

Operation and Maintenance Manual

VERDEGRO LTMA



VERDEGRO®



READ BEFORE USE!
ONLY AUTHORIZED PERSONS MAY WORK WITH THE MACHINE
IMPROPER USE CAN CAUSE SERIOUS INJURIES!
All maintenance and repair should be done by the manufacturer or under their supervision by an official distributor.

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1 Data producer and specific machine:

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Date release : _____

Machine number : _____

Cushion number : _____

Company stamp:



Note: This document is only valid with an original company stamp of the producer.

2 Introduction:

A Light Truck Mounted Attenuator (LTMA 70K) is an energy absorbing device attached to the rear of a light truck (3500kg) or utility vehicle. A LTMA 70K is designed to provide a controlled stop of a vehicle impacting the rear of the truck. LTMA have been used since the mid- 1970's to reduce the severity of impacts between errant motorists and slow moving or stopped shadow vehicles used to protect highway maintenance workers.

The National Cooperative Highway Research Program Report 350 (NCHRP 350) specifically addresses the performance requirements of LTMA. The recommended tests to evaluate LTMA crash performance are defined for two different Test Levels. The basic Test Level, TL-2, is conducted at a nominal impact speed of 70 kph. TL-3 is the higher test level and is conducted at 100 kph. This report presents the manual for the Verdegro LTMA.

The Verdegro LTMA 70K, in this manual called LTMA. The LTMA is fully hydraulic operated and must be placed behind a supporting truck with a minimum weight of 3.500 Kg and a maximum weight of 12.000kg for best performance results. The crash cushion mounted on this LTMA is 70K, which means test with the LTMA were done according TL-2 of the Report NCHRP-350.

The LTMA is amply equipped with features that promote safety. By inspect them, the quality, efficiency and safety of the LTMA improved.

Check the condition of the LTMA daily before starting work on the base of the instructions. It is strictly forbidden to use the LTMA when it is damaged, not maintained or inspected.

The Manufacturer reserves the right to the machine construction, parts and maintenance instructions without notice.

This manual is only for the Verdegro LTMA. Some drawings or colors in this manual can be slightly different from the delivered model which should be recognized as a typical Verdegro LTMA.



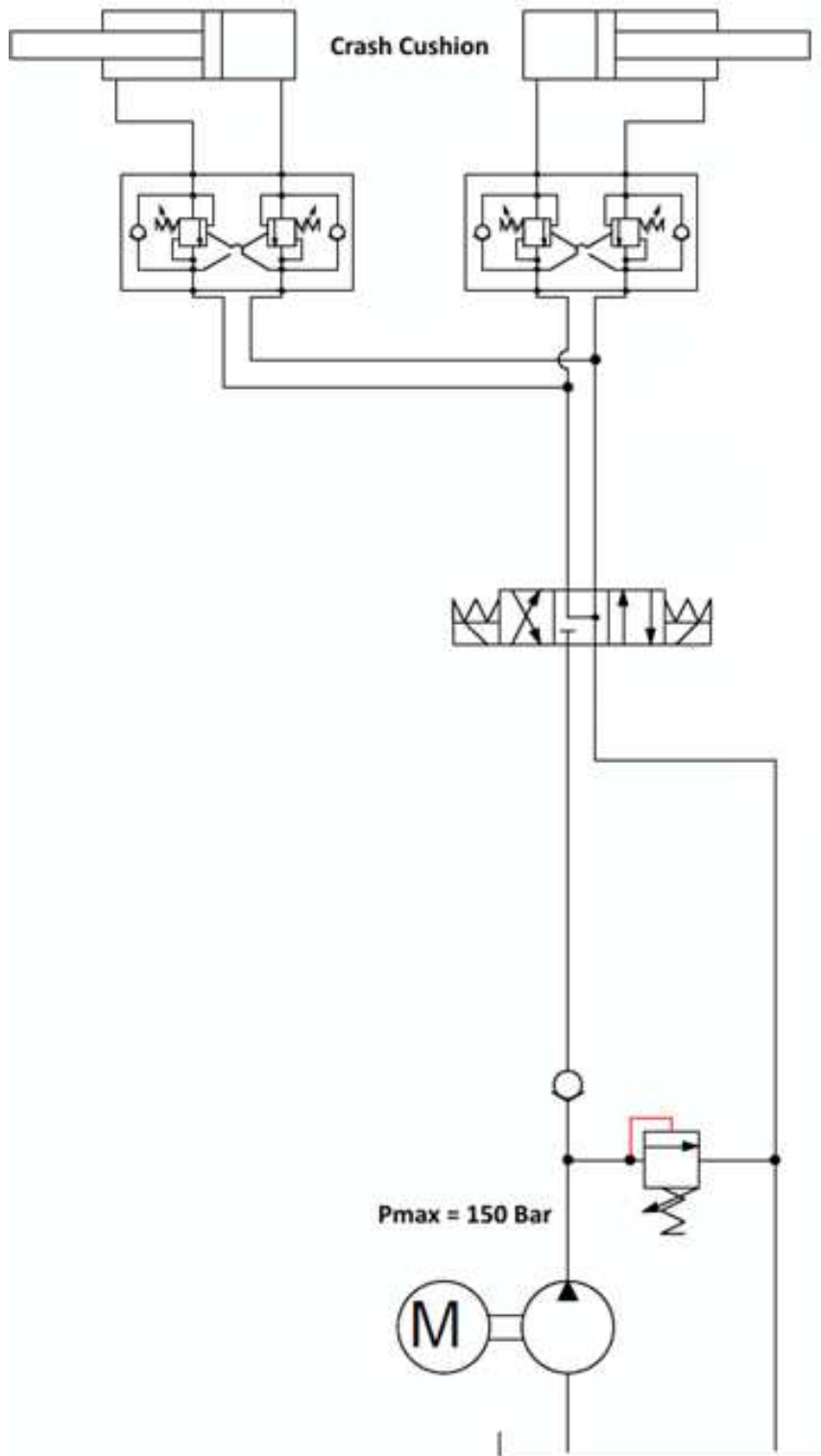
Attention! Before maintenance or checks, disconnected the power!

3 Recognition and dimensions

3.1 Photos of a typical LTMA



4 Hydraulic schedule



5 General specifications and instructions

- A. Always make sure the system is delivered with the right certificates, stickers and documentation!. **Do not remove the sticker(s)!!**
- B. Never remove safety instructions of the LTMA!
- C. All Verdegro Truck Mounted Attenuators (Verdegro LTMA) shall be designed and manufactured by the Verdegro Group, in accordance with the specifications.
- D. The Verdegro LTMA is an attenuator system designed for installation at the back of trucks with gross vehicle weight (GVW) ranges between 3500 kg and 12 000 kg (Contact your country for other specifications!).

Note: Any added ballast must be adequately anchored to the truck so that it will not move during impacts. Because the back end of the truck supports the weight of the rearward protruding LTMA, care must be taken not to exceed the manufacturer's published maximum axle loads. To ensure that the driving characteristics of the vehicle are maintained, the manufacturer's recommended center-of-gravity zone should also be adhered to.

5.1 Description of system

- A. The Verdegro LTMA shall consist of the following basic components: An aluminum foldex box with 2 aluminum *Cartridges*, a steel *Support Structure* and a *Support Frame with 2 mounting options* for attaching the system to the truck.
A hydraulic system shall also be included in the system to raise the structure and cartridges to a vertical position. When the system is in a horizontal position, the frame assembly shall be capable of collapsing when impacted by an errant vehicle. No portion of the system shall protrude forward under the truck during an impact. The complete Verdegro LTMA is designed to make attachment or detachment from the truck simple and fast.
- B. The Verdegro LTMA shall have a standard trailer lighting system. This system shall include brake lights, taillights and turn signals. The wiring for the rear lights shall be routed and secured on the articulating frame. This system also has additional lights on the cartridge so that the lighting system meets the standards, whether the system is in its horizontal or vertical orientation.
- C. Under the support frame are two tubes to lift the complete system with a forklift, for example to mount on the truck.
- D. All welding is done by, or under the direction of, a certified welder. Metal work shall be made at the Verdegro Group.
- E. All exposed steel surfaces on the LTMA shall be primed and painted and or galvanized.
- F. The LTMA shall be assembled with Commercial Quality bolts, nuts, and washers conforming to European Standards.
- G. The hydraulic system shall consist of a pump with a 12 or 24 (standard) volt DC motor, cylinders, hoses, switches, wiring, and necessary subcomponents to tilt the frame assembly to a 90° position from horizontal. The complete hydraulic system, including the pump and hoses, shall be factory assembled and mounted to the LTMA by the Verdegro Group.

6 Safety

1. Read these instructions carefully before using the "LTMA"
2. The LTMA should not be used without knowledge of the operating instructions and safety precautions. Keep the operating instructions, always within easy reach of the machine, the operator's manual should ALWAYS be at or near the machine.
3. The operator of the LTMA must be at least 18 years old and experienced in serving Truck Mounted Attenuators.
4. The owner/holder of the LTMA must ensure that all users are trained in the use of the machine.
5. Be careful when the machine is used near live power lines.
6. Transport the LTMA only if it is properly secured to vehicle.
7. On the platform are no persons during storage and adjustment of the machine or in transit.
8. Make use at all times during the adverse influences of wind, rain, temperature, brine, thunderstorms, snow, hail and ice.
9. Use the LTMA purely as Truck Mounted Attenuator, and not as a lifting mechanism or other device.
10. The wind load of the LTMA does not increase with additional signs or other objects that could catch wind.
11. Set the whole machine back together in a smooth continuous motion so as to avoid shock effects of road users.
12. Inspect the entire machine for loose materials such as bird nests, twigs, leaves, but also tools, bolts, nuts, etc. which may end up on the lanes during mobilization or transport.
13. Do not hoist the LTMA!
14. The safety devices are not deactivated. Defective safety devices or by a qualified repair service company to recover before the LTMA is used again.
15. Before and during operation of the machine always look at / near the machine, no persons are present, guiding also takes into account the rotation range of the machine!
16. For safe and trouble-free operation, the LTMA clean snow and ice held.
17. Be careful with fuels, lubricants, hydraulic oils and greases of the LTMA. Avoid skin contact with these substances. Exposure Danger !
18. The LTMA regular inspection and maintenance of service - repair outsourcing to an expert in this field service company.
19. The construction of the LTMA may not be altered without permission and the manufacturer's instructions.

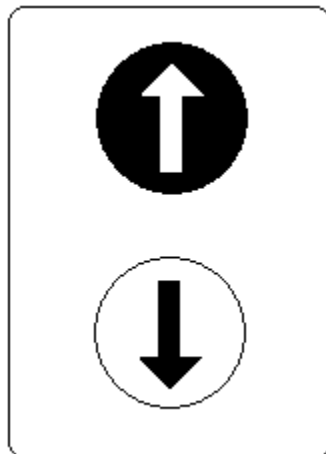
20. Inspect the LTMA every day before work or during use and pass through the machine.
21. Axles control all bolts / nuts: Before each use the principal axes, bolts and nuts.
22. Let the LTMA annual inspect by the manufacturer. The inspection must take place more frequently if welding is done in supporting parts, or other special reasons exist for the device to be debating. For modification and repair, always contact the manufacturer!. After repair or replacement of parts, the LTMA should always be served a full test facility. **The Verdegro Group can only guarantee the working when repair and service is done by the Verdegro Group or under their supervision by an official distributor.**
23. If you leave the LTMA, put it somewhere where it does not preclude others. Keep the whole machine in transport position. Close all hatches well for unauthorized persons. Take your keys with you.
24. The operator of the machine may not be under the influence of alcohol or narcotic drugs.

7 Operation

The operation of the machine depends on the chosen type. It can be wireless, with buttons on the LTMA or buttons in the truck. Ask the manufacturer or distributor for the optional equipment guidance on your LTMA.

Standard:

To rotate the cushion you use the black and white buttons on the remote.



8 Inspection table

General inspection points (If they are in bad condition, use of the LTMA is forbidden)	Every application	Weekly	Monthly
Level hydraulic oil		X	
Condition hydraulic cylinders	X		
Leakage hydraulic	X		
Condition of the hydraulic hoses	X		
Visual inspection of shafts, bolts and structural bearings		X	
Operation-end position defectors	X		
Inspection LED display control (errors) / arrow configuration(s)	X		
Visual inspection loose machine parts	X		
Cracks			X
Damage on the cushion	X		

8.1 Control position Crash Cushion

Verify proper operation / adjustment of the cushion on a right road surface where no height difference is present. After unfolding the cushion, the machine / pillow should be horizontal.



If the machine is not leveled horizontal, directly contact the manufacturer; use prohibited!

8.2 Use of the machine in cold

- Take into account delays in cold (-5° or colder)
- Ensure that there is no snow, ice or dirt on the frame and cushion.
- Protect the machine from the snow and ice when not in use.

8.3 High voltage

Not use this machine within:

- 50 Meters at power Lines on steel towers
- 25 Meters at low voltage lines on wooden poles
- 5 Meters in contact Lines of railway and tramway etc.

9 Maintenance

Scheduled maintenance keeps the LTMA in safe and reliable condition. From the maintenance schedule and checklist for the annual inspection shows what measures are required. Read for the maintenance of the LTMA the entire manual carefully!. If in doubt about the maintenance work it is better that it is carried out by the manufacturer. If not, than it must be done under supervision of the manufacturer, for example by an official distributor. Distributors can be found on the website www.verdegro.com

9.1 Check hydraulic oil

The LTMA has an oil level in the tank.

- Open the hydraulic compartment
- Make sure the cylinders are retracted
- Before opening the cap or around the filling is clean, clean it if necessary.
- Add the oil with a special pump with filter. The use of the oil directly from the can to pour.

Term	Actions
Daily or before any start up	Check level Hydraulic oil
	Check bearings parts
	Check hydraulic hoses and cylinders, pipes and fitting
	Check operation of emergency and safety devices
	Piston rods outrigger daily check for debris, leaks or damage. If severely polluted or clean brine is presents.
	Try all in normal position
Each 500 h	Lubricate all bearings and sliding surfaces
	Turntable bolts tightened
	Check condition of cylinders and outrigger
Each 1000 h of latest 6 months	Check of total LTMA
Every 12 months	Annual inspection. + Full service preventive replacement valves and seals.
Cushion	Check daily for damages

9.2 Torque index Tension

Dimensions thread	Of torque for bolt with thread in hermetically ISO Nm		
	Hex bolt Class 8.8	Hex bolt Class 10.9	Hex bolt Class 12.9
M4	2,8	4,0	4,9
M5	5,7	7,9	9,5
M6	9,7	13,7	16,2
M8	23,5	33,3	39,2
M10	47,1	65,7	79,4
M12	81,4	114,7	137
M14	130	181	216
M16	196	280	333
M18	270	382	461
M20	382	539	647
M22	519	730	873
M24	662	932	1118
M30	1324	1863	2236

10 General control points of LTMA

- Chassis:
 - Corrosion
 - Welds (no cracks visible)
 - Permanent deformation

- Turn table:
 - Bolts / nuts wreath
 - Welds
 - Sufficient fat is present in wreath
 - Corrosion

- Turn section:
 - Assessment of hinge shafts and cylinders
 - Welds / corrosion
 - Cracks and other damage
 - Cable and pipe installation
 - Cylinders

- Hydraulic system:
 - Condition hoses (replaced by the least damage or leaks)
 - Piston rods for damage
 - Control for leaks or damage
 - Bolt connection outriggers control

- Elektrical system:
 - Condition and suspension of cables
 - Condition of connectors
 - Operation of end position detectors

- Crash Cushion:
 - Control of cracks and dents or cracks

- Emergency stop:
 - The control for the emergency stop should be red, along with a plate with the inscription "STOP"
 - The emergency must immediately stop the movement, the machine may not start immediately when the emergency stop is released or put back, but keep in mind the time required for a fully running engine to stop.
 - The emergency must be clearly distinguishable from other button.
 - The emergency must not be used to machine just freeze it only with the power button.
 - The emergency stop is not out of service / bridged

- Test running
 - Set up the entire machine as defined
 - Try all labor movements, which may not be expired as shocking
 - After the test it must be properly monitored or stressed parts do not exhibit cracks or permanent deformation.

11 Repairs (by manufacturer or official distributor)

11.1 Welding

If parts of the LTMA are repaired with welding, it should be noted in the report under "Remarks"

- Welded points
- Date of welding
- Make sure when welding the manufacturer's instructions are followed

11.2 Other welding

If other repairs are made to supporting parts (example cylinders), make a note under "Remarks"

- Maintenance points
- Date
- Contractor
- Ensure that the repair to the manufacturer's instructions are followed

12 Warranty

Verdegro strives by various internal and external inspections and final inspections that the delivered LTMA system is free from error into operation. We provide the following warranty for any defects in materials or workmanship.

The guarantee is effective up to 12 months from the date of delivery of the machine to the buyer. The guarantee applies only to a new LTMA sold in possession of the first owner, and officially delivered by Verdegro or an official distributor.

Verdegro is based on an obligation to guarantee the absence of LTMA occurred in accordance with this warranty for free repair. The warranty repair is performed only during normal working hours by a technician authorized by Verdegro BV.

Verdegro decides whether parts and labor are under warranty or not.

The warranty does not cover defects caused by neglect of the use - and safety instructions in the operations manual, or mainly due to improper or inadequate use, installation or maintenance unauthorized persons, or resulting from normal wear or deterioration quality or caused by an accident.

Verdegro does not reimburse any damage to property or persons / companies due to a defective LTMA, neither revenue, driving costs to the repair company etc.

The guarantee *will terminate immediately* in full if the LTMA is repaired or serviced by another company / person than the Verdegro Group or an official distributor, when strange or inappropriate components are mounted on the LTMA, or when the settings of the LTMA are changed by unauthorized persons.

13 CE certification



CE Verklaring van conformiteit
CE Declaration of conformity
CE Konformitätserklärung
Déclaration CE de conformité

The Verdegro Group

verklaart hiermee, dat het produkt
hereby declare, that the product
erklären hiermit, daß das Produkt
déclare par la présente, que l'outil

LTMA

NL

Is geproduceerd conform de normen en normatieve documenten overeenkomstig de bepalingen van de EG-richtlijnen 2006/42/EG.

GB

Is manufactured in conformity with the EG 2006/42/EG.

Other applied standards

Machinerichtlijnen / CE- markering 2006/42/EG	CROW 96a/96b
ARAB/CODEX/AREI	Arbo-wet

14 Maintenance history

Date:..... Hours:..... Stamp:	Date:..... Hours:..... Stamp:
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