Publication 679
August 2011
Part No. 22674.79
Revision: 18.01.18

McCONNEL ROBOCUT

REMOTE CONTROLLED MOWER

Operator Manual

Machines from 07-13 / Serial No. 011400323 ►

IMPORTANT

VERIFICATION OF WARRANTY REGISTRATION

Dealer Warranty Information & Registration Verification

It is imperative that the selling dealer registers this machine with McConnel Limited before delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines; log onto https://my.mcconnel.com and select 'Machine Registration' which can be found in the 'Warranty' section of the site. **Confirm to the customer that the machine has been registered by completing the verification form below.**

Registration Verification

Serial No.

Dealer Name: ……..……..

Dealer Address: ……..……..

Customer Name: ……..……

Date of Warranty Registration: ……/……/..…. Dealer Signature: ……..……

Note to Customer / Owner

Please ensure the section above has been completed and signed by the dealer to verify your machine has been registered with McConnel Limited.

IMPORTANT: During the initial 'bedding in' period of a new machine it is the customer's responsibility to regularly inspect all nuts, bolts and hose connections for tightness and re-tighten if required. New hydraulic connections occasionally weep small amounts of oil as the seals and joints settle in – where this occurs it can be cured by re-tightening the connection – *refer to torque settings chart below.* The tasks stated above should be performed on an hourly basis during the first day of work and at least daily thereafter as part of the machine's general maintenance procedure.

CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES

Torque Settings for Hydraulic Fittings

Hydraulic Hose Ends		
BSP	**Setting**	**Metric**
1/4"	18 Nm	19 mm
3/8"	31 Nm	22 mm
1/2"	49 Nm	27 mm
5/8"	60 Nm	30 mm
3/4"	80 Nm	32 mm
1"	125 Nm	41 mm
1.1/4"	190 Nm	50 mm
1.1/2"	250 Nm	55 mm
2"	420 Nm	70 mm

Port Adaptors with Bonded Seals		
BSP	**Setting**	**Metric**
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with McConnel Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

1. LIMITED WARRANTIES

1.01. All mounted machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.
All Self Propelled Machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months or 1500 hours. Engine warranty will be specific to the Manufacturer of that unit.

1.02. All spare parts supplied by McConnel Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.

1.03. The warranty offered by McConnel Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.

1.04. This warranty does not extend to any product from which McConnel Ltd's serial number plate has been removed or altered.

1.05. The warranty policy is valid for machines registered in line with the terms and conditions detailed and on the basis that the machines do not extend a period of 24 months or greater since their original purchase date, that is the original invoice date from McConnel Limited.
Machines that are held in stock for more than 24 months cannot be registered for warranty.

1.06. This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.

1.07. Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.

1.08. Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.

1.09. Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which McConnel Ltd cannot be held liable, and may have safety implications.

1.10. If in exceptional circumstances a non McConnel Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnel Ltd's standard dealer cost for the genuine part.

1.11. Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnel Ltd.

1.12. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:

1.12.1. Hoses, exposed pipes and hydraulic tank breathers.

1.12.2. Filters.

1.12.3. Rubber mountings.

1.12.4. External electric wiring.

1.12.5. Bearings and seals

1.12.6. External Cables, Linkages

1.12.7. Loose/Corroded Connections, Light Units, LED's

1.12.8. Comfort items such as Operator Seat, Ventilation, Audio Equipment

1.13. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.

1.14. Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.

NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. McConnel Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

2. REMEDIES AND PROCEDURES

2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the McConnel web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.

2.02. Any fault must be reported to an authorised McConnel Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which McConnel Ltd cannot be held liable.

2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by McConnel Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.

2.04. All claims must be submitted, by an authorised McConnel Ltd Service Dealer, within 30 days of the date of repair.

2.05. Following examination of the claim and parts, McConnel Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnel Ltd and appropriate labour and mileage allowances if applicable.

2.06. The submission of a claim is not a guarantee of payment.

2.07. Any decision reached by McConnel Ltd. is final.

3. LIMITATION OF LIABILITY

3.01. McConnel Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.

3.02. McConnel Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.

3.03. Except as provided herein, McConnel Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.

3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

4. MISCELLANEOUS

4.01. McConnel Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.

4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.

4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.

McConnel Limited

For Safety and Performance…

ALWAYS READ THE BOOK FIRST

McCONNEL LIMITED

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Ludlow
Shropshire
England

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Operating, servicing and maintaining this equipment can expose you to chemicals including gasoline, diesel fuel, lubricants, petroleum products, engine exhaust, carbon monoxide, and phthalates, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. This website, operated by California's Office of Environmental Health Hazard Assessment, provides information about these chemicals and how individuals may be exposed to them.

LIST OF CONTENTS

GENERAL INFORMATION

Always read this manual before attempting to operate the machine – whenever any doubt exists contact your dealer or the McConnel Service Department for advice and assistance.

Use only McConnel Genuine Service Parts on McConnel Equipment and Machines

DEFINITIONS – *The following definitions apply throughout this manual:*

WARNING
An operating procedure, technique etc., which –
can result in personal injury or loss of life if not observed carefully.

CAUTION
An operating procedure, technique etc., which –
can result in damage to either machine or equipment if not observed carefully.

NOTE
An operating procedure, technique etc., which is –
considered essential to emphasis.

LEFT AND RIGHT HAND
These terms are applicable to the machine when it is viewed from the rear facing forwards.

Note: The illustrations in this manual are for instructional purposes only and may on occasion not show some components in their entirety. In some instances an illustration may appear slightly different to that of your particular model but the general procedure will be the same. E&OA.

MACHINE & DEALER INFORMATION

Record the Serial Number of your machine on this page and always quote this number when ordering parts. Whenever information concerning the machine is requested remember also to state the make and model of tractor to which the machine is fitted.	
Machine Serial Number:	**Installation Date:**
Machine Model details:	
Dealer Name:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

FEATURES & SPECIFICATIONS

RoboCut

- 40HP *(29kW)* 3 Cylinder ISUZU Diesel Engine
- Tracked Carriage Hydraulically Driven via Piston Pumps
- Self-Tightening Tracks
- Remote Controlled Operation (up to 150m range)
- Rubber Tracks with Removable Riveted Stirrups
- Rubber Stopper Spike Protection for Transport
- Potentiometer Speed Control from 0 to 100%
- Independent Cooling System for Hydraulic Circuits
- Self-Cleaning Reversible Fan
- Electronically Controlled, Hydraulically Powered Flail Head
- Proportional Joystick Speed Control – Forwards & Backwards 0 to 7km/h
- 21 Litre Fuel Tank Capacity
- 1280mm Carriage Width
- 1.3m Flail Head capable of cutting materials up to 30mm diameter
- Machine Weight 1000kg

This machine has the potential to be extremely dangerous - in the wrong hands it can kill or maim; It is therefore imperative that both owner and operator of the machine reads and understands the following section to ensure they are fully aware of the dangers that do, or may exist, and their responsibilities surrounding the use and operation of the machine.
The operator of this machine is responsible not only for their own safety but equally for the safety of others who may come into the close proximity of the machine, as the owner you are responsible for both.
When the machine is not in use it should be parked on a firm level site with the cutting head resting on the ground and the starting key removed.
In the event of any fault being detected with the machine's operation it must be stopped immediately and not used again until the fault has been corrected by a qualified technician.

- *Before starting the machine the operator must read and understand all aspects of use and maintenance of the machine as stated in this manual.*
- *The machine must only be used by a responsible adult who is familiar with all aspects relating to safe operation.*
- *The machine must not be operated by children or non-authorised persons.*
- *Operators must know the meaning of all operation and safety decals on both the machine and the remote control unit.*
- *Operators must know the procedure for switching the machine off normally and the correct procedure for using the Emergency Stop.*
- *Do not attempt to use the machine if the Emergency Stop switch is damaged or malfunctioning.*
- *Never use the machine with safety guarding removed or defective.*

- *Operators should practice operation on flat open ground to familiarise themselves with driving and manoeuvring the machine before attempting to use it on sloping ground.*

- *Operators should practice manoeuvring the machine around obstacles without the flail head running before using the machine for work purposes.*

- *Never operate the machine when your vision is blocked by obstacles such as vehicles, buildings, hedges etc.; move to a position where you have an un-interrupted view of the machine.*

- *Never operate the machine standing directly in the line of travel.*

- *Do not use the machine on sand piles, gravel, or similar materials.*

- *Only operate the machine in good light conditions.*

- *Never run the machine in an enclosed area or building.*

- *Keep the machine clean to avoid build ups of dry materials that could ignite on hot components.*

- *Never stand directly below a machine that is operating or parked on a slope.*

- *Always operate the joystick control slowly; rapid or jerky movements can cause the machine to rear up causing loss of control.*

- *When operating the machine with the flail head running the operator must remain at least 5 metres away from the machine; always switch the flail head off before approaching it.*

- *When using the machine the operator should place themselves in a position that provides optimum visibility over the work area.*

- *Never leave a running machine unattended; always switch the engine off and remove the ignition key.*

- *Always stop and switch the machine off if persons or animals enter the work area, do not restart the machine until they are at a safe distance.*

- *Never use the machine to perform tasks it was not designed for.*

- *Never ride, or allow others to ride on the machine.*

- *Always inspect the work area prior to operation and remove stones, glass, metal, wire or any other foreign objects that are hazardous. Immovable hazards should be 'marked' so they can be avoided.*

- *Take extra care when operating the machine on slopes or uneven ground, there is increased risk of objects being thrown from the flail head when working in these conditions.*

- *The machine can be used on slopes up to a maximum of 55° (track option dependant) providing the surface is dry and firm.*

- *Should a machine overturn, a suitable crane or winch should be used to recover it, keep all persons at a safe distance before and during recovery.*

- *Do not operate the machine in foggy or frosty conditions as there is increased risk of accidents.*

- *Take extra care when working in close proximity to electrical cables; in some circumstances, operating the machine under overhead power lines can result in loss of radio signal causing the engine to deactivate.*

- *Do not operate the machine close to vehicles or properties where there is risk of damage by objects accidentally thrown from the flail head.*

- *It is the user's responsibility to protect persons in or near the work zone.*

- *When servicing or maintaining the machine no one should be allowed beneath it when it is raised unless it is securely supported on suitable ramps or stands.*

- *Never attempt to service or maintain the machine whilst it is running; always switch off the engine and remove the starting key.*

- *When transporting the machine on another vehicle or trailer the engine must be switched off and the machine chocked and secured using suitable ropes or chains.*

- *Check the condition of the flails and fixings on a regular basis; never use the machine with damaged/missing flails or loose fixings.*

- *Always clean the machine after use; care must be taken if the machine is hot. Never use solvent based chemicals for cleaning.*

- *When operating in excessively dusty conditions work may need to be interrupted on a regular basis to remove any build ups of dust on components that could cause overheating.*

- *Ensure engine is switched off and Emergency Stop switch is in the 'off' position before refuelling.*

- *Wherever possible refuel the machine before work when the engine is cold. If refuelling during work, switch off the engine and allow it to cool before adding fuel.*

- *Test the Emergency Stop switch before each period of work to ensure it functions correctly.*

- *Never leave the machine, ignition key and control unit unattended where it could be started and used by un-authorised persons.*

- *Any inspection, service or maintenance of the flail head must only be performed with machine switched off and the starting key removed.*

- *Always wear safety gloves and glasses when performing service or maintenance on the flail head.*

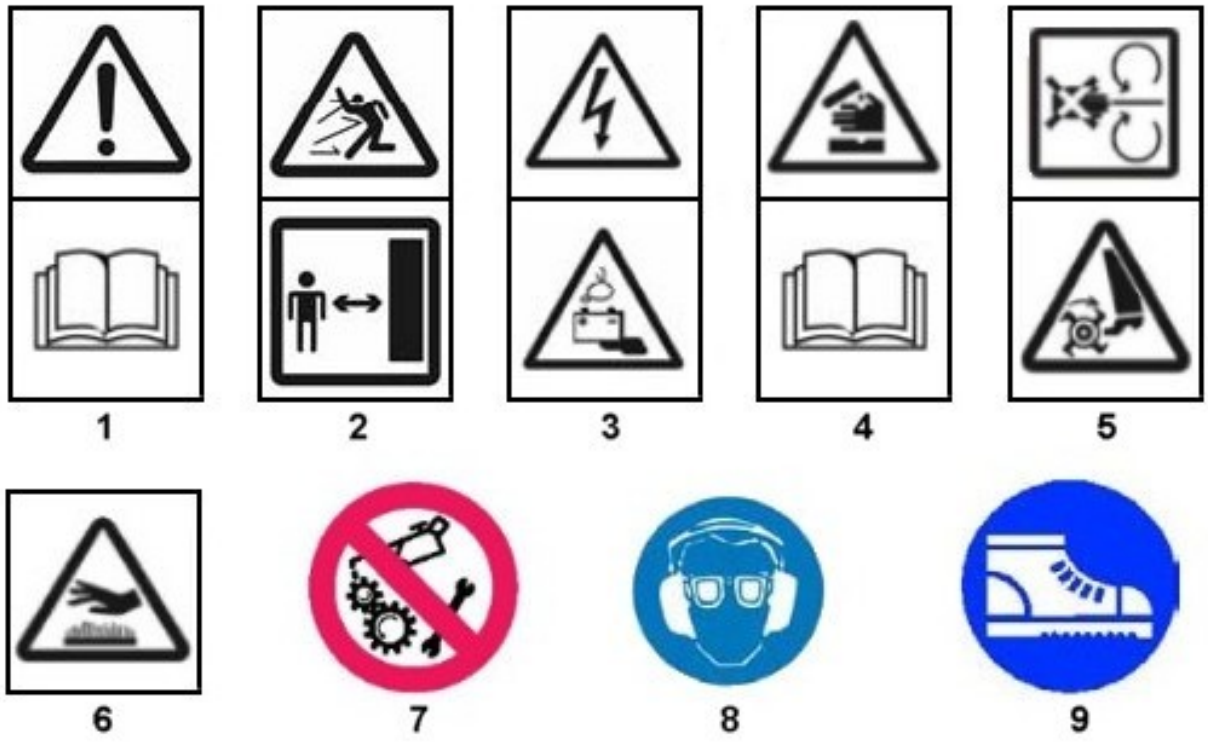
- *Flail head must always be switched off when manoeuvring outside of the work zone.*

AS SUPPLIED

The flail head is fitted with a hydraulic ram to allow movement of the hinged hood. The movement of this ram is restricted with an internal spacer. This is to stop operators inadvertently opening the hood when cutting alongside the highway. This reduces the risk to passing traffic from being hit by objects ejected at speed from the working flail head. It should be noted that with the hinged hood opened objects could be thrown a considerable distance. Being struck by a thrown object could result in injury or death.
If the machine is being used away from the highway, other vehicles and bystanders are not normally in the vicinity then the spacer can be removed provided the general safety information and specific following conditions are met;

- **A detailed work area and bystander risk assessment is undertaken before work begins.**
- **The operator has been trained in the safe use of the Robocut, including safe retrieval of the unit from any situation where it could become stuck or trapped.**
- **The hydraulic ram is returned to the approved version after usage away from the highway and before the re-sale to another party.**

SAFETY & WARNING DECALS



1. WARNING: Read the manual first.
2. DANGER: Risk of thrown objects, keep your distance.
3. DANGER: Electrical voltage and harmful substances.
4. DANGER: Acid, read the user and maintenance manual.
5. DANGER: Rotating components, keep clear.
6. DANGER: Hot components, risk of burns.
7. WARNING: Do not lubricate or service moving components, stop the machine first.
8. ADVISORY: Always wear ear defenders and safety glasses when using the machine.
9. ADVISORY: Always wear safety footwear when using the machine.

NOISE LEVEL

LpA = the value indicates the maximum sound level perceived by the operator at a distance of 1m from the machine.

LwA = the value indicates the sound level outside the machine and refers to the noise perceived by those who are in the vicinity of the work area.

Personal Safety Gear

Users should wear suitable personal safety gear at all times whilst operating this machine.

Automatic Emergency Safety Features
As the RoboCut is operated by remote control and the user is not directly operating the driving elements of the machine specific safety features have been built in to protect the user, third party persons and the machine itself; these are as follows

Danger / Risk Situation	Automatic Safety Feature
Machine beyond signal reception area or radio signal blocked.	EMERGENCY STOP will activate.
Radio signal failure.	EMERGENCY STOP will activate.
Another machine on same frequency operating in the area.	EMERGENCY STOP will activate.

Manual Emergency Safety Feature
In addition to the automatic safety features stated above the operator can immediately stop machine movements / operations either by pressing the Emergency Stop button located on the remote control unit or by pressing the Emergency Stop button located on the top panel of the machine itself.

In all instances stated above, emergency stopping of the machine will take a maximum of 0.2 seconds from execution of the automatic or manual command and the following actions will occur;

Machines to June 2015;

- **Machine movement / operations and functions will be halted.**
- **Electrical voltage will be deactivated.**
- **Entire electrical system will be disabled.**
- **Engine will be switched off**
- **Ignition will be turned off.**

Machines June 2015 onward;

- **Machine movement / operations and functions will be halted.**
- **Engine will remain running (Engine RPM is automatically reduced to idle speed).**

Note; after using Emergency Stop the machine will cease to function completely, to regain functions and continue operating the Connection/Horn button on the Remote Control Unit must be operated or the engine manually switched off and a normal restart performed.

In the unlikely event of movement malfunction
If machine movements perform in an unexpected or incorrect manner follow the instructions below;

1) Release the forwards/backwards movement joystick – *the control is equipped with automatic zero position; on release it will automatically return to the central (stop) position, this action activates the track brakes.*
2) Press the Emergency Stop button on the control unit.

DANGER! Do not approach the machine if it is moving.

3) Press the machine's Emergency Stop button.
4) Turn the ignition key into the off position *(anti-clockwise)* and remove the key.

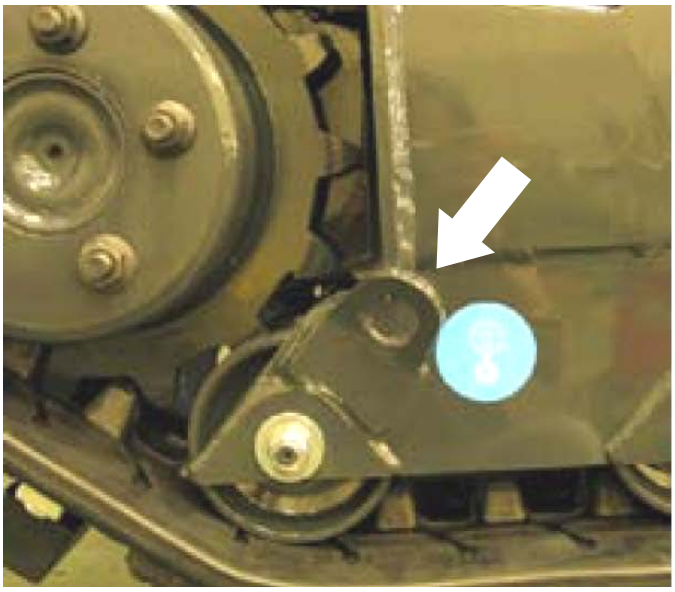
Contact your Authorised Dealer or McConnel Service – do not attempt to operate the machine until advice has been sought.

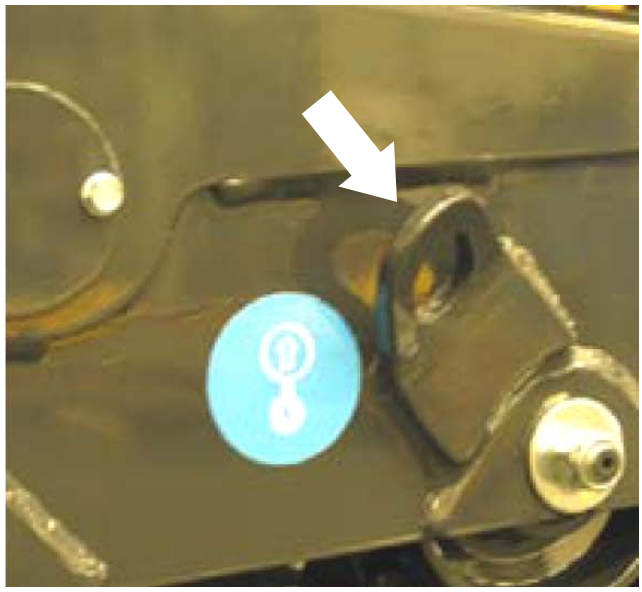
The machine will be delivered ready for use having been pre-filled with all necessary lubricants and fluids other than fuel.
Before use all packaging must be removed and the transport fasteners loosened.
The reception antenna will be supplied as a loose item and must be screwed onto the machines receiver prior to use.
The standard items supplied will be as follows:

Standard Equipment

- *Machine with Mounted Receiver*
- *Transmitter and Battery Pack*
- *Reserve Battery Pack*
- *Battery Charger 12V CA*
- *Antenna*
- *Belt for the Radio Control*
- *Ignition Key*
- *Use and Maintenance Manual for Machine*
- *Use and Maintenance Manual for Transmitter*
- *Use and Maintenance Manual for Engine*

Machine Lifting Points
The photos below shown the machine's lifting points; the lifting eyes are located at each end of the track plates on both sides of the machine. The positions of the lifting points enable the machine to be safely raised using suitable overhead lifting equipment.





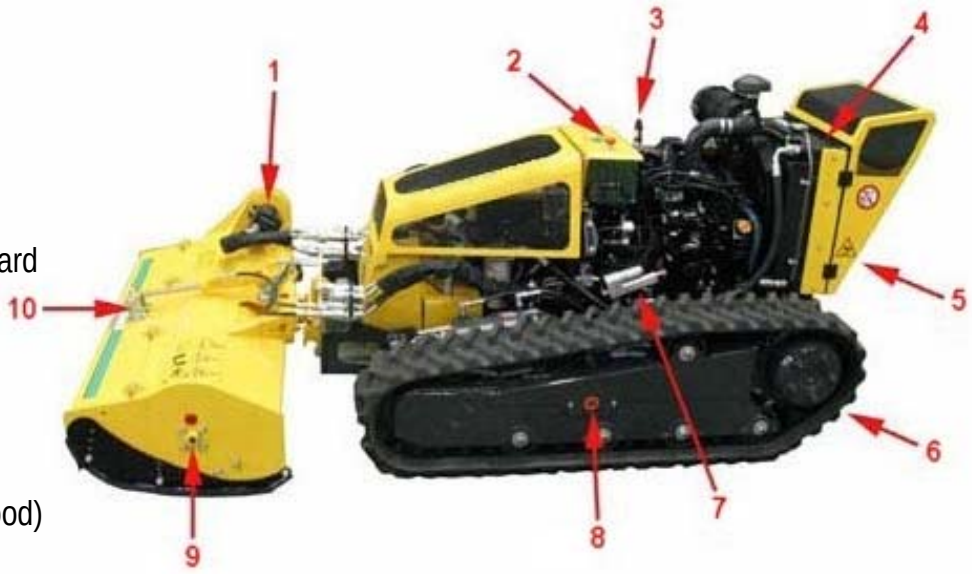
Note: All equipment used to raise the machine must have a SWL in excess of the total weight of the machine – keep all persons at a safe distance from the machine during the lifting procedure.

◄ Right Side View

1. Oil Tank
2. Diesel Fuel Tank
3. Track Tensioner Access
4. Track Roller
5. Drive Wheel
6. Alternator (12V)

Left Side View ►

1. Hydraulic Motor
2. Electrics
3. Warning Beacon Mount
4. Water / Oil Radiator
5. Conveyor & Radiator Guard
6. Rubber Tracks
7. Electric Actuator
8. Track Tensioner Access
9. Lubrication Point
10. Hydraulic Ram (Front Hood)



◄ Engine Top View

1. Air Filter Clogging Sensor
2. Radio Control Antenna
3. Warning Beacon Mount
4. Engine Oil Filler Plug
5. Air Filter
6. Air Filter Breather

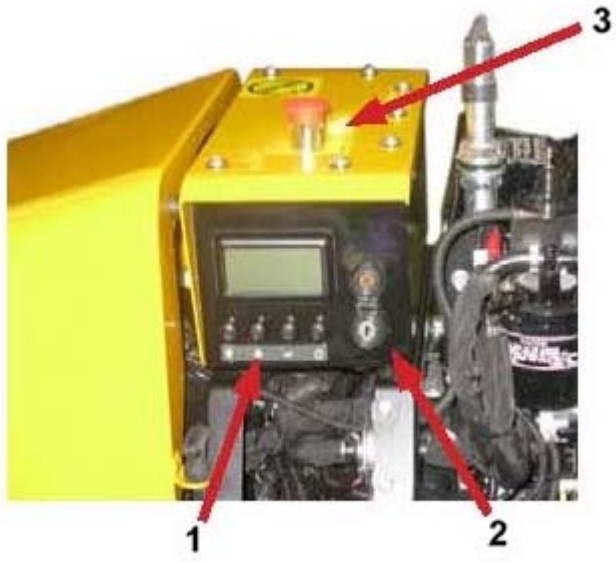
Engine Right Side View ►

1. Radiator Filler
2. Radio Control Antenna
3. Warning Beacon Mount
4. Emergency Stop Switch
5. Electric Plug for Services (12V)
6. Horn
7. Electric Compressor (Self-Cleaning Radiator Fan)
8. Ant-vibration Engine Support
9. Exhaust Pipe
10. Alternator (12V)
11. Air Filter

◄ Engine Left Side View

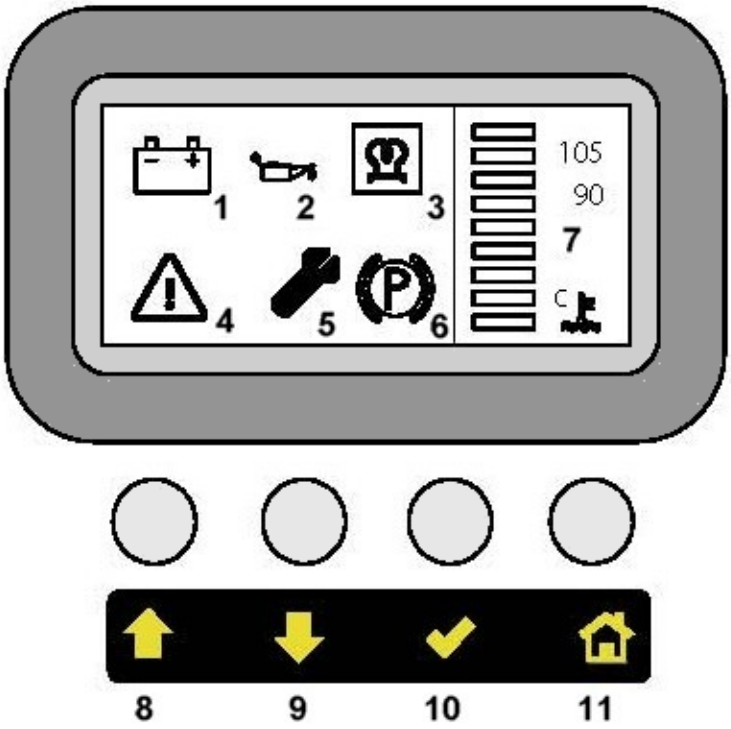
1. Emergency Stop Switch
2. Warning Beacon Mount
3. Air Filter
4. Radiator Fan Guard
5. Radiator Filler
6. Oil Cooler Input
7. Oil Cooler Output
8. Engine Oil Filler Plug
9. Secondary Fuel Filter
10. Electric Actuator
11. Electric Pump
12. Temperature Gauge (Engine Coolant)
13. Ignition Key

Ignition Panel Components



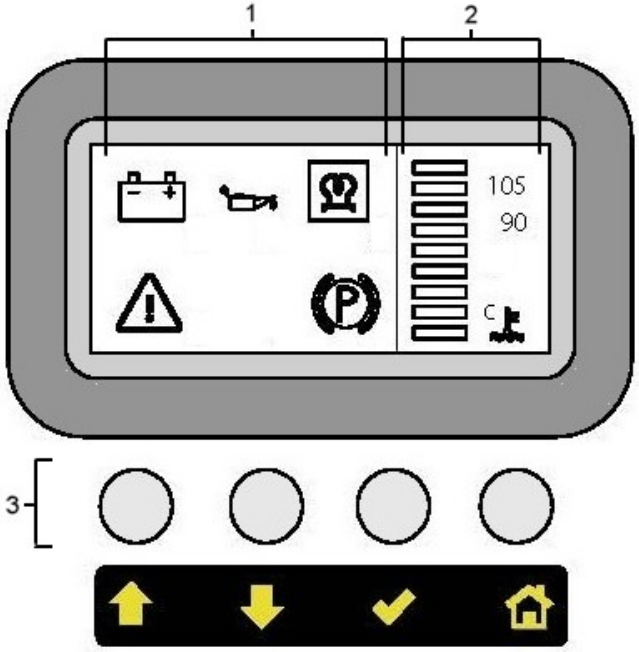
1. Display LCD
2. Ignition Switch
3. Emergency Stop Switch

Display LCD (CANBUS)



1. Alternator
2. Engine Oil Low Pressure
3. Pre-heater (optional feature)
4. Engine Stop
5. Service
6. Parking Brake
7. Water Temperature
8. Page Up
9. Page Down
10. Enter
11. Home Page (Screen)

Display LCD - Features & Functions



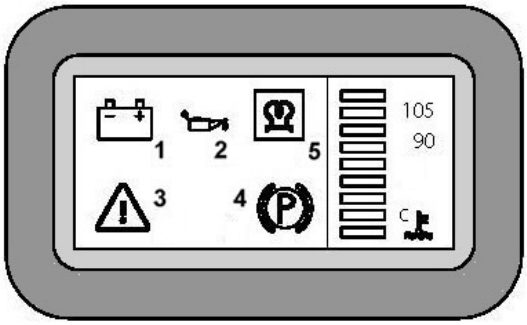
Area 1. - Warning & Error Codes

Area 2. - Coolant Gauge

Area 3. - Menu Access Buttons

Home Screen

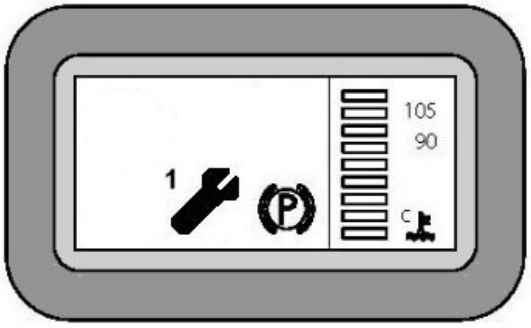
Insert ignition key and turn clockwise to the first position; the display will switch on showing the 'home screen'. The features displayed will be as shown below;

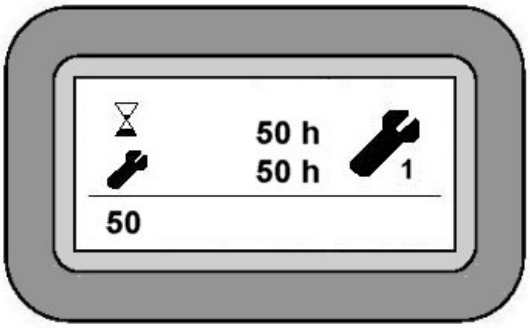


1. – Battery / Alternator Warning
2. – Engine Oil Pressure warning
3. – Parking Brake Warning
4. – Engine Stop
5. – Pre-Heat Plugs (*)

(*) *Only applicable to machines fitted with optional heater plugs.*

Service Menu



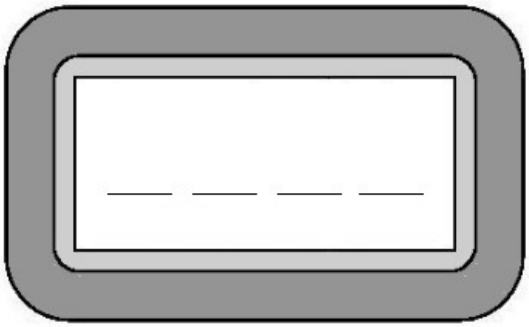


The service screen displays the number of hours the machine has been used and the number of hours remaining before the next service is due.

The service warning symbol will be displayed when the pre-set service interval has been reached, the machine must now be serviced, (*refer to maintenance section for details),* and the service counter reset.
When the correct service work has been performed contact McConnel Service on +44 (0)1584 875 848 to obtain a 4 digit code needed to reset the counter.

Note: the service warning symbol will continue to flash each time the engine is started until the service counter has been reset.

Service Code



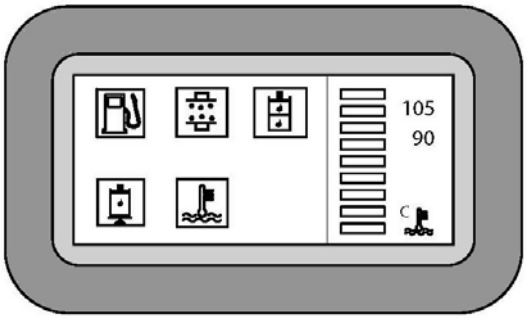
Once the required service has been performed, the procedure for resetting the counter is as follows;

1. Press and hold the enter button for 3 seconds.
2. Enter 4 digit Service Code using the buttons to select the numbers, and the home button to scroll from left to right.
3. Confirm the entry by pressing the enter button

The 4 digit service reset code is available from McConnel Service on: +44 (0)1584 875 848

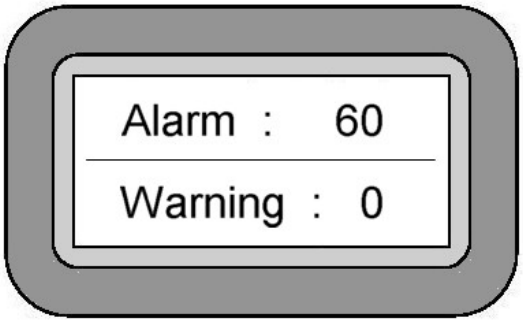
CAUTION! Entering a service code without performing the correct scheduled maintenance will void machine warranty.

Warning Symbols



DASHBOARD		HORN	SHUTDOWN	CAUSE	REMEDY
LED 1		YES	NO	Fuel level less than 1/4	Add fuel
LED 2		NO	NO	Parking brake on	Forward or reverse to release brake
LED 3		YES	NO	Hydraulic oil level less than 2/3	Top up and check for leaks
		YES	YES	Low hydraulic oil	Top up and check for leaks
LED 4		NO	NO	Alternator not charging battery	Check belt tension / test alternator
LED 5		NO	YES	Air filter clogged	Replace filter element
LED 6		NO	YES	Hydraulic oil filter clogged	Replace filter element
LED 7		NO	NO	Pre-heating on (optional)	Start engine when light goes out
LED 8		NO	YES	Low engine oil pressure	Check oil level / check wiring
LED 9		NO	YES	Engine stop	Reset E/start button / check LED status
LED 10		NO	YES	Coolant temp. >110° C	Clean radiator / check coolant level

Alarm



In the case of a failure or malfunction the screen will display ‘Alarm’ and a numeric error code to identify the component that has malfunctioned.

Refer to the chart below for identification of the source of the fault and report it to McConnel Service if the problem persists.

Error Code	Cause
Set 4 + *number*	Error / Failure - Display
Set 6 + *number*	Error / Failure - Remote Control Communication
Set 7 + *number*	Error / Failure - Joystick
Set 9 + *number*	Error / Failure - Level Sensor
Set 50 + *number*	Error / Failure - Output CPU

Radio Control Unit – Control Locations & Functions

A. Left Joystick
■ Drive (Forward)
□ Drive (Reverse)

▲
O Default ◄ ▷
▽

▲
O Drive Swap Mode ◁ ►
▽ *switch L activated*

B. Right Joystick
■ Steering (Left / Right)
□ Flail Head (Up / Down)

△
◄O►
▽

C. Power ON / Emergency Stop Button

D. Speed Control

E. Steering Bias

F. Flail Head Pump Control (Rotor Speed)

G. Auxiliary #1

H. Auxiliary #2

I. Front Hood

J. Rotor Direction Selector

K. Gear Selector

L. Direction Swap

M. Fan Reverse Control (Radiator Self-Clean)

N. Engine Stop

O. Engine Start

P. Engine Revs (+)

Q. Engine Revs (-)

R. Connection / Horn

S. S-Key (Codified Key)

Before attempting to start the engine ensure you have read and understood the manual and observe all safety instructions surrounding use of the engine and machine.

WARNING!
Engine must only be started in open air, never in an enclosed environment.

Before Starting

- Observe all Safety Instructions.
- Ensure machine is in the open air and not in an enclosed environment.
- Check fuel level and replenish if required.

Diesel Engine Starting

- Turn ignition key on the machine clockwise to the first position.
  NOTE: the machine will initially perform a sequence of system checks.
  On machines equipped with the optional heater plugs, the pre-heat plug light on the ignition panel will illuminate - wait for the light to go out before continuing.
- Start engine by a further turn of the ignition key or by using the remote control.

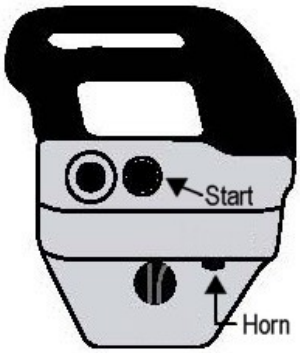
NOTE: When the engine is started using the key on the machine's control panel it is not possible to link to or operate with the Remote Control Unit. Starting the engine using this method is for running of the engine and/or using the Emergency Manual Control Unit.

Diesel Engine Starting for Remote Operation

In order to operate the machine remotely the control unit and the machine must first be 'linked' so that command signals can be transmitted and received; the procedure is as follows;

NOTE: Ignition key on the machine must be turned to the pre-starting position.

Turn on the control unit by rotating the Emergency Stop Button clockwise – *the button will 'spring out' to the ON position.*



- Press and hold the horn button – *the unit will search for the machine's transmitter and lock onto the signal, the horn will sound to confirm that the units have linked. Release the horn button as soon as the confirmation sound is received.*
- The machine can now be started by operation of the start button on the remote controls – *release button as soon as the engine starts.*
  NOTE: If the engine fails to start within 5 seconds release the button and wait for a minute or so before trying again.

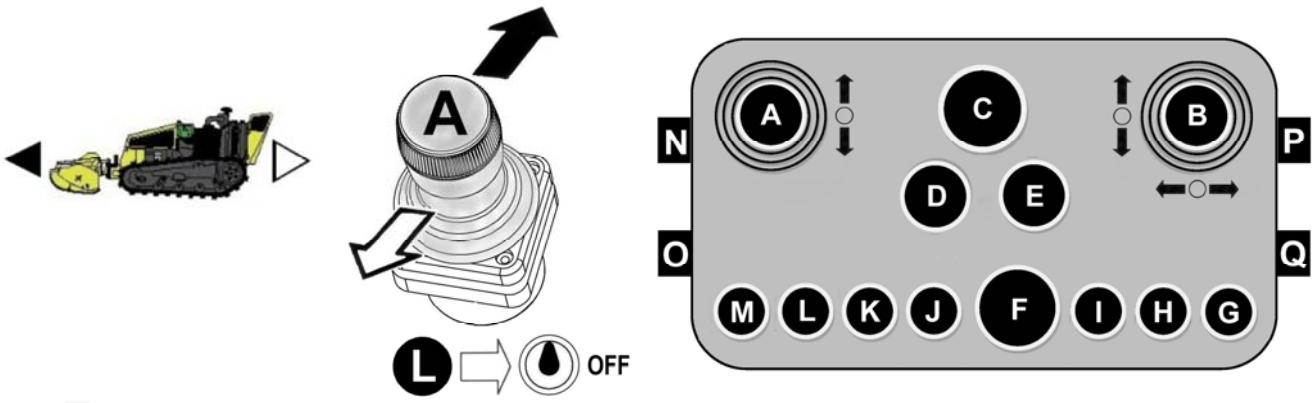
GENERAL CAUTION!
Never operate a starter for excessive uninterrupted periods attempting to start an engine as this can damage or burn out the starter motor.

Operation of the machine must only be performed by a responsible person who has read the manual and is familiar with the machine controls and all aspects relating to its safe use.

It is advisable that all new operators practice using the machine, without the cutting head running, in a safe open area in order to familiarise themselves with the controls and movements of the machine.

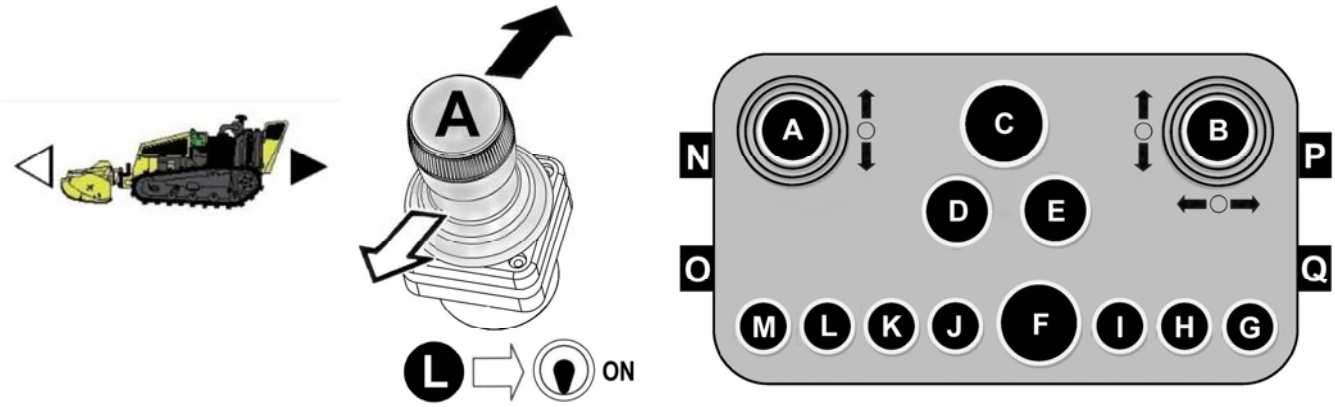
Forwards & Backwards Travel (Default Mode)

Operation of the machine's forward and backwards movements are controlled by using the left-hand joystick (A) on the remote controls; push the lever forwards to move the machine forwards, pull the lever backwards to move the machine backwards. The joystick operates proportionally, therefore; the further the lever is moved the faster the machine travels. The maximum speed available will be determined by gear and potentiometer settings, switch 'K' and dial switch 'C', details of which are in the following pages.



Forwards & Backwards Travel (Direction Swap Mode)

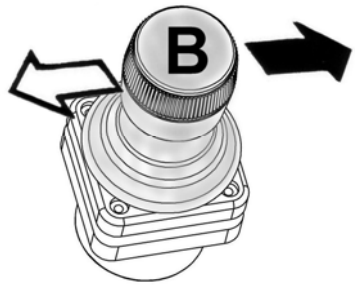
Direction Swap Mode is selected by activation of switch 'L'; this swaps the machines direction of travel on operation of joystick 'A'. The primary function of this feature is for ease of operation when the machine's particular work tool is 'rear mounted' type and requires the machine to be operated in reverse.

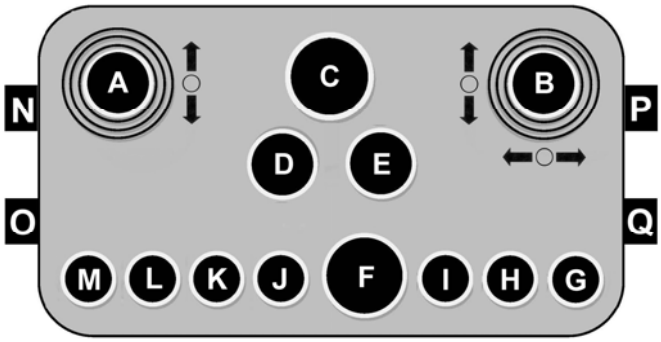


Steering Direction Control

The steering direction of the machine is controlled by sideways operation of the right-hand joystick (B); moving the lever to the right will steer the machine to the right and moving the lever to the left will steer the machine left.

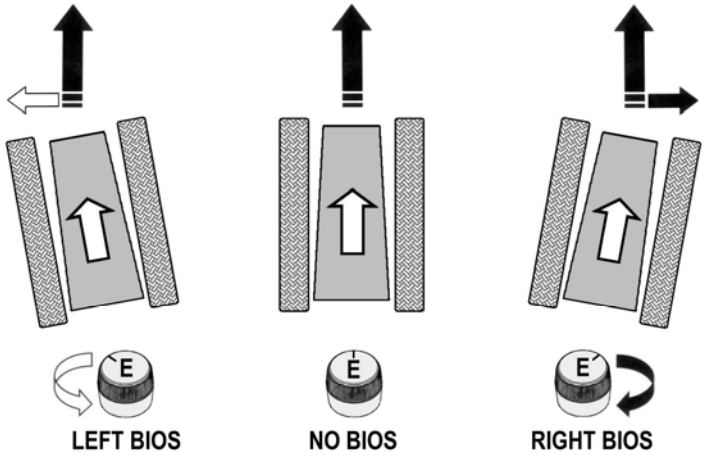
Steering is achieved by adjusting the speed or the turning direction of the tracks in relation to each other; depending on the intensity of the turn one or other track will decelerate, stop or even reverse causing the machine to change direction, the sharpness of the turn is relative to how far the operation lever is moved.





Steering Bias

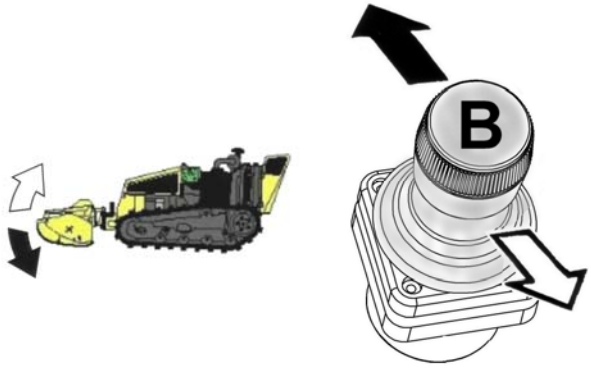
The steering bias feature allows a degree of ‘steer’ to be pre-set for operating the machine across slopes, adjustment is made using the dial switch ‘E’; rotate the dial either clockwise or anti-clockwise for right or left bias respectively, the further it is rotated the greater the bias. Although steering will still need to be monitored and operated as normal it will be to a much lesser degree.

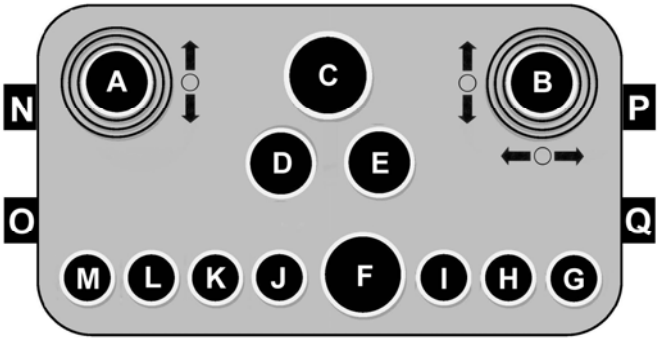


NOTE: When the machine is operating in ‘direction swapped mode’ (refer to previous page), steering direction control will be swapped so the steering direction lever continues to operate in the same left and right manner to match the selected drive direction, the same will also apply to the steering bias feature.

Flail Head (Tool) Height Control

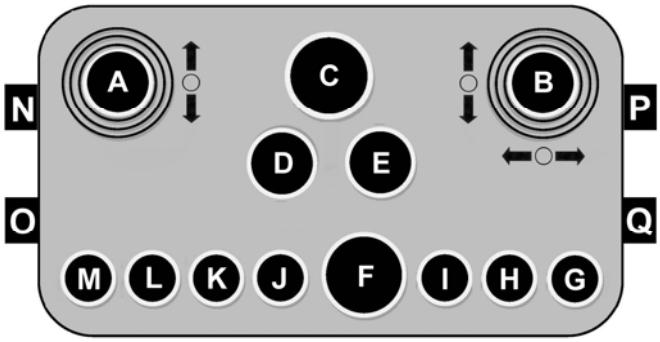
The tool height is controlled by forward and backwards operation of the right-hand joystick (B); pushing the lever forwards will lower the tool and pulling the lever backwards will raise the tool.





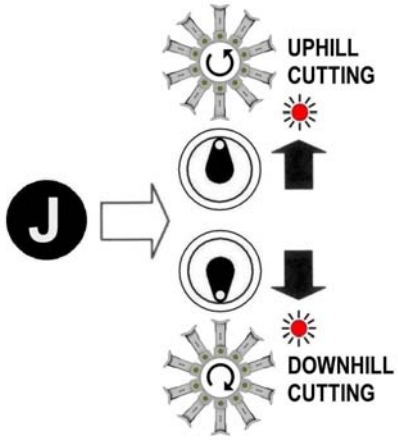
Flail Head Rotor Controls

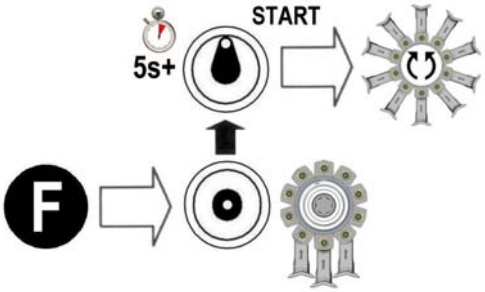
Operation of the rotor is controlled by using switches ‘J & ‘F’. Each of the switches performs a dual function; switch ‘J’ is for pre-setting the rotor cutting direction and for switching the rotor off, and switch ‘F’ is for starting the rotor and adjusting its speed. *Refer below for specific details of each function.*



Selection of Rotor Cutting Direction ►

Switch ‘J’ is for pre-selection of the rotor cutting direction; move the switch to the up position for uphill cutting or to the down position for downhill cutting - an led light will be illuminated to indicate the direction selected. Starting the rotor is performed by operation of switch ‘F’ – *see below.*



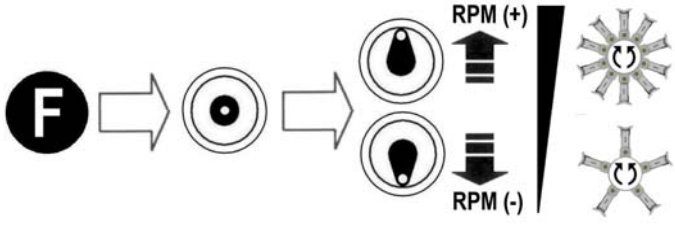


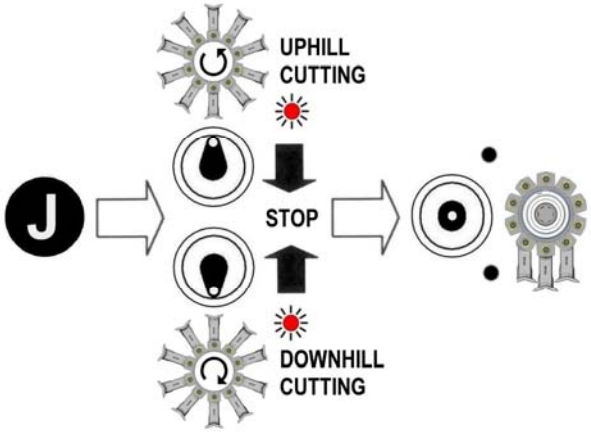
◄ Rotor Start

Starting the rotor is by operation of switch ‘F’; set engine speed to run at minimum revs before pressing the switch upwards – the switch has a built in time delay to avoid unintentional rotor operation and must be held in position for at least 5 seconds; release the switch as soon as the rotor starts to run. Engine revs can now be increased according to requirements.

Rotor Speed (RPM) ►

Once the rotor is running its speed can be increased or decreased as required by subsequent operations of switch ‘F’; each upward or downward operation of the switch will respectively speed up or slow down the rotor by a determined amount.





◄ Rotor Stop

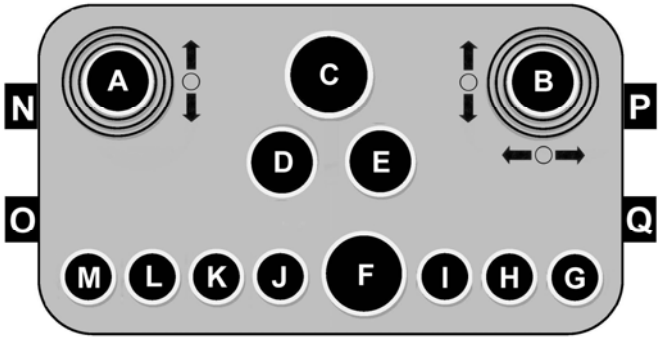
To stop the rotor, first reduce the rotor speed to its minimum using switch ‘F’ as described above, then move Switch ‘J’ into the central ‘off’ position.

Note (Pre-June 2015 machines only);

In an emergency situation the rotor can be stopped by use of the Emergency Stop Button ‘C’; this will immediately switch off and deactivate all machine functions completely, including the engine.

This feature is not applicable to later machines.

Flail Hood Control (Machines Operating with Flailhead Attachment)
The flail head is equipped with hydraulically operated front hood allowing the operator to remotely adjust its opening position to suit differing materials and conditions. The hood, which is powered by a hydraulic ram, is controlled by up and down operation of switch 'I'; the switch is self-centering so operation of the hood in either direction only occurs when the switch is held in the up or down 'on' positions, on release of the switch hood operation stops.



Engine Speed Control (RPM)
The speed of the engine is adjusted using control buttons 'P' and 'Q'; pressing button 'P' will increase engine revs and pressing button 'Q' will decrease the revs.

Gear Control
The machine has 2 gears to provide a choice of travel speeds; in addition to the gear selected the travel speed will be managed by operation of the travel joystick which itself is directly proportional to the speed setting of the potentiometer – *see below.*
When in work it is recommended that the machine is operated in gear 1 and speed limited especially when working on steep slopes. Gear 2 is primarily for use when driving the machine between work areas on smooth even terrain where it is safe to use higher speed.

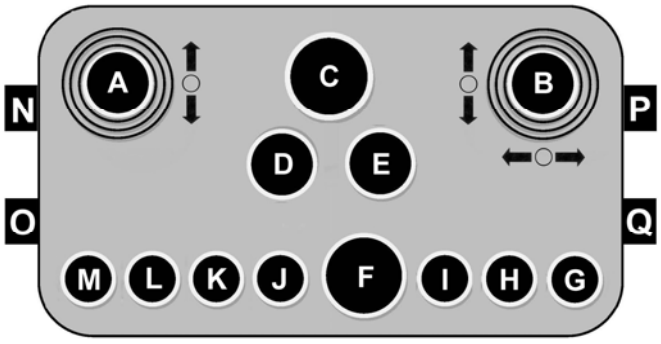
Potentiometer
The potentiometer control (rotational switch 'D') determines the maximum travel speed capability of the machine, from 0 – 100%, when operating the travel joystick - it is in effect an adjustable speed governor.
Adjustment is by rotating the switch to the required speed (%) position; the setting chosen will depend on numerous factors but should always be at a setting that allows the operator optimum control of the machine in work.

Engine Shutdown
Before shutting down the engine all machine movements must be halted, engine revs reduced to minimum and the rotor switched off. Allow the machine to run at this level for about 1 minute to stabilize pressures and temperatures - shutting down the engine is then performed by pressing button 'N' which will stall the engine. When the engine has stopped the procedure is completed by switching off the ignition key on the machine.

⚠CAUTION

Always turn ignition key OFF after stopping the engine; failure to observe this risks possible fuel pump damage due to electric pump overheating.

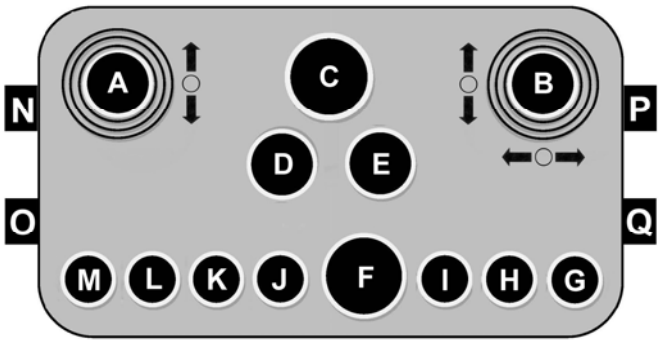
If the machine is to be left unattended the key should be removed and control unit and key placed in a secure safe location.



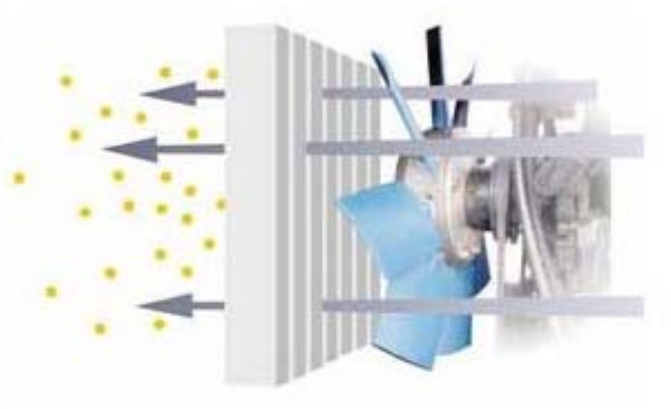
Engine Start
Engine start from the remote control unit is by use of button 'O' – *refer to 'Starting Engine' section for details of this procedure.*

Clean Fix Control

Clean Fix is a built in 'self-clean' feature designed to reduce the build-up of dirt and dust in the radiator matrix; on activation of the its control switch ('M') the blades of the fan change angle diverting air flow back through the radiator thus removing dirt and dust particles.



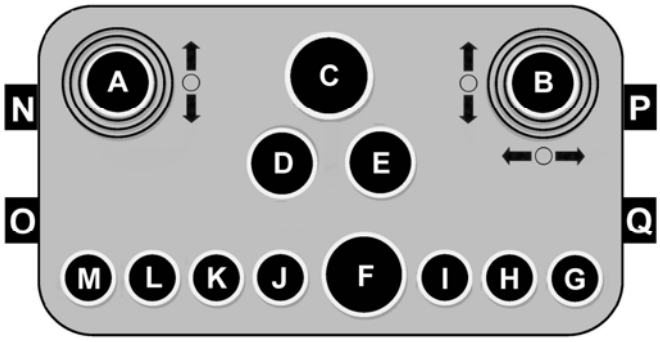
Normal fan operation ▲
– air drawn through radiator for cooling



Clean Fix activated ▲
– air blown through radiator for cleaning

Auxiliary Functions

Switches 'H' & 'G' are reserved for optional or additional auxiliary functions that may be required to operate different attachments and equipment.



S-Key

The address of the remote control unit is stored in the S-Key and is matched to the machine it was supplied with, therefore the controls will only communicate with a specific machine; the S-Key cannot be removed for use in an alternate control unit and will not operate a different machine.

WARNING! Do not attempt to turn off or stop a machine by removing the S-Key; only use the correct commands and procedures to stop and switch off the machine.

Manual Control Unit (Emergency Track Operation only)

A manual control device for track operation is provided with the machine to allow the operator to bypass the Radio Controller in the event of a controller malfunction.

When connected to the machine, this devise will allow the operator to raise and lower the flailhead and manoeuvre the mower in any direction.

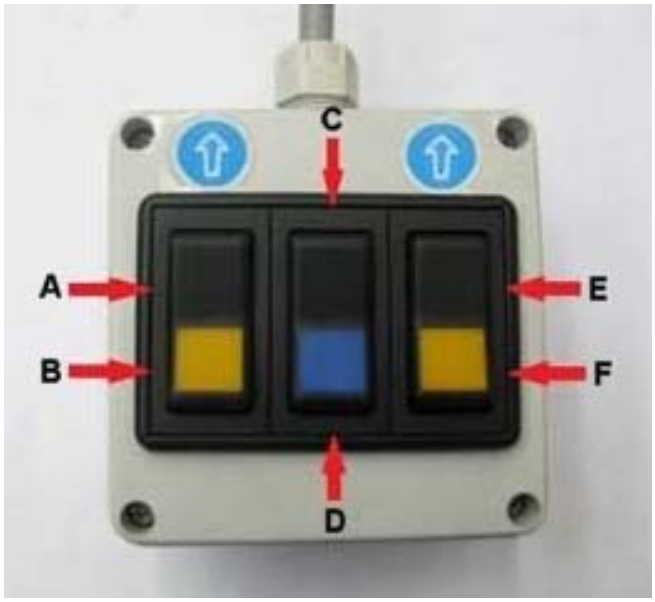
This feature is primarily for use in an emergency situation to allow transport of the machine in the event of a sudden breakdown or for diagnosing an issue with the controller.

When operated in this mode the machine will only travel at minimum speed and all other control features are deactivated.

To use this control the unit must first be connected to the electronic ignition box, refer to the following page for details.

WARNING!
The manual track control is for emergency situations and troubleshooting purposes only – never attempt to use this feature for normal work operations.

Manual Controller



A) Forwards left track

B) Backwards left track

C) Flailhead (tool) lift

D) Flailhead (tool) lower

E) Forwards right track

F) Backwards right track

Manual Controls Operation

To manoeuvre the machine;

Forward travel is by simultaneous operation of buttons ‘A’ & ‘E’.

Right turn is by operation of button ‘A’ only.

Left turn is by operation of button ‘E’ only.

Reverse travel is by simultaneous operation of buttons ‘B’ & ‘F’.

Counter-rotation to the right is by simultaneous operation of buttons ‘A’ & ‘F’.

Counter-rotation to the left is by simultaneous operation of buttons ‘B’ & ‘E’.

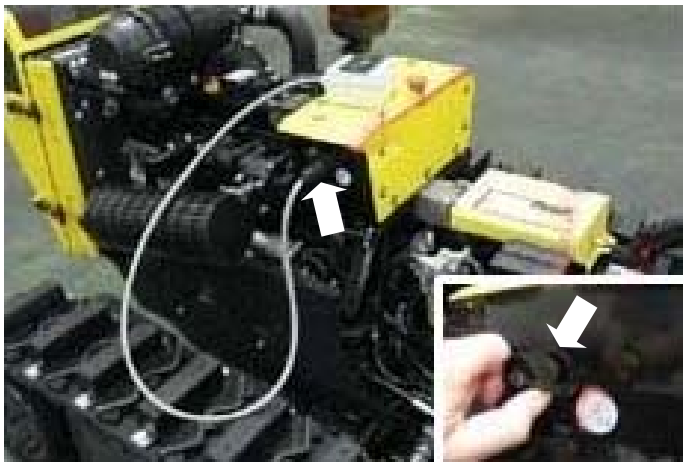
Flailhead (tool) lift is by operation of button ‘C’.

Flailhead (tool) lower is by operation of button ‘D’.

Converting the Machine for use with the Manual Control Unit
The method of adapting the machine for use with the manual control unit requires attachment of the Control Unit and deactivation of the Brake Control Module; the procedures are as follows;

Control Unit Attachment
Connect the manual control unit to its connection point on the electronic ignition box, this point is located on the right hand side of the machine as shown in the photos below.

Location of connection point for the Manual Control Unit


Remove dust cover and plug unit into the connection point

Deactivating the Brake Control Module
Machine builds prior to Serial No. 011400323 only
Under normal operating conditions when using the remote control, movement of the joystick sends a signal to the brake system instructing it to release the brakes.
When using the manual control unit the brake controller must be bypassed to allow the brakes to release, this is achieved by disconnecting the wiring loom from the brake control module.
The brake control module is located under the bonnet on the right hand side of the machine – *indicated 'T' in the photographs opposite and below.*

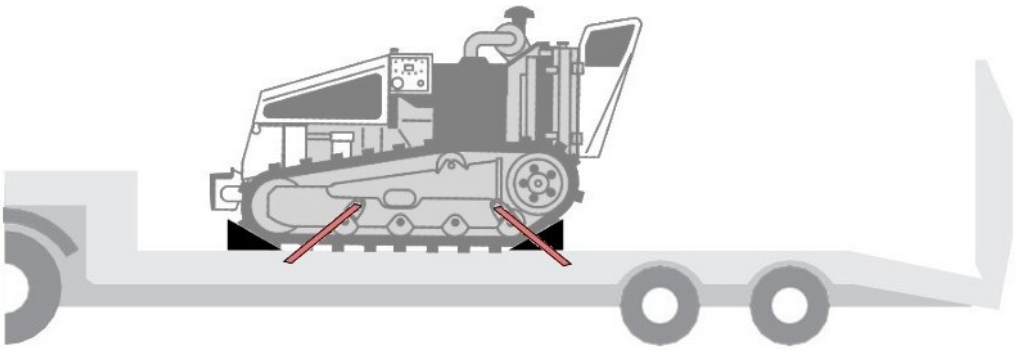
Location of Brake Control Module (T)

Brake Control Module identification (indicated 'T')

Disconnect the wiring loom plug from the Brake Control Module to allow machine operation with Manual Control

Note: Failure to disconnect the Brake Control Module will result in the engine stalling when attempting to transport the machine in Manual Control Mode.

TRANSPORTATION



Use suitable vehicles with a carrying capacity of greater than 1600 kg to transport the machine. Use loading ramps, both of which are suitable for supporting a load of not less than 800 kg and which are hooked to the bed of the vehicle. The ramps must be positioned at the correct distance for the tracks and must make an angle with respect to the ground of no more than 50°. Once the machine has been loaded onto the vehicle, it is recommended to secure it to the bed of the vehicle using wire ropes or slings attached to the lifting rings as shown above.

PRE-OPERATION CHECKS

WARNING! All checks or inspections of the machine should be performed with the machine parked on firm level ground with the engine switched off and the starting key removed.

The following checks should be made daily before using the machine;

- Check all safety guarding is in good condition and fitted correctly.
- Check nuts and bolts for tightness, retighten if required.
- Check track condition and tension, re-tension if required.
- Check flail head for damaged or missing flails – replace if required before use.
- Check oil, coolant and fuel levels, replenish if required.
- Check filters – clean or replace if required.
- Check radiator matrix is clean – clear blockages if required using compressed air.
- Lubricate machine as per details stated in the maintenance section.

Work and Work Area Precautions

- Always inspect the work area prior to operations; check for and remove foreign bodies such as large stones, metal component, wire and glass etc. which could damage machine component or be ejected by the flail head. Any immoveable object should be visually marked or avoided.
- Ensure the area is clear of animals and persons. Never manoeuvre the machine into an area where you can no longer see it working.
- Only work the machine in grass or brushwood that is within its cutting capability; attempting to cut materials beyond the machines capability will damage components.
- Never run the machine down a slope that is in excess of its track option capability.
- Never operate the machine on slopes or ground where there is a risk of overturn.


Always wear safety shoes, ear defenders and safety glasses when operating the machine.

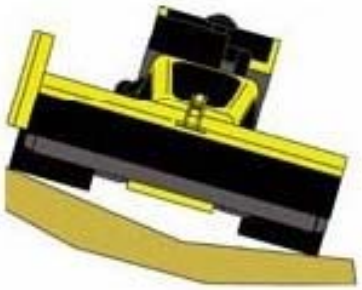
Always work in good lighting conditions. If necessary, use artificial lighting in compliance with local rules in force.

Do not smoke near the machine; oils, fuels and lubricants are flammable.

Before moving the machine, ensure that there are no persons, animals, or obstacles in the work zone.

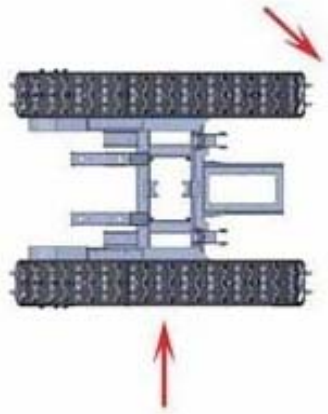
Do not change direction whilst moving on kerbs, rocks or surfaces with considerable differences in height *(more than 20cm)*; in these instances always move perpendicular to the obstacles.

When reversing uphill, do not steer when transferring from the level surface to the slope, if this is unavoidable, perform the manoeuvre gradually.



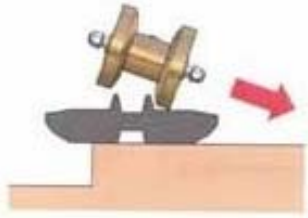
Do not move along the edge of a slope or on uneven ground with one track in the horizontal position and the other inclined or partially raised *(when machine is inclined in excess of 10°)*.
To avoid risk of track damage, always proceed with both tracks travelling on the same horizontal plane.

When the machine manoeuvres over an obstacle, a space is created between the bearing rollers and the track - this can cause the track to come off its seat. The same situation can occur in reverse when a space is created between bearing roller, idler roller, and track. To eliminate this risk, track guides are provided on the front part of the undercarriage.



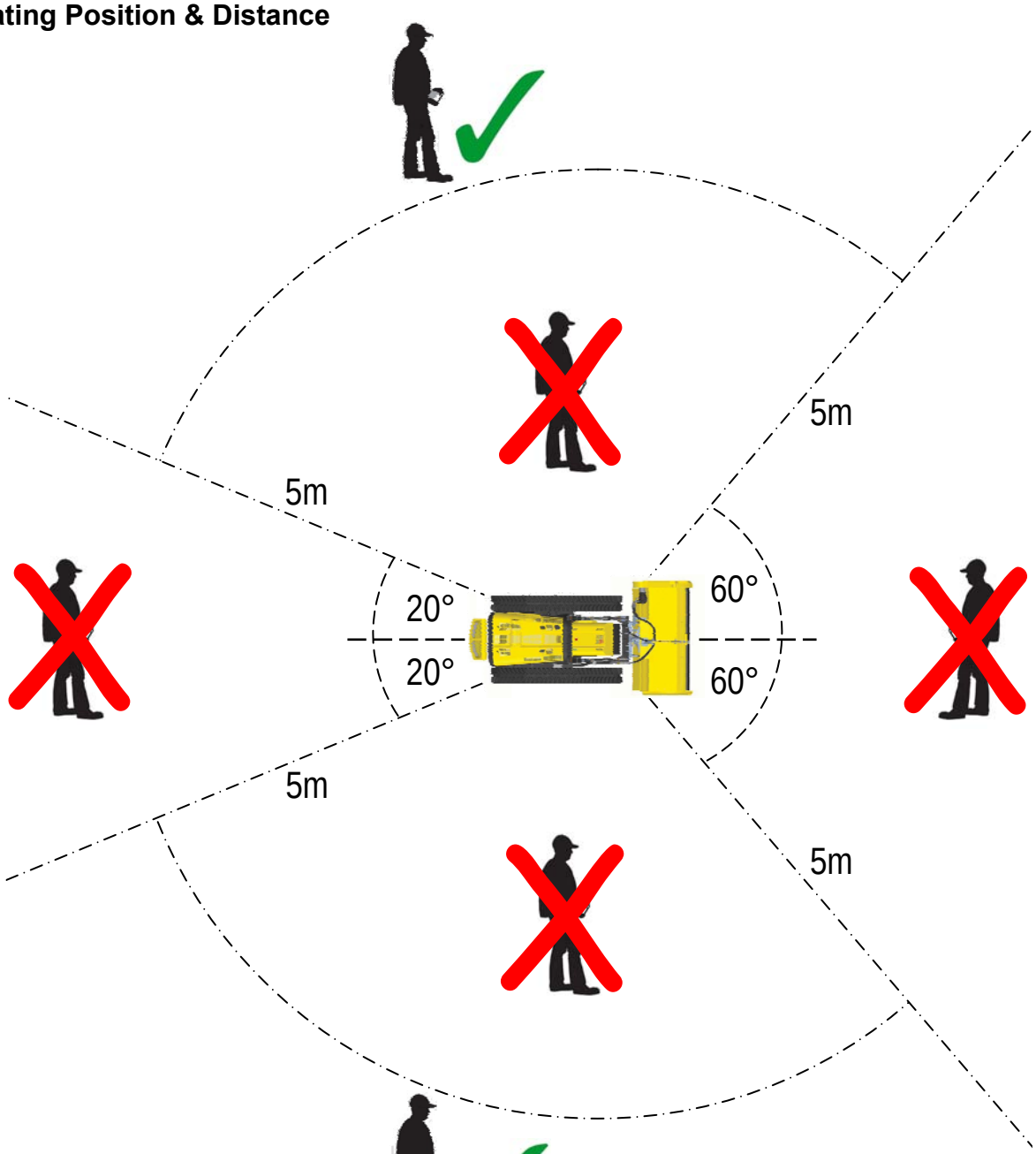
If the machines changes direction, and the track cannot move sideways due to the presence of an obstacle, there is a risk that the track can be damaged or come of its seat; wherever possible avoid turning the machine when it is against an obstacle, if unavoidable, make manoeuvres slowly and gradually until clear of the object.

◄ If the machine moves in reverse in these conditions, there is risk of the track coming off its seat.

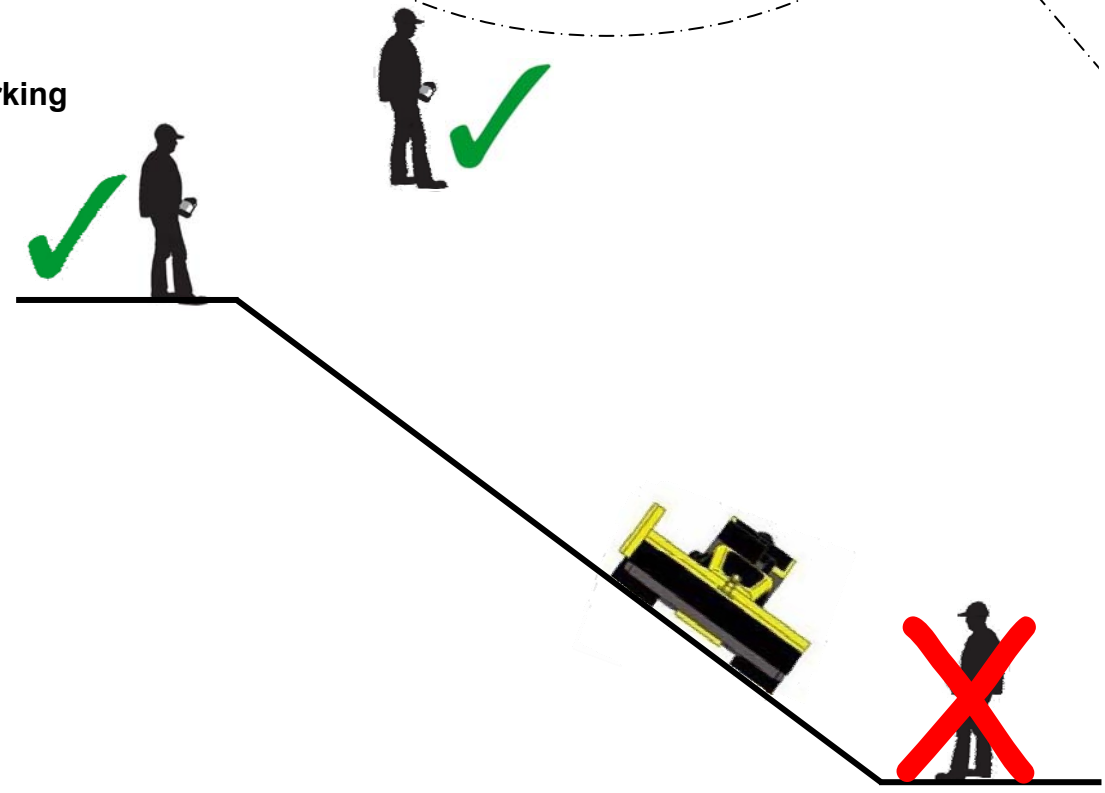


◄ If the machine is steered in these conditions, the track will come off its seat.

Operating Position & Distance



Slope Working



Diesel Engine Maintenance
For specific service and maintenance information regarding the diesel engine, refer to the engine manufacturer's handbook provided with the machine. Ensure all service and maintenance work on the engine is carried out at the intervals stated in that manual.

Service Schedule
Refer to the service schedule section in this manual for details of the required maintenance and service tasks for the machine.

Periodic Checks
Check brakes and safety warning decals are in good condition.
Make sure the machine is thoroughly cleaned on a regular basis.
Check all fastenings, supports, steel structural parts, welds and pins etc. are in good condition.
Ensure paintwork is kept in good condition.
Lubricate the tracked undercarriage every 20 working hours.

Hydraulic Hoses
Hoses and hydraulic connections should be inspected for signs of wear or damage on a regular basis, damaged or worn components must be replaced immediately. The working life of undamaged hoses is approximately six years, they should be replaced after this period.

Recommended Lubricants / Coolant
Always use the recommended lubricants/coolants taken from the chart below or a good quality equivalent product.

Machine Component	Recommended Lubricant
Hydraulic System (Biodegradable)	PANOLIN HLP SYNTH E 46
Hydraulic System (Mineral)	Q8 ELI 1298 L
Engine	MOBIL SUPER 3000 X1 5W-40
Pins / Bushes / Bearings	GREENPLEX EP GREASE

Machine Component	Recommended Coolant
Cooling System	PERMENANT SUPER ANTIFREEZE LF (50% Dilution)

Cleaning the Air Filters Grills & Radiator

If the machine is running, reduce to minimum revs and allow engine to run for a further minute before switching off – *remove and pocket the ignition key.*

Clean outsides of air suction grills before releasing the three rubber hooks and opening the cover. Clean the radiator matrix, inside of the air intake grill and surrounding area using a compressed air line, do not use any tools to clean the radiator that may cause damage to the fins. Close the cover and secure in place with the rubber hooks.



Clean air intake grills of the machines front cover to ensure maximum airflow to the engine.



Ensure covers are closed and secured correctly to stop dirt getting in.

WARNING!

If the engine temperature becomes too high a red temperature warning light on the ignition panel will be illuminated to notify the operator – where this occurs refer to the engine manufacturer's manual.

Checking Hydraulic Oil Level

The procedure for checking and replenishing the machines hydraulic oil is as follows;

- Park the machine on a firm level site.
- Ensure engine is switch off and the key removed and pocketed.
- Release rubber hooks and raise the front engine cover.
- Unscrew the dipstick (located under the filler cap), remove and wipe with a clean rag.
- Replace dipstick without screwing in, then remove again and check the level – *oil level is correct if the oil reaches the marker on the dipstick.*
- If oil level is too low, top up using the correct recommended oil. Do not overfill beyond MAX level.
- When oil level is correct, screw the dipstick back in, close and secure the engine cover.

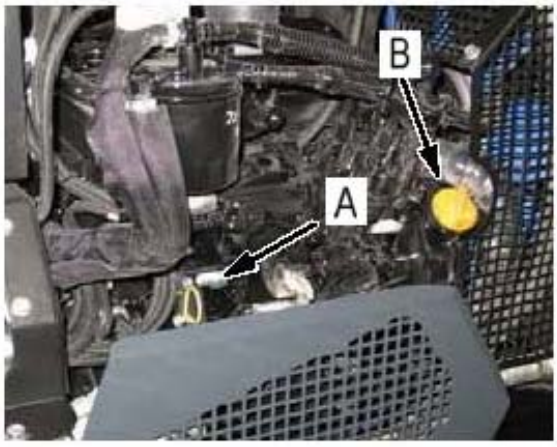
CAUTION! Always use the same type and brand of oil for 'topping up' of the hydraulic system; never mix different types and brands of oil.

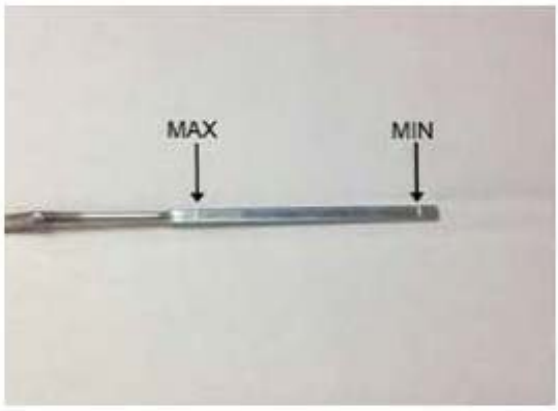
Checking Engine Oil Level

The procedure for checking and replenishing the machines engine oil is as follows;

- Park the machine on a firm level site.
- Ensure engine is switch off and the key removed and pocketed.
- Undo the 4 knurled head screws and remove the cover.
- Remove dipstick (A) and wipe with a clean rag.
- Replace dipstick then remove again and check the level – *oil level is correct when the oil level is between lower and upper marks on the dipstick.*
- If oil level is too low, top up using recommended engine oil. The engine oil filler location is indicated 'B' opposite.

  When topping up oil always clean the surrounding area of the filler cap before removal to avoid the risk of dirt contaminating the oil.
- When oil level is correct, replace dipstick before replacing and securing the cover.





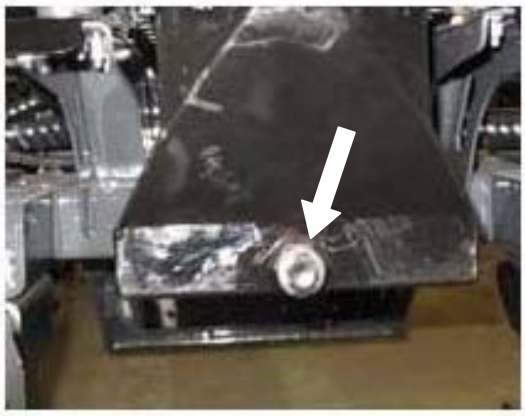
Engine Oil Replacement and Filter Change

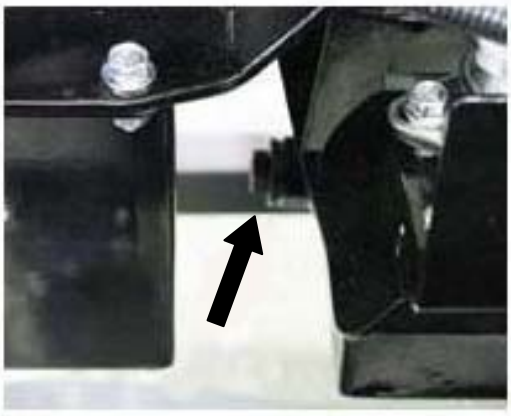
Oil Capacity: 6.1L without filter
6.6L with filter

Oil Type: MOBIL SUPER 3000 X1 5W-40

The procedure for changing the engine oil and filter is as follows;

- Park the machine on a firm level site.
- Remove drain plug and release the oil into a suitable container – *ensure the container used has sufficient capacity for the amount of oil.*





Engine oil drain plug location

- Once all the oil has been released, replace drain plug and torque to 34.5Nm.
- Unscrew and remove the engine oil filter ►

- Take the new filter and smear some engine oil on the rubber seal before fitting – *screw the filter hand tight, then turn it approximately a further ¾ of a turn.*
- Remove filler cap and slowly refill with 6.6L of MOBIL SUPER 3000 X1 5W-40 engine oil.
- Replace filler cap and start the engine.
- Run engine for 5 minutes or so and stop for a further 3 minutes before checking the oil level is correct.

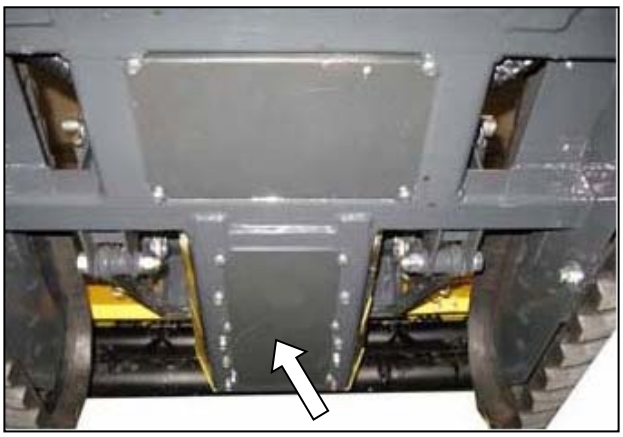
WARNING! Used engine oil is both a dangerous waste and a precious raw material; collect it in a suitable container and recycle it. Never pour waste oil into drains or waterways – it is both harmful and illegal.

Hydraulic Oil Replacement and Filter Change

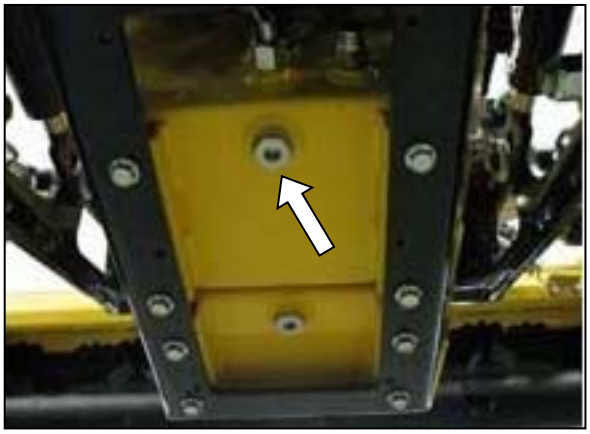
Hydraulic Oil Tank Capacity: 12 Litres
Complete System Capacity: 20 Litres

The procedure for changing the hydraulic oil and filter is as follows;

- Remove the protection plate from the underside of the hydraulic oil tank.
  Note: Removal of the plate allows access to both the hydraulic tank drain plug and the fuel tank drain plug – identify the correct plug before continuing to the next step.



Tank protection plate



Hydraulic oil tank drain plug

- Remove drain plug and release the oil into a suitable container.
- When the oil has drained completely, replace drain plug and refit protection plate.
- Unscrew cap and remove the hydraulic oil filter, this is located under the bonnet on the left hand side of the machine – *the filter is removed by using a 32mm spanner.*

Hydraulic oil filter location

Remove cap to access filter

- Fit new hydraulic oil filter and replace cap securely – take care not to over tighten.
  Note: Always replace filters at the intervals stated in the maintenance schedule using quality original filters as specified and supplied by the manufacturer.
- Refill the hydraulic oil tank with 'PANOLIN HLP SYNTH E46' hydraulic oil – check using the dipstick until the level is correct.
- Start engine and allow it to run for 2 minutes.
- Stop engine and re-check oil level on the dipstick, top up if the level has dropped.
- Check all components and covers are tightly secured before using the machine.

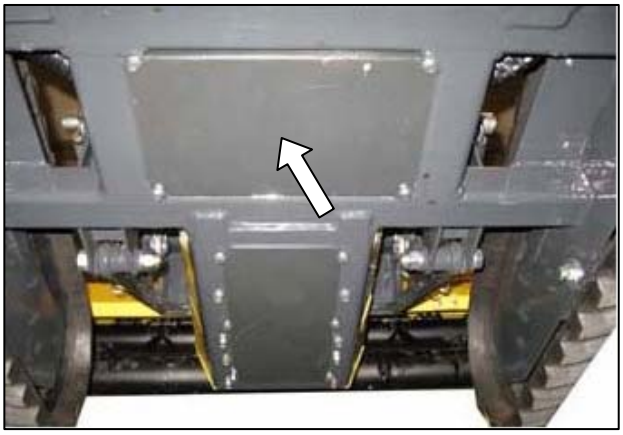
Hydraulic oil tank filler location

Hydraulic Distributor Valve

The distributor valve that controls the hydraulic functions of the machine is located under the vehicle and is only accessible from beneath the machine. When working on this, or any other item located under the machine, great care must be adopted to ensure the machine is securely positioned before attempting to access or work on the component.

WARNING: Never attempt to work under any machine that it not safely supported and chocked using suitable equipment specifically designed for the task and capable of supporting its weight.

Access to the valve is gained by removal of the protection plate which is held in position by six bolts.



Hydraulic valve protection plate

Hydraulic distributor valve

Expansion Vessel – Flail Head Hydraulic Circuit

Machines are provided with an 'Expansion Vessel' to protect the flail head's hydraulic system when the head has been removed from the machine. The Expansion Vessel attaches to the flail head drain line to permit oil escape for protection of the hydraulic motor's shaft seals.

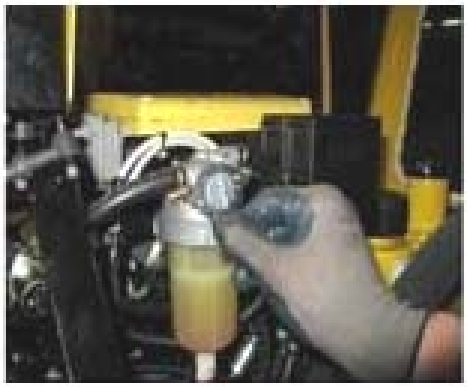
The 'Expansion Vessel' must be installed on the flail head drain line at all times when the flail head is unattached.

Fuel Filter Cleaning / Replacement

The procedure for cleaning or renewing the fuel filter is as follows;

Park the machine on a firm level site, switch the engine off and open the engine cover.

Fuel Filter



Fuel Supply Tap

- Close the fuel supply tap located on the filter housing.
- Place a suitable container under the filter assembly and unscrew the filter bowl securing ring using a filter key.
- Carefully remove filter bowl using the container underneath to catch spilled fuel - retain sealing ring for subsequent re-attachment.
- Remove and clean (or renew) the filter element.
- Clean out the inside of the filter bowl using a clean rag.
- Re-install the filter and refit the filet bowl ensuring the sealing ring is fitted.
- Screw the filter bowl securing ring to a point where the sealing ring seats on the housing and tighten further third of a turn.
- Open tap to restore the fuel supply to the filter.
- Unscrew the breather screw on the fuel filter by approximately one turn.
- Place a collecting bowl under the fuel filter.
- Turn ignition key to position 1, this will switch on the electric fuel pump.
- Allow the pump to run until fuel (free of bubbles) begins to flow from the breather screw.
- Screw the breather screw back in.
- Start the engine.
- Check components to ensure there is no fuel leakage.

WARNING: Do not allow the starter motor to run for more than 30 seconds at a time if the engine fails to start – allow at least 2 minutes before re-starting.

Fuel Filter Water Drain

Water will accumulate in the filter bowl that will from time to times need to be purged; the frequency of this task will primarily depend on the quality of the diesel being used. The filter bowl should be regularly inspected, and water drained off as and when required.
The procedure for draining the water is as follows;

- With the engine switched off, place a suitable container under the fuel filter.
- Open the water drain valve located on the base of the filter bowl.
- Allow water to run into the container until it is gradually replaced by a flow of fuel.
- Close the drain valve.

Water Drain Valve

Priming the Fuel System

If at any time the machine runs out of fuel, it will be necessary to prime the fuel system in order to get it running again – the procedure for this is as follows;

- Fill the tank with fuel.
- Unscrew the breather screw on the fuel filter by approximately one turn.
- Place a collecting bowl under the fuel filter.
- Turn ignition key to position 1, this will switch on the electric fuel pump.
- Allow the pump to run until fuel (free of bubbles) begins to flow from the breather screw.
- Screw the breather screw back in.
- Start the engine.

WARNING: Do not allow the starter motor to run for more than 30 seconds at a time if the engine fails to start – allow at least 2 minutes before re-starting.

Support Springs

The hydraulic rams that position the front mounted flailhead are equipped with support springs, the support pressure offered by the springs can be adjusted to suit differing needs and applications by altering their work position tension. The procedure for adjusting the springs is as follows;

- Raise the flailhead fully by operation of the hydraulic rams.
- Remove bolt and washer from the ram rod end and release the chain from the lug.
- Re-attach the chain selecting an alternative link to either increase or decrease tension.
- Replace washer and bolt to secure in position.
- Repeat the process on the opposite ram.

Steel Tracks

Tracks equipped with steel treads can be supplied as an alternative to the normal all rubber type - the steel tread version has the additional option of being fitted with steel spikes.

To fit the spikes remove every second steel tread by removal of the 3 x M8 Allen headed screws, and replace with the steel spike treads using the screws supplied and torque to 70Nm.

If a machine is fitted with spikes the operator must avoid driving the machine on any surfaces that would suffer damage from the spikes such roads, car parks, recreation areas etc. unless the machine has been fitted with rubber transport blocks specifically designed to protect surfaces.

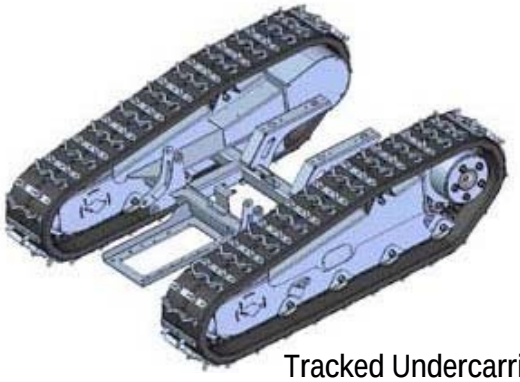
Transport Blocks Fitment

The rubber transport blocks have holes in them that locate on the spikes and are fitted by pushing them onto each set of accessible spikes before slowly driving the machine forward so its weight forces them tightly into place; repeat the process until all the spike sets are fitted with a block. After transportation a lever or large screwdriver will be required to prise the blocks back off the spikes.

Replacing Tracks

Tracks must be changed when only 10mm of tread remains, or before if they show signs of excessive cuts or cracks.

The components shown below are constituent parts of the track system illustrated here for identification purposes.

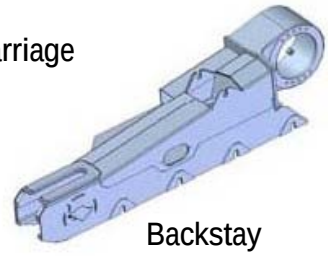


Tracked Undercarriage

Lower Roller Unit

Sprocket Assembly

Idler Roller



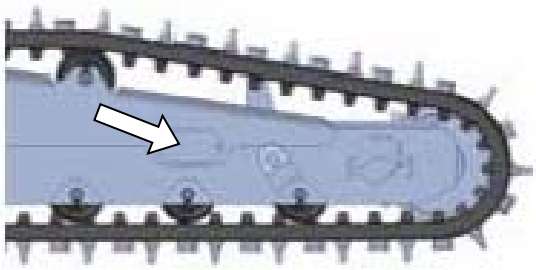
Backstay

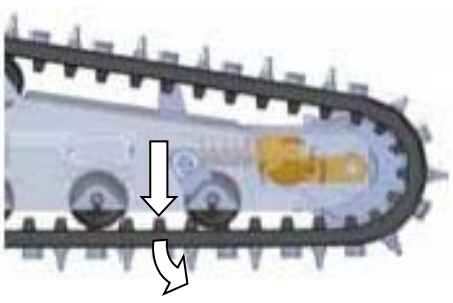
Rubber Track

The procedure for changing the tracks is as follows;

WARNING: Never attempt to work on any machine that it not safely supported and chocked using suitable equipment specifically designed for the task and capable of supporting its weight. Ensure suitable safety gear is worn at all times when performing maintenance tasks. Beware, there is 'pinch risk' when working on these components.

- Raise the machine off the ground to a height of approximately 30-40cm; *ensure the machine is stable and suitably supported.*
- Clean undercarriage components and their surrounding area prior to performing maintenance on them.
- Remove backstay side cover ►
- Loosen valve on the tensioner unit to release the grease pressure.
- Once pressure has been fully released the valve can be removed.
- Compress the idler roller; this can be done by using your foot to press the track back.
- Draw the track down and outwards at its mid point on the lower run to pull it off its seating, levering between the track and the idler roller until it is free enough to be removed. Take care to keep clear of the track as it falls to the ground.





Installing the new track is basically a reversal of the above – tension the track by pumping grease into the tensioner unit to a pressure of 130 Bar. (Max. 150 Bar).

Track Tension Kit (Optional)

A grease tensioner system controls the track tension on the machine. Keeping the tracks correctly tensioned is an important duty that must be carried out at the intervals stated in the maintenance schedule; failure to observe the correct tension can result in the tracks coming off the machine during operations.

A Tension Kit, comprising of a grease pump equipped with a manometer, is available as an option for use in correctly checking and setting the pressure. The correct pressure is 130 Bar. (Max. 150 Bar).

Track Tension Kit (4000271)

Wear Limits

The track components shown opposite must be replaced when they reach their maximum wear limit, corresponding to 100% in the figures stated below;

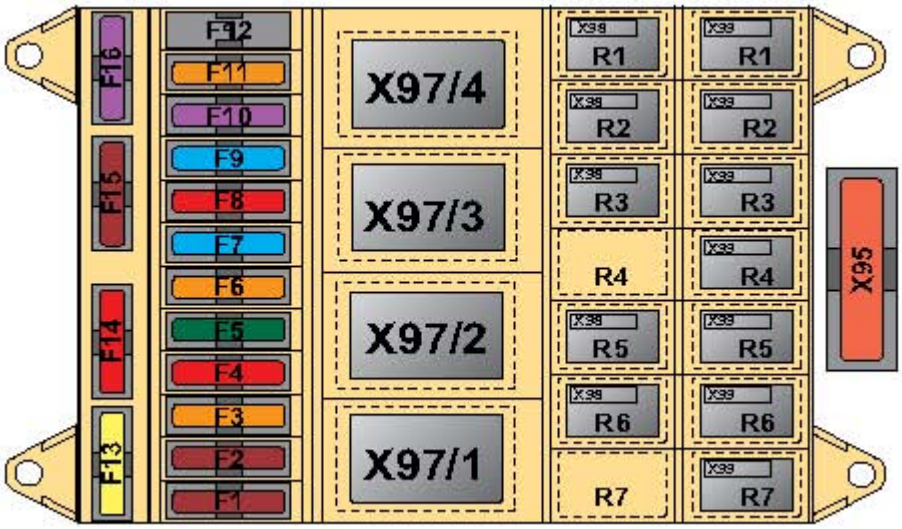
	Lower Rollers	Front Cogs	Drive Cogs
Ø when new ►	*130.0mm*	*264.0mm*	*290.0mm*
Ø at 25% wear ►	*128.0mm*	*263.0mm*	*289.0mm*
Ø at 50% wear ►	*126.0mm*	*261.5mm*	*287.5mm*
Ø at 75% wear ►	*124.0mm*	*259.5mm*	*285.5mm*
Ø at 100% wear ►	*121.0mm*	*257.0mm*	*283.0mm*

Lubrication of Undercarriage Components

Components of the tracked undercarriage (rollers, pins, bushings etc.), must be greased every 20 working hours.

UNDERCARRIAGE SPECIFICATIONS

Loading Capacity	1.2T
Length	1548mm
Axle to axle length	1192mm
Track height	479.5mm
Cross-member height (from ground)	150mm
Fixed undercarriage width	1260mm
Number of lower rollers per side (per machine)	4 + 4 (8)
Number of upper rollers per side (per machine)	1 + 1 (2)
Track width	230mm
Number of links per side (per machine)	47 + 47 (94)
Chain pitch	72mm
Track tensioner pressure (Max)	150Bar
Total weight	444kg
Hydraulic motor displacement	332cm³
Hydraulic motor pressure (Max)	190Bar
Hydraulic flow rate (Max)	39l/min
Maximum speed	7km/h
Operating temperature range	-10/+40°C
Maximum operating humidity	95%
Brake release pressure range	12-16Bar
Maximum gradeability	114%



Fuses & Relays

F1	Fuel Pump	7.5 Amp
F2	Actuator	7.5 Amp
F3	+15 Controllers & Display	5 Amp
F4	Hold Solenoid + Safety Stopdown	10 Amp
F5	Pull Solenoid	30 Amp
F6	+15 Warnings Relay	5 Amp
F7	Beacon	15 Amp
F8	Horn	10 Amp
F9	Wiring Control	15 Amp
F10	+12V Sensors & Buttons	5 Amp
F11	Alternator	5 Amp
F12	Free	
F13	+30 3B6 Controller	20 Amp
F14	+12V Plug	10 Amp
F15	Receiver Fuse	7.5 Amp
F16	+20 Canview Display	3 Amp
X95	General Fuse	40 Amp

X97/R1	Pull Solenoid relay	X99/R2	Manual control
X97/R2	Air Heater (optional)	X99/R3	Beacon lamp
X97/R3	Starter relay	X99/R4	Clean Fix fan
X97/R4	Battery switch	X99/R5	Check test before start
X98/R1	Actuator +	X99/R6	Engine oil pressure sensor
X98/R2	Actuator -	X99/R7	High water engine temperature
X98/R3	Horn		
X98/R4	Free		
X98/R5	Lower hyd. oil level		
X98/R6	Hold solenoid		
X98/R7	Free		
X99/R1	Radio-Control stop (Link missing)		

TROUBLESHOOTING

Symptom	Possible Cause	Solution
Track damage.	Excessive tread wear; Loosening/breaking of internal structural steel rope.	Replace track.
Track slackens frequently.	Faulty tensioner valve. Damaged tensioner seal. Worn tensioner components.	Replace valve. Replace seal. Replace worn components.
Upper track does not stay in position.	Track slide worn. Upper roller worn.	Replace slide. Replace upper roller.
Lower track does not stay in position.	Lower track guide worn. Lower roller worn.	Replace lower track guide. Replace lower roller.
Track 'jams' when the machine is steering.	Material (stones, rocks, earth etc.) trapped between rollers, sprockets, idler roller and track.	Remove material by turning the track in both directions while slackening slightly, raise machine at same time if possible.
Oil leakage	Hardened seals. Gasket/seals damaged or worn.	Clean around component and recheck after a few days. Contact dealer.
Excessive noise.	Internal malfunction. Worn seals.	Contact dealer.
Excessive vibration.	Internal malfunction. Worn seals.	Contact dealer.
Overheating	Lack of oil. Arduous conditions/hot climate. Brakes binding.	Add oil. Contact dealer. Check brake release pressure.
Motor runs but gear unit not working.	Motor wrongly assembled. Internal malfunction. Brake jammed.	Check coupling between motor and gear unit. Contact dealer. Check braking system.
Brake not releasing.	Lack of brake pressure. Faulty brake seals.	Check brake connections. Contact dealer.
Brakes not locking.	Residual pressure in circuit. Worn brake components.	Check hydraulic system. Contact dealer.

ROBOCUT

SERVICE SCHEDULE

SERVICE SCHEDULE

- Periodic maintenance schedules imply the performance of regular checks.
- Record all interventions carried out in addition to routine maintenance.

DAILY CHECKS

- Inspect the engine (leaks or damage).
- Check the fuel level (top up if necessary).
- Check the engine oil (top up if necessary).
- Check the hydraulic oil (top up if necessary).
- Check the coolant (top up if necessary).
- Check for oil, fuel or coolant leaks
- Check the level indicators (engine oil etc.)
- Clean the machine of cuttings or other residues.
- Check and cleaning of the fan radiator intercooler guards
- Clean the air intake filter.
- Check tightness of screws or nuts.
- Grease as indicated.
- Check tyre pressures / wear of tyres / tracks
- Check the safety devices, beepers and guards are in proper order.

WARNING:

Check the type of oil in the machine and do the following:

Type	Brand	Replace by
Mineral	Q8 ELI 1298 L	1000 hours
Biodegradable	Q8 HOLBEIN HP SE BIO 46	2000 hours
	PANOLIN HLP SYNTH E 46	15000 hours

SERVICE SCHEDULE

AFTER THE FIRST 50 h

- □ Check tightness of wheel nuts and tyre pressures or regulate track tension.
- □ Check drainage of the water/fuel separator
- □ Check electrical system.
- □ Check battery.
- □ Check and clean heating fins.
- □ Check and adjust cooling fan V-belt.
- □ Clean machine from cutting residues.
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Clean air pre-filter.

Date

Stamp

Signature

250 h

- □ Check and clean radiator fins.
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).

Date

Stamp

Signature

(*) See whether there is water sludge in the tank If there is, changing the diesel filter is recommended.

SERVICE SCHEDULE

500 h

- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Check battery.
- □ Change hydraulic oil filter (Part No. 4000259).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).
- □ Change fuel filter (Part No. 4000105).
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).

Date

Stamp

Signature

750 h

- □ Check and clean radiator fins.
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).

Date

Stamp

Signature

(*) See whether there is water sludge in the tank If there is, changing the diesel filter is recommended.

SERVICE SCHEDULE

1000 h

- □ Adjust valve clearances (**)
- □ Change coolant (every year or 1,000 h).
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Check battery.
- □ Check the hydraulic oil (see page 1).
- □ Change hydraulic oil filter (Part No. 4000259).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).
- □ Change fuel filter (Part No. 4000105).
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).

Date

Stamp

Signature

(**) At authorised workshops.

1250 h

- □ Check and clean radiator fins.
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).

Date

Stamp

Signature

(*) See whether there is water sludge in the tank If there is, changing the diesel filter is recommended.

SERVICE SCHEDULE

1500 h

- □ Inspect, clean and test fuel injectors (if necessary). (**)
- □ Inspect engine crankcase ventilation system (**)
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Check battery.
- □ Change hydraulic oil filter (Part No. 4000259).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).
- □ Change fuel filter (Part No. 4000105).
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).

Date

Stamp

Signature

(**) At authorised workshops.

1750 h

- □ Check and clean radiator fins.
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).

Date

Stamp

Signature

(*) See whether there is water sludge in the tank If there is, changing the diesel filter is recommended.

SERVICE SCHEDULE

2000 h

- □ Polish the valves' seats (if required). (**)
- □ Adjust valve clearances (**)
- □ Change supply system.
- □ Change cooling system piping.
- □ Change coolant.
- □ Check and adjust cooling fan V-belt.
- □ Check engine accelerator.
- □ Check battery.
- □ Check the hydraulic oil (see page 1).
- □ Change hydraulic oil filter (Part No. 4000259).
- □ Change engine oil.
- □ Change engine oil filter (Part No. 4000257).
- □ Drain fuel tank (*).
- □ Change fuel filter (Part No. 4000105).
- □ Change air pre-filter/filter (Part Nos. 4000260 / 4000261).

Date .....

Stamp

Signature .....

(**) At authorised workshops.

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