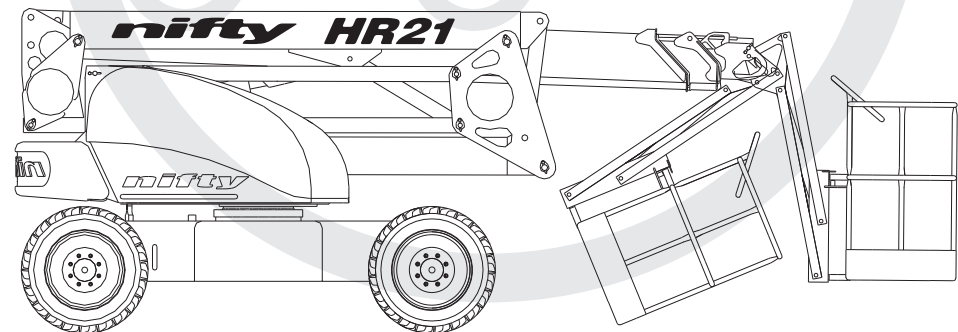


nifty

Heightrider

Operating & Safety Instructions
MODEL HR21 (SP64) SERIES
(4x4)



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1 Introduction and General Information

1.1 FOREWORD

The purpose of this manual is to provide the customer with safety, operating and maintenance instructions essential for proper machine operation.

This manual should be READ and fully UNDERSTOOD before any attempt is made to operate the machine!

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

These manuals are very important tools - Keep them with the machine at all times.

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.**

Remember: Any equipment is only as safe as those who operate it!

1.2 SEVERITY OF HAZARDS

The use of this type of equipment presents certain dangers to the operator which are clearly identified both in this manual and on the machine. The varying levels of risk 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 which may lead to serious injury or death, if ignored.



IMPORTANT and INSTRUCTIONS

This denotes procedures essential to safe operation and prevention of damage to, or destruction of the machine.

NOTICE

This 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.

1.3 SCOPE

These operating instructions contain all the necessary information required to allow the safe operation of any Niftylift Height Rider 21 4x4 (SP64 in the USA), with a diesel (D) engine.

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.

1.4 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

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

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

Nifty Pty Ltd, 265 King Street, Newcastle, NSW 2300, Australia

Tel: +61 (0) 2 4929 6700 Fax: +61 (0) 2 4925 2570

Driven from the platform, the Niftylift Height Rider 21 (SP64) is an extremely versatile articulated boom platform of unique and simple design. It is capable of placing two men and their tools up to a height of 21.20m (69ft 2in) or an outreach of 13.20m (43ft 4in).

The compact narrow base and tight turning circle, combined with powered slew, up and over capability, good outreach, combined with sensitive controls, ensure 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 five-degree tilt sensor help to prevent the operator from working on unsafe terrain whilst elevated.

The Niftylift Height Rider 21 provides a fast, safe, cost effective method of access, both inside and out, for a multitude of applications where overhead working is required.


Models include the following:

D: - DIESEL

Operating & Safety Instructions**1.5 GENERAL SPECIFICATION**

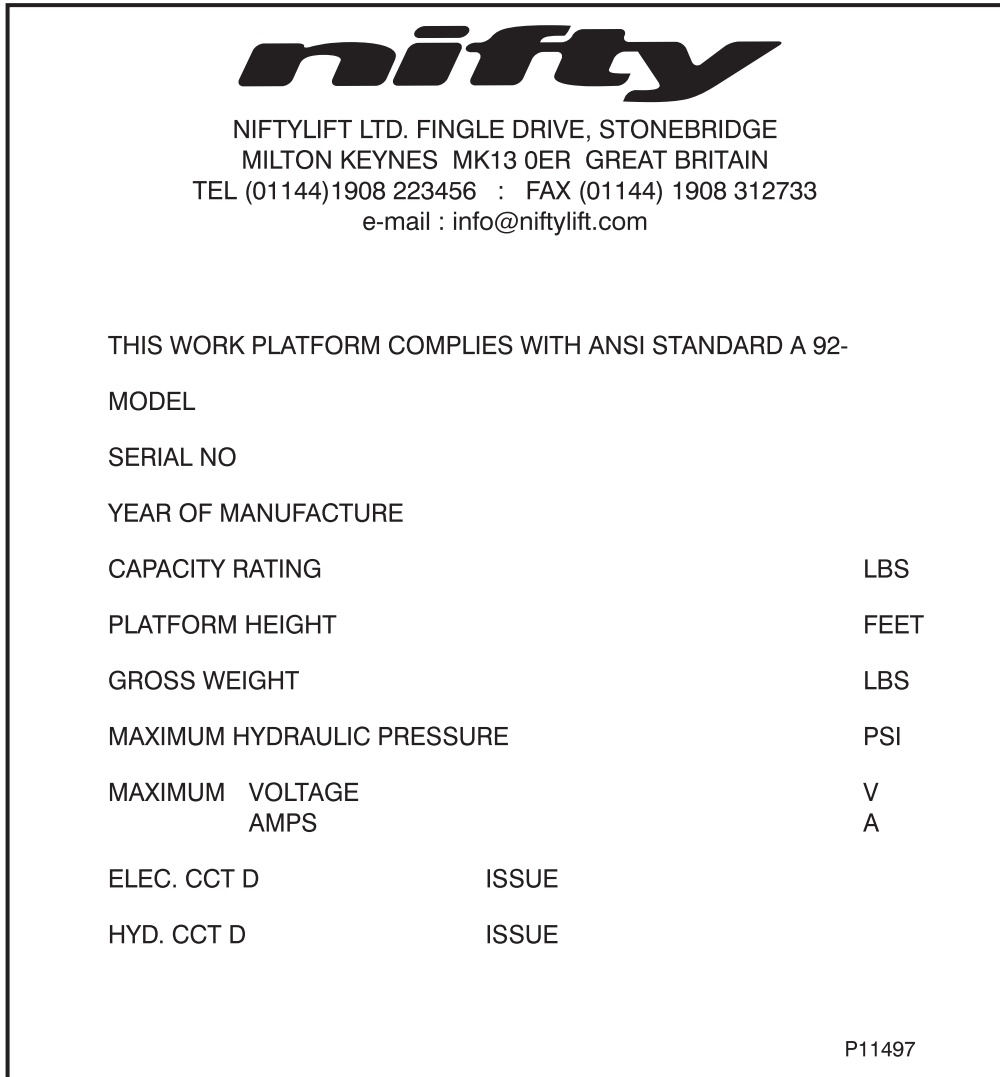
FEATURE	HR21 (SP64)
MAXIMUM HEIGHT - WORKING	20.66m 67ft 9in
MAXIMUM HEIGHT - PLATFORM	18.70m 61ft 4in
MAXIMUM OUTREACH	12.60m 41ft 4in
MAXIMUM HEIGHT – STOWED	2.15m 7ft
MAXIMUM WIDTH	2.25m 7ft 5in
MAXIMUM LENGTH – STOWED	5.00m 16ft 5in
PLATFORM CAPACITY - Europe	225kg (500lbs)
WHEELBASE	2.30m 7ft 6in
TURNING RADIUS – OUTSIDE	3.97m 13ft
TURRET ROTATION	355°
TURRET TAIL SWING	0.49m 1ft 7in
TRAVEL SPEED	0-4.1mph 0-6.6kph
PLATFORM SIZE	1.80m x 0.70m 5ft 11in x 2ft 2in
CONTROLS	Proportional electric over hydraulic
HYDRAULIC PRESSURE	200bar
TYRES	Foam Filled
GRADE-ABILITY	45%
MINIMUM VEHICLE WEIGHT	6,220kg 13,700lb
MAXIMUM GROUND PRESSURE	0.1051kn/cm ² 21,951lb/ft ²
POWER SOURCE	D (Diesel) models - Kubota 1505 (4x4)

1.6 IDENTIFICATION (UK PLATE)

			
NIFTYLIFT LTD. FINGLE 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		
			P10805

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.

1.6a IDENTIFICATION (USA PLATE)



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.

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 CONFORMANCE 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 the safety of operations shall be repaired prior to the use of the Niftylift.
- 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.

Operating & Safety Instructions



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.
- 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.

Operating & Safety Instructions

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 not to 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/s².

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 (i.e. Charger has a solid green light and a pulsing red light).
- 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 emergency 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 5° or more the alarm should sound and drive should be disabled).
- 13) 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 that the joystick manipulators are secure.
- 3) Check battery fluid levels and specific gravity (after charging) and general condition.
- 4) Check hydraulic oil level (ISO Grade 22).
- 5) Inspect the engine air filter and clean or replace if necessary.
- 6) 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 bolts holding the wheel motors to the chassis are secure.
- 4) Check that the slew worm is secured and correctly in mesh. Clean and re-grease.
- 5) Inspect brakes for operation and wear.
- 6) Grease the knuckle and centre post.
- 7) Inspect the engine fuel tank for damage or leaks.
- 8) Check telescopic boom wear pads and nylon studs (if applicable).
- 9) Check that the end cap on the main knuckle pin is secure and the roll pin is in place.
- 10) Check and adjust if necessary the Nylatron studs around the telescope boom.
- 11) Every **three** months check and verify the calibration of the cage weigh system. See section 4.5.4 for the calibration procedure.
- 12) 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 ringbolts are secure (torque 220ft lbs. 300Nm).

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

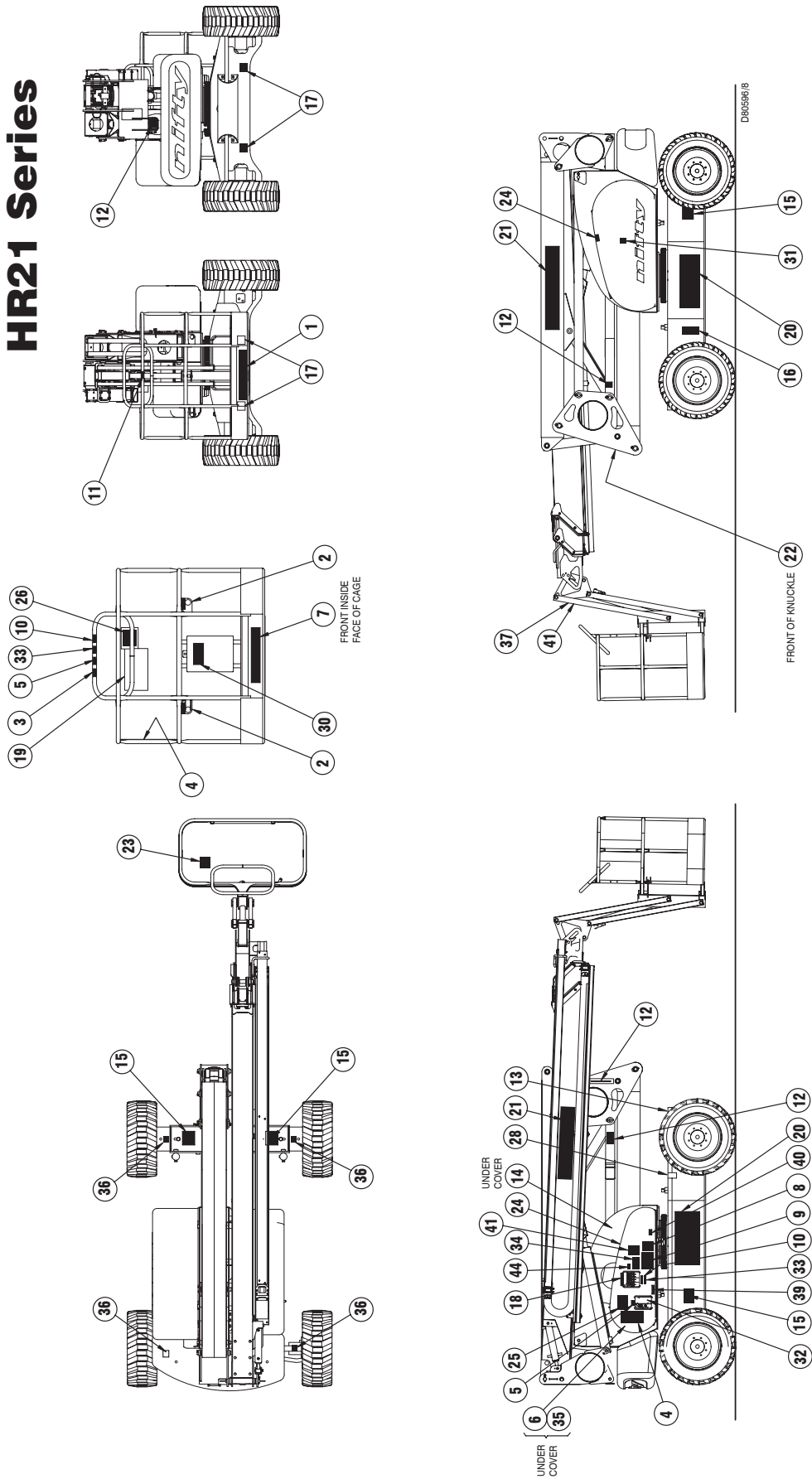
ITEM	DESCRIPTION	NUMBER	QTY
1	"Niftylift.com"	P14390	1
2	Harness Point	P14883	2
3	Head Protection	P14921	1
4	Danger HR & TM's	P20330	2
5	"If E-Stop Disabled	P14864	2
6	Hydraulic Oil	P14415	1
7	SWL 225kg	P17328	1
8	Emergency Hand Pump	P19605	1
9	Daily Safety Check List	P14908	1
10	"If Tilt Alarm Sounds"	P14868	2
11	Cage Gate Warning	P18335	1
12	Hand Crush – Pictorial	P14782	4
13	Travel Direction	P14784	1
15	Gearbox Disengage	P14802	4
16	Oil Level Indicator	P14676	1
17	Tie-down point	P14958	4
18	Hydraulic Levers – Base	P14018	1
19	Hydraulic Levers -Cage	P14020	1
20	"4 x 4"	P14697	2
21	"HR21" Logo	P16998	2
23	Footswitch	P14884	1
24	No Step	P14785	2
25	General Notice HR's	P18870	1
26	Cage Button Box	P14015	1
28	Diesel	P14414	1
30	Operating Instructions	P14892	1
31	Noise Warning	P17124	1
32	Base Button Box	P16752	1
33	Overload Warning	P18848	1
34	Component Stability	P19708	1
35	Trip – Push to Reset	P19056	1
36	Point Loading	P15215	4
37	"Raise Flyboom"	P19442	1
39	110v Power Inlet	P17719	1
40	Chain Inspection	P16535	1
41	HR21 Slew Pin	P18587	2
44	Battery Isolator	P18600	1

nifty HR Series

Operating & Safety Instructions

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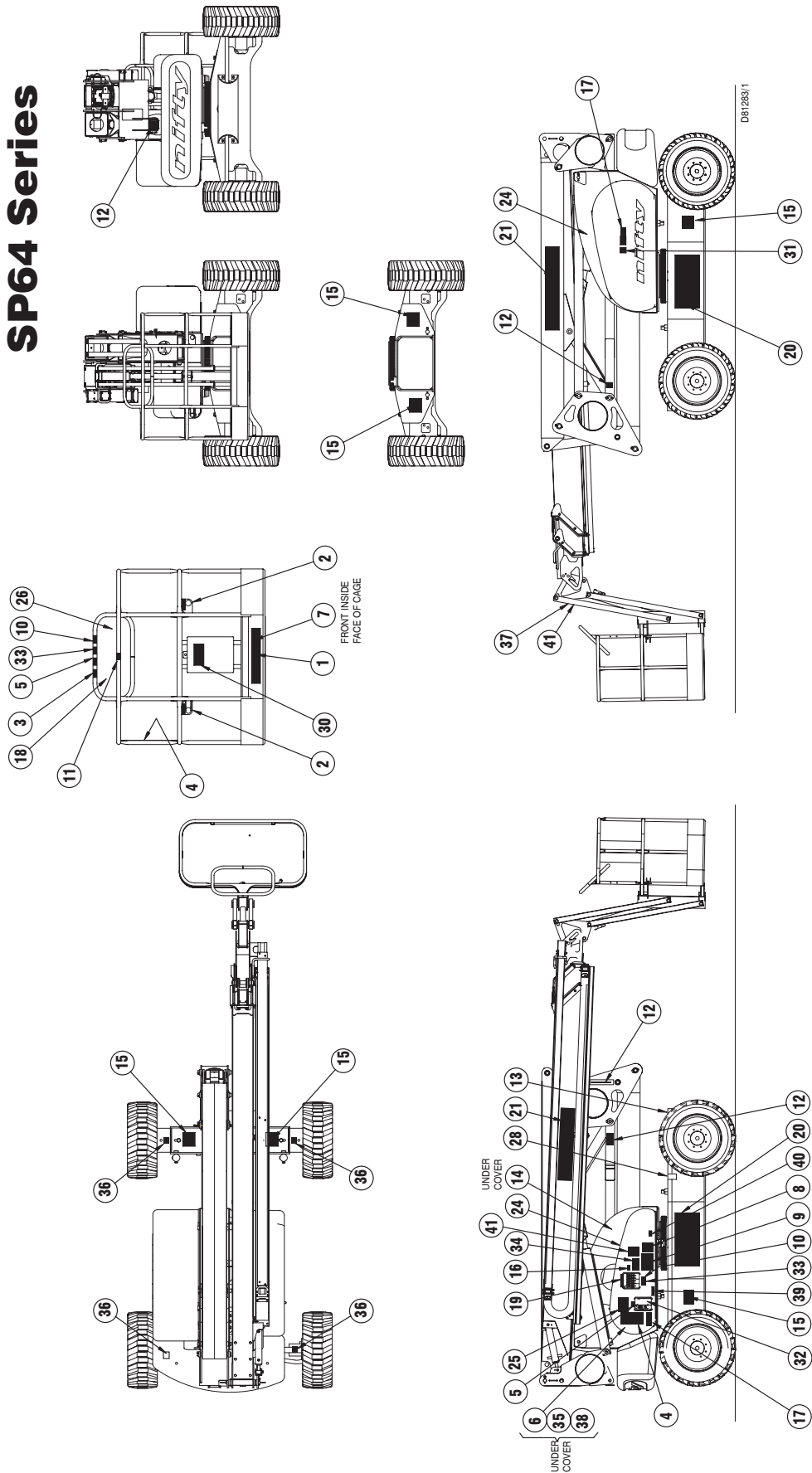
HR21 Series



Operating & Safety Instructions**3.4a PLACARD, DECALS & INSTALLATION (USA)**

ITEM	DESCRIPTION	NUMBER	QTY
1	"Niftylift.com"	P14390	1
2	Harness Point	P14883	2
3	Head Protection	P14921	1
4	Danger HR & TM's	P20330	2
5	"If E-Stop Disabled"	P14864	2
6	Hydraulic Oil	P14415	1
7	SWL 500 lbs	P17328	1
8	Emergency Hand Pump	P19605	1
9	Daily Safety Check List	P14908	1
10	"If Tilt Alarm Sounds"	P14868	2
11	Cage Gate Warning	P18335	1
12	Hand Crush	P14782	5
13	Travel Direction	P14784	1
15	Gearbox Disengage	P14802	4
16	Battery Isolator	P18600	1
17	Rotating Machinery	P15010	2
18	Hydraulic Levers -Cage	P14020	1
19	Hydraulic Levers – Base	P14018	1
20	"4 x 4"	P14697	2
21	"SP64" Logo	P19070	2
24	No Step	P14785	2
25	General Notice HR's	P18870	1
26	Cage Button Box	P14015	1
28	Diesel	P14414	1
30	Operating Instructions	P14892	1
31	Noise Warning	P17124	1
32	Base Button Box	P16752	1
33	Overload Warning	P18848	1
34	Component Stability	P19708	1
35	Trip – Push to Reset	P19056	1
36	Point Loading	P15215	4
37	"Raise Flyboom"	P19442	1
38	Level Indicator	P14676	1
39	110v Power Inlet	P17719	1
40	Chain Inspection	P16535	1
41	SP64 Slew Pin	P18587	2

nifty
SP64 Series



Operating & Safety Instructions**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	

4 Operation

4.1 CONTROL CIRCUIT COMPONENTS

4.1.1 MAIN CONTROL BOARD: - Situated under the left-hand superstructure cover, the encapsulated control board comprises a PCB (printed circuit board) design which incorporates all of the relays to control the machine operation. The control boards are common to all models, and contain functions which might not be utilised on your particular machine.

4.1.2 TILT ALARM: - Fitted to the superstructure underneath the base controls cover, 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.

4.1.3 SOUNDER: - Situated on the side of the base control box is a small piezo electric sounder, which is used to provide an intermittent alarm whenever the machine is in operation. Pushing the green "power control" button, or depressing the foot switch in the cage (if fitted) will energise this sounder. This serves to warn personnel of the operation of the machine.

4.1.4 KLAXON: - Also located on the back of the base control 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 low 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 D.C. motors is mimicked by the Klaxon, reinforcing the message to the operator to charge the machine.

4.1.5 DRIVE CONTROL VALVE: - This valve contains the ON/OFF solenoid and PRV for the boom controls. It also contains the steer valve and the brake release system. If any of these functions need to be overridden this can be done by using the hand pump, (see Section 5.3).

4.1.6 SUSPENSION CONTROL VALVE (OPTIONAL ON 2X4 AND STANDARD ON 4X4): - This valve controls the cylinders on the unique suspension system. This system will only be active when the booms are in the down position and the telescope is retracted.

4.1.7 BOOM-SWITCHES: - Mounted on the tele-knuckle and links knuckle, and operated by any of the booms raising and/or the telescopic boom going out, these switches control 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, High drive (Depicted by a Hare Icon) is possible, as is fast throttle on those machines so equipped. When the booms are raised or the telescope is out, the Tilt Alarm Sensor becomes activated, only slow speed operation is possible and only Low drive (Depicted by a Tortoise Icon) is permitted. When the booms are raised and the telescope out is engaged the machine goes to a third slower speed. 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.

Operating & Safety Instructions

4.1.8 BATTERY MANAGEMENT (ELECTRIC/BI-ENERGY MACHINES ONLY): - Battery condition is permanently monitored by the control circuit, such that when available power has decreased to 80% 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 & start, signalling to the operator that re-charging is necessary. At the same time the Klaxon will begin to sound intermittently reinforcing 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.

4.1.9 BATTERY ISOLATOR: - A battery disconnect plug is located beneath the base control canopy, which allows the machine control and power circuits to be isolated from the batteries themselves. Under normal operation, the machine Key switch should be used to isolate the machine, with the Battery plug only being required for emergencies to disconnect the batteries in the event of a short circuit, or during servicing of the machine to ensure that the power is disconnected.

On electric and bi-energy machines, the battery charging circuit is connected directly to the battery side, so charging is un-affected by use of this switch. The main battery pack is grounded to the chassis.

4.1.10 DUTY SELECTOR: - On multiple power option machines, the machine will default to electric power unless the diesel engine has been started.

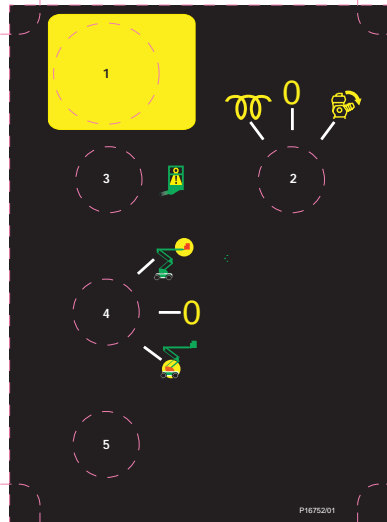
4.1.11 DIESEL ENGINE: - Generally a Kubota V1505 engine described in the maintenance section of the Workshop Manual, driving swash plate pump with integral relief valve on the main control valve. The arrangement allows two speed operation of all functions.

4.1.12 FUSES AND TRIP SWITCHES: -

- 1) **125A** fuse near the diesel engine battery (starter motor and alternator).
- 2) **10A** circuit breaker (main control system).
- 3) **35A** circuit breaker (heavy duty circuit for diesel throttle/Glow plug).

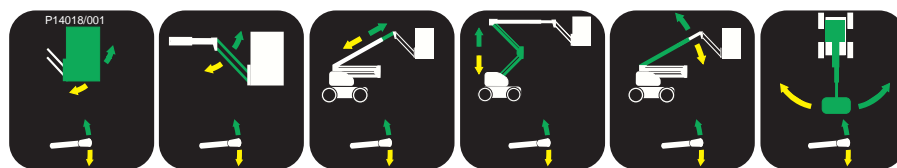
4.2 GROUND CONTROL OPERATION

4.2.1 GROUND CONTROL FUNCTIONS



(Base Button Box)

1 Emergency Stop	Push to Stop machine	Turn clockwise to Release
2 Diesel Glow/Start Selector	Turn Clockwise – Glow, Off and Start positions	
3 Cage Overload Indicator		
4 Base/Platform Selector	Up for Booms	Down for Base
5 Green Power Button	Push and hold to activate machine	



(Base Levers)

1 Operates Platform Levelling	Up for Forward **	Down for Backward **
2 Operates the Flyboom	Up for Up	Down for Down
3 Operates Telescoping	Up for Tele Out	Down for Tele In
4 Operates the Link Booms	Up for Up	Down for Down
5 Operates the Upper Boom	Up for Up	Down for Down
6 Operates Swing	Up for Right	Down for Left

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

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 **Base/Platform** selector at ground control station to **Ground** (Clockwise).

DIESEL ENGINE

- 3) **COLD ENGINE:** - turn the **Diesel Glow/Start** selector 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.
- 4) **WARM ENGINE:** - turn the **Diesel Glow/Start** selector to the **Start** position (clockwise) and the engine will fire.

ALL MODELS

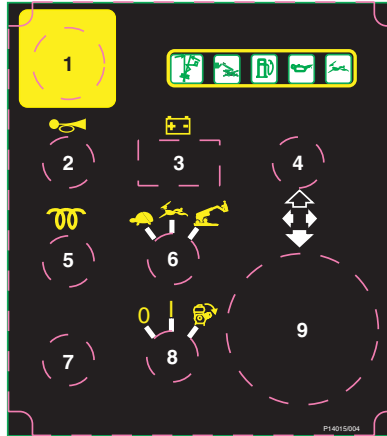
- 5) Push and hold green power button on the base control box.
- 6) Select a function and operate the appropriate hydraulic lever in full accordance with manufacturers operating and safety manual.
- 7) To return control to the platform turn the **Base/Platform** selector to the **Platform** position (anti-clockwise).
- 8) When not in use return machine to stowed position, turn the **Base/Platform** selector to centre **Off** position, remove key and chock wheels.

EMERGENCY PROCEDURES

- 9) Push in red emergency stop to shut down all functions.
- 10) In the event that the controls fail or the operator becomes incapacitated the booms can be operated by using the hand pump which is located under the canopy next to the base controls. To operate:
 - a) Check the selector under the middle bonnet is turned to booms.
 - b) Move and hold lever to be operated.
 - c) Use hand pump lever to move machine.
 - d) Release control lever to halt machine movement

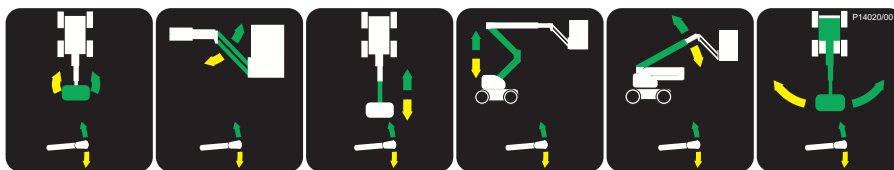
4.3 PLATFORM CONTROL OPERATION

4.3.1 PLATFORM CONTROL FUNCTIONS



(Cage Button Box)

1 Emergency Stop	Push to Stop machine	Turn clockwise to Release
2 Horn	Push to sound	
3 Battery Charge indicator		
4 Cage Overload Indicator		
5 Diesel Glow	Push to Glow Engine	
6 Drive Speed Selector	Turn Clockwise - Slow, Fast and Rough terrain modes	
7 Green Power Button	Push and hold to activate machine	
8 On/Off & Diesel Start		
9 Joystick		



(Cage Levers)

1 Operates Platform Rotation	Up for Clockwise	Right for Anti-Clockwise
2 Operates the Flyboom	Up for Up	Down for Down
3 Operates Telescoping	Up for Tele-In	Down for Tele-Out
4 Operates the Link Booms	Up for Up	Down for Down
5 Operates the Upper Boom	Up for Up	Down for Down
6 Operates Swing	Left for Left	Right for Right

Operating & Safety Instructions

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 the **Base/Platform** selector at the ground control station to **Platform** (anti-clockwise).

DIESEL ENGINE

- 6) **COLD ENGINE:** - push the **Diesel Glow** button to engage the glow plug pre-heat system. Hold for 3-5 seconds then turn the **On/Off Diesel Start** selector to the **Start** position (clockwise) and the engine will fire.
- 7) **WARM ENGINE:** - turn the **On/Off Diesel Start** selector to the **Start** position (clockwise) and the engine will fire.

ALL MODELS

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



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.

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 switch located on the front of the joystick.
- 3) Use the **Drive Speed** selector on the platform control station to determine speed.

Low Drive (Tortoise) - gives low speed and low engine revs..

High Drive (Hare) - gives high speed and high engine revs.

RT Drive (Rough Terrain) - gives low speed and high engine revs.

N.B. High Drive is only available when the booms are in the stowed position. The HR21 will default to Low Drive speed whenever the booms are elevated.

- 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 **High Drive** (Hare) 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 five-degree working limit. In normal operation the drive is therefore unaffected when driven onto a slope in excess of five degrees, until the booms are raised, whereupon the drive would be disabled and the tilt alarm sounds continuously.
- 8) **Under no circumstances** should any **Height Rider 21** series machine be driven on slopes exceeding the gradeability in the general specification.



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 emergency 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.

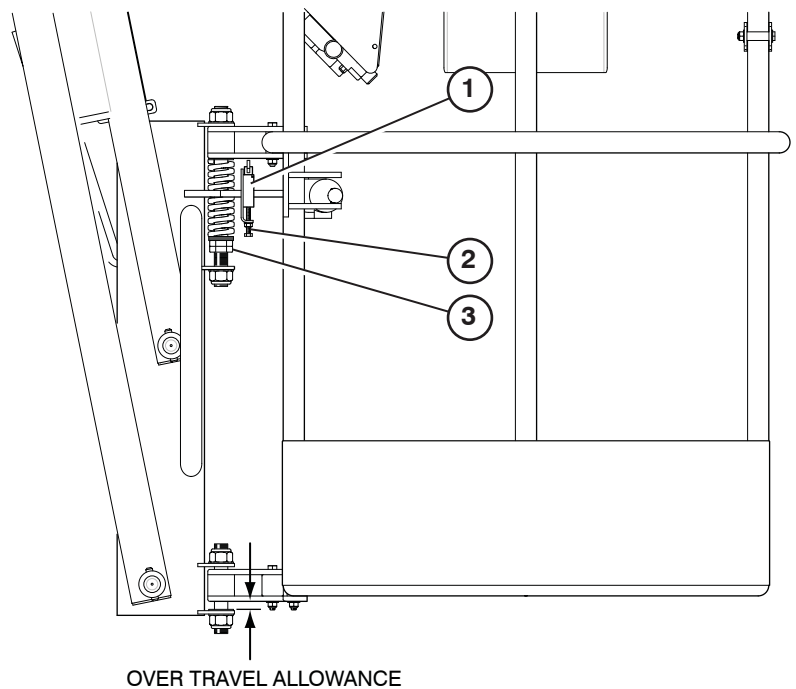
4.5.3 TESTING

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 its 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.

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 a 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 1.6).

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

Operating & Safety Instructions

4.6 TRANSPORTING, CRANEAGE, STORAGE AND SETTING TO WORK

4.6.1 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.

Do not tow machine without first following the towing procedure described in Section 5.6 of this manual.



4.6.2 CRANEAGE

- 1) Observe all of the limitations relating to straps and chains stated above under 'Transporting'. (4.6.1)
- 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.)

D80461	HR10/12
D80935	HR15N
D80936	HR15 4x4
D81301	HR17N
D80937	HR17 4x4
D80938	HR21

4.6.3 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.
- 2) If machine is to be left on an incline, chock wheels to prevent creep.
- 3) If machine is to be left outdoors or in a hostile environment, cover with suitable weatherproof media to prevent deterioration.

4.6.4 SETTING TO WORK

If your machine has arrived direct from the factory or via a dealer, then it may safely be put straight to work. However, if the machine has been in storage or if unsure about the machine's recent history then a full safety check should be made:

- 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 battery for electrolyte & state of charge.
- 5) Check electrics for damage & insulation.
- 6) Using base 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.

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- 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 **Base/Platform** selector at ground control station to **ground** (clockwise). Lower on ground controls as detailed under Section **4.2 Ground Control Operation**.

5.3 IN THE EVENT OF MACHINE FAILURE

If all machine power is lost, the **Emergency Hand pump** can be used to provide the hydraulic power to manoeuvre the machine. Lower platform using hand lever controls at ground control station.

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 **Emergency 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.

Opening the nearside machine canopy reveals the ground controls, plus the dedicated hydraulics for the Emergency recovery of the machine.



Primarily there are two emergency hand pumps, one for the boom functions only, mounted separately and adjacent to the ground control valve block. The second hand pump is specifically for the drive system and is incorporated into the Drive Control Valve.

Operating & Safety Instructions

5.4 BOOM CONTROLS

On opening the canopy cover, the two hand pump handles are revealed. The black handle with a red handgrip fits the Boom hand pump. Remove the handle and fit this to the appropriate pump. When the handle is actuated, hydraulic flow is generated and will be supplied directly to the ground control valve block. Operating the ground control lever will permit the machine to be manoeuvred by the ground personnel.



If desired, the Cage operator can hold the appropriate lever to manoeuvre the machine, whilst a ground operative provides the motive power using the emergency hand pump. When not in use, the handle should be stowed back in its clips.

5.5 DRIVE CONTROLS

Situated to the side of the ground controls is found the Drive Control Valve. This valve block controls the drive, brakes and emergency controls for all of the drive functions.



Under normal operation the brake release knob should be closed. To do this, turn the red knob fully clockwise to close that circuit. When the machine is driving, the brake tell-tale will 'pop' out to indicate that brake pressure is being generated. The silver hand pump handle fits the integral pump, which is now ready for use.

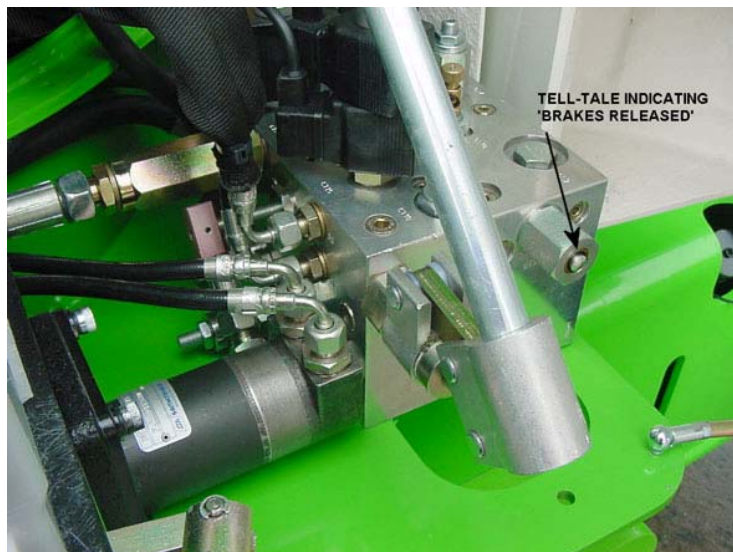
5.6 TOWING

To tow the machine it is necessary to bypass the parking brakes. First, ensure that the machine is restrained against running away, i.e. positioned on a flat, level surface or adequately chocked on two or more wheels in both directions. Moving the machine must not be attempted until adequate means to restrain it from running away are in place.



Fit the hand pump handle to the drive control valve pump. Push and hold down the brake release actuator, whilst pumping the handle. When brake pressure is generated, the brake 'tell-tale'- will indicate this by 'popping' out of the housing.

The brakes are now bypassed and the machine is capable of being towed at a low speed. The tow valve, integrated into the drive control valve, is piloted open at the same time as the brakes are released, and permits this.



To re-set the parking brakes, the brake release knob should be opened. This is the red knob on the side of the Drive Control Valve. Opening this knob allows the brake pressure to dissipate from the bypass circuit, re-setting the parking brakes and de-energizing the tow valve. The machine will now lock the wheels and deny any attempt at towing.



If this function is not used, the next time the machine drives under power, the same discharge will occur, allowing the machine to re-set its own brake system.

For safety, the machine should not be left with the brakes bypassed. If the machine is to be left with the brakes bypassed and the wheels chocked, suitable placards should be attached to the machine to warn operators of this condition.

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



5.7 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

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 _____

TOWING	PASS	FAIL	N/A
Machine secured on trailer			
Straps correctly positioned and tightened			
Wheels chocked if necessary			
AXLES, WHEELS AND BRAKES			
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			
BASE			
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 emergency hand pump			
SLEWING			
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			
PLATFORM			
Operation of control valve and buttons			
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			

Operating & Safety Instructions

TILT ALARM	PASS	FAIL	N/A
Booms raised on slope - drive disabled, siren tone constant			
Boom operation unaffected			
Booms lowered - drive restored			
INTERNAL (POWER PACK)			
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			
FINISH			
Pivot pin tag bolts			
Correct decals, all visible			
Canopy/bonnets			
Grease nipples (Feet, Knuckle, Centre Post)			
LEAK CHECK			
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:** ____ / ____ / **0**