

Customer:
Study no.:
Order no.:
Serial no.:



FMA[®] SEMI-TRAILER 

OPERATING MANUAL

Introduction	6
A) General overview of the semi-trailer	7
A.1) Overview	8
A.2) Identification	8
A.2.1) Plate location	8
A.2.2) Safety and information sticker	9
B) Safety instructions	10
B.1) General instructions	10
B.2) Before each departure	11
B.3) Maintenance operations	11
B.3.1) Specific precautions relating to hydraulic and electrical power	11
B.3.2) Work at height	12
C) Before initial use	13
D) Detailed equipment on the semi-trailer	14
D.1) King pin	14
D.2) Air connection	14
D.3) Braking	15
D.3.1) EBS kit	15
D.3.2) Parking brakes, emergency function	15
D.3.3) Diaphragm cylinder	16
D.3.4) Connecting the braking system	17
D.3.5) Braking force regulator adjustment plate	17
D.3.6) Maintenance	17
D.4) Air suspension	18
D.4.1) General	18
D.4.2) Raising and lowering mechanism	18
D.4.3) Load indicator	18
D.4.4) Air suspension height setting	19
D.4.5) Axle raising mechanism	19
D.5) Braking and suspension diagram	20
D.6) Telescopic landing gear	21
D.7) Wheels and accessories	21
D.7.1) Wheels	21
D.7.2) Wheel carrier	21
D.7.3) Wheel chock	22
D.7.4) Mudguards	22
D.7.5) Wheel fitting and removal	23
D.8) Doors	24
D.8.1) Manual door with pneumatic locking and unlocking	24
D.8.2) Side door	24
D.8.3) Hydraulic door	25
D.8.4) Inspection door	26
D.9) Roof equipment	26
D.9.1) Roof tarpaulin	26
D.9.2) Roof net	26
D.9.3) Roof trap	27
D.10) Bows	28
D.11) Movable wall	29
D.11.1) Manual movable wall	29
D.11.2) Hydraulic movable wall	29
D.12) Lighting and signalling	30
D.12.2) Connecting the various sockets	31
D.12.3) Wiring diagram	32
D.12.4) Signalling	34

E) Miscellaneous equipment	35
E.1) Retractable ladder, right-hand interior access handle	35
E.2) Tool box	35
E.3) Shovel and broom holder under chassis F00027100	35
E.4) Side protection	36
E.5) Rear bumper	36
E.6) Floor canvas with reel	36
E.7) 3 m ladder	37
E.8) Floor cover	37
E.9) Lifeline	38
E.10) Panel-mounted sensors	39
E.11) Light guard	39
E.12) Side panel viewing window	39
F) Loading/Unloading	40
G) Maintenance	43
G.1) Axles	43
G.1.2) Axle alignment	44
G.2) Lubrication	45
G.3) Body cleaning and maintenance	45
G.4) Maintenance table	46
NOTE	47
APPENDIX	48
WARRANTY	49



Dear Customer,

Legras Industries is delighted that you have chosen our **FMA®** semi-trailer.

Our semi-trailers are designed to guarantee you continuous use.

With correct use and regular maintenance, you can be assured of optimum operational reliability.

The new equipment below complies with the applicable technical regulations and procedural rules:

We recommend that you read the whole manual before using your equipment. If you have any problems or need any advice, please don't hesitate to contact us - our team will be happy to help!

Thank you for choosing a Legras semi-trailer.

Kind regards

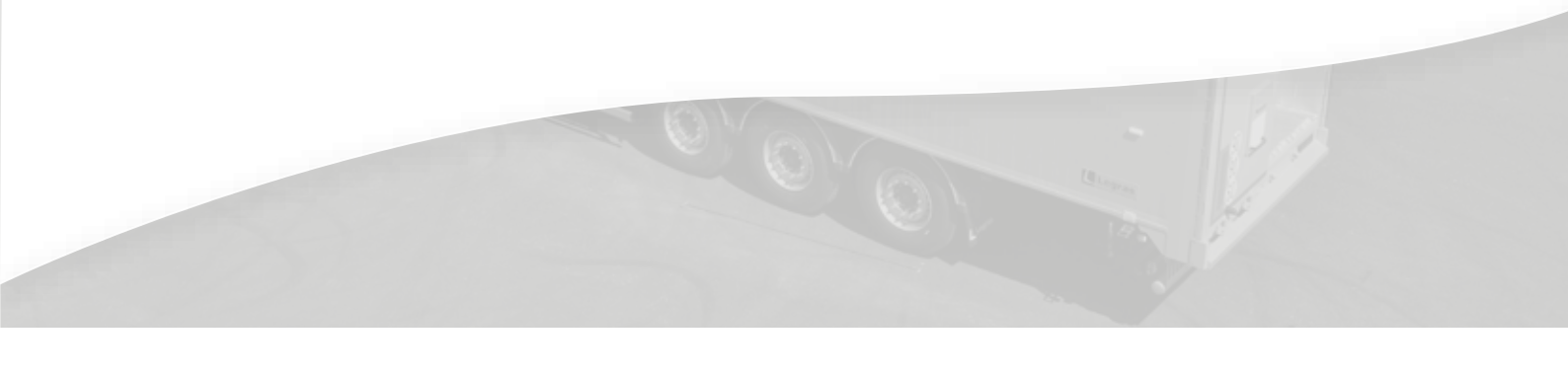


Epernay, 12/04/2017

CHIEF EXECUTIVE OFFICER
Jean-Remy Legras

SA LEGRAS Industries
37 rue Marcel PAUL - BP 204
51206 EPERNAY CEDEX
Tél. 03 26 53 32 10 - Fax 03 26 51 97 05
Code APE 342 A
SIRET 095 550 307 00011

Président Directeur Général
Jean-Remy LEGRAS



Purpose of this manual:

This operating and maintenance manual contains the information necessary for thorough knowledge and correct use of a semi-trailer. This manual describes the semi-trailer and a number of options; your semi-trailer might not have some of these options, or they might not be available on your type of semi-trailer. The information in this manual is intended for qualified personnel (1). If you have any doubt about the correct interpretation of the instructions, please contact the manufacturer for the necessary explanation.

This manual forms an integral part of the semi-trailer and must be kept intact in an easily accessible location for future consultation.

In the event of transfer of ownership, please pass it on to the new user.

For ease of reading, this manual is divided into sections identifying the main concepts.

To find the topics covered quickly, see the descriptive index.

Liability exclusion:

The manufacturer considers itself free of all liability in the event of:

- ➔ Incorrect installation or installation that does not comply with current legislation;
- ➔ Use of the semi-trailer by untrained or unauthorised persons;
- ➔ Complete or partial non-compliance with the instructions;
- ➔ Lack of maintenance;
- ➔ Unauthorised modifications or operations;
- ➔ Unapproved use;
- ➔ Use of non-original spare parts or spare parts that are not specific to the model;
- ➔ Exceptional atmospheric events.

Instructions for calling a service technician:

In case of malfunction or failure that might require the service of qualified technicians, and for spare parts requests, please fax, email or phone the LEGRAS service centre directly.

LEGRAS Service centre

Tel.: +33 (0)3 26 53 32 60

Fax: +33 (0)3 26 51 87 33

Email

sav@legras.fr

Disclosure of this manual:

The reproduction or disclosure of the information contained in this manual, in full or in part, is prohibited without the written permission of the manufacturer.

The use of this instruction manual for unauthorised purposes is prohibited without the written permission of the manufacturer.

Legal action will be taken regarding any infringement of the above.

(1) Qualified personnel refers to persons who have the experience, technical training and knowledge of the applicable standards and laws required to perform the necessary operations and to recognise and avoid all possible hazards during the handling, installation, use and maintenance of the semi-trailer.

- ➔ Please note that the application of the manufacturer's warranty is dependent on compliance with the maintenance operations described below.
- ➔ The stated frequency of said operations applies to normal operating conditions.
- ➔ You will have to perform certain operations more frequently if the semi-trailer is used in more severe conditions.
- ➔ LEGRAS Industries original parts or parts that we recommend are intended to ensure the long service life of your semi-trailer.
- ➔ The FMA is designed for use with the nets and rear doors closed. Any other use is the user's responsibility.
- ➔ Any build-up (ice, snow, branches, etc.) on the nets or sills must be removed before the vehicle departs or manoeuvres.

WARNINGS

It is well known that our FMA semi-trailers are highly versatile. However, we feel that it is vital that we inform you that certain products cannot be unloaded using our equipment.

These include in particular **abrasive powdered and fine grade materials** together with **certain fertilisers** without anti-coagulant, which harden during transport.

By carrying this type of product, **you run the risk of clogging the delivery system**. If the system becomes clogged, the deck must be completely dismantled and **this is not covered by our warranty**.

As a general rule, all products that cannot be "dumped", together with abrasive products, which cause premature wear on the joints between the floor boards, should be avoided.

If this is not possible, it is essential that the deck be protected using plastic sheeting or a manual or pneumatic tarpaulin liner; see options.

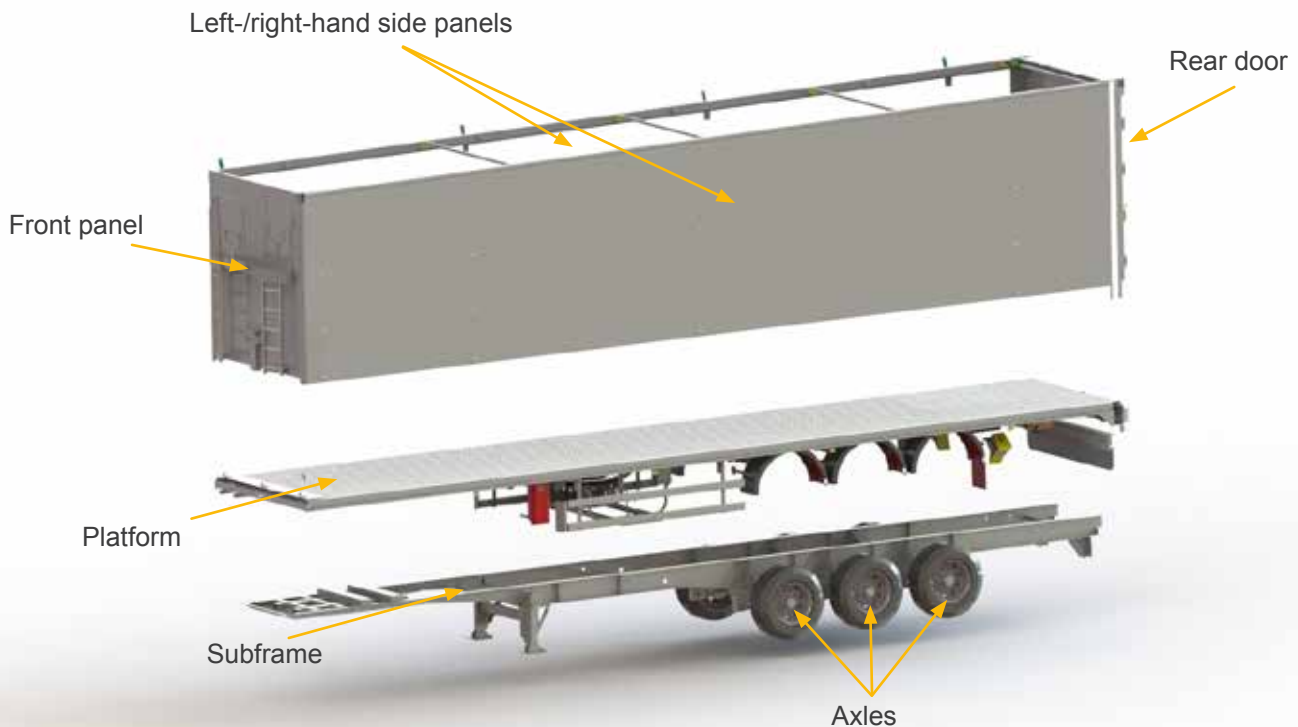
We are more than happy to share our experience with you.

Please don't hesitate to contact us.

A) General overview of the semi-trailer

A.1) Overview

The semi-trailer is made up of a Legras chassis comprising: side members, subframe, platform and tridem. A loading/unloading kit with floor is added (different floors are fitted depending on the application, i.e. household waste, sawdust, particle, etc.) and the aluminium body is fastened to the chassis assembly. The body comprises a front panel, left- and right-hand panels and rear doors.



A.2) Identification

A.2.1) Plate location

→ Manufacturer's plate

- Vehicle type
- Identification no.
- Gross vehicle weight rating (GVWR*)
- Axle and fifth wheel forces
- Total permissible weight
- Permissible axle and fifth wheel forces

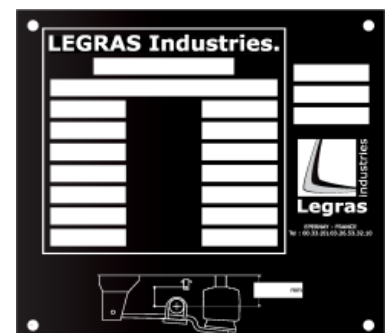
*The actual GVWR chosen by the customer is stated on the weight and dimensions plate (232A1376)

- Suspension height

→ CE plate

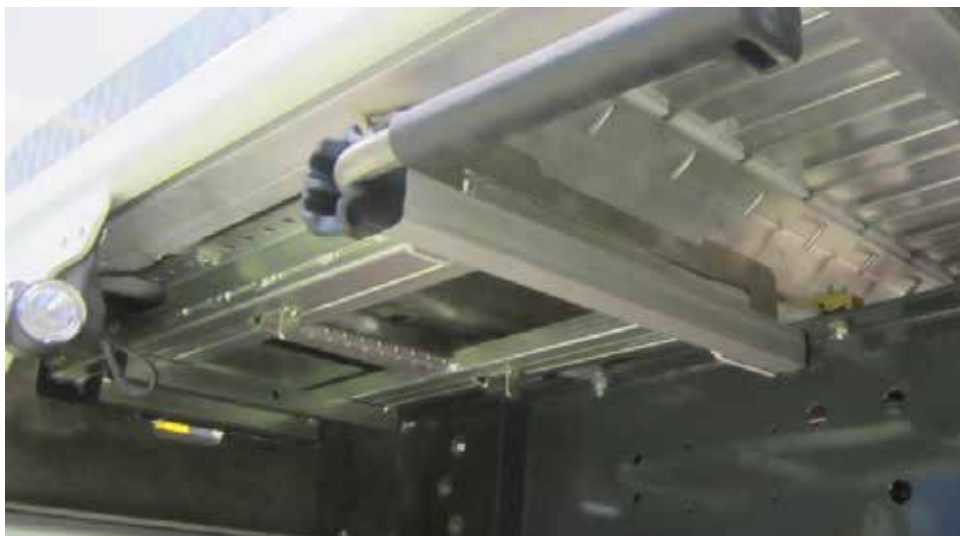
- Type: FMA
- No.: F_____ (drawing number)
- Year: 20__ (Year of manufacture)
- R.C.*: C_____

* order routing card number



B) Safety instructions**B.1) General instructions**

- ➔ Respect the axle and hitch plate load limits as per the manufacturer's instructions.
- ➔ Check that the load is evenly distributed (dump truck) not required.
- ➔ Semi-trailer floors are designed to withstand forklift trucks with a maximum GVWR of 5 tonnes during loading and unloading. For heavier loads, please consult Legras.
- ➔ Watch out for bridges, underpasses and tree branches, which can damage the top of your vehicle.
- ➔ When going downhill, use the tractor's engine braking as much as possible to prevent overheating the brakes.
- ➔ If your tractor has one, only use the trailer brake in the event of extreme necessity. Unreasonable and inappropriate use can lead to:
 - Very rapid wear of the towed vehicle's brake linings
 - Overheating, which can cause the tyres to burst or set the vehicle on fire.
- ➔ Maintain a safe braking distance.
- ➔ A compressed-air braking system is sensitive to pollution. Close the covers on the brake hose couplers after unhitching your vehicles.
- ➔ Remove the ABR or EBS electronic unit before carrying out welding on the semi-trailer.
- ➔ When washing the semi-trailer, avoid spraying water on the ABR or EBS units.
- ➔ For ease of unhitching, take care to align the tractor with the semi-trailer.
- ➔ Unhitching on flat, even ground is recommended.
- ➔ Check that the fire extinguisher (if supplied) is in the compartment on the driver's side landing gear. To release it, open the compartment by pulling on the two rubber handles.
- ➔ To get into/out of your trailer safely, use the retractable ladder located on the right at the rear; check that the floor is not running when you get in.



B.2) Before each departure

The following checks must be carried out:

Vehicle documents are in the vehicle

1) Vehicle unhitched

Check that there is a sufficient layer of heavy grease on the following elements and that it is completely free of foreign bodies to ensure perfect coupling:

- ➔ Hitch plate
- ➔ King pin
- ➔ Fifth wheel plate

2) Vehicle hitched

Check that you have the vehicle documents.

- Hitch : Ensure that the hitch mechanism is properly locked.
- Landing gear : Check that the two landing gear units are retracted.
- Wheels : Check the tyre pressure and make sure that the wheel nuts are correctly tightened.
- Signalling : Check that all signalling devices are clean and in proper working order.
- Body : Check that all the body elements are in place (doors closed, bows and tarpaulin secured, etc.)
- Suspension : Make sure that the raise/lower valve is in the "drive" position and wait until the air suspension is in the "drive" position.
- Brakes : test the brakes and bleed the air tanks to eliminate water condensation and all traces of oil.
- Parking brake : For spring-brake actuators, check that the parking brake is fully released.



Note: Check braking efficiency before reaching speeds in excess of 30 km/h. If the pressure in the braking system is not greater than 7.4 bar, do not set off.

B.3) Maintenance operations

B.3.1) Specific precautions relating to hydraulic and electrical power

As a general rule:

All work must be meticulously prepared.

Top up the oil in the tank with a fluid with the same properties (new), if possible using a filtering-filling assembly.

If the work involves:

- ➔ **Removing parts:**
Clean the part to be removed, to avoid impurities entering the circuit.
- ➔ **Changing pipes:**
Rinse the tubes and hoses, especially if they are very long, before connecting them.
- ➔ **Electrical connection:**
Check that the pump is rotating in the correct direction before starting it up.
- ➔ **Filling the tank:**
Use the quantity and quality of oil specified.
Ensure a high degree of cleanliness is maintained during this operation.
Clean the cap and the surrounding area on the oil drum before opening it.
Before filling, check that the tank is clean. If not, clean it again.
Check that there has been no water present in the hydraulic fluid.
Under no circumstances must the metal screen or the filter cartridge be removed from the filling aperture, or the filler tube be removed during filling.
If possible, a filling assembly fitted with suitable filters should be used.
Comply with the filling level marked on the tank.

B.3.2) Work at height

Before using scaffolding, check the following points:

The deck is protected by a guard rail regardless of its height:

- Top rail: 1 m
- Middle rail: 0.46 m
- Toe boards: 0.16 m

Distance between two putlogs greater than or equal to 1.50 m.

Deck width greater than or equal to 0.60 m.

Boards placed on the entire length of the putlog. No gap between two boards.

At least one brace between two platforms.

Means of access to the work platform.

For rolling scaffolds:

- Installation of stabiliser legs
- Braked wheels

The following are prohibited when working on scaffolding:

- ➔ Wearing sandals, hobnailed shoes and shoes with slippery soles.
- ➔ Jumping or running.
- ➔ Parking or driving underneath the scaffolding unnecessarily.
- ➔ Overloading (place materials away from putlogs).
- ➔ Putting heavy objects down suddenly, throwing or tipping them over on the boards.
- ➔ Using a jack or cylinder resting on the scaffolding.
- ➔ Acrobatics (such as climbing on the guard rails), however urgent the job.

✓ Choose a ladder that is the right height for the work.

Check that ladders are in good condition. The use of ladders known to be faulty is PROHIBITED.

Service ladders must extend at least one metre beyond the point that the user is accessing, or have an upright extended by the same length

✓ Single ladder

The ladder must be placed at an angle such that the foot of the ladder is between one quarter and one third of the length of the ladder away from the base of the vertical surface. Climbing the back of the ladder or attaching oneself to the ladder is PROHIBITED.

✓ Extending ladder

The foot = 1/4 of the length of the ladder away from the base rule must be applied. The two sections of the ladder must overlap by 1 m or more.

It is essential that a bi-line system be installed for access to the semi-trailer load:

Once connected, the operator has his hands free and can access the entire length of the full load. The lanyard simply slides along the retaining line as the operator moves along the roof surface. The length of the lanyard from its attachment to the retaining line to the hook is less than the width of the vehicle in order to prevent the operator from falling down the sides.

Work positioning belt



C) Before initial use

After the first 50 kilometres, then after a further 100 kilometres

Check: ➔ Tightness of the wheel nuts (see page 30)

After the first 500 kilometres

Check: ➔ Steering geometry of the self-steering axle
 ➔ Tightness of all axle nuts
 ➔ Tightness of all suspension nuts

After the first 5,000 kilometres

Check: ➔ Amount of brake lining or pad wear.
 ➔ Have the manual brake slack adjusters adjusted.
 ➔ Steering geometry of the self-steering axle.
 ➔ Tightness of all axle nuts.
 ➔ Tightness of all suspension nuts.
 ➔ Axle alignment.
 ➔ Air suspension drive height.
 ➔ Air suspension shock absorbers (traces of oil, joints, rubber).
 ➔ Leak-tightness of air suspension air intakes.
 ➔ Air spring diaphragms.



Note: The maintenance operations after the first 500 and 5,000 kilometres must be conducted in a workshop.

D) Detailed equipment on the semi-trailer

D.1) King pin

Function:

The king pin locks into the fifth wheel plate on the tractor. The working portion is topped with a collar secured using special screws to a mounting rigidly connected to the hitch plate.



Operation:

Before hitching

- The condition and securing of the hitch plate (no pull-out, no deformation, no dents).
- The condition and securing of the king pin.
- The layer of grease on the hitch plate, king pin and fifth wheel plate. This must be sufficiently thick and free of foreign bodies to ensure perfect coupling between the tractor and the semi-trailer without causing any damage.

Comply* with the hitch height

*If this value is not complied with, we cannot be held liable for the consequences

Maintenance:

When the maximum wear diameter has been reached at any point on the pin, it must be replaced

Whenever the pin is removed or replaced, the special screws must be replaced.



→ Every week (5,000 km)

- Clean the surface of the fifth wheel plate and the semi-trailer hitch plate.

→ On the semi-trailer

- Liberally grease the king pin and hitch plate.

→ Fifth wheel

• Liberally grease the surface of the fifth wheel plate and the locking mechanism, together with the bearing joints.

→ 2" king pin

- Every 50,000 km, check for wear.
- **Replace the king pin when its wear limit has been reached.**
- **Nominal diameter: 50.8 mm**
- **Wear limit: 49 mm**

→ Hitch plate

- Every 50,000 km, check for wear.
- **Replace the hitch plate when the wear reaches 1 mm**

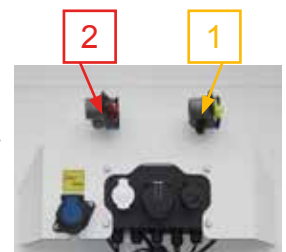
D.2) Air connection

The brake hose couplers are located on the front panel of the semi-trailer

Function:

The brake hose connectors are used to connect the braking systems on the towing vehicle and the trailer. A built-in filter isolates the air braking system and the auxiliary systems from any pollution. To prevent a clogged filter from trapping air in the control and supply lines, a bypass system is used to discharge the air.

The brake hose connectors are colour-coded to identify air control (yellow) and supply (red) lines, and are designed in accordance with DIN ISO 1728; to prevent incorrect connection, they are fitted with interlock devices.



- Installation of a EUROPEAN braking system (2 lines) in accordance with EEC Directives 71/320-75/524-85/647 and 88/194.

- Installation equipped with ISO brake hose couplers, identified according to the international colour coding system:

- 1) **YELLOW** connector: Control line with pressure take-off.
- 2) **RED** connector: Supply line.

D.3) Braking

D.3.1) EBS

Braking is performed by an EBS module.

The EBS incorporates the functions of the ABS. The trailer electronic braking system combines the electronic control unit, the sensor system and the air control in a single module.

The anti-lock and load correction functions are incorporated into and electronically controlled by the module. This enables more precise, more consistent control of the braking force generated, with reduced hysteresis compared to a conventional braking system, thus improving tractor-trailer compatibility and optimising brake pad wear and therefore helping to reduce overall trailer operating costs. The anti-compounding function is also incorporated into the module, with four outputs to the double spring-brake actuators.

EBS brake module

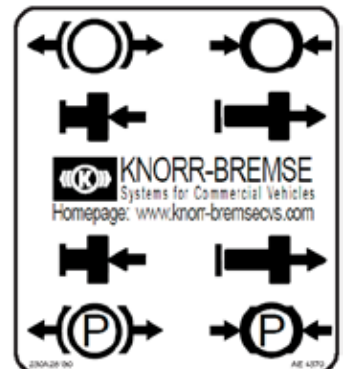


Instead of an anti-compounding valve, the brake module has: A built-in emergency brake valve to perform the automatic brake function. The built-in emergency valve exhausts the double spring-brake actuators directly through the brake module, ensuring a faster response time. The built-in emergency valve also performs the anti-compounding function.

D.3.2) Parking brake (Knorr)

The parking brake dual control valve is used to release and apply the trailer brakes manually. It is incorporated into the automatic brake function in order to improve its response time.

The parking brake dual control valve has a plastic body and is fitted with a built-in shutoff valve and PTC quick couplers. The shutoff valve ensures that the brake air reservoir is filled as a priority before the auxiliary circuit (air suspension) is supplied. In the event of a loss of pressure in the braking system or the auxiliary circuits, the valve will prevent the pressure dropping in the system.



"Manoeuvre" function (braking) to be used when the trailer is uncoupled (black BUTTON)



Manual parking brake control (RED button),

D.3.3) Diaphragm cylinder

16 DIAPHRAGM CYLINDER

Function:

This range of diaphragm cylinders are used on axles fitted with disc brakes and performs the service brake function. Diaphragm cylinders have a seal incorporated into the front body that prevents dirt or moisture from entering the calliper.

On Optimised Brake Chamber (OBC) diaphragm cylinders, the join between the front and rear bodies is crimped, i.e. there is no clamping collar. This improves leak protection and reduces the weight of the cylinder.



16/24 DIAPHRAGM CYLINDER

Function:

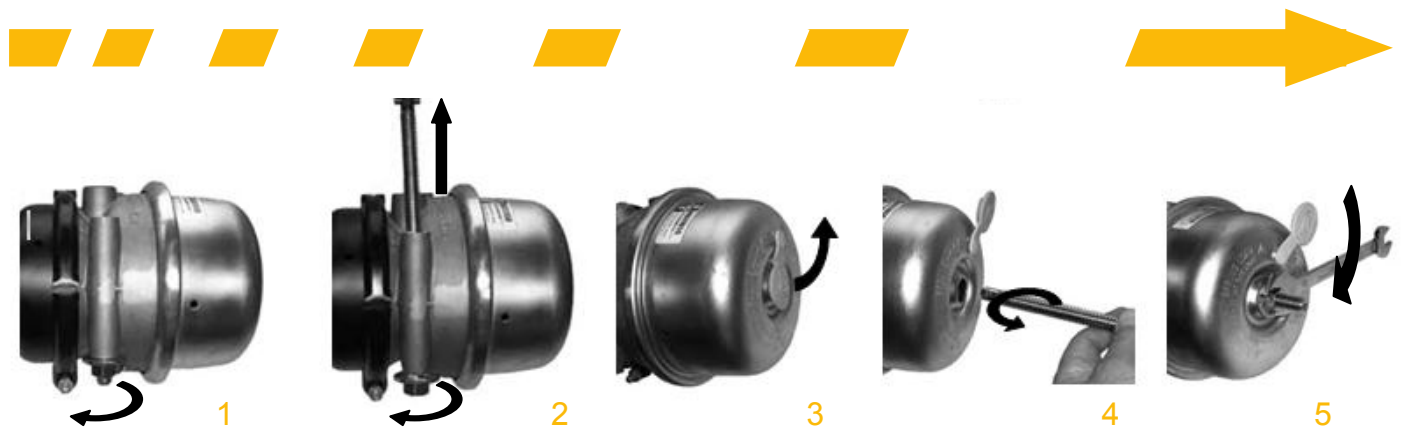
This range of double cylinders are used on axles fitted with air disc brakes, to perform the service brake and parking brake functions.

The built-in release mechanism makes it possible to release the parking brake in the event of air pressure loss. Double cylinders have a seal incorporated into the secondary chamber, preventing dirt and moisture from entering the calliper.



Maintenance:

To release the prestressed spring in the event of a fault in the air system:



- ➔ Make sure that the wheels are securely chocked
- ➔ Undo the nut and remove the loosening screw from its housing (figures 1 & 2)
- ➔ Remove the cover (figure 3)
- ➔ Put the loosening screw into the spring chamber and turn it to engage it in the groove (figure 4).
- ➔ Fit the washer and nut.
- ➔ Turn the nut with a 19 mm open-ended spanner (figure 5), max. torque 68 Nm.
- ➔ Only use a suitable ring spanner or open-ended spanner

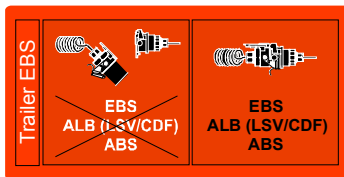


CAUTION: Once you have performed this operation, move the vehicle carefully (there is no brake on the towed vehicle). For safety reasons (spring compressed with over one tonne of pressure), an approved workshop must be consulted for all operations on the cylinders (removal).

The spring chamber on the double cylinder contains a very strong elastic force, and it is therefore absolutely not recommended that you try to dismantle it. This must also be taken into account when scrapping spent cylinders. Comply with all local regulations regarding waste treatment and accident prevention.

D.3.4) Connecting the braking system

The braking system is connected on the front panel; a sticker (163A27941) marks the location of the EBS/ABS socket.



ABS socket
EEC-88/194 ISO 7638

163A27941



No.	Description	Circuit
1	Red 4 mm ²	Valve supply
2	Black 1.5 mm ²	ECU supply
3	Yellow 1.5 mm ²	ECU earth
4	Brown 4 mm ²	Valve earth
5	White 1.5 mm ²	Indicator lamp
6	White/Green	CAN HI
7	White/Brown	CAN LO

D.3.5) Braking force regulator adjustment plate

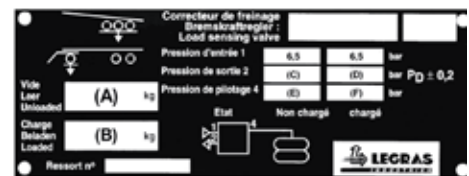
Adjustment information is provided on an engraved plate mounted on the side member.

The plate provides the following information:

- ➔ Reference of the factory-fitted regulator.
- ➔ Minimum weight according to the type approval (A).
- ➔ Maximum laden axle weight (B).
- ➔ Minimum pressure value (C).
- ➔ Laden pressure value (D).

For air suspension only:

- Minimum pressure value in the bellows
- Laden pressure value in the bellows

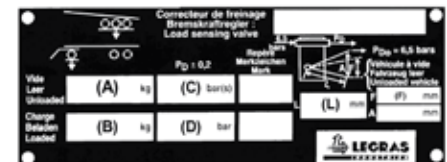


Air suspension

These pressures are to be respected to within ± 0.2 bar for an inlet pressure of 6.5 bar.

For mechanical suspension only:

- Dimension (L) corresponds to the length between the control rod and the pivot point of the vertical control arm.
- The vertical dimension (G) corresponds to the deflection of the suspension springs between the theoretical minimum weight and the approval maximum weight.



Mechanical suspension

For braking systems with EBS, there is a sticker instead of the plate. The sticker states the parameters of the EBS braking system.



This sticker can only be checked by a service centre.

D.3.6) Maintenance

Before taking to the road or at least once a week, the air reservoirs must be bled to discharge any accumulated oil and water formed by condensation.

The braking system must only be repaired by qualified technicians.



Proper tractor/semi-trailer braking harmonisation is essential to ensure maximum service life of the braking systems. The pressure predominance of the tractor over the semi-trailer must not exceed 200 g/cm². For vehicles equipped with EBS, the supply and control connections are ensured by the ISO 7638 7-pin socket; this socket must be connected.



Reservoir and bleeding

D.4) Air suspension

D.4.1) Levelling valves

Air suspension absorbs shocks elastically, therefore improving road holding and reducing tyre wear.

The levelling valve maintains a consistent chassis height by means of the air springs, regardless of the vehicle load.

Levelling valve :

Levelling valves with a height limiting function cut off the air supply to the raising and lowering valve when the lever is at a certain angle, thus limiting the maximum height of the chassis. This angle is set by default in accordance with the information on the plate under the chassis.



D.4.2) Raising and lowering mechanism

The raising and lowering valve is fitted to vehicles with air suspension and is used to manually control the volume of the air springs to raise or lower the vehicle chassis as needed.

Valve versions are available with a "Reset to Ride" function. When this is activated, the valve returns to the drive position and the chassis returns to a normal levelling height to avoid any damage to the suspension. This ensures that the pressure in the suspension is correct and improves the efficiency of the braking force regulator.



Z006844



- ➔ The rotary distributor must only be operated in coupled vehicle position with the brakes released and landing gear raised.
- ➔ To operate the distributor:
- ➔ The rotary distributor has 3 positions:
- ➔ The levelling valve is neutralised in the "RAISE" and "LOWER" positions. Air intake and exhaust are performed directly by the distributor and when returned to the drive position, the height is adjusted automatically depending on the load via the levelling valve.



WARNING, DANGER: Before taking to the road or prior to any manoeuvring, make sure:

- That the lever of the rotary distributor is in the "drive" position and that the air springs are filled to the height corresponding to this position.
- That the supply pressure is in compliance with the manual.

D.4.3) Load indicator

This additional equipment on the air suspension shows the pressure in the suspension springs. The pressure is linked to the load on the axles.

Load indicator



Locking of rear doors

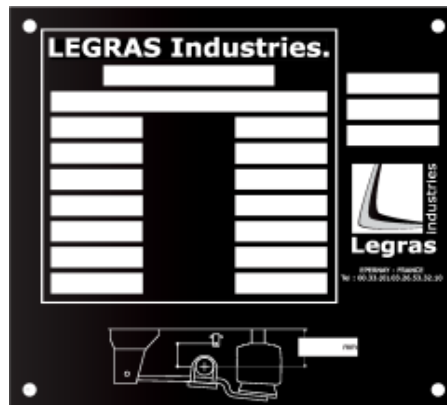


D.4.4) Air suspension height setting

All levelling valves are adjusted and the suspension is fully tested in the factory.

It is unnecessary to make any other adjustments but in some situations (such as the replacement of a suspension component), the settings must be checked.

This must be done at an approved workshop.
The height setting is shown on the plate below.



 **WARNING, DANGER:** If you have to replace a mechanical or pneumatic component, first ensure that there is no longer any pressure in the suspension and brake air circuits.

D.4.5) Axle raising mechanism

Operation

This optional additional equipment on the air suspension is used to raise an axle when the vehicle is travelling unladen or with a part load.

However the vehicle is wired, the front lift axle can also be controlled by activating the service brake system.

The preconditions are as follows:

Vehicle stationary.

Release the parking brake on the towing vehicle (only for towing vehicles without EBS).

Release all of the brakes for at least 2 seconds.

Activate the service brake system three times for 8 seconds at a pressure of at least 3 bar in the brake hose connector.

The pressure should drop below 0.4 bar between each application.

There is an electric button to operate the raising mechanism.



Lift front axle



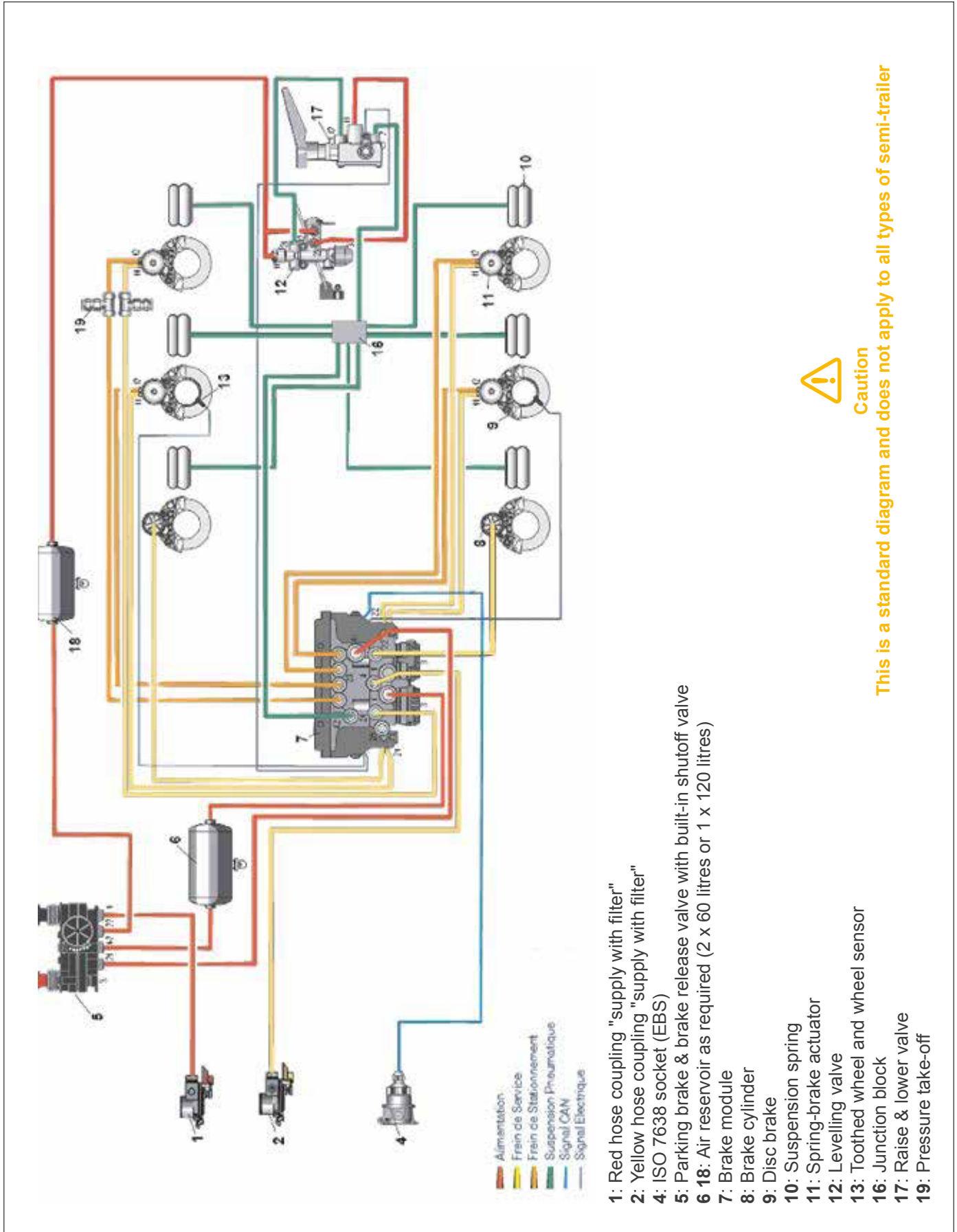
Neutral position



Lower of all lift axles



D.5) Braking and suspension diagram



Caution
This is a standard diagram and does not apply to all types of semi-trailer

D.6) Telescopic landing legs

Instructions

Once the trailer is coupled, raise the landing legs to the maximum retracted height to ensure sufficient road clearance.

The landing legs should move freely; if they become stiff, check the lubrication or clean them thoroughly.

The trailer must be immobilised during coupling and uncoupling operations to avoid subjecting the landing leg to abnormal forces.

2-speed mechanical landing legs

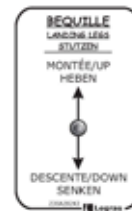
- Low gear (1) : Crank handle pushed in (fully)
: Lift per 1 crank turn: 1 mm
- Neutral (PM) : Crank handle centred
- High gear (2) : Crank handle pulled out (fully)
: Lift per 1 crank turn: 10.6 mm

Hydraulic landing legs

- ➔ Activate the hydraulic circuit.
- ➔ Then push the spool valve lever up to raise the landing legs or down to lower the landing legs.



Control Hydraulic



Control Electric



CAUTION: The landing legs cannot be used as a jack

Maintenance

- ➔ Regularly clean the telescopic tubes of each landing leg and coat them with a thin layer of grease.
- ➔ Moving tube on each leg: • frequent cleaning recommended.

D.7) Wheels and accessories

D.7.1) Wheels

All of the wheels fitted on the semi-trailer are identical
Comply with the recommended tyre pressure.

The tyre pressure is stated on the red sticker on the front panel housing.
See also section D.7.5) Wheel fitting and removal.

D.7.2) Wheel carrier (If fitted)

The spare wheel is housed in a standard manner
To release the wheel, remove the wheel fastener (rod or screw)



Wheel fastener kit



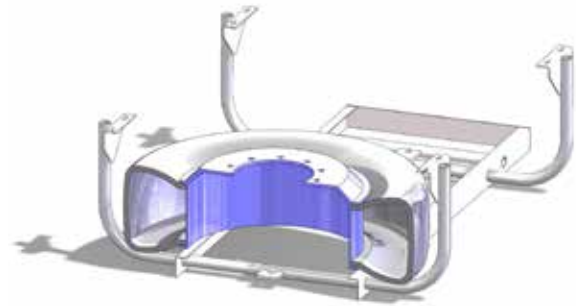
Rod type wheel fastener kit

⚠ CAUTION ⚠

When fitting or removing the spare wheel, pay attention to positioning; the rim must not touch the wheel carrier. See below (double wheel carrier):



Incorrect positioning



Correct positioning

The same applies to a single wheel carrier

D.7.3) Wheel chock (If fitted)

The use of wheel chocks is strongly recommended during unhitching. Once the tractor is hitched, do not forget to remove the wheel chocks before setting off.



D.7.4) Mudguards

The rear mudguards are fitted with dirt shields, which must be cleaned at regular intervals. The fitting of the mudguards is subject to regulations and cannot be modified.



D.7.5) Wheel fitting and removal

Before fitting

- ➔ Check that the wheels, discs and rims are free of foreign bodies, burrs and oil.
- ➔ Check that there are no foreign bodies on the various components to be assembled in order to ensure a clean seat.

 **IMPORTANT: In order for these operations to be carried out safely, operators must be trained when they start working for the company.**

Fitting/removal:

- ➔ Lightly oil (do not grease) the bolt threads and the back faces of the nuts.
- ➔ Screw on the nuts without locking them, in the order specified below.
- ➔ Lock the nuts (in the same order as before), using the spanner provided with the vehicle, as indicated below (see table on page 23 for tightening torques).
- ➔ If necessary, check that the bushings are correctly positioned (depending on make of axle).




PROHIBITED



CORRECT



TIGHTENING ORDER

 **Note:**

- Excessive tightening can cause damage. It is therefore strongly recommended that extensions are not used to increase the tightening torque.
- In the event of nut loosening problems, it is strongly recommended that a specialist with an impact spanner be called.

After fitting:

- ➔ The tightening of the wheel nuts must be checked after around 50 km, then after a further 100 km, after commissioning and wheel changes.
- ➔ Check that there are no foreign bodies on the various components to be assembled in order to ensure a clean seat.

Tyres:

The tyre pressure must be checked with cold tyres (several hours after stopping).

- Reminder:
- ➔ Never deflate a hot tyre.
 - ➔ Unequal pressure in dual tyres causes many types of damage.

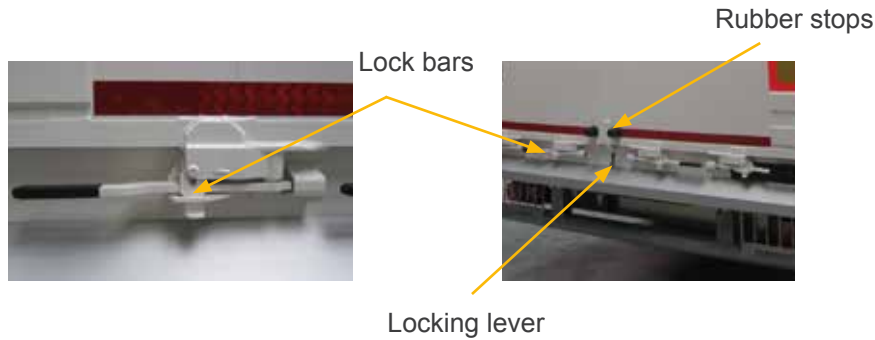
Tightening torque table
daN.M (+/-5%)

Rim	M18	M20	M22
Aluminium	X	X	55 to 65
Steel	25 to 30	35 to 45	45 to 55

Type of tyre	TYRE PRESSURE	
	BAR	PSI
445/45 R19.5	9.0	130
11 R22.5	8.0	115
12 R22.5	8.5	125
13 R22.5	8.5	125
385/55 R22.5	9.0	130
385/65 R22.5	9.0	130

D.8) Doors

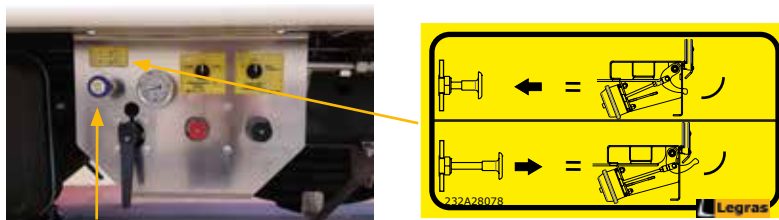
D.8.1) Manual door with pneumatic locking and unlocking



Rear door locking system to prevent them being opened from the left-hand side

Operation:

- If grain or any other product that exerts a large amount of pressure on the rear doors is being transported, open the grain trap(s) (optional) before unlocking the doors.
- Then, lift the two-door lock bar locking levers on the right-hand door and open it. Carry out the same procedure with the other side.
- Before operating the unlocking control, check that this can be done safely (there are no people or obstacles in the operating range of the door).
- Operate the unlocking control (the doors open).
- Fold the doors back on the side of the body and secure them with the wind brace hooks.
- The doors close like conventional doors.
- When the doors are closed operate the control to activate the lock hook.



Locking/unlocking control



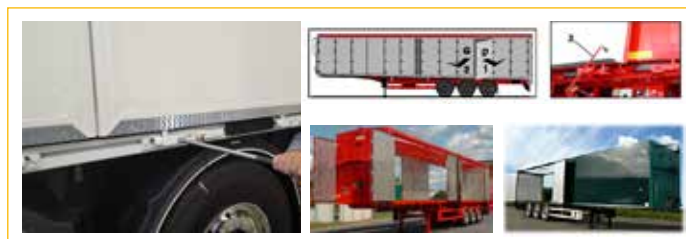
CAUTION:

- Before operating the unlocking control, check that this can be done safely (there are no people or obstacles in the operating range of the door).
- For safety reasons (spring compressed with over one tonne of pressure), an approved workshop must be consulted for all operations on the lifting cylinder (removal).

D.8.2) Side door

Manual side door

- ➔ Lift the door lock bar locking levers on the right-hand doors (1), open the doors and secure them with the wind brace hooks (3) or chains and snap hooks provided for this purpose.
- ➔ Carry out the same procedure for the left-hand doors (2).
- ➔ To close, start by closing and locking the left-hand doors (2). Then close the right-hand doors (1); a lever is provided to help close the doors.



D.8.3) Hydraulic door

Equipment:

The hydraulic door is operated by two cylinders
The control is located in the left-hand rear overhang in the direction of travel



Operation:

- Before opening or closing the door, check that this can be done safely (there are no people or obstacles in the operating range of the door). A buzzer sounds when the door moves
- First, start up the tractor or unit hydraulic circuit
- Then press the middle push-button to open the door.
- Simultaneously press the two push-buttons located at the ends of the control to close the door



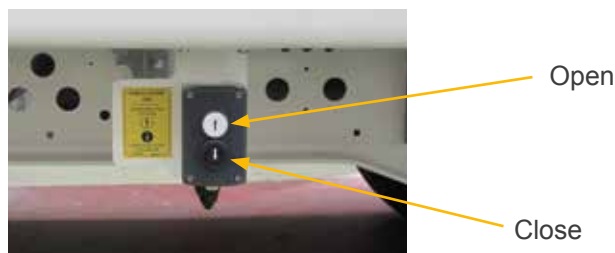
IMPORTANT

- Before any operation of the door, check that this can be done safely (there are no people or obstacles in the operating range).
- Do not open the hydraulic door before the nets have been opened.
- Check the cleanliness of the locking levers located on the side panels.
- The factory settings for the hydraulic door opening/closing speed must not be altered under any circumstances.

In the case of lack of accessibility at the back of the vehicle, the control box is fitted in the wheelbase.



WARNING : To be used only in case of unloading in pit.



IMPORTANT : The levers of the hydraulic distributors should be fitted only for maintenance reason, not in use



D.8.4) Inspection door on front panel or hatch

This is a small sealed door with a ladder on the right- or left-hand side. It provides access for cleaning the rear of the movable wall and semi-trailer. Before opening the hatch, check that the hydraulic unit is not operating; after use, check that the hatch is closed properly.



D.9) Roof equipment

D.9.1) Roof sheet

Remove the straps from the sides and the bungee cords (cords on flat roof only) with the tarpaulin pole (1), then insert the tarpaulin handle (2) into the sheet profile. Roll the sheet around the profile to the opposite edge, against the tarpaulin stops (3). Carry out the reverse procedure to replace the tarpaulin.



Tarpaulin stop



Tarpaulin profile



Tarpaulin pole



U-shaped tarpaulin handle

D.9.2) Roof net

D.9.2.1) Mechanical nets:

Using the crank located on the front left or right of the front panel, turn the reduction gear shaft to open or close the nets.



D.9.2.2) Hydraulic nets:

Start up the tractor or unit hydraulic circuit.

Push the spool valve lever upwards to open the nets or press the net opening push-button.

Push the spool valve lever downwards to close the nets or press the net closing push-button.

D.9.2.3) Two thirds/one third nets or tarpaulin net:

As for mechanical nets

OR

As for hydraulic nets

This system is used to close part of the nets or tarpaulin



BEFORE OPERATING THE NETS

- Check that it can be done safely (there are no people or obstacles in the operating range of the nets).
- Do not open the hydraulic door before the nets have been opened.
- The nets must be opened in the following order:
 - *Opening: - open the left net and then the right net.
 - *Closing: - close the right net then the left.
- No attempt must be made to compact products with the nets.

D.9.3) Hydraulic Roof opening

- Before opening or closing the roof, check that this can be done safely (there are no people or obstacles in the operating range of the roof).
- First, start up the tractor or unit hydraulic circuit
- Push the spool valve lever upwards to open the roof or press the roof opening push-button for semi-trailers fitted with a solenoid valve block assembly.
- Push the spool valve lever downwards to close the roof or press the roof closing push-button for semi-trailers fitted with a solenoid valve block assembly.

ROOF CLOSED



ROOF OPEN



The triangles act as a guide when opening and closing the roof.



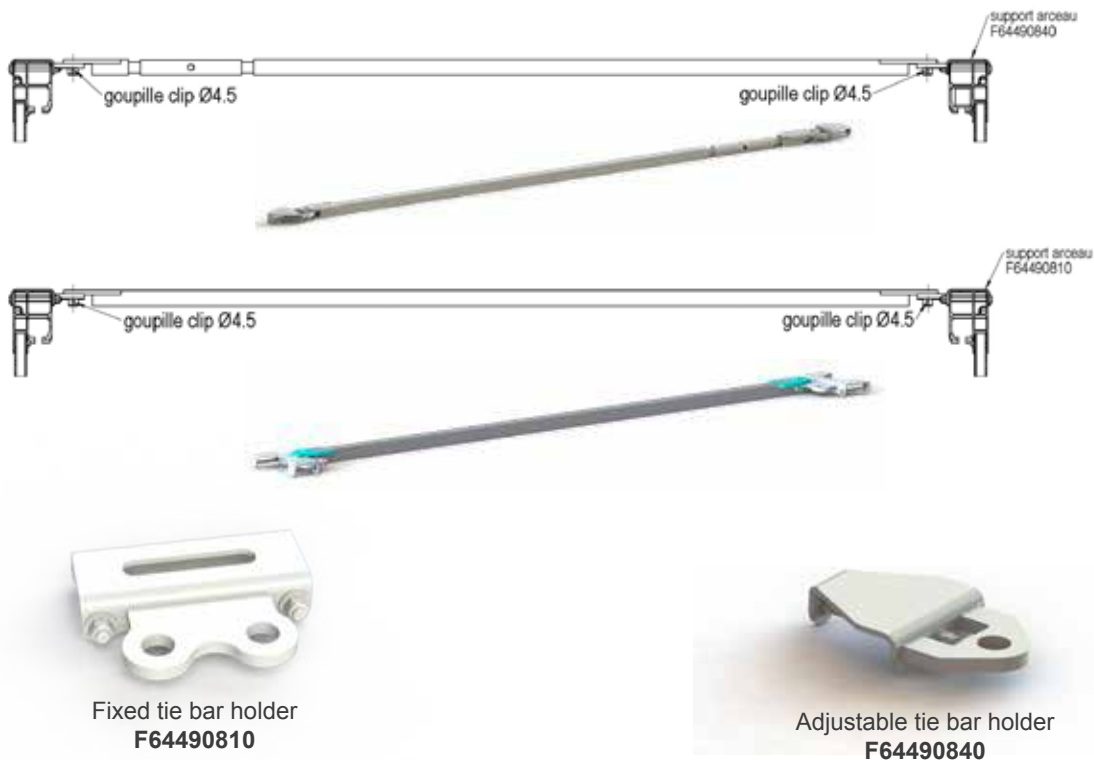
CAUTION:

- No attempt must be made to compact products with the roof.
- The closing of the roof is factory set. Do not adjust the flow valves to speed up closing.
- Brush and clean the guide rails frequently, and check the wear on the friction pads.

D.10) Tie bar fixture

USING THE FIXED TIE BAR AND THE ADJUSTABLE TIE BAR :

Before loading the tie bars can be moved to give fully open loading space (only if it is safe to do so and in exceptional circumstances), after removing the tarpaulin, fold back the tie bars along the right-hand panel. Hook the free end of the tie bars into the free holder.



After loading, put the tie bars back in position; if they cannot be put back in their holders, use the adjustable bow. Place the adjustable tie bar next to the tie bar to be repositioned, loosen the adjustable part until it fits in place on the panel and then tighten it until the fixed tie bar can be put in place. Carry out the same procedure for the other tie bar. Red triangles mark the location of each tie bar. (this operation should only be done in exceptional circumstances)



Caution: All of the tie bars must be put back in place before setting off.

D.11) Mobile wall

D.11.1) Manual mobile wall

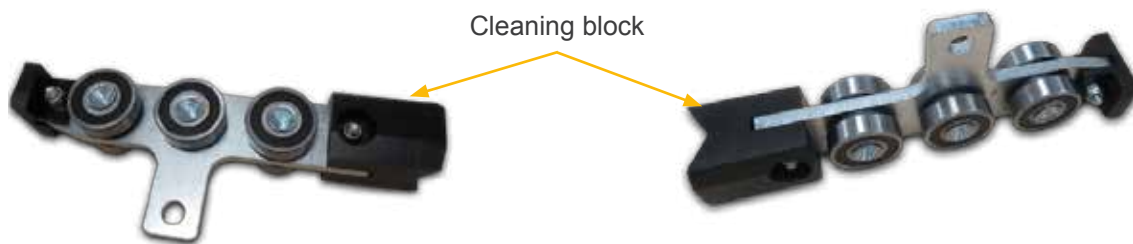
- ➔ Before loading, push the mobile wall right back towards the front panel of the semi-trailer.
- ➔ Lower the canvas liner onto the floor if it has previously been folded back against the mobile wall.
- ➔ Position the canvas block as far away from the wall as possible.
- ➔ Load the semi-trailer, distributing the load over the entire inside length.
- ➔ Clean the guide rails frequently to optimise smooth operation



Leave some play so that the protective canvas is not stretched too tight.

Top rail cleaner:

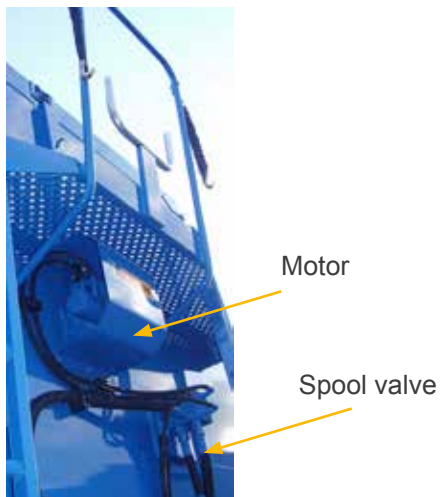
The rail cleaner works during operation of the movable wall and is made up of three components; it is fixed to the mobile wall



D.11.2) Hydraulic mobile wall

Before loading, push the mobile wall right back towards the front panel of the semi-trailer by pressing the push-button.

Front panel



Canvas start position



Unfolded canvas

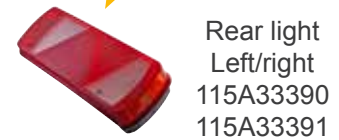
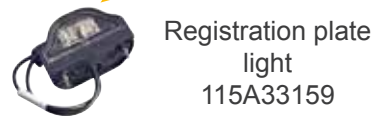
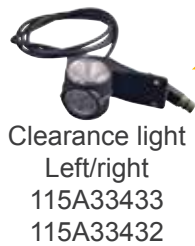


Electric control

Button located on the left-hand side at the rear, in the direction of travel (other side for the UK)

D.12) Lighting and signalling D.12.1) Lighting

IDENTIFICATION ON THE SEMI-TRAILER



Rear light in detail



- 1. Cabochon
- 2. Bulbs
24V 21W
24V 21W orange
24V 10W
- 4. 7-pin connector
- 5. Protective cover
- 6. Stop light mount
- 7. Turn signal bulb 24V 21W orange
- 12. 2-pin connector
- 11. Seal connecting screw

D.12.2) Connecting the various sockets

24N socket

Contact	Circuit	Wire colour
1	Earth	White
2	Left-hand clearance and rear position light and reg plate lighting	Black
3	Left-hand direction indicator light	Yellow
4	Stop light	Red
5	Right-hand direction indicator light	Green
6	Right-hand clearance and rear position light and reg plate lighting	Brown
7	Optional (locking, self-steering axle, working light, etc.)	Yellow/Black



24N socket
N.F.R.43-406 ISO 1185

24S socket

Contact	Circuit	Wire colour
1	Earth	White/Black
2	-	Purple
3	Reversing light and trailing axle	Grey
4	Power supply	Brown/Blue
5	Laden delayed lifting control (earth)	Green
6	Lift axle	Pink
7	Fog light	Blue

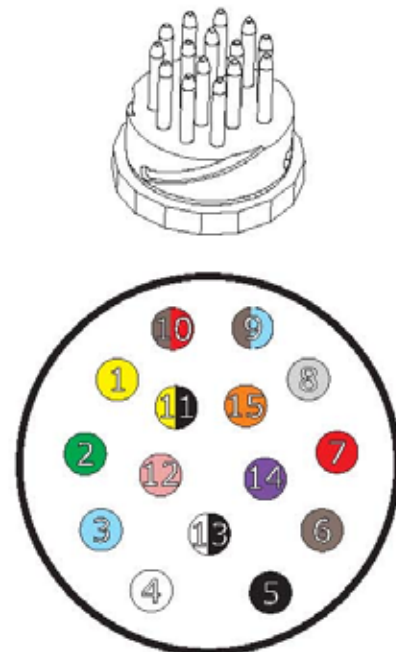


24S socket
N.F.R.43-409 ISO 3731

24-VOLT 15-PIN PLUGS For lorries, trailers and semi-trailers

Contact allocation	Section in mm ²
1 Left turn signal light	1.5
2 Right turn signal light	1.5
3 Rear fog light	1.5
4 Earth	2.5
5 Left-hand rear light Left-hand position light Left-hand registration plate light (1)	1.5
6 Right-hand rear light Right-hand position light Right-hand registration plate light (1)	1.5
7 Stop light	1.5
8 Reversing light	1.5
9 General power supply (+24V)	2.5
10 Brake wear sensor	1.5
11 Brake pressure sensor	1.5
12 Axle raising mechanism	1.5
13 Earth for contacts 14 and 15	2.5
14 Reserved for data transmission	1.0
15 Reserved for data transmission	1.0

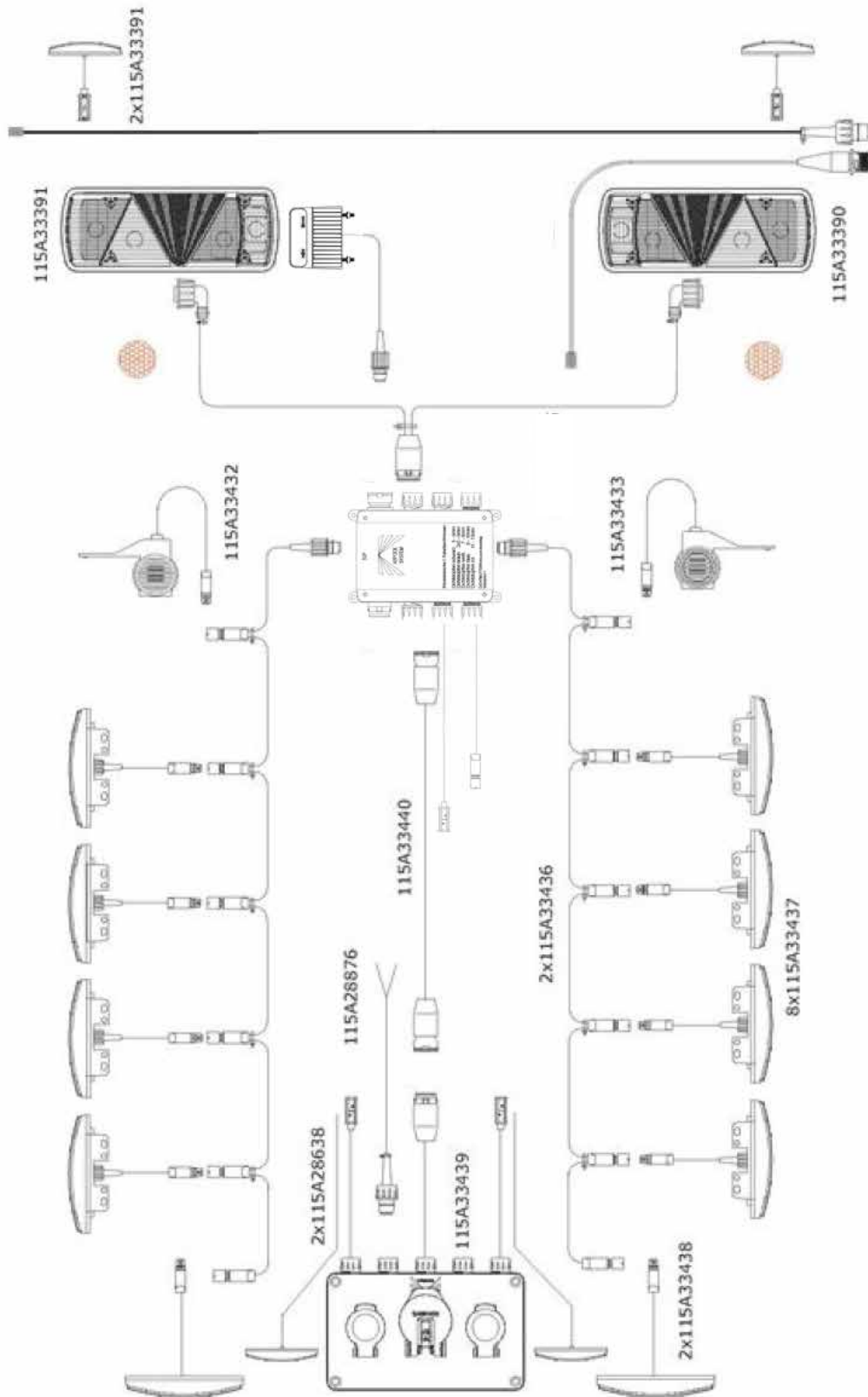
Prises 15 broches 24 volts



(1) The registration plate lighting unit must be secured so that none of the lights in the unit is connected to contacts 5 or 6.

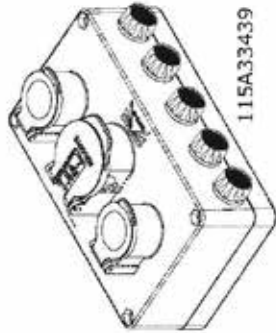
D.12.3) Wiring diagram

WIRING DIAGRAM

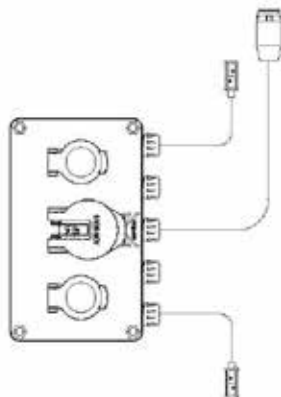


WIRING DIAGRAM

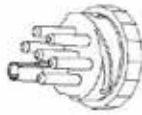
Front distribution box



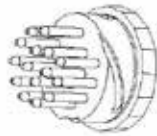
115A33439



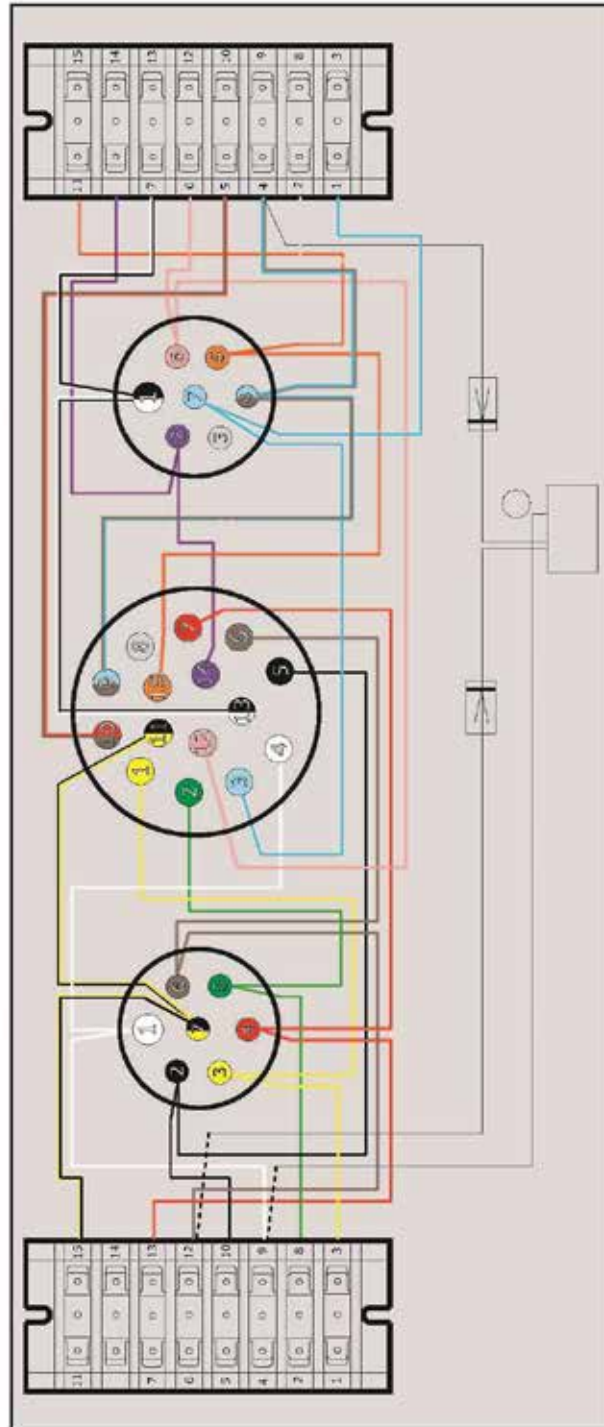
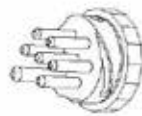
Socle type 24s



Prises 15 broches 24 volts

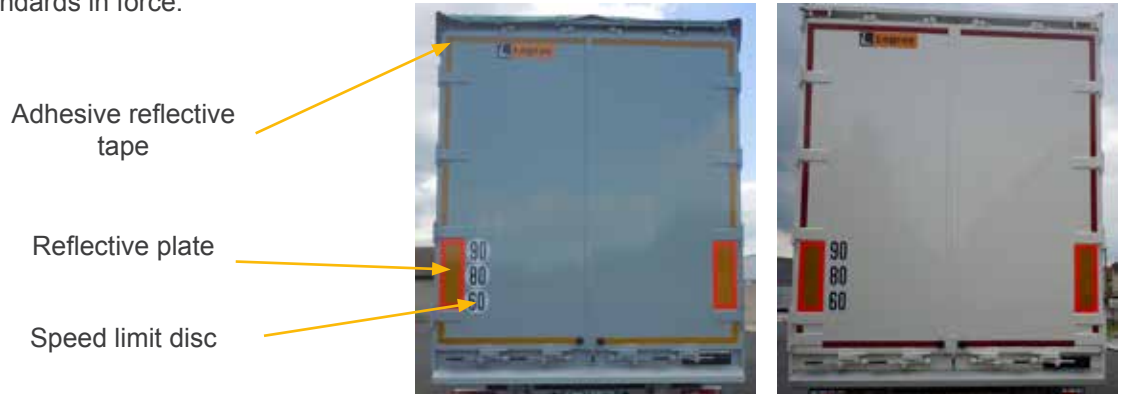


Socle type 24N

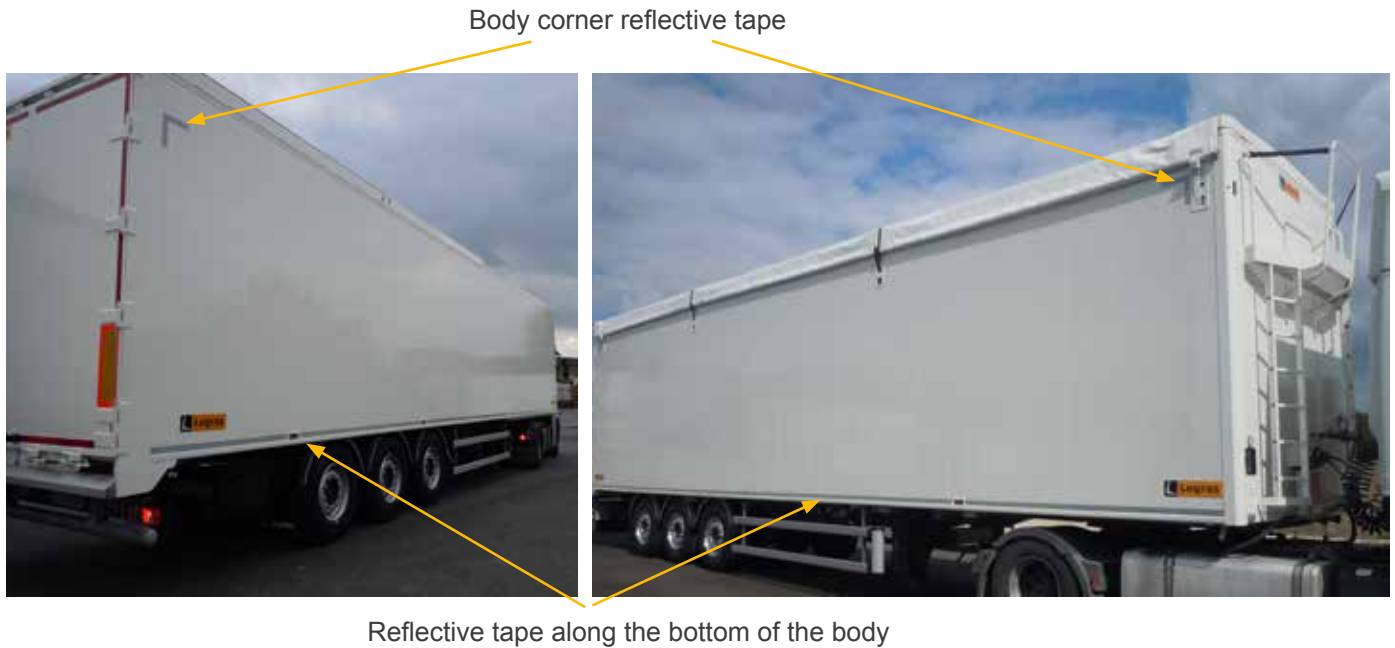


D.12.4) Signalling

Reflective plates are riveted to the side of each rear door (Not required in the UK).
 Yellow or red reflective tape.
 Speed limit discs depending on the country (not required in the UK).
 In accordance with standards in force.



Reflective tape all along the bottom of the side panel and on the upper body corners.



Option: for transport of hazardous materials, plates are fastened to the rear doors (**figure 1**) and to the safety guards (**figure 2**).

This provides information about the type of load and can be changed depending on the product being transported in the semi-trailer.



Fig. 1

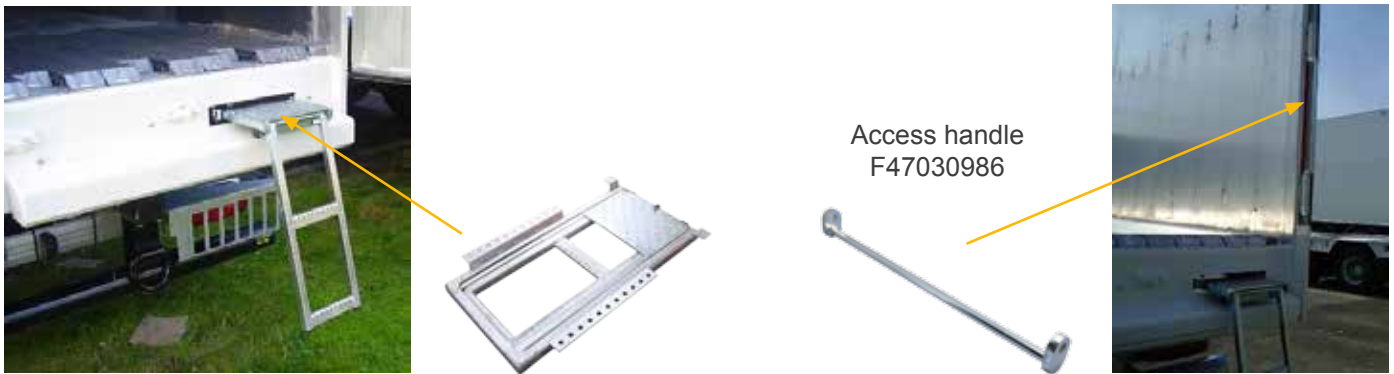


Fig. 2

E) Miscellaneous equipment and options

E.1) Retractable ladder, right-hand interior access handle

There is a retractable step with a platform built into the rear platform cross-member. To make it easier to climb into the semi-trailer, an access handle can be fastened between the two rear door hinges.



E.2) Tool box in rear overhang

Tool box secured with two aluminium angle brackets painted the same colour as the chassis. The assembly is fastened to the flat surface of the side member.

Internal volume 80 litres.



E.3) Shovel and brush holder under chassis F00027100

Assembly made up of angle brackets and long-handled tool clips, fastened to the underside of the side member, generally between the spare wheel carrier and the axles.



Tool clip
107A28625

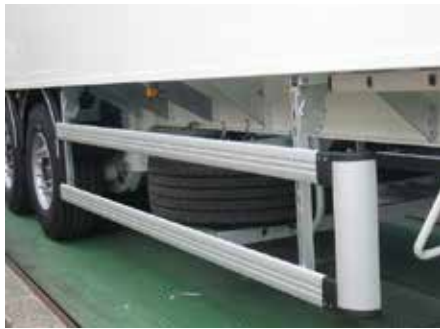
Shovel and brush holder angle
bracket F21860231

E.4) Side protection

The side protection helps to protect other road users (motorcyclists, cyclists, etc.)

Operation

- ➔ Remove the clips on each side of the brackets.
- ➔ Position the guard upwards and put the clips back in the holes provided.



After handling, the guards must always be left in their initial position; check that the clips are put back securely in the guard brackets

E.5) Rear buffer

One-piece rear buffer with concealed fastening screws.
Enables better flow of product.



E.6) Floor canvas liner with reel

The floor canvas liner protects the floor and is used for abrasive products (glass, etc.); it also makes cleaning easier to facilitate transport of different products.

There are three types of operation: Manual
Pneumatic
Hydraulic

The same principle applies to all three methods.



Ratchet



Reel handle

Open the doors

Lower the light guard and extend the canvas up to the front panel (figure 1).
Position the mobile wall canvas on top of the canvas from the reel (figure 2).
Close the doors; the semi-trailer is ready for loading (figure 3).



Fig. 1



Fig. 2



Fig. 3

E.7) 3.5 m ladder

Operating conditions

- ➔ Clear the area around the bottom of the ladder (secure the perimeter, remove obstacles, eliminate holes, etc.).
- ➔ Do not place the ladder above a door or passageway.
- ➔ Check that the ladder is stable before climbing it. It must not pivot or move. The supporting surfaces must be flat.
- ➔ Only one person must climb the ladder at a time. More than one person must never climb the ladder at a time, even if their total combined weight does not exceed the maximum permitted load.
- ➔ The slope of the ladder must be between 65° and 75°.



Location of the ladder

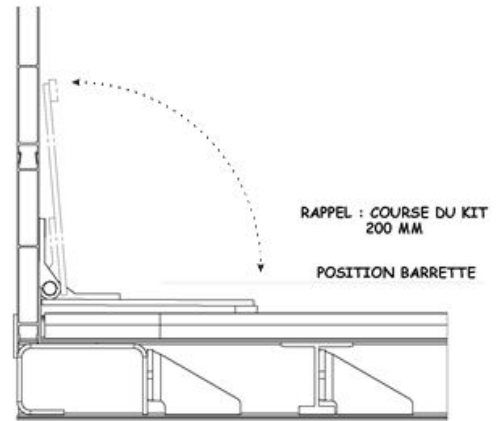
E.8) Front floor cover

Retractable front floor cover

Seals the floor, prevents the product from compacting and blocking the floor; made of aluminium sheet with clevis mounting welded onto the inside of the front panel.
A locking lever located inside on the left-hand side in the direction of travel secures the cover.

The cover is fixed to the front panel using hinges, to facilitate lifting for floor cleaning and prevent deformation of the front panel. This operation must be performed regularly depending on the product transported.





Fixed front floor cover with for open front panel

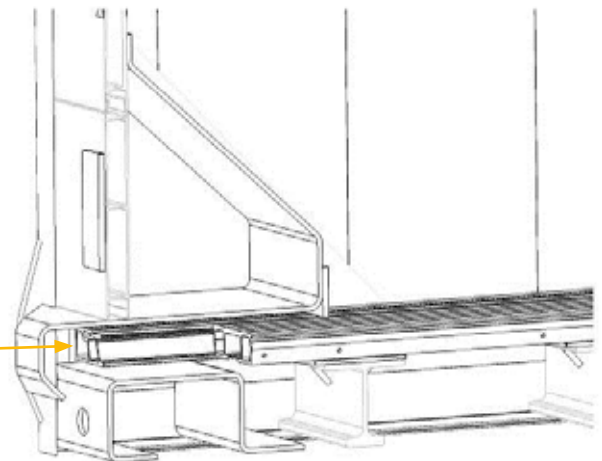
This cover is fixed to the front panel to enable the floor to be cleaned. The cover is open at the front, making it possible to insert a hand or blower and thus avoid deforming the front panel. This operation must be performed regularly depending on the product transported.



Do not operate the floor as there is a risk of accidents (crushed hands).



Access for cleaning



Travel = 200 mm

E.9) Lifeline

The safety system with harness must be used when climbing on the loaded semi-trailer. It enables the user to attach himself to protect against the risk of falling. The installation generally comprises a double lanyard attached to two retaining lines, one along each outside edge of the vehicle roof. The double lanyard is attached to the retaining line by sliding shuttles, allowing access along the full length and across the width of the vehicle.



E.10) Panel-mounted sensors

These sensors are positioned at the rear of the semi-trailer and detect the product during unloading. Once the product has been detected, the system stops the floor and the forklift operator can then take the product with his forklift truck.

Generally used for reels of paper.

On request, front and rear sensors can be installed for loading and unloading, as this prevents damage to the front panel during loading.

Sensor operation



E.11) Light guard

Light guard incorporated into the floor canvas reel mount
Prevents the lights from being damaged when the FMA is operating.



After use, check that the guard is returned to its original position.

E.12) Side panel viewing window

Plexiglas window used to view the product inside the semi-trailer.

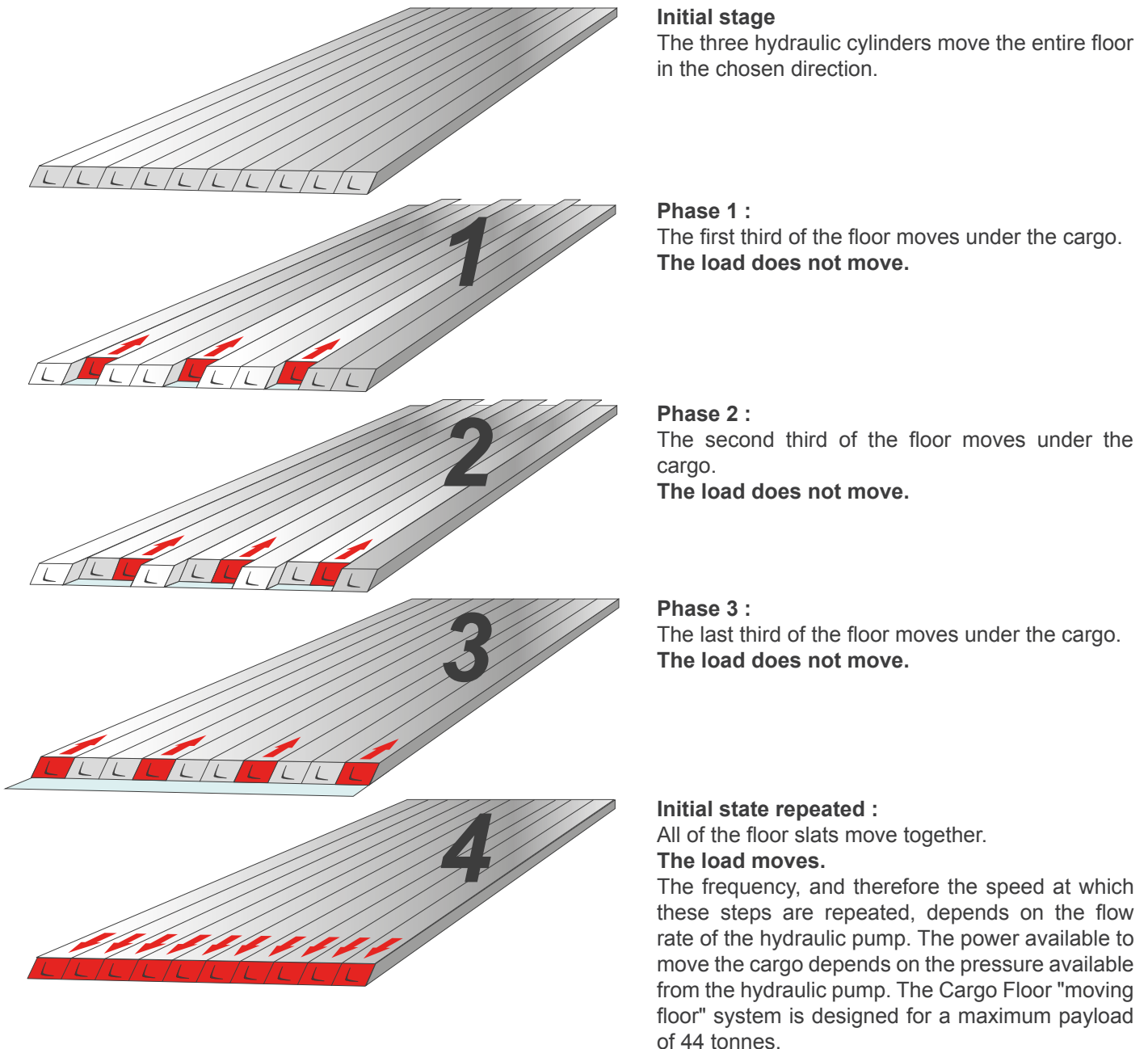
The viewing window can be located at the front/rear, left/right and on each side

Easy to remove in the event of a problem



F) Loading/Unloading

The "FMA[®] moving floor" system is a versatile horizontal loading and unloading system enabling fast, efficient transport of almost any product. The system is ideal for unloading a wide variety of bulk products, which are typically loaded from the top and unloaded horizontally from the rear, using the FMA[®] kit. It can also be used to unload and load packaged materials.



The same principle applies in both directions. In other words, the system can be used for **LOADING** and **UNLOADING**

(Phases 1, 2 and 3 require more pressure than the initial stage).

Please ensure that the maximum permissible king pin and axle loads stated on the manufacturer's plate are complied with.

In the absence of specific information, vehicles are designed to transport evenly distributed loads, and cannot be used for isolated or uneven loads without the manufacturer's permission.

All isolated loads must be placed on a spreader, the strength of which will be designed so that the load per m² borne by the platform is no greater than the value obtained with an evenly distributed load.



F.1) Bulk products

Loading:

Check that the load is evenly distributed and meets the conditions specified for the vehicle.

These instructions are particularly important for centre-axle trailers.

In the event of a problem, please contact Legras Industries.

Unloading:

It is vital that the driver is at the wheel of the tractor with the kit control in his hand, moving the semi-trailer forwards gradually during unloading (onto the ground) to prevent the vehicle from moving forwards by itself due to the force exerted by the product (this does not apply to unloading into a pit).

- ➔ Before loading, push the mobile wall right back towards the front panel of the semi-trailer.
- ➔ Lower the canvas onto the floor if it has previously been folded back against the movable wall.
- ➔ Position the canvas block as far away from the wall as possible, so that the canvas is as flat as possible.
- ➔ Load the semi-trailer, distributing the load over the entire inside length.

Clean the space between the floor and the front panel regularly to prevent the product from clogging.



1) Through the grain hatch(s):

In this case, release the pressure exerted on the doors and then use the unloading system intermittently.



2) Doors open:

See the section relating to doors (manual, hydraulic) and the kit catalogue.



F.2) Products on pallets

It is essential that the bottoms of the pallets are clean (no stones, nails, etc.).

During loading and unloading, Legras floors are designed to withstand forklift trucks with a total laden weight of no more than 7 tonnes or 9 tonnes depending on the floor.

For heavier loads, please consult Legras Industries.



Disposable pallets should be avoided (bottom panels too thin, poor load distribution for heavily laden pallets). If poor quality pallets are being used, place a board 27 to 30 mm thick and 200 mm wide underneath the first layer of pallets and at each end. The board should be placed perpendicularly to the FMA floor slats.

Check that the load is correctly chocked and lashed. In the event of a problem, please contact Legras Industries



Loading:

See the different sections in the following order - door or side door (page 25)
- mobile wall (page 29)

Unloading:

See the section relating to doors (manual, hydraulic) (pages 24, 25) and the kit catalogue.

Bottom panel of the pallet perpendicular to the floor slats. The bottom panel must be as thick as possible (add two boards if necessary).



When loading at a dock, it is recommended that pallets only be loaded with a forklift truck.

G) Maintenance
G.1) Axles

AXLE ASSEMBLY

See the axle manual provided in the information pack.

THE EARLIEST INTERVAL GIVEN APPLIES



For more details, refer to the axle manufacturer's instructions.

	First service operation	Every month or 10,000 km	Every 3 months or 30,000 km	Every year or 120,000 km
Check and adjust the brakes (this does not apply to self-adjusting levers)		D		
Check wear on brake linings or pads		D		
Check the tightening of all nuts	A		0	
Check the correct operation of the brake lever, and grease			0	
Grease cam bearings			0	
Grease steering components of self-steering axle	B		0	
Check steering geometry and tightening torques on self-steering axle	B		0	
Check cam bearings for wear				C
Remove dust from shoes and drum (use a vacuum cleaner, DO NOT USE AN AIR JET)				C
Completely clean hubs and pack with grease				0
Remove brake lever, clean and grease splines				E
Check condition of disc brake castings (cracks, wear, etc.)				0
Check condition of disc brake (cracks, wear, runout, etc.)				0
Check condition of guide pins (play, calliper mobility, etc.)				0

A	Each time a wheel is replaced, check wheel nut tightening after the first 50 kilometres, then after a further 100 kilometres
B	After the first 500 kilometres, then at 5,000 kilometres
C	Each time brake linings are replaced
D	Every 5,000 kilometres for intensive use conditions
E	Every 4 months or 40,000 kilometres for intensive use conditions or for use with frequent pressure washing

G.1.2) Axle alignment

Every 10,000 km.

This is necessary for minimum, even tyre wear.

Regularly check that your tyres are wearing evenly. If necessary, check the axle alignment.

Alignment must be adjusted on a flat surface, without air in the suspension, brakes off and vehicle unladen.

The measurements are taken from the king pin to the centre axle, from the centre axle to the front axle, then from the centre axle to the rear axle.



NOTE: The alignment inspection or adjustment operation is efficient only if the various components are in good condition.

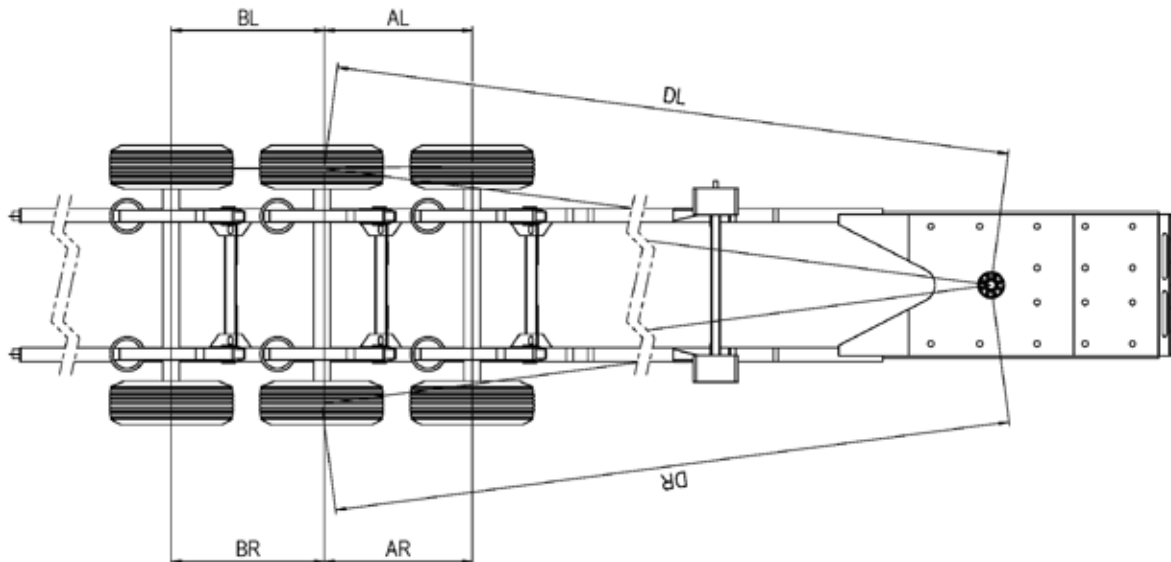
Alignment procedure:

- 1) Loosen the U-bolts on the reference axle (centre).
- 2) Align the axle.
- 3) Tighten the U-bolt nuts progressively and sequentially to the torque setting specified.
- 4) Align the other axles to the reference axle, following the procedure above.

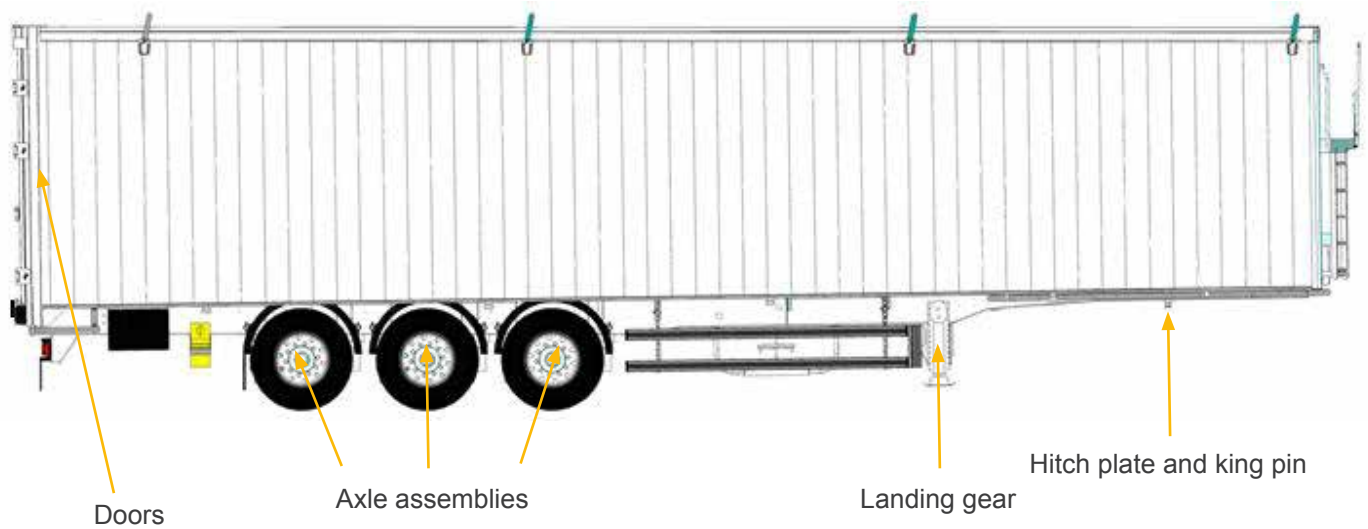
$$AR = AL \pm 3 \text{ mm}$$

$$BR = BL \pm 3 \text{ mm}$$

$$DR = DL \pm 1.5 \text{ mm}$$



G.2) Lubrication



RECOMMENDED LUBRICANTS:

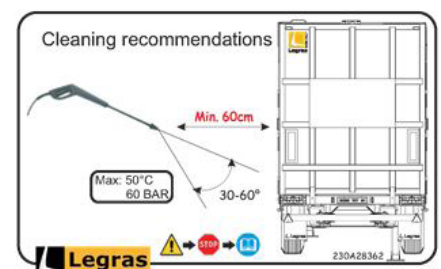
COMPONENT	LUBRICANT
Fifth wheel plate	High pressure molybdenum grease
Hitch plate	High pressure molybdenum grease
Landing gear (housing)	Molybdenum or graphite grease
Landing gear (leg)	Multi-purpose grease
Equaliser beam (spring seat)	Multi-purpose grease
Cam bearings	Multi-purpose grease
Brake levers	Multi-purpose grease
Parking brake screw	Multi-purpose grease
Parking brake linkage	Multi-purpose grease
Hubs	Bearing grease
Brake mechanism (cams, rollers)	Molybdenum grease
Fixed points	Oil

G.3) Body cleaning and maintenance

An acrylic and polyester resin-based (two-part polyurethane) paint system has been used. This provides excellent physical and chemical resistance and is capable of withstanding attack by most products that might damage paint.

In order to maintain satisfactory paint appearance:

- Use detergents with a pH of seven.
 - Automatic washers can be used, but check the detergents applied (pH)
 - High-pressure washers can be used, but the temperature must be below fifty degrees (50°C). The washer nozzle must be kept at least sixty centimetres (60 cm) away from the surface and the pressure must not exceed sixty bar (60 bar).
 - To prevent corrosion of components damaged by impacts, stones, friction, etc., they must be repaired as soon as possible in accordance with the specifications.
 - The use of brushes with hard bristles should be avoided to prevent scratching
 - We will not be held liable for deterioration due to repairs made to damage to the paint that do not comply with our recommendations.
- Do not use caustic soda under any circumstances.



G.4) Maintenance table

TABLE OF MAINTENANCE OPERATIONS AND ROUTINE CHECKS

		Every week or 2,500 km	Every 2 weeks or 5,000 km	Every month or 10,000 km	Every 3 months or 30,000 km	Every year or 120,000 km
Replace	Grease in axles					
Inspect	Wheel nut tightening					
	Tyre pressure					
	Parking brake stroke					
	Brake cylinder stroke, adjust if necessary (manually adjusted lever)					
	Adjustable rod screw locking					
	Axle alignment					
	Oil level in the hubs					
	Brake cylinder stroke (self-adjusting lever)					
	Brake lining wear					
	Condition of parking brake and fixings					
Lubricate	Wear on the king pin and hitch plate					
	Condition of shock mounts on big ends					
	Condition of shock mounts or wear on equaliser bushings					
	Tightening torque of spring clamps					
Bleed	Landing gear telescopic tubes					
	Fifth wheel plate surface and locking mechanism (after cleaning)					
	Cam bearings					
	Brake levers (manual or automatic)					
	Parking brake system					
	Brake cams and compensating pulleys (in moderation)					
Check	Oil the pivot points (in moderation)					
	Compressed air reservoirs					
	In-line filters					
	Loosening torque on automatic brake levers					
	Tightening of draft arm joints					
	Flange nut tightening					
	Air circuit leaktightness					
	Condition of bellows					
	Condition of shock absorbers					
	Condition of draft arms (corrosion)					
Triangulation and alignment						
Check	Condition of wear shims					
	Condition of draft arm rubber joint					
	Hopper cleanliness at all times					



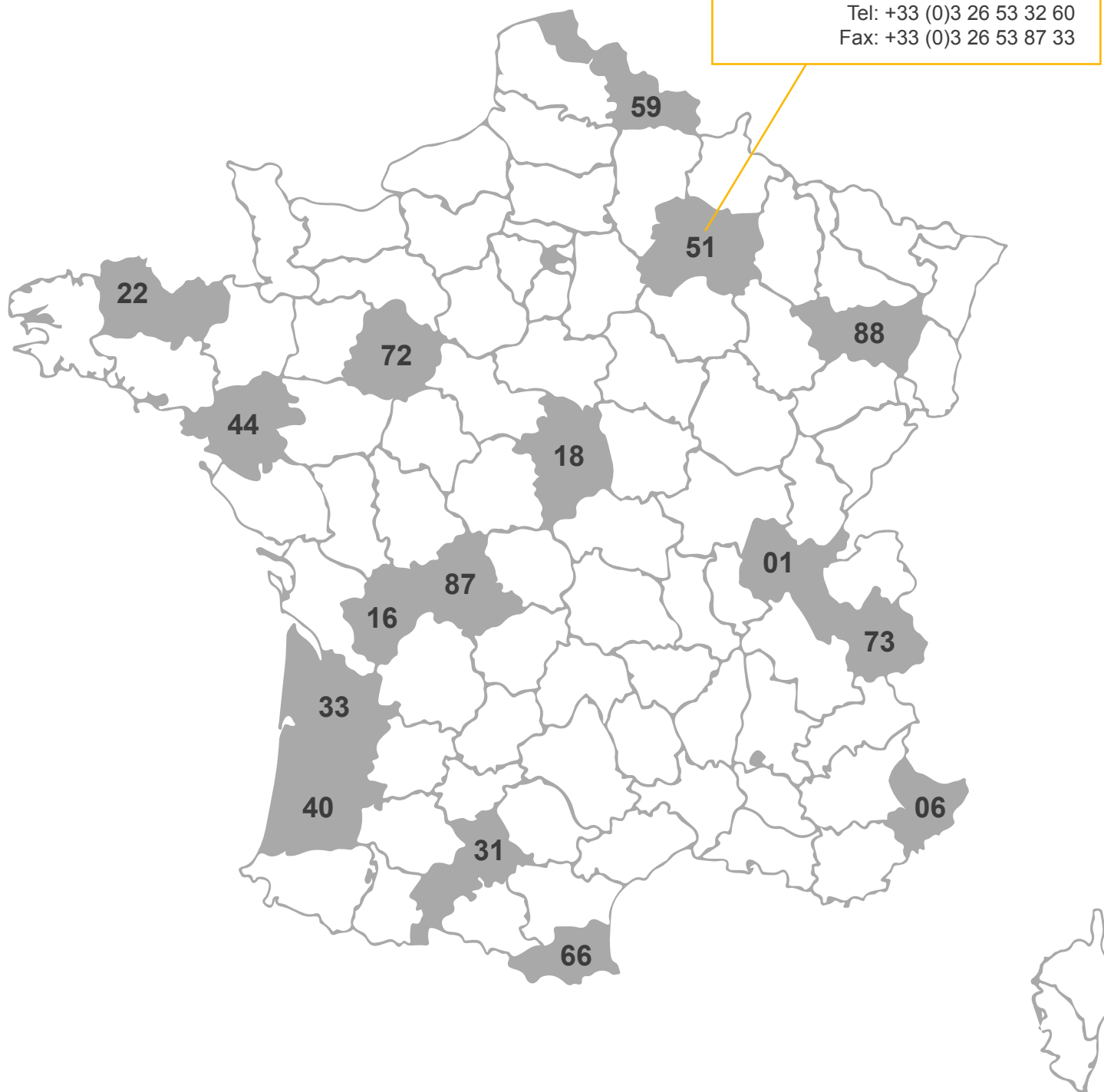
CARNET D'ENTRETIEN
MAINTENANCE BOOKLET
WARTUNG SHEFT

Un réseau France
à votre service !



LEGRAS INDUSTRIES S.A.V

Usine de Korhogo - Rue Vincent Ballu
CS20204 - 51206 Épernay Cedex
Tel: +33 (0)3 26 53 32 60
Fax: +33 (0)3 26 53 87 33



ALL OF OUR ADDRESSES CAN BE FOUND AT:

<http://fr.legras-industries.com/points-services/>

WARRANTY

It is expressly agreed between the purchaser and LEGRAS Industries that:

- 1) New equipment sold by LEGRAS Industries is guaranteed against all material defects and faulty construction for a period of 12 months with effect from the date of delivery
- 2) This warranty covers, for a period of 12 months only, the replacement of parts acknowledged as being defective by LEGRAS Industries or their repair, at the convenience of LEGRAS Industries, with the express exclusion of all incidental expenses.
The purchaser undertakes to return any parts that have been acknowledged as being defective and replaced by new parts.
- 3) The warranty does not cover normal wear and tear as a result of use, or damage that may have been caused by excessive or incorrect use of the equipment.
- 4) The warranty will be withdrawn from any equipment that has been modified without prior written agreement, or from any equipment on which original LEGRAS Industries spare parts have been replaced with parts from another source.
- 5) The warranty does not cover the consequences of work, such as assembly or fitting of components on its products, carried out by third parties.
- 6) Exchanges or repairs of parts carried out under the terms of the warranty will not have the effect of extending the warranty and must be carried out in the LEGRAS Industries workshops.
- 7) The application of the warranty is dependent on the purchaser ensuring that the servicing and instructions concerning maintenance or work on the equipment, as set out in the maintenance documentation provided on delivery, are carried out.

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LEGRAS Industries, a limited company with capital of €3,100,000
Office and factory: 37, rue Marcel-Paul - CS20204 - 51206 EPERNAY CEDEX FRANCE
After sales service tel no: +33 (0)3.26.53.32.60 – After sales service fax no: +33 (0)3.26.51.87.33
Web site: <http://www.legras.fr> - Email: info@legras.fr

BNP Epernay 30004/01 707/000 2500 3454/86 – SIRET no. 095 550307 000 11
VAT no. – FR 25 095 550 307 – APE code 342 A – Company reg. no. B 095 550 307