INSTRUCTION MANUAL
ACROSS CAR



Caravan



Motorhomes

EN

Dear customer,

Thank you for purchasing a vehicle made by ACROSS CAR and thank you for the confidence placed in us.

These instructions will assist you to fully understand your vehicle. Please read this manual before running your vehicle. Here you will find vital safety messages.

If needed, please contact our nearest service centre. The list of our authorized dealers can be viewed on our website www.across-car.es

Please note that this manual is not a warranty. Please send the warranty card to your dealer for warranty terms. Warranty card must have been completed with the dealer's stamp, date of purchase and stamped at each annual service.

Yours sincerely

ACROSS CAR

Across Car S.L.

Algezar,9
Polígono Industrial Tres Hermanas
03680 Aspe (Alicante)
Spain

email: info@across-car.es
web: www.across-car.es

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1 Prologue

Welcome to ACROSS CAR team and thank you for your choice. This caravan or motorhome will be your new holiday home. In this new home, we selected the best materials for your journeys and trips.

These instructions are intended to help in all matters related to use and maintenance of your vehicle. Even the most perfect machine needs time to maintain its' condition and checking of its operation.

This allows you to obtain the best performance and maximum life on the Across vehicle elements. Annually, and within the warranty card, there are subsequent annual reviews and services to be checked by an approved dealer.

ACROSS CAR.

1.1 Technical documentation.

The following documents are contained in the folder inside the vehicle:

Manufacturer's documentation:

Warranty certificate, which indicates the annual revisions to be carried out by your dealer.

Additional documents (depending on the model and the extras included in it):

User manuals for the different elements installed in your vehicle.

1.2 Explanations of symbols.

Advice, danger and use/maintenance information

These instructions are specially marked with symbols and accompanying texts. Always follow these instructions to help you avoid misuse, damage to property or injury to persons.

USE AND MAINTENANCE



This symbol together with the word "USE AND MAINTENANCE" indicates useful hints and recommendations for the correct use and maintenance of the vehicle.

RECOMMENDATION



This symbol together with the word "RECOMMENDATION" indicates useful hints and recommendations for efficient handling of the vehicle and its equipment.

DANGER WARNINGS



This symbol together with the word "DANGER WARNING" draws your attention to dangers, non-observance of which may lead to material damage or injury to persons.

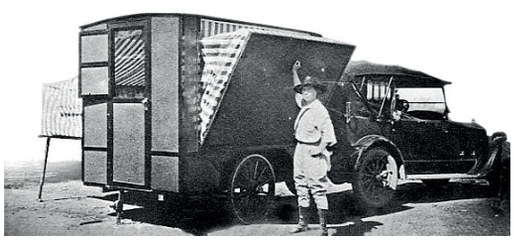
2 Caravan history.

We believe the beginnings were in 1885.

A British Navy doctor retired and tried to navigate the sea. On his return, he had a new understanding: Nature: Unknown in the navy. He decided to complete a tour through the UK using a four-wheeled carriage to sleep. That car weighed over 2000 Kg, and was pulled by horses. It was the first caravan, 6 m. x 1.8 m. wide, which is currently located in Bristol Museum.

Growing as a fashion item for the aristocrats at that time, it was in 1896 when the idea crossed the sea. This invention, with automotive industry help, provided the desired contact with nature.

Dr. William Gordon STABLES, died in 1910 and is remembered in England as the Caravanning pioneer. It was his books, "The Cruise of the Land Yacht Wanderer" and "Leaves from the Log of a Gentleman Gipsy" that popularized caravanning







3 Caravan and motorhomes identification.

Unique in its manufacture, as well as having been conceived as a piece manufactured individually in our facilities, it has been treated as such, therefore our team has created it independently from the others, in a handcrafted way that no one else can offer you, it has had its creation process in which each worker has considered it as unique and different from all the others, therefore a caravan made to measure, with which we try to get closer day by day.

The chassis or frame number of your caravan has been designated within the canons of European homologation of our models (UNE 26313).

This number can be found on the warranty card, carved on the drawbar or on the right-hand side of the caravan on the type approval plate (Fig. 1) or next to the chassis manufacturer's plate on the engine in the case of motorhomes (Fig. 2).

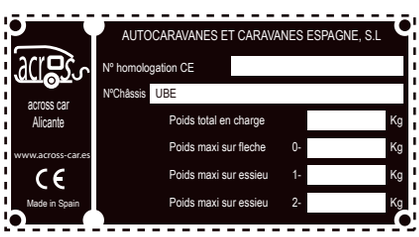


Figure 1: Caravan type-approval plate

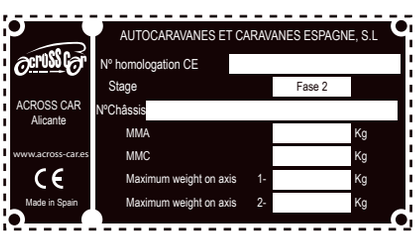


Figure 2: Type-approval plate for motorhomes

In addition, the technical characteristics of the model will be essential before starting our journey.

We must check these data in the I.T.V. sheet. There we will find all the necessary information, especially to study and know the weights of our vehicle, a subject that we will analyse later on.

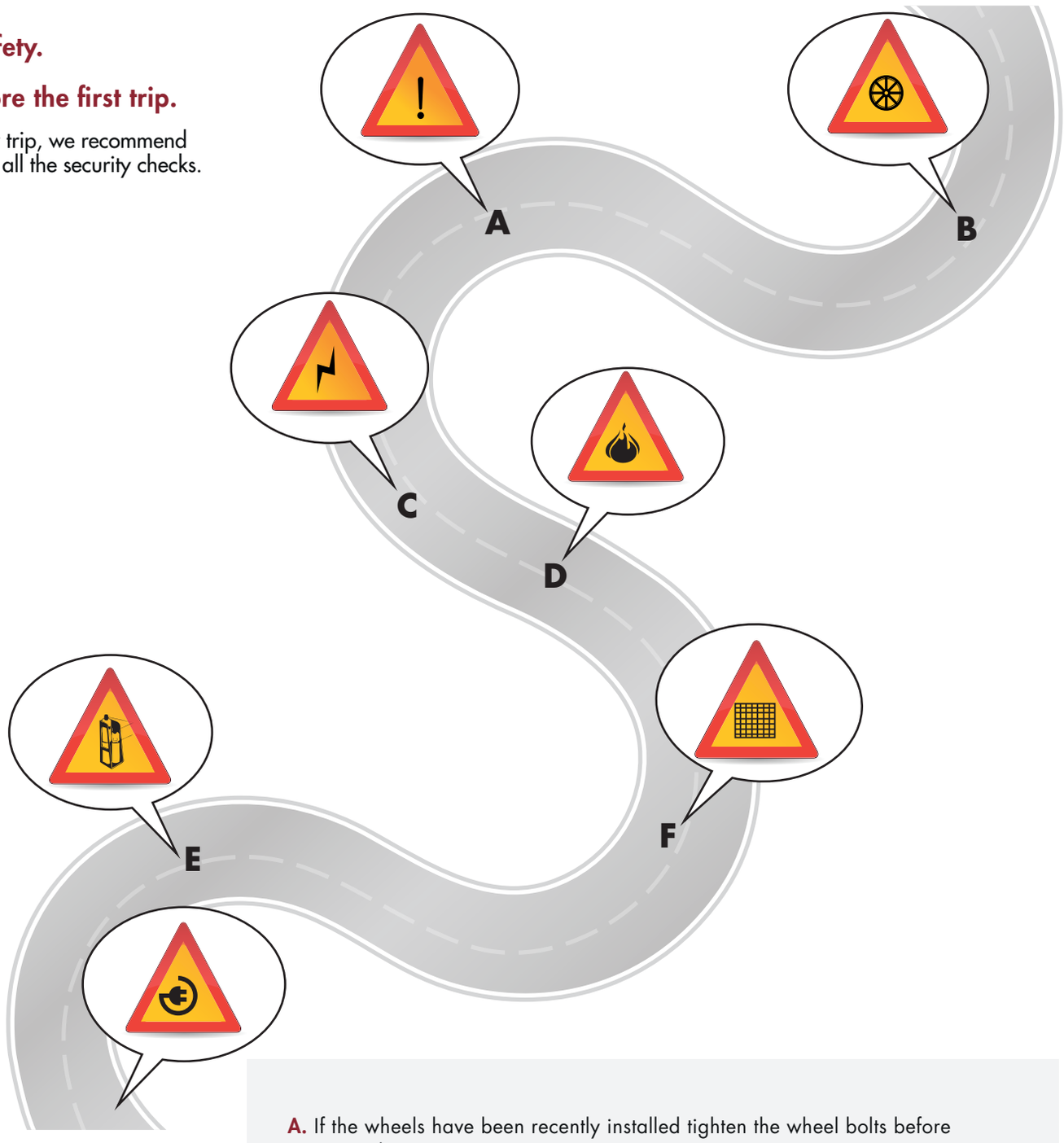
The vehicle is homologated in the European Community, you will find the registers on the adhesive plate on its structure.

Depending on the vehicle classification, Across Car has different approvals at European level, updated under the directive 2007/46/CE, to issue the corresponding I.T.V. cards and complying with different regulations (NFS 56200 and 5620 France, low voltage regulation). The European homologation is controlled by the S.N.C.H. (Société Nationale de certification et D`Homologation).

4 Safety.

4.1 Before the first trip.

Before any trip, we recommend you follow all the security checks.



A. If the wheels have been recently installed tighten the wheel bolts before starting a long journey.

B. Check the tyre pressures.

C. Charge the battery of the vehicle.

D. In the case of temperatures below 0°, allow the vehicle to warm up first and then undertake the water installation.

E. Transport gas cylinders strapped securely.

F. Keep areas clear for mandatory ventilation.

G. Turn off gas appliances if you must refuel the vehicle.

4.2 Fire protection.

To prevent possible fires, you must:

A. Never leave children alone in the caravan.

B. Keep flammable materials away from heating appliances and the kitchen.

C. The lights can overheat. Always keep a minimum distance of 30 cm.

D. Never use portable space heaters or the kitchen appliance for heat.

E. Changes in the electricity, gas systems and appliances should be performed by authorized and qualified specialists only.

In case of fire:

F. Evacuate the occupants of the vehicle immediately, if necessary provide first aid.

G. Turn off the power supply and separate it from the network.

H. Close the stopcock of the gas cylinder.

I. Notify the fire department.

J. If possible and not at risk, fight the fire.

RECOMENDACIÓN



It is advisable to have a 1Kg fire extinguisher, and to periodically pass its corresponding revisions.

4.3 Overview.

A. Provide adequate ventilation. Do not cover or block vents (skylights, chimneys, windows, etc.) Keep free of dust and snow. Obstruction of these can cause carbon dioxide poisoning.

B. Always consider the height of the access door.

C. You can only access the roof of the vehicle via a ladder designed for this purpose. Before this operation make sure the vehicle is level and stable.

D. The trivalent refrigerator should run on 12V before starting the trip. Once finished, it will be necessary to switch to gas or 220V.

4.4 Road safety.

Driving on public roads always requires special care and attention. Always observe the local traffic regulations the vehicle's owner's manual and the following instructions:

4.4.1 Vehicle.

The caravan and the towing vehicle form a unit, which differs from an individual vehicle in that the unit is large and heavy.

Inappropriate driving behaviour can lead to accidents with serious injuries and fatal consequences, especially for inexperienced drivers, which is why it is necessary to adapt the driving style and follow the following instructions:

- When loading the vehicle, never exceed the permissible gross vehicle weight or the permissible axle load and the permissible axle load.
- Bear in mind that the braking distance is greater than with a car.
- When entering parking areas, level crossings, bridges or tunnels, always observe the clearance dimensions and the height and width indications.
- Pay attention to traffic restrictions or specific driving instructions for caravans.
- The dimensions, weight and driving behaviour of the caravan may change as a result of the additional load or the installation of accessories.
- If the caravan is parked on a slope, wedges must be carried to wedge the caravan.

4.4.2 Hitch

When coupling the caravan to the towing vehicle, the following instructions must be observed in order to avoid injury to persons in the coupling area:

- The car (towing vehicle) must have a safe towing hitch and a safe plug-in electric hitch.
- The caravan must be in optimum condition.
- Do not hitch or unhitch the caravan with the locking brake on.
- Be careful when hitching or unhitching the caravan.
- There must be no persons inside the caravan or between the towing vehicle and the caravan.
- It shall only be possible to enter the danger area between the towing vehicle and the caravan if both are completely stopped and secured by the parking brakes.
- After hitching up, check that the vehicle's lighting devices are working properly on the caravan and check the brake lights. After hitching up, check that the vehicle's lighting equipment in the caravan is working properly and check the brake lights.

4.5 Gas equipment.

A. Close all stopcocks before any trip.

B. Do not use any gas appliances while refuelling the vehicle.

C. The system may only be checked, repaired or operated by authorised specialist personnel.

D. An inspection of the gas installation is mandatory once a year.

E. In case of suspicious odours, immediately turn off the gas valves and open doors and windows. Never smoke, light fires or operate electrical appliances. Immediately contact a specialised workshop.

F. Open a window or skylight before using a gas fire point.

G. Never use the kitchen for heating purposes.

H. The flue gas extraction pipe, the heating chimney must never be damaged.

I. The gases must be able to escape unhindered and the air must be regenerated through the ventilation ducts.

J. If the caravan is not to be used, leave all gas taps closed.

K. Each gas appliance must have its own separate tap in addition to the main tap.

L. Use only approved pressure regulators with safety valve. These must be replaced every 6 years.

M. Always secure gas cylinders.

N. Butane gas cannot be used in temperatures below 0°C.

O. The rubber tube of the gas regulator must be checked periodically. These should be changed after a maximum of 6 years, checking the expiry date on the regulator.

P. The cylinder's interior is an open cavity in order to evacuate the gas in case of leakage, never cover or cover the vents of the cylinder. The gas is heavier than air, it will escape through the interior holes to the outside.

Q. Do not use the gas cylinder compartment for storage.

R. The main key must always be accessible.

S. The gas cylinder compartment must always be locked to prevent access by outsiders.

4.6 Electrical installation.

A. Work on the electrical installation may only be carried out by authorised, qualified personnel.

B. Before carrying out any checks, disconnect the main power cable and the battery cable.

C. Use only original components with the same characteristics as those replaced.

D. Replace defective fuses only when they have been identified as such or when they have been the cause of a fault.

E. Do not bypass or repair fuses under any circumstances.

4.7 Water equipment.

A. In case of freezing, if you cannot heat the cabin, leave open the taps and drain valves to drain the system.

B. Standing water in the tanks and facilities must be emptied before use or if the vehicle has not been used for more than 2 weeks. Always empty the fresh water tank before and after each trip as the drinking water only stays fresh for a short time.

C. It is advisable to check with your dealer for possible leaks or damage before using to prevent any internal deterioration. Poor maintenance by the user will not be covered by the warranty.

5 Before and during the trip.

5.1. Coupling the trailer or caravan.

Before the docking manoeuver you should review the operating instructions of the chassis manufacturer. There is a risk of injury so we recommend you carefully read the instructions for this procedure. During this manoeuvre, there should never be anyone between the tow vehicle and the trailer. Check that the coupling is not dirty and articulated parts are well oiled.

To make the coupling you will need to implement the following steps:

A. Make sure that the stabilizer legs are in place and the parking brake is on to prevent movement of the trailer.

B. Place the ball of the jockey wheel in its highest position.

C. Turn the knob on the jockey wheel until completely extended.

D. Raise all stabilizer legs so that the trailer is free from the ground only supported by the wheels of the axle and wheel above the jockey.

E. Un-brake the trailer by releasing the hand brake and with the help of a second person (or some automated motor mover installed to move the vehicle), place the coupling bowl over the ball hitch of the tow bar.

G. Operate the jockey wheel handle to lower the cup onto the ball of the towing vehicle.

H. Operate the handle on the hitch cup and make sure the link is successfully connected and locked (usually indicated by a pivot or green light - (d) in the diagram).

I. Remove the jockey wheel from the trailer and keep it in a safe place. The Towing device weight must not be up to 100Kg. (between 4% and 10% from total caravan weight).

J. Pass the brake safety cable around the tow bar ball hitch of the vehicle and clip the end back around the cable.

K. Proceed to connect pin 13 pin electric plug on the trailer to the towing vehicle leaving enough slack for turning.

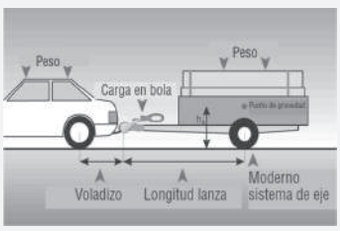
L. Check all windows and rooflights are closed. Fridge must be turned on on 12v. Window moskito/blind cassette must be stored up. Store room divider curtains.











5.2. Gravity center.

The Centre of Gravity (COG) to the ground, is the point through which passes the resultant of the different forces of the masses present in the vehicle. Forces are coplanar and concurrent acting by gravity, the centre of these forces is precisely C. O. G. In automotive it is also called centroid. In geometry, that point of intersection of the medians.

And it is the imaginary point where the sum of all bodies acting vehicle, and it is important to have the minimum distance to the ground. (Enhanced stability).

- It has to be taken with full load. In other words, in full use.
- As close to the ground as possible.
- As centrally as possible between the two sides. The right and left wheels should have the minimum weight difference. (Not to exceed 100 kg between the two).
- As close as possible to the axis of the caravan.
- With the correct distribution of the load in the caravan, excellent c.d.g. is achieved, which improves the driving performance.
- The lower the c.d.g., the better the traction in running and cornering.

5.3. It's a question of sharing space/weight.

In a caravan it is necessary to take advantage of the lack of space in the most appropriate way. Where in a house the bedroom is for sleeping and the living room is for eating, in a caravan this space is multi-purpose. This has an impact on storage needs. Therefore, the organisation and order of the different elements to be transported during our journeys is fundamental.

It is important to know how to dispense with the unnecessary, which is what should be kept close at hand, and what can be stored in the most inaccessible place. Do not forget the maximum transportable weight, and avoid overloading.

Furniture is used to organise and store all your belongings. The Egyptians were the first to build furniture, based on the findings in their tombs. When designing a caravan, all its nooks and crannies are taken into account in order to optimise its space.

Try not to carry weight on the rear overhang (from the axle to the rear).

Tie down or secure the heavy elements so that they do not move when in circulation (It is recommended to place them in the boot of the towing vehicle).

The load must be placed with a correct distribution, both in its transversal direction and in its maximum approach to the axle of the caravan, longitudinally.

Do not exceed the maximum mass of the axle of the caravan (empty weight + load) or exceed the limit that appears on the vehicle's MOT certificate.

The maximum weight of the caravan must be taken into account when adding accessories or occupants' luggage. Considering unused internal passenger compartment volumes does not mean that they have to be filled with cargo. A caravan is a light trailer, not a cargo trailer. Fixing or relocating items that can be moved during the journey (TV, bottles,...)

To calculate the maximum mass of a motorhome before leaving on a trip, 75kg will be taken for each person who will occupy a seat, as well as the equivalent of full tanks, gas bottles,...

The weight distribution in a motorhome is similar to that of a caravan, so it is best to concentrate the maximum weights as close as possible to the axles (front and rear), distributing the load evenly.

Normally, the traction of the motorhome engines are usually front-mounted, so an excessive load on the rear axle (in the case of models with a garage) will hinder the driving and traction of the front axle. The heaviest objects should be placed in the lowest part close to the ground and axle (see element a in Fig.3).

Therefore, the organisation and order of the different elements to be transported during our journeys is fundamental.

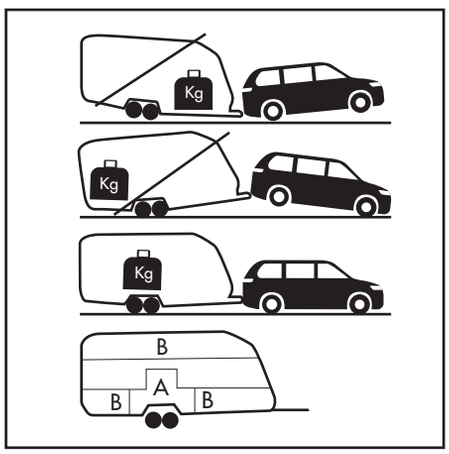


Fig 3. Mass distribution.

It is not allowed to drive a caravan with people in it, only the motorhome allows this by using seat belts.

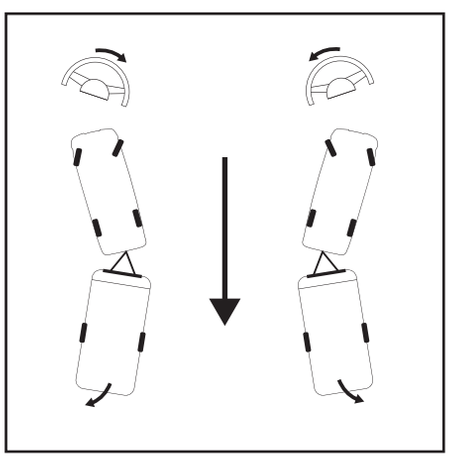
5.4. Maneuvering the caravan : backwards.

The caravan is equipped with an automatic reversing system (Retromatic, which means that the brake piston does not act on the brakes when reversing).

In curves, as the set is longer, it has to be taken with a larger radius.

The greater length of the lances (arrow) makes it easier to reverse. This longer distance slows down the reaction of the caravan to the steering wheel. Short drawbars make it easier for the trailer to change direction.

When you try to move the caravan backwards, you will notice that by turning the steering wheel to the right, the caravan turns backwards to the left. See attached graph.



Maniobra de marcha atrás.

AERODYNAMICS.

It revealed that the degree of resistance of the air conduction is largely dependent on the shape of the vehicle (front projection), air density and speed. It is customary to discuss the dynamic penetration coef cient Cx (there is also the Cy and Cz corresponding to the 3-axis trigonometric space).

In automotive the most common is by way of example Cx reviews 4 of them:

- Parachute Cx = 1.35
- Sphere = 0.10 Cx
- Pro le of one wing = 0.05 Cx
- Towing Cx = 0.35

The air resistance that gives the power to a vehicle is approximately 60% of all energy or power developed by the engine. In special cases a 10% increase in speed can make 50% more strength in the air.

The driver can influence:

•Eliminate external elements that are not required for active safety (position of the TV antenna on the roof, etc)

•Keep car windows closed, caravan or motorhome windows and roof lights closed.

•Distribute the load properly (the rear of the car), an overloaded vehicle up front will give more air resistance. It will also be more unstable by decreasing the front axle adherence.





5.5. Rules of circulation and urbanism.

A. When driving with a caravan.

The only way to save on fuel consumption and emit less CO2 to the environment, is to lift the foot off the accelerator. Drive at a steady speed of between 88 and 96 km/hour, to reduce by 10% (savings), over fuel consumption circulate between 105 and 112 km/hour.

The mirrors allow us to see up to 20 meters behind the caravan. The accident/breakdown pack will have the same contents as the standard points for cars, reflective triangles, warning lights etc. The effects of wind are one of the elements you must consider, especially by the sudden shock that can give. The slipstream of trucks occurs when we advance causing a suction of air. You should be attentive to the mirrors and when we over taking and be at full throttle to compensate for the recoil of its mass.

The same can happen with a truck that passes in the opposite direction. The exits of tunnels and bridges can also affect stability when exiting there can be strong gusts of wind.

B. Driving the motorhome.

Motorhome is classified as M1 type (car) so you have to take care about it's rights and rules. Maximum speed must be checked in your country regulations. Don't park your Motorhome in areas where it may disturb visibility to pedestrians or traffic signs located in the track.

When driving the motorhome consider your height. The height of the "coach built Luton" is 3.12 meters while the "low pro le" is 2.64. We must remember that the obstacles in our path may be lower in height than our vehicle and therefore anticipation will be necessary to avoid collision with them.

In France Parking for example, as L417-1 rule indicates, is permitted to be stay parked in same place maximum 7 days ('code de la route'). Parking is different from Camping. If you make one of the following actions, it's considered as camping (not parking):

* Opening windows, using leg stabilizers, using wheel chocks.

Park where permitted and keep in mind that camping is different from parking. The maximum time speci ed for parking, unless local rules prevail is 48 hours.

Our camper because of its size, offers greater wind resistance than a passenger car, so unexpected wind gusts can cause some instability when driving. You should take care to weight balanced elements.



C. In camping.

Use your limited space Camping ground area, your neightbor area must be not used in any case, including way through area.

Respect sleeping and resting time schedules. Maximum sound level permitted in inner residence area is 50 dB. Is it a very low effort to respect people and nature environment. Good education is always better than antipathy.

Is better thanksgiving often because may be one day a time we will need our neightbors to help us. Clean your assigned area before leaving the camping.

D. Touring caravan braking.

During long descents during travel, brake systems will be working, so it's recomended to refresh brake systems frequently while this happens.

Braking distance is much longer when we are towing a caravan. Use the same gear when driving in descents or climbs.

E. Pendulum movements.

While driving with a toruing caravan wind can suddenly be appearing producing violent movements on our towing. Instinctively we will correct it with the wheel drive producing the pendulum movements. If this happens, is recomended to accelerate without using wheel drive movements, just centering the direction.

This dangerous movement can also be appearing exiting a tunnel, crossing a bridge or during a lorry overdrive. Try always to exit from turbelences as much as possible (for lorry overdriving for example, separeting from it as much as possible).

F. Maximum speed.

The Spanish highway code says for masses of 3500 kg max. speed 90 km/h but the most sensible is from Germany from 2005 which says: If you have a towing vehicle with ABS brake + caravan with shock absorbers + tyres of the caravan less than 6 years old + stabiliser, you can drive 100km/h. If any condition or requirement fails, it will be at 80km/h for masses over 3500kg. The maximum speed will be 80km/h.

G. Driving weights.

For standard car license you must check your country limits. Normally you cannot drive more than 3500 Kg without special driving license. It means you must check car and caravan maximum weight and be sure together are maximum 3500Kg. If you have doubts is better test yourself on a weighing machine.

Driving with a wrong weight limits can produce tyres or brakes failure, which is very dangerous. Max axle load is indicated on manufacturer plate and jockey wheel weight must be
carried for touring car.

5.6. Itinerant camping.

You can travel long distances, and experience different Countries, counties, cities, and cultures. Each place has its own peculiarities. It's fast, free, and provides continued mobility. It allows short or long stays in different stages, depending on the worst or best offer of the place.

Obviously, this type of travel, needs study and advance preparation for the route and destinations. Good planning "a priority" and good documentation, result in the full experience.

5.7. Storage and humidity.

We call hibernating (spending a winter somewhere) those months when the caravan will remain inactive. We can start with cleaning. In the fridge with a mild detergent for the shelves if food has been poured in or for the cooker burners. PVC partitions can be washed with detergent, the floor should be cleaned thoroughly. Check upholstery if it needs to be cleaned. After a long period of inactivity, if we wish to start a journey, we should first check the brakes and gas installations. It is advisable to visit your dealer. We will eliminate humidity as the first enemy for the immobilisation of the caravan. Leaving areas where air can flow freely, to prevent the formation of mould and mildew. Before folding the awning, check that it is dry.

It is best to park in a covered, dry and well ventilated area. Although most of them remain outside uncovered, various preventive measures can also be taken in such cases (lower the four levelling feet so that there are seven points of support, clean the bodywork with soap and degreaser). Do not apply the handbrake. Holster the coupling head.

Condensation starts to occur when the interior temperature is below 15°C. It is caused by humidity. It is promoted by ambient humidity, or by humidity from breathing (oxygen is taken in and carbon dioxide is expelled with water vapour).

A human ingests 2.4 litres of water per day and gives off 0.75 litres of water per day through the lungs and skin. During the night this produces a humid environment of about 0.50 litres of water per person. We therefore insist on ventilating the room daily and do not close existing vents.

It is advisable to avoid cooling the walls to prevent condensation. Condensation is caused by inadequate: ventilation, heating or thermal insulation. This can lead to: mould, unhealthy and smelly air, condensation on walls and windows, excessive heating consumption, allergies in children, asthma in the elderly.
The best solution: Efficient ventilation and no areas without air circulation. There must be a continuous renewal of air. Also, every morning after going to sleep, a generous ventilation should be carried out (from 15 to 20 minutes).

A comfortable environment should have a relative humidity of 50-60% and 40% to 70% is considered acceptable.
Water condensation tends to appear in areas where there are thermal bridges (lack of thermal insulation). It can occur on the internal wooden slats, which are used to form sandwich panels, both in floors and ceilings. In the small surfaces of windows, where there is no air chamber,...

Another reason may be the absence of indoor heating, camping in very cold weather outside, staying in very shady areas of the forest, ...

Unremoved condensation dampness can end up being a source of mould, forming a colony that is difficult to eliminate.

Dampness caused by an internal fault in the water installation must be immediately solved by your dealer. Continuous deterioration caused by the user's passivity to solve it will not be covered by the guarantee (frost monitoring, emptying pipes, ...) When using the caravan as a home, open the skylight.

Bad heating, butane cookers (catalytic), propane, oil, boiling water to heat the environment, ... Produce excessive water vapour, as well as reducing the oxygen in the environment. They are not suitable for caravans, only those that do not release water vapour into the interior and do not reduce the oxygen in the passenger compartment.

The vents are located in the floor and roof. They are usually found in the lower part under the refrigerator or under the kitchen unit, and the skylight, even if it remains closed, or circular vents, which form a mushroom on the outside, in the upper part.

The warm air rises as it loses pressure and escapes through the upper vents, at the same time sucking in fresh air from under the floor. This eliminates CO2 from human respiration. Remove snow and leaves that may obstruct the roof vents.
Before lighting the cooker, open the skylight, through which the combustion gases will escape.

RECOMENDACIÓN



Never cover static vents with blankets, objects, etc...
The vents are intended to provide a constant renewal of oxygen.





5.8. Ecological and environmental standards.

1. Separate household waste (glass, cardboard, ...). Plan to empty them when visiting cities, which normally already have specific containers.

2. Organic waste should also be emptied into the organic waste bin. Never in the litter bins or bins in the car parks.

3. Control CO2 emissions into the atmosphere, especially those produced by the engine of the towing vehicle. An idling or cold engine emits more harmful substances into the environment than a running one.

4. Waste water (black or grey) should not be disposed of in the sewers and never in a corner in nature. There are hygienic sanitary stations for this purpose at campsites, overnight stays or service areas, ...

5. In the sanitary stations it is possible:

- Empty grey water (soapy water from the shower, washbasin, sink...).
- Empty black water (toilet water).
- Fill drinking water (by means of a ¾" thread)
- Dumping of household waste
- Clean the toilet cassette with clean water.

6. Always use environmentally friendly soaps and chemicals that indicate on their containers that they are biodegradable.

7. Do not empty the contents of the toilet cassette into a septic tank either, as this will destroy the existing bacterial fauna in the septic tank.





5.9. Traveling with pets.

1. The education of a dog, cat, ... is that of its owner. It will do or abstain according to the instructions it receives from its master.

2. It is one more servitude. If you like animals, you have to make small sacrifices to keep them clean, so that their faeces are not left uncollected, ...

3. Walking the dog on a leash. This will result in less barking, less nuisance, ...

4. Do not leave it unattended for long periods of time. It may bark, disturbing the neighbours as it feels lonely and far from its owners.

5. Have up to date vaccinations, anti-tick fluids, the vet's telephone number, ...



6 Know your caravan and your maintenance.

Of the model you have chosen, which has attracted you with different details and requirements, and now you are ready to start using it. It is time to get to know the different elements of the caravan or motorhome. This instruction will help you in this task.

Beforehand, carry out a complete inspection of all the elements, this will help you to follow the different topics in this book. Afterwards, periodic inspections will help you to keep your caravan in excellent health. And if you have any doubts, go to your "General Practitioner" (your ACROSS CAR Dealer).

We have drawn up a list of the families of the materials that make up the caravan, and you will find the comments on each element in parallel as an index (Index on page 3.). At the end of each chapter, for your conservation, we indicate:

All the materials that make up the caravan are attacked to a greater or lesser extent by: - The high temperatures that heat up all the materials that make up the caravan:
The high temperatures that heat all elements, both exterior and interior.
Solar radiation affects plastic materials.

The cold produces contractions in the materials, with its maximum in frost.

Heat and cold cycles damage materials.
Excessive humidity impregnates materials causing different states of these, saltpetre from marine environments accelerates oxidation processes in metallic elements.

Dirt. The caravan also needs a "shower". Cleaning the caravan as a rule is the best way to keep it in good condition. Spend some time cleaning the exterior and interior. The bodywork will always look like new, the clean interior ages more slowly, bad smells are avoided,... The use itself, the modifications or repairs,...

Why should you have your caravan "Fit"?

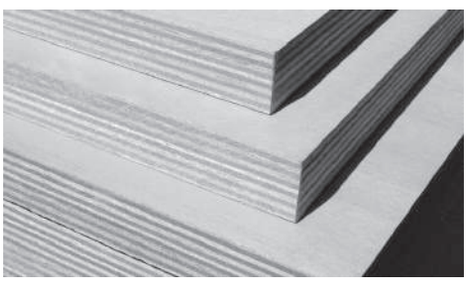
Because you will avoid dangers and increase your safety. Because you will save money and time with the "After" solutions. Because you will have the desired comfort.

Our body is fit, for example, when we have a good state of health and in addition to healthy habits, we go to preventive medical check-ups to keep it in good condition. This is when we suffer from fewer illnesses, and if there are any, they are easier to recover from.

6. 1 Chassis and floor.

6.1.1 Floor.

Element that makes up the floor, on top of the chassis. It is made in "sandwich" structure, by means of the intimate union of several elements.



Upper part:
With plywood plywood boards (Several sheets of wood joined together, forming each board).

Central part:
For thermal insulation: With Expanded Polystyrene (EPS) boards and perimeter and transverse slats.



Inner part:
A single polyester sheet to preserve humidity and offer less weight to the assembly, the union of the three elements is made by pressing with high adherence and humidity resistant glues. This results in a highly resistant monolithic element.

The thermal conductivity for EPS is 0.0285 Kcal/hmK. Low coefficient, to insulate the coldest part of the caravan (floor).

6.1.2 Underside.

Walkable surface on top of the pavement. Element with a surface hardness of 1.4 mm thick, formed by 4 layers of expanded vinyl, with fibreglass reinforcement. The use or surface layer is the hardest, made of transparent vinyl.

It´s incompatible with rubber. Therefore, it is important to know that the rubber of a tyre attacks this plastic composition. Therefore, leaving a tyre on top of the plastic filter for a long period of time leaves a black border, which is impossible to remove.

USE AND MAINTENANCE



Simple observance of the undercoats. That the protective layer is continuous, and that there is no uncovered area due to accidental breakage.

6.1.3 Axle and chassis.

The manufacturer's instruction booklet is enclosed. AL-KO, or KNOTT, is the equipment assembled by ACROSS CAR. They are super-light chassis of decreasing profile, whose loads are supported by the axle.

Their objective: to lighten their weight as much as possible, without losing their structural strength.

This steel structure is hot-dip galvanised by zinc immersion (greater durability in the open air).
The galvanic bath process is carried out at 450 °C; with this high temperature, the composition of the steel reacts with the zinc, forming different layers of "Zn - Fe" of variable composition. The pure zinc (98.5 %) remains fully adhered to the outer surface. This system provides effective protection against corrosion and oxidation. The axle, in addition to supporting the loads of the entire caravan, incorporates an independent suspension for each wheel, the hexagonal suspension.

USE AND MAINTENANCE



Easy cleaning with neutral soaps, without the use of solvents. Difficult stains, with lightly degreasing with gas-oil and subsequent cleaning with detergents. Even the use of esparto scouring pad.

To check the maximum load, you can access a plate located in the centre of the axle, which indicates the maximum weight. This load is reduced in the documentation of the caravan, for circulation and homologation purposes. The maximum weight shown on the Technical Data Card (MMTA./MMA) must not be exceeded. In the coupling head, there is a spherical cup for coupling to the towing vehicle coupling (with a 50 mm spherical ball). It is responsible for transmitting the different forces in circulation to the brakes; always by means of a friction piston acting as a shock absorber.

The brakes are drum brakes, with two brake shoes on each wheel. They act by inertia, depending on the forces transmitted from the spherical cup to a cable that acts by opening the brake shoes.
The brake drum has a mechanism inside it that makes the reverse gear automatic (retromatic).

The independent swing-arm suspension on each wheel. It is provided by two systems: Hexagonal axle with rubber suspension acting on each swing arm, which dampens the vibrations received from the wheel rocker arm. Circular torsion bar, by means of internal nylon bushes where the suspension acts.

Wheel nuts and road safety nuts. The tightening torque (from 80 to 110 Nm) has been carried out twice on the assembly line (the second check is marked with red paint). It should be checked after the first 50 km of driving. Every 2000 km, proceed to check its tightness.

6.1.4 Mudguards

Covers the wheels on top. Polystyrene (PST) black 4mm thickness. Receive water and gravel movement, in its cavity.



USE AND MAINTENANCE

Check its condition. That there are no breaks,

6.1.5 Wheels and shock absorbers.

Caravan:

If your vehicle does not have a spare wheel as standard, you can use a puncture kit or use the one that comes with the towing vehicle.

Tyres: They are calculated for a maximum speed of 140 km/h (Letter N) and for maximum weights (89 = 580 kg or,...), depending on the axle model of each caravan. They are of the "Tubeless" type, without inner tube (in case of repair, it does not admit inner tube, do not mount it in any case). The inscription Reinforced means that the sidewalls have been reinforced, as well as having a lower speed category. On motorhomes they indicate camping-car with its allegorical drawing.

Cuadro de presiones máximas en caravanas - *Maximum Pressure caravan data.*		
Modelo neumático - *Tyre model*	Peso máximo - *Max weight*	Presión máxima - *Max pressure*
155/80	R13 500 kg	2,8 bar
185/70	R13 530 kg	2,8 bar
195/70	R14 710 kg	2,8 bar

Car Tyre Pressure for tow vehicle: to tow a caravan, the tyre pressure of the rear axle of the tow vehicle must be increased by 0.2 bar. Static caravan tyre pressure - for long periods of parking, because the pressure is reduced over time, in anticipation of the possible deformation of the tyres, it is recommended to raise the pressure by 0.3 bar. Alternately remove the wheels to prevent warping.



Touring caravan tyre pressure: before starting a trip you should check the tyre pressures. This must be the same for both sides of the caravan. Low pressure produces a higher heat, higher rolling resistance, increased consumption, and accelerated tyre wear. The caravan is compounded by having an increased load which may even produce a puncture.

Cuadro de presiones máximas en autocaravana - *Maximum Pressure motorhome data.*		
Modelo neumático - *Tyre model*	Peso máximo - *Max weight*	Presión máxima - *Max pressure*
215/70 R15	1030 kg	5,7 bar

Use tyres of the same brand and model on all 4 wheels and checked every 300kms or after a long period without use. It should be noted if there is some wear on it and if it is uniform, the depth in the grooves of the profile, if there is any exterior damage on its walls, etc. Watch the old and replace between 4 and 6 years. On the outer sidewall of the rubber is the date of manufacture (e.g. 42 08, where 42 is the week of manufacture - from 6 to October 12 and 08 year - 2008).

Only fit tyres recommended by the motor vehicle manufacturer. During the first 2000kms. We must drive with caution, especially after replacing tyres. After that period, the grip is lost progressively as it wears over the miles. For extended parking periods, longer than one month is advisable to move your position so the tyres are not deformed by the load effects.

Telescopic Axle stands are also available that allow the ground to lift the camper. The torque of tyres depends upon the model and will be in pre-set placement. Depending on the type of wheel (aluminium or steel) have a different key and bolts. See the manufacturer's instructions to learn the motor vehicle Nm, which usually includes between 130 (aluminium) and 160 (steel) Nm. For tightening the bolts to both motor caravan must be made by crossing selection. Tighten the second bolt as the opposite of what we have selected first.

Here is a universal explanation of the meaning of the symbols that we see on the tyres.

1 Manufacturer's logo.

2 Tyre model.

3 Characteristics of dimensions, measurements and construction.

P. the letter "P" or there is no specification, it is mainly used in tyres for passenger vehicles. Those containing the letters "LT" indicates that tyres are enhanced construction work vehicles or pickups.

185. Section width in millimetres.

65. Technical Series. Relationship between section height and width of the section.

R. Indicating radial structure.

14. Internal diameter of the tyre or rim in inches. In the case of commercial vehicles or vans if the side has the word "reinforced" and then to the extent the letter "C" indicates that it is reinforced tyres required for such use.

4. Load index / Speed code. In the example, 85 = up to 515 kg (see table) / T = allows speeds up to 190 km/h (see table).

5. Tubeless tyre type ("tubeless") or tube type ("tube type").

6. Position of the T.W.I. (Tread Wear Indicators): at this point, it is indicated that this is the limit for the use of the tyre (1.6 mm).

7. Internal codes for factory control.

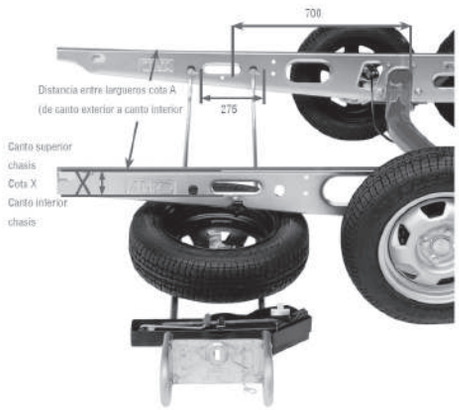
8. Country where the tyre was produced.

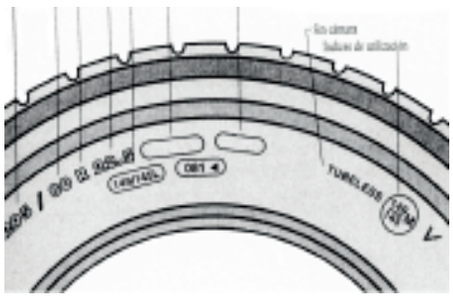
9. Registration DOT requirements for export. Indicates the production company, tyre type and period of manufacture.

10. Load and maximum pressure. (Normally given in PSI)

11. Tyre classification according to UTQG (Uniform Tyre Quality Grading).

12. M-S (Suitable for use on wet surfaces).











Speed indexes			
J	100	S	180
K	110	T	190
L	120	H	210
M	130	V	240
N	140	W	270
P	150	Y	300

Pressure control: In long travels specially, while overheating happens in the tyres, pressure must be checked before starting the trip. Overpressure can produce busts while driving which is very dangerous. There are many devices (not expensive) to check

Critical Aging: The rubber tyre loses elasticity over time, it hardens. Tyres with more than 6 years may pose a considerable danger. Review annually the status of the side walls and valve and proceed to replace between 4 and 6 years.



The double-acting, wheel-acting shock absorbers are mounted between the chassis and the wheel drum.

They soften the abrupt forces of the traffic, both in the ascending direction (obstacle on the road) and in the descending direction (hollowness on the road). They are a great help when cornering and make the suspension more stable.
The shock absorbers are adjusted to the weight of the caravan or motorhome.

HAZARD WARNINGS

No person should ever stand under or near the vehicle before, during or after changing a wheel.

USE AND MAINTENANCE

Check wear (If less than 3 mm. in the tread groove or tread blocks, replace). Check for ageing (grooves in the rubber). If it is deformed, it must be replaced. Check the tightening torque of the bolts, especially between the first 100 and 500 km of travel (max. 110 N. for 13" rims and 120 N. for 14" rims).

To remove a wheel, in the caravan you can use the same handle that lowers the 4 levelling legs of the caravan, which measures 19mm hex. For aluminium wheels that measurement is 17 mm so the handle is hex 17mm.

Park on level ground. Then let the handbrake and select first gear on the tow vehicle (or automatic transmission park position is applicable). Use a jack to lift the metal chassis (not the wooden floor), near to the axle and wheel we are going to replace. Raise the vehicle until the wheel we are going to change is almost off the ground (using jack in motorhome and caravan levelling legs) and proceed to loosen the screws on the rim a couple of turns (without extracting).For Motorhome we will use a lifting jack on the chasis (never on the floor) near the wheel needed to be changed. For touring caravans you must use stabilizing jacks using a progressive elevation between 4 corners. If you use only 1 corner stabilizing jack chasis can be damaged.

Then continue raising up the vehicle until the tyre is off the ground, then proceed to completely loosen the screws and remove the wheel. Now we just must position the new wheel and tighten the screws on a cross (cross selection). Once we lowered the car completely, retighten the bolts to the torque specified by the manufacturer.

For using a fiat tyre reparation kit (Fix & go) you must read specific device manual instructions. This kind of devices works through a small compressor after using sealing product and inflating pipe to tyre valve. You must use almost 250ml of sealing product to became effective. Never exceed 80 km/h speed while using it.





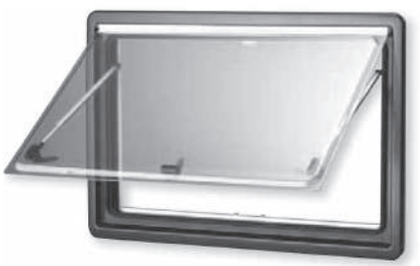
6. 2 External structure.

6.2.1 Windows.

Made of Polycarbonate. Forming an internal insulating air chamber double glazed. The outer plate tinted and a clear inner plate. Hinged at the top with adjustable opening side arms. To close, the arms must reach their maximum opening. (Up) This will unlock the automatic adjusters allowing the window to close and lock by two latches that are fixed in the frame. There are two positions in the closing of the windows.



One vented (outside position), and completely shut (innermost position), which provides the seal. Likewise roof skylights are not airtight. Regulations allow ventilation in the closed position for regeneration air and cabin ventilation for exhaust of gases. When travelling they should be always closed. For checking window rubber waterproof only needed to use a standard paper between window and rubber while it is closed completely. If we must strech it strongly means works fine. You can check it in all window perimeter.



Cleaning the windows: They must be cleaned exclusively with water and special neutral soap. Common soaps, hidrocarbure ones or abrassive products like alcohol ones can damage it. Never use painting devices near the windows.

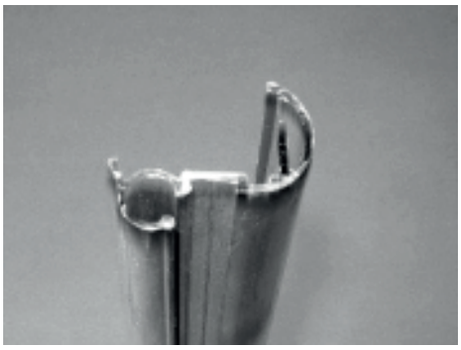
USE AND MAINTENANCE

Due to the low hardness of polycarbonate, it is recommended to use plenty of water for cleaning (dust can scratch), and an extremely clean cloth. Do not dry dust. If scratches are present, they should be removed with polish and a wool disc.

6.2.2 Aluminium profiles.

There are different types, depending on their use and purpose.

Perimeter blunt aluminium profile.
It is used to join the roof panels and the side walls. This type of profile, the only one manufactured for ACROSS CAR caravans, is designed to obtain maximum resistance.



It is an inverted profile compared to the standard ones, the groove for sliding the awning is on the inside, while the outside part offers with its curve a better resistance to small knocks. It offers a higher resistance arm for the stresses that the awning is subjected to (wind load).

Aluminium profile awning skirt: Located in the lower part, it also has a groove for sliding the awning skirt. Aluminium profile hinge windows. They serve as a support for the different windows, and at the same time, due to their design, they have the female part of the hinge for opening the windows (which incorporate another male aluminium profile at the top).

Pittsburgh profile: Located in the central part of the exterior walls. The top aluminium plate features a fold to accommodate the lower plate. The profile eliminates the drilling of other profiles for the overlap.

6.2.3 Outdoor accessories and plastics.

All external elements (like the front face) have a protective coat against UVA rays so they do not degenerate. The plastic casings act as protectors. At the top we nd the skylights and ventilators which have the main function for the circulation of air (for safety) and facilitate the entry of external light during the day. Do not forget that you cannot cover the ventilation of these elements and that during the journey they must remain closed.



USE AND MAINTENANCE



No special care is required. Cleaning can be included with the exterior of the caravan.

6.2.4 Exterior door/gates.

The outer door is made of the same elements as the outer wall: Sandwich aluminium or polyester + expanded Polystyrene panel or dashboard plastic interior. Sometimes in two halves (top + bottom). In caravans the door has 2 sheets By closing the bottom half, the top can open, which becomes an additional window. Using the closing latch you can have it opened and it will works also as a emergency exit system as if we push it strongly it opens easily to evacuate quickly our caravan.

Including main entry door, all other lockers use the same key code. It makes possible opening other elements with the same key. For example is it possible to use it with the fron chest, service door, waterfill or system for the cassette access door to the toilet.

6.2.5 Front locker.

The front of the caravan is not like the rest of the body. To improve the aero dynamics (lower spoiler, lower weight, etc.), it is made of ABS (Acrylonitrile Styrene Butadienol) with an outer film of PMMA (poly methyl methacrylate), charged with protecting the ABS from UVA rays (ABS can change colour by ultraviolet rays). Normally it's built into the body and on the inside is also insulated.



The front locker opens assisted by a gas spring. Inside is housed the gas cylinder, water tank and other equipment for camping. Ventilation is for gas regulations. Everything inside the front locker on the caravan ACROSS CAR, comes wrapped in aluminium.

Pull handles: The caravan has four. Two front and two rear. They are designed for mobility in the parking lot, by pulling them we can position the trailer in place. NB: No pushing or pulling the trailer from the front locker. (Pushing the side of ABS and not by the handles can damage and crack the plastic or ABS plate - PMMA).



RECOMMENDATION



It is advisable to drive with the caravan, without weights in the front box (the weight of the ball of the hitch has an impact). With empty tanks, and with light-weight belongings.

6.3 Internal furniture.

The internal partition walls are not solid, as they are hollow, which saves a great deal of weight. The internal part of the toilet has a PVC coating, impermeable to water.

The drawers are made of plastic to lighten the weight, and it should also be borne in mind that their function is not to support weight, as it is a mobile element and is raised off the floor. All the mezzanines and drawers are designed to hold light items such as cutlery, clothes, papers or other necessary items.

The bed bases that we will find in the fixed beds are of semi-wide slats and are the same as those that we can find in our homes.
The furniture doors follow the same idea as the rest in order to lighten the whole. It is not surprising, therefore, that in all our vehicles the focus of attention is always on the weights, their distribution and the elements and methods used to achieve a practical, light and safe vehicle.

Following this line, we find the thermo-moulded toilets, which are made of plastic to lighten the whole, offer flexibility and resist the passage of time with the contact of water.
The tables follow the same standard. They are lightweight thanks to the vacuum-pressing method of the components. The tables have the peculiarity of being used as a table and at the same time as a base for a bed. This is thanks to the two-position leg.

Tables with a sliding rail can only be removed by lifting it upwards (taking care not to hit any other element) and positioning it on the other rail after pressing the button on the foot plate to change the height of the table (folded or extended).

Tables with an automatic footrest have a lever which, when operated, releases the spring to move them into the upper or lower position.



RECOMMENDATION



Do not carry items on the shower tray. These circulating weights can damage or even break it.

6.4 Fabrics and interior accesories.

The inner foam rubber has an average density of 25 kg/m3 in the seats, which is the basis for the hardness of the mattresses.

All the mattresses of the dining room seats have the peculiarity of being able to be transformed into a mattress for the bed position by means of a simple puzzle.

For this purpose, the backrests can be used as a footrest and headboard. To ensure that the structure of the mattresses is stable during sleep, it is advisable to always place the small pieces against the wall, as if they are placed on an edge, they can fall to the floor during sleep.



USE AND MAINTENANCE



The mattress covers must be removed for washing after use. They can be removed by means of a zip.

When travelling, it is advisable to leave the table and mattresses in bed mode to avoid oscillations on the road. The partition doors are fixed by means of a strap that is held in place by pressure clips. The mosquito nets and sun blinds come in cassette format for automatic retraction. Just bear in mind that these are spring-loaded, so care must be taken not to force it.

By taking the handle in the central part, we can lower one of the two rolls (blackout or mosquito net) to the desired position where we will push slightly inwards. Please note that the positions are preset by the side rails. In order to release the roll and to pick it up in the upper position, we have to push the central handle inwards again and push it up to the upper position so that it does not hit the cassette.



6. 5 Electricity.

6.5.1 Electrical wires.



All the wiring is made of copper, covered with plastic insulation or outer sheath. The installation is determined by 220V power, 12V AC power and 12V DC power.

The 12V connection to the car must always be made via a 13-pin plug. The plug is approved for the correct operation of your trailer. The installation of this connection to your car must be carried out by a specialised workshop (taking into account that a caravan has more wired connections than a simple trailer, e.g. the direct battery connection for the refrigerator). The installation of the hitch ball must be checked regularly by your installer.

6.5.2 General connection to 220V.

It's located in a box with a cover on the outside wall, where the 220V supply arrives. It is powered by the transformer that distributes it at 12V with a maximum of 170W for lighting and water pump (the 20W pump works with direct current through a bridge rectifier).

6.5.3 Differential, transformer, diodes.

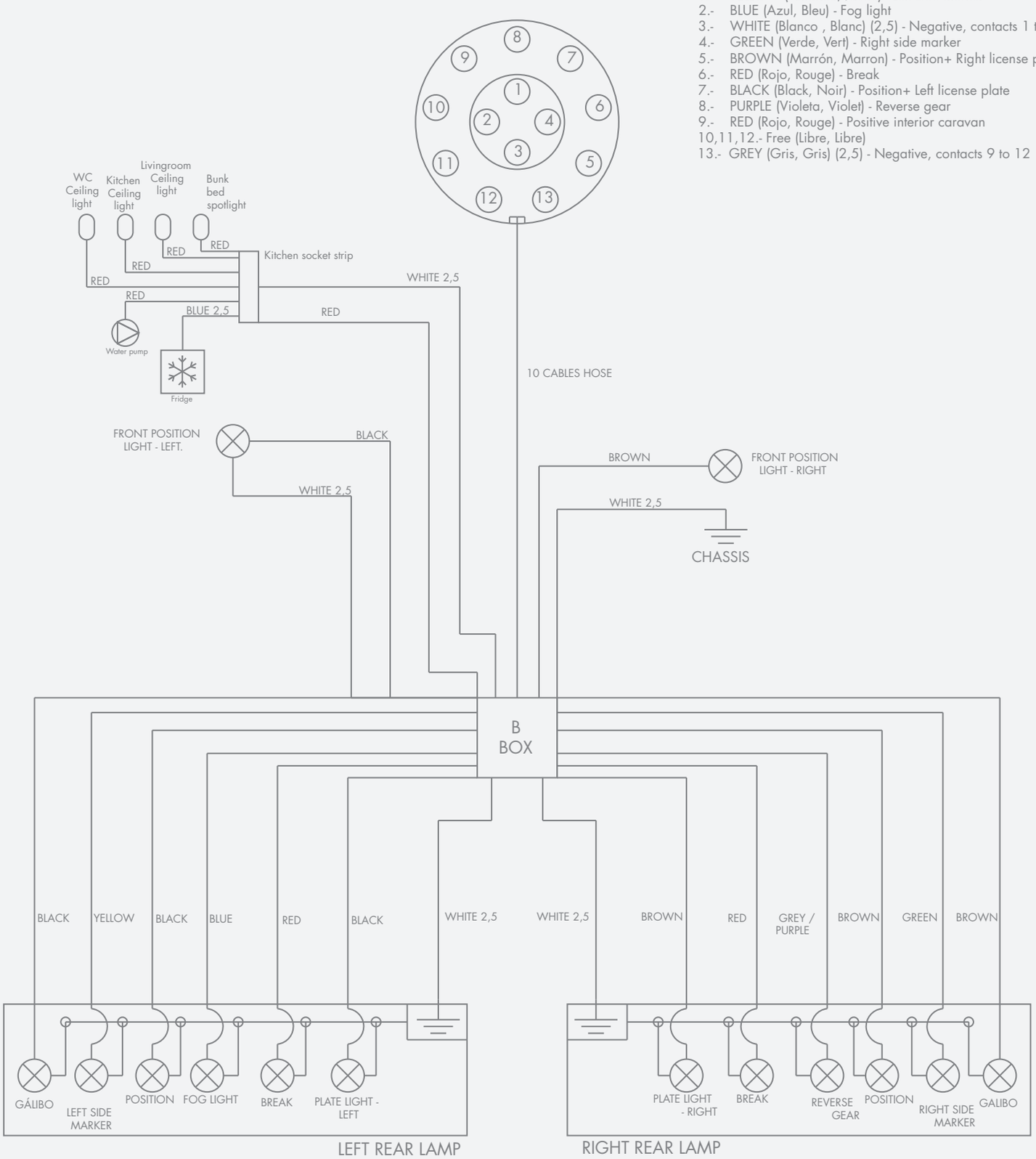
The caravan has a Differential Switch (D.I.), which protects the circuits and avoids being electrocuted. All ACROSS vehicles are fitted with a 25 A I D for 220 V installation. Therefore the total consumption is limited to 5500W. The High Sensitivity Protector with its 30 mA prevents discharges, due to possible accidental contacts. To test it, simply press the T button and the installation is disconnected.

The grounding is initially provided by the 220V supply cable of the caravan, when it is plugged into the campsite installation. All the metallic elements, as well as the electrical appliances, will come with this socket. There are also 220V earth sockets and 12V ground sockets on the body structure. The capacitor will only be necessary for 12V sockets at maximum power (upper part of the sinusoidal current curve). It is intended for truma - Boiler, refrigerator, etc....

INSTALLATION DRAWNING EXTERIOR LIGHTS WITH 13 PIN PLUG

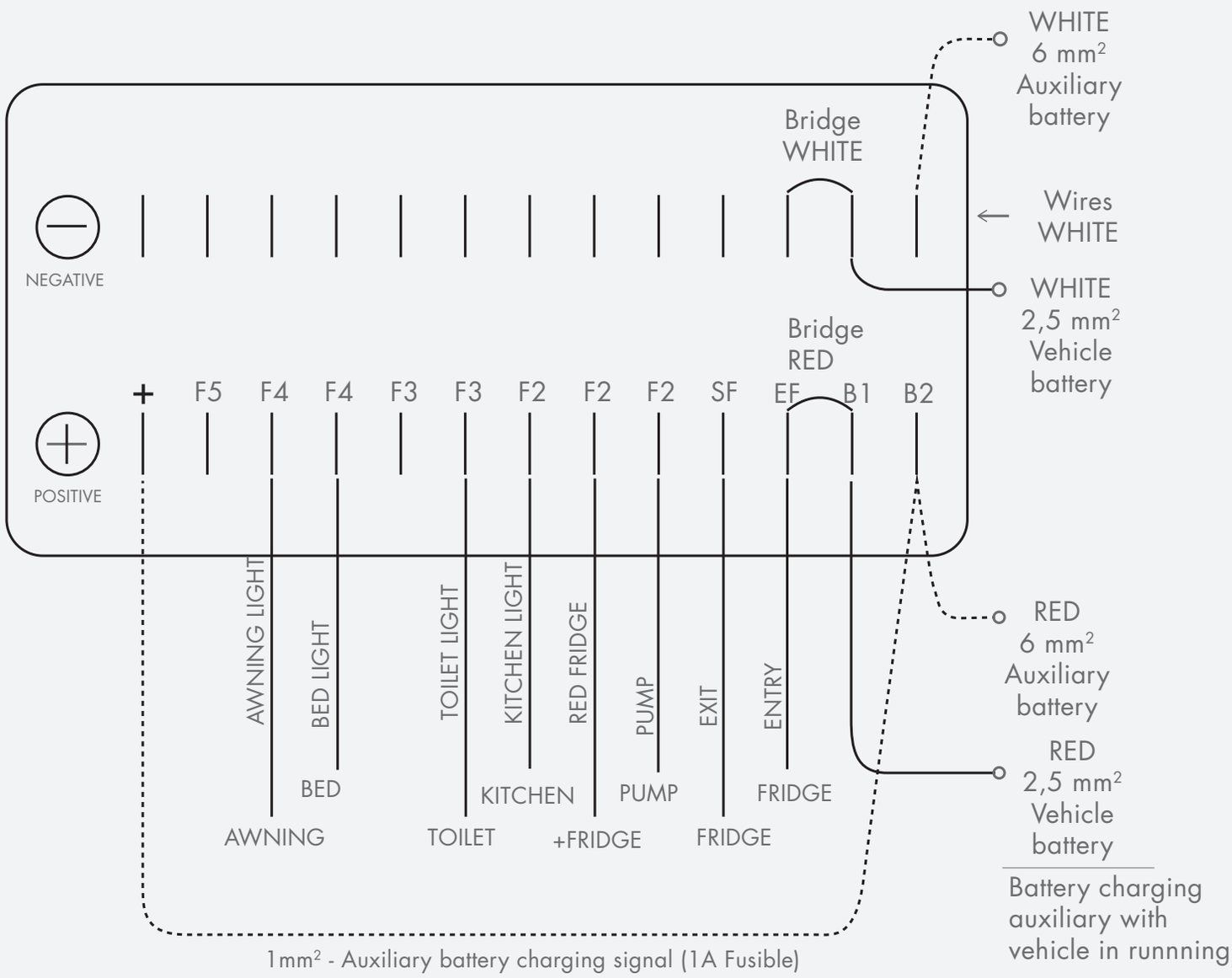
PINEAPPLE OF 13

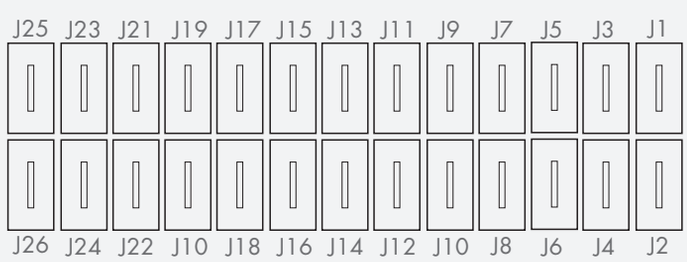
1.- YELLOW (Amarillo, Jaune) - Left side marker
2.- BLUE (Azul, Bleu) - Fog light
3.- WHITE (Blanco , Blanc) (2,5) - Negative, contacts 1 to 8
4.- GREEN (Verde, Vert) - Right side marker
5.- BROWN (Marrón, Marron) - Position+ Right license plate
6.- RED (Rojo, Rouge) - Break
7.- BLACK (Black, Noir) - Position+ Left license plate
8.- PURPLE (Violeta, Violet) - Reverse gear
9.- RED (Rojo, Rouge) - Positive interior caravan
10,11,12.- Free (Libre, Libre)
13.- GREY (Gris, Gris) (2,5) - Negative, contacts 9 to 12



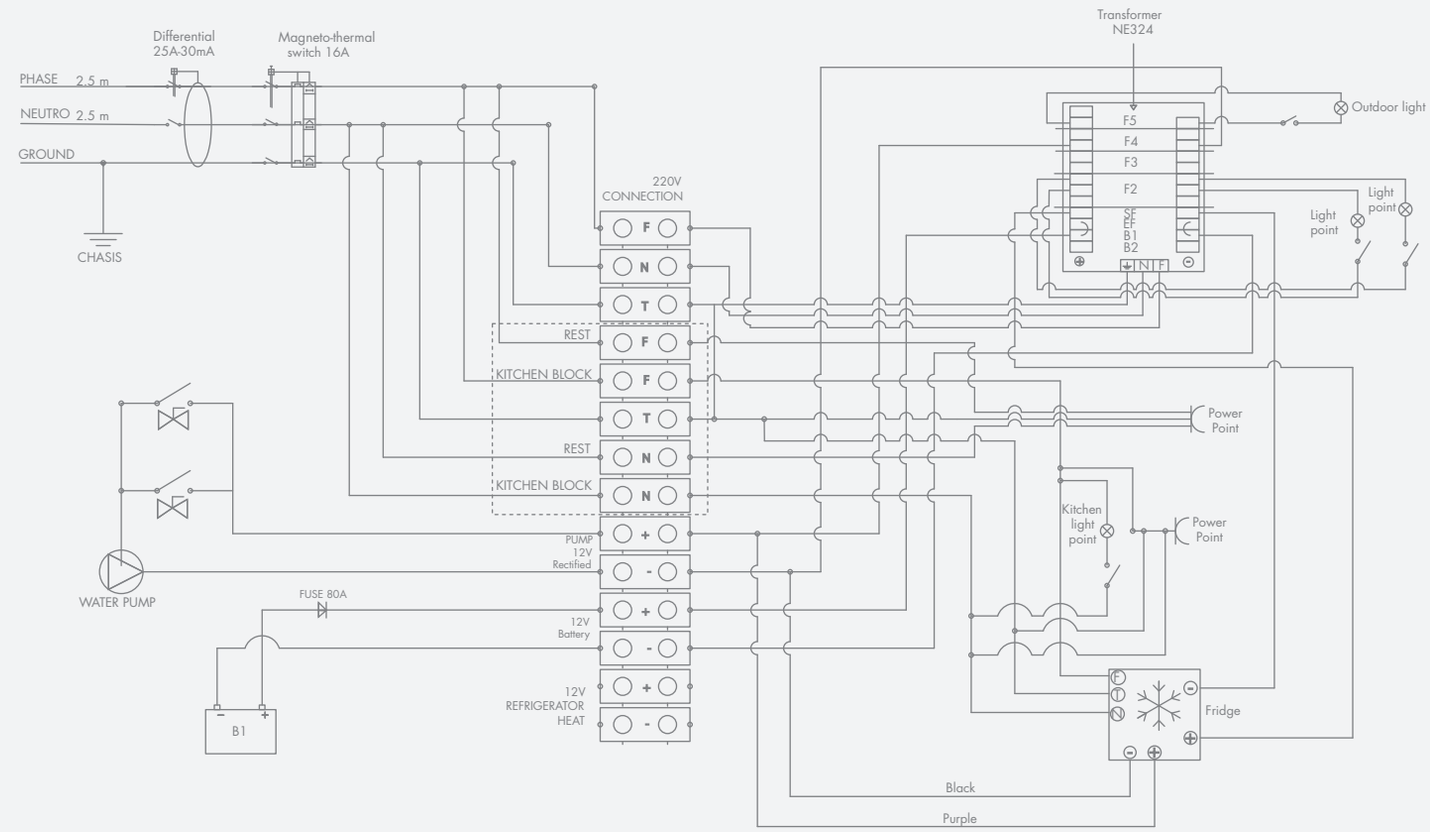
CARAVAN CONTROL UNIT “NORDELECTRONICA NE213”

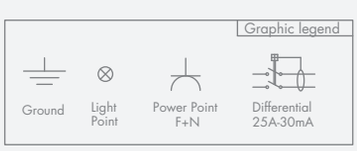
CONNECTION TERMINALS



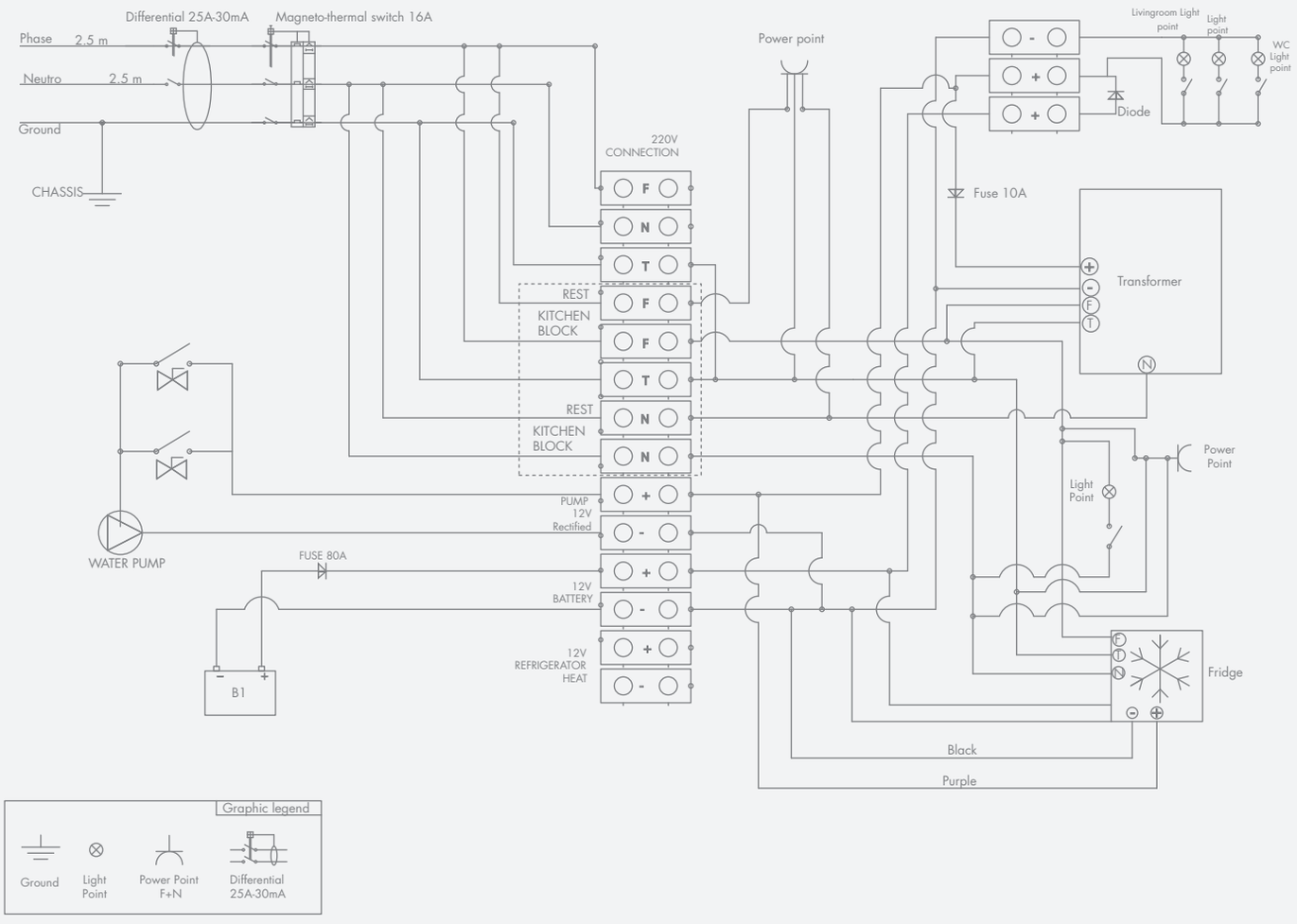


CARAVAN CONTROL UNIT - NORDELECTRONICA NE324



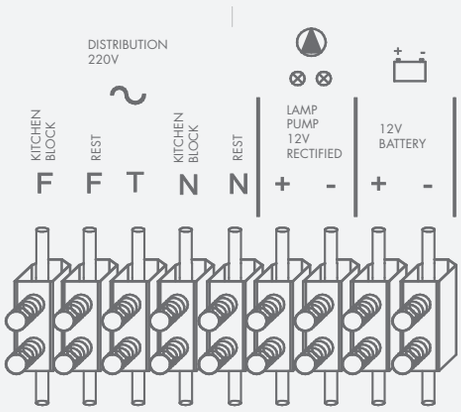


CARAVAN COMMON TRANSFORMER

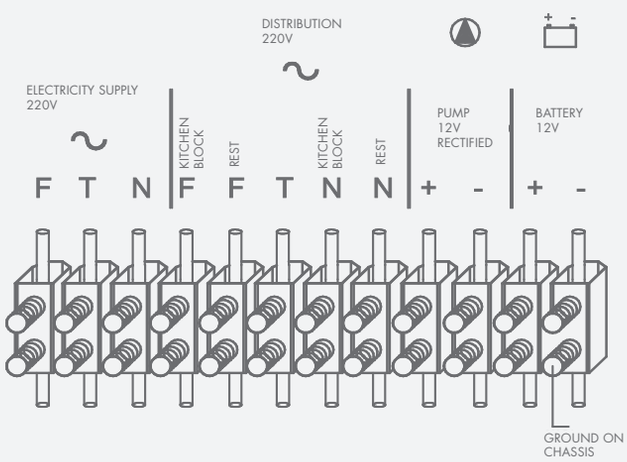


CARAVAN ELECTRICAL CONNECTION “TERMINAL BLOCK STRIP”

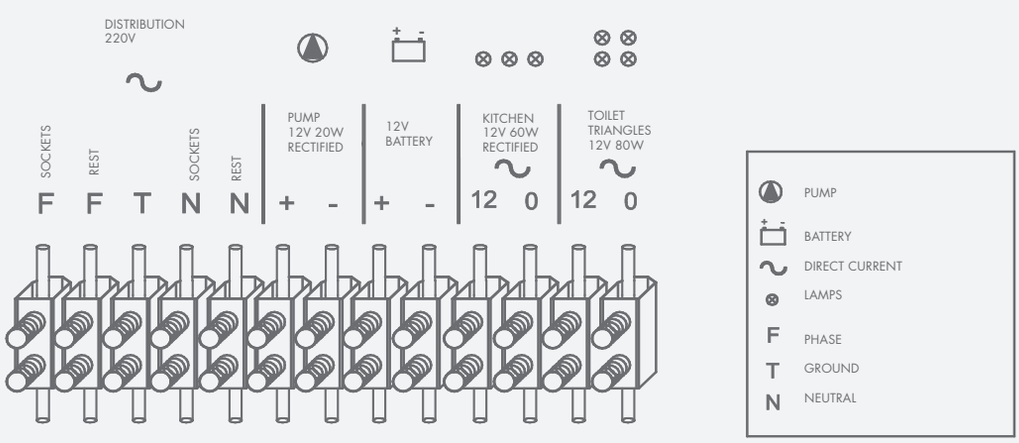
KITCHEN LOFT FURNITURE “TERMINAL BLOCK STRIP”



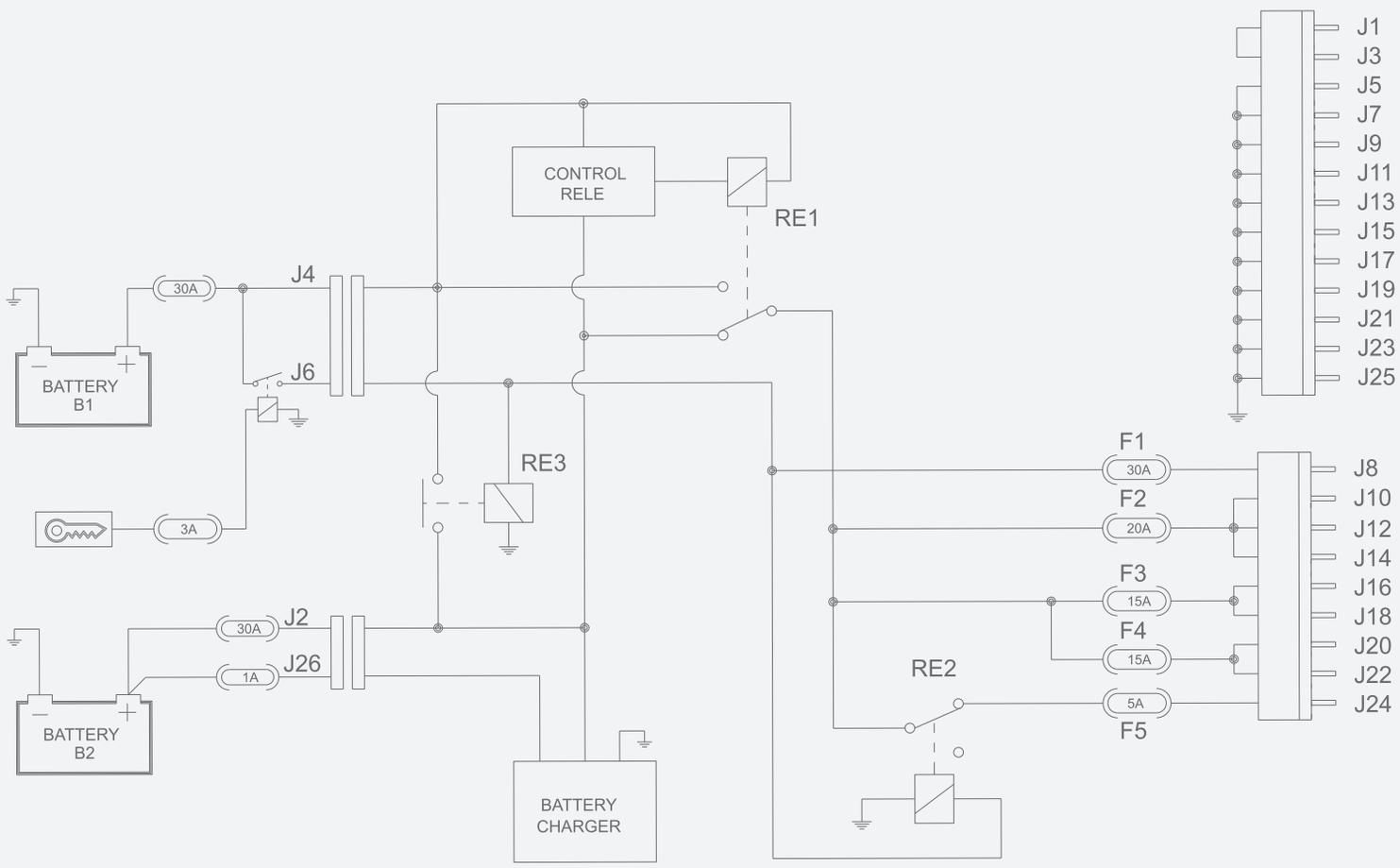
UNDER KITCHEN WORKTOP “TERMINAL BLOCK STRIP”

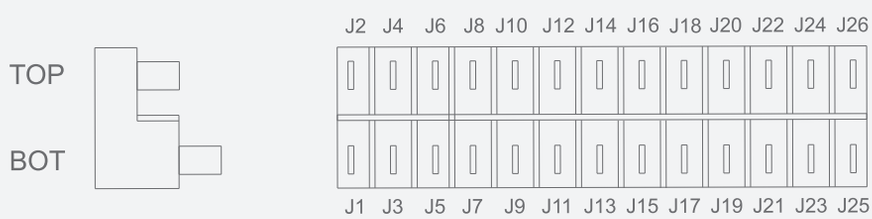


KITCHEN LOFT FURNITURE “TERMINAL BLOCK STRIP” WITH ELECTRIC POWER SUPPLY



CARAVAN REAR INSTALLATION OF POWER SUPPLY





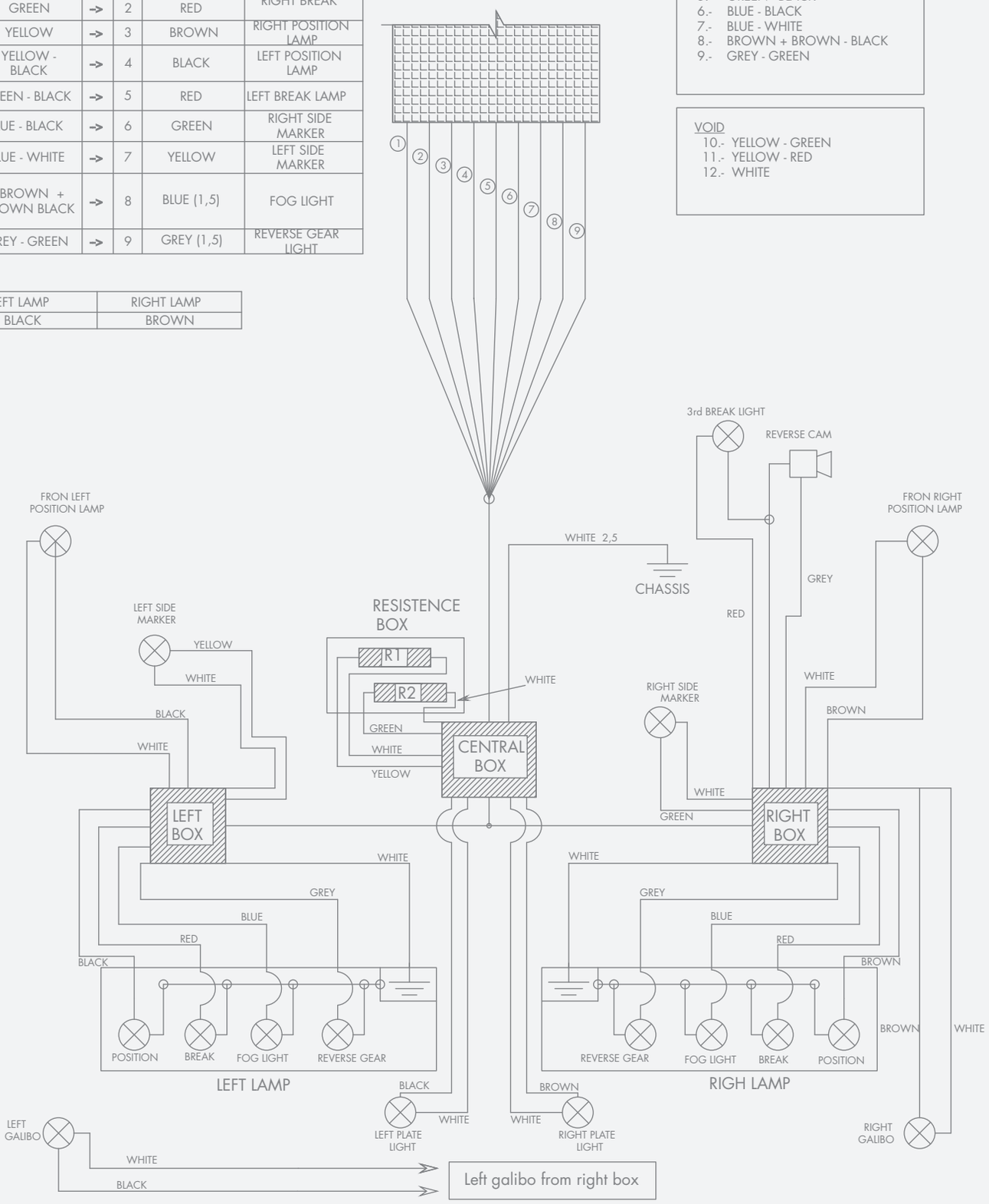
INSTALLATION OF EXTERIOR LIGHTS MOTOR HOME

CONNECTION TABLE REAR LAMPS - FIAT					
	FIAT CABLES			ACROSS CAR CABLES	DESCRIPTION
1	WHITE CHASSIS	->	1	WHITE	GROUND (CHASSIS)
2	GREEN	->	2	RED	RIGHT BREAK
3	YELLOW	->	3	BROWN	RIGHT POSITION LAMP
4	YELLOW - BLACK	->	4	BLACK	LEFT POSITION LAMP
5	GREEN - BLACK	->	5	RED	LEFT BREAK LAMP
6	BLUE - BLACK	->	6	GREEN	RIGHT SIDE MARKER
7	BLUE - WHITE	->	7	YELLOW	LEFT SIDE MARKER
8	BROWN + BROWN BLACK	->	8	BLUE (1,5)	FOG LIGHT
9	GREY - GREEN	->	9	GREY (1,5)	REVERSE GEAR LIGHT

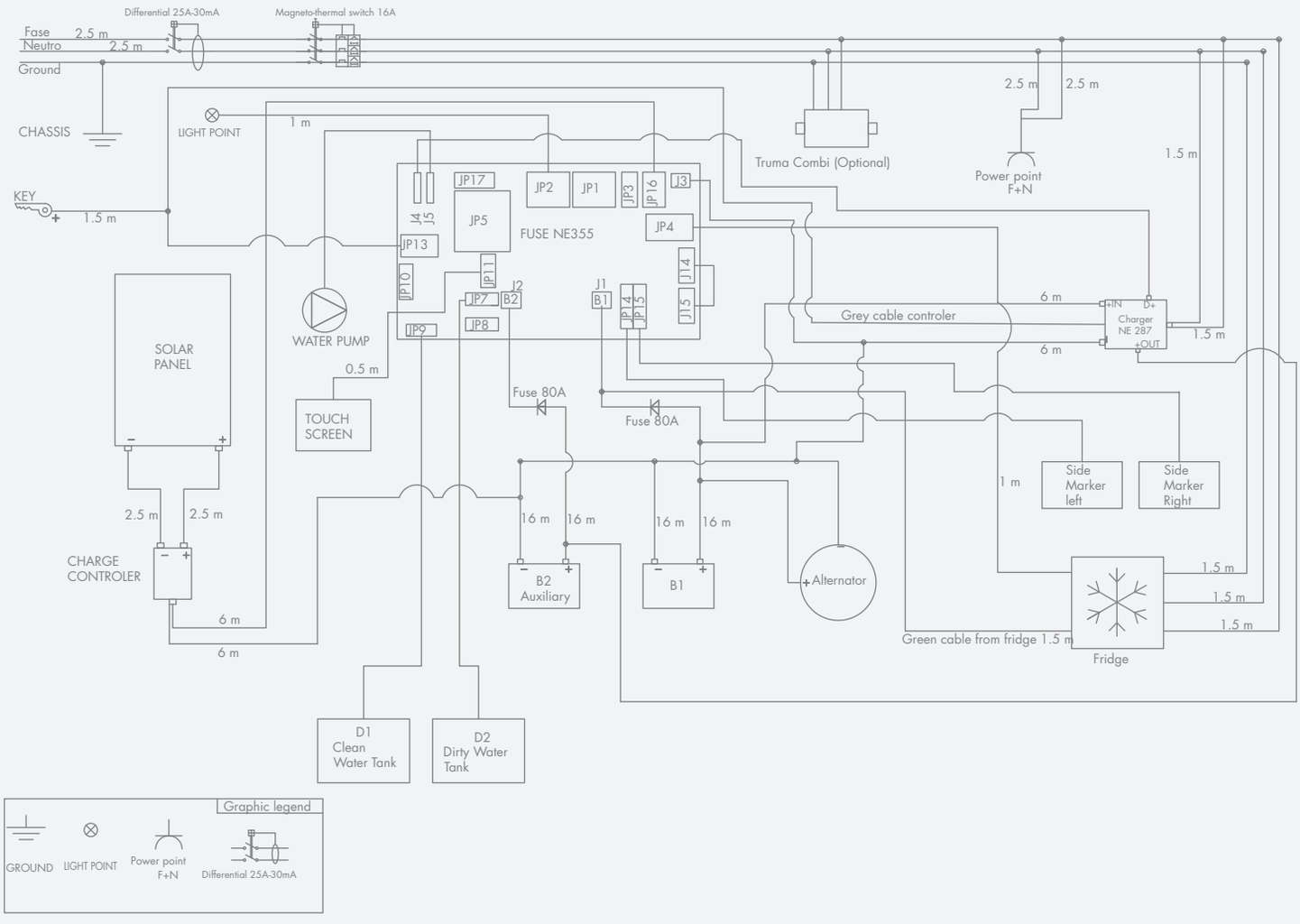
LEFT LAMP	RIGHT LAMP
BLACK	BROWN

FIAT CABLE HOSE
1.- WHITE
2.- GREEN
3.- YELLOW
4.- YELLOW - BLACK
5.- GREEN - BLACK
6.- BLUE - BLACK
7.- BLUE - WHITE
8.- BROWN + BROWN - BLACK
9.- GREY - GREEN

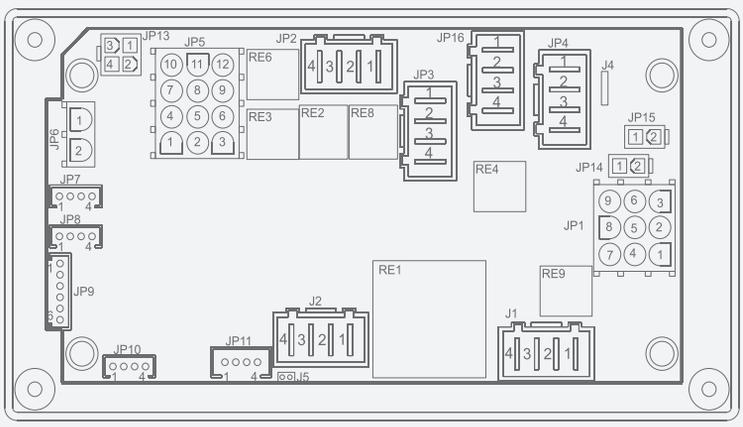
VOID
10.- YELLOW - GREEN
11.- YELLOW - RED
12.- WHITE



MOTOR HOME CONTROL UNIT NE355



SHUNT NE 185/NE 148 - MOTOR HOME



JP11: ***CONTROL PANEL***
4-pole connector to connect the control panel with the cable provided.

JP9: ***TANKS (S1)***
1. NEGATIVE
2. 1/3 drinking water tank S1
3. 2/3 drinking water tank S1
4. 3/3 drinking water tank S1
5- 3/3 recycle tanks S3
6. NEGATIVE

JP8: ***RECYCLE TANKS S2***
1. NEGATIVE
2. 1/3 recycle tanks S2
3. 2/3 recycle tanks S2
4. 3/3 recycle tanks S2

JP7: ***RECYCLE TANKS S3***
1. NEGATIVE
2. 1/3 recycle tanks S3
3. 2/3 recycle tanks S3
4. 3/3 recycle tanks S3

JP10: ***AMPEROMETRIC SHUNT***
(Not run from the NE152/NE188 control panel)

JP2: ***LIGHT OUTPUT (BLACK)***
1. NEGATIVE
2. NEGATIVE
3. LIGHTS_1 (+) (F5 15A)
4. LIGHTS_2 (+) (F6 15A)

JP4: ***FRIDGE OUTPUT (WHITE)***
1. NEGATIVE
2. Gas ignitin power supply (+) (F7 10A)
3. Fridge output (+) activated by relay (F2 20A)
4. Direct fridge output (+) (F2 20A)

JP6: ***D+ INPUT, POWER MAINS ON***
1. D+ input from alternator
2. POWER MAINS ON input from battery charger

JP5: ***POWER OUTPUTS***
9. Heater ignition (F7 10A)
1,4,5,7,8. Ignition (F9 10A)
12. PUMP output (+) (F7 10A)
6. External light output (+) (F8 5A)
2,3. Courtesy light output (+) (F8 5A)
10. output d+ (max 1A)
11. output step in (max 1A)

JP3: ***STEP OUT, TRUMA (RED)***
1. NEGATIVE
2. NEGATIVE
3. STEP output (+) (F3 10A)
4. Webasto / Combi output (+) (F4 20/10A)

JP16: ***PREPARATION OF SOLAR PANEL (GREEN)***
1. NEGATIVE
2. Ignition (F7 10A)
3. Service BATTERY (F3 10A)
4. Auto BATTERY (F2 20A)

JP1 : ***NEGATIVE***
1.2.3.4.5.6.7.8.9: NEGATIVE

J1: ***AUTO BATTERY INPUT***
1,2. NEGATIVE
3. Input + AUTO battery (B1)
4. Input + AUTO battery (B1)

J2: ***SERVICE BATTERY INPUT***
1,2,3,4. Input + SERVICE battery (B2)

J4 : ***D+ OUTPUT***
Positive output (max. 0.5A) to activate all charges operating with engine running (e.g. fridge AES, aerial entry, discharge valves, etc.)

J5 : ***COUPLER RELAY ENABLING***
When the bond is removed the shunt no longer couples the batteries with the engine running.

Additional connections on shunt version NE185

JP13: ***D+ CONTROL INPUT, SIDE MARKER***
1. n.c.
2. D+ negative control input (C036L1A -2)
3. +Key input (C036L1A -13)
4. Side Marker negative control input (C036L1A -11)

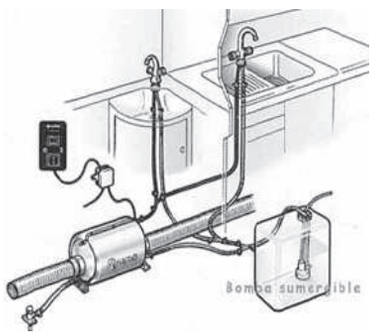
JP15: Side Marker right output
1. Side Marker dx output (+) (F1 5A)
2. NEGATIVE

JP14: Side Marker left output
1. Side Marker sx output (+) (F1 5A)
2. NEGATIVE

LEDs are the new generation in lighting. They change luminous intensity, different colours, reduced consumption. They last longer and transmit less heat... they have waged a great war against incandescent bulbs and halogen bulbs. LED technology plays with two parameters: Brightness and colour temperature. A kitchen has cold lighting (violet blue tone) and a temperature of 8000° Kelvin. For the living room a warm lighting and 3000° Kelvin a LED lamp lasts 15 times longer than a classic bulb.

6. 6 Water and gas.

6.6.1 Pipes, water pumps, valves and water fittings.



Domestic water is supplied according to regulations, with a flow rate of 10 litres per minute. For the caravan it is normally supplied with a submersible pump which operates at 12V (direct current). It is operated by electrical contactors, it is centrifugal. They are always submerged, so it is advisable to empty the water tank during hibernation. Air-operated, automatic diaphragm pumps are installed externally to the water tank: they make a little more noise due to the "resonance box" effect as they are inside a casing. They are automatic by detecting a low vacuum in the circuit (pre-switch) which starts the pump at a working pressure of 2.4 /2.8 bars.

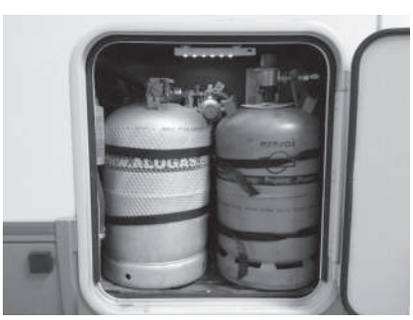
RECOMMENDATION



Halogen lamps generate a lot of heat, so they should be placed 50 or 60 cm away from people or objects, so as not to affect them. Or at a prudent distance from the luminaire. This type of light is not suitable for prolonged reading, computer work, ...

6.6.7 Gas and components.

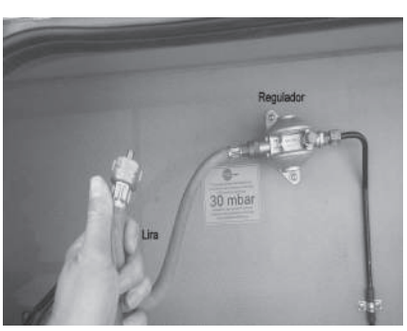
Gas is one of the most perfect energy alternatives. It is the best energy for the environment and one of the most economical for the user. Gas is better and much cheaper than electricity. The only drawback is that you have to be extremely careful when handling it, as well as having to pass inspections or checks on its installation. Coal, wood and oil pollute a lot. Electricity has high costs, and to obtain it produces certain problems with the environment. It should be noted that butane gas freezes at temperatures below 0 °C. For snow camping, propane is the most common. The pressure regulators are 28 mbar for butane and 37 mbar for propane.



Gas cylinders must be operated in a vertical position. The horizontal position would impede the exit of the gas, due to the obstruction of its exit when the gas is liquefied. A good gas combustion (with oxygen) is carried out with a blue flame and gives off carbon dioxide CO2.

A bad gas combustion (little oxygen), is carried out with an orange flame, and gives off carbon monoxide CO (odourless and toxic). For this reason, the flue pipes and flue gas outlet pipes must be monitored.

Periodic inspection of the installation - checking for gas leaks, pipes, connections.



Liquefied petroleum gas (LPG) is another alternative for use in motorhomes. Its composition 55% butane and 45% propane, its large capacities, its fast filling and its location under the floor make it a very interesting option. There is a filling limit of 80% (UN / ELE / 67-01). The pressurised LPG tank can pass the technical certification controls, it also has a limited durability (in Italy it has to be replaced after 10 years) and a test pressure (30 bar).

There are static air inlet and outlet vents, one(s) at the bottom or floor, and one(s) at the top or skylights in the roof. or skylights located in the roof. These vents are intended for constant air renewal and oxygen supply to the passenger compartment.



With the skylight closed and through a second opening, hot air rises due to the effect of the heat. Fresh air from outside (under the floor) enters through the lower part, providing oxygen renewal. It should be remembered that under no circumstances should any of these vents be closed.

(Even if there were a gas leak, as the gas is denser than air, it would escape to the outside through the lower vent opening).

In case of doubt or suspicion of a fault in the installation:



- Do not open electrical appliances (light switch).
- Do not access with matches or lighters. Do not smoke.
- Open all windows fully, in order to ventilate the room as much as possible.
  the room as much as possible.
- All stopcocks must be closed, starting with the cylinder stopcock.
  that of the cylinder.
- Call a qualified installer or company to check and repair the fault.
  repair the fault.

USE AND MAINTENANCE



Change the rubber of the cylinder connection when it expires (the expiry date is indicated on the tubes, normally after five years). Check the condition of the stopcocks and the regulator and replace them if necessary. According to the current regulations (R.D. 9 9/2006), of 28 July 2006. The installation must be checked by a competent gas organisation or body to ensure that it is working properly.

RECOMMENDATION



Always close the stopcocks when the installation is not in use. There is one for the gas cylinder (General), and one tap for each household appliance. Close the main stopcock of the gas cylinder when driving the caravan (in this case, the refrigerator must work at 12V). Respect the ventilation grilles. Do not cover them. There is usually one in the pavement under the refrigerator.

6.6.9 Taps, showers, ...

They are designed for low domestic water pressure, given the limited availability of their tanks.

They have been manufactured with very different materials to optimise their performance, so it is therefore advisable to be careful in their use and maintenance.

Some work by electronic contact (caravans) while others work by pressure drop (motorhomes).

6.6.10 Water tanks.



Depending on the vehicle model there are different types and capabilities for fresh water filling. Depending on the size of the tank we will use a submersible pump (for small deposits) or an external pump (for large deposits of 100L for example).

We recommend cleaning the tank before filling.

The absence of water, before the frost prevents breakage of the circuit. Empty circuits to temperatures below 0 °. C.

USE AND MAINTENANCE	RECOMMENDATION
Check for possible water leaks. Inspect the seals every two years and replace them if they are damaged.	Do not leave standing water in tanks for periods longer than 10 days. In anticipation of the formation of algae. They will be eliminated with bleach, detergents; but they are difficult to eradicate.

6.7 Appliances.

6.7.2 Cooker and oven

Before we start using it, read the manual provided by the manufacturer. There we will find complete information about it. The kitchen countertops have an ultra-thin glass lid which provides us with more space when the sink and stove are not in use and is also more aesthetically pleasing. The gas oven allows us to cook dishes once we arrive.

It has a large capacity (33 litres). Do not cover the front outputs as they are necessary for ventilation. Likewise, the rear also has a grid for this purpose.

USE AND MAINTENANCE	RECOMENDATION
Never cook with the lid closed, as it is not an electric or glass ceramic hob. Always open the windows before use and the corresponding gas tap.	We should always keep our kitchen and oven clean as this is where we will prepare our food.

6.7.4 Fridge.



Before we start using it, read the manual provided by the manufacturer. There we will find complete information about it. Certain absorption refrigerators do not work perfectly if the inclination of the vehicle is over 4°. A fridge, depending on the temperature and volume, used to consume between 200 and 300 amps per 24 hours of continued use.

Increased efficiency and power output can be obtained by using the 220v. The gas should be used only for camping (when no 220v available) and 12v only while we are travelling.

USE AND MAINTENANCE

The rear grilles of the refrigerator must be removed once a year to clean the dust and dirt accumulated on the back of the refrigerator. This is necessary in order to operate the gas burner correctly. If it is not cleaned, we can get a bad combustion or we can have problems to operate the spark plug, since the dust can prevent it from igniting.

RECOMENDATION

When moving the appliance, only operate it on 12V. Never connect the refrigerator to gas when driving. This will avoid major risks in the event of an accident. Once camping and during extremely hot temperatures, there are certain recommendations to be followed for its correct operation. The refrigerator can improve its performance by increasing the ventilation at the back of the refrigerator. This can be achieved by installing additional fans in the grilles.

6.7.7 Toilet.

Before we start using it, read the manual provided by the manufacturer. There we will nd complete information about it.

RECOMENDATION

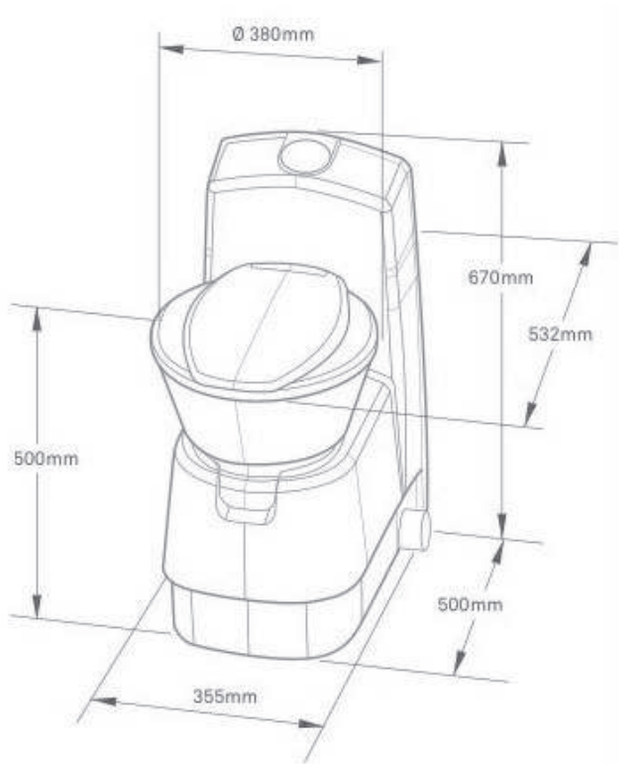
Do not empty the contents of the chemical cassette directly into a septic tank. In order not to destroy the bacterial fauna of the septic tank.

RECOMENDATION

Do not empty waste water of any kind into the sewers or into nature. Toilet contents should be disposed of at campsite service stations or at the disposal facilities provided for this purpose.

RECOMENDATION

The cassette does not necessarily have to be emptied when it is full. As a sanitary and hygienic measure, it is better to start with a clean cassette. After emptying, rinse the cassette with clean water.



6.8 Raw materials.

6.8.1 Thermal insulation.

The expanded polystyrene, is the ultimate insulator. Often used in different densities (cohesion and internal hardness) and are located inside the sandwich panels (walls, floors, ceilings). Thermal insulation is essential as full insulation is the quickest way to save energy and achieve good comfort.

6.8.2 Plywood.

The internal part of the exterior walls, as well as partitions, furniture and others are made with plywood. The usual thickness is between 3mm and 12mm. They are covered by a decorated paper and sealed with varnish. (Decorative side on view). In the areas where there may be concentrations of humidity (toilet, ceiling, etc.), these same boards are usually covered with sheets of P.V.C. instead of decorated paper.

It should be remembered that the partition walls are formed by a perimeter wooden frame and two 3mm boards on each side, leaving the interior hollow.

USE AND MAINTENANCE



To proceed with the cleaning of walls and partition walls, use soapy water, but do not use pressure or cleaning time on paper-coated boards, which are more resistant to PVC (Polyvinyl Chloride), but do not use solvents for these.
PVC (Polyvinyl Chloride) coated boards are more resistant, but solvents should not be used for these (they would eliminate the decoration that is printed on the PVC).

6.8.3 Polyester and smooth aluminium.

Polyester sheets, are made:
With bundles of fiberglass strands (roving), grouped longitudinally, and Polyester resin or vinyl resins. (These form a polyester chain: dialcohols, diacids, styrene monomer and solvent.). There are some thixotropic additives. (Silica powder, calcium carbonate, talc, etc.) that serve to thicken the resin. The gel-coat is usually a wax that is used to give colour.

6.8.4 Silicon, butyl, ...

The silicone sealant is well known in all industries. This is a product from silicon (silicon is its derivative) and monoclomethanol which with atmospheric moisture, forms elastic and adhesive products. (The acetic acid given off in curing, are the most commonly used.). These are not normally used in the assembly of caravans due to instability and rapid aging. Butyl rubber sealant is a paste-component, low solvent content (smells like gasoline), so it has low shrinkage by volume. This is used for detachable joints (Skylights, under exterior aluminium etc.). Its great virtue is "not drying" and good aging resistance which makes it waterproof to the thermal expansion movements.

USE AND MAINTENANCE



Polyester cleaning. The exterior parts (GRP on side or roof panels) can be cleaned using a common vehicle detergent. Or, using or not using the following materials:
* Acetone: No. (But can be used, wiping very briefly).
* Alcohol: Yes. * Benzol: No. * Gasoline: Yes.

USE AND MAINTENANCE



To remove the excess or overflowing butyl. It can either be adhered to another part of butyl that has evaporated solvent (Ball), or with adhesive paper tape.
Always check that all joints are tightly closed and sealed with butyl.

6.8.5 Sandwich panels and others.

The walls, oors and other elements of the caravan panels are made in one piece, by the intimate union of the elements that compose it.

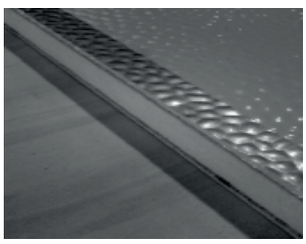
An exterior wall is made from different materials (aluminium, expanded polystyrene, plywood, wood strips, plates, etc.) and joined together by glue and pressed properly make a new panel resulting which is extremely light.

Inside the panels are different fixings for the later locating of partitions, racks, shelves, etc. Once mounted mechanical interlocking
makes one large monolithic structure.

6.9 Optional accessories.

There is the possibility to install several optional extras which will give us more comfort and we will enjoy our outdoor holiday to a greater degree.

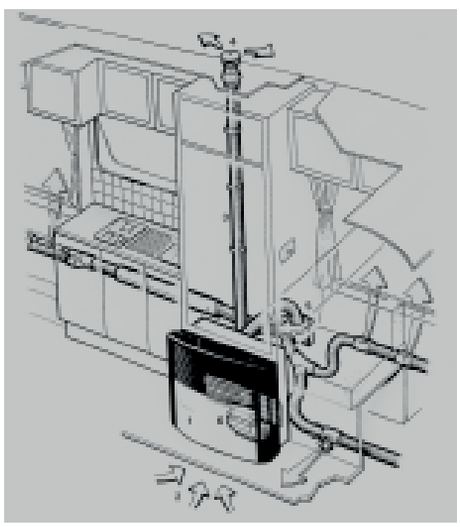
The ACROSS CAR catalogue provides the opportunity to install the best brands. All accessories installed should be checked by your installer and/or dealer. Before their rst use, it is necessary to read the instruction manual of the accessory itself.



6.9.1 Heating and air conditioning.

Before we start using it, read the manual provided by the manufacturer. There we will nd complete information about it. The heaters are usually powered by gas. (Butane or Propane). Motorhomes are used in winter. Its great advantage is that it rapidly reaches room temperature. The heaters are powered by internal combustion. Oxygen does not burn inside the trailer but exhausted outside through a chimney.

Driven air heating systems allows warm air to be distributed in the lower part of the caravan. This is done through a turbine and tubes until the desired temperature is achieved throughout the caravan. Temperatures should be controlled. (No need to be 25° in winter nor at 18° in summer. It would be a luxury, and unnecessary wasted energy wasted). Good control helps the pocket and the environment. Optimum temperature ranges from 18° to 20° in winter an 22° to 25° in summer. There are different heating and cooling systems available to be installed. Please contact your dealer to know more details about the most suitable for your vehicle.



RECOMENDATION



Before and after the heating, ventilate the cabin for 15 – 20 minutes. Do not close the vents. Very little cold comes from them. They are located on the floor and ceiling (skylight). They are for permanent ventilation of the cabin.

6.9.2 Hot water system.

Thanks to the water heater, we can get the same comfort we enjoy at home for example when showering, washing, or just during times of intense cold. There are models for electricity or gas. The electric is simpler to use since you can just turn on the device through a switch. Its capacity is 5 litres and is ideal for camping caravan stays.

The gas offers independence as by taking our gas bottle we always have hot water. Its volume is 10 litres and is operated by a key and its corresponding gas electronic ignition which lights the ame for the heat it generates. There is also combined heating and hot water. It combines the best of heating and hot water in a single device (which reduces the space occupied) and has greater capacity in the water tank (12.5 litres) and higher heating power (4,000 W).

6.9.3 TV antenna.

If we want to enjoy our TV we can install an antenna that will allow us to receive our favourite channels. It incorporates an amplifier and allows us to receive channels wherever we go. There are two models: telescopic and omnidirectional. The telescopic model allows us to raise the antenna when we are standing still thanks to its mast. By raising the antenna up to 2 metres, we can improve the reception point of the antenna, which is sometimes obstructed by trees or walls. This is the directional system, which points in the direction of the transmitter. The omnidirectional model picks up 360°, and does not require a mast, since its reception has a greater range and a different methodology.

The HD reception signal can be received by two types of antenna, terrestrial or satellite.

RECOMENDATION



We must bear in mind that the antenna is an element located on the roof and that it protrudes from the roof surface. It is therefore advisable to drive carefully so that the antenna does not collide with any low object (trees, bridges, etc.).
Likewise, we must also dismantle the rods that are screwed into the antenna to improve wave reception, as they can be damaged or become detached when in circulation.

6.9.4 Microwave.

The microwave is an element that today can only be used with 220V supply as their power is at 800W. They also include the possibility of using the grill. 12v microwave ovens today do not offer the minimum requirements for installation in caravans and motorhomes. Therefore, we must consider that we use to access a 220v supply directly or through a generator.

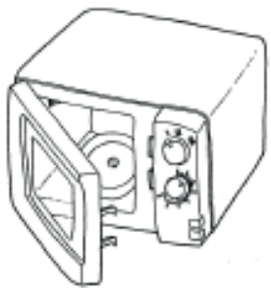
6.9.5 Stabilizer - Caravan.

With this item, we can improve the security of our caravan. Their points of friction and smooth linings allow us to stabilise torque generated by the path changes, speed changes or sudden movement by wind effects. It also offers the ability to function as anti-theft if desired, adding a lock to it. They are of different manufacturers and different weights.

6.9.6 Awnings.

Awnings provide additional outdoor terrace space for our caravan or motorhome. Its special fabric allows us to enjoy the outdoors more as it thermally insulates a few degrees and is also waterproof.

The caravan comes ready to install them thanks to its integrated aluminium profile that will secure the perimeter of our awning. A motorhome awning gives the opportunity to be enjoyed in short stops thanks to its rapid assembly and disassembly. The awning comes with aluminium housing for protection on the road.









6.9.7 Solar panels.

One of the ways to collect green energy, economically and independent. Using plates coated with silicon cells, it transforms the sun's energy into electrical energy. Solar panels have limited power capacity so we cannot have a high-energy demand. They come in 50W, 75W, 100W, etc. and usually charge at about 6.7 A/hour.

Starting from a full charged baterry, we can use 4 hours TV and low consume fridge during 5-7 days while full sun power ultraviolet rays are charging the solar panels continuosly during the day (in summer season for example). In winter, when sun power is lower, the durability of the batteries can fall down to 2-3 days. The best Charging time for this system is 2 hours before and after the midday. There are 2 solar panels types, rigid and flexible. Avoid shadows as much as possible, only small shadowed area can make it work not propertly.

6.9.8 Bike carrier, mobility carrier, spare wheel and carrier.

The exterior bike carrier and mobility carrier allow us to increase our range of movement. With these, we transport our bikes easily to our destination. The carrier is installed in the front of the trailer (above the draw bars) and the back wall in the camper. The carrier (camper only) is suitable for carrying light bikes in the back of the motorhome (maximum 120 kg in total).

The spare wheel support will enable us more security in case of failure. We save you time in case of necessity, as we can continue our journey without delay. This is fixed in the bottom of the chassis and serves to carry the spare wheel. Thanks to its mechanism, we can keep it there, take the dead space and access it when necessary, quickly.

6.9.9 Fuel cells.

Supersofisticated technology dedicated to guarantee battery charging based on chemical reaction between metanol and oxygen molecules through a charging regulator which automatically feeds instalation when it falls down 5/10/12 volts.



It's an expensive system which also needs ventilation for condensed water.

6.9.10 Generator.

Energy idyllic generator system. Built in 2 or 4 times engines, together with inverter technology, offers 1.000-3.500 Watts depending the model used. Works through different fuels like petrol, diesel, butane gas, propane gas or LPG. The most important to take care before choosing the best unit for us is check the noise polution.

Produce a lot of heating so it must be stored in a very ventilated area, also due to it's exhaust pipe, which must be take carefully to be not accesible to inside vehicle through any joimt or hole.



Across Car S.L.

Algezar,9
Polígono Industrial Tres Hermanas
03680 Aspe (Alicante)
Spain

email: informacion@across-car.es
web: www.across-car.es