

Lada Niva

Endurance Rally Preparation

Translated by Mary Waller,
with thanks to David Rolston and Kealan Allen.

The “African” preparation depends on the condition of your Niva, the mileage covered, and it has to be said on the way it is driven. We will show the essential points with an asterisk.

The other modifications are included to allow you to put luck on your side to ensure a good trip.

Lightening The Vehicle

In the first instance think about lightening the car as much as possible, due to the fact that you will be adding to the weight with the preparation procedures (extra fuel tank, drinking water supplies, food, tools, spare parts, personal belongings).

You can remove all the useless elements fitted as standard on Nivas

Examples:

- Trim*
- Floor carpets
- Soundproofing (felt, even Blaxon/ WaxOyl *)

It is also possible to replace the doors, the bonnet and the tailgate with parts in glassfibre (available from the Poch network).

Fitting bucket seats instead of the originals is only worthwhile if the weight difference is significant and if you are worried about backpain. The choice of bucket seat will allow you to have rear seats or load.

Useful load of Niva: 400kg

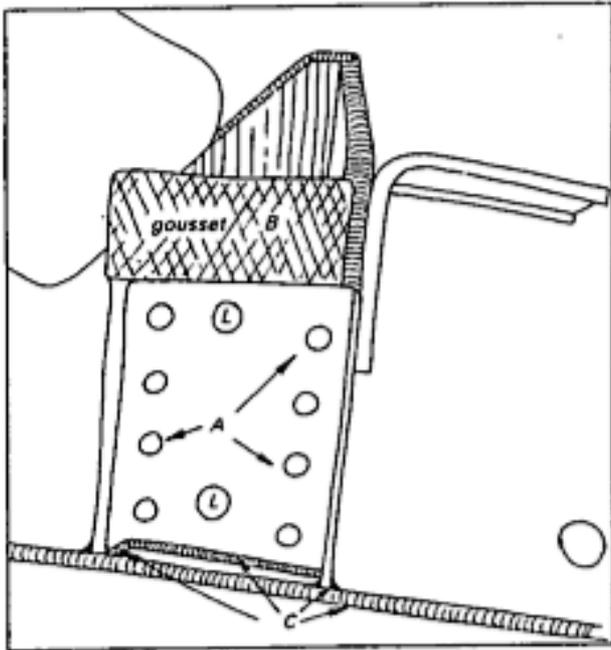
P.T.R.A. 1,590 kg

*Blaxon/ WaxOyl also protects against corrosion. It adds to the weight but it also protects your car – think about it and choose...

Bodywork – Reinforcements

*** Reinforcement of the front shock absorber mountings**

- Continuous weld on the edge of the chassis arm C.
- L : existing facings
 - A. parallel to the existing holes, carry out a line of facings on both sides, in order to proceed to spot weldings of the shock absorber support on the chassis arm. This, in addition to little strings/rows on the side edges of the latter.



warning!

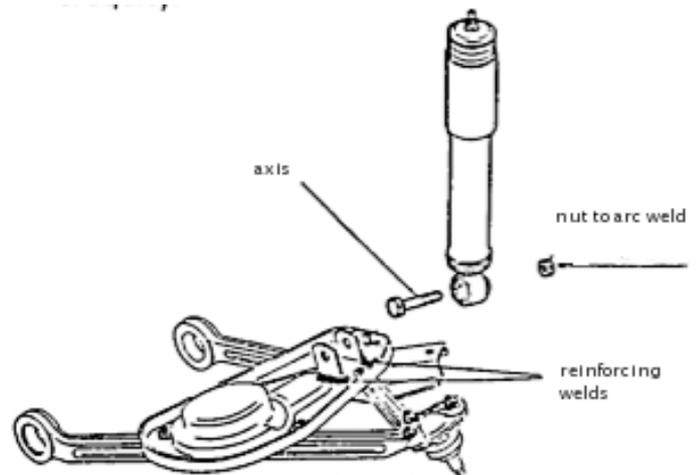
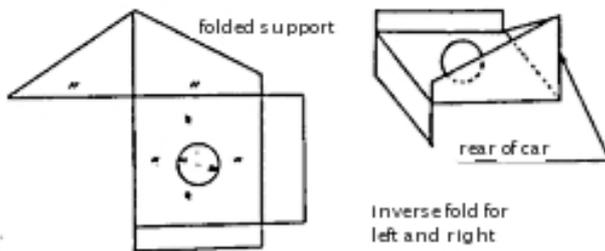
This bracket must be bolted *after* fitting the shock absorber (don't weld it).

Advice: to allow rapid replacement of the rear shock absorbers, pay attention to the mounting of the upper silentbloc (mount bush) on the axis. It is necessary to test-fit then coat it with a very fine layer of grease before assembly.

Reinforcing the lower mounting point of the shock absorber by welding

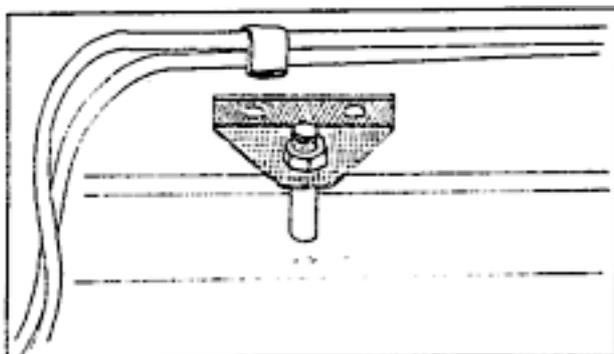
Advice: in order to facilitate removal of the shock absorber, when replacing it, arc weld the lower axis fixing nut (see diagram)

B. Double the existing plate by a support in 2mm plate – see the diagram below – and weld this all around the perimeter.



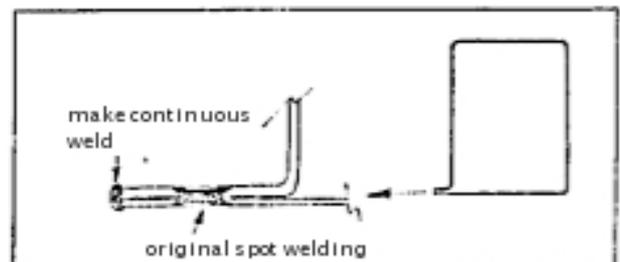
Rear shock absorber mounts

Reinforce the solidity of the upper axis of the shock absorber by creating an angle bracket in plate (see drawing below)



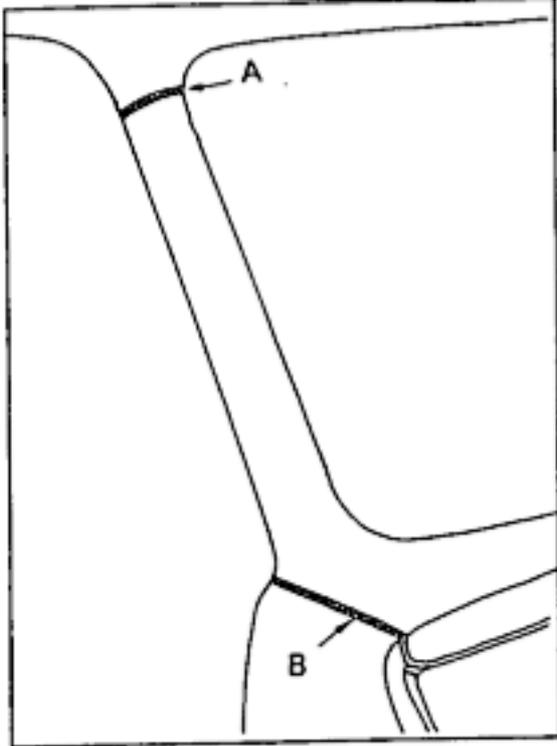
Front chassis arm

Replace the welding the length of the chassis arms.

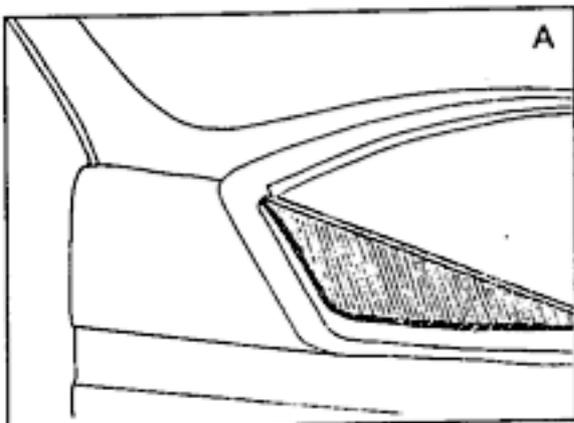


Front wings (interior and exterior)

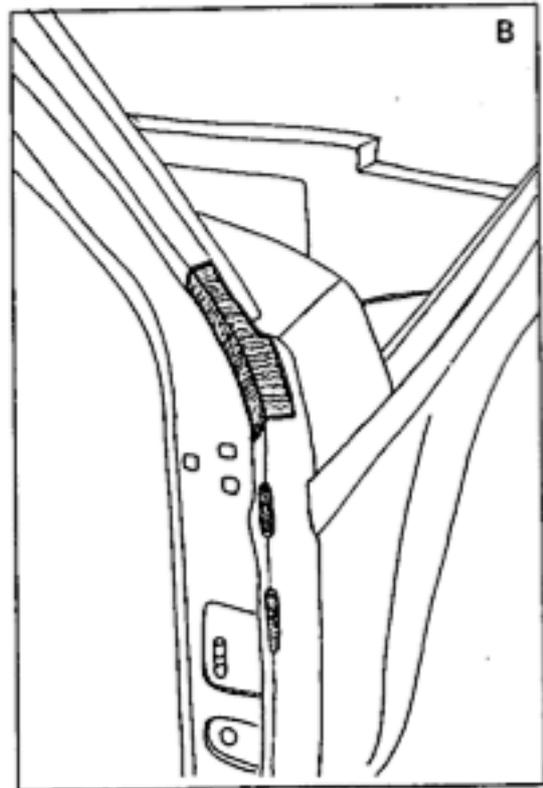
- Weld or rivet the interior reinforcements, originally bolted.
- Redo the welding between the windscreen bay and the wing, and also between the roof and windscreen bay – A and B below.



- Using 2.5mm plate, bracket the cheek of the wing and apron (fig A)



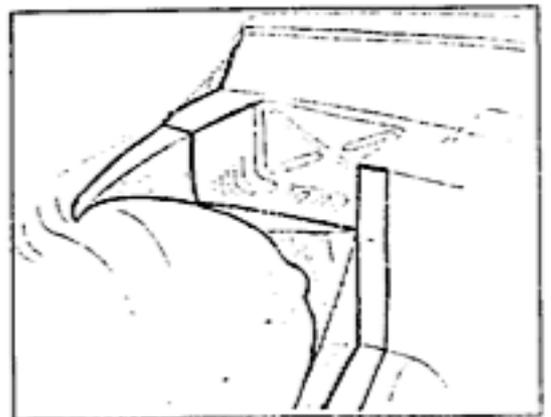
- Reinforce the front wing fixing on the body side with a cold-formed plate welded to the windscreen bay.
- Reinforce the wing welds on the body side (drawing B)



Engine Compartment

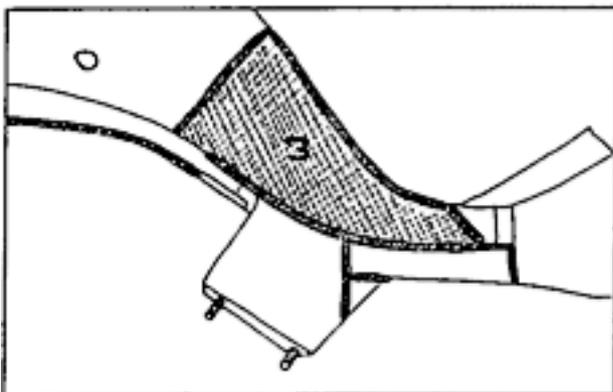
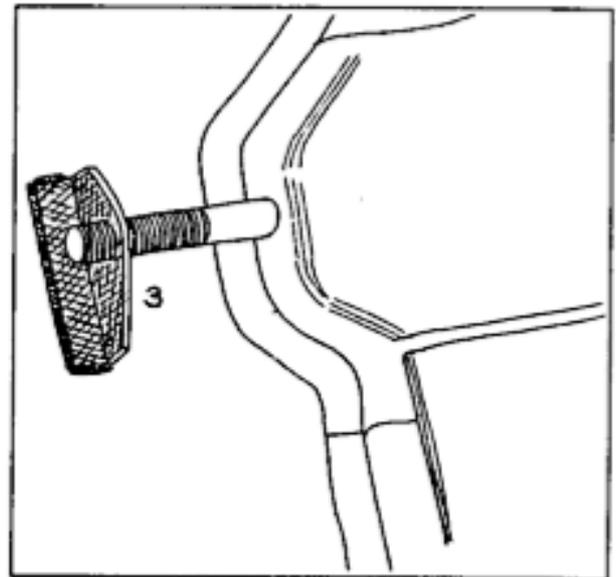
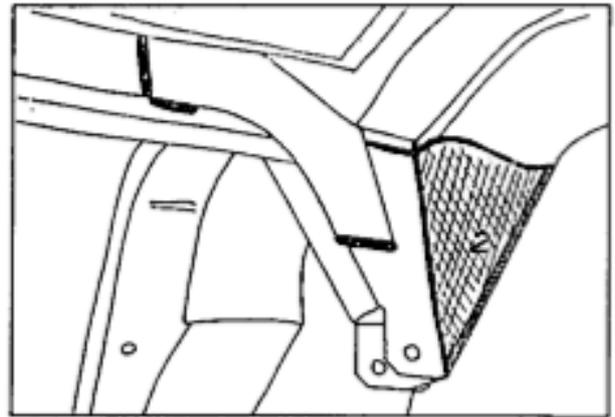
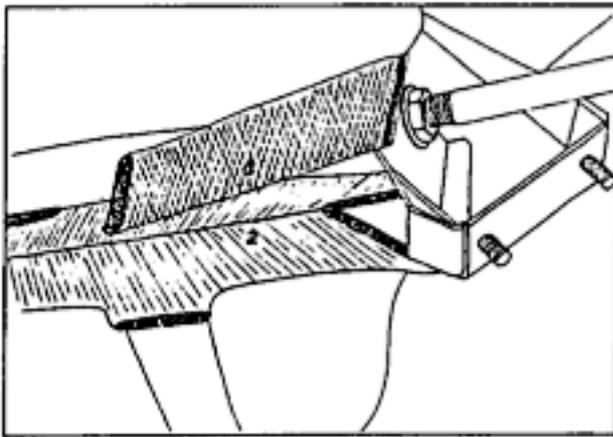
Reinforce the front junction block on the apron at the level of the battery tray by welding cold formed 1.2mm plates. The plates are greyed out in the figs below.

- For the reinforcement (1) on LHS of the engine compartment, limit its height under the clutch cylinder mounting.
- As for the chassis arms, re-do the welding on the gearbox tunnel.
- Reinforce the support brackets of the cooling radiator.



Under the body

- To reinforce the front tie-rod, weld a foot in plate (2.5mm thick) on the end of the support and the chassis arm (1 on the drawing)
- Weld a shaped plate (1.2mm thick) on the chassis arm to reinforce this part of it and the support of the stabilizing bar (2 on the drawing)
- Make the joint between the chassis arm / front block of the cheek of the wing more rigid by welding a formed plate (1.5mm thick) on the chasis arm. Redo the neighbouring welds (3 on drawing)

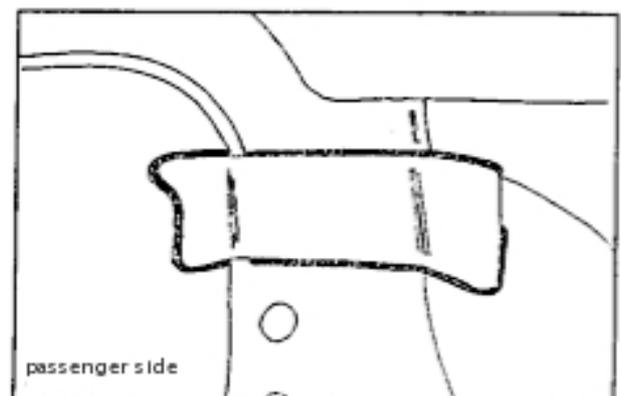


The cockpit

Reinforce the floor on the passenger side by welding a plate (1.5mm thick) shaped to the floor (1 on drawing)

Use the shape from the RHS to do the driver's side.

- Redo the welds, at the level of the Panhard bar mount, on the body and reinforce the anchorage with a welded iron bar (2 on drawing)
- Reinforce the anchorages of the upper tie rods with a welded bracket (3 on drawing)



- Reinforce the gearbox and transfer box mount points by welding a plate on the floor.
- Replace the original screws by more resistant six-sided (BTR) screws.

The seats : to improve the seat fixation, replace the slide guide with a rack guide (it will be necessary to use both controls to adjust the seat)

Advice :

- To make the body more rigid, you can glue the windscreen by replacing the assembly on a rubber joint.
- For the comfort of the team, ensure the cockpit is dustproof.

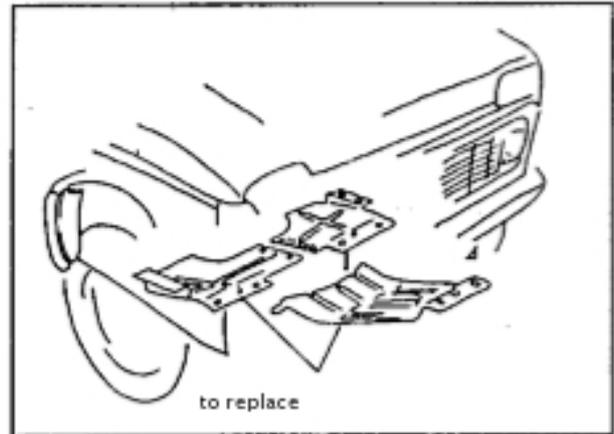
Mechanical.

Checks and modifications

Engine protection – front axel

By its suspension system (independent wheels), the axel and the engine casing are very exposed to impacts as the ground clearance can be greatly reduced depending on the terrain.

An aluminium covering (in 10mm AUG4G) gives a good protection, also a crossbeam (in AU4G aluminium , tack welded), the whole serving to reinforce the chassis arm and the triangulation of the suspension crossbeam (available from the Poch network)



Engine

Cooling system

- Check the watertightness of the system (under pressure up to 0.8 to a max of 1 bar), check the pressure after ½ hour – it should not have dropped). This should be done by a specialist.
- Replace the original clips with screw collars, this will make taking apart easier, and you can even double them up as they can always be used for other things.
- Check the expansion tank mounting and hoses.
- So as not to lose the caps to the expansion tank and radiator, attach them to the bodywork with pieces of small chain or nylon.

Advice :

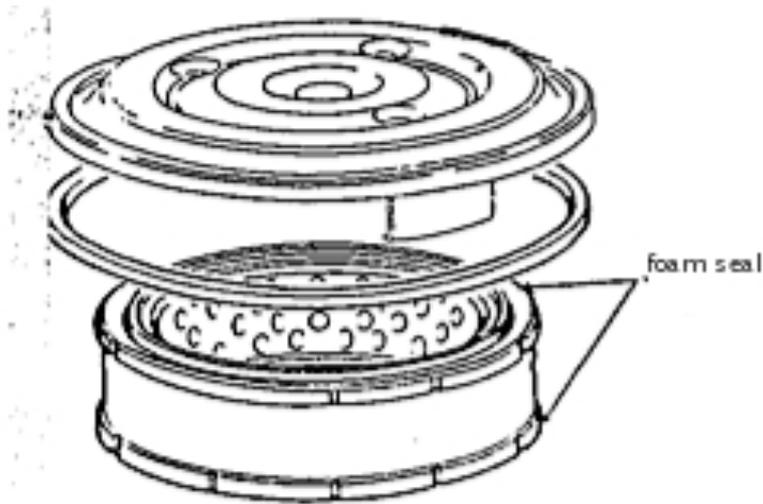
If your Lada is more than 2 years old, change all the cooling hoses before leaving. If you are sure that the temperatures will be hot enough, you can remove the thermostat.

Warning!

So the cooling is perfect, you must block off the bypass drain on the cylinder head and take the lower hose directly off the water pump. It's best to do this on site, as too much cooling can damage the engine.

Air filter

Ensure that the air filter seals properly. On dusty routes you can cover the air entry with a nylon stocking which should regularly have the dust removed.

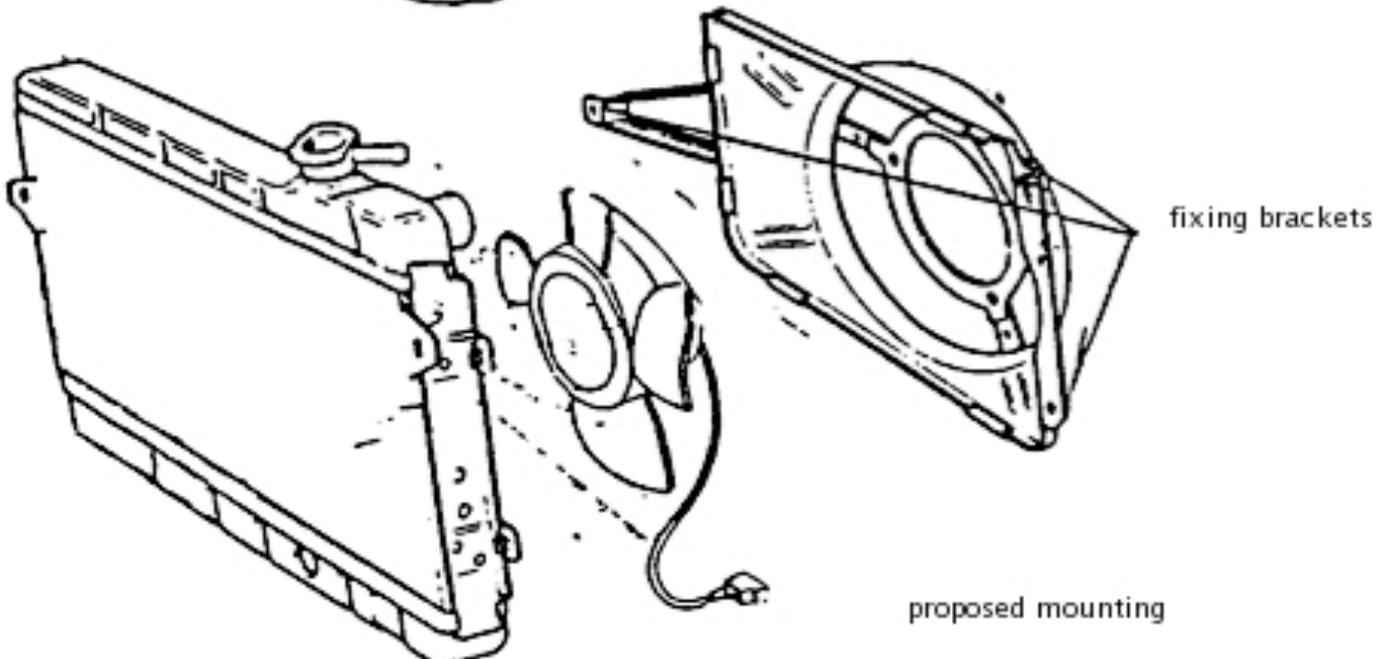
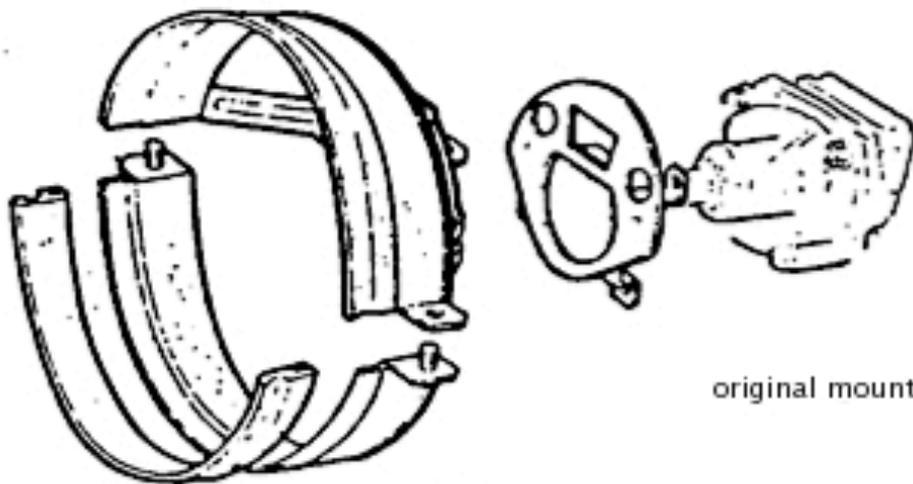


Engine ventilation

- Replace the mechanic fan with an electric one
- Take out the old fan (keep it in the car in case of breakdown)
- Take out the metal deflector and replace with a plastic one and the electric berline (truck) fan.

It is possible to fit two electric fans.

In all cases, you must avoid taking off the radiator itself to limit cracks through vibrations.

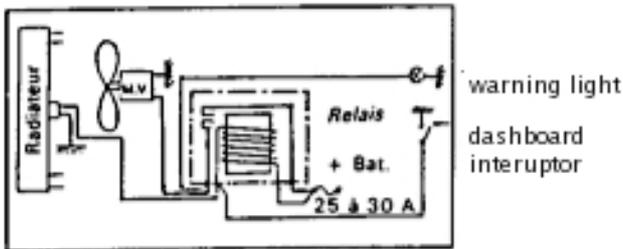


It is advisable to mount an on/off switch with a warning light in parallel with the thermocontact.

Have the thermocontact fitted by a specialist.

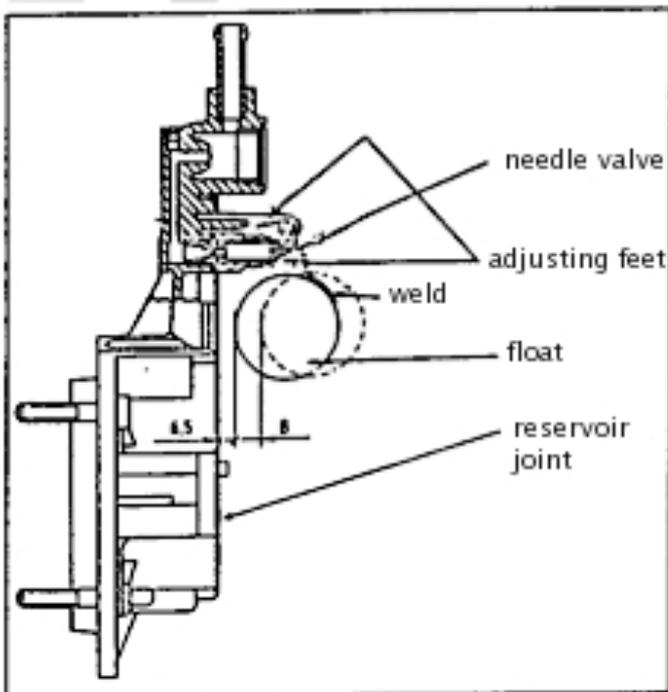
Example wiring scheme :

- Use a 30A relay and protect the line with a 25-30A fuse, depending on the power of the electric fan.

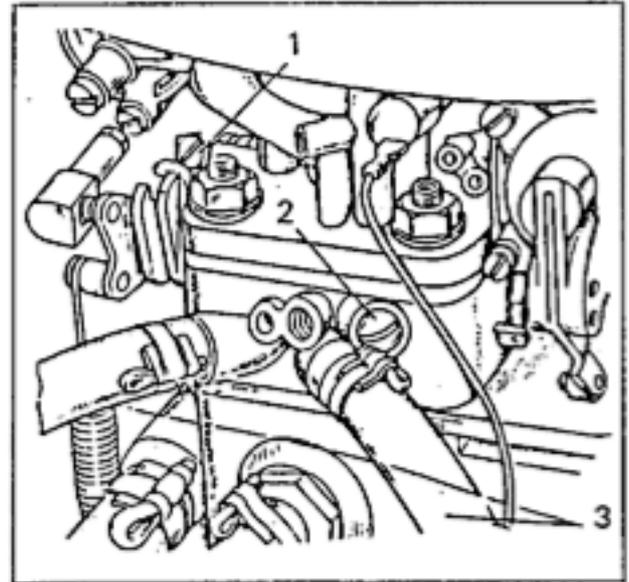


Carburetor

To limit petrol consumption, we advise you to have your carburetor adjusted by a specialist. On the other hand, the level of the reservoir plays an important part in consumption. The distance between the joint plane and the float is 6.5 mm.



Important : it is essential to redo the tin welds of the float leg. These have a tendency to break under vibration.



1. butterfly stop screw
2. mixture richness screw
3. sole reheating pipe

Other possibilities : you can change the original carb to a Weber (with a plastic float). Available from Weber.

Advice : put an extra thermal block in. To fix the entirety, screw in longer pins.

Petrol feed

Several solutions are possible, and once again it's up to you to choose the solution best adapted to your type of journey.

Keeping the original pump: it must be in good condition, and the refueling pressure must be checked (250 g/cm²). This adjustment is done by increasing (pressure drops) the block under the sole of the pump.

Mounting an electric fuel pump, and bypassing it in case of breakdown (recommended solution) : in this case, take off the mechanical pump, take out the push rod and remount the pump on the engine. Put the rod in a fuel pipe and use it to join the entry and exit pipes of the pump.

If your electric pumps break down, all you need to do is replace the push rod and rejoin the pipes. If you take "Facett" pumps then petrol can cross even when they break down, so you don't need to remove them.

Mounting electric fuel pumps example :

Avoid mounting them in too hot an environment ($60^{\circ}+$), or somewhere that vibrates, or too exposed to the weather.

Warning : if earthing is done on the body of the pump, take the earth to the bodywork with a bonding strip.

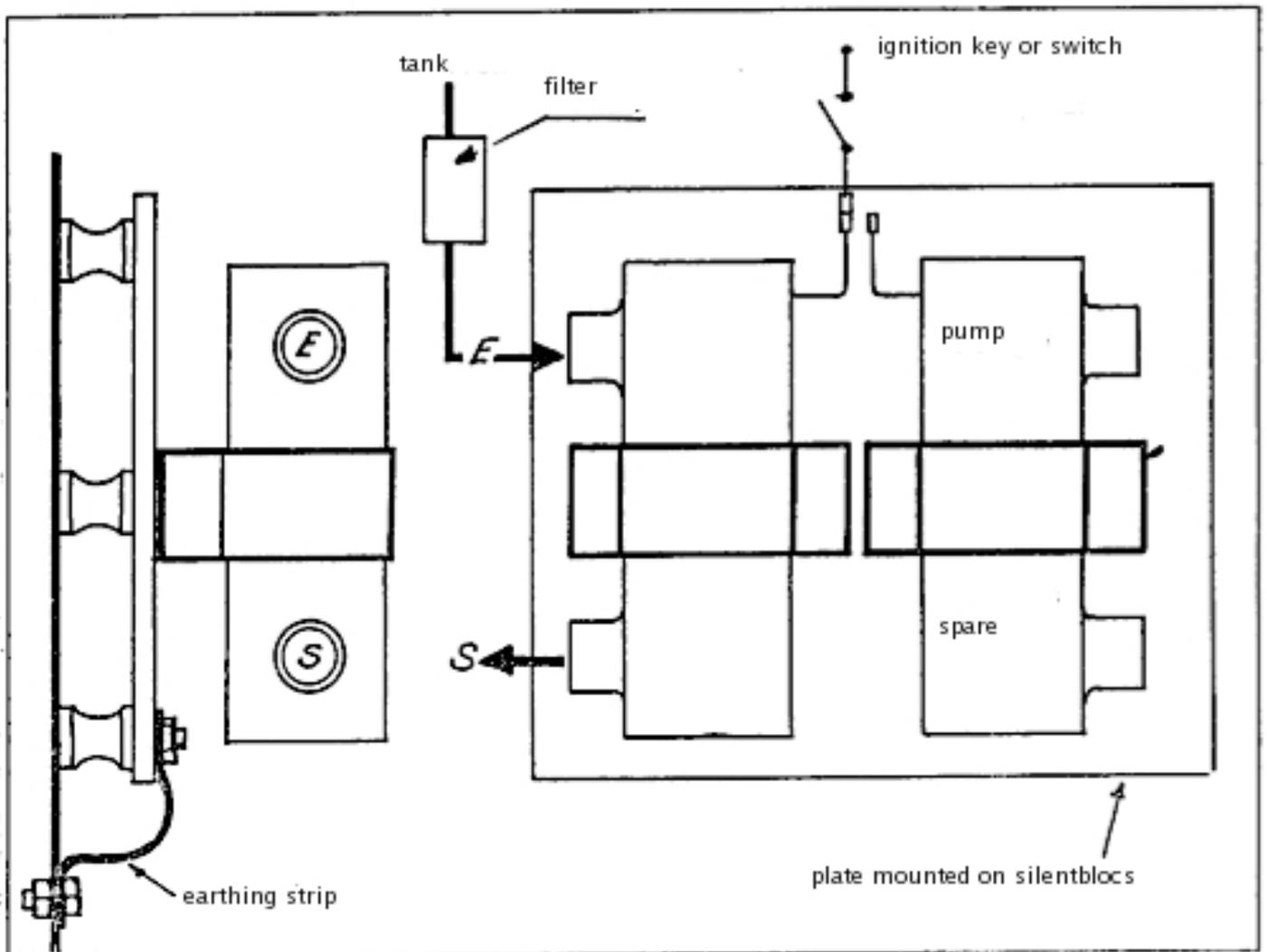
Fuel filtration

Mount a large fuel filter (Purflux) between the fuel pump and the tank. This will avoid worries about fuel.

Ignition (firing order 1-3-4-2)

Check:

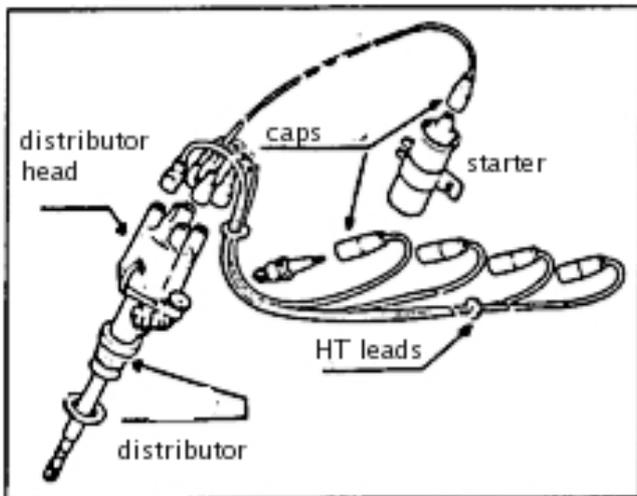
- the mechanical state of the distributor (centrifugal advance and when depressed); the points, condenser and spark plugs must be new.
- The cam angle: $55^{\circ} \pm 2^{\circ}$
- The resistance of the rotor arm: 5 to 6 k Ω .
- The timing of the distributor. With super, 3 to 5° of advance. With regular, 0 to 3° of advance. Up to you to choose, adjust the advance depending on the quality of the fuel (adjust by clicks).



- The state of the HT leads (resistance 1000 to 1500 Ω).
- The coil (primary resistance 3 to 5 Ω , secondary resistance 5.4 to 9.2 Ω).

Advice :

- Mount a second coil as spare.
- Seal the distributor by plugging the holes on the head with silicon from a tube.
- Stop the ends of the HT leads by tightening the caps on the head of the distributor with tie-wraps. Do the same thing for the spark plug caps. Spray water repellent over the entire ignition system.



Exhaust

- Stop the bronze collector nuts with plate or counter-nuts.
- You can replace the exhaust fixing belts with silentblocs
- Check the fixing of the exhaust collar on the gearbox.

Other mounting:

If you have mounted a tank in place of the exhaust, you must fit a Thuvignon lateral exhaust (tel. 34.19.53.42). The previous advice is still relevant.

Petrol Tanks

Autonomy will depend on the areas traveled and the availability of petrol supplies. If we consider a consumption of 20 litres/100 km (load and terrain), then 800 km of autonomy is a safeguard. There are two solutions:

- Take along jericans
- Adapt a secondary tank.

The original 45 litre tank will necessitate 5 or 6 20 litre jericans. This represents a weight of approximately 90 kg for 120 litres, which you can spread inside or outside the car.

Limit heavy weights on the roof – holding the road off-road becomes precarious (the centre of gravity is too high, and there is a tendency to bounce).

You can mount a 75 litre tank under the car in place of the exhaust. A complete kit (tank, gauge, three-way tap and lateral exhaust) is sold by the company Thuvignon.

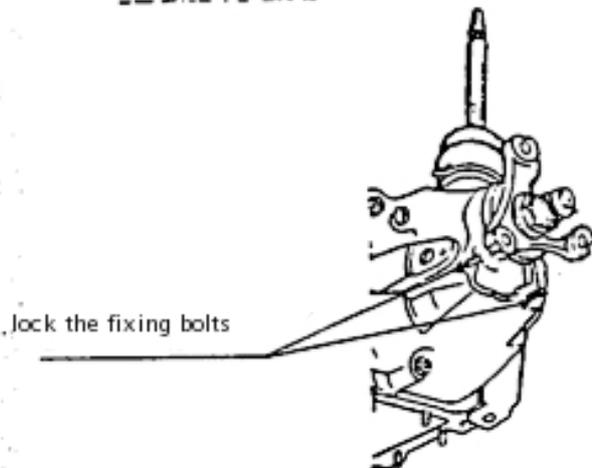
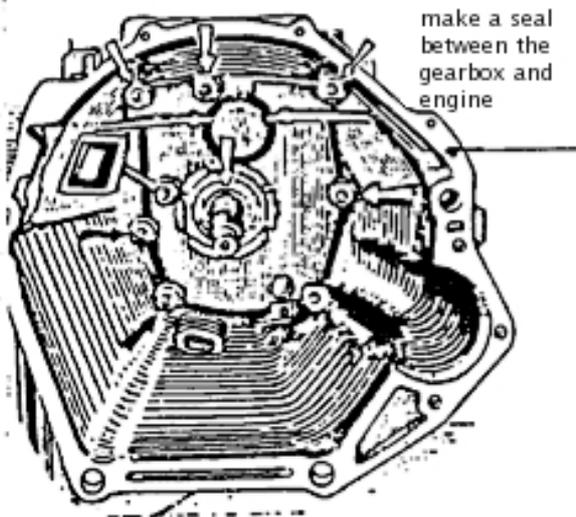
For a greater autonomy, you can adapt a tank inside the car (preferably behind the front seats to distribute the weight).

There are specialists who can make made-to-measure aluminium tanks (the most expensive solution).

In all cases, this is an important preparation that must be treated very seriously (for safety reasons).

Gearbox

- Check the gearbox works well, also the seals and the tightness of the bolts.
- Check the state of the silentbloc at the mount point and replace the screws with six-sided BTR screws (see bodywork)
- Use joint compound to seal between the engine and the gearbox.
- Lock the silentbloc fixing bolts on the gearbox.



Advice

- For safety, it's better to fit European bearings.
- Reinforce the gearbox with a plate welded across it (2.5mm thick).

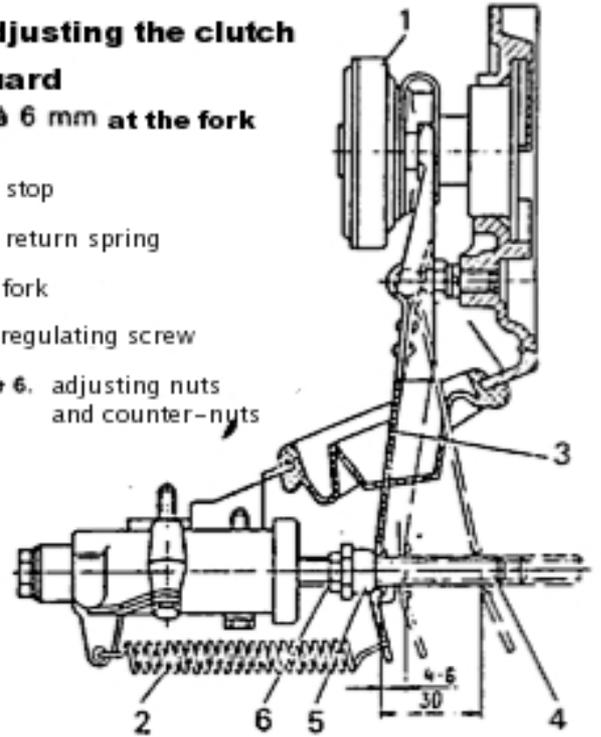
Clutch

- Fit a more powerful Valeo clutch kit (disc, mechanism and stop).
- The working and adjustment should be perfect, and there should be no oil leaks.

Adjusting the clutch guard

4 à 6 mm at the fork

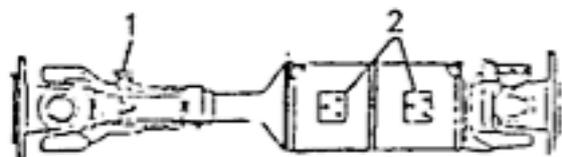
1. stop
2. return spring
3. fork
4. regulating screw
- 5 & 6. adjusting nuts and counter-nuts



Drive Shaft

Important: The location of the parts is imperative in the event of disassembling.

- Fit the universal joints well greased.
- If vibrations are felt after changing the universal joints get your transmission balanced by a specialist.



1. greasing the sleeve
2. balancing weights

Transfer Box

A careful revision of the transfer box must be made.

As for the gearbox, original bearings must be replaced by European ones.

- Check the locking of the pinion shafts (before model 87).
- Lock the rim fixing screws (on the differential) and all the bolts with Loctite.

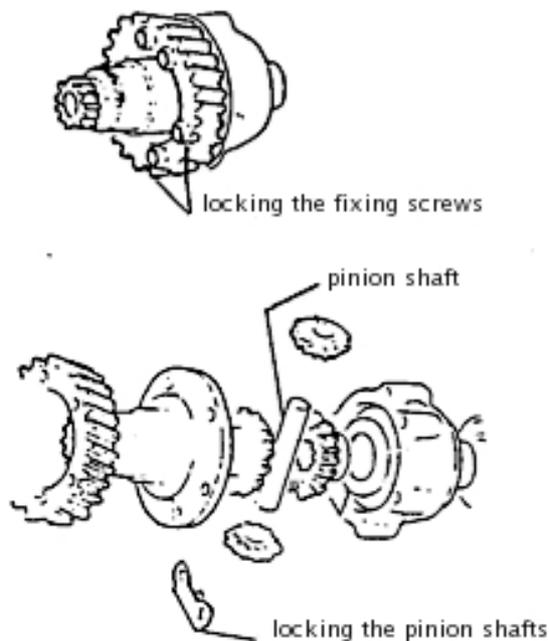
Differential

For Nivas built before 1987 it's best to replace the case to a new one that has steel holds behind each pinion.

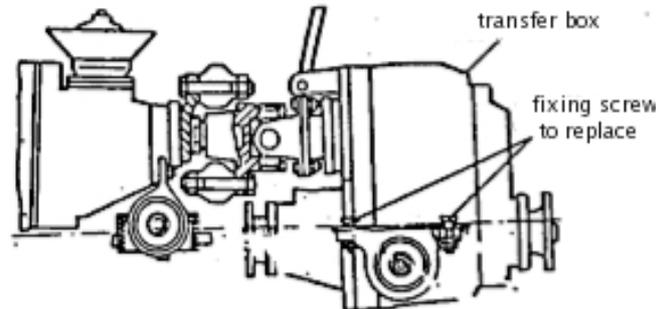
In all cases, it is possible to improve the greasing of the pinions by grinding spidery patterns into the part in contact with the case.

The pinion lubrication problem only appears if the car runs a long time at a fast pace, so off-road there is nothing to worry about.

Transfer box differential



- Replace the original floor fixing screws by 6-sided BTR screws welded on a reinforcement plate (see bodywork).

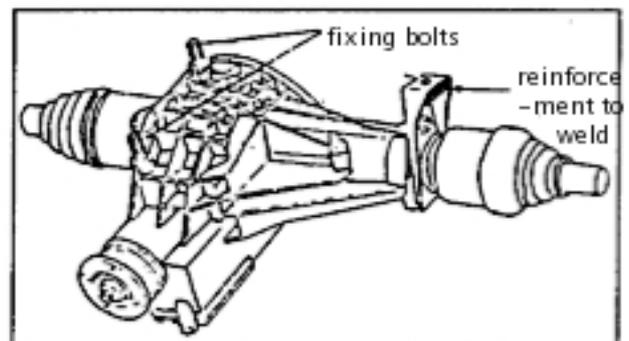


Advice:

Whatever the origin of the transfer box, it must be well sealed. This will avoid having to do frequent and impractical oil top-ups.

Front Axel and Power Train

- Replace the original bearings with European ones. The seals must be perfect.
- Locktite and nylstop the axel fixing bolts and the cap bolts.



The power train must be in good condition and not have any significant play. The rubber boots must be changed if they show signs of leakage or damage.

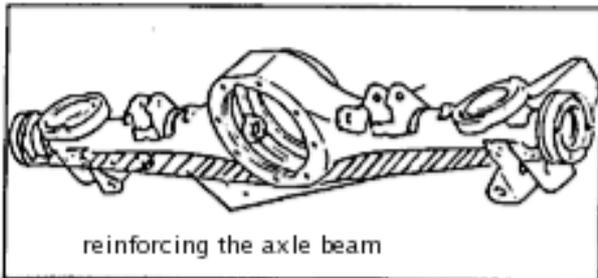
If used for long periods with damaged boots it will be necessary to change the complete transmission.

Remove the plastic bowls.

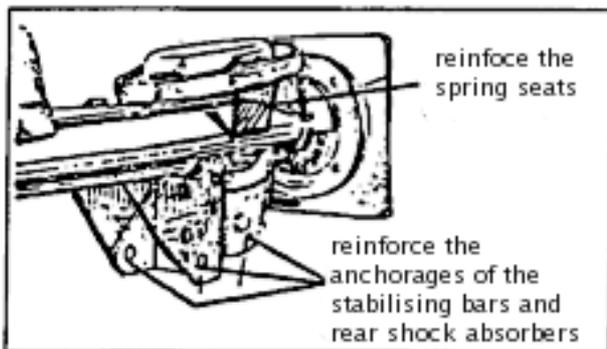
Back Axle

Axle beam:

- Reinforce the axle half-shafts with 3mm plate in a U-shape (to be done by a specialist to avoid deformations)



- Reinforce the anchorage points of the rear shock absorbers and the lower ties of the axle with a plate.



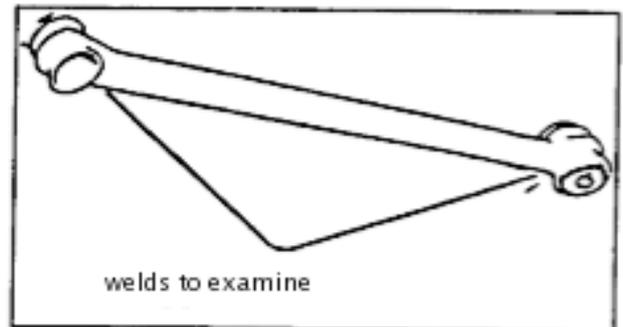
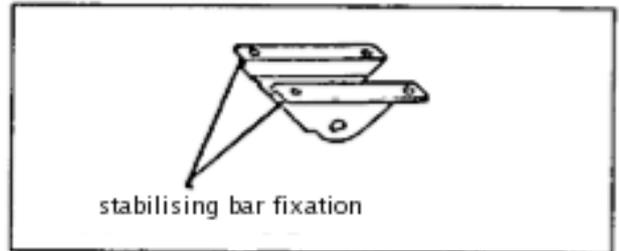
Rear Differential:

As for the front axle, it's advisable to replace the original bearings and also the lip seal of the drive pinion.

- Lock the fixing bolts of the large crown with Loctite.
- Ensure the axle is well sealed.
- Replace the fixing bolts of the diff housing with six-sided BTR bolts locked with locking thread. The heads should be drilled (0.8mm diam hole)
- On the inside of the axle you can also bolt 8 x 30 BTR bolts (threaded all their length & locked with Loctite) in the tapped holes that fix diff housing. Using locking washers and Nylstop nuts allow a permanent tightening after the axle

is mounted. Check regularly at each stage.

- Check the welds of the upper stabilising bars and lock their fixing bolts on the bodywork.



Differentials

If you are sure of always (or often) driving on hard ground then the original differentials are OK.

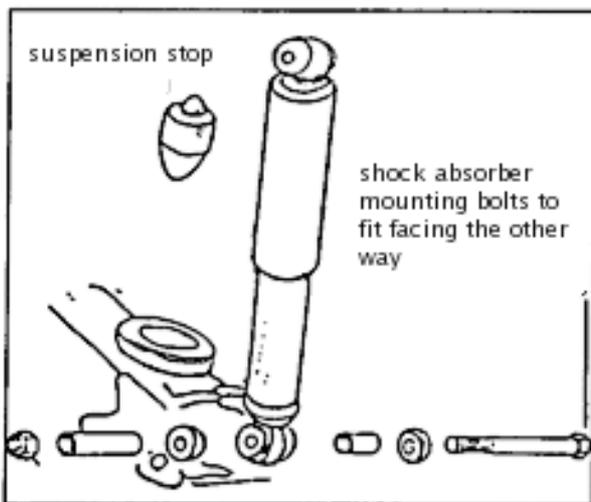
If most of your journey will be on sand or wet ground it is in your interest to replace the differentials with some with shorter ratios. Your speed will be slightly reduced (about 115 km/h) but you will better your chances of clearing your Niva.

- The 2101 axle (break) is well adapted (9/40).

should be done using a leg welded on the cheek of the wing.

Front and rear suspension

- Replace the original springs with African type springs.
- Replace the original shock absorbers with African type shock absorbers.
- Reverse the direction of the rear shock absorber and stabilizing bar mounting bolts. This avoids damaging the thread of the bolts with flying stones, so the parts can be replaced easily. This manoeuvre is relevant wherever this could be a problem.



Doubling up the Shock Absorbers

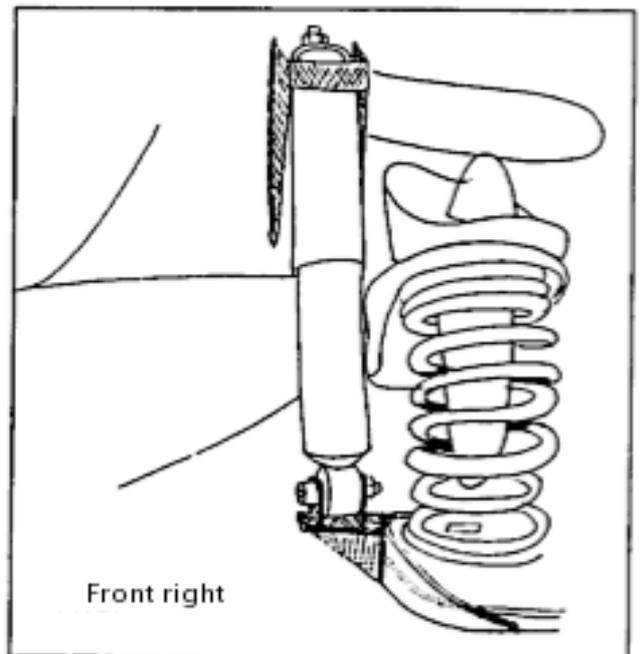
- Mounting two shock absorbers at each wheel gives the advantage of reducing the amount of work done by each. The overloading of the car and the difficult terrain takes a lot out of the shock absorbers, which tend to overheat and become almost useless.

Doubling up the shocks allows shock absorbency to be maintained without reducing the road holding of the car. The additional shock absorber should be of the African type, and should be mounted on the edge of the suspension triangle using a plate. The upper mount

Warning!

The new anchorage position will depend on the maximum travel of the shock absorber. To determine the position, raise the vehicle with the front wheels hanging and mount the shock on the lower triangle. Fix the upper leg on the shock, let the shock out to its maximum travel, locate its position (tack it if necessary) then weld the leg all around its perimeter.

The shock absorbers should not, under any circumstance, hold the suspension in place when the wheels are hanging.



The rear shock absorber is situated in the spring. The lower mount is made by welding two legs to the lower coil spring seat.

The upper mount is made from the inside of the cockpit, by welding a support on the cheek of the rear wing. The shock passes through a hole cut out in the middle of the upper guide of the spring.

Seal the cutout and the top of the shock with silicon paste.

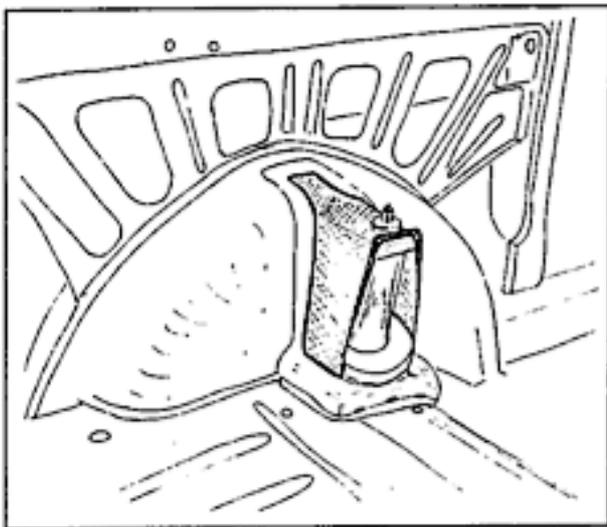
Rear suspension clearance

As for the front suspension, the rear shock absorbers should not hold the axle in place. At the front, the upper triangle is held in place by a flexible stop. At the rear, straps or slings (one on each side) should be mounted – paying attention to the adjustment.

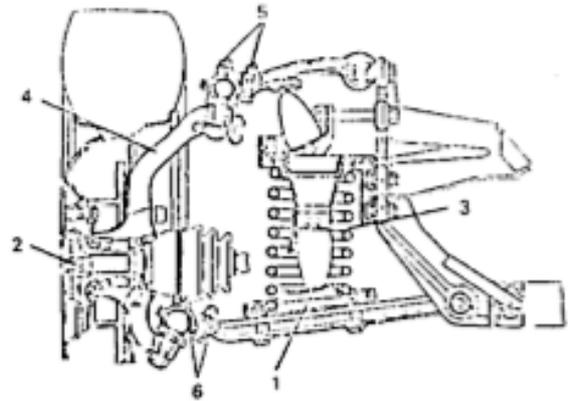
Nylon straps or slings

Opinions are divided so the choice is yours. Straps have the advantage of being supple and not damaging the half-shafts. They have the disadvantage of being exposed to flying stones and wearing out or breaking.

This type of problem doesn't occur with belts, but violent enough shocks will be felt every time the wheel leaves the ground.



If you have made this modification, you must make it both at the front and rear to maintain the balance of the car. It is possible to do it only at the rear axle for weight reasons, but never ever just at the front.



1. suspension stop to replace
2. play adjusting bolt of the hub
3. suspension spring to replace
4. hub carrier
5. 6. Mount BTR bolts and Nyslop nuts.

Front Suspension

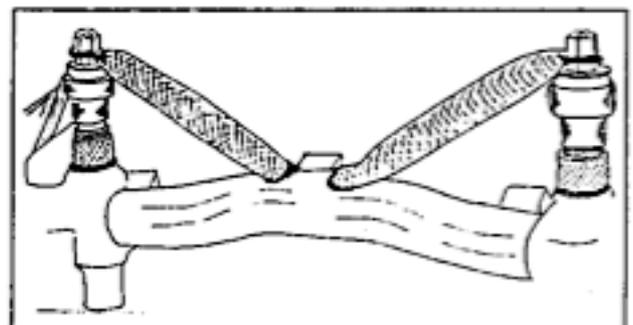
Front axle

- The entirety of the front axle must be in good condition and well adjusted.
- Reverse the direction of track rods and tack the bolts on the tightening collars of the sleeves (small ball-joint on the inside, long one on the outside)
To make replacement easier, the mounting of the track rods must be done with care. The threads should be well greased and shouldn't jam.

Reinforcing the adjusting sleeves:

The sleeves are weakened by the use of a split down their length.

A 3mm thick ring with the interior diameter adapted to the outside of the sleeves (made



to measure in place) and about 25mm long should be slipped into place in a way that leaves room for the tightening collars. Replace the original mounting bolts with upper and lower ball joints with BTR bolts and Nylstop nuts.

(relais de direction)

to avoid excessive play, replace the original rings with bronze ones of the same size.

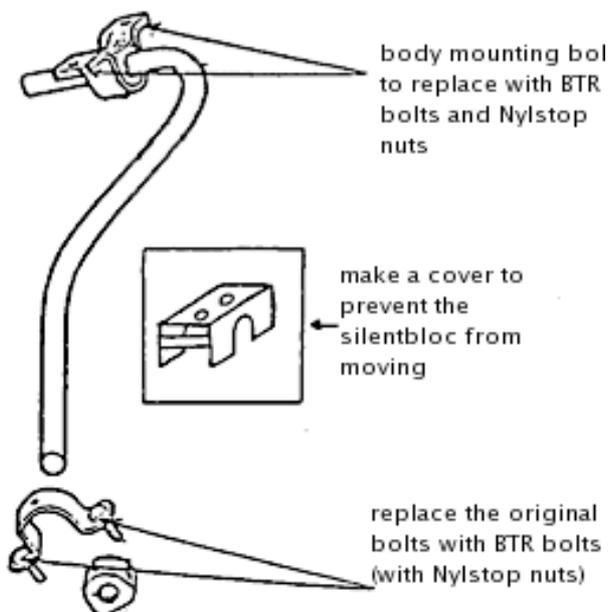
Front hub nuts

If you have had to take out the transmission, the adjustment of the wheel bearings is done as follows:

- Tighten the bolt to 1 m daN¹ to put the bearings in place while turning the wheel and slacken by 25°. The conical/beveled bearings should never be tightened and the play should be close to 0 (about 0.05 mm).
- Don't forget to lock the bolts.

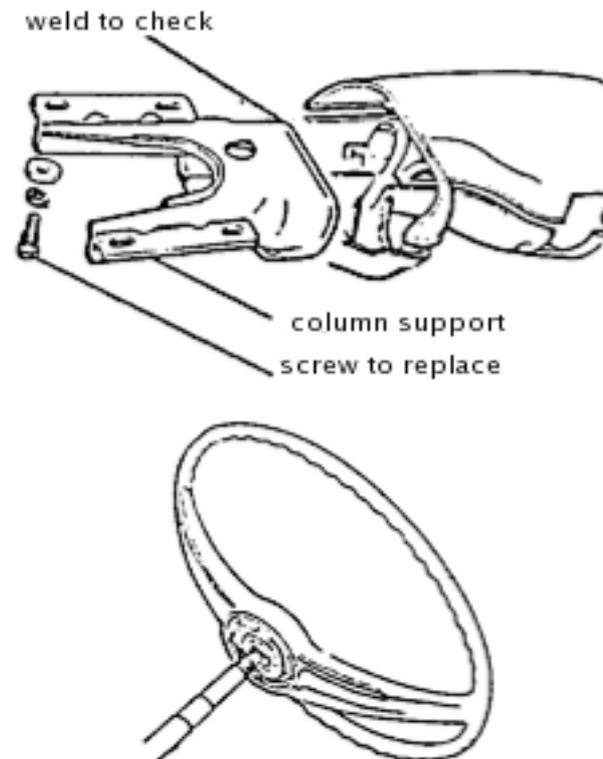
¹ tightening torque

Anti-roll bar



Steering column

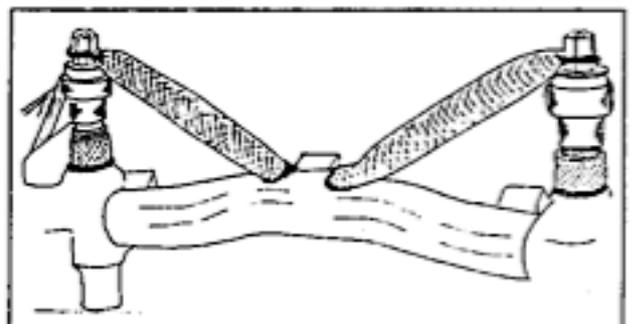
- Replace the auto-breaking screws with BTR screws.
- Check and eventually re-weld the column support.



Front suspension cross-member

To avoid shattering the suspension arm casings in the event of a violent shock, you can encase (1) them in a 5mm thick ring.

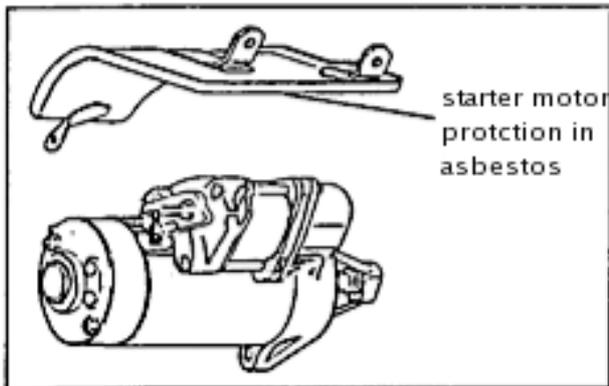
- Weld two tubes (2), the flattened ends welded to the centre of the cross-member and fixed to the rotational axis of the triangle.
- Replace the washers on the lower rotational axis of the triangle with a single one of the same thickness, for ease of disassembly.



Electrics

The entire wiring loom must be checked and adequately protected in places where there is a risk of damage (from plates and the heat of the exhaust).

- Reinforce the protection of the starter motor against the heat of the exhaust by an asbestos cover (pop rivet with bands of plate).



- Check and lock the solenoid bolts.

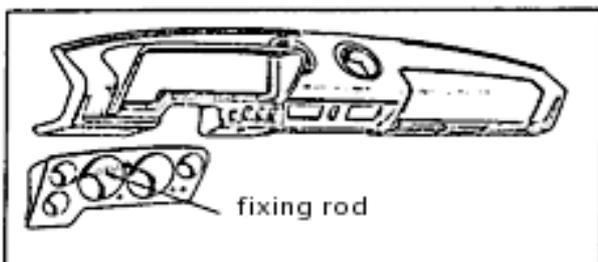
Alternator:

- Put a nylon stocking filter on the air intake of the alternator.
- Mount an electronic regulator in place of the original (take care that the mass/unit is perfect).

Fuse box:

Protect against oxidization with a specialized product. After, turn the fuses from time to time to remove the inevitable oxidization points and to ensure good contacts.

Fix the combined dashboard instruments with a threaded rod and Nylstop nuts.



Some General Tips

- Lock the hinge-pins of the tailgate hinges with a pin.
- Mount boot-catches so the vibrations don't break the originals.
- Double-up the speedometer cable
- Re-weld the mounting foot of the pivot of the accelerator on the rocker arm and the pulling arm of the accelerator (rod of 8 with two feet).
- To plug in a card reader, use the supply in the passenger ceiling light.
- The roof-rack must be of very good quality (CFDA/78 Coignières).
- Replace the original steering wheel with that fitted on the 2107 saloon.
- To avoid the windscreen coming out of its fixing under impact, fix four aluminium arms on the pillars.
- Fitting a work spotlight will do you more favours than fitting extra spotlights.
- You can install a second toothed rack instead of the guidance slide on the front seats.
- To eliminate water ingress in certain units (gearbox, transfer box, front and rear axles), you can replace the free-air valves by drains coming up to the cock-pit.

Care of the Car

At Each stage, systematically check the following:

- Tightness of all the nuts and bolts under the body, especially the propeller/universal shafts, the mounting of the front suspension (and all the associated parts (balljoints, suspension triangle, etc)).
- Tightness of all the bolts from the cap (nose?) of the front axle to the

transfer box, also the transfer box's mounts.

- Tightness of the silentbloc rear of the gearbox.
- Tightness of the nose of the front axle on the banjo, also the reaction push rods and the anti-rollbar.
- Visually check the anti-rollbar.
- Tightness of the axis of the upper triangle (put a drilled counter-nut with a pin).
- Tightness of the brake backplates.

Check for leaks and replenish levels for the :

- Engine. Check the tightness of the oil filter.
- Front axle
- Gearbox
- Transfer box
- Rear axle
- Radiator
- Battery
- Windscreen washer

Check the state and replace as necessary :

- The fan belt
- All hoses (check for leaks between the water pump and heater hose).
- Radiator core (cleaning, possibly filling) .

Check the fixing and state of :

- Extension – retraction of the shock absorbers at all difficult stages.

Check the play in :

- The transmission system, the steering and eventually the adjustment of the housing.
- Front hubs and wheel bearings
- Rear axle shaft bearings – noise and play.

Clean or replace:

- Air filter
- Fuel filter

Visually check:

- All the electrical and accessories connections.
- Brakes for leaks and good working order.
- Wheel rims – eventually straighten or replace them.
- The state and pressure of the tyres (don't forget for these last two items to check the insides of the wheels and the inside walls of the tyres)
- The inflection of the rear axle (without the wheels)..

Tools and Toolsets

Most important spare parts

- Upper hose from radiator to engine block.
- Hose from engine block to the thermostat.
- Hose from thermostat to the radiator.
- Small hose from the water pump to the thermostat.
- Heater hose.
- Fan belt.
- 4 spark-plugs.
- Complete distributor, comprising:
 - Distributor cap
 - Contacts
 - Condenser
- Rotor arm and set of HT leads.
- Carburetor float.
- Carburetor return spring.
- Oil filter.
- Lots of air filters.
- Wheel nuts.
- Inner tubes.
- Fuel pipe by the metre.
- A front and rear shock absorber.

- Tachometer.
- Complete track rods.
- Carburetor plastic control rods.
- Complete balljoint.
- Neiman cartridge.
- Fuses.
- Thermostat
- Stabilizing bar fixation brackets.
- Silentbloc set for transfer box fixing.

Supplies

- Engine oil
- TMG-EP 80 oil for transfer box, front and back axles.
- Grease
- Electrical cable
- Electrical wire
- Assortment of "Serflux" clips, 3 or 4.
- Loctite thread lock.
- Inner tube puncture repair kit.
- Mastic (type Cosmofer, Metolux)
- Roll of sticky tape.
- (?Bande W)
- Flexible water container
- Raffia matting.
- Joint compound (Loctite blue joint)
- Cottar pins
- 2 universal joints (L and R)
- an alternator
- Axle ties (long and short)
- A rear and a front spring
- Brake pads
- The original mechanical fan
- A Panhard bar
- Rope or straps
- Jerricans of water
- Sand ladders.

Personal effects

- Sleeping bag and camp-bed.
- Flexible water containers
- Collapsible bucket
- Drinks container
- Binoculars
- Clothes
- Safety equipment
- First-aid kit

Toolkit

Ring spanners	Flat spanners
7	—
8	8
10	10
12	—
13	13
17	17
19	19
—	22 (mixte)
24	24
—	27 (mixte)

Needed

- Adjustable open-end wrenches.
- Set of BTR spanners (if you fitted the BTR screws)
- 50 hammer.
- Mallet
- Set of flat and cross head screwdrivers
- Wire cutters
- Adjustable pliers
- A grip vice
- A set of pin drifts.
- A crowbar.
- A jemmy.
- Ball-joint splitter.
- Bradawl.
- Knife
- Pair of scissors
- Scraper.
- Flexible spade
- Metal saw
- Lada toolkit containing
 - Hand pump
 - Tyre lever

Advised:

- Riveter and set of rivets.
- Hand drill and drill-bits.
- Socket set with 210 lengthener.
- Hydraulic jack.
- Oil syringe.
- Nylon rope.