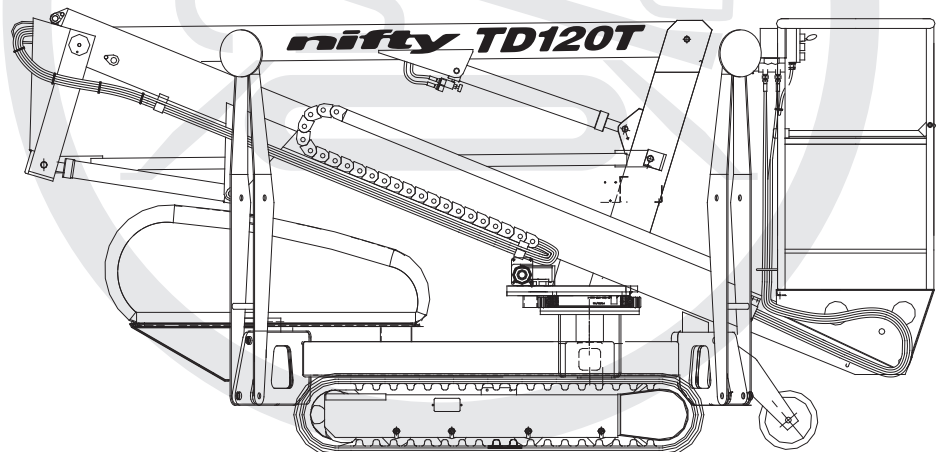


nifty

TrackDrive

Operating & Safety Instructions
MODEL TD120T/TD34T SERIES



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M50261/06



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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 HHAZARDS 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 TD120T (TD34T), mains electric (AC), diesel (D), petrol/gasoline (P) engine, or a combination of these.

For further technical information, circuit diagrams and specific instructions for all maintenance which may need to be carried out by specialist trained personnel, see the associated Workshop and Parts manual for your model of Niftylift TD120T (TD34T).

1.3 INTRODUCING THE TD120T TRACK DRIVEN (TD) 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 you require further information after reading this manual, please do not hesitate to contact us.

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

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

The Niftylift TD120T (Track Drive) is an extremely versatile articulated boom platform of unique and simple design. It is capable of placing two men and their tools up to a height of 12.20m (40ft) or an outreach of 6.10m (20ft 1in).

The booms are mounted via a 406⁰ powered swing mechanism on to a compact base mounted on rubber tracks. The fourth boom is telescopic, and when combined with the use of the articulating booms gives an outstanding working envelope. The powered tracks enable the machine to reach areas previously thought unattainable.

The four outriggers make a simple and swift set up possible. A unique pressure sensitive micro switch system fitted to each outrigger prevents operation of the machine until all outriggers have been correctly deployed and also provides a loud audible alarm warning of a possibly hazardous situation.

Standard build is four fully hydraulically operated outrigger legs, with integral load holding valves mounted on each outrigger cylinder.

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

Models include the following:

DAC: - DIESEL & AC ELECTRIC

D: - DIESEL ONLY

P: - PETROL ONLY

PAC: - PETROL & AC ELECTRIC

PG: - PETROL & LPG (PROPANE)


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1.4 GENERAL SPECIFICATION

FEATURE	TD120T (TD34T)	
MAXIMUM HEIGHT - WORKING	12.2m 40ft	
MAXIMUM HEIGHT - PLATFORM	10.2m 34ft	
MAXIMUM HEIGHT - STOWED	1.9m 6ft 3in	
MAXIMUM OUTREACH	6.1m 20ft 1in	
MAXIMUM WIDTH - TRANSIT	1.1m 3ft 7in	
MAXIMUM WIDTH – TRANSIT (VARIABLE TRACKS)	1.5M 4ft 11in	
JACK SPREAD	3.55m 11ft 8in	
MAXIMUM LENGTH - STOWED	3.95m 12ft 11in	
MAXIMUM CAPACITY - (EUROPEAN) (USA)	200kg (440lbs) 500lb	
TURRET ROTATION	406°	
TURRET TAIL SWING	Zero	
MAXIMUM TRAVEL SPEED	1.04 mph (High) 1.67 kph	0.62 mph (Low) 1.0 kph
PLATFORM SIZE - LENGTH X WIDTH	0.65m x 1.1m 25in x 44in	
CONTROLS	Full proportional hydraulic	
HYDRAULIC PRESSURE	200 bar	
TRACKS	1745 x 250 Rubber	
GRADEABILITY	60% (31°)	
GROSS VEHICLE WEIGHT (MAXIMUM)	1,890kg 4,167lb	
MAXIMUM GROUND PRESSURE	0.038kN/cm ² 7,940lb/ft ²	
POWER SOURCE	P (G) (Petrol/Gasoline) models - Honda Engine D (Diesel) models - Kubota 722E engine	

1.5 IDENTIFICATION (UK PLATE)

			
NIFTYLIFT LTD. RINGLE DRIVE, STONEBRIDGE MILTON KEYNES MK13 0ER ENGLAND TEL 01908 223456 : FAX 01908 312733 e-mail : info@niftylift.com			
SERIAL No			
TYPE			
YEAR OF MANUFACTURE			
WEIGHT			kg
RATED LOAD	PERSONS	+	kg
MAXIMUM SAFE WORKING LOAD			kg
MAXIMUM PULL			N
MAXIMUM WIND SPEED			m/s
MAX. ALLOWABLE INCLINATION			Deg.
MAXIMUM HYDRAULIC PRESSURE			bar
MAXIMUM VOLTAGE			V
AMPS			A
ELEC. CCT D	ISSUE		
HYD. CCT D	ISSUE		
			P10805

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

1.6 EC DECLARATION OF CONFORMITY (Typical)



EC DECLARATION OF CONFORMITY

MANUFACTURER
AND PERSON
RESPONSIBLE FOR
DOCUMENTATION:

**NIFTYLIFT LTD
MARTIN CROSS**

ADDRESS:

**CHALKDELL DRIVE,
SHENLEY WOOD,
MILTON KEYNES,
MK5 6GF,
ENGLAND.**

MACHINE TYPE:

MOBILE ELEVATING WORK PLATFORM

MODEL TYPE:

SERIAL NUMBER:

** /*****

APPROVED BY:

**NIFTYLIFT LTD
CHALKDELL DRIVE,
SHENLEY WOOD,
MILTON KEYNES,
MK5 6GF,
ENGLAND.**

TECHNICAL FILE NUMBER:

APPLICABLE STANDARDS:

EN 280:2013
DIN EN 60204-1, 2006/42/EC

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

SIGNED:

DATE: 19/10/2015

NAME: Steven Redding

POSITION: Development Director

NOTE:

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

2 Safety

2.1 MANDATORY PRECAUTIONS

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

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



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

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

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- 2.1.8** Never exceed the maximum platform capacity, as indicated on the decals and machine serial plate.
- 2.1.9** Only operate the Niftylift on a firm level surface.
- 2.1.10** Never position any part of the Niftylift inside the **Minimum approach distances (MAD)** to above-ground electrical conductors as listed in the table below. (Reference ISO 18893:2014).

Voltage range (kV)	MAD (m)
<0.7	1
≥0.7 to 7	1.2
>7 to 50	3
>50 to 220	4
>220 to 500	5
>500 to 750	10
>750 to 1000	13
>1000 to 1250	16



THIS MACHINE IS NOT INSULATED.

If in doubt, contact the local appropriate governing authority.

- 2.1.11** On entering the platform, ensure that the drop down entry bar is closed afterwards.
- 2.1.12** Use of an approved safety belt and lanyard, hardhat and appropriate safety clothing is mandatory. Fasten harness to designated harness securing points within the platform and do not remove until leaving the platform whilst in the stowed position.
- 2.1.13**  Always remain standing within the platform. Do not attempt to increase your height or reach by standing and/or climbing on the platform guardrails or any other object. **KEEP YOUR FEET ON THE PLATFORM FLOOR.** Do not sit, stand or climb on the guardrail, mid rail or boom linkage. Use of planks, ladders or any other devices on the Niftylift for achieving additional height or reach shall be prohibited.
- 2.1.14** Do not use the platform levelling system to artificially increase the outreach of the platform. Never use boards or ladders in the platform to achieve the same result.
- 2.1.15** Do not use the platform to lift overhanging or bulky items that may exceed the maximum capacity or carry objects that may increase the wind loading on the platform. (e.g. Notice boards etc.)
- 2.1.16** The Niftylift shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds or similar equipment unless Niftylift Ltd in Great Britain approves the application in writing.
- 2.1.17** Always check the area below and around the platform before lowering or slewing to ensure that it is clear of personnel and obstructions. Care should be taken when slewing out into areas where there may be passing traffic. Use barriers to control traffic flow or prevent access to the machine.

- 2.1.18** Stunt driving and horseplay, on or around the Niftylift, shall not be permitted.
- 2.1.19** The aerial platform is not equipped for, or intended for use on a public highway.
- 2.1.20** When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the work place. Warnings such as, but not limited to, flags, roped off areas, flashing lights and barricades shall be used.
- 2.1.21** 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 of the type required. (For the USA refer to ANSI/NFPA 505)
- 2.1.22** 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.
- 2.1.23** 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.
- 2.1.24** The operator shall immediately report to his supervisor any potentially hazardous location(s) (environment) which become evident during operation.
- 2.1.25** If an operator encounters any suspected malfunction of the Niftylift or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation he shall cease operation of the Niftylift and request further information as to safe operation from his management, or owner, dealer or manufacturer before further operation of the Niftylift.
- 2.1.26** The operator shall immediately report to his superior any problems or malfunctions of the Niftylift, which becomes evident during operation. Any problems or malfunctions that affect the safety of operation shall be repaired prior to continued use.
- 2.1.27** The boom and platform of the Niftylift shall not be used to jack the wheels/tracks off the ground.
- 2.1.28** The Niftylift shall not be used as a crane.
- 2.1.29** The Niftylift shall not be positioned against another object to steady the platform.
- 2.1.30** Care should be taken to prevent rope, electric cords and hoses from becoming entangled in the aerial platform.
- 2.1.31** Batteries shall be recharged in a well-ventilated area free of flame, sparks or other hazards, (e.g. do not smoke near the machine) which may cause explosion. Highly explosive hydrogen gas is produced during the charging process.
- 2.1.32** When checking electrolyte levels, great care should be taken to protect eyes, skin and clothing. Battery acid is highly corrosive and protective glasses and clothing is recommended.



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

- 2.1.33** If the platform or elevating assembly becomes caught, snagged or otherwise prevented from normal motion by adjacent structure or other obstacles, such that control reversal does not free the platform, all personnel shall be removed from the platform safely before attempts are made to free the platform using ground controls.

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

2.1.35



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

2.1.36

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

2.1.37

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

2.1.38

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

2.1.39

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.

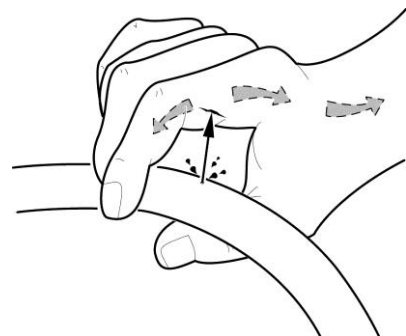
2.1.40

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.

2.1.41



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.



2.2 ENVIRONMENTAL LIMITATIONS

All Niftylift machines are limited to operation as previously described and any slopes must be adjusted by use of the outriggers and jacks. Unless specifically configured otherwise, the machine will have short time rating for operation in extreme temperatures, i.e. reduced battery cycle times for low temperatures such as freezers, food storage etc. and cooling limitations for high temperatures as oil temperature must remain between -23° and 93° Celsius.

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

Extended operation in dusty environments is not recommended and 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 also be removed.

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



DO NOT USE THE NIFTYLIFT IN ELECTRICAL STORMS

2.3 NOISE AND VIBRATION

The airborne noise emission on the 120T range of machines does not exceed 85dB(A), measured at a perpendicular distance of 10m, under equivalent continuous A-weighted sound pressure test conditions. This was based on a Diesel powered machine, working under load. All other models will exhibit significantly lower emissions than this figure, dependant on power option.

In normal operation the Vibration level to which the operator is subjected will not exceed a weighted root mean square acceleration value of 2.5 m/s².

2.4 TEST REPORT

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

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

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

3 Preparation and Inspection

3.1 UNPACKING

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

- A) Remove all ropes, straps and or chains used to secure the aerial platform during transit.
- B) Ensure any ramp, loading dock or forklift used is capable of supporting or lifting the aerial platform.

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

3.2 PREPARATION FOR USE

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



THIS IS NOT A REQUEST IT IS MANDATORY

To assist the user in this task you will find enclosed an Inspection Check List (see section 6.3), which must be filled out upon delivery/receipt of the machine.

Before the user carries out the Inspection Check List 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.

3.3 PRE-OPERATIONAL SAFETY CHECK SCHEDULES

Before use at the beginning of the work shift, the aerial platform shall be given a visual inspection and functional tests 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 battery is charged.
- 4) Check the fuel level (if applicable).
- 5) Check that canopies/covers and guards are in place and secure.
- 6) Check that the boom rest switch is operable (if applicable).
- 7) Check that control levers are secure and operate freely.
- 8) Check that operating buttons and emergency stop buttons function properly.
- 9) Check the operation of the manual hand pump.
- 10) Visually inspect all hydraulic hoses and fittings for damage or leaks.
- 11) Check operation of the stabiliser alarm.
- 12) Check that outrigger footpads are secure.
- 13) Check that the platform pivot pins and their tag bolts are secure.
- 14) Check security and operation of the boom clamp (if applicable).
- 15) Check the operation of the cage weigh system (If fitted).

3.3.2 WEEKLY SAFETY CHECKS

- 1) Inspect tracks and wheels for damage and wear.
- 2) Check tracks for correct tension – see manufacturers' handbook.
- 3) Check battery fluid levels and specific gravity (after charging) and general condition.
- 4) Check hydraulic oil level, ISO Grade 22 (Europe), Grade 32 (Rest of World).
- 5) Inspect the engine air filter and clean or replace if necessary.
- 6) Check operation and security of stabiliser micro switches in conjunction with the alarm system.
- 7) Inspect hose track for damage or missing parts.

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3.3.3 MONTHLY SAFETY CHECKS

- 1) Check the engine oil level (if applicable).
- 2) Check outriggers for condition, security and operation.
- 3) Check that the slew gearbox is secure and correctly in mesh. Clean and re-grease.
- 4) Grease the slew ring.
- 5) Inspect the engine fuel tank for damage or leaks.
- 6) Check telescopic boom wear pads and nylon studs (if applicable).
- 7) Check that the end cap on the main knuckle pin is secure and the roll pin is in place.
- 8) Lightly oil the jack pad ball joints and outrigger housings.
- 9) Check and adjust if necessary the Nylatron studs around the telescope boom.
- 10) Every **three** months check and verify the calibration of the cage weigh system (if fitted). See section 4.5.4 for the calibration procedure.
- 11) 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 and the oil filters.
- 4) Check that slew ring bolts are secure (torque 206ft lbs. 279Nm).

3.4 PLACARD, DECALS & INSTALLATION

ITEM	DESCRIPTION	NUMBER	QTY	
1	Safe Working Load	200kg	P14801	1
		(USA) 225kg	P17328	1
2	Hydraulic oil	P14415	1	
3	Footswitch	P14884	1	
4	Hydraulic Controls – Base	P14937	1	
5	General Warning - Icons	P29379	2	
6	General Warning - Text	P29380	2	
7	E-Stop warning	P14864	2	
8	Head Protection	P14921	1	
9	Machine Plate	P15383	1	
10	Cage Gate Warning	P18432	1	
11	IPAF training	P22055	1	
12	Crush Hazard	P14782	8	
13	Diesel Fuel Only	P14414	1	
14	Point Load 13kN	P14965	4	
15	Hydraulic Controls – Cage	P14927	1	
16	Manual Hand Pump	P19090	1	
17	Outrigger Alarm	P18842	2	
18	Overload Warning	P18848	2	
19	Outrigger	P16363	1	
20	Track Drive - Controls	P16364	1	
21	Harness Points	P14883	2	
22	No Step	P14785	1	
23	Outriggers	P14841	4	
24	General Notice	P21941	1	
25	Power to Cage Socket	P24787	1	
26	Nifty TD120T	P29881	4	
27	Niftylift.com	P14390	1	
28	Emergency Controls	P22877	1	
29	Tank Pressure	P16365	1	

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30	Black/Yellow Warning Stripes	N/A	A/R	
31	Cage Levelling	P10853	1	
32	Base Controls	P15881	1	
33	Cage controls	<i>Standard</i>	P12832	1
		<i>Cage weigh</i>	P18961	1
34	E-Stop background (USA)	P24893	1	
35	Operating Instructions	P14892	1	
36	Safe Cage Entry (USA)	P18192	1	
37	Noise Warning – 85dB	P17124	1	
38	Daily Safety Check List	P14908	1	
39	Tie Down Point	P14958	4	
40	Cage tie-down warning	P21404	2	
41	Booms/Drive Selector	P28433	1	
42	Manual Hand Pump Diverter	P28432	1	
43	Clunk Click	P19961	2	
44	Mains Power Socket	P25891	1	
45	Rotating Machinery (USA)	P15010	2	
46	ANSI compliance (USA)	P25250	1	
47	Caution – Canopy Damage	P26083	2	

Operating & Safety Instructions**3.5 TORQUE REQUIREMENTS**

BOLT QUALITY/SIZE	Tightening torque in lbs ft (Nm)					
	Plated			Unplated		
Grade	8.8	10.9	12.9	8.8	10.9	12.9
M 6	5 (7)	8 (10)	9 (12)	6 (8)	8 (11)	10 (13)
M 8	13 (17)	18 (25)	22 (29)	14 (19)	20 (27)	23 (32)
M 10	25 (34)	36 (49)	43 (58)	27 (37)	40 (54)	46 (63)
M 12	43 (58)	63 (85)	73 (99)	47 (63)	69 (93)	80 (108)
M 14	68 (93)	100 (135)	117 (158)	74 (101)	109 (148)	127 (172)
M 16	106 (143)	154 (209)	180 (245)	115 (156)	168 (228)	197 (267)
M 20	212 (288)	301 (408)	352 (477)	224 (304)	328 (445)	384 (521)
M24	362 (491)	515 (698)	602 (806)	383 (519)	561 (760)	656 (889)
WHEEL NUTS	N/A					
SLEW RING BOLTS	206ft lbs (279 Nm)					

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 OVERVIEW

4.1.1 CONTROL CIRCUIT COMPONENTS

CONTROL BOARD: - Situated under the canopy, the control board comprises a PCB (printed circuit board) design which incorporates all of the relays to control the machine operation. The control board is common between models with the same power source, and will contain, where appropriate, discrete fuses for the circuits concerned.

KLAXON: - Also mounted on the base is a klaxon, which performs several functions: - Firstly, it can be used as a manual alert, by pushing the “Horn” button at the platform control position. Secondly, it is this device which sounds continuously if a jack goes light during operation, with the booms raised, warning the operator of this condition. It will also sound if the Ground Control Key switch is turned to “Platform” before the jacks are deployed correctly.

BOOM-SWITCH: - Mounted on the side of Boom 1 near the boom rest and operated by contact with the boom 3, this switch controls the changeover function between jacks and platform. The jack control function is not available unless this switch is engaged with the boom, ensuring that the machine must be stowed to operate the hydraulic jacks. It is also similarly linked into the platform control circuit, such that if the switch is not engaged with the booms, (i.e. machine is in operation) then the outrigger sensors are active and would warn the operator of an unsafe condition, should one of them loose contact with the ground. 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.

HYDRAULIC DUTY SELECTOR VALVE: - Mounted on the top of Boom 1. Allows the selection of either ‘Booms’ or Outrigger’ control, operated from the rotary switch located in the cage. (Refer to Section 4.4.2)

DIESEL ENGINE: - Generally a Kubota 722E engine, described in the maintenance section of the Workshop Manual, driving a double bodied pump with direct mounted pump dump valve.

CONTROL BOX: - Located adjacent to the Diesel engine, the control box combines all of the functions for Dual power operation (Bi-energy machines), as well as controlling the Diesel engine. The relays in this box control Starting, High Throttle, Pump Dump, Duty Selector and Diesel stop timer. There is also an integral Thermal trip, which protects the Throttle solenoid and other functions.

PETROL ENGINE: - Generally a Honda engine, described in the maintenance section of the Workshop Manual, driving a double body pump with direct mounted pump dump valve.

PETROL BOX: - Located adjacent to the Petrol engine, the Petrol Box combines all of the functions for dual power operation, as well as controlling the petrol engine itself. The relays in this box control Starting, High Throttle, Pump Dump, Duty Selector and Engine Stop. There is also an integral Thermal Trip, which protects the Throttle solenoid and other functions.

LPG OPERATION: - On machines equipped for LPG operation (propane), the Honda engine will also have an LPG vaporiser, valve lock and micro-vac switch. The vapour take-off system requires a vaporiser to convert the liquid gas into an airborne mixture. This is then held by the micro-vac switch and valve lock until the engine turns over, creating a vacuum on the inlet to the engine carburettor. The micro-vac switch then tells the valve lock to open, admitting the gas to the engine. If the engine is halted, the system returns to normal, holding the gas until a re-start is attempted. When running on petrol, the main tap to the gas bottle should be securely closed to prevent the engine from trying to run on a mixture of the two fuels. If starting to run on LPG, it should be ensured that all petrol is discharged from the carburettor bowl before changing to LPG, since the engine will not run satisfactorily if any petrol is in the carburettor bowl.

4.1.2 POWER SELECTION

The Kubota engine, AC power pack, hydraulic reservoir and starter battery are all packaged beneath a two-piece fibreglass canopy, sandwiched between the two front jacks. Cold-starting the engine (See section 4.3.1) is permissible from the side of the canopy, and once running, all controls are situated at the head of the lowest boom.

If the machine is to be used in an enclosed area, or within a domestic setting, the diesel engine can be switched off and AC power selected. The auxiliary motor is a 1.5 kW single-phase motor (refer to motor plate for voltage) driving a direct coupled 1,5cc gear pump. This can be manually selected to provide hydraulic flow to either the Outriggers or the Booms.

Once plugged in, the electric motor will run whenever the platform Key switch is turned to the 'I' position. If the diesel engine is running, this will stop it. This interlock is there to prevent both power sources providing hydraulic flow at the same time. When the electric motor is running, hydraulic flow is available for switching between the Booms or the Outriggers. This is achieved by using the same control system described previously. The electric motor will provide adequate flow to deploy the outriggers, although their speed will be somewhat reduced. When directed to the Boom function, speeds are roughly the same as the diesel engine.

NB: If the diesel engine is needed for faster movement between work locations, it will be necessary to remove the mains plug from the socket, to allow the diesel engine to be started.

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING.



4.1.3 MANOEUVRING

Once the engine is running, the operator can manoeuvre the machine from the platform. On entering the platform and selecting 'drive' on the duty selector switch, the operator can now reach forward and grasp the two drive handles to enable the drive function. Depressing the platform mounted footswitch will energise the drive dump solenoids, at the same time bringing the diesel engine to full revs, if selected. If the levers are moved forwards or backwards, the twin tracks will drive the machine in the desired direction. If the levers are moved in opposition, the machine will turn. The control function of each handle is fully proportional, in as much as the final speed will be dependant on how far the lever is moved. Two drive speeds are available, one being a 'fast' tick over and the other high throttle. This function is selectable from within the platform, but is also limited by the tilt transducer, such that high travel speeds become unavailable when excessive working angles are encountered. It is recommended that all ramp angles are approached at minimum revs, allowing the machine to climb at the best speed for controllability.

To halt the drive function, release either the Drive handles or the footswitch. The drive motors feature automatic braking for load holding on un-level ground, as well as flow control devices to prevent over-speed when driving down gradients.

If difficult terrain is to be tackled, the operator can walk alongside the machine in 'Pedestrian' mode and manoeuvre the machine whilst adjacent to the right hand track. Two-travel speeds are available, the 'fast' mode being controlled by the on-board tilt transducer, which denies the use of high throttle when on an excessive slope. The Operator also has control of when high throttle is used, permitting the creep speed to remain under control. The drive system works from the platform mounted footswitch, controlling both the engine speed and the drive pump dump valve, for increased safety.

4.1.4 RAMPS AND INCLINES

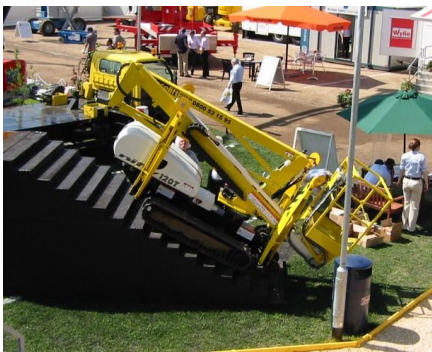
The ability of the Track Drive machine to ascend and descend slopes of up to 60% (31 degrees) introduces a new level of complexity to the use and operation of the machine. The operator must now be additionally responsible for assessing the suitability of the terrain to be tackled. Although within the capabilities of the machine, some areas would be undesirable for access, and present a real danger to the operators themselves or other people around at the time. In order to ascend a slope safely, it is best if the incline is approached 'square-on' to the angle, in order to maximise the grip and ensure an even drive effort by both tracks. The operator can quickly judge the maximum permitted angle by comparing the maximum angle of the slope to the front angled plate on the machine. If the slope is steeper than the approach plate, then the angle is outside the capability of the machine. Under no circumstances should an excessive slope be attempted.

When driving up a slope, it is recommended that the machine drive forwards, when driving down a slope, again drive forwards down it. The operator should be aware of the response of the machine when reaching or departing the top of a slope. The machine will climb, or descend until the balance of the tracks places more of the weight beyond the point of contact with the ramp and the tracks. The machine will then topple forwards or backwards to meet the next level. If the operator is in the platform, this sudden change of level will cause a fast angular movement, which they will have to counteract. Ensure a firm grip is taken of the platform handrail, keep the legs loose and do not lock the knees, and release the drive joystick as the machine changes level. If the drive speed becomes erratic at any time, this can be due to operator-induced oscillations on the drive levers. Again, release the levers, stabilise the machine and start driving again. Avoid sudden changes of drive lever position; a smooth driving action is much preferred.

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When climbing steps, a further judgement will be needed as to whether the weight of the machine, or the traction required to climb or descend would cause damage. Many domestic installations feature soft edge strips or boards to provide the front edge of the step. These edging strips are unlikely to tolerate the action of climbing and might detach causing degradation of the steps themselves. More importantly, the edge reliability is critical to the tractive effort and if less than adequate might cause the machine to 'slew' sideways on a step rather than climb. The risks to the operator are obvious, whether in the platform or driving from the side. A stair built from flagstones or loose blocks is not likely to support the weight or accept the track movement over it. Loose ramps or ply sheets to spread the track forces can be used, but again must be securely anchored to prevent the tracks from 'gripping' the surface and shooting the boards out from under the machine.



The single greatest factor affecting the ability of the Track Drive 120T to attack any slope, incline or stair is **traction**.

If there is inadequate adhesion between the tracks and the surface to which the machine is presented **it will not climb**.

Driving across a slope is not recommended, but if this is unavoidable then the outriggers legs can be used, if space permits. Deploying the downhill legs gives the operator a further protection against toppling, but with the additional risk of damage to the machine. **Better safe than sorry.**

4.1.5 VARIABLE WIDTH TRACK OPTION

On machines fitted with variable width tracks, (i.e. the 'Light weight' version of the Track Drive machines) it is recommended that whenever the machine is driven across a slope, or for added safety when climbing or descending, the tracks should be extended to their maximum width. To achieve this, the two position, four port valve can be moved to the cross position, (i.e. lever horizontal). When the drive function is next used, the tracks will automatically extend to their maximum width and stay in this position. If the drive controls are operated gently, exerting pressure in the drive circuit, but not sufficient flow being supplied to start the machine moving, the tracks will change their width with the machine virtually stationary. If the machine is on a particularly rough floor, it might be advantageous to move the machine forward and backwards to allow the tracks to change width whilst moving the machine. If the machine is already on a slope, selecting width change will cause the tracks to move briskly the next time the drive function is operated. This is because the width change cylinders will see the high pressure and all the flow available will 'default' to the width change circuit. To change back to minimum travelling width, the two position, four-port valve is moved back to the in-line position (i.e., upright) and the drive function used again. When minimum width is achieved, the tracks will again stay at this width. The Operator should make any adjacent personnel aware of the machine operation, particularly in respect of the extending tracks, and ensure that no one is close enough to the machine when the tracks are moving in or out. If a track 'digs in' whilst changing width the machine can slew slightly along its length and could cause injury.

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Minimum width – Selector in line.



Maximum width – Selector sideways.



Minimum width – Track in.



Maximum width – Track extended.

4.1.6 OUTRIGGERS

The four outriggers are deployed using the individual levers behind the main turret. Each lever controls the movement of an outrigger leg, their relative positions being indicated by the lever spacing. The left hand lever controls the left rear jack, the next the left front, then the right front and lastly the right rear. To allow the outrigger circuit to generate flow to the individual legs, the hydraulic selector switch is turned clockwise to 'outriggers'. This diverts flow to the outrigger circuit and at the same time energises the boom/jack dump valve. If high throttle is selected, the engine will go to high revs, allowing the four outriggers to be deployed in the best possible time. As the feet reach the end of travel, the high throttle control can be turned 'off' allowing fine positioning of each leg and assisting in the levelling process. The machine should be levelled using the indicator mounted on the machine base, clearly visible between the outrigger controls and the platform edge. If necessary, each jack foot should have a spreader plate inserted beneath it to spread the foot load and prevent sinking. The machine must be set up level before the booms are elevated, on firm ground or with the working area adequately consolidated.

FAILURE TO DEPLOY THE OUTRIGGERS CORRECTLY COULD RESULT IN DEATH OR SERIOUS INJURY.



4.1.7 BOOM CONTROLS

As soon as all four outriggers are making contact with the ground, the four sensing switches will activate allowing the Booms to be elevated. Turning the Hydraulic Duty Selector switch to 'Booms' re-sets the circuit to permit this. If the Ground Station Key Switch is turned to the 'On' position, the adjacent green button will allow the Booms to be moved, using the Ground control levers. At the same time, the Foot Switch in the platform would be inoperable. Turning the Ground control Key Switch to the 'Off' position allows the Platform footswitch to be used to elevate the Boom using the platform controls. As soon as the Booms are raised sufficiently to clear the 'booms-down' switch, the outrigger controls are isolated, preventing any ground personnel from taking control of the outriggers, when elevated. At the same time, the drive control levers also become isolated.

The machine can now be manoeuvred through its entire working envelope, allowing both operators to ascend to a working height of 12.2 metres and an outreach of 6.1 metres. The slew control gives an effective slew angle of 406 degrees (203 each way from rest.) allowing the machine to project further over the nose of the machine. It is necessary to return back the opposite way to stow the machine before raising the outriggers.



When the machine is fully stowed, with the booms in-line with the major axis of the machine, the four outriggers can be raised, reversing the controls used previously and selecting 'outriggers' on the Hydraulic Duty Selector switch. If the machine is being moved a short distance over a level surface, or for fine positioning of the outriggers themselves, the legs can be left down and the Drive function used at the same time. This imposes a greater level of responsibility on the operator to ensure that all areas are clear and particularly that any ground personnel are aware of the movement of the machine. Ideally the operating area should be coned off whilst this is achieved.

4.1.8 EMERGENCY CONTROLS

Emergency descent and/or machine recovery is achieved by the use of the standby hand pump, mounted on the base of Boom 1. This can accommodate all functions, with the exception of the drive system.

The Ground controls are located primarily to permit the machine to be recovered if the operator is unable to manoeuvre the machine himself. To enable the Ground controls a second key is required other than the one in the platform. The second key turns the ground station 'On' and the Platform controls 'Off' allowing the machine to be moved using the ground controls. It should be noted however, that if the platform operator has turned the platform Key switch to the 'Off' position, then neither power function is selected, effectively isolating the machine. In addition, the Hydraulic Duty Selector switch **must** be turned to the 'Booms' position to permit operation of the booms from the ground controls.

The Manual hand pump can be used to move the machine in all directions permitting recovery of the elevated booms and personnel. Attention should be given to the direction of recovery of the work platform, since the hand pump gives the ground operator the ability to manoeuvre the machine in all planes, including slewing towards or lowering into a potentially unstable area. It is always recommended to evaluate the nature of the emergency before recovery is attempted, and if appropriate, the machine can be moved to limit the projection of the booms in the prohibited direction.

Once stowed, the outriggers can be fully raised to enable the machine to be recovered for attention, although it might be desirable to leave the front outriggers deployed to permit the canopies to be removed. The Manual hand pump does not allow the drive controls to be operated, minimal flow being available in any event.

If the diesel engine requires 'jump' starting, external connection points are provided adjacent to the starter battery on the vehicle nearside. Connecting a separate 12V battery of adequate size to the terminals provided, positive-to-positive, negative-to-negative, will allow the Diesel Key switch to turn the engine over, even in the event of a dead on-board battery. Once started, the jump leads can be removed, the engine giving sufficient feed to the starter battery to recover and also power the control circuit. The diesel engine should not be allowed to stop until sufficient charge has been restored to the battery, otherwise another 'jump' start would be needed.

Shutting down all functions is possible by depressing the Emergency stops, positioned at both platform and ground control stations. The diesel engine can be stopped in a similar fashion, or by turning off the selector key in the platform or the diesel Key switch. Selection of the power source is only possible from the platform, effectively interlocking the two available options.

4.2 SETTING UP PROCEDURES

FAILURE TO DEPLOY THE OUTRIGGERS CORRECTLY COULD RESULT IN DEATH OR SERIOUS INJURY.



TRACK DRIVE MODELS ONLY

- 1) Read and fully comply with all safety precautions and operating instructions in the Operating and Safety manual and the warning decals on the machine.
- 2) Position Niftylift on firm ground, bearing in mind range of boom movement so that any overhead obstructions or possible hazards such as, but not limited to, power cables, telephone lines, drains, manhole covers, etc. can be safely avoided
- 3) If the load bearing capacity of the ground is in any doubt the machine must **NOT** be used.
- 4) Levelling the machine using the hydraulic outriggers can accommodate a slope of up to 12 degrees, if necessary using suitable load bearing pads to support the downhill jacks. **Do not elevate the platform unless the base can be corrected to within three degrees of level.**
- 5) Cordon off area using appropriate cones, barriers and flags, (if applicable).
- 6) Check all red emergency stops are not engaged (i.e. fully out).
- 7) Ensure that the key switch at the ground control station is turned to the "ON" position (i.e. clockwise).
- 8) From the platform control station, turn the Duty Selector switch **clockwise** to 'Outriggers' whilst pressing the platform foot switch to give hydraulic power to the outriggers and select the appropriate control lever. Note: No power will be available if the booms are not fully stowed.
- 9) Using the four outrigger control levers, lower each outrigger onto a firm, level surface and level the machine base ensuring each outrigger foot is taking equal weight with the tracks clear of the ground.
- 10) Check that the base is level using the spirit level on the machine base.
- 11) Turning the Duty Selector switch **anti-clockwise** to 'Booms' sets the control circuit to the 'Booms Enabled' condition. The booms can now be operated from the platform or ground control station by use of the foot switch, or by depressing and holding the base green power button. Note: If no power is available, check that each outrigger is lowered and each footpad is taking equal weight.
- 12) Always lower booms fully before adjusting, raising, retracting or moving the outriggers in any way.
- 13) Never alter, modify or block any of the safety circuits on the Niftylift.

THIS MACHINE IS NOT ELECTRICALLY INSULATED. DO NOT WORK WITHIN 10FT (3M) OF OVERHEAD CABLES EXCEEDING 415 VOLTS



4.3 GROUND CONTROL OPERATION

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING



4.3.1 GROUND CONTROL INSTRUCTIONS

ALL MODELS

- 1) Check below, above and around the platform for any obstructions or hazards before operating any function.
- 2) Ensure all red emergency stops are out.
- 3) Ensure key switch at platform control station is turned to either position 'I' for AC power or position 'II' for diesel power. Refer to Section 4.4.1.
- 4) Turn the key switch at the ground control station to the "ON" position (i.e. clockwise).
- 5) Battery/Electric models go to step 12).

DIESEL ENGINE OR BI-ENERGY MODELS

- 6) Turn the main engine ignition switch, located on the side of the canopy through "ON", to the "ST" (start) position and the engine will fire.
- 7) Go to step 12). Note – Unless the diesel engine is running, the TD120T will automatically default to the primary power source (usually mains AC)

PETROL (GASOLINE) ENGINE OR PETROL (GASOLINE)/ELECTRIC MODELS

- 8) For a cold engine start go to step 9) or for a warm engine start go to step 10).
- 9) **COLD ENGINE:** - turn the engine fuel tap "ON" and engage the choke lever. Turn the main engine ignition through "ON" to "ST" (Start) and the engine will fire. Return the choke lever to its normal running position after the engine is started.
- 10) **WARM ENGINE:** - turn the engine fuel tap on and turn the main engine ignition through "ON" to "ST" (start) position and the engine will fire.
- 11) Go to step 12). Note – Unless the petrol engine is running, the TD120T will automatically default to the primary power source (usually mains AC).

ALL MODELS

- 12) Push and hold green power button.
- 13) Select the boom function required and operate hand levers in full accordance with manufacturers Operating and Safety manual.
- 14) When not in use return machine to stowed position, fully raise and stow all outriggers, turn the key to the "OFF" position (i.e. anti-clockwise) and remove key.

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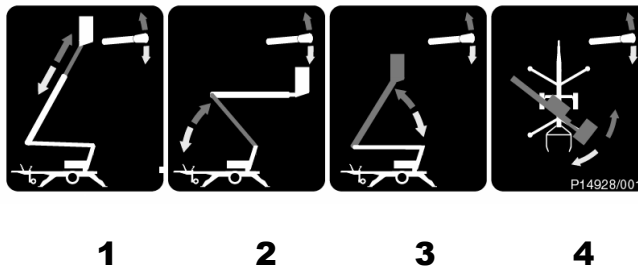
Operating & Safety Instructions

EMERGENCY PROCEDURES

- 1) Push in red emergency stop to shut down all functions.
- 2) Use manual hand pump to provide motive power and manoeuvre the machine as normal using the hand levers (Platform or Base).

4.3.2 BOOM FUNCTIONS

- A) Push and hold green power button.



- B) Select lever 1, 2, 3 or 4 for desired boom function.

1 Operates Telescope	UP for out	DOWN for in. **
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

** (If applicable, Ground control of telescoping is optional)



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

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

4.4 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 4.3.1*****

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING.

4.4.1 PLATFORM CONTROL INSTRUCTIONS

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) Remove the key from the ground control station (turn key anti-clockwise) and put the key in the platform control station and switch to “ON” (clockwise).
- 5) Battery electric models go to step 11).

DIESEL ENGINE OR BI ENERGY MODELS ONLY

- 6) Ensure that the main engine ignition switch is “ON”. Turn the “Engine Start” switch on the platform control box clockwise and the engine will fire.
- 7) Go to step 11). Note – Unless the diesel engine is running, the TD120T will automatically default to the primary power source (usually mains AC).

PETROL ENGINE OR PETROL/ELECTRIC MODELS ONLY

- 8) Ensure that the fuel tap is turned to the “ON” position and that the main engine ignition switch is “ON”. Turn the “Engine Start” switch on the platform control box clockwise and the engine will fire.
- 9) Go to step 11). Note – Unless the petrol engine is running, the TD120T will automatically default to the primary power source (usually mains AC)
- 10) If the engine is too cold to start from the platform, try starting from the ground controls as described in step 8) of the ground control operation section (4.3.1).

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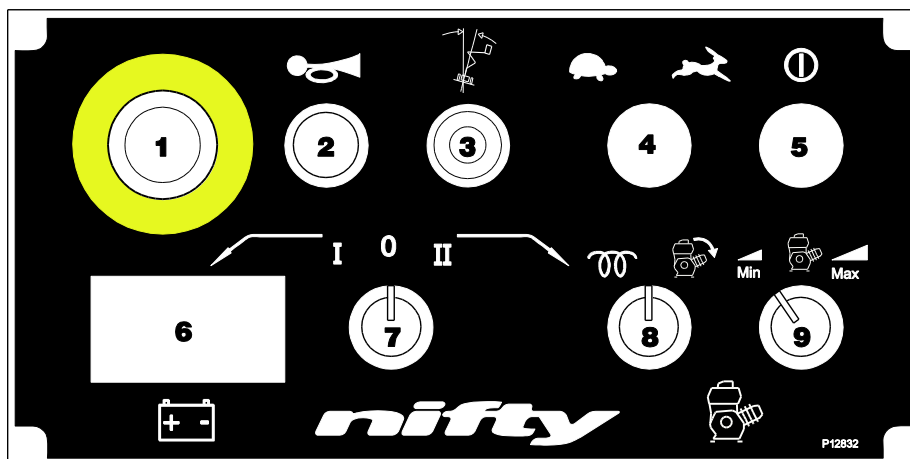
ALL MODELS

- 11) Push and hold green Power Control button (if fitted), or depress footswitch.
- 12) Select the boom function required and operate hand levers in full accordance with manufacturers Operating and Safety manual.
- 13) When not in use return machine to stowed position, fully raise and stow all outriggers, turn the key to the "OFF" position (anti-clockwise) and remove key.

EMERGENCY PROCEDURES

- 1) Push in red emergency stop to shut down all functions.
- 2) Use manual hand pump to provide motive power and manoeuvre the machine as normal using the hand levers (Platform or Base).

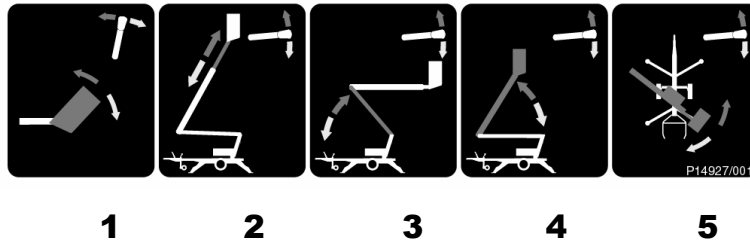
PLATFORM CONTROL STATION



- 1) **Emergency Stop Button** – Push to operate, twist knob to re-set to the 'Out' position.
- 2) **Horn** – Operates audible alarm.
- 3) **Tilt Alert** – Illuminates when excess drive angle is detected. High speed drive is lost until machine returns to level.
- 4) Hi/Lo Drive – **Not used.**
- 5) Power Control Button – **If fitted.**
- 6) Battery Condition Meter – **Not used.**
- 7) **Key Switch** – Turn to left (position I) for AC power, turn to right (position II) to permit the diesel or petrol engine to start.
- 8) **Glow/Start Selector** – Turn to the left and hold for 3 – 4 seconds to energise the glow function before starting. Turn to the right to fire the engine, release when engine fires.
- 9) **Max RPM Selector** – Switches between the High and Low Rev setting on the engine. High speed is not available if booms are in operation or machine is driven on an excessive slope ($>10^\circ$).

4.4.2 BOOM FUNCTIONS

- 1) Push and hold green "Power Control" button (if fitted) or depress footswitch



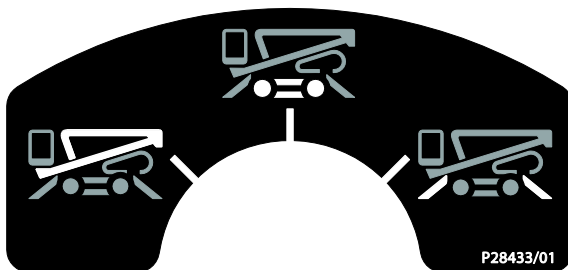
- 2) Select lever 1, 2, 3, 4 or 5 for desired function

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



IF ALARM SOUNDS, DESCEND IMMEDIATELY AND RE-LEVEL THE MACHINE BASE USING THE FOUR OUTRIGGER CONTROL LEVERS

HYDRAULIC DUTY SELECTOR



Located on the right hand side of the Platform Control Levers, it is a three position, stay-put selector switch. **Left** (anti-clockwise) for Booms, **Centre** for Drive and **Right** (clockwise) for Outriggers.

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4.5 CAGE WEIGH SYSTEM (If fitted)

4.5.1 LOAD CELL

The Niftylift TD120T 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 95% of the safe working limit. The design of the unit meets the requirements of both BS EN280 and ISO 13849 with a safety integrity level of "Category 3 PL d. (Refer to Appendix A)

4.5.2 CALIBRATION, INSPECTION AND MAINTENANCE

Calibration, maintenance and repair of the Niftylift TD120T cage load cell requires specialist knowledge and equipment. **For this reason, no part of the Niftylift TD120T 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 TRANSPORTING, CRANEAGE, STORAGE AND SETTING TO WORK

4.6.1 TRANSPORTING

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

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

Operating & Safety Instructions

4.6.2 CRANEAGE

- 1) Observe all of the limitations relating to straps and chains stated above under 'Transporting'. (Section 4.6.1)
- 2) When utilising the designated lifting points never apply a 'snatch' load, i.e. lift slowly to take up the load before raising. Similarly, do not drop machine when positioning after lifting.
- 3) If the machine is to be lifted by crane, use the designated lifting points and observe the recommendations regarding spreader beams. Individual drawings are available for each machine type, on request. (See list below.)

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TD120T

4.6.3 STORAGE

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

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

4.6.4 SETTING TO WORK

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

- 1) Check all lubrication points for adequate application of grease, oil etc.
- 2) Inspect all threads for ease of operation.
- 3) Check level and quantity of oil. Remove any contaminants - water, etc.
- 4) Check batteries for electrolyte and state of charge.
- 5) Check electrics for damage and insulation.
- 6) Using base controls, cycle machine over complete envelope in accordance with the Operating Instructions. Cure any defects.
- 7) Ensure that all safety devices and controls operate in accordance with the instructions.
- 8) If necessary, perform a load test to establish the machine stability before putting the machine to work.

- 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 unattended for an extended period, it is likely that the hydraulic cage levelling will become un-pressurised. Normal operation is then lost, with a noticeable delay in the forwards or backwards motion as the booms move. To restore normal function, the cage needs to be fully levelled forwards and backwards, using the cage-levelling lever whilst not standing in the cage (i.e. with the operator standing adjacent to the cage side whilst simultaneously operating the lever and green button to move the cage). Take care not to become trapped between the moving cage and a fixed object, and ensure those around you are clear of the moving cage. When the system has been charged in both directions, the cage levelling function should be restored. If the system operates but is 'jerky' in either direction, this indicates air in the system. Repeat the procedure as described above until the movements are smooth and uninterrupted. If in doubt, contact our Service Department for further advice.

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

5 Emergency Controls

5.1 GENERAL

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



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

5.2 IN THE EVENT OF AN INCAPACITATED OPERATOR

Turn the key switch selector at ground control station to ground (i.e. fully down). Lower on ground controls as detailed under section 4.3 Ground Control Operation.

5.3 IN THE EVENT OF MACHINE FAILURE

Operate manual hand pump (located adjacent to the base controls) and lower platform to the ground using either platform or base controls. If initial movement of the machine allows the master alarm to reset, normal controls will be available. This is then the fastest method of lowering the platform to the ground.

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



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

5.4 INCIDENT NOTIFICATION

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

6 Responsibilities

6.1 CHANGES IN OWNERSHIP

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

nifty TrackDrive (TD) Series

Operating & Safety Instructions

6.2 Inspection/Service/Pre-Hire Check list

MACHINE SERIAL NO _____

TOWING	PASS	FAIL	N/A
Machine secured on trailer			
Straps correctly positioned and tightened			
Machine chocked if necessary			
TRACK ASSEMBLY			
Tracks are complete and engaged with drive sprockets			
Track tension correct – grease in tensioner.			
Machine climbs slope			
Brakes hold machine on slope			
BASE			
Operation of base control valve and buttons			
Operation of all booms over full range			
Wheel bearings OK			
Cylinders are silent			
Platform is level over full range			
Booms, levelling rods not damaged or distorted			
Booms levelling rods, cylinders not fouling			
Hoses not tight, kinked or fouled			
Operation of manual hand pump			
SLEWING			
Slew assembly and motor are secure			
Gearbox mesh correct, no excessive wear			
No excessive back-lash			
Slew wheel bolts secure			
Slew guards secure			
PLATFORM			
Operation of control valve and buttons			
Levelling lock valve holds in both directions, lines vented			
Operation of all booms over full range			
Cylinders are silent			
Platform levelling over full range			
Slewing smooth over full range			
Operation of boom 4 over full range (if fitted)			
No excessive movement of boom 4 and boom 3			

nifty TrackDrive (TD) Series
Operating & Safety Instructions

TILT ALARM	PASS	FAIL	N/A
Machine driven on to excessive slope - drive disabled, siren tone constant			
Hi drive operation affected			
Return to level ground – Hi drive restored			
INTERNAL (POWER PACK)			
Power pack and all components secure			
All cables and terminals secure			
All hose connections secure			
Hoses not kinked or fouled			
Charger/control box secure			
Battery secure			
Electrolyte level and specific gravity			
Hydraulic oil level			
Engine/Gear box oil			
FINISH			
Pivot pin tag bolts			
Correct decals, all visible			
Canopy/bonnets			
Grease nipples (Feet, Knuckle, Centre Post)			
LEAK CHECK			
Cylinders (Lift, Jacks, Telescope, Levelling)			
Control valves			
Check valves			
Power pack/pump			
Slew motor			
Hose connections			
Filter			
Track Motors			

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 280:2013+A1 2015 section 5.11 Table 5.

Safety Related Part of the Control System (SRP/CS)	Approval (Standard, Performance Level)
A1 Monitoring of stabilisers - Setting up	ISO 13849-1:2008 PL c
A2 Monitoring of stabilisers - Booms	ISO 13849-1:2008 PL d
A3 Platform levelling	ISO 13849-1:2008 PL c
A4 Interlocking of control positions	ISO 13849-1:2008 PL c
A5 Prevent movements of load holding cylinders in case of pipe failure	ISO 13849-1:2008 PL c

A1 MONITORING OF STABILISERS – SETTING UP

The monitoring of the stabilisers is PL c in accordance with ISO 13849-1:2008 as required by BS EN 280:2013+A1 2015.

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

The stabiliser monitoring is only active when the booms are lifted up off the boom rest such that the boom switch is actuated.

The boom switch relies on the electrical contacts opening allowing the stabiliser monitoring circuit to become 'active'.

The opening of the contacts is forced by the use of the spring contained within the jack foot switch assembly. **Proper maintenance and daily safety checks to be observed.**

The boom switch cannot be overridden to bypass the tilt system other than by demounting the switch with the use of tools. **Reasonably foreseeable misuse.**

If the boom switch is removed or if it is not maintained in accordance with the appropriate documentation the stabiliser monitoring may not function in compliance with the requirements as a PL c category 1 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 monitoring of the stabilisers 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 become unstable.

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 monitoring of the stabilisers is primarily the series circuit through the outrigger feet on each stabiliser. The initial 'proving' circuit that permits the booms to rise has to pass through the safety relay module which provides a two channel output for safety. The first channel will allow the operation of the selected power option on the trailer. The second channel has overall control of the Master dump for the hydraulic circuit. Simultaneous operation of both channels is required for the machine to function. Loss of either channel will cause the circuit to halt operation.

5. Response time

The monitoring of the stabilisers is active at all times providing the security of the outrigger feet being in contact with the ground whilst the booms are elevated. In the event of encountering a loss of foot contact the system will sound an alarm until the booms have been lowered on to the boom rest and the foot contact has been corrected.

6. Operating limits (including environmental conditions);

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

7. Indications and alarms;

Jack feet contact

The action of the stabiliser monitoring circuit will cause the klaxon to sound and will be indicated by the red warning light on the base and cage location, if the booms are raised and the loss of any jack foot contact is detected.

8. Muting and suspension of safety functions;

While the stabiliser monitoring is always active with the booms raised, the changeover of the boom switch permits continued operation of the booms until they are returned to the 'stowed' position. The loss of jack foot contact will be indicated via warning lights regardless of the boom position.

9. Control modes;

The stabiliser monitoring circuit has no user controllable modes of operation.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of jack foot switches, boom switch and connection wires.
- Check of power supply to verify it is correct.

Operating & Safety Instructions

- Check of the equipment correct operation, by simulating a fault condition and correspondent resetting. See “Means for easy and safe trouble shooting”
- Check correct operation of the boom switch.

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 which contains the electronic board, to reveal any unauthorized 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 Boom Switch, Jack Safety Switch, PCB or Hydraulic valve block.

Do not attempt to open the safety module 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 stabiliser monitoring system

1. Power on the Niftylift and select the base control location.
2. Using the jack duty selector, engage the selected power option and deploy the jacks into contact with the floor, levelling the spine of the machine.
3. In order to verify the stabiliser monitoring safety circuit it is necessary for someone to operate and hold the base green button whilst a second operative performs the jack foot switch test. Manually depress each jack foot switch plunger in turn by reaching inside the outrigger housing and finding the safety switch. Once depressed, the hydraulic power on the machine will be lost until the plunger is released. As each switch is manually depressed, operating a boom lever will not cause the boom to move, the alarm will however not sound, as the booms are still stowed.
4. Return to the ground control location and using the base green button raise the booms to clear the boom rest and operate the cam switch. (Situated between booms 2 and 3 adjacent to the knuckle)

5. In order to verify only the operation of the alarm circuit whilst the booms are elevated, it is possible to again manually depress each jack foot switch plunger in turn by reaching inside the outrigger housing and finding the safety switch. Once depressed, the alarm should sound until the plunger is released. Operation of the booms is left unaffected as the 'boom switch bypass' function will allow the operator to return the booms to the stowed position, even whilst the alarm is still sounding. This is to prevent the operator being stranded in the air whilst a jack foot remains in the unstable position.

6. 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 stabiliser monitoring system at the beginning of every duty cycle.

A2 MONITORING OF STABILISERS – BOOMS

The monitoring of the stabilisers is PL d in accordance with ISO 13849-1:2008 as required by BS EN 280:2013+A1 2015.

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

The stabiliser monitoring is performed from the boom switch which allows movement of the stabilisers only when the booms are stowed.

The boom switch relies on the electrical contacts closing allowing the jack circuit to become 'active'.

Proper maintenance and daily safety checks to be observed.

The boom switch cannot be overridden to bypass the monitoring system other than by demounting the switch with the use of tools. **Reasonably foreseeable misuse.**

If the boom switch is removed or if it is not maintained in accordance with the appropriate documentation the stabiliser monitoring may not function in compliance with the requirements as a PL d category 3 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 monitoring of the stabilisers 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 become unstable.

Operating & Safety Instructions

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

The monitoring of the booms is primarily the circuit through the booms elevated switch, operated via a cam on Boom 2/3. The initial 'proving' circuit that permits the stabilisers to move has to pass through the safety relay module which provides a two channel output for safety. The first channel will allow the operation of the selected power option on the trailer. The second channel has overall control of the Master dump for the hydraulic circuit. Simultaneous operation of both channels is required for the machine to function. Loss of either channel will cause the circuit to halt operation.

5. Response time

The monitoring of the booms is active when the jack control lever is depressed at the control station, ensuring the booms are stowed before permitting use of the jacks.

6. Operating limits (including environmental conditions);

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

7. Indications and alarms;

Boom stowed.

The action of the booms monitoring circuit will interface with the jack control circuit. There is however no alarm or indication function associated with the booms being in 'normal' operation.

8. Muting and suspension of safety functions;

While the stabiliser monitoring is always active with the booms raised, the changeover of the boom switch permits continued operation of the booms until they are returned to the 'stowed' position. The loss of jack foot contact will be indicated via warning lights regardless of the boom position.

9. Control modes;

The boom monitoring circuit has no user controllable modes of operation.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of jack foot switches, boom switch and connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by simulating a fault condition and correspondent resetting. See "Means for easy and safe trouble shooting"
- Check correct operation of the boom switch.

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 which contains the electronic board, to reveal any unauthorized 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 Boom Switch, Jack Safety Switch, PCB or Hydraulic valve block.

Do not attempt to open the safety module 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 elevated drive speed system

1. Power on the Niftylift and select the base control location.
2. Using the jack duty selector, engage the selected power option and deploy the jacks into contact with the floor, levelling the spine of the machine.
3. At the ground control location and using the base green button raise the booms to clear the boom rest and operate the cam switch. (Situated between booms 2 and 3 adjacent to the knuckle)
4. Return to the jack control station and deploy the stabiliser operating lever. Both the electrical and hydraulic system will be rendered inoperative and jack controls will not function.
5. 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 stabiliser monitoring system at the beginning of every duty cycle.

15. Proof testing

This two channel system must be proof tested to identify unrevealed failures every six months by a competent person with appropriate safety function experience.

Repair must be carried out by a competent person(s) with appropriate safety function experience.

Monitoring of stabilisers

Test 1

1. Identify the two solenoid valves maintaining the safety function for each channel using the machine electrical and hydraulic schematics
2. Stow the machine and remove the coil on the channel 1 hydraulic solenoid valve
3. Attempt to operate the jack legs
4. Fit the coil back onto the hydraulic solenoid valve

Operating & Safety Instructions

5. Repeat steps 1 to 4 for channel 2.

Pass criteria – If the jack legs do not operate the system is functioning correctly.

Fail criteria – If the jack legs move there is a previously undetected fault with the system and the Niftylift must not be used until this fault has been repaired.

Test 2

1. Deploy the jack legs and raise the boom up off the boom switch

2. Take a voltage reading of the electrical feed into each of the hydraulic solenoid valves from test 1.

Pass/Fail criteria – Both channels should read 0V. Any voltage greater than 0V shows a previously undetected fault with the system and the Niftylift must not be used until this fault has been repaired.

Repair must be carried out by a competent persons with appropriate safety function experience.

Test 1 and 2 shall be repeated after the repairs.

If both tests pass then the system has no undetected faults proving the safety system is providing required coverage for performance level d.

A3 PLATFORM LEVELLING

The Platform levelling system is PL c in accordance with ISO 13849-1:2008 as required by BS EN 280:2013+A1 2015.

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

The Platform levelling system comprises of a load holding device mounted to the slave levelling 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 luffing booms as the angle of the cage will not be maintained. See effect of deviations from the specified performance below.

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 levelling system of the product does not function as intended the angle of the cage 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 levelling system comprises of two hydraulic cylinders and interconnecting hoses.

One is referred to as the Master levelling cylinder

The other is referred to as the Slave levelling cylinder.

In normal operation when the luffing booms are elevated the master levelling cylinder responds to the movement of the booms and causes a transfer of hydraulic fluid to the appropriate side of the slave levelling cylinder.

This transfer of hydraulic fluid maintains the level aspect of the cage.

5. *Response time*

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

Operating & Safety Instructions

6. Operating limits (including environmental conditions);

All components within the tilt interlock 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 levelling system is or is not functioning.

8. Muting and suspension of safety functions;

It is not possible to suspend the operation of the Elevated levelling system

9. Control modes;

The levelling system has two modes of operation

1. Normal movements of the luffing booms cause the system to constantly adjust the cage angle to keep it level.
2. Manual adjustment to account for drift of the system over time.

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. If the cage does not remain level the system should be serviced by trained persons fully conversant with the system functionality.

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 at the beginning of every duty cycle.

A4 INTERLOCKING OF CONTROL POSITIONS

The interlocking of the control positions is PL c in accordance with ISO 13849-1:2008 as required by BS EN 280:2013+A1 2015.

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 electrical 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.**

Since the physical installation of the electrical contacts is the means by which the control circuit operates it is imperative that the functionality is retained. If the internal wiring is interfered with the control isolation could be lost or altered in a way that promotes a dangerous mode of operation.

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 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 energised by means of a key operated 'mode selector' which electrically 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 gravity descent (if used.)

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.

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9. Control modes;

The standard EU control circuit will permit independent operation of either control position, working through a series Emergency Stop control circuit. In some countries (e.g France and Australia) the alternate control interlock permits the cage system to be isolated by the ground control key switch and will ignore the use of the Cage Emergency Stop. This function effectively promotes the Ground control position to have overall authority over the machine, when selected.

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 and supplied 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 climb 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 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 13849-1:2008 as required by BS EN 280:2013+A1 2015.

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 out 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 security of the booms may not be maintained.

If the angle of the 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.

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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 or is not 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 system functionality.

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 at the beginning of every duty cycle.

niftylift