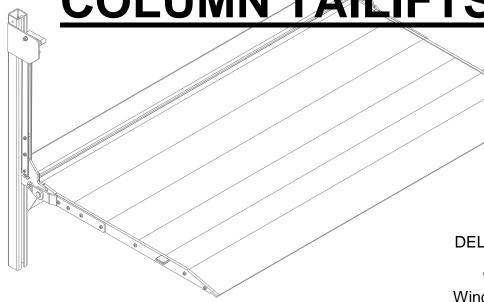


# INSTALLATION MANUAL COLUMN TAILIFTS



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P/No. 73870 - Issue H



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# **EC Declaration of conformity for machinery**

We hereby declare that:

DEL Column Tailift Models: DL, DT, DO, GB, S, TL

- are in conformity with the provisions of the Machinery Directive (2006/42/EC)
- and furthermore declare that parts of the following European harmonised standards have been used:

BS EN 1756-1:2001

Signed: Journe

Name: Ian Forman

Position: Managing Director, DEL Equipment (UK) Ltd.

Place, Date: Witney, OX29 7HA, 29th December 2009

# **Important:**

This declaration is null and void without a completed Lift Installation Test Certificate attached and all signatures completed, or if modifications are made to the machine without prior written approval from Del Equipment (UK) Ltd.

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# INTRODUCTION

This manual covers the installation of the column tailift range DL, DT, DO, GB and S. The correct installation and setting up of the lift is vital to the working life of the lift.

Safety must be regarded as of paramount importance during installation.

A risk assessment for the installation and commissioning of the tailift is required before starting work.

Read this manual fully before commencing work. The lift frame and platform are heavy and can crush. Never work under the lift unless it is securely supported and always disconnect the vehicle battery before starting work.

Do not make any design modification to the tailift unless written permission is first obtained from DEL Equipment (UK) Ltd.

Please note that any unauthorised modification may: -

- Invalidate the warranty
- Lead to equipment failure
- Create a hazard that is not immediately obvious at the time of installation.

If you are unsure about any aspect of the installation procedure please contact DEL service.

# **IMPORTANT**

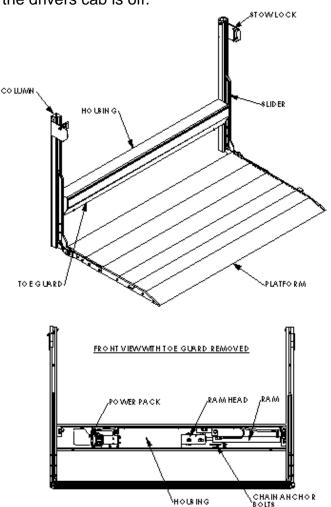
This manual forms part of the Inspection record for the tailift, and should be passed on to the end user, together with the operators handbook.

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# 1. OPERATING SYSTEMS

The tailift is powered from the vehicle battery. A wire is taken from the battery positive to the powerpack starter switch and the hand control. These circuits are protected by in-line fuses. The power to the hand control is isolated by a switch in the driver's cab. When the isolation switch is switched on, the up button on the hand control provides power to the starter switch, which operates the powerpack motor. This pumps high-pressure hydraulic fluid to extend the ram. On release of the up button the fluid is held in the ram due to a non return valve which locks the ram in position therefore holding the platform stationary. Pushing the down button powers the lowering solenoid, which allows the hydraulic fluid back from the ram to the power pack reservoir. The ram is connected to the powerpack with two pipes, one the high pressure feed hose the other the low pressure return hose to the reservoir. The ram pushes two chains, which, via a sprocket system, are connected to the sliders at each side of the platform, which run inside the lift columns. When the down button is pressed the platform lowers by gravity. Each slider has a load safety device, which, in the unlikely event of a chain break, jams the slider in its column. The opening and closing of the platform is torsion bar assisted. The torsion bar is pre-set on manufacture and located inside the platform and is not a user serviceable part. The platform is stowed vertically when not in use and is held in place by the platform locks. Care must be taken when stowing the platform that the locks are correctly engaged and the stow indicator (if fitted) in the drivers cab is off.

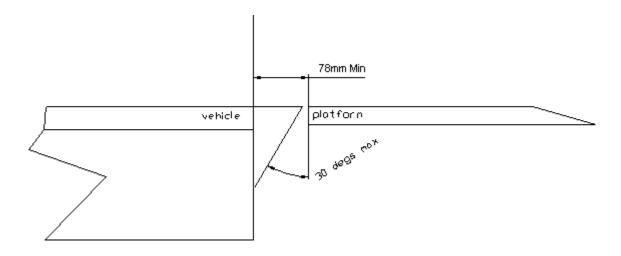


# 2. INSTALLATION PROCEDURE

The following procedure covers a standard bolt-on installation, if the lift is to be welded to the vehicle body, please refer to the welding notes.

# Special precautions

When fitting the tailift, there has to be a minimum horizontal gap of 78mm between the moving parts of the platform and the fixed parts of the vehicle, except at those points where adequate toe protection is provided by a guard whose rear sloping edge is at an angle of no greater than 30 degrees to the vertical (see diagram below).



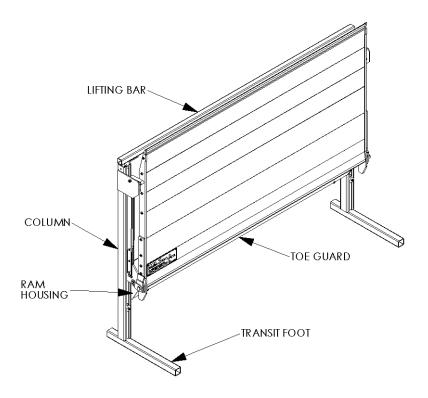
### Safety

Make sure you fully understand the safe operation of the tailift by reading the operator/maintenance handbook before attempting to install the lift.

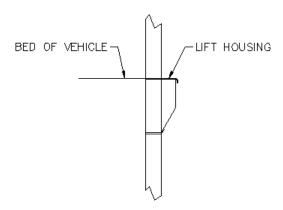
Ensure all work is supervised by a competent engineer in a clear area with adequate lighting.

Check that any specific requirements as stated in the relevant chassis manufacturer's bodybuilder's handbook are adhered to.

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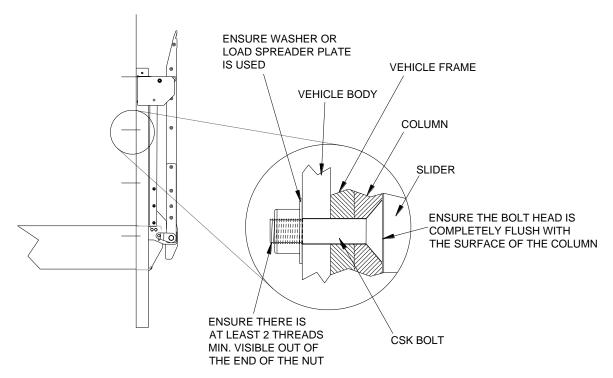


- 1. Ensure the body rear is flat and clear before fitting the lift and the vehicle battery is disconnected.
- 2. Remove the toe guard.
- 3. Position the lift close to the vehicle rear and raise the lift until the top of the lift housing is level with the vehicle floor, using a forklift truck or other suitable lifting device.



- 4. Using suitable G Clamps, clamp the columns and ram housing to the rear frame of the vehicle, ensuring that the lift is central to the rear of the body.
- 5. Check the lift is square and level with the vehicle floor.
- Drill suitable clearance holes into the vehicle frame to correspond with the counter-sunk holes, which are pre-drilled in the lift columns. Using the countersunk bolts provided, bolt the lift to the vehicle frame ensuring that

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the nut is tightened to the torque specified in the technical section for that size bolt. Ensure that the washers provided are used between the nut and the body.

- 7. Re-check the lift columns for squareness using square and diagonal measurements. Brace the columns as indicated in section 5.
- 8. Ensure that the face of all the countersunk bolts in the back of both columns are flush with the face of the column.
- 9. Remove the lifting device and both transit feet. Retain the transit feet to brace the tailift if required (see section 5).
- 10. Remove the Lifting bar and retain ready to brace the tailift back to the chassis/body if required (see section 5).
- 11. Fix the control in position and route the 3-core cable to the control. (see section 3). Connect the control, note that a control bracket may have to be welded to the frame to protect the control and allow its installation, (see wiring diagrams).
- 12. For vehicles with a chassis mounted power pack, mount the powerpack with the brackets provided in a suitable position on the vehicle chassis. Connect the powerpack to the lift ram using 1/4" bsp hoses.
- 13. Route the power cables to the vehicle battery and the isolation cable to the cab.

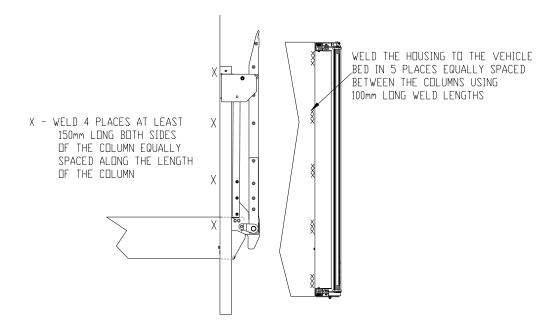
- 14. Drill a 12mm diameter hole in a suitable place in the dashboard to mount the in cab isolation switch. Connect the isolation switch following the wiring diagram.
- 15. Connect the power cables to the vehicle battery; ensure that the in-line fuse is located as close to the battery as possible, and in a position where it is the least susceptible to the elements. For 12v chassis earth systems, connect the earth lead on the back of the lift housing to the vehicle chassis, and fit the additional earth cable from the battery negative terminal to the chassis.
- 16. Turn on the isolation switch in the cab; ensure that the red light on the switch comes on. For lifts with chassis mounted power packs, press the raise and lower buttons simultaneously for 5 seconds to prime the pump.
- 17. For DL1000 and DL1500 lifts, press the lower button to release the platform from its locks before opening the platform and continuing to lower it to the ground. For DL500 lifts press the raise button, to ensure the platform is in its fully raised position, lift the catch and open the platform before fully lowering the platform to the ground.
- 18. Operate the lift up and down 3 4 times to ensure correct operation.
- 19. Carry out the post installation tests (section 10). The test sheets must remain in the installation handbook as part of the service/maintenance record for the lift.
- 20. Check and adjust if needed the fully raised position of the platform. The DEL design of tailift differs from all other lifts in operation and the floor level adjustment is critical to the safe working and life of the lift. DO NOT adjust the platform more than 6mm above floor height (see section 8).
- 21. Activate the Load Safety Device (see section 6).
- 22. Refit the toe guard.
- 23. Before the lift is painted, run a bead of sealant between the vehicle bed and the top of the lift housing.
- 24. Once the vehicle has been painted, the Warning, Instruction and Safe Load working decals must be fitted (see section 9). Also fit the caps to the top of each column.
- 25. Complete the final inspection checklist.
- 26. Complete the test certificate and forward a copy to DEL.
- 27. Ensure that the installation and operators handbooks are passed on to the end user of the lift.

### WELD ON LIFTS

### **IMPORTANT**

When welding ensure: -

- The vehicle's battery is disconnected.
- A good earth is achieved, by clamping the earth cable onto the lift columns, NEVER any lift fittings.
- All paint is removed from the weld site before starting to weld
- The power pack and all hydraulic hoses and electrical wires are protected from weld heat and splatter.
- Do not weld near the vehicle batteries.
- The weld area is painted after welding.



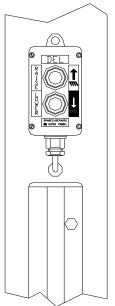
- a) Ensure the vehicle battery is disconnected, and that all other vehicle electrical systems are disconnected as detailed in the chassis manufacturer's instructions.
- b) Stitch weld the ram housing at bed level and tack the top of the columns to the vehicle frame.
- c) Ensure that the lift is level and square with the bed of the vehicle before fully welding the lift in position.
- d) Continue fitting the lift following the procedure from step 9 detailed above.

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# 3. LOCATION OF CONTROL POSITIONS

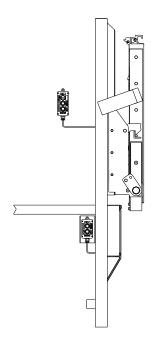
# 3.5T BOX/LUTON BODY

Position control above column. Route the wire inside the body through a grommet



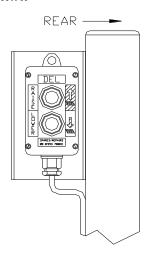
# 7.5T BOX/CŬRTAIN SIDE BODY

Position 3 button control inside body housed inside cover with the wires down. Weld a cover to the column to mount the 2-button control.



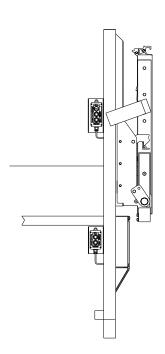
# 3.5T DROPSIDE BODY

Position control onto the rear of the column facing out or forward. Care must be taken to protect the wire



# 7.5T DROPSIDE BODY

Weld a cover to the column to position the 3-button control facing into the body with the wires down. Repeat for the 2-button control facing out



# 4. INSTALLATION OF IN-LINE FUSE & EARTH

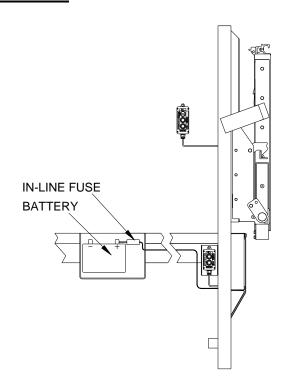
The following instructions cover lifts fitted with an insulated earth cable, which cover all of the 24v systems supplied and some of the 12v systems. For 12v systems not fitted with an insulated earth cable i.e. the tailift is earthed to the vehicle chassis; a separate earth to chassis lead must be fitted (supplied in the kit). DO NOT rely on the vehicle manufacturers earth cable, this is not adequate.

# 3.5T WITH THE BATTERY UNDER THE BONNET

Route main battery cable from tailift to the battery along the chassis avoiding the exhaust, fuel pipes and sharp edges.
Locate the fuse holder as IN-LINE FUSE close to the battery as possible, inside the engine compartment using the short cable to the battery +ve terminal

# 7.5T VEHICLE WITH CHASSIS BATTERY

Route main battery cable from tailift to the battery along the chassis avoiding the exhaust, fuel pipes and sharp edges.
Locate the fuse holder inside the battery case, using bolts, not self-tappers. If insufficient space inside case, locate as close to the battery as possible, in an area least susceptible to the elements

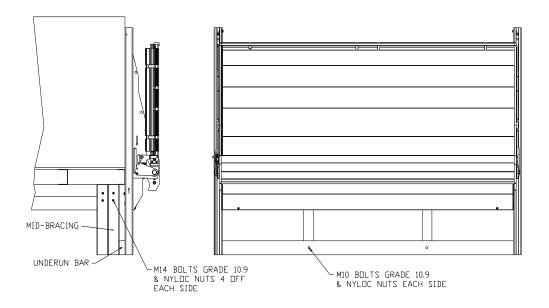


# 5. TAILIFT BRACING

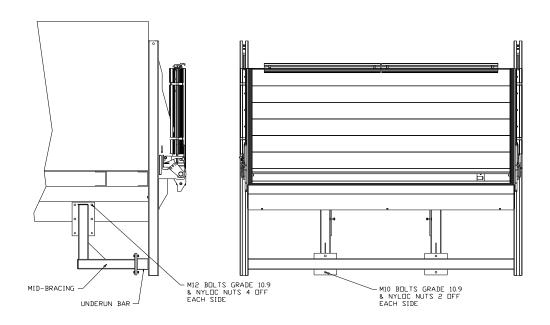
# MID BRACING

When a lift is fitted to a vehicle over 3.5 tonnes (N2, N3), then It is a compulsory requirement that they are fitted with the mid bracing supplied by Del; in order to support the underun bar and to comply with the UNECE Type Approval legislation. The mid bracing is bolted to the vehicle chassis and underun bar, using the fixings stated.

1000kg Capacity Column lifts require mid bracing as below:



1500kg Capacity Column lifts require mid bracing as below:



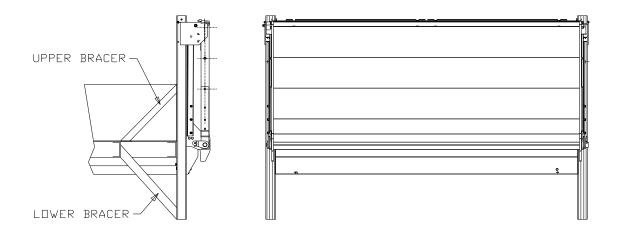
# 500KG LIFTS

# 3.5T LUTON/BOX BODY

Bracing is not normally required when mounting a standard 500kg lift to a Luton/box body vehicle.

### 3.5T DROPSIDE BODY

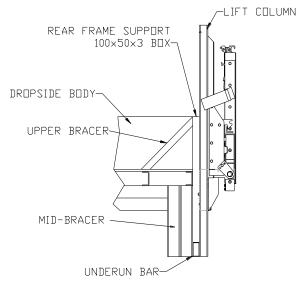
Both upper and lower bracing is required when mounting a standard 500kg lift to a dropside body vehicle. The body should be built with a box section rear frame or other suitable framework.



# ABOVE 500kg LIFTS

# 7.5T DROPSIDE BODY

Upper bracing is also required when mounting a lift rated above 500kg to a dropside body vehicle. The body should be built with a box section rear frame. The diagrams below give examples of how the lift can be braced.



# **IMPORTANT**

Please refer to page 9 for precautions to take when welding.

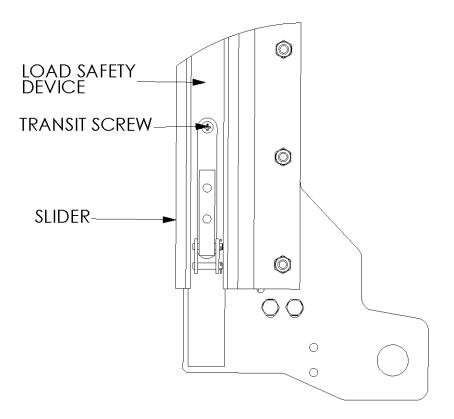
# 6. LOAD SAFETY DEVICE

DEL Tailifts is fitted with a chain failure LSD. During transit and installation of the lift, the LSD is disengaged to prevent accidental operation.

# TO ACTIVATE THE LSD

- 1. Lower the platform to within 300mm of the ground. Remove the LSD transit screw from both sliders.
- 2. The LSD will now be active

Please contact DEL Service if you are unsure or have any problems.



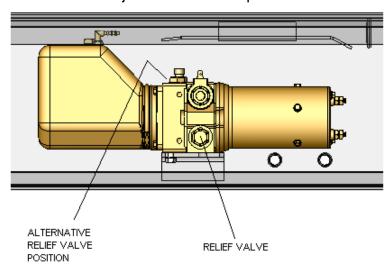
# 7. SETTING THE POWERPACK RELIEF VALVE

Turn the relief valve **CLOCKWISE** to **INCREASE** the load.

Turn the relief valve ANTICLOCKWISE to DECREASE the load.

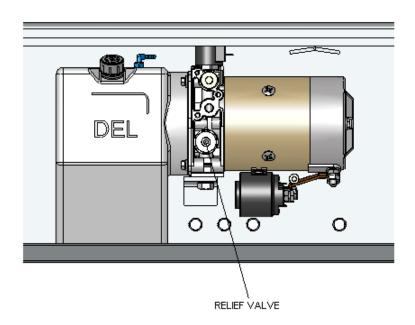
# DL500 Lifts

- Remove the cover cap
- Adjust the valve
- Refit the cap
- Check the adjustment with the post-installation tests



# DL1000 and DL1500 Lifts

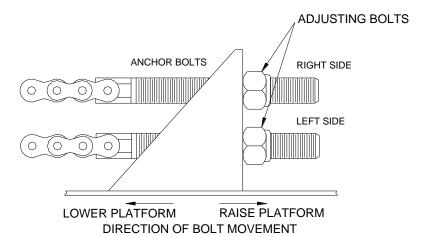
- Release the locknut
- Adjust the relief valve with an Allen key.
- After adjustment, tighten the locknut.
- Check the adjustment with the post-installation tests



# 8. CHAIN ADJUSTMENT

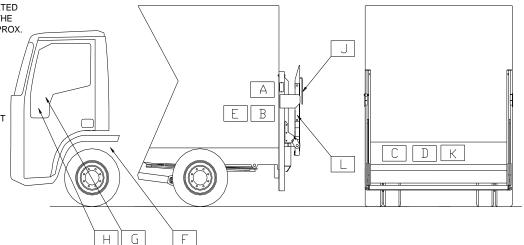
- Remove the main housing cover.
- Open the platform.
- Raise the tailift to the full height possible while in the horizontal position.
- Check the adjustment required on each side.
- Lower the platform to the ground.
- Turn the NUT on the anchor bolt to either tighten or loosen the chain. Tightening will raise platform, loosening will lower it. Note that for every 5mm of adjustment, the platform will move 5mm
- Replace the main housing cover.

The platform should now be level with the truck bed or up to <u>6mm</u> above floor level.



# 9. LOCATION OF WARNING DECALS

- A LOCATED NEXT TO THE CONTROL BOX. WITH REMOTE CONTROL OPERATION IT IS LOCATED ON THE PASSENGER SIDE, AS CLOSE TO THE LIFT AS POSSIBLE AND AT EYE LEVEL (APPROX. 5 FEET FROM THE GROUND)
- B LOCATED NEXT TO 'A'
- C LOCATED ON THE MAIN HOUSING COVER ABOVE THE TOE GUARD ON THE PASSENGER SIDE.
- D LOCATED ON THE MAIN HOUSING COVER ABOVE THE TOE GUARD OR TO THE RIGHT OF 'B'
- E LOCATED NEXT TO 'B'
- F LOCATED AROUND THE POSITIVE CABLE FROM THE LIFT TO THE BATTERY
- G LOCATED IN THE DRIVERS CAB AS CLOSE TO THE STOW INDICATOR AS POSSIBLE.
- H LOCATED IN THE DRIVERS CAB AS CLOSE TO THE ISOLATION SWITCH AS POSSIBLE.
- J REFLECTIVE FLAGS LOCATED AT THE TOP OF THE PLATFORM ON BOTH SIDES



- K LOCATED ON THE MAIN HOUSING OR ON THE POWER PACK BOX (CHASSIS PACKS)
- L LOCATED ON THE EDGE OF BOTH SIDES OF THE PLATFORM

#### A) TAILIFT OPERATION



#### B) CAUTION



#### C) WARNING



#### D) MAX LOAD



#### E) MAINTENANCE



#### F) TAILIFT ISOLATION



# G) STOW INDICATOR (ON DASHBOARD) IF FITTED



H) ISOLATION (ON DASHBOARD)



J - FLAGS



K) ISOLATE POWER SUPPLY

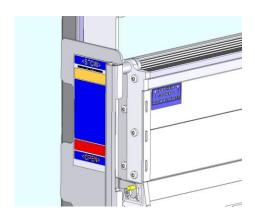


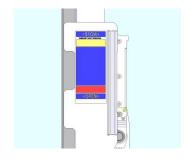
L) KEEP FEET CLEAR



# LIFT OPERATION DECAL POSITIONS, DUMPOVER LIFTS

Affix the 'TAILIFT OPERATION, and 'HOLD HERE TO OPEN & CLOSE PLATFORM' decals where shown.





**DUMPOVER TAILIFT OPERATION** 



HOLD HERE TO OPEN & CLOSE PLATFORM

# 10. TESTS AFTER INSTALLATION

After the lift has been initially installed the following tests <u>MUST</u> be completed to ensure the lift has been installed and set up correctly in accordance with CE regulations. The results of the tests should be entered on the test certificate provided and a copy returned to DEL Equipment (UK) Ltd, the original should remain in this handbook as part of the inspection record for the tailift. This handbook should be kept, together with the operators handbook, with the tailift as part of the inspection record for the lift.



# Do not leave a loaded platform unattended

IMPORTANT – CE REGULATIONS REQUIRE THE TEST CERTIFICATE TO BE COMPLETED AND RETURNED TO DEL Equipment (UK) Ltd

The lift shown for illustration purposes is the DL500. The same tests apply to all other column lift models.

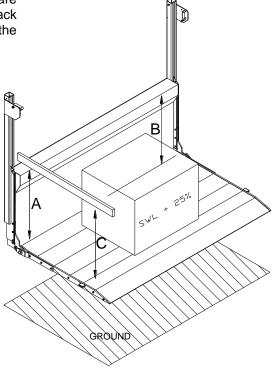
# 1) STATIC TESTS

# a) Deformation

This test is to ensure that the lift attachment is secure.

- Lower the platform mid-way between vehicle floor level and ground level.
- Measure the height of the platform from the vehicle floor at each side of the platform and at the front of the platform (measurements A, B and C below). Note that a straight edge resting flat on the lift housing will be needed to measure dimension C. Record the initial measurements in the table below.

Dimensions A are taken from the back left hand side of the platform



Dimension B is taken from the back right hand side of the platform

Dimension C is taken from either the front left or front right of the platform

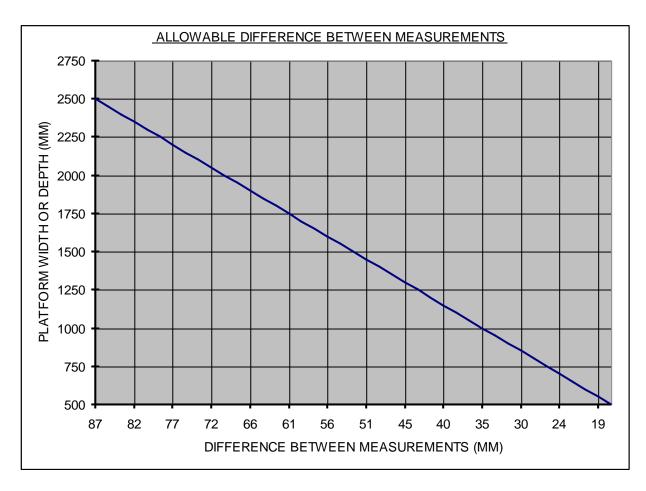
- Apply a load equal to the safe working load +25% (e.g. 625 kgs for 500kg rated lift), at a distance of 500mm from the load centre to the back of the platform, leave it for 10 seconds before removing it.
- Re-measure the distances A, B and C and record under 'measurement 1' in the table below.
- If the new values of A, B and C recorded under measurement 1 are not the same as the previous values, repeat the test until they are, recording all subsequent tests in the spaces given.
- Check that no permanent deformation has occurred in the lift or its attachment to the vehicle, which would affect its function.

	INITIAL	MEASUREMENT 1	MEASUREMENT 2	MEASUREMENT 3
Α				
В				
С				

# b) Platform drift

This test is to ensure that the platform remains stationary within 15mm of its original position over a 15-minute test period.

- Raise the platform to vehicle bed height.
- Apply a load equal to the safe working load + 25% at a distance of 500mm from the load centre to the back of the platform. (note that the power pack relief setting prevents this load from being raised)
- Measure the distances A, B, and C and record them in the table below.
- Leave the platform loaded for 15 minutes.
- After the 15 minutes test period, re-measure the values A to C and record them in the table.
- Check that:
  - 1) The difference between measurements A and A' and B and B' does not exceed 15mm
  - 2) The angular drift of the platform does not exceed 2 degrees. This is checked using the graph below. The graph shows the allowable difference allowed between measurements A' and B' and A' and C' (angular drift, side to side and front to back). If the difference between the measurements is more than that shown in the graph, contact DEL Service for advice.



	Initial		After 15 minutes	Difference between
	Measurement			Measurements
Α		A'		A' & B'
В		B'		A' & C'
С		C'		

# 2) TEST TO VERIFY THAT THE LIFT CANNOT RAISE EXCESSIVE LOAD

- Lower the platform to Ground level.
- Apply the safe working load + 25% to the platform in the position shown in the deformation test.
- Verify that the load cannot be lifted.

<u>Note</u> If the load is lifted reset the power-pack relief valve by following the procedure given under the installation procedure section.

### 3) DYNAMIC TEST

- Apply the safe working load to the platform.
- Ensure that the lift operates through its full range of movements.
- With the load still on the platform go straight to the safety tests.

# 4) TEST OF SAFETY FUNCTIONS

# a) Vertical speed

- With the safe working load on the platform measure the time taken for the platform to lower from bed height to the ground.
- With NO load on the platform, measure the time taken for the platform to raise from the ground to vehicle bed height.
- Record the values in the table below.
- Using the height 'A' measured in the platform drift section above calculate the speed for both the lowering and raising operations (speed = A/time), and record them in the table.
- Check that the speeds do not exceed 150 mm/second

	Laden (lowering)	Unladen (raising)	Measurement 'A'
Time			
Speed (A/Time)			

# **NOTE**

• If the speeds exceed 150 mm/second check that there is no damage to mechanical parts and that the correct oils/greases have been used.

# 11. CHECK LIST

•	Static test complete	
•	Dynamic test complete	
•	Excessive load test complete	
•	Safety function test complete	
•	Vertical speeds measured	

# 12. TECHNICAL INFORMATION

# **TORQUE SETTINGS** –

	TIGHTENING T	ORQUES (N/M)
	GRADE 8.8	GRADE 10.9
M6	8	12
M8	20	29
M10	40	57
M12	70	99
M14	112	158
M16	175	246
G 1/4	2	0
G 3/8	3	4

# **HYDRAULIC FLUID** –

Automatic Transmission Fluid – Viscosity - 39 Centi-strokes at 40°C 7.5 Centi-strokes at 100°C

Type 'A' automatic transmission fluid or Shell T22 or equivalent is recommended.

# **ELECTRICAL WIRES** -

Where not supplied with the tailift, the wires used on the lift should be of the following minimum CSA.

Power and Earth - 1500kg: 35mm<sup>2</sup>, 1000kg: 25mm<sup>2</sup>, 500kg: 20mm<sup>2</sup> Hand control and isolator - 1mm<sup>2</sup>

### **BOLTS** –

Where not supplied with the tailift, the minimum specification for the bolts to mount the tailift should be:

Grade 10.9, diameter 8mm, countersunk.

Note that the mounting bolts should have a minimum shank length of 5mm and screws should never be used.

# MANUAL EFFORT WHEN OPERATING TAILIFT -

Manual effort shall not exceed 250N, however, to initiate motion, the effort shall not exceed 350N. Note that these requirements do not apply to the effort used when handling loads.

# WEIGHTS -

	MASS (KG)		
MODEL	STEEL PLATFORM	<b>ALUMINUM PLATFORM</b>	
GB450	-	140	
DL500T	290	250	
DL500G/FC	-	250	
DL500F	205	145	

BD500	-	250
DO500T	330	200
DT500	300	270
DL550GP	185	-
DL750T	310	270
BD750	-	230
DO750T	340	-
DL1000T	310	270
BD1000	-	270
S1000	330	280
DO1000T	350	-
GB1000	360	325
S1500	425	280
GB1500	425	350

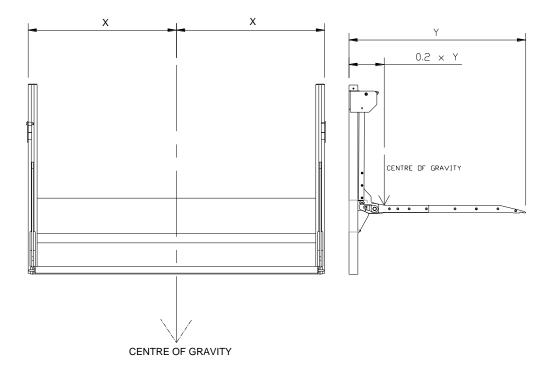
For platforms with 3 way folding ramps add 10kgs to the weight of the platform.

NOTE: - The above weights are approximate and are given as a guide only, and assume a standard width platform.

# **CENTRE OF GRAVITY** -

The centre of gravity of a column tailift lies at approximately 0.2 times the distance from the back of the lift columns to the front edge of the platform and halfway between the lift columns.

<u>NOTE</u> when loading the platform; place the centre of the load as close to the centre of gravity of the platform as possible.



# 13. FINAL INSPECTION CHECKLIST



CAUTION: Do not use the tailift if any of the items below are not checked and verified. If you have any questions contact DEL sales. Failure to verify the following could result in severe damage to the tailift or personal injury.

Installation is not fully complete until all the following items are checked and verified and the Installation Manual is passed on to the end user of the lift. Oil level meets fill mark in pump reservoir. All tack welds are now complete welds. Platform meets the bed height. Hydraulic components checked for leakage. Battery cables attached and clamped tight. Lights wired properly, are operational, and comply with current lighting Regulations. Vehicle licence plate properly fitted. All decals in place and legible after painting. Operators manual in vehicle. Earth strap properly installed. Columns greased if needed. Platform opens properly. Platform safety catches operational. Control switch operates properly. Platform torsion assistance working. LSD transit screws have been removed. Tailift tested and test certificate completed. Minimum toe gap of 78mm

Wire protection fitted to all cable holes

DATE: .....



# LIFT TEST CERTIFICATE

DEL Equipment (UK) Ltd Building 1 Windrush Industrial Estate Windrush Park Road Witney OX29 7HA

TEL: 01993 708811 FAX: 01993 708787 EMAIL: sales@del-uk.com

CUSTOMER NAME:INSTALLER/TESTER NAME:
ADDRESS:ADDRESS:
MODEL SERIAL NO:FITTED TO:
RATEDCAPACITY:KG VEHICLE REG: (TEST LOAD)
OVERLOAD SETTING: KG (TEST LOAD + 25%)
<u>INSTALLATION TESTS</u>
1. STATIC TEST: PASS/FAIL?
2. DYNAMIC TEST: PASS/FAIL?
3. EXCESSIVE LOAD TEST: PASS/FAIL?
4. SAFETY FUNCTION: PASS/FAIL?
5. VERTICAL SPEED TEST PASS/FAIL?
HAS THE LSD TRANSIT SCREW BEEN REMOVEDYES/NO?
HAS THE FINAL INSPECTION CHECKLIST BEEN COMPLETEDYES/NO?
HAS THE OPERATORS MANUAL BEEN PASSED ON TO THE ENDUSERYES/NO?
GENERAL.OBSERVATIONS
We certify that the product detailed above has been installed in accordance with the manufacturers instructions and that all post installation tests have been completed and passed. We confirm that the manufacturer and end user have been consulted with regard to the products compatibility with the vehicle taking into account the intended use.  The product has not been modified in any way. Any modifications have been
approved in writing by the manufacturer.
TESTED BY: SIGNED.
COMPANY

THIS CERTIFICATE SHOULD REMAIN IN THE INSTALLATION HANDBOOK AND A COPY MADE TO BE RETURNED OR FAXED TO DEL EQUIPMENT (UK) LTD.

