

1.0 - 1.5 Tonne

Thwaites

Mach 2001 / 2002 / 2003

Operator's Instruction Manual



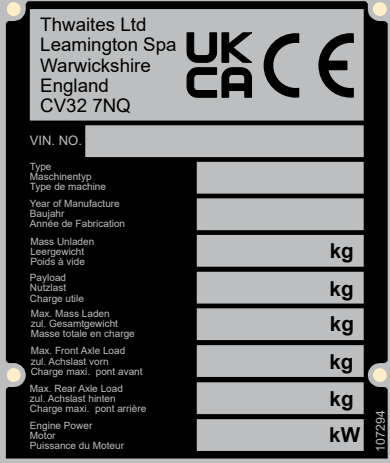
Mach 2002 / 2003 Powerswivel



Mach 2001 Hi-tip



Serial plate



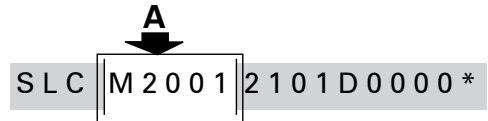
Please enter your machine Model Type and VIN number here and quote when in communication with your Thwaites distributor.

Model Type

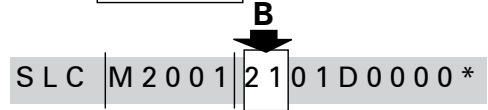
Vin N°

The VIN number incorporates a number of security features and also the machine model and individual serial number.

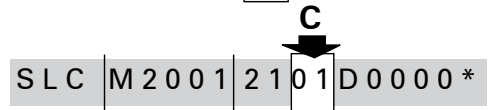
VIN number example.



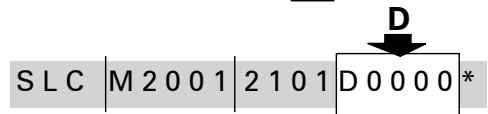
A. Model or MACH number



B. The year of manufacture



C. Issue level, Prefix Number



D. Unique machine serial number:

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Declaration of conformity




Thwaites

A copy of the Declaration of Conformity is supplied with all machines manufactured to EU legislation.

This sample copy applies to all machines with CE marks that have not been modified since the machine was first placed the market.

The Declaration of Conformity is not a quality certificate, nor a guarantee for safety.

The Declaration of Conformity should be retained as it provides documentary evidence that a product complies with the safety requirements applying to the machine when first placed on the market.

			
		Declaration of Conformity	
We	Thwaites Limited		
of	Leamington Spa, Warwickshire, England, CV32 7NQ		
Declare under our sole responsibility that the product,			
Machine Type	Compact Dumper		
Model			
Serial No			
to which this declaration relates has been designed and manufactured in compliance with the following essential Health and Safety Regulations identified in:-			
Machinery Directive 2006/42/EC (formerly 98/37/EC) and harmonised European standards based thereon.			
Electromagnetic Compatibility Directive 2004/108/CE (formerly 89/336/EC)			
Notified Body - Mira, Nuneaton, England.			
REGULATION (EU) 2016/1628 of the EU - Requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No 167/2013, and amending and repealing Directive 97/68/EC			
Noise Emission for use Outdoors Directive 2000/14/EC, Annex 6 - Procedure 1 as amended by 2005/88/EC.			
Notified Body N60026 - Vinçotte nv, Jan Oliebiergelaan 35, B-1800 Vivroords, Belgium.			
Sound Power Levels (Lwa)			
Net Power (Kw)	Mean Measured	Guaranteed Level	Model
15.9	100	101	1.0, 1.5 Tonne
18.4	101	101	2.0, 2.3, 3.0 Tonne
21.1	101	101	2.0 Tonne
24.8	100	101	2.0, 2.3, 3.0 Tonne
24.8	101	101	3.0 Tonne
33.3	101	101	3.0, 3.5, 4.5 Tonne
55.4	101	101	5.0, 6.0, 7.0, 9.0 Tonne
55.4	101	101	5.0, 6.0, 7.0, 9.0, Tonne (Cab)
85.0	103	103	9.0 Tonne
Name and Signature of authorised Person	R McElvogue 		
Position	Engineering Manager		
Place of Issue	Leamington Spa, Warwickshire, England		
Date of Issue			
6112/2020			

Thwaites Limited puts safety first

It is the policy of Thwaites Limited to promote safety in the operation of its machines and to create a general awareness of site safety and safe working practices for the operators of its machines.

This Operator's Instruction Manual is intended for both new and experienced machine operators. It should remain with the machine at all times. All operators should be aware of its location and contents.

It is important that all operators are fully trained and familiar with the machine and that they have read and understood the information contained within this book, before they attempt to operate in the site conditions for which the machine was designed.

This book details practices and operations which Thwaites Limited recommends. **DO NOT** operate this machine in ways other than those detailed within this book.

Due to the varied nature of the operation of site dumpers and the absence of an agreed test standard, any figures quoted by Thwaites in relation to vibration values and exposure are for reference purposes only. It is the responsibility of the employer

to assess vibration exposure based on the actual site conditions, and operating practices, at the point of use.

Hand arm vibration - The daily exposure Action/Limit Values of between 2.5 - 5.0m/s⁻² (A8) are unlikely to be exceeded in an eight-hour reference period.

Whole body vibration - The daily exposure can only be accurately determined at the point of use. This exposure must be managed in respect of the Action/Limit Values of 0.5 and 1.15 m/s⁻² (A8) respectively.

Employers should not rely solely on published vibration figures when undertaking risk assessments. Depending on the site conditions, cycle times may need to be adjusted in order to reduce operator exposure levels.

Vibration values based on typical duty cycles are available on request from Thwaites. These may be used for reference purposes only.

Safety symbols



- Attention!
- Be alert!
- Your safety is involved!



- Correct action



- Incorrect action/procedure which should NOT be carried out

Signal words: are used on the machine and within this manual to identify levels of hazard seriousness:



DANGER



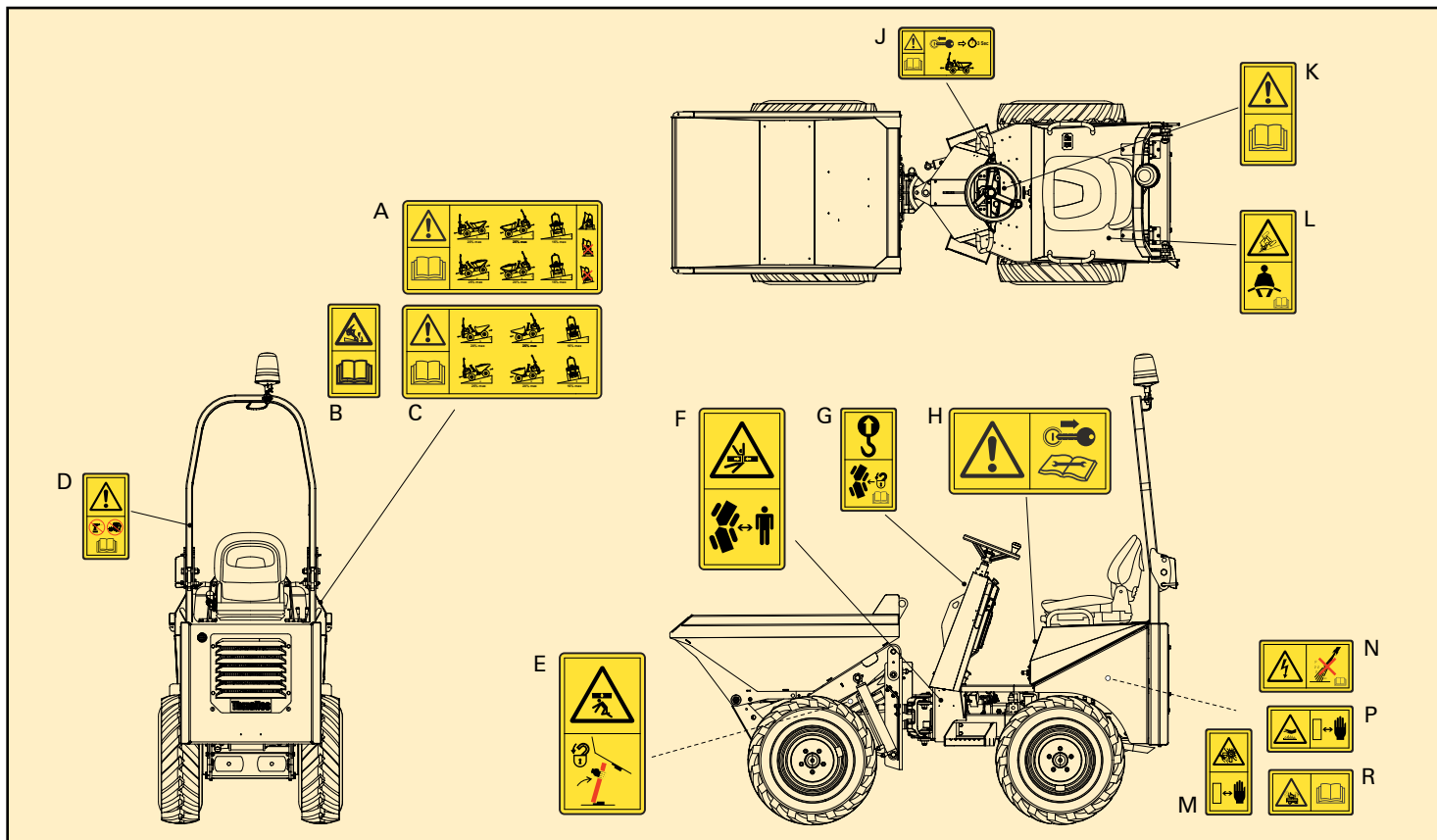
WARNING



CAUTION

1 Safety label identification

Thwaites



Complete checks in section **1** before starting the engine

1 Safety label identification

Safety labels

The safety labels fitted to these machines are to warn the operator or bystanders of possible hazards.

- Be sure you fully understand the content and position of the labels.
- Ensure labels are clean and in good condition, do not clean labels with solvents.
- Replace lost or damaged safety labels.



There are also other labels in addition to the safety labels, handle these labels in the same way.

Orientation of labels may vary from those shown.

Item	Description	Qty	Item	Description	Qty
A	Gradient Powerswivel - Read the operator's manual before working on gradients	1	J	Warning - After starting engine wait for 3 seconds for brakes to release, before engaging drive.	1
B	Stability hazard - Do not discharge load when working on sloping ground	1	K	Warning - Read the operator's manual before you operate the machine	1
C	Gradient Front Tip - Read the operator's manual before working on gradients	1	L	Crushing hazard due to machine roll over - Always wear seat belt	1
D	Warning roll over protective structure (ROPS) - Never modify structure	1	M	Warning severing of finger or hand - Keep hands a safe distance from rotating parts (under engine cover)	2
E	Crushing of whole body - Never work under an unlocked skip or scissor frame (Hi swivel model)	2	N	Electrical shock - Do not use pressure washer on electrical items (under engine cover)	1
F	Crushing of whole body - Stay a safe distance from articulation area	2	P	Hot surface - Keep hands a safe distance from hazard (under engine cover)	1
G	Warning lift point - Read the operator's manual before lifting the machine	1	R	Warning hot fluid under pressure - Read the operator's manual (under engine cover)	1
H	Warning engine maintenance - Read the service manual before working on the machine	1			

Complete checks in section  1 before starting the engine

1 Machine overview

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This machine is designed for customary construction site operations, and the transportation of bulk materials commonly carried on such sites; that is their 'intended use'. Loading is carried out by other equipment .

Under certain controlled conditions the dumper may be used for towing wheeled loads.

Descriptions

1. Skip
2. Leg guard
3. Hand rails
4. Folding ROPS frame
5. Engine cover
6. Floorplate
7. Steps
8. Wheels / Tyres



8

Complete checks in section **1** before starting the engine

1 Before operating this machine

Thwaites



Read operator's instruction manual



Thwaites
Distributor

1. Contact your Thwaites representative in case of further questions
2. Learn to operate this machine
3. Ensure you are fit to operate
4. Wear correct safety clothing and ensure that safety equipment is available

Complete checks in section

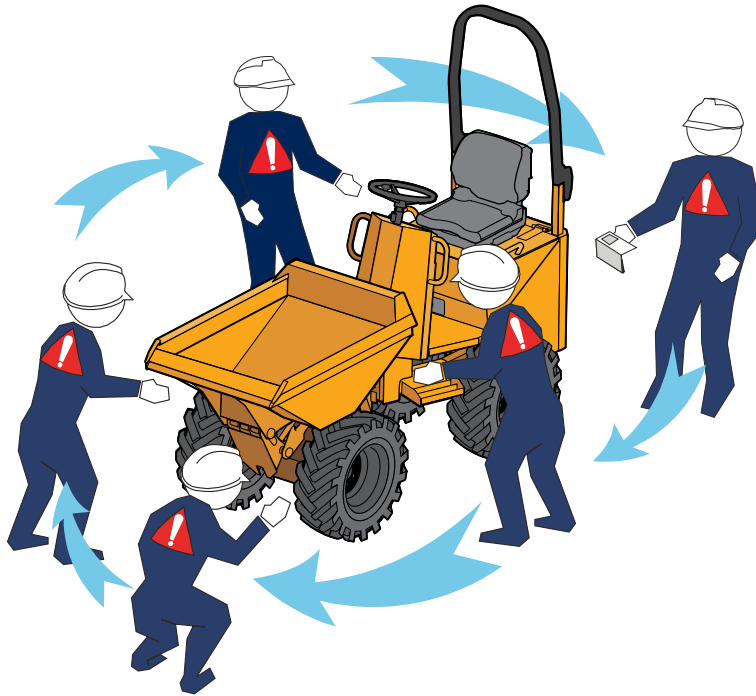


before starting the engine

1 Before operating this machine

Thwaites

Walk around the machine



Visually check the machine

- 1 Are the chassis lock and the skip lock disengaged?
- 2 Are the controls, crush zone or hydraulic rams clean, and clear of any debris?
- 3 Is the Roll-Over Protective frame (ROPS frame) secure, fully upright and undamaged?
- 4 Is the seatbelt anchorage secure and serviceable?
- 5 Are the covers, mudguards and footplate secure?
- 6 Are the hoses free from fluid leaks?
- 7 Are all safety decals legible?
- 8 Are the tyres free of cuts or splits?
- 9 Are all bolts tight and in position?
- 10 Are the steering wheel and the steering column undamaged?
- 11 Have the daily maintenance tasks been performed?
(See section 5)

Report all faults immediately.



WARNING

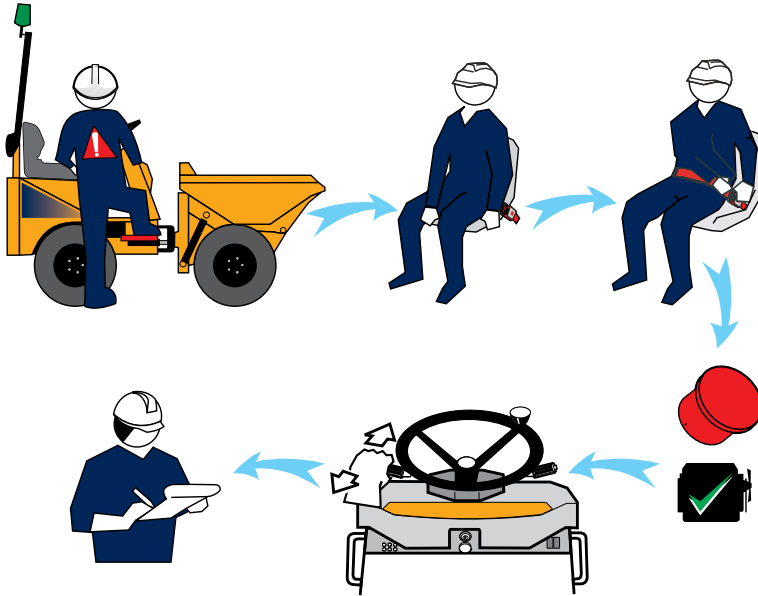
Incorrect tyre pressures reduce machine stability.



**DO NOT OPERATE THE MACHINE UNTIL
ALL FAULTS HAVE BEEN RECTIFIED**



1 Before operating this machine



Mount the machine and check the controls

- 1 Use the grabrails and foot steps provided to manoeuvre into seating position. Face the machine at all times when mounting and dismounting
- 2 Is the engine cover secure and locked?
- 3 Adjust the seat position for comfort and easy access to controls
- 4 Fasten the seatbelt. Adjust accordingly for safety and comfort
- 5 Is the emergency stop button in a raised position?
- 6 Set the transmission to neutral
- 7 Do not operate the machine without understanding all its controls as described in the following pages



WARNING

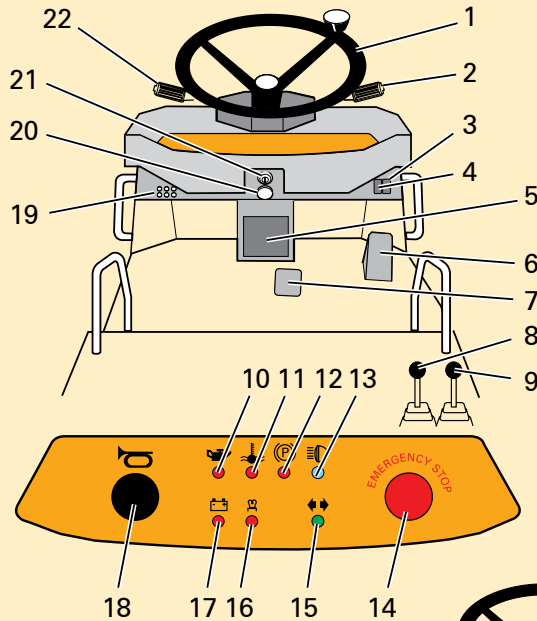
A seatbelt **MUST BE WORN** when operating machines fitted with a ROPS frame

Complete checks in section

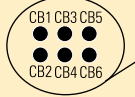


before starting the engine

1 Layout of controls



- CB1 Fuel/Direction Solenoids.
- CB2 Instrumentation/Warning.
- CB3 L/H Sidelights.*
- CB4 R/H Sidelights.*
- CB5 Ignition Fed Lights.*
- CB6 Battery Fed Lights.*



Control locations & functions

1. Steering wheel
2. Lights switch*
3. Hazard switch*
4. Blank
5. Operator safety guide housing
6. Throttle pedal
7. Retarder Pedal*
8. Raise-skip lever (Hi-Tip model)
Tip-skip and rotate-skip lever (Powerswivel model)
9. Raise-skip lever (Hi-Tip model only)
10. Engine oil pressure warning light
11. Water temperature warning light
12. Park brake applied light
13. Full-beam lamp*
14. Emergency stop button
15. Direction lamp*
16. Heat/start pilot light
17. Battery charging warning light
18. Horn push
19. Circuit breakers (push to reset)
20. Warning buzzer
21. Ignition switch
22. Forward/neutral/reverse (FNR) lever

*Optional features

1 Control functions - in depth

Seat adjustment (Type 1)


- A – Turn knob to set driver weight
- B – Lift to slide seat assembly forwards/backwards
- C – Lift handle to adjust backrest


Seat adjustment (Type 2)

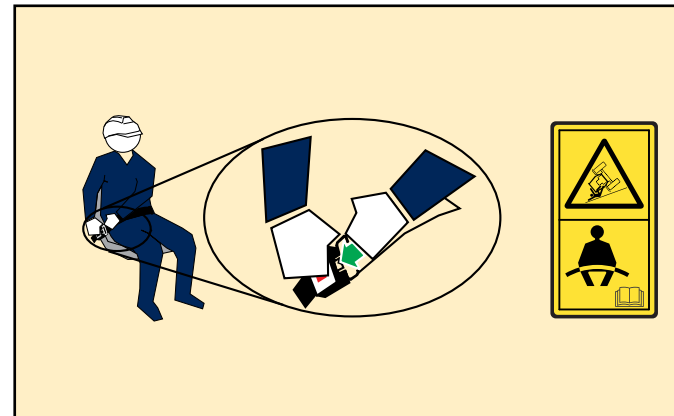
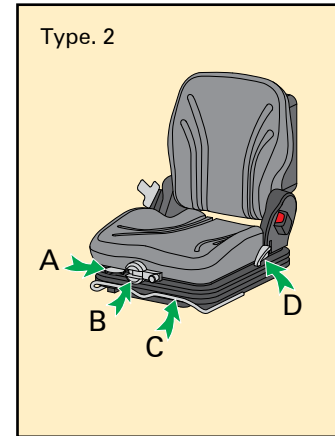
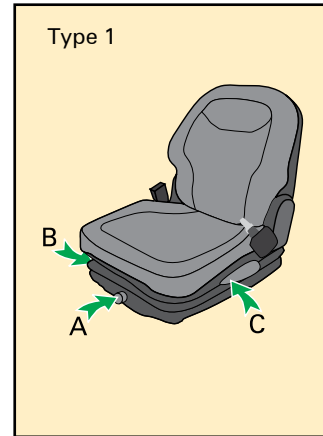
- A – Weight indicator
- B – Turn knob to set driver weight
- C – Lift bar to slide seat assembly forwards/backwards
- D – Lift handle to adjust backrest

Seatbelt

- Press grey seat belt button to release belt from housing
- Pull belt across body and press buckle blade into buckle lock
- Release belt by pressing red button on buckle lock
- Press grey button to retract belt into housing

 *Seatbelt should not be worn loose, it should pass comfortably across hip bones and not the abdomen.*

 *Machine will not move if buckle is not inserted into the lock.*

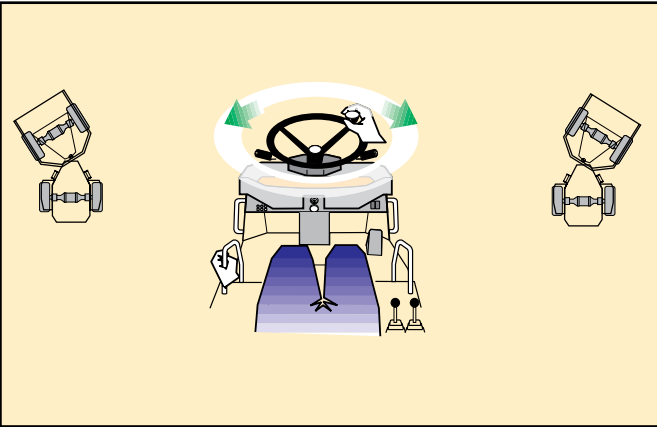


Complete checks in section




before starting the engine

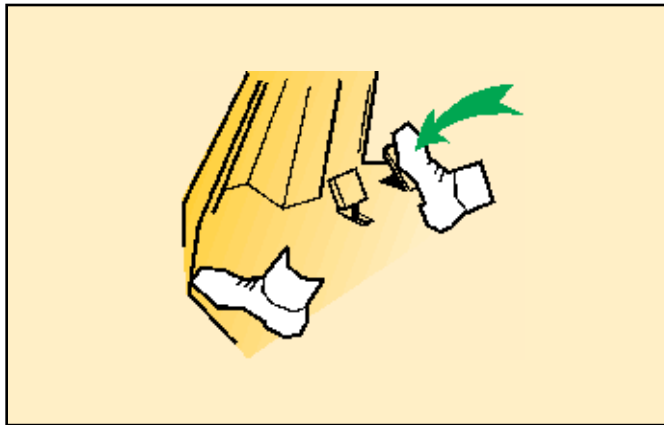
1 Control functions - in depth



Steering wheel – both hands


- Turn the wheel clockwise to turn machine to the right
- Turn the wheel anti-clockwise to turn machine to the left

 Ensure the non-steering hand is on the engine cover grabrail when using the spinner knob for low speed single-handed steering.



Throttle pedal – right foot

- Apply pressure to increase speed
- Release pressure from the pedal to reduce speed
- Fully release the pedal to stop

 When throttle pedal is fully released, the transmission is set to neutral. After 2.5 seconds the park brake is applied.

Retarder pedal (Optional) – right foot

- Apply to reduce stopping distance
- Release pressure from pedal when machine stopped

1 Control functions - in depth

Thwaites

Tip-skip lever - Right Hand (Hi-tip & Powerswivel models)

- Push forward to discharge skip.
- Pull backwards to lower skip.

Raise-skip lever - Right Hand (Hi-tip model only)

- Push forward to raise skip.
- Pull backwards to lower skip.

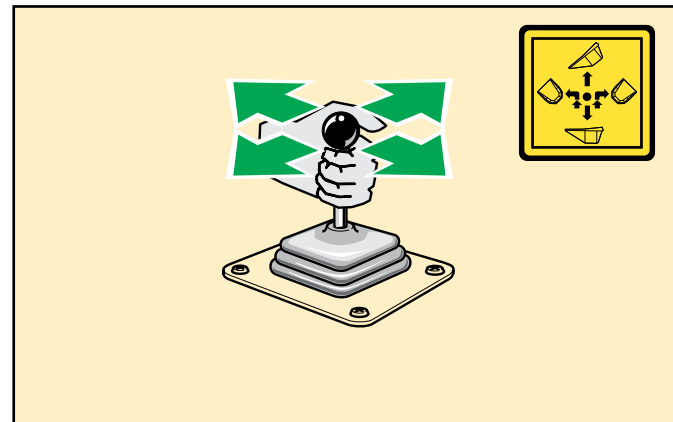
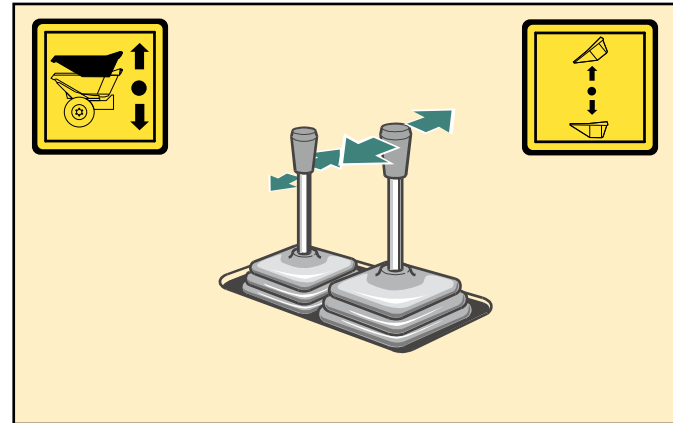
Rotate-skip lever (1.5 T Powerswivel model only)

- Raise skip 100 mm (4") to disengage pivot centring lock
- ☞ Rotate skip, fully lowered, to automatically engage centring lock
- Raise skip and push lever to the right to rotate skip to right
- Raise skip and push lever to the left to rotate skip to left
- Increased engine speed reduces cycle times

☞ Movement of the skip is disabled if the steering wheel is moved (Priority Steering)

Rotate - skip lever - (1.0 T Powerswivel model only)

- Push lever to the right to rotate the skip clockwise
- Push lever to the left to rotate the skip anti-clockwise

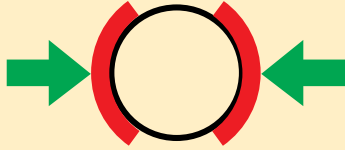


Complete checks in section



before starting the engine

1 Control functions - in depth




Automatic park brake (both rear wheels)


The park brake is applied in the following conditions:

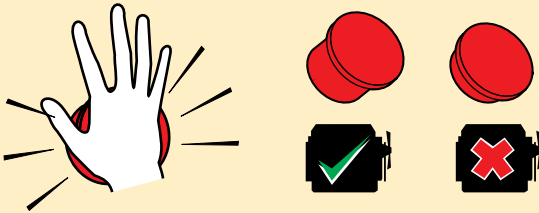
- the FNR lever is in a neutral position
- the ignition switch is in an 'off' position
- the engine is stopped, with emergency stop button pressed
- the throttle pedal is fully released

Emergency Stop Button - Right Hand

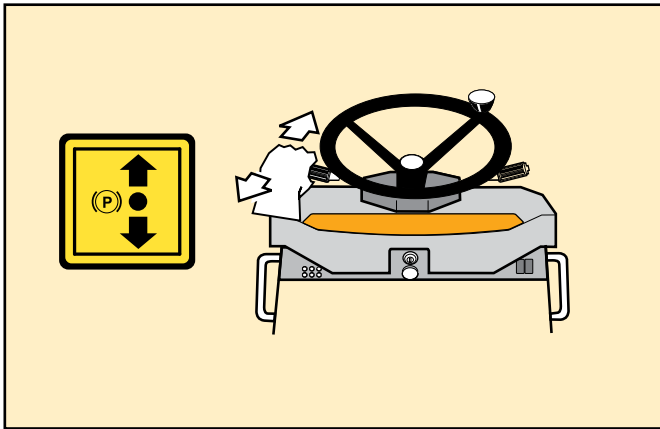
- Press to apply.
- Pull up to release.

 If the emergency stop button is pressed, it will cause the engine to stop running. A warning buzzer and a warning light will be activated.

 The automatic park brake is applied when the ignition is turned off, or if the emergency stop button is pressed.



1 Control functions - in depth



FNR lever - left hand

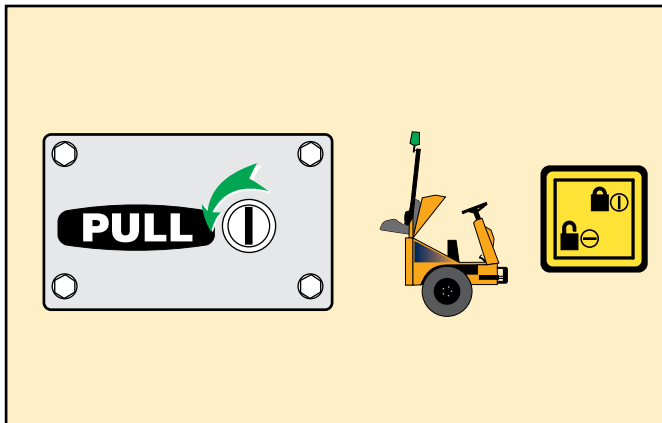
- Push forwards to travel forwards
- Lever centred = neutral
- Pull back to travel backwards

The automatic brake is applied when the FNR lever is in a centred (neutral) position for longer than 2.5 seconds.



WARNING

Stop machine before changing direction from reverse/forward and forward/reverse.



Engine Cover Open/Close

- Insert ignition key and turn anti-clockwise to unlock.
- Pull handle to release and raise cover.
- Lower cover, secure and turn key clockwise to lock.

Complete checks in section



before starting the engine

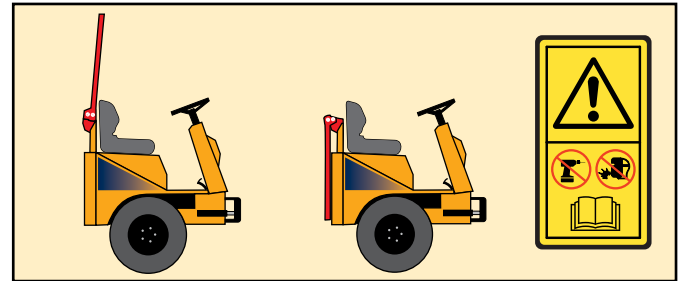
1 Control functions - in depth

Thwaites

Lowering and raising the folding ROPS frame

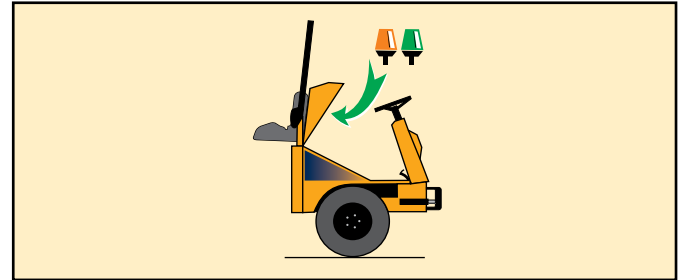
- Remove beacon before lowering frame.
- Remove clips and withdraw frame lock pins.
- Lower frame and insert lock pins and clips in new position.
- Reverse the procedure to raise the frame.
- Ensure all pins are secure before driving.

 Never modify ROPS structure



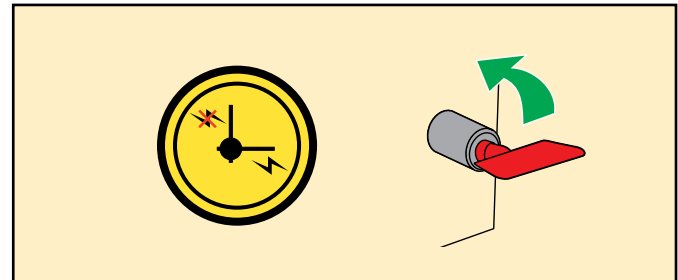
Beacon stowage

- Unplug and remove beacons.
- Secure beacons on brackets provided beneath bonnet.



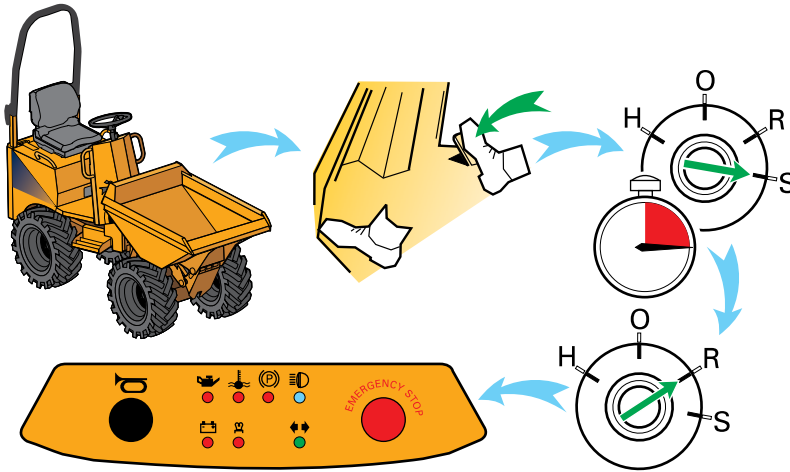
Battery isolator (*beneath engine cover*)

- Turn key anti-clockwise to isolate the battery power supply.
- Turn key clockwise to activate power supply.



2 How to START and STOP the engine

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To start the engine:

- FNR lever to neutral.
- turn the key clockwise to the start position 'S'.

All panel lights self-test (illuminate) and should extinguish on start-up.

Cold Start Aid (below 0° C) -

Turn key to position 'H'. When panel light  extinguishes start engine (as above).

- Allow the engine to turn for 15 seconds max.
If the engine does not start within 15 seconds return key to position 'O' and wait 30 seconds before turning to 'S' again.
- When the engine fires, release key. (Springs back to 'Run' position 'R').

To stop the engine:

- Turn key to position 'O'.

CAUTION

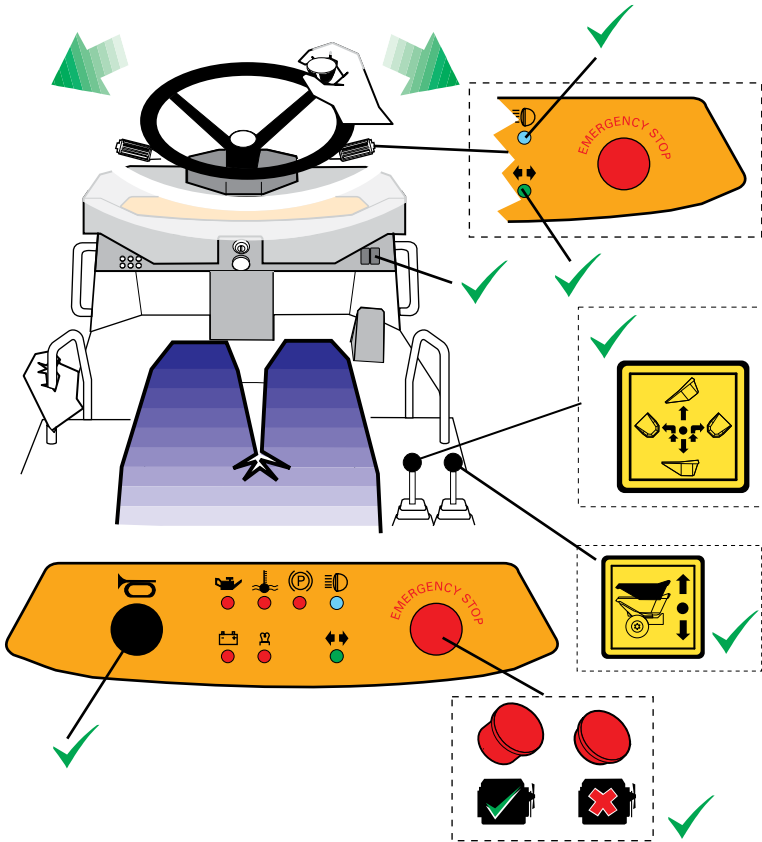
- Do not use unauthorised starting aids.
- If a panel warning light remains on, switch off engine (key to 'O') and investigate the problem.
- This machine cannot be TOWED or BUMP started (see section 3 for recovery instructions).
- Do not engage the transmission until the self-test procedure is complete.

WARNING

DO NOT START THE ENGINE UNLESS SEATED IN THE DRIVING POSITION.

Complete checks in section  before loading the machine

2 Preliminary Checks



Function checks - engine ON

Steering:

- Rotate steering wheel clockwise and anti-clockwise.

Electrics:

- Does the horn sound correctly?
- Is the beacon flashing?
- Are the lights working correctly? (optional)
 - side
 - main
 - stop
 - indicators
 - hazards

Tip-skip lever:

- Tip and return the skip.
- Rotate the skip clockwise/anti-clockwise (powerswivel model only)

Raise-skip lever (Hi-tip model only):

- Raise and lower the skip.

Emergency stop button:

- Does the engine stop upon pressing?
- Does the warning buzzer sound upon pressing?

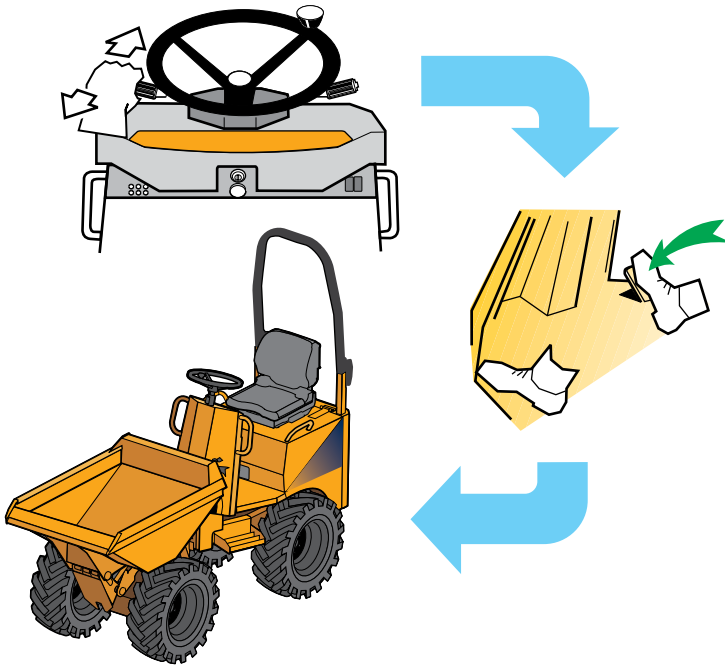
Reset the ignition switch after performing emergency stop checks.



Do not press throttle pedal during these checks.

2 Driving procedure and safe parking

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Moving from rest and stopping

- Seat belt must be buckled.
- Select forward or reverse.
- Hold steering wheel with both hands.
- Slowly depress throttle pedal to move away.
- Remove foot from throttle pedal to slow and stop.
- Select neutral after stopping.

Park safely after operating

- always leave skip empty in lowered position;
- ensure machine is on firm level ground;
- select neutral (FNR lever);
- stop engine and remove key;
- stow beacon for security (turn battery isolator off);
- lock engine cover.



WARNING - CHANGING DIRECTION

STOP machine before changing direction - forward/reverse or reverse/forward.



CAUTION

Novice operators should always begin with forward motion on clear, level ground.

Complete checks in section



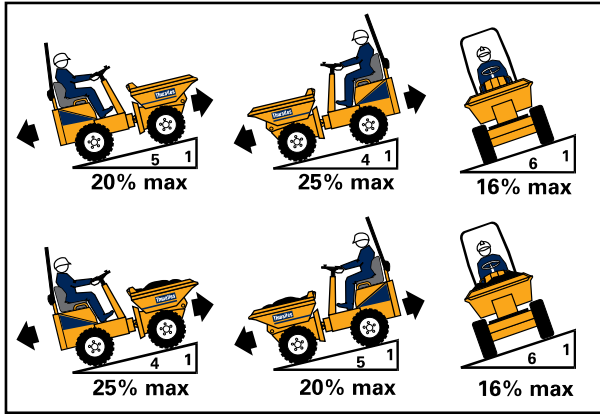
before loading the machine

3

DANGER

IMMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH

Thwaites



Working On Gradients

DO NOT exceed maximum stated gradients



DO NOT turn across gradients



DO NOT run down hill with controls in neutral



DO NOT work on rough or rutted ground, or drive across kerbs etc.



DO NOT raise or tip the skip on sloping ground



DO NOT discharge load when working on sloping ground.



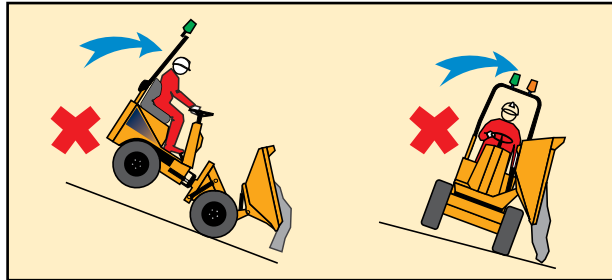
Travel straight up, down or along a gradient, keeping speed to a minimum.

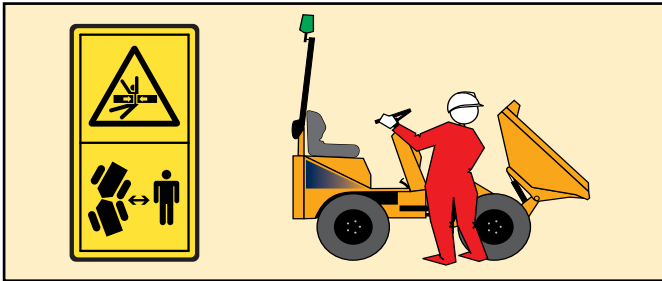


To prevent movement when leaving the machine unattended on sloping ground, always turn off the ignition (this will engage the automatic brakes). Chock wheels securely.



Always park the skip in a forward-facing position. (Powerswivel model only)

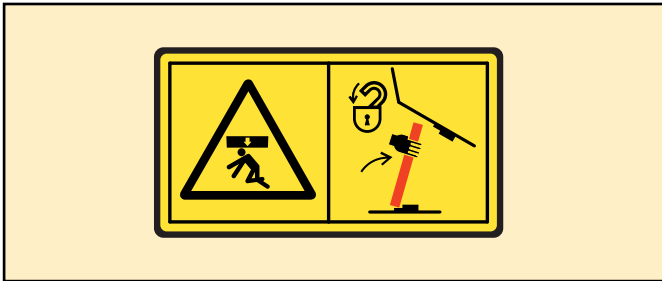


3**DANGER****IMMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH****Thwaites****Crush zone**

Stay clear of articulation area when the engine is running



Never operate the machine's controls when standing on either side of machine

**Working under a raised skip**

Lock skip and lift arm with safety props during maintenance.



Never work under an unpropped skip or lift arm.

Visibility


The visibility maps show machines in standard build and travel configuration.

The maps provide an approximate indication of what can be seen by the operator and any blind spots when seated in the driving position wearing a seatbelt.

The maps have been provided to assist the operator / user and may be used as part of a risk assessment for the safe operation of the machine.

The machines are compliant with the visibility requirement given in EN 474-1 with regards to the rectangular boundary and a test object of 1.2m high and 0.3m wide and the 12m circular boundary.

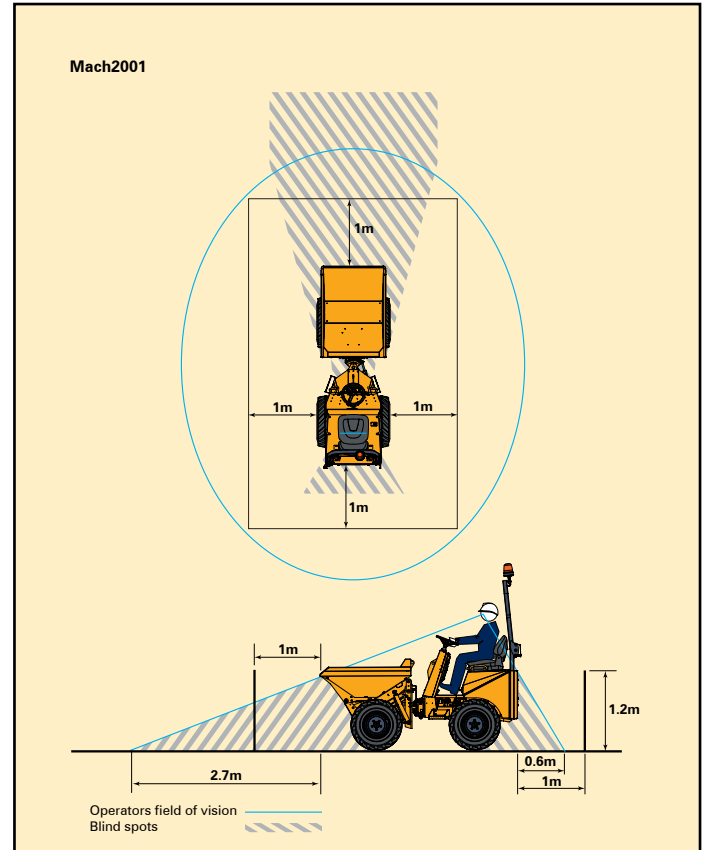
- Check all around the machine before operation.
- Be sure all mirrors are adjusted before operating the machine (if fitted).
- All cameras and mirrors must be kept clean (if fitted).
- Be aware of all blind spots.

 The blind spot areas marked on the plan views of these maps are ground plane only



WARNING

Camera angles are factory set, any modifications to the machine configuration by any end user that may result in the restriction of visibility and will require a new risk assessment to be performed.

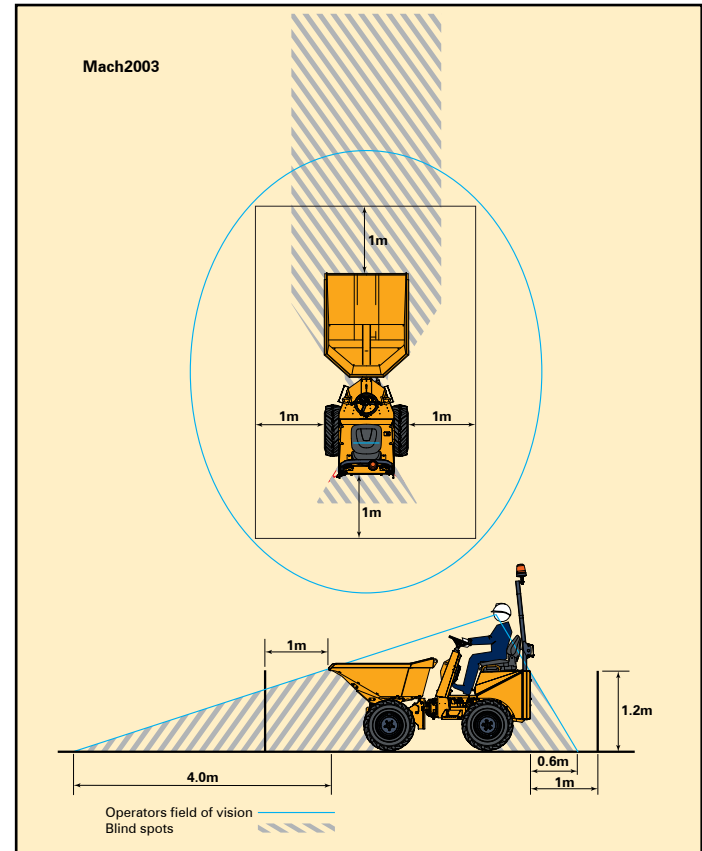
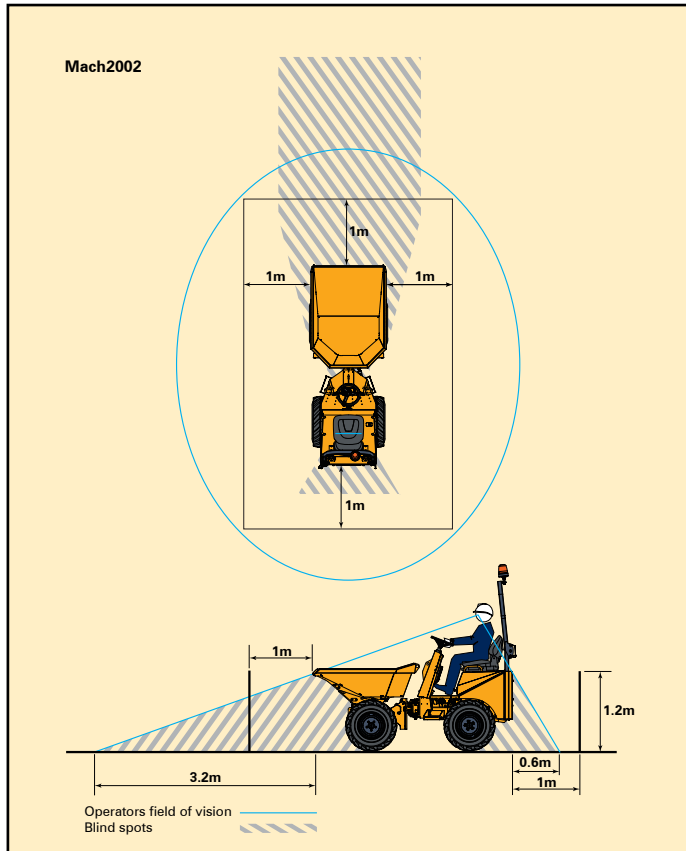


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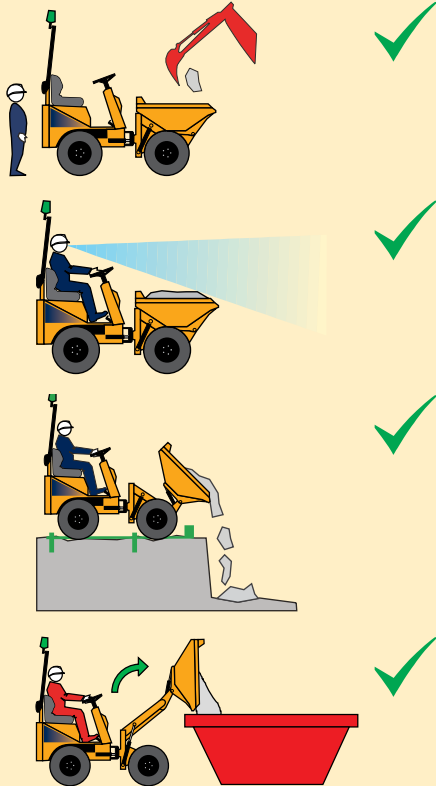
DANGER

IMMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH

Thwaites



Attention! Section  correct and incorrect working practices

3**WARNING****HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH****Thwaites****Loading the machine****DO NOT** exceed the machine's rated capacity**DO NOT** load the skip with the lift arms in a raised positionSet transmission to **NEUTRAL**, turn engine **OFF**, disembark the machine and **STAND CLEAR**.

Clear debris from controls, floorplate, centre joint, steering ram, throttle pedal

Ensure **SAFE STABLE LOW** load, allowing for good visibility

Reduce payload if materials being carried are not free flowing

**Unloading**Use **STOPBOARDS** and **SUPPORT** walls on trenches**DO NOT** tip the skip if its load is sticking

Stop on level ground when unloading into a skip or raising skip arm.

Select neutral using **FNR** lever when raising or tipping skip – this will prevent the machine from moving

3

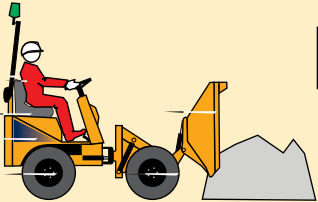



WARNING


HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH


Thwaites

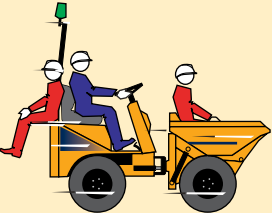
Driving





 DO NOT drive with the skip in a raised or tipped position





 NEVER dismount from a moving machine





 DO NOT carry passengers




 Avoid confined work areas - exhaust fumes and noise can be a hazard




 Site hazards to avoid: adverse weather conditions; icy surfaces; people



 DO NOT operate with a damaged ROPS frame or when folded in the down position

Note: damaged ROPS frame must be replaced NOT repaired!

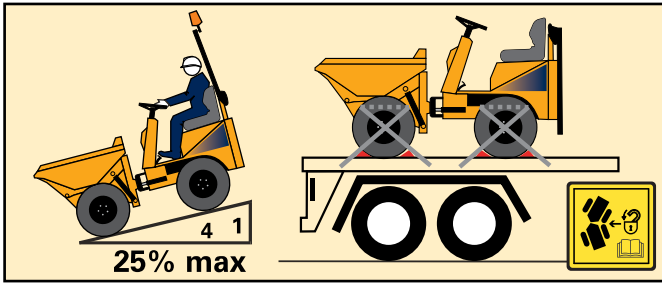
Attention! section  correct and incorrect working practices

3

WARNING

HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH

Thwaites



Transportation

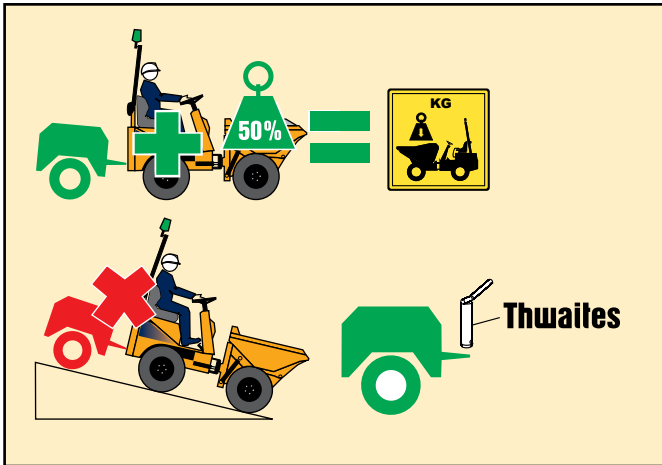
Reverse the machine slowly onto a suitable trailer.



DO NOT drive the machine forwards when loading on a ramp



- 1 Stop engine (automatic park brake applied).
- 2 Chock wheels (*to prevent movement*)
- 3 Engage chassis locking pin
- 4 Secure to trailer
- 5 Ensure legal load (*height/weight*)



Towing a trailer

Place ballast load in skip. This load should be a minimum of 50% of the machine's rated payload.



The gross weight to be towed plus the ballast load **MUST NOT** exceed rated payload of machine



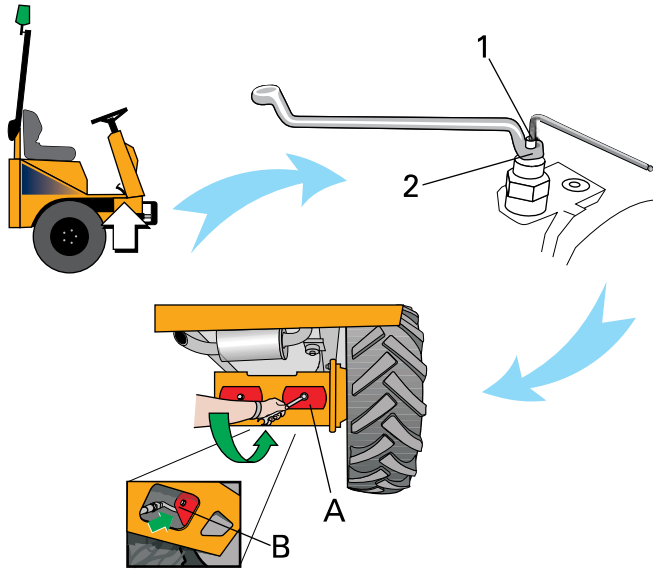
DO NOT exceed maximum tow bar pull or vertical load



Towing must not be carried out on sloping ground



Always use a Thwaites-approved towing pin

3**CAUTION**HAZARDS OR UNSAFE PRACTICES WHICH **COULD** RESULT IN MINOR PERSONAL INJURY OR PRODUCT OR PROPERTY DAMAGE**Thwaites****Towing the vehicle**

In order to tow the vehicle, the hydrostatic drive on the engine must be bypassed, and the spring-loaded brakes at the two rear wheel motors must be disconnected.

Bypassing the hydrostatic drive

This is achieved by unscrewing two valves on the pump. One valve is beneath the footplate; the other is opposite this, underneath the pump.

To activate the hydrostatic transmission bypass:

- release lock nut (2);
- screw in grub screw (1) until flush with top of nut (2);
- tighten nut (2).

To re-activate the hydrostatic transmission:

- screw back item 1 to stop;
- screw back the nut.


Disconnect the spring-loaded brakes

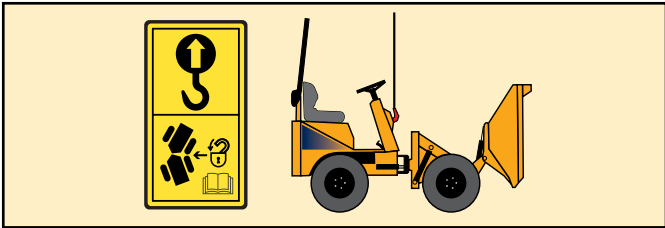
- Chock wheels to prevent movement when brakes are disconnected
- dismantle the two extractors (A) attached at the rear axle box (This is achieved by unscrewing the hexagon bolts)
- remove the plastic plug in the centre of the wheel motor face.
- place the extractor on the wheel motor (B) and screw in the hexagon bolt removed earlier.
- Tighten bolt to 42 Nm until wheel removes freely.
- Replace extractors to re-activate spring-loaded brakes and replace plastic plug.

**CAUTION**

When towing the vehicle:

- Do not exceed the maximum towing speed of 2 km/h.
- Do not exceed the towing distance of 1 km.

Attention! Section  correct and incorrect working practices



Lifting using a crane

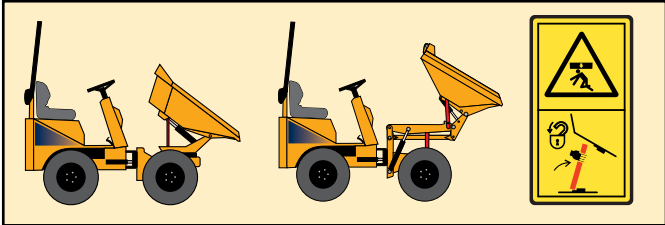
Tip skip fully forward



Engage chassis locking pin

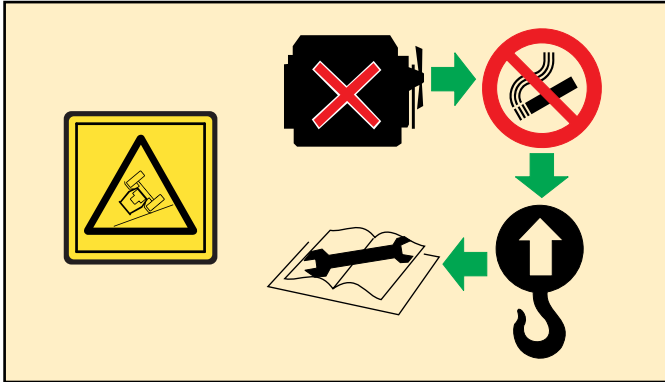


Lift using centre eye provided



Maintenance

Engage skip safety prop and lift arm prop when working beneath the skip.



Attending to a rolled-over machine





Failure to adhere to the safe working practices described in this manual could lead to the machine rolling onto its side.

In the event of the machine rolling onto its side, the following steps should be taken:

1. Turn off engine. Use either the emergency stop button or the ignition switch;
2. Protect against fire. Fuel or oil leaks may cause combustion;
3. Return machine to an upright position using suitable lifting equipment;
4. Refer to service manual for instructions on how to safely restart engine.

Failure to follow this procedure could result in serious damage to the engine. This will invalidate your warranty.

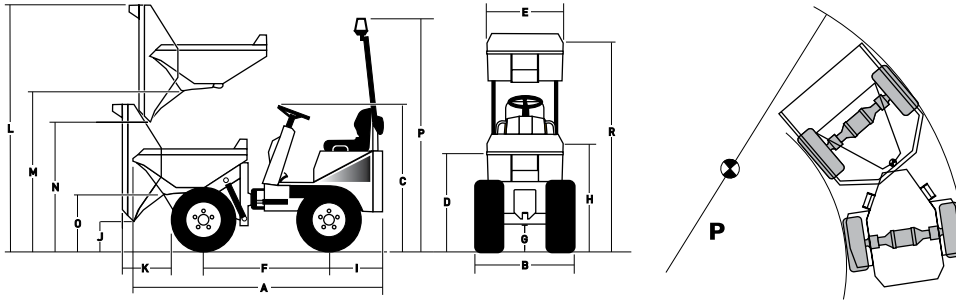
4 Troubleshooting

Problem	Reason	Solution
Engine will not start	Isolator switch OFF FNR lever not in neutral Emergency stop button pressed down Circuit breaker tripped Battery voltage too low Faulty fuel supply Electrical stop on fuel pump defective.	Switch on Shift to neutral Release button upwards Reset (Push to reset) Check battery and connections Check fuel level and connections Check connections
Engine starts and stops	Blocked fuel or air filter Air in fuel system	Replace fuel or air filter Check fuel line connections
Black engine smoke	Air filter clogged (Indicator red). Fuel system defect Wrong fuel	Replace or clean air filter Contact Thwaites dealer Replace fuel and filter
 ● Engine oil pressure  ● High engine temperature  ● Irregular alternator  ● Automatic park brake remains applied	Low oil level Radiator choked Low coolant level Defective or loose alternator belt Forward/reverse selected within 2 seconds of engine start	Top up engine oil Clean radiator Top up coolant Adjust, or, if necessary, replace the alternator belt Select neutral and wait 2 seconds before re-selecting forward/reverse
Warning buzzer sounds	Starting Machine with FNR lever in forward/reverse Emergency stop button pressed down LED warning light on	Shift to neutral Release button upwards Turn off ignition and investigate fault

Always investigate panel warning lights and tripped circuit breakers and blown maxi fuse

4 Data Chart - Hi-tip model

Thwaites

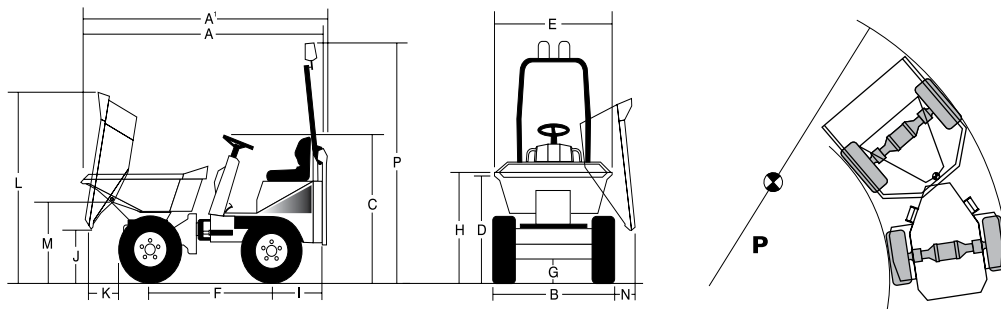


Dimensions (mm)	1T	Weight (Kg)	1T	Noise
A. Length (max).....	3032	Unladen		Airbourne (10m)
B. Width.....	1115 (982*)	Front axle	440	
C. Height (ROPS folded)	1822	Rear axle	780	
D. Skip lip height.....	1155	Total.....	1220	Operator
E. Skip width	982	Laden (including driver at 75 kg)		
F. Wheelbase	1500	Rated payload.....	1000	
G. Ground clearance	274	Front axle	1490	
H. Skip load height.....	1262	Rear axle	805	
I. Axle to rear	654	Total	2295	
J. Tipping ground clearance	346	Towbar (Max)		
K. Tipping tyre clearance	505	Pull Load	500	
L. Max height tipped (raised skip)	3005	Vertical Load.....	50	
M. Skip over height (raised skip)	1913	Tyre Pressure		
N. Tipping ground clearance (raised skip)	1573	Bar (psi) Front	3.0 (44)	
O. Skip over height	720	Rear.....	3.0 (44)	
R. Skip lip height (raised skip).....	2370			
P. Height (ROPS & Beacon - max).....	2860			
Q. Tyre clearance diameter	5.45m			

*with optional narrow tyres

Note: pressures shown are for both std 10/75 x 15.3 & optional 7.00 x 12 tyres

4 Data Chart – Powerswivel model



Dimensions (mm)	1T	1.5T	Weight (Kg)	1T	1.5T	Noise
A. Length (ROPS raised)	3062	3097	Unladen			Airbourne (10m)
A ¹ . Length (ROPS folded).....	3222	3257	Front axle	465	450	
B. Width.....	1195	1300	Rear axle	760	830	Operator
C. Height (ROPS folded)	1773	1773	Total	1225	1280	
D. Skip lip height.....	1204	1286	Laden (including driver at 75 kg)			
E. Skip width.....	1151	1300	Rated payload.....	1000	1500	
F. Wheelbase	1500	1600	Front axle.....	1475	1895	
G. Ground clearance	274	274	Rear axle	825	960	
H. Skip load height.....	1256	1328	Total	2300	2855	
I. Axle to rear	654	654	Towbar (Max)			
J. Tipping ground clearance.....	642	651	Pull Load	500	750	
K. Tipping tyre clearance.....	461	422	Vertical Load	50	50	
L. Max height tipped	2244	2270				
M. Skip over height	901	901	Tyre Pressure			
N. Tipping side clearance	154	177	Bar (psi) Front	3.0 (44)	3.0 (44)	
P. Height (ROPS & Beacon - max).....	2860	2860	Rear	3.0 (44)	3.0 (44)	
Q. Tyre clearance diameter	5.55 m	6.00 m				

Note: pressures shown are for both std 10/75 x 15.3 & optional 7.00 x 12 tyres

5 Maintenance Tasks

Thwaites

Safe Working Practice:

Before lubrication and maintenance tasks:

- Machine must be on firm level ground.
- Place FNR/gear lever in neutral to apply parking brake.
- Stop engine and remove ignition key.
- Isolate the battery (See section 1 - Battery isolator).
- Allow engine to cool.
- Fit chassis locking pin.
- Chock the wheels.
- Prop bucket when working beneath.
- Lock skip safety prop(s).



Refer to service manual for further reference.



WARNING - FUEL HANDLING

- Diesel fuel is FLAMMABLE.
- Never refuel or service the fuel system while smoking or near naked flames.
- Never refuel the machine while the engine is running.

Recommended maintenance tasks:

- Turn ignition switch 'ON' without starting engine, and wait 2 seconds for all warning lamps to turn off.
- Note any lamp that remains lit and correct system fault identified before operating the machine.
- Turn ignition switch 'OFF'.

Daily (10 hour) maintenance check list:

- Diesel fuel level
- Engine oil level
- Engine coolant level
- Hydraulic filter indicator
- Air filter indicator
- Steering wheel and column condition

Weekly (50 hour) maintenance check list:

- Hydraulic tank oil level
- Tyre pressures & wheel nut torque
- Drivebelt tension
- Sufficient lubricant in all grease points

5 Daily (10 Hour) maintenance checks

Diesel fuel tank volumes

- Check fuel level on gauge (Fig 1, A) and fill fuel tank through filler cap (Fig 1, B) with required amount of diesel, noting MAX/MIN volumes and fuel quality:

Maximum 20.0 litres

CAUTION - COMPLIANT FUEL USAGE

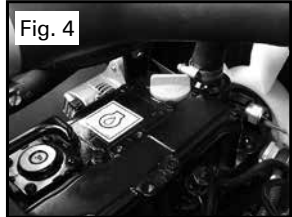
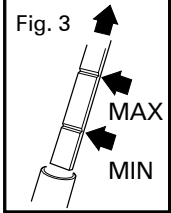
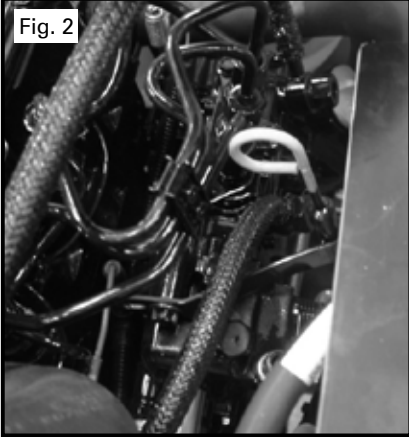
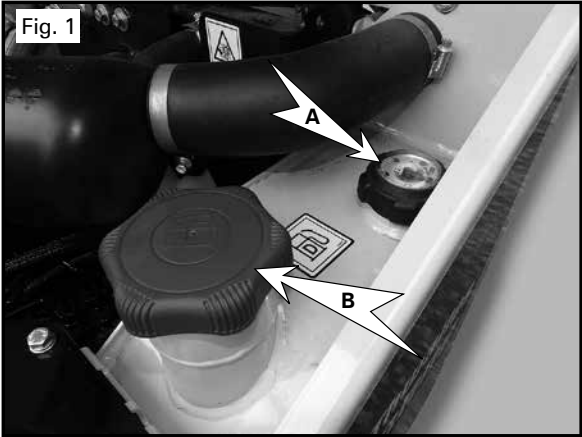
To avoid fuel system damage and to satisfy exhaust gas legislation, fuel used in this machine MUST comply with one of the following approved low sulphur diesel specifications. DIN 51628, EN 590 or BS 2869 (Sulphur <10 mg/kg)

Engine oil level

- Pull out lubricating oil dipstick and wipe clean (Fig 2)
- Insert lubricating oil dipstick as far as it will go.
- Pull out lubricating oil dipstick, ensure oil level is between the MIN and MAX markers (Fig 3).
- Top up to MAX marker if necessary, through oil filler cap (Fig 4), using recommended oil. Machine initially filled with BP Vanellus C5 Global 15W 40.

CAUTION - HOT FLUIDS

Check oil levels with machine on firm, level ground and with the machine cooled down.




5 Daily (10 Hour) maintenance checks


Thwaites

Engine coolant level

- Remove radiator cap (Fig. 1 (A)).
- Check that the water level is visible in the radiator
- Top up as required.
- Maintain coolant at indicated level on expansion bottle (Fig. 2 (B)).

 The expansion bottle is behind the rear grill of the machine.

- Ensure radiator fins are clean and clear of all obstructions.

 Use the correct concentration of coolant. Machine initially filled with water plus 50% antifreeze to BS.6580.

Hydraulic oil filter indicator

- Check hydraulic filter indicator (Fig 3, (A)).
- If the RED button has 'popped out' the filter requires changing (Refer to service manual for procedure).

Note: Check hydraulic filter indicator with the oil HOT. Filter indicator may 'pop out' when the oil is cold and should be reset.

CAUTION - HOT FLUIDS

DO NOT attempt to remove radiator cap until system has cooled down.

Fig. 1

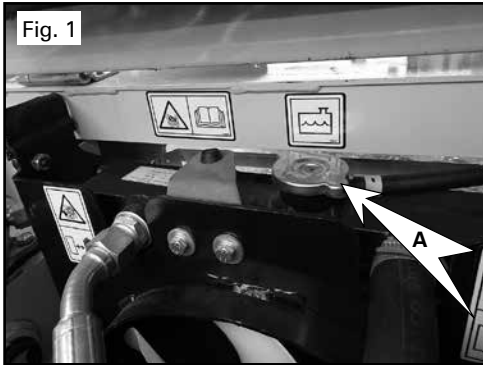


Fig. 2

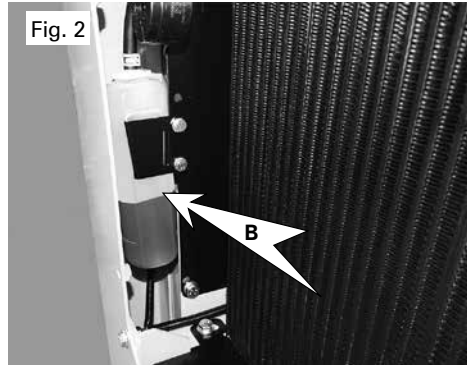
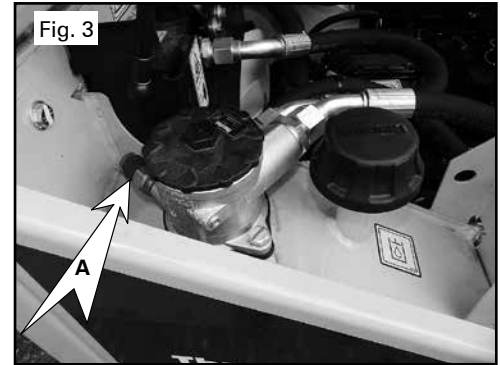


Fig. 3



5 Daily (10 Hour) maintenance checks

Air filter indicator


- When window shows **RED** (Fig. 1(A)), the air filter element requires cleaning or changing.

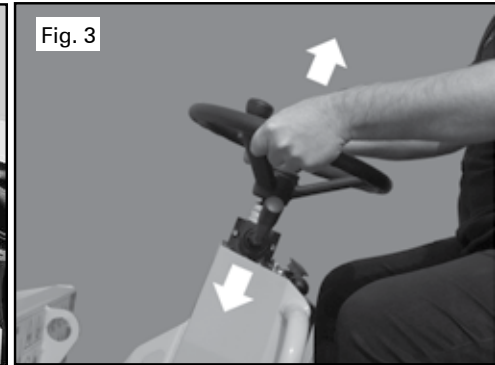
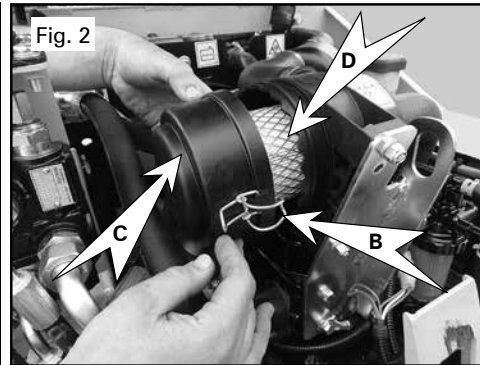
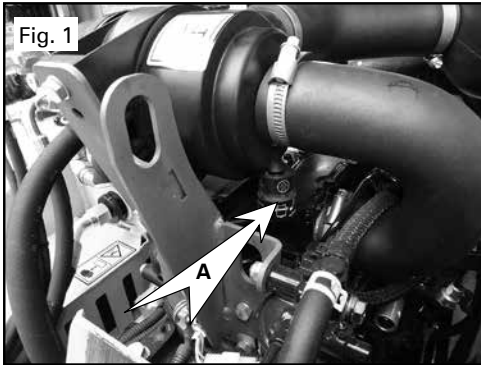
To remove the filter element:

- Release clips (Fig. 2 (B)) and remove end cap (C);
- Remove primary element (D) and secondary element;
- Clean inside body and reset indicator (Fig. 1 (A));
- Refit or replace elements ensuring correct seating;
- Refit the end cup (Fig. 2 (C)) and secure clips (B).

Steering wheel / column

- Check the steering wheel for signs of damage (misshapen or broken).
- Hold the steering wheel push and pull to check for excessive movement in the steering column (Fig 3).

 If either is found do not operate the machine until the fault has been corrected.



5 Weekly (50 Hour) maintenance checks

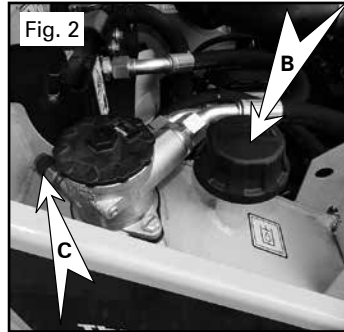
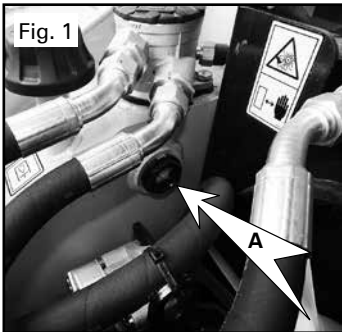
Thwaites

Hydraulic oil level

- With oil cold, ensure rams are in correct position by lowered bucket, turning steering to full left lock and if power swivel, turn bucket into the straight ahead position.
- Level is correct when visible in sight gauge (Fig 1, (A)).
- If no oil can be seen top up as required using approved hydraulic oil to (HV 46) through filler cap (Fig 2, (B)).
- Do not overfill above sight gauge (Fig 1, (A)).
- If the RED button has 'popped out' (Fig. 2, (C)) the filter requires changing.

CAUTION

It is imperative that hydraulic oil is clean to avoid damage to hydraulic components.



Check wheels and tyres

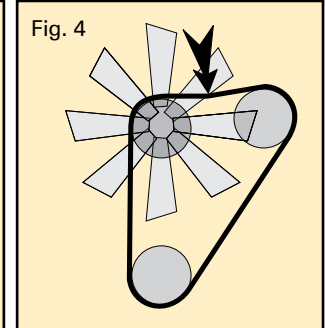
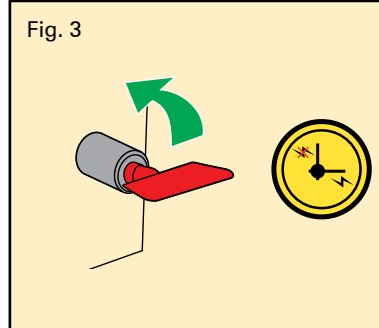
Check tyre pressures (Refer to data chart in section 4) and ensure wheel nuts are in position and tight (170Nm)

Check Fan/Drivebelt Tension

- Isolate the battery (Fig. 3).
- Belt should have 10-15 mm of movement for correct tension (Fig. 4). (Refer to service manual for adjustment procedure)

WARNING

Isolate the battery before servicing, or making adjustments to the electrical system.

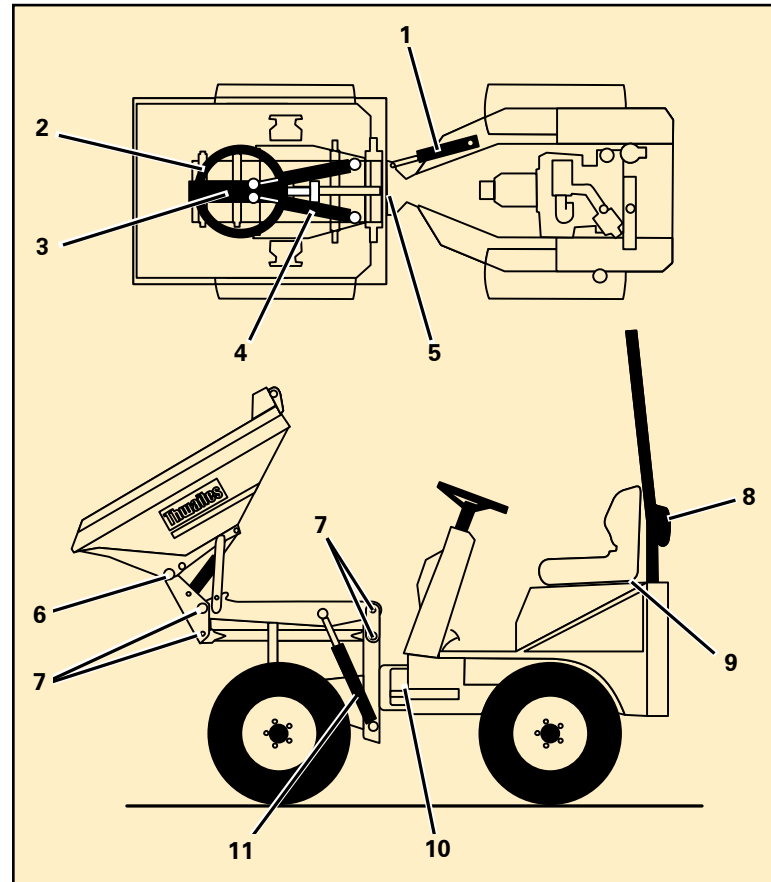


5 Weekly (50 Hour) maintenance checks

Lubricate all grease points:

Apply grease to the following points provided around the machine to improve operation of moving parts:

1. Steering cylinder
2. Slew Ring (Powerswivel Only)
3. Tipping cylinder
4. Slew cylinders (Powerswivel Only)
5. Central skip lock (Powerswivel Only)
6. Skip pivot pins
7. Skip lift pivot pins (Hi-tip Only)
8. Folding ROPS frame pins
9. Engine cover hinges
10. Centre Pivot
11. Lift cylinder (Hi-tip Only)



The logo for Thwaites, featuring the word "Thwaites" in white, bold, sans-serif font on a dark blue rectangular background.

Normal service intervals:

10hrs, 50hrs, (first 100hrs), 250hrs, 500hrs, 1000hrs, 2000hrs

Please refer to the Thwaites service manual for further maintenance information.

We reserve the right to change all specifications without prior notice.

www.thwaitesdumpers.co.uk