



Nissan Terrano D21 Rear Seatbelt Anchorage/Floor Rust Problem and LVV Modification Solution

This Infosheet replaces Infosheet #02-2004

Introduction:

As an LVV Certifier, you may be aware of the problems that exist with early Nissan Terranos in relation to floor rust around the area of the rear seatbelt anchorages. The extent of this problem is such that until now, upon the identification of any rust whatsoever in this region by a WoF issuer or entry certifier, LTNZ has required the full replacement of the central floor section. Due to the reduction in value of these vehicles as they get older, LTNZ has recently asked LVVTA to design a low volume modification process under LVV Seatbelt Anchorage Standard 175-00(01) to resolve this problem. This has been achieved, and an alternative cost effective solution is now available for these vehicles under the Low Volume Vehicle Code. This Information Sheet outlines the problem, the solution and the procedures involved.

Affected models, as advised by the Imported Motor Vehicle Dealers Association, are:

N-WBYD21	1986-87
Q-WBYD21	1988-on
E-WHYD21	1987-1993
S-VBYD21	1989-on
N-VBYD21	1986-89
Y-LBYD21	1993-95
Y-WBYD21	1993-95
Q-WBYD21	1989-93

The Problem:

(This is an excerpt from LTNZ Infosheet 1.35 Rev 2, amended slightly for clarity).

In some models of Nissan Terrano vehicles, the rear floorpan assembly consists of a two-layer (double-skin) panel. The lower layer is a reinforcing panel spot-welded to the upper layer floor section.

These vehicles have a rear seat with three seating positions. Situated in the rear floor, beneath the seat, are:

- four seatbelt anchorages; and
- two seat anchorages.

If moisture gets trapped between the two layers of the floorpan, corrosion can occur around the seat or seatbelt anchorages. Corrosion can also occur where the under-floor reinforcing panel overlaps the top floor skin.

A WoF inspector is required by LTNZ to lift the rear seat to examine this area effectively. It is important to note that damage may be more extensive than is first apparent. Indicators of more extensive corrosion may be:

- bubbling of the paint or surface irregularities in the top floor skin or paint; or
- a patch repair that has rust around it; or
- separation of the reinforcement panel and the top skin; or
- discoloration or rust stains at the edges of the reinforcement panel; or
- rust holes.

The primary safety concern is that corrosion in the rear floor pan area may affect the rear lower seatbelt anchorage points. Up until now, entire central floor section replacement together with reinforcer plate replacement has been required (even for discoloration or rust stains, or if rust patch repairs have been carried out in the floorpan).

The cost for this repair process, combined with the repair certification process, varies from \$2500 to \$4500, which is approaching the value of earlier models of affected vehicles.

The Low Volume Solution:

LVVTA has, during February and March of this year, with input from expert hot rod builders, LVV certifiers, and panel repairers, developed a modification known as the "LVVTA Rear Floor Load-bar Seatbelt Anchorage Reinforcement System" or "LVV Seatbelt Anchorage Load-bar" for short. This LVV Seatbelt Anchorage Load-bar is designed (after patch repairs, rust treatment and anti-corrosive paint application have been carried out to the floor and reinforcer) to attach to the underside of the vehicle by plug-welding to both the reinforcer and the floor section of the vehicle.

The load-bar is designed to spread any load that the seatbelt anchorages may be subjected to in an impact over a huge area of floor surface, and importantly, over a floor surface area that is unaffected by the vehicle's rust problem.

This modification is recognised by the LTNZ as requiring LVV certification under the Compliance Rule 35001/1 and is legally able to be used as an alternative to the full floor replacement. A memo dated 16 April 2004 from LTNZ is attached to the back of this Information Sheet that may be used as evidence to entry certifiers and warrant of fitness issuers that this modification has been approved

The following important points should be noted:

- This procedure may be applied to all affected vehicles both at entry certification and in-service.
- In order to maximise the quality of the job and minimise costs to the vehicle owner, the modification should be undertaken by someone whom the LVV Certifier can recommend to the vehicle owner. This should be a tradesman repairer experienced in modern vehicle repair, although an individual who does not meet this criteria can still carry out the modification provided that competence and welding skill can be demonstrated to the LVV Certifier in accordance with NZHRA Tech Bulletin #3.

- This modification can be LVV certified by any LVV Certifier holding Category LVV 1C – ‘Modified Production – Structures’.
- Note that clause 1.1(3) of the LVV Certifier Operating Requirements Schedule that requires LTNZ approval of inspection premises used for LVV Certification does not apply in this case.
- Each affected vehicle must be modified and LVV certified according to the following procedure, using LVV Formset FS028.
- Only LVV Seatbelt Anchorage Load-bars supplied by LVVTA and marked with the LVV logo may be used for this modification and LVV certification process. These load-bars may be ordered by using the enclosed order form, or via the LVVTA website www.lvvta.org.nz
- These LVV load-bars are only available to Category 1C LVV Certifiers at this stage, and carry a wholesale cost of \$49 incl GST. This is LVVTA’s cost price including packaging. Payment by cheque is required with order so that we do not have to set up accounts, send statements and chase late payments. Courier fees are to be added by the LVV certifier as specified on the order form.
- The recommended load-bar retail price (which you may discount if you wish) is \$74 incl GST.
- From the trials carried out, most Terranos can be modified in accordance with this procedure for around the \$600-\$900 mark. This consists of 6-9 hours for the repairer (depending on the extent of rust), plus consumables, LVV certification (which is very straightforward in this case as the repairer already has the vehicle on the hoist and ready for inspections) \$250-\$300, and the Load-bar itself, which carries a recommended retail price of \$74.00.
- Note that the photographs in this procedure may be viewed and printed via the LVVTA website (www.lvvta.org.nz), and are much clearer in colour.

Automotive products that must be used in this process are:

- Corrosion Converter – a liquid that neutralises any remaining rust after panel cleanup.
- Automotive Epoxy Primer – an automotive epoxy product, which should be lightly, but thinly applied in sufficient quantity for a change in colour of the surface being coated to be evident. The epoxy-coated surfaces can be handled and overcoated for welding once touch-dry, which (depending on the brand of product) is usually about 1 hour at 20 deg C, or 30 minutes using infra-red lamp heating.
- Weld-through Primer – usually a spray-can product with a visible colour, and conducting properties to allow easy welding. The active ingredient in weld-through primers is zinc or copper, which protects the edge of the finished weld. The primary function of weld-through primer is to melt into the edge of welds. Weld-through primers do not offer a high level of corrosion protection when used alone, compared with epoxy primer, and are normally overcoated with epoxy primer.
- Penetrating Rust-proofing Coating – a thin penetrating coating, also known as Penetrant Cavity Wax.
- Automotive Urethane Seam Sealant – an edge sealing product.
- Underbody Protective Coating – a final underbody coating of black rubber/plastic compound.

Load-bar Modification & LVV Certification Procedure (1986-95 Nissan Terrano):

All parts of this procedure apply to the repairer, except those shown in **bold**, which apply to the **LVV Certifier**. **The LVV certifier is responsible for the control of the quality of the total process.**

Reinforcing plate removal

- 1) Remove the rear seats, seatbelts, trim, and carpet from the central floor section of the vehicle. (*Photo A*)
- 2) From inside the vehicle, strip to bare metal with a wire-wheel, then identify the spot-welds in the rear floor section that attach the reinforcing plate to the central floor section. (*Photo B*) These can be identified by the presence of a small upstanding nipple immediately beside most spot-welds. Drill all spot-welds through the centre of the spot-weld, through both the rear floor section and the reinforcing panel using (approximately) a 2 mm (1/8") drill-bit. This is followed by an 8 mm or 8.5 mm (5/16") drill through the central floor section (1 layer only) to remove the spot-welds. (*Photos C & D*). (These holes are now prepared and ready for plug-welding the complete assembly back together at the end of the process).
- 3) Undo all body mount bolts holding the body to the chassis and remove the rear six bolts completely. Lift the back of the body away from the chassis by about 100 mm, and support the rear of the body in the raised position with some timber blocks or other appropriate material. (This is to provide enough room to remove the reinforcing plate through the wheel-arch opening). (*Photo E*).
- 4) From the outside of the vehicle, in the wheel-arch area, clean to bare metal using a wire-wheel, then drill through the four spot-welds attaching each end of the reinforcing plate to each wheel-arch panel. Drill right through the bodywork and reinforcing plate (2 layers) using a 2 mm drill bit (1/8"). (*Photos F & G*).
- 5) Remove the reinforcing plate out from under the vehicle, through either one of the wheel-arches. The plate will need to be tapped rearward once the spot welds are free to release the plate from two locating tabs at the front of the plate. (*Photo H*).
- 6) Using an 8 mm or 8.5 mm (5/16") drill bit, drill through the four spot-weld holes in the wheel-arch bodywork on each side (1 layer only). (These wheel-arch holes are now prepared and ready for plug-welding the complete assembly back together at the end of the process).
- 7) **Thoroughly inspect both sides of the reinforcing plate and the central floor section. The LVV certifier is to inspect the reinforcing plate and the central floor section, record their condition, and determine with the repairer whether the reinforcing plate and the central floor section can be economically and safely patch-repaired prior to Load-bar installation. [Note: - the LVV certifier may at his discretion delegate this step to the repairer if he has developed confidence in the repairer's competence and integrity during a working relationship].** (*Photo I*).

Note that during the visual inspection, scratching and sanding should be carried out as necessary, to ensure no attempts have been made to cover or disguise any rust or previous repairs.

If there is not a consensus between the repairer and the LVV certifier that the reinforcing plate and the central floor section can be economically and safely patch-repaired, the LVV Load-bar modification must be abandoned and full floor replacement must be undertaken instead.

- 8) If present, thoroughly inspect any previous localised patch repairs. Any previous localised patch-repairs that have not been carried out to a tradesman-like standard, incorporating good weld quality, must be cut out and replaced with patch-repairs to a tradesman-like standard.

Rust removal, treating and repairs

- 9) Drill out the spot-welds holding each of the two seatbelt anchorage plates (*Photo J*) on the underside of the reinforcing plate, remove, and clean-up by wire-wheel, grinding, disc-sanding or sandblasting to a bright steel condition.
- 10) If rust holes or heavy pitting are present on the seatbelt anchorage plates, discard and make similar plates from 25 mm x 3 mm flat-bar or other suitable material that meets all applicable requirements of LVVTA Seatbelt Anchorage LVV Standard 175-00{01}).
- 11) Remove any visible signs of rust-pitting, bubbling, discoloration or rust-staining by wire-wheel, grinding, disc-sanding or sandblasting on both the topside and the underside of the reinforcing plate and the central floor section, back to a clean bright-steel condition. (*Photo K*) Ensure that all of the area on the reinforcing plate where the load-bar will sit against is also cleaned back to bright steel.
- 12) Where rust-holes or excessively heavy rust-pitting are present in either the reinforcing plate or the central floor section, carry out localised patch-repairs to a tradesman-like standard. Patch repairs must be carried out by an experienced and skilled trades-person using a MIG-welder, applying a continuous butt-weld (no overlaps).
- 13) Enlarge the six 2mm (1/8") holes in the reinforcing plate rear edge; two outboard spot welds and two central spot welds with an 8.5 mm (5/16") drill bit. These 6 holes can be seen in (*Photo L*) and will be used to plug-weld the reinforcing plate to the load-bar in step 18.
- 14) Thoroughly inspect any joins where the central floor section attaches to any other floor or wheel-arch sections for any rust-heave, discoloration or staining. Where this is visible, open up these joins, clean-up, rust-treat with an automotive corrosion-converter, apply an automotive epoxy primer and re-weld (using weld-through primer).
- 15) Treat all bare steel and rust-affected areas on both the topside and underside of the reinforcing plate, and the central floor section, and the two seatbelt anchorage plates, with an automotive corrosion-converter.
- 16) Apply an automotive epoxy primer to all bare steel and unpainted areas on both the topside and underside of the reinforcing plate, the central floor section, and the two seatbelt anchorage plates.
- 17) In addition to the epoxy primer coating, any localised weld-points on the central floor section, reinforcing plate, and load-bar must be pre-coated prior to welding with a weld-through primer. (*Photo L*).

Joining of reinforcing plate, LVV Load-bar and seatbelt anchorages

- 18) After the primers have dried to a handleable condition, position the LVV Seatbelt Anchorage Load-bar against the underside of the reinforcing plate. (*Photo M*). Position the two seatbelt anchorage plates to the underside of the LVV Seatbelt Anchorage Load-bar over its pre-drilled seatbelt anchorage holes. Temporarily clamp the LVV Seatbelt Anchorage Load-bar and the reinforcing plate together, and the two seatbelt anchorage plates into place using the seatbelt anchorage bolts, ensuring a firm close-contact fit between the LVV Seatbelt Anchorage Load-bar and the reinforcing plate. (*Photos N & O*)

- 19) Plug-weld the LVV Seatbelt Anchorage Load-bar to the underside of the reinforcing plate through the 11 pre-drilled holes in the LVV Seatbelt Anchorage Load-bar, and plug-weld the seatbelt anchorage plates to the underside of the LVV Seatbelt Anchorage Load-bar. (*Photos P & Q*). (Note: - where any difficulty is encountered in achieving a firm close-contact fit between the two surfaces, this may be resolved by tapping and the intermittent stitch-welding of the edges of the LVV Seatbelt Anchorage Load-bar to the reinforcing plate to close up any gaps). Turn over the assembly and clamp and plug-weld the reinforcing plate to the load-bar through the 6 holes drilled in step 12. (*Photo R*).
- 20) After appropriate cleaning and preparation of welds and heat affected areas, apply an automotive epoxy primer to all plug-welds and any stitch-welds on both the topside and underside of the reinforcing plate, the LVV Seatbelt Anchorage Load-bar, and the two seatbelt anchorage plates.
- 21) After the automotive epoxy primer has sufficiently set to a handleable condition apply weld-through primer to the areas on the topside of the reinforcing plate, which will be plug-welded to the underside of the central floor section. These areas will be visible as 2 mm (1/8") holes that were drilled through the spot-welds holding the reinforcing plate to the central floor section and also on the 6 plug-welds at the rear edge of the reinforcing plate that now connect the LVV Seatbelt Anchorage Load-bar.
- 22) Apply automotive urethane seam sealant to all edges where the LVV Seatbelt Anchorage Load-bar mates with the reinforcing plate. (*Photo S*)
- 23) Drill a 12 mm hole through the reinforcing plate, via the large central hole in the load-bar opposite the LVV logo, (*see the arrow on Photo Q*). This hole may already be present on some reinforcing plates, but is necessary for injecting rust-proofing coating later.
- 24) **The LVV certifier is to inspect the completed plug-welded LVV Seatbelt Anchorage Load-bar & reinforcing plate assembly, including the two seatbelt anchorage plates, before the assembly is reinstalled into the vehicle, and record his approval on the appropriate section of LVV Formset FS028.**

Reinstallation of the reinforcing plate and load-bar assembly

- 25) Slide the finished LVV Seatbelt Anchorage Load-bar and reinforcing plate assembly back through the wheel-arch to the central floor section, locating the assembly into the two tags still attached to the floor, and temporarily clamp into place with the seatbelt anchorage bolts and seat bolts. If necessary in order to further achieve a firm close-contact fit between the LVV Seatbelt Anchorage Load-bar & reinforcing plate assembly and the central floor section, some PK screws can be temporarily installed to pull the sections together. (*Photo T*).
- 26) Clamp the side joints of the reinforcer plate assembly to the body in the wheel-arch area. (*Photo U*)
- 27) Plug-weld the LVV Seatbelt Anchorage Load-bar & reinforcing plate assembly back into place against the underside of the central floor section from inside the vehicle, and from outside the wheel-arch opening. (*Photo V*). (Tip: using an airgun to cool the weld immediately after each plug-weld minimises the flame damage to the coatings underneath each plug-weld).
- 28) Clean-up and grind smooth all plug-welds and apply final automotive epoxy primer to plug-welds and to any patch-repairs on the topside of the central floor section (*Photos W & X*). Check, clean-up and apply final automotive epoxy primer to any affected underside areas also.

Final assembly and treatments

- 29) From underneath the vehicle, seal any joins on the underside of the vehicle's central floor section using automotive urethane seam sealant. This is to include around the full perimeter of where the reinforcing plate/load-bar assembly mates with the central floor section.
- 30) From underneath the vehicle, through the holes pre-cut in the LVV Seatbelt Anchorage Load-bar, apply a generous application of penetrating rust-proofing coating into the open area between the LVV Seatbelt Anchorage Load-bar & reinforcing plate assembly and the underside of the central floor section. (This needs to flow and penetrate into every part of the aperture).
- 31) From underneath the vehicle, apply an underbody protective coating to the LVV Seatbelt Anchorage Load-bar & reinforcing plate assembly and the underside of the central floor section.
- 32) Lower the body back down and re-bolt it to the chassis. Re-install the rear seats, and re-install the seatbelts, applying the correct torque to the seatbelt anchorage bolts. These settings can be found in LVV Seatbelt Anchorage Standard 175-00.
- 33) **The LVV certifier is to inspect the completed LVV Seatbelt Anchorage Load-bar modification and record his approval on the remaining sections of LVV Formset FS028.**
- 34) **The LVV certifier is to fill out the 'base formset' recording 'LVVTA REAR FLOOR LOAD-BAR SEATBELT ANCHORAGE REINFORCEMENT SYSTEM' in the 'CONSTRUCTION/New Seatbelt Anchorages' section of the FS012 (data sheet).**
- 35) **The LVV certifier is to forward the 'base' formset together with the FS028 Formset to the LTNZ plate administrator with the normal LVV Compliance Plate fees.**

Note that for entry certification of Nissan Terranos, the scope of the LVV Certification procedure is limited to the rust in and associated with the central floor section. Any other structural rust in the vehicle that has been rejected by the entry-certifier (TSDA) or AVIC should be repaired to a tradesman-like standard by the repairer following the same principles for patch-repairing, treating and coating as specified for the localised patch repairs in this procedure, however this will need to be carried out in consultation with a Repair Certifier. Note that any rust repair work other than to the central floor section and reinforcing plate is a customer service unrelated to the LVV Seatbelt Anchorage Load-bar Modification process and should be treated as a separate contract with the vehicle owner.

Attachments:

- LTSA Memo dated 16th April 2004
- LTNZ Infosheet 1.35 Rev 3
- Survey Sheet FS028 Issue #2, September 2004
- Load-bar order form for LVV Certifiers revised 1st July 04

If you have any queries or require any further clarification relating to this Information Sheet, please feel free to contact Doug St George at the LVVTA office on (09) 268-9550.

Tony Johnson
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Terrano floor, inside vehicle, with seat removed, photo taken from left rear door opening, very little visible rust was showing in the interior of this vehicle.

A



Interior of vehicle floor, stripped back to bare steel with wire wheel to reveal spot-welds.

B



Interior of vehicle floor, spot-welds have been drilled through using a 2mm drill bit, through both the central floor section and the reinforcing plate (2 layers).

C



Interior of vehicle floor, spot-welds drilled 8.5 mm through the central floor section only, (1 layer), ready for later plug-welding.

D



The body is lifted away from the rear end of the chassis and supported by approximately 100mm solid blocks.

E



Wheel-arch spot welds are exposed by wire-wheel brushing back to bare metal.

F



After drilling out the 4 wheel-arch spot-welds, a check is made by levering to ensure that all other spot-welds have been drilled out, to allow reinforcing plate to be easily removed.

G



The reinforcing plate is manoevered out through the gap between the wheel-arch and the chassis rails.

H



The reinforcing plate upper face (hidden from view when in the vehicle) is inspected. This example is one of the better ones. Any patch repairs to the reinforcing plate are done at this stage.

I



The spot welds holding the seat-belt anchorages to the reinforcing plate are drilled through 2mm (both layers) then 8.5 mm through the anchorage plate only (1 layer).

J



The reinforcing plate underside is cleaned to bare metal by wire-wheel and grinding to remove rust, etc and where the LVV load-bar overlaps.

K



The underside of the OE reinforcing plate has been cleaned back to bare metal where there are any signs of rust, and where the LVV load-bar overlaps it. It is treated using automotive corrosion-converter then automotive epoxy primer over the whole mating surface, followed by weld-through primer where welding will occur. Six 8.5 mm holes have been drilled through the lower edge in the photo for plug-welding to the LVV load-bar.

L



The LVV load bar is clamped and aligned to the OE reinforcing plate.

M



Seatbelt bolts through the seatbelt-anchorage plates help clamp the assembly for welding.

N



LVV load-bar and seatbelt anchorages ready to be plug-welded.

O



Stitch-welding of edges of LVV load-bar minimises the gap between the LVV load-bar and reinforcing plate.

P



Plug welding of LVV load-bar and seat-belt anchorages is completed. The arrow shows where a 12 mm hole may need to be drilled to allow for injecting penetrating rust-proofing coating later.

Q



Assembly is turned over and plug-welded from topside of reinforcing plate at 6 locations on rear edge. This attaches the load-bar at this edge. These holes were pre-drilled – see photo L.

R



Urethane sealant has been applied to all edges of the LVV load-bar where it mates with the reinforcing plate, to provide a complete seal.

S



The LVV load-bar/reinforcing plate assembly has been re-fitted and is bolted through from the inside of the vehicle with temporary bolts in the seat mountings and seat-belt anchorages. Plug-welding is now done from inside the vehicle.

T



Plug-welds in wheel-arch area are about to be welded.

U



Plug-welds in wheel-arch area have been completed, ready to grind flush.

V



Plug-welds in the central floor area have been welded, ready to grind flush.

W



An example of a patch-weld in the central floor area of another vehicle, ready to clean up and coat with automotive epoxy primer.

X