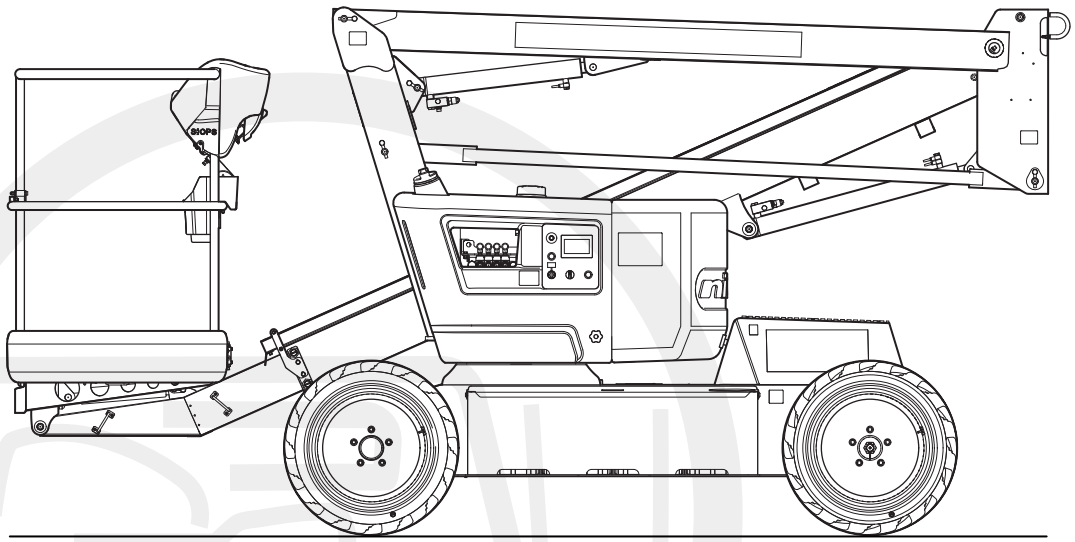
Heightrider

Operating & Safety Instructions

MODEL HR12 SERIES

4x4

MK2



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HR12 4x4 MK2 EMERGENCY PROCEDURES

Emergency Stop

1) Push in red emergency stop to shut down all machine movement and any rotating equipment.
2) Release both emergency stops to restore normal controls.

Recovery from Base Controls

If normal controls are available (Fastest recovery time):

1) Switch to base, press green button and operate desired function lever(s).

If normal controls are not available:

2) Switch to base, press the white button and operate the desired function lever.
3) Release lever or white button to halt machine movement.
4) If the cage has contacted a fixed object and cage overload has disabled the machine, move machine slightly using step 2. The overload alarm and visual warning will cease once normal controls are available.
5) If normal controls are still not available, continue pressing white button to lower machine.

If normal controls are not available (Complete machine failure):

6) Switch to base, press the white button and operate the desired function lever.
7) Release lever or white button to halt machine movement.

Recovery from Cage Controls

1) Press white override button situated on the cage console.
   If engine is running, it will stop. Override mode is for **booms only** and will not operate drive.
2) Activate a single desired function lever.
3) If the cage has contacted a fixed object and cage overload has disabled the machine, move machine slightly using steps 1-2. The overload alarm and visual warning will cease and normal controls are available.
4) Restart engine with selector switch.
5) Use normal controls if available for fastest recovery time.
   Press green button or footswitch and operate desired function lever(s).
6) If normal controls are not available, continue using override button to lower machine using auxiliary power.

SiOPS

If white button is flashing (SiOPS is active and cage is overloaded):

1) Follow procedure described in 'Recovery from Cage Controls' until green button flashes or normal operation is restored.

If green button is flashing (SiOPS is active):

2) Press flashing green button and operate cage controls to manoeuvre machine to a safe position.

To reset footswitch and normal controls:

1) Release load from front of console.
2) Ensure cage controls are in neutral position and clear of objects.
3) Raise foot clear of footswitch then lower foot onto footswitch to reactivate.

Note: If footswitch is not reset within **15 seconds**, then blue beacon on underside of cage will flash until footswitch is reset as described.

For further information on all controls refer to Sections 4.2 and 4.3.

Emergency lowering instructions vary between different types of Mobile Elevating Work Platform. Niftylift recommend that operators, site-safety personnel, and ground workers are trained in and practise these machine-specific procedures.

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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 12 4x4, powered by diesel (D) and DC electric (E).

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.

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Driven from the platform, the Niftylift Height Rider 12 4x4 MK2 is an extremely versatile articulated boom platform of unique and simple design. The HR12 can place two men and their tools at a height of 12.1m (39ft 8in) or an outreach of 6.6m (21ft 8in).

The booms are mounted via a 415^{o} 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 4.5 degree tilt sensor help to prevent the operator from working on unsafe terrain whilst elevated.

A digital control system gives smooth, reliable movement of the platform and maximum reliability in the harshest environments.

Models include the following:

HYBRID - (DIESEL & BATTERY)

D: - DIESEL

1.4 GENERAL SPECIFICATION

FEATURE	HR12 4x4
MAXIMUM HEIGHT - WORKING	12.0m 39ft 5in
MAXIMUM HEIGHT - PLATFORM	10.0m 32ft 10in
MAXIMUM OUTREACH	6.40m 20ft 11in
MAXIMUM HEIGHT – STOWED	1.99m 6ft 7in
MAXIMUM WIDTH	1.6m 5ft 3in
MAXIMUM LENGTH	4.0m 13ft 2in
MAXIMUM LENGTH - TRANSIT	4.0m 13ft 2in
PLATFORM CAPACITY - Europe	227kg (500lbs)
WHEELBASE	1.9m 6ft 2in
TURNING RADIUS – OUTSIDE	3.6m 11ft 10in
TURRET ROTATION	415^0
TURRET TAIL SWING	0.0m 0in
TRAVEL SPEED	0 – 5.0kph 0 – 3.1mph
PLATFORM SIZE	1.05m x 0.75m 3ft 5in x 2ft 6in
HYDRAULIC PRESSURE	207bar (booms) 280bar (drive)
TYRES	Solid
GRADEABILITY	40%
MINIMUM VEHICLE WEIGHT	3450kg/7600lbs
MAXIMUM GROUND PRESSURE	$0.095kN/cm^2$ $19841lb/ft^2$
POINT LOAD	21.8kN
MAXIMUM ALLOWABLE INCLINATION	4.5^0
POWER SOURCE	(Diesel & Battery) - Kubota OC95 or D722 engine, electric motor and 8 x 6v 390 AH batteries (Diesel) – Kubota D902 engine
FUEL TANK CAPACITY	12 Litres 3.2 US Gallons
SOUND POWER LEVEL Hybrid Hybrid Diesel	Kubota OC95 105dBA Kubota D722 102dBA Kubota D902 TBD

1.5 IDENTIFICATION (UK PLATE)

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

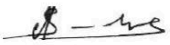
For easy access to any machine related documents go to www.niftylift.com/register, sign-in to 'My-account', then navigate to 'Support' and enter the Niftylift Serial number. Alternatively scan the QR code on the Niftylift Serial plate with a suitable device.

1.6 EC DECLARATION OF CONFORMITY (Typical)

EC DECLARATION OF CONFORMITY

MANUFACTURER AND PERSON RESPONSIBLE FOR DOCUMENTATION:	NIFTYLIFT LTD STEVEN REDDING
ADDRESS:	CHALKDELL DRIVE, SHENLEY WOOD, MILTON KEYNES, MK5 6GF, ENGLAND.
MACHINE TYPE:	MOBILE ELEVATING WORK PLATFORM
MODEL TYPE:	HR12 4x4 MK2
SERIAL NUMBER:	13/*****
NOTIFIED BODY:	TÜV SÜD Danmark
NOTIFIED BODY NUMBER:	2443
ADDRESS:	TÜV SÜD Danmark Aps, Strandvejen 125, 2900 Hellerup, Denmark.
CERTIFICATE NUMBER:	MAC0000** i01
APPLICABLE STANDARDS:	BS EN 280-1:2022, BS EN 60204-1:2018, BS EN ISO 13849-1:2015

We hereby declare that the above mentioned machine conforms with the requirements of the Machinery Directive, 2006/42/EC and EMC Directive 2014/30/EU.

SIGNED:  DATE: **08/02/2024**

NAME: Marcel Schepers POSITION: General 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.

N.424 Issue 003 Date 04-10-2016

2 Safety

2.1 MANDATORY PRECAUTIONS

When operating the Niftylift, your safety is of utmost concern. In order to fully appreciate all aspects of the machine's 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 this 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 CONFORMITY WITH GOOD SAFETY PRACTICES IS THE RESPONSIBILITY OF THE USER AND THEIR OPERATING PERSONNEL. FAILURE TO UNDERSTAND AND FOLLOW ALL SAFETY RULES COULD RESULT IN SERIOUS INJURY OR DEATH.

2.1.1 Only trained persons are permitted to operate the Niftylift.

2.1.2 Always operate the Niftylift in accordance with these model-specific Operating & Safety Instructions.

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 brake disengagement as described in Section 4.7.2**

2.1.5 Always ensure that all warning labels, instructions, placards, control markings and Operating & Safety Manuals are intact and clearly legible. If replacements are required contact your local dealer or Niftylift. **Always obey the safety and operating instructions on 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 The user must ensure that, prior to and during use, the working area and transport route is free from 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 This machine contains several hazardous substances such as but not limited to: Battery acid, Hydraulic Fluid, Engine Coolant, Antifreeze, Diesel Fuel, Petrol, Engine Oil, Grease, Gasoline.

2.1.9 Covers and canopies should remain closed when the machine is in operation. Only trained personnel should carry out maintenance on the machine, always ensuring they protect themselves from electrical, heat and mechanical hazards.

2.1.10 Never exceed the maximum platform capacity, as indicated on the decals and machine serial plate.

2.1.11 Only operate the Niftylift on a firm, level surface.

2.1.12 Never position any part of the Niftylift inside the **Minimum approach distances** (MAD) to above-ground electrical conductors as listed in the table below. These distances meet and exceed those specified in many countries and regions. In the event the voltage is not known, the maximum distance shall be observed - 9m from wooden poles carrying power lines and 15m from steel pylons.

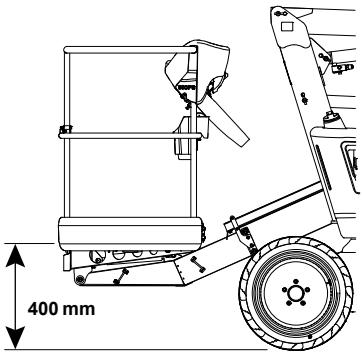
Voltage range (kV)	MAD (m)
≤50	3
>50 to 130	4
>130 to 270	6
>270 to 330	7
>330 to 500	8
>500 to 750	10
>750 to 1000	13
>1000 to 1250	15

THIS MACHINE IS NOT INSULATED.

If in doubt, contact the local appropriate governing authority.

2.1.13 On entering the platform ensure that the drop-down entry bar is closed afterwards.

2.1.14 **Cage Access: -** the platform floor of the HR12 is 600mm (23.6 in) from the ground in its stowed position. To avoid personal injury, it is necessary to position the booms such that the platform floor is within 400mm (16 in) of the ground when entering or exiting the platform (See figure below). This can be achieved by use of the ground control station prior to entering the platform. Refer to Section 4.2 for detailed ground control operation instructions.



2.1.15 Use of an approved full-body harness with short lanyard and appropriate personal protective equipment is mandatory. Fasten lanyard to designated anchor point within the platform and do not remove until leaving the platform whilst in the stowed position. Attach only one lanyard per anchorage. Note; if working next to or over water, the risk of injury from either falling or drowning must be assessed. Then the decision can be made if it is appropriate to wear a harness.

Niftylift anchorages meet design requirements for use with either a fall restraint or fall arrest system. Niftylift fall arrest anchorages are designed and tested in accordance with ANSI A92.20:2021 and exceed EN280-1 requirements. Fall arrest equipment may only be used if approved for use in the MEWP by the equipment manufacturer and must be used in accordance with all applicable instructions and governmental regulations. **A restraint system must be used at all other times**.

2.1.16

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.

2.1.17 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.

2.1.18 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.)

2.1.19 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.

2.1.20 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.

2.1.21 Stunt driving and horseplay, on or around the Niftylift, is not permitted.

2.1.22 When other moving equipment or vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings, such as but not limited to, flags, roped off areas, flashing lights and barricades shall be used.

2.1.23 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.

2.1.24 The aerial platform is not equipped for or intended for use on a public highway.

2.1.25 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.

2.1.26 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.

2.1.27 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 where applicable).

2.1.28 The operator shall immediately report to his supervisor any potentially hazardous location(s) (environment) which become evident during operation.

2.1.29 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, they shall cease operation of the Niftylift and request further information as to safe operation from their management, or owner, dealer or manufacturer before further operation of the Niftylift.

2.1.30 The operator shall immediately report to their 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.

2.1.31 The boom and platform of the Niftylift shall not be used to jack the wheels off the ground.

2.1.32 The Niftylift shall not be used as a crane.

2.1.33 The Niftylift shall not be positioned against another object to steady the platform.

2.1.34 Care should be taken to prevent rope, electrical cords and hoses from becoming entangled in the aerial platform.

2.1.35 Batteries shall be recharged in a well-ventilated area free of flame, sparks or other hazards (e.g. do not smoke near the machine), which may cause explosion. Highly explosive hydrogen gas is produced during the charging process.

2.1.36 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.

2.1.37

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

2.1.38 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) AND DIESEL FUELS ARE FLAMMABLE.**

2.1.39

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

2.1.40 The operator must ensure that engine powered machines are used in a well-ventilated area to minimise the risk of carbon monoxide poisoning.

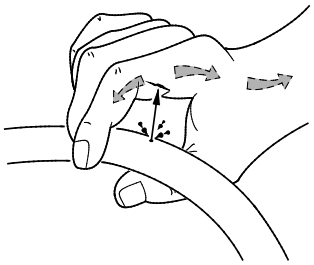
2.1.41 The operator shall implement means provided to protect against use by unauthorised persons.

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

2.1.43 The operator must ensure that the controls are not obstructed (e.g. by tools or equipment) and **clear access to the Emergency Stop** is available at all times. Ensure the control console cover is fully open when operating the machine.

2.1.44 All persons in the cage must take suitable precautions to prevent items falling or being ejected from the cage. E.g. Tethering tools to the machine or operator if practical and an assessment of any resulting risks is acceptable.

2.1.45 Hydraulic oil escaping under pressure can penetrate the skin and cause **serious injury**. Do not allow hydraulic oil to squirt or spray. **Seek immediate medical attention in the event of hydraulic oil penetrating the skin.** Wear chemical-resistant protective gloves and suitable eye protection when handling hydraulic oil. Relieve system pressure before removing any hydraulic connections, undo fittings slowly to make sure there is no residual pressure. If pressure is detected, allow it to be released slowly before completely removing hose. Fluid leaks may not be visible to the naked eye. Use a piece of cardboard to check for leaks, not your hand. **Never** install hydraulic lines or components that are damaged.



2.1.46 The HR12 4x4 MK2 has been tested in a UKAS accredited electromagnetic compatibility (EMC) chamber and complies with the relevant clauses of EN61326-3-1:2008, EN61000-6-2:2005 and EN55012:2007 for emissions and immunity. Niftylift offer an AC Inverter option on this machine but cannot control the device that is connected to the system or the resulting variation in the amplitude of electrical noise produced when operating the generator. Niftylift therefore recommend that the AC inverter is not used when the machine is located near any equipment that may be sensitive to electromagnetic disturbance.

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. Engine oil must be within the range -37°C to 110°C. Hydraulic Oil temperature must not exceed –23°C to 93°C.

The recommended operational range for these machines is - 5°C to +30°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 they 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

In normal operation highest root mean square value of weighted acceleration to which the whole body is subjected to is less than 0.5m/s2 when operating in ELECTRIC or HYBRID mode.

Hybrid mode – OC95 & D722 engine

Declared dual-number noise emission values In accordance with ISO 4871		
Test Description	**Outcome from test – 0.1dB(A)**	
	OC95	**D722**
Measured A-weighted sound power level, L_{WA} (ref. 1 pW), in decibels	101.7	98.9
Sound power level Uncertainty, K_{WA}, in decibels	3.2	3.2
Guaranteed A-weighted sound power level L_{Wad}, (ref. 1 pQ) in decibels	104.9	102.1
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the cage operator position, in decibels	86.8	78.39
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the base operator position, in decibels	87.7	82.45
Highest measured A-weighted sound pressure level, L_{pA} (ref. 20 μPa, on path 1m away from EUT chassis at 1.6m high	81.5	83.30
Sound pressure level Uncertainty, K_{pA}, in decibels	3.2	3.2
Values determined according to noise test code given in BS EN:280-1:2022, using basic standards BS EN ISO 11210:2010 and BS EN ISO 374:2010		

Electric mode

Declared dual-number noise emission values In accordance with ISO 4871	
Test Description	**Outcome from test – 0.1dB(A)**
Measured A-weighted sound power level, L_{WA} (ref. 1 pW), in decibels	N/A
Sound power level Uncertainty, K_{WA}, in decibels	N/A
Guaranteed A-weighted sound power level L_{Wad}, (ref. 1 pQ) in decibels	N/A
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the cage operator position, in decibels	55.9
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the base operator position, in decibels	54.3
Highest measured A-weighted sound pressure level, L_{pA} (ref. 20 μPa, on path 1m away from EUT chassis at 1.6m high	60.3
Sound pressure level Uncertainty, K_{pA}, in decibels	3.2
Values determined according to noise test code given in BS EN:280-1:2022, using basic standards BS EN ISO 11210:2010 and BS EN ISO 374:2010	

Diesel only – D902 engine

Declared dual-number noise emission values In accordance with ISO 4871	
Test Description	**Outcome from test – 0.1dB(A)**
Measured A-weighted sound power level, L_{WA} (ref. 1 pW), in decibels	TBD
Sound power level Uncertainty, K_{WA}, in decibels	TBD
Guaranteed A-weighted sound power level L_{Wad}, (ref. 1 pQ) in decibels	TBD
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the cage operator position, in decibels	TBD
Measured A-weighted sound pressure level, L_{pAd} (ref. 20 μPa, at the base operator position, in decibels	TBD
Highest measured A-weighted sound pressure level, L_{pA} (ref. 20 μPa, on path 1m away from EUT chassis at 1.6m high	TBD
Sound pressure level Uncertainty, K_{pA}, in decibels	TBD
Values determined according to noise test code given in BS EN:280-1:2022, using basic standards BS EN ISO 11210:2010 and BS EN ISO 374:2010	

2.4 TEST REPORT

All Niftylift machine models are subjected to a comprehensive 'type test' which examines the worst-case combination 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 dynamic stability requirements.

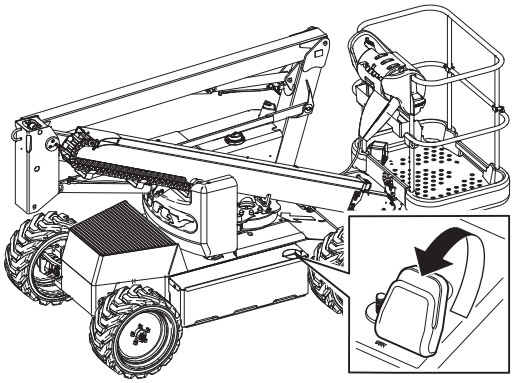
Each individual machine is then subjected to static overload tests on flat level ground with 150% of the SWL, exceeding the requirements of BS EN280-1:2022 for power operated MEWPs. Self-propelled machines are also tested at the maximum working angle **plus** 0.5º with a test load of 125% of the SWL. 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.

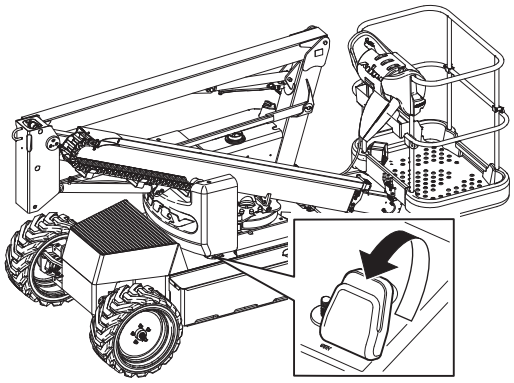
2.5 ELECTRICAL SAFETY

Machines are electrically isolated prior to shipment as shown and require reconnection before use.

48V



12V



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.

1) Remove all ropes, straps, and or chains used to secure the aerial platform during transit.
2) Ensure any ramp, loading dock or forklift used is capable of supporting or lifting the aerial platform.
3) 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 (Refer to Section 6.3) 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.

MACHINE STABILITY - The Hybrid machine requires battery mass for stabilisation. If the batteries or any other significant component have been removed, **the machine will be unstable**. Contact Niftylift, UK before removal or replacement of any significant component.

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: It is recommended that these be performed at regular intervals as indicated on each checklist.

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 cam switch is functioning correctly.
7) Check that control levers are secure and operate freely.
8) Check that operating buttons and emergency stop buttons function correctly.
9) Check the operation of the auxiliary descent 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 correctly (On a slope of 4.5^0 or more the alarm should sound and drive should be disabled).
13) Check the operation of SiOPS (Refer to Section 4.3.7).
14) Check the operation of the cage weigh system.
15) Check that the earth strap is secure and in contact with the ground.

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 hydraulic oil level, ISO Grade 22 (Europe), 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.
2) Check wheel nuts are secured (torque 166ft lbs / 225Nm).
3) Check that the slew worm is secured and correctly in mesh. Clean and re-grease.
4) Check the track rod linkages.
5) Inspect brakes for operation and wear.
6) Inspect the engine fuel tank for damage or leaks.
7) Check telescopic boom wear pads and nylon studs (if applicable).
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 steer hubs for wear.
5) Check that slew ring bolts are secure (torque 205ft lbs. 279Nm).

Toughcage

Niftylift **tough**cage is fully UV stabilised for outdoor use in the most demanding climates. However, the user and machine owner should consider the following;

- Discolouration of the material may occur; this is a natural aging process which does not significantly alter the material properties.
- Degredation to the floor may occur as a consequence of product use and effect of UV exposure. The **tough**cage's multi-layer construction means degradation of the top surface may occur over time without compromising the structural strength of the internal and base layers.
- The rate at which the **tough**cage floor ages is dependent upon the machines application and its country of use (Typical levels of UV exposure). Refer to table below for aging rate applicable to your specific area.

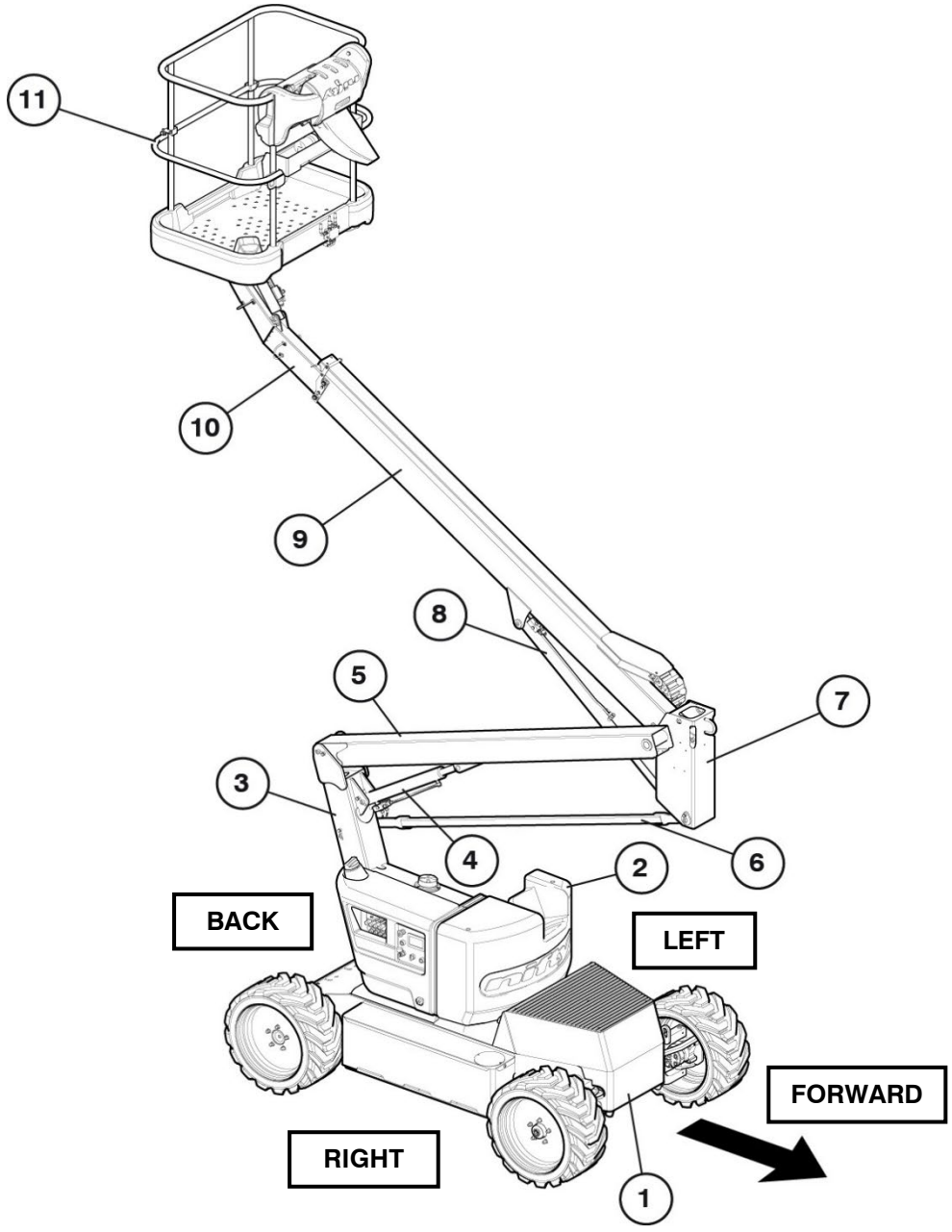
UK, NETHERLANDS, GERMANY, POLAND, SCANDINAVIA, CANADA, RUSSIA	14 years
FRANCE, ITALY, USA (NORTH EAST STATES)	11 years
SPAIN, GREECE, TURKEY, CHINA, USA (MID WEST STATES), AUSTRALIA (TASMANIA)	9.5 years
MALAYSIA, INDONESIA	8 years

USA (SOUTH STATES), SOUTH AMERICA, AUSTRALIA (VICTORIA, NEW SOUTH WALES)	7.5 years
USA (WEST STATES), SOUTH AFRICA, INDIA, PAKISTAN, IRAN, AUSTRALIA (WESTERN, SOUTH, QUEENSLAND)	7 years
NORTH AFRICA, SAUDI, DUBAI, AUSTRALIA (NORTHERN TERRITORY)	6 years

Note: The date of manufacture of the **tough**cage floor is located on its underside.

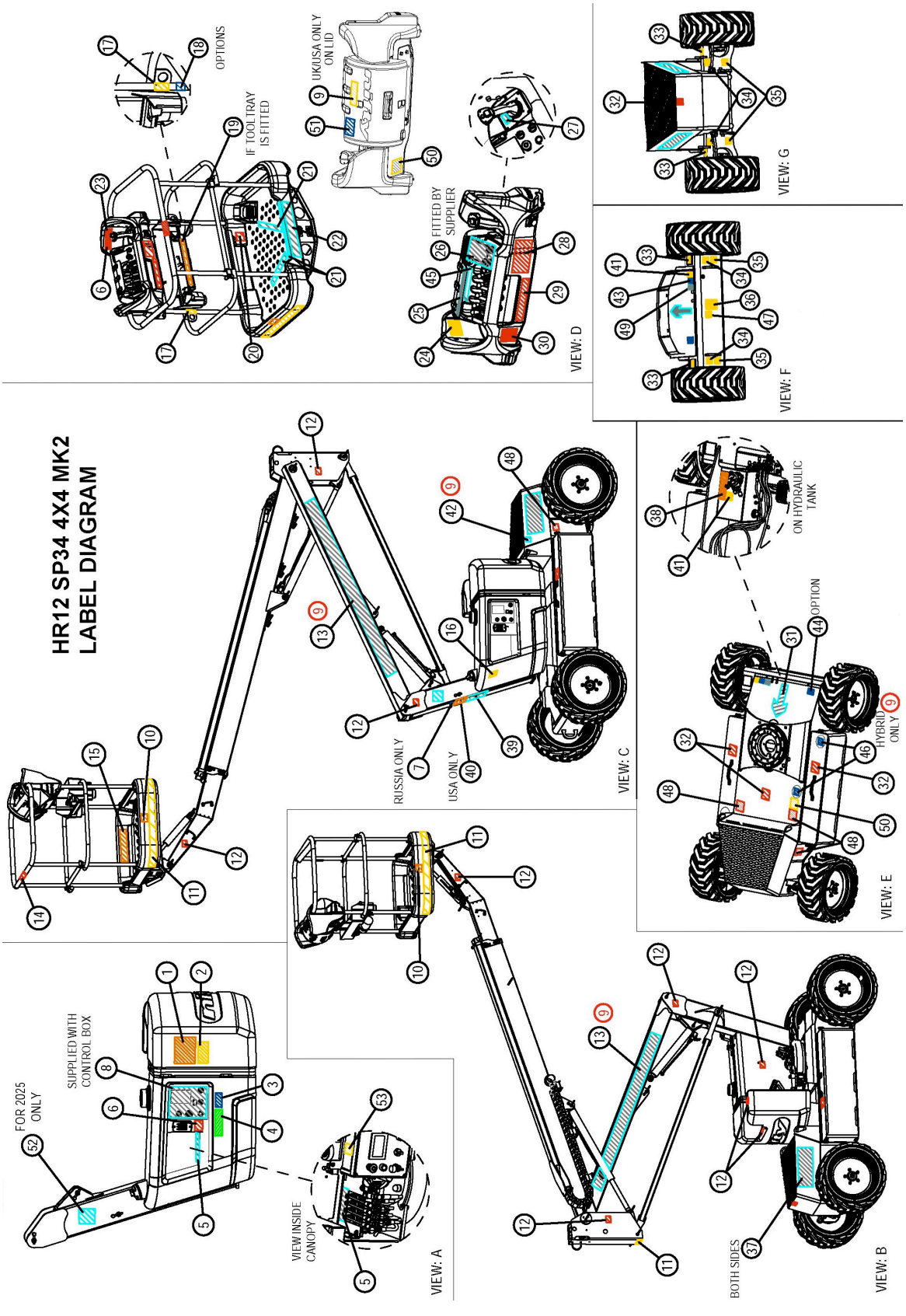
Niftylift recommends that the user and machine owner **regularly** inspect the **tough**cage floor for damage. If any significant damage is found then the floor **must** be replaced. For further guidance please contact Niftylift Limited.

3.4 NIFTY GLOSSARY

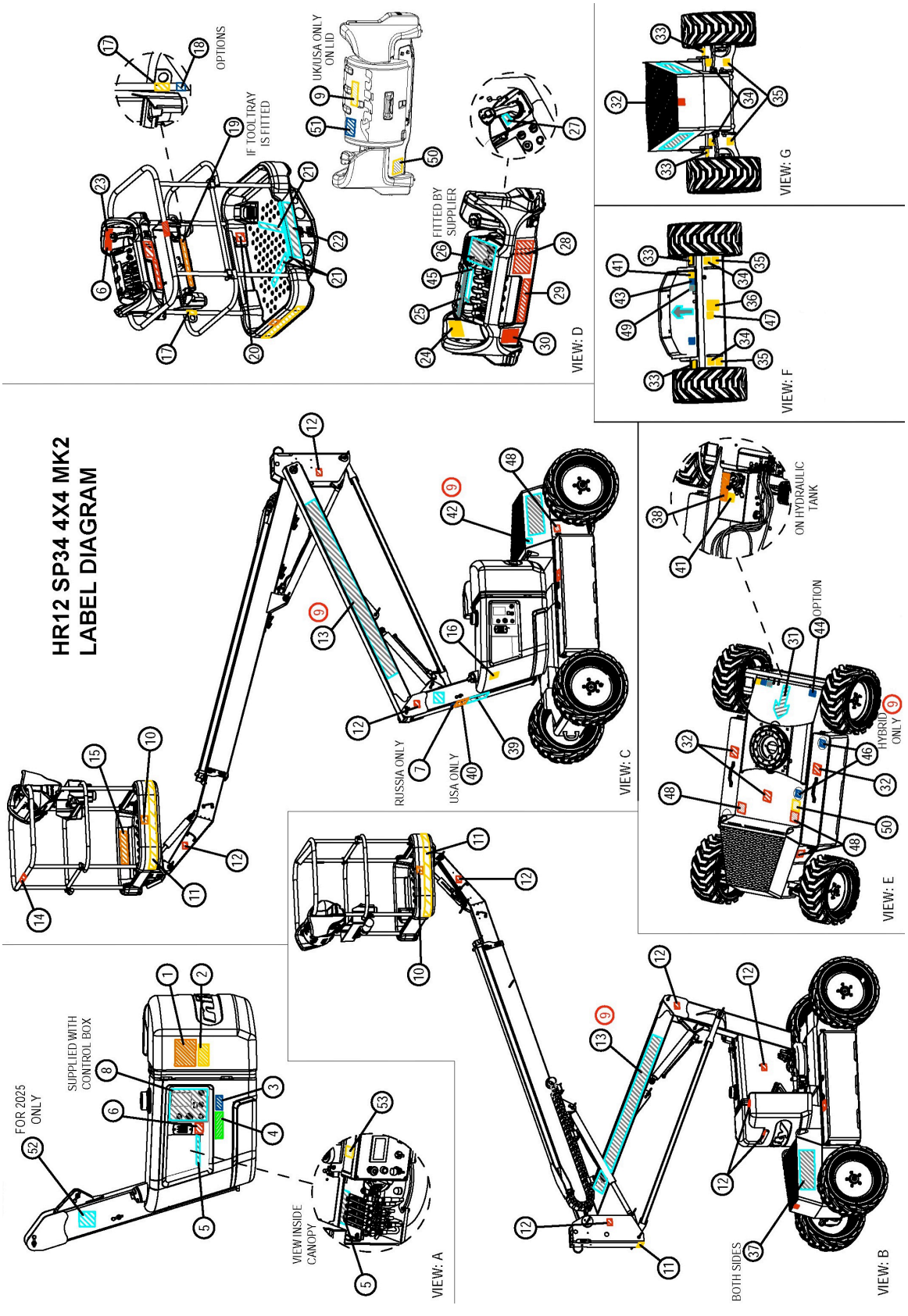


No.	DESCRIPTION	No.	DESCRIPTION
1	Chassis	7	Knuckle
2	Counterweight	8	Ram 2
3	Boom 1 (Superstructure)	9	Boom 3 (Upper Boom)
4	Ram 1	10	Boom 4 (Tele Boom)
5	Boom 2 (Lower Boom)	11	Cage
6	Levelling Rod		

3.5 DECAL INSTALLATION

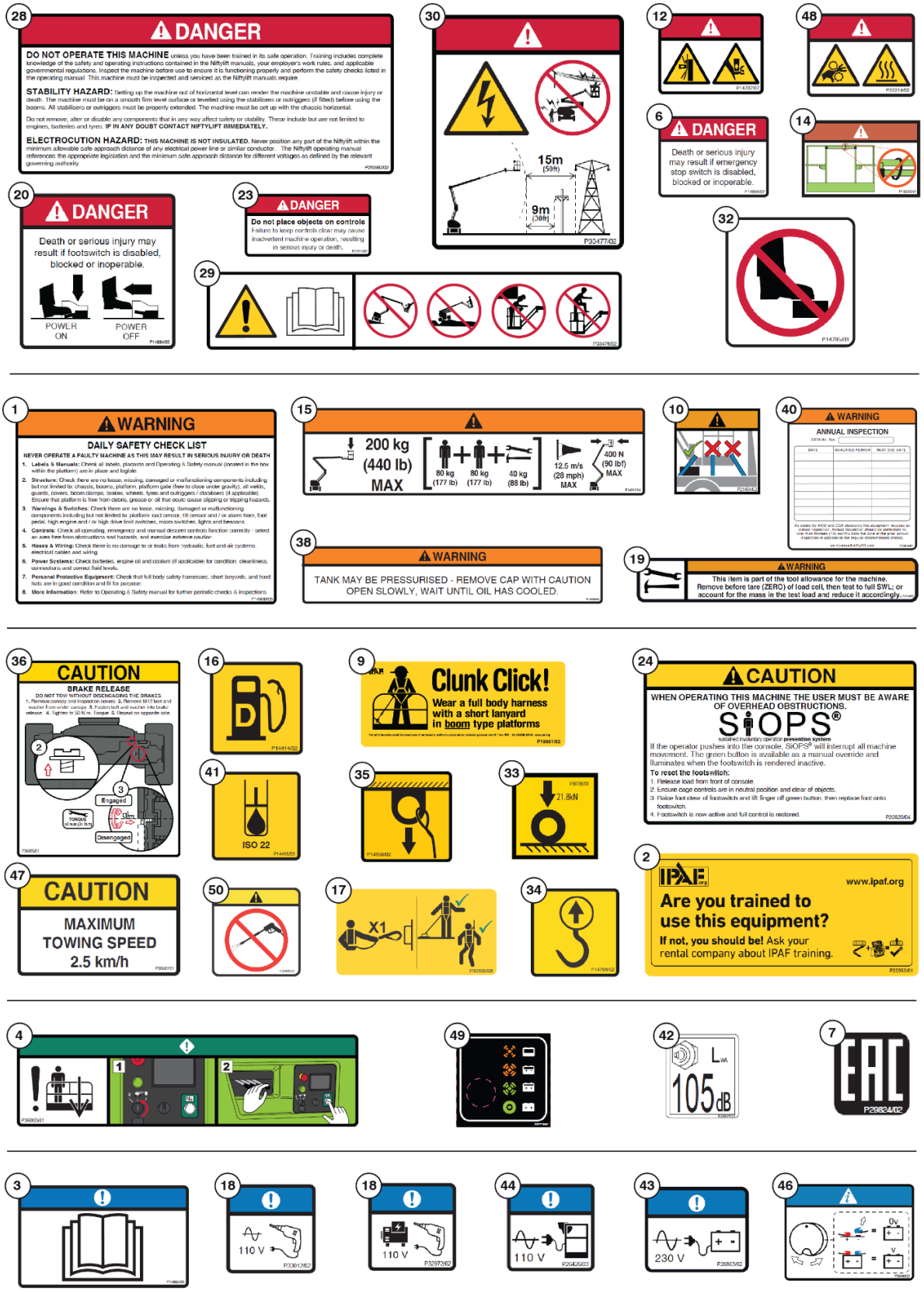


No.	DESCRIPTION	UNIVERSAL	UK	NOTES
1	Daily Checks		P14908	
2	Are You Trained?		P22055	
3	Read the Manual	P14892		
4	Emergency Decent	P36003		
5	Base Levers	P36053		
6	If E-Stop Disabled		P14864	
8	Base Button Box	P35051		Supplied with control box
9	Clunk Click		P19961	UK/USA Only
10	Cage Tie Down Warning	P21404		
11	Hazard Tape	Consumable		
12	Hand Crush	P14782		
13	HR12/SP34 Diesel HR12/SP34 Hybrid		P14604 P39241	
14	Cage Gate	P18335		
15	Safe Working Load	P30267		
16	Diesel	P14414		
17	Harness Point	P32302		
18	110V Power to Cage Socket (Tool)		P33012	
	110V Power to Cage from Generator		P32972	
19	Remove Item Before Calibrating Load Cell		P31040	If Tool Tray is Fitted
20	Footswitch		P14884	
21	Grip Tape	Consumable		
22	Niftylift.com (Black)	P30187		
23	Danger - Do Not Place Objects		P21511	
24	SiOPS Caution		P22820	
25	Cage Levers	P36054		
26	Cage Panel	P35972		Fitted by supplier
27	Joystick	P36055		
28	Danger Warning Text		P29380	
29	Danger Warning Icons	P33476		
30	Minimum Approach Distances	P33477		


HR12 SP34 4X4 MK2
LABEL DIAGRAM
OPTIONS
IF TOOLTRAY IS FITTED
UK/USA ONLY ON LID
FITTED BY SUPPLIER
VIEW: D
VIEW: G
VIEW: F
ON HYDRAULIC TANK
OPTION
HYBRID ONLY
VIEW: E
RUSSIA ONLY
USA ONLY
VIEW: C
FOR 2025 ONLY
SUPPLIED WITH CONTROL BOX
VIEW INSIDE CANOPY
VIEW: A
BOTH SIDES
VIEW: B

No.	DESCRIPTION	UNIVERSAL	UK	NOTES
31	Travel Direction Arrow	P29066		
32	No Step	P14785		
33	Point Load	P38186		
34	Lifting Point	P14786		
35	Tie Down Points	P14958		
36	Brake Release		P36485	
37	4x4	P14697		
38	Pressurised Tank		P16365	
39	Serial Plate	P32187		
41	Hydraulic Oil ISO22	P14415		Customer Option
	Low Temperature Oil	P23622		
	Hydraulic Oil ISO32	P17226		
42	Noise Warning - OC95 Noise Warning - D722	P29974 P39271		Hybrid Only Hybrid Only
43	110V Battery Charger Socket		P26424	
44	110V Power to Cage Socket		P26426	
45	Cage Levers (Under Cover)	P36102		
46	Battery Isolation	P36486		
47	Towing Speed		P36487	
48	Hot Surfaces	P22314		
49	LED Charging Indicator	P37718		
50	Do Not Jet Wash This Area	P29665		
51	Ensure Cover is Open		P38438	
52	40 Years of Niftylift 2025		P38898	
53	High Voltage Warning		P39070	

3.6 DECALS


28
DANGER
DO NOT OPERATE THIS MACHINE unless you have been trained in its safe operation. Training includes complete knowledge of the safety and operating instructions contained in the Niftylift manuals, your employer's work rules, and applicable governmental regulations. Inspect the machine before use to ensure it is functioning properly and perform the safety checks listed in the operating manual. This machine must be inspected and serviced as the Niftylift manuals require.
STABILITY HAZARD: Setting up the machine out of horizontal level can render the machine unstable and cause injury or death. The machine must be on a smooth firm level surface or levelled using the stabilisers or outriggers (if fitted) before using the booms. All stabilisers or outriggers must be properly extended. The machine must be set up with the chassis horizontal.
Do not remove, alter or disable any components that in any way affect safety or stability. These include but are not limited to engines, batteries and tyres. IF IN ANY DOUBT CONTACT NIFTYLIFT IMMEDIATELY.
ELECTROCUTION HAZARD: THIS MACHINE IS NOT INSULATED. Never position any part of the Niftylift within the minimum allowable safe approach distance of any electrical power line or similar conductor. The Niftylift operating manual references the appropriate legislation and the minimum safe approach distance for different voltages as defined by the relevant governing authority.
30
15m (50ft)
9m (30ft)
P35477/02
12
48
6
DANGER
Death or serious injury may result if emergency stop switch is disabled, blocked or inoperable.
14
20
DANGER
Death or serious injury may result if footswitch is disabled, blocked or inoperable.
POWER ON
POWER OFF
23
DANGER
Do not place objects on controls
Failure to keep controls clear may cause inadvertent machine operation, resulting in serious injury or death.
29
32
1
WARNING
DAILY SAFETY CHECK LIST
NEVER OPERATE A FAULTY MACHINE AS THIS MAY RESULT IN SERIOUS INJURY OR DEATH
1. Labels & Manuals: Check all labels, placards and Operating & Safety manual (located in the box within the platform) are in place and legible.
2. Structure: Check there are no loose, missing, damaged or malfunctioning components including but not limited to: chassis, booms, platform, platform gate (free to close under gravity), all welds, guards, covers, boom clamps, brakes, wheels, tyres and outriggers / stabilisers (if applicable). Ensure that platform is free from debris, grease or oil that could cause slipping or tripping hazards.
3. Warnings & Switches: Check there are no loose, missing, damaged or malfunctioning components including but not limited to: platform load sensor, tilt sensor and / or alarm horn, foot pedal, high engine and / or high drive limit switches, micro switches, lights and beacons.
4. Controls: Check all operating, emergency and manual descent controls function correctly - select an area free from obstructions and hazards, and exercise extreme caution.
5. Hoses & Wiring: Check there is no damage to or leaks from hydraulic, fuel and air systems, electrical cables and wiring.
6. Power Systems: Check batteries, engine oil and coolant (if applicable) for condition, cleanliness, connections and correct fluid levels.
7. Personal Protective Equipment: Check that full body safety harnesses, short lanyards, and hard hats are in good condition and fit for purpose.
8. More Information: Refer to Operating & Safety manual for further periodic checks & inspections.
15
200 kg (440 lb) MAX
80 kg (177 lb)
80 kg (177 lb)
40 kg (88 lb)
12.5 m/s (28 mph) MAX
400 N (90 lbf) MAX
10
40
WARNING
ANNUAL INSPECTION
38
WARNING
TANK MAY BE PRESSURISED - REMOVE CAP WITH CAUTION OPEN SLOWLY, WAIT UNTIL OIL HAS COOLED.
19
WARNING
This item is part of the tool allowance for the machine. Remove before tare (ZERO) of load cell, then test to full SWL; or account for the mass in the test load and reduce it accordingly.
36
CAUTION
BRAKE RELEASE
DO NOT TOW WITHOUT DISENGAGING THE BRAKES.
1. Remove canopy and inspection covers. 2. Remove M12 bolt and washer from under canopy. 3. Fasten bolt and washer into brake release. 4. Tighten to 50 N.m. Torque. 5. Repeat on opposite side.
Engaged
Disengaged
16
9
Clunk Click!
Wear a full body harness with a short lanyard in boom type platforms
24
CAUTION
WHEN OPERATING THIS MACHINE THE USER MUST BE AWARE OF OVERHEAD OBSTRUCTIONS.
SIOPS®
If the operator pushes into the console, SIOPS® will interrupt all machine movement. The green button is available as a manual override and illuminates when the footswitch is rendered inactive.
To reset the footswitch:
1. Release load from front of console.
2. Ensure cage controls are in neutral position and clear of objects.
3. Raise foot clear of footswitch and lift finger off green button, then replace foot onto footswitch.
4. Footswitch is now active and full control is restored.
41
ISO 22
35
33
21.8kN
47
CAUTION
MAXIMUM TOWING SPEED 2.5 km/h
50
17
X1
34
2
IPAF
www.ipaf.org
Are you trained to use this equipment?
If not, you should be! Ask your rental company about IPAF training.
4
1
2
49
42
LWA
105dB
7
CE
P29824/02
3
18
110 V
18
110 V
44
110 V
43
230 V
46
0V
V

3.7 TORQUE REQUIREMENTS

Bolt quality/size	Tightening torque in Nm (ft-lbs)					
	Plated			Unplated		
Grade	**8.8**	**10.9**	**12.9**	**8.8**	**10.9**	**12.9**
M6	7 (5)	10 (8)	12 (9)	8 (6)	11 (8)	13 (10)
M8	17 (13)	25 (18)	29 (22)	19 (14)	27 (20)	32 (23)
M10	34 (25)	49 (36)	58 (43)	37 (27)	54 (40)	63 (46)
M12	58 (43)	85 (63)	99 (73)	63 (47)	93 (69)	108 (80)
M14	93 (68)	135 (100)	158 (117)	101 (74)	148 (109)	172 (127)
M16	143 (106)	209 (154)	245 (180)	156 (115)	228 (168)	267 (197)
M20	288 (212)	408 (301)	477 (352)	304 (224)	445 (328)	521 (384)
M24	491 (362)	698 (515)	816 (602)	519 (383)	760 (561)	889 (656)
WHEEL NUTS						225 Nm (166ft lbs)
SLEW RING BOLTS						279 Nm (205ft lbs)

This torque chart is based on the following assumptions:

1) Bolts to ISO 898-1 "Mechanical properties of fasteners made of carbon steel and alloy steel"
2) For "unplated" bolts, all grades:
   Hex head bolts
   Black oxide steel bolt with a rolled & oiled thread, no finish on steel nut
   Prevailing torque includes Nylock (minimum prevailing torque figure assumed)
   Medium Clearance holes to ISO 273
   Bolt tightening condition = Yield factor of 75%
3) For "plated" bolts, all grades:
   Hex head bolts
   Zinc plated oiled (rolled or cut) steel external thread with no finish on steel internal thread
   Prevailing torque includes Nylock (minimum prevailing torque figure assumed)
   Medium Clearance holes to ISO 273
   Bolt tightening condition = Yield factor of 75%

Figures quoted in **Nm** have been calculated in Nm and then rounded to the nearest whole number. Figures quoted in **lb-ft** have been calculated in Nm, converted using a factor of 0.737561 and then rounded.

4 Operation

4.1 CONTROL CIRCUIT COMPONENTS

4.1.1 GROUND CONTROLS

PROGRAMMABLE LOGIC CONTROLLER (PLC): - Situated under the ground controls canopy, behind the Ground Controls Station is the PLC. Its purpose is to receive signals from **all** areas of the control, to process the instructions and machine status, and to safely operate the relevant machine functions.

TILT SENSOR: - Installed on the superstructure under the links lift cylinder, the tilt sensor is a solid-state sensor, which monitors the inclination of the machine chassis. When the platform is in use, (i.e. Booms are raised), if the inclination exceeds the pre-set limit, it will disable all drive functions, sound the alarm and display a warning symbol on the screen. In order to recover the machine, boom operation is unaffected, allowing the operator to restore drive by lowering the booms into the stowed position. It is then possible to drive back onto level ground, fully restoring machine operation.

MULTI-TONE SOUNDER & BEACON: - The Niftylift will warn personnel that the machine is about to move when the green, white power button or footswitch is pressed. The machine's default setting is to sound a beeper at the base control location and flash a beacon mounted on the top of the engine canopy. However, the machine can be configured to select either the sounder or the beacon if site conditions require the machine to behave differently. (e.g. Beacon only, when used at night in a residential area). It is mandatory that one alert device is functioning, and it is not possible to turn off or permitted to disable both the beacon and sounder.

If a **safety-critical** situation occurs (Refer to Section 4.3.3), the sounder will emit a "ricochet" sound to alert the user and nearby personnel. This warning occurs even if the motion sounder setting has been disabled.

HORN: - Located behind the ground control box is a horn, which is used as a manual alert, by pushing the "Horn" button on the Platform Control Panel.

BOOM SWITCH: - Mounted on boom 3 and operated by the raising of either boom, this switch controls both the operation of the Tilt Sensor, and the speed control function. With the booms in the stowed position, the Tilt Sensor is disabled, allowing the machine to negotiate slopes in excess of the permissible elevated working angle, without isolating the drive function. At the same time, High Speed drive (Depicted by a Hare Icon) is possible. When the booms are raised the Tilt Sensor is activated and only Slow Speed 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.**

4.1.2 PLATFORM

CAGE DISPLAY UNIT: - Mounted in the Platform Control Station, this screen receives signals from the PLC to provide a warning indication to the operator for a range of functions. Refer to Section 4.3.2 for further details.

LOAD SENSING CONSOLE (SiOPS™): - This machine incorporates a load sensing 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 4.3.7.

4.1.3 CHASSIS

MOTION CONTROL VALVE: - This valve comprises several individual components all directly involved in the hydraulic supply to the wheel drive motors. Amongst these are the drive control valves which allow the operator to propel the machine forward or backward by using the Joystick (See Section 4.3).

In addition the Brake Release Valve (BRV) is also incorporated into this valve block. It is a solenoid operated 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. The BRV will only operate when the green power button in the cage is being used (or the Platform Foot-switch is depressed) in Drive mode. If the tilt sensor detects an excessive inclination whilst the booms are raised it is the BRV which is de-energised disabling drive to the machine.

4.1.4 FUSES

Power Tray (Hybrid)

10A (58VDC) blade fuse (fuse holder)

20A (58VDC) blade fuse (fuse holder)

Chassis

250A Fuse inside battery pod

12V Battery

2 x 30A (32VDC) MIDI fuse (fuse holder)

150A (32VDC) MIDI fuse (fuse holder)

Ground Control Station

11 x 2A (58VDC) inside Ground Control Box

4 x 10A (58VDC) inside Ground Control Box

3 x 15A (58VDC) inside Ground Control Box (D722)

2 x 15A (58VDC) inside Ground Control Box (D902)

1 x 25A (58VDC) inside Ground Control Box (D902)

1 x 3A (58VDC) inside Ground Control Box

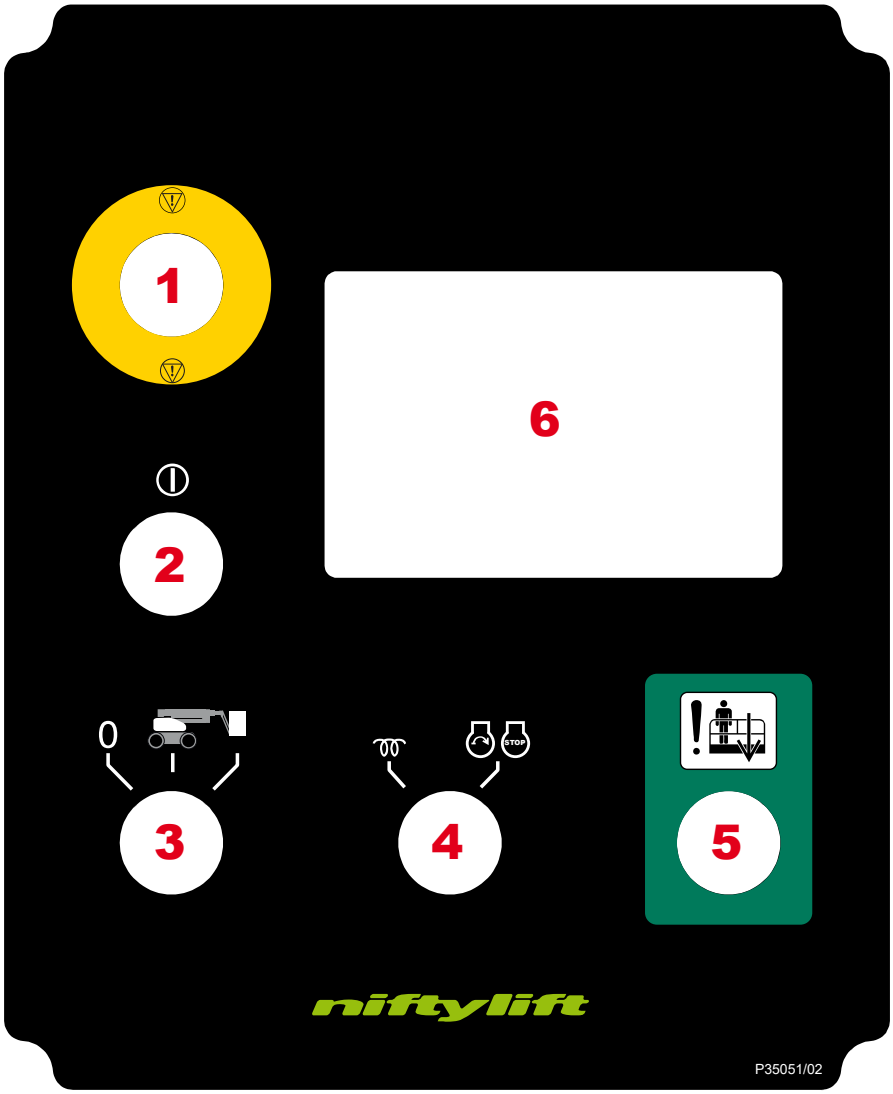
7 x 5A (58VDC) inside Ground Control Box

Ground Control Box

(Refer to Service Manual for fuse layout diagram)

4.2 GROUND CONTROL OPERATION

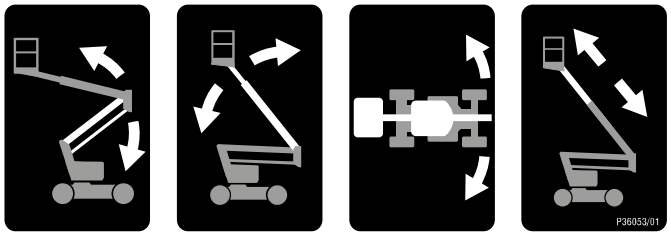
4.2.1 GROUND CONTROL FUNCTIONS



1 Emergency Stop	Push to **Stop Operation**	Pull to **Enable Operation**
2 Green Power Button	Push and hold for **Power**	Release to **Cease** operation
3 Base/Platform Selector	**Clockwise** for Platform, **Centre** for Base, **0** for all power off	
4 Engine Glow & Start/Stop	Anti-clockwise for **Glow**, Clockwise to **Start/Stop** engine	
5 White override button	**Push** and hold to enable boom functions in the event of normal operation loss. (Emergency or recovery use ONLY. Refer to Section 4.3.6 for correct use of white override button)	
6 Display Screen	See Section 4.3.2	

Further information on Emergency Stop operation can be found in Appendix A, A7.

Base Levers



1 **2** **3** **4**

1 Operates the Lower Boom	Up for **Up**	Down for **Down**
2 Operates the Upper Boom	Up for **Up**	Down for **Down**
3 Operates Slew/Swing	Up for **Anti-clockwise**	Down for **Clockwise**
4 Operates Telescoping	Up for **Out**	Down for **In**

4.2.2 OPERATION

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING

ALL MODELS

1) Ensure all red emergency stops are out and engine battery terminal clamps are secure.
2) Turn key switch at ground control station to **Ground** (Single turn clockwise).
3) For **Battery** powered operation, go to step 7).
4) For **Diesel** powered operation, go to step 5).

DIESEL ENGINE

Note: On the HR12 4x4 the engine will not start if the footswitch, Green or White button are pressed.

5) **COLD ENGINE**: - turn the **Diesel Glow/Start** selector to the **Glow** position (anti-clockwise). This engages the glow plug pre-heat system. Hold for 5-10 seconds then turn the key to the **Start** position (fully clockwise) and the engine will fire.
6) **WARM ENGINE**: - turn the **Diesel Glow/Start** selector to the **Start** position (clockwise) and the engine will fire.

Note: Unless the diesel engine is running, the HR12 Hybrid will automatically default to the primary electrical power source (battery).

ALL MODELS

7) Push and hold green power button on the base control panel.
8) Select a function and operate the appropriate control lever in full accordance with the manufacturers operating and safety manual. (Refer to Section 4.2.1)

9) To return control to the platform, turn base control key-switch to the **Platform** position (fully clockwise).

10) When not in use return machine to stowed position. Turn the base control key-switch anti-clockwise to the **OFF** position, remove key and chock wheels.

EMERGENCY PROCEDURES

1) **Push in** red emergency stop to shut down **all** machine movement.

2) **Release** both emergency stops to restore normal controls.

In the event that the controls fail, the cage overload is activated due to contact with a fixed object or a cage operator is incapacitated, the booms can be operated from the base location as described below:

If normal controls are available (fastest recovery time):

1) Turn key switch to **ground**, press the **green** button and operate the desired function lever.

If cage overload is activated, main power source is depleted, or normal controls are not available (complete machine failure):

2) Turn key switch to **ground**, press the **white** button and operate the desired function lever.

3) If recovering the machine because cage overload has deactivated the machine due to contact with a fixed object, then moving the machine slightly using step 2 should be sufficient to re-enable normal operation. The cage overload alarm and visual warning will cease once normal controls are available.

4) Restart engine if main battery pack is discharged.

5) If normal controls are still not available, continue pressing the white button to lower the machine manually.

4.3 PLATFORM CONTROL 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.

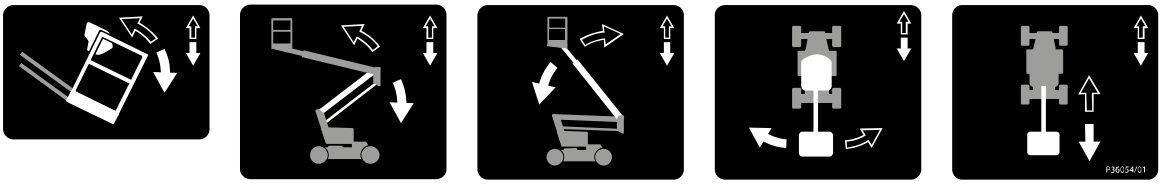
****FOR COLD START PROCEDURES SEE SECTION 4.3.6****

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING.

4.3.1 PLATFORM CONTROL FUNCTIONS

BOOM FUNCTIONS

1) Push and hold green "Power Control" button.

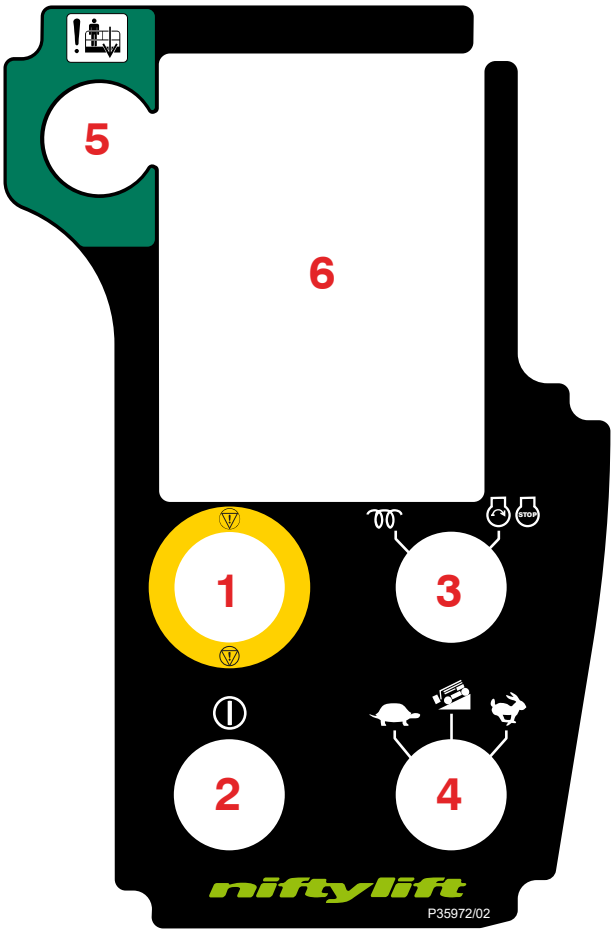


1 **2** **3** **4** **5**

2) Select lever 1, 2, 3, 4 or 5 for desired function.

1 Operates Platform Levelling	**FWD** for forward	**BACK** for back
2 Operates Lower Boom	**UP** for up	**DOWN** for down
3 Operates Upper Boom	**UP** for up	**DOWN** for down
4 Operates Swing	**UP** for right	**DOWN** for left
5 Operates Telescope	**UP** for in	**DOWN** for out

PLATFORM FUNCTIONS



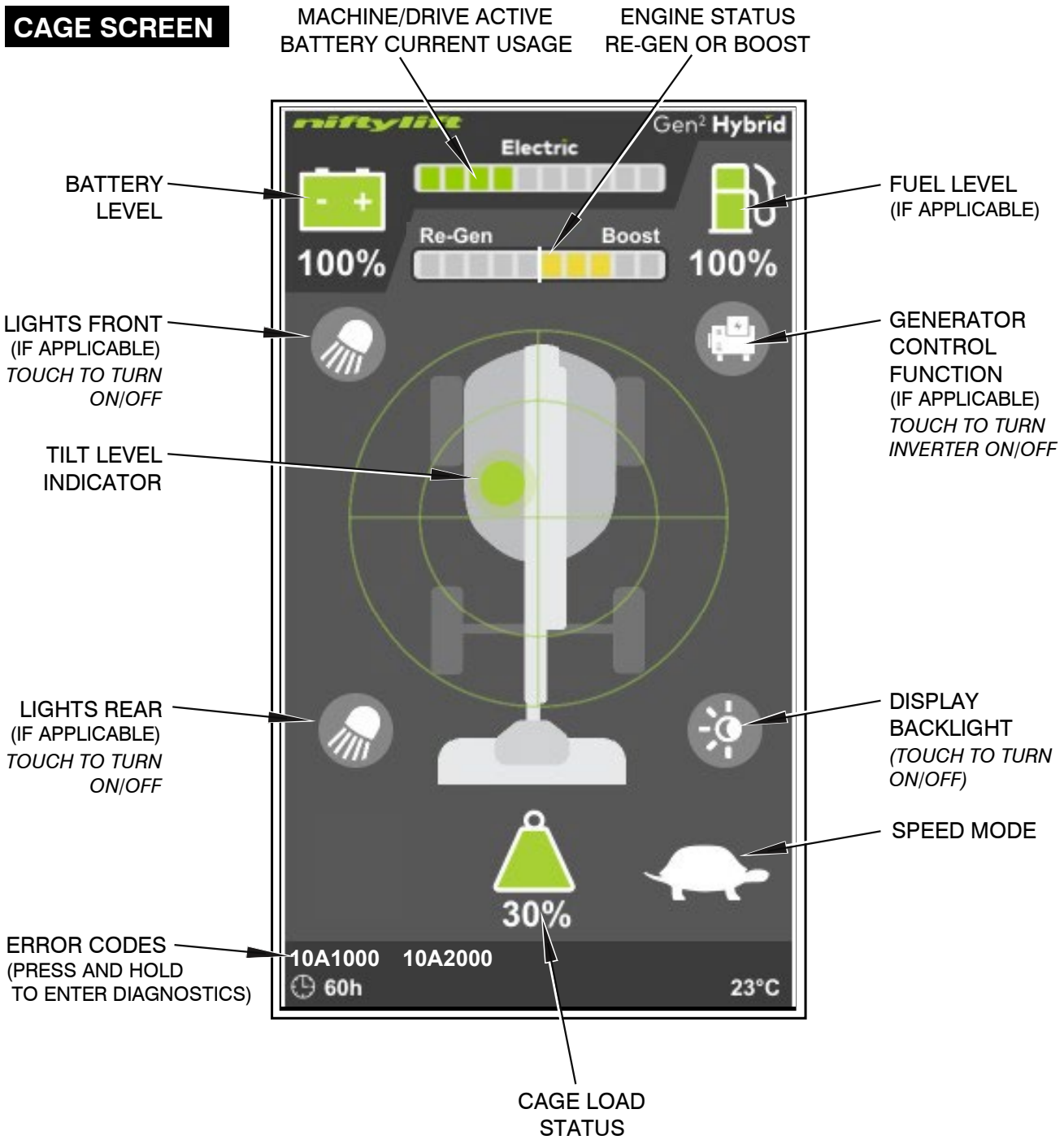
1 Emergency Stop	**Push**: Stop Operation	**Pull**: Enable operation
2 Green Power Button	**Push** and hold to activate machine	
3 Engine off/on/start	Anti-clockwise for **Glow**, Clockwise to **Start/Stop** engine	
4 Speed selector	**Left** - Speed I **Tortoise** **Centre** - Speed II **Off-road** **Right** - Speed III **Hare**	
5 Override button	**Push** and hold to enable boom functions in the event of normal operation loss (Emergency or recovery use ONLY. Refer to Section 4.3.6 for correct use of white override button)	
6 Display screen	Refer to Section 4.3.2	

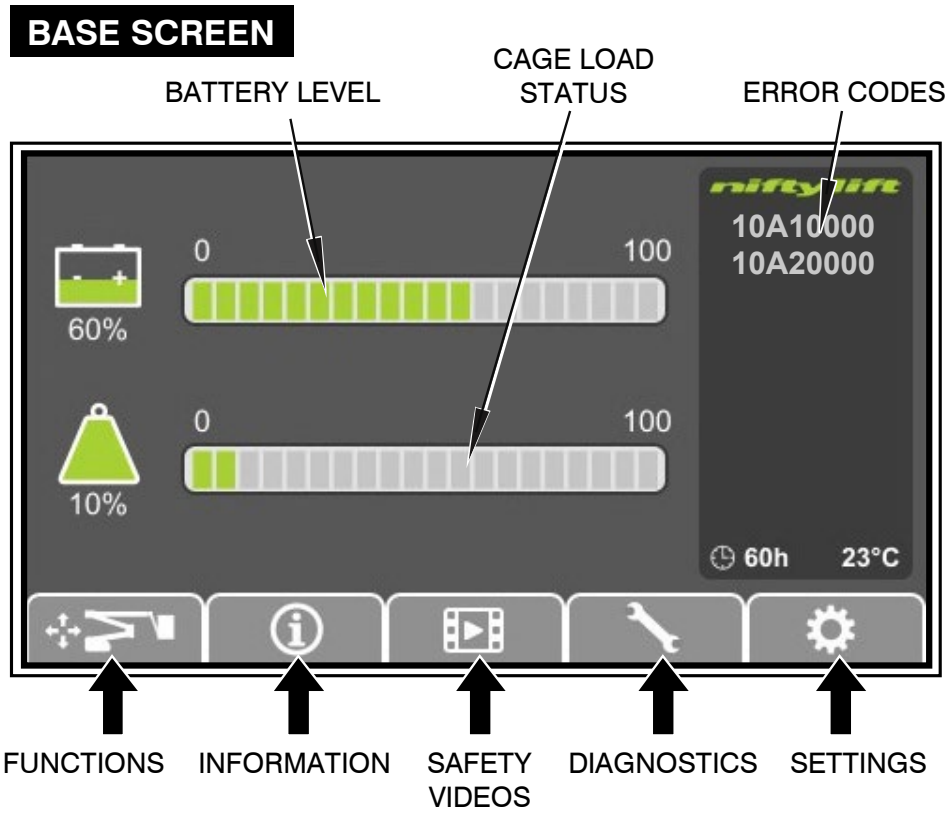
Further information on Emergency Stop operation can be found in Appendix A, A7.

4.3.2 DISPLAY SCREENS

Situated on the Ground and Cage Control Panels, these screens provide operational and/or a warning indication for a range of functions. For further information refer to Section 4.3.3 'Information Icons' on Page 34 or Section 4.3.4 'Menu Screens' on page 38. During machine operation the display shows current battery level, cage load status, chassis inclination level (cage screen) and current boom/drive speed setting (cage screen).

CAGE SCREEN





4.3.3 INFORMATION ICONS

Full Screen Warnings - Safety Critical

MAX tilt angle exceeded:- The alarm sounds, the display shows this image and drive is disabled. Lower booms down into the stowed position and drive onto level ground to fully restore machine operation.

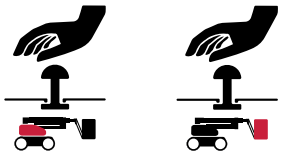
Safe Working Load (SWL) exceeded:- The alarm sounds and the display will show this image. The Maximum SWL (225kg/500lbs) has been exceeded. Immediately remove any unnecessary items from the platform **in a safe manner** to restore machine functions.

Alternatively, the platform may have come into contact with a fixed object, see Section 4.3.6 for recovery procedure.

Descend immediately:- The alarm sounds and the display shows this image. A safety system has been activated, lower booms down into the stowed position immediately.

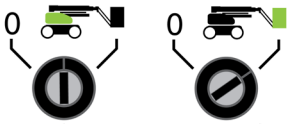
Note: If a **Safety Critical** condition has been detected, the safety warning lamp on the Platform Control Panel and Base Control Panel will also illuminate.

Full Screen Warnings - Advisory

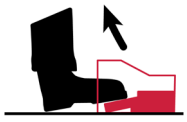


Release E-Stop:- Warning indicating one or both e-stops are pressed. Release e-stop to restore normal controls.

See Appendix A (A7) for overriding e-stops.



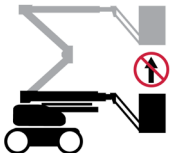
Select Controls: To enable **ground** or **platform** controls, selector switch located on **ground** controls must be turned anti-clockwise or clockwise (Refer to Section 4.2.1, Item 3).



Footswitch Timeout:- Machine will not operate. Release and re-press footswitch or green button to restore normal controls (Refer to Section 4.3.1).

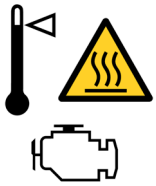
Controls Neutral:- Boom control paddle or drive joystick has moved from the neutral position **before** the green button or footswitch was pressed. Return to neutral position and move **after** green button or footswitch has been pressed (Refer to Section 4.3.1).

Joystick Timeout:- Machine drive will not operate. Release and re-press trigger to restore normal controls (Refer to Section 4.3.1).

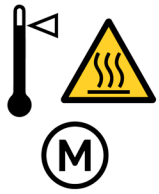


Boom-up Disabled:- The alarm sounds and the display shows this image. A safety system has been activated, boom elevation is not possible until the problem is rectified.

Drive Disabled:- The machine is on charge, do not activate drive mode.

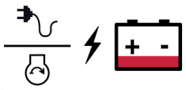


High Temperature - Engine Oil/Engine:- Machine has detected a high temperature within the engine. Refer to the error code portion of the screen (Section 4.3.4) to establish source.



High Temperature - Motor:- Machine has detected a high temperature within the electric motor.

Low Temperature:- Machine has detected a low ambient air temperature (<-18 °C). All boom functions will cease if ambient temperature falls below -23 °C.



Low Battery state:- Machine batteries require recharging. Refer to Section 4.6.

SiOPS:- SiOPS has been activated, to restore normal machine controls refer to Section 4.3.6.

Cage Level:- The cage angle has exceeded 5°, use the platform levelling button (Refer to Section 4.3.1, Item 5) in conjunction with the green button or footwitch to reduce this angle, therefore restoring boom and drive functions.

Engine error:- An error has been detected, Refer to Error Codes screen.

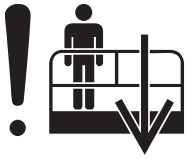
Motor error:- An error has been detected, Refer to Error Codes screen.

Engine disabled:- Refer to Error Codes screen.

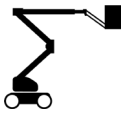
Machine locked:- Please input the correct access code to allow machine operation.

Advisory (Mode of operation)

Drive Speed: Determined by the Speed Selector switch on the Platform Control Panel (Refer to Page 31). Digital display reverts to these icons once the joystick trigger is activated.



Override: Auxiliary power is in use (Refer to Section 4.2.1/4.3.1, Item 5).



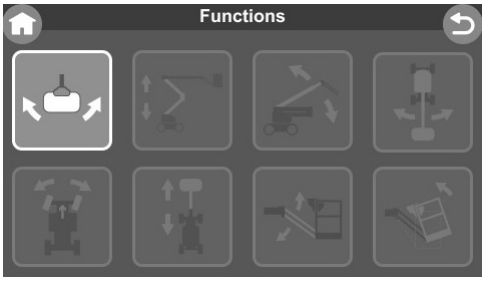
Elevated drive:- Machine is in Low Drive speed mode (Tortoise) due to the booms being elevated.

Drive Disabled: Drive function has been disabled due to a safety critical condition. To restore drive, refer to Safety Critical Section on Page 34.

Engine active:- Engine is running.

Engine off:- Engine is **not** running.

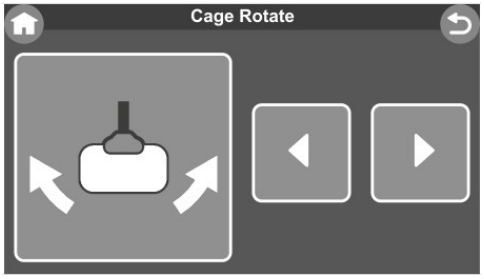
4.3.4 MENU SCREENS – BASE



FUNCTIONS

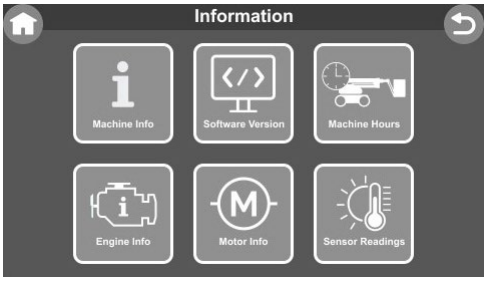
To access this screen, press the functions button.

This allows the operator to rotate the cage from the Ground Controls.



Push and hold green power button on the ground control panel. Press either the left or right arrow on the screen as required.

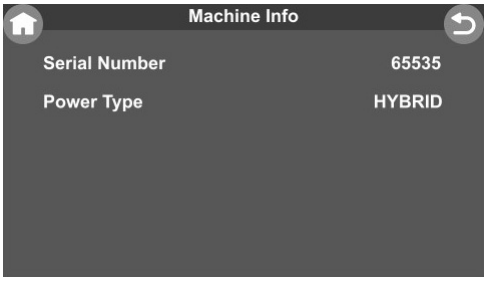
Note: Example only, may not be applicable to this machine.



INFORMATION

To access this screen, press the information button.

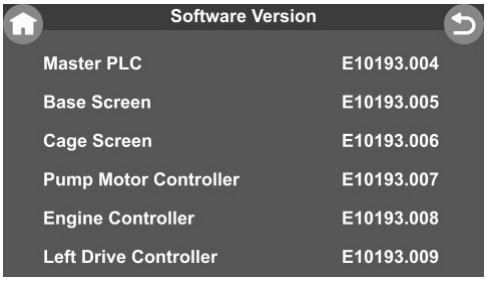
This displays options to access **Machine Info, Software Versions, Machine Hours, Engine/Motor Info** and **Sensor Readings** information.



Machine Info

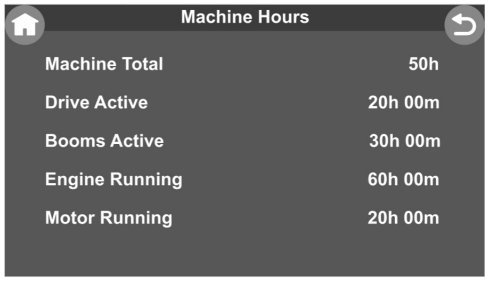
This displays information specific to the individual machine.

Serial Number and Power Type.



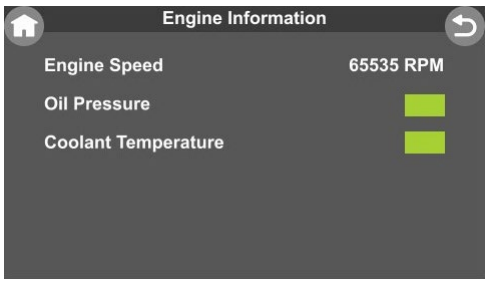
Software Version

Displays a list of the programmable devices installed on the machine and the software version for each device. (Scroll down)



Machine Hours

Total Hours, Drive Hours, Booms Hours, Engine and Motor Running Hours are displayed.

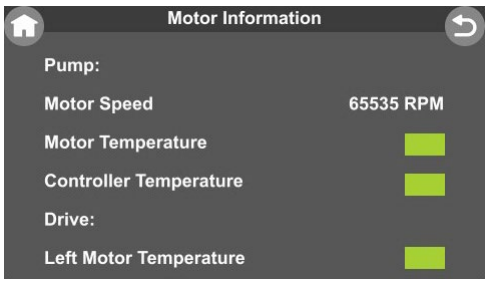


Engine Information

Current Engine Speed, Oil pressure and Coolant temperature status are displayed.

Green = OK

Red = Error (Check error code display).

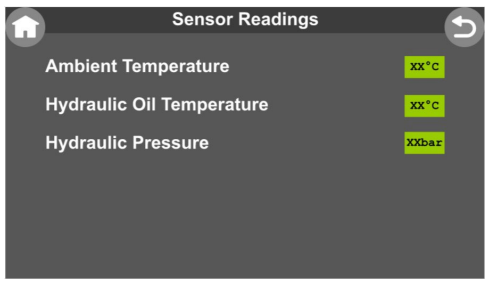


Motor Information

Current Electric Motor speed, Motor and Controller temperature status, LH and RH Drive Motor temperature status (scroll down) are displayed.

Green = OK

Red = Error (Check error code display).



Sensor Readings

Current Ambient Air temperature, Hydraulic Oil temperature and Hydraulic Pressure are displayed.

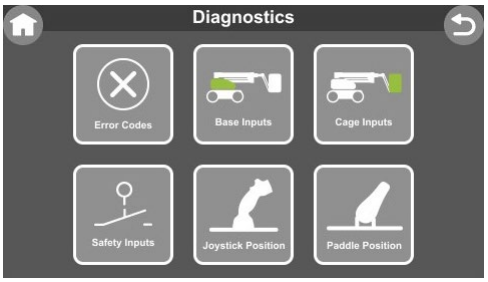
Green = OK

Red = Error (Check error code display).

SAFETY VIDEOS

To access this screen, press the video button.

This displays options to view a range of safety videos demonstrating how to isolate the machine, **Electrical Isolation.** Or operate the machine for **Auxiliary Descent System, SiOPS** and **E-Stop**.



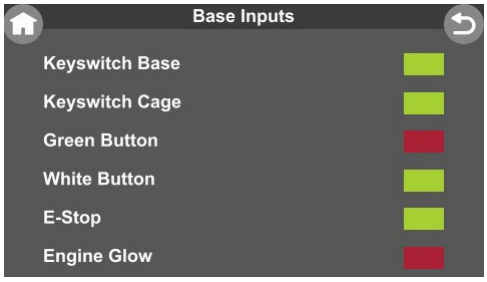
DIAGNOSTICS

To access this screen, press the diagnostics button.

This displays options to access **Error Codes, Joystick Position, Paddle Position, Base Inputs, Cage Inputs and Safety Inputs** information.

Error Codes

If the control system detects a malfunction on the machine, an error code will be displayed. For further information refer to, https://www.niftylift.com/uk/support/error-code-lookup
or the HR12 4x4 MK2 Service Manual.



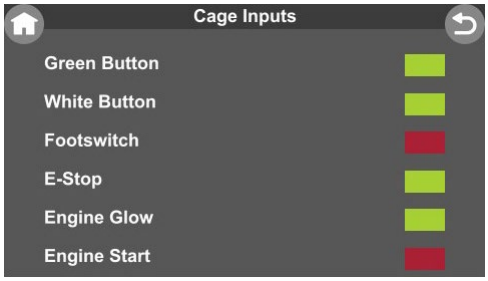
Base Inputs

The screen displays status of functions on the Base Control station. (scroll)

White = Off/inactive

Green = On/OK

Red = Error (Check error code display).



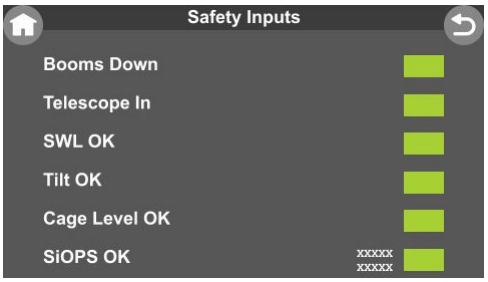
Cage Inputs

The screen displays status of functions on the Cage Control station. (scroll)

White = Off/inactive

Green = On/OK

Red = Error (Check error code display).



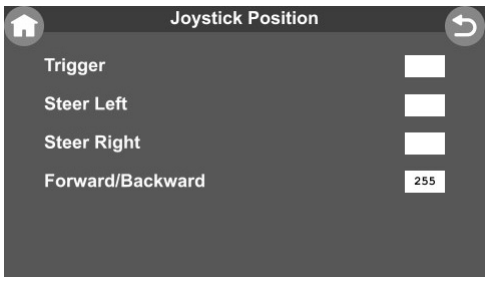
Safety Inputs

The screen displays status of safety sensor inputs. (scroll)

White = Off/inactive

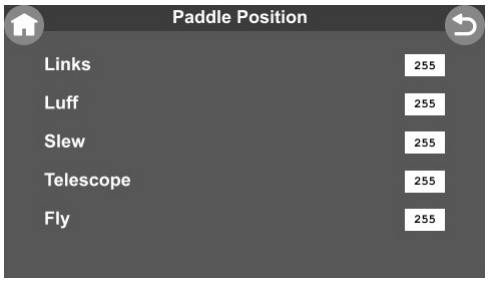
Green = OK

Red = Error (Check error code display).



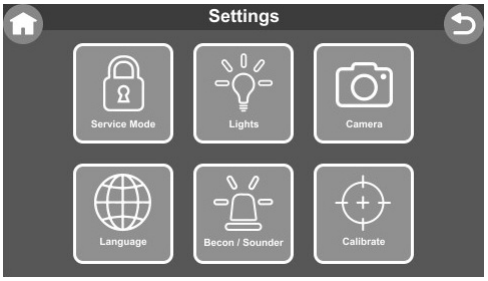
Joystick Position

The screen displays signal function whilst operating the Joystick.



Paddle Position

The screen displays signal function whilst operating any cage control paddle.



SETTINGS

To access this screen, press the settings button.

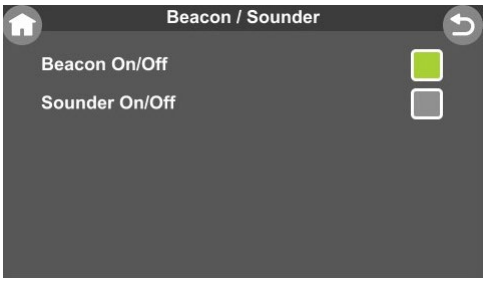
This displays options to access **Service Mode, Languages, Lights, Beacon/Sounder, Camera and Calibrate**.

Service Mode

This allows access to additional service features via a security code.

Lights

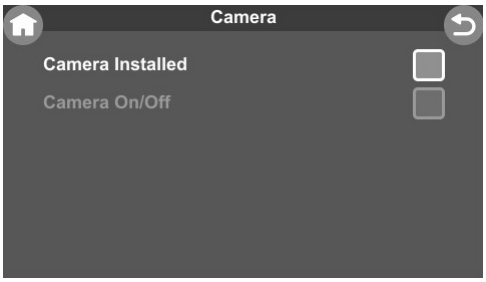
This allows the operator to turn machine work lights (if installed) ON or OFF. In addition the Base and Cage screen brightness can be adjusted here.



Beacon/Sounder

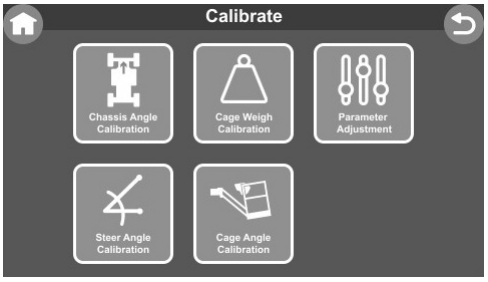
This allows the operator to select between the beacon or sounder for a motion alert.

Note: Either the Beacon or Sounder MUST be enabled; the system will automatically select one if the operator attempts to deselect both.



Camera

This allows the operator to turn machine camera (if installed) ON or OFF.

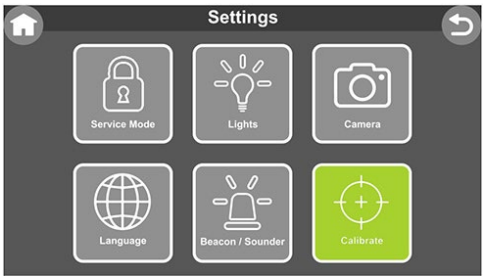


Calibrate

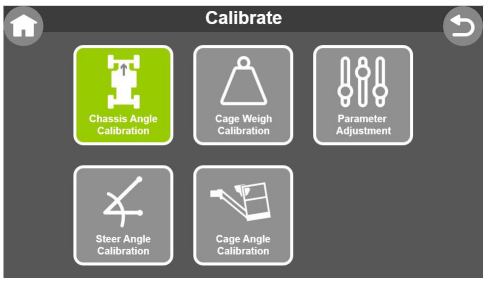
This allows access to machine calibration features via a security code. For further information refer to the HR12 4x4 Service Manual.

LOAD SENSING OVERRIDE EVIDENCE RESET

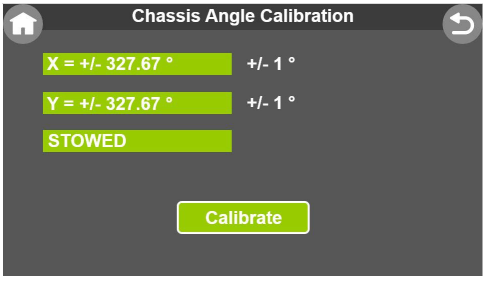
With the error code present, press the settings button.



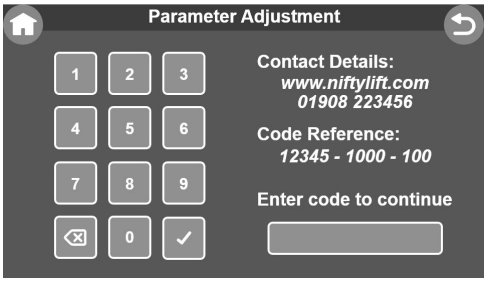
Press the Calibrate menu button.



Press the Chassis Angle Calibration button.



Press the Calibrate button.

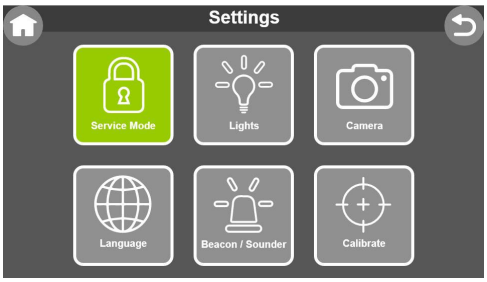


Observe and record the Code Reference.

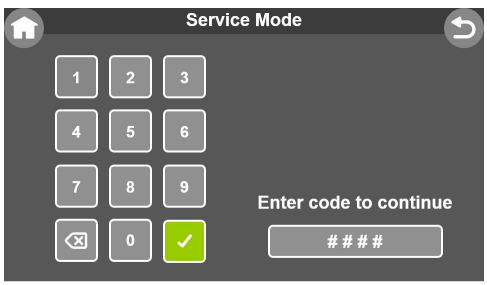
Contact Niftylift using the details displayed and quote the Code reference number displayed on the screen or go to https://www.niftylift.com/uk/support/override-reset-code-generator and input the Code Reference to obtain the Override reset code.

Press the Home button.

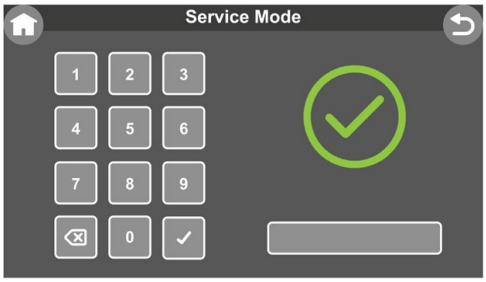
Press the settings button.



Press the Service Mode button.



Enter the Override reset code using the keypad and press ✓.



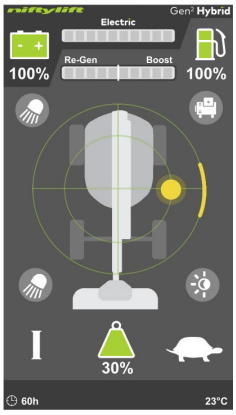
Following a short pause, a green checkmark indicates that the override evidence code has been successfully reset.

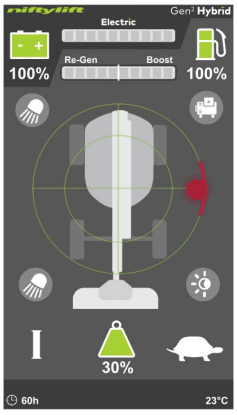
If a red cross is displayed, recheck the entered code and machine reference used, then retry.

Press the Home button.

Confirm that the error code is no longer present in the display.

4.3.5 DISPLAY SCREEN – CAGE



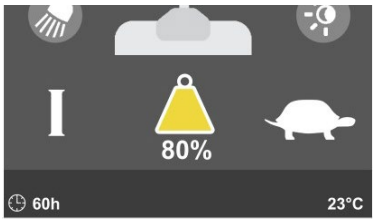


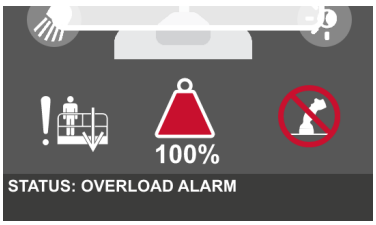
Tilt Angle

The screen displays a spirit level bubble determined by the chassis angle and its direction of tilt. If the machine exceeds the preset value whilst the booms are elevated, drive will be disabled.

Amber = 2 ^{0}

Red = 4 ^{0}



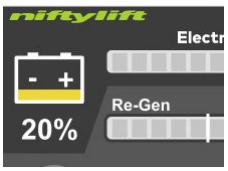


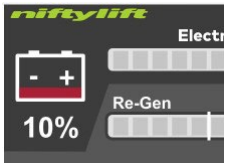
Cage Load

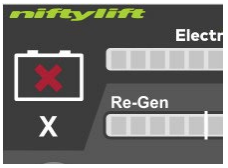
The screen displays a constant status of the load in the cage. If this value increases towards the SWL limit the display changes as follows:

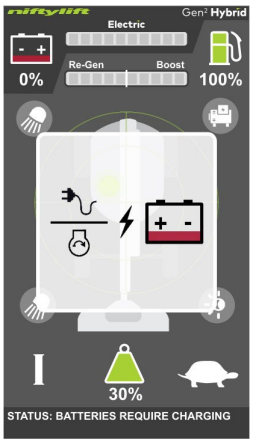
Amber = >80% of SWL

Red (Flashing) = 100% of SWL









Battery Level

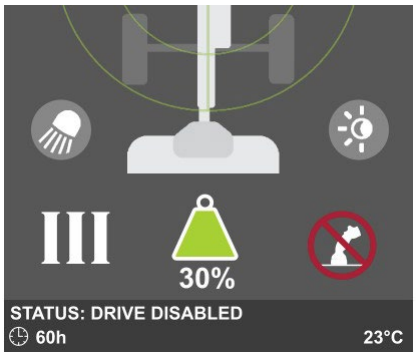
The screen displays a constant status of the battery capacity. If this value decreases the display changes as follows:

Amber = <20% charge

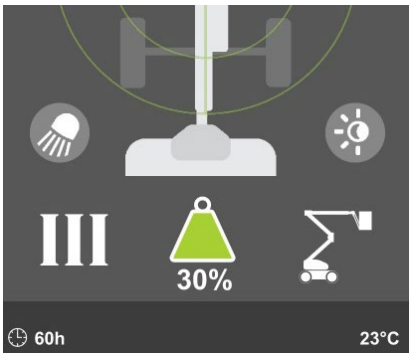
Red (Flashing) = <10% charge

Red (Flashing) + Warning = <5% charge

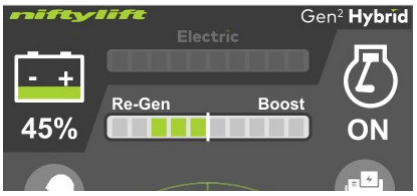
Red (X) =Error



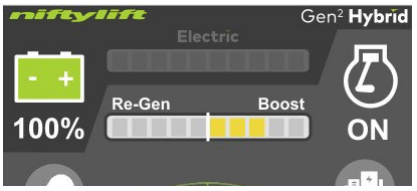
Drive Disabled: Drive function has been disabled due to a safety critical condition. To restore drive, refer to Safety Critical Section on Page 34.



Elevated drive:- Machine is in **Low Drive speed** mode (Tortoise) due to the booms being elevated.



Re-Gen Mode:- Engine is on and recharging the batteries.



Boost Mode:- Engine is on and providing additional power to the batteries in order to maintain machine function/drive speed.

4.3.6 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) **NEVER** exceed the maximum platform capacity.
2) Check below, above and around the platform for any obstruction or hazards before operating any function.
3) Ensure all red emergency stops are out.
4) Turn key switch at ground control station to **Platform** (fully clockwise).
5) For **Battery** powered operation, go to step 9).
6) For **Diesel** powered operation, go to step 7).

DIESEL ENGINE

Note: On the HR12 4x4 the engine will not start if the footswitch or Green button are pressed.

7) **COLD ENGINE**: - turn the **Diesel Glow/Start** selector to the **Glow** position (anti-clockwise). This engages the glow plug pre-heat system. Hold for 5-10 seconds then turn the key to the **Start** position (fully clockwise) and the engine will fire.
8) **WARM ENGINE**: - turn the **Diesel Glow/Start** selector to the **Start** position (clockwise) and the engine will fire.

Note: Unless the diesel engine is running, the HR12 Hybrid will automatically default to the electrical power source (battery).

ALL MODELS

9) Set the **speed selector** control as required. Tortoise gives **minimum** drive speed and Hare allows **maximum** drive speed.
10) Depress the footswitch or push and hold green power button on the platform control panel.
11) Select one or more functions and operate the appropriate proportional levers in full accordance with manufacturers operating and safety manual.
12) To return control to the base, turn the base control key-switch to the **Base** position (centre).
13) When not in use return booms to the stowed position. Turn key switch on the ground control station to the fully anti-clockwise **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.

EMERGENCY PROCEDURES

1) Push in red emergency stop to shut down **all** machine movement.

2) **Release** both emergency stops to restore normal controls.

In the event that the controls fail or the cage overload is activated as described in Section 5.3, the booms can be operated from the cage location as described below:

1) Press **white override button** situated on the cage console. (Refer to Section 4.3.1)
If engine is running, it will stop. Override mode is for booms only and will not operate drive.

2) Activate a **single** desired function lever.

3) If the cage has contacted a fixed object and cage overload has disabled the machine, move machine slightly using steps 1-2. The overload alarm and visual warning will cease and normal controls are available.

4) Restart engine with selector switch if main battery pack is discharged.

5) Use normal controls if available for the fastest recovery time. Press the green button or footswitch and operate the desired function lever(s).

6) If normal controls are not available, continue using the override button to lower the machine using auxiliary power.

Note: The override mode is for booms only and will not operate the drive function. It should only be used in an emergency or when the machine or operator needs recovery, i.e. cage overload activated, power failure or empty fuel tank (Diesel only). Excessive use of the override button may lead to damage to the machine. Damage caused by failure to comply with this instruction will not be covered by the warranty.

4.3.7 SiOPS™ - LOAD SENSING CONSOLE

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. If cage overload has also activated, the procedure described in Section 4.3.6, 'Emergency Procedures' (above) should be followed first.

To reset the footswitch and normal controls:

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 to reactivate.

Note: If SiOPS™ has been activated and the footswitch is not reset within **15 seconds**, then the blue warning beacon will flash (located on underside of the cage) 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 footswitch located on platform floor.

3) Set the **speed selector** switch on the platform control station as required.

   Tortoise (Low Speed) - gives low speed and low engine revs.
   Off-road (High Gradeability) - gives low speed and high engine revs.
   Hare (High Speed) - gives high speed and high engine revs.

   Note: High Drive Speed (Hare) is only available when the booms are in the stowed or 'off boom rest' (5^0 elevation) position. **The HR12 will default to Elevated Drive speed whenever the booms are elevated beyond 'off boom rest' .** At this point **Off-road** or **Tortoise** can be selected to determine the most appropriate mode for the current terrain.

   If the machine is driven using High Drive Speed (Hare) on slopes exceeding 10^0 it automatically reverts to **Off-road** speed (High Gradeability). To return the machine to High Drive Speed, drive on to level ground ($<10^0$) then release and reactivate the joystick or footswitch.

4) Select drive joystick from the platform control panel.

   Push forward for **FORWARD DRIVE**

   Pull backwards for **REVERSE DRIVE**

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

   Left for **STEER LEFT**

   Right for **STEER RIGHT**

The driving horn is activated by a button on the platform controls (Refer to Section 4.3).

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.

When driving with the booms fully stowed, the Tilt Sensor is disabled to allow the Niftylift to be driven in areas where the slope exceeds the allowable inclination limit. In normal operation the drive is therefore unaffected when driven onto a slope in excess of this limit, until the booms are raised, whereupon the drive is 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 THEIR STOWED POSITION AND RE-POSITION BASE ON FIRM, LEVEL GROUND.

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

4.5 CAGE WEIGH SYSTEM

4.5.1 LOAD CELL VERSION

The Niftylift HR12 4x4 is fitted with an electronic load cell. This load cell is a moment-independent design. This means that independent of the load position inside the machine cage, the actual load is measured and if pre-calibrated limit values are exceeded, warnings will be activated. If load exceeds the safe working limit (SWL) of the machine, the machine will be disabled until the load is reduced to below 100% of the safe working limit. The design of the unit meets the requirements of both BS EN 280 and ISO 13849 with a performance level of PL d. (Refer to Appendix A)

The current load in the cage is displayed on the digital display unit as a percentage of SWL. Please refer to Section 4.3.2.

4.5.2 CALIBRATION, INSPECTION AND MAINTENANCE

Calibration, maintenance and repair of the Niftylift HR12 4x4 cage load cell requires specialist knowledge and equipment. **For this reason, no part of the Niftylift HR12 cage-weigh system can be adjusted, repaired or inspected by the operator**.

All enquiries relating to calibration, inspection or maintenance should be directed to Niftylift or one of their approved dealers. Contact details are listed in Section 1.3.

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. The recharging time can be reduced to approx.. 4 - 6 hours by running the engine whilst charging).

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.) It is possible to change the AC mains charger adapter to suit the available power supply.

RISK OF SHOCK. ALWAYS DISCONNECT THE NIFTYLIFT FROM THE AC POWER SUPPLY BEFORE CHANGING THE AC MAINS CHARGER ADAPTER.

3) Take note of the indicator provided on the base:

Red lamp (Slow flash) - Batteries are charging (between 0% & 50% capacity.)

Red lamp (Fast flash) - Batteries are charging (50% & 75% capacity.)

Green lamp (Fast flash) - Batteries are charging. (75% & 100% capacity)

Green lamp (Static) - Batteries are fully charged.

Red lamp (Intermittent flash) – Fault (turn on keyswitch and observe fault codes on the screen).

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. **Drive** mode is disabled to avoid damage to cables etc. To disconnect charger, firstly switch off the power supply. Ensure LEDs 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 Orange, fast flash lamp, immediately followed by the Green, fast flash 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 automatically reduces the drive speed to 50% in electric only mode. However, there is sufficient power remaining to enable the operator to drive slowly to the nearest charging point.

3) During normal machine usage with the engine running, the batteries are on continuous recharge, except when the control system decides that additional electric power is required in order to maintain drive/function speed.

CHARGING LIMITATIONS

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.

When connecting the on-board battery charger to an earthed AC power supply, use the shortest length lead possible. Where this is not practicable, observe the following information to ensure effective battery charging.

EXTENSION LEADS MUST HAVE APPROPRIATE SAFETY APPROVALS FOR THE COUNTRY IN WHICH THEY ARE USED.

EXTENSION LEADS 230V

EXTENSION LEADS ARE TO BE UNCOILED TO PREVENT OVERHEATING AND MUST BE VISUALLY INSPECTED FOR ANY DEFECTS BEFORE USE.

ONLY USE APPROVED EXTENSION LEADS WITH A PASSED PAT LABEL FITTED.

DO NOT EXCEED THE MAXIMUM LENGTHS STATED IN THE TABLE, INCLUDING WHEN JOINING MULTIPLE LEADS.

ENSURE THE MACHINE IS CONNECTED DIRECTLY TO THE POWER SUPPLY SOURCE AND AVOID THE USE OF SPLITTERS

230V (UK Only) standard Type G 13A plug maximum extension lead length		
Cable core size	**Connector maximum current**	**Maximum length**
1.5mm	13A	15m (49.2ft)
1.5mm	13A RCD protected	25m (82ft)
2.5mm	13A	25m (82ft)
2.5mm	13A RCD protected	45m (147.6ft)

230V 16A rated plug maximum extension lead length		
Cable core size	**Connector maximum current**	**Maximum length**
1.5mm	16A	15m (49.2ft)
1.5mm	16A RCD protected	22m (72.2ft)
2.5mm	16A	25m (82ft)
2.5mm	16A RCD protected	35m (114.8ft)
4mm	16A	40m (131.2ft)
4mm	16A RCD protected	55m (180.4ft)

230V 15A rated plug maximum extension lead length		
Cable core size	**Connector maximum current**	**Maximum length**
1.5mm	15A	15m (49.2ft)
1.5mm	15A RCD protected	22m (72.2ft)
2.5mm	15A	25m (82ft)
2.5mm	15A RCD protected	40m (131.2ft)
4mm	15A	40m (131.2ft)
4mm	15A RCD protected	60m (196.9ft)

EXTENSION LEADS 110V (UK ONLY)

Ensure the supply from the transformer is suitable for the application. It must allow continuous supply based on the current required in order to allow a complete charge cycle and avoid nuisance tripping.

IF CHARGING A MACHINE WITH A 16A SUPPLY, THE 110V TRANSFORMER MUST HAVE A CONTINUOUS RATING OF 2.25KVA OR ABOVE.

IF CHARGING A MACHINE WITH A 32A SUPPLY, THE 110V TRANSFORMER MUST HAVE A CONTINUOUS RATING OF 3.5KVA OR ABOVE.

EXTENSION LEADS ARE TO BE UNCOILED TO PREVENT OVERHEATING AND MUST BE VISUALLY INSPECTED FOR ANY DEFECTS BEFORE USE.

ONLY USE APPROVED EXTENSION LEADS WITH A PASSED PAT LABEL FITTED.

DO NOT EXCEED THE MAXIMUM LENGTHS STATED IN THE TABLE, INCLUDING WHEN JOINING MULTIPLE LEADS.

ENSURE THE MACHINE IS CONNECTED DIRECTLY TO THE POWER SUPPLY SOURCE AND AVOID THE USE OF SPLITTERS

110V maximum extension lead length		
Cable core size	**Connector maximum current**	**Maximum length**
1.5mm	16A	10m (32.8ft)
2.5mm	16A	18m (59.1ft)
4mm	16A	28m (91.9ft)
4mm	32A	14m (45.9ft)
6mm	32A	23m (75.5ft)

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

Fault Conditions

If a fault occurs keep the charger connected to AC power and turn the machine key switch to the base position. Observe the fault codes on the screen, and refer to table:

Error code	Cause	Solution
Solid	Communication interruption	1) If the CAN line is disconnected reconnect it 2) Measure 12V (CAN line red and black wire) without voltage, repair or replace charger. Contact a Niftylift approved service centre 3) To determine a battery management system failure, contact the battery manufacturer
E01 bAt	The output is not connected to the battery, is reversed, short circuited or poorly connected	1) Check the battery pack is connected correctly 2) Check the regulated power supply is connected correctly
E02 AC	Mains power abnormal (voltage)	1) Check the AC power cord is connected between the regulated power supply and the AC outlet 2) Check the AC power supply plug is connected correctly Reset charger (interrupt AC power for 15 seconds)

Error code	Cause	Solution
E03 Hot	Regulated power supply high temperature protection	1) Charger shuts down and enters protection mode due to excessive charger / environmental temperature 2) Ensure the charger is in a well-ventilated environment. Disconnect the charger and wait for 15-20 minutes before reconnecting for charging
E04 bAt	Battery high temperature protection	1) When the battery temperature exceeds the preset value, the regulated power supply will turn off the output to prevent the battery from continuing to overheat 2) When the battery temperature drops, the regulated power supply will automatically restart
E05 Err	Output current is too high	1) Ensure the output current is not excessive 2) Power cycle the battery charger to check if the fault persists 3) If the above does not eliminate the problem, repair or replace charger. Contact a Niftylift approved service centre
E06 bAt	Battery voltage is too high	Ensure the output voltage of the battery is correct
E08 Err	Read curve memory address error	1) Power cycle the battery charger to check if the fault persists 2) If the above does not eliminate the problem, repair or replace charger. Contact a Niftylift approved service centre
E10 Err	Relay fault	1) Disconnect the battery charger for 5 minutes to release the capacitor voltage and then reconnect the AC power supply 2) If the above does not eliminate the problem, repair or replace charger. Contact a Niftylift approved service centre
E11 Err	Poor connection	1) Check the battery pack is connected correctly 2) Check the battery pack for poor connections

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. 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.

BATTERY CONTROLLER

This machine is fitted with a Battery Management System that monitors battery condition. A main component of this is the Battery Controller Unit. If for any reason the battery controller circuit has been disconnected, please ensure that the batteries are **fully recharged** before using the machine as this enables the Battery Controller Unit to reset automatically.

Note; this requirement does not apply to the automatic battery disconnect, performed when the keyswitch is turned off.

The Battery Controller Unit has been calibrated to function correctly with Niftylift factory fitted batteries. If for any reason you suspect **any** of the batteries have been replaced with a non-factory fitted unit then please contact the Niftylift Service Department on (44) 01908 857899, Fax: 01908 227460. As machine performance will be severely affected.

DURING CHARGING, THE CHARGER SURFACE MAY BECOME HOT ESPECIALLY IN HIGHER AMBIENT TEMPERATURES. THIS IS NORMAL.

TOPPING UP

The batteries installed on this machine are Maintenance Free. **DO NOT ATTEMPT TO REFILL** or irreparable damage will occur.

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 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, slew rotation lock 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.

4.7.2 TOWING

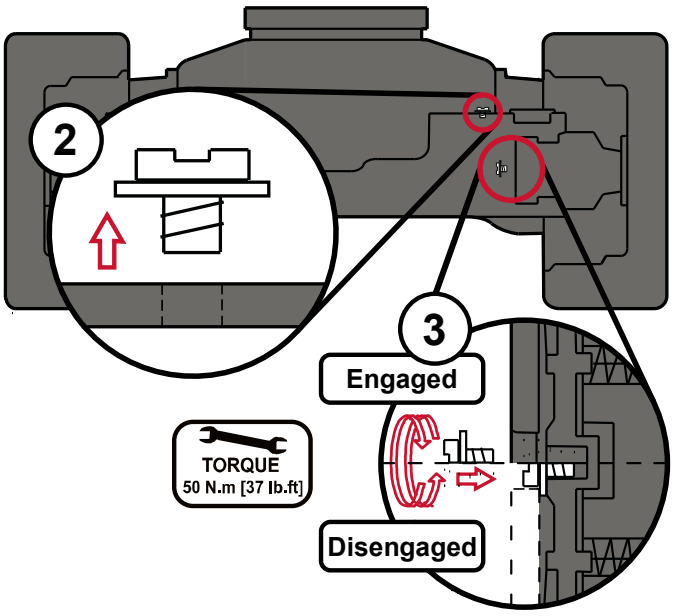
If the Niftylift needs to be towed in case of an emergency, it will be necessary to **chock the wheels** before starting any of the following actions.

In order to safely tow the HR12 4x4, the drive mechanism will need to be bypassed.

BRAKE DISENGAGEMENT

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

1) Remove canopy and inspection covers.
2) Remove M12 bolt and washer from under canopy.
3) Fasten bolt and washer into brake release. Tighten to **50 N.m**. Torque.
4) Repeat on opposite side. **Note: Damage caused by failure to comply with this notice will not be covered by the manufacturer's warranty.**



4.7.3 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 below.)

D82332 **HR12 4x4 MK2**

4.7.4 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) Check batteries for state of charge, damage, dirt, etc. Ensure batteries are **fully charged** before storage. If no use of the platform is intended, an occasional "top-up" charge of the batteries will serve to equalise their charge level. **Never leave in a state of discharge for any length of time**. Refer to HR12 4x4 MK2 Service Manual for further information.

4) If the machine is going to be left unused and disconnected from mains power for a period >1 week, disconnect the negative pole of the 48V battery pack and the 12V battery using the terminal clamp to prevent discharge of batteries through leakage.

5) If machine is to be left outside or in a hostile environment, cover with suitable weatherproof media to prevent deterioration.

4.7.5 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) Check level and quantity of oil. Remove any contaminants - water, etc.

3) Check batteries for state of charge.

4) Check electrics for damage and insulation.

5) Using ground controls, cycle machine over complete envelope in accordance with the Operating Instructions. Cure any defects.

6) Ensure that all safety devices and controls operate in accordance with the instructions.

7) Ensure the auxiliary power system is functional and capable of operating boom functions.

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, operate the cage-levelling function at the Cage Control Station, the cage needs to be fully levelled forwards and backwards. When the system has been charged in both directions, the cage levelling function should be restored. 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 their representatives.

4.8 ONBOARD AC POWER / POWER TO CAGE (OPTIONS)

EXPLOSION HAZARD! DO NOT USE THE INVERTER IN THE VICINITY OF FLAMMABLE FUMES OR GASES. AVOID COVERING THE VENTILATION OPENINGS. ALWAYS OPERATE UNIT IN AN OPEN AREA.

PROLONGED CONTACT TO HIGH HEAT OR FREEZING TEMPERATURES WILL DECREASE THE WORKING LIFE OF THE UNIT.

DO NOT EXPOSE INVERTER TO OIL, DIRT, MUD OR DIRECT HEAVY WATER SPRAY WHEN CLEANING VEHICLE. NEVER EXPOSE UNIT TO SNOW OR DEEP WATER.

ONBOARD AC POWER: - Optional outlet available in the platform as a source of AC power (for suitable hand tools/equipment) without the need for connecting the machine to an external mains supply

The onboard AC power option shall only be used to power equipment at the cage. Ensure the electrical equipment used in the cage does not exceed the maximum load permitted. Niftylift will not be held accountable if any of the above is not followed.

The machine behaviour is designed to protect the operator and machine by disabling the onboard AC power in certain scenarios such as an emergency stop being activated, change of control position, machine functions in use (green button/footswitch pressed), and low state of battery charge.

Machine users should be aware that the onboard AC power supply may be interrupted unexpectedly and for this reason the use of the onboard AC power as a supply for safety equipment or lighting is not recommended without a risk assessment and suitable method statement.

POWER TO CAGE: - The onboard AC power option can be disconnected at the base by disconnecting the plug before the RCD box. This allows an alternative power source from a private supply to be used to power equipment in the cage, providing it is suitable to the voltage specified and does not exceed the maximum load permitted. Any private supply circuit must be adequately protected in line with safe working practices and any other requirements applicable to the safe use of electricity at work.

Before using an external AC power source, always secure the cap on the socket of the inverter/generator lead to prevent use when disconnected. Do not start the inverter/generator when it is disconnected from the RCD unit plug.

The machine boom functions can be used whilst plugged into an external power source. Do not drive machine when connected to an external power source to avoid damage to cables etc.

When finished, always reconnect the socket back to the RCD unit plug.

Checks before use

1. Ensure connectors are not damaged in anyway. If damaged, **DO NOT USE** and report back to the Owner/Hire company.
2. If cable is damaged in anyway, **DO NOT USE** and report back to the Owner/Hire company.
3. If damaged, turn the RCD to the **O** position to prevent further use until repaired.
4. Check test label fitted at RCD box to ensure it is within date.

Operation of Inverter / generator

1. Ensure the base/cage duty selector switch is turned to the cage position.
2. For generator option only, the engine must be running before starting the generator.
3. Press the inverter/generator push button on the cage control panel to start the inverter/generator. *Note: Generators fitted with a voltage control contactor will only turn on when the generator reaches the correct voltage and frequency. This may cause a delay in using power to cage.*
4. To turn off the inverter/generator, press the inverter/generator push button again.
5. In case of emergency, the Emergency stop at base and cage will turn off the inverter/generator.

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** (central position).
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 **auxiliary descent pump** can be used to provide the hydraulic power to manoeuvre the machine. 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 contacts 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 **Auxiliary Descent 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 can now be lowered using the controls as described previously in Section 4.3.

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 directly 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 any relevant 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/SAIA A92 Standards, 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 _____

ADMINISTRATION	PASS	FAIL	
Daily, **Weekly**, **Monthly** checks carried out as outlined in manufacturers Operating and Safety Manual?			
Machine has valid LOLER Certificate? (UK only)			
TOWING	**PASS**	**FAIL**	**N/A**
Check brakes are released or…			
Check wheel gearboxes disengage when required			
AXLES, WHEELS AND BRAKES			
Axles are secure			
Wheels are secure, tyre condition acceptable			
Wheel alignment and tracking correct			
Tyre pressure correct			
Wheel nut torque correct			
Operation of front and rear steer functions			
Operation of suspension dampers			
Pivot pins and swing bolts secure			
BASE			
Operation of Emergency Stop button			
Operation of Base control valve and buttons			
Operation of all booms over full range			
Platform maintains level over full range			
Hoses not tight, kinked or fouled			
Operation of manual hand pump			
Operation of auxiliary descent pump			
Operation of tilt sensor when driven elevated on slope $>5^{o}$			
Pivot pins and swing bolts secure			
BOOMS/LINKS			
Inspect for damaged, distorted or loose components			
Wear pads present and secure			
Cylinders are silent and not fouling during operation			
Cylinders do not drift when machine is switched off			
Operation of micro-switches i) Links ii) Luffing iii) Telescope iv) Flyboom			
Chain inspection - Correctly tensioned, damage etc.			
Energy chain correct and secure over tele function range			
Bushes (Condition check)			
Pivot pins and swing bolts secure			

PLATFORM	PASS	FAIL	N/A
Operation of Emergency Stop button			
Operation of SiOPS (Refer to Section 4.3.6)			
Operation of control valve and control panel buttons/switches			
Operation of all booms over full range			
Operation of Footswitch			
Platform levelling over full range			
Slewing smooth over full range			
Condition of harness points			
Condition and operation of entry/exit drop gate			
POWER SYSTEM			
Engine - Refer to Pre-Operation and Maintenance sections in engine manufacturers Operating Manual as supplied			
All cables and terminals secure			
All hose connections secure			
Charger/control box secure			
Battery secure			
Hydraulic oil level			
SLEWING			
Slew gearbox and motor are secure			
Slew wheel bolts secured			
Slew guards secure			
FINISH			
Serial plate against documentation			
Check all decals in place and legible			
Canopies in place and secure			
Check all guards are in place and in good condition			
Grease nipples (Slew ring, Steer pins)			
LEAK CHECK			
Hydraulic Cylinders (Lift, Telescope, Levelling)			
Control valves			
Check valves			
Power system pump			
Filters			
Auxiliary descent pump			
Slew motor			
Hydraulic Hose connections and fittings			

Note; Environmental factors and usage amount will affect the type of checks and also the frequency of inspection intervals.

Comments, remedial work required etc;

INSPECTED BY: _____ **DATE:** / /

Appendix A

Safety Related Parts of the Control System (SRP/CS)

The Niftylift control system has been designed and validated according to the required standards. The table below lists the safety related parts of the control system and the level to which they have been approved.

The performance level (PL) of each SRP/CS is specified by BS EN 280-1:2022 section 4.11 Table 4.

Safety Related Part of the Control System (SRP/CS)	Approval (Standard, Performance Level)
A1 Prevent travel above inclination limit	ISO 13849-1:2015 PL c
A2 Limitation of travelling speed	ISO 13849-1:2015 PL c
A3 Load sensing system	ISO 13849-1:2015 PL d
A4 Interlocking of control positions	ISO 13849-1:2015 PL c
A5 Prevent movements of load holding cylinders in case of pipe failure	ISO 13849-1:2015 PL c
A6 Interlocking of travel controls	ISO 13849-1:2015 PL b
A7 Emergency Stop	BS EN ISO 13850:2015 PL d/c
A8 SiOPS	BS EN ISO 13849-1:2015 PL d

A1 PREVENT TRAVEL ABOVE INCLINATION LIMIT

The inclination interlock or Tilt System is PL c in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022.

1.The limits of the safety-related parts to the category selected and any fault exclusions;

The tilt interlock is only active when the telescoping booms are lifted out of the lowered transport position (approximately 5 degrees above the booms rest).

The boom switch relies on Normally Open and Normally Closed electrical contacts opening allowing the tilt system to permit drive within the rated angle.

The state change of the contacts is forced by the boom switch cam actuating the plunger of the booms down switch assembly. **Proper maintenance and daily safety checks to be observed**

It is reasonably foreseeable misuse if an operator tries to override the boom switch in order to bypass the tilt system. Therefore, the system has been designed such that this is not possible without modification of the machine using tools.

If the boom switch is removed or if it is not maintained in accordance with the appropriated documentation the tilt system may not function in compliance with the requirements as a PL c device.

2.The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried out by appropriately trained and competent persons.

3.The effects of deviations from the specified performance on the safety function(s);

If the tilt interlock does not function as intended it is possible that the Niftylift may encounter slopes for which it is not rated.

If the Niftylift encounters slopes beyond the rating as specified on the serial plate the product may occur instability.

If the product becomes unstable, damage to the Niftylift, other equipment and properties, injury or loss of life of the operator and surrounding persons may be a risk.

4.Clear descriptions of the interfaces to the SRP/CS and protective devices;

The tilt system comprises of a primary device the “tilt sensor” the booms down switch, and control PLC, and protective devices, for example solenoid operated hydraulic valves or contactors.

If the drive forward or backwards functions are selected when the booms are below the preset activation angle (i.e., in the lowered transport configuration), the drive functions will be available regardless of angle of inclination.

If the drive forward or backwards functions are selected when the booms are raised outside of the lowered transport configuration, the output from the tilt sensor not being present will deny drive functions.

5.Response time

The tilt sensor is active at all times providing the correct signal in relation to the angle of inclination of the chassis. In the event of encountering an angle of inclination greater than allowable the system will prevent drive functions from being performed until the booms have been lowered on to the boom rest and the angle of inclination has been corrected.

6.Operating limits (including environmental conditions);

All components within the tilt interlock are rated to the environmental conditions acceptable for the machine; refer to Section 2.2.

7.Indications and alarms;

Tilt alarm

The action of the tilt alarm will cause the klaxon to sound and will be indicated by the full screen warnings on the displays at the base and cage location, if the booms are raised and the allowable tilt limit is detected.

8.Muting and suspension of safety functions;

None.

9.Control modes;

The tilt system has no user controllable modes of operation.

10.Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of transducers, board (box), PLC and connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by simulating a locked condition and correspondent rearming. See “Means for easy and safe trouble shooting”
- Check correct operation of the boom switch.

The tilt sensor will not normally require special maintenance. Should special maintenance be required please observe the following precautions.

- Cut off power supply before every check or replacement.
- Do not weld on machine structure before removing power supply (positive and negative) and detaching boxes from vehicle frame or possible connections towards vehicle frame.
- Provide suitable mechanical protections for connection wires, paying particular attention for transducers.
- Do not place board, transducers or cabling close to sources of heat, electromagnetic interferences or power transmissions.
- Do not touch directly boards, transducers and boxes with flushing or degreaser fluids under pressure.
- Do not cut holes in the base control box.

11.Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

If parts require replacement only replace the whole such as Tilt Sensor, Safety Switch, PLC or Hydraulic valve block.

Do not attempt to open the tilt sensor or replace components soldered to any PCB.

Do not attempt maintenance of hydraulic components i.e. replace seals or internal component.

Only Niftylift original and supplied parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the tilt sensor system

With booms slightly raised so that the boom switch is fully depressed, drive onto a slope equal to the rated angle of the machine. The machine should cease driving and apply the brakes as soon as the level is reached.

13.Information explaining the applications for use relevant to the category to which reference is made**;**

Not applicable.

14.Checking test intervals where relevant.

Check the operation of the tilt sensor system to be made at the beginning of every duty cycle.

A2 LIMITATION OF TRAVELLING SPEED

The limitation of travelling speed interlock, also known as the elevated drive speed system, is PL c in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022.

1.The limits of the safety-related parts to the category selected and any fault exclusions;

The elevated drive speed system is only active when the telescoping booms are elevated outside of the lowered transport configuration such that the boom switch is actuated.

Depending on the state of the boom switch contacts the PLC controls if elevated drive speed is selected.

The boom switch is actuated by the boom switch cam. Proper maintenance and daily safety checks to be observed.

It is reasonably foreseeable misuse if an operator tries to override the boom switch in order to bypass the tilt system. Therefore, the system has been designed such that this is not possible without modification of the machine using tools.

If the boom or tele switch is removed or if it is not maintained in accordance with the appropriated documentation the elevated drive speed system may not function in compliance with the requirements as a PL c device.

2. *The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);*

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried on by appropriately trained and competent persons.

3. *The effects of deviations from the specified performance on the safety function(s);*

If the elevated drive speed interlock does not function as intended it is possible that the Niftylift may experience dramatic dynamic effects which may adversely affect the stability of the product.

If the product becomes unstable, damage to the Niftylift, other equipment and properties, injury or loss of life of the operator and surrounding persons may be a risk.

4. *Clear descriptions of the interfaces to the SRP/CS and protective devices;*

The elevated drive speed interlock consists of the booms down switch a PLC and an electronically controlled hydraulic proportional spool valve.

If the drive forward or backwards functions are selected when the booms are in the lowered transport position the PLC will control the drive valve allowing the full speed drive functions. If the drive forward or backwards functions are selected when the booms are elevated outside of the lowered transport configuration the output from the PLC Limits the drive signal sent to the drive valve to reduce the drive speed.

5. *Response time*

The boom switch is active at all times providing the correct signal in relation to the position of the booms. With the booms in the raised position or the telescopic sections are extended the system will prevent high speed drive functions from being performed until the booms have been lowered or telescoped in.

6. Operating limits (including environmental conditions);

All components within the elevated drive speed are rated to the environmental conditions acceptable for the machine; refer to Section 2.2.

7. Indications and alarms;

There are no indicators or alarms to show that the Niftylift is under the control of the elevated drive speed interlock.

8. Muting and suspension of safety functions;

None.

9. Control modes;

The elevated drive speed interlock has no user controllable modes of operation.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Check correct operation of the boom switch.

11. Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

If parts require replacement only replace the complete item such as Safety Switch, PLC or Hydraulic valve block.

Do not attempt maintenance of hydraulic components i.e. replace seals or internal component.

Only Niftylift original and supplied parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the elevated drive speed system

1) Ensure that the Niftylift has sufficient clearance in all directions to drive for a minimum distance to ascertain that the elevated drive speed in correct.
2) Power on the Niftylift and select the cage control location.
3) From the cage control elevate the booms sufficiently high enough off the booms rest such that the boom switch is fully actuated.
4) By the use of the drive forward and backwards functions in turn, depress the joystick trigger and depress the joystick in the desired direction.
5) Observe that that the speed of the drive functions is no more than 1km/h. This can be characterised as a very slow walking pace.
6) Release the joystick to cease driving operations.

13. *Information explaining the applications for use relevant to the category to which reference is* made;

Not applicable

14. Checking test intervals where relevant.

Check the operation of the elevated drive system to be made at the beginning of every duty cycle.

A3 LOAD SENSING SYSTEM

The Load sensing system is PL d in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022

1.The limits of the safety-related parts to the category selected and any fault exclusions;

The load sensing system is comprised of a Load Cell, the Master PLC, and the safety related power control devices.

The Load Cell is a Category 2 architecture dual channel device, that processes the input from a single load cell bridge on the load cell body. Two amplifier circuits process the input, along with monitoring other variables such as supply voltage to determine if there are any system faults present that would prevent correct operation of the system.

The two amplifier circuits inside the Load Cell communicate the load measurements to the Master PLC using the CANOpen Safety communication protocol, and the Master PLC compares the measurements from both to check that the error between the two channels is small, operating conditions are correct, and that the Load Cell measurements are within the allowable operating range.

If the Master PLC determines any of these checks to have failed, it activated the Load sensing safety function.

2.The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s)

No part of the load cell body or its internals are user serviceable.

If the unit is damaged (e.g. electrically, mechanically) such that it no longer functions correctly, the whole load cell must be replaced.

Calibration and Maintenance must only be carried out by appropriately trained and competent persons.

3. The effects of deviations from the specified performance on the safety function(s)

Consult the Load Sensing Functional Requirements Specification (00000995C1) for information.

4.Clear descriptions of the interfaces to the SRP/CS and protective devices

The load sensing system is comprised of a Cage Load Sensor (the Load Cell), the Master PLC, and the safety related power control devices.

If the Load Sensing System triggers the Load Sensing safety function, an alarm will sound, and a clear visual indication will be given at each control location (e.g. overload warning symbol displayed on a screen).

If Load Sensing was triggered by a cage overload, the safety function will remain triggered as long as the cage load exceeds the rated load. Once the cage load is reduced below 100% of the rated load, the safety function will enable the machine to return to its standby state ready for a new command.

If Load Sensing was triggered by a system fault, the safety function will remain triggered as long as the fault persists. Once the fault is removed, the safety function will enable the machine to return to its standby state ready for a new command.

5.Response Time

The Load Sensing System is always active when the machine is powered on. The load measurement response time is near instantaneous; however delays are implemented to prevent nuisance tripping of the system due to transient loads from vibration, shock loads, etc.

When the machine is stationary, the application of an overload continuously for 2 seconds will trigger the load sensing system

When the machine is in motion (i.e., stabiliser, booms, or drive functions are active), the application of an overload continuously for 4 seconds will trigger the load sensing system.

6.Operating limits (including environmental conditions)

The Load Cell is rated to the environmental conditions acceptable for the machine.

Calibration of the Load Cell must occur within the ambient temperature range of +10°C to +30°C.

For more information on the other Load sensing System components operating limits, the machine specific functional safety documentation must be consulted.

7 Indications and alarms

If the Load Sensing Safety Function is triggered, an alarm will sound. If the Load Sensing Safety Function is triggered, a visual indication at each control location will indicate that the cage has been overloaded (e.g. overload warning symbol displayed on a screen).

Machines featuring a display will show continuous feedback of the cage load amount as a percentage of the rated load (limited to between 0% and 100%).

8. Muting and suspension of safety functions

It is not possible to Mute or Suspend the load sensing safety function whilst the control system is active.

9. Control modes

In normal operating conditions, there are no user controllable modes of operation. Special machine modes are available to allow the below operations, however these have restricted access using a single use pass code available from Niftylift to competent persons only:

Calibration Mode (full rated load)

Calibration Mode (partial rated load)

Overload Test Mode (150% rated load. Operation from the base controls only on flat level ground)

10. Maintenance; Maintenance check lists

The Load Cell unit does not require any periodic maintenance.

The Load Sensing System does not require periodic calibration.

The condition of the wiring between the load cell and the PLC (including into and out of any intermediate control assemblies) should be inspected for condition and correct connection.

The condition of the load cell body should be inspected for damage to the protective coating, evidence of corrosion, damage to the strain measurement surfaces (top and bottom potted areas).

Isolate the machine power supply(s) before check/replacement of components.

Do not weld onto the machine structure before isolating all of the machine power supply(s), and disconnecting the load cell from the machine wiring.

Do not place the Load Cell or it's cabling close to sources of heat, electromagnetic interferences or power transmissions.

Do not modify the wiring between the Load Cell and the PLC, except in accordance with the machine schematic (e.g. fitting Niftylift supplied customer option wiring adaptors).

11. Ease of accessibility and replacing of internal parts;

No part of the Load Cell or Master PLC are user serviceable. Components must be replaced as a whole unit.

Wiring between control units may be repaired in line with the machine schematic, or replaced using Niftylift supplied spare parts.

12. Means for easy and safe trouble shooting;

To check for the correct operation of the Load Sensing System:

1. Ensure the cage is empty of all non-permanent equipment.

2. Power on the machine, and select the Base control location.

3. Allow the machine to complete its power up procedures, and ensure it is in standby ready to receive control commands. Observe the cage load feedback on the HMI, this should indicate 0% cage load.

4. Observe the error code feedback on the HMI. There should be no Load Sensing related faults recorded on the machine. If there are load sensing faults recorded, address the recorded faults first, prior to commencing with further troubleshooting.

5. Press the Base Green Button and observe that the machine operates booms functions with no load in the cage (the full range of motion does not need to be tested). There should be no Alarms.

6. Select the Cage control location, and enter the cage.

7. Press the Cage Green Button or Foot Switch and observe that the machine operates booms functions (the full range of motion does not need to be tested). The HMI should feedback a partial cage load as a percentage of the rated load from the machine serial plate. There should be no Alarms.

8. Add sufficient load to the cage to exceed the rated load from the machine serial plate (do not exceed the rated load by an excessive amount or permanent damage to the Load Sensing System or the Niftylift may occur). The alarm should sound, and there should be an overload warning indication displayed at both the base and cage control locations. Where fitted, the White Button(s) should be flashing.

9. Press the Cage Green Button or Foot Switch and observe that booms and drive functions will not operate.

10. Exit the Cage, and select the Base control location.

11. Press the Base Green Button and observe that booms functions will not operate.

12. Remove sufficient load from the cage to bring the measured load below 100% of the rated load. The alarm should cease, and the HMI should feedback a partial cage load as a percentage of the rated load from the machine serial plate. Where fitted, the White Button(s) should stop flashing.

13. Press the Base Green Button and observe that the machine operates booms functions (the full range of motion does not need to be tested). There should be no Alarms.

14. Remove the load from the cage

15. Observe the error code feedback on the HMI. There should be no Load Sensing related faults recorded on the machine.

16. Power off the Niftylift.

13. Information explaining the applications for use relevant to the category to which reference is made.

Not applicable.

14. Checking test intervals where relevant.

The Load Cell and Master PLC perform their own internal checks at the required intervals. No checks are required by the user.

15. Proof Testing

The Load Cell and Master PLC perform their diagnostics continuously during operation. No manual proof tests are required by the user.

A4 INTERLOCKING OF CONTROL POSITIONS

The interlocking of the control positions is PL c in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022

1. The limits of the safety-related parts to the category selected and any fault exclusions;

The physical interlocks between the multiple control positions are controlled through primarily hydraulic means such that neither position takes sole command unless selected. The alternate control position is then rendered inoperative by isolation of that control circuit. **Proper maintenance and daily safety checks to be observed.**

2. The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried on by appropriately trained and competent persons, who are conversant with all modes of operation, speeds and characteristics of this model.

3. The effects of deviations from the specified performance on the safety function(s);

If the interlocking of the control positions does not function as intended it is possible that the Niftylift may allow modes of operation that render it potentially dangerous.

If the controls do not remain independent in their operation, damage to the Niftylift, other equipment and properties, injury or loss of life of the operator and surrounding persons may be a risk.

4. Clear descriptions of the interfaces to the SRP/CS and protective devices;

Each control position is capable of being activated by means of a key operated 'control location selector' which both electrically and hydraulically isolates the other circuit when one is selected. The reliability of this function depends on the correct device operator in conjunction with the appropriate contact and internal wiring.

5. Response time

Operation of the mode selector key switch is immediate. Control authority is transferred over and no residual power functions remain with the alternate control position, other than the emergency stop controls.

6. Operating limits (including environmental conditions);

All components within the control interlock system are rated to the environmental conditions acceptable for the machine; see Section 2.2.

7. Indications and alarms;

None, other than by key position.

8. Muting and suspension of safety functions;

None.

9. Control modes;

The control circuit will permit independent operation of either control position with the key positions: OFF, BASE and CAGE.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of switch operators, (Key switch) and connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by selection of the alternate control position and then checking that the green button is inert at the non-selected position.

11. Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

Individual parts of the control devices can be replaced, ensuring like-for-like exchange of parts, security of the wiring and polarity of components if applicable (Diode outputs etc.)

Only Niftylift original parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the load sensor system.

1. Power on the Niftylift and select the base control location.
2. Allow the power circuits to cycle and ensure the machine is ready for the command signal.
3. Press the base green button and observe that the machine is ready to function with no load in the cage. (Machine runs, pump flow is available for machine functions.)
4. Leave the base key in the ground control position and mount into the cage.
5. Enable the cage controls and then press the cage green button or foot switch to enable the machine functions. Check that no controls are active and that no functions are permitted with the key in the 'ground' control position.
6. Have the base key switch position altered to the Cage position. Check that the control functions are now transferred to the cage, and that all controls are active.
7. Dismount from the cage and check the ground controls are now inoperative. All checks are then complete.
8. Power off the Niftylift.

13. Information explaining the applications for use relevant to the category to which reference is made;

Not applicable

14. Checking test intervals where relevant.

Check the operation of the control position interlock to be made at the beginning of every duty cycle.

A5 PREVENT MOVEMENTS OF LOAD HOLDING CYLINDERS IN CASE OF PIPE FAILURE

The load holding system is PL c in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022

1.The limits of the safety-related parts to the category selected and any fault exclusions;

The load holding system comprises of a load holding device mounted to the cylinder.

2.The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

In the event of a hose failure ensure a recovery plan is in place that does not require the movement of the affected cylinder. A safe route of recovery might involve the replacement in-situ of the failed hose before further movement of the machine is possible.

Maintenance must only be carried on by appropriately trained and competent persons.

3.The effects of deviations from the specified performance on the safety function(s);

If the load holding system of the product does not function as intended the angle of the booms may not be maintained.

If the angle of cage is not maintained there is an increased risk of ejection of tools and equipment from the cage;

In the event of the operator or other occupants of the cage not using the required safety equipment they may be ejected from the cage and serious injury or death may occur.

There is a load holding device contained within the assembly of the slave levelling cylinder such that if a hose fails the cage position is maintained until the operator can be recovered from the cage.

4.Clear descriptions of the interfaces to the SRP/CS and protective devices;

The load holding system comprises of a pilot operated over centre valve on each load holding cylinder.

The opening of the load holding valve is dependent on the application of a pilot pressure in the descent line to bring the machine down. Excessive over pressure either by overload or thermal expansion can induce an over centre pilot descent until the excess pressure condition is removed.

5.Response time

The load holding system is a direct acting hydraulic system and as such the response time is near instantaneous.

6.Operating limits (including environmental conditions);

All components within the load holding system are rated to the environmental conditions acceptable for the machine; see Section 2.2.

7.Indications and alarms;

There are no indicators or alarms to show that the Niftylift load holding system is functioning.

8.Muting and suspension of safety functions;

It is not possible to suspend the operation of the load holding system.

9.Control modes;

The load holding system has two modes of operation

1) Normal movements of the booms cause the system to constantly adjust the cylinders to maintain machine position and load holding.
2) Manual adjustment to recover the machine under emergency conditions.

10.Maintenance; Maintenance check lists;

Normal maintenance

- Removal of air from the hydraulic system if the product is left unused for long periods of time.

11.Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

If parts require replacement only replace the whole components such as hoses, hydraulic cylinders or load holding and over centre valve.

Do not attempt maintenance of hydraulic components i.e. replace seals or internal component.

Only Niftylift original and supplied parts shall be used.

12.Means for easy and safe trouble shooting;

Elevate the luffing booms and check that the cage remains level and the booms remain in their elevated position. If the cage does not remain level the system should be serviced by trained persons fully conversant with the function of the system.

13.Information explaining the applications for use relevant to the category to which reference is made;

Not applicable

14.Checking test intervals where relevant.

Check the operation of the load holding system to be made at the beginning of every duty cycle.

A6 INTERLOCKING OF TRAVEL CONTROLS

The interlocking of the control positions is PL b in accordance with ISO 13849-1:2015 as required by BS EN 280-1:2022

1. The limits of the safety-related parts to the category selected and any fault exclusions;

The interlock to prevent simultaneous operation of the booms and travel controls consists of a PLC which checks all cage controls. The PLC which controls the outputs does not allow a booms and a drive function to operate simultaneously. **Proper maintenance and daily safety checks to be observed.**

2. The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried out by appropriately trained and competent persons, who are conversant with all modes of operation, speeds and characteristics of this model.

3. The effects of deviations from the specified performance on the safety function(s);

If the interlocking of the travel controls does not function as intended it is possible that the Niftylift may allow modes of operation that render it potentially dangerous.

If the controls do not remain independent in their operation, damage to the Niftylift, other equipment and properties, injury or loss of life of the operator and surrounding persons may be a risk.

4. Clear descriptions of the interfaces to the SRP/CS and protective devices;

The PLC that controls the boom or travel controls is located in the superstructure of the machine.

5. Response time

Loss of the boom functions is immediate as soon as a drive or steer function is selected.

6. Operating limits (including environmental conditions);

All components within the travel control interlock system are rated to the environmental conditions acceptable for the machine; see Section 2.2.

7. Indications and alarms;

None.

8. Muting and suspension of safety functions;

None.

9. Control modes;

Either drive or booms operation modes are available.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of all levers including the mechanical links from the levers to the valve spools.
- Ensure the smooth and uninterrupted operation of Drive controls.
- Check the loss of functions for all boom movements with the machine drive functions are operated and held to one end of travel. No boom functions should be available if any drive function is operated. Repeat for drive, but when doing so, be aware of the possibility of the machine moving as the control functions are checked. This should be performed in a clear, open area.

11. Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

Only Niftylift original and supplied parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the travel control interlock.

1. Power on the Niftylift and select the cage control location.
2. Allow the power circuits to cycle and ensure the machine is ready for the command signal.
3. Press the base green button and operate a boom function to raise.
4. At the same time, operate the trigger and steer the drive wheels in one direction or the other.
5. Observe that the boom control function is lost and does not return until the steer lever is released.
6. In a clear area, repeat for a drive forward/ drive backward lever function whilst operating a boom raise command.
7. Observe that the boom control function is lost and does not return until the drive lever is released.
8. Power off the Niftylift.

13. Information explaining the applications for use relevant to the category to which reference is made;

Not applicable

14. Checking test intervals where relevant.

Check the operation of the travel control interlock to be made at every service interval.

A7 EMERGENCY STOP SYSTEM

The Emergency stop system is PL d in accordance with BS EN ISO 13850:2015 as required by BS EN 280-1:2022.

1.The limits of the safety-related parts to the category selected and any fault exclusions;

There is a 2 channel input from both a base E-stop and a cage E-stop button into the base PLC. Each button operates a normally open and a normally closed switch contact. The failure mode of "Will not open" for the NC contact is excluded. If either E-stop button is pressed by the operator the booms enable valve and drive valve will de-energize disabling machine boom and drive functions. Rotating machinery (engines, motors, pumps etc.) will also be stopped, to render the machine inert.

Reasonably foreseeable misuse

2.The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried on by appropriately trained and competent persons, who are conversant with all modes of operation, speeds and characteristics of this model.

3.The effects of deviations from the specified performance on the safety function(s);

If the Emergency stop system does not function as intended it is possible that the Niftylift may function when the E-stop is pressed.

If the product moves unexpectedly, damage to the Niftylift, other equipment and properties, injury or loss of life of the operator and surrounding persons may be a risk.

4. Clear descriptions of the interfaces to the SRP/CS and protective devices;

The Emergency stop system comprises of primary devices, the 2 Emergency stop buttons and a PLC, and protective devices, for example solenoid operated booms enable valve and the proportional drive valve.

If the E-stop system is activated the system will not re-set until the button has been released.

5. Response time;

Operating the emergency stop is immediate

6. Operating limits (including environmental conditions);

All components within the emergency stop system are rated to the environmental conditions acceptable for the machine; see Section 2.2.

7. Indications and alarms;

When activated the emergency stop button remain visually in an operated position

8. Muting and suspension of safety functions;

If the E-stop button in the cage is operated the operator at the base may override this E-stop by changing the control location to the base using the key switch located at the base. The cage operator may then release the E-stop and operate it again to disable drive and boom functions. All audible and visual alarms will remain active regardless of e-stop position.

9. Control modes;

The emergency stop system has no user controllable modes of operation.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by simulating an emergency stop. See “Means for easy and safe trouble shooting”

The emergency stop will not normally require special maintenance.

Should special maintenance be required please observe the following precautions.

- Cut off power supply before every check or replacement.
- Do not weld on machine structure before removing power supply (positive and negative) and detaching boxes from vehicle frame or possible connections towards vehicle frame.
- Provide suitable mechanical protections for connection wires, paying particular attention for transducers.
- Do not place board, transducers or cabling close to sources of heat, electromagnetic interferences or power transmissions.
- Do not touch directly boards, transducers and boxes with flushing or degreaser fluids under pressure.
- Do not pierce the board box.
- Seal the box and/or the panel who contains the electronic board, to reveal any not authorized access or tampering.

11. Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

If parts require replacement only replace the complete item such as the contact blocks, PLC, or Hydraulic valve block.

Do not attempt to open the main base PLC or replace components soldered to any PCB.

Do not attempt maintenance of hydraulic components i.e. replace seals or internal component.

Only Niftylift original and supplied parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the emergency stop system

1. Power on the Niftylift and select the base control location.
2. Allow the power circuits to cycle and ensure the machine is ready for the command signal.

3. Press the base green button and observe that the machine is ready to function with no load in the cage. (Machine runs, pump flow is available for machine functions.)
4. Select the Cage control position and mount into the cage.
5. Enable the cage controls and then press the cage green button or foot switch to enable the machine functions. (Machine runs, pump flow is available for machine operation.)
6. Press the cage emergency stop button. Press the green button or foot switch and observe that machine movements have been halted.
7. Release the cage emergency stop button, switch the controls to the base and repeat for the base emergency stop button.
8. Power off the Niftylift.

13. Information explaining the applications for use relevant to the category to which reference is made;

Not applicable

14. Checking test intervals where relevant.

Check the operation of the emergency stop system to be made at the beginning of every duty cycle.

A8 SiOPS

The Sustained Involuntary Operation Prevention System (SIOPS) is PL d in accordance with BS EN ISO 13849-1:2015 as required by the machine risk assessment.

1.The limits of the safety-related parts to the category selected and any fault exclusions;

The SiOPS is always active. The system input is a two-channel which takes the signal from the cage console, the console position is determined, and in the case of an involuntary operation, machine function ceases

Proper maintenance and daily safety checks to be observed.

2.The limits of the SRP/CS and any fault exclusion, for which, when essential for maintaining the selected category or categories and safety performance, appropriate information (e.g. for modification, maintenance and repair) shall be given to ensure the continued justification of the fault exclusion(s);

Do not alter, modify or disable in any way the controls, safety devices, interlocks or any other part of the machine.

Maintenance must only be carried on by appropriately trained and competent persons, who are conversant with all modes of operation, speeds and characteristics of this model.

3.The effects of deviations from the specified performance on the safety function(s);

If the SiOPS does not function as intended it is possible that the operator or operators may be exposed to a crushing hazard

If the operator or operators experience a crushing hazard they may be subject to severe injury or loss of life.

4. Clear descriptions of the interfaces to the SRP/CS and protective devices;

The SiOPS comprises of a primary device the “console switches”, a PLC and protective devices, for example solenoid operated boom enable valve and proportional drive valve.

If SiOPS is triggered the machine functions will stop.

5. Response time;

The SiOPS system is always active when the machine is in use

6. Operating limits (including environmental conditions);

All components within the SiOPS are rated to the environmental conditions acceptable for the machine; see Section 2.2.

7. Indications and alarms;

The action of the SiOPS will cause the cage and base green buttons to flash, and if the safety function remains triggered for more than 15 seconds, it will cause the klaxon (if fitted) to sound and will be indicated by the blue warning light on the cage location.

8. Muting and suspension of safety functions;

In the case of the SIOPS being detected the alarm (if fitted) can be silenced by releasing the green button or footswitch. Suspension of the function will continue until the green button is released.

9. Control modes;

The SiOPS system has no user controllable modes of operation, other than when an operator activates the SiOPS system.

10. Maintenance; Maintenance checklists;

Normal maintenance

- Visual check of connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by simulating a SiOPS condition and correspondent re-setting. See "12. Means for easy and safe trouble shooting"

The switches will not normally require special maintenance

Should special maintenance be required please observe the following precautions.

- Cut off power supply before every check or replacement.
- Do not weld on machine structure before removing power supply (positive and negative) and detaching boxes from vehicle frame or possible connections towards vehicle frame.
- Provide suitable mechanical protections for connection wires, paying particular attention for transducers.
- Do not place board, transducers or cabling close to sources of heat, electromagnetic interferences or power transmissions.
- Do not touch directly boards, transducers and boxes with flushing or degreaser fluids under pressure.
- Do not make holes in the board box.
- Seal the box and/or the panel who contains the electronic board, to reveal any not authorized access or tampering.

11. Ease of accessibility and replacing of internal parts;

Replacement of parts should only be carried out by appropriately trained and competent persons.

If parts require replacement only replace the whole such as input switch, PLC, PCB. Do not attempt to open the PLC or replace components soldered to any PCB.

Do not attempt maintenance of hydraulic components i.e. replace seals or internal component.

Only Niftylift original and supplied parts shall be used.

12. Means for easy and safe trouble shooting;

To check the operation of the SiOPS system

1. Power on the Niftylift and select the cage control station.
2. Allow the power circuits to cycle and ensure the machine is ready for the command signal.
3. Press the cage foot switch or cage green button and operate the machine functions from the cage. (Machine runs, pump flow is available for machine functions, drive functions)
4. Whilst operating the machine from the cage foot switch or cage green button, apply pressure to the cage console and observe that the functions will stop operating. With the pressure being applied to the cage console, both the cage and the base green buttons should be flashing green.

5. If the pressure remains applied to the cage console for 15 seconds observe that the klaxon (if fitted) sounds and the blue warning light flashes.
6. Check that the machine functions (Machine runs, pump flow is available for machine operation) are not available.
7. To check the SiOPS override functionality from the cage controls, while maintaining pressure on the cage console, release either the footswitch or cage green button and then re-press the cage green button. Machine functions will return (Machine runs, pump flow is available for machine operation.)
8. To check the SiOPS override functionality from the base controls. Repeat steps 4, 5 and 6 with a second operator, select the base control station. While maintaining pressure on the cage console, press base green button. Machine functions will return (Machine runs, pump flow is available for machine operation.)
9. Remove the pressure from the cage console and observe that the flashing green buttons, the klaxon (if fitted) and the blue warning light should stop. Normal operation will be returned.
10. Power off the Niftylift.

13. Information explaining the applications for use relevant to the category to which reference is made;

Not applicable

14. Checking test intervals where relevant.

Check the operation of the SiOPS system to be made at the beginning of every duty cycle.

15. Proof testing

None.

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