

Operation and Maintenance Manual Cameleont

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JOAB

Table of Contents

Introduction	V
About Cameleont	1
Cameleont Components	2
Manufacture Plate	3
Safety	5
Operation	9
Hydraulic Pump And Tow-Hitch	9
Hydraulic Control Panel	9
Power/Hydraulic Supply Unit	10
Emergency Stop	10
Loading A Body	13
Unloading A Body	17
Service And Maintenance	21
Daily Maintenance	21
Maintenance For Stationary Vehicles	22
Washing The Cameleont	22
Lubrication Points	23
Service Of The Cameleont	24
Service-Reminder Sticker	24
Technical Data	25
Safety Warnings	27
Contact Information	29
Service And Warranty	29

Introduction

This manual explains how to operate and maintain your Cameleont. It contains important information for your own safety and the surrounding environment.

JOAB's products are characterised by a high level of safety, reliability, and long service-life. To get the best out of your Cameleont, we recommend reading this manual carefully.

This manual also contains information regarding lubrication, and servicing of your Cameleont. This manual is based on the original mounted equipment only. Refer to the relevant supplier's manuals for all other optional or auxiliary equipment.

JOAB takes no responsibility for consequences that occur due to work carried out by non-professionals. Do not make any modifications to the Cameleont as this can effect its structural properties. If a modification is required, contact JOAB for advice before making a modification to the Cameleont.

After receiving the Cameleont, ensure that it is in proper working order. If it is not, contact JOAB, your dealer, or other supplier.

The specifications, constructions, and illustrations found in this manual are not binding. JOAB AB retains the right to make changes without prior notice.

For all Cameleonts sold in Sweden, the general delivery regulations apply.

A training CD is included with certain deliveries. This comprehensively describes how to use JOAB's products, such as Cameleonts, skip loaders, and the Hookmaster.

Always bare in mind that it is the operator that is responsible for handling the Cameleont.

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About Cameleont

Cameleont is an intermediate framework that is jig mounted onto a vehicle's chassis and allows for different types of body to be loaded onto it. This in turn allows a vehicle to become multi-purpose. It can be loaded with various bodies for different functions. To change a body only takes five minutes or less.

Examples of bodies that can be loaded onto a vehicle using the Cameleont include, but not limited to, the following:

- Skip loaders
- Hook lifts
- Refuse containers
- Fifth wheel coupling
- Tip trailer
- Fixed flat bed
- Concrete rotator
- Container tanks
- Vacuum tank
- Logging body
- Crane lift

The Cameleont is designed to work with most manufacturers' chassis and is primarily intended to be mounted on vehicles with three axles. However, it can also be mounted on vehicles with two or four axles.

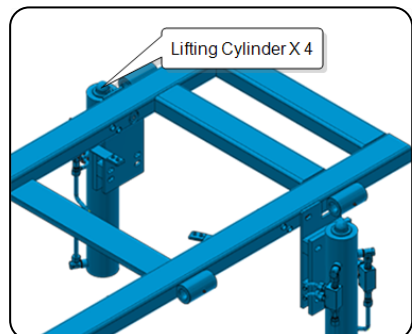
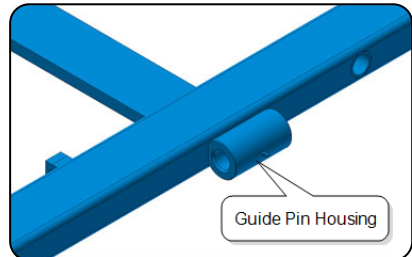
The Cameleont frame is 60 mm high. It has seven guide pin housings on each side of it, as shown opposite (see also "*Cameleont Components*", on page 2). These are used to ensure that a body is correctly guided and secured onto the Cameleont.

The changing of bodies onto and off the Cameleont is done with the use of four hydraulic lifting cylinders and two hydraulic pulling cylinders that are built onto the Cameleont.

The four lifting cylinders are mounted towards the front and the rear of the Cameleont, as shown opposite, two at the front and two at the back.

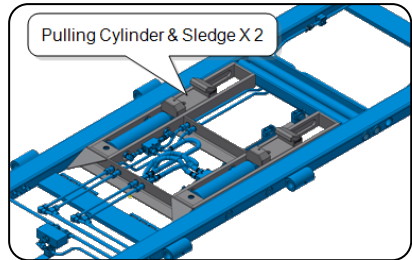
The lifting cylinders are raised and make contact with four corresponding lifting cylinder mountings that are located on the body. This is what bares the load of a body and allows for it to be loaded onto and off the Cameleont.

It is also possible to use a vehicle's own air suspension system, where applicable, to raise

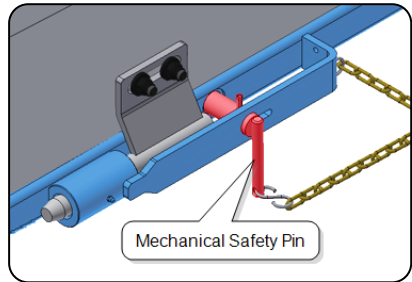


and lower the vehicle so that a body can be landed and removed from the vehicle's chassis. In such cases it is not necessary to use the lifting cylinders. However, the pulling cylinders will still need to be used.

The pulling cylinders are mounted in the middle of the Cameleont, as shown opposite. When a body is lowered onto the Cameleont, a cross member on the body will land into the pulling cylinder sledges. The pulling cylinders are then used to pull the body forwards on the Cameleont. Pulling the body forward moves the guide pins on the body into the corresponding guide pin housings on the Cameleont. This is what locks the body onto the Cameleont.



The body is secured into the guide pin housings with the use of a mechanical safety pin. This is inserted behind one of the guide pins, as shown opposite.



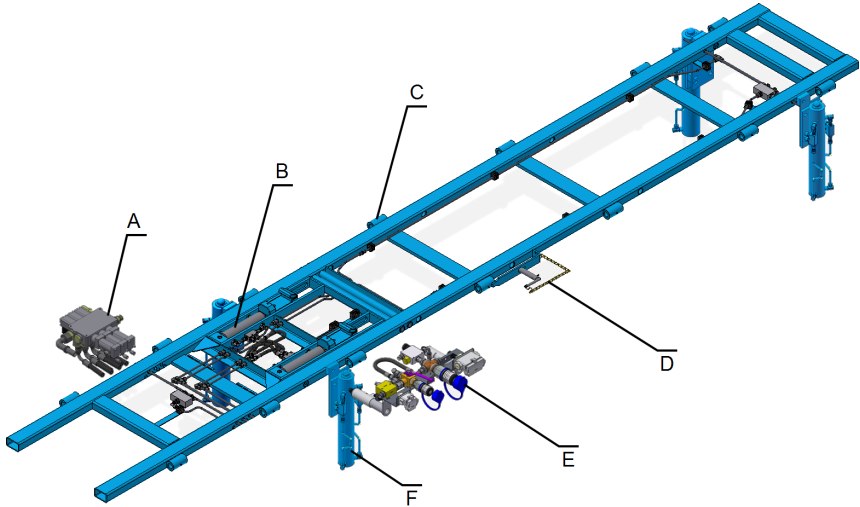
Control of the hydraulic cylinders is done using a hydraulic control panel that is located on the front-right-hand side of the vehicle. Connection of the hydraulic supply as well as the electrical and air connection is made using the power/hydraulic supply unit. This is located on the front left-hand-side of the vehicle. For further information see "*Power/Hydraulic Supply Unit*", on page 10.

It is also possible to order a Cameleont that is either longer or shorter than the standard Cameleont. If a non-standard system is ordered, it is possible that the system cannot be used with other systems. That is, you can only change bodies with your system and not others.

Cameleont Components

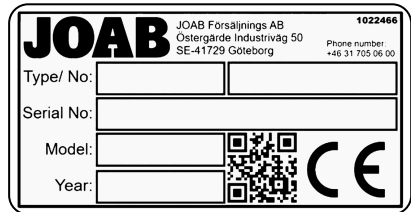
The main components of the Cameleont are listed and shown below.

- | | |
|----------------------------|--------------------------------|
| A. Hydraulic Control Panel | D. Mechanical Safety Pin |
| B. Pulling Cylinder X 2 | E. Power/hydraulic Supply Unit |
| C. Guide Pin Housing X 14 | F. Lifting Cylinder X 4 |

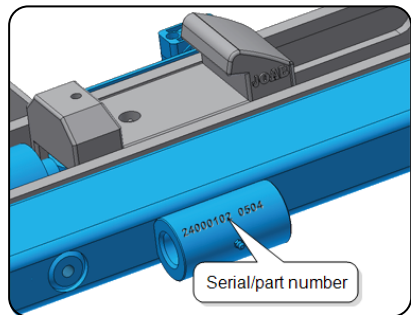


Manufacture Plate

The Cameleont has a manufacture-plate located on the frame. The information on the manufacture-plate must be provided in the event of making a claim or when ordering spare parts from JOAB.



In addition to the manufacture plate, the manufacture number and part number is also stamped onto the guide pin housing on the left side of the pulling cylinder, as shown opposite.



Safety

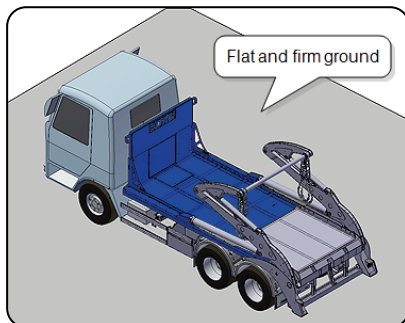


Observe all safety warnings. Failure to do so can lead to serious injury or damage to equipment. For further information regarding warning labels placed on the Cameleont, refer to "Safety Warnings", on page 27.

All personnel operating the Cameleont must read and follow all warnings provided in this manual and on the Cameleont. In addition, all safety warnings stated in manuals for bodies that are used with the Cameleont must also be adhered to.

Before using the Cameleont make sure that you are fully aware of its operation and use. Practise using it so that you are confident in the use of it.

Before changing a body, make sure that the vehicle is positioned on a flat and firm surface. Failure to do so can lead to the body falling over.



Before operating a loaded body ensure that there are no unauthorised person within a 8 meter radius of the vehicle and body.

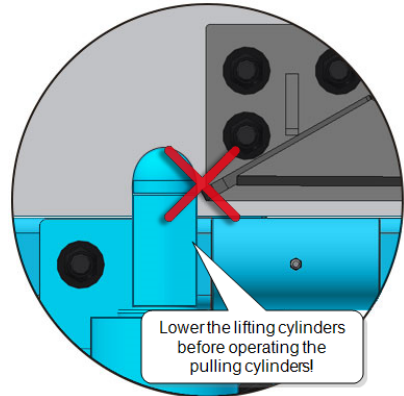


Do not lean or stand under a body or a free standing body. There is a serious risk of injury or death in the event of a failure in the equipment.



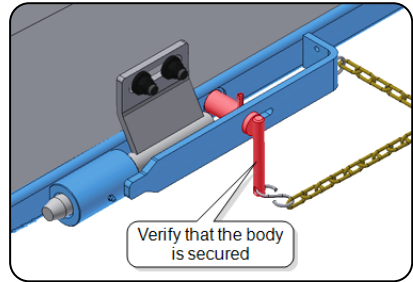
Make sure that the weight on a body is evenly distributed, laterally. Do not change a body if its weight is unevenly distributed.

Fully lower all lifting cylinders on the Cameleont before operating its pulling cylinders. Failure to do so will lead to damage. The lifting cylinders will make contact with the lifting cylinder mountings when pulling a body, as shown opposite.



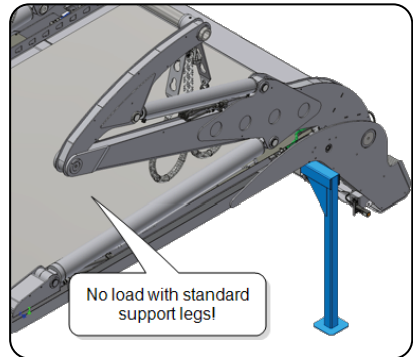
Before driving a vehicle with a loaded body, or operating a loaded body on a vehicle, make sure that the body is fully engaged with the Cameleont.

Verify that all guide pins on the loaded body are fully engaged with their corresponding guide pin housing and the mechanical safety pin is correctly inserted in the Cameleont, as shown opposite.



The support legs that are used to support a free standing body are designed to be used with bodies that **do not** have a load. Do not use the standard support legs with bodies that have a load on them.

Never operate the front and back lifting cylinders at the same time. There is a risk that bodies such as cement mixers, that have a high centre of gravity, can tilt over. Use the front and back lifting cylinders alternatively, and ensure that the body is raised and lowered with a level lift, as much as possible.



Never drive a vehicle with a body resting on the lifting cylinders. There is a serious risk that the body will fall off the vehicle or cause damage to the lifting cylinders.

Do not make any modifications to the Cameleont as this can effect its structural properties. If a modification is required, contact JOAB for advice before making a modification to the Cameleont.

Operation

Operation of the Cameleont is controlled using a set of hydraulic levers and a pump switch. Provided below is a description of this equipment.

Hydraulic Pump and Tow-Hitch

The Cameleont is fed with a hydraulic supply that must be activated in order to operate it or a loaded body. A small LED panel and button for activating the hydraulic pump are normally mounted on the driver's dashboard for this purpose, as shown opposite.



These buttons are JOAB's standard buttons. However, it is possible that the vehicle's own equipment is used instead of those shown.

The driver should familiarize themselves with which buttons and lamps are actual for the operation of the hydraulic pump and tow hitch.

The right button is used to start and stop the hydraulic pump. When active, the pump LED will illuminate red on the left LED panel. For some vehicles a warning will also be displayed in the driver's dashboard. This is dependent upon the manufacturer of the vehicle.

The left LED panel also has two LEDs for vehicles equipped with a tow-hitch, indicating whether or not the tow-hitch is open or closed. Red when it is open and green when closed. The manufacturer of the vehicle may also have their own warning lamp for the tow hitch in the driver's display.

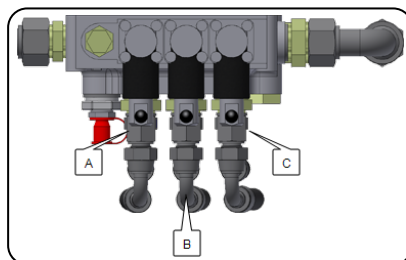
Certain manufacturers, such as Scania, have a reset switch for the tow-hitch's servo. This must be pressed to deactivate the warning for the tow-hitch after it has been locked. If it is not reset, the warning for the tow-hitch will remain active both on the LED panel, and in the driver's display, where applicable.



Hydraulic Control Panel

Control of the hydraulic components on the Cameleont is done using the hydraulic control panel, as shown opposite.

This is located on the right-hand-side of the Cameleont (see *"Cameleont Components"*, on page 2) and controls the lifting cylinders and the pulling cylinders.



The levers allow for the cylinders to be extended and retracted. They have the following functions:

- A. Lifting Cylinders – front
- B. Pulling Cylinders
- C. Lifting Cylinders – back

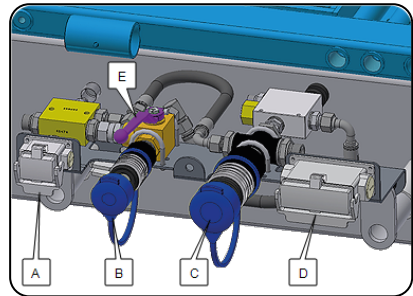
Labels are placed next to the controls to clearly indicate what each lever does.

The lifting cylinders are used to lift and lower a body onto the Cameleont. The pulling cylinders are used to pull the body forwards so that it engages with the Cameleont's guide pin housings and is secured onto the vehicle.

Power/Hydraulic Supply Unit

On the left-hand-side of the Cameleont is the power/hydraulic supply unit, as shown opposite. This is used to connect the hydraulic lines, the electrical feed, and the air supply to the loaded body.

It is also used to switch the hydraulic supply to either the Cameleont or the loaded body, using the hydraulic lever valve. Provided below is an explanation of the different connections.



- A. Electrical supply
- B. Hydraulic supply ($\frac{3}{4}$ " coupling)
- C. Hydraulic return (1" coupling)
- D. Air supply
- E. Hydraulic-lever-valve

The connections shown above have a label placed next to them stating the function each connection has.

To set the hydraulic lever valve so that it supplies the loaded body, turn it so that the handle is in line with the supply connection, as shown.

Emergency Stop

In case of an emergency, such as a hydraulic leak or risk of injury, an emergency stop button is fitted to all vehicles.



Pressing the emergency stop button will stop all functions of the Cameleont or loaded body immediately. The button is usually placed below the steering wheel, in the cab.

To reset the emergency stop function, pull the button out, reset all functions to neutral, then switch off and restart the vehicle's engine.

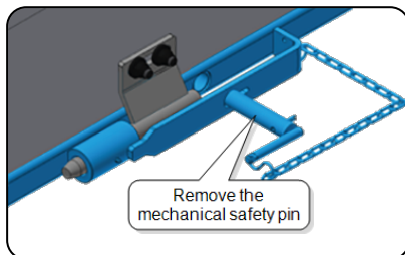
Loading a Body



The operator of the Cameleont is responsible for handling it. Care must be taken to avoid injury or damage. Before operating the Cameleont make sure that you have read and are fully aware of the warnings in this manual and on the Cameleont.

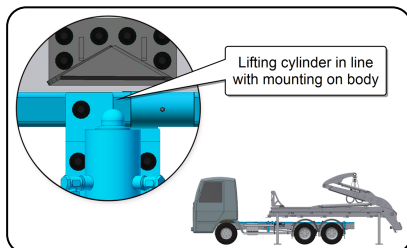
To load a body onto the Cameleont, follow the procedure listed below:

1. Fully Lower the front and the back lifting cylinders to ensure that all of them are in their bottom most position before starting a loading operation. This will ensure that the lifting cylinders do not cause any damage when reversing the vehicle in, under the body.
2. Remove the mechanical safety pin from the Cameleont. To do this, turn the mechanical safety pin 90 degrees clockwise and then pull it out, as shown.



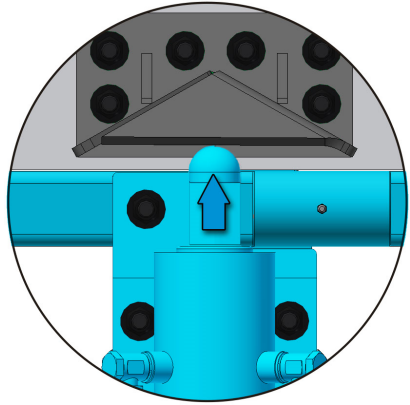
3. Carefully reverse the vehicle in under the body and stop when the four lifting cylinders on the Cameleont are vertically in line with the lifting cylinder mountings on the body, as shown opposite.

Be careful when reserving the vehicle in under the body. Make sure that the same amount of distance exists on both sides of the vehicle and the support legs on the body.

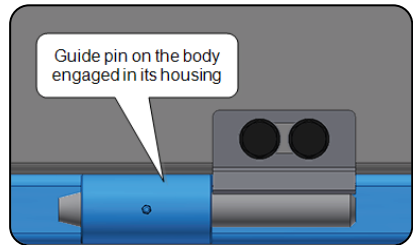


4. Apply the vehicle's parking brake.
5. Turn the hydraulic pump ON. See *"Hydraulic Pump and Tow-Hitch"*, on page 9.

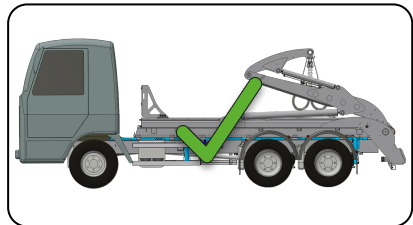
6. Raise the front and the back lifting cylinders, in turn, until they enter their corresponding lifting cylinder mountings on the body and then stop.
7. Visually inspect and verify that the four lifting cylinders are correctly aligned with the lifting cylinder mountings and that they are at the same height. Adjust as necessary.
8. Fully raise the front and the back lifting cylinders, in turn, so that the body is lifted off the ground and its support legs are free.
9. Either remove, or raise and secure the support legs on the body, as appropriate.
10. Lower the front and back lifting cylinders, in turn, until they are fully lowered and the body is resting on the Cameleont.



11. Visually inspect the body and ensure that it is correctly lowered onto the Cameleont.
12. Operate the pulling cylinders and pull the body forward on the Cameleont so that the guide pins on the body fully engage with their corresponding guide pin housings on the Cameleont.



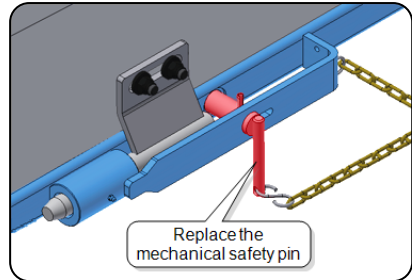
13. Inspect and verify that the body has correctly loaded onto the Cameleont and that all guide pins are correctly inserted in their housings on the Cameleont.



14. Place the Cameleont's mechanical safety pin back into its corresponding hole on the Cameleont frame as shown, so that the body is secured. Insert the pin and then turn it 90 degrees anti-clockwise.



Failure to make sure the mechanical safety pin is correctly placed can lead to serious injury or damage.

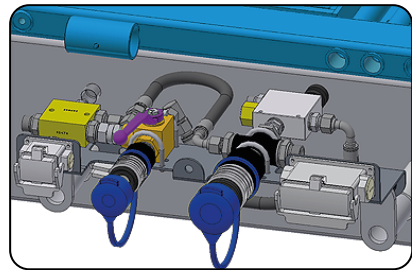


15. Connect the supply lines to the loaded body in the order listed below.



***Do not** connect them in any other order than listed below. This will ensure safe and correct operation of the equipment.*

- a. Connect the hydraulic return line onto the 1" coupling.
- b. Connect the hydraulic supply line onto the 3/4" coupling.
- c. Connect the air system to the body.
- d. Connect the electrical system to the body.
- e. Turn the hydraulic-lever-valve to "Påbyggnad Superstructures".
- f. Turn the hydraulic pump OFF.



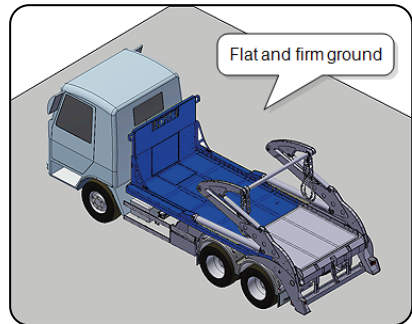
Unloading a Body



The operator of the Cameleont is responsible for handling it. Care must be taken to avoid injury or damage. Before operating the Cameleont make sure that you have read and are fully aware of the warnings in this manual and on the Cameleont.

To unload a body from the Cameleont, follow the procedure listed below:

1. Select a flat and firm area for the body to be unloaded. If the surface is not flat and secure there is a risk that the body may fall over.

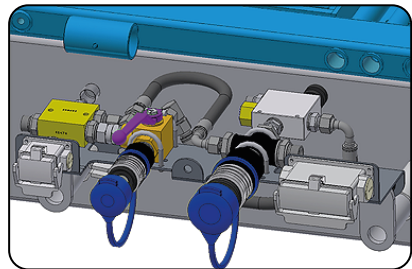


2. Disconnect the supply lines from the body in the order listed below.



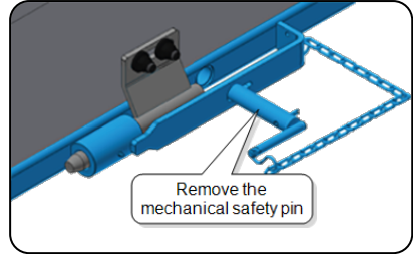
Do not dis-connect them in any other order than listed below. This will ensure safe and correct operation of the equipment.

- a. Turn the hydraulic pump OFF. See "Hydraulic Pump and Tow-Hitch", on page 9.
- b. Turn the hydraulic lever valve so that it supplies the Cameleont.
- c. Disconnect the hydraulic supply line from the $\frac{3}{4}$ " coupling.
- d. Disconnect hydraulic return line from the 1" coupling.
- e. Disconnect the air system.
- f. Disconnect the electrical system.



A label is stuck next to the connections, clearly stating what each is for.

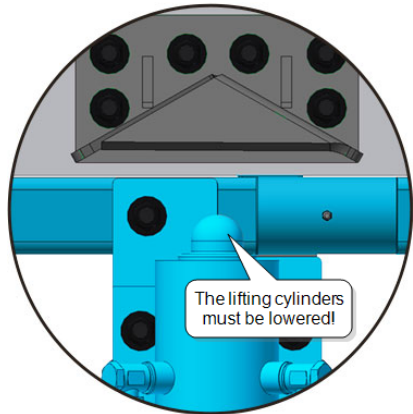
3. Remove the mechanical safety pin from the Cameleont. Turn the pin 90 degrees clockwise and then pull it out, as shown opposite.
4. Turn the hydraulic pump ON.



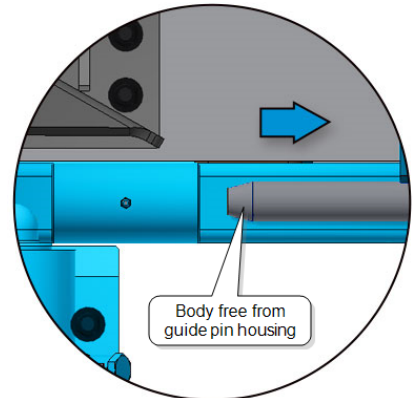
5. Use the hydraulic control panel and *lower* the front and the back lifting cylinders to their lowest level.



Failure to lower the lifting cylinders will cause damage. When the body is pulled backwards the lifting cylinder mountings will make contact with the lifting cylinders if they are raised. Lower the lifting cylinders first.

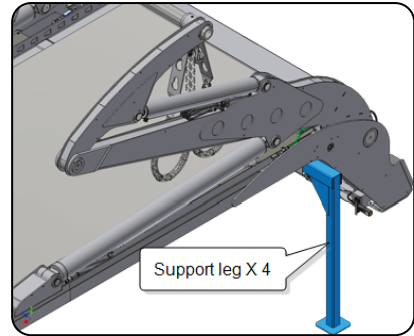


6. Operate the pulling cylinders and move the body backwards, so that it becomes free from the guide pin housings on the Cameleont, as shown.
7. Visually inspect and verify that the body is free from the guide pin housings on the Cameleont.
8. Raise the front and the rear lifting cylinders, in turn, so that the body is lifted from the Cameleont and the lifting cylinders are fully extended.



9. Mount the four support legs for the body into their corresponding mounting points on the body, two at the front and two at the back, so that they are able to take the load of the body (or lower the support legs where applicable). Make sure that the support legs are correctly positioned and secure.

10. Lower the front and rear lifting cylinders, in turn, until the support legs on the body make contact with the ground and then stop.



11. Visually inspect and verify that the body is stable and has a firm grounding.

12. Fully lower the front and rear lifting cylinders.

13. Turn the hydraulic pump OFF.

14. Drive the vehicle carefully out from under the body.

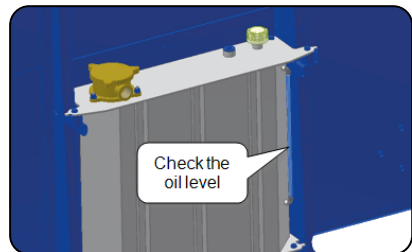
Service and Maintenance

To prevent unnecessary wear, it is important to maintain the Cameleont continuously. Provided below is information regarding daily maintenance and servicing.

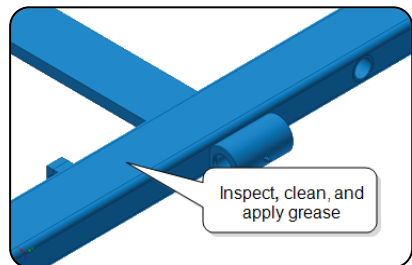
Daily Maintenance

Daily care, which only takes a few minutes, can prolong the service life of your Cameleont. Provided below are some daily steps to help maintain the Cameleont.

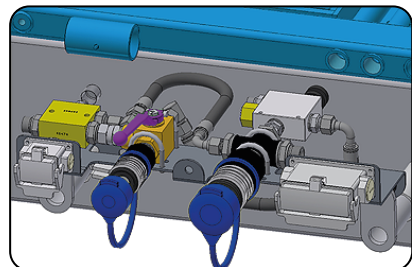
1. Check the oil level.



2. Inspect the contact surfaces of the Cameleont and its guide pin housings. Remove any dirt and apply new grease where necessary. Failure to do so can lead to premature wear of the materials. Use only lubricants recommended by JOAB (see "Lubrication Points", on page 23 below).

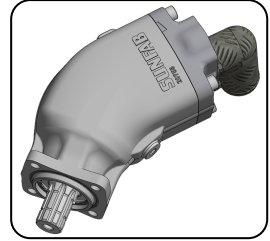


3. Make sure that the hydraulic connections on the power/hydraulic supply unit are clean and free from dirt. This is especially important in environments where the Cameleont is exposed to harsh weather and dirt.
4. Inspect and make sure that there are no damaged pipes or hoses.



5. Check that the Cameleont is free from deformation or cracks.
6. Finish by inspecting the hydraulic pump.

If any damage is found, contact your JOAB workshop immediately.



Maintenance for Stationary Vehicles

If a vehicle is left out of operation with a body loaded on it, the body must be removed at regular intervals. After every fourteen days, remove the body from the Cameleont and apply fresh grease onto the contact surfaces of the Cameleont and its guide pin housings.

Washing the Cameleont

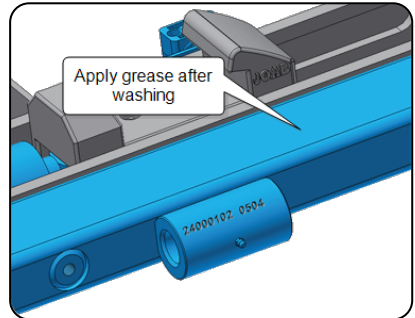
Newly lacquered surfaces must be cleaned using detergent and a sponge only. Do not use a high pressure washer. A high pressure washer should only be used after at least three weeks following treatment of surfaces.

Detergents contain acids. Make sure that the cleaning fluid used to clean surfaces contains less than 9pH. The maximum temperature of the cleaning fluid must not exceed 50 °C above the ambient temperature. After washing, make sure to rinse all surfaces thoroughly.

Cleaning the Cameleont with a high pressure washer entails risks. All electrical components, even enclosed, are sensitive to water under high pressure.

When using a high pressure washer, make sure to hold the nozzle at least 45 cm from all lacquered surfaces. Use a standard nozzle only, do not use a turbo nozzle.

Always apply fresh grease around lubrication points after washing. For more information regarding the Cameleont's lubrication points refer to below.

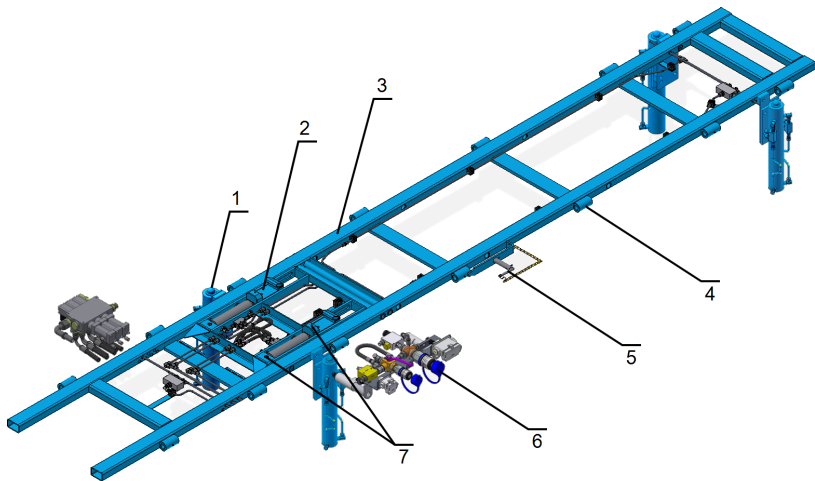


Lubrication Points

The following table and image highlight the locations on the Cameleont that shall be kept lubricated. Use the lubrication stated in the table.

Table 1: Lubrication points

Position	Lubrication point	Lubrication to use
1	The top of all lifting cylinders	STATOIL ALEXOL LCH 92 or similar
2	Both of the sledges on the pulling cylinders	Chassis grease
3	The top surface of the Cameleont's frame	STATOIL ALEXOL LCH 92 or similar
4	Inside all guide pin housings	Chassis grease
5	The mechanical safety pin	Chassis grease
6	Hydraulic couplings on the power-/hydraulic supply unit	Standard oil
7	The link bearings on each of the pulling cylinders	Chassis grease



Service of the Cameleont

During normal operation, it is recommended that the hydraulic oil is changed as follows:

- Mineral oil – once every two years
- Green oil – once every year

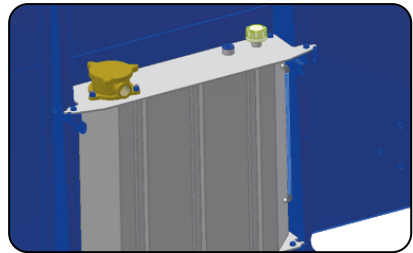
JOAB recommends that the oil is changed during the autumn period.

Hydraulic oil type 32-cst/40 is recommended for mineral oil.

If green oil is used for the system, always use the same type of oil and manufacturer of the oil.

The oil-filter must be changed after the first fifty hours of operation, then with every oil change.

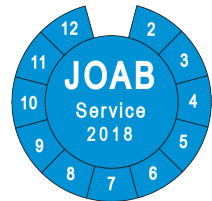
The air-filter should be replaced at least once every two years, or more often, as required.



Service-Reminder Sticker

A JOAB service sticker is placed on the inside of the drivers door to indicate when the Cameleont is due for its next service. In the example shown opposite, the numbers around the outside represent the months January to December.

As the month numbered 1 (January) is missing from the sticker, this indicates that the next service is due during the month of January. Make sure that the Cameleont is serviced in accordance with the sticker.



Technical Data

Provided below is technical information for the Cameleont system.

Table 2: Technical specifications

Specification	Value
Intermediate Frame	Weight: 300 kg (approx, dependent on length) Height: 60 mm Width: 800 mm
Pulling Cylinder	185 mm stroke
Lifting Cylinder	Weight: approx. 170 kg Stroke: 450 mm
Guide Pin Housing	Short frame: 7 on each side. Long frame: 8 on each side. Inner diameter = 30 mm.
Hydraulic oil pressure	250 bar
Oil volume in system	Approx. 20 litres
Return filter	180 litres/minute Filtration grade 25 µm absolute

Safety Warnings

The Cameleont has a number of safety labels attached to it, as shown below. It is important to read and adhere to these warnings. Failure to do so can lead to serious injury or damage to equipment.

Make sure that the labels are in good condition. If necessary, new safety labels can be ordered from JOAB.

Safe Working Distance

Make sure that there are no unauthorised persons in close proximity of the Cameleont's working area. The risk zone is 8 metres in all directions of the Cameleont and body.



Risk of Slipping

Be aware when operating the Cameleont that there may be a risk of slipping, that could lead to injury.



Suspended Loads

Do not stand or walk underneath a suspended load. If a suspended load breaks free it can lead to serious injury or death.



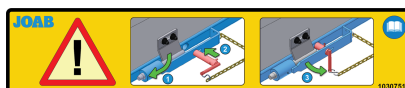
Risk of being Trapped

Be aware that there is a serious risk of becoming trapped when operating the Cameleont or loaded body. Always verify that there is no risk of anyone becoming trapped or injured before operating the equipment.



Securing the Body

The body must be correctly secured onto the Cameleont using the mechanical safety pin. Failure to do so can cause serious injury or damage.



See also *safety information on page 6*.

Contact Information

Table 3: Contact Information

Information	Details
Address	JOAB Försäljnings AB Östergärde Industriområde 417 29 Göteborg Sweden
Telephone	031-705 06 00
Fax	031-705 06 09
E-post	info@joab.se
Web site	www.joab.se

Service and Warranty

For contact information regarding service or warranty, refer to the table below. Always have the information provided on the manufacture plate ready before making contact.

Table 4: Service and Warranty

Department	Contact Details
Service workshop	031 7050 687
Spare Parts	031-7050 686
Technical Support	031-7050 688
Warranty	031-7050 717
Body Builder Support	031 7050 705

Visit our website: www.joab.se to order spare parts and find your nearest JOAB authorised workshop.