LOW VOLUME VEHICLE TECHNICAL ASSOCIATION Inc

LVVTA Position Statement:

UDM Skoda Vehicles Returned to Road

From Tony Johnson, CEO, Low Volume Vehicle Technical Association (Inc), December 2014

Six people with disabilities and their respective care-givers and families will be pleased that their U-Drive Mobility (UDM) Skoda Yeti vehicles, which have been modified to enable disabled persons to travel in, and in some cases drive, were considered to be sufficiently safe to return to the road by the New Zealand Transport Agency (NZTA) during the last week of November 2014.

LVVTA identified during June 2013 that the vehicles had been modified unsafely, and had been incorrectly certified by an LVV Certifier. LVVTA reported this to the NZTA. LVVTA inspected all of the 8 affected vehicles and established a list of engineering and mechanical faults that needed rectification, which was communicated to UDM. Because unproven materials and construction methods had been used, LVVTA also requested material information and test documentation that would support the unusual products and construction methods used.

LVVTA certified all 9 vehicles from the commencement of production, when a TAC application had been lodged with the certifier. Over the next 12 months of production LVVTA appeared unaware that any of these processes had taken place until by their own admission a complaint was lodged by potential industry competitors. Without having even seen one of these vehicles, the LVVTA on the 26th June 2013 instructed the certifier to close the UDM factory from any further production of vehicles for the NZ market. LVVTA subsequently requested test data with no direction as to test procedure requirements. When a torsion test was requested they finally nominated an ADR test procedure, whereupon UDM appointed a qualified Melbourne based ADR Compliance Engineer to instruct and oversee the test procedures. The tests were carried out by an independent NZ engineering firm under the ADR engineers guidance. The engineers opinion and test results were ignored by LVVTA.

The impact on the owners and users of the vehicles was not taken lightly, and to ensure that LVVTA's initial concerns were well-founded, LVVTA involved over 30 industry experts and specialists, including automotive engineers, aviation engineers, composite specialists, welding specialists, and race car constructors in the process of assessing the safety and durability of the modifications that had been made to the vehicles.

Four months after issuing the factory closure LVVTA assembled its technical advisory committees (a team of tradesmen, none of whom have any academic qualifications or experience with sandwich panel use in the automotive industry) to endorse the staff recommendation not to grant Type approval. This would appear to be a further attempt to

provide justification for the previous action taken by the LVVTA without any discussion with UDM. It is inconceivable that an Incorporated society acting as a contractor to a government department would shut down a commercial factory without inspection or discussion with the company concerned, but it is indicative of the high handed approach taken by LVVTA ever since to minimize their exposure to legal action after the event. Any compliance agency should establish the facts before making unilateral decisions, not make decisions and then spend the next two years trying to justify those decisions.

LVVTA would not identify the 30 industry experts or provide their relevant qualifications.

Throughout the second half of 2013, UDM were unable to rectify the vehicles to an acceptable standard, and were unable to provide evidence that supported the use of the materials and construction methods used in the modifications. NZTA also investigated the vehicles during this period and developed the same serious safety concerns, which led to a decision by NZTA to remove the vehicles from the road when the safety concerns had still not been adequately addressed by UDM in December of 2013.

NZTA has not advised UDM that it undertook its own inspections of the vehicles prior to the 19th December. It is our understanding that Davey Uprichard, a registered engineer employed by NZTA, acts as the NZTA Liaison person with LVVTA. Davey had been party to some of the inspections but to our knowledge has never produced a written report prior to the 19th December 2013. If he did it, has never been disclosed to UDM.

On the other hand the evidence that UDM produced was ignored, including bonding tests supported by the bond label, Manufacturer supplied warranties on the floor material, and structural test data that all exceeded test requirements, including a field suspension performance handling review by a professional race driver. The NZTA decision to deregister the vehicles was based on LVVTA engineering advice that ignored all the test data supplied.

1. *LVVTA apparently calculated the floor would only support a load of 300Kg and was therefore unsafe. Actual test of the floor without the car additional support of the car chassis showed it would support 1300Kg and was safe*

2. *LVVTA claimed the Glue would not support the floor and was unsafe.*
The Epoxy bond label shows a minimum load of 300 tonnes to displace the floor. This was backed a series of tests including non optimized bonding conditions. The test data substantiated the label claim and was safe.

3. *The rear suspension had excessive bump steer.*
After expert analysis the NZTA accepted the bump steer was within conventional operating parameters and was safe. While NZTA would not admit that the "measurements" done by LVVTA were wrong, it is clearly obvious that they were and that these incorrect measurements had been used as the third reason for removing the cars from the road.

LVVTA engineering advice proved wrong on all counts. This UDM conclusion was supported by a qualified experts inspection of crash test cars being prepared for ECE/EU certification in France. NZTA later commissioned the same expert for their own report

Mr. Johnson omitted to say that in early January 2014 LVVTA staff members Dan Myers and Justin Hansen were instructed by him to establish yet another panel to inspect one of the cars in Auckland and to come up with a "fix". While the panel members were identified LVVTA refused to provide their relevant qualifications. LVVTA would not allow a representative of UDM, or the certifier, to be present during the inspection. Despite this LVVTA required UDM to deliver the vehicle from Waiuku to Auckland for the inspection using Dealer plates to enable it to be driven on the road, despite the fact that it had deemed the vehicle to be unsafe two weeks earlier. Either my life was expendable, or the risk was not deemed to be significant. LVVTA's definition of Expert does not appear to include tertiary qualified members of NZIE who can operate legally as consultants. Instead, it relies on trades personnel with no ability to sign off on their opinions. None of the people brought in signed off on the comments or the proposed "fix".

The fix was the destruction of the existing floor and installing a series of steel RHS sections in its place. The "design" such as it was, was done by Dan Myers and while he knew that there was a test floor available at Waiuku he made no attempt to check its strength against his calculations. When he came to Waiuku at the end of January to instruct UDM staff on what needed to be done, UDM showed him the test floor loaded with 1296kg of cement bags to show him that the problem that he had identified of a 300kg maximum load, was not a problem that needed fixing.
He ignored this and spent three hours instructing UDM on his fix that he would not warrant for a Type Approval application or that it would even be certified. Needless to say this destroyed any vestige of credibility that he may have had left and left all present in no doubt that the LVVTA had no competence.
Davey Uprichard at that presentation claimed to have peer reviewed the calculations done by Dan Myers and he was very surprised to see the actual load supported by the floor section. Those calculations have never been made available to UDM.
After this debacle UDM approached NZTA directly and asked that ongoing discussion on the UDM vehicles be between UDM and NZTA as we had no confidence whatsoever with the LVVTA technical ability or the belligerence of the CEO Tony Johnson.
This was agreed between NZTA and UDM at a meeting in Auckland with an external facilitator.

During 2014, in an effort to assist the owners and users of the vehicles, NZTA commissioned an independent engineering review to determine if the vehicles could be assessed as being made 'fit for purpose' in a reduced capacity, despite not being able to comply with low volume vehicle certification requirements. The independent review determined that several critical structural issues had to be addressed before the vehicles could be

considered ‘fit for purpose’.
The critical structural engineering work required by the independent engineering review included:

- the replacement of the entire floor in four of the eight vehicles due to insufficient strength of the flooring material used;

The independent report did not require the replacement of the four floors, it said that the Alucore floors met the strength requirements but the Ayrelite floors were weaker. To quote the report
“Overall, the Alucore front and rear sandwich panels have adequate strength for the expected in–service loads. There is inadequate data and /or testing to enable a conclusion to be made about the strength of the AYRLITE panels.”

“We note that this conclusion differs from that of the LVVTA who concluded from the same manufacturer’s data that the (Alucore) panel has a load capacity of only 300kg/m2 for a 1mx1m panel and stated that this is far below that required for the vehicle”

Clearly the LVVTA is trying to provide an interpretation of the report that minimizes its own exposure. In fact the 4 floors in question had passed required strength tests as installed, however there was no manufacturer supporting data on the Ayrlite, which differed from the Alucore published material data. The report did not make any allowance for the additional strength from the tub assembly framing and the car chassis contribution.
NZTA gave UDM three options

- *Commission an FEA analysis to provide theoretical verification of the adequacy of the Ayrlite floors to support the existing test data,*
- *Repeat the skelton tests done in France for combined seat and seat belt loading, or*
- *Replace the undocumented Australian Floors with the documented German floors.*

UDM made the pragmatic decision to replace the Ayrlite floors with the accepted Alucore floors as it was a quicker/cheaper way of getting clients cars back on the road While we believe from the seat belt pull tests that the Ayrlite floors in situ with the steel bracing and the car chassis support are strong enough, the cost of proving this was prohibitive, especially for a product that was not from our preferred supplier.

- the fitment of mechanical fasteners to provide a mechanical connection between the new aluminium floor and the existing vehicle structure rather than relying just on the bonding system (which could have peeled apart);

To quote the actual report
"2.6 Expected life of the adhesive
In general, automotive industry has demonstrated that properly implemented adhesive bonds can be expected to last the lifetime of a vehicle and adhesive suppliers claim better life than welded joints.
In this case, the main area of concern is the apparent lack of process documentation for these particular vehicles. We specifically considered the lack of a rigid formal QA system and associated records that had not been put in place before manufacture started and the absence of formal evidence of pre production testing and production testing. The question in our minds was whether this created a sufficient risk that the adhesive joints could not be relied upon. Key factors considered which may mitigate this risk include:

- The primary joints have very large bonded areas and hence low stress levels.
- The performance of the adhesive is not particularly sensitive to surface preparation.
- Additional mechanical fasteners will be required at the primary joints to ensure good peel resistance, which will also supplement the strength of the joints"

The bonded areas of the car that support the floor tub already had 220 rivets which were enough to support the whole loaded floor without any adhesive. At the loads concerned and with the angle sections involved the risk of peel failure is minimal. It was easier to add 47 more rivets than to maintain a protracted debate with an organization that was struggling to justify its earlier decision and UDM had no appeal rights. We either did what NZTA said or we had no cars on road.

The addition of 47 peel rivets to the 220 already installed, with an optimised bond label strength of 450 plus tones, non optimized at 300 tonnes make potential peel failure fanciful to say the least. The successfully tested EU compliant UDM vehicles do not have this addition, added again, solely to get clients cars back on the road.

- the fitment of a protective structure to the fuel tank to prevent damage to the fuel tank as a result of its new (lowered) position relative to the road surface.

Again, not fitted to EU cars, but it is specified in the Hobby Car Manual, although not deemed to be warranted by the certifier. ***While this was not a recommendation from the experts report*** *NZTA insisted that it be done in order to get NZ clients cars back on the road this was a simple task and was done at the same time as the extra rivets were added to get the cars back on the road.*

The existing tank is 3mm thick alloy. The addition of a 1mm steel plate may afford some additional protection as a disposable shield. With the oldest car now 3 years in continual use with no tank issues it is unlikely that this could be seen as a significant safety issue. It should be noted the first car was exported to Australia, and has not been deregistered and has been in full time use by its owner, as have all the French vehicles delivered.

In addition to the structural issues identified by the independent engineering review, other important engineering work was also required to be carried out to the vehicles which included:

- structural reinforcement of the front floor with conventional materials to ensure that in the event of a crash the vehicles' seats and seatbelt anchorages would not become detached from the vehicle floor-

All of the cars had been fitted steel seat and seat belt anchorages from the outset and these had been sized in discussion with the certifier based on the hobby car manual. What had not been appreciated was that the seat belt support was sized for a single belt and not dual belts. This was identified and all cars were retrofitted with a steel diaper, *5 months prior to vehicle deregistration.*

- structural reinforcement of the rear of the vehicle floor where failure had occurred on some vehicles;

UDM after a report from France identified a potential issue, prior to any identification by LVVTA this related to the hinge connection for the ramp and this was upgraded, 5 months prior to vehicle deregistration

- a redesign of the rear suspension to return the vehicles' modified suspension geometry to within an acceptable tolerance of the vehicle manufacturer's specifications

The UDM rear suspension required no modification at all. Normal alignment adjustment within design tolerances have been carried out and checked on all vehicles by calibrated laser equipment. NZTA were proposing to engage and Australian consultant to report on the suspension. The consultant asked NZTA to send him independent test results on the change in toe over the operating range. This was done and NZTA immediately accepted that there was no issue with the suspension as it was and decided that a consultant's report was unnecessary. The claims that the rear suspension was unsafe arose from LVVTA's inability to measure the rear suspension correctly, and ***LVVTA refuses to accept that it got it wrong.***

- load-testing on other aspects of the vehicle including rear suspension uprights.

All load and hub tests have met test requirements and were accepted by the independent consultants without any modification

Many other safety faults on the vehicles that were identified by LVVTA have not been rectified, and some concerns remain about the on-going durability of the vehicles. However, as at late November 2014, some re-engineering work has been undertaken by UDM relating to the main points outlined above to sufficiently reduce the safety concerns of NZTA, and NZTA have consequently issued exemptions to 6 of the 8 vehicles. The exemptions enable the vehicles to be returned to the road without the requirement to be low volume vehicle certified, which they

would be unable to meet. The remaining safety faults and concerns over durability will be dealt with by the implementation of a scheduled monitoring process for each of the vehicles (over and above normal Warrant of Fitness inspections) that NZTA have imposed to enable any premature deterioration of the modified areas to be identified at any early stage.

For some reason known only to the NZTA it is issuing exemptions for the car owners. As two of the car owners have died during this debacle NZTA has only exempted 6 of the 8 vehicles. The families of the two deceased owners wish to sell the two vehicles and NZTA is trying to sort out how best to deal with this.
The CEO of LVVTA still claims that the vehicles would not be able to meet the low volume vehicle certification criteria for which he is responsible. We accept that no matter what UDM does LVVTA is determined to find reasons not to certify the UDM vehicles.
The same vehicles in France have been Low Volume certified and the full EC certification paperwork is almost complete that takes these vehicles out of the low volume certification process and they will be approved as primary and secondary manufactured vehicles which can be exported directly to New Zealand as is any other European car.
We believe that the EU test requirements and certification systems are scientifically based and are not focused on Hobby Car rhetoric. It is UDM's hope that these road safe cars designed for people confined to wheelchairs will soon be available to anyone in New Zealand without having to endure the inadequacies of the LVVTA staff and processes.

UDM has questioned the validity of the required durability testing as another self justification argument after the fact. The application of a time, not mileage or use related test, does not provide valid durability data. The testing to date uses an ADR torsional test normally used for stretched limo's. To date no deterioration has been identified and because of the rigidity of the overall vehicle is unlikely to ever be an issue.

It has been claimed by UDM that, in France during July 2014, some testing of these vehicles has occurred, and that the vehicles have passed a structural test for seat anchorages and seatbelt anchorages. However no evidence of this has been presented to LVVTA or NZTA as at the end of December 2014.

NZTA have evidence that full ECE/EU compliance testing took place at UTAC in Paris in June 2014 on vehicles produced and shipped from NZ. For UDM's French Distributor who has applied for full secondary vehicle unlimited volume manufacturer compliance. This has been supported by the original equipment manufacturer in writing and also with commercial distribution support through the European Dealer network. All required data from both Skoda and ACA/UDM has now been submitted for Formal ECE/EU compliance homologation within the coming month. This also triggers ADR approval for entry into the Australian market. On approval new UDM cars have NZTA approved access to the NZ market as LVVTA restrictions no longer apply. UDM is free to build and import cars from France while it is prevented by LVVTA from building them here. What is wrong with this picture

The low volume vehicle system has a smooth and simple path for vehicles that are modified in ways which employ conventional and time-proven materials and construction methods. The low volume vehicle system also, however, has established processes, using its technical committees and network of technical specialists, to cater for new and innovative products and ideas provided that the modifier or constructor provides supporting evidence – which would include technical specifications and test results -to show that the new ideas and systems are appropriate, safe, and durable.

UDM can only comment on its experience as we have not got any evidence from other innovative car manufacturers.

We do know that the campervan manufacturers have gone to a lot of trouble to avoid the LVVTA pathway. ***UDM is aware of other LVVTA modern technology CLIENTS that have taken 15 months to get LVV certification for one vehicle!*** *If you ask the question does New Zealand have a Thriving Innovative Niche Market development hub for car manufacture, the answer is clearly no. The UDM experience is enough to put anybody off.*

LVVTA and NZTA have worked collaboratively through this whole complex and difficult issue during the past year and a half, and NZTA has expressed its appreciation to LVVTA for its form-set review process (a desk-top auditing regime that forms part of LVVTA's certification plate issuing process) which identified the problem at an early stage and prevented potentially many more unsafe vehicles from going on the road.

The relationship between the certifier and the LVVTA should have identified and supported solutions to the potential issues with the UDM vehicles from the very first car. We believe that the certifier sought assistance early on and was ignored. A vehicle as innovative and as smart as this, should have attracted positive interest from LVVTA from the very beginning. Not liaising with one of the country's most experienced certifiers and only acting a year late on a complaint from a competitor may draw an appreciative comment from the NZTA, but if that is the level of performance and accuracy that is acceptable to NZTA for a registration agency then NZTA clearly does not have very high standards or levels of expectation. The certifier arguably made two mistakes, the first was undersizing of the steel seat belt support plate and the second was not requiring a wear plate on the fuel tank. He did assist UDM with the solutions long before the vehicles were taken off the road. On the other hand the LVVTA developed three arguments for pulling the vehicles from the road and all three were proven to be incorrect. The certifier resigned his right to certify wheelchair vehicles but none of the LVVTA staff involved have put up their hands. You might well ask who is the scapegoat here and where is the accountability within the LVVTA?

The LVV Certifier who incorrectly LVV certified the vehicles has worked very openly and co-operatively with LVVTA and NZTA, and has tried to be a part of the solution wherever he has had the opportunity. NZTA suspended the LVV Certifier's authority for six months, and he will undergo training and mentoring from LVVTA before his LVV certification authority is reinstated in March 2015.

UDM has indicated to NZTA that it is quite happy to have the certifier continue to work with UDM. What training and mentoring is from an agency with no appropriate technical competence in this area of the industry is an interesting concept. It is quite clear that The NZTA does not recognize that it has a problem that it needs to fix and that at the very least it warrants an independent inquiry .
There is no formal mechanism where a Car Manufacturer can appeal any decisions made by the LVVTA or NZTA and this effectively means that neither party can be held accountable for their actions, other than through a formal judicial process. This is hardly in line with any of the other enforcement agencies in New Zealand.

LVVTA has introduced a number of new safeguards into its internal operational processes and systems that will identify any serious incorrect decisions by an LVV Certifier in the future at vehicle number one, rather than with the fourth vehicle as happened in this case. LVV certification is, by its very nature, complex and diverse in the extreme, and LVV Certifiers and LVVTA alike must always be vigilant in ensuring poorly-modified and unsafe vehicles are not able to go onto public roads.

It appears rather important that LVVTA correctly assess the roadworthiness of vehicles seeking certification and if it wants to use a type approval system then it needs to develop a type approval system that has relevance for complete vehicles. When its own staff are not capable of correctly measuring bump steer it begs the deeper question of how it proposes to correctly tell the difference between safe and unsafe. Its refusal to use properly qualified people or international performance standards, for modern technical products and practices is symptomatic, as is calling a composite two pot product like Powerbond a glue.

By getting this wrong disadvantaged New Zealanders were deprived of the right to use their essentially safe vehicles for a year and two died without being able to enjoy the freedom that they so desperately wanted. It also meant that UDM has not been able to make or market cars for the New Zealand market for two years. All of the modifications agreed after the 19th December 2014 could have been done with a simple recall process which is standard practice in the automotive industry.

Until NZTA accept that LVVTA and its 20th century methodology and poor assessment systems that rely on opinions rather than test standards is properly overhauled, this travesty has the potential to reoccur any time a modern production vehicle is assessed for certification. This impost effectively snuffs out niche market innovation of commercial production. Any serious production manufacturer, and there are several, applies for ADR certification to get round the LVV chokehold. Alternatively the manufacturer establishes a staff member to be an in house certifier so that there is no outside independent assessment to deal with.

This is in direct contrast to The Prime Ministers stated objectives of diversification and development of export opportunities for small business the country needs

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NZ Transport Agency statement re UDM Skoda Yeti vehicles

The NZ Transport Agency has recently been able to issue exemptions for six of eight heavily modified Skoda Yeti vehicles which were removed from the road last year due to serious safety concerns.

The vehicles were heavily modified by U·Drive Mobility to enable the transportation of people with disabilities.

The eight vehicles had been unable to be used on the road since December 2013 , when the Transport

Agency revoked the vehicles' certification after discussions with the Low Volume Vehicle Technical Association (the LVVTA) over collective concerns about the safety of the eight vehicles.

Earlier, the LVVTA had identified issues with the vehicles, and alerted the Transport Agency to its concerns. Prior to revocation, representatives from the Transport Agency and the LVVTA had worked with UDM to encourage them to address the various issues that gave rise to these concerns.

UDM did address all of the concerns expressed and tabled that information as requested on the 18th December 2013

To try and provide certainty for the vehicle owners, in June 2014 the Transport Agency commissioned an independent engineering review to determine if the vehicles could be assessed as being "fit for purpose".

6 months after the revocation

This review, which was carried out in conjunction with UDM, determined that the vehicles could be assessed as fit for purpose, but only after several critical structural issues were addressed through remedial work.

The report identified the critical structural issues were:

- the bonded joints between the new aluminium floor and the existing vehicle structure. The independent review required additional mechanical fasteners to be fitted to prevent peel failure occurring

The cars that were tested in France do not have these additional fasteners

- replacing entire floors in four of the eight vehicles due to insufficient strength of the material used

NZTA gave UDM 3 options and UDM chose this option because the cost of proof of adequacy was 5 times greater

- fitting a protective structure to the fuel tank to prevent damage due to its proximity to the ground.

This has been done at the request of NZTA and was not part of the experts report

Other important design issues had to be addressed with the vehicles, including reinforcement of the floor area around the seat belt and seat belt anchorages, and the modified rear suspension geometry also required readjustment.

The reinforcement for seat belt floor anchorages was identified by UDM and done months before the cars were taken off the road

The rear suspension geometry was correct and did not require modification other than in two cases where minor wheel alignment was needed, which is usual for most cars on NZ Roads

These issues have now been resolved, and the Transport Agency has issued exemptions for six of the vehicles. This has been with several conditions, one of which is an Inspection regime to address ongoing durability concerns.

Also since June, UDM has been waiting to get the results of a new design tested in Europe. A successful pass of these tests would provide evidence to address the concerns raised about these vehicles. The European testing was due to be completed by July 2014 but, as of December 2014, this has still not been provided.

Once this report is received by the Transport Agency, the Transport Agency will be reviewing the decision to issue these exemptions. In addition, should there be any concerns raised through the on· going inspection regime, the exemptions will be re·considered.

EC and all party sign off has proved to take as long in Europe as it does in New Zealand We are now expecting the documentation in May 2015

This situation is a timely reminder to those in the industry involved in modifying vehicles that the low volume vehicle system should be followed from the outset before any modifications are carried out.

This system, and its associated low volume vehicle standards, is set up to guide people through the vehicle modification process using well· developed methods.

Where the modification is such that it cannot meet the standards, the low volume vehicle system, through its technical committees and networks of technical specialist, enables alternative methods of compliance by reviewing documented evidence of the modification with supporting material data and test results.

The Transport Agency is pleased the auditing regime carried out by the LVVTA enabled the certifier's incorrect decisions relating to these modified Yetis to be identified early on .

It also advises the modification Industry that, where innovative modification materials and methods are being considered, discussion with the LVVTA should take place at the beginning of the process. Any innovation must be properly supported by sound engineering design and evidence of safety performance.

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