

Publication 1099
April 2025
Part No. 24215.99



McCONEL

ROBOCUT BUCKET GRAPPLE BUCKET

Operation Manual



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. <input type="text"/>
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			Port Adaptors with Bonded Seals		
BSP	Setting	Metric	BSP	Setting	Metric
1/4"	18 Nm	19 mm	1/4"	34 Nm	19 mm
3/8"	31 Nm	22 mm	3/8"	47 Nm	22 mm
1/2"	49 Nm	27 mm	1/2"	102 Nm	27 mm
5/8"	60 Nm	30 mm	5/8"	122 Nm	30 mm
3/4"	80 Nm	32 mm	3/4"	149 Nm	32 mm
1"	125 Nm	41 mm	1"	203 Nm	41 mm
1.1/4"	190 Nm	50 mm	1.1/4"	305 Nm	50 mm
1.1/2"	250 Nm	55 mm	1.1/2"	305 Nm	55 mm
2"	420 Nm	70 mm	2"	400 Nm	70 mm

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell Ltd cannot be held liable, and may have safety implications.*
- 1.10. *If in exceptional circumstances a non McConnell Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnell 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 McConnell 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. McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell 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 McConnell Ltd Service Dealer, within 30 days of the date of repair.*
- 2.05. *Following examination of the claim and parts, McConnell Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnell 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 McConnell Ltd. is final.*

3. LIMITATION OF LIABILITY

- 3.01. *McConnell 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. *McConnell Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.*
- 3.03. *Except as provided herein, McConnell 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

**Temeside Works
Ludlow
Shropshire
England**

**Telephone: +44 (0)1584 873131
www.mcconnel.com**

**This manual must be read and used in conjunction with:
ROBOCUT Operation Manual**

Robocut operation manuals are available on our website via the links below;



In line with our policy of constant improvement this publication may be periodically updated. To ensure you have access to the latest version of this manual please visit the manuals library on our website where an up-to-date version can be referenced online or downloaded.

To access manuals use the QR code opposite or the web address below;

<https://my.mcconnel.com/service/pdf-manuals/pdf-operator-manuals/remote-control-technology-manuals/>

SAFETY FIRST

MACHINE SAFETY DECALS MUST BE KEPT IN CLEAN READABLE CONDITION AT ALL TIMES;
Any safety decals that are missing, damaged or illegible must always be replaced immediately.
McConnel have a policy of providing replacement safety decals and manuals free of charge.

TABLE OF CONTENTS

1 - GENERAL DESCRIPTION 4

1.1 - PRELIMINARY INFORMATION	4
1.2 - TRAINING REQUIRED FOR THE OPERATOR	5
1.3 - WARNINGS ON USE AND STORAGE	5
1.4 - INTRODUCTION	6
1.4.1 - UPDATING THE MANUAL	6
1.4.2 - COPYRIGHT	6
1.5 - WARRANTIES	6
1.6 - RESPONSIBILITIES	7
1.7 - PERMITTED USES	7
1.8 - IMPROPER OR PROHIBITED USES	8
1.9 - RUNNING-IN AND TESTING OF THE MACHINE	9
1.10 - FOR YOUR SAFETY	9

2 - MACHINE SPECIFICATIONS 10

2.1 - MACHINE DESCRIPTION	10
2.2 - RULES APPLIED	10
2.3 - IDENTIFICATION OF THE EQUIPMENT	10
2.3.1 - DEFINITION OF THE DIRECTIONS OF THE EQUIPMENT	11
2.4 - NOISE LEVEL	11

3 - SAFETY REQUIREMENTS 12

3.1 - GENERAL SAFETY RULES	12
3.1.1 - GETTING TO KNOW THE MACHINE THOROUGHLY	12
3.1.2 - WEAR PROTECTIVE CLOTHING	12
3.1.3 - WARNINGS FOR CHECKS AND MAINTENANCE	12
3.1.4 - INSPECTION OF THE MACHINE	13
3.2 - GENERAL PRECAUTIONS	13
3.2.1 - SAFETY WARNINGS	14
3.2.2 - SAFETY REQUIREMENTS FOR ROAD TRAFFIC CIRCULATION	14
3.2.3 - OPERATIONAL SAFETY	15
3.2.4 - SAFETY RULES WHEN USING THE MACHINE	15
3.2.5 - HYDRAULIC SYSTEM SAFETY REQUIREMENTS	16
3.2.6 - LOCATION OF THE SAFETY DECALS	17
3.2.7 - DESCRIPTION OF THE SAFETY SIGNS	18
3.3 - SAFETY PRECAUTIONS FOR MAINTENANCE	19
3.3.1 - CARE AND MAINTENANCE	19
3.3.2 - WARNING PLATES	20
3.3.3 - TOOLS	20
3.3.4 - PERSONNEL	21
3.3.5 - KEEP THE EQUIPMENT CLEAN	21
3.3.6 - PERIODIC REPLACEMENT OF ESSENTIAL SAFETY COMPONENTS	21

4 - TECHNICAL DATA	22
4.1 - DIMENSIONS AND WEIGHTS	22
4.2 - MACHINE COMPONENTS	22
5 - TERMINOLOGY	24
5.1 - DEFINITION OF THE TERMS USED	24
6 - USE OF THE MACHINE	25
6.1 - PRELIMINARY CHECKS	25
6.2 - CHECKS BEFORE THE START OF EACH WORKING DAY	25
6.3 - CONNECTING THE EQUIPMENT	26
6.4 - TRANSMITTER UNIT	29
6.4.1 - LIFTING DEVICE	29
6.4.2 - TILTING / RETURNING THE BUCKET	30
6.4.3 - OPENING / CLOSING THE GRAPPLE	31
6.5 - USING THE BUCKET	32
6.5.1 - LOADING FROM PILE	32
6.5.2 - LEVELLING PROCEDURE	33
7 - TRANSPORTATION AND HANDLING	34
7.1 - LIFTING	34
8 - STORAGE	36
8.1 - FIRST USE OR RE-COMMISSIONING AFTER A LENGTHY PERIOD OF INACTIVITY	36
8.2 - DISMANTLING, DECOMMISSIONING	37
9 - MAINTENANCE	38
9.1 - INTRODUCTION	38
9.2 - GENERAL RULES	38
9.3 - EXTRAORDINARY INTERVENTIONS	39
9.4 - TABLES FOR THE CHOICE OF FLUIDS	39
9.4.1 - GREASES TABLE	39
9.5 - DAILY MAINTENANCE	39
9.5.1 - CLEANING THE EQUIPMENT	39
9.6 - GREASING OF PARTS	40
9.6.1 - GRAPPLE CYLINDER GREASING	40
9.6.2 - SHOVEL PIN GREASING	40
9.6.3 - TILTING CYLINDER GREASING	41
9.6.4 - CHECKS ON CHROME-PLATED PARTS	41
9.7 - PERIODIC REPLACEMENT OF THE SAFETY COMPONENTS	42
9.8 - MAINTENANCE OPERATIONS	42

10 - INSTRUCTIONS FOR EMERGENCY SITUATIONS	43
10.1 - FIRE	43
11 - TIGHTENING TABLES	44
11.1 - CLASSES OF COARSE PITCH BOLTS	44
11.2 - CLASSES OF FINE PITCH BOLTS	45
11.3 - FITTINGS TIGHTENING TABLE	46
12 - NOTES	47

1 - GENERAL DESCRIPTION

1.1 - PRELIMINARY INFORMATION

This is the instruction manual for use and maintenance of the machine according to:

- Machinery Directive 2006/42/EC and subsequent amendments and additions.
- Statutory instruments 2008 No. 1597.

Do not destroy or modify it and only supplement it with additional files.

Publication:	1099
Issue Date:	April 2025
Part No:	24215.99
Machine WGC:	4000981
Model:	GRAPPLE BUCKET

The manual is valid from serial number: **M1955439**

McConnel Limited

Temeside Works,
Ludlow, SY8 1JL, UK

Telephone number: +44 (0)1584 873131

Website address: <https://www.mcconnel.com>

Email: sales@mcconnel.com

1.2 - TRAINING REQUIRED FOR THE OPERATOR

Read this manual thoroughly:

- All machine maintenance personnel must read this entire manual thoroughly and pay maximum attention to its requirements.
- The employer has an obligation to ensure that the operator possesses the required abilities to operate the machine, and that they have read this manual.

1.3 - WARNINGS ON USE AND STORAGE

The operating instructions contained in this manual are valid exclusively for the McConnel machine, model: **GRAPPLE BUCKET**.

The instruction manual must be read and used as follows:

- Carefully read the instruction manual and consider it an integral part of the machine;
- The instruction manual must be readily accessible by the personnel assigned to operate it and to perform maintenance on it;
- This manual should be kept for the entire service life of the machine;
- Make sure that any received update is incorporated into the text;
- Pass on the manual to any other user or subsequent owner of the machine;
- Use the manual in such a way as not to damage it;
- Do not remove, tear out or rewrite parts of the manual for any reason;
- Store the manual in areas protected from moisture and heat;
- If the manual is lost or partially damaged and it is no longer possible to read its contents either partially/completely, it is advisable to request a new manual from the manufacturer.

Pay maximum attention to the following symbols and to their meanings. They serve to highlight particular information such as:

WARNING



With reference to additions or suggestions for the correct use of the machine.

ATTENTION



With reference to dangerous situations that can occur when using the machine and which could cause severe injury to people or damage to property.

DANGER



With reference to dangerous situations that can occur when using the machine and which could cause severe injury or death if not avoided.

1.4 - INTRODUCTION

The service instructions outlined in this manual represent an integral part of the machine supply contract.

These instructions are also addressed to operators already specifically trained to operate this kind of machinery and contain all the information necessary and essential for safe operation and for the correct/optimal use of the machine. Rushed and incomplete preparations lead to improvisation, which is the cause of many accidents.

Before starting work, carefully read and thoroughly follow the following suggestions:

- Become familiar confident with all permissible operations and operating positions before starting to operate the machine;
- The operator must always have the instruction manual available at all times;
- Plan each intervention carefully;
- Obtain all the information necessary for machine road transport, such as distance, itinerary, height of level crossings, height of bridges, etc.;
- Know in detail where and how the machine is expected to be used: ground capacity;
- Before starting work, ensure that the safety devices are working correctly and that there is no uncertainty regarding their operation; otherwise, do not use the machine under any circumstances whatsoever;
- Carefully read the warnings relating to special hazards contained in this manual;
- Constant and thorough preventive maintenance always guarantees high operational safety of the machine. Never put off necessary repairs and ensure they are performed exclusively by specialised personnel, using only original spare parts.

1.4.1 - UPDATING THE MANUAL

The information, descriptions and illustrations contained in this manual reflect the state of the art at the time the machine was marketed.

The manufacturer reserves the right to make changes to the machines at any time for technical or commercial reasons. In the event that such changes are made, the manufacturer has no obligation (for safety reasons) to modify the other machines sold up to that point or to send updates for the manual. Moreover, this publication shall not be considered inadequate. Any additions that the manufacturer deems appropriate to issue for changes made must be kept with this manual.

1.4.2 - COPYRIGHT

The copyright of this manual belongs to the machine manufacturer. This manual contains technical texts, drawings and illustrations which cannot be disclosed or transferred to third parties, in whole or in part, without the written authorisation of the machine manufacturer.

1.5 - WARRANTIES

The parts supplied by McConnel are covered by a 12-month warranty, that becomes valid upon commissioning, proven by the documentation delivered to the customer. In any case, refer to the machine order confirmation or specific agreements entered into during the sale.

McConnel shall repair, or replace, parts recognised as defective during the warranty period.

By replacing the defective part, McConnel shall consider itself free from any other expenses borne by the Dealer and the Dealer's Customer, for instance alleged damage, either present or future, such as lost earnings, conventional penalties, etc.

Ordinary and extraordinary maintenance must be performed in accordance with the instructions contained in this manual. McConnel shall not be held responsible for any damage or malfunctions due to technical operations carried out on the machine by unauthorised personnel.

1.6 - RESPONSIBILITIES

McConnel considers itself exempted from all liability and obligations for accidents involving personal injuries or damage to property which may occur due to:

- Failure to observe the instructions given in this manual to run, operate and perform maintenance on the machine;
- Abrupt actions or incorrect manoeuvres when operating or performing maintenance on the machine;
- Modifications made to the machine without prior written authorisation from McConnel;
- Any other events that cannot be considered normal and/or incorrect use of the machine.

In any case, whenever the user blames the accident on a defect of the machine, it is necessary to prove that the consequent damage was a main and direct consequence of such defect.

Any tampering or the use of non-original spare parts will create the conditions for voiding the warranty and put the operator's safety at risk.

ATTENTION



- **For repairs or maintenance always use genuine spare parts.**
- **McConnel declines all liability for any damage that may be caused as a result of non-compliance with the above.**
- **The machine is guaranteed according to the contractual agreements entered into upon sale.**
- **The warranty will not apply if the rules and instructions of use contained in this manual have not been complied with.**

1.7 - PERMITTED USES

The hydraulically operated GRAPPLE BUCKET is ideal attachment for handling waste or other bulk plant material, the grapple 'holds' the material in the bucket to prevent it from falling out.

Use of this equipment for any other purpose is forbidden, the manufacturer declines any responsibility for any damage to persons, property or to the equipment itself that might derive from inappropriate use. The equipment does not have its own lighting; should it be necessary to use it at night or in conditions of reduced visibility, a suitable lighting system that ensures a visibility of at least 50 metres must be provided. This machine is should normally be used during the day; if exceptional night use is required or in conditions of reduced visibility, it must be used with an auxiliary lighting system. Operate in daylight or with artificial lights which guarantee a visibility of at least 100 metres.

1.8 - IMPROPER OR PROHIBITED USES

ATTENTION



This paragraph states some examples of improper or unauthorised uses. It is impossible to predict all examples of improper uses; where doubt exists regarding a particular task consult McConnell or your local dealer before attempting the task.

The following uses are strictly forbidden:

- Use of the machine by minors, inexperienced, untrained or unlicensed persons;
- Use of the machine to lift and/or to transport persons or property;
- Use of the equipment as a pile driver;
- Use of the machine to tow damaged vehicles;
- Lifting or pulling tilted loads;
- Putting the machine into contact with accessories or equipment classified as dangerous due to their chemical or physical properties (e.g. materials which are flammable, toxic, explosive, etc.);
- Overloading the machine beyond its allowed limits;
- Use of the machine with tools not authorised by McConnell;
- Making changes to the machine (hydraulic, electrical or mechanical);

DANGER



Use of the machine without suitable protections can be dangerous both for the operator and for persons or animals within the operating range of the machine.

Range of action means the distance around the machine that should be clear of animals and/or persons as a hazard may occur.

1.9 - RUNNING-IN AND TESTING OF THE MACHINE

Each machine is carefully adjusted and tested before delivery.

A new machine must however be used with caution for the first 100 hours for the purpose of the efficient running-in of the various components.

If the machine is subjected to an excessive workload during the initial phase of operation, its potential performance will be prematurely compromised and its functionality reduced in a short period of time.

1.10 - FOR YOUR SAFETY

- Do not remove the safety guards when the bucket and/or accessories are moving
- While the bucket is being operated, it is advisable to keep at a safe distance of 50 metres and check that there are no persons and/or animals within the danger range of the machine. In such case, immediately stop the machine functions.
- Before carrying out any work on the bucket, such as cleaning or maintenance operations, stop the Robocut engine.
- Do not carry persons or animals on the machine during transport or work.
- When the bucket is moving, do not attempt to introduce or remove material with any tools, especially with your hands or feet.

ATTENTION



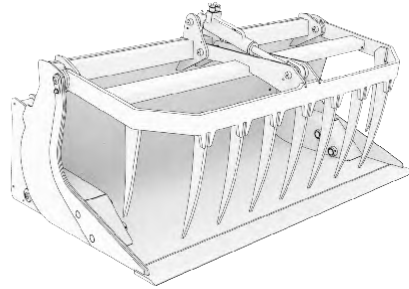
- **Stickers are applied to the machine to ensure safer use. It is therefore very important to replace them if they are no longer legible.**
- **The operator must not be an occasional one, they must be experienced with this type of machine and fully trained in its use.**
- **If the direct view of the work area from the driving position is not sufficient, the operator must be assisted by an expressly appointed person.**
- **The person assisting the activity must always stand to the side of the machine and NEVER in front or behind it in order to be protected and at a safe distance.**
- **Check daily the integrity and functionality of all parts subject to wear resulting from use: (pins, valves, piping etc.). Where necessary, replace any worn parts with original components.**
- **Never, under any circumstances, tamper with the hydraulic system or remove the seals from the valves as this would invalidate the warranty. For valve adjustments, contact an authorised McConnel workshop.**

2 - MACHINE SPECIFICATIONS

2.1 - MACHINE DESCRIPTION

The GRAPPLE BUCKET is ideal for handling waste or other bulk plant material, it is designed to hold the materials within the bucket to prevent it from falling out.

Use of the bucket for any processes other than those stated and not in accordance with what is described in this manual, exempts McConnell from any direct and/or indirect responsibility.



2.2 - RULES APPLIED

This equipment is designed and built in compliance with the EC directives on safety and with the approximation of the laws of the member States, specifically with the Machinery Directive 2006/42/EC to the extent applicable.

The following standards were also taken into account in the design:

- UNI EN ISO 12100:2010 "machinery safety";

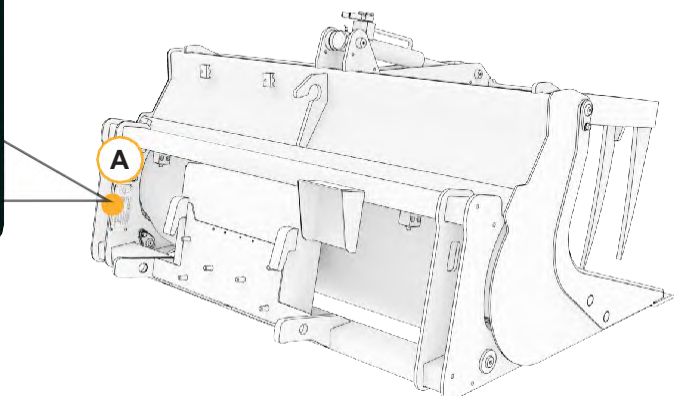
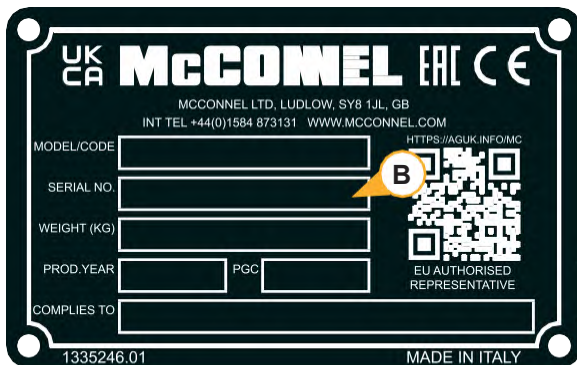
The following technical specifications were used to update the equipment:

- ISO 3767-1:2016;
- ISO 11684:1995.
- ISO 3864-3:2012

2.3 - IDENTIFICATION OF THE EQUIPMENT

The identification plate (A) is located on the side at the back of the frame.

The serial number (B) and operating hours should be stated when requesting service or ordering replacement parts.

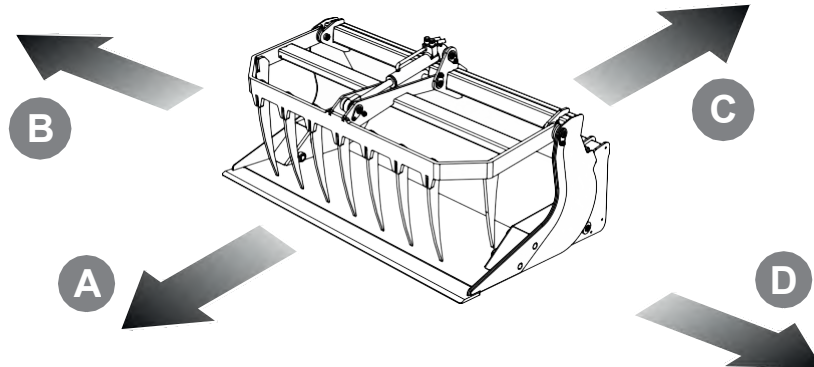


WARNING

The serial number and year of manufacture should always be stated in assistance requests and spare parts orders.

2.3.1 - DEFINITION OF THE DIRECTIONS OF THE EQUIPMENT

Left or right relates to the driving direction of the machinery.



- A** Forward (work direction)
- B** Right side
- C** Back
- D** Left side

2.4 - NOISE LEVEL

For the sound levels refer to the operation manual of the machine this equipment is mounted on.

3 - SAFETY REQUIREMENTS

3.1 - GENERAL SAFETY RULES

3.1.1 - GETTING TO KNOW THE MACHINE THOROUGHLY

The machine must be used only by qualified personnel, who must be familiar with the location and function of all its controls and components.

3.1.2 - WEAR PROTECTIVE CLOTHING

Wear tight fitting clothing and use personal protective equipment in accordance with current regulations. In particular, the following items are recommended:

- Noise protection headphones;
- Safety footwear;
- Overalls;
- Work gloves.



During use, the machine may produce dust emissions. If working with dusty materials and/or in dusty conditions, it is advisable to use the following protective equipment:

- Eye protection goggles;
- Respiratory dust masks.

3.1.3 - WARNINGS FOR CHECKS AND MAINTENANCE

When the machine is under maintenance:

- Remove the ignition key from machinery before carrying out any maintenance or checks;
- Clearly display a sign on the machine which reads, "DO NOT START THE ENGINE".
- Limit the area with road cones;
- When performing maintenance, be sure to first check which operations are to be performed;
- In the event of extraordinary maintenance involving lifting the machine or parts of it, the machine must be taken to a workshop which is suitably equipped with appropriate lifting devices;
- During routine maintenance, the bucket should be lowered and placed on firm level ground.

3.1.4 - INSPECTION OF THE MACHINE

- Carefully check the machine every day before use, checking the integrity and functionality of the parts affected by wear and tear deriving from use: (pins, valves, piping etc.). Where necessary, replace worn or defective items using original replacement parts.
- Only start an engine in well-ventilated areas and make sure that there are no persons within the operating range of the machinery.
- Covers and safety elements must not be removed. They are designed and built for your safety.
- Do not use the machine if the protective devices or covers are damaged or missing.
- After cleaning or repair any protective devices removed must be replaced before use.
- Always keep the machine and its accessories good clean condition, remove shredded materials and/or material deposits from the machinery after use.

ATTENTION



- **It is strictly forbidden to make changes to the machine without prior authorisation from the manufacturer.**
- **Changes to the machine can cause hazards and injuries.**
- **If these instructions are not observed, the manufacturer assumes no responsibility for the machine.**

***Range of action** means the distance around the machine that should be free from animals and/or persons as a hazard may occur.*

3.2 - GENERAL PRECAUTIONS

- The operator must never be an occasional user, they must have experience with operating this type of machine.
- 'Operator' refers to a person trained to work with these types of machines and/or equipment.
- It is mandatory to read and follow the instructions given in the use and maintenance manual before performing any operation or manoeuvre with the machine. It is too late to do so while working. Improper use or an incorrect manoeuvre can result in serious damage to people or property;
- The operators and maintenance technicians must be familiar with the machine, in particular they must know the dangers that can result from incorrect use or incorrect repairs;
- If the direct view of the work area from the driving position is not sufficient, the operator must be assisted by an expressly appointed person.
- Before starting the machine, carry out all checks on the self-propelled vehicle and tool concerning:
 1. Operation;
 2. Road safety;
 3. Accident prevention regulations;
 4. Safety precautions.
- Even when using the machine correctly, stones or other objects can be ejected from the machine, **persons and animals must remain at a safe distance from the working machine at all times.**
- Pay close attention when working near roads or buildings;
- Before starting the work, always check the integrity of the tools and guards; if damaged or missing, they must be replaced before using the machine;
- Make sure that nobody can involuntarily start the machine during checks and repairs.
- Do not wear loose clothing;
- Never lift people with the bucket;
- Never work, walk or stand under the bucket;
- Never carry people on the bucket;
- Never stand near the equipment until it is completely still or stopped;
- Before each operation, check persons and/or animals are a safe distance from the machinery;

- Before leaving the machine, proceed as follows:
 1. Inhibit all functions;
 2. Park the machine safely;
 3. Turn engine off and remove the ignition key.
- Replace any missing, damaged or illegible safety warning decals immediately;
- Never underestimate or ignore safety regulations;
- If the safety devices are not working, replace them immediately.

3.2.1 - SAFETY WARNINGS

The machine has been designed and built according to the current regulations. The laws, dispositions, prescriptions, ordinances and directives in effect for such machines have been observed.

The materials used for the equipment parts, as well as the production procedures, quality guarantee and checks meet the highest safety and reliability standards.

Only use the machine for the purposes specified in this manual, manoeuvre it with the due diligence and carry out accurate maintenance and repairs as envisaged to obtain the highest performance, continuous operation and ensure a long lifespan of the machine.

When operating in public spaces, respect all laws and regulation for the country of use.

3.2.2 - SAFETY REQUIREMENTS FOR ROAD TRAFFIC CIRCULATION

The manufacturer shall not be held responsible for any accidents, while using the equipment, if the user does not to comply with all laws and regulations.

The equipment is designed for use in normal weather conditions at temperatures from -10 C° to +40 C°, therefore it should operate only under such environmental conditions.

3.2.3 - OPERATIONAL SAFETY

The manufacturer shall not be held responsible in case of malfunction and damage if the machine:

- is used for purposes other than those for which it was intended;
- is not manoeuvred and maintained according to the service instructions specified in the manual;
- does not periodically and constantly undergo maintenance as prescribed or non-original replacement parts are used;
- is modified or altered without written authorisation from the manufacturer, especially when the effectiveness of the safety systems has been intentionally reduced or eliminated;
- is used outside the authorised temperature range and the purposes for which it was designed;

The machine user is responsible for all property damage or personal injuries caused by the machine's operation.

3.2.4 - SAFETY RULES WHEN USING THE MACHINE

- When working, be very careful not to come into contact with resistant objects, such as manholes, wells, pavements, guardrails, railway lines, stony ground, etc. This could cause the tools to break, and they could be dangerously projected at very high speed.
- Do not continue to use the bucket in the presence of vibrations which could lead to a breakage and serious damage. Ascertain the cause of such a problem and eliminate it.
- It is forbidden to intervene for maintenance, cleaning, adjustments or similar actions with the machine in motion, on any part of it or on the interchangeable equipment connected to it. Any maintenance, cleaning or adjustment must be carried out strictly with the engine switched off.
- During operation, pay attention to electrical cables, especially if you need to pass under them, as you could lose the Robocut radio signal. In these cases, the machine immediately switches off the engine and stops.

If a danger situation is perceived use the emergency stop button on the machine and/or on the remote control to halt the Robocut immediately.

The two emergency buttons, however, do not have the same function: the one on the remote control is used to interrupt all the functions of the machine while keeping the engine on; the one on the machine, in addition to interrupting all the functions of the machine, also turns off the engine.

DANGER



If there is a danger that requires the entire machine to be turned off, operate with the emergency button on the remote control and then turn off the engine or operate the emergency stop button on the machine directly.

3.2.5 - HYDRAULIC SYSTEM SAFETY REQUIREMENTS

- Stop immediately if you notice oil leaks.
- Periodically check the hoses. Replace immediately if they are worn or damaged.
- Before working on the hydraulic system use a suitable container to catch spilt oil.
- Dispose of oils and greases in compliance with environmental rules and regulations.
- Do not tamper with the hydraulic system for any reason and never remove the seal on the valves; this would invalidate any form of warranty. To adjust the valves, contact an authorised workshop.
- Excessive heating of the oil causes damage to the gaskets of the hydraulic circuit and deterioration of the fluid itself. For this reason, avoid extended operation of the hydraulic rams at the end of the stroke.

WARNING



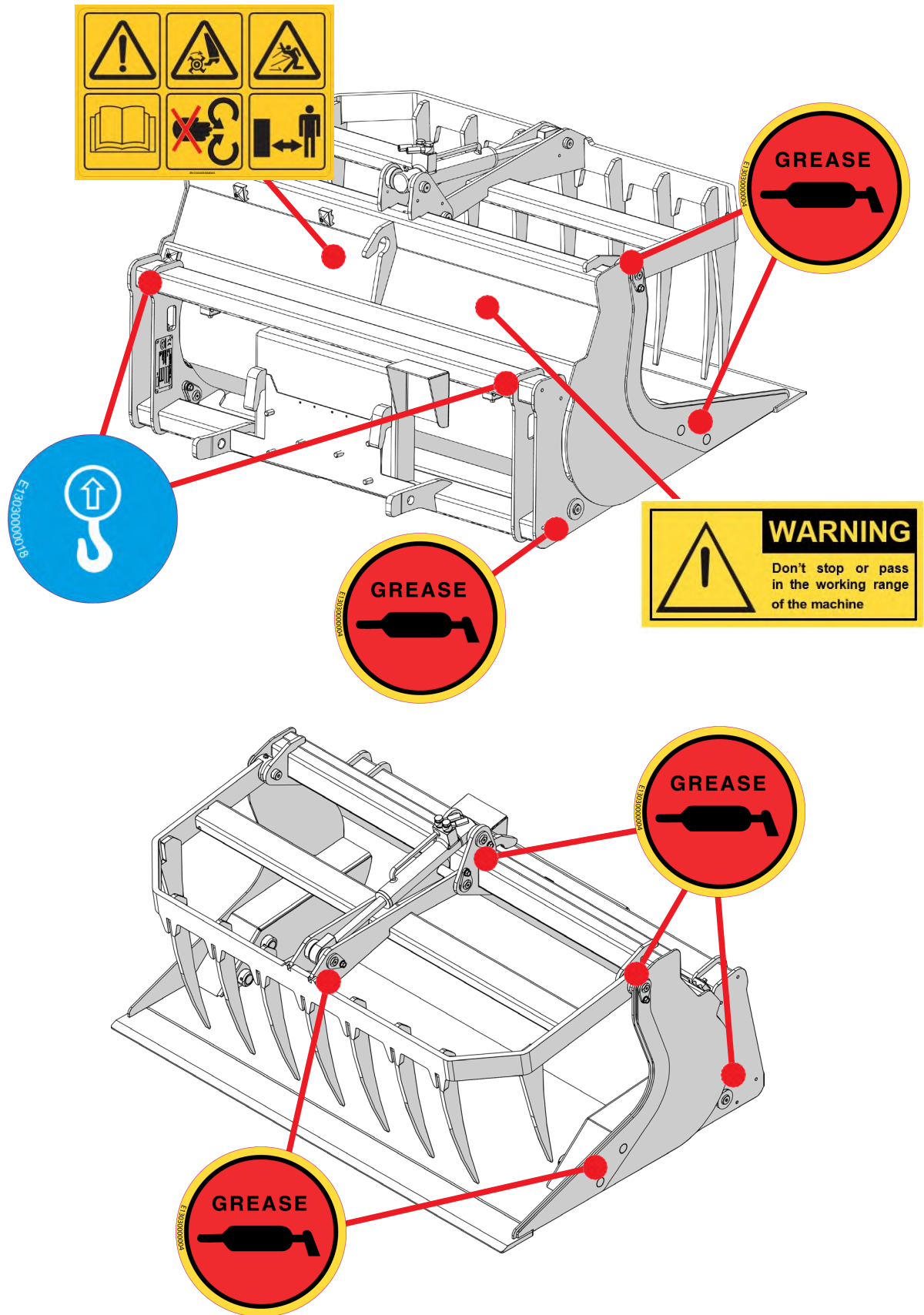
- **Never search for oil leaks with bare hands or other body parts; use paper or cloths to locate the leak.**
- **Always wear waterproof safety gloves and goggles.**
- **Wait until the oil has cooled before intervening.**
- **Discharge the oil pressure before disconnecting the hoses or when performing maintenance on the system.**
- **High pressure oil may penetrate the skin and cause serious infections; in such case seek medical attention immediately.**
- **These operations must be carried out by authorised and adequately trained personnel.**

ATTENTION



**Replace hydraulic hoses immediately if they are worn or damaged.
Replace hoses that are older than 6 years.**

3.2.6 - LOCATION OF THE SAFETY DECALS



3.2.7 - DESCRIPTION OF THE SAFETY SIGNS

WARNING



Ensure safety decals are kept in a clean readable condition. If safety decals are missing, damaged, or illegible they must be replaced immediately with original replacement decals that can be requested free of charge from McConnell. Replace the decals in the position indicated in the manual. Clean them using a damp cloth with soap and water.

Warning decal

Read the manual before using the machine.

Warning signal – Rotating Tools

Danger of injury to lower or upper limbs.

Ensure the machine is stopped during maintenance operations and keep at a safe distance when machine is working.



Danger - Flying objects risk

Indicates the possibility of stones or other projectiles being ejected from the machine.

Remain at a safe distance when machine is working.

Lifting point decal

Identifies the lifting points of the machine.



Greasing point decal

Identifies the greasing points of the machine.

Refer to this manual for greasing information.



Warning decal

Do not stand or transit within the range of the Machine when it is working.



3.3 - SAFETY PRECAUTIONS FOR MAINTENANCE

3.3.1 - CARE AND MAINTENANCE

The cause of the majority of damage and accidents can be attributed to mistakes or insufficient maintenance, such as:

1. Insufficient oil, grease;
 2. Insufficient cleaning;
 3. Failure in the hydraulic system (damaged hoses, loose screws, etc.);
 4. Inaccurate maintenance or alterations of the systems without permission.
 5. Work on stony terrain or materials that can be projected at high speed.
- Please note that all maintenance operations must be carried out by qualified and trained personnel, with the machine switched off.
 - Maintenance and repairs should be performed in a suitably equipped workshop.
 - The operator must wear appropriate Personal Protective Equipment (PPE) during use, adjustment, maintenance, repair and handling of the machine.
 - Used oil must be properly recovered and disposed of in accordance with current legislation; it is classified as hazardous waste and as such must be taken to an appropriate waste collection centre approved to handle used oil.

Before starting any maintenance, the following operations must be carried out:

- During maintenance operations, the equipment must be placed on flat, solid ground.
- Turn off the machine motor and remove the ignition key.
- Set up all the forms of accident prevention envisaged for the type of operation in progress.
- If compressed air is used to clean the equipment, it is necessary to protect yourself with appropriate safety glasses and dust mask.
- Do not perform any repairs with which you are not familiar. Always follow the instructions and, in the absence of these, contact the machine supplier or a suitable expert.
- Before any maintenance operation, make sure that the parts which can get hot are cold.
- Attention: replace the hydraulic hoses whenever they are damaged and, in any case, always within and no later than every 6 years.
- Only use the dedicated lifting points on the machine.
- Make sure that the lifting equipment selected is suitable for the operations to be carried out and complies with safety regulations.
- Before carrying out operations under suspended parts or with the machine raised from the ground, secure the machine using suitable adequate supports or trestles that can support the weight of the specific part or machine.
- Do not keep an engine running in closed places without a suitable ventilation system to dispose of harmful exhaust gases that concentrate in the air.
- Avoid prolonged and repeated skin contact with fuels, lubricants, fluids as they can lead to skin disorders and/or health issues.
- Do not ingest any fuel, lubricant or fluid. In the event of accidental contact with the eyes, wash the affected area with plenty of water.
- Do not perform any welding in a closed or inadequately ventilated space.
- Do not perform any welding on painted surfaces, or near painted surfaces, to avoid toxic vapours from being generated. Remove paint with suitable products then wash the surfaces and leave them to dry.
- Discharge the pressure from hydraulic circuits before carrying out any intervention.
- Do not use your hands to locate leaks of pressurised fluids. Leaks of fluids under pressure can penetrate the skin and the eyes with extremely serious consequences.

The interventions described in the following points do not require any specialisation. The operator must be aware of, and follow, the instructions precisely and must have put the equipment out of service.

- Periodic checks and maintenance operations must be carried out at the times and in the manner established and are the operator's responsibility.
- Failing to observe the standards and timing for maintenance threatens the proper operation of the machine and its lifespan and consequently invalidates the warranty.
- Intensify the frequency of maintenance in severe operating conditions (frequent stops and starts, prolonged winter season, etc.).
- Never leave the operating position of the machine with the machine switched on.
- **ATTENTION:** Due to vibrations, regularly check that all screw connections are firmly tightened. This check should be performed for the first time after 8 hours of operation. Make sure that the bucket and bolts are tight.
- If for any reason the bucket starts to vibrate, immediately stop the machine and restore balance; McConnell declines all responsibility relating to persons or property caused by an operator's negligence.
- Clean the machine after use. Do not use petrol or solvent-based products to clean the machine. Do not clean electrical parts with water under pressure.
- During operation, especially in the presence of wind, the user must choose their position carefully so as not to be exposed to exhaust fumes or dust.
- Do not operate the equipment if you are unable to fully see it (behind ridges, round corners of buildings, in tall grass etc...).

3.3.2 - WARNING PLATES

Before performing any maintenance operation, park the machine on a firm level site, lay the equipment on the ground and stop the engine. If other people start the engine and use the control levers while maintenance is being performed there is a risk of serious injuries or death. To avoid these dangers, before carrying out the maintenance, put the remote control in a safe position, remove its battery and hang a warning sign on the machine.



3.3.3 - TOOLS

Only use tools specified by the manufacturer to avoid injuries that can be caused by failure of poor quality or unsuitable parts. Discard worn or damaged, poor quality or improvised tools.

3.3.4 - PERSONNEL

The routine maintenance indicated in the manual must be carried out exclusively by authorised and trained personnel. To perform maintenance on or service components not specified in this manual, please contact McConnel or your local dealer.

3.3.5 - KEEP THE EQUIPMENT CLEAN

Cleaning the bucket is an integral part of the machine's routine maintenance and is an essential activity to check the condition of the machine.

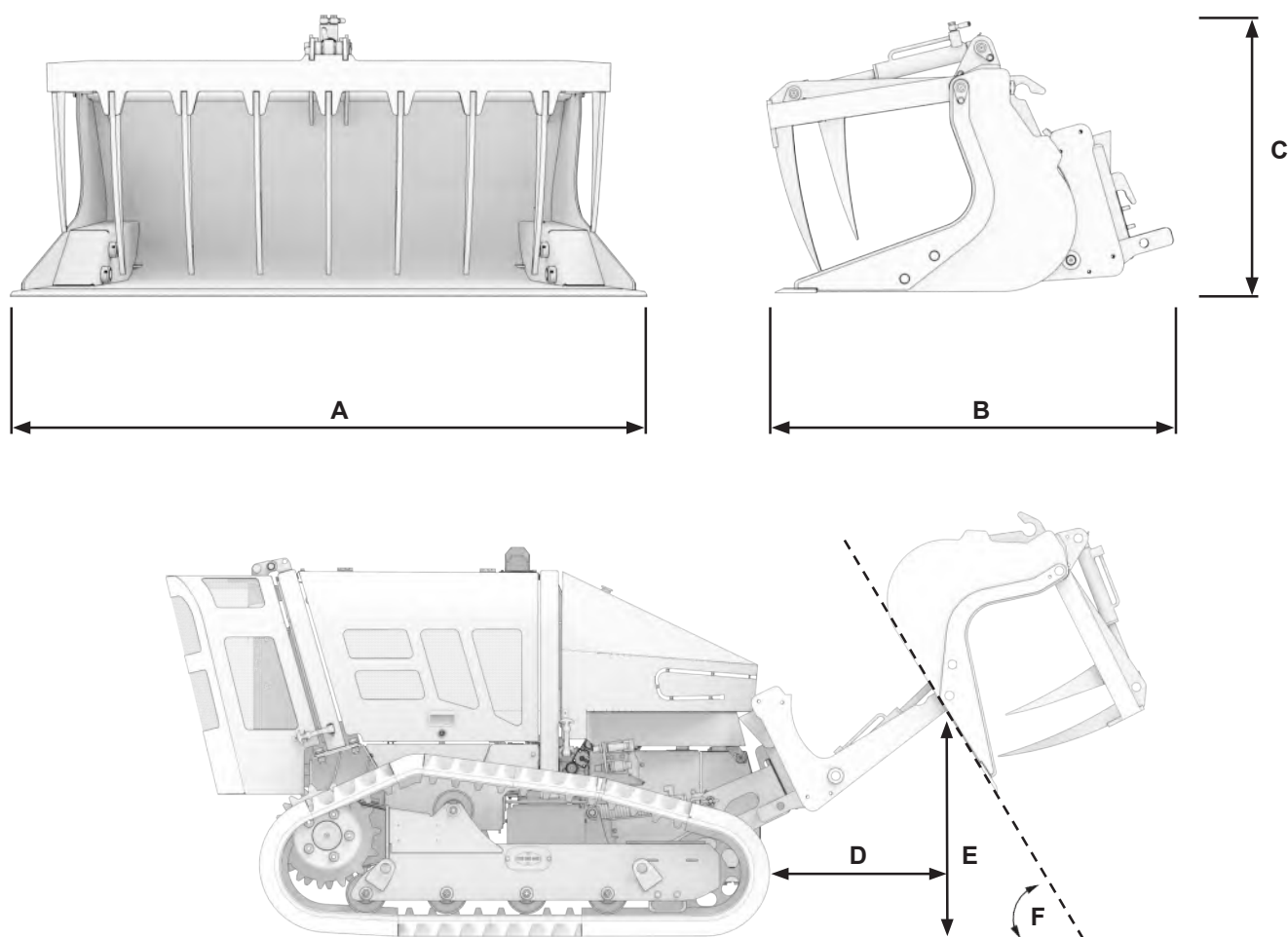
3.3.6 - PERIODIC REPLACEMENT OF ESSENTIAL SAFETY COMPONENTS

Periodically check the following components:

- Carefully check the efficiency and cleanliness of the quick coupling devices supplied with the machine.
- Even if they appear to be in good condition, these components must be replaced periodically with new parts, these components tend to deteriorate over time.
- In the event that one or more parts are faulty, replace or repair them immediately.

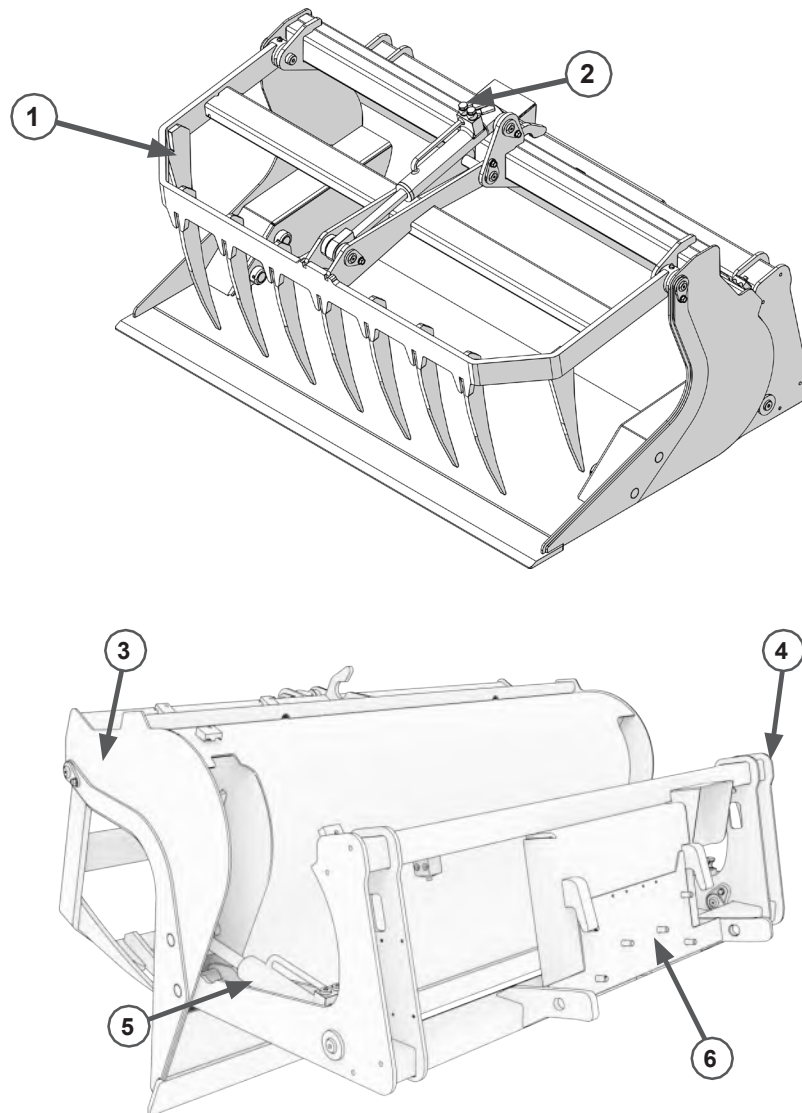
4 - TECHNICAL DATA

4.1 - DIMENSIONS AND WEIGHTS



GRAPPLE BUCKET		
WIDTH	A	1300mm
DEPTH	B	930mm
HEIGHT	C	680mm
UNLOADING DISTANCE	D	690mm
UNLOADING HEIGHT	E	530mm
TILTING ANGLE	F	53°
WEIGHT		250kg
LIFTABLE LOAD		300kg
SHOVEL VOLUME		0.22m ³

4.2 - MACHINE COMPONENTS



No.	DESCRIPTION	No.	DESCRIPTION
1	Grapple	4	Chassis
2	Grapple cylinder	5	Tilting bucket cylinders
3	Tilting bucket	6	Equipment attachment

5 - TERMINOLOGY

5.1 - DEFINITION OF THE TERMS USED

OPERATOR

Personnel trained to manoeuvre the machine to perform work, movement and trained to carry out ordinary checks and cleaning on the machine.

Must be physically fit and do not suffer from any kind of health problems.

SPECIALISED OR MAINTENANCE PERSONNEL

Personnel responsible for carrying out routine maintenance, assembly, disassembly and reassembly of some machine components.

Must be physically fit and do not suffer from any kind of health problems.

AUTHORISED PERSONNEL

Personnel trained to carry out extraordinary maintenance operations, assembly, disassembly and reassembly of machine components.

Must be authorised by McConnel to intervene on the machine.

Must be physically fit and do not suffer from any kind of health problems.

OPERATOR ASSISTANT

Personnel assigned to assist the operator in some machine manoeuvres (manoeuvres on site with reduced visibility, loading and unloading from means of transport, manual pump operation, etc.), assisting with the activities in the mobile site (operations on public roads).

Must know the main work safety requirements.

AUTHORISED WORKSHOP

Workshop consisting of personnel assigned to performing operations of extraordinary maintenance, assembly, disassembly and reassembly of particular components of the machine.

Must be authorised by McConnel to intervene on the machine.

The operator is invited to refer to the Standard EN 12100-2010 for the definition of the other terms used.

6 - USE OF THE MACHINE

6.1 - PRELIMINARY CHECKS

The operator must verify that the equipment is accompanied by an Operation Manual.

In case of resale as a "second-hand machine" the owner/seller must provide the buyer with a readable complete copy of the Operation Manual.

6.2 - CHECKS BEFORE THE START OF EACH WORKING DAY

Carry out an external inspection of the machine (joints, pipes, hydraulic components, etc.) and check if oil or other liquids are leaking.

Check the rubber hoses of the machine and make sure there are no cuts, holes, scratches, leakages, etc.

Check that the safety guards are correctly positioned and intact. If they are damaged, replace them. If they are incorrectly positioned, arrange them appropriately.

WARNING



Never search for oil leaks with bare hands or other body parts; use paper or cloths to locate the leak. Always wear waterproof gloves and eye protection.



6.3 - CONNECTING THE EQUIPMENT

DANGER

- When coupling or uncoupling equipment, stand at the side of the machine away from the equipment (at least one metre away).
- Before connecting the quick fit attachments, the equipment must be connected to the machine mechanically.
- The hydraulic connections must be carried out with the engine switched off.

ATTENTION

- Before making a hydraulic connection between machine and equipment, clean the quick couplings of both parts with a cloth; this prevents risk of the hydraulic oil becoming contaminated with foreign matter.
- Firmly tighten the screw-on hydraulic couplings after hitching the equipment.
- Failure to tighten the quick couplings (even partially) can cause the hydraulic motor of the tool to break and / or the oil seal to be ejected.

ATTENTION

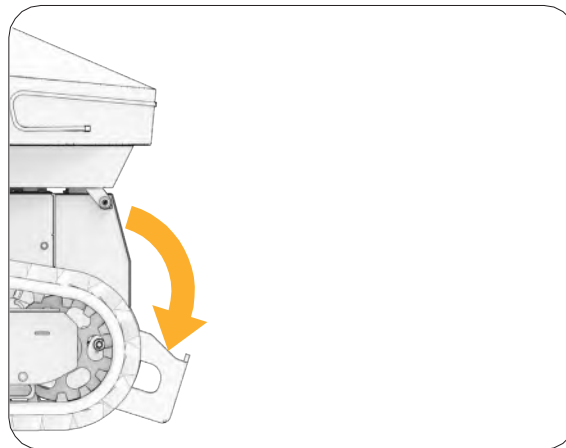
- Read and follow the instructions provided to ensure safety during the use of the equipment moved by the PTO.
- Comply with the indications provided by the equipment manufacturer.
- Use the safety devices prescribed and make sure that they are in good condition.
- Make sure that the equipment is correctly connected and that it does not hit other parts of the machine when raised.

ATTENTION

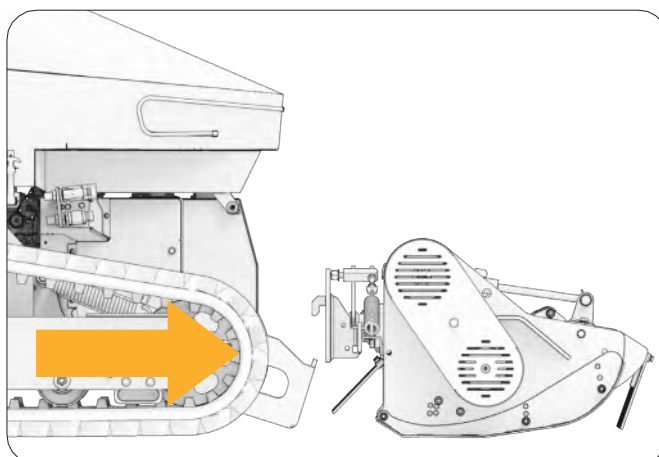
In some cases, the tool change causes the overall centre of gravity to shift which could make the machine unstable. Contact McConnel about adding ballast to correct the machine's centre of gravity.

The machine is fitted with a lifting device on which the various approved tools can be attached. To do this, follow the steps below:

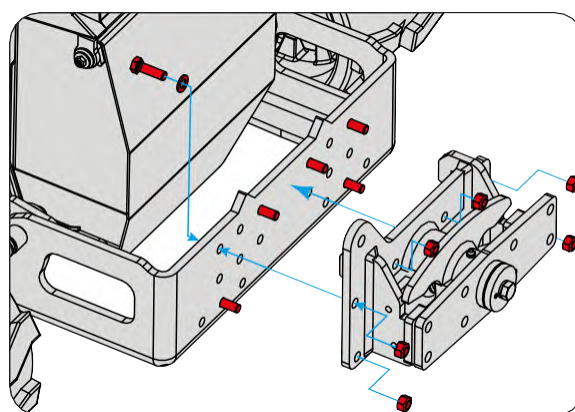
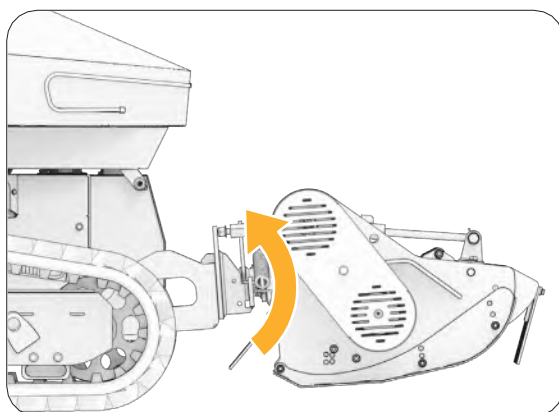
1. Start the diesel engine, and connect with the radio remote control;
2. Lower the lifting device as far as possible using the right-hand joystick (**B**);



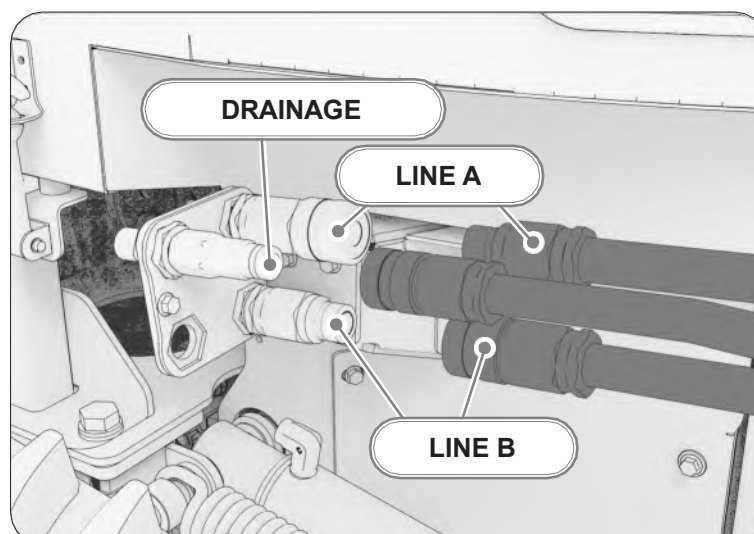
3. Drive machine slowly up to the mounting plate of the equipment you are attaching;



4. Using the right-hand joystick (**B**), raise the lifting device to attach the equipment;
5. Fasten the tool to the support on the machine using six M12 x 40 screws using an 18 mm wrench;
6. Turn off the engine;



7. Connect the hydraulic power lines of the tool to the quick couplings on the right-hand side of the machine; taking care to clean them before making the connection. The outermost coupling is for the drainage line, while the inner two are for lines (**A**) and (**B**).



ATTENTION



When the Grapple Bucket is replacing a Flail Head:

- If the Flail Head is disconnected from the machine and left without an expansion vessel (H), the hydraulic motor gasket may fail.
- McConnel is not responsible for any damage or malfunction if the operator fails to install an expansion vessel to the Flail Head when the head has been removed.
- Expansion vessel connects to the female coupling of the Flail Head drain line.



6.4 - TRANSMITTER UNIT

6.4.1 - LIFTING DEVICE

The lifting device is controlled by the right-hand proportional joystick (B).

- Moving the joystick (B1) forward lowers the lifting device.
- The lifting device is raised by moving the joystick (B2) backwards.

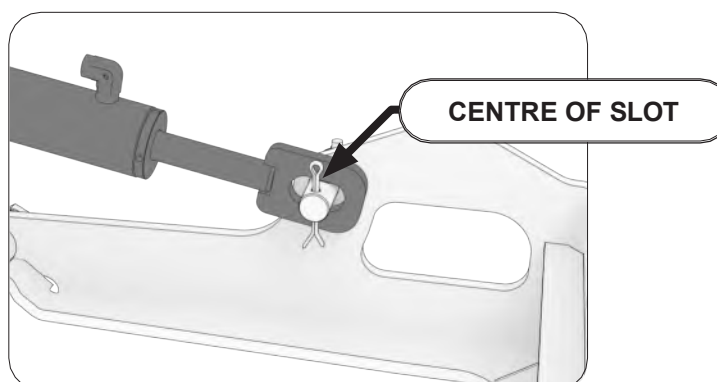


WARNING



FLOATING FUNCTION

Lower the lifting device so that the tool is resting on the ground. Extend the cylinder rod of the lifting device until the pin reaches the centre of the slot; this allows the tool to follow the contour of the ground more accurately.



ATTENTION

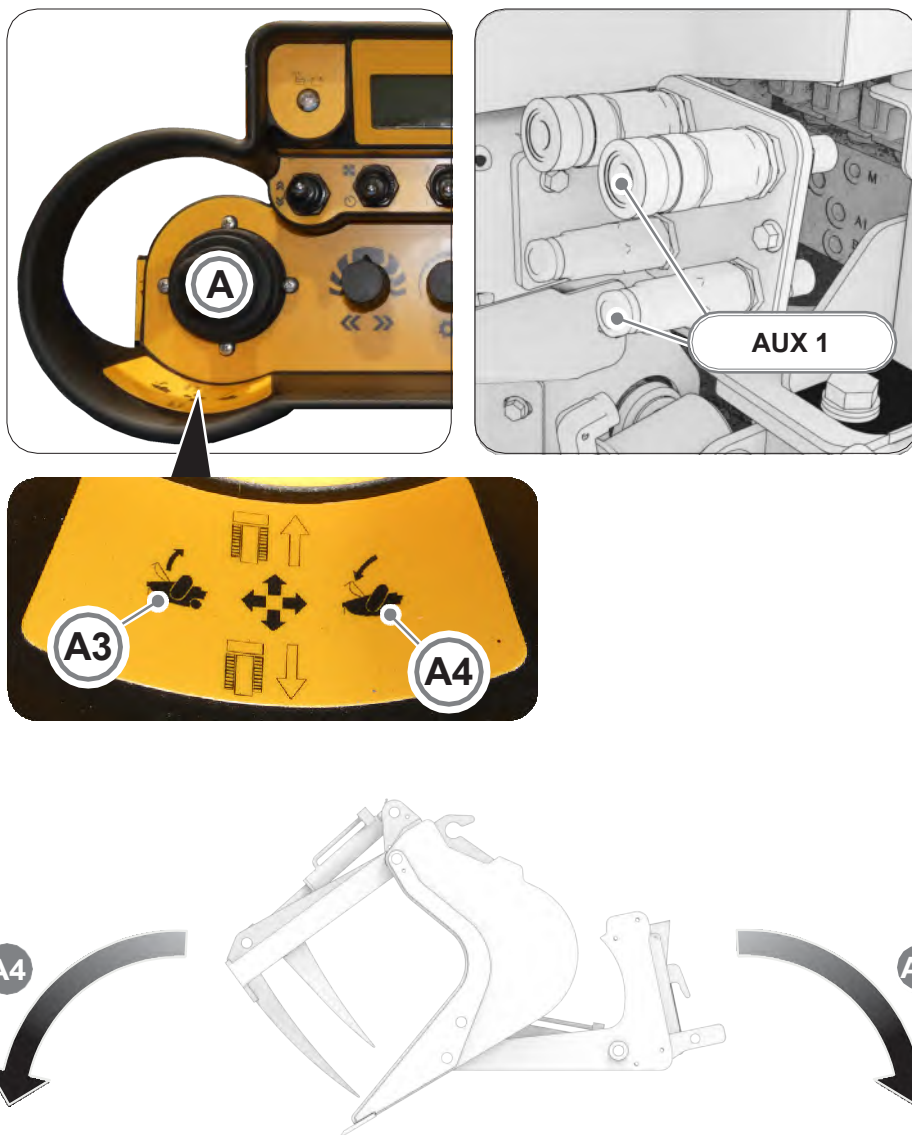


- It is recommended not to adjust the lifting device when the equipment is in operation to prevent cutting residues from being ejected.
- It is recommended not to adjust the lifting device if you are on a slope with the front of the machine facing uphill.

6.4.2 - TILTING / RETURNING THE BUCKET

The auxiliary function (AUX 1) is controlled by the left-hand proportional joystick (A).

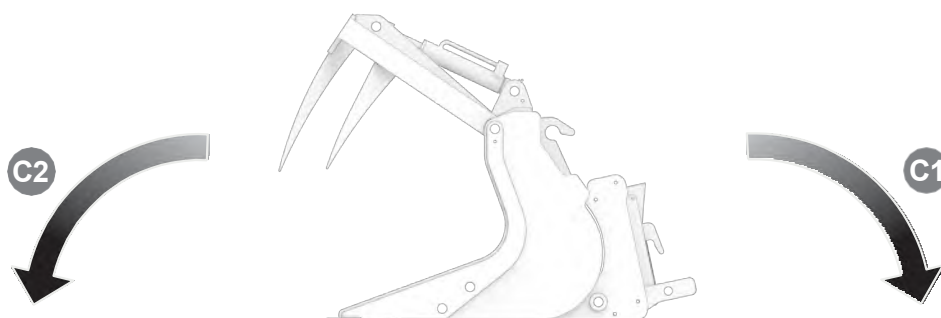
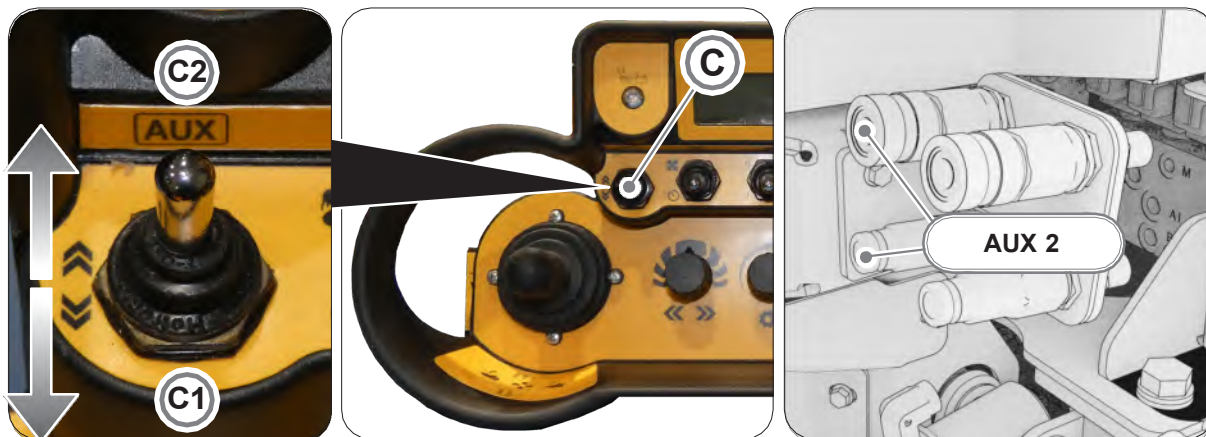
- Move the joystick (A4) to the right to tilt the bucket.
- Move the joystick (A3) to the left to return the bucket.



6.4.3 - OPENING / CLOSING THE GRAPPLE

The translation control (AUX 2) is performed by the selector switch (C).

- Move the selector switch (C1) forward to operate the grapple cylinder, thus opening it.
- Move the selector switch (C2) back to operate the grapple cylinder, thus closing it.



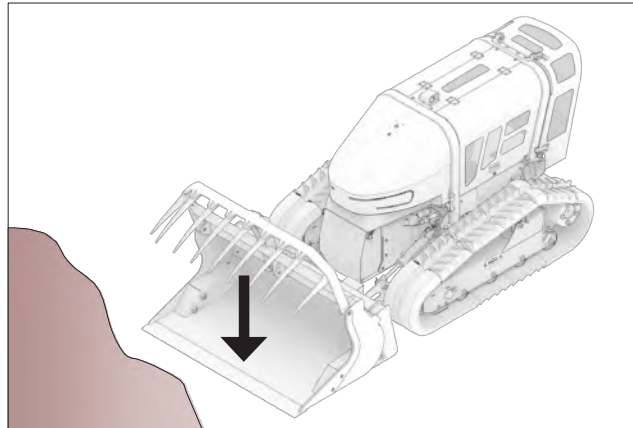
6.5 - USING THE BUCKET

New users should operate the machine slowly and with extreme care until they are fully familiar with the control and operation of the bucket.

Use the manoeuvrability of the shovel. Reduce workspaces as much as possible. Limit the work area to shorten the work cycles.

Keep the work area as flat as possible. Fill the bucket up to its nominal capacity. During transport, keep the bucket as close as possible to the ground. Tilt the bucket and close the grapple while lifting or climbing up a slope; this will prevent material from falling off the bucket.

Do not go up or down slopes transversally. Always go straight up or down slopes with the bucket pointed uphill and as close to the ground as possible to maintain maximum stability.

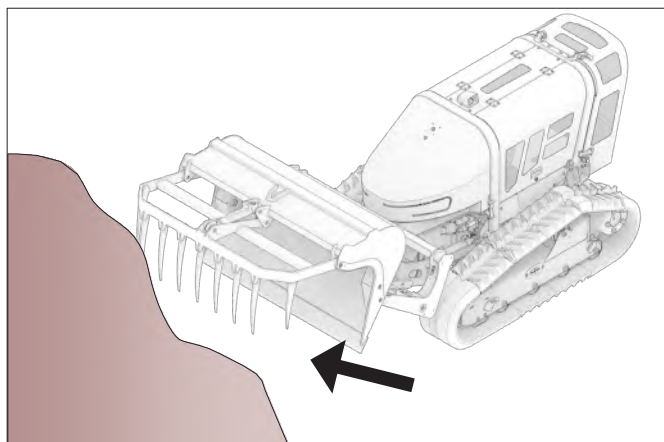


6.5.1 - LOADING FROM PILE

Lower the lifting device completely by operating the joystick (**B**). Lower the bucket cutting edge to the ground by operating the selector switch (**A**). Place the bucket cutting edge on the ground, then open the grapple with the selector switch (**C**).

Let the shovel move forward slowly. As the bucket fills, operate the selector switch (**A**) to lift the front part and raise the lifting device. Operate the joystick (**B**). With the bucket full, close the grapple with the selector switch (**C**) and move away from the pile in reverse.

To unload the bucket, lift the lifting device by operating the joystick (**B**). To prevent the loaded material from falling out of the back of the bucket while it is being lifted, tilt the bucket downwards slightly by operating switch (**A**). When the bucket has reached the height required for it to be unloaded, move the selector switch (**A**), open the grapple with the selector switch (**C**) and unload it.



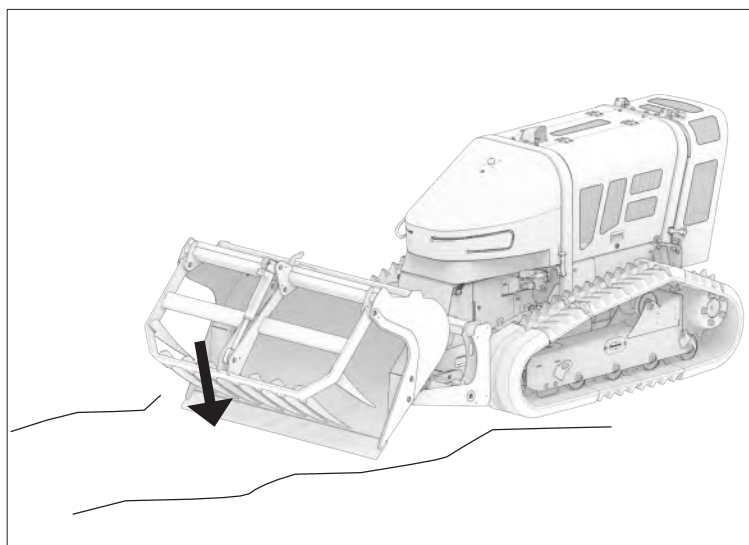
6.5.2 - LEVELLING PROCEDURE

To distribute the load on irregular ground, raise the lifting device by operating the joystick **(B)** and, while moving forwards, tilt the bucket downwards by operating the selector switch **(A)** and open the grapple by operating the selector switch **(C)**.

To level the ground, raise the lifting device and tilt the bucket downwards. Move the joystick **(B)** up and hold it in position to block the lifting device.

The weight of the lifting device and of the bucket will keep the bucket in contact with the ground. Move backwards to level the material.

To fill a hole, approach it slowly with the bucket lowered. As soon as the bucket passes the edge of the hole, unload it, by operating the selector switch **(A)** and open the grapple with the selector switch **(C)**. If necessary, raise the lifting device.



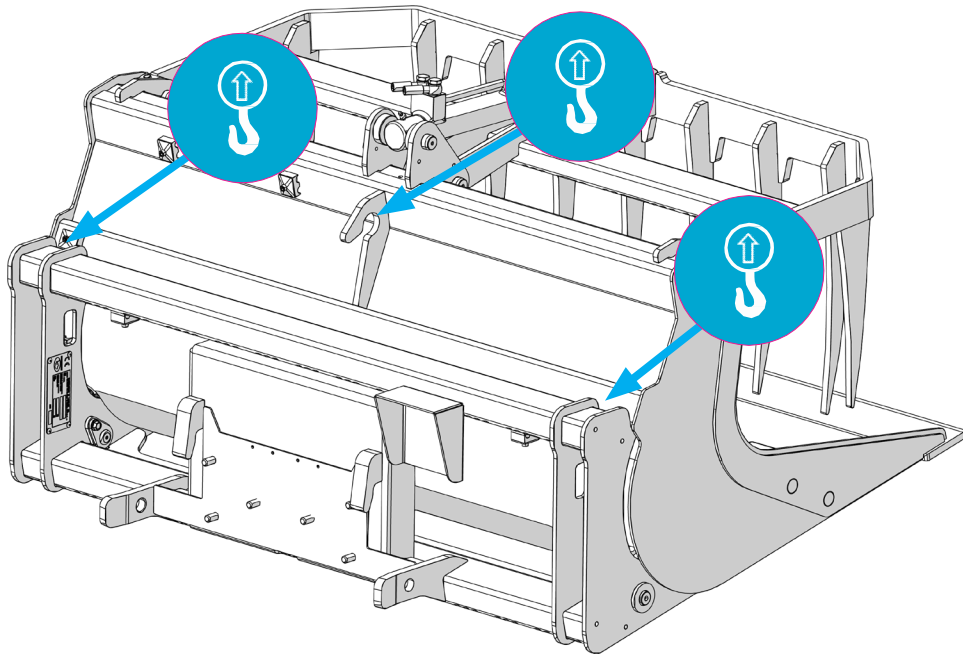
7 - TRANSPORTATION AND HANDLING

7.1 - LIFTING

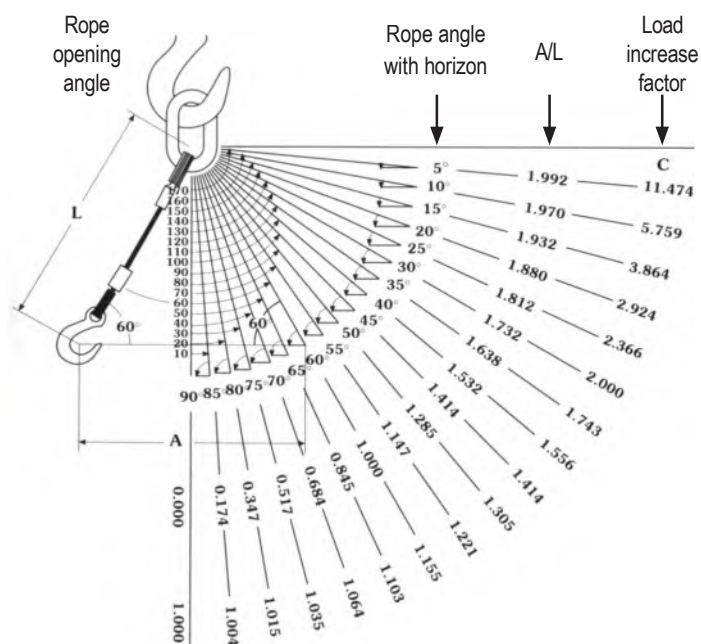
Pay the utmost attention to safety during loading and unloading operations, which should be performed by qualified personnel.

When lifting the bucket use suitable lifting gear and only use the dedicated lifting points indicated by the lift point decals; ensure the unit is balanced and secure during the lifting procedure.

A suitably equipped flatbed vehicle of adequate power and size must be used for transportation of the bucket. The bucket should be carefully placed on the bed of the vehicle and adequately secured using suitable straps, ropes or chains. Ensure the load is stable and secure before transportation.



It should be noted that using ropes, slings or chains for lifting the equipment, it is necessary to comply with the diagram below, indicating the minimum pulling angles.



Apex angle	Load increase factor
0°	1
10°	1,004
20°	1,015
30°	1,035
40°	1,064
50°	1,103
60°	1,155
70°	1,221
80°	1,305
90°	1,414
100°	1,556
110°	1,743
120°	2,000
130°	2,336
140°	2,924
150°	3,864
160°	5,759
170°	11,474

8 - STORAGE

If the equipment is stored for extended periods, it must be stored in a place protected from the elements to prevent damage. Before storage it is advisable to thoroughly clean the equipment and lubricate mechanical parts to prevent rust.

The machine should be stored in a safe location where the temperature remains between 0°C and 40°C.

Prior to storage, the following tasks should be conducted:

- Thoroughly clean the equipment;
- Carry out a full inspection of the equipment to identify structural damage or worn/broken parts; repair and/or replace immediately.
- Check all safety decals are in good legible condition; damaged or unreadable safety decals must be replaced immediately in their original positions.
- Grease all mechanical parts and unpainted components to avoid the formation of rust;
- If possible, store the equipment in a covered area on a hard level surface; ensure it is left in a safe stable condition.

8.1 - FIRST USE OR RE-COMMISSIONING AFTER A LENGTHY PERIOD OF INACTIVITY

Before using the equipment for the first time, or after a long period of inactivity, proceed as follows:

- Check that the equipment is not damaged;
- Check the mechanical parts, which must be in a good condition and not rusty;
- Check the state of wear of the tools;
- Carefully grease all moving parts;
- Check that there are no oil leaks coming from fittings or pipes;
- Check that all the protections are correctly positioned.

8.2 - DISMANTLING, DECOMMISSIONING

- If it is decided to no longer to use the equipment, or any part of it, it must be dismantled and decommissioned.
- Before proceeding with scrapping, it is necessary to separate all the plastic, rubber, and electrical components and dispose of them at an appropriate disposal/recycling centre.
- Collect any waste oil and dispose of it at the appropriate collection centres.
- Carry out these operations according to the regulations in force.

ATTENTION



If the equipment, or part of it, has been put out of service, its parts that are likely to cause any danger must be made harmless.

ATTENTION



It should be remembered that for any replacement of oils, rubber pipes and any part of the equipment subject to separate disposal, it is always necessary to refer to the current legal provisions on the subject. For waste oil disposal contact your local recycling centre or a registered waste oil collection company.

9 - MAINTENANCE

ATTENTION



- During the coupling/uncoupling operations to/from the machine, pay particular attention to the work area between the machine and the equipment. The operation should only be performed by authorised personnel.
- Before starting the machine, make sure that people or animals are at a sufficient distance away from the machine and are not within the area of the operating machine and the attachment.



9.1 - INTRODUCTION

To obtain the machine's best performance and ensure maximum durability of all of its components, the use and maintenance instructions must be followed carefully by the machine operators.

All users must carefully read these instructions and consult the manual any time they need advice on how to eliminate possible problems. As the machine operates normally in contact with water, sand, earth, etc., regular lubrication is necessary, which assumes vital importance not only to ensure lengthy use of the machine, but also to keep down its running costs.

For further information, please contact our service centre:

Contact McConnel Service Department :

Telephone	+44 (0)1584 873131
Email	service@mcconnel.com

9.2 - GENERAL RULES

- Before carrying out any maintenance, checking and/or verification on the equipment, turn off the machine engine and remove the starter key from the machine.
- When disassembling or reassembling parts of the equipment, always use suitable extractors, keys and equipment in order not to damage the specified components.
- To release solidly adhering parts, use wooden mallets.
- Separate the parts of the various units and partially screw in the nuts on their corresponding pins or stud bolts. Clean the parts using brushes or rags, then wash using petroleum or warm water and remove all residues using compressed air.
- After sandblasting or finishing operations with abrasive elements, thoroughly clean the parts making sure that all abrasive powder residues have been removed completely.
- When reassembling the parts, make sure that they are clean. Then, lubricate them appropriately.
- Pay great attention to the safety rings and lock pins. Replace them immediately if you notice breaks.
- Maintenance operations on the equipment must be carried out by authorised personnel.

9.3 - EXTRAORDINARY INTERVENTIONS

These are repairs or replacements of one or more components of the machine, which usually become necessary after a few years of operation and which do not alter the characteristics of the machine. In the event of considerable changes, the manufacturer shall not be held responsible for possible hazards which might arise. These interventions must be performed by authorised personnel.

9.4 - TABLES FOR THE CHOICE OF FLUIDS

9.4.1 - GREASES TABLE

COMPONENT	RECOMMENDED LUBRICANT	Specification INTERNATIONAL
HYDRAULIC SYSTEM Mineral Oil	ISO 46; Q8 HELLER 46	DIN 51 524, 2-HLP DIN 51 524, 3-HLP API CD, CE, CF
HYDRAULIC SYSTEM Biodegradable Oil	PANOLIN BIO HLP SYNTH E	FZG Test A/8.3/90 stage 12 ISO 15380 HEES
	Q8 HOLBEIN HP SE Bio 46	ISO 11158 Category HV Din 51524, Part 3 Category HVL ISO 15380 / CEC-L33-A-93 - Water Hazard Class (VwVwS) WGK 1 - Category HEES
PINS, BUSHINGS AND FIFTH WHEELS	MOLY GREASE EP NLGI2 or NLGI3EP GREASE	Black greased with lithium soap with molybdenum disulphide. For automatic greasing the use of added CONTACT GREASE NLGI2 with purple lithium soap is recommended

9.5 - DAILY MAINTENANCE

At the start of each working day, systematically carry out the following operations:

- Check and, if necessary, tighten loose screws and nuts.
- Check the efficiency of the accident prevention protections with possible replacement in case of damage or wear.
- Check the integrity of the hydraulic pipes and in the event of damage or wear, replace them.

9.5.1 - CLEANING THE EQUIPMENT

Clean the equipment at the end of the working day using pressurised water; removing shredding residues, earth, dust, etc., in particular residues of flammable material.

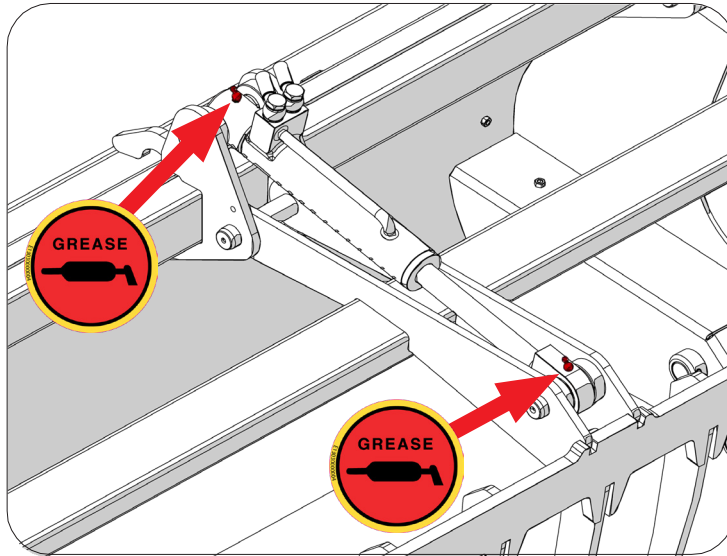
9.6 - GREASING OF PARTS

WARNING

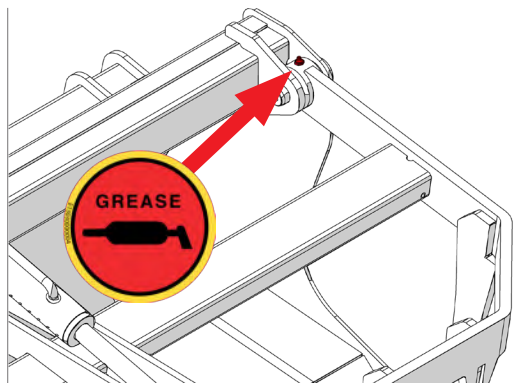
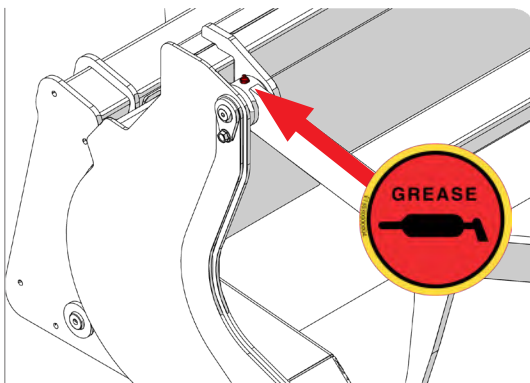


The various parts of the equipment must be greased every 4 hours.

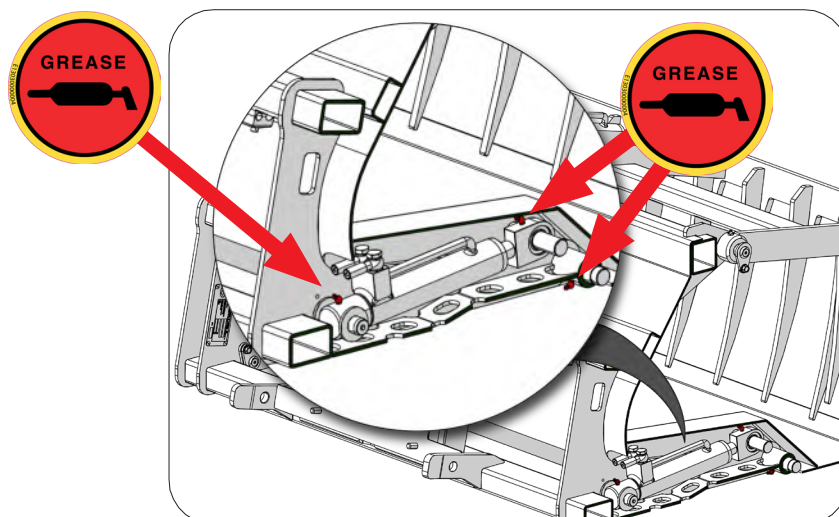
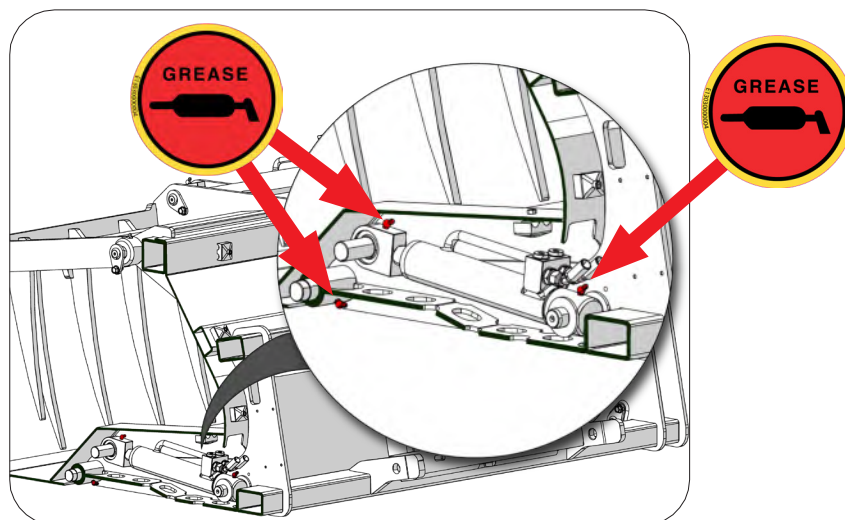
9.6.1 - GRAPPLE CYLINDER GREASING



9.6.2 - SHOVEL PIN GREASING



9.6.3 - TILTING CYLINDER GREASING



9.6.4 - CHECKS ON CHROME-PLATED PARTS

ATTENTION



Inspect the chrome-plated parts of the machine (cylinders) and make sure that they are not scored or damaged every 40 working hours or weekly.

9.7 - PERIODIC REPLACEMENT OF THE SAFETY COMPONENTS

To ensure safety when using the machine, the operator is required to replace the components listed below:

- Hydraulic pipes **every 4000 hours / 6 years**

9.8 - MAINTENANCE OPERATIONS

MAINTENANCE FREQUENCY

Component \ Period		Every 4 hours	Every 8 Hours / Daily	Every 40 hours / Weekly	4000 hours
BUCKET	Check		X		
	Greasing	X			
CHROME-PLATED PARTS	Check			X	
HYDRAULIC PIPES	Check		X		
	Replacement				X

10 - INSTRUCTIONS FOR EMERGENCY SITUATIONS

10.1 - FIRE

In case of fire, use a fire extinguisher according to the standards in force. If the carrying machine is on fire and cannot be extinguished, exit the area immediately and raise the alarm.

11 - TIGHTENING TABLES

11.1 - CLASSES OF COARSE PITCH BOLTS

Diameter (mm)	Pitch (mm)	Friction coefficient	8.8		10.9		12.9	
			Preload	Tightening torque	Preload	Tightening torque	Preload	Tightening torque
			N	Nm	N	Nm	N	Nm
M2	0.40	0.14	899	0.37	1,264.3	0.52	1,517.1	0.63
M2.5	0.45	0.14	1499.8	0.77	2,109.1	1.08	2,531	1.30
M3	0.50	0.14	2,251.9	1.34	3,166.7	1.88	3,800	2.26
M3.5	0.60	0.14	3,022.6	2.05	4,250.6	2.89	5,100.7	3.47
M4	0.70	0.14	3,901.9	3.06	5,487	4.30	6,584.4	5.16
M5	0.80	0.14	6,393.7	6.04	8,991.1	8.50	10,789.3	10.20
M6	1.00	0.14	8,998.2	10.37	12,653.7	14.59	15,184.4	17.51
M7	1.00	0.14	13,199.2	17.21	18,561.4	24.20	22,273.6	29.04
M8	1.25	0.14	16,531.2	25.07	23,247	35.26	27,896.5	42.31
M10	1.50	0.14	26,334.8	49.52	37,033.3	69.64	44,439.9	83.56
M12	1.75	0.14	38,408	84.84	54,011.2	119.31	64,813.5	143.17
M14	2.00	0.14	52,522.4	135.13	73,859.6	190.02	88,631.5	228.03
M16	2.00	0.14	72,728.5	211.61	102,274.4	297.58	122,729.3	357.09
M18	2.50	0.14	87,372.3	290.32	123,711	402.26	148,453.2	489.92
M20	2.50	0.14	113,494.2	412.78	156,601.2	580.47	191,521.5	696.56
M22	2.50	0.14	141,583.7	567.58	199,102.1	798.16	238,922.5	957.80
M24	3.00	0.14	16,523.6	713.68	229,955.1	1,003.61	275,946.1	1,204.33
M27	3.00	0.14	21,488.3	1,050.16	302,179.2	1,476.79	362,615	1,772.15
M30	3.50	0.14	26,541.2	1,428.97	367,792.3	2,009.49	441,350.8	2,411.39
M33	3.50	0.14	326,115.9	1,940.86	458,600.5	2,729.33	550,320.6	3,275.19
M36	4.00	0.14	382,483.6	2,496.81	537,867.6	3,511.14	645,441.1	4,213.37
M39	4.00	0.14	459,805.2	3,241.92	646,601	4,558.96	775,921.3	5,470.75
M42	4.50	0.14	525,878	4,010.93	739,516	5,640.37	887,419.2	6,768.44
M45	4.53	0.14	618,303.6	5,039.09	869,489.3	7,086.23	1,043,387	8,503.47
M48	5.00	0.14	691,725.8	6,036.23	972,739.4	8,488.45	1,167,287	10,186.14

11.2 - CLASSES OF FINE PITCH BOLTS

Diameter (mm)	Pitch (mm)	Friction coefficient	8.8		10.9		12.9	
			Preload	Tightening torque	Preload	Tightening torque	Preload	Tightening torque
			N	Nm	N	Nm	N	Nm
M8	1	0.14	18,159.1	27.05	25,536.2	38.04	30,643.4	45.65
M10	1	0.14	28,350.1	52.55	39,867.3	73.89	47,840.8	88.67
M10	1	0.14	30,443.3	55.61	42,810.8	78.2	51,373	93.84
M12	2	0.14	40,811.6	89.06	57,391.3	125.24	68,869.5	150.29
M12	1	0.14	43,338.4	93.41	60,944.6	131.36	73,133.5	157.63
M14	2	0.14	58,691.9	147.85	82,535.4	207.91	99,042.5	249.49
M16	2	0.14	79,175.5	226.12	111,340.6	317.98	133,608.7	381.57
M18	2	0.14	95,503.3	310.05	134,301.6	436	161,161.9	523.2
M 18	2	0.14	103,155.2	329.35	145,062.1	463.15	174,074.5	555.77
M20	2	0.14	121,772.4	436.34	171,242.5	613.61	205,491	736.33
M20	2	0.14	130,638.1	461.1	183,709.9	648.42	220,451.9	778.1
M22	2	0.14	151,067.8	597.49	212,439.1	840.22	254,927	1,008.27
M22	2	0.14	160,663.6	626.82	225,933.2	881.46	271,119.8	1,057.75
M24	2	0.14	183,386.5	780.67	257,887.3	1,097.82	309,464.8	1,371.38
M24	2	0.14	194,192.1	816.24	273,082.6	1,147.84	327,699.1	1,377.41
M27	2	0.14	238,370.1	1,139.34	335,207.9	1,602.2	402,249.5	1,922.64
M30	2	0.14	299,914	1,590.29	421,754.2	2,236.34	506,105	2,683.61
M33	2	0.14	368,980.2	2,136.49	518,878.4	3,004.43	622,654	3,605.32
M36	3	0.14	413,097.9	2,652.26	580,918.9	3,729.74	697,102.7	4,475.68
M39	3	0.14	494,054.1	3,430.3	694,763.5	4,823.86	833,716.1	5,788.63
M42	3	0.14	582,537.4	4,349.18	819,193.3	6,116.04	983,031.9	7,339.24
M45	3	0.14	676,135.5	5,401.43	950,815.6	7,595.77	1,140,979	9,114.92
M48	3	0.14	774,830.6	6,594.93	1,089,606	9,274.12	1,307,527	11,128.94
M45	4.53	0.14	618,303.6	5,039.09	869,489.3	7,086.23	1,043,387	8,503.47
M48	5.00	0.14	691,725.8	6,036.23	972,739.4	8,488.45	1,167,287	10,186.14

11.3 - FITTINGS TIGHTENING TABLE

Series	Ø Pipe	THREADING - TIGHTENING TORQUE					
		Ø Threaded metric	Form B MT (Nm)	Shape E MT (Nm)	Ø Metric Gas	Shape B MT (Nm)	Shape E MT (Nm)
Light	6	M 10x1.0	18	18	G 1/8	18	18
	8	M 12 x 1.5	30	25	G 1/4	35	35
	10	M 14 x 1.5	45	45	G 1/4	35	35
	12	M 16 x 1.5	65	55	G 3/8	70	70
	15	M 18 x 1.5	80	70	G 1/2	140	90
	18	M 22 x 1.5	140	125	G 1/2	100	90
	22	M 26 x 1.5	190	180	G 3/4	180	180
	28	M 33 x 2.0	340	310	G 1	330	310
	35	M 42 x 2.0	500	450	G 1 1/4	540	450
	42	M 48 x 2.0	630	540	G 1 1/2	630	540
Strong	6	M 12 x 1.5	35	35	G 1/4	55	40
	8	M 14 x 1.5	55	45	G 1/4	55	40
	10	M 16 x 1.5	70	70	G 3/8	90	80
	12	M 18 x 1.5	110	90	G 3/8	90	80
	14	M 20 x 1.5	150	125	G 1/2	150	115
	16	M 22 x 1.5	170	135	G 1/2	130	115
	20	M 27 x 2.0	270	180	G 3/4	270	180
	25	M 33 x 2.0	410	310	G 1	340	310
	30	M 42 x 2.0	540	450	G 1 1/4	540	450
	38	M 48 x 2.0	700	540	G 1 1/2	700	540

12 - NOTES



McConnel Limited, Temeside Works, Ludlow, Shropshire SY8 1JL. England.
Telephone: 01584 873131. Facsimile: 01584 876463. www.mcconnel.com