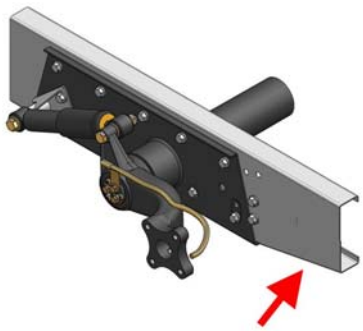
Installation Manual

L.AL.07(HD) / L.AL.07(B)

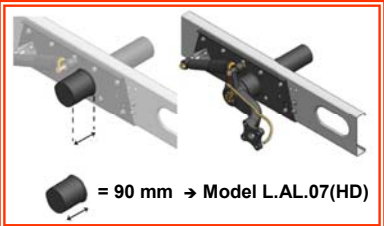
AL-KO AMC Chassis, 2007 ➔

Single and Tandem Rear Axle

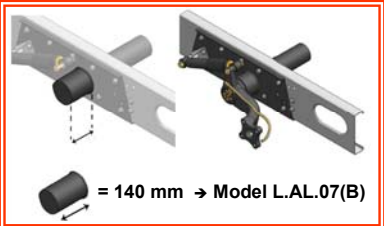
** IMPORTANT**
Not suitable for 'Up Going Chassis'



** IMPORTANT**
Axle passes through Chassis



= 90 mm ➔ Model L.AL.07(HD)



= 140 mm ➔ Model L.AL.07(B)

RDW

L.AL.07(HD) / L.AL.07(B)

CONTENTS

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L.AL.07(HD) / L.AL.07(B)

1. FOREWORD

This manual provides instructions for the installation of an auxiliary air suspension kit, developed specifically for Vehicles with an ALKO AMC single and tandem torsion axle. A separate kit is required for each rear axle. To ensure correct installation of the kit, it is strongly recommend that these instructions are read thoroughly before commencing any installation work. Installation should only be carried out by a suitably qualified mechanic or specialist installation facility. DSC Nederland will not accept any responsibility for faults or defects arising from incorrect installation, which automatically renders the guarantee invalid.

IMPORTANT : Manufacturer's Declaration Form

A manufacturer's declaration form is provided with your kit. Following installation of the kit please ensure that this form is completed, signed by a qualified fitter and a copy is returned to DSC Nederland by post, fax or e-mail. Our e-mail address is: info@dscsystems.nl

L.AL.07(HD) and L.AL.07(B) - Auxiliary air suspension for AL-KO AMC chassis

Valid for:
AMC 33L, 35LB, 35LH, 35L, 37L, 35H, 38H, 35HA, 40H, 42H, 45HT, 50HT

2. VERY IMPORTANT PREREQUISITES

Check the condition of the Torsion Axle of your Vehicle

Before attempting to fit an auxiliary air suspension system to your vehicle, it is extremely important to be aware that the torsion axle of your vehicle must be in good condition. **Please observe all of the following guidelines**...

- **Never** install air springs if there is any indication of faults within the axle assembly
- AL-Ko advises a revision of the axle every 100,000 – 120,000km (62000 - 75000 miles)
- Air springs serve only to assist the torsion springs
- Observe whether the vehicle is listing significantly to one side, which would indicate a damaged or broken torsion spring
- Lift the rear of the vehicle until the lever arm rests against the bump stop and...
  - ... observe that the lever arm moves smoothly during lifting, so indicating adequate lubrication
  - ... listen in the area near to the lever during lifting, since noise may indicate a broken torsion spring. If in doubt, repeat the lift using some means of improving audibility (ideally a stethoscope if available, or alternatively a screwdriver or length of bar touching the lever at one end and an ear at the other)
- There are 2 types of torsion springs. Please note that if one torsion spring breaks, AL-KO suggests that all should be replaced.
- Be aware that if the torsion bar fixing points are broken, then the lever arm may dismount from its housing with the vehicle in motion!!
- Try to find out whether any galling of the bearings has taken place
- Remove grease nipples and check the quality of the grease (make a point of greasing the nipples as a matter of course)

3. INTRODUCTION

Thank you for choosing an auxiliary air suspension kit from the range offered by *DSC Nederland* Auxiliary air suspension is fitted in tandem with the standard steel springs of the vehicle suspension, and provides enhancements in terms of both the stability of the vehicle and the comfort of the passengers…

Vehicle Levelling

Simply by varying the air pressure in the springs, the vehicle can be levelled both front-to-rear and side-to-side. Keeping the vehicle level optimises stability, ensures correct headlamp beam distribution and reduces tyre wear arising from uneven distribution of weight.

Straight Line Stability

Straight line stability is greatly increased at higher speeds, and when subjected to buffeting from cross-winds or large overtaking vehicles

Reduced Body Roll

Body roll when cornering or negotiating roundabouts is significantly reduced.

Fatigue Reduction and Wear Compensation

Suspension fatigue is reduced, so helping to prevent leaf springs from sagging under repeated or constant loading.

Any sagging already present can be compensated-for. This is a particular benefit for motorhomes, which are always fully laden.

Ride Comfort

Air springs help to absorb shock loads from uneven road surfaces, therefore general ride quality is much improved.

4. VERY IMPORTANT NOTES

Gross Vehicle Weight (GVW)

Air assist kits are not in themselves designed to increase the gross vehicle weight (GVW) rating of a vehicle. They do not legally allow for carriage of a load greater than the carrying capacity stated on the data plate of the vehicle.

Do not exceed the maximum load specified by the vehicle manufacturer…

- to avoid compromising passenger safety
- to prevent possible damage to the vehicle
- for legal reasons

Vehicle Uprating

Despite the above words of caution, it is possible to upgrade the weight rating of your vehicle. This must be carried-out by a specialist supplier that will…

- carry out any necessary modifications in addition to fitting the air assist kit
- complete documentation as necessary to inform the Vehicle and Operator Services Agency (*VOSA*) – a mandatory requirement
- supply and fit a new weight plate to replace the original plate supplied with the vehicle

This process applies to United Kingdom registered vehicles. The process in other countries may be different.

Safety Guidance Note

The following very useful guidance note is available for free download from the *Health and Safety Executive* (HSE)…

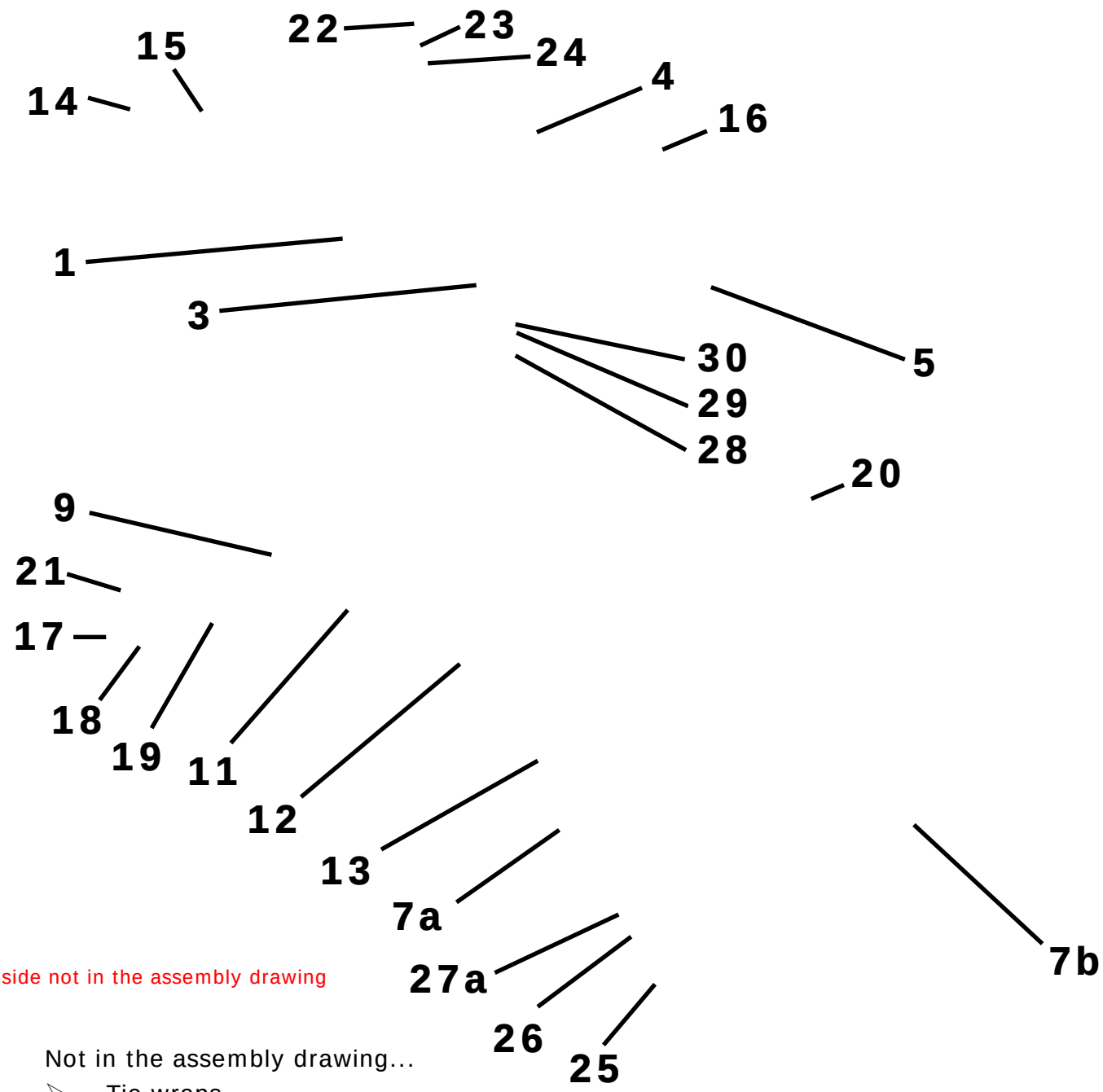
PM85, July 2007 *Safe recovery (and repair) of buses and coaches fitted with air suspension*

The uniform resource locator (URL) for this document is…

http://www.hse.gov.uk/PUBNS/pm85.pdf

L.AL.07(HD) / L.AL.07(B)

5. CONTENTS OF THE AIR SUSPENSION KIT



* Right side not in the assembly drawing

Not in the assembly drawing...

- Tie wraps
- Black and blue hose
- An inflate option
- Declaration of conformity
- Installation manual

Note:

a = L.AL.07(HD)

b = L.AL.07(B)

L.AL.07(HD) / L.AL.07(B)

5.1 Parts list

Number	Part Number	Description	Quantity
1	03.06.00.1.01.01	Upper bracket left	1
2*	03.06.00.1.02.01	Upper bracket right	1
3	03.05.00.1.01.03	Distance strap 8mm	2
4*	03.06.00.1.01.02	Distance strap 5mm	2
5	03.06.00.1.01.04	Reinforce bracket Left	1
6*	03.06.00.1.02.04	Reinforce bracket Right	1
7a	03.05.00.1.04.S	Lower bracket left L.AL.07 (HD)	1
7b	03.06.00.1.04	Lower bracket left L.AL.07 (B)	1
8a*	03.05.00.1.05.S	Lower bracket right L.AL.07 (HD)	1
8b*	03.06.00.1.05	Lower bracket right L.AL.07 (B)	1
9	03.05.00.1.04.02	Connection Side plate left	1
10*	03.05.00.1.05.02	Connection Side plate right	1
11	03.05.00.1.04.04	Spacing tube	2
12	OP.LB02716AAA01	6" Air Spring	2
13	03.06.00.1.04.04	Plastic Disc	2
14	DIN 933 M12 x 40 (10.9)	Hexagon bolt	8
15	DIN 125A M12 (200HV)	Washer	18
16	DIN 985 M12 (10.9)	Self locking nut	8
17	DIN 933 M8 x 20	Hexagon bolt	10
18	DIN 125A M8	Washer	12
19	DIN 7991 M8 x 25	Countersunk bolt	2
20	DIN 9623 M8	Flange nut	14
21	DIN 933 M8 x 80	Hexagon bolt	2
22	DIN 933 M6 x 18	Hexagon bolt	4
23	DIN 127 M6	Spring washer	4
24	DIN 9021 M6	Washer	4
25	DIN 912 M10 x 40	Allen screw	2
26	DIN 127 M10	Spring washer	2
27a	DIN 9021 M10	Washer	2
27b	DIN 125A M10	Washer	2
28	DIN 933 M6 x 14	Hexagon bolt	4
29	DIN 127 M6	Spring washer	4
30	DIN 125A M6	Washer	4

* Right side not in the assembly drawing

Note:

a = L.AL.07(HD)

b = L.AL.07(B)

6. INSTRUCTIONS FOR INSTALLATION

Preparation and Precaution

Before beginning installation, ensure that you have sufficient clearance, the wheels need to be free from the floor. Use a jack if necessary.

Pay attention to your safety at all times during installation - always use axle stands to support the vehicle!

6.1. General Torque Recommendations

METRIC TORQUE CHART in N.m				
SIZE	CLASS 8.8	CLASS 10.9	Aluminium	PA6G
M6 x 1	10	14	4	3
M8 x 1.25	23	34	9	6
M10 x 1.5	48	67	18	11
M12 x 1.75	83	117	31	18
M16 x 2	200	285	80	47

- When both the bolt and nut are made from steel, use either class 8.8 or 10.9.
- For the air spring of both L.AL.07(HD) and L.AL.07(B), refer to Aluminium and PA6G.
- For all other materials, tightening torque is left to the discretion of a person skilled in the art.

The following instructions make reference to the diagrams on pages 16 to 20 inclusive.

6.2. Installing the Lower Brackets

1. Remove the three fixing bolts that secure the torsion bar - Figures 1 to 3.
2. Remove the three M6 bolts so that the cover plate can be removed - Figures 2 and 3. This plate is no longer needed and may be discarded.

3. Check the plane for protrusions sometimes a welding is pointing out a bit. If so, then you need to flex it.
4. Attach the lower side plate at the position vacated, using the original bolts - Figures 4 and 5 - at the same time attaching the hand brake cable support (the metal pipe may need to be bent a little in order to achieve a good fit against the support)
5. Place the spacing tube with the M8 x 80 bolt and washer trough the hole in the side plate - Figures 5 and 6.
5. Attach the lower bracket to the suspension plate as shown in pictures 7 to 9.

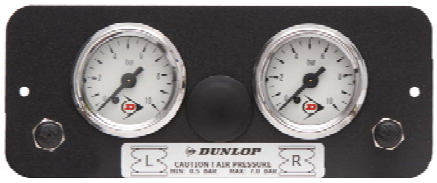
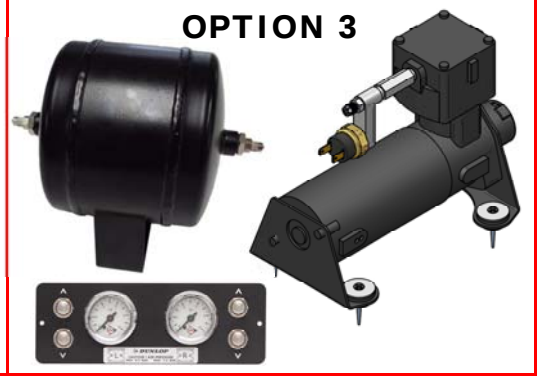
6.3. Installing the Upper Brackets

1. Attach the spacer plates to the upper brackets using M6 x 14 bolts with both flat washers and spring washers - Figures 10 and 11.
2. Check the surface where the upper bracket should be installed. You can use the upper bracket itself. The hole with the red arrow is always there - Figure 13.
3. Attach the upper bracket to the chassis, not forgetting the spacer bracket and washer between the upper bracket and the chassis - Figures 12 to 13. Secure the bracket using M12 x 40 bolts with washers and self-locking nuts. Note that it may be necessary to drill holes since not all brands of motorhome have the same hole pattern. The holes in the brackets of your kit are positioned where recommended by AL-KO for popular motorhome brands. Also use the reinforcing plate on the inside of the chassis.
4. In case needed, a hole pattern is appended - See Page 20. This page can be used as a template provided that, on the printed page, the dimension shown is exactly 130mm.

6.4. Installing the Air Springs

1. Connect the tubes to the air springs, using black for the left side and blue for the right side (see Section 7.6). Guide the tube through the designated hole in the upper bracket (the one closest to the chassis)
2. Attach the air spring to the upper bracket, using two M6x 18 bolts with washers and locking rings. Do not tighten the bolts as yet - Figures 15 and 16.
3. Replace the wheels and lower the vehicle until the lower bracket is almost in contact (2cm space) with the underside of the air spring piston.
4. Place the nylon disc under the air spring - Figure 16.
5. Carefully inflate the air spring a little until the air spring piston is actually in contact with lower bracket - Figures 17
6. Attach the piston and disc to the lower bracket using a single M10 x 40 bolt with washer and locking ring. Do not tighten the bolt as yet - Figure 17.
7. Position the vehicle at the desired ride level. Align the air springs (see Section 7.9), and finally tighten the bolts at both the top and the bottom to secure the springs to the brackets.

6.5. Fitting of Inflator Console

OPTION VALVES	OPTION MANO / OPTION 1
	(OPTION MANO = Without Console) 
OPTION 2	**OPTION 3**
	

Your kit is supplied with one of the inflator options shown above…

- **OPTION VALVES** : Two valves and a small bracket
- **OPTION MANO** : Two valves and two independent 10-bar pressure gauges
- **OPTION 1** : Two valves in a console with two independent 10-bar pressure gauges
- **OPTION 2** : Two valves in a console with two independent 10-bar pressure gauges and a rocker on/off switch to operate the electric motor driven air compressor
- **OPTION 3** : Four valves (two for raising the vehicle ('UP') and two for lowering the vehicle ('DOWN')) in a console with two independent 10-bar pressure gauges. A pressure switch operates the electric motor driven air compressor to keep the air reservoir of 2.2-litre at pressure.

A special dashboard X250 panel (LHD and RHD) is available for ***OPTION 1, OPTION 2*** *and* ***OPTION 3***

L.AL.07(HD) / L.AL.07(B)

Mount the console in a position of your choice whereby it is firmly fixed, has some protection from the environment (particularly important for the console with gauges) and is easily accessible. Suggested possible locations include...

'Standard' Console...

- on the rear bumper
- at the rear beside the license plate
- on the chassis next to a rear wheel
- in a service shutter (motorhomes)
- beside the fuel cap

'Option 1', 'Option 2' or 'Option 3' Console...

- in the vehicle cabin, within reach and sight of the driver
- Beside, under the driver seat
- in the wall of a cupboard (motorhomes)
- in a service shutter (motorhomes)

'Comfort' Packages

The 'Option 2' and 'Option 3' panels, as shown above, are each part of a *Comfort Package* that is supplied with a compressor (and also an air reservoir in the case of the 'Option 3' panel) for ease of spring inflation and ride height setting. For further information please ask your dealer.

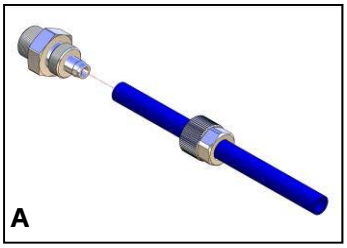
The photograph below shows all of the parts of Comfort Package 'Option 2'...

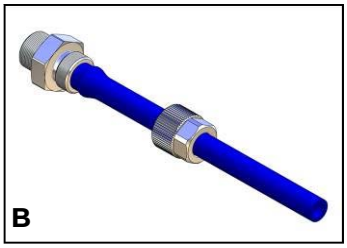
Comfort Package 'Option 2'

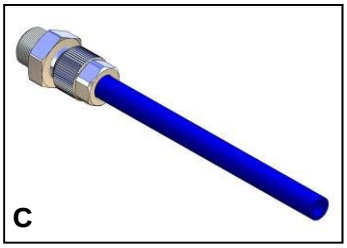
6.6. Tube Connection and Disconnection, Cutting and Routing

Connection and Disconnection

Tubes are connected as shown by the diagrams below...





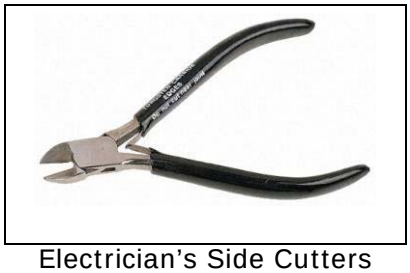


A. Slide a nut over the end of the tube
B. Push the tube onto the connector as far as possible
C. Feed the nut up to the connector, fully tighten by hand and finally tighten one additional turn using spanners

Cutting

To achieve good sealing and air-tight fitting of tube ends to their connecting parts, it is very important to cut tubing cleanly and squarely. A dedicated guillotine action tubing cutter is recommended, or a craft knife if such a tool is not available. Do not use electrician's side cutters.

A dedicated tubing cutter - **Recommended**



Electrician's Side Cutters **NOT Recommended**

Routing

Study the underside of the vehicle and decide how to route each branch of the air circuit...

- To minimise the risk of chafing, avoid running tubing over metal edges as much as possible
- Avoid close proximity to heat sources such as the exhaust assembly
- Choose a route that provides as much protection as possible from dirt, debris and any solid objects that may impact the underside of the vehicle

It is recommended that tubes are guided alongside brake lines as much as possible.

Use cable ties ('tie wraps') to secure tubing to the chassis, taking care not to over-tighten them.

6.7. Spring Inflation

Once installation of the air assist kit is complete, inflate the springs via the inflator console taking careful note of the following...

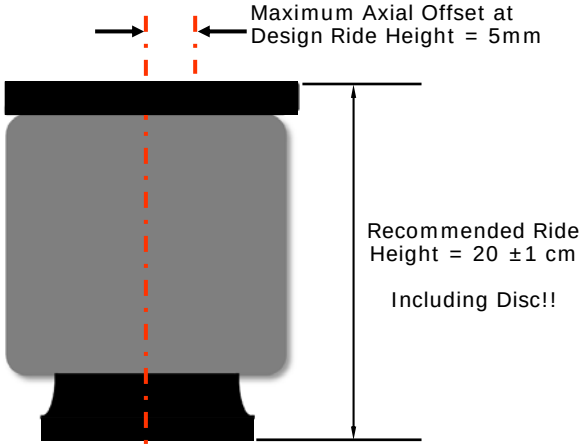
Maximum and Minimum Pressure

Maximum Pressure 7.0bar **Minimum Pressure 0.5bar**

Do not exceed 7.0bar (101psi), which is the recommended maximum charge pressure for the air springs.

The springs may be deflated if the vehicle is to be stored for a lengthy period without use, but a pressure of at least 0.5bar (7.25psi) should be maintained at all times in order to avoid possible compression damage to the springs.

6.8. Spring Alignment



In Alignment
The axes of the air spring top plate and piston are parallel and coaxial.

CAUTION!

Before tightening the bolts that connect the air spring top plate to the upper bracket and piston to the lower bracket, set the vehicle at design ride height (spring height ideally between 17.0 and 19.0cm) and ensure that the spring is as closely in alignment as possible (maximum axial offset between top plate and piston = 5 mm).

6.9. Check List

Before driving the vehicle following completion of installation of the auxiliary air suspension system, please check...

...all bolts tightened to the recommended torque (Section 6.1)? ☐

...air springs set in alignment (Section 6.8)? ☐

...enough free space around the air springs to avoid wearing? ☐

...all metal parts wax coated (Section 6.10)? ☐

...manufacturer's declaration form completed and a copy returned? ☐

A wait of 24 hours is recommended in order to ensure that the vehicle has maintained its stance and that there are no air leaks present.

6.10. Maintenance

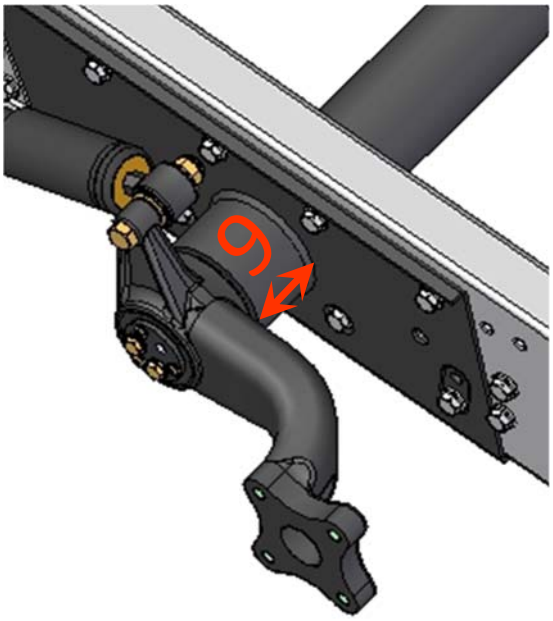
Following installation, it is recommended that all metal parts are coated with a protective substance such as body wax. Following each winter, check the wax coating and re-coat as necessary.

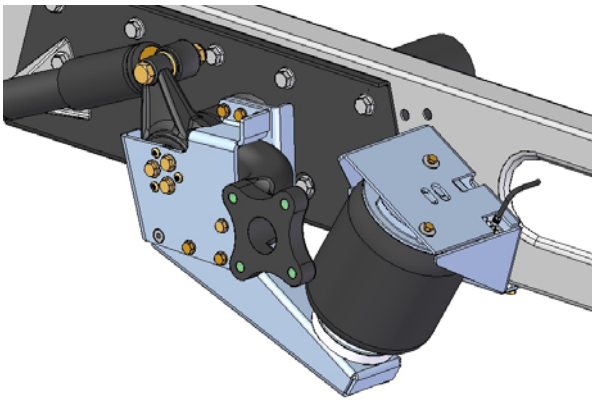
The system does not require very much maintenance other than...

- to maintain air pressure in the springs. Much like a tyre, the system may lose a little air over time.
- to keep the air bellows clean. It is suggested that, when washing the vehicle, the bellows are inspected and cleaned as necessary (preferable by spraying). Look in particular for stones or grit trapped between convolutes, as this may damage the bellow.
- to check the protective substance and recoat as necessary

7. INSTALLATION DIAGRAMS

L.AL.07 (HD)





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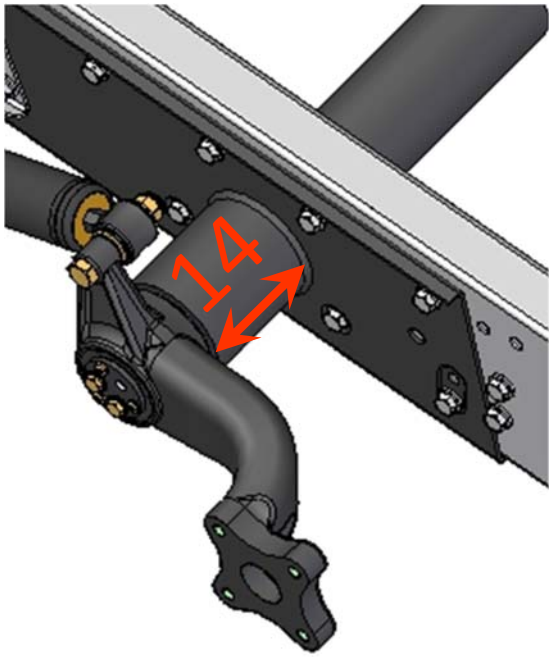

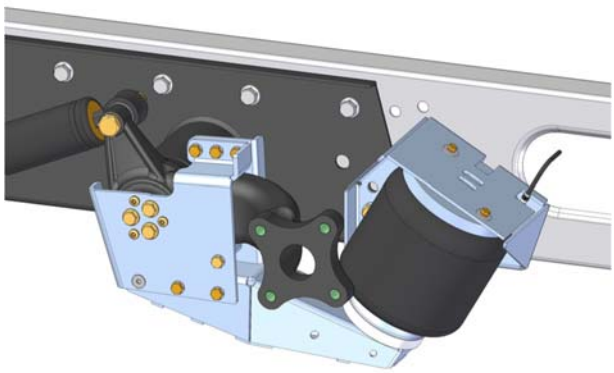

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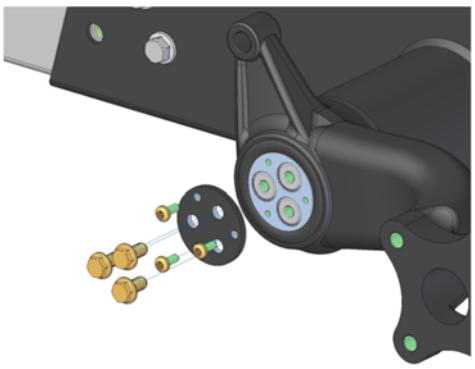

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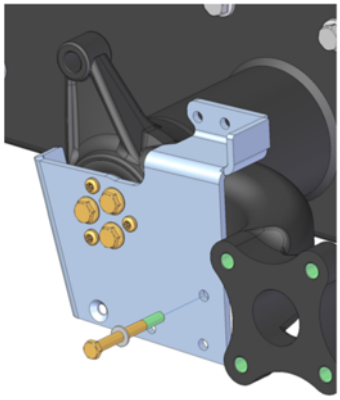

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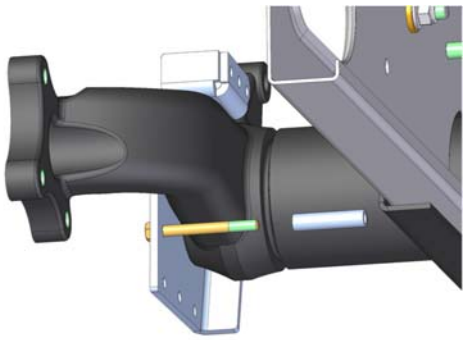

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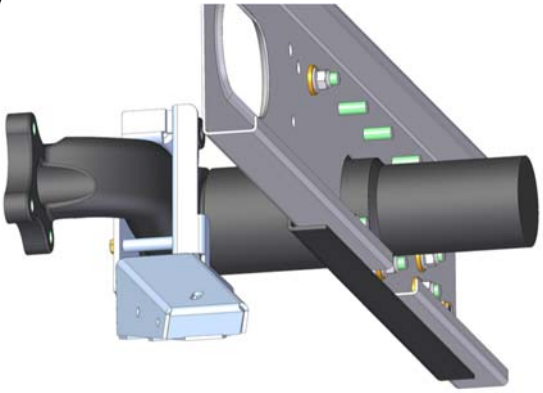

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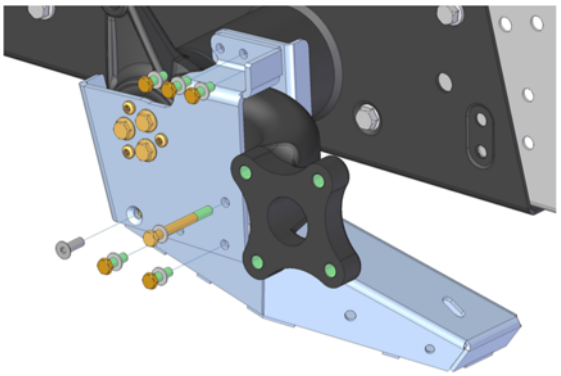

L.AL.07(HD) / L.AL.07(B)

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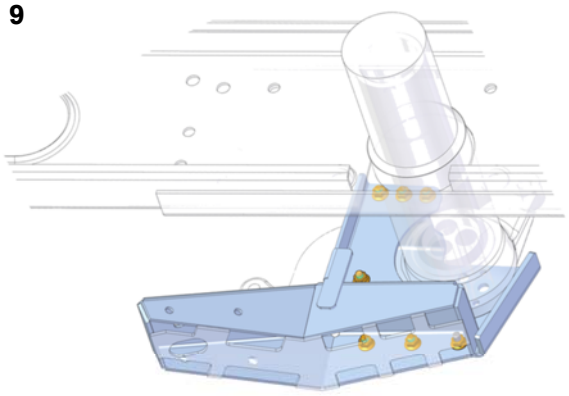

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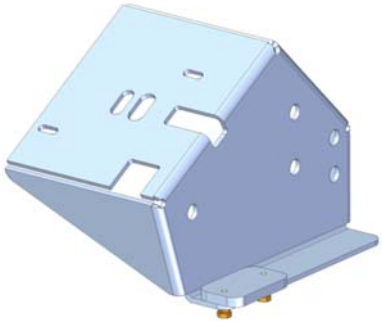

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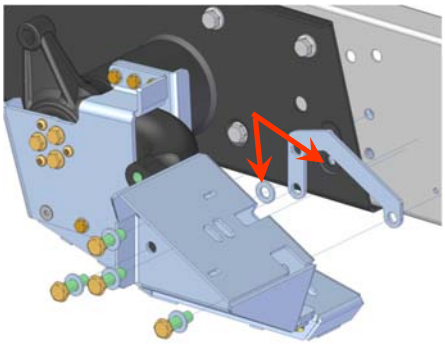

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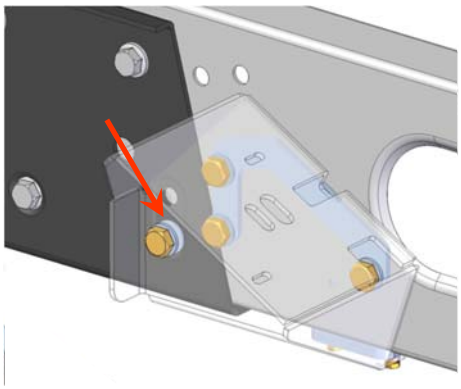

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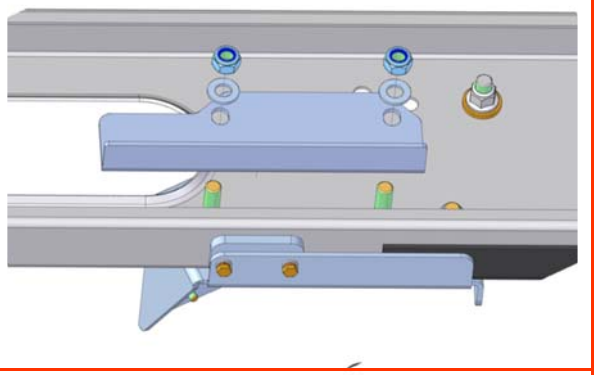

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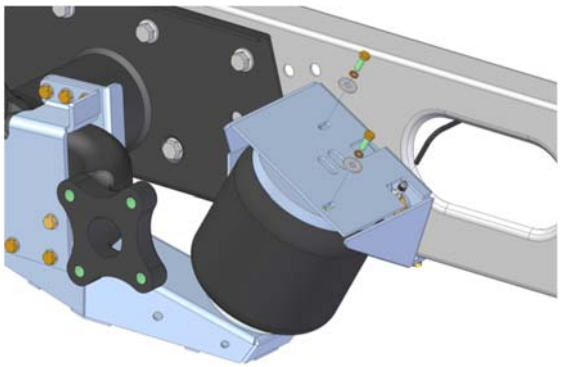

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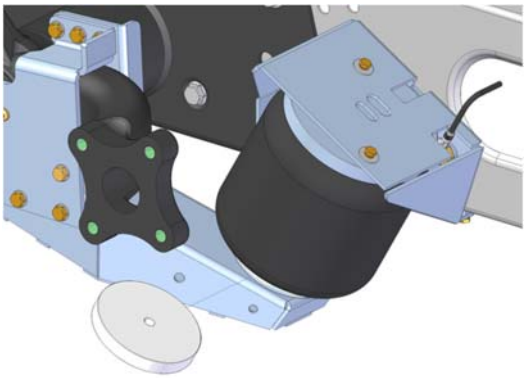
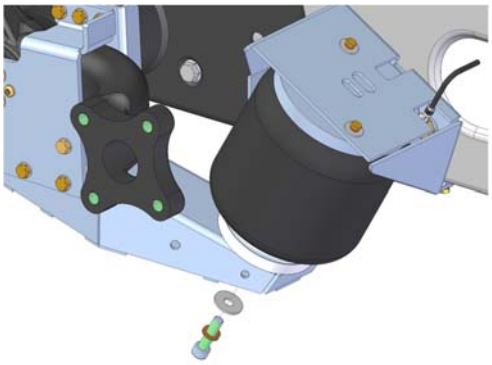
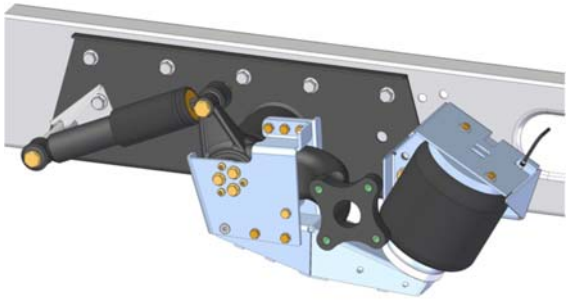


L.AL.07(HD) / L.AL.07(B)

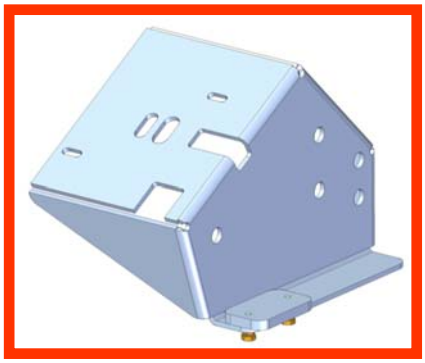
17



18

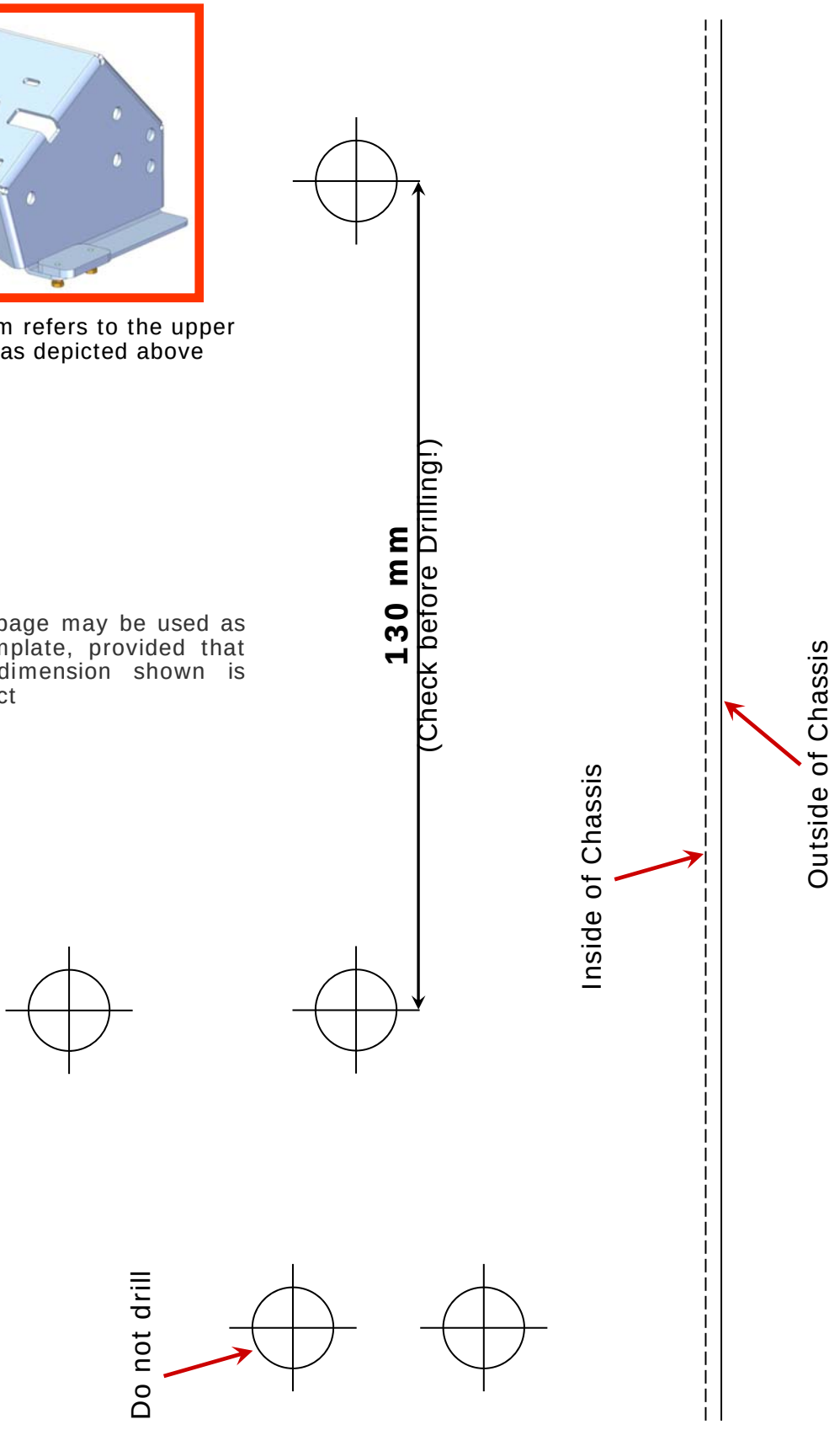


L.AL.07(HD) / L.AL.07(B)



This diagram refers to the upper bracket, as depicted above

This page may be used as a template, provided that the dimension shown is correct



8. EPILOGUE

DSC Nederland hopes that you enjoy the benefits that your *DUNLOP* air suspension system will provide for you. To ensure optimal performance, we advise that you have your system checked frequently by qualified personnel. As recommended in the fitting instructions, it is important to coat all the steel parts with a protective substance such as body wax.

IMPORTANT : Manufacturer's Declaration Form

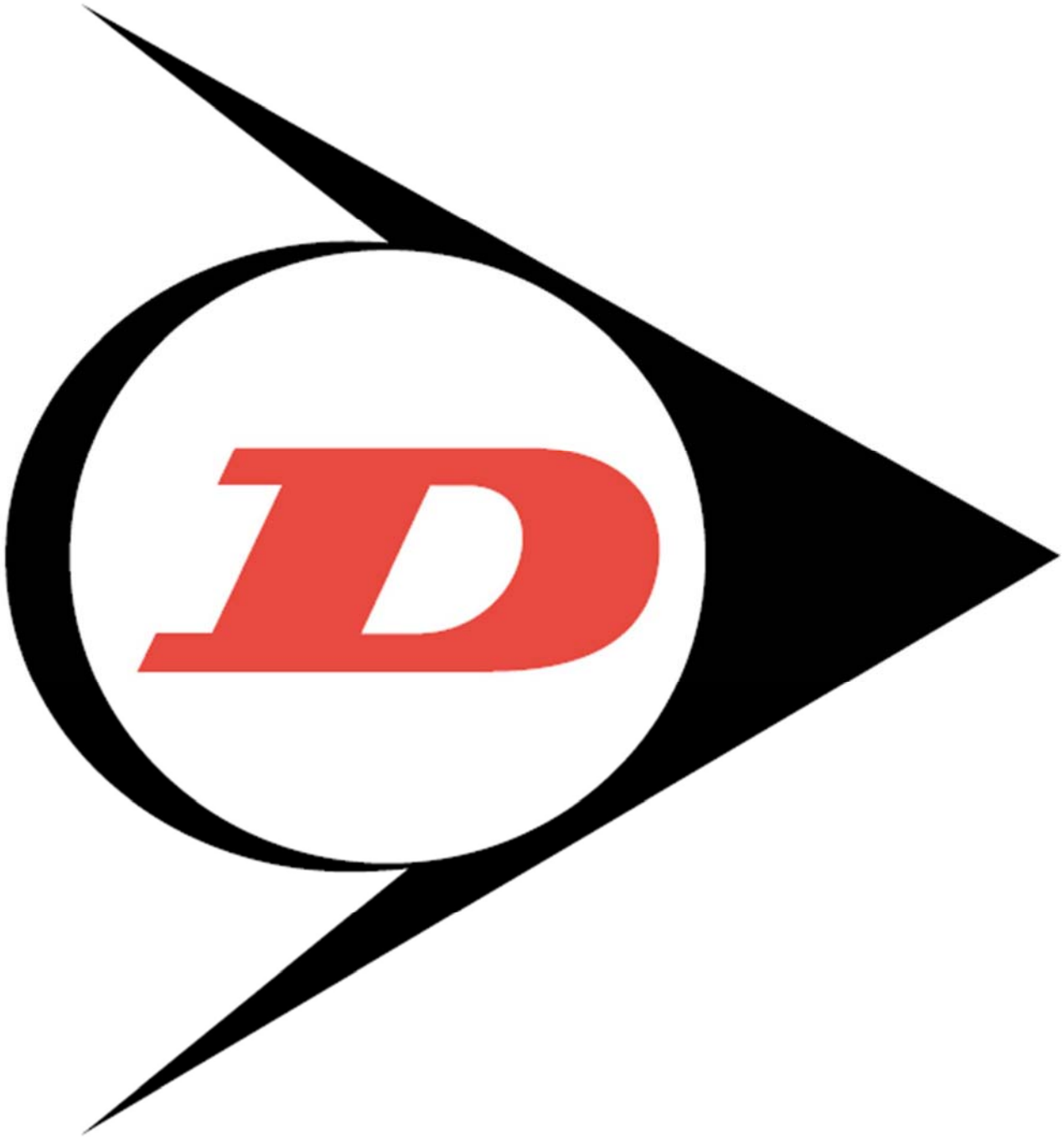
A manufacturer's declaration form is provided with your kit. Following installation of the kit please ensure that this form is completed, signed by a qualified fitter and a copy is returned to DSC Nederland by post, fax or e-mail. Our e-mail address is: info@dscsystems.nl

As a condition of your warranty, modifications to the system may only be carried out by personnel of DSC Nederland.

Enquiries

For general enquiries please contact one of our dealers. You can find them on our website.

www.dscsystems.nl



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