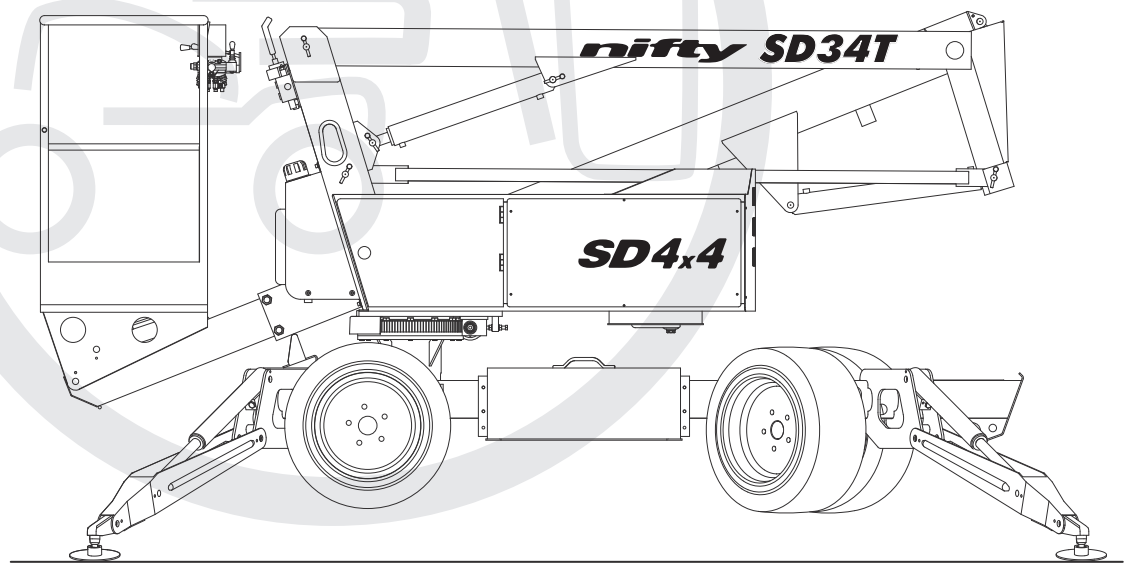


nifty

SD34T

Service Manual

MODEL SD34T SERIES



Niftylift Limited
1525 S.Buncombe Road
Greer
SC 29651
USA

niftylift.com
info@niftylift.com



www.niftylift.com
e-mail: niftyusa@niftylift.com
Tel: 864-968-8881
Fax: 864-968-8836

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1 Introduction and general information

1.1 Foreword

The purpose of this manual is to provide the owner, service engineer or technician with information to service and maintain the Niftylift.

Prior to carrying out any maintenance or operating the Niftylift the operator's manual should be read and fully understood.

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

All information in this manual is based on the use of the Niftylift under proper operating conditions.

Alteration and/or modification of the Niftylift are strictly forbidden.

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

Warnings and Cautions

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



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

⚠ DANGER

Indicates hazardous situations, which if not avoided, will result in serious injury or death.

⚠ WARNING

Indicates potentially hazardous situations, which if not avoided, could result in serious injury or death.

⚠ CAUTION

Indicates potentially hazardous situations, which if not avoided, could result in minor or moderate injury.

NOTICE

Indicates important information that is not safety related. This includes general safety rules and/or procedures relating to the Niftylift.

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

1.1.1 Defined maintenance terms

Defined maintenance terms used within this manual can be found in the Table 1, "Defined Maintenance Terms," on page 2.

Table 1: Defined Maintenance Terms

Term	Action
Remove	Disconnect and take off component
Install	Place component in position ready for use
Replace	Remove and discard the original component and put a new component in its place
Secure	Install or attach locking device
Reinstall	Install the previously removed component
Tighten	Apply specified torque
Clean	Remove all dirt and deposits
Inspect	Determine general condition conforms to required standards
Check	Determine a particular condition e.g. completeness, security, position
Adjust	Change or move in order to achieve a desired result
Connect	Install, engage component
Lubricate	Apply lubricant
Disconnect	Remove, disengage component

1.2 Warranty

During the warranty period, consult Niftylift prior to carrying out any corrective maintenance on your Niftylift. If work is carried out without Niftylift's consent your warranty will be invalidated.

Clean assembly practices must be observed when carrying out repairs, as seals and other hydraulic components are sensitive to contamination.

The Niftylift must not have been neglected, misused or modified and must have been regularly maintained.

Failure to comply with these conditions invalidates the warranty.

1.3 Scope

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, alter, modify or improve its products without any obligations to install them on previously manufactured Niftylifts.

If information is found to be either incorrect or missing Niftylift encourage you to send in suggestions which will aid our continuous product improvement.

If after reading this manual you require further information please do not hesitate to contact us at your nearest office.

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

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

1.4 General maintenance information

Any repair or maintenance work on a Niftylift must be undertaken by a competent person with sufficient training and experience to perform the activity. Basic mechanical, hydraulic, and electrical skills are required to perform routine maintenance and minor repairs to a Niftylift. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, it is recommended that maintenance and repair be performed by Niftylift or at a Niftylift approved service center.

Niftylift's safety rules and instructions must be obeyed at all times.

Refer to "Frequent inspection" on page 4 where the Niftylift has been out of service for a period longer than 3 months.

⚠ WARNING **FAILURE TO PERFORM PREVENTATIVE MAINTENANCE AT THE REQUIRED INTERVALS MAY RESULT IN A NIFTYLIFT THAT IS NOT SAFE TO USE WHICH COULD CAUSE INJURY OR POSSIBLE DEATH.**

Regular inspections and appropriate maintenance will ensure the Niftylift performs efficiently and economically with minimal service or repair down time.

1.4.1 Pre-Maintenance checks

Perform the following before maintaining the Niftylift:

- Park the Niftylift on firm and level ground,
- Turn off ignition, remove the key, and relieve hydraulic system pressure,
- Ensure the Niftylift is in transport mode, i.e. all booms lowered and rotated parallel to the base, and basket floor horizontal,
- Ensure wheels are chocked, and, if installed, engage the parking brake,
- Allow the Niftylift to cool down,
- Disconnect power to the Niftylift,
- Disconnect batteries before replacing electrical components.

1.4.2 Maintenance information

Ensure maintenance is carried out in suitable workshop facilities with appropriate tools and suitable lifting equipment.

Components must be replaced with identical or equivalent parts. If unsure contact your nearest Niftylift approved dealer for advice.

Inspect all parts prior to reassembly and replace if necessary. Do not install faulty, used, or worn parts to a Niftylift.

Replace all O-rings, seals and gaskets at reassembly.

Replace any parts with damaged threads; replace all roll pins, self locking fittings and circlips.

If any part resists removal check all fasteners, hydraulic lines, electrical wires and interferences before continuing.

Keep all new parts in their packaging until they are to be installed, carry out inspection before installation.

Mark or tag all hydraulic lines before removal to avoid confusion and error during reinstallation. Never leave hydraulic lines open or open them in a contaminated area. Always use plugs or caps.

Use only recommended lubricants. See section 2.4.2.

In general, installation of components can be completed by reversing the removal process and instructions.

Please refer to the following documents for further details.

Table 2: Technical Documents

Document	Number	
	DIESEL	BI-ENERGY
Hydraulic Schematic	D81383	
Electric Schematic	D81446	D81384
Operating and Safety Instructions	M50905	
Parts Manual	M50350	
Engine Operator's Manual	M50291	

For easy access to any of the above documents go to www.niftylift.com, register in the '**My Nifty Registration**' section, then navigate to the '**My Nifty**' section and enter the **Niftylift Serial Number**.

1.4.3 Frequent inspection

The owner of the Niftylift shall make sure that a frequent inspection is carried out in accordance with Niftylift instructions, on a machine:

- (1) That was purchased used. This inspection shall be accomplished unless it is determined that the frequent and annual inspections are current.
- (2) That has been in service for three months or 150 hours, whichever comes first.
- (3) That has been out of service for a period longer than 3 months.

The inspection must be made by a person qualified as a technician on the specific type of Niftylift or one having similar design characteristics. The inspection must be in accordance with items specified by the manufacturer for a frequent Inspection and shall include, but not limited to the following:

- (1) All functions and their controls for speed(s), smoothness, and limits of motion.
- (2) Lower controls including the provisions for overriding of upper controls.
- (3) All chain and cable mechanisms for adjustment and worn or damaged parts.
- (4) All emergency and safety devices.
- (5) Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, and engine oil as specified by the manufacturer.
- (6) Visual inspection of structural components and other critical components such as fasteners, pins, shafts, and locking devices.
- (7) Placards, warnings and control markings.
- (8) Items specified by the manufacturer.
- (9) Emergency lowering means.

1.4.4 Annual inspection

The owner of the Niftylift shall make sure that an annual inspection is performed no later than thirteen (13) months from the date of the prior annual inspection.

The inspection must be made by a person qualified as a technician on the specific type of Niftylift or one having similar design characteristics. The inspection shall include all items included in the frequent inspection (See section 1.4.3) plus items specified by the manufacturer for an annual inspection, to include manufacturer's bulletins.

The inspection shall verify that the MEWP (Mobile Elevated Work Platform) is registered with Niftylift and that any open safety-related bulletins are addressed as part of the inspection. The MEWP shall not be placed back into service until all malfunctions and problems identified in the inspection have been rectified.

The owner shall maintain on the MEWP a means to identify the date the last annual inspection was performed and the interval at which annual inspections are required.

1.5 Maintenance safety information

1.5.1 Personal injury prevention

⚠ WARNING **CORRECT PPE (PERSONAL PROTECTION EQUIPMENT) MUST BE WORN FOR ALL MAINTENANCE OPERATIONS CARRIED OUT ON YOUR NIFTYLIFT ACCESS PLATFORM.**

Do not wear jewellery whilst carrying out maintenance. Restrain long hair and do not wear loose clothing. Ensure the work area is well ventilated and well lit.

Never work under an elevated boom. Booms must be restrained from movement by blocking, using overhead slings or fitting a safety prop.

Ensure all stepping surfaces, hand holds and anti-slip surfaces are free from oil, dirt, fuel and ice. Do not step on parts of the Niftylift which are not intended for this.

Use caution when checking hot pressurized systems such as hydraulic and engine coolant.

Use correct tools and equipment, broken or damaged tools and equipment should be replaced/repaired.

Where hydraulic or electrical circuits need to be energized e.g. during maintenance or diagnostic procedures, personnel must be aware of moving parts and position themselves accordingly to avoid being crushed or injured.

1.5.2 Machine damage prevention

Never reset a pressure relief valve to a value higher than that stated by the manufacturer.

Ensure no tools, equipment or other objects have been left on the Niftylift.

Please contact your nearest Niftylift approved dealer prior to carrying out any welding.

1.5.3 Diesel system safety

Escaping fuel under pressure can penetrate the skin causing serious injury. Do not attempt work on the fuel system without proper training and safety equipment.

Seek immediate medical attention in the event of fuel penetrating the skin.

1.5.4 Electrical safety

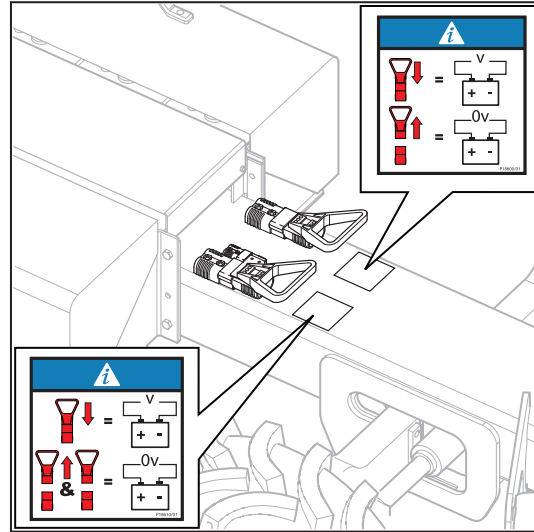
During maintenance of the electrical system, pull the battery-disconnect handle (Anderson). For Bi-energy machines, also isolate the 24V battery system by pulling the adjacent battery-disconnect handle (Anderson).

Ensure sparks, flames or lighted tobacco are kept away from batteries as they emit explosive gases.

Keep metallic objects (tools, etc.) well clear from battery posts.

Ensure battery posts are always protected and caps are installed and in good condition.

Never connect a discharged battery in series with a fully charged battery as this creates a risk of explosion. Always use batteries that have the same level of charge.



1.5.5 Hydraulic safety

Hydraulic oil escaping under pressure can penetrate the skin and cause serious injury. Do not allow hydraulic oil to squirt or spray.

Seek immediate medical attention in the event of hydraulic oil penetrating the skin.

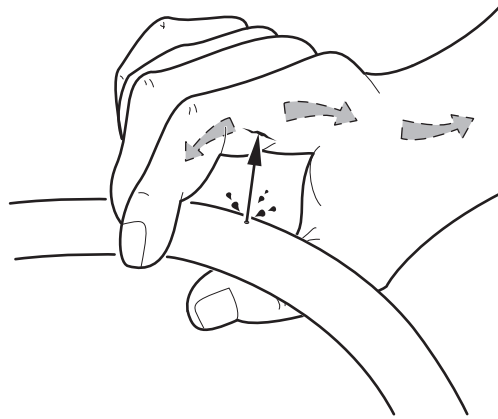
Wear chemical-resistant protective gloves and suitable eye protection when handling hydraulic oil.

Relieve system pressure before removing any hydraulic connections, undo fittings slowly to make sure there is no residual pressure. If pressure is detected, allow it to be released slowly before completely removing the hose.

Fluid leaks may not be visible to the naked eye. Use a piece of cardboard to check for leaks, **not** your hand.

Never install hydraulic lines or components that are damaged.

Ensure all connections are correctly tightened (See section 2.7).



1.5.6 Environmental awareness

When draining fluids, ensure they are collected in a suitable container and spillages are avoided.

Used batteries must be disposed of in the correct manner as waste is harmful to the environment.

Consumables such as oils, rags and gloves should also be disposed of correctly as waste is harmful to the environment.

2 Specifications

Information correct at time of print, refer to serial number of the Niftylift.

2.1 Engine specifications

Feature	Kubota D722
Type	Water cooled 4-cycle, 3 cylinder diesel engine
Fuel	Diesel fuel grade 2-D
Engine oil	See section 2.4.2
Mass (Dry weight)	63kg (139 lbs)
Displacement	719cm ³ (43.8 cu.in)
Net power	14.9kW/20hp @ 3600rpm
Oil capacity	3.8 L (0.84 gal)(1.00 US Gal)
Fuel capacity	16 L (4.2 US Gal)
Coolant capacity	3.1 L (0.7 gal)(0.8 US Gal)
Valve clearance (cold)	0.165mm - inlet & exhaust (0.0065in.)

2.2 Gearbox specifications

Type	PGWF130 R 5.75 GWS100
Mass (Dry weight)	21.5kg (47.4 lbs)
Oil capacity	0.3 L (0.06 gal)(0.63 US Pints)
Oil type	See section 2.4.3

2.3 Function times

Function	Up/Right/Out		Down/Left/In	
	Time, (Seconds)			
	Diesel	Electric	Diesel	Electric
Rotation (180°)	25	31	25	31
Boom 2 (Ram 1)	15	22	20	20
Boom 3 (Ram 2)	16	27	31	31
Telescope Horizontal	18	22	11	13
Niftylift drive speed FWD/REV	Diesel		Battery	
Max hare speed	6.00 km/h - (3.73 mph)		3.00 km/h - (1.86 mph)	
Max tortoise speed	3.27 km/h - (2.03 mph)		1.89 km/h - (1.18 mph)	
FWD/REV drive speed must be measured over a 10 meter (33 feet) distance on flat level ground.				
All measurements carried out with 225kg (500 lbs) in basket (including operator) and operated from basket. Niftylift must be at full working temperature. Hydraulic oil must be between 30-40°C (86-104°F). Function speeds may vary depending on ambient air temperature (e.g. extreme cold).				

2.4 Fluid properties

2.4.1 Fluid volumes

Fluid Volumes	
Hydraulic oil tank	28 L (7.4 US Gal)
Fuel tank	16 L (4.2 US Gal)
Engine oil	3.8 L (0.84 gal)(1.00 US Gal)
Coolant	3.1 L (0.7 gal)(0.8 US Gal)

2.4.2 Engine oil specifications

Engine	Ambient temperature	Oil type	
Kubota D722	ABOVE 25°C (77°F)	SAE30 OR	SAE 10W/30 SAE 10W/40
	0°C / +25°C (32°F / +77°F)	SAE20 OR	SAE 10W/30 SAE 10W/40
	BELOW 0°C (32°F)	SAE10W OR	SAE 10W/30 SAE 10W/40

2.4.3 Gearbox oil specifications

Ambient temperature	Oil type
-20°C (-4°F) to +45°C (113°F)	ISO VG 220 (Standard fitment)

2.4.4 Hydraulic oil specifications

Market	Oil type
Europe	ISO VG 22 (Standard fitment)
Rest of World	ISO VG 32 (Standard fitment)

See table above for standard fitment, for other climates or harsh operating conditions please contact your nearest Niftylift approved dealer.

2.4.5 Engine coolant specifications

Use permanent type (PT) for the Kubota D722 engine.

When anti-freeze is mixed with water, the ratio must be **less than 50%**, see table below.

Engine	Volume % Anti-freeze	Volume % Water	Freezing Point		Boiling Point	
			°C	°F	°C	°F
Kubota D722	40	60	-24	-12	106	222
	50	50	-37	-34	108	226

2.4.6 Hydraulic pressure settings

Refer to hydraulic schematic as supplied with the machine noting the serial number of the Niftylift.

2.5 Tire specifications

Standard tire fitment: 26x 12 - 16.5.

⚠ WARNING DO NOT REPLACE TIRES WITH ANYTHING OTHER THAN THE ABOVE SPECIFICATION. CONSULT NIFTYLIFT PRIOR TO REPLACEMENT.

2.6 Torque settings

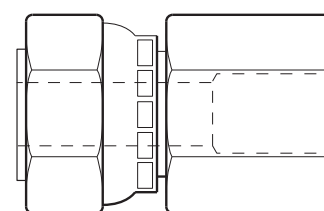
Bolt quality/size	Tightening torque in Nm (lbf·ft)					
	Plated			Unplated		
Grade	8.8	10.9	12.9	8.8	10.9	12.9
M6	7 (5)	10 (8)	12 (9)	8 (6)	11 (8)	13 (10)
M8	17 (13)	25 (18)	29 (22)	19 (14)	27 (20)	32 (23)
M10	34 (25)	49 (36)	58 (43)	37 (27)	54 (40)	63 (46)
M12	58 (43)	85 (63)	99 (73)	63 (47)	93 (69)	108 (80)
M14	93 (68)	135 (100)	158 (117)	101 (74)	148 (109)	172 (127)
M16	143 (106)	209 (154)	245 (180)	156 (115)	228 (168)	267 (197)
M20	288 (212)	408 (301)	477 (352)	304 (224)	445 (328)	521 (384)
M24	491 (362)	698 (515)	816 (602)	519 (383)	760 (561)	889 (656)
WHEEL NUTS	86 Nm (65 lbf·ft)					
ROTATION RING BOLTS	210 Nm (155 lbf·ft)					
<p>This torque chart is based on the following assumptions:</p> <p>Bolts to ISO 898-1 “Mechanical properties of fasteners made of carbon steel and alloy steel”</p> <p>For “unplated” bolts, all grades:</p> <p>Hex head bolts</p> <p>Black oxide steel bolt with a rolled & oiled thread, no finish on steel nut</p> <p>Prevailing torque includes Nylock (minimum prevailing torque figure assumed)</p> <p>Medium Clearance holes to ISO 273</p> <p>Bolt tightening condition = Yield factor of 75%</p> <p>For “plated” bolts, all grades:</p> <p>Hex head bolts</p> <p>Zinc plated oiled (rolled or cut) steel external thread with no finish on steel internal thread</p> <p>Prevailing torque includes Nylock (minimum prevailing torque figure assumed)</p> <p>Medium Clearance holes to ISO 273</p> <p>Bolt tightening condition = Yield factor of 75%</p> <p>Figures quoted in Nm have been calculated in Nm and then rounded to the nearest whole number.</p> <p>Figures quoted in lbf·ft have been calculated in Nm, converted using a factor of 0.737561 and then rounded.</p>						

2.7 Hydraulic hose and fitting torque specifications

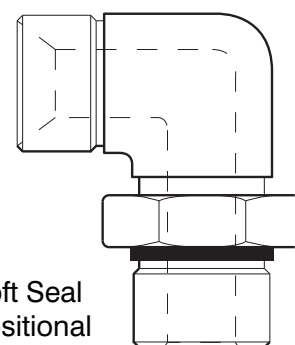
BSP (Solid Black Nut)

O-Ring Seal Female (ISO 8434)			Soft Seal Positional/Banjo/Block Fittings (ISO 6149 & 1179)		
Size	Thread	Torque Nm (lbf-ft)	Size	Thread	Torque Nm (lbf-ft)
4	1/4" - 19	25 (18)	4	1/4" - 19	40 (30)
6	3/8" - 19	35 (26)	6	3/8" - 19	75 (55)
8	1/2" - 14	55 (41)	8	1/2" - 14	100 (74)
10	5/8 - 14	65 (48)	10	5/8 - 14	130 (96)
12	3/4" - 14	100 (70)	12	3/4" - 14	190 (140)
16	1" - 11	125 (92)	16	1" - 11	300 (221)
20	1 1/4 - 11	190 (140)	20	1 1/4 - 11	330 (243)
24	1 1/2 - 11	250 (184)	24	1 1/2 - 11	460 (339)
32	2" - 11	400 (295)	32	2" - 11	N/A

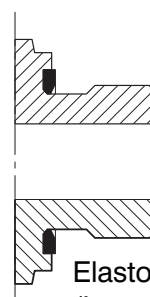
Elastomeric Seal Male (ISO 1179)			
Size	Thread	Torque Nm (lbf-ft)	
		Steel	Aluminium
4	1/4" - 19	60 (44)	30 (22)
6	3/8" - 19	90 (66)	45 (33)
8	1/2" - 14	130 (96)	65 (48)
10	5/8 - 14	N/A	N/A
12	3/4" - 14	200 (148)	100 (74)
16	1" - 11	300 (221)	150 (111)
20	1 1/4 - 11	500 (369)	250 (184)
24	1 1/2 - 11	600 (443)	300 (221)
32	2" - 11	N/A	N/A



O-Ring female



Soft Seal Positional



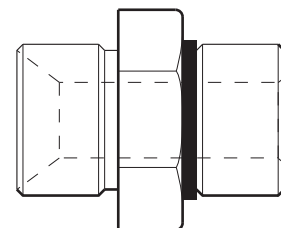
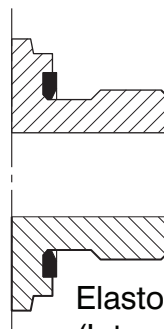
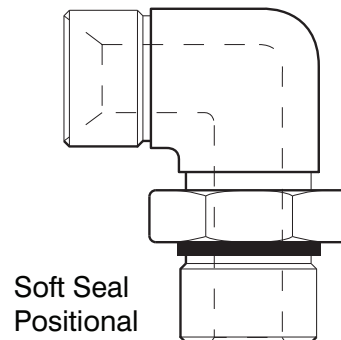
Elastomeric (Integrated Seal)

Metric (S-Series)

Soft Seal Positional/Banjo/Block Fittings (ISO 6149 & 1179)		Elastomeric Seal Male (9974/3869)		
Thread	Torque Nm (lbf·ft)	Thread	Torque Nm (lbf·ft)	
			Steel	Aluminium
M12 X 1.5	35 (26)	M12 X 1.5	40 (30)	20 (15)
M14 X 1.5	45 (33)	M14 X 1.5	60 (44)	30 (22)
M16 X 1.5	55 (41)	M16 X 1.5	80 (59)	40 (30)
M18 X 1.5	70 (52)	M18 X 1.5	95 (70)	45 (33)
M20 X 1.5	80 (59)	M20 X 1.5	140 (103)	70 (52)
M22 X 1.5	100 (74)	M22 X 1.5	150 (111)	75 (55)
M27 X 2.0	180 (133)	M27 X 2.0	200 (148)	100 (74)
M30 X 2.0	N/A	M30 X 2.0	380 (280)	190 (140)
M42 X 2.0	330 (243)	M42 X 2.0	480 (354)	240 (177)

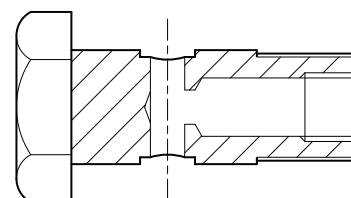
UNF Male with O ring

Connector Male SAE UNF with O.R ISO 11926 Ports	
Thread	Torque Nm (lbf·ft)
7/16"	21 (16)
1/2"	27 (20)
9/16"	40 (30)
3/4"	78 (58)
7/8"	110 (81)
1"1/16	180 (133)
1"3/16	230 (170)
1"5/16	285 (210)
1"5/8	320 (236)



UNF Bolts

Dowty Seal Positional / Banjo Bolts		
Size	Thread	Torque Nm (lbf-ft)
4	1/4" - 19	40 (30)
UNF	9/16" - 18	40 (30)



Dowty Seal
Positional/Banjo

3 Preventative maintenance

3.1 Maintenance schedules

Machine maintenance is required at periodic or hourly intervals as indicated on the machine hour meter.

3.1.1 Engine maintenance

Operation	Every Day	Every 50 Hours	Every 100 Hours	Every 200 Hours	Every 400 Hours	Every 500 Hours	Every Month	Every Year	Every 2 Years
Engine Oil		● ^{a)}		•			▲		
Engine Oil Filter		● ^{a)}		•					
Air Filter @			■ ^{b)}					● ^{b)c)}	
Engine Coolant									•
Coolant Hoses & Clamp Bands				▲					•
Fuel Filter					•				
Fuel Hoses & Clamp Bands @		▲							● ^{d)}
Battery	▲								
Fan Belt			▲			•			
Air Intake Line @				▲					● ^{e)}
Electrical Wiring / Connections								▲	
▲	Check/Inspect								
■	Clean								
•	Replace								
@	Emission Critical Component								

a) First time procedure.

b) In arduous conditions (high levels of dust) the air filter must be cleaned and replaced more frequently.

c) After six checks with cleaning or annually; whichever occurs sooner.

d) Contact a Kubota approved dealer.

e) Replace if necessary.

3.1.2 Machine maintenance

Operation	Every Day	Every Week	Every 100 Hours	Every 500 Hours	Every 1000 Hours	Every Month	Every Year
Gearbox oil			● ^{a)}		● ^{b)}		
Battery condition	▲	▲ ^{c)}					
Hydraulic oil level		▲					
Pressure filter		▲					
Hydraulic oil and filters (suction and pressure)				● ^{a)}			●
Telescopic boom wear pads						▲ ^{**}	
Hose trunking and energy chain		▲					
Boom pivot pin/bushes	▲						^{**}
Rotation gear engagement						▲	
Rotation ring						^{**}	
Rotation ring bolts							▲
Stabilizer foot plate	▲ ^{**}						
Stabilizer pivot pin/bushes	▲						^{**}
Tire pressures		▲					
Tyres		▲					
Wheel bolts						▲	
Rear axle suspension							▲
▲	Check/Inspect						
■	Clean						
●	Replace						
^{**}	Lubricate						

a) First time procedure.

b) After 1000 hours or annually; whichever occurs sooner.

c) Excludes optional Absorbent Glass Mat (AGM) maintenance-free batteries.

3.2 Consumables

Consumable items required for maintenance can be found in Table 1.

Table 1: Consumables

Type	Detail	Frequency
Engine oil (Diesel)	SAE 10W30 ^{a)}	Replace after 50 hours, then every 200 hours
Hydraulic oil	ISO VG 22 or ISO VG 32	Replace after 500 hours, then annually
Hydraulic oil pressure filter	6 Micron screen filter	
Hydraulic oil suction filter	10 Micron spin on filter	
White grease	Renolit CZ2	Apply as required
Black EP grease	Multis MS 2	
Gear oil	ISO VG 220	Replace after 100 hours, then every 1000 hours
Anti friction dry PTFE lubricant	WD 40 anti friction dry PTFE lubricant	Annually as required
SAE 20 oil	3-in-1 Motor oil	Monthly as required
Battery terminal protector	Ambersil anti-corrosion terminal treatment	As required
Anti-seize copper grease	Ambersil Copper anti-seize paste	
Fuse	125A SIBA 80VDC	Replace as required
Fuse	225A MEGA 32VDC	
Fuse	7.5A ATO 32VDC	

a) Meets or exceeds API CD grade or equivalent.

3.2.1 Data, safety and specification

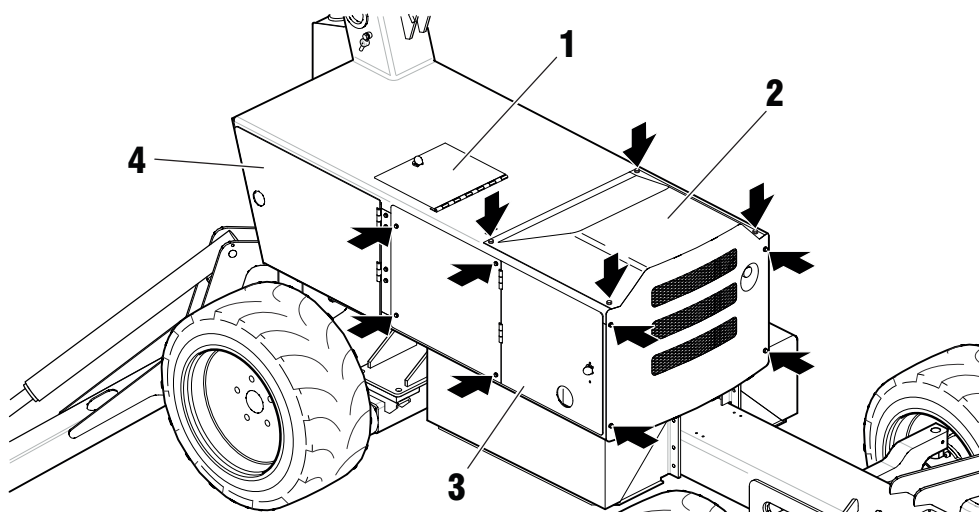
Data, safety and specification details are listed in Table 2.

Table 2: Data and Specification

Type	Detail	Information
Hydraulic oil	ISO VG 22/32	Haydn.pdf
Gear oil EP	ISO VG 220	Q8 Goya.pdf
White grease	Renolit CZ2	RENOLIT CZ 2_sds.pdf
Black EP grease	Multis MS 2	msds.pdf
Anti-seize copper grease	Ambersil Copper anti-seize paste	BDS000288_3_20171009 (EN).pdf
WD 40 W/D44394 aerosol	Anti Friction Dry PTFE Lubricant	WD-40-Specialist-High-Performance-PTFE-Lubricant.pdf
SAE 20 oil	3-in-1 Motor oil	WD-40 3-in-1 Motor oil.pdf
Engine oil	10W30	Q8 T 760 10W-30.pdf
Battery terminal protector	Ambersil Battery Terminal Protector	UDS000453_3_20170629.PDF
Thread locking adhesive	Loctite 243	243-EN.pdf

3.2.2 Access and inspection panels

Access panels and covers are listed below.

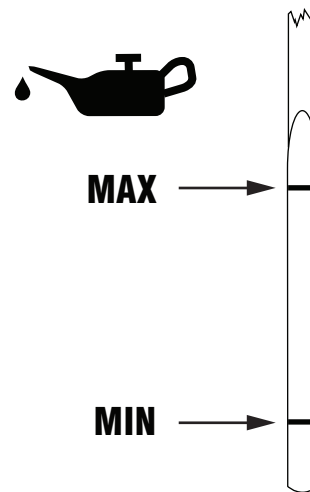
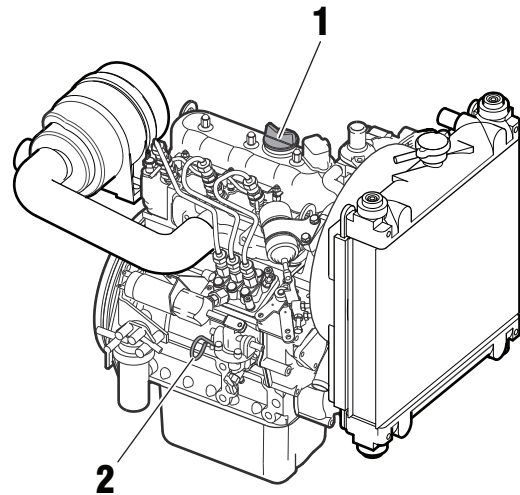


Remove bolts (arrowed) to remove the engine cover (2) and side access panel (3).

1	Top access panel
2	Engine cover
3	Side access panel
4	Control panel door

3.2.3 Engine oil level check

- 1) Check with the Niftylift on level surface before starting or more than 5 minutes after stopping the engine.
- 2) Open the side access panel.
- 3) Remove oil level dipstick (1) and wipe clean.
- 4) Insert dipstick and remove to check oil level.
- 5) If low, remove the engine cover. See section 3.2.2.
- 6) Add correct specification oil to the oil filling port (2) until the upper limit of the dipstick is reached.
- 7) After adding oil, wait for 5 minutes and re-check oil level. Do not overfill.
- 8) Reinstall the oil filler cap and tighten by hand.
- 9) Reinstall the engine cover and tighten 8 bolts.
- 10) Close the side access panel.



3.2.4 Engine oil replace

⚠ CAUTION

ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE OFF AND COOLED.

NOTICE

WHEN DRAINING ENGINE OIL, PLACE A CONTAINER UNDERNEATH THE ENGINE AND DISPOSE ACCORDING TO LOCAL REGULATIONS.

- 1) Remove the drain plug located on the engine oil sump and drain the oil into a suitable container. Note; This will be easier if the oil is warm.
- 2) Replace seal ring and reinstall drain plug.
- 3) Tighten drain plug. See section 2.6 for torque settings.
- 4) Top up engine oil to the upper limit of the dipstick. Oil type and quantities can be found in the oil specification table. See section 2.4.
- 5) Re-check oil level at least 5 minutes after filling engine.

3.2.5 Engine oil filter replace

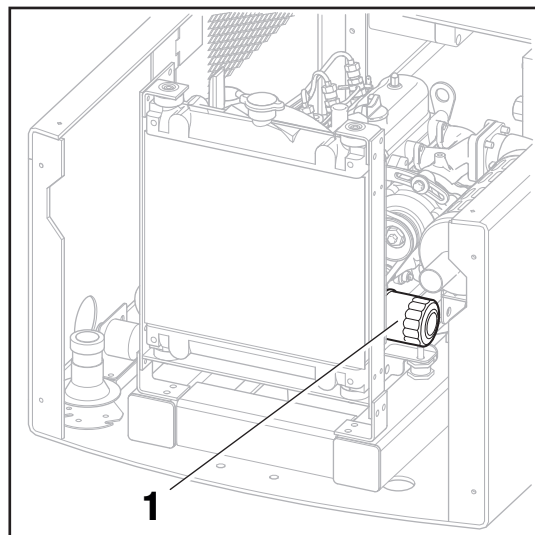
⚠ CAUTION

ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE OFF AND COOLED.

NOTICE

PLACE A CONTAINER UNDERNEATH THE ENGINE OIL FILTER AND DISPOSE ANY WASTE ACCORDING TO LOCAL REGULATIONS.

- 1) Remove the engine cover. (See section 3.2.2).
- 2) Using a filter wrench or strap, remove the engine oil filter (1).
- 3) Replace oil filter, apply a film of oil to the seal of the oil filter. Ensure oil filter is marked with the Niftylift's hours and date of filter change.
- 4) Screw oil filter onto engine by hand. When seal contacts the seal surface, tighten oil filter by hand. **Do not tighten with filter wrench.**
- 5) Run engine for a short period and check for leaks.
- 6) Wait 5 minutes and check the oil level.
- 7) Reinstall the engine cover and tighten 8 bolts. See section 2.6 for torque settings.



3.2.6 Engine coolant level check

NOTICE

DO NOT STOP ENGINE SUDDENLY, IDLE ENGINE FOR 5 MINUTES BEFORE STOPPING.

WORK SHOULD BE CARRIED OUT AFTER LETTING THE ENGINE AND RADIATOR COOL OFF COMPLETELY (A MINIMUM OF 30 MINUTES AFTER STOPPING ENGINE).

⚠ WARNING

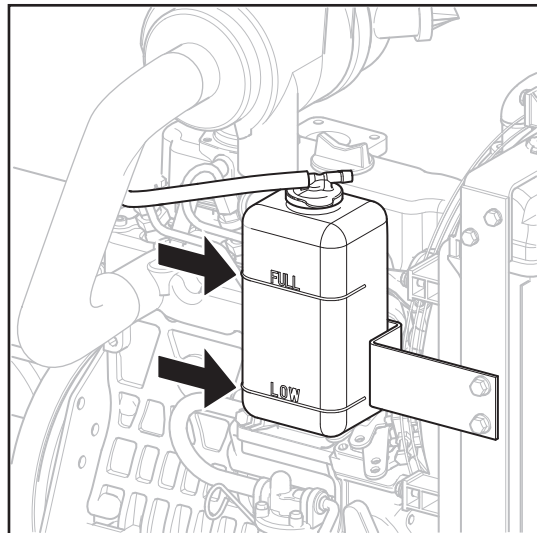
RISK OF BURNS - DO NOT REMOVE RADIATOR CAP WHILST ENGINE COOLANT IS HOT AND PRESSURIZED. WHEN COOL TO TOUCH, ROTATE CAP TO THE FIRST STOP TO ALLOW EXCESS PRESSURE TO ESCAPE, THEN REMOVE CAP COMPLETELY.

IF OVERHEATING SHOULD OCCUR, STEAM MAY GUSH FROM THE RADIATOR OR RESERVE TANK RESULTING IN SEVERE BURNS.

- 1) Remove the radiator cap after the engine has completely cooled. Ensure the coolant level reaches the supply port.
- 2) Ensure coolant level is sufficient on the reserve tank. The level should be between the full and low marks (arrowed).
- 3) If coolant levels are low, top-up using the correct specification fluid. See section 2.4.5 for coolant specifications and 2.4.1 for fluid volumes.

Important;

- If the radiator cap has to be removed follow the caution label and securely tighten the cap.
- If coolant should leak, consult your local Kubota dealership.
- Make sure contaminated or sea water does not enter the coolant system.
- Use clean, fresh water with the correct amount of anti-freeze. (See section 2.4.5).
- Do not refill reserve tank with coolant higher than the "FULL" level mark.
- Make sure the radiator cap is installed correctly. If the cap is loose or improperly closed, coolant may leak out and quickly decrease the coolant level.



3.2.7 Engine coolant replace

NOTICE

DO NOT STOP ENGINE SUDDENLY, IDLE ENGINE FOR 5 MINUTES BEFORE STOPPING.

WORK SHOULD BE CARRIED OUT AFTER LETTING THE ENGINE AND RADIATOR COOL OFF COMPLETELY (A MINIMUM OF 30 MINUTES AFTER STOPPING ENGINE).

⚠ WARNING

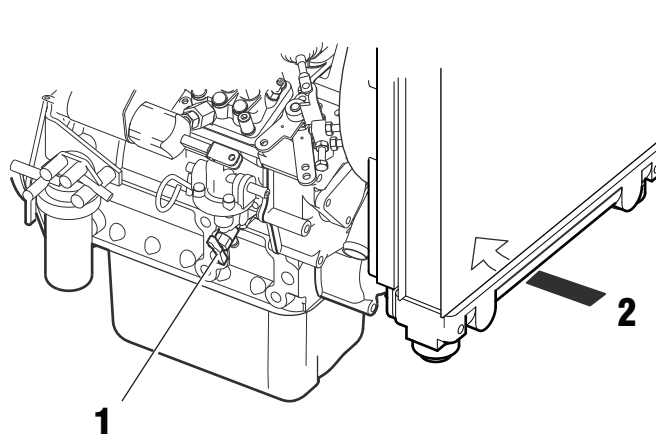
RISK OF BURNS - DO NOT REMOVE RADIATOR CAP WHILST ENGINE COOLANT IS HOT AND PRESSURIZED. WHEN COOL TO TOUCH, ROTATE CAP TO THE FIRST STOP TO ALLOW EXCESS PRESSURE TO ESCAPE, THEN REMOVE CAP COMPLETELY.

IF OVERHEATING SHOULD OCCUR, STEAM MAY GUSH FROM THE RADIATOR OR RESERVE TANK RESULTING IN SEVERE BURNS.

NOTICE

WHEN DRAINING COOLANT, PLACE A CONTAINER UNDERNEATH THE RADIATOR AND DISPOSE ACCORDING TO LOCAL REGULATIONS.

- 1) Remove the engine cover. (See section 3.2.2).
- 2) Open the side access panel.
- 3) Open drain plugs (1) and (2) simultaneously open the radiator cap. This must be removed to allow a full coolant drain.
- 4) Undo the clamp band and remove the overflow pipe underneath the reserve tank.
- 5) Drain the reserve tank.
- 6) Reinstall the overflow pipe to the reserve tank and tighten clamp band.
- 7) Ensure both drain plugs are tightened.
- 8) See section 2.4.5 for coolant specifications and 2.4.1 for fluid volumes.
- 9) Reinstall the engine cover and tighten 8 bolts. See section 2.6 for torque settings.
- 10) Close the side access panel.



3.2.8 Coolant hoses and clamp bands check

⚠ CAUTION BE SURE TO CHECK RADIATOR HOSES AND CLAMPS PERIODICALLY. IF RADIATOR HOSE IS DAMAGED OR COOLANT LEAKS, OVERHEATING OR SEVERE BURNS MAY OCCUR.

- 1) Check radiator hoses are securely fixed every 200 hours of operation or 6 months, whichever comes first.
- 2) If hose clamps are loose or water leaks, tighten hose clamps securely.
- 3) If hoses are swollen, hardened or cracked they must be replaced along with clamps. Clamps must be tightened securely.

3.2.9 Antifreeze check

⚠ CAUTION ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN.

⚠ CAUTION RISK OF BURNS - DO NOT REMOVE RADIATOR CAP WHILST ENGINE COOLANT IS HOT AND PRESSURIZED. WHEN COOL TO TOUCH, ROTATE CAP TO THE FIRST STOP TO ALLOW EXCESS PRESSURE TO ESCAPE, THEN REMOVE CAP COMPLETELY.

Periodically the antifreeze specific gravity should be checked to ensure suitable freeze protection.

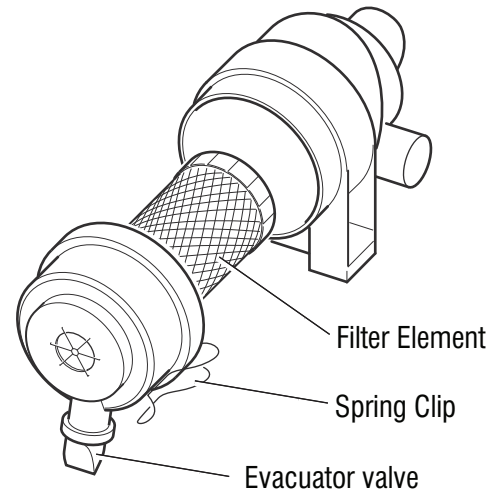
- 1) Allow the engine to cool down and carefully remove the radiator cap.
- 2) Using a suitable antifreeze hydrometer, test the antifreeze specific gravity. See section 2.4.5 for the appropriate protection level.
- 3) Replenish coolant if necessary; use a ratio of 1:1 clean water and antifreeze.
- 4) Reinstall the radiator cap, ensure it is securely fitted.

3.2.10 Air filter element maintenance

NOTICE

DO NOT APPLY OIL TO THE AIR FILTER; YOUR NIFTYLIFT IS FITTED WITH A DRY TYPE AIR FILTER. AVOID TOUCHING THE ELEMENT EXCEPT WHEN CLEANING.

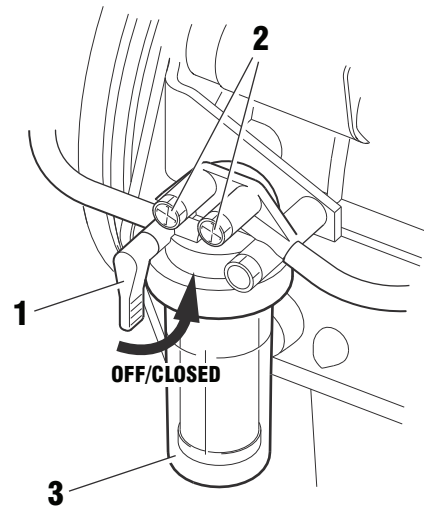
- 1) Open the evacuator valve once a week under ordinary conditions, daily when used in a dust rich environment. This allows dirt and dust to be removed from the air filter.
- 2) Release spring clips and remove cover.
- 3) Slide the filter element out of the air filter body.
- 4) Wipe inside the air cleaner with cloth if found to be dirty or wet.
- 5) When dry dust adheres to the filter element, blow compressed air from the inside out whilst rotating the filter. Air pressure must be no more than 686kPa (7kgf/cm² 99 psi).
- 6) When carbon or oil adheres to the filter, soak the filter in detergent for 15 minutes.
- 7) Wash it several times in water, rinse with clean water and allow to dry naturally.
- 8) After filter is fully dried, inspect the inside with a flashlight for damage. Refer to instruction label attached to the filter.
- 9) Reinstall filter element into the air filter body, reinstall washer and tighten bolt.
- 10) Replace filter element every year or after 6 cleanings. This is in standard operating conditions; dust enriched operating environments will require shorter intervals.



3.2.11 Fuel filter and water separator clean/replace

⚠ WARNING **FUEL ESCAPE - PLACE A SUITABLE CONTAINER UNDERNEATH THE WORK AREA AND DISPOSE FUEL ACCORDING TO LOCAL REGULATIONS.**

- 1) Open the side access panel.
- 2) Close the fuel filter tap (1).
- 3) Undo the top ring and remove container and fuel filter (3).
- 4) Rinse out container with clean diesel fuel.
- 5) Wash fuel filter with clean diesel or replace if necessary.
- 6) Observe clean assembly practices to avoid contamination by dust or dirt.
- 7) Reinstall the container and tighten the top ring by hand.
- 8) See section 3.2.12 for bleeding of air from the fuel system before attempting to start the engine.



3.2.12 Bleeding air from the fuel system

⚠ DANGER **DO NOT BLEED A HOT ENGINE. FUEL COULD SPILL ON TO THE EXHAUST MANIFOLD CREATING A FIRE RISK.**

⚠ WARNING **ENSURE SUITABLE EYE PROTECTION AND CLOTHING ARE WORN WHEN BLEEDING THE FUEL SYSTEM.**

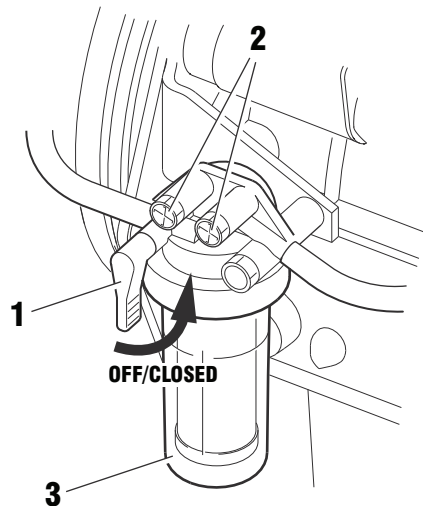
NOTICE **DO NOT OPERATE THE STARTER FOR MORE THAN 15 SECONDS. AFTER 15 SECONDS, STOP AND WAIT 30 SECONDS BEFORE OPERATING THE STARTER.**

This procedure is required when;

- the fuel filter and hoses have been detached and refitted
- the fuel tank has become empty
- the Niftylift has been in prolonged storage.

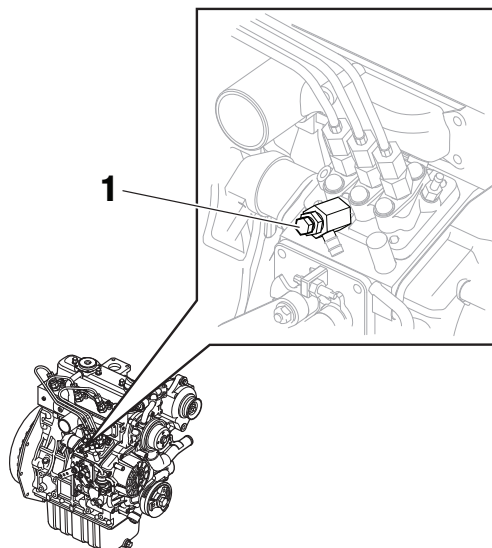
Fuel filter

- 1) Fill the fuel tank.
- 2) Open the fuel filter tap (1) as shown.
- 3) Loosen air vent plug (2) by a few turns.
- 4) Tighten plug (2) once air bubbles are no longer present in container (3).
- 5) Carry out procedure to bleed the fuel injection pump before attempting to start the engine.



Fuel injection pump

- 1) Fill the fuel tank and bleed fuel filter.
- 2) Ensure air has been bled from the fuel filter.
- 3) Loosen air vent plug (1) on the fuel injection pump.
- 4) Tighten plug once fuel flows and air bubbles are no longer present.
- 5) Start the engine and inspect for leaks. If engine fails to start repeat bleed procedure.
- 6) Close the side access panel.



3.2.13 Fuel pipes check

- 1) Fuel pipes and clamps should be checked every 50 hours of engine operation.
- 2) If clamp bands are found to be loose, apply oil to screw of the band and tighten securely.
- 3) If rubber fuel pipes are found to be worn, replace immediately.

When fuel pipes are not installed, ensure they are capped to prevent dirt entering. This could lead to fuel injection pump malfunction.

3.2.14 Exhaust system inspect

⚠ CAUTION ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN. BEWARE OF HOT ENGINE COMPONENTS.

⚠ WARNING THE POWER TRAY RETAINING BOLT MUST BE INSTALLED AND TIGHTENED TO THE SPECIFIED TORQUE BEFORE STARTING THE ENGINE.

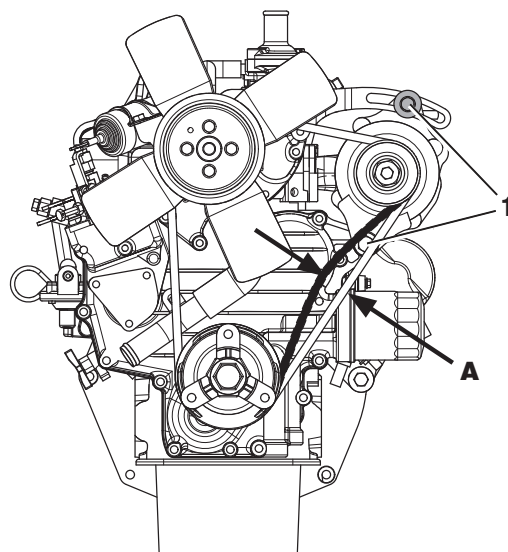
- 1) Remove the engine cover. See section 3.2.2.
- 2) Inspect the exhaust components for signs of cracks and leaks; e.g. carbon build up around joints and seams.
- 3) Reinstall the engine cover and tighten 8 bolts. See section 2.6 for torque settings.

3.2.15 Fan belt check

⚠ CAUTION ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN. BEWARE OF HOT ENGINE COMPONENTS.

Every 100 hours

- 1) Ensure engine is switched OFF.
- 2) Remove the engine cover. (See section 3.2.2).
- 3) Open the side access panel.
- 4) Ensure engine is switched OFF.
- 5) Apply moderate pressure to belt using your thumb in area shown on diagram. If dimension **A** does not fall in the range 7 to 9 mm (0.28 to 0.35 in.), loosen the alternator mounting bolts (1) and adjust accordingly until the belt deflection falls within these limits.
- 6) Tighten alternator mounting bolts. See section 2.6 for torque settings.
- 7) If belt is damaged, replace immediately. (See section 4.4.2).
- 8) Reinstall the engine cover and tighten 8 bolts. See section 2.6 for torque settings.
- 9) Close side access panel.



3.3 Wheels and tires

3.3.1 Tire condition check

Tires should be checked every week. Worn or defective tires can impair safety and machine handling. Check the tires have sufficient tread and there are no cuts, bulges, abrasions or damage to the tire tread and sidewall. Tires must be inflated to the correct pressure.

Worn or defective tires should be replaced before placing the Niftylift into service. See section 2.5 for tire specifications.

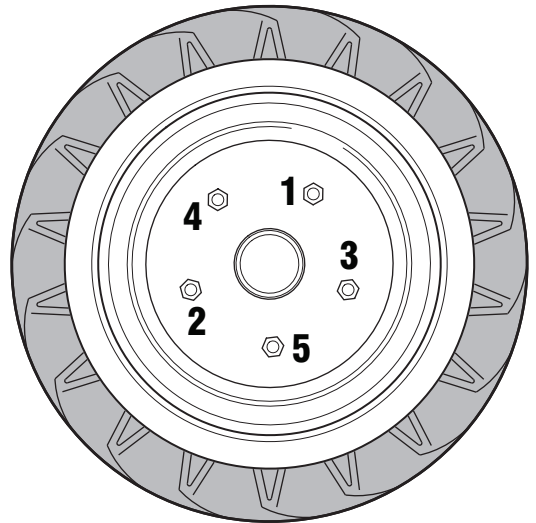
3.3.2 Tire pressure check

Tire pressures should be checked every week. Incorrect tyre pressures impair safety, machine handling and may increase tyre wear.

Tire pressures should be checked and adjusted when cold to 2.3 bar (34 psi).

3.3.3 Wheel bolt torque (Monthly)

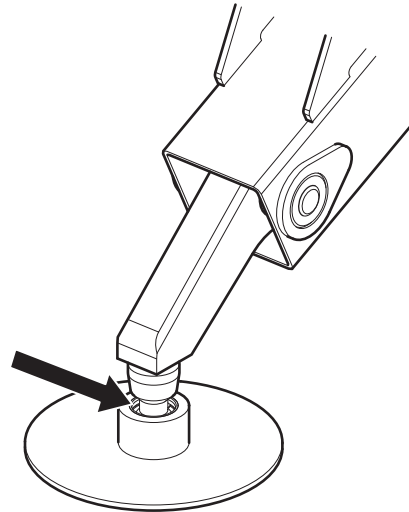
- 1) Ensure that the Niftylift is on level ground and the wheels are chocked.
- 2) Slacken each wheel bolt and tighten to the specified torque as per the sequence shown in the diagram. See section 2.6 for torque settings.
- 3) Repeat process for each wheel.



3.4 Base assembly

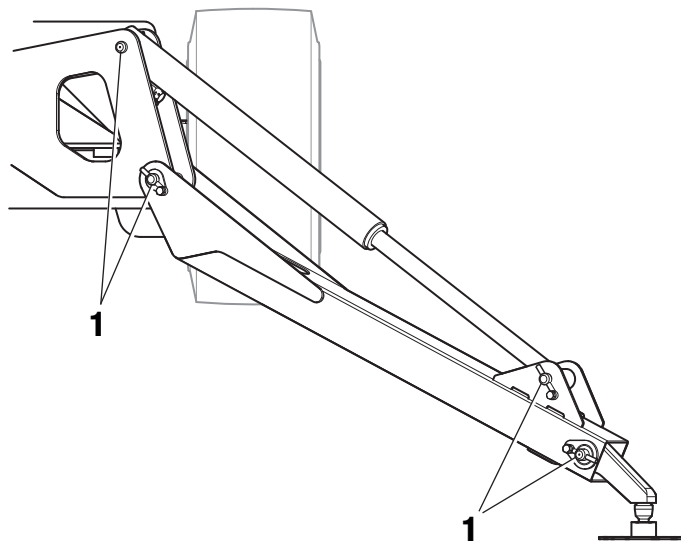
3.4.1 Stabilizer foot plate check and lubricate (Monthly)

- 1) Check each stabilizer foot plate is free to move and is secure.
- 2) Lightly oil each joint on the stabilizer foot plate.
- 3) Use SAE 20 or equivalent oil. (See section 3.2.1).



3.4.2 Stabilizer pivot pins

- 1) Check the locking device is installed and secure on all stabilizer pivot pins (1) daily. Rectify any defects before placing the Niftylift back into service.

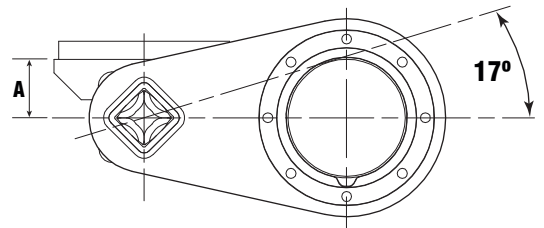


- 2) Lubricate the pivot pin bushes on the stabilizers annually. Use a dry PTFE aerosol lubricant. (See section 3.2.1). Apply lubricant spray and allow to penetrate at each of the pivot pin bushes.

3.4.3 Rear axle suspension

The rear axle suspension should be checked annually.

- 1) With the Niftylift on a flat level surface, check the ride height is level.
- 2) If there is a noticeable difference in ride height, check the angle of the suspension trailing arm.
- 3) An angle of 17° from the unladen position (A) should be observed when the Niftylift is in the stowed position.
- 4) Refer to the Operating & Safety Instructions supplied with the Niftylift and lower the stabilizers to inspect the suspension.
- 5) Inspect the axle and suspension for signs of damage or wear.



The axle will require replacement if worn or damaged. Contact Niftylift for further information.

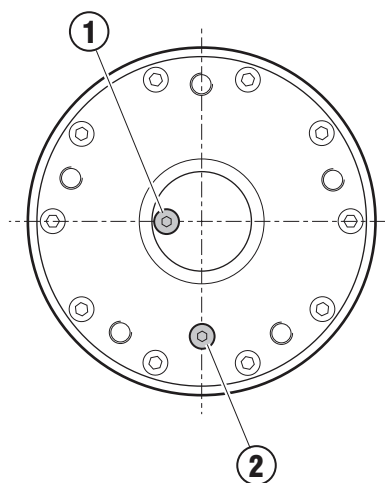
3.5 Drive hub gearbox

3.5.1 Oil replace

NOTICE

WHEN DRAINING OIL, PLACE A SUITABLE CONTAINER UNDERNEATH THE GEARBOX AND DISPOSE ACCORDING TO LOCAL REGULATIONS.

- 1) Manufacturer's specifications require this procedure to be carried out after the first 100 hours, then every 1000 hours or once a year. Depending on the operating cycle this frequency may vary.
- 2) Select the drive hub to be serviced. Manoeuvre the Niftylift until the fill level plug (1) is at the position shown (see diagram).
- 3) Loosen each wheel bolt by half a turn.
- 4) Refer to the Operating & Safety Instructions supplied with the Niftylift and lower the stabilizers.
- 5) Support the wheel using a suitable wheel jack.
- 6) Undo the wheel bolts and remove the wheel.
- 7) Remove level/filler plug (1) and drain plug (2).
- 8) Drain oil into a suitable container. Dispose of waste oil in accordance with local environmental policies.
- 9) Reinstall drain plug, ensure it is tight.
- 10) Fill gearbox through the level/filler plug hole until oil level reaches bottom of plug hole. See section 2.2 and 2.4.3 for oil specification and capacity.
- 11) Reinstall level/filler plug, ensure it is tight.
- 12) Reinstall wheel and partially tighten bolts.
- 13) Remove the wheel jack.
- 14) lower Niftylift and tighten wheel bolts. See section 2.6 for torque settings.
- 15) Repeat for remaining gearboxes.



3.5.2 Bleeding air from the braking circuit

⚠ WARNING

MAKE SURE SUITABLE EYE PROTECTION AND CLOTHING ARE WORN WHEN OPENING THE HYDRAULIC CIRCUIT.

NOTICE

PLACE A SUITABLE CONTAINER UNDERNEATH THE WORK AREA AND DISPOSE OIL ACCORDING TO LOCAL REGULATIONS.

- 1) Connect the hydraulic couplings to the brake ports on the gearbox.
- 2) Pressurize the hydraulic circuit, then carefully loosen the hose union on the inlet port.
- 3) Tighten the hose union once oil flows and air bubbles are no longer present. See section 2.7 for hydraulic hose torque settings.
- 4) Clean any excess oil and inspect for leaks.

3.6 Batteries

⚠ WARNING

MAKE SURE SUITABLE EYE PROTECTION AND CLOTHING ARE WORN WHEN MAINTAINING THE BATTERIES.

MAKE SURE THERE IS ADEQUATE VENTILATION WHEN CARRYING OUT MAINTENANCE ON THE BATTERIES.

⚠ WARNING

CONTACT WITH CONCENTRATED SULFURIC ACID RESULTS IN RAPID DESTRUCTION OF BODY TISSUE VIA BURNS. IF INHALED, SEEK FRESH AIR AND IMMEDIATE MEDICAL ATTENTION. IN THE EVENT OF SKIN OR EYE CONTACT, FLUSH WITH LARGE VOLUMES OF WATER AND SEEK IMMEDIATE MEDICAL ATTENTION. IN THE EVENT OF INGESTION, DO NOT INDUCE VOMITING AND SEEK IMMEDIATE MEDICAL ATTENTION.

3.6.1 Condition check (Daily)

- 1) Check that the batteries are fully charged. Batteries should be recharged at the end of each working day or shift. See manufacturer's Operating Manual for correct battery charging procedure.
- 2) Check batteries for evidence of leaks or spilt battery acid. If material is released or spilled, lime or soda ash may be used to neutralize, or flush with large volumes of water. Dispose of waste in accordance with local regulations for acid and lead scrap. Use approved respiratory protection, rubber gloves, and splash-proof safety goggles. Use rubber boots and acid-proof clothing for major spills. Replace any defective batteries.
- 3) Check the condition of battery cables and link wires. Ensure that the insulation is intact along the length of each cable. Replace any defective battery cables or link wires. Use insulated spanners on battery terminals. Do not lay tools or other metal objects on the batteries.
- 4) Check that all battery cables and link wires are securely fastened to the battery terminals. Clean and remove any corrosion from the battery terminals and clamps.
- 5) Spray the battery clamps and terminals if required with Battery terminal protector. (See section 3.2.1).

3.6.2 Condition check (Weekly) - Excludes AGM batteries

- 1) Carry out all procedures listed above in Daily checks.
- 2) Remove all battery cell caps and check the fluid level in each cell in each battery. The level should be sufficient to cover the plates. Top-up each battery cell as necessary using distilled (deionised) water, do not overfill. Replace and tighten battery cell caps and put batteries on charge. Leave batteries to stabilise for one hour before proceeding with further checks.
- 3) Using a hydrometer, check the specific gravity of the battery fluid in each cell in each battery (Target 1.27 when fully charged). If the specific gravity is not within the serviceable range, battery de-sulfate fluid may be used to restore batteries.
- 4) Reinstall all battery cell caps and clean any liquid from the top surface of the batteries.

3.6.3 Storage

Fully charge batteries before placing into storage. Isolate the batteries (See section 1.5.4) and monitor open circuit voltage every 4 - 6 weeks (2 - 4 weeks if stored in temperatures greater than 32°C (90°F)). Batteries in storage should be charged when they decline to the following state of charge:

- 6.19V (70% state of charge).

Where possible always keep batteries in cool, dry environments. Storage in hot environments can negatively impact batteries. Avoid direct exposure to heat sources during storage. Batteries self-discharge faster at high temperatures.

Avoid storing in freezing temperatures, batteries can freeze in cold temperatures (less than 0°C (32°F)) if they are not fully charged. If batteries are stored in cold environments, it is critical that they be kept at a high state of charge.

Due to the potential for self-discharge during storage, batteries should be given a full charge prior to placing back into service.

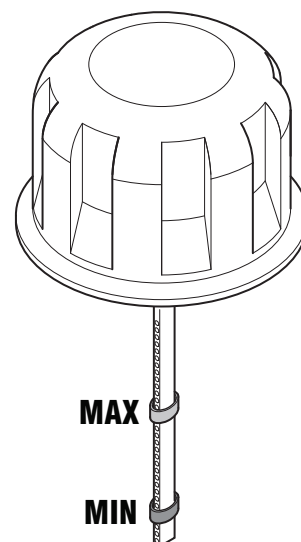
3.7 Hydraulic oil

3.7.1 Level check (Weekly)

Ensure the Niftylift is on level ground with the platform stowed. Locate the hydraulic tank filler cap underneath the top access panel. Loosen the filler cap to relieve pressure. Caution must be taken when removing the tank cap as the hydraulic tank is pressurized.

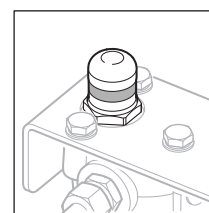
Check that the oil level is between the minimum and maximum marks on the dipstick. Top-up the tank with oil if the level is below the minimum mark. Use the same oil grade as indicated on the label attached to the hydraulic tank.

If the oil level is above the MAX mark, drain as required. (See section 3.7.3).



3.7.2 Pressure filter check (Weekly)

With the Niftylift running and the oil temperature at 40°C (104°F), observe the pressure filter condition indicator (viewed through the top access panel). If visual indicator is red, the pressure filter element should be replaced once the oil has cooled sufficiently.



3.7.3 Hydraulic oil and filters replace

⚠ CAUTION

ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN. BEWARE OF HOT ENGINE COMPONENTS.

⚠ CAUTION

RISK OF BURNS - ALLOW THE HYDRAULIC OIL SUFFICIENT TIME TO COOL BEFORE DRAINING.

NOTICE

PLACE A SUITABLE CONTAINER UNDERNEATH THE WORK AREA AND DISPOSE OIL ACCORDING TO LOCAL REGULATIONS.

Replace the hydraulic oil and filters after the first 500 hours of operation, then annually thereafter.

Replacement or testing of the hydraulic oil is essential for optimum machine performance. Contaminated oil and filters may cause poor performance and continued use may cause component damage. Depending upon the operating environment, more regular oil changes may be required.

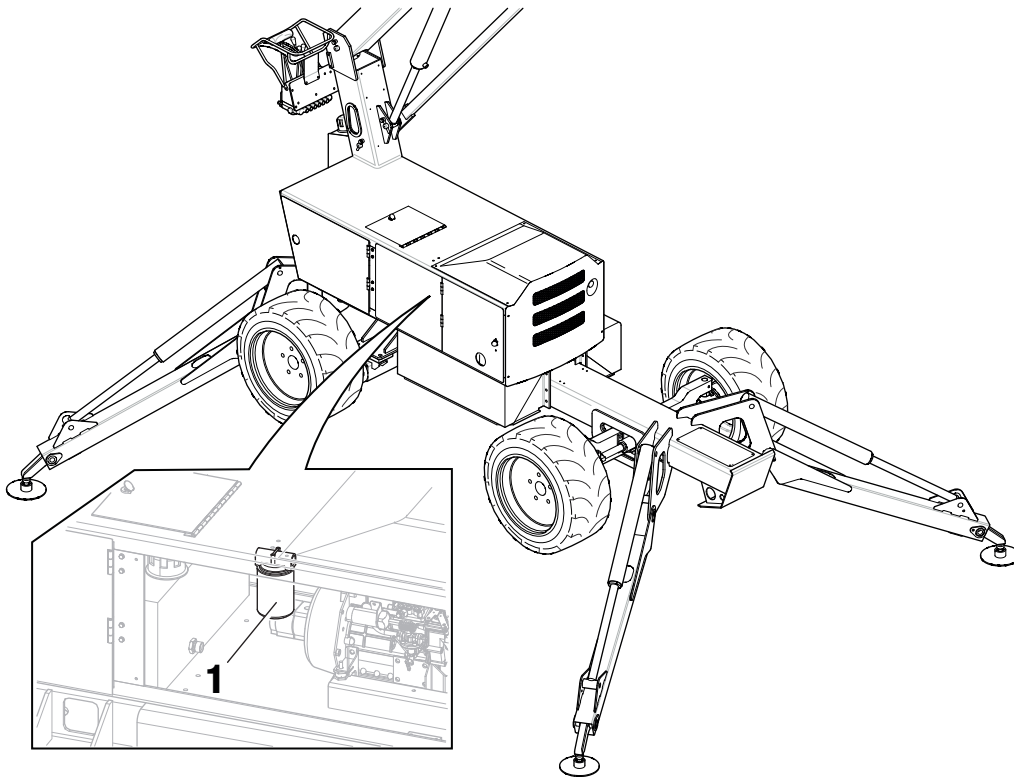
Observe clean working practices when servicing the hydraulic system.

- 1) Ensure that the Niftylift is on level ground with the platform stowed and the oil temperature is not above 40°C (104°F).
- 2) Open the top access panel.

- 3) Loosen the filler cap to relieve pressure. Caution must be taken when removing the tank cap as the hydraulic tank is pressurized.
- 4) Using a suitable pump, drain the hydraulic oil tank and dispose of any waste oil in accordance with local environmental policies.

Suction filter

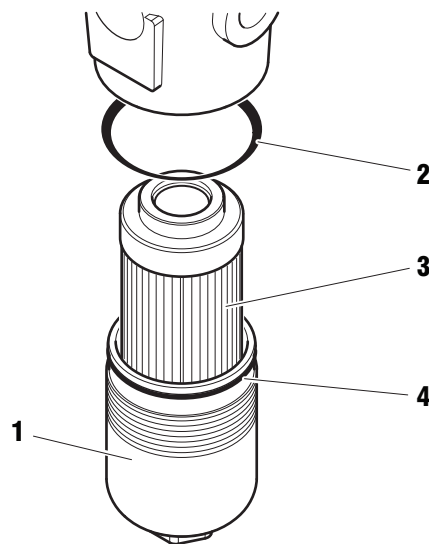
- 5) Remove the side access panel. (See section 3.2.2).
- 6) Place a suitable container underneath the suction filter (1).



- 7) Using a filter wrench or strap, remove the suction filter.
- 8) Replace suction filter, apply a film of oil to the seal of the filter.
- 9) Screw filter on by hand. When seal contacts the seal surface, tighten filter by hand. **Do not tighten with filter wrench.**
- 10) Remove container and dispose of any waste oil in accordance with local environmental policies.

Pressure filter

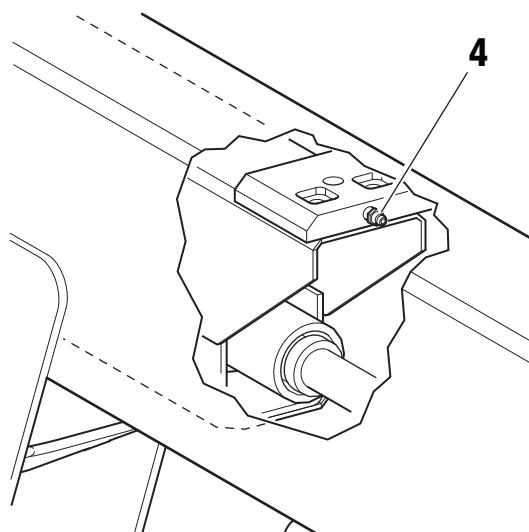
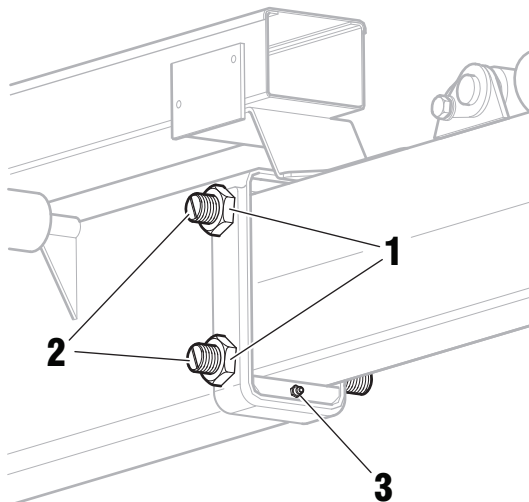
- 11) Place a suitable container underneath the filter housing.
- 12) Remove the filter bowl (1) and seal ring (2).
- 13) Remove filter element (3) and seal ring (4).
- 14) Replace seal rings on filter bowl, lubricate with clean hydraulic oil.
- 15) Replace filter element.
- 16) Reinstall filter bowl and tighten. **DO NOT APPLY EXCESSIVE TIGHTENING TORQUE.**
- 17) Remove container and dispose of any waste oil in accordance with local environmental policies.
- 18) Refill tank with oil until level is between MIN and MAX on gauge. See section 2.4.1 for capacity and 2.4.4 for oil specification.
- 19) Operate the hydraulic system until oil temperature reaches 40°C (104°F). Check operation and inspect for leaks.
- 20) Reinstall side access panel and tighten 4 bolts.
- 21) Close top access panel.



3.8 Telescopic boom

3.8.1 Wear pad check (Monthly)

- 1) With the booms down and the telescope boom fully retracted, check that there are no loose, missing, or defective components in the superstructure end of the telescope boom. This includes wear pads, shims, spacers and fasteners.
- 2) Fully extend the telescope booms.
- 3) It may be necessary to raise the telescope boom slightly to avoid the platform hitting the floor.
- 4) Check that there are no loose, missing, or defective components in the knuckle end of the telescope boom. This includes wear pads, shims, spacers, fasteners, wear screws and locking nuts.
- 5) Check the clearance between each of the 4 wear screws and the inner telescope boom sections.
- 6) If adjustment is required, release the locking nut (1) and tighten each wear screw (2) until it makes contact at the tightest point with the inner telescope boom section.
- 7) Back-off each wear screw before tightening the locking nuts.
- 8) Check that the sides of the inner telescope boom section are adequately lubricated and free from scoring or rubbing marks.
- 9) Connect a grease gun to the grease nipple (3) and pump the grease gun two to three times as required.
- 10) Locate the two grease nipples (4) at the knuckle end of telescope boom and pump the grease gun two to three times as required.
- 11) Use Hycote White Grease or equivalent.



3.8.2 Hose trunking and energy chain check (Weekly)

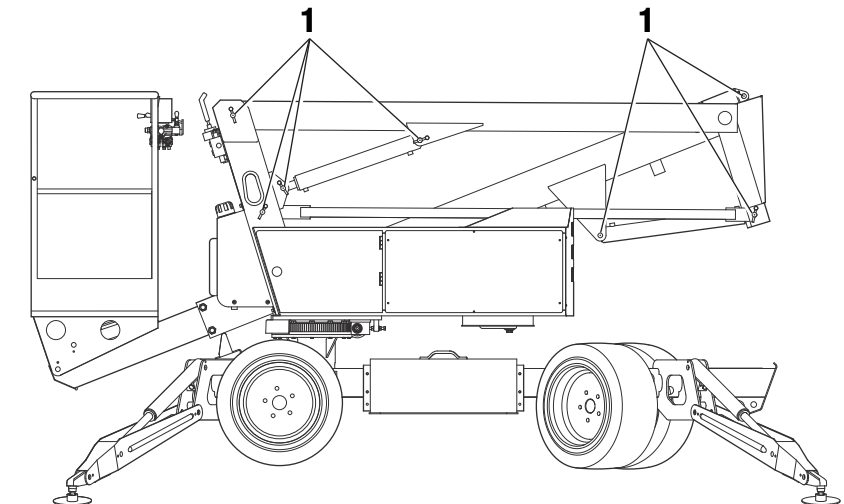
- 1) Examine the hose trunking and check that there are no loose, missing, or defective components.
- 2) Check that the hose trunking does not make contact with or “snag” on the boom structure at any point over its range of travel.
- 3) With the telescope section fully extended, check that the trunking system adequately supports the weight of the hose bundle. The upper section of aluminium trunking should be approximately parallel with the top surface of the boom.
- 4) Check the condition of the energy chain, paying particular attention to the condition of the links at both ends, as this is where the highest loads and wear rates occur. See section 4.3.1 if any links require replacement.
- 5) Check that the energy chain is free from debris or any abrasive material that could cause damage to the hydraulic hoses. Remove & dispose of any debris in accordance with local environmental policies.

3.8.3 Boom pivot pin check (Daily)

Check the respective locking device is installed and secure on all boom pivot pins.

3.8.4 Boom pivot bushes lubricate (Yearly)

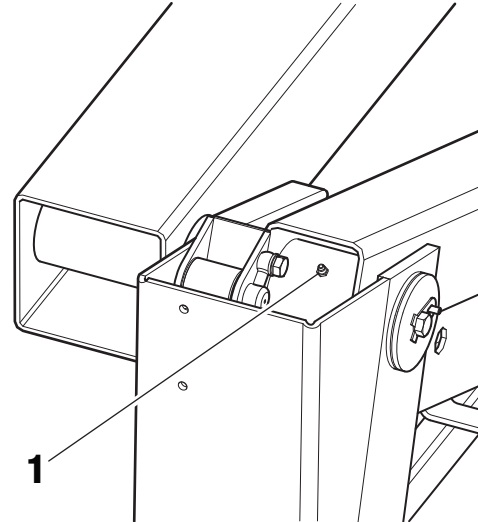
At yearly intervals lubricate all DU pivot bushes (1) on the boom assembly.



Use a dry PTFE aerosol lubricant spray such as WD40 W/D44394 or equivalent. Apply lubricant spray and allow to penetrate at each of the pivot bush joints identified in the diagram above. Note; with the exception of the boom knuckle, there are no grease or lubrication nipples on the pivot bushes.

Boom knuckle

- 1) Ensure that the Niftylift is on level ground with the platform stowed.
- 2) Locate the boom knuckle grease nipple (1).
- 3) Connect a grease gun to the grease nipple and pump the grease gun two to three times as required. Use Black EP grease. (See section 3.2.1).

**3.9 Boom rotation gear****3.9.1 Rotation gear engagement check (Monthly)**

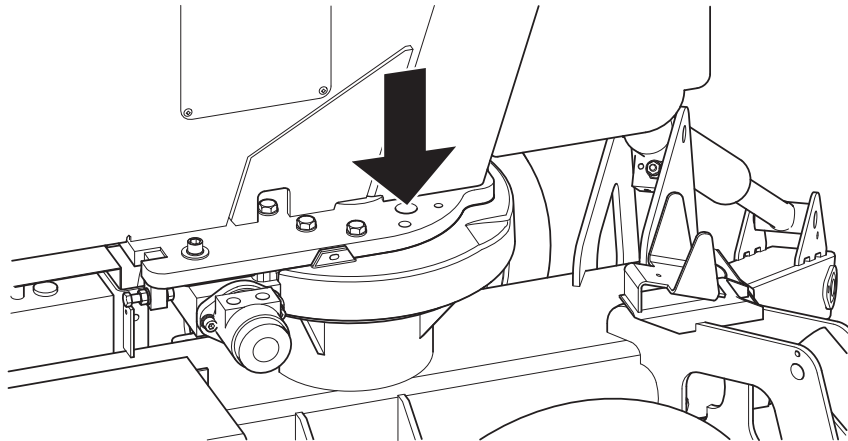
- 1) Check the play between the slew ring and pinion.
- 2) With the telescope boom fully extended, manually push the booms from side-to-side. A small amount of play is permissible.
- 3) Inspect the slew gear for signs of uneven wear, damage or missing teeth.
- 4) Rotate the machine through a full revolution and check that there are no tight spots where the superstructure struggles to rotate.

3.9.2 Rotation ring lubrication (Monthly)

⚠ CAUTION

DO NOT CARRY OUT THIS PROCEDURE WHILST THE ENGINE IS RUNNING.

- 1) Locate the grease nipple on the inner rotation ring.
- 2) Connect a flexi-end grease gun through the access hole (arrowed) to the grease nipple.



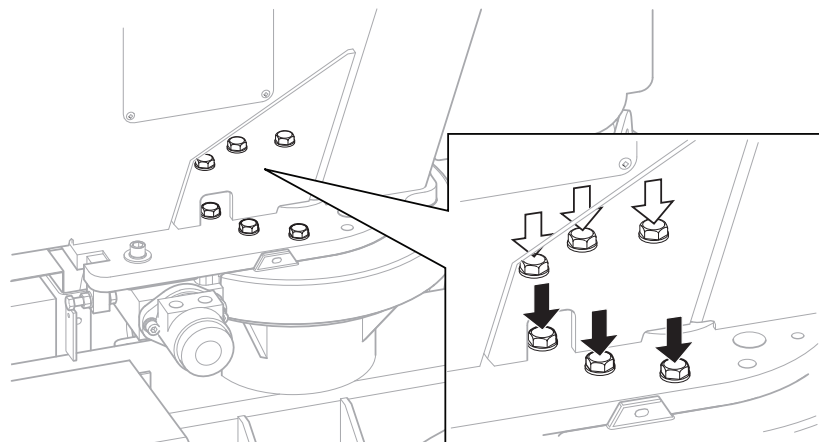
- 3) Pump the grease gun two to three times as required. Use black EP grease. (See section 3.2.1).
- 4) Power up the Niftylift and rotate the booms 180°.
- 5) Power down the Niftylift and repeat steps 2 and 3.
- 6) Apply black EP grease to the teeth of the rotation gear as required.

3.9.3 Rotation ring bolts check (Yearly)

⚠ CAUTION

DO NOT CARRY OUT THIS PROCEDURE WHILST THE ENGINE IS RUNNING.

Check the torque setting of the rotation ring bolts (arrowed). See section 2.6 for torque settings.



4 Repair procedures

4.1 General

4.1.1 Fuses

The main replaceable fuses on the Niftylift are as follows:

- 225A MEGA 32V DC (x2) - DC system,
- 7.5A ATO 32V DC - DC regulator,
- 125A SIBA 80V DC - diesel engine starter motor and alternator.

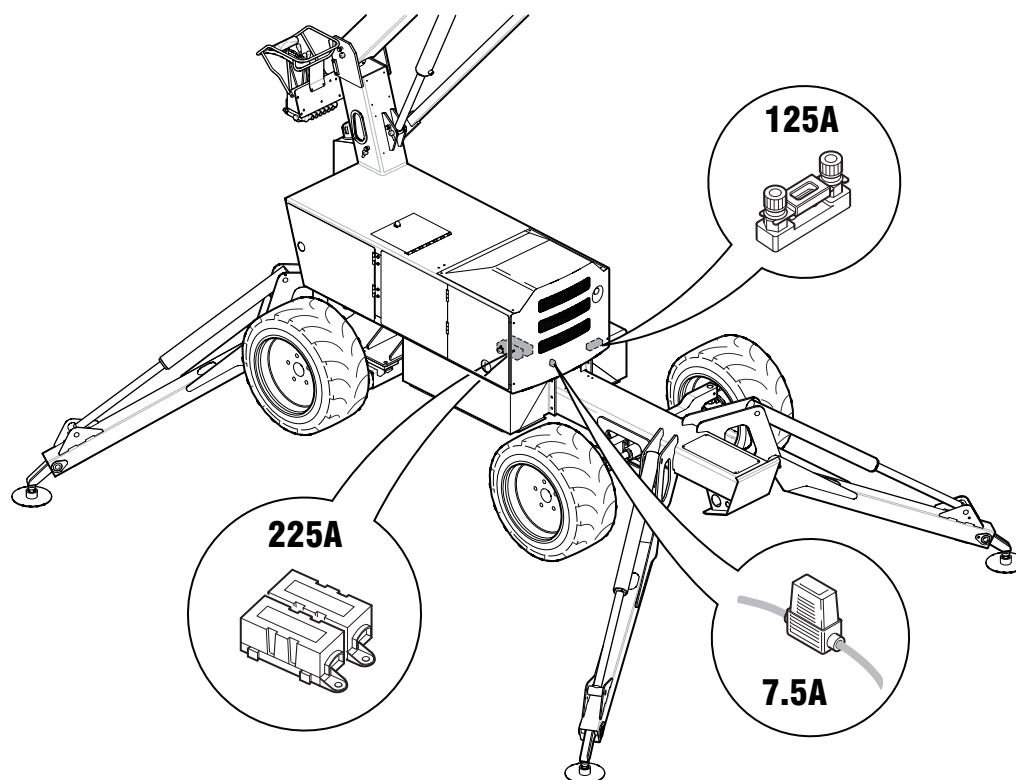
Prior to the replacement of any fuse, determine the cause of the fault. Do not replace the fuse until the cause of the fault has been remedied. When replacing SIBA or MEGA fuses, tighten the fixing nuts to 16 Nm (12 lbf·ft).

Isolate the Niftylift from the power supply during maintenance of the electrical system. (See section 1.5.4).

The replacement fuse must always be the same rating as the defective one.

See location diagram.

Main fuse location



4.2 Platform/Basket

4.2.1 Footswitch - contact switch replace

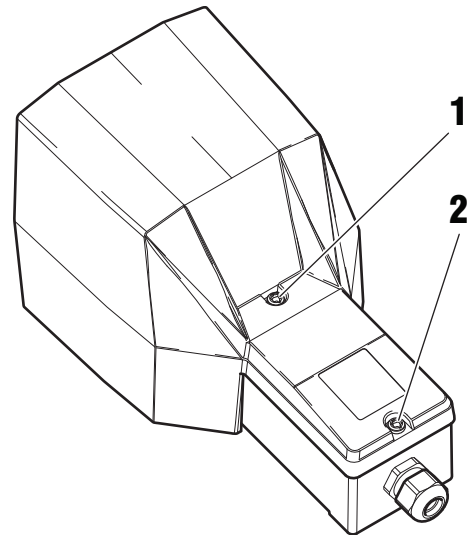
The footswitch is used to provide power to the Niftylift controls.

Remove

- 1) Isolate Niftylift from power supply. (See section 1.5.4).
- 2) Remove bolts (1) and (2) and remove the footswitch cover and rubber gasket.

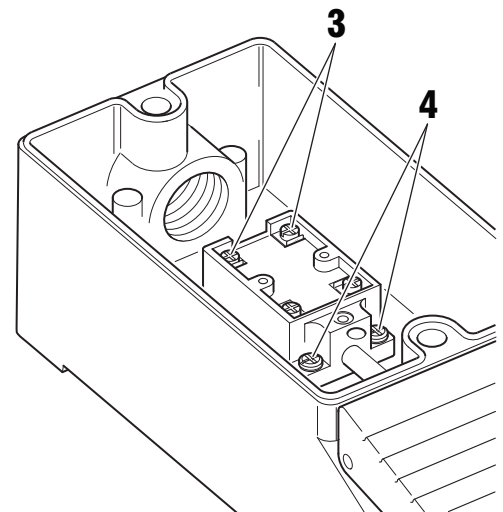
Note; the longer length of bolt (1).

- 3) Record wiring locations.
- 4) Disconnect wiring from switch terminals (3).
- 5) Remove 2 screws (4) from contact switch and remove.



Install

- 6) Replace contact switch and tighten 2 screws.
- 7) Connect wiring to contact switch terminals as observed in step 3.
- 8) Reinstall footswitch cover and rubber gasket making sure bolts are in the same position as step 2.
- 9) Tighten bolt (1) to 3.0Nm (2.2 lbf-ft) and bolt (2) to 2.5Nm (1.8 lbf-ft).
- 10) Connect the power supply (See section 1.5.4).



4.3 Booms

Booms are safety critical components, please contact your nearest Niftylift approved dealer for further information.

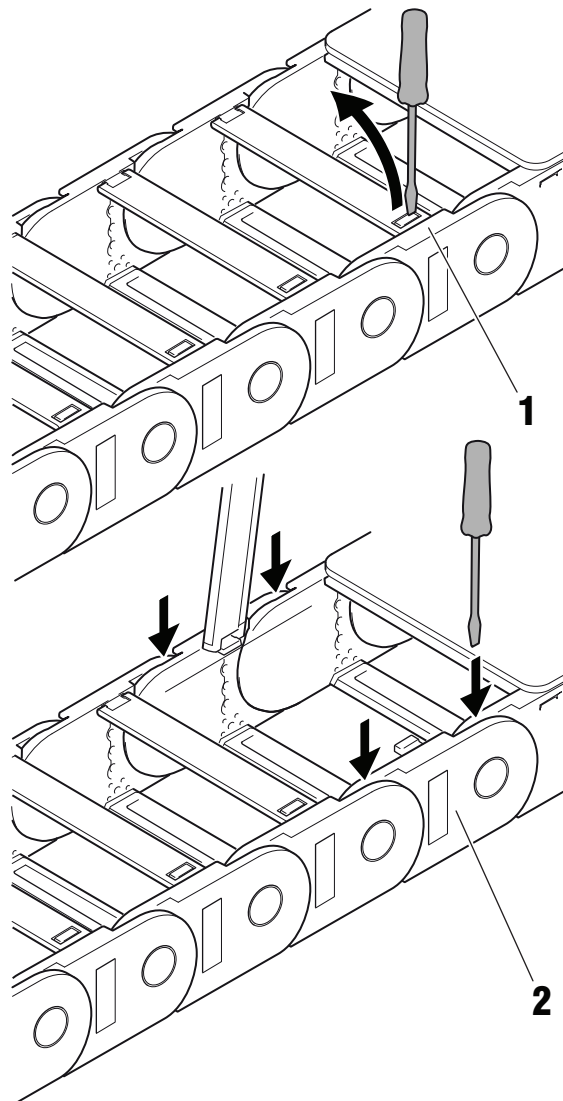
4.3.1 Energy chain link

Remove

- 1) Operate telescopic boom to access the worn or damaged link.
- 2) Insert a small flat screwdriver into the chain bridge (1) and prize upwards.
- 3) Raise the chain bridge until vertical.
- 4) Carefully prize apart link (2) at the four points arrowed.
- 5) Remove link from the chain.

Install

- 6) Replace the link section and click into position.
- 7) Lower the chain bridge and click into position.



4.4 Power tray

4.4.1 Exhaust

⚠ CAUTION

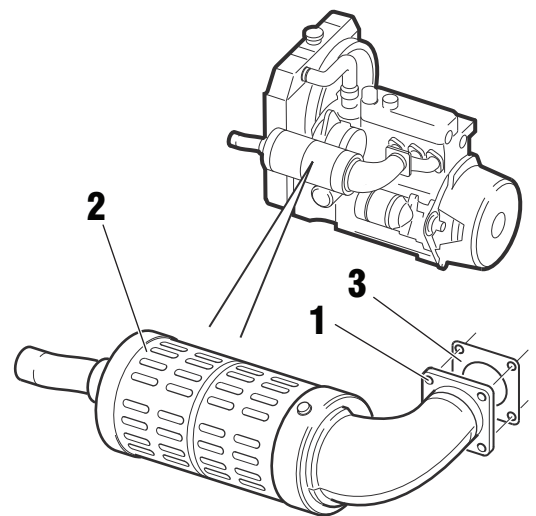
ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN.

Remove

- 1) Isolate Niftylift from power supply. (See section 1.5.4).
- 2) Remove the engine cover. (See section 3.2.2).
- 3) Remove 4 nuts and 4 washers (1).
- 4) Remove the exhaust (2) and exhaust gasket (3).
- 5) Undo clamp and remove tail pipe.

Install

- 6) Reinstall tail pipe, ensure clamp is tight.
- 7) Replace exhaust gasket.
- 8) Replace exhaust, 4 washers and 4 nuts.
- 9) Tighten 4 nuts. See section 2.6 for torque settings.
- 10) Connect the power supply. (See section 1.5.4).
- 11) Start the engine and check the exhaust system.
- 12) Reinstall the engine cover and tighten 8 bolts. See section 2.6 for torque settings.



4.4.2 Fan Belt

⚠ CAUTION

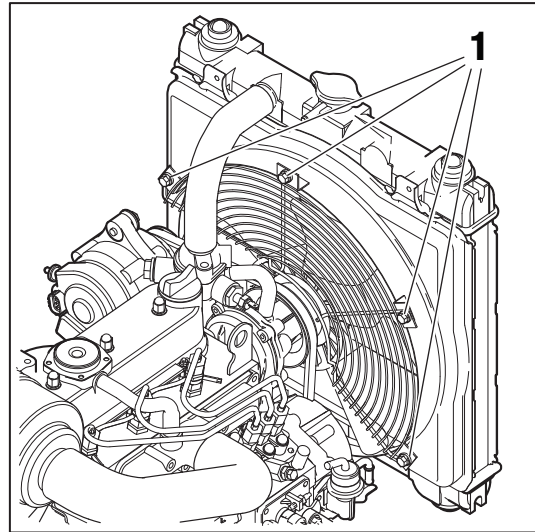
ONLY CARRY OUT THIS PROCEDURE WITH THE ENGINE SWITCHED OFF AND COOLED DOWN.

Remove

- 1) Isolate Niftylift from power supply. (See section 1.5.4).
- 2) Remove the engine cover. See section 3.2.2.
- 3) Remove 4 bolts (1) and remove fan guard.
- 4) Loosen the alternator mounting bolts and remove the fan belt.

Install

- 5) Replace fan belt.
- 6) Reinstall fan guard and tighten 4 bolts. See section 2.6 for torque settings.
- 7) See section 3.2.15 for fan belt adjustment.
- 8) Connect the power supply. (See section 1.5.4).
- 9) Start engine and check operation.
- 10) Reinstall the engine cover and tighten 8 bolts.



4.5 Base assembly

4.5.1 Steer cylinder

⚠ WARNING

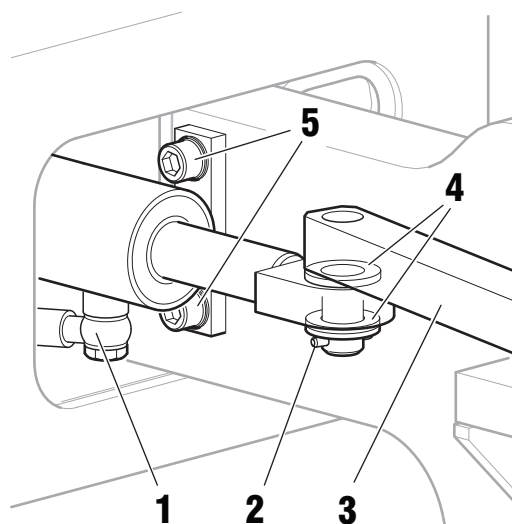
ENSURE SUITABLE EYE PROTECTION AND CLOTHING ARE WORN WHEN OPENING THE HYDRAULIC CIRCUIT.

NOTICE

PLACE A SUITABLE CONTAINER UNDERNEATH THE WORK AREA AND DISPOSE OIL ACCORDING TO LOCAL REGULATIONS.

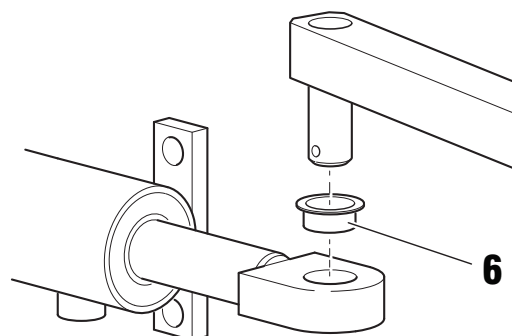
Remove

- 1) Ensure the Niftylift is in its stowed position.
- 2) Open the top access panel and loosen the filler cap to relieve pressure.
- 3) Centre the steering so wheels point straight ahead.
- 4) Isolate Niftylift from power supply. (See section 1.5.4).
- 5) Observe clean assembly practices to avoid contamination by dust or dirt.
- 6) Carefully remove 2 hydraulic hoses (1) from the steer cylinder. Slowly loosen fittings to allow pressure to dissipate.
- 7) Insert plugs and cap to prevent oil loss.
- 8) Remove and discard roll pins (2) from the track rods (3).
- 9) Observe the position of the washers (4).
- 10) Remove 4 bolts and washers (5).
- 11) Remove steer cylinder and upper washers from front axle.



Install

- 12) Install 2 bushes (6) into the steer cylinder eyelets and lubricate with Anti-seize copper grease. (See section 3.2.1).
- 13) Reinstall upper washers to the track rod ends.
- 14) Apply Loctite 243 or equivalent thread locker to bolt threads. (See section 3.2.1).
- 15) Install steer cylinder using 4 washers, 4 spring washers and tighten 4 bolts to 100 Nm (74 lbf-ft).

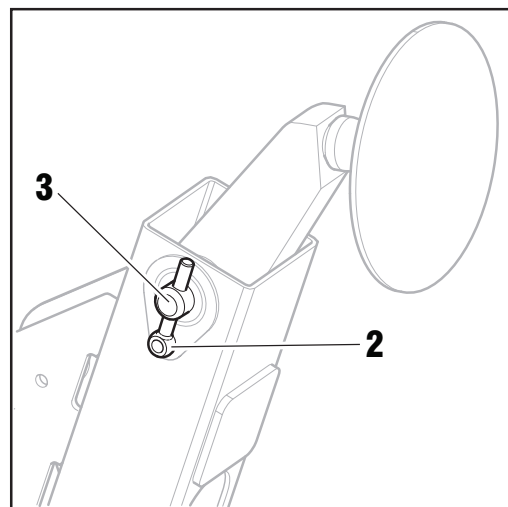
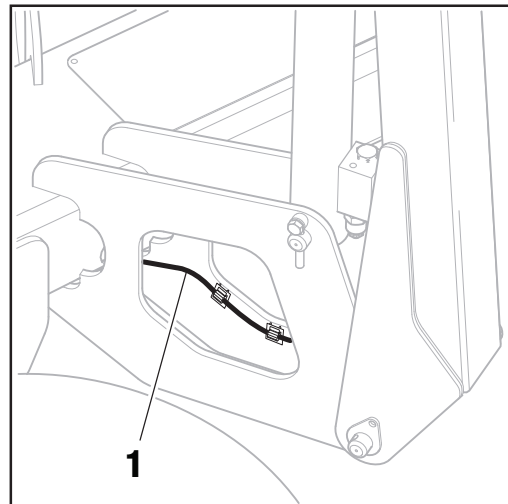


- 16) Reinstall lower washers and replace roll pins to the track rods.
- 17) Remove caps from hydraulic hoses.
- 18) Reconnect hydraulic hoses and tighten connectors. See section 2.7 for torque settings.
- 19) Connect the power supply. (See section 1.5.4).
- 20) Operate the hydraulic system until oil temperature reaches 40°C (104°F). Check operation and inspect for leaks.
- 21) Check hydraulic oil level and top up with appropriate grade of oil if necessary. (See section 2.4.4).
- 22) Close the top access panel.

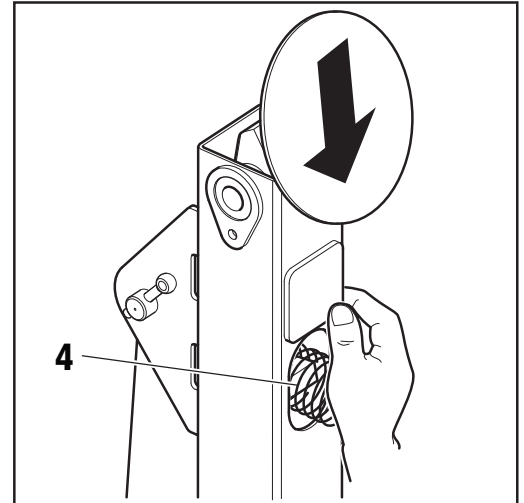
4.5.2 Stabilizer microswitch

Remove

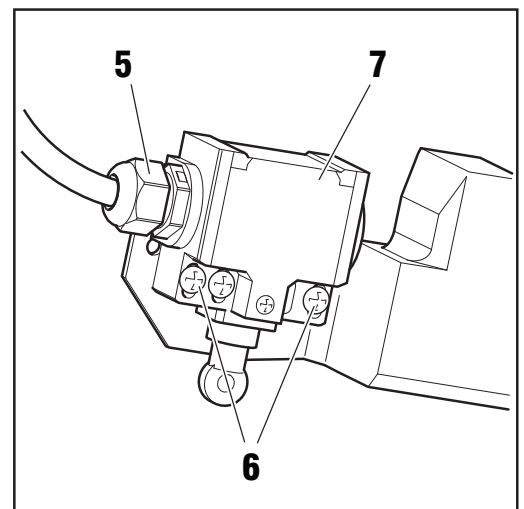
- 1) Ensure the Niftylift is in its stowed position.
- 2) Ensure the stabilizer is upright in the stowed position.
- 3) Isolate Niftylift from power supply. (See section 1.5.4).
- 4) Release the wiring harness (1) from the clips.
- 5) Undo bolt and remove the swing bolt (2).
- 6) Using a suitable drift, knock out the pin (3).



- 7) Slowly lower the foot plate assembly into the stabilizer until the spring (4) is visible.
- 8) Caution should be taken when releasing the spring as it is under tension.



- 9) Lift the foot plate assembly out of the stabilizer.
- 10) Loosen gland (5).
- 11) Undo bolts (6) and remove switch.
- 12) Open front cover (7).
- 13) Record the position and disconnect four wires.
- 14) Withdraw wiring from switch.



Install

- 15) Insert wiring into switch.
- 16) Connect wiring to switch terminals as observed in step 13.
- 17) Close front cover.
- 18) Install switch and tighten 4 bolts.
- 19) Tighten gland.
- 20) Lower foot plate assembly and reinstall spring.
- 21) Position the foot plate assembly and replace pin.
- 22) Reinstall swing bolt and tighten fixing bolt. See section 2.6 for torque settings.
- 23) Reinstall wiring harness back into the clips and check free movement of the wiring harness.
- 24) Connect the power supply (See section 1.5.4).
- 25) Operate the stabilizer and check for correct operation.

5 System overview

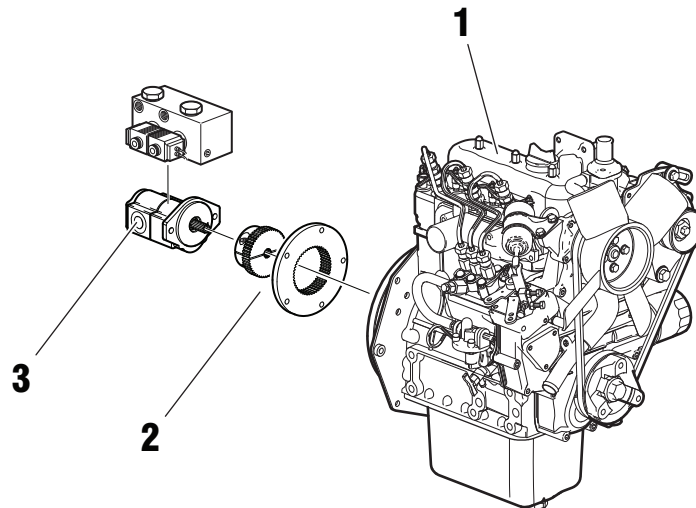
5.1 Introduction

Power options consist of Diesel only, Bi-Energy (Diesel or DC battery).

5.1.1 Diesel system

The main hardware for this system consists of the following:

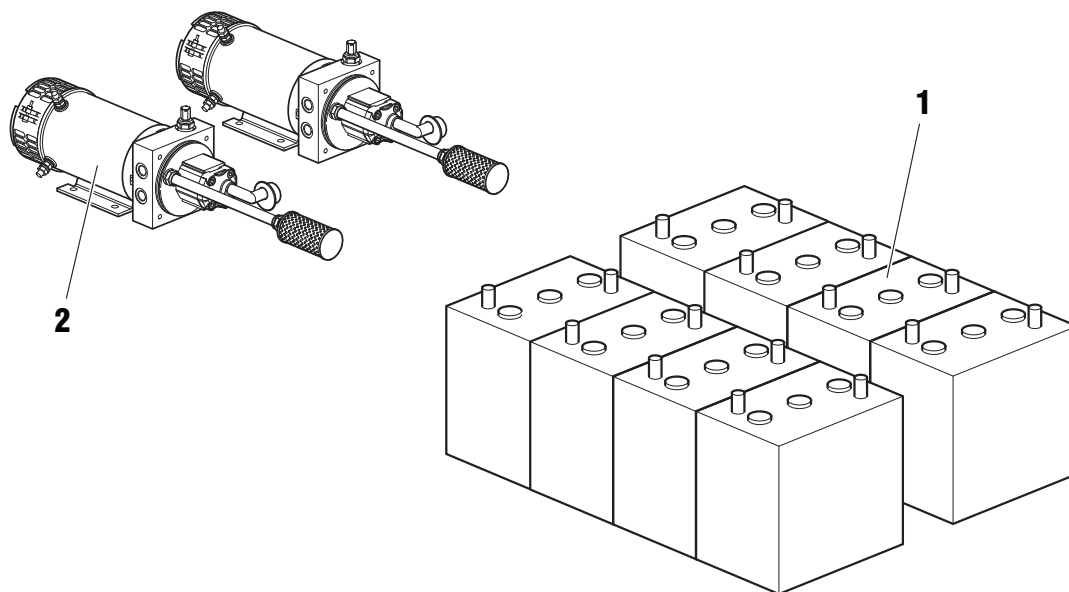
- (1) 14.9kW Kubota D722 Diesel engine
- (2) Drive Hub and Flange
- (3) Engine Pump.



5.1.2 DC electric system

The main hardware for this system consists of the following:

- (1) 240Ah 6V batteries x8
- (2) Power Packs x2 (3kW 24V).



Battery pack

Eight 240Ah 6V batteries wired in parallel supply 24V to both power packs. The on-board battery charger requires connection to either a 230V or 110V AC power supply. Recharge batteries at the end of every working day or shift. A step down DC voltage converter reduces the output voltage from 24V to 12V to supply the control circuit and start battery.

Power packs

The 24V battery system powers x2 3kW 24V power packs. Each has an integral hydraulic pump 1.2CC (RH power pack) and 2.2CC (LH power pack) providing power to the hydraulic circuit.

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.

Batteries

240Ah batteries are fitted as standard. If alternative batteries are used the charger must be reconfigured to suit the replacement batteries. Contact Niftylift for further information.

Absorbent Glass Mat (AGM) batteries

As an alternative to the standard 240Ah batteries, the Niftylift may be fitted with 240Ah Absorbent Glass Mat (AGM) batteries.

These batteries are maintenance free, therefore **DO NOT REFILL** with distilled (deionised) water. Irreparable damage will occur.

5.2 Charging and batteries

The engine alternator charges the start battery when the engine is running which keeps the battery at 14.4V. Further information on the charging system and batteries, refer to the Operating & Safety Instructions as supplied with the machine.

5.3 Bi-Energy system

5.3.1 Duty selector

On multiple power option machines, (Bi-Energy) one of the functions on the platform control station will be a duty selector. This key switch allows the selection of either power option, i.e. from Diesel to Battery or vice-versa. On single energy source machines the key switch serves as an "On-Off" control.

5.4 Boom system

5.4.1 Boom switch

Mounted between the main booms, near the knuckle and operated by a cam, 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, fast throttle is enabled. When the booms are raised, the tilt alarm sensor becomes activated, and the boom switch isolates the jack 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.

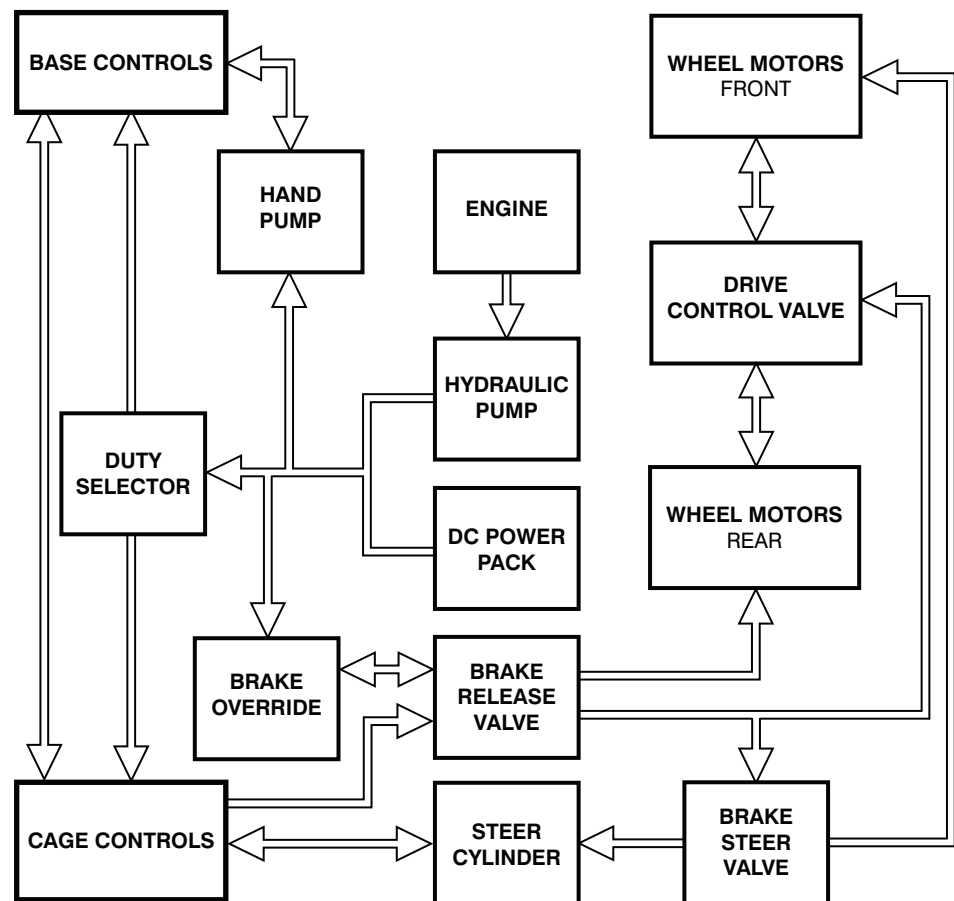
5.5 Drive system

5.5.1 Overview

A Kubota D722 diesel engine drives a twin bodied pump with direct mounted pump dump valves (one per section). The arrangement allows two speed operation and fast throttle. The maximum hydraulic pressure is 200 bar (2900 psi). Hydraulically driven gearbox motors provide drive to each wheel giving the machine four wheel drive capability. See section 2.3 for the available driving modes and machine speeds.

5.6 Hydraulic system overview

A simplified version of the hydraulic system is shown below in block diagram format. Brief descriptions of the operation of individual blocks are given below. Component details, valve arrangement and connections are shown in the hydraulic schematics. Please refer to the hydraulic schematics in conjunction with the electric schematics listed in “Maintenance information” on page 3 for in-depth understanding of the complete system.



5.7 Hydraulic pump

The Niftylift is equipped with a fixed displacement engine (gear) pump. See Pump Specifications table for information.

Pump Specifications
Engine Pump
9cc double body, aluminum, external gear
Maximum pressure 275 bar (3988 psi)

Maximum system operating pressure 200 bar (2900 psi).

5.8 Hydraulic valve blocks

5.8.1 Drive control valve (DCV)

The DCV comprises of several individual components all directly involved in the hydraulic supply to the wheel drive motors. The pressure relief valves and non-return valves serve to control the machine speed in normal drive and to prevent overspeed when descending slopes.

5.8.2 Brake release valve (BRV)

The DCV 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 hydrostatically applied parking brakes will remain engaged. Only when the green "power control" button is being used (or the platform foot switch is depressed) will the BRV operate. Pressing the drive joystick trigger will then energise the BRV and permit the drive function.

5.9 Electrical control system overview

Component level details and connections are provided in the Electric Schematic listed in Table 2, "Technical Documents," on page 4.

6 Troubleshooting guide

6.1 Trouble shooting information

This guide is designed to help identify and rectify faults more easily. Known faults are listed below. Your specific Niftylift fault may not be listed here, if not please contact your local Niftylift approved dealer in order for the guide to be continually improved and updated.

6.2 Platform function fault finding

Problem	Cause / Test	Solution
Niftylift will not drive	Check that power is reaching the solenoids on the Motion Control Valve block	Main PCB may need replacement
No functions, but engine operates correctly	Coupling failure	Connect coupling. Replace any damaged parts
	Footswitch fault	Contact switch may need replacement (See section 4.2.1)
	Hydraulic pump dump valves not operating correctly	Solenoid / relay may need replacing on dump valve circuit
Niftylift inactive, engine will not start	Battery disconnect handles (Anderson) Disconnected	Reconnect Battery disconnect handles (Anderson) (See section 1.5.4)
	Check main fuses	If fuse blown, replace with direct replacement (See section 4.1.1)
	Battery discharged	Recharge battery
	E-stops activated	Ensure e-stops are pulled out, at base controls and basket controls
	Basket weigh activated	Remove weight from basket

6.3 Engine fault finding

Problem	Cause / Test	Solution
Engine difficult to start	Fuel is thick and doesn't flow	Check the fuel tank and fuel filter. Remove water, dirt and other impurities
		As all fuel will be filtered by the filter, if there should be water or other foreign matters on the filter, clean the filter with diesel
	Air or water mixed in fuel system	If air is in the fuel filter or injection lines, the fuel pump will not work properly. To attain proper fuel injection pressure, check carefully for loosened fuel line couplings, loose cap nuts etc.
		Loosen joint bolt at top of fuel filter and air vent screws of fuel injection pump to eliminate all the air in the fuel system
	Thick carbon deposits on orifice of injection nozzle	This is caused when water or dirt is mixed in the fuel. Clean the nozzle injection piece, being careful not to damage the orifice
		Check to see if nozzle is working properly. If not, install a new nozzle
	Valve clearance is incorrect	Adjust valve clearance to 0.165mm (0.0065in.) when the engine is cold
	leaking valves	Grind valves
	Fuel injection timing is wrong	Adjust injection timing
		The injection timing 0.35 rad (20°) before top dead centre (TDC)
	Engine oil becomes thick in cold weather and engine cranks slow	Change grade of oil appropriate to the ambient temperature
	Low compression	Bad valve or excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts
	Battery is discharged and the engine will not crank	Charge start battery
		In winter, always remove battery from the Niftylift, charge fully and keep indoors. Install on the Niftylift when required

Problem	Cause / Test	Solution
Engine output insufficient	Carbon stuck around orifice of injection nozzle piece	Clean orifice and needle valve, being careful not to damage the nozzle orifice
		Check nozzle for condition. Replace if necessary
	Inadequate compression. Leaking valves	Bad valve or excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts
		Grind valves
	Fuel supply is deficient	Check fuel system
	Moving parts overheating	Check lubricating oil system
		Check lubricating oil filter is functioning correctly
		Filter element deposited with impurities will cause poor lubrication. Replace element
		Check clearance of bearings are within factory specifications
		Check ignition timing
	Valve clearance is wrong	Adjust valve clearance to 0.165mm (0.0065in.) when the engine is cold
	Air cleaner is dirty	Clean the air filter every 100 hours of operation
Engine cutting out due to low fuel level	Fuel injection pressure is incorrect	Adjust to correct pressure. 13.7 Mpa (140kgf/cm ² , 1991 psi)
	Injection pump wear	Do not use poor quality fuel as it will cause excessive pump wear. Use only grade 2-D Diesel
		Check the fuel injection pump element and delivery valve assembly and replace if necessary
	Fuel level too low	Re-fill fuel tank if problem persists see above for 'Air or water mixed in fuel system'
	Fuel line crushed	Release fuel line and replace if damaged
	Lift pump not functioning correctly	Replace lift pump

6.4 Gearbox fault finding

Problem	Cause / Test	Solution
Oil leakage from seals	Hardening of the seals due to prolonged storage	Clean area and check for leakage after a few days
	Seals damaged or worn	Contact a Niftylift approved service center
	Too much lubricant	Check oil level (See section 3.5.1)
Vibrations and/or excessive noise	Wheel gear is not correctly installed	Check the fixing
	Internal anomaly	Contact a Niftylift approved service center
	Bearings badly lubricated or faulty	Contact a Niftylift approved service center
	Dented or chipped teeth	Contact a Niftylift approved service center
	Low oil level	Check oil level, top-up if necessary (See section 3.5.1)
Brakes fail to disengage	Low pressure in the braking circuit	Check the brake connection and hydraulic circuit
	Brake stuck due to prolonged storage	Contact a Niftylift approved service center
Brakes do not engage	Residual pressure in the circuit	Check hydraulic circuit
Over-heating	Either too much or too little oil	Check the oil level
	Unsuitable lubricant	Check the lubricant type and condition
	Bearings badly lubricated or faulty	Contact a Niftylift approved service center
	Multiple-disc brake not opening completely	Check brake opening pressure
	High thermal power	Contact a Niftylift approved service center

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