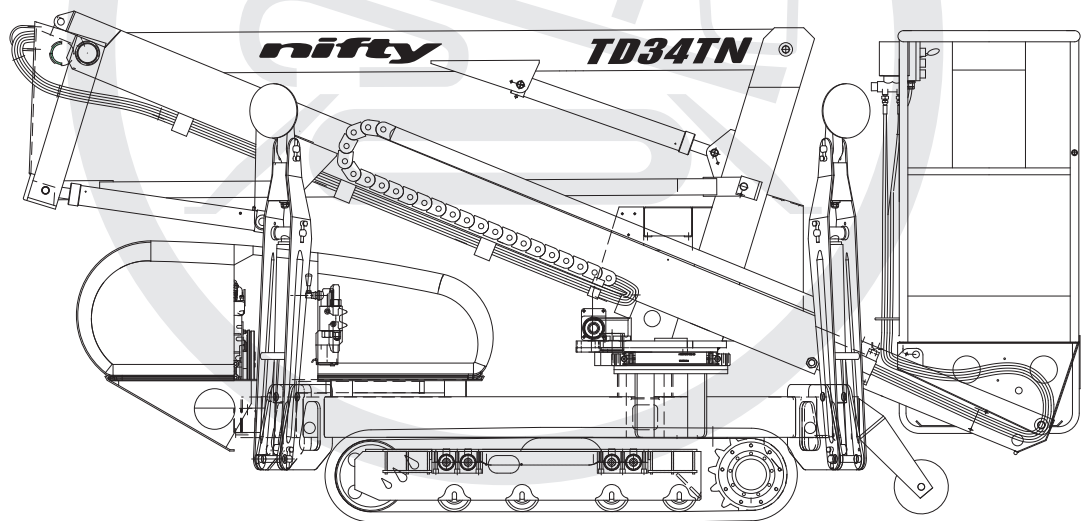


nifty

TrackDrive

Operating & Safety Instructions

MODEL TD34TN SERIES



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M50909/02



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1 Introduction and General Information

1.1 FOREWORD

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

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

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

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

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

DANGER, WARNING, CAUTION, IMPORTANT, INSTRUCTIONS AND NOTICE

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

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

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



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

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

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

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

1.2 SCOPE

These operating instructions contain all the necessary information required to allow the safe operation of the Niftylift TD34TN 'Narrow', mains electric (AC)/Diesel (D)

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 TD34TN.

1.3 INTRODUCING THE TD34TN 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.

Niftylift Inc, 1525 S. Buncombe Road, Greer, SC 29651 USA

Tel: **864 968 8881**

Fax: **864 968 8836**

Email: **niftyusa@niftylift.com**

The Niftylift TD34TN 'Narrow' (Track Drive) is an extremely versatile articulated boom platform of unique and simple design. It is capable of placing up to two persons and their tools up to a height of 40ft or an outreach of 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 basket and maximum reliability in the harshest environments.

This product has been designed and manufactured in compliance with ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

Models include the following:

DAC: - DIESEL & AC ELECTRIC

1.4 GENERAL SPECIFICATION

FEATURE	TD34TN
MAXIMUM HEIGHT - WORKING	12.2m 40ft
MAXIMUM HEIGHT - BASKET	10.2m 33ft 6in
MAXIMUM HEIGHT - STOWED	1.9m 6ft 3in
MAXIMUM OUTREACH	6.1m 20ft 1in
MAXIMUM WIDTH – TRANSIT (VARIABLE TRACKS)	1.15m 3ft 10in
JACK SPREAD	3.54m 11ft 7in
MAXIMUM LENGTH - STOWED	3.96m 13ft
MAXIMUM CAPACITY - Standard Basket Extending Basket	120kg (265lbs) 225kg (500lbs)
TURRET ROTATION	406°
TURRET TAIL SWING	Zero
MAXIMUM TRAVEL SPEED	1.5 kph (High) 0.94 kph (Low) 0.93 mph 0.58 mph
BASKET SIZE - LENGTH X WIDTH	0.65m x 0.75m 25in x 30in
CONTROLS	Full proportional hydraulic
MAXIMUM HYDRAULIC PRESSURE	200bar (2900 psi)
TRACKS	1745 x 250 Rubber
GRADEABILITY	60% (31°)
GROSS VEHICLE WEIGHT (MAXIMUM)	1,860kg 4,090lb
MAXIMUM GROUND PRESSURE	0.039kN/cm ² 8,109lb/ft ²
MAXIMUM ALLOWABLE INCLINATION	0.5°
POWER SOURCE	D (Diesel) models - Kubota 722E engine

1.5 IDENTIFICATION (USA PLATE)

			
NIFTYLIFT LTD., CHALKDELL DRIVE, SHENLEY WOOD MILTON KEYNES MK5 6GF GREAT BRITAIN TEL (01144) 1908 223456 : FAX (01144) 1908 312733 e-mail: info@niftylift.com			
THIS NON-INSULATING WORK PLATFORM COMPLIES WITH ANSI STANDARD A92.20-2020 / CSA STANDARD B354.6-2017			
SERIAL No			
MODEL			
YEAR OF MANUFACTURE			
WEIGHT			lbs
RATED LOAD	PERSONS	+	lbs
MAXIMUM SAFE WORKING LOAD			lbs
MAXIMUM PULL			lbf
MAXIMUM WIND SPEED			mph
MAXIMUM ALLOWABLE INCLINATION			deg
MAXIMUM HYDRAULIC PRESSURE			psi
MAXIMUM VOLTAGE			V
MAXIMUM AMPS			A
ELECTRICAL SCHEMATIC	D	ISSUE	
HYDRAULIC SCHEMATIC	D	ISSUE	
PLATFORM HEIGHT			ft
PLATFORM REACH			ft
TYPE	GROUP		
			P33792/3

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.

Electrical and hydraulic circuits: See drawings listed on the bottom of the machine nameplate for exact drawing number and issue relating to the machine build.

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 basket to work. If in doubt, contact your local dealer or Niftylift Ltd (see front cover for address).



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

- 2.1.1** Only authorised persons trained on the same or a similar model will be permitted to operate the aerial 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 basket, 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.

- 2.1.8** Never exceed the maximum basket capacity, as indicated on the decals and machine serial plate.
- 2.1.9** Only operate the Niftylift on a firm level surface.
- 2.1.10** Never position any part of the Niftylift within the Minimum Approach Distances of any electrical power line, conductor, or similar stated in Occupational Safety and Health Administration Regulations for CFR 1910.333(c) for Minimum Approach Distance for electrical wires.
- 1910.333(c)(3)(i)(A)(1): For voltages to ground **50kV or below** - 10 feet (305 cm);
- 1910.333(c)(3)(i)(A)(2): For voltages to ground **over 50kV** - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV.

**THIS MACHINE IS NOT INSULATED.**

If in doubt, contact the appropriate authorities.

- 2.1.11** On entering the basket, 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 basket and do not remove until leaving the basket whilst in the stowed position.

2.1.13

Always remain standing within the basket. Do not attempt to increase your height or reach by standing and/or climbing on the basket guardrails or any other object. **KEEP YOUR FEET ON THE BASKET 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** To obtain the correct basket position above the ground when initially setting up the machine, use the base functions for booms and telescope to position the basket for safe entry.



THE BASKET FLOOR MUST BE WITHIN 400MM (16IN) OF THE GROUND WHEN ENTERING OR EXITING. DO NOT CLIMB IN OR OUT OF THE BASKET WITH THE BOOMS IN THE TRANSPORT POSITION.

- 2.1.15** Do not use the basket levelling system to artificially increase the outreach of the Niftylift. Never use boards or ladders in the basket to achieve the same result.
- 2.1.16** Do not use the Niftylift to lift overhanging or bulky items that may exceed the maximum capacity or carry objects that may increase the wind loading on the basket. (e.g. Notice boards etc.)
- 2.1.17** 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.
- 2.1.18** Always check the area below and around the basket 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.
- 2.1.19** Stunt driving and horseplay, on or around the Niftylift, shall not be permitted.

Operating & Safety Instructions

- 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 baskets operated in hazardous locations shall be approved and of the type required. (For the USA refer to ANSI/NFPA 505.)
- 2.1.22** The operator shall immediately report to his supervisor any potentially hazardous location(s) (environment) which become evident during operation.
- 2.1.23** 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.
- 2.1.24** 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.
- 2.1.25** The boom and basket of the Niftylift shall not be used to jack the wheels off the ground.
- 2.1.26** The Niftylift shall not be used as a crane.
- 2.1.27** The Niftylift shall not be positioned against another object to steady the basket.
- 2.1.28** Care should be taken to prevent rope, electric cords and hoses from becoming entangled in the aerial basket.
- 2.1.29** Batteries shall be recharged in a well-ventilated area free of flame, sparks or other hazards that may cause explosion. Highly explosive hydrogen gas is produced during the charging process.
- 2.1.30** When checking electrolyte levels, great care should be taken to protect eyes, skin and clothing. Battery acid is highly corrosive and protective glasses and clothing is recommended.
- 2.1.31**



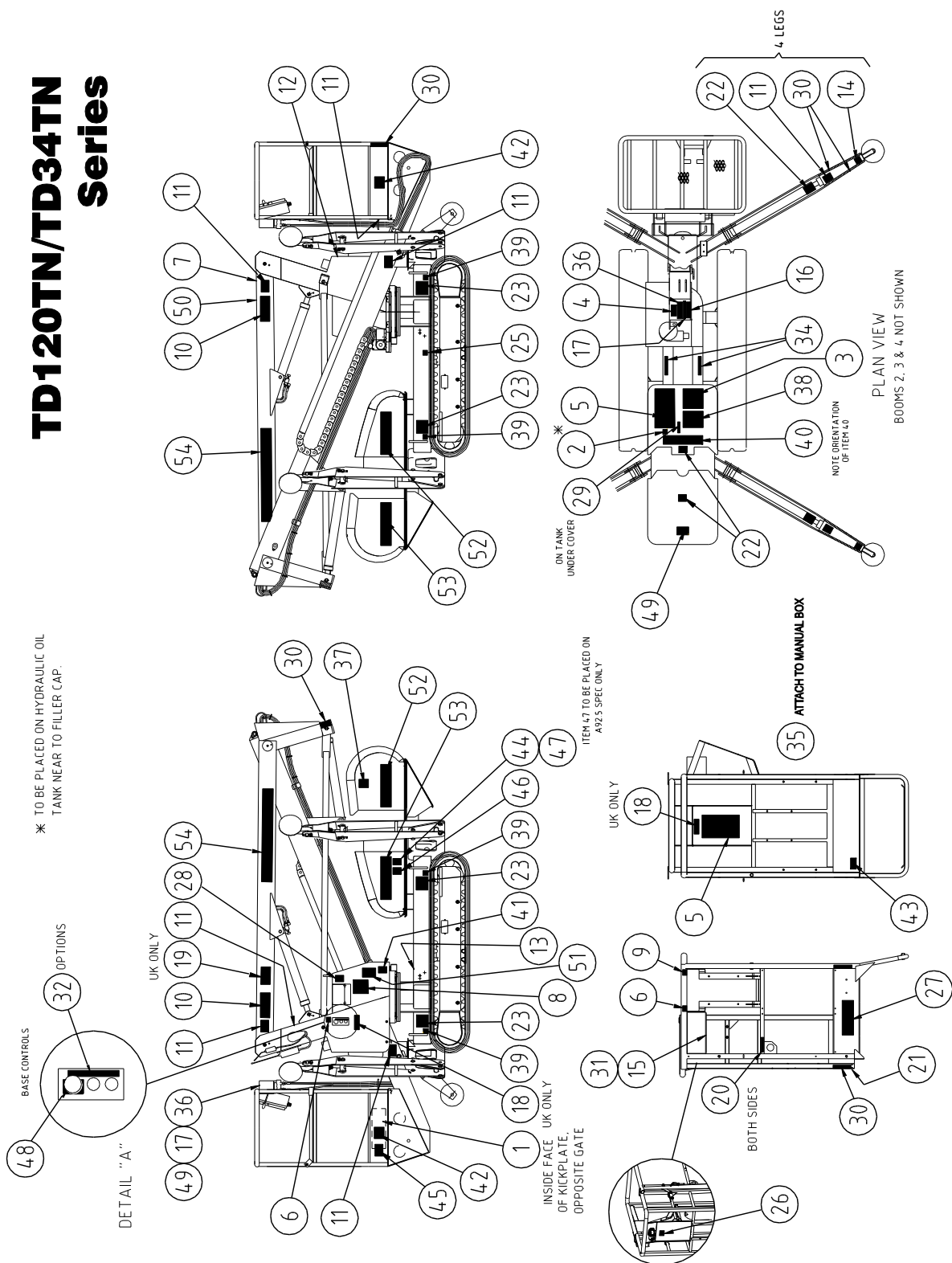
When the machine is not in use always stow the booms correctly. **NEVER LEAVE THE KEYS IN THE MACHINE**, if it is to be left for any period of time. Use wheel chocks if leaving on an incline.

- 2.1.32** If the basket 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 basket, all personnel shall be removed from the basket safely before attempts are made to free the basket using ground controls.

nifty TrackDrive (TD) Series

Operating & Safety Instructions

TD120TN/TD34TN Series



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)
ROTATION GEAR RING BOLTS		206ft lbs (279 Nm)				
LOAD CELL BOLTS		M16x35 Grade 8.8 Plated Hex Head - 151ft lbs (205 Nm)				
		M16x40 Grade 12.9 Geomet Cap Head - 173ft lbs (235 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 basket control position. Secondly, it is this device which sounds continuously is 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 “Basket” before the jacks are deployed properly.

BOOM-SWITCH: - Mounted on the side of Boom 2 near the knuckle and operated by contact with a cam on boom 3, this switch controls the changeover function between jacks and basket. 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 basket 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 lose 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.

DIESEL ENGINE: - Generally a Kubota 722E engine, described in the maintenance section of the Workshop Manual, driving a tandem pump set.

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.

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 in the basket.

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 the Booms only.

Once plugged in, the electric motor will run whenever the base Key switch is turned to a control 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 to the Booms. This is achieved by using the same control system described previously. When directed to the Boom function, speeds are roughly the same as the diesel engine.

NB: If the diesel engine is needed for 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 basket. On entering the basket, the operator can now turn the selector to the right to enable the drive function. Pressing the green power button will energise the drive dump solenoids, at the same time bringing the diesel engine to full revs, if selected. If the drive paddles are moved up or down, the twin tracks will drive the machine in the desired direction. If the paddles are moved in opposition, the machine will turn. The control function of each control 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 basket, 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 machine, simply by de-mounting the control panel. 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 panel mounted green button, 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 basket, 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 basket 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. In this case, release the levers, stabilise the machine and start driving again. Avoid sudden changes of drive lever position; a smooth driving action is much preferred.

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 basket 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 TD34TN 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 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

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 basket selector switch is left in the 'Track Drive' position, (i.e. to the right). Then using the variable width toggle switch with the green button, the tracks will extend to their maximum width and stay in this position. To change back to minimum travelling width, the toggle switch can be used in the reverse direction, again in conjunction with the green button. 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.



Minimum width – Track in.



Maximum width – Track extended.

4.1.6 OUTRIGGERS

The four outriggers are deployed using the individual switches on the basket control box. Each lever controls the movement of an outrigger leg, their relative positions being indicated by their position on the control box. To allow the outrigger circuit to generate flow to the individual legs, the selector switch is moved to the left position. 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 basket 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. If the Ground Station Key Switch is turned to the 'Ground' position, the adjacent green button will allow the Booms to be moved, using the Ground control levers. At the same time, the controls in the basket would be inoperable. Turning the Ground control Key Switch to the 'Basket' position allows the Basket controls to be used to elevate the Boom using the basket 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 the operator to ascend to a working height of 40' and an outreach of 20'. The boom rotation control gives an effective rotation 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. If the machine is being moved a short distance over a level surface, or for fine positioning of the outriggers themselves, the outriggers 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, although the drive system would require more flow than would be apparent.

The Ground controls are located primarily to permit the machine to be recovered if the operator is unable to manoeuvre the machine himself. In order to do this the ground control key must be turned to the 'ground' position (clockwise). This overrides the basket controls allowing the machine to be manoeuvred using 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 Niftylift, since the hand pump gives the ground operator the ability to manoeuvre the machine in all planes, including rotating 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 over-ride levers, situated on the proportional control block are used in conjunction with the hand pump to operate the outriggers manually. The Manual hand pump does allow the drive controls to be operated, although minimal flow would be available in any event.

If the diesel engine requires 'jump' starting, connect a separate 12V battery of adequate size to the existing battery terminals, positive-to-positive, negative-to-negative, this 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 basket and ground control stations. The diesel engine can be stopped in a similar fashion, or by turning off the selector key in the basket or the diesel Key switch. Selection of the power source is only possible from the basket, 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 0.5 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 "Basket" position.
- 8) From the basket control station, turn the three position selector to the left 'Outrigger' position, press and hold the Green Button to give hydraulic power to the outriggers and select the appropriate control switches. Note: No power will be available if the booms are not fully stowed.
- 9) Using the four outrigger control switches, 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) Turn the three position selector to the centre 'Booms' position. The booms can now be operated from the basket or ground control station by use of the green button, 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 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 basket for any obstructions or hazards before operating any function.
- 2) Ensure all red emergency stops are out and the red isolator handle is pushed in.
- 3) Turn the key switch at the ground control station to the “Ground” position (i.e. clockwise).
- 4) Battery/Electric models go to step 7).

DIESEL ENGINE OR BI-ENERGY MODELS

- 5) 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.
- 6) Go to step 7). Note – Unless the diesel engine is running, the TD34TN will automatically default to the primary power source (usually mains AC)

ALL MODELS

- 7) Push and hold green power button.
- 8) Select the boom function required and operate hand levers in full accordance with manufacturers Operating and Safety manual.
- 9) When not in use return machine to stowed position, fully raise and stow all outriggers, turn the key to the “OFF” position (i.e. central) and remove key.
- 10) Turn the engine ignition switch to ‘OFF’ and disconnect the red isolator by pulling the handle upwards.

EMERGENCY PROCEDURES

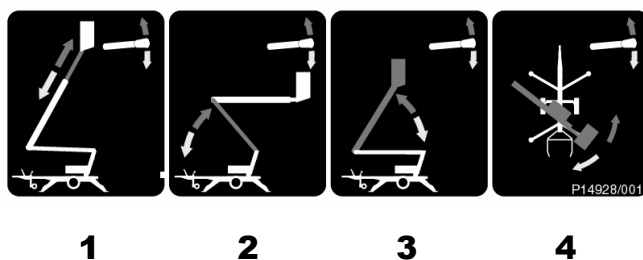
- 1) Push in red emergency stop to shut down all functions.
- 2) Use manual hand pump to provide motive power and manoeuvre the machine as normal using the hand levers (Basket or Base).

nifty TrackDrive (TD) Series

Operating & Safety Instructions

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 Boom Rotation	UP for right	DOWN for left

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



ALWAYS ENSURE THE NIFTYLIFT 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 BASKET 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 BASKET CONTROL INSTRUCTIONS

ALL MODELS

- 1) **NEVER** exceed the maximum basket capacity.
- 2) Check below, above and around the basket for any obstruction or hazards before operating any function.
- 3) Ensure all red emergency stops are out and the red isolator handle is pushed in.
- 4) Turn the key switch at the ground control station to the “Cage” position and turn the selector in the platform to “ON”.
- 5) Battery electric models go to step 8).

DIESEL ENGINE OR BI ENERGY MODELS ONLY

- 6) Ensure that the main engine ignition switch is “ON”. Turn the “Engine Start” switch on the basket control box clockwise and the engine will fire.
- 7) Go to step 8). Note – Unless the diesel engine is running, the TD34TN will automatically default to the primary power source (usually mains AC).

ALL MODELS

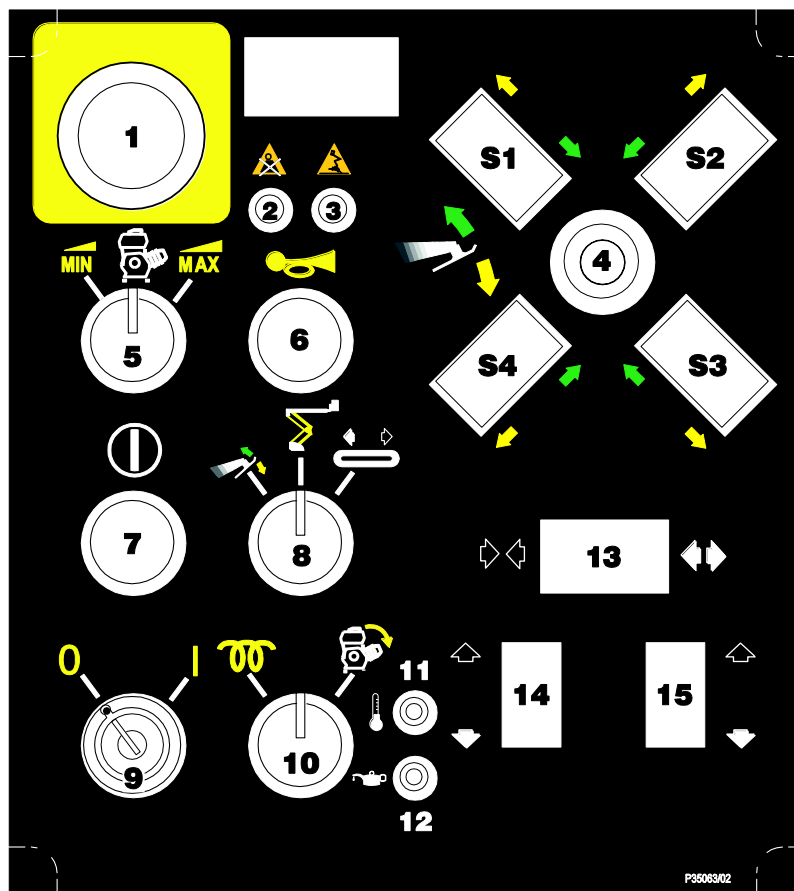
- 8) Push and hold green power button.
- 9) Select the boom function required and operate hand levers in full accordance with manufacturers Operating and Safety manual.
- 10) When not in use return machine to stowed position, fully raise and stow all outriggers, turn the key to the “OFF” position (central) and remove key.
- 11) Turn the engine ignition switch to ‘OFF’ and disconnect the red isolator by pulling the handle upwards.

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 (Basket or Base).

BASKET CONTROL STATION

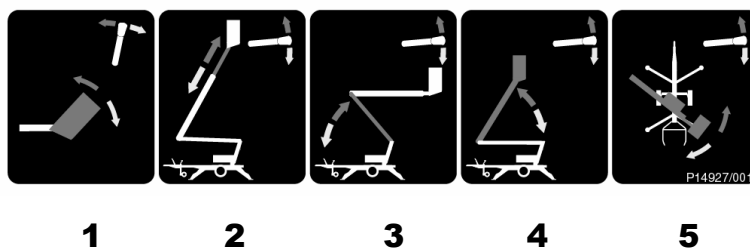


- 1) **Emergency Stop Button** – Push to operate, pull knob to re-set to the 'Out' position.
- 2) **Overload Warning** – Illuminates when weight in basket exceeds the Safe Working Load.
- 3) **Tilt Alert** – Illuminates when an excess machine base angle is detected.
- 4) **Tilt Alert (2)** – Illuminates when one or more of the stabiliser feet are not fully lowered on to the ground surface and taking equal weight.
- 5) **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 ($>10^\circ$).
- 6) **Horn** – Operates audible alarm.
- 7) **Power Control Button** – Press and hold Green button to enable machine.

- 8) **Duty Selector** – Three position control allows operator to select between:-
Left: Jacks/ Outrigger operation
Centre: Booms only
Right: Track Drive and variable width control.
- 9) **Selector switch** – Turn to 'ON' position to enable machine controls.
- 10) **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.
- 11) **Water Temperature** – Illuminates if coolant temperature is too high.
- 12) **Engine Oil Pressure** – Illuminates and buzzer sounds if pressure drops. Check oil level. Note; will also activate when Selector (9) is turned 'ON', until engine has been started and run to achieve correct pressure.
- 13) **Track Width** – Increases or decreases width of tracks when used with Power Control Button.
- 14) **LH Track Direction** – Switches between Forward and Reverse.
- 15) **RH Track Direction** – Switches between Forward and Reverse.

4.4.2 BOOM FUNCTIONS

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



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

1 Operates Basket Levelling	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 Boom Rotation	UP for right	DOWN for left



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

4.4.3 PROPORTIONAL BLOCK

The proportional block and adjacent green button, serve to provide a manual override for the outrigger and variable width controls. This function permits a machine to be stowed for transport if the basket controls become inoperative for any reason. The Green button, situated inside the canopy, becomes operative only when the base control key switch is turned to the "GROUND" position. If the canopy green button is depressed, the base control green button is switched out and vice versa when the control key switch is in the 'OFF' or 'Basket' position. Pushing and holding the green button energises the hydraulic circuit providing flow for the proportional block. Moving the selected lever forward or backwards allows individual control of each outrigger leg. Great care should be taken when using these controls to ensure that adjacent personnel and particularly the operator themselves are not in the vicinity of the leg being raised. Similarly, when using the variable width control, care should be taken when standing adjacent to the machine. Control of the drive function is not recommended, nor is it possible with the ground controls, due to the risk of entrapment.

When the control key switch is in the "OFF" position, the canopy green button is rendered inoperative, and the proportional control block is available only from the basket controls.

4.5 BASKET WEIGH SYSTEM

4.5.1 LOAD CELL VERSION

The Niftylift TD34TN 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 basket of the machine, the actual load is measured and if pre-configured 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 FUNCTION

The machine informs the operator, via the load cell output, of the current state of the machine with regard to basket load. The red lamps for the load cell are located on the basket and base control panels (see section 4.4.2). This lamp can be interpreted as follows:

Lamp	Description	Load value	Machine Behaviour
Flashing red (Safety Warning Lamp)	Load in the basket has exceeded safe working load	Above 225kg	Controls isolated – safely remove excess load to restore normal operation

4.5.3 CALIBRATION, INSPECTION AND MAINTENANCE

Calibration, maintenance and repair of the Niftylift TD34TN basket load cell requires specialist knowledge and equipment. For this reason, no part of the Niftylift TD34TN basket-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 Niftylift's approved dealers. Contact details are listed in Section 1.4.

4.6 TRANSPORTING, CRANEAGE, STORAGE AND SETTING TO WORK

4.6.1 TRANSPORTING

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

- Always ensure the truck or trailer you are loading or towing the Niftylift with can carry it legally.
- If loading by crane the use of shackles and an adequately rated spreader beam, with four leg slings, is **MANDATORY**.
- When loading or un-loading from the side of the vehicle, the use of the forklift pockets to retain one of the forks is recommended. (If fitted). Spread the forks to their widest capacity, with due regard to the components fitted to the machine. Never forklift or crane an entire machine under the booms, always lift beneath the spine or under the ends of the axle mountings in the case of a self-propelled unit. Ensure forklift is adequately rated for the load to be carried.
- Once positioned on the transport carrier ratchet straps should be used to secure the machine. The machine should be positioned to allow easy access around the machine in transit, and to ensure that 'creepage' during transport does not permit the machine to come into contact with other goods being shipped, or the container itself. Some movement of the machine structure might occur during transit, which could lead to fretting or other damage.
- If the machine is equipped with a transit device such as a boom clamp etc, this should be securely applied.
- Strap booms carefully to constrain them from sideways movement. When using straps or chains, adequate packing should be applied to stop any damage to the structure and paintwork. Due regard of the movement of the straps or chains must be taken into account.
- Where a machine has designated points for strapping, lifting or forking, these can be used for tie-down duty. When they are absent, the major structure of the Niftylift 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 outrigger 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 basket support structure or the basket 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 basket weigh assemblies, which would render them useless. Such catastrophic damage to say, an electronic load cell would require the component to be replaced before the machine would function.

4.6.2 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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TD34T

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 Niftylift 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 and disconnect the red isolation connector to prevent discharge of batteries through leakage.
- 4) If Niftylift is to be left on an incline, chock the track to prevent creep.
- 5) If the Niftylift 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 Niftylift 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 un-attended for an extended period, it is likely that the hydraulic basket 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 basket needs to be fully levelled forwards and backwards, using the basket-levelling lever whilst not standing in the basket (i.e. with the operator standing adjacent to the basket side whilst simultaneously operating the lever and green button to move the basket). Take care not to become trapped between the moving basket and a fixed object, and ensure those around you are clear of the moving basket. When the system has been charged in both directions, the basket levelling function should be restored. If the system operates but is 'jerky' in either direction, this indicates air in the system. Repeat the procedure as described above until the movements are smooth and un-interrupted. If in doubt, contact our Service Department for further advice.

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

5 Emergency Controls

5.1 GENERAL

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



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

5.2 IN THE EVENT OF AN INCAPACITATED OPERATOR

Turn the key switch 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 basket to the ground using either basket 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 basket to the ground.



FOLLOWING AN EMERGENCY DESCENT RECOVERY OF THE NIFTYLIFT, 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.

6.2 MANUAL OF RESPONSIBILITIES

You are required by ANSI/SAIA A92.20 2020, to read and understand your responsibilities before you use or operate this Niftylift.

Please read the enclosed document, as failure to do so could result in death or serious injury.

Wherever any contradiction may appear, the Manual of Responsibilities shall take precedence over all other documents.

6.3 Inspection/Service/Pre-Hire Check list

MACHINE SERIAL NO _____

TOWING	PASS	FAIL	N/A
Machine secured on trailer			
Straps correctly positioned and tightened			
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			
Basket 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			
BOOM ROTATION			
Rotation assembly and motor are secure			
Gearbox mesh correct, no excessive wear			
No excessive back-lash			
Rotation gear wheel bolts secure			
Rotation gear guards secure			
BASKET			
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			
Basket levelling over full range			
Boom rotation 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			
Boom rotation motor			
Hose connections			
Filter			
Tack 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 ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

Safety Related Part of the Control System (SRP/CS)	Approval (Standard, Performance Level)
A1 Monitoring of stabilisers - Setting up	ISO 13849-1:2015 PL c
A2 Monitoring of stabilisers - Booms	ISO 13849-1:2015 PL d
A3 Load sensing system	ISO 13849-1:2015 PL d
A4 Platform levelling	ISO 13849-1:2015 PL c
A5 Interlocking of control positions	ISO 13849-1:2015 PL c
A6 Prevent movements of load holding cylinders in case of pipe failure	ISO 13849-1:2015 PL c

A1 MONITORING OF STABILISERS – SETTING UP

The monitoring of the stabilisers is PL c in accordance with ISO 13849-1:2015 as required by ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

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.

Operating & Safety Instructions

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 a safety relay which provides a single channel output for safety.

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 basket 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.

- 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) Refer to Section 4 of the Operating and Safety Manual, ‘Setting up Procedures’ for correct operation of the stabilisers.
- 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 13849-1:2015 as required by ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

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.

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 a safety relay which provides a single channel output for safety.

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.

Operating & Safety Instructions

- 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) Refer to Section 4 of the Operating and Safety Manual, 'Setting up Procedures' for correct operation of the stabilisers..
- 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 controls and deploy the stabiliser operating lever or switches. 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

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 LOAD SENSING SYSTEM

The Load sensing system is PL d in accordance with ISO 13849-1:2015 as required by ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

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

The load sensing system is activated whenever a green button or footswitch input is given to the PCB. The sensing system is a two-channel device which takes the input from a single load cell bridge on the basket load cell. The actual basket load is determined, and in the case of an overload, the alarm will sound and the output signal is lost.

The loss of the output signal is converted into two separate signals, one of which is used to isolate Channel 1 output (EN) and the other to isolate the Channel 2 output. (GBO). **Proper maintenance and daily safety checks to be observed.**

On initial set-up the machine must be zero loaded to allow the 'Tare' function to register the no-load condition. Following that, a calibrated test load is put into the basket to set the upper limit. Proper adherence to the zero set point and the correct test load must be taken to ensure the load sensing system is working correctly. It is possible to apply the overload to the machine in the rest position, and then only to detect this on the next application of the command signal. If the machine has been in the elevated position the consequences of this would be more significant than if the machine were stowed.

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

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

If the load sensing system does not function as intended it is possible that the Niftylift may encounter overloads for which it is not rated.

If the Niftylift encounters loads 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 load moment control system comprises of a primary device the "load sensor" and control PCB, and protective devices, for example solenoid operated Master dump valves or contactors.

If the load sensing system cuts out, an alarm will sound and a clear indication of visual overload will be given at each operating position. The system will not re-set until the overload has been removed, by recommendation of reducing the overload in a safe manner.

5. Response time;

The Load sensing system is active all the time the green button or footswitch is depressed, the application of an overload will be detected within 4 seconds to cater for transient loads and acceleration forces. The alarm and visual indication will continue to sound as long as the machine is overloaded and the command signal is being applied. Removal of the overload by reduction of the applied load will take the basket weigh below the threshold for activation as there is 95% hysteresis in the system. Once restored the load system will function as before and no re-calibration will be necessary.

6. Operating limits (including environmental conditions);

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

7. Indications and alarms;

The action of the basket overload detection will cause the klaxon to sound and will be indicated by the red warning light on the base and basket location, only as long as the green button or footswitch is continued to be depressed.

8. Muting and suspension of safety functions;

In the case of the overload being detected the alarm can be silenced by releasing the green button or footswitch. Suspension of the function will continue until the overload has been safely removed.

9. Control modes;

The load sensing system has no user controllable modes of operation, other than by use of the calibration tool.

10. Maintenance; Maintenance check lists;

Normal maintenance

- Visual check of transducers, board (box) and connection wires.
- Check of power supply to verify it is correct.
- Check of the equipment correct operation, by simulating an overload condition and correspondent re-setting. See "Means for easy and safe trouble shooting"

The load sensor will not normally require special maintenance

Should special maintenance be require 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.

Operating & Safety Instructions

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 Load Sensor, PCB or Hydraulic valve block.

Do not attempt to open the load sensing PCB or replace components soldered to any PCB.

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

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 basket. (Machine runs, pump flow is available for machine functions.)
- 4) Select the Basket control position and mount into the basket.
- 5) Enable the basket controls and then press the basket green button or foot switch to enable the machine functions. (Machine runs, pump flow is available for machine operation.)
- 6) Add sufficient load to the basket to exceed the safe working load. Press the green button or foot switch and observe that the basket overload system brings in the alarm and halts all machine movements.
- 7) Remove the overload to below the threshold for safe working load and observe that the basket load control automatically re-sets and restores all machine functions.
- 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 load sensing 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.

Load sensing system

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 booms
- 4) Fit the coil back onto the hydraulic solenoid valve
- 5) Repeat steps 1 to 4 for channel 2.

Pass criteria - If the booms do not operate the system is functioning correctly.

Fail criteria – If the booms 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) Overload the basket
- 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.

A4 PLATFORM LEVELLING

The Platform levelling system is PL c in accordance with ISO 13849-1:2015 as required by ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

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 basket 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 basket may not be maintained.

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

In the event of the operator or other occupants of the basket not using the required safety equipment they may be ejected from the basket 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 basket position is maintained until the operator can be recovered from the basket.

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 basket.

5.Response time

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

6. Operating limits (including environmental conditions);

All components within the 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 basket 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 basket remains level. If the basket 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.

A5 INTERLOCKING OF CONTROL POSITIONS

The interlocking of the control positions is PL c in accordance with ISO 13849-1:2015 as required by ANSI/SAIA A92.20-2020 and CAN/CSA B354.6-2017.

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.

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 basket system to be isolated by the ground control key switch and will ignore the use of the Basket 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 basket. (Machine runs, pump flow is available for machine functions.)
- 4) Leave the base key in the ground control position and climb into the basket.
- 5) Enable the basket controls and then press the basket 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 Basket position. Check that the control functions are now transferred to the basket, and that all controls are active.
- 7) Dismount from the basket 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.