PRE-RENTAL CHECK OFF LIST NIFTY SD50

CUSTOMER NAME/CONTRACT NUMBER_____

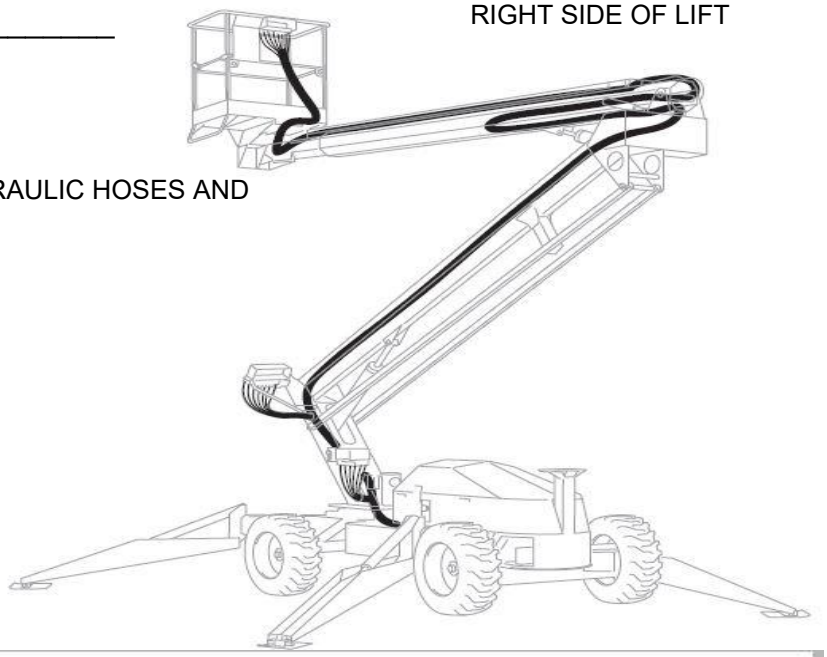
Customer Initials:_____ CUSTOMER INDICATE CUSTOMER HAS BEEN SHOWN THE OPERATION OF LIFT AND IS CONFIDENT OF OPERATION AND THE OPERATION MANUAL IS ON LIFT.

Employee Intials:_____

physical damages_____
please note
and/or take pictures

VISUAL INSPECTION HYDRAULIC HOSES AND FITTINGS_____

RIGHT SIDE OF LIFT



LEFT SIDE OF LIFT

HAVE PICTURES BEEN TAKEN? YES / NO

PLEASE COMPLETE FORM AND RETURN TO FRONT COUNTER

SCAN FOR COMPLETE SAFETY MANUAL
(Mobile device with quick response code application required)

4 Operation

4.1 CONTROL CIRCUIT COMPONENTS

4.1.1 **CONTROL BOARD: -** Situated under the canopy, the encapsulated control board comprises of a PCB (printed circuit board) design which incorporates all of the relays to control the machine operation. The control board is common to all models and contains functions which might not be utilised on your machine. A thermal trip switch is integral to the box, which protects the control circuit components. If power is lost, the switch can be manually reset.

4.1.2 **TILT ALARM: -** Fitted under the canopy, on the power tray at the front of the machine, the tilt alarm is a solid state sensor which monitors the inclination of the machine. The tilt alarm does not operate when the machine is being driven, as the boom switch overrides this function as long as the booms are lowered.

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

4.1.4 **KLAXON: -** Also mounted on the top of the control board box is a klaxon, which performs several functions.-

Firstly, it can be used as a manual alert, by pushing the "Horn" button at the Basket Control Station.

Secondly, it is the device which sounds continuously if the tilt alarm sensor detects excessive inclination, with the outriggers incorrectly deployed and the booms raised.

Lastly, it is linked into the battery management system, such that when low battery state is reached the "pulsing" of the DC motors is mimicked by the Klaxon, re-enforcing the message to the operator to re-charge the batteries.

4.1.5 **DRIVE CONTROL VALVE (DCV):-** The motion control valve comprises of several individual components all directly involved in the hydraulic supply to the wheel drive motors. Principal amongst these are the drive control valves, which electrically change the drive motor hydraulic supply from series flow to parallel, or vice versa. This control function is only available when the booms are lowered and allows the operator to select "Hi" or "Lo" drive. "Hi" drive gives fast speed of travel, but low gradeability, "Lo" drive gives best gradeability, but slow speed. "Lo" drive is used for climbing inclines and delicate positioning of the machine.

4.1.6 **BRAKE RELEASE VALVE (BRV):-** The motion control valve also incorporates a solenoid operated dump valve which controls the brake function on the machine. This valve must be energised to allow the machine to move. If no voltage is present, the wheel motors will not be able to develop drive torque, whilst at the same time, the spring applied parking brakes will remain engaged. Only when the green "power control" button is being used (or the basket foot switch is depressed) will the BRV operate. If the tilt alarm sensor detects an excessive inclination whilst the booms are raised, it is the BRV which is de-energised to isolate the machine (at the same time the Klaxon tone changes to a continuous one to indicate this condition).

4.1.7 **BOOM SWITCH: -** Mounted on the boom rest on Boom 1, and operated by the upper boom, this switch controls both the operation of the tilt alarm sensor, and the outrigger interlock. With the booms in the stowed position, the tilt alarm sensor is bypassed, allowing the machine to negotiate slopes in excess of the permissible working angle, without isolating the drive function. At the same time, "Hi" drive is possible, as is fast throttle on those machines so equipped. When the booms are raised, the tilt alarm sensor becomes activated, and the boom switch isolates the outrigger control circuit. These control functions are of primary importance to the safety of the machine and operator; under no circumstances should this control function be isolated or bypassed.

4.1.8 **BATTERY MANAGEMENT: -** Battery condition is permanently monitored by the control circuit, such that when available power has decreased to 20% of full charge, the battery status circuit begins to "chop" the power to the hydraulic power packs. This function causes the drive system to alternately stop and start, signalling to the operator that re-charging is necessary. At the same time the Klaxon will begin to sound intermittently re-enforcing the charge warning. At this point, sufficient power remains to drive to the nearest power point. Should the operator ignore the on-set of the discharge warning, the "chopping" will continue until the machine is rendered inoperative. Immediate charging will then be required.

Under no circumstances should a machine be left fully discharged or severe battery damage can occur in a relatively short time.

4.1.9 **BATTERY ISOLATOR: -** A battery disconnect switch is located next to the engine ignition switch in the right hand canopy, which allows the machine control and power circuits to be isolated from the batteries themselves. Under normal operation, the machine key switch should be used to isolate the machine, with the Battery Isolator only being required for emergencies to disconnect the batteries in the event of a short circuit. The battery charging circuit is connected directly to the battery side, so charging is unaffected by use of this switch.

4.1.10 **DUTY SELECTOR: -** On multiple power option machines, one of the functions on the Basket Control Station will be a Duty Selector. This key switch allows the selection of either power option i.e. from Diesel to Battery, or Gasoline to Battery, or vice versa. On other machines this same key switch serves as an "ON-OFF" control.

4.1.11 **DIESEL ENGINE:-**Generally a Kubota D722-E engine, described in the maintenance section of the Workshop Manual, driving a twin bodied pump with direct mounted pump dump valves (one per section). The arrangement allows two speed operation and fast throttle.

4.1.12 **DIESEL BOX: -**Located adjacent to the Diesel engine, the Diesel box combines all of the functions for Dual power operation, (Bi-Energy machines), as well as controlling the Diesel engine itself. 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.

4.1.13 **GASOLINE ENGINE:-**Generally a Honda engine, described in the maintenance section of the Workshop Manual, driving a single body pump with direct mounted pump dump valve. The engine is also equipped with a throttle solenoid for two speed operation.

4.1.16 **SPEED CONTROL:** A two position selector allows high throttle for the engine to be selected, or twin power pack operation for fast speed duty. This will operate when the booms are lowered, to allow fast set-up of the outriggers, and fast drive speed.

4.1.17 **4WD:** This variation is four wheel drive and front wheel steer. Braking is hydrostatic on all wheels and with fail-safe hydraulic parking brakes on the rear wheels. Speed control is fully proportional with hi/lo throttle control and series/parallel or parallel/parallel switching of the drive motors (Tortoise/Hare).

4.2 SETTING UP PROCEDURES

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

ALL MODELS

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) Release boom travelling clamp. (If applicable)
7) Check all red emergency stops are not engaged i.e. fully out.
8) Ensure selector valve adjacent to drive/outrigger control station is turned fully down to outrigger/drive position. (For four wheel drive machine grasp and hold duty selector. Power will be available automatically).
9) From the basket control station depress and hold the green power button or footswitch to give hydraulic power to the outriggers and select the appropriate control lever. Note: No power will be available if the booms are not stowed onto the boom rest.
10) Using the four outrigger control levers, lower each outrigger onto a firm, level surface and level machine base ensuring each outrigger foot is taking equal weight with the wheels clear off the ground.
11) Check machine is level using spirit level on the base, visible from the basket.
12) Change selector valve at drive/outrigger control station to basket, i.e. turn fully up. (On four wheel drive machines, releasing the duty selector handle automatically returns the machine to "basket" operation).
13) The booms can now be operated from the ground or basket control station by depressing and holding the green power button. Note: If no power is available check each outrigger is lowered and each footpad is taking equal weight.
14) Always lower booms fully before adjusting, raising, retracting or moving the outriggers in any way.
15) Never alter, modify or block any of the safety circuits on the Niftylift.

4.3 GROUND CONTROL OPERATION

ALWAYS ALLOW THE ENGINE TO WARM UP BEFORE OPERATING.

4.3.1 GROUND CONTROL INSTRUCTIONS

ALL MODELS

1) Ensure all red emergency stops are out.
2) Turn key switch at ground control station to ground (i.e. fully down).
3) Ensure selector hand valve (if applicable) is turned to basket position (i.e. fully up).
4) Battery electric models go to step 11.

DIESEL ENGINE OR BI-ENERGY MODELS

5) For a cold engine start, go to step 6) or for a warm engine go to step 7).
6) **COLD ENGINE:** - turn the main engine ignition switch (located beneath the front cover) through "ON" to "GL". This engages the glow plug pre-heat system. Hold for 3-5 seconds then turn key fully to "ST" (start) position and the engine will fire.
7) **WARM ENGINE:** - turn the main engine ignition switch (located beneath the front cover) through "ON" to "ST" (start) position and the engine will fire.

Note – Unless the diesel engine is running, the SD50 will automatically default to the primary power source (usually battery).

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

8) For a cold engine start, go to step 9) or for a warm engine 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.

Note – Unless the diesel engine is running, the SD50 will automatically default to the primary power source (usually battery).

ALL MODELS

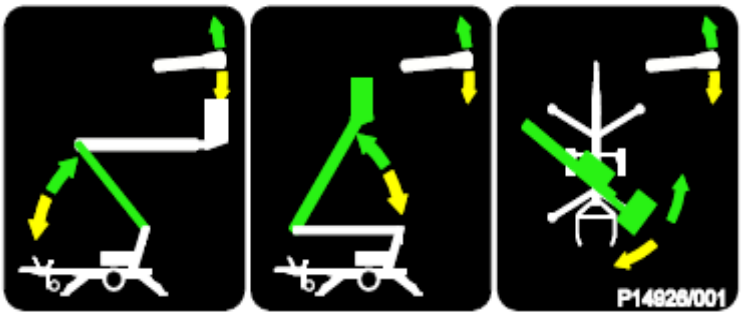
11) Push and hold green power button.
12) Select function and operate hand levers in full accordance with manufacturers Operating and Safety manual. Note: all outriggers must be down before booms can be operated.
13) To return control to basket turn key fully clockwise to up position.
14) When not in use return machine to stowed position, fully raise and stow all outriggers, turn the key to the centre off position, remove key and chock wheels.

EMERGENCY PROCEDURES

1) Push in red emergency stop to shut down all functions.
2) Use manual hand pump to manoeuvre machine into a safe place. Base or basket controls can be used whilst the hand pump is being operated. Only when the machine is fully stowed should the flow be directed to the outrigger controls in order to recover the outriggers. Failure to follow this procedure could result in serious injury or risk of death.

4.3.2 BOOM FUNCTIONS

A) Push and hold green power button.



1 2 3

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

1 Operates Lower Boom	**UP** for up	**DOWN** for down
2 Operates Upper Boom	**UP** for up	**DOWN** for down
3 Operates Swing	**UP** for right	**DOWN** for left

ALWAYS ENSURE THE AERIAL BASKET 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 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.

4.4.1 BASKET CONTROL INSTRUCTIONS

ALL MODELS

1) Ensure all red emergency stops are out.
2) Turn key switch at ground control station fully up to basket position.
3) Ensure selector hand valve (if applicable) is turned to basket position, i.e. fully up.
4) Turn selector switch on basket control box to **I** (anti-clockwise) for **battery** operation or **II** (clockwise) for **engine** operation.
5) Battery electric models go to step 12).

DIESEL ENGINE OR BI ENERGY MODELS ONLY

6) For a cold engine start go to step 7) or for a warm engine start go to step 8).
7) **COLD ENGINE:** - turn the engine ignition switch (on the basket control box) to the Glow position (anti-clockwise). This engages the glow plug pre-heat system. Hold for 3-5 seconds then turn the switch to the Start position (fully clockwise) and the engine will fire.
8) **WARM ENGINE:** - - turn the main engine ignition switch (on the basket control box) to the Start position (clockwise) and the engine will fire.

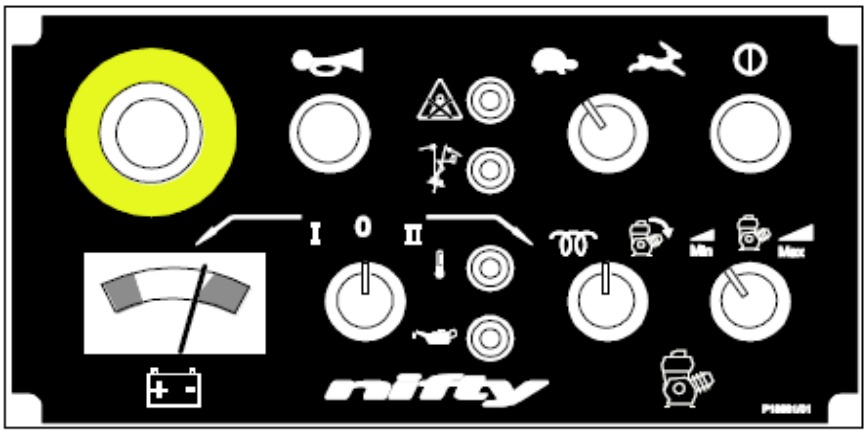
GASOLINE ENGINE OR GASOLINE/ELECTRIC MODELS ONLY

9) For a cold engine start go to step 10) or for a warm engine start go to step 11).
10) **COLD ENGINE:** - (From the ground only) 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.
11) **WARM ENGINE:** - Ensure the main engine ignition switch is ON. Turn the 3 position engine ignition switch to the right and the engine will fire. When released, the selector will return to the centre, 'OFF' position.

ALL MODELS

12) Depress foot switch or push and hold green power button.
13) Select function and operate hand levers in full accordance with manufacturers Operating and Safety manual.
14) When not in use return booms to stowed position. Fully raise and stow all outriggers. Turn key switch at ground control to centre off position, remove key and chock wheels.

4.4.2 BASKET PUSH-BUTTON CONTROLS STATION

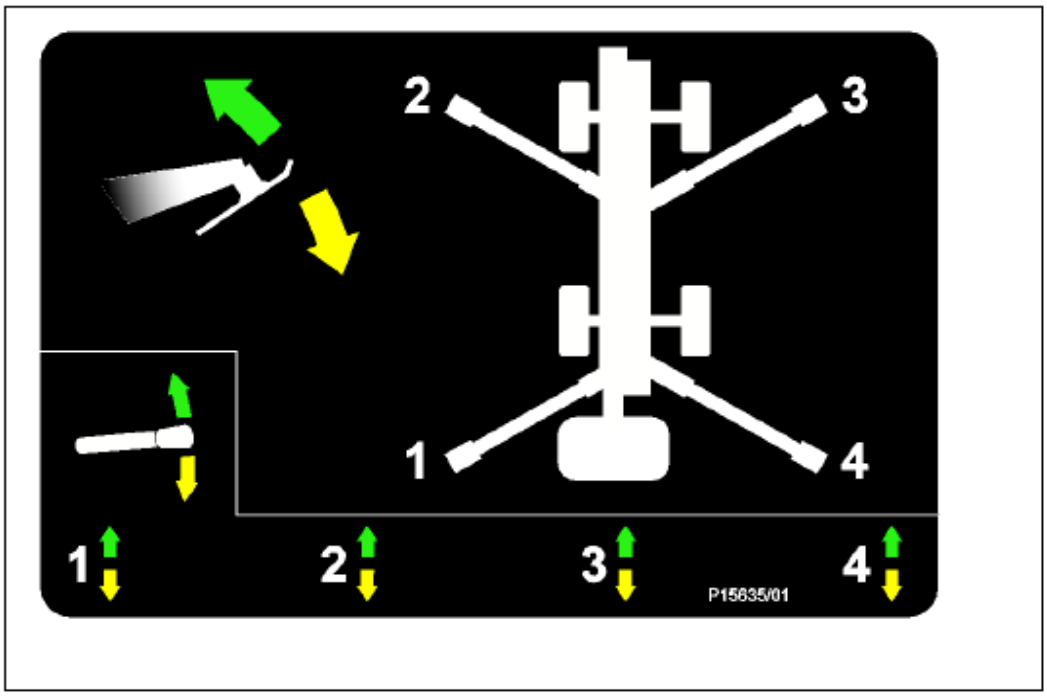


(BI-ENERGY MODEL SHOWN)

4.4.3 DRIVE AND OUTRIGGER FUNCTIONS

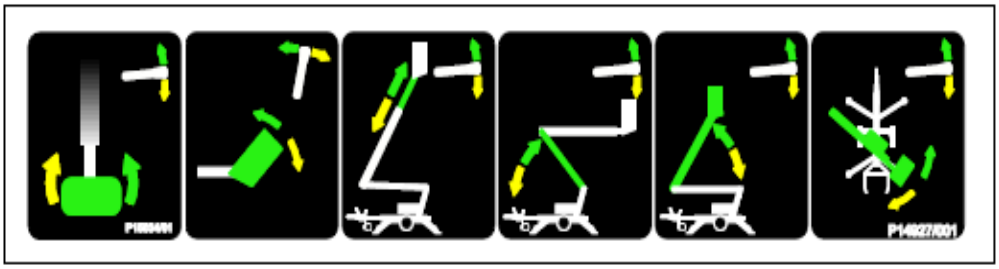
Situated at the top of Boom 1 (superstructure) is the 4 lever drive/outrigger hand valve. These control the following functions:

Control the jack deployment as indicated on the label below. (Mounted adjacent to the jack control position).



4.4.4 BOOM CONTROLS

1) Never exceed the maximum basket capacity of 500lb.
2) Check below, above and around the basket for any obstruction or hazards before operating any function.
3) Depress foot switch or push and hold green power button.



1 2 3 4 5 6

4) Select lever **1, 2, 3, 4, 5** or **6** for desired boom function.

1 Operates Basket Swivel (optional)	**UP** for right	**DOWN** for left
2 Operates Basket Levelling	**FORWARD** for forward	**BACK** for back
3 Operates Telescope	**UP** for telescope out	**DOWN** for telescope in
4 Operates Lower Boom	**UP** for up	**DOWN** for down
5 Operates Upper Boom	**UP** for up	**DOWN** for down
6 Operates Swing	**UP** for right	**DOWN** for left

IF ALARM SOUNDS - DESCEND IMMEDIATELY

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

4.5 DRIVING CONTROLS

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

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

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

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

4) Select drive joystick from hand lever controls (left hand lever of five, situated at the drive/outrigger control position).

   A. Up for **FORWARD**
   B. Down for **REVERSE**
   C. Left for **STEER LEFT**
   D. Right for **STEER RIGHT**

5) All control levers give a fully proportional response therefore the more the lever is moved away from the centre (OFF) position the faster the function will become.
6) Maximum drive speed is only attainable when all booms are fully stowed and the **HI/LO** selector is in the **HI** position.
7) When driving with the booms fully stowed, the Tilt Alarm is bypassed to allow the Niftylift to be driven in areas where the slope exceeds the five degree working limit. In normal operation the drive is therefore unaffected when driven onto a slope in excess of five degrees, until the outriggers are lowered and the booms are raised, whereupon the drive would be disabled and the tilt alarm sounds continuously.
8) Under no circumstances should any Niftylift SD series machine be driven on slopes exceeding 30%, with the booms fully stowed.

4.6 BATTERIES AND CHARGING

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

1) Recharge batteries at the end of every working day or shift.

   (**Note:** To recharge batteries fully from flat takes approx. 12 Hours, this consists of 8 hours bulk charging plus 4 hours equalisation).

2) Plug charger into suitable power supply, either 240 volts or 110 volts AC (see **Charging Limitations**). (Note: If using 240V, use of a suitably rated Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD) at the point of supply is highly recommended.)

   Press **green power button** briefly to energise a motor contactor. This activates the Control Battery Regulator allowing it to charge the 12v engine battery at the same time as the main batteries.

3) Take note of the indicators provided:

   Red Light - Batteries are charging.

   Pulsing Green light - the charge is equalising.

   Constant Green light and pulsing Red light - the batteries are fully charged.

UNDER NO CIRCUMSTANCES SHOULD BATTERIES BE LEFT ON CHARGE FOR PERIODS IN EXCESS OF 24 HOURS

4) **DISCONNECT FROM POWER SUPPLY ONCE BATTERIES ARE FULLY CHARGED.** The machine can now be left unattended, however, in the event of the machine being left unused for extensive periods then a **4 to 6 hour** 'top-up' charge every **4 weeks** is recommended. A 'top-up' charge the day before use ensures a full day of operation from the machine.

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

5) To avoid damage to charger disconnect from mains supply before using machine.

Note:

1) If the charger is reconnected to the power supply shortly after it has gone through its full charging cycle the Red LED may come on although the batteries may be fully charged. The charger would then go through its complete cycle again at an accelerated rate, depending on the time difference between connection, reconnection and level of battery charge.

2) Some machines are fitted with a Battery Management System, which permanently monitors the condition of the batteries. When the batteries become discharged to 20% of their capacity the management system will begin to "shut down" the hydraulic power packs. This causes the drive/boom operating system to alternately stop and start, signalling to the operator that re-charging is necessary. However, there is sufficient power remaining to enable the operator to drive slowly to the nearest charging point.

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

CHARGING LIMITATIONS

Battery charging times will increase slightly if using an 110V supply as opposed to a 240V supply. This is due to the connection of the primary coils being in parallel, which in effect only allows the transformer to see 220V. Similarly, the capacity of the 110V supply will decide the input current available; hence a small hand-tool transformer will not operate the battery charger efficiently, therefore: - charging times will increase further due to input limitations.

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

The charger requires a minimum battery voltage of 4.5 volts per battery (overall for two batteries 9 volts, for 4 batteries 19 volts for 8 batteries 38 volts). If the voltage is below these values then the charger will not function (Charger will not detect batteries to begin charge.) If the batteries have fallen to such a poor state they will have to be removed from the machine and charged individually with an independent charger until the optimum voltage has been reached. This is best performed at very low currents to 'recover' the batteries if sulphation has already started i.e. a 'trickle' charger. This can take several hours, possibly days. Careful monitoring of the rise of battery voltage will indicate when recovery has been achieved.

TOPPING UP

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

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

4.7.5 SETTING TO WORK

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

1) Check all lubrication points for adequate application of grease, oil etc.
2) Inspect all threads for ease or operation - especially descent valves, brake release valve etc.
3) Check level and quantity of oil. Remove any contaminants - water, etc.
4) Check batteries for electrolyte and state of charge.
5) Check electrics for damage and insulation.
6) Using 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.