

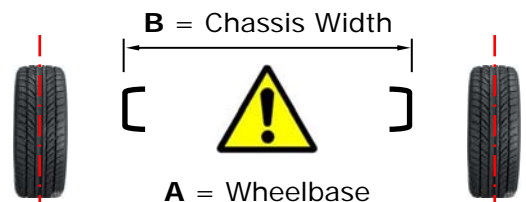
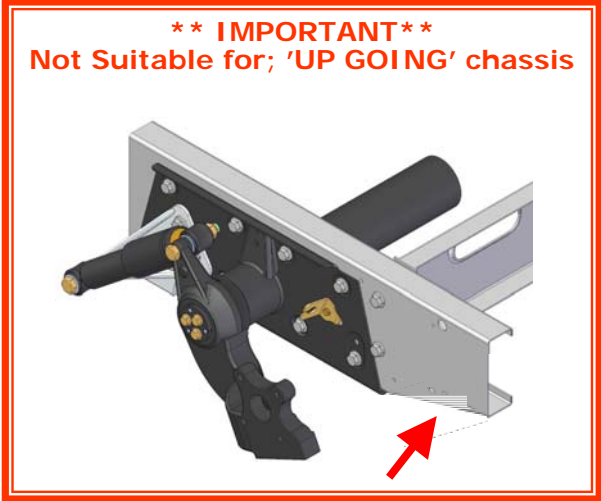
# Installation Manual

## L.AL.02

### AL-KO Chassis 2002—2006 (Disc Brakes)



**\*\* IMPORTANT \*\***  
Not Suitable for; 'UP GOING' chassis



This Air Suspension Kit is suitable only when  $A - B = 565\text{mm}$

**\*\* IMPORTANT \*\***  
Axle passes through Chassis



## L.AL.02

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### 1. FOREWORD

This manual provides instructions for the installation of an auxiliary air suspension kit, developed specifically for Motorhomes with an AL-KO torsion axle (2002—2006). To ensure correct installation of the kit, it is strongly recommended 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. DCS 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@dunlopsystems.nl](mailto:info@dunlopsystems.nl)**

Part Number:

**L.AL.02**

**Auxiliary Air Suspension for Al-Ko chassis**

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### 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-AL-KO recommends a replacement of the axle every 100,000—120,000 km (62,000—75,000 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)
  - ... lift a road wheel by hand and observe the lever arm in its housing for backlash. This should not exceed approximately 0.5mm.
- The axle has three splined torsion bars. Be aware that if the fixing points of these bars 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)

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### 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

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### Vehicle Upgrading

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...

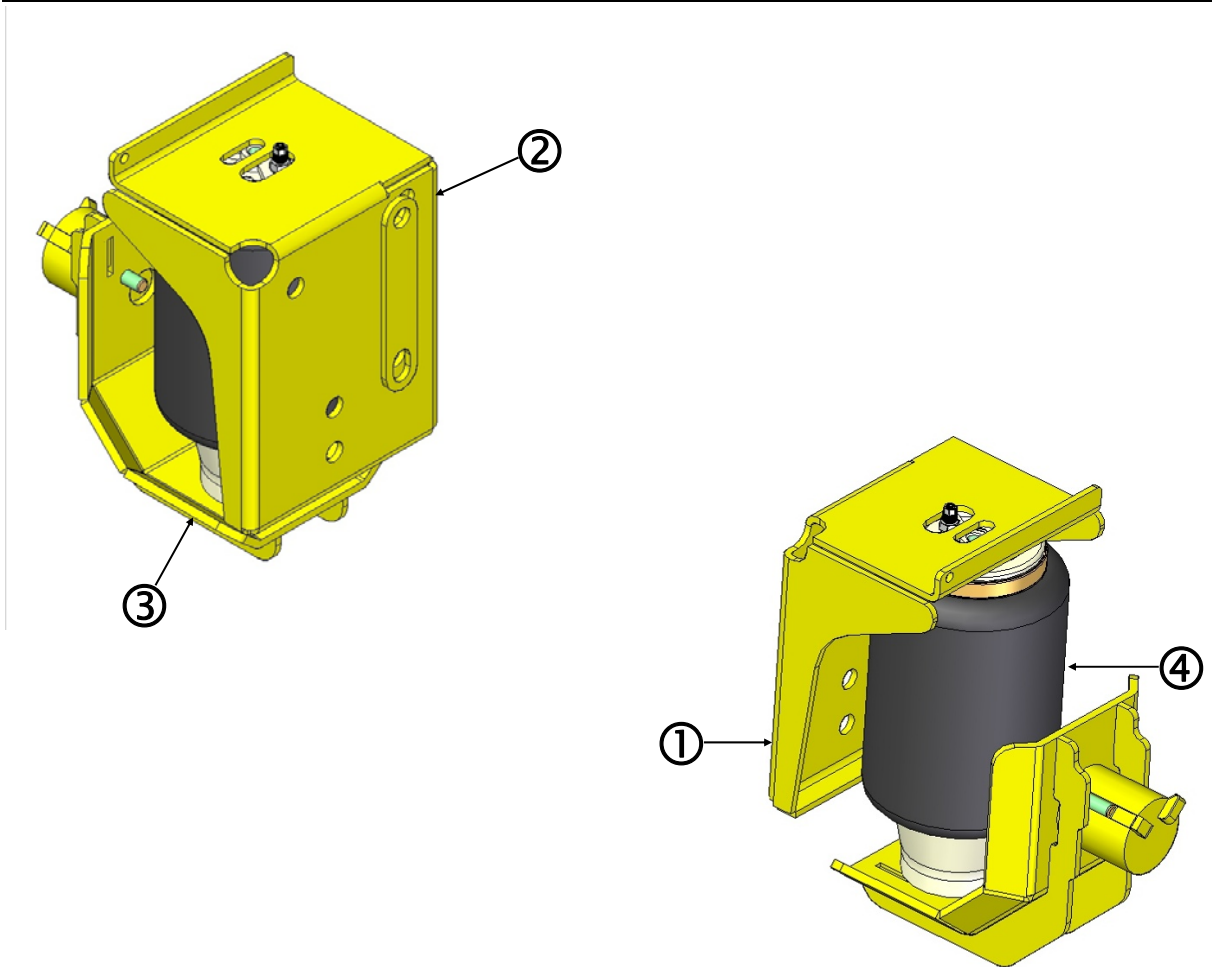
- ◆ carry out any necessary modifications in addition to fitting the air assist kit
- ◆ complete documentation as necessary to inform the Vehicle and Operator Services Agency (VOSA) – a mandatory requirement
- ◆ supply and fit a new weight plate to replace the original plate supplied with the vehicle

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

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**5. CONTENTS OF THE AIR SUSPENSION KIT**

Item #	Part Number	Description	Quantity
1	03.04.00.101	Upper bracket—left side	1
2	03.04.00.102	Upper bracket—right side	1
3	03.04.00.104	Lower plate—left and right side	1
4	OP.LB.CO.SZ5520	Air Spring	2



Other Parts, not on the Assembly Diagram as above...

- Bolts and Nuts, as required
- Blue and black air tubing
- Tie Wraps
- Schrader Valves
- Declaration of Conformity
- Installation manual

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### 6. INSTRUCTIONS FOR INSTALLATION



#### Preparation and Precaution

Before beginning installation, ensure that you have sufficient clearance between the axle and the chassis. Use a jack if necessary. Install at one side of the vehicle at a time.



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 and PA6G
M6 x 1	10	14	4
M8 x 1.25	23	34	9
M10 x 1.5	48	67	18
M12 x 1.75	83	117	31
M16 x 2	200	285	80

- When both the bolt and nut are made from steel then use column class 8.8 or 10.9.
- For the air springs use the column of Aluminium and PA6G.
- For all other materials it is up to the discretion of the person skilled in the art.

The following instructions make reference to the diagrams on pages 14 to 18 inclusive.

#### 6.2. Installing the Lower Brackets

1. Lift the rear of the vehicle until there is no tension in the springs - Figures 1 and 2
2. Insert the keys into the large central hole of the suspension arm - Figures 3 and 4
3. Push the lower plate into the large hole in the suspension arm until only the top of the ribs are in contact with the arm - Figures 5 and 6.
4. Secure the keys with M8 self locking nuts and washers. Do not fully tighten, so that alignment is possible at a later stage - Figures 7 and 8.
5. Check if the bracket is hanging on the shaft, that means that the ribs are only on top in contact with the suspension arm.



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### 6.3. Installing the Upper Brackets

1. Remove the clamping strap from the brake hose, then lift the hose from its fixing bracket. Now remove the fixing bracket from the chassis - Figures 9 and 10.
2. Remove the four bolts as shown in figures 13 and 14
3. Prepare the upper bracket for installation by inserting four bolts through the holes in both the bracket and the spacer plate - Figures 11 and 12
4. Attach the upper bracket to the chassis - Figures 15 and 16
5. Attach the brake line to the upper bracket via the clamp - Figure 26

### 6.4. Installing the Air Springs

1. Connect the air tubes to the air springs, using black for the left side and blue for the right side - Section 6.6. Guide the tube through its designated hole in the upper bracket (the one closest to the chassis) - Figures 17 and 18
2. Attach the air spring top plate to the upper bracket using a single M10 x 20 bolt with washer and locking ring - Figures 19 and 20. Do not tighten the bolt as yet.
3. Lower the vehicle to the desired ride height - Figure 21
4. Carefully inflate the air spring a little until the piston is in contact with the lower bracket
5. Attach the piston to the bottom bracket using a single M12 x 25 bolt with washer and locking ring. Once again, do not tighten the bolt as yet.
6. Inflate the spring to a pressure of approximately 1 bar (14.5psi). Align the spring, and then tighten the bolt at both the top and the bottom.
7. Check the position of the bottom bracket and align as necessary
8. Once all alignments are complete, **CHECK AGAIN** that the ribs of the brackets are in good contact with the surface of the suspension arm and modify if needed. Once satisfied, tighten the nuts to secure the keys - Figures 24 and 25

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**6.5. Fitting of Inflator Console**

**Option Valves**



**Option 1**



**Option 2**



**Special Dashboard Panel for Fiat Ducato X244**



Your kit is supplied either with option valves having two valves only (above, top-left), or an optional console having both valves and pressure gauges (Option 1 or 2, or the Special Panel above). Mount the console in a position of your choice whereby it is firmly fixed, has some protection from the environment (particularly important for a console with gauges) and is easily accessible. Suggested possible locations include...

**Console with Valves Only...**

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

**Console with Valves and Gauges...**

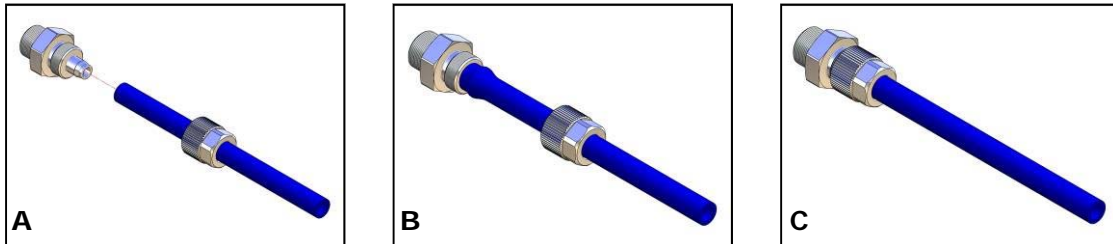
- in the vehicle cabin, within reach and sight of the driver
- in the wall of a cupboard (motorhomes)
- in a service shutter

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### 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.

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### 6.7. Brake Adjustment

As your vehicle is fitted with an antilock braking system, there is no need for any adjustment following fitment of your air assist kit.

### 6.8. Spring Inflation

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



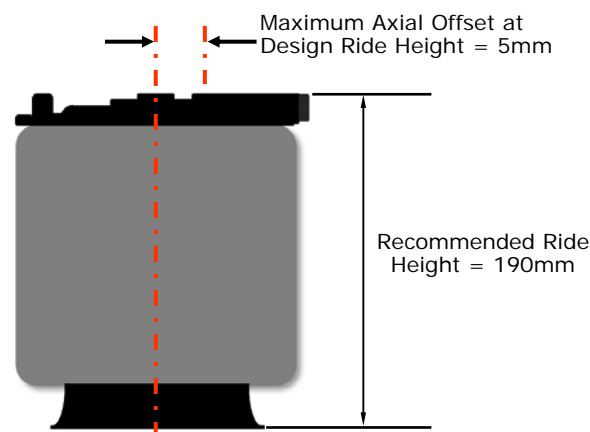
#### Maximum and Minimum Pressure

**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.

### 6.9. 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 18.0 and 20.0cm) and ensure that the spring is as closely in alignment as possible (maximum axial offset between top plate and piston = 5mm).

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### 6.10. 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)? | <input type="checkbox"/> |
| ...air springs set in alignment (Section 6.9)?                  | <input type="checkbox"/> |
| ...all metal parts wax coated (Section 6.11)?                   | <input type="checkbox"/> |
| ...manufacturer's declaration form completed and returned?      | <input type="checkbox"/> |



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.

### 6.11. Maintenance

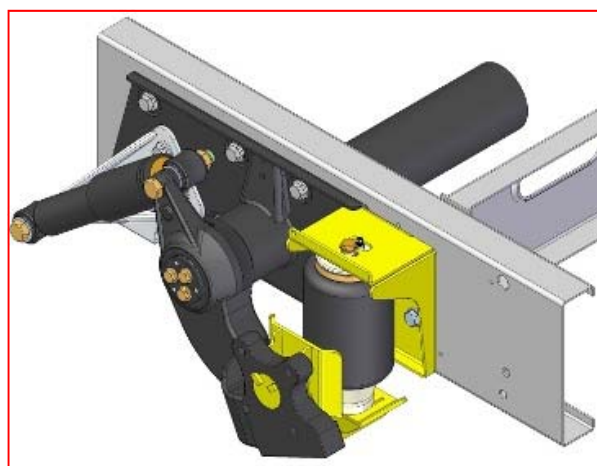
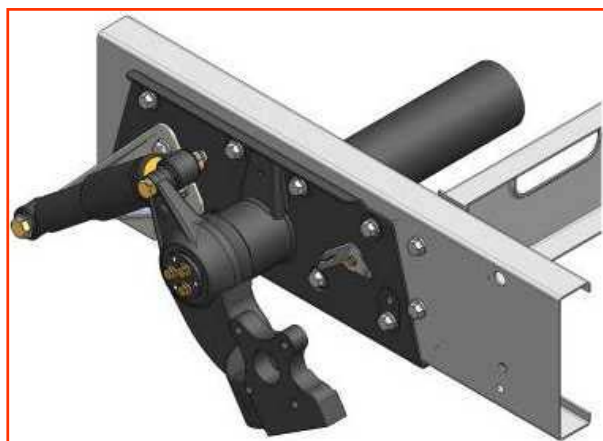
Following installation, it is recommended that all metal parts are coated with a protective substance such as body wax. Following each winter, check the wax coating and re-coat as necessary.

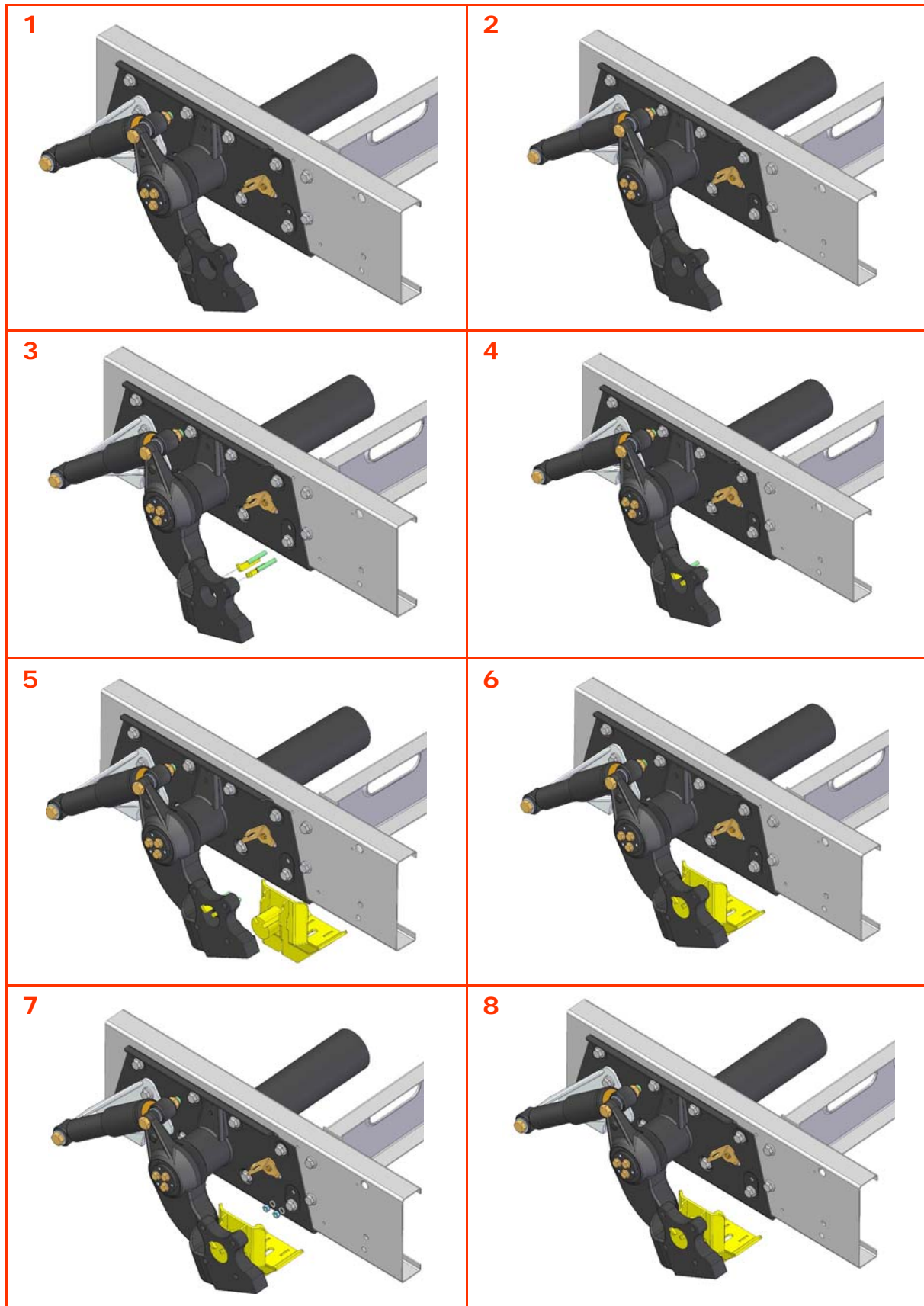
The system does not require very much maintenance other than...

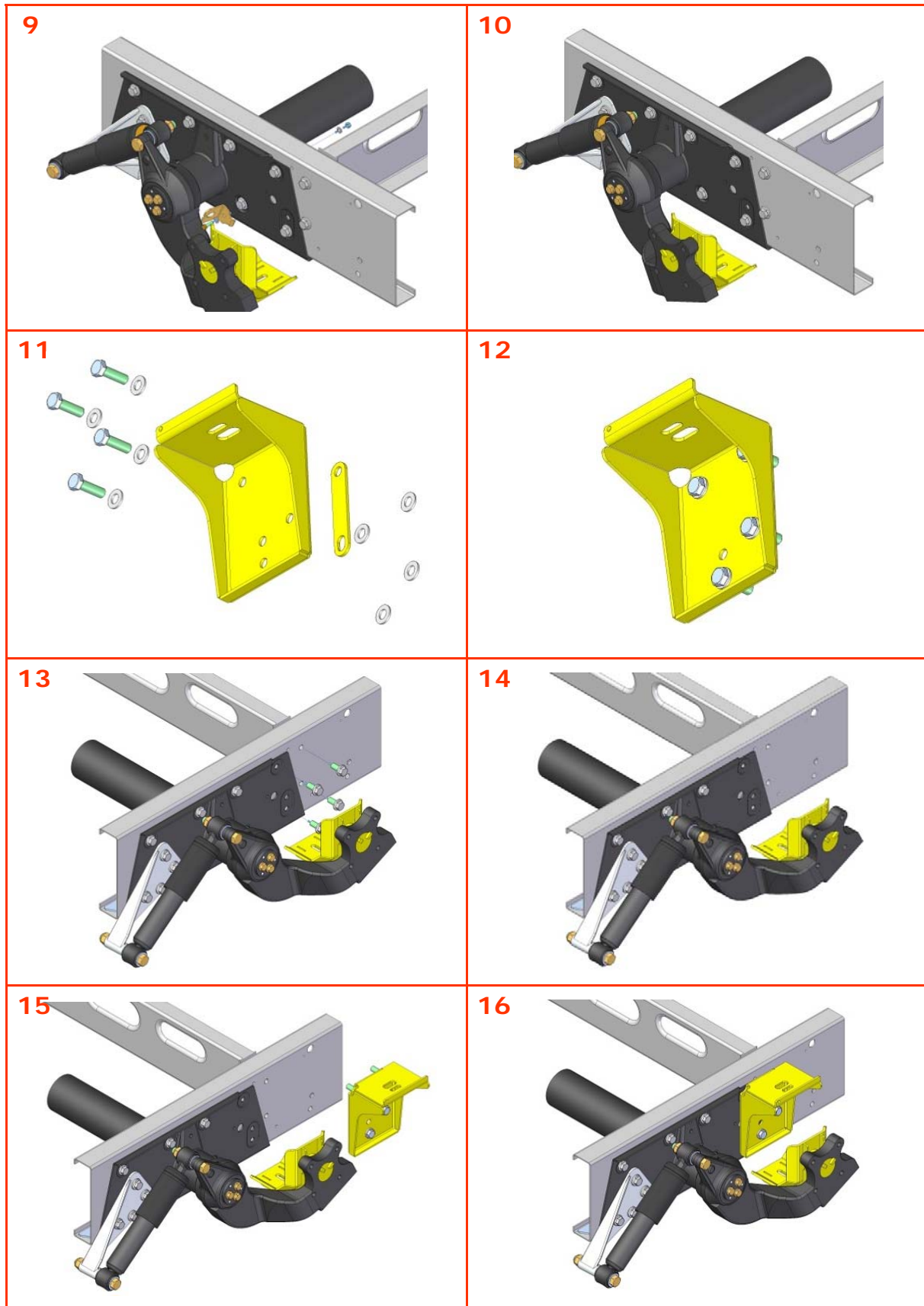
- ◆ to maintain air pressure in the springs. Much like a tyre, the system may lose a little air over time.
- ◆ to keep the air bellows clean. It is suggested that, when washing the vehicle, the bellows are inspected and cleaned as necessary (preferable by spraying). Look in particular for stones or grit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

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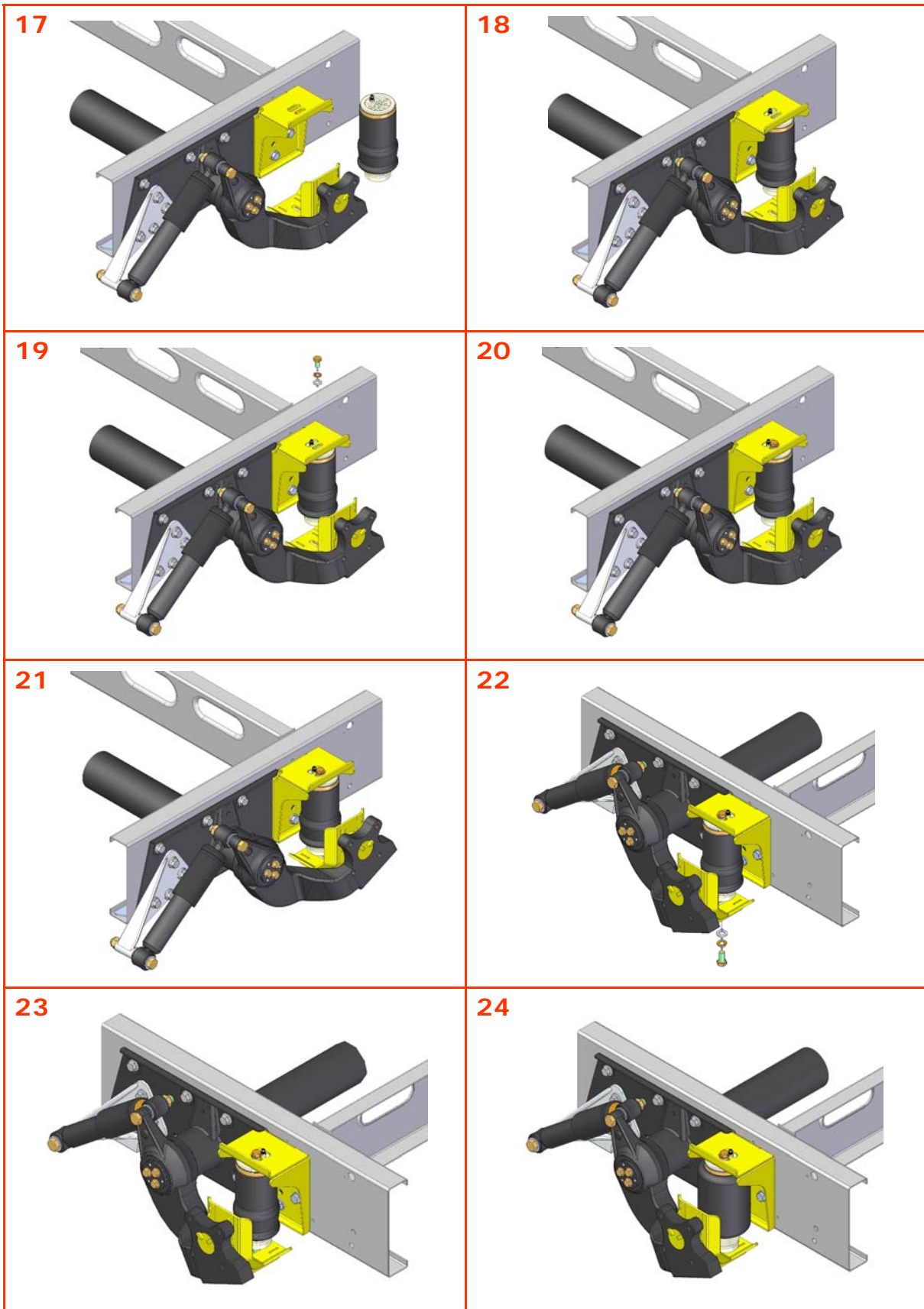
### 7. INSTALLATION DIAGRAMS



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### 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**

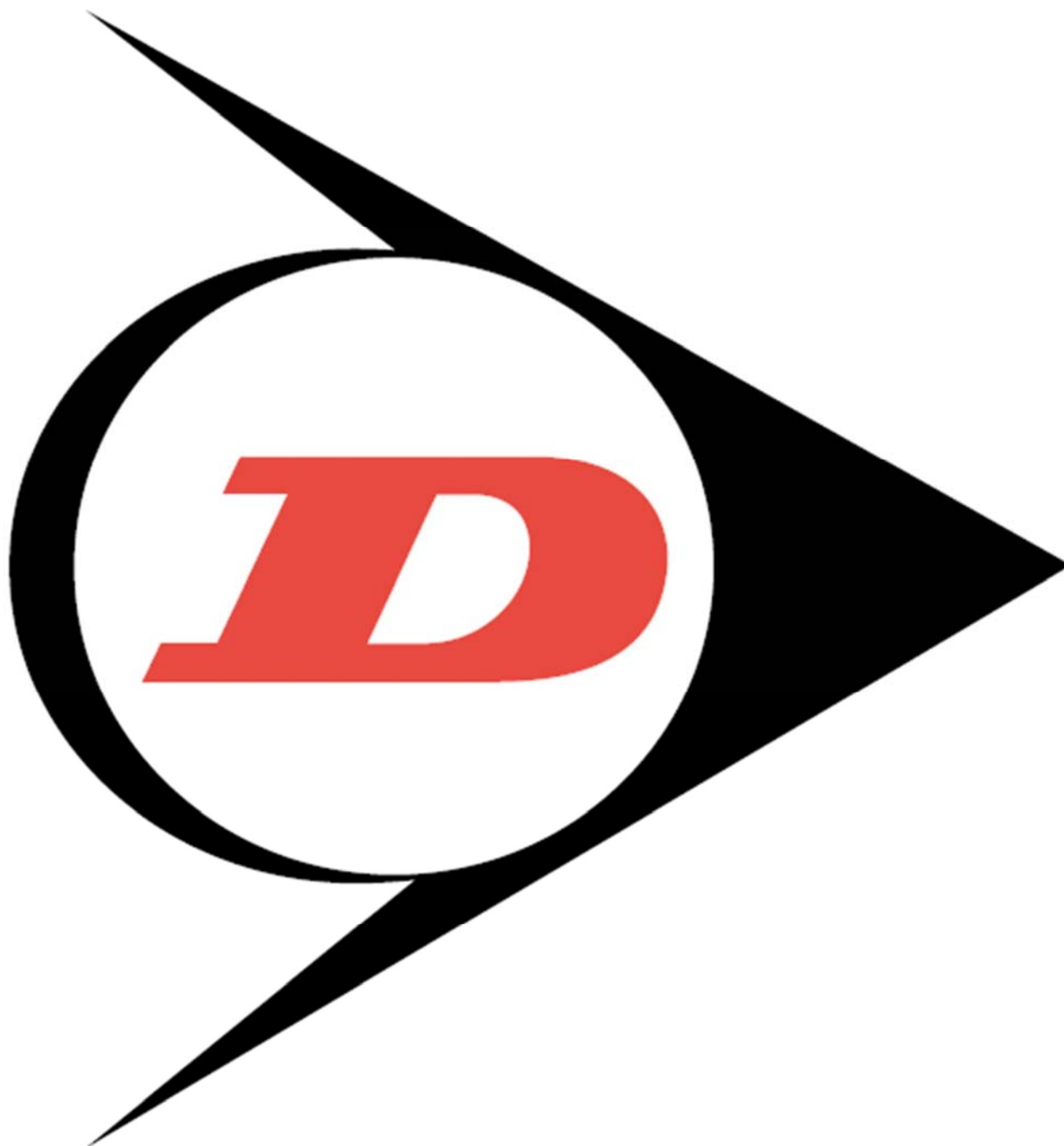
**A manufacturer's declaration form is provided with your kit. Following installation of the kit please ensure that this form is completed, signed by a qualified fitter and a copy is returned to DSC Nederland by post, fax or e-mail. Our e-mail address is: [info@dunlopsystems.nl](mailto:info@dunlopsystems.nl)**

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.dunlopsystems.nl](http://www.dunlopsystems.nl)



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