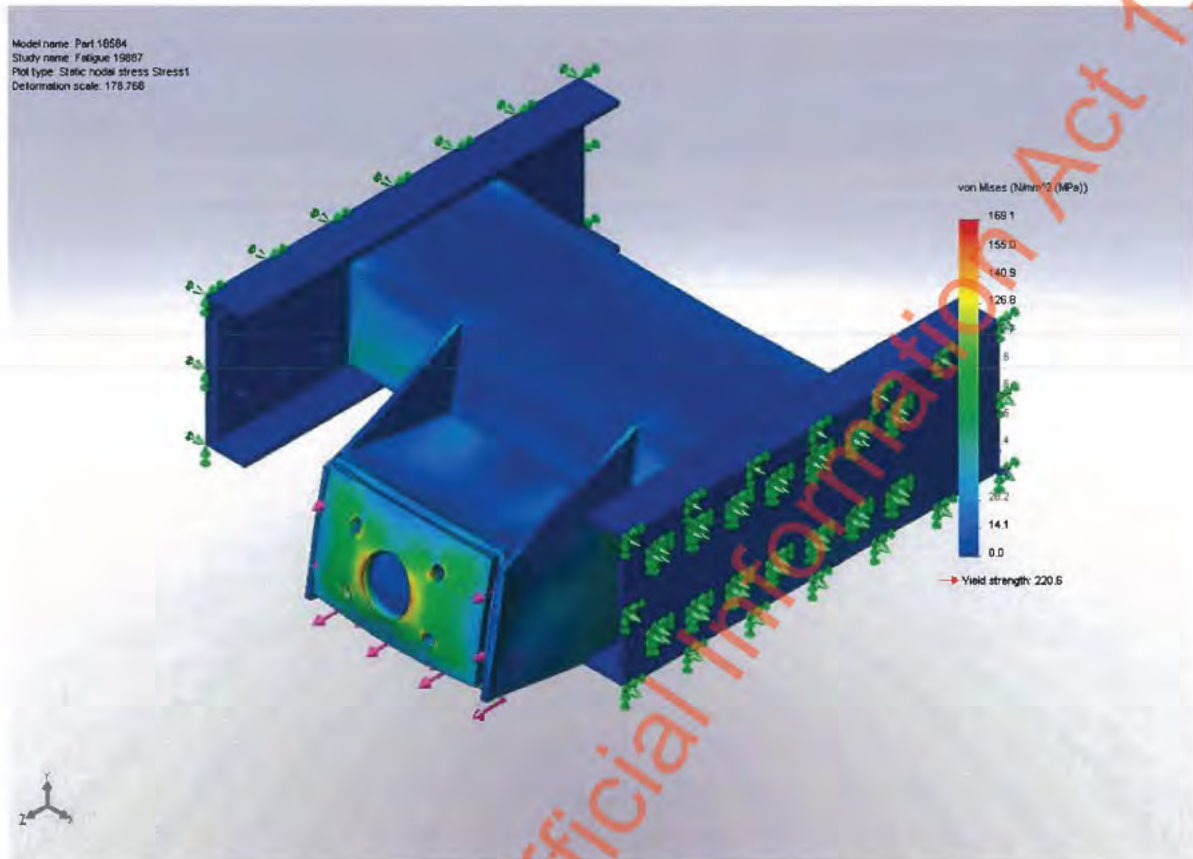
Insufficient detailing to allow weld analysis from FEA Results.

I cannot understand why you cannot obtain this, as I believe complete files were forwarded.

Fatigue analysis not included in provided CAD Files.

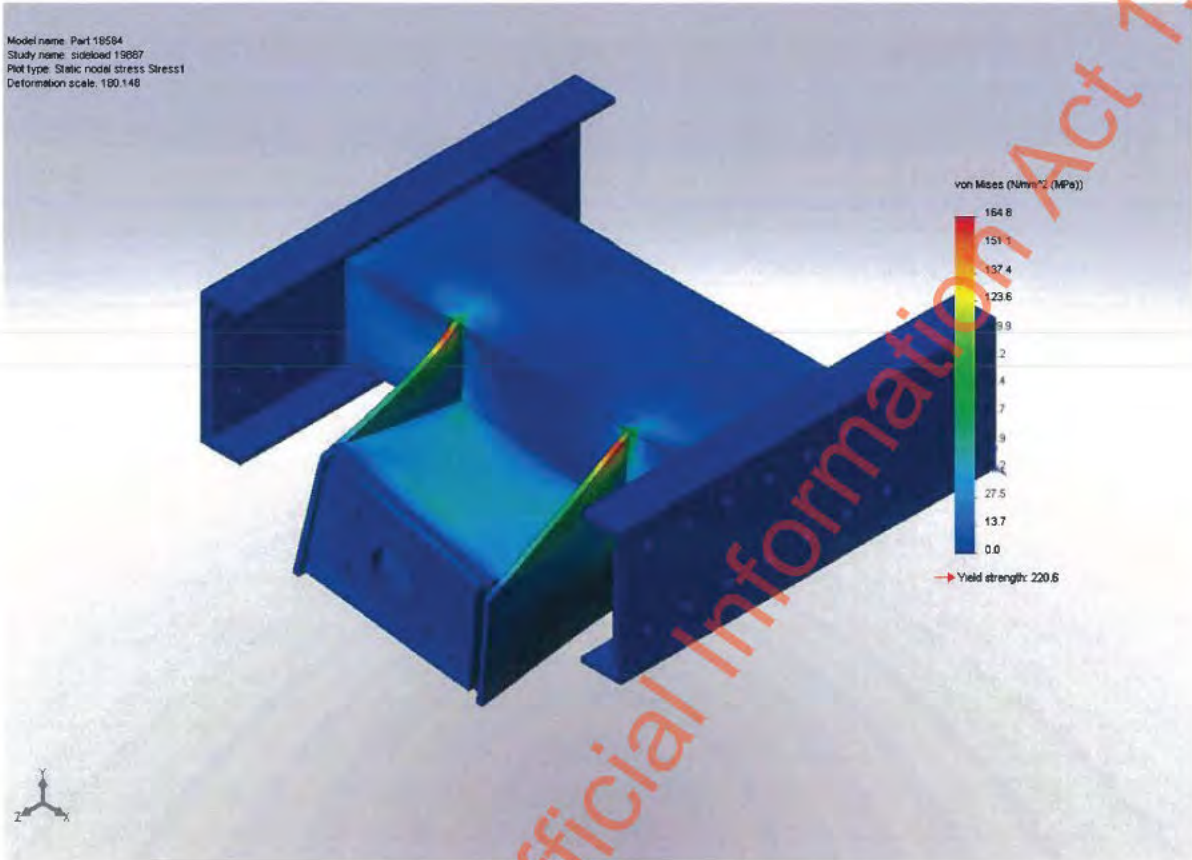
I cannot understand why you cannot access these, as I believe all files were included.

You did not include the following screen plot from analysis, but again stress levels being higher than 60% of yield.



This plot shows the loading as prescribed by NZS 5446 applied to the area bounded by the towing coupling flanges. This is not quite correct, as this area is clamped by the flanges. A more representative result would be obtained by applying this load as a rigidly applied load, or by modelling the actual coupling onto the drawbeam. However, both of these methods have drawbacks. It can be shown that so long as the section being bolted through is at least 16mm thick, there is no problem in the section of the drawbeam contained within the coupling flange meeting NZS 5446 loading. In analysing this plot, therefore, the stresses bounded by the coupling flange may be ignored. In this case, it can be seen that drawbeam stresses are actually within the 60% threshold of Yield Stress.

You raised the query on the Side Load Analysis on the above drawbeam, noting in the attached Diagram that the analysed stress was 165 mPa, higher than the 60% of yield for 220 mPa material.



This was in small surface areas of the Gussets. Although the analysis was carried out for 220 mPa yield, manufacture for this new drawbeam was from 300 mPa Yield plate, so this design was accepted as being within the allowable limits.

Regards,



Peter Wastney MIPENZ(Mechanical) CPEng
CHARTERED PROFESSIONAL ENGINEER

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Job No. 5775-19848

Bolt Load Calculation

MTM = 30000

Max load (kN) = 260

Centroid Ht. c = 250

Half Horiz. Ctrs a = 175

Half Vert Ctrs b = 45

$a^2 + b^2 = 32650$

Horiz Comp. x = 5.975421133

Vert. Comp y = 29.04718606

Direct Shear = 13

Load Bolt 1 = 29.88

Load Bolt 2 = 29.88

Load Bolt 3 = 34.70

Load Bolt 4 = 34.70

Load Bolt 5 = 17.64

Load Bolt 6 = 17.64

Load Bolt 7 = 19.15

Load Bolt 8 = 19.15

Load Bolt 9 = 19.15

Load Bolt 10 = 19.15

Allowable AS 3900 42

Max Capability 118

Check

8ay+8bx 42817.21

F.c 65000

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Job No. 5775-15000

Bolt Load Calculation

MTM = 27000

Max load (kN) = 254

Centroid Ht. c = 255

Half Horiz. Ctrs a = 185

Half Vert Ctrs b = 70

$a^2 + b^2 = 39125$

Horiz Comp. x = 9.661697444

Vert. Comp y = 25.5344861

Direct Shear = 15.875

Load Bolt 1 = 26.28

Load Bolt 2 = 26.28

Load Bolt 3 = 36.11

Load Bolt 4 = 36.11

Load Bolt 5 = 16.88

Load Bolt 6 = 16.88

Load Bolt 7 = 21.74

Load Bolt 8 = 21.74

Allowable AS 3900 63

Max Capability 184

Check

8ay+8bx 43201.59

F.c 64770

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Tom Logan

From: Brian Sara
Sent: Friday, 24 November 2017 3:49 p.m.
To: david@thesandbox.co.nz
Cc: Tom Logan
Subject: FW: Re-certification of revoked LT400s
Attachments: 20171020_144932.jpg; 20171020_144814.jpg; KJP59.pdf; DOC241117-24112017133047.pdf

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Hello David

Can you please provide brief comment on this file for [REDACTED]. In particular, it seems that the drawings stipulate 10mm plate but it has been fabricated using 6mm plate. Some additional photos are attached also.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines
NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: [REDACTED]
Sent: Friday, 24 November 2017 2:35 p.m.
To: Brian Sara
Subject: Re: Re-certification of revoked LT400s

Hi Brian,

Please find attached job file and file that [REDACTED] sent through of Peter Wastney's LT400 and drawbeam drawing.

That client was given detail for a new beam and has not at this stage been recertified.

If you need anything else, let me know.

Regards

On 22 November 2017 at 11:55, Brian Sara <Brian.Sara@nzta.govt.nz> wrote:

Hello [REDACTED]

We are getting close to a critical time for determining the next steps in our investigation and I need to provide a further report in relation to the LT400s that had been issued for 6 drawbeams that we formally revoked.

I am aware that you were requested by Aratuna Freighters Ltd to review and recertify the drawbeam on their truck [REDACTED]. There are no Landata records for recertification of the drawbeam on [REDACTED] at this stage. It may be that the drawbeam has been recertified but the LT400 information has not been updated yet.

If you have recertified the drawbeam on this vehicle, can you please provide a copy of your file. Additionally, if the drawbeam required full replacement, significant modification or was found to be significantly different to previous drawings (E.G. I am aware the folded plate used for one of the revoked drawbeams was actually 8mm whereas the drawings show it being 10mm), can you please indicate this when replying.

Can you please provide a response by Friday 24 November?

I am happy to discuss any questions you may have by phone if you wish.

Thanks for your cooperation.

Regards,

Brian Sara / Manager Vehicles

Operational Standards & Guidelines – Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St

Private Bag 6995, Wellington 6141, New Zealand



Find the latest transport news, information, and advice on our website:

www.nzta.govt.nz

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[Redacted]

[Redacted]

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DESIGN CERTIFICATE No 5775/19467

ISSUED BY PETER WASTNEY ENGINEERING LTD. ID. PW

WAKAPUAKA, MOTU, NEW ZEALAND (03) 5450848

Complies with N.Z.S. 5446 - 1987 requirements

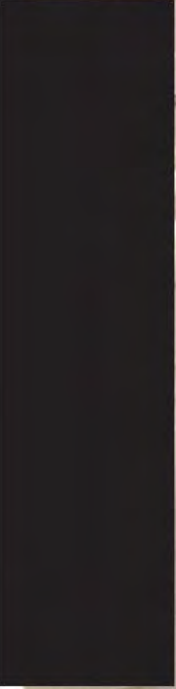
Expiry Date 02 27 CH. No 3 0086

G.C.W. [redacted] kg Gross Towed 29.000 kg

REMOVAL OF THIS PLATE INVALIDATES DESIGN CERTIFICATE

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Heavy vehicle specialist certificate

Must be presented to a CoF (heavy) inspecting organisation Heavy vehicle specialist inspector and inspecting organisation

Heavy vehicle specialist inspector's or manufacturing inspecting organisation's name (PRINT IN CAPS) PETER WASTNEY ID PW

Vehicle registration (optional) VIN/chassis number

Make Iveco Component being certified: Chassis Load anchorage

Model (optional) Stralis Log bolsters [x] Towing connection Brakes

Certification category HVET SRT PSV stability PSV rollover Swept path PBS

Description of work Re Mounted Drawbeam ex [redacted] originally Certified by [redacted] 9361 Total of 1,071,000 kg travelled prior to installation

Code/standard/rule certified to NZS 5446 Component load rating(s) 29,000 kg MTM

General drawing number(s) 5775-19467

Supporting documents 5775-18619, [redacted] 9361, Cert 5775-19466

Special conditions (optional) None

Certification expiry date (if applicable) 2-2-2027 or Hubodometer reading (whichever comes first)

Declaration

I the undersigned, declare that I am the heavy vehicle specialist inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my appointment. To the best of my knowledge the information contained in the certificate is true and correct.

Designer's ID (if different from inspector below) PW

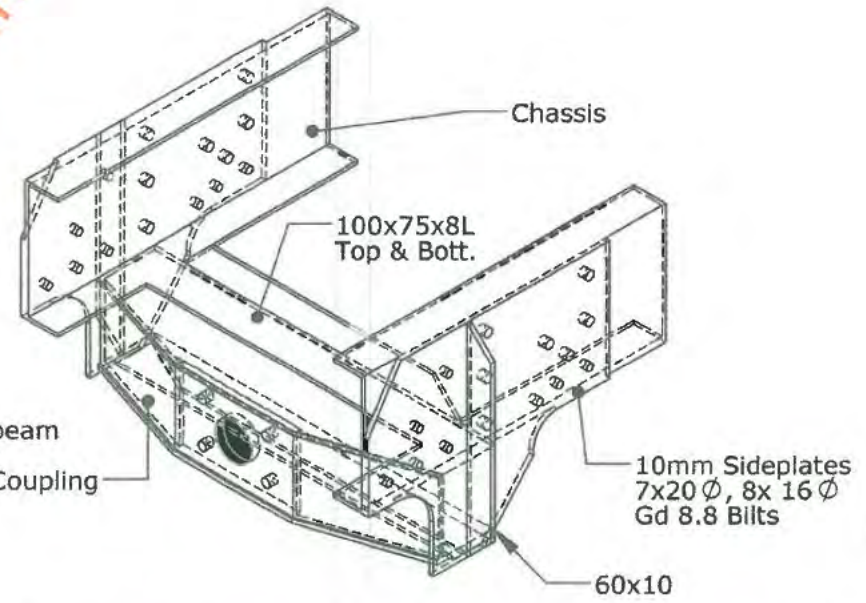
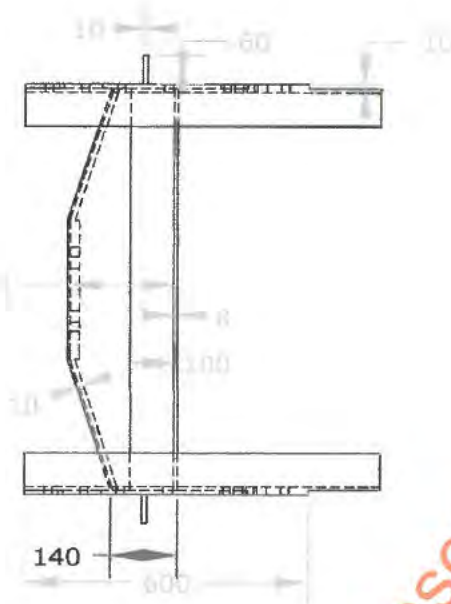
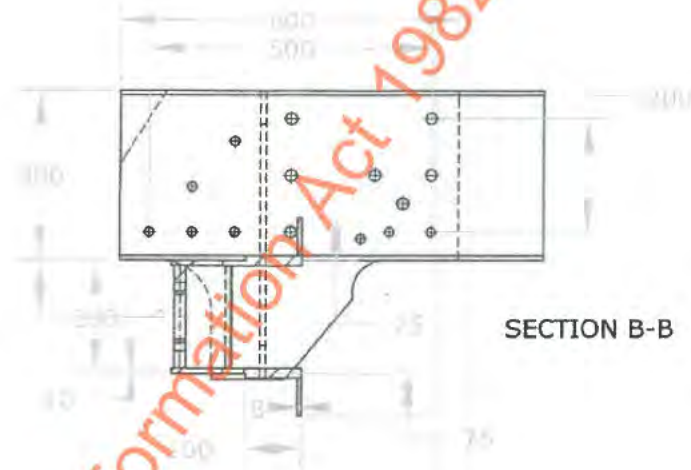
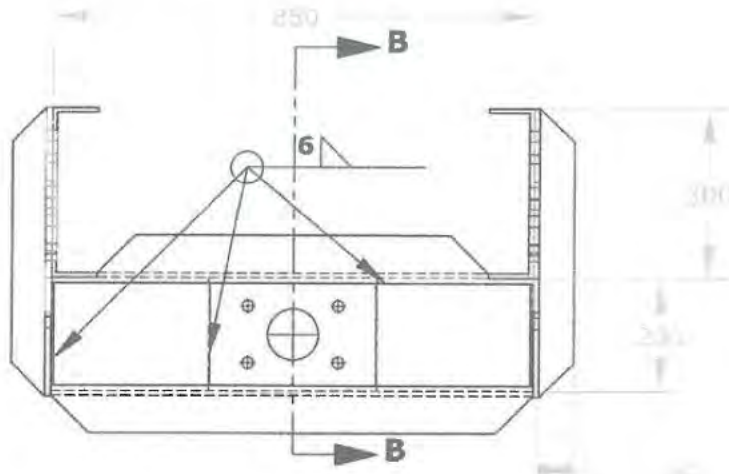
Inspector [redacted]

Inspector's name (PRINT IN CAPS) PETER WASTNEY ID number

Date 10-2-17 Number 580066

CoF vehicle inspector ID CoF vehicle inspector signature Date

All fields are mandatory unless otherwise stated.



Fabricated Drawbeam
ex 12 Pl. Drill for
200 kN D Value Coupling

Welds to Category SP of AS/NZS 1554. Chassis web bolts to be in centre 66% of chassis rail depth



PETER WASTNEY ENGINEERING LTD
222 Wakapuaka Rd
RD 1, Nelson
www.pwe.co.nz

Job 5775 - 19467
Drawbeam - Aratuna Freighters
Iveco - [REDACTED]
30,000kg MTM Rating

Scale 1:10
Checked/Date :
Approved/Date :
Drawn by PLW Date Feb 2017 Sheet 1 of 1

Draft

Design

As Built

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Quick links Application menu Sign out

Quick Navigate
ICORE

Core Vehicle Information

4.50v28

LTPRO

Inquire

Plate VIN/Chassis No Inspector ID

Make **2017 IVECO STRALIS AD500** **WHITE** 1st NZ Reg **16/02/2017**

Reg Prsn **ARATUNA FREIGHTERS LIMITED**

Vehicle Type Inspection Group **22**

Vehicle Class CC Rating

Colours VIN Location

Engine Type Alternative Fuel

Seats (Including Driver) Body Type **OTHER TRUCK**

Static Roll Threshold (g) Max Height X1 Gross Mass Y1

VDAM Weight **25800** RUC Weight **50000** Gross Mass Y2 Max Height X2

No of axles Axle Spacing (mm) F- -R

Chassis ratings: GVM GCM Wheel Base

Axle Set Rating Front Rear Derive chassis ratings

AVIC holding original documents **VTNZ GREYMOUTH**

24/10/2017

Next

08:24:56:54 INPUT REQUEST

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Quick Navigate

ILOAD

Loading and Dimension Details

4.50v16

LTPRO

Inquire

Plate VIN/Chassis No Inspector ID

Make 2017 IVECO STRALIS AD500 WHITE 1st NZ Reg 16/02/2017

Reg Prsn ARATUNA FREIGHTERS LIMITED

Loading Details: (kg)

Tare Weight 13100 Tow Bar 0 5th Wheel Coupling 0

MTM Braked 0 MTM Unbraked 0 Draw Bar Rating 0

Standards Code BCL NZ554-44,46,HVBA Number of Axles 4

Front Axle Capacity 12600 Rear Axle Capacity 23200

Front Axle					Rear Axle						
	Tyre Size	Ply	Conf	Tst Wgt		Tyre Size	Ply	Conf	Tst Wgt		
1	2214	275/70R22	148	S	3240	1	2214	275/70R22	145	D	4350
2	2214	275/70R22	148	S	3240	2	2214	275/70R22	145	D	4350
3						3					
						4					

Dimension Details: (mm)

LT/OD Approval number

Front Overhang 840 Rear Overhang 2290 Height 4200

Width 2490 Forward Distance 7430

24/10/2017

ICORE

Next

08:25:05:04 INPUT REQUEST

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Quick links Application menu Sign out

Quick Navigate IVCERT

Vehicle Certification 4.50v8

LTPRO

Inquire [checked] START of table reached

Plate [redacted] VIN/Chassis No [redacted] Inspector ID [redacted]

Make **2017 IVECO STRALIS AD500** WHITE 1st NZ Reg **16/02/2017**

Reg Prsn **ARATUNA FREIGHTERS LIMITED**

Scroll [Next] (A) or (L)atest [A]

Mnt	Type	Number	Issue ID	Issue Date	Expiry Date	Expiry Odo
<input type="checkbox"/>	HVEA	580089	PW	20/02/2017		0
	HV LOAD ANCHORAGES ENGINEER CE REMOUNTED CURTAIN SDE TIPPER					
<input type="checkbox"/>	HVET	580066	PW	10/02/2017	10/10/2017	0
	HV TOWING CONNECTIONS ENGINEER REMOUNT X [redacted] 1071000 KM					
<input checked="" type="checkbox"/>	HVET	580066	PW	10/02/2017	02/02/2027	0
	HV TOWING CONNECTIONS ENGINEER REMOUNT X [redacted] 1071000 KM					
<input type="checkbox"/>	HVEC	580065	PW	10/02/2017		0
	HV CHASSIS ENGINEER CERTIFICAT REMOUNT U/B TIP DECKX [redacted]					
<input type="checkbox"/>						0

24/10/2017 ILOAD [redacted]

Next

08:25:19:44 SUCCESSFUL ENTRY 000008

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[Redacted]

Quick links Application menu Sign out

Quick Navigate

VHHIS

Hubodometer History of Vehicle

4.50v3

LTPRO

Inquire [v] START of table reached

Plate [Redacted] or VIN [Redacted]

Make 2017 IVECO STRALIS AD500

Scroll Next [v]

Hubo	Date From	To	Distance Start	End	Current Plate
12/5-10273	16/02/2017				[Redacted]

24/10/2017 IVCERT [Redacted]

Next

08:25:29:94 INPUT REQUEST

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Quick links Application menu Sign out

Quick Navigate
 IQL ECU Query - Hubodometer Licence Trail 4.50v11 LTPRO
 START of table reached

Plate Print Report No Create Extract No

Make 2017 IVECO STRALIS AD500
 Owner ARATUNA FREIGHTERS LIMITED

VIN/Chassis No Tare 13100 GVM 31000 Reg NZ 16/02/2017

Scroll

Inspection Detail						Licence Detail				
Sel	Date	T	Hubo	Read	Odo(K)	R	Start	End	Weight	Hubo
<input type="checkbox"/>	12/10/2017						66000	71000	50	12/5-10273
<input type="checkbox"/>	21/09/2017						61000	66000	50	12/5-10273
<input type="checkbox"/>	14/09/2017						56000	61000	50	12/5-10273
<input type="checkbox"/>	08/09/2017						51000	56000	50	12/5-10273
<input type="checkbox"/>	17/08/2017						46000	51000	50	12/5-10273
<input type="checkbox"/>	04/08/2017	C	12/5-10273	40430	41002	P				
<input type="checkbox"/>	03/08/2017						41000	46000	50	12/5-10273

24/10/2017 HVCERT

Next

08:24:18:41 INPUT REQUEST

Remount 1071000km
 + 71000
 = 1162000km

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ENGINEER

JOB NUMBER

CLIENT

Arakana Transport

DATE

20/10/17

SHEET

OF

13100
31000
75000

2017 IVECO stralis AD500

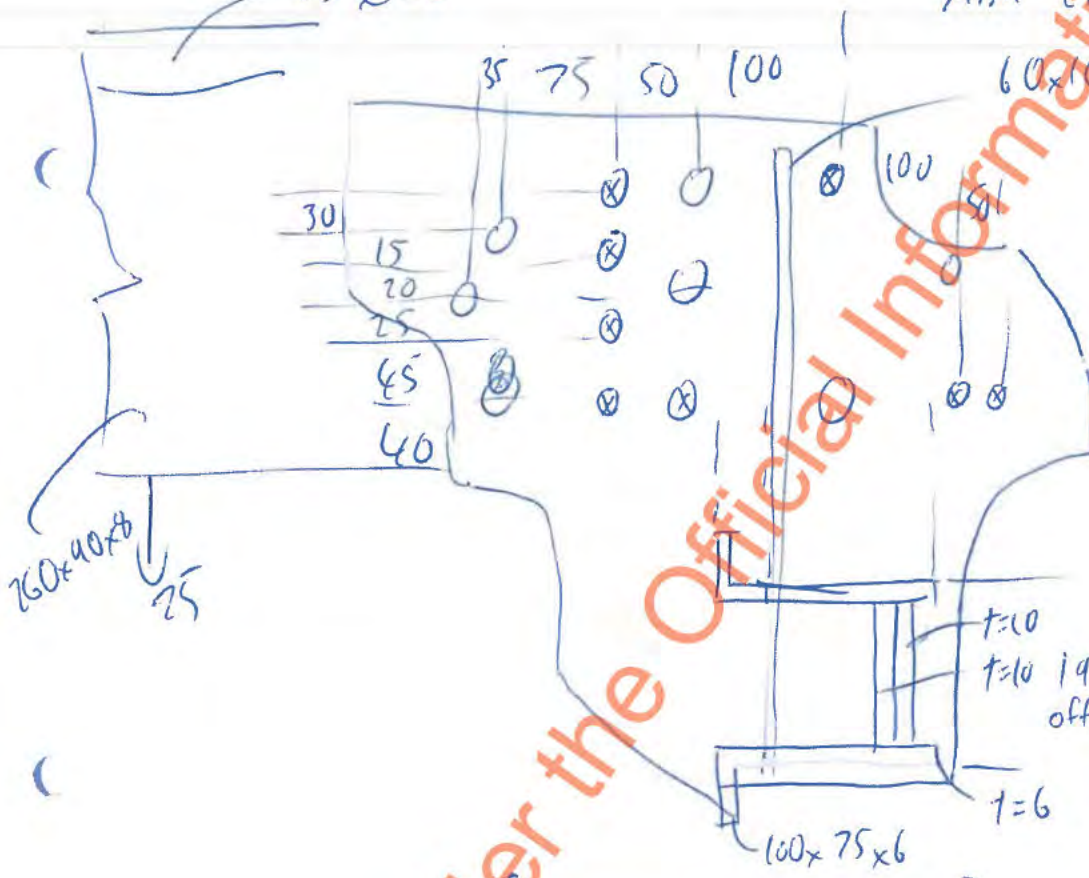
ON 126

Peter Washney

ex) 0 4/27

MTM = 29000

75 x 50



⊗ M16 G10.9

○ M16 G10.9

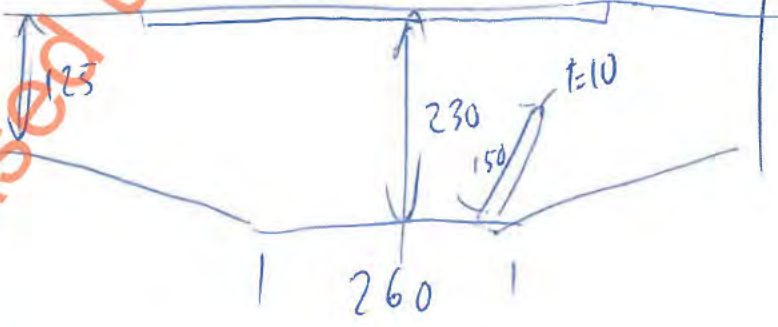
Span = 860

260 x 40 x 8
25

610 x 10

640

top gaurset



260

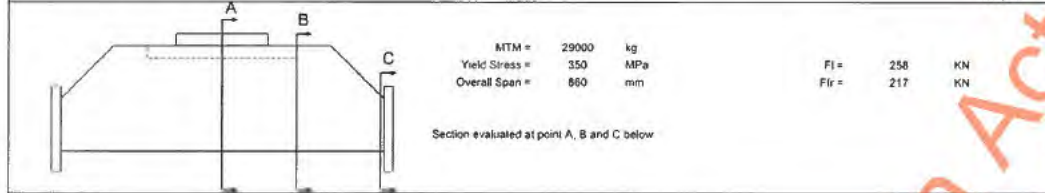
340 to edge of gaurse +

DATE: / /

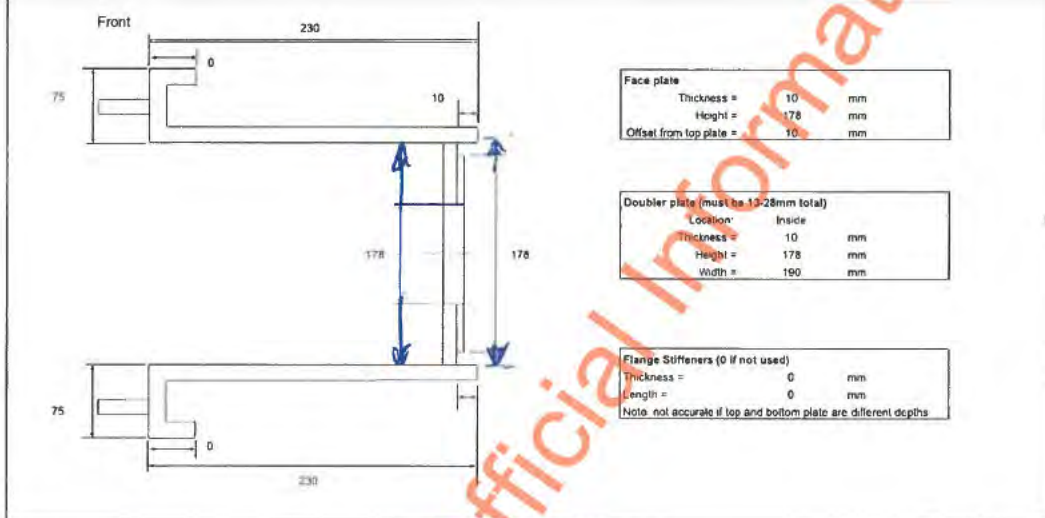
SIGNED:

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Title: Standard Drawbeam Inputs/Outputs



Section A - Centre		Section B - Stiffener Edge		Section C - End	
Top plate	Thickness = 6 mm Depth = 230 mm Flange height = 75 mm Flange off flange width = 0 mm	Bottom plate	Thickness = 6 mm Depth = 230 mm Flange height = 75 mm Flange off flange width = 0 mm	Top plate	Thickness = 6 mm Depth = 125 mm Flange height = 0 mm Flange off flange width = 0 mm



Face plate	Thickness = 10 mm Height = 178 mm Offset from top plate = 10 mm	Doubler Plate (0 if not relevant)	Location: Inside Thickness = 0 mm Height = 0 mm
------------	---	-----------------------------------	---

Face plate	Thickness = 10 mm Height = 178 mm Offset from top plate = 10 mm	Doubler Plate (0 if not relevant)	Location: Inside Thickness = 0 mm Height = 0 mm
------------	---	-----------------------------------	---

At Centre:		Static Stress =		Fatigue Stress (Cat B) =	
Area =	7148.00 mm ²	178.63	MPa	71.09	MPa
x back =	149.34 mm				
x front =	80.66 mm				
lyy =	46.37 x10 ⁶ mm ⁴				

At Edge Stiffener:		Static Stress =		Fatigue Stress (Cat E) =	
Area =	5368.00 mm ²	144.97	MPa	83.02	MPa
x back =	130.88 mm				
x front =	99.12 mm				
lyy =	39.02 x10 ⁶ mm ⁴				

(At stiffener weld)

At End:		Static Stress =		Fatigue Stress (Cat C) =	
Area =	3364.00 mm ²	542.97	MPa	456.88	MPa
x back =	86.15 mm				
x front =	38.85 mm				
lyy =	4.40 x10 ⁶ mm ⁴				

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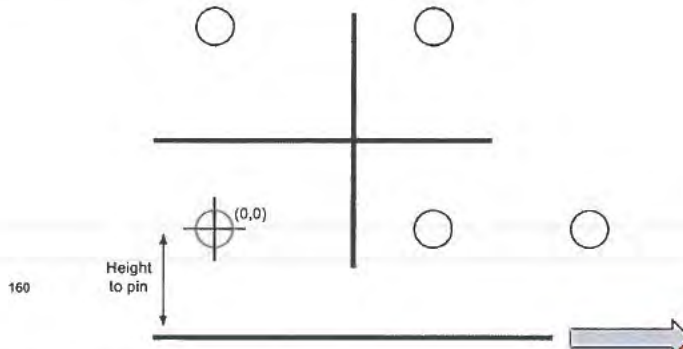


ENGINEER: [Redacted]
 CLIENT: Aratuna freighters

JOB NUMBER 17102375
 DATE 43032

Title **BOLT GROUP** Eccentrically Loaded in Shear

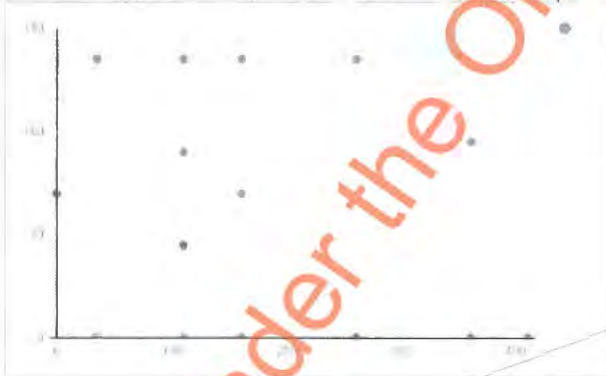
Inputs
 Outputs



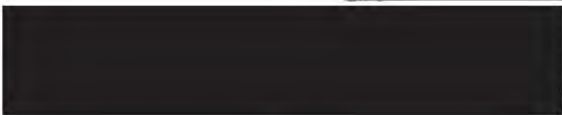
NTM =	29000	kg
	129	kN
1/2 load through 1 side		
x =	172.04	mm
y =	60.40	mm

Is the shear plane in the Threaded or Unthreaded region of the bolt?
 unthreaded

	Co-ordinates (mm)		Bolt Dia (mm)	Force (kN)			Allowable	
	x	y		Fm	Fd	Total		
1	35	0	M16	16.63	9.83	21.56	42	OK
2	0	70	M16	17.99	9.83	20.01	42	OK
3	35	135	M16	16.29	9.83	14.45	42	OK
4	110	0	M14	9.04	7.53	15.27	31	OK
5	110	45	M14	6.67	7.53	11.20	31	OK
6	110	90	M14	7.17	7.53	7.85	31	OK
7	110	135	M14	10.13	7.53	6.48	31	OK
8	160	0	M14	6.43	7.53	13.89	31	OK
9	160	70	M16	1.61	9.83	8.92	42	OK
10	160	135	M16	7.89	9.83	2.40	42	OK
11	260	0	M16	11.14	9.83	18.56	42	OK
12	260	135	M14	12.04	7.53	9.19	31	OK
	360	0	M16	20.61	9.83	25.40	42	OK
	360	95	M14	19.95	7.53	20.01	31	OK
	410	0	M14	25.63	7.53	28.43	31	OK



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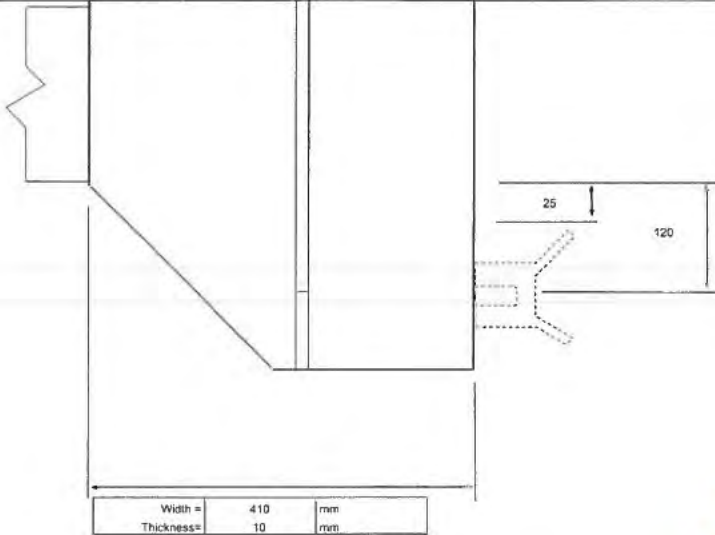


ENGINEER: [REDACTED]
 CLIENT: Araluna freighters

JOB NUMBER 17102375
 DATE 43032

Title: **SIDE PLATES AND CHASSIS**

Inputs
 Outputs



MTM = 29000 kg

Loads
 FL = 258.0 KN
 Fs = 38.7 KN

Chassis rail to top of beam
 H1 = 25 mm

Chassis Rail to Pin Height
 H2 = 120 mm

Stiffeners
 Size (W x t) = 60 10
 Number: 1
 Assume stiffener is centred on side plate: Yes

Properties:
 x = 205.0 mm
 y = 80.5 mm
 I_{yy} = 57.43916667 x 10⁶ mm⁴
 I_{xx} = 855.3368784 x 10³ mm⁴

Side Force
 M = 1.0 kNm
 Stress = 68.5 MPa

Longitudinal
 A1 = 15.5 kNm
 Stress = 55.2 MPa

30/11/2007 is not a date for side force

CHASSIS

Chassis Rail	C Section		Longitudinal - Static
Web Depth	260 mm		A1 = 32.25 kNm
Flange Width	90 mm		Stress = 128.8 MPa
Thickness	8 mm		<input type="button" value="OK"/>
c _y	130 mm ⁴		Longitudinal - Fatigue Loading
I _{xx}	32553643 mm ⁴		A1 = 27.13 kNm
			Stress = 108.3 MPa
			<input type="button" value="OK"/>

cut B



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ENGINEER _____

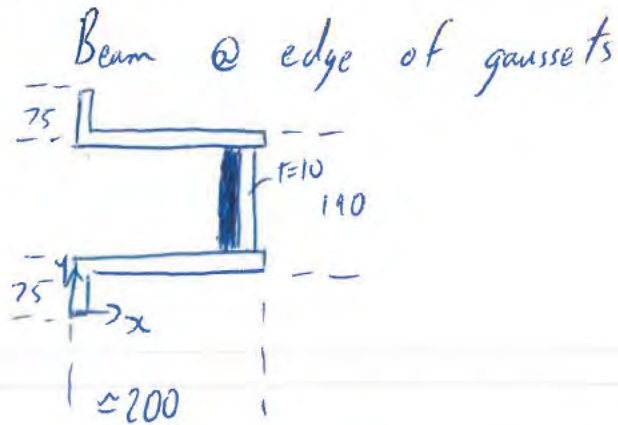
JOB NUMBER _____

CLIENT _____

DATE _____

SHEET _____

OF _____



$$\begin{aligned} & 300 \\ & \quad \swarrow \quad \searrow \\ & \quad 75 \quad 105 \\ & \frac{300}{105} = \frac{75}{x} \\ & x = 26.25 \end{aligned}$$

$$\begin{aligned} I_{yy} &= 28 \times 10^6 \text{ mm}^4 \\ \bar{x} &= 114.2 \text{ mm} \quad (85.8 \text{ mm}) \end{aligned}$$

$$M = FL = 55.47 \text{ kNm}$$

$$= 29.025 \text{ kNm}$$

$$\sigma = \frac{(29.025)(114.2)}{28}$$

$$= 118.4 \text{ MPa} \quad \boxed{1016}$$

$$118.4 \text{ MPa} \quad \checkmark$$

$$M_f = 46.65 \text{ kNm}$$

$$= 24.42 \text{ kNm}$$

$$\sigma = \frac{(24.42)(114.2)}{28}$$

$$= 99.60 \text{ MPa}$$

edge of gusset @ 10 mm away from centroid. \checkmark

$$\sigma \approx 8.72 \text{ MPa} \quad \boxed{1016}$$

Cat E \checkmark

SIGNED: _____

DATE: / /

ENGINEER _____

JOB NUMBER _____

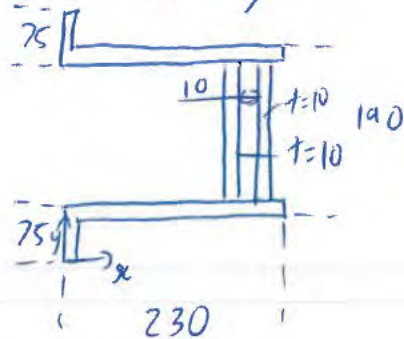
CLIENT _____

DATE _____

SHEET _____

OF _____

Beam @ edge of doubler



$$I_{yy} = 39 \times 10^6 \text{ mm}^4$$

$$\bar{x} = 130.9 \text{ mm} \quad (66.8 \text{ mm})$$

$$t_{\text{e cat weld}} = 63.2 \text{ mm}$$

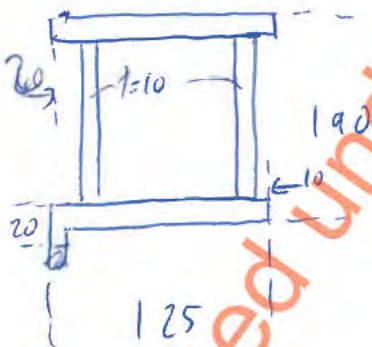
$$M = \frac{F(\text{@ edge of doubler})}{4} = \frac{(217)(0.86 - 0.26)}{4}$$

$$= 32.55 \text{ kNm}$$

$$\sigma = \frac{(32.55)(63.2)}{45} = 65.715 \text{ MPa} \quad \boxed{\text{OK}} \quad \text{Lat E load cond 3}$$

$$\sigma = \frac{(32.55)(146.8)}{45} = 106.185 \text{ MPa} \quad \boxed{\text{OK}} \quad \text{Lat B load cond 3}$$

Beam @ ends



$$I_{yy} = 8.768 \times 10^6 \text{ mm}^4$$

$$\bar{x} = 65 \text{ mm}$$

$$M_s = \frac{FL}{8} = 27.735 \text{ kNm} \quad M_F = 23.33 \text{ kNm}$$

$$M_s = \frac{(27.735)(65)}{8.768}$$

$$= 205.61 \text{ MPa} \quad \boxed{\text{OK}}$$

$$\sigma_F = \frac{(23.33)(65)}{8.768}$$

$$= 172.95 \text{ MPa} \quad \boxed{\text{OK}}$$

SIGNED: _____

DATE: / /

ENGINEER _____

JOB NUMBER _____

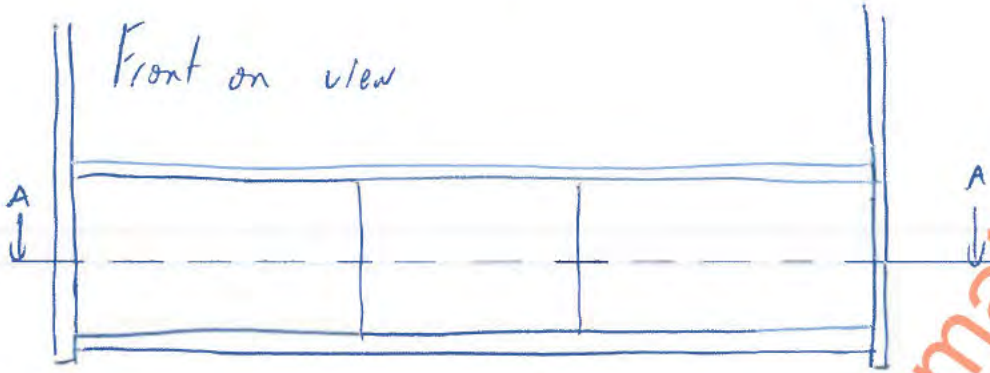
CLIENT _____

DATE _____

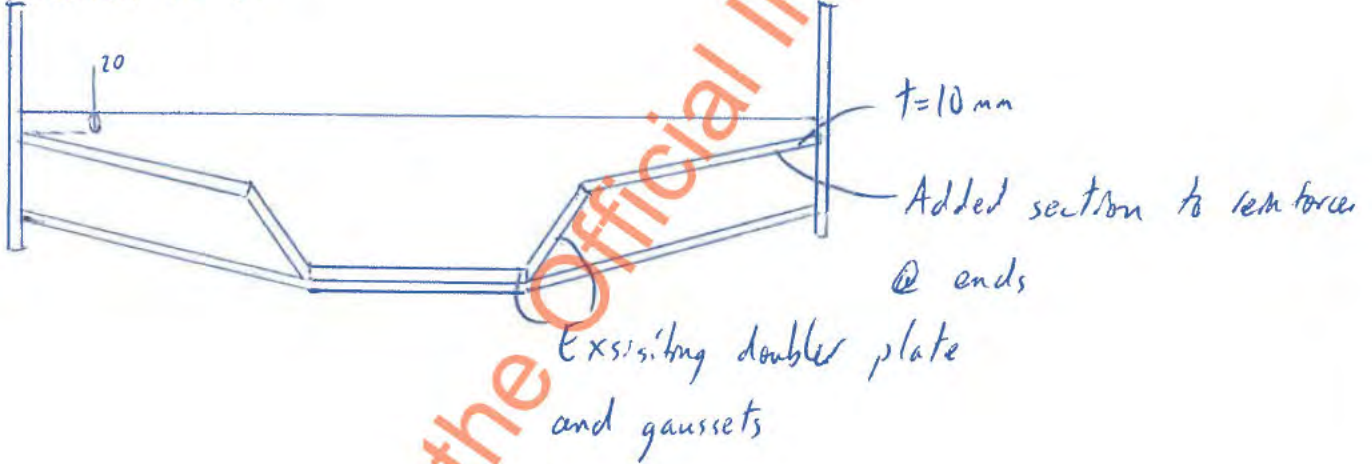
SHEET _____

OF _____

Box section to be added



Section A-A



High mileage with
 High fatigue
 decided to scrap
 beam and give new
 beam

SIGNED: _____

DATE: / /

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Procedure Documentation Sheet					
Project Description	LT400 - Drawbeam recert			Project No.	17102375
				Lt 400 No.	
Inspector	Name			Vehicle	
	VIN/Chassis Number				
Business	ID Number			Registration	
	Address			Model	
				2017 IVECO STRALIS AD500	
			Owner		Aratuna Freighters Limited
Vehicle Weights	GVM	31000	TARE	13100	Payload Capacity
Critical Matters Assessed During Inspection and Date(s) When Vehicle Was Inspected	Drawbeam non ^{std} compliant as ^{std} stresses very high Drawing showed 10mm plate actually plate 8mm				
Code Compliance Reference	NZS 5446				
Limit State or Working Stress Limit	≈ 100 ~ 200 MPa industry standard				
Assumptions	Fixed ends conservative				
Results	543 MPa static				
Reference					
Code Compliance Reference					
Limit State or Working Stress Limit					
Assumptions					
Results					
Reference					
Code Compliance Reference					
Limit State or Working Stress Limit					
Assumptions					
Results					
Reference					
I understand and declare that I am the Certifier identified above and hold a current valid appointment. I certify that at the time of inspection the above mentioned vehicle component design and this certification complies in all respects with the Land and Transport rule Vehicle Standards Compliance 2002 and my Deed of Appointment. To the best of my knowledge the information contained in this certificate is true and correct.					
Certifier's Signature:			Date: 24/11/17		

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Tom Logan

From: Brian Sara
Sent: Monday, 20 November 2017 3:08 p.m.
To: Tom Logan (Tom.Logan@nzta.govt.nz)
Subject: FW: Sheridan Transport

Hello Tom

As discussed, can you please request the drawbeam files for this vehicle. I have been advised that the drawbeam for LT400 number 538266 failed. Can you please ask if the file has been used for any other vehicles also.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines
NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: [REDACTED]
Sent: Friday, 3 November 2017 4:13 p.m.
To: Brian Sara
Cc: [REDACTED]
Subject: Sheridan Transport

Brian

As per our earlier discussion today
Have spoken with [REDACTED] from Sheridan Transport
The vehicle concerned is Reg Number [REDACTED]
The defective draw beam would appear to be covered under LT400 number 538266
[REDACTED] has replaced this with a new drawbeam and has since sold the vehicle
I have assured grant that you will not need to contact the new owners and copied him into this email
The landata certification page is below

Mnt	Type	Number	Issue ID	Issue Date	Expiry Date	Expiry Odds
<input type="checkbox"/>	HV ET	571814	PW	08/11/2016	07/11/2026	0
	HV TOWING CONNECTIONS ENGINEER NEW DRAW BEAM NZ55446					
<input type="checkbox"/>	HV EP	524888	PAS	12/01/2016		0
	HV BRAKE SPECIALIST HEAVY BRAKE RULE & TRUCK CONNV					
<input type="checkbox"/>	HV ET	538266	PW	05/01/2016	05/01/2026	0
	HV TOWING CONNECTIONS ENGINEER RE MOUNTED DRAWBEAM EX [REDACTED]					
<input type="checkbox"/>	HV EC	538267	PW	05/01/2016		0
	HV CHASSIS ENGINEER CERTIFICAT FOB TIPPER DECK FITMENT					
<input type="checkbox"/>	HV EC	4*3102	WRD	16/03/2012		0
	HV CHASSIS ENGINEER CERTIFICAT WHEEL BASE CHANGE					

Regards



Released under the Official Information Act 1982

Tom Logan

From: Brian Sara
Sent: Tuesday, 28 November 2017 10:10 a.m.
To: david@thesandbox.co.nz
Cc: Tom Logan
Subject: FW: PW Files uplifted 22 November 2017
Attachments: Part.17452.SLDPRT; Part.18635.SLDDRW; Part.19288.SLDDRW; Part.19288.SLDPRT; Section 198 letter dated 20-11-2017.pdf; LT400 571814 Certification File PW 19288 Reg BFP872.pdf; LT400 538266 Certification File PW 18635 Reg BFP872.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hello David

Attached are further files that we uplifted for Reg No [REDACTED] from P Wastney last week that we would like you to assess for us.

(.LT400 No 538266 was issued on 5/1/2016. We have been advised that this drawbeam failed in service, shortly afterwards and was replaced. Can you please check the attached files (particularly the solid-works files that we are unable to access) and advise if there is sufficient information available to make a certification decision and in the case of this particular drawbeam, is there anything in the file that indicates that it may not comply with NZS:5446.

Similarly in the case of LT400 No 571814, can you please check those files also. This is for the replacement drawbeam which we believe is currently still in service.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines NZ Transport Agency DDI 64 4 901 6712 M [REDACTED]

20 November 2017

Mr P L Wastney

Peter Wastney Engineering Ltd
222 Wakapuaka Road
RD1
NELSON

Dear Mr Wastney

HEAVY VEHICLE SPECIALIST CERTIFICATION: SECTION 198 LAND TRANSPORT ACT 1998

In accordance with the provisions of section 198 of the Land Transport Act 1998 and sections 3.1(2) & (3) of the Vehicles Standards Compliance 2002 Rule 35001/1, you are advised of my intention to conduct an inspection of records associated with your approval.

Certifier ID: PW
Approval name: Peter Lawrence Wastney

The following records are to be provided to me upon service of this demand or if the documents are held off-site, at a time and date to be agreed upon. Records requested are to include LT400, and/or Statements of Design Compliance (SODC), and all supporting documentation including any electronic files for the following vehicles:

License plate	LT400	Date of certification
██████	538266	05/01/2016
██████	571814	08/11/2016

Can you please also advise me of any other drawbeams you have certified that are similar to the one certified on LT400 538266, as I understand this failed in service and I am concerned there may be other at-risk vehicles in service.

Pursuant to Section 51(1) of the Land Transport Act 1998, you are advised that a person commits an offence if the person, without reasonable excuse, fails or refuses to comply with a requirement made under section 198 in relation to an audit or inspection. The maximum penalty on conviction for an offence against section 51(1) is a fine not exceeding \$5,000.00.

I have enclosed copies of the relevant legislation for your information:

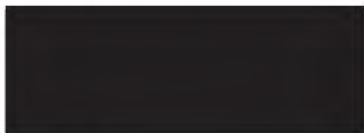
Section 198 of the Land Transport Act 1998
Sections 3.1(2) & (3) Vehicles Standards Compliance 2002 Rule 35001/1
Section 51 of the Land Transport Act 1998.

17-30
Paul 22/11
██████

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Should you have any queries, please contact me, on email, Brian.Sara@nzta.govt.nz or phone 04 901 6712.

Yours sincerely



Brian Sara
Manager Vehicles

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Land Transport Act 1998

198

Inspections and audits

(1)

The [Agency] may in writing require any person who holds a land transport document that authorises the provision of a service in the land transport system to undergo such inspections and audits as the [Agency] reasonably considers necessary in the interests of land transport safety (including inspections and audits of vehicles operated by such persons).

(2)

The [Agency] may carry out such inspections and audits as the [Agency] reasonably considers necessary in the interests of land transport safety.

(3)

For the purposes of any inspection or audit carried out in respect of any person under this section, the [Agency] may in writing require that person to provide such information as the [Agency] reasonably considers relevant to the inspection or audit.

(4)

A person to whom a requirement is made under this section must comply with that requirement.

Land Transport Act 1998

51

Contravention of section 198(4)

(1)

A person commits an offence if the person, without reasonable excuse, fails or refuses to comply with a requirement made under section 198 in relation to an audit or inspection.

(2)

The maximum penalty on conviction for an offence against subsection (1) is a fine not exceeding \$5,000.

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the Director must disclose that information to the applicant and give the applicant a reasonable opportunity to refute or comment on it.

2.6(3) Nothing in 2.6(2) requires the Director to disclose any information if such disclosure would be likely to endanger the safety of any person.

2.6(4) If the Director does not disclose information in accordance with 2.6(3), the Director must inform the applicant:

- (a) of the fact of non-disclosure; and
- (b) that they may seek a review of the non-disclosure by the Privacy Commissioner under the *Privacy Act 1993* or by the Ombudsman under the *Official Information Act 1982*.

Section 3 Monitoring and reviewing of performance, and suspension and revocation of appointments

3.1 Procedures for monitoring and reviewing performance

3.1(1) The Director may monitor and review the performance of a vehicle inspector or inspecting organisation in complying with the requirements and conditions imposed by the Director under 2.3, including the performance of inspection and certification activities at individual sites.

3.1(2) In monitoring and reviewing performance under 3.1(1), the Director may require a vehicle inspector or inspecting organisation to undergo such monitoring and review, and to provide such information as the Director reasonably considers relevant.

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3.1(3) A vehicle inspector or inspecting organisation must comply with a requirement from the Director under 3.1(2).

3.1(4) A vehicle inspector or inspecting organisation must bear the costs of the monitoring and reviewing of their performance in accordance with any prescribed fee.

3.2 Action following failure to comply with conditions of appointment or with this rule

3.2(1) If the Director has reason to believe that a vehicle inspector or inspecting organisation has failed to comply with any of the conditions of their appointment, or has failed to comply with this rule, the Director may require the inspector or organisation to undergo such an investigation and to provide such information as the Director reasonably considers appropriate.

3.2(2) Subject to 3.2(3), if, following an investigation under 3.2(1), the Director is satisfied that a vehicle inspector or inspecting organisation has failed to comply with any of the conditions of their appointment, or failed to comply with this rule, the Director may do one or more of the following:

- (a) require that remedial action, such as training, be undertaken by the inspector or organisation;
- (b) suspend the whole or any part of the appointment of the inspector or organisation for a specified period or until specified conditions are met;
- (c) revoke the whole or any part of the appointment of the inspector or organisation.

3.2(3) Subject to 3.3, before carrying out an action under 3.2(2)(b) or (c), the Director must notify the vehicle inspector or inspecting organisation in writing of:

8/11/2016

██████████
17 Grove Road,
Blenheim

Drawbeam Mount Certificate 5775 -- 19288

Freightliner

Reg. No. ██████████

S/No. ████████████████████

Owner: ████████████████████

Manufacturer: ████████████████████

This is to certify that the new Drawbeam Certification, as shown in the photo and Drawing 5775-19288, as fitted to the above vehicle, has been manufactured to comply with NZS 5446:2005 for a maximum Towed mass of 30,000kg. Original Certification was 5775-18635.



Photo of fabricated drawbeam



Rear View.



Released under the Official Information Act 1982



"I declare that I am a Heavy Vehicle Specialist Certifier - Engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002; my Deed of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct."

Peter Wastney

REGISTERED MECHANICAL ENGINEER ID PW

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Heavy vehicle specialist certificate

Must be presented to a CoF (heavy) inspecting organisation
Heavy vehicle specialist inspector and inspecting organisation

Heavy vehicle specialist inspector's or manufacturing inspecting organisation's name (PRINT IN CAPS) ID
PETER WASTNEY PW

Vehicle registration (optional)	VIN/chassis number
Make Freightliner	Component being certified: <input type="checkbox"/> Chassis <input type="checkbox"/> Load anchorage
Model (optional)	<input type="checkbox"/> Log bolsters <input checked="" type="checkbox"/> Towing connection <input type="checkbox"/> Brakes
Certification category HMET	<input type="checkbox"/> SRT <input type="checkbox"/> PSV stability <input type="checkbox"/> PSV rollover
	<input type="checkbox"/> Swept path <input type="checkbox"/> PBS

Description of work
 New Draw Beam by Spring Creek Engineering

Code/standard/rule certified to: N25 5442
 Component load rating(s): 3,000 kg MTM

General drawing number(s): 5775-19288

Supporting documents: None

Special conditions (optional): None

Certification expiry date (if applicable): 7-11-2026 or Hubodometer reading (whichever comes first)

Declaration

I the undersigned, declare that I am the heavy vehicle specialist inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my appointment. To the best of my knowledge the information contained in the certificate is true and correct.

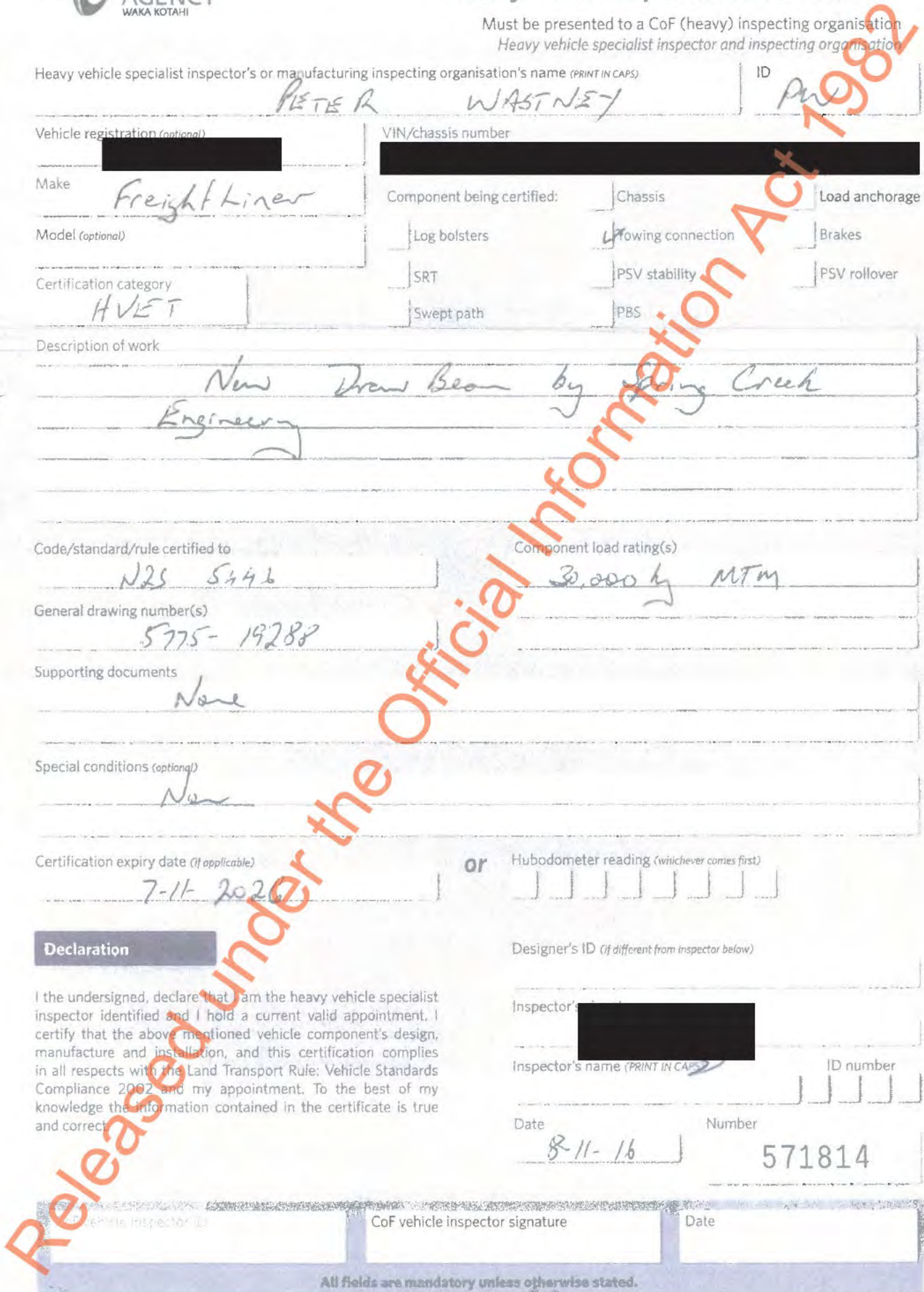
Designer's ID (if different from inspector below)

Inspector's name (PRINT IN CAPS) ID number
[Redacted] [Redacted]

Date: 8-11-16 Number: 571814

Inspector's ID: [Redacted] CoF vehicle inspector signature Date

All fields are mandatory unless otherwise stated.



**Peter Wastney Engineering PDS - Certification
ID PW**

Operating from 224 Main Road, Wakapuaka, R. D. 1, Nelson

Job Number 5775- 19288

Vehicle details



Identity of Owner



Measurements, and other factors relevant to the Certification

Factors to be taken into account in the design. *Per sketch*

Relevant Standards and guidelines *Handy to NZS*

Assumptions and Calculations *NZS 5446*

Design and detailed Drawings 5775- *Per computer*

Materials and fabrication methods *19288*

Critical matters assessed during inspection *Welded m/s*

Inspection Dates *Welded grade*

Reasons for refusing to certify *5/11*

When the vehicle is certified, that that is certified is within safe tolerance of the relevant specifications

Time taken to inspect and complete process *me*

Signed

Date *8/11*

"I declare that I am a Heavy Vehicle Specialist Certifier - Engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 1998; my Deed of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct."

Released under the Official Information Act 1982

5/01/2016

██████████
17 Grove road,
Blenheim

Drawbeam Mount Certificate 5775 -- 18635

Freightliner

Reg. No. ██████████

VIN ██████████

Manufacturer: ██████████

This is to confirm that the mounting of the Drawbeam, attached to Subframe, has been completed in accordance with NZS5446 for a 30 Tonne MTM Rating. Assembly is re mounted complete from ██████████ which was certified 5775-17452. This vehicle had travelled 53,000 km since Drawbeam was fitted new.



Photo of fabricated drawbeam.

"I declare that I am a Heavy Vehicle Specialist Certifier - Engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002; my Deed of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct."

Peter Wastney

REGISTERED MECHANICAL ENGINEER ID PW

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Heavy Vehicle Specialist Certificate

Must be presented to a CoF (Heavy) Inspecting Organisation
Heavy Vehicle Specialist Inspector and Inspecting Organisation

Heavy Vehicle Specialist Inspector's or Manufacturing Inspecting Organisation's Name (PRINT IN CAPS) **PETER WASTNEY** ID **PH**

Vehicle Registration* **[REDACTED]** VIN/Chassis Number **[REDACTED]**

Component being certified:

<input type="checkbox"/> Chassis	<input type="checkbox"/> Load Anchorage	<input type="checkbox"/> Log Bolsters
<input checked="" type="checkbox"/> Towing Connection	<input type="checkbox"/> Brakes	<input type="checkbox"/> SRT
<input type="checkbox"/> PSV Stability	<input type="checkbox"/> PSV Rollover	<input type="checkbox"/> Swept Path
<input type="checkbox"/> PBS		

Certification Category
HVET

Description of Work
**Re Mounted Draw Beam on [REDACTED]
Previous Cert. Fictio 5775-17452.**

Code/Standard/Rule Certified to **N25 5446** Component Load Rating(s) **30000 kg MTM**

General Drawing Number(s) **5775-18635** **N2 60000 kg GCM**

Supporting Documents **5775-17452**

Special Conditions* **None**

Certification Expiry Date (if applicable) **5/1/2026** or Hubodometer Reading (whichever comes first) **[] [] [] [] [] [] [] [] [] []**

Declaration

I the undersigned, declare that I am the Heavy Vehicle Specialist Inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my Appointment. To the best of my knowledge the information contained in the Certificate is true and correct.

Designer's ID (if different from inspector below)

Inspector's Signature **[REDACTED]**

Inspector's Name (PRINT IN CAPS) ID Number

Date **5/1/16** Number **538266**

CoF Vehicle Inspector ID CoF Vehicle Inspector Signature Date

All fields excluding those marked with * must be completed before this certificate can be accepted.

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HCPW1 : PETER/WASTNEY

Quick links Application details Signal

Quick Navigate

VHHS

Historical History of Vehicle

1303

1304

Inquire START of table reached

Plate [redacted] or VIN [input field]

Make 2002 FREIGHTLINER ARGOSY TSB

Scroll Next

Hubo	Date From	To	Distance Start	End	Current Plate
2/628699NZ	25/03/2014		2	53,000	[redacted]
2/565390NZ	09/10/2013	25/03/2014	168463	180091	
2/565390	18/06/2010	09/10/2013		168000	
2/379949	22/06/2006	18/06/2010		414000	
4/233738	04/04/2003	22/06/2006		388311	

05/01/2016 HVCERT HCPW1 GAM445

Next

10:58:33:62 SUCCESSFUL ENTRY 000005

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[redacted]

153063

17452

30/60

29/15/14

468776

Tony

30844?



Motochek

Vehicle details query results

05/01/2016 11:03 PETER WASTNEY ENGINEERING LIMITED - MOTOCHek A/C [REDACTED]

[return to immediate query entry](#)

2002 Freightliner Argosy Tsb Articulated Truck

Plate: [REDACTED]

VIN: [REDACTED]

Odometer history details

(Current odometer is recorded in kilometres)

Odometer source	Date recorded	Odometer
Certificate of Fitness Inspection	18/08/2015	115,243
Certificate of Fitness Inspection	02/03/2015	111,790
Certificate of Fitness Inspection	25/08/2014	71,196
Certificate of Fitness Inspection	03/03/2014	27,460
Certificate of Fitness Inspection	02/09/2013	976,940
Certificate of Fitness Inspection	07/03/2013	947,550
Certificate of Fitness Inspection	06/03/2013	947,476
Certificate of Fitness Inspection	18/04/2012	946,834
Certificate of Fitness Inspection	16/03/2012	946,615
Certificate of Fitness Inspection	11/01/2012	945,878
Certificate of Fitness Inspection	16/08/2011	907,187
Certificate of Fitness Inspection	17/02/2011	869,965
Certificate of Fitness Inspection	13/08/2010	813,492
Roadside Inspection	30/04/2010	785,666
Certificate of Fitness Inspection	16/02/2010	761,246
Roadside Inspection	09/11/2009	733,941
Roadside Inspection	20/10/2009	725,691

mass:		Last COF inspection:	18/08/2015 (Pass)
Fuel type:	Diesel	Expiry date of last COF:	07/03/2016
Tare weight:	8,980 kg	No. of axles:	4
Axle type:	4-Axle Twin Steer + Tandem	Wheelbase:	4,930
Front axle group rating:	10886	Rear axle group rating:	19958

Registration details

Date first registered in NZ:	12/04/2003	Registration status:	Active
Licence expiry date:	06/12/2016	Plate type:	Standard
Licence issue date/time:	15/12/2015 09:41	Licence type:	Licence
Cause of latest registration:	New	Continuous licence:	Yes
Date of last registration:	12/04/2003	Usage:	Transport Licensed Goods
Latest odometer:	115,243	Subject to COF:	Yes
Date of odometer reading:	18/08/2015	Subject to RUC:	Yes
Odometer source:	Certificate of Fitness Inspection	Subject to WOF:	No
Odometer unit:	Kilometres		

Plate history

Plate	Date issued
██████████	12/04/2003

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Certificate of Fitness Inspection	07/08/2009	701,431
Roadside Inspection	29/06/2009	692,100
Roadside Inspection	14/05/2009	679,019
Certificate of Fitness Inspection	11/02/2009	647,080
Certificate of Fitness Inspection	15/08/2008	595,151
Certificate of Fitness Inspection	11/02/2008	540,643
Certificate of Fitness Inspection	08/02/2008	540,633
Certificate of Fitness Inspection	17/08/2007	497,122
Certificate of Fitness Inspection	19/02/2007	449,856
Certificate of Fitness Inspection	03/08/2006	394,679
Certificate of Fitness Inspection	02/08/2006	394,672
Roadside Inspection	14/07/2006	389,469
Certificate of Fitness Inspection	20/02/2006	337,084
Certificate of Fitness Inspection	20/02/2006	337,084
Certificate of Fitness Inspection	24/08/2005	279,079
Certificate of Fitness Inspection	22/08/2005	278,814
Certificate of Fitness Inspection	15/03/2005	225,567
Certificate of Fitness Inspection	14/09/2004	165,479
Certificate of Fitness Inspection	23/03/2004	108,108
Certificate of Fitness Inspection	16/09/2003	49,515
Certificate of Fitness Inspection	12/04/2003	1,085
Pre-registration Check	17/12/2002	329

Vehicle details

Vehicle type:	Goods Van/Truck/Utility	Engine no:	S6NZ83717
Chassis number:	no info	CC rating:	14,600
Colour:	Green	Country of origin:	United States Of America
Power:	324 kw	Assembly type:	Imported Built-Up
Gross vehicle	30,844 kg	No. of seats:	2

Peter Wastney Engineering PDS - Certification
ID PW

Operating from 224 Main Road, Wakapuaka, R. D. 1, Nelson

Job Number 5775- 18635

Vehicle details



Identity of Owner



Measurements, and other factors relevant to the Certification

Per sketch

Factors to be taken into account in the design.

hang to N20

Relevant Standards and guidelines

N20 5466

Assumptions and Calculations

Per computer

Design and detailed Drawings 5775- 18635

Materials and fabrication methods

Ballast Ring

Critical matters assessed during inspection

Ring

Inspection Dates

16/12

Reasons for refusing to certify

/

When the vehicle is certified, that that is certified is within safe tolerance of the relevant specifications

Time taken to inspect and complete process

20

Verified

Signed

Date



5/1/16

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Tom Logan

From: Brian Sara
Sent: Tuesday, 28 November 2017 10:10 a.m.
To: david@thesandbox.co.nz
Cc: Tom Logan (Tom.Logan@nzta.govt.nz)
Subject: FW: PW Files uplifted 22 November 2017
Attachments: Part.17452.SLDPRT; Part.18635.SLDDRW; Part.19288.SLDDRW; Part.19288.SLDPRT; Section 198 letter dated 20-11-2017.pdf; LT400 571814 Certification File PW 19288 Reg BFP872.pdf; LT400 538266 Certification File PW 18635 Reg BFP872.pdf

Hello David

Attached are further files that we uplifted for Reg No [REDACTED] from P Wastney last week that we would like you to assess for us.

LT400 No 538266 was issued on 5/1/2016. We have been advised that this drawbeam failed in service, shortly afterwards and was replaced. Can you please check the attached files (particularly the solid-works files that we are unable to access) and advise if there is sufficient information available to make a certification decision and in the case of this particular drawbeam, is there anything in the file that indicates that it may not comply with NZS:5446.

Similarly in the case of LT400 No 571814, can you please check those files also. This is for the replacement drawbeam which we believe is currently still in service.

Regards,
Brian Sara
Manager Vehicles – Operational Standards & Guidelines NZ Transport Agency DDI 64 4 901 6712 [REDACTED]
[REDACTED]

6th December 2017

P 06 355 1777 M 021 829 435
E eng@thesandbox.co.nz
287 Park Road, Hokowhitu
Palmerston North 4410
www.thesandbox.co.nz

Brian Sara
Customer Design & Delivery Group
NZ Transport Agency
Private Bag 6995
Wellington 6141
New Zealand

RE: Drawbeams on registration [REDACTED] - Initial Findings

Introduction

The towing connection fitted to [REDACTED] on the 5th of January 2016, design 17452, is compared with a similar design which failed in service on the 27th of August 2017 while fitted to JWN197.

Reportedly the 17452-design failed while fitted to [REDACTED] and Peter Wastney certified a replacement drawbeam on the 8th of November 2016, design 19288. Drawbeam 17452 was initially fitted to [REDACTED] on the 29th of May 2014 before being moved to [REDACTED] in January 2016.

The history of the three vehicles involved and relevant certification dates are shown in Figure 1.



Figure 1 Towing connection history

Drawbeam 17452

A review of the 17452's fatigue history, using Landata, shows the component was fitted to two vehicles over its service life, Table 1 and Figure 1.

Table 1 Drawbeam 17452 Vehicle history

Registration	Date certified to vehicle	Travel Distance ¹
[REDACTED]	29 th May 2014	39,000 km
[REDACTED]	5 th of January 2016	40,000 km

¹ Approximate km travelled based on certification dates, no account is made for the down time while fitting moved or replacement towing connections i.e. time off the road.

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The basic design of the drawbeam is shown in Figure 2.

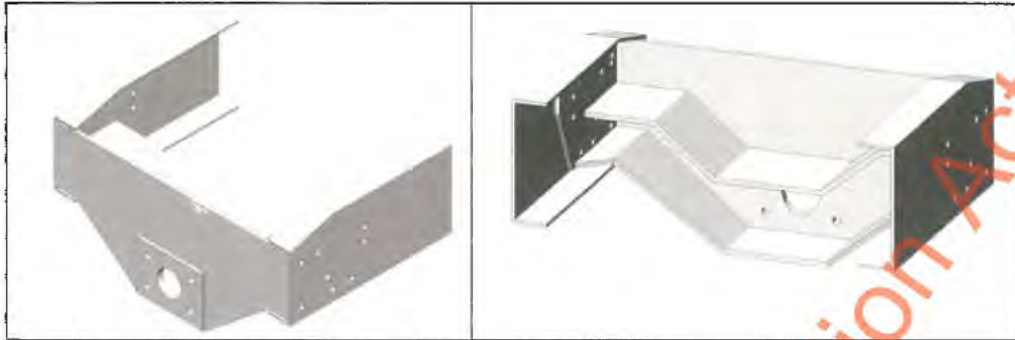


Figure 2 Drawbeam design 17452, Isometric view (left), Isometric view rear (right)

The drawbeam was certified on [REDACTED] in January 2016 before being replaced due to failure after approximately 40,000km of service on the 8th of December 2016. The total approximate service life of the drawbeam is 79,000km.

Drawbeam 18877

Drawbeam 18877 which failed on the 27th of August 2017 on JWN197, had travelled approximately 80,000 km. Basic design views are shown in Figure 3.



Figure 3 Drawbeam design 18877, Isometric view (left), Isometric view rear (right)

SolidWorks Design Timeline 17452 & 18877

The 17452 SolidWorks file was created on the 29th of May 2014, the same day as the initial certification on [REDACTED]. The file was last saved on the 29th of August 2017 which is 2 days after the JWN197 accident date, Figure 4.



Figure 4 SolidWorks Summary information - 17452



Figure 5 SolidWorks Summary Information - 18877

Overlaying the SolidWorks CAD files shows that both drawbeam designs, 17542 and 18877, are identical. The only differences are in the truck chassis dimensions and the bolt group detail. The SolidWorks stamp dates and suppressed features in the SolidWorks model tree also support this conclusion, Figure 4 and Figure 5.

Note SolidWorks last saved means the files were modified to some extent on that date.

Query to Certifier

On the 4th of September 2017, Sandbox sent an email to NZTA querying the date the original design for JWN197 was created in SolidWorks, May 2014. The drawbeam on JWN197 was certified on the 16th of June 2016 some two years after the SolidWorks CAD file was created; this indicated that the design might have been used for multiple certifications. Sandbox and NZTA were concerned that other vehicles using the same design may prematurely fail due to the design issues found in 18877 (JWN197's Drawbeam).

The certifier responded back to NZTA on the 5th of September and stated, "No, this was a one-off, only".

It was assumed that the response from the certifier was correct and that there was some other reason for the age of the SolidWorks CAD file.

It is now apparent given the date of the certification of the drawbeam on [REDACTED] and the CAD file creation date that the statement made by Mr Wastney was incorrect.

Conclusions

Based on the SolidWorks files and the design timelines the following can be concluded:

- The certifier's statement that JWN197 was a one-off design is not correct.
- The certifier opened the design 17452 CAD file within 2 days of the JWM197 accident and made some modification to the file.
- The certifier was aware of the failure on [REDACTED] some seven months before the failure in service of the towing connection JWN197.
- The two drawbeams failed at approximately the same service life.
- The failure of the design 17452 on [REDACTED] has not been reported or investigated. There are no notes on the certifier's replacement [REDACTED] drawbeam design certificate (design 19288) stating the reason for replacement of the 17452 design.

The conclusions show a breach of the primary duty specified in the NZTA Vehicle Inspection Requirements Manual Section 3.1.1 and the ethical responsibilities as a Chartered Professional Engineer.

DAVID MANLEY *BE, MEngSt, MEngNZ*
SENIOR CONSULTING ENGINEER

Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Monday, 11 December 2017 6:04 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

Follow Up Flag: FollowUp
Flag Status: Flagged

The design was used on Both [REDACTED] and [REDACTED] but has since been replaced on both of these vehicles. No other vehicle has been fitted with this design

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [mailto:Tom.Logan@nzta.govt.nz]
Sent: Monday, 11 December 2017 3:52 p.m.
To: peter@pwe.co.nz
Subject: RE: LT400 554622 questions

Hi Peter,

You have previously confirmed to us that the design of the drawbeam that failed on JWN197 in August 2017 was a one-off design, and that the CAD file was developed in May 2010 but not used as the analysis showed that the design failed to meet the requirements of the standard.

However it appears that this design was in fact certified by you on 29 May 2014 for use on [REDACTED] this drawbeam was then moved to [REDACTED] and certified by you on 5 January 2016. The SolidWorks model from LT400 554622 (JWN197) is identical in detail (except for mountings) to the one on LT400 538266 ([REDACTED]) which is reported as having failed at a similar fatigue age.

Can you please clarify this for us and advise if this design, or similar, has been used on any other vehicles as it appears that you may have been mistaken about it being a one-off.

Thanks and regards,
Tom.

From: Peter Wastney (PWE) [mailto:peter@pwe.co.nz]
Sent: Tuesday, 26 September 2017 3:11 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

Background

In 2014, a drawbeam model was developed for an application, mounting inside the Chassis rails in a very compact situation. It is mandatory to save the model before carrying out stress analysis, if the model is unsaved, then an arbitrary saved file is created by the programme. If analysis shows a weakness in design, the model is modified, and

the analysis is re run. In this particular case, it was decided that the model could not be modified to meet required loading, so an alternative design was made up from scratch. In such cases, the saved file is overwritten, but for some reason this was not done in this case, an unsatisfactory design remained on file, together with analysis to match the loading of a 30 Tonne towing connection.

Inspections.

I was in Greymouth on 12th May, 2016, when the deck framework had been built. The photos in the subsequent Load Anchorage certificate were taken at this time. Aratuna Freighters expressed a desire for a drawbeam that would fit inside the Chassis rails for this vehicle, and as a result I sent details of several different models from my files. Without realising it, I forwarded the failed design amongst these, I did not examine the stress analysis at that time.

I was next in Greymouth on 1st June, 2016, at this time crane mount and drawbeam were incomplete.

Drawbeam and Crane mount certificates were issued on 16th June 2016, the photos used in those certificates were taken at 5:30 pm on 15th June, I was not in Greymouth that day.

I was next in Greymouth for final inspection on 23rd June, 2016, and would have inspected this vehicle in the yard of Aratuna freighters. I did not notice the cut-out or missing extended gussets, these would have been obscured by the chassis spacers over the crane bolts at that time. I did not notice the incorrectly seated washers, they would have been hard up inside the lower drawbeam member. The specification for the hole spacing referred to the distance from the chassis flange, rather than the mounting plate. In particular, the 12mm diameter hole would have been a factory hole in the chassis that was picked up because it was there. These factors may have hastened the catastrophic failure of this drawbeam, but did not cause it. The cause was in faulty design.

.EA Analysis

If the requirement for analytical analysis was replaced by a requirement to conduct a laboratory test, then a means of restraint would need to be spelled out. For example, it would need to be stated that the chassis be attached to a cradle, supported at its suspension mounts, and load applied to the drawbeam. Similar restraints are needed for analytical analysis, but NZS 5446 is silent on how these are to be selected. Obviously different assumptions are going to give different results, but I contend that either allowing flexure of the Chassis rails, or taking these as rigid has and can provide robust Drawbeam designs for New Zealand conditions.

Mesh size was chosen as default by the programme for high quality meshing, I would only use draft quality as preliminary analysis. I could have manually selected a smaller mesh size, but generally when this is done, results are very similar.

The only way a design difference between model and drawing can occur is if the drawing was prepared and printed with subsequent modification of the model. If the drawing was opened subsequent to change in the model, it would reflect these changes.

When the analysis was run for this particular drawbeam, they were re run from the earlier file, without the critical evaluation of the results that were warranted. Earlier analysis showed that this design failed to meet the requirements of the standard, the same should have been picked up at this analysis, but was not.

The Motochek data for Nissan [REDACTED] was for a completely different job, and was misfiled



Peter Wastney

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Friday, 22 September 2017 2:01 p.m.
To: Peter Wastney (PWE)
Subject: LT400 554622 questions

Hi Peter,

We have received the attached report on your certification LT400 number 554622 (your file reference 5775-18877) - a drawbeam certification on an Iveco truck. I would appreciate any explanation or comments on the findings of this report, by the end of business on the 6th of October 2017 at the latest, so that we can take those into consideration for our investigation.

In particular I would appreciate comments on the following points raised in the report and/or noted from your certification file provided:

- Did you carry out a final inspection with the drawbeam installed, and if so
 - why you certified the drawbeam when there were washers not seating correctly due to interference on the weld
 - Why you certified the drawbeam when mounting holes were closer to the edge than specified
 - Why you certified the drawbeam when the design was different to the one analysed, eg a 10mm cut-out and no extended rear gussets
- With regards to your FEA analysis,
 - what was the basis of the boundary conditions chosen and how does that correlate to the real-world situation
 - what was the basis for your choice of mesh size for the analysis
 - why is there a design difference between the drawing and FEA model in your certification file
 - why, when the material yield strength is identified as 220.6MPa, you have certified the drawbeam showing areas of stress over 280MPa
- Why is there Motochek information for a 2008 Nissan truck, license plate number [REDACTED], included in your certification file for an Iveco truck license number JWN197

Regards,
Tom.

Tom Logan / Senior Advisor

Technical Services

E tom.logan@nzta.govt.nz / W nzta.govt.nz

National Office / Victoria Arcade, 50 Victoria Street,
Private Bag 6995, Wellington 6141, New Zealand



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Tom Logan

From: Tom Logan
Sent: Tuesday, 12 December 2017 2:08 p.m.
To: 'peter@pwe.co.nz'
Cc: Brian Sara
Subject: RE: LT400 554622 questions
Attachments: RE: Request for files - Urgent; RE Request for files - Aratuna Freighters Ltd Iveco Stralis Reg No JWN197 - Urgent (3).msg

Hi Peter,

I am concerned about an apparent contradiction in relation to your answers to questions relating to the design certification of the drawbeam used on JWN197 that failed on 17 August 2017.

On 5 September 2017 Brian Sara asked you "Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle" and you replied "No, this was a one off only"

Again on 5 September 2017 Brian pointed out the dates of the SolidWorks files: "You have advised that "this was a one off only" when asked if "you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle." We have noted that the CAD file you provided (see clip below) was created on Thursday 29 May 2014 at 2:26:43 pm." Your explanation was "CAD file was created in 2014, but not used because I had concerns for it then."

Below you state "In 2014, a drawbeam model was developed for an application, mounting inside the Chassis rails in a very compact situation. It is mandatory to save the model before carrying out stress analysis, if the model is unsaved, then an arbitrary saved file is created by the programme. If analysis shows a weakness in design, the model is modified, and the analysis is re run. In this particular case, it was decided that the model could not be modified to meet required loading, so an alternative design was made up from scratch"

It is now apparent that you did in fact certify this design on two other vehicles (the same component relocated) which does not give us confidence that this design, or similar, has not been used on even more vehicles. Your statement that it was not used in 2014 is incorrect.

Can you please provide an explanation for this apparent contradiction.

Regards,
Tom.

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Monday, 11 December 2017 6:04 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

The design was used on Both [REDACTED] and [REDACTED] but has since been replaced on both of these vehicles. No other vehicle has been fitted with this design

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]

Sent: Monday, 11 December 2017 3:52 p.m.

To: peter@pwe.co.nz

Subject: RE: LT400 554622 questions

Hi Peter,

You have previously confirmed to us that the design of the drawbeam that failed on JWN197 in August 2017 was a one-off design, and that the CAD file was developed in May 2010 but not used as the analysis showed that the design failed to meet the requirements of the standard.

However it appears that this design was in fact certified by you on 29 May 2014 for use on [REDACTED] this drawbeam was then moved to [REDACTED] and certified by you on 5 January 2016. The SolidWorks model from LT400 554622 (JWN197) is identical in detail (except for mountings) to the one on LT400 538266 ([REDACTED]) which is reported as having failed at a similar fatigue age.

Can you please clarify this for us and advise if this design, or similar, has been used on any other vehicles as it appears that you may have been mistaken about it being a one-off.

Thanks and regards,
Tom.

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]

Sent: Tuesday, 26 September 2017 3:11 p.m.

To: Tom Logan

Subject: RE: LT400 554622 questions

Background

In 2014, a drawbeam model was developed for an application, mounting inside the Chassis rails in a very compact situation. It is mandatory to save the model before carrying out stress analysis, if the model is unsaved, then an arbitrary saved file is created by the programme. If analysis shows a weakness in design, the model is modified, and the analysis is re run. In this particular case, it was decided that the model could not be modified to meet required loading, so an alternative design was made up from scratch. In such cases, the saved file is overwritten, but for some reason this was not done in this case, an unsatisfactory design remained on file, together with analysis to match the loading of a 30 Tonne towing connection.

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FEA Analysis

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to give different results, but I contend that either allowing flexure of the Chassis rails, or taking these as rigid has and can provide robust Drawbeam designs for New Zealand conditions.

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Peter Wastney

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]

Sent: Friday, 22 September 2017 2:01 p.m.

To: Peter Wastney (PWE)

Subject: LT400 554622 questions

Hi Peter,

We have received the attached report on your certification LT400 number 554622 (your file reference 5775-18877) - a drawbeam certification on an Iveco truck. I would appreciate any explanation or comments on the findings of this report, by the end of business on the 6th of October 2017 at the latest, so that we can take those into consideration for our investigation.

In particular I would appreciate comments on the following points raised in the report and/or noted from your certification file provided:

- Did you carry out a final inspection with the drawbeam installed, and if so
 - why you certified the drawbeam when there were washers not seating correctly due to interference on the weld
 - Why you certified the drawbeam when mounting holes were closer to the edge than specified
 - Why you certified the drawbeam when the design was different to the one analysed, eg a 10mm cut-out and no extended rear gussets
- With regards to your FEA analysis,
 - what was the basis of the boundary conditions chosen and how does that correlate to the real-world situation
 - what was the basis for your choice of mesh size for the analysis
 - why is there a design difference between the drawing and FEA model in your certification file

- why, when the material yield strength is identified as 220.6MPa, you have certified the drawbeam showing areas of stress over 280MPa
- Why is there Motochek information for a 2008 Nissan truck, license plate number [REDACTED], included in your certification file for an Iveco truck license number JWN197

Regards,
Tom.

Tom Logan / Senior Advisor

Technical Services

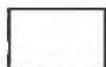
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Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Tuesday, 5 September 2017 10:08 a.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

No, this was a one off only
Regards,
Peter Wastney

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Tuesday, 5 September 2017 9:04 a.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: FW: Request for files - Urgent
Importance: High

Hello Peter

Copied below is one of the questions that was included in the formal letter requesting files that was delivered to you on Friday 1 September 2017 and also raised in the email below:

Additionally: All documents pertaining to any other vehicles, irrespective of make and model that have been certified by you, involving the same or similar designs and specifications for drawbeams and/or crane mounting.

Email: Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

Can you please respond to this question urgently?

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Monday, 4 September 2017 4:49 p.m.
To: 'peter@pwe.co.nz'
Subject: RE: Request for files - Urgent

Hello Peter

Thanks for sending these through.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency
DDI 64 4 901 6712 M [REDACTED]

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Monday, 4 September 2017 3:39 p.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Friday, 1 September 2017 5:44 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: Request for files - Urgent

Hello Peter

Further to our telephone discussion where we lost reception, attached is a copy of the letter that was delivered to your address today.

I want to confirm for clarity that in addition to original hard copies we want a full electronic copy of the drawing-analysis files in whatever the original format that it was produced, i.e AutoCAD, Solid Works, etc included. These are for the certification of the Drawbeam LT400 554622, Crane Mounting LT400 554623 & Load Anchors LT400 550344.

Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

I will arrange for somebody to call on Monday to pick these up. Can you please contact me by 10:00 am on Monday 4 September 2017 to confirm you have these available.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

E brian.sara@nzta.govt.nz / W nzta.govt.nz

Chews Lane Precinct, 50 Victoria St
Private Bag 6995, Wellington 6141, New Zealand



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Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Wednesday, 6 September 2017 3:13 p.m.
To: Brian Sara
Subject: RE: Request for files - Aratuna Freighters Ltd Iveco Stralis Reg No JWN197 - Urgent

CAD file was created in 2014, but not used because I had concerns for it then. It re surfac4e3s when Aratuna wanted a compact design, along with others that would have been more suitable. They picked that one, and unfortunately I did not look closely enough at the analysis at that time. I can now see that your analysis is correct.

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Brian Sara [mailto:Brian.Sara@nzta.govt.nz]
Sent: Tuesday, 5 September 2017 4:41 p.m.
To: peter@pwe.co.nz
Subject: RE: Request for files - Aratuna Freighters Ltd Iveco Stralis Reg No JWN197 - Urgent
Importance: High

Hello again Peter

We have had some initial analysis carried out on the drawbeam fitted to the Aratuna Freighters Ltd Iveco Stralis Reg No JWN197 that recently suffered a catastrophic failure. As a result we are of the opinion the design is seriously deficient and that drawbeams of similar design pose an immediate risk to the public.

You have advised that "this was a one off only" when asked if "you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle."

We have noted that the CAD file you provided (see clip below) was created on Thursday 29 May 2014 at 2:26:43 pm.

Summary Custom Configuration Specific

Author:

Keywords:

Comments:

Title:

Subject:

Statistics

Created: Thursday, 29 May 2014 2:26:43 PM

Last Saved: Monday, 4 September 2017 11:01:28 AM

Last Saved By: Administrator

Last Saved With: SOLIDWORKS 2009

OK Cancel Help

The LT400 that you issued for the failed drawbeam fitted to Iveco Stralis Reg No JWN197, was issued on 16 June 2016 – some 25 months after the file was created. This raises a further question in that either the intention to certify this particular drawbeam was signalled over two years before it was completed or the drawing may have been used for another vehicle or vehicles prior to the June 2016 certification. Given that we now have a concern that drawbeams of similar design pose an immediate risk to the public, it is imperative that we, as the regulator, ensure that appropriate steps are taken to ensure public safety.

Can you please check your records again in case there are other vehicles that have drawbeams that are of a similar design to the one that has failed. If you do identify other vehicles which share a similar design, please advise us immediately so we can consider what steps are necessary to mitigate the risk of a similar failure. If you are certain that there are no other vehicles that might be at risk of failure, please confirm this and please explain the timing of the CAD file creation in relation to the issuing of the LT400 on 16 June 2016.

I am sure you understand the need for a response to this email with urgency and I look forward to your reply as early as possible tomorrow 6 September 2016.

Regards,
 Brian Sara
 Manager Vehicles – NZ Transport Agency
 DDI 64 4 901 6712 M [REDACTED]

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Tuesday, 5 September 2017 10:08 a.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

No, this was a one off only
 Regards,
 Peter Wastney

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Tuesday, 5 September 2017 9:04 a.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: FW: Request for files - Urgent
Importance: High

Hello Peter

Copied below is one of the questions that was included in the formal letter requesting files that was delivered to you on Friday 1 September 2017 and also raised in the email below:

Additionally: All documents pertaining to any other vehicles, irrespective of make and model that have been certified by you, involving the same or similar designs and specifications for drawbeams and/or crane mounting.

Email: Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

Can you please respond to this question urgently?

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Brian Sara
Sent: Monday, 4 September 2017 4:49 p.m.
To: 'peter@pwe.co.nz'
Subject: RE: Request for files - Urgent

Hello Peter

Thanks for sending these through.

Regards,
Brian Sara
Manager Vehicles – NZ Transport Agency

DDI 64 4 901 6712 M [REDACTED]

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Monday, 4 September 2017 3:39 p.m.
To: Brian Sara
Subject: RE: Request for files - Urgent

From: Brian Sara [<mailto:Brian.Sara@nzta.govt.nz>]
Sent: Friday, 1 September 2017 5:44 p.m.
To: Peter Wastney (peter@pwe.co.nz)
Subject: Request for files - Urgent

Hello Peter

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I want to confirm for clarity that in addition to original hard copies we want a full electronic copy of the drawing-analysis files in whatever the original format that it was produced, i.e AutoCAD, Solid Works, etc included. These are for the certification of the Drawbeam LT400 554622, Crane Mounting LT400 554623 & Load Anchors LT400 550344.

Also can you please advise if you have issued certification to NZS5446 for any other drawbeams the same or similar to this vehicle.

I will arrange for somebody to call on Monday to pick these up. Can you please contact me by 10:00 am on Monday 4 September 2017 to confirm you have these available.

Regards,

Brian Sara / Manager Vehicles

Customer Design & Delivery Group

DDI 64 4 901 6712 M [REDACTED]

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Tom Logan

From: Peter Wastney (PWE) <peter@pwe.co.nz>
Sent: Tuesday, 12 December 2017 3:29 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

No, I cannot explain this apparent contradiction. My comment were based on the premise that no other example of this design was in current use.

Regards,

Peter Wastney
Peter Wastney Engineering
224 Wakapuaka Road, RD1
Nelson 7071

64 3 545 0848
peter@pwe.co.nz
www.pwe.co.nz

From: Tom Logan [mailto:Tom.Logan@nzta.govt.nz]
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To: peter@pwe.co.nz
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Subject: RE: LT400 554622 questions

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Can you please provide an explanation for this apparent contradiction.

Regards,
Tom.

From: Peter Wastney (PWE) [mailto:peter@pwe.co.nz]
Sent: Monday, 11 December 2017 6:04 p.m.

To: Tom Logan
Subject: RE: LT400 554622 questions

The design was used on Both [REDACTED] and [REDACTED] but has since been replaced on both of these vehicles. No other vehicle has been fitted with this design

Regards,

Peter Wastney
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From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Monday, 11 December 2017 3:52 p.m.
To: peter@pwe.co.nz
Subject: RE: LT400 554622 questions

Hi Peter,

You have previously confirmed to us that the design of the drawbeam that failed on JWN197 in August 2017 was a one-off design, and that the CAD file was developed in May 2010 but not used as the analysis showed that the design failed to meet the requirements of the standard.

However it appears that this design was in fact certified by you on 29 May 2014 for use on [REDACTED] this drawbeam was then moved to [REDACTED] and certified by you on 5 January 2016. The SolidWorks model from LT400 554622 (JWN197) is identical in detail (except for mountings) to the one on LT400 538266 ([REDACTED]) which is reported as having failed at a similar fatigue age.

Can you please clarify this for us and advise if this design, or similar, has been used on any other vehicles as it appears that you may have been mistaken about it being a one-off.

Thanks and regards,
Tom.

From: Peter Wastney (PWE) [<mailto:peter@pwe.co.nz>]
Sent: Tuesday, 26 September 2017 3:11 p.m.
To: Tom Logan
Subject: RE: LT400 554622 questions

Background

In 2014, a drawbeam model was developed for an application, mounting inside the Chassis rails in a very compact situation. It is mandatory to save the model before carrying out stress analysis, if the model is unsaved, then an arbitrary saved file is created by the programme. If analysis shows a weakness in design, the model is modified, and the analysis is re run. In this particular case, it was decided that the model could not be modified to meet required loading, so an alternative design was made up from scratch. In such cases, the saved file is overwritten, but for some reason this was not done in this case, an unsatisfactory design remained on file, together with analysis to match the loading of a 30 Tonne towing connection.

Inspections.

I was in Greymouth on 12th May, 2016, when the deck framework had been built. The photos in the subsequent Load Anchorage certificate were taken at this time. Aratuna Freighters expressed a desire for a drawbeam that would fit inside the Chassis rails for this vehicle, and as a result I sent details of several different models from my files. Without realising it, I forwarded the failed design amongst these, I did not examine the stress analysis at that time.

I was next in Greymouth on 1st June, 2016, at this time crane mount and drawbeam were incomplete. Drawbeam and Crane mount certificates were issued on 16th June 2016, the photos used in those certificates were taken at 5:30 pm on 15th June, I was not in Greymouth that day.

I was next in Greymouth for final inspection on 23rd June, 2016, and would have inspected this vehicle in the yard of Aratuna freighters. I did not notice the cut-out or missing extended gussets, these would have been obscured by the chassis spacers over the crane bolts at that time. I did not notice the incorrectly seated washers, they would have been hard up inside the lower drawbeam member. The specification for the hole spacing referred to the distance from the chassis flange, rather than the mounting plate. In particular, the 12mm diameter hole would have been a factory hole in the chassis that was picked up because it was there. These factors may have hastened the catastrophic failure of this drawbeam, but did not cause it. The cause was in faulty design.

FEA Analysis

If the requirement for analytical analysis was replaced by a requirement to conduct a laboratory test, then a means of restraint would need to be spelled out. For example, it would need to be stated that the chassis be attached to a cradle, supported at its suspension mounts, and load applied to the drawbeam. Similar restraints are needed for analytical analysis, but NZS 5446 is silent on how these are to be selected. Obviously different assumptions are going to give different results, but I contend that either allowing flexure of the Chassis rails, or taking these as rigid has and can provide robust Drawbeam designs for New Zealand conditions.

Mesh size was chosen as default by the programme for high quality meshing, I would only use draft quality as preliminary analysis. I could have manually selected a smaller mesh size, but generally when this is done, results are very similar.

The only way a design difference between model and drawing can occur is if the drawing was prepared and printed with subsequent modification of the model. If the drawing was opened subsequent to change in the model, it would reflect these changes.

When the analysis was run for this particular drawbeam, they were re run from the earlier file, without the critical evaluation of the results that were warranted. Earlier analysis showed that this design failed to meet the requirements of the standard, the same should have been picked up at this analysis, but was not.

The Motochek data for Nissan [REDACTED] was for a completely different job, and was misfiled



Peter Wastney

Regards,

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From: Tom Logan [<mailto:Tom.Logan@nzta.govt.nz>]
Sent: Friday, 22 September 2017 2:01 p.m.
To: Peter Wastney (PWE)
Subject: LT400 554622 questions

Hi Peter,

We have received the attached report on your certification LT400 number 554622 (your file reference 5775-18877) - a drawbeam certification on an Iveco truck. I would appreciate any explanation or comments on the findings of this report, by the end of business on the 6th of October 2017 at the latest, so that we can take those into consideration for our investigation.

In particular I would appreciate comments on the following points raised in the report and/or noted from your certification file provided:

- Did you carry out a final inspection with the drawbeam installed, and if so
 - why you certified the drawbeam when there were washers not seating correctly due to interference on the weld
 - Why you certified the drawbeam when mounting holes were closer to the edge than specified
 - Why you certified the drawbeam when the design was different to the one analysed, eg a 10mm cut-out and no extended rear gussets
- With regards to your FEA analysis,
 - what was the basis of the boundary conditions chosen and how does that correlate to the real-world situation
 - what was the basis for your choice of mesh size for the analysis
 - why is there a design difference between the drawing and FEA model in your certification file
 - why, when the material yield strength is identified as 220.6MPa, you have certified the drawbeam showing areas of stress over 280MPa
- Why is there Motochek information for a 2008 Nissan truck, license plate number [REDACTED] included in your certification file for an Iveco truck license number JWN197

Regards,
Tom.

Tom Logan / Senior Advisor

Technical Services

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