



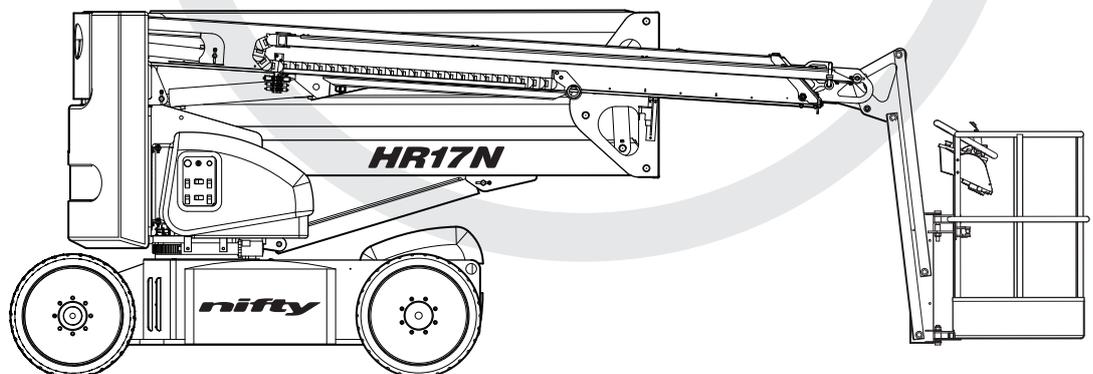
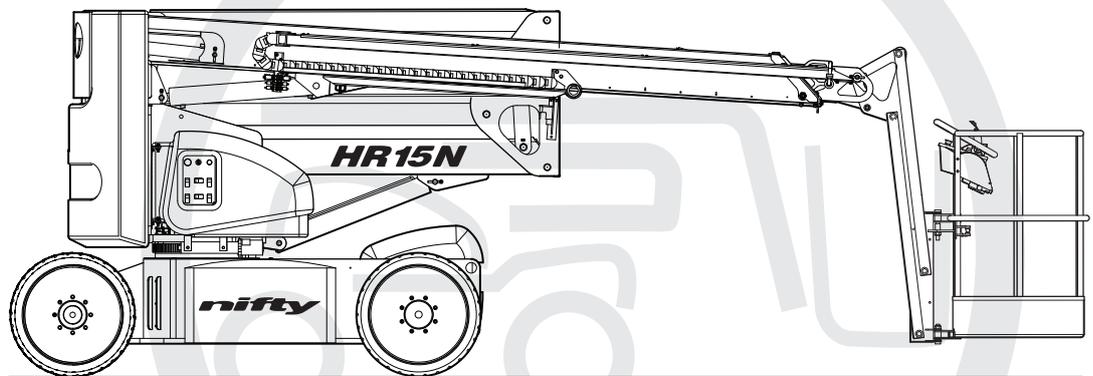
**nifty**

**ADVANCED  
ACCESS PLATFORMS**

# Heightrider

Operating & Safety Instructions

**MODEL HR15N (SP45N) &  
HR17N (SP50N) SERIES**



Manufactured by:  
**Niftylift Limited**

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MK13 0ER  
England

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# 1 Introduction and General Information

## 1.1 FOREWORD

The purpose of these manuals is to provide the customer with appropriate safety operating and maintenance instructions essential for proper machine operation.

All information in these manuals should be **READ** and fully **UNDERSTOOD** before any attempt is made to operate the machine. **THESE MANUALS ARE VERY IMPORTANT TOOLS** - Keep them with the machine at all times.

**The manufacturer has no direct control over machine application and use, therefore conformance with good safety practices is the responsibility of the user and his operating personnel.**

**All information in these manuals is based on the use of the machine under proper operating conditions. Alteration and/or modification of the machine are strictly forbidden.**

**One of the most important facts to remember is that any equipment is only as safe as those who operate it.**

### **DANGER, WARNING, CAUTION, IMPORTANT, INSTRUCTIONS AND NOTICE**

Any place these topics may appear, either in this manual or on the machine, they are defined as follows:

**DANGER:** If not correctly followed there is a high probability of serious injury or death to personnel.

**WARNING OR CAUTION:** If not correctly followed there is some possibility of serious injury or death to personnel.



THE '**SAFETY ALERT**' SYMBOL IS USED TO CALL ATTENTION TO POTENTIAL HAZARDS THAT MAY LEAD TO SERIOUS INJURY OR DEATH, IF IGNORED.

**IMPORTANT AND INSTRUCTIONS:** Denotes procedures essential to safe operation and prevention of damage to or destruction of the machine.

**NOTICE:** Indicates general safety rules and/or procedures relating to the machine.

**It is the owner's/user's responsibility to know and comply with all applicable rules, regulations, laws, codes and any other requirements applicable to the safe use of this equipment.**

## 1.2 SCOPE

These operating instructions contain all the necessary information required to allow the safe operation of any Niftylift Height Rider 15N or 17N (SP45 OR SP50N in the USA), powered by electric (DC), diesel (D), or a combination of these.

For further technical information, circuit diagrams and specific instructions for all maintenance which may need to be carried out by specialist trained personnel, see the associated Workshop and Parts manual for your model of Niftylift Height Rider.

## 1.3 INTRODUCING THE HEIGHT RIDER SELF-PROPELLED (SP) SERIES

Please note at the time of going to press all information, illustrations, details and descriptions contained herein are valid. Niftylift reserves the right to change, modify or improve its products without any obligations to install them on previously manufactured machines.

If, after reading this manual you require further information, please do not hesitate to contact us.

**Niftylift Ltd, Fingle Drive, Stonebridge, Milton Keynes MK13 0ER, Great Britain**

**Tel: +44 (0) 1908 223456      Fax: +44 (0) 1908 312733**

**Niftylift Inc, 32 Concourse Way, Greer, SC 29651 USA**

**Tel: +01 864 968 8881      Fax: +01 864 968 8836**

**Nifty Pty Ltd, 11 Kennington Drive, Tomago, NSW 2322, Australia**

**Tel: +61 (0) 2 4964 9765      Fax: +61 (0) 2 4964 9714**

Driven from the platform, the Niftylift Height Rider 15N or 17N (SP45N OR SP50N) is an extremely versatile articulated boom platform of unique and simple design. In the case of the HR17N it is capable of placing two men and their tools up to a height of 17.23m (56ft 6in) or an outreach of 9.6m (31ft 6in). The HR15N can place two men and their tools at a height of 15.53m (51ft) or an outreach of 9.6m (31ft 6in).

The booms are mounted via a 360<sup>0</sup> powered swing mechanism onto a compact narrow base with a tight turning circle that ensures excellent manoeuvrability and maximum efficiency.

High traction tyres and powerful hydraulic wheel motors give unsurpassed performance with the option of fast drive speed when the booms are in the stowed position. Automatic braking and audible alarms activated by a four degree (HR15N) or three degree (HR17N) tilt sensor help to prevent the operator from working on unsafe terrain whilst elevated.

A simple, all-hydraulic proportional control system gives smooth, reliable movement of the platform and maximum reliability in the harshest environments.

*Models include the following:*

E: - DC ELECTRIC

DE: - BI-ENERGY (DIESEL & BATTERY)

D: - DIESEL

LPG: - PROPANE GAS

# **nifty** Height Rider/SP Series

## Operating & Safety Instructions

### 1.4 GENERAL SPECIFICATION

<b>FEATURE</b>	<b>HR15N (SP45N)</b>	<b>HR17N (SP50N)</b>
MAXIMUM HEIGHT - WORKING	15.53m 51ft	17.23m 56ft 6in
MAXIMUM HEIGHT - PLATFORM	13.53m 44ft 5in	15.23m 50ft
MAXIMUM OUTREACH	9.60m 31ft 6in	
MAXIMUM HEIGHT – STOWED	2.1m 6ft 11in	
MAXIMUM WIDTH	1.50m 4ft 11in	
MAXIMUM LENGTH – STOWED	5.00m 16ft 5in	
PLATFORM CAPACITY - Europe	225kg (500lbs)	
WHEELBASE	1.95m 6ft 5in	
TURNING RADIUS – OUTSIDE	4.40m 14ft 5in	
TURRET ROTATION	355°	
TURRET TAIL SWING	Zero	
TRAVEL SPEED	0-2.5mph 0-4kph	
PLATFORM SIZE	1.50m x 0.70m 5ft x 2ft 4in	
CONTROLS	Proportional electric over hydraulic	
HYDRAULIC PRESSURE	200 bar	
TYRES	Solid, non marking optional	
GRADE-ABILITY	25%	
MINIMUM VEHICLE WEIGHT	6680kg 14700lbs	7200kg 15900lbs
MAXIMUM GROUND PRESSURE	0.119kN/cm <sup>2</sup> 24958lbs/ft <sup>2</sup>	0.128kN/cm <sup>2</sup> 26817lbs/ft <sup>2</sup>
POWER SOURCE	E (Electric) models - 8 x 6v 350 AH batteries D (Diesel) models - Kubota 722 DE (Diesel & Battery) – Diesel Bi-Energy	

## 1.5 IDENTIFICATION (UK PLATE)

			
NIFTYLIFT LTD. RINGLE DRIVE, STONEBRIDGE MILTON KEYNES MK13 0ER ENGLAND TEL 01908 223456 : FAX 01908 312733 e-mail : info@niftylift.com			
SERIAL No			
TYPE			
YEAR OF MANUFACTURE			
WEIGHT			kg
RATED LOAD	PERSONS	+	kg
MAXIMUM SAFE WORKING LOAD			kg
MAXIMUM PULL			N
MAXIMUM WIND SPEED			m/s
MAX. ALLOWABLE INCLINATION			Deg.
MAXIMUM HYDRAULIC PRESSURE			bar
MAXIMUM VOLTAGE			V
AMPS			A
ELEC. CCT D	ISSUE		
HYD. CCT D	ISSUE		
			P10205

**This manufacturer's plate is attached to Boom 1 on each machine at the time of manufacture on every Niftylift. Please ensure all sections have been stamped and are legible.**

# **nifty** Height Rider/SP Series

## **Operating & Safety Instructions**

### **1.5a IDENTIFICATION (USA PLATE)**

	
NIFTYLIFT LTD. RINGLE DRIVE, STONEBRIDGE MILTON KEYNES MK13 0ER GREAT BRITAIN TEL (01144) 1908 223456 : FAX (01144) 1908 312733 e-mail : info@niftylift.com	
THIS WORK PLATFORM COMPLIES WITH ANSI STANDARD A 92-	
MODEL	
SERIAL NO	
YEAR OF MANUFACTURE	
CAPACITY RATING	LBS
PLATFORM HEIGHT	FEET
GROSS WEIGHT	LBS
MAXIMUM HYDRAULIC PRESSURE	PSI
MAXIMUM VOLTAGE	V
AMPS	A
ELEC. CCT D	ISSUE
HYD. CCT D	ISSUE
P11497	

**This manufacturer's plate is attached to Boom 1 on each machine at the time of manufacture on every Niftylift. Please ensure all sections have been stamped and are legible.**

## 1.6 EC DECLARATION OF CONFORMITY (Typical)



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### ***EC DECLARATION OF CONFORMITY***

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MANUFACTURER AND PERSON RESPONSIBLE FOR DOCUMENTATION: **NIFTYLIFT LTD  
MALCOLM NORTH**

ADDRESS: **FINGLE DRIVE,  
STONEBRIDGE,  
MILTON KEYNES,  
MK13 0ER,  
ENGLAND.**

MACHINE TYPE: **MOBILE ELEVATING WORK PLATFORM**

MODEL TYPE:

SERIAL NUMBER:

NOTIFIED BODY: **RWTUV Anlagentechnik GmbH**

NOTIFIED BODY NUMBER: **0044**

ADDRESS: **POSTFACH 10 32 61  
D-45141 ESSEN  
GERMANY**

CERTIFICATE NUMBER:

APPLICABLE STANDARDS: **EN 280:2001+A2:2009  
DIN EN 60204-1, 2006/42/EC**

*We hereby declare that the above mentioned machine conforms with the requirements of the Machinery Directive, 2006/42/EC and EMC Directive 2004/108/EC*

SIGNED:  DATE: 14<sup>th</sup> December 2009

NAME: Malcolm North POSITION: Engineering Manager

**NOTE:**  
THIS DECLARATION CONFORMS WITH THE REQUIREMENTS OF ANNEX II-1.A OF THE COUNCIL DIRECTIVE 2006/42/EC. ANY MODIFICATIONS TO THE ABOVE MENTIONED MACHINE WILL INVALIDATE THIS DECLARATION, AND THE MACHINE'S APPROVAL.

## **2 Safety**

### **2.1 MANDATORY PRECAUTIONS**

When operating your Niftylift, your safety is of utmost concern. In order to fully appreciate all aspects of the machines operation it should be ensured that each operator has **READ** and fully **UNDERSTOOD** the relevant manual covering machine use, maintenance and servicing. If any doubts exist concerning any points covered in your manual, contact your local dealer or Niftylift Ltd.

Before using any Niftylift, thoroughly inspect the machine for damage or deformation to all major components. Likewise, check the control systems for hydraulic leaks, damaged hoses, cable faults or loose covers to electrical components. At no time should damaged or faulty equipment be used - Correct all defects before putting the platform to work. If in doubt, contact your local dealer or Niftylift Ltd (see front cover for address).



**THE MANUFACTURER HAS NO DIRECT CONTROL OVER THE MACHINE APPLICATION AND USE. THEREFORE CONFORMATION WITH GOOD SAFETY PRACTICES IS THE RESPONSIBILITY OF THE USER AND HIS OPERATING PERSONNEL. FAILURE TO UNDERSTAND AND FOLLOW ALL SAFETY RULES COULD RESULT IN SERIOUS INJURY OR DEATH.**

- 2.1.1** Only trained persons will be permitted to operate the Niftylift.
- 2.1.2** Always operate the Niftylift in full accordance with the manufacturers Operating & Safety Instructions for that model.
- 2.1.3** Before use each day and at the beginning of each shift the Niftylift shall be given a visual inspection and functional test including, but not limited to, operating and emergency controls, safety devices, personal protective clothing, including fall protection, air, hydraulic and fuel system leaks, cables and wiring harness, loose or missing parts, tyres and wheels, placards, warnings, control markings and Operating and Safety Manuals, guards and guard rail systems and all other items specified by the manufacturer.
- 2.1.4** Any problems or malfunctions that affect operational safety must be repaired prior to use of the platform, with specific regard to any safety components refer to the Parts Manual for part numbers and details. If in doubt, contact Niftylift Ltd (Details on page 3). **Ensure wheels are chocked before carrying out any maintenance that involves gearbox disengagement as described in Section 4.7.2.**
- 2.1.5** Always ensure that all warning labels, instructions, placards, control markings and Safety Manuals are intact and clearly legible. If replacements are required contact your local dealer or Niftylift. Always observe and obey safety and operating instructions on such labels.
- 2.1.6** Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.
- 2.1.7** Before the Niftylift is used and during use the user shall check the area in which it is to be used for possible hazards such as, but not limited to, uneven ground drop-offs, holes, bumps, obstructions, debris, floor and overhead obstructions, high voltage conductors, wind and weather, unauthorised persons and any other possibly hazardous conditions.

- 2.1.8** Never exceed the maximum platform capacity, as indicated on the decals and machine serial plate.
- 2.1.9** Only operate the Niftylift on a firm, level surface.
- 2.1.10** Never position any part of the Niftylift within 4.0m, (12ft) of any electrical power line, conductor or similar not exceeding 66kV. (Minimum span 125m) Other distances for increased voltages and different spans are given in NZECP 34:1993.



**THIS MACHINE IS NOT INSULATED.**

If in doubt, contact the appropriate authorities

- 2.1.11** On entering the platform ensure that the drop down entry bar is closed afterwards.
- 2.1.12** Use of an approved safety belt and lanyard, hard hat and appropriate safety clothing is mandatory. Fasten harness to designated harness securing points within the platform and do not remove until leaving the platform whilst in the stowed position.

**2.1.13**



Always remain standing within the platform. Do not attempt to increase your height or reach by standing and/or climbing on the platform guard rails or any other object. **KEEP YOUR FEET ON THE PLATFORM FLOOR.** Do not sit, stand or climb on the guard rail, mid rail or boom linkage. Use of planks, ladders or any other devices on the Niftylift for achieving additional height or reach shall be prohibited.

- 2.1.14** Do not use the platform levelling system to artificially increase the outreach of the platform. Never use boards or ladders in the platform to achieve the same result.
- 2.1.15** Do not use the platform to lift overhanging or bulky items that may exceed the maximum capacity or carry objects that may increase the wind loading on the platform. (e.g. Notice boards etc.)
- 2.1.16** The Niftylift shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds or similar equipment unless the application is approved in writing by Niftylift Ltd in Great Britain.
- 2.1.17** Always check that the area below and around the platform is clear of personnel and obstructions before lowering or slewing. Care should be taken when slewing out into areas where there may be passing traffic. Use barriers to control traffic flow or prevent access to the machine.
- 2.1.18** Stunt driving and horseplay, on or around the Niftylift, shall not be permitted.
- 2.1.19** When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the work place. Warnings such as, but not limited to, flags, roped off areas, flashing lights and barricades shall be used.
- 2.1.20** Before and during driving while the platform is elevated the operator shall maintain a clear view of the path of travel, maintain a safe distance from obstacles, debris, drop offs, holes, depressions, ramps and other hazards to ensure safe elevated travel. Maintain a safe distance from overhead obstacles.

## **Operating & Safety Instructions**

- 2.1.21** Under all travel conditions the operator shall limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel and other factors causing hazards of collision or injury to personnel.
- 2.1.22** The aerial platform shall not be driven on grades, side slopes or ramps exceeding those for which the aerial platform is rated by the manufacturer.
- 2.1.23** It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location. Aerial platforms operated in hazardous locations shall be approved and suitable for the duty. (See ANSI/NFPA 505-1987 where applicable).
- 2.1.24** The operator shall immediately report to his supervisor any potentially hazardous location(s) (environment) which become evident during operation.
- 2.1.25** If an operator encounters any suspected malfunction of the Niftylift or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation, he shall cease operation of the Niftylift and request further information as to safe operation from his management, or owner, dealer or manufacturer before further operation of the Niftylift.
- 2.1.26** The operator shall immediately report to his superior any problems or malfunctions of the Niftylift, which becomes evident during operation. Any problems or malfunctions that affect the safety of operation shall be repaired prior to continued use.
- 2.1.27** The boom and platform of the Niftylift shall not be used to jack the wheels off the ground.
- 2.1.28** The Niftylift shall not be used as a crane.
- 2.1.29** The Niftylift shall not be positioned against another object to steady the platform.
- 2.1.30** Care should be taken to prevent rope, electric cords and hoses from becoming entangled in the aerial platform.
- 2.1.31** Batteries shall be recharged in a well-ventilated area free of flame, sparks or other hazards, which may cause explosion. Highly explosive hydrogen gas is produced during the charging process.
- 2.1.32** When checking electrolyte levels great care should be taken to protect eyes, skin and clothing. Battery acid is highly corrosive and protective glasses and clothing is recommended.
- 2.1.33** If the platform or elevating assembly becomes caught, snagged or otherwise prevented from normal motion by adjacent structure or other obstacles, such that control reversal does not free the platform, all personnel shall be removed from the platform safely before attempts are made to free the platform using ground controls.

**2.1.34**



When the machine is not in use always stow the booms correctly. **NEVER LEAVE THE KEYS IN THE MACHINE**, if it is to be left for any period of time. Use wheel chocks if leaving on an incline.

- 2.1.35** The engine must be shut down while fuel tanks are being filled. Fuelling must be done in a well-ventilated area free of flame, sparks or any other hazard that may cause fire or explosion. **PETROL (GASOLINE), LIQUID PROPANE AND DIESEL FUELS ARE FLAMMABLE.**

**2.1.36**



**NEVER START THE NIFTYLIFT IF YOU SMELL PETROL (GASOLINE), LIQUID PROPANE OR DIESEL FUEL. THESE FUELS ARE HIGHLY FLAMMABLE**

**2.1.37**

The operator shall implement means provided to protect against use by unauthorised persons.

**2.1.38**

Never remove anything that may affect the stability of the machine such as, but not limited to, batteries, covers, engines, tyres or ballast.

## **2.2 ENVIRONMENTAL LIMITATIONS**

Unless specifically configured otherwise, the machine will have a short operational time in extreme temperatures such as freezers and cold storage, due to reduced battery performance. For electrical cables and components, the temperature must be within the range -5°C to 60°C.

The machine is limited in high temperatures because of the cooling requirement for engines and hydraulic oil. Coolant temperatures must be within the range -37°C to 110°C (at 50% mixture of water to anti-freeze). Oil temperature must not exceed -23°C to 93°C.

**The recommended operational range for these machines is - 5°C to +40°C. Please contact Niftylift Ltd for special considerations if the machine is required to operate outside these temperatures.**

Extended operation in dusty environments is not recommended, frequent cleaning will be necessary. All dust, dirt, salt encrustation, excess oil or grease should be removed. Deposits of paint or bitumen, particularly on legends or labels should be removed.

All standard Niftylift machines are rated for a wind speed of 12.5 m/s, which equates to 45kph / 28mph or force 6 on the Beaufort scale. No attempt should be made to operate a Niftylift in wind strengths above this limit and if the operator has any doubts over the wind speed he / she should cease operation immediately until it can be established that the wind speed has fallen to a safe level.



**DO NOT USE THE NIFTYLIFT IN ELECTRICAL STORMS**

## **2.3 NOISE AND VIBRATION**

The airborne noise emission on the Height Rider range of machines does not exceed 79dB(A), measured at a perpendicular distance of 4m, under equivalent continuous A-weighted sound pressure test conditions. This was based on a Diesel powered machine, working on high throttle, and under load. All other models will exhibit significantly lower emissions than this figure, dependant on power option. In normal operation the Vibration level to which the operator is subjected will not exceed a weighted root mean square acceleration value of 2.5 m/s<sup>2</sup>.

## **2.4 TEST REPORT**

All Niftylift machine models are subjected to a comprehensive 'type test' which duplicates all combinations of safe working load (SWL), overload, windage, inertia and pull force to assess the various safe stability criteria. Self propelled machines are also subjected to kerb and braking tests at the SWL to satisfy additional 'worse case' stability requirements.

Each individual machine is then subjected to static overload tests on flat level ground with 150% of the SWL, exceeding the requirements of EN280 for power operated MEWPs. Self propelled machines are also tested at the maximum working angle **plus** 0.5° with a test load of 125% of the SWL. Finally, on all machines, a functional test is performed with 110% of SWL.

All safety devices are checked for correct operation, operating speeds are checked against benchmark figures and the dynamic functions ensure that all acceleration and deceleration forces are within acceptable limits. All noted defects are rectified and recorded before the machine is permitted to enter into service.

## **3 Preparation and Inspection**

### **3.1 UNPACKING**

Since the manufacturer has no direct control over the shipping or carriage of any Niftylift it is the responsibility of the dealer and/or owner and/or lessee to ensure the Niftylift has not been damaged in transit and a Pre-operational Report has been carried out by a qualified engineer before the aerial platform is put into service.

- A) Remove all ropes, straps and or chains used to secure the aerial platform during transit.
- B) Ensure any ramp, loading dock or forklift used is capable of supporting or lifting the aerial platform.
- C) If the aerial platform is to be driven off, please ensure that the operator has read and fully understood this entire manual. Refer to the appropriate section for precise operating instructions.

**\*\*\*Carry out the Pre-operational Report before placing machine in service.**

### **3.2 PREPARATION FOR USE**

Whilst every effort has been made at the Niftylift factory to ensure your machine arrives in a safe and operable condition it is necessary to carry out a systematic inspection prior to putting the aerial platform into service.



**THIS IS NOT A REQUEST IT IS MANDATORY**

To assist the user in this task you will find enclosed a Pre-operational Report, which must be filled out upon delivery/receipt of the machine.

Before the user carries out the Pre-operational Report he must have read and fully understood all the contents of the Operating, Safety and Maintenance Manual.



**WARNING - DO NOT OPERATE A POTENTIALLY DEFECTIVE OR MALFUNCTIONING MACHINE. CORRECT AND REPAIR ANY DEFECTS BEFORE OPERATING YOUR NIFTYLIFT.**

## Operating & Safety Instructions

### 3.3 PRE-OPERATIONAL SAFETY CHECK SCHEDULES

Before use each day and at the beginning of each shift the aerial platform shall be given a visual inspection and functional test including, but not limited to, the following:

#### 3.3.1 DAILY SAFETY CHECKS

- 1) Check that all labels (decals) are in place and legible.
- 2) Visually inspect the machine for damaged or loose components.
- 3) Check that batteries are charged (Refer to Section 4.6 for further information).
- 4) Check the fuel level (if applicable).
- 5) Check that canopies/covers and guards are in place and secure.
- 6) Check that the boom rest switch is operable (if applicable).
- 7) Check that control levers are secure and operate freely.
- 8) Check that operating buttons and emergency stop buttons function properly.
- 9) Check the operation of the manual hand pump.
- 10) Visually inspect all hydraulic hoses and fittings for damage or leaks.
- 11) Check that the platform pivot pins and their tag bolts are secure.
- 12) Check that the tilt alarm is functioning properly (On a slope of 3° (HR17N), 4° (HR15N) or more the alarm should sound and drive should be disabled)
- 13) Check the operation of SiOPS (Refer to Section 4.3.3).
- 14) Check the operation of the cage weigh system (If fitted). See section 4.5.3 for testing and verification procedure.

#### 3.3.2 WEEKLY SAFETY CHECKS

- 1) Inspect tyres and wheels for damage and wear.
- 2) Check battery fluid levels and specific gravity (after charging) and general condition.
- 3) Check hydraulic oil level, ISO Grade 22 (European), Grade 32 (Rest of World).
- 4) Inspect the engine air filter and clean or replace if necessary.
- 5) Inspect hose track for damage or missing parts.

### **3.3.3 MONTHLY SAFETY CHECKS**

- 1) Check the engine oil level (if applicable).
- 2) Check the wheel nuts (torque 110ft lbs / 150Nm).
- 3) Check that the slew worm is secured and correctly in mesh. Clean and re-grease.
- 4) Check the track rod linkage.
- 5) Inspect the engine fuel tank for damage or leaks.
- 6) Check telescopic boom wear pads and nylon studs (if applicable).
- 7) Every **three** months check and verify the calibration of the cage weigh system. See section 4.5.4 for the calibration procedure.
- 8) Every **Six** months perform a **thorough examination** in accordance with the 'Lifting Operation and Lifting Equipment Regulations' (LOLER) 1998, Regulation (9)(3)(a).

### **3.3.4 ANNUAL SAFETY CHECKS**

- 1) Check that all pivot pins and their tag bolts are secure.
- 2) Inspect for any cracks or badly rusted areas on booms and chassis.
- 3) Change the hydraulic oil filters.
- 4) Check the bushes in the front wheel hubs for wear.
- 5) Check that slew ring bolts are secure (torque 220ft lbs. 300Nm).

**Operating & Safety Instructions****3.4 PLACARD, DECALS & INSTALLATION (UK SPEC)**

ITEM	DESCRIPTION	NUMBER	QTY
1	"Niftylift.com"	P14390	1
2	Harness Point	P14883	2
3	Head Protection	P14921	1
4	General Warning	P24900	2
5	"If E-stop disabled"	P14864	2
6	Hydraulic Oil	P14415	1
7	Safe Working Load 225kg	P17328	1
8	Cage Gate Warning	P18335	1
9	"If tilt alarm sounds"	P14868	2
10	Tie down point	P14958	3
11	General Crush	P14782	4
12	Travel Direction	P14784	1
13	Blank serial plate	P15383	1
14	Gearbox Disengage	P19180	2
15	Battery Isolator	P18600	1
16	No Step	P14785	5
18	Logo	Nifty HR15N P26431	2
		Nifty HR17N P26433	2
19	Trip – Push to reset	P19056	1
20	"If footswitch disabled"	P14884	2
21	Heightrider 15N	P14607	2
	Heightrider 17N	P15165	2
23	Are you trained?	P22055	1
24	"Raise flyboom"	P19442	1
25	Platform Controls	P22454	1
26	Warning Stripes	N/A	A/R
27	Daily Check List	P14908	1
28	Point Load	HR15N P20709	4
		HR17N P20710	4
29	Battery Charger Warning	P14904	1
30	Battery Drain	P19850	1
31	Diesel Warning	P14414	1
33	SiOPS instructions	P22820	1
34	General Notice HR's	P18870	1
36	Base Controls	P18337	1
39	Oil Level Indicator	P14676	1
41	Operating Instructions	P14892	1
42	Manual Hand Pump	P14811	1
47	Cage Overload Warning	P18848	2
48	Noise Warning	P17124	1

52	Charger socket	P26425	1
53	Power to cage socket 240v	P26427	2
54	Cage Tie-down Warning	P21404	2
55	Twin Charger (Left)	P24582	1
56	Twin Charger (Right)	P24583	1
57	Control levers - Cage	P21139	1
58	Emergency Controls (1)	P22877	1
60	Emergency Controls (2)	P21700	1



### 3.5 TORQUE REQUIREMENTS

SCREW QUALITY/SIZE	Tightening torque in ft lbs (Nm)			
	Grade	8.8		10.9
M 6	7.0	(10)	10	(14)
M 8	19	(25)	26	(35)
M 10	36	(49)	51	(69)
M 12	63	(86)	89	(120)
M 14	99	(135)	140	(190)
M 16	155	(210)	218	(295)
M 18	214	(290)	300	(405)
WHEEL NUTS	110ft lbs		150Nm	
WHEEL MOTOR NUTS	99ft lbs		135Nm	
SLEW RING BOLTS	220ft lbs		300Nm	

## Operating & Safety Instructions

# 4 Operation

## 4.1 CONTROL CIRCUIT COMPONENTS

- 4.1.1 MAIN CONTROL BOARD:** - Situated under the left-hand superstructure canopy, the principle electrical box houses the Main Control Box. This PCB (Printed Circuit Board) incorporates all of the relays to control the machines operation. The control board is common to all models and contains functions, which might not be utilized on your particular machine. Thermal trips are integral to the box, the functions of which are described in a later section of this manual. (See 4.1.14) The purpose of the Main Control Board is to interpret the signals received from the two control stations and energise the machine movements accordingly.
- 4.1.2 BASE CONTROL BOARD:** - Adjacent to the Main Control Board and attached to the same bracket is the Ground Control Station. Situated behind the Ground Control Pushbuttons will be found the Base Control Board. This PCB incorporates all of the relays to control the ground functions of the machine. The purpose of the Ground Control Board is to generate all of the signals required to operate the machine, which are then fed to the Main Control Board.
- 4.1.3 PLATFORM CONTROL BOARD:** - Situated in the platform is the Platform Control Station. Behind the platform control pushbuttons will be found the Platform Control Board. This PCB incorporates all of the relays to control the platform functions of the machine. The purpose of the platform control board is to generate all of the signals required to operate the machine, which are then fed through to the Main Control Board.
- 4.1.4 TILT ALARM:** - Fitted to the superstructure behind the base controls cover, the tilt alarm is a solid-state sensor, which monitors the inclination of the machine. It directly controls the BRV (Brake Release Valve) and when the platform is in use, i.e. Booms are raised, if the inclination exceeds the pre-set limit, it will disable the drive to the machine and sound the alarm. In order to recover the machine, the platform operation is unaffected, allowing the operator to restore drive when the machine is stowed. It is then possible to drive back onto level ground, fully restoring machine operation.
- 4.1.5 SOUNDER:** - Situated on the back of the base control box is a small electric sounder, which is used to provide an intermittent alarm whenever the machine is in operation. Pushing a green "power control" button or depressing the foot switch in the platform (if fitted) will energise this sounder. This serves to warn personnel of the operation of the machine.
- 4.1.6 KLAXON:** - Also mounted on the top of the control board box is a klaxon, which performs several functions: Firstly, it can be used as a manual alert, by pushing the "Horn" button at the platform control position. Secondly, it is this device, which sounds continuously if the tilt alarm sensor detects excessive inclination, with the booms raised. Thirdly this will sound when the fuel warning light comes on. Lastly, it is linked into the battery management system, such that when low battery state is reached the "pulsing" of the DC motors is mimicked by the klaxon, re-enforcing the message to the operator to recharge the batteries.

- 4.1.7 DRIVE CONTROL VALVE (DCV):-** The motion control valve comprises several individual components all directly involved in the hydraulic supply to the wheel drive motors. Principal amongst these are the drive control valves, which electrically change the drive motor hydraulics supply from series flow to parallel, or vice versa. This control function is only available when the booms are lowered, and allows the operator to select "Hi" or "Lo" drive. "Hi" drive gives fast speed of travel, but low gradeability, "Lo" drive gives best gradeability, but slow speed. "Lo" drive is used for climbing inclines and delicate positioning of the machine.
- 4.1.8 BRAKE RELEASE VALVE (BRV):-** The motion control valve also incorporates a solenoid operated dump valve, which controls the brake function on the machine. This valve must be energised to allow the machine to move. If no voltage is present, the wheel motors will not be able to develop drive torque, whilst at the same time, the parking brakes will remain engaged. Only when a green "Power Control" push-button is being used (or the Platform Foot-switch is depressed) will the BRV operate. If the tilt alarm sensor detects an excessive inclination whilst the booms are raised it is the BRV which is de-energised to isolate the machine. (At the same time the klaxon tone changes to a continuous tone to indicate this condition).
- 4.1.9 BOOM SWITCH: -** Mounted on the links knuckle and operated by the raising of any boom, this switch controls both the operation of the tilt alarm sensor, and the speed control function. With the booms in the stowed position, the tilt alarm sensor is by-passed, allowing the machine to negotiate slopes in excess of the permissible working angle, without isolating the drive function. At the same time, "Hi" drive is possible, as is fast throttle on those machines so equipped. When the booms are raised, the tilt alarm sensor becomes activated, only slow speed operation is possible and only "Lo" drive is permitted. These control functions are of primary importance to safety of the machine and operator. Under no circumstances should this control function be isolated or by-passed.
- 4.1.10 BATTERY MANAGEMENT: -** Battery condition is permanently monitored by the control circuit, such that when available power has decreased to 20% of full charge, the battery status circuit begins to "chop" the power to the hydraulic power packs. This function causes the drive system to alternately stop and start, signalling to the operator that re-charging is necessary. At the same time the Klaxon will begin to sound intermittently re-enforcing the charge warning. At this point, sufficient power remains to drive to the nearest power point. Should the operator ignore the on-set of the discharge warning, the "chopping" will continue until the machine is rendered inoperative. Immediate charging will then be required.
- Under no circumstances should a machine be left fully discharged or severe battery damage can occur in a relatively short time.
- 4.1.11 BATTERY ISOLATORS: -** The battery-disconnect handle is located beneath the central canopy. In order to isolate the machine control and power circuits from the batteries it is necessary to pull the release handle, which in turn also disconnects the supply to the PCB control box. Under normal operation, the machine key switch should be used to isolate the machine, with the battery isolator handle only being required for emergencies, in the event of a short circuit, or during routine maintenance.

## **Operating & Safety Instructions**

**4.1.12 DUTY SELECTOR:** - On multiple power option machines, one of the functions on the platform control station will be a duty selector. This key switch allows the selection of either power option, i.e. from Diesel to Battery or Petrol to battery, or vice-versa. On other machines this same key switch serves as an "On-Off" control.

**4.1.13 DIESEL ENGINE:** - Generally a Kubota 722 engine, driving a twin bodied pump with direct mounted pump dump valves (one per section), and integral relief valve on the rear pump. The arrangement allows two speed operation, fast throttle and automatic relief for ramp climbing.

**4.1.14 FUSES & TRIP SWITCHES: -**

**Electric Power Tray**

**225A** Fuse, in Main Box

**Bi-energy Power Tray**

**125A** Fuse, in Fuse Box

**225A** Fuse, in Fuse Box

**10A** Circuit Breaker, in Fuse Box

**Battery Charger (Euro)**

**20A** Fuse

**Battery Charger (UK)**

**32A** Fuse

**20A** Fuse

**Main Control Box**

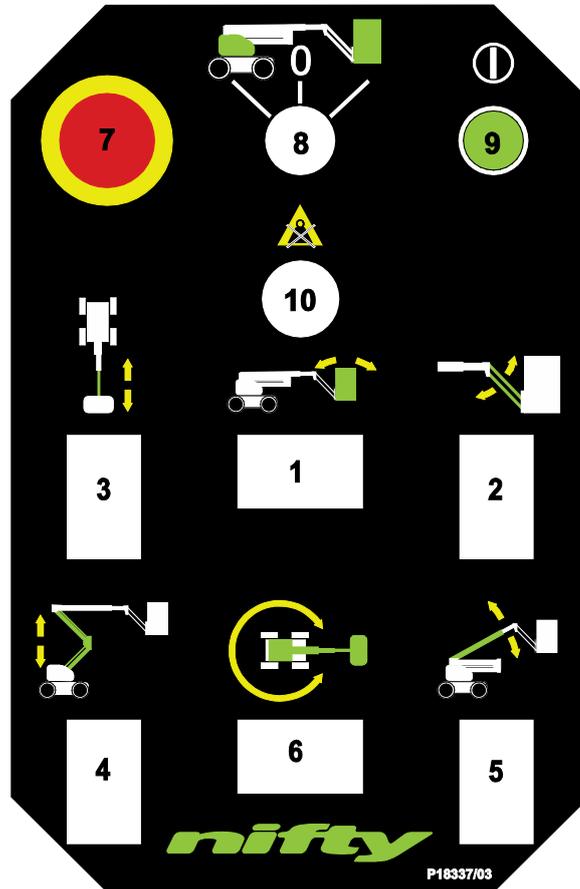
**1A** Circuit Breaker

**10A** Circuit Breaker

**4.1.15 LOAD SENSING CONSOLE - SiOPS™ (If fitted):** - This machine may incorporate a load sensing cage console that senses if the operator has been pushed or has fallen against the console. If the load applied to the front of the console is greater than the pre-determined amount, the footswitch will be disabled to increase operator safety and reduce the possibility of sustained involuntary operation of the cage controls. For further information refer to Section 4.3.3.

**4.2 GROUND CONTROL OPERATION**

**4.2.1 GROUND CONTROL FUNCTIONS**



**(Ground Control Station)**

<b>1</b> Operates Platform Levelling	Left for <b>Forward **</b>	Right for <b>Backward **</b>
<b>2</b> Operates the Flyboom	Up for <b>Up</b>	Down for <b>Down</b>
<b>3</b> Operates Telescoping	Up for <b>In</b>	Down for <b>Out</b>
<b>4</b> Operates the Link Booms	Up for <b>Up</b>	Down for <b>Down</b>
<b>5</b> Operates the Upper Boom	Up for <b>Up</b>	Down for <b>Down</b>
<b>6</b> Operates Slew	Left for <b>Left</b>	Right for <b>Right</b>
<b>7</b> Emergency Stop	Push to <b>Stop Operation</b>	Twist to <b>Enable Operation</b>
<b>8</b> Base Key Switch	Anti-clockwise for <b>Base</b>	Clockwise for <b>Platform</b>
<b>9</b> Green Power Button	Push and hold for <b>Power</b>	Release to <b>Cease</b> operation
<b>10</b> Cage overload indicator		

**\*\*** Platform levelling only active when booms are down.

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**Operating & Safety Instructions**

**4.2.2 OPERATION**

**ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING**



**ALL MODELS**

- 1) Ensure all red emergency stops are out.
- 2) Turn key switch at ground control station to **Ground** (fully anti-clockwise).
- 3) For **Battery** powered operation, go to step 8).
- 4) For **Diesel** powered operation, go to step 5).

**DIESEL ENGINE OR BI-ENERGY MODELS**

- 5) Turn the duty selector in the platform to **Engine** (fully clockwise). For a cold engine start go to step 6), for a warm engine start go to step 7).
- 6) **COLD ENGINE:** - turn the main engine ignition key switch (located beneath the central cover) to the **Glow** position (anti-clockwise). This engages the glow plug pre-heat system. Hold for 3-5 seconds then turn the key to the **Start** position (fully clockwise) and the engine will fire.
- 7) **WARM ENGINE:** - turn the main engine ignition switch (located beneath the central cover) to the **Start** position (clockwise) and the engine will fire.

**Note:** Unless the diesel engine is running, the HR15N/17N will automatically default to the primary power source (usually battery).

**ALL MODELS**

- 8) Push and hold green power button on the base control box.
- 9) Select a function and operate the appropriate rocker switches in full accordance with manufacturers operating and safety manual.
- 10) To return control to the platform, turn base control key-switch to the **Platform** position (fully clockwise).
- 11) When not in use return machine to stowed position, turn the base control key-switch to centre **Off** position, remove key and chock wheels.

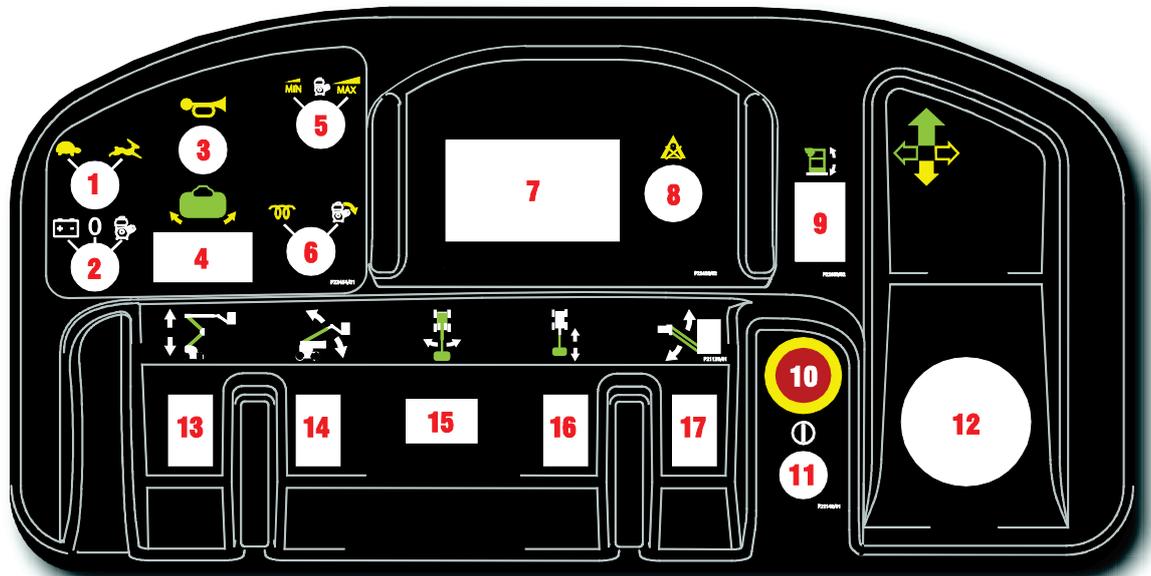
**Note:** Unless the diesel engine is running, the HR15N/17N will automatically default to the primary power source (usually battery).

**EMERGENCY PROCEDURES**

- 1) Push in red emergency stop to shut down all functions.
- 2) Operate the emergency descent valves located under the base control panel on the superstructure. These must be pulled in or out depending on the direction of travel required. Refer to the decal inside the panel for the relevant controls.
- 3) With the relevant descent valve pushed in or pulled out operate the manual hand pump, located inside the same panel.
- 4) If hand pump locks up, check that the **Booms** tap on the DCV is open. (See section 5.3)

## 4.3 PLATFORM CONTROL OPERATION

### 4.3.1 PLATFORM CONTROL FUNCTIONS



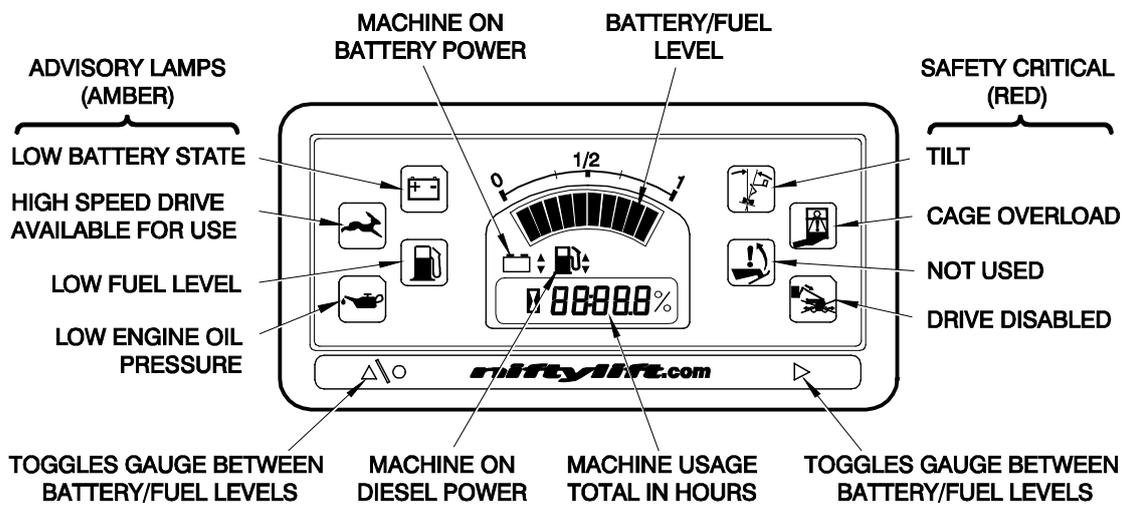
\* Drive function for HR17N only active when telescopic boom is fully retracted.

\*\* Platform levelling only active when booms are down.

<b>1</b> Drive Speed	Anti-clockwise for <b>Slow *</b>	Clockwise for <b>Fast *</b>
<b>2</b> Duty Selector	Anti-clockwise for <b>Battery</b>	Clockwise for <b>Engine</b>
<b>3</b> Horn	Press & hold to <b>Sound</b>	
<b>4</b> Platform rotation	Right for <b>Anti-clockwise</b>	Left for <b>Clockwise</b>
<b>5</b> Engine Revs	Anti-clockwise for <b>½ Revs</b> (gradient)	Clockwise for <b>Max Revs</b> (level ground)
<b>6</b> Engine Start	Anti-clockwise for <b>Glow</b>	Clockwise for <b>Start</b>
<b>7</b> Digital Gauge	See diagram on page 27	
<b>8</b> Cage Overload Indicator		
<b>9</b> Cage Levelling	Up for <b>Forward **</b>	Down for <b>Backward **</b>
<b>10</b> Emergency Stop	<b>Push</b> to Stop Operation	<b>Turn clockwise</b> to Release
<b>11</b> Green Power Button	<b>Push</b> and hold to activate machine	
<b>12</b> Joystick	Grip the joystick and hold the trigger switch at the front. Machine movement is achieved by slowly moving the joystick away from the neutral position in the required direction. Steer by using the thumb rocker switch located on top of the joystick.	
<b>13</b> Operates the Link Booms	Up for <b>Up</b>	Down for <b>Down</b>
<b>14</b> Operates the Upper Boom	Up for <b>Up</b>	Down for <b>Down</b>
<b>15</b> Operates Slew	Left for <b>Left</b>	Right for <b>Right</b>
<b>16</b> Operates Telescoping	Up for <b>Tele-In</b>	Down for <b>Tele-Out</b>
<b>17</b> Operates the Flyboom	Up for <b>Up</b>	Down for <b>Down</b>

**MULTI-FUNCTION DIGITAL GAUGE**

Situated on the Cage Control Panel, this gauge provides a warning indication for a range of functions. The red warning lamps on the right hand side indicate a safety critical situation where **immediate** action is required; the amber lamps on the left are advisory. It also displays fuel or battery levels when machine is in operation, automatically reverting to fuel level when diesel engine is started. Refer to diagram below.



### 4.3.2 OPERATION



**NEVER START THE NIFTYLIFT IF YOU SMELL PETROL (GASOLINE), LIQUID PROPANE OR DIESEL. THESE FUELS ARE FLAMMABLE.**

**BEFORE OPERATING THE NIFTYLIFT ENSURE THAT EACH OPERATOR HAS READ AND FULLY UNDERSTOOD THE OPERATING MANUAL. FAILURE TO DO SO MAY RESULT IN DEATH OR SERIOUS INJURY.**

#### ALL MODELS

- 1) Ensure all red emergency stops are out.
- 2) Turn key switch at ground control station to **Platform** (fully clockwise).
- 3) For **Battery** powered operation, go to step 8).
- 4) For **Diesel** powered operation, go to step 5).

#### DIESEL ENGINE OR BI ENERGY MODELS

- 5) Turn the duty selector in the platform to **Engine** (fully clockwise). For a cold engine start go to step 6), for a warm engine start go to step 7).
- 6) **COLD ENGINE:** - turn the engine ignition switch (on the platform control box) to the **Glow** position (anti-clockwise). This engages the glow plug pre-heat system. Hold for 3-5 seconds then turn the switch to the **Start** position (fully clockwise) and the engine will fire.
- 7) **WARM ENGINE:** - turn the main engine ignition switch (on the platform control box) to the **Start** position (clockwise) and the engine will fire.

**Note:** Unless the diesel engine is running, the HR15N/17N will automatically default to the primary power source (usually battery).

#### ALL MODELS

- 8) Depress the footswitch or push and hold green power button on the platform control box.
- 9) Select a function and operate the appropriate proportional paddles (levers) in full accordance with manufacturers operating and safety manual.
- 10) To return control to the base, turn base control key-switch to the **Base** position (fully anti-clockwise).
- 11) When not in use return booms to the stowed position. Turn key switch on the ground control station to the centre **Off** position, remove key and chock wheels.

**Note:** Unless the diesel engine is running, the HR15N/17N will automatically default to the primary power source (usually battery).



**ALWAYS ENSURE THE AERIAL PLATFORM IS ON A FIRM LEVEL SURFACE AND THE AREA IS FREE OF ANY OVERHEAD OBSTRUCTIONS.**

**ENGAGING THE RED EMERGENCY STOP BUTTON WILL SHUT DOWN THE ENGINE, AND THE ELECTRIC CIRCUIT PREVENTING OPERATION OF ANY FUNCTION.**

**Operating & Safety Instructions**

**4.3.3 SiOPS™ - LOAD SENSING CONSOLE (If fitted)**



**WHEN OPERATING THIS MACHINE THE USER MUST BE AWARE OF ANY OVERHEAD OBSTRUCTIONS.**

This machine incorporates a load sensing cage console that senses if the operator has been pushed or has fallen against the console. If the load applied to the front of the console is greater than the pre-determined amount, the footswitch will be disabled to increase operator safety and reduce the possibility of sustained involuntary operation of the cage controls.

**Note:** The green button will illuminate once the footswitch has been disabled, but continues to be available for use at all times. This allows the operator to use the cage control functions and manoeuvre the machine to a safe position.

To reset the footswitch:

- 1) Release the load from the front of the console.
- 2) Ensure cage controls are in the neutral position and clear of objects.
- 3) Raise foot clear of footswitch then lower foot onto footswitch.
- 4) Footswitch is now active and full control has been restored.

**Note:** If SiOPS™ has been activated and the footswitch is not reset within **15 seconds**, the blue warning beacon will flash (If fitted, located on underside of the cage) and a warning announcement will sound until the footswitch is reset as described previously.

## 4.4 DRIVING CONTROLS



**DO NOT OPERATE THE NIFTYLIFT WHILST ELEVATED UNLESS ON A FIRM, LEVEL SURFACE FREE FROM ANY POSSIBLE OBSTRUCTIONS OR HAZARDS BOTH AT GROUND LEVEL AND OVERHEAD.**

- 1) Check proposed route for possible hazards, obstructions and personnel.
- 2) Depress foot switch located in platform floor (if applicable).
- 3) Use the **Drive Speed** selector on the platform control station to determine speed.

**High Drive** (Hare) - GIVES HIGH SPEED AND LOW GRADEABILITY.

**Low Drive** (Tortoise) - GIVES LOW SPEED AND HIGH GRADEABILITY.

**Note: Drive function on the HR17N is only available when the telescopic boom is in its fully retracted position.** High Drive is only available when the booms are in the stowed position. The HR15N or HR17N will default to Low Drive speed whenever the booms are elevated. Drive speed can only be changed when the joystick is in the neutral position.

- 4) Select drive joystick from the platform control box.

- A. Up for **FORWARD**
- B. Down for **REVERSE**

Steering is controlled by the rocker-switch button on the top of the joystick

- C. Left for **STEER LEFT**
- D. Right for **STEER RIGHT**

The driving horn is activated by the button on the front of the joystick and there is also a separate horn button on the platform controls for use when the drive and boom controls are switched off.

- 5) All control levers give a fully proportional response therefore the more the lever is moved away from the centre **Off** position the faster the function will become.
- 6) Maximum drive speed is only attainable when all booms are fully stowed and the **Drive Speed** selector is in the HI position.
- 7) When driving with the booms fully stowed, the Tilt Alarm is bypassed to allow the Niftylift to be driven in areas where the slope exceeds the four degree working limit. In normal operation the drive is therefore unaffected when driven onto a slope in excess of four degrees, until the booms are raised, whereupon the drive would be disabled and the tilt alarm sounds continuously.



**ALL NIFTYLIFTS ARE FITTED WITH A TILT ALARM - PRE-SET IN THE FACTORY. ONCE ENERGISED THE NIFTYLIFT WILL LOSE ALL POWER TO DRIVE FUNCTIONS AND A LOUD AUDIBLE ALARM WILL BE ACTIVATED. TO DE-ACTIVATE, LOWER THE BOOMS FULLY TO STOWED POSITION AND RE-POSITION BASE ON FIRM, LEVEL GROUND.**

**IF ALARM SOUNDS - DESCEND IMMEDIATELY AND RE-LEVEL MACHINE BASE.**

## **Operating & Safety Instructions**

### **4.5 CAGE WEIGH SYSTEM**

#### **4.5.1 MECHANICAL VERSION**

The Niftylift range of machines is available fitted with mechanical cage weigh systems. These are configured to sense a vertical cage overload, which when detected will halt the machine movement. No further use of the platform is then permitted until the overload has been removed. This must be done in a responsible manner and not one in which a greater hazard might be induced. Therefore, if the addition of external items such as light fittings; brickwork or tiles etc were allowed into the cage, the machine would not operate. In order to restore the functions, the excess load should be safely removed, NOT by discharging them out of the basket to the detriment of persons below.

The mechanical cage weigh system works on the principle of a pre-loaded spring, rated to the cage safe working load. Excess load in the cage forces the spring to further compress, the movement of which is detected by a precision micro-switch. With the machine turned 'On', this movement first gives an audible alarm in the cage, as well as a visual indication at both control positions (cage and base). Additional deflection due to increased load serves to cut off the machine control circuit, effectively halting all machine movements.

Under the circumstances where the cage overload cannot be removed, the machine can only be manoeuvred by use of the manual hand pump. Great care must be taken when utilising this facility, especially if the machine is significantly overloaded; any motion that causes the machine outreach to increase could induce instability. The machine must be manoeuvred in such a manner as to reduce outreach, then height, until a safe level is reached to permit the operator to dismount or the overload to be removed.

#### **4.5.2 FUNCTION**

The cage overload system is powered from the machine control circuit, so the system is inactive if the machine is turned 'Off'.

'Enabling' the emergency stops allows the system to become 'active', when either the cage or base key switch is turned 'On'. If the cage is overloaded, the control circuit will immediately indicate this by the audible and visual alarm. Pressing the emergency stop or turning the key switch to the 'Off' position merely silences the alarm. The alarm will continue to sound as long as the overload persists, unless the machine is turned 'Off'.

Whilst the overload is detected, pressing the green button at base or cage will generate no response from the control circuit. The machine will not function under power until the overload is removed. Removing the overload as previously described will re-set the system automatically, requiring no additional intervention from the operator. All machine functions will be restored.

#### **4.5.3 TESTING**

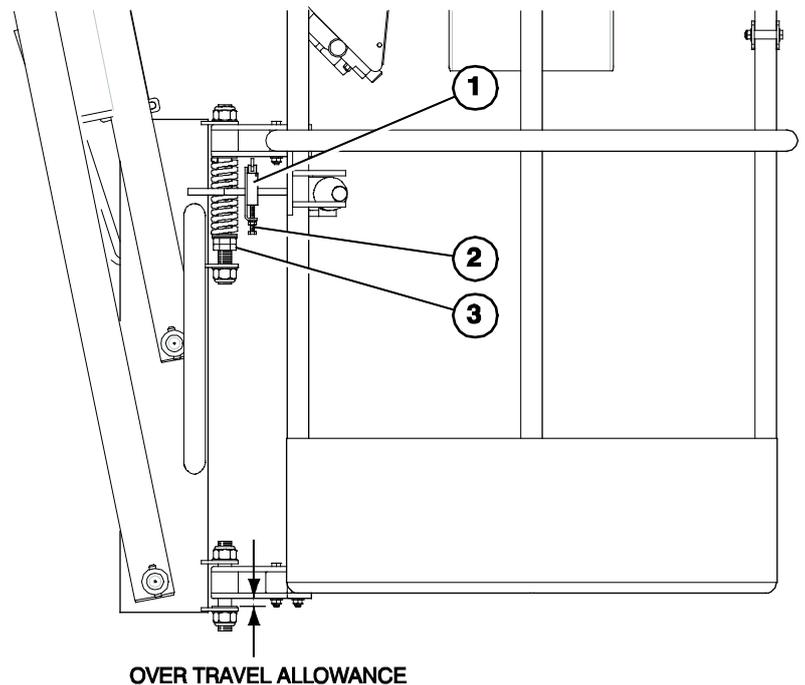
At the simplest level, before working on the platform, the function of the cage overload can be checked by the following method: - Place two men into the cage and a larger quantity of tools than is permitted to be carried. (Typically 40 kg). The alarm should sound and all functions should be lost. Reducing the cage contents to the safe working load should silence the alarm and restore the machine operation.

#### 4.5.4 CALIBRATION

If a closer examination of the system is required, typically for testing and approval, the safe working load should be placed in the cage, carefully weighing the test load to ensure accuracy. The addition of a 5kg weight, to any of the four corners of the cage, should sound the alarm. If the alarm does not sound, carefully inspect the weigh mechanism for signs of damage. All parts of the weigh mechanism should be free to move, and the inspection should look for any impact damage that might have caused the assembly to become disabled, for any reason. If the mechanism seems to be functioning correctly, the adjustment of the weigh sensing micro-switch should be checked. A competent person, who has the authority to perform such adjustments, must perform this. Adjustment must not be permitted by anyone without the approval of the person responsible for the platform.

With the machine emergency stops 'enabled' and either the cage or base key switch turned 'On', first check the cage weigh micro-switch is secure (1). If this is the case, the first step is to loosen the securing screws attaching it to the support bracket, with the lock screw (2) below it backed-off, allowing downwards movement. The tension in the weigh spring can now be released, by backing off the two half-nuts securing it (3). With the spring mechanism relaxed, the bottom cage bracket comes into contact with the cage support frame and will support the cage travel. This also gives the system it's full 'over travel', enabling the micro-switch to be checked. Make sure the switch is fully compressed, now tighten the securing screws on the switch and ensure the lock screw (2) is wound up into contact with the switch, preventing any further travel downwards.

Lightly apply lubricant to the support assemblies (WD40, or similar.), allowing thorough wetting of the swivel bolts and bearing assemblies, this will reduce the hysteresis (i.e. 'back-lash') in the system and ensure maximum accuracy. The first (upper) half nut can now be adjusted upwards until the spring becomes partially loaded. Continue adjustment until the switch just loses contact with the top cage bracket, silencing the alarm. The second (lower) half-nut supporting the adjustment bolt can be partially tightened to lock the bolt in place.



The addition of a 5 kg weight should now be used to prove that the system detects the applied overload, sounds the alarm and cuts off the machine operation. The sensitivity of the assembly is such that the alarm will sound, slightly before the functions are disabled. The mechanism should be adjusted to allow the alarm to sound and functions to be lost within this 5 kg limit. Once this has been achieved, securely lock the lower half-nut (3).

The machine can now have the overload removed and the machine functions checked for correct operation.

## **Operating & Safety Instructions**

### **4.5.5 INSPECTION**

The cage weigh system is controlled through the detection printed circuit board, part number P16164. This PCB is connected directly to the safety micro-switch and monitors the function of the cage weigh system. The two relays are configured such that both need to operate to permit safe operation of the assembly. Should either of them fail, an error signal is generated which can be seen on the printed circuit board itself. This occurs if pressing the green button does not allow the machine to operate, no overload signal to be given, with no load in the cage. In this case, open the cage pushbutton box or separate box containing the PCB and look at the printed circuit board.

There are three LED's (Light Emitting Diodes) on the board, Red LD1 for 'Overload', Red LD2 for 'Relay 1/2 failed' and Green LD3 for 'Machine enable'. The first indicates the overload when the machine is turned 'On', the second indicates a relay failure when the green button is pressed, and the third shows the machine is enabled, again when the green button is pressed.

The failure signal is generated if either relay fails to respond to the 'safe' cage weigh signal from the safety micro-switch, either due to a coil or contacts failing or if a contact sticks in place due to welding. Under either circumstance the 'enable' signal is blocked, instead generating the error message, illuminating the red LD2. The machine will not operate under this situation. The red error signal from LD2 requires the board to be changed, as the relays are not serviceable items.

### **4.5.6 MAINTENANCE**

The cage weigh mechanism is supported on maintenance-free precision needle roller bearings for smooth running and friction-free operation. The accuracy of the entire assembly and in particular the hysteresis is dependent on these components. Keeping them free of dust and dirt is recommended; and an occasional application of WD40 to the external faces should keep them mobile and deny the entry of dust and moisture.

The hysteresis is the amount of load required to be removed before the system re-sets allowing continued operation.

If the assembly is subjected to any external impact force, typically whilst manoeuvring the machine under power, or in the case of trailer units, whilst being reversed into position, the cage assembly will require close inspection. If there is evidence of any deformation in any part of the structure, then the advice of a Niftylift Service technician should be sought. Physical damage to the assembly is liable to render the cage weigh system inactive, or to affect the accuracy of the result. Under no circumstance permit a damaged machine to enter service without performing a thorough inspection and calibration of the weigh assembly.

For this reason it is not recommended to restrain the machine in transit using strap or chains passed through or over the cage itself. This is particularly true of the electronic load cell system, which could be permanently damaged by the application of such excessive external forces. Whilst the mechanical system could be considered to be more robust in operation, the same restraint forces that could be generated through ratchet straps and the like, is likely to cause some severe deformation in the lightweight cage structure. Use only the designated tie-down points on your Niftylift when strapping the machine down for transport. Failure to observe this instruction could render the machine unusable, and a considerable repair bill for the damaged components.

#### **4.5.7 REPLACEMENT**

If components are replaced, they must be genuine Niftylift parts. The accuracy and function of the cage weigh system relies on the like-for-like application of the component parts. A switch from a similar manufacturer might reverse the contact arrangement and critically affect the function of the mechanism. Similarly, the accuracy of the sensing circuit relies on the duplication of the contact travel within the switch itself. Using a non-equivalent component will render the cage weigh system inactive. Under no circumstances should you permit a machine with a defective cage weigh assembly to enter service.

If in doubt about the operation or function of your machine, always request the circuit diagram that goes with the machine serial number. Look at the bottom of the machine serial plate; one of the final two numbers stamped there will give the electrical circuit for the machine. ('D80000' number, plus the issue status immediately afterwards: - /01;/02;/03; etc, see Section 1.5)

If in doubt, contact the Niftylift Service Department on (44) 01908 223456, Fax: 01908 227460.

## 4.6 BATTERIES AND CHARGING



**BATTERIES MUST BE RECHARGED IN A WELL-VENTILATED AREA FREE OF FLAME, SPARKS OR OTHER HAZARDS THAT MAY CAUSE EXPLOSION. HIGHLY EXPLOSIVE HYDROGEN GAS IS PRODUCED DURING THE CHARGING PROCESS.**

- 1) Recharge batteries at the end of every working day or shift.  
**(Note:** To recharge batteries fully from 20% takes approx. 12 Hours, this consists of 8 hours bulk charging plus 4 hours equalisation).
- 2) Plug charger into suitable power supply, either 240 volts or 110 volts AC (see **Charging Limitations**). (Note: If using 240V, use of a suitably rated Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD) at the point of supply is highly recommended.)
- 3) Take note of the indicators provided:  
**Amber AC lamp** - Batteries are charging.  
**Amber CHARGE lamp** - Batteries are charging and between 80% & 100% capacity.  
**Green FINISH lamp** - the batteries are fully charged.  
**Red lamp flashing** – Fault (see 'Charging Limitations').
- 4) The charger will automatically switch off once the batteries are fully charged. It is recommended to reconnect the charger to a suitable power supply when the machine is not in use to maintain good battery condition. Charger will monitor and maintain correct battery charge level.



**UNDER NO CIRCUMSTANCES SHOULD A MACHINE BE LEFT FULLY DISCHARGED AS SEVERE BATTERY DAMAGE CAN OCCUR IN A RELATIVELY SHORT TIME.**

- 5) The machine boom functions can be used whilst on charge. **Do not drive** machine to avoid damage to cables etc. To disconnect charger, firstly switch off the power supply. Ensure LED's are **off** before disconnecting the charger from the power supply.

### Notes:

- 1) If the charger is reconnected to the power supply shortly after it has gone through its full charging cycle, the charger will show the Amber AC lamp, immediately followed by the Amber Charge lamp. The charger would then go through its complete cycle again at an accelerated rate, depending on the time difference between connection, reconnection, and level of battery charge.
- 2) Some machines are fitted with a Battery Management System, which permanently monitors the condition of the batteries. When the batteries become discharged to 20% of their capacity the management system will begin to "shut down" the hydraulic power packs. This causes the drive/boom operating system to alternately stop and start, signalling to the operator that re-charging is necessary. However, there is sufficient power remaining to enable the operator to drive slowly to the nearest charging point.

Should the operator ignore the onset of the battery discharge warning the "shut down" of the motors will continue, until the machine is rendered in-operative. **Immediate charging will then be required.**

**CHARGING LIMITATIONS**

The capacity of the 110V supply must be capable of 3.5kVA (32A current); hence a small hand-tool transformer must **not** be used with the battery charger.

**Note;** charger output will fall if air temperature is below 0°C or above 50°C.

**Fault Conditions**

If a fault occurs, count number of flashes between pauses and refer to table:

Red LED status	Cause	Solution
<b>One</b> flash	Battery High Voltage	Check battery size and condition. This fault will automatically clear once the condition has been corrected.
<b>Two</b> flashes	Battery Low Voltage	Check battery size and condition. This fault will automatically clear once the condition has been corrected.
<b>Three</b> flashes	Charger Timeout. Caused by battery pack not reaching required voltage.  Charger output reduced due to high ambient temperature.	Check connections.  Operate charger at a lower ambient temperature.  Reset charger (interrupt AC power for 15 seconds)
<b>Four</b> flashes	Check Battery(ies); battery could not be trickle charged up to minimum voltage.	Check for shorted or damaged cells  Reset charger (interrupt AC power for 15 seconds)
<b>Five</b> flashes	High temperature. Charger shut down due to high internal temperature.	Ensure sufficient cooling airflow and reset charger (interrupt AC power for 15 seconds)
<b>Six</b> flashes	Charger Internal Fault	Reset charger (interrupt AC power for 15 seconds). Return to service department if fault persists.

Attention should also be given to the use of extension cables as power leads. Excessive cable lengths from the supply point to the battery charger will result in significant voltage drop, leading to a reduction in the chargers efficiency. In addition, inadequate sized cable cores will have a limiting effect on its current carrying capacity, which will again lead to a reduction in the chargers efficiency. Both of these can result in over-heating of the cable with an increased risk of fire, short circuits, or damage to the components themselves.

### **Operating & Safety Instructions**

The charger requires a minimum battery voltage of 1.5 volts per battery (overall for two batteries 3 volts, for 4 batteries 6 volts for 8 batteries 12 volts and 18V for 72V). If the voltage is below these values then the charger will not function (Charger will not detect batteries to begin charge.) If the batteries have fallen to such a poor state they will have to be removed from the machine and charged individually with an independent charger until the optimum voltage has been reached. This is best performed at very low currents to 'recover' the batteries if sulphation has already started i.e. a 'trickle' charger. This can take several hours, possibly days. Careful monitoring of the rise of battery voltage will indicate when recovery has been achieved.

#### **TOPPING UP**

During the course of normal operation, the batteries should be inspected at least once a fortnight to check the level of electrolyte. During the end of charge, gassing takes place, which will cause a slight reduction in the volume of acid in the battery. This can be topped up with de-ionised water as required. During this inspection, it is useful to note any imbalance in the fluid levels. One indication of a faulty cell would be an increase in the loss of battery acid, which would then require more frequent topping up on that cell, or cells. Faulty cells can liberate excess hydrogen, even during normal operation, with the resulting risk of explosion if ignited. **Any faulty batteries should be replaced as soon as possible with an equivalent sized and rated unit.**

**Note: BATTERIES CONTAIN ACID; therefore, protective safety glasses and gloves (Appropriate PPE) MUST be worn whilst performing these checks.**

## **4.7 TRANSPORTING, TOWING, CRANEAGE, STORAGE, AND SETTING TO WORK**

### **4.7.1 TRANSPORTING**

If a work platform is to be moved over a longer distance, whether the machine is trailer mounted, vehicle mounted, self propelled or tracked, the following procedure should be read before restraints are attached to the machine. Cross loading is most frequently the cause of problems, as the method of loading is no longer in sight of our own personnel. The recommendations made herein should be passed on to subsequent carriers, such that the entire journey is carried out without incident.

- Always ensure the truck or trailer you are loading or towing the Niftylift with can carry it legally.
- If loading by crane the use of shackles and an adequately rated spreader beam, with four leg slings, is **MANDATORY**.
- When loading or un-loading from the side of the vehicle, the use of the forklift pockets to retain one of the forks is recommended (If fitted). Spread the forks to their widest capacity, with due regard to the components fitted to the machine. Never forklift or crane an entire machine under the booms, always lift beneath the spine or under the ends of the axle mountings in the case of a self-propelled unit. Ensure forklift is adequately rated for the load to be carried.
- Once positioned on the transport carrier ratchet straps should be used to secure the machine. The machine should be positioned to allow easy access around the machine in transit, and to ensure that 'creepage' during transport does not permit the machine to come into contact with other goods being shipped, or the container itself. Some movement of the machine structure might occur during transit, which could lead to fretting or other damage.
- If the machine is equipped with a transit device such as a boom clamp etc, this should be securely applied.
- Strap booms carefully to constrain them from sideways movement. When using straps or chains, adequate packing should be applied to stop any damage to the structure and paintwork. Due regard of the movement of the straps or chains must be taken into account.
- Where a machine has designated points for strapping, lifting or forking, these can be used for tie-down duty. When they are absent, the major structure of the platform can be used, giving due consideration to the design and function of the area chosen. Where possible, use the spine of the machine or axle mounts over which to apply the holding down forces. Using a single plate, such as an outrigger or stabiliser support plate might be unsuitable. If the component was clearly not designed to accommodate a side load, one should not be applied.
- Under no circumstances should straps or chains be applied over booms or through the cage support structure or the cage itself. The relative strength of the carrying structure is not conducive to the massive forces capable of being applied through ratchet chains or slings. Severe damage to the steelwork can be caused, as well as deformation to sensitive mechanisms such as cage weigh assemblies, which would render them useless. Such catastrophic damage to say, an electronic load cell would require the component to be replaced before the machine would function.

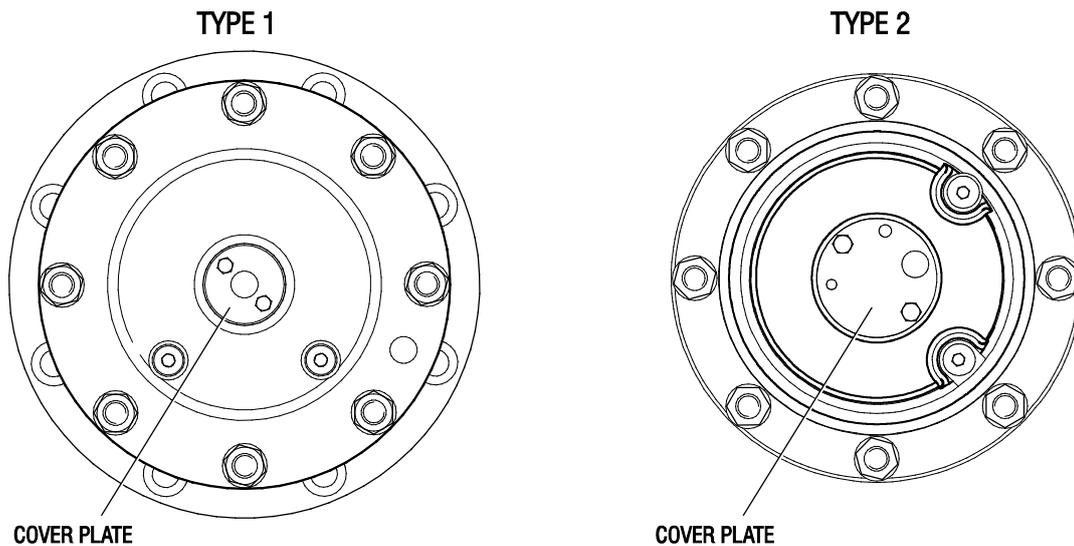
**Operating & Safety Instructions**

**4.7.2 TOWING**

If the Niftylift needs to be towed in case of an emergency, it will be necessary to **chock the wheels** before commencing gearbox disengagement.

**IDENTIFYING GEARBOX TYPE**

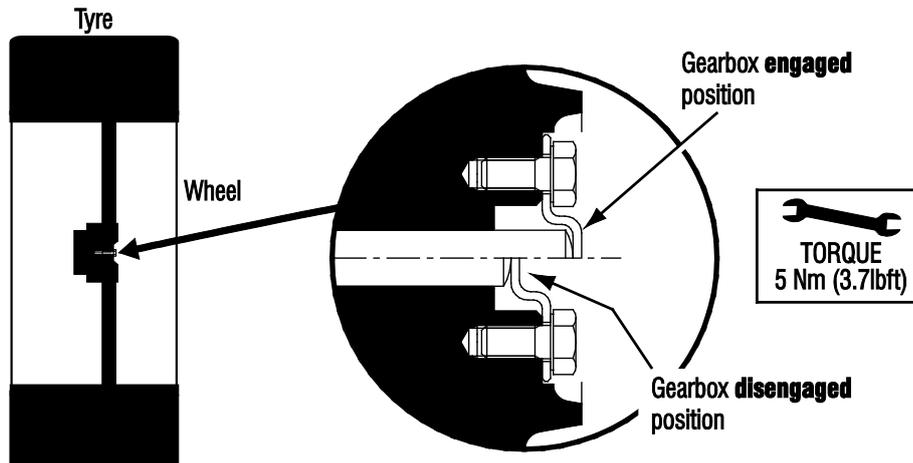
In order to safely tow the HR15N/17N, the drive mechanism will need to be bypassed. Identify the type of gearbox fitted to the machine then refer to the relevant procedure for disengagement of the gearboxes.



**4.7.3 GEARBOX DISENGAGEMENT (TYPE 1)**

The drive gearboxes located on the rear wheel hubs must be disengaged as follows;

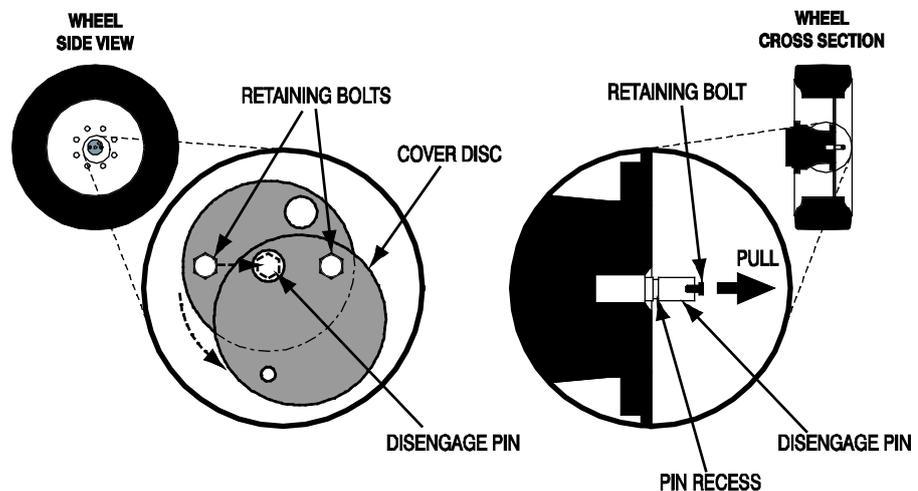
- 1) To disengage the gearbox, remove both screws from the cover plate, turn it upside down (as per the diagram below), re-tighten the M5 screws to a torque of 5 Nm (3.7lbf).
- 2) Before attempting to re-engage the gearbox, ensure that the machine is jacked up so the relevant wheel is clear of the ground in order to prevent damage. **Note; Damage caused by failure to comply with this notice will not be covered by the manufacturer's warranty.**



#### 4.7.4 GEARBOX DISENGAGEMENT (TYPE 2)

The drive gearboxes located on the rear wheel hubs must be disengaged as follows;

- 1) Remove both retaining bolts that secure the cover disc to the centre of the wheel hub.
- 2) Partially screw one of the retaining bolts into the end of the central disengage pin and pull the pin out fully, ensuring the recess on the pin is visible.
- 3) Place the cover disc over the pin, ensuring the retaining disc is engaged in the pin recess and secure in place using the remaining retaining bolt.
- 4) To re-engage the gearbox, complete the above instructions in reverse order, ensuring gearbox drive is free to engage before pushing the pin 'home'. If necessary, jack up each wheel & rotate slightly to allow re-engagement of pin.



#### 4.7.5 CRANEAGE

- 1) Observe all of the limitations relating to straps and chains stated above under 'Transporting'. (4.7.1)
- 2) When utilising the designated lifting points never apply a 'snatch' load, i.e. lift slowly to take up the load before raising. Similarly, do not drop machine when positioning after lifting.
- 3) If the machine is to be lifted by crane, use the designated lifting points and observe the recommendations regarding spreader beams. Individual drawings are available for each machine type, on request. (See list below.)

**D80935**  
**D81301**  
D80936  
D80937

**HR15N**  
**HR17N**  
HR15 4x4  
HR17 4x4

#### 4.7.6 STORAGE

If being stored for any length of time without use, then the machine should be thoroughly inspected for the following:-

- 1) Grease all bearings /slides, worm drives, etc.

### **Operating & Safety Instructions**

- 2) Check batteries for electrolyte levels, state of charge, damage, dirt, etc. Never leave in a state of discharge for any length of time. If no use of the platform is intended, an occasional "top-up" charge of the batteries will serve to equalise their charge level.
- 3) Leave battery disconnect switch in OFF position to prevent discharge of batteries through leakage.
- 4) If machine is to be left on an incline, chock wheels to prevent creep.
- 5) If machine is to be left outside or in a hostile environment, cover with suitable weatherproof media to prevent deterioration.

#### **4.7.7 SETTING TO WORK**

Before use each day and at the beginning of each shift the machine shall be given a visual and functional test including, but not limited to, the following

- 1) Check all lubrication points for adequate application of grease, oil etc.
- 2) Inspect all threads for ease of operation - especially descent valves, brake release valve etc.
- 3) Check level and quantity of oil. Remove any contaminants - water, etc.
- 4) Check batteries for electrolyte and state of charge.
- 5) Check electrics for damage and insulation.
- 6) Using ground controls, cycle machine over complete envelope in accordance with the Operating Instructions. Cure any defects.
- 7) Ensure that all safety devices and controls operate in accordance with the instructions.
- 8) If necessary, perform a load test to establish the machine stability before putting the machine to work.
- 9) On completion of an extended period of road transport, the machine might need additional inspection to identify any transit degradation, which could render the machine unsafe. Perform a P.D.I. inspection on the unit before it enters service. Record any faults found and rectify them immediately.
- 10) If left un-attended for an extended period, it is likely that the hydraulic cage levelling will become un-pressurised. Normal operation is then lost, with a noticeable delay in the forwards or backwards motion as the booms move. To restore normal function, the cage needs to be fully levelled forwards and backwards, using the cage-levelling lever whilst not standing in the cage (i.e. with the operator standing adjacent to the cage side whilst simultaneously operating the lever and green button to move the cage). Take care not to become trapped between the moving cage and a fixed object, and ensure those around you are clear of the moving cage. When the system has been charged in both directions, the cage levelling function should be restored. If the system operates but is 'jerky' in either direction, this indicates air in the system. Repeat the procedure as described above until the movements are smooth and un-interrupted. If in doubt, contact our Service Department for further advice.

Niftylift Limited is not liable for any third party damage caused during transport. Careful attention to correct procedures will prevent many of the small snags that can happen in transit. Re-work is both expensive and time consuming. A defective machine arriving at the place of work is a poor advertisement for our product, the company's reputation and those of our dealers and clients. The responsibility for safe and damage-free transport rests with the haulier or his representatives.

## 5 Emergency Controls

### 5.1 GENERAL

#### **CHECKING THE OPERATION OF THE EMERGENCY CONTROLS EVERY DAY AND/OR BEFORE EACH SHIFT IS AN ESSENTIAL PART OF THE OPERATOR'S DUTIES**



The operator and all ground personnel must be thoroughly familiar with the location and operation of the emergency controls.

### 5.2 IN THE EVENT OF AN INCAPACITATED OPERATOR

Turn the key switch at the ground control station to **ground** (Anti-clockwise).  
Manoeuvre the machine using the ground controls as described previously in Section 4.2.

### 5.3 IN THE EVENT OF MACHINE FAILURE

If all machine power is lost, the **Manual hand pump** can be used to provide the hydraulic power to manoeuvre the machine.

- 1) Operate the emergency descent valves located under the base control panel on the superstructure. These must be pulled in or out depending on the direction of travel required. Refer to the decal inside the panel for the relevant controls.
- 2) With the relevant descent valve pushed in or pulled out operate the manual hand pump, located inside the same panel. If initial movement of the machine allows the master alarm to reset, normal controls will be available. This is then the fastest method of lowering the platform to the ground.

**Note:** If the machine is fitted with a cage overload system, and the cage comes into contact with a fixed object whilst operating at height, this would be detected as an overload condition. All power to the machine controls would be lost, requiring the machine to be recovered using the **Manual Hand Pump**. It is sufficient for the cage to be manoeuvred away from the collision point to re-set the cage weigh mechanism, thereby restoring normal machine operation. The cage could then be brought down using the controls as described previously.

#### **FOLLOWING AN EMERGENCY DESCENT RECOVERY OF THE PLATFORM, FULLY EXTEND AND RETRACT ALL CYLINDERS FROM GROUND CONTROL STATION BEFORE USING THE MACHINE.**



### 5.4 INCIDENT NOTIFICATION

It is a mandatory requirement that any accident or incident involving a Niftylift, regardless of whether any party received injury or property was damaged is reported by telephone directly to Niftylift. Failure to do so may render any warranty on the machine void.

## **6 Responsibilities**

### **6.1 CHANGES IN OWNERSHIP**

When a change of ownership of a Niftylift occurs, it shall be the responsibility of the seller to notify Niftylift direct of the unit, model and serial number and the name and address of the new owner within 60 days. This important step is required so that all future Technical Bulletins are able to reach the registered owner of each machine without delay. Please note warranties are not transferable.

### **6.2 MANUAL OF RESPONSIBILITIES (USA only)**

You are required by ANSI/SIA 92.2 1990, to read and understand your responsibilities before you use or operate this aerial platform. Please read the enclosed document, as failure to do so could result in death or serious injury. Wherever any contradiction may appear, the Manual of Responsibilities shall take precedence over all other documents.

### 6.3 INSPECTION/SERVICE/PRE-HIRE CHECK LIST

**MACHINE SERIAL NO** \_\_\_\_\_

<b>TOWING</b>	<b>PASS</b>	<b>FAIL</b>	<b>N/A</b>
Machine secured on trailer			
Straps correctly positioned and tightened			
Wheels chocked if necessary			
<b>AXLES, WHEELS AND BRAKES</b>			
Wheels are secure, tyre condition acceptable			
Wheel bearings O.K.			
Brake linkages and cables secure			
Brake shoe wear not excessive			
Machine climbs slope			
Brakes hold machine on slope			
Rear hub nut secure			
Track rod secure, not fouling axle plate			
<b>BASE</b>			
Operation of ground control valve and buttons			
Operation of all booms over full range			
Wheel bearings OK			
Cylinders are silent			
Platform is level over full range			
Booms, levelling rods not damaged or distorted			
Booms levelling rods, cylinders not fouling			
Hoses not tight, kinked or fouled			
Operation of manual hand pump			
<b>SLEWING</b>			
Slew assembly and motor are secure			
Worm/wheel mesh correct, no excessive wear			
No end float of worm in housing			
Slew wheel bolts secure			
Slew guards secure			
<b>PLATFORM</b>			
Operation of control valve and buttons			
Operation of SiOPS			
Levelling lock valve holds in both directions, lines vented			
Operation of all booms over full range			
Cylinders are silent			
Platform levelling over full range			
Slewing smooth over full range			
Operation of boom 4 over full range (if fitted)			
No excessive movement of boom 4 and boom 3			

# **nifty** Height Rider/SP Series

## Operating & Safety Instructions

<b>TILT ALARM</b>	<b>PASS</b>	<b>FAIL</b>	<b>N/A</b>
Booms raised on slope - drive disabled, siren tone constant			
Boom operation unaffected			
Booms lowered - drive restored			
<b>INTERNAL (POWER PACK)</b>			
Power pack and all components secure			
All cables and terminals secure			
All hose connections secure			
Hoses not kinked or fouled			
Charger/control box secure			
Batteries secure			
Electrolyte level and specific gravity			
Charger operation			
Hydraulic oil level			
Engine/Gear box oil			
<b>FINISH</b>			
Pivot pin tag bolts			
Correct decals, all visible			
Canopy/bonnets			
Grease nipples (Feet, Knuckle, Centre Post)			
<b>LEAK CHECK</b>			
Cylinders (Lift, Jacks, Telescope, Levelling)			
Control valves			
Check valves			
Power pack/pump			
Slew motor			
Hose connections			
Filter			
Wheel motors			

**Comments, remedial work required etc;**

**INSPECTED BY:** \_\_\_\_\_

**DATE:**    /    /