McHale C4 Series

C430/C460/C470/C490
Bale Chopper

Operator Instruction Manual

Issue 3

(valid from serial number 852500)

McHale
Ballinrobe
Co. Mayo
F31 K138 Ireland

Tel: +353 94 9520300
Email: sales@mchale.net
Website: www.mchale.net

QUALITY
ISO 9001:2015
NSAI Certified

CLT01129_0.01

ENVIRONMENT: Reduce paper consumption

Think before printing documents! Is a PDF on a laptop or tablet sufficient? If a printed copy is required, always select ‘Print on both sides of paper’ and always try to limit the number of printed pages by selecting a specific page range or just select ‘Current page’ if that is sufficient.

This is the original operator manual with ‘Original Instructions’. The English language version of the operator manual is the source document for all translations.

If there is any conflict as to the accuracy or content, of any translation, the English source manual remains the authorised document.

Thank you for buying this **McHale** machine, you have chosen wisely!
Given proper care and attention, you can expect it to provide you with years of dependable service.

Warranty/Guarantee

Attention End User!

Please ensure your machine is fully registered with **McHale**,
by your dealer, at the time of delivery.
Failure of the dealer to register the machine will render your warranty void!
You can check the registration of your machine by visiting **www.mchale.net**.

It is important to quote the machine serial number when ordering spare parts or requesting technical assistance. Space is provided below to record machine details.
(See 'Description of the serial number plate')

Serial number:	
Year of manufacture:	
Date of delivery:	

If you require further copies of this instruction manual,
please quote part number: CLT01129

This manual covers the following machine types:

C430	Linkage machine
C460/C470/C490	Trailed machine

Due to a policy of continuous product development and improvement, **McHale** Engineering reserves the right to alter machine specifications, including the contents of this manual, without prior notice or any obligation to make changes or additions to the equipment previously sold. Images and screenshots used in this manual may differ in appearance from the actual product.

It is vital to replace defective parts of the machine immediately and to use only genuine **McHale** spare parts, as these are designed and manufactured to the same standard as the original machine. Spare parts can be obtained from your **McHale** dealer.

Throughout this manual there are links to other relevant sections of the manual, to guide the reader to additional information to convey the complete message. These links are in *(grey italic font)*. See the example above i.e. the link to the description of the serial number plate. When you click on the link in the PDF document, the page will jump automatically to the linked section. With Adobe Reader, you can go back to the page on which you clicked the link, by clicking on the 'Previous view' button (or by holding 'Alt' and pressing the 'left arrow').

Table of Contents

1

Introduction

This machine has been designed to chop or shred round or square bales of forage or straw. The design has been developed based on years of extensive research and development in the field of bale choppers and shredders. Given proper care and attention, the machine will provide years of reliable and dependable performance.

Please do not assume that you know how to operate and maintain your machine before reading this manual carefully. In order to prevent misuse, damage and accidents, it is very important that everybody who will operate the machine is a fully trained operator. *(See 'Trained operator criteria')*. They must read and fully understand all of the contents of this manual, before operating the machine, paying particular attention to the following:

- Safety instructions
- Functions
- Controls (hydraulic & electrical)

It is highly recommended to get acquainted with any new machinery slowly. Take time to learn and understand all of the features of the machine. Proficiency will increase as more experience is obtained.

If you have any questions in relation to the instructions in the manual, please contact your **McHale** dealer. It is highly recommended that training be sought from your local **McHale** dealer.

The operator is solely responsible for the safe use and maintenance of the machinery, in accordance with this manual. Keep this manual safe and make sure it remains with the machine, at all times.

ENVIRONMENT: Reduce paper consumption

Think before printing documents! Is a PDF on a laptop or tablet sufficient? If a printed copy is required, always select 'Print on both sides of paper' and always try to limit the number of printed pages by selecting a specific page range or just select 'Current page' if that is sufficient.

2

Product information

The machine is protected against many dangers to itself while being operated. However, it is of the utmost importance for the safety of the operator and for others, that the operator pays attention to all warnings and instructions given in this manual. In particular all safety devices, decals, guards and controls must be in place and in fully functioning condition. Never try to clear any malfunction when the tractor is switched on or while the machine is running. Keep the 'Danger Zone' (an area around the machine) free of all persons and animals at all times, while the machine is in operation *(See 'Danger Zone')*. This manual must be read and fully understood by anyone who will operate the machine.

2.1 Designated use of the machine

The machine is exclusively designed for normal use in agricultural applications. The machine has been designed to chop up or shred round or square bales of forage primarily for feeding livestock, or bales of straw for use as bedding under livestock. This designation includes the movement of the machine, between fields by track or road, incidental to the machine's main use. The manufacturer will not be held responsible for any loss or damage resulting from machine applications other than those specified above. Any other use the machine may be put to is entirely at the owner/operator's risk.

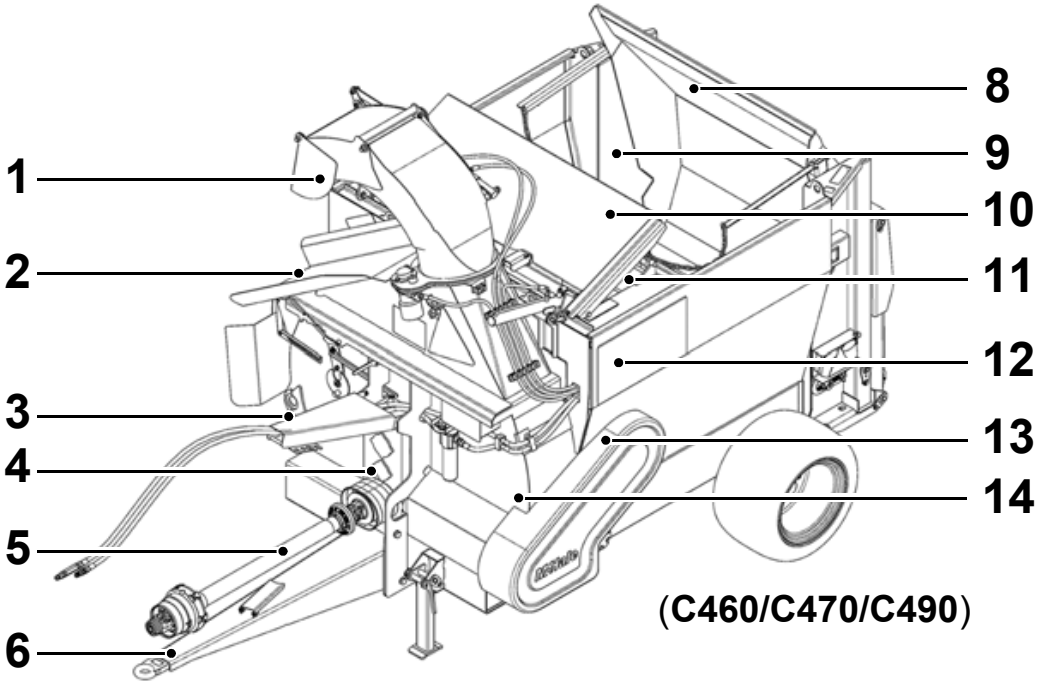
The designated use of the machine includes that:

- The operating, maintenance and repair instructions given by the manufacturer will be strictly fulfilled.
- Exclusively persons who are familiar with it and instructed about the risks are entitled to operate, maintain and/or repair the machine.
- The relevant health and safety requirements that may be in force in the country of use will be strictly followed.
- No other equipment or accessories, other than released by **McHale**, are installed in the machine. The use of any other equipment or accessory is entirely at the owner/operator's risk. In such cases, unauthorised modifications/changes exclude any liability of the manufacturer.

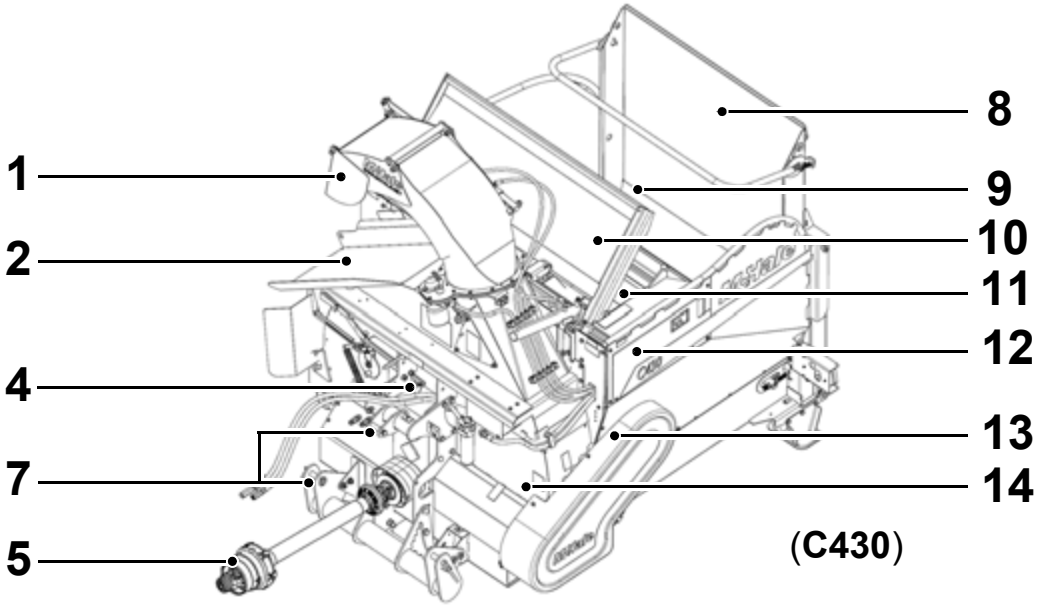
WARNING: Loss of machine validity

By any alteration of safety equipment, the declaration of conformity and the CE sign loses its validity for this machine.

2.2 Front view



No.	Machine function	No.	Machine function
1	Chute	**8**	Loading door
2	Distribution slide	**9**	Bale chamber
3	Hose carrier	**10**	Comb
4	Gearbox	**11**	Floor conveyor
5	PTO input shaft	**12**	Hydraulic section (inside cover)
6	Drawbar (**C460/C470/C490**)	**13**	Rotor
7	3-point linkage, CAT 2 (**C430**)	**14**	Fan



2.3 General dimensions & specifications

Units are given in both metric and UK imperial values, with the latter shown in brackets.

Model	C430 Linkage	C460/C470/C490 Trailed
Transport length	2.64 m (104”)	4.5 m (177”) **C460** 5.0 m (197”) **C470** 6.0 m (236”) **C490**
Transport width	2.12 m (83”)	2.25 m (89”)
Transport height (chute closed)	2.45 m (96”)	2.65 m (104”)
Unladen weight	1,800 kg (3,968 lbs)	2,220 kg (4,894 lbs) **C460** 2,450 kg (5,401 lbs) **C470** 2,900 kg (6,393 lbs) **C490**
Road speed (max)	40 km/h (25 mph)	40 km/h (25 mph)

2.4 Tractor attachment

Model	C430 Linkage	C460/C470/C490 Trailed
Tractor size (min)	110 kW	60 kW
Attachment	3-point linkage, CAT 2	Low drawbar / lower link arms
PTO speed	540 rpm	
Lighting	12 V / 7-pin socket	
Electrics	12 V, 20 A socket	
Hydraulic systems	Open-centre	
Minimum pressure	180 bar (2,610 psi)	
Minimum flow rate	20 l/min (4.54 gal/min) @ 180 bar (2,610 psi)	

2.5 Machine specifications

Model	C430 Linkage	C460/C470/C490 Trailed
Bale chamber length	1.17 m (46”)	1.66 m (65”) **C460** 2.16 m (85”) **C470** 3.23 m (127”) **C490**
Bale chamber width	1.4 m (55”)	1.80 m (71”)

2.6 Tyre specifications (C460/C470/C490)

Details	Type	Pressure	Part No.
260/70-15.3 122 A8 (Vredestein)	Flotation+	3.1 bar (45 psi)	CWH00011*
340/55-16 133 A8 (Vredestein)	Flotation+	3.1 bar (45 psi)	CWH00022

*Not available for the C490

3

General safety

3.1 Be aware of all safety information

Follow all safety precautions and practice safe operation of machinery, at all times.

Warning, caution, note & environment messages:

When reading this manual, pay particular attention when you see the symbols below i.e. warning, caution, note and environment. They will be used at various points in this manual and may also appear on safety decals on the machine. The purpose of these messages is to ensure that the most important information stands out from the rest of the text.

WARNING: This symbol indicates a potentially hazardous situation, that if not avoided could result in machinery damage, personal injury or even death.

CAUTION: This symbol indicates a potentially hazardous situation, that if not avoided could result in machinery damage or personal injury.

NOTE: This symbol is used to identify special instructions or procedures which, if not followed strictly, could result in machinery damage.

ENVIRONMENT: This symbol reminds you to respect the environment in relation to the correct disposal of waste material.

3.2 Follow all safety instructions

Using this manual, read all safety instructions and messages, and be aware of the meanings of all safety decals. *(See 'Safety warnings & instructions explained')*. The spare part codes for each decal are also listed, which are available from your **McHale** dealer. If safety decals are damaged or missing due to wear and tear or component replacement, ensure that they are replaced.

As with all machinery, learn all operations and use controls by reading this manual thoroughly. Do not attempt to let anyone operate this machine without being fully instructed.

3.3 Store all items carefully

Store all attachments in a secure and safe manner so as to prevent items from falling. Keep storage areas clear of bystanders and children.

3.4 Personal protective equipment (PPE)

The following PPE should be worn, at all times, when carrying out maintenance work on this machine, to help prevent health and safety hazards:

- Safety glasses
- Ear muffs
- Safety boots
- Gloves
- Tight fitting clothing

Use of mobile phones or radio/music headphones are strictly forbidden while operating machinery and driving, as these impair the operator’s attention.

3.5 In case of emergencies

In the event of any accident, emergency equipment should be kept close at hand. A first aid kit and fire extinguisher along with emergency phone numbers should always be available to machine operators.

3.6 Stay clear of rotating elements

Serious injury or death can result from entanglement of clothing or body parts with PTO shafts, drivelines and other rotating and moving components.

Keep all guards in place at all times, only wear close fitting clothing and ensure that the tractor engine has stopped, the key has been removed and that the PTO has stopped turning before carrying out any adjustments, connections or cleaning of PTO driven equipment.

3.7 Trained operator criteria

Age related requirements		General requirements
18 +	The operator needs to be fully trained in the use of this machine and have a valid tractor driver's licence.	■ The operator must be in full control of his/her senses and must not be under the influence of any alcohol or drugs, prescribed or otherwise. ■ The operator must have read and understood all aspects of the operator manual in order to operate, maintain and clean the machine. Ideally, they should also receive training from their **McHale** Dealer. ■ It is only acceptable to have more than one person in the tractor cab, if it has a second seat.
16 - 18	An operator between the age of 16 and 18 years old must have a provisional licence and must be accompanied by an experienced driver/operator, at all times, even during maintenance and cleaning!	
< 16	Persons younger than 16 years of age are not allowed to operate, clean or carry out maintenance on this machine, under any circumstances!	

3.8 Operating the machine

WARNING: Never clear a blockage while the machine is in operation!

Never attempt to clear a block while the machine is in operation. You could be pulled in by the rotating parts, which could be extremely hazardous, or even fatal!

In order to avoid serious injury or even death by being pulled into the machine:

- Never attempt to clear a blockage while the machine is running.
- Disengage the PTO, apply the hand brake, shut the tractor engine off and remove the key from the ignition.

WARNING: Stand well clear of the machine while it is in operation!

Stand well clear of the machine and tractor when the machine is operating. Objects such as loose tines, stones and other debris may be discharged from the machine.

3.9 In the event of a fire

In the event of a fire, it is the operator's decision to determine the seriousness and hence the solution to the situation. The following is given only as a guideline procedure:

1. Switch off the control box.
2. Move the tractor and machine away from the flammable material.
3. Disengage the PTO, turn off the tractor and remove the key from the ignition.
4. Remove all hosing and electrical looms from the machine, assuming it is safe to do so.
5. With all connections removed, disengage the machine from the tractor.
6. Drive the tractor away from the machine.
7. Using a suitable fire extinguisher, put out all the fires or call the fire brigade.

WARNING: Fire prevention

It is recommended that the machine be kept reasonably clean and free of build-ups of crop, lubricants, etc. This will help to reduce the risk of fires.

3.10 General safety warnings

It is important to be aware of the potential hazards associated with the operation of farm machinery. Numerous research studies have shown that the majority of machinery-related accidents occur as the result of human negligence, including taking shortcuts to save time, lack of or improper maintenance, ignoring warnings, failing to read the operator's manual, lack of or improper instruction and failure to follow safety rules.

Read and understand this operator manual before using the machine. If any of the instructions appear unclear do not hesitate to contact your **McHale** dealer.

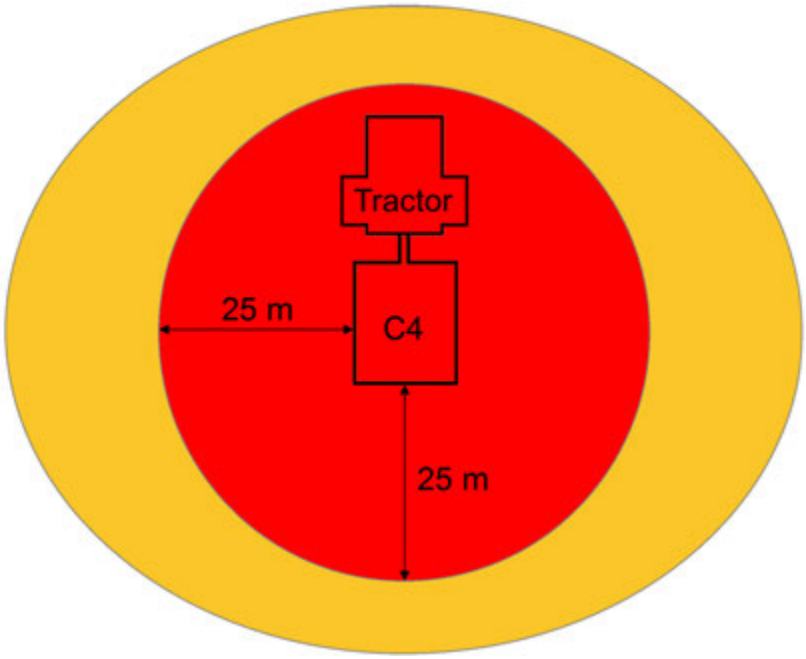
Only competent persons who have read and fully understood this manual are qualified to operate this machine. *(See 'Trained operator criteria')*. The owner of this machine is obliged, by law, to ensure that every operator understands all of the functions, controls, working processes and safety warnings, before operating the machine.

Safety devices

- All safety devices such as guards, protection parts and safety controls must be in place and in fully functioning condition. It is forbidden to operate this machine with defective or incomplete safety devices.

Danger Zone

- The ‘Danger Zone’ is the area in front of the tractor, between the tractor and the bale chopper and a minimum of 25 m behind the machine and 25 m on either side.



NOTE: ‘Danger Zone’ can vary in size

The operator must be aware of the ‘Danger Zone’ which can vary in size, depending on operating conditions, i.e. hilly terrain.

- It is the operator’s responsibility to ensure that there is no person in the ‘**Danger Zone**’ while operating the machine, especially during start up.

Before repair or reassembly

- Safe lifting gear of sufficient capacity must be used for machine assembly. All chains and slings used must be in good condition.

Before operation

- Never operate farm machinery while under the influence of drugs or alcohol. The physiological effects of drugs and alcohol impair performance and can lead to operators taking risks or putting others at risk. This includes over-the-counter cold/flu and allergy medications or prescription drugs that are not recommended to be taken whilst driving a car or operating machinery.
- The operator must ensure that the manufacturer’s instructions for attaching and detaching the machine are followed. This includes the drawbar or linkage attachment, the electric and hydraulic lines and, in particular, the lighting system.

- The operator must ensure that all covers are closed and all safety devices are in operating mode.
- The operator must ensure that there is no person in the ‘Danger Zone’.
- Always be familiar with the health and safety requirements that may be in force in the country of use.

During operation

- While operating this machine on hilly, rough or sloping ground the operator must take extra precautions. The ‘Danger Zone’ is increased in such conditions. Precaution must be taken due to the risk of overturning. Always travel at a speed suitable for the ground conditions.
- The operator must ensure that there is a minimum of 4 m clearance between the machine and any obstacle above, in particular electrical high voltage lines.
- Particular care must be taken, if the machine is left idle for any extended period, to ensure that all sensors and safety features are working correctly.

WARNING: Do not carry people or animals on the machine

The operator must ensure that no persons or animals are carried on the machine at any time or are hidden under the machine (on the tractor persons are only allowed to sit on the relevant seats).

Before travelling on public roads

- The owner of this machine is obliged by law to ensure that every operator has a valid driving licence and is familiar with the road traffic regulations relating to the country of use.
- Always ensure that the electronic control box and hydraulic supply are switched off.
- Always ensure that the chute and slide extension are fully retracted.
- Ensure that the rear loading door is closed fully and the tail lights are swung out into their full visible position.

Performing maintenance

- Maintenance and repair work on the machine should always be carried out in accordance with this manual.
- Maintenance and repair work exceeding the content of this manual should only be carried out by qualified persons or your **McHale** dealer.
- When conducting maintenance work tie long hair behind your head. Do not wear a necktie, necklace, scarf or loose clothing when you work near the machine or moving parts. Rotating machinery parts can entangle loose clothing, long hair or dangling jewellery faster than a victim can react. If these items were to get caught, severe injury could result.

- Before working on this machine or altering any setting, the operator must ensure the following:
  (a) The tractor has definitely stopped moving
  (b) The hand brake is applied
  (c) The engine is shut down
  (d) The ignition key is removed
  (e) PTO shaft is removed from PTO stub
  (f) Electronic power supply and control box is disconnected
  (g) Hydraulic oil supply is switched off
  ***** *It is forbidden to open any safety guards or to carry out any work on the machine, unless the above specified precautions have been carried out.*

- When conducting maintenance work always support the machine properly. Where possible, lower the attachment or implement to the ground before you work on the machine. If it is not possible to lower the machine or attachment to the ground, always securely support the machine or attachment. Do not work under a machine that is solely supported by a jack. Never support the machine with props that may break or crumble under continuous load.

- Never disable any electrical safety circuits, tamper with safety devices or carry out any unauthorised modification to the machine.

- Replace any electrical or hydraulic devices immediately, at the first sign of malfunction or failure, as these components affect the functionality, sequencing and thus safety of operation. Never use a machine where a malfunction exists! Contact your **McHale** dealer to achieve a solution. Always think ‘Safety First’!

- Avoid heating near pressurised fluid lines, as pressurised lines can be accidentally damaged when heat goes beyond the immediate flame area.

- Regular clean down is recommended in order to maintain the machine in a safe and reliable working condition. **McHale** recommend that the machine be blown down with an air line, as opposed to a pressure washer, due to the dangers involved with pressure washing and to protect the overall paint work on the machine. If, despite our advice, a pressure washer is used then take extreme caution and operate from ground level only. Never climb onto any part of the machine, while pressure washing, due to the fact that all metal surfaces become extremely wet and slippery and always ensure that the tractor has been shut down, with the ignition key removed.

- Tyres should be inspected for wear on a regular basis. Tyres should be replaced before wear becomes excessive or after 10 years from the date of manufacture, as indicated on the tyre. Care must be taken when handling tyres. Tyres shall be inflated to the pressures indicated in this manual and on the machine and never over inflated. Tyres shall only be inflated while on the machine or in an appropriate safety cage.

During inspection

- If carrying out an inspection during machine operation within the ‘Danger Zone’ (**extremely dangerous and NOT recommended!**), then there should be a fully trained and competent second person operating both the tractor and machine controls. If at any time the second operator loses sight of the

inspector, turn off all tractor power immediately! Such inspection should only be carried out if all guards are fully in place, the machine is on level ground and a safe distance is kept from any hazards on the machine.

Guidance for safety of children on farms

- All adults working or present on farms are required, by law, to do everything reasonably practical to ensure the safety and health of children and young people on the farm.
- Children must be supervised at all times! Remember, farms are not playgrounds!
- Store farm machinery with safety & stability in mind.
- Always exclude children from potentially dangerous areas (they will often get into apparently inaccessible places). Do not allow them in farm yards on busy days. Contractors should always be made aware of the presence of children.
- Never leave children alone in a tractor cab as they can interfere with controls and many children have been killed falling from the door or rear window of a tractor.
- Children under 16 years of age should never operate power-driven machinery. Keys should be removed from vehicles and controls left in neutral. Lower any implements or loaders to the ground and apply the hand brake.
- Do not allow children to use bales of any description for playing. It is very easy to fall from stacked bales resulting in serious injury, or fall between them leading to suffocation. Make sure there is no evidence of children burrowing under stacked bales. Keep matches in a safe place.
- Children under 16 should never handle chemicals. Always keep them in their correct containers and securely stored out of sight under lock and key.

Danger of lightning strike

- If there is a risk of lightning in the area, stop all work.
- If there is a risk of lightning when travelling, find a safe place to pull over and stop the tractor.
- Do not leave the tractor cab or start work until the risk of lightning has passed.

4

Specific safety warnings

4.1 Electronic safety warnings

- This machine is equipped with electronic parts and components which comply to the EMC Directive 2014/30/EU but still may be influenced by electromagnetic transmissions of other apparatus, such as welding machines, etc.
- Check electric cables regularly for signs of breakage or wear. If in doubt always replace.
- Do not modify any safety circuits (faulty safety circuits will cause risks).

4.2 Hydraulic safety warnings

- The maximum pressure in the hydraulic system of this machine should not exceed 210 bar.
- Always ensure the system is not under pressure before working on the machine. Oil under pressure can penetrate the skin and cause injury. Beware of pipes under accumulator pressure, depressurise lines by unthreading connections extremely slowly.
- Hydraulically actuated devices must be blocked mechanically against movement, before working on the machine.
- If any hoses are removed or replaced ensure they are marked and re-installed to the correct position during re-assembly.
- Check hoses monthly for signs of leakage or wear. Use a piece of card when checking for leaks. Fine jets of hydraulic fluid can penetrate the skin. Never use your fingers or face to check for leaks. If in doubt always replace. The recommended maximum working time of hoses should not exceed 5 years. Only use exact specification **McHale** genuine replacement parts.
- Do not work on hydraulic systems unless you are qualified to do so. This work should only be carried out by qualified persons or your **McHale** dealer.

4.3 Noise level

- The European Directive 2003/10/EC directs employers and employees to control the noise level at work. The noise level at field work may differ according to the tractor, ground, crops and other environmental conditions.
- In normal conditions, whilst driving the machine, the noise level to the driver's ear does not exceed 70 dB (A) with the rear screen of the tractor cabin open. The common noise level of the machine and the tractor is primarily influenced by the tractor noise (radio is an additional noise source). It is recommended to operate this machine with closed cabin windows.

4.4 Fire precautions

- Be aware that crops are easily inflammable.
- Do not smoke or make use of any open fire next to the machine.
- A functioning fire extinguisher should always be available on the tractor.
- The machine is to be kept clear of oil, grease, crops, string, plastic or any other flammable material at all times.
- Do not continue to work with overheated parts, cables or pipes, unless you have identified and eliminated the reason for overheating.
- Equipment being refuelled should have its engine turned off before refuelling. Personnel should be instructed on how to properly refuel equipment: do periodic maintenance checks on the tank, pump, hose and nozzle; and abide by safety rules, such as not smoking when around the refuelling area.

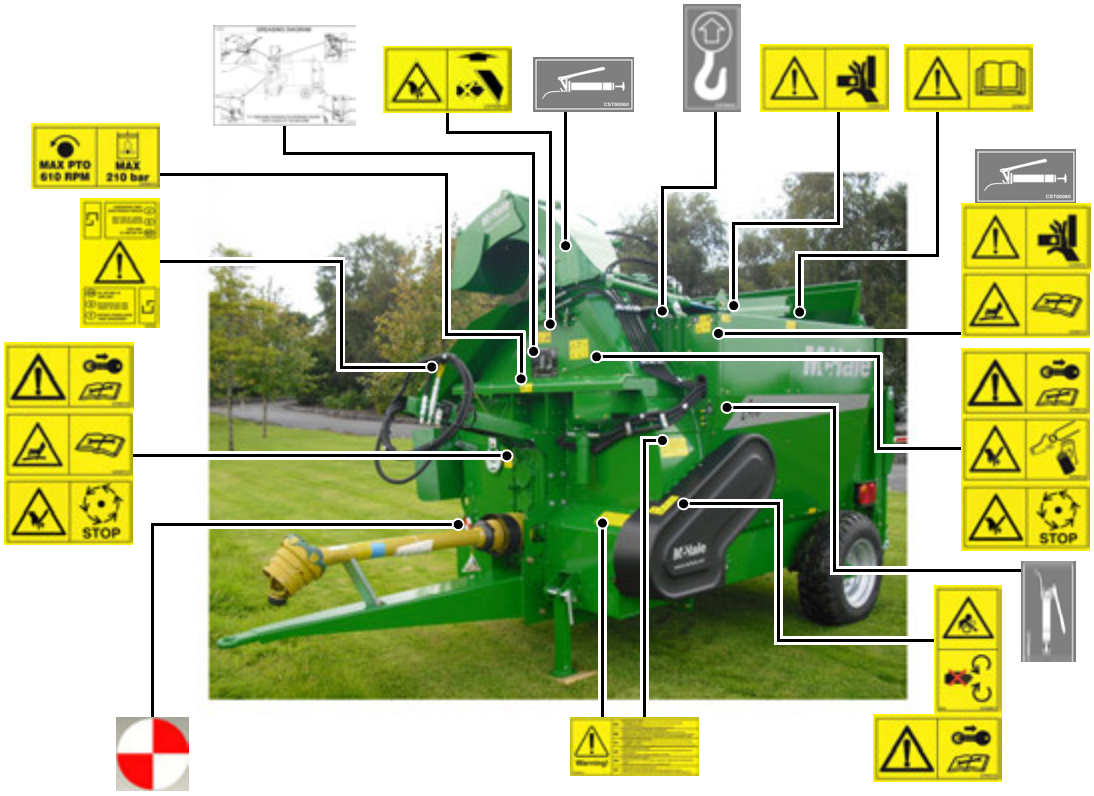
4.5 Special safety devices/instructions

- When maintenance or repair work has to be carried out on the machine, the hand brake must be applied, engine shut down with ignition key removed. The PTO shaft must be removed from the PTO stub, with the hydraulic and electric power supply disconnected. It is forbidden to open any safety guards or carry out any work on the machine unless the specified precautions have been carried out.
- Always use protective clothing and gloves when working at the chopping system and avoid all contact with the chute base knife.

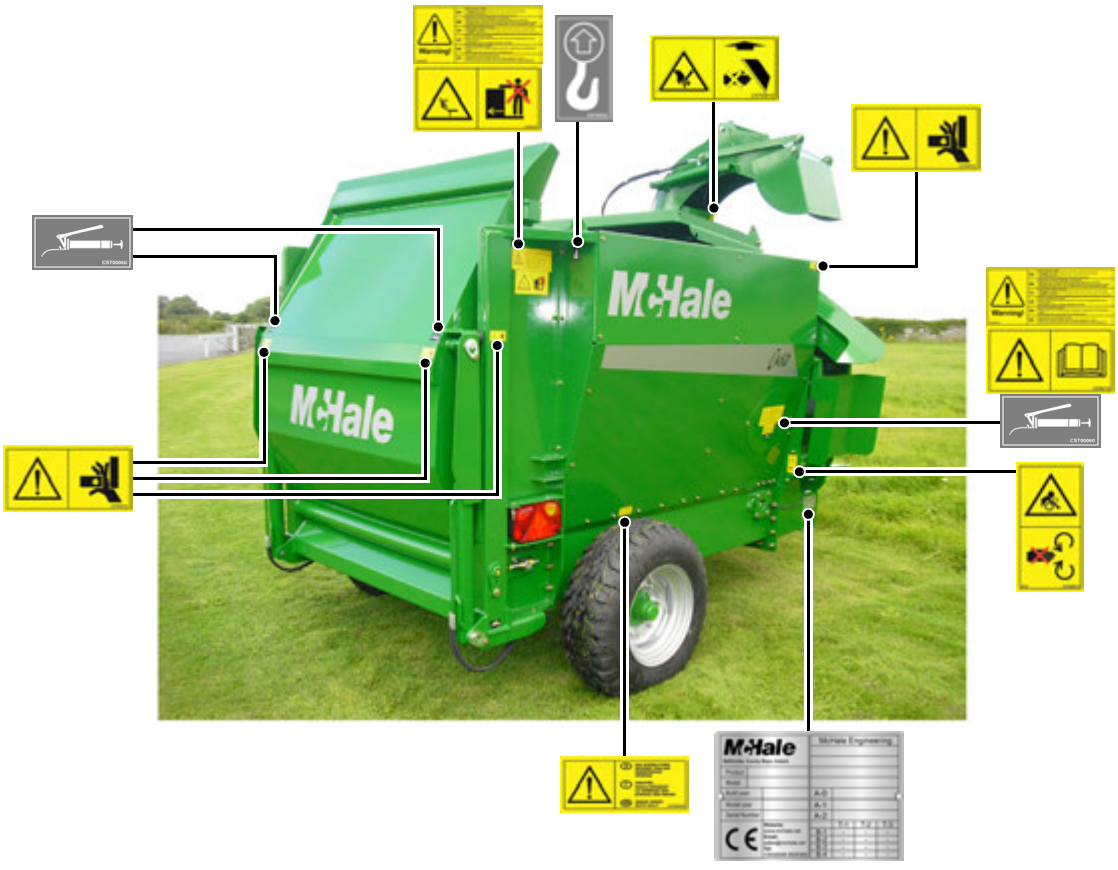
WARNING: The machine must be completely shut down before using the unblocking system!

Ensure the engine has been shut down and PTO has been disconnected before using the unblocking system. Never attempt to remove material from the machine until it and the tractor have both come to a complete stop (this is extremely important when working on the fan outlet, where there is a risk of mutilating a finger or hand on the support plate or on sections of the beater bar).

4.6 Safety instruction decal locations



Decals on the front of the machine (C460 shown)



Decals on the rear of the machine (C460 shown)

4.7 Safety warnings & instructions explained

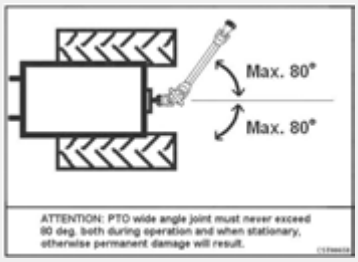
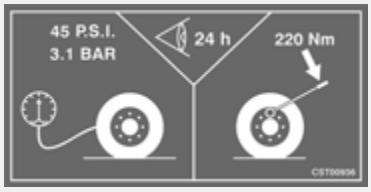
Danger areas which cannot be protected by any devices are marked by yellow safety decals. Therefore it has to be ensured that all safety warnings and instructions are understood and followed. If any of the decals are damaged or missing, they are available from your **McHale** dealer. The relevant part numbers are shown in brackets.

The decals featured on the machine are displayed with their meanings below:

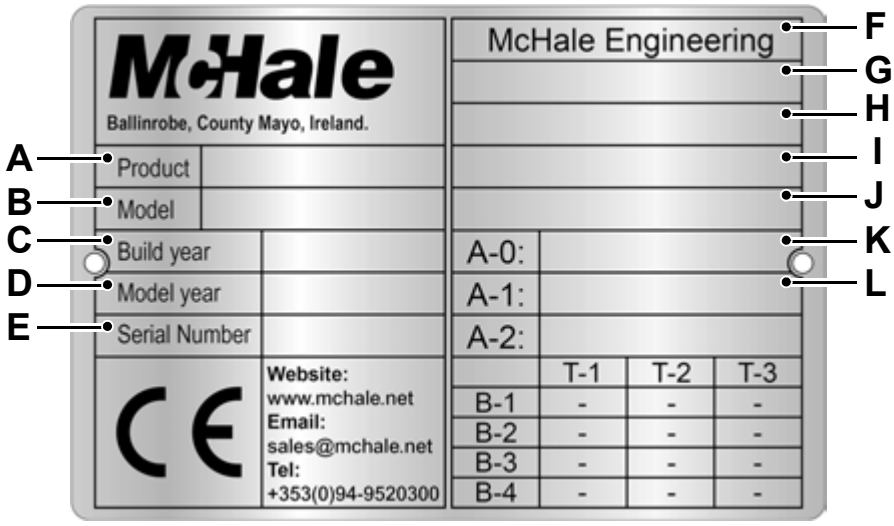
	Free flow return to tank **(CST00006)**
	Keep hands clear of rotating roller(s) **(CTS00017)**
	Keep hands out of crush area **(CST00019)**
	Lifting hook location **(CST00032)**

	Grease daily **(CST00060)**
	Do not stand on the platform or elsewhere on the machine when the machine is moving or working **(CST00107)**
	Read instruction manual before use **(CST00110)**
	Beware of high-pressure hoses, even when the machine is switched off. Also, read and understand the manual before working on any part of the hydraulic system. **(CST00111)**
	Knives of the chopping device should only be removed with an appropriate tool and wear protective gloves **(CST00112)**
	Turn off and remove key from tractor. Read and understand the manual before working on or performing maintenance on the machine. **(CST00113)**
	Maximum hydraulic pressure and maximum PTO speed. This machine must not be connected to hydraulic systems with pressure higher than 210 bar. **(CST00121)**

	Do not stand in the articulation area while the tractor engine is running **(CST00141)**
	Stay clear of the rotating PTO shaft. Never use the machine if the PTO guarding is missing or damaged. Entanglement in rotating drive line can cause serious injury or death. It is important to ensure that the rotating guard on the driveline rotates freely. Always stop the engine and ensure that driveline has stopped before making connections, adjustments or cleaning out PTO driven equipment. **(CST00143)**
	Ensure all of the components of the machine have stopped rotating completely before carrying out any maintenance **(CST00216)**
	Stay well clear of the chute-blow area while the machine is in operation **(CST00222)**
	Keep hands clear of rotating roller(s) **(CST00230)**

	Keep hands and feet clear of moving floor slats and rollers, while the tractor is running. Close all covers and guards and keep out of the danger zone. **(CST00231)**
	Keep hands away from knives and sharp edges **(CST00619)**
	The PTO wide angle joint must never exceed 80 degrees, both when stationary or during operation. Permanent damage may result otherwise. **(CST00658)**
	Floor movement indicator **(CST00734)**
	Tie down points **(CST00901)**
	Jacking points (triangle) **(CST00923)**
	Check tyre pressure and wheel nuts **(CST00936)**

4.8 Description of the serial number plate



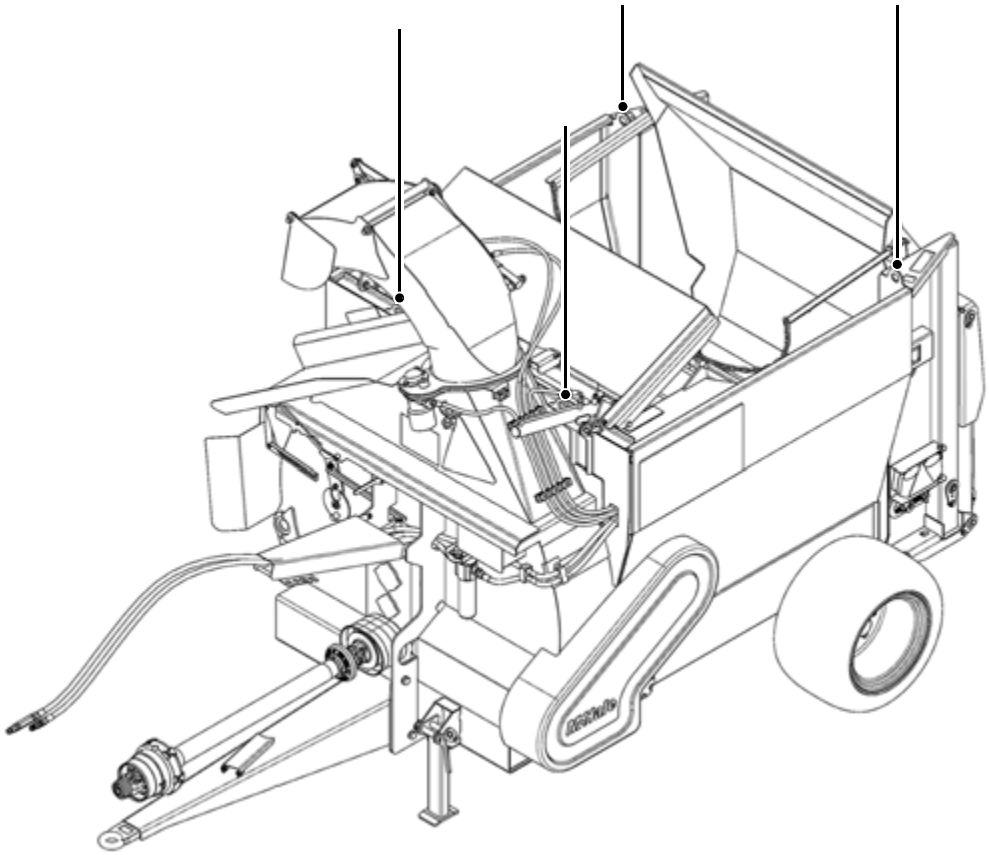
The following is a description of the serial plate content:

- **A.** Product description
- **B.** Model name/number of the machine
- **C.** Year of manufacture of the machine
- **D.** Model year of the machine
- **E.** Serial number of the machine
- **F.** Name of the manufacturer
- **G.** Vehicle category
- **H.** Machine type approval number
- **I.** Vehicle identification number (VIN)
- **J.** Technically permissible maximum laden mass
- **K.** Vertical load on the coupling point
- **L.** Technically permissible maximum mass per axle

4.9 Machine lifting guidelines

WARNING: Machine lifting

- Only use chains or strapping that are rated for a minimum load of 1.0 tonne (1,000 kg) per chain or strap when using the four lift eye locations on the chassis, shown below.
- The crane or lifting device must be capable of lifting a minimum load of 4.0 tonnes (4,000 kg).
- Never go under a suspended machine or attempt to try and stop it if moving erratically, death or serious injury may result.
- Always be observant of people and objects around the suspended machine and do not allow the machine to impact heavily on the ground after suspension or movement.



Machine lifting points (C460 shown)

4.10 Jacking guidelines

Ensure the machine is on flat solid ground and attached to a tractor. Apply the tractor hand brake, switch off the tractor and remove the key, disconnect the hydraulics and PTO. Use wheel chocks on the opposite wheel to secure against unexpected movement. Suitable well maintained equipment shall be used to raise the machine. Never go under the machine while it is raised off the ground. The jacking points are at the rear of the machine. Only approach the machine with the jack from the rear, to ensure that there is adequate working room. Ensure the jack makes solid contact with the plate below the jacking point decal, before raising the machine off the ground.

WARNING: Do not rely solely on a hydraulic jack!

Ensure the machine is additionally supported with axle stands or equivalent of suitable capacity. Never support the machine with props that may break or crumble under continuous load.

5

Tractor requirements & preparation

5.1 Tractor requirements

The minimum recommended size of tractor for operating the machine comfortably depends mainly on the forage being chopped. For normal conditions, **McHale** recommends a tractor size of approximately 60 kW. For the **C430** a tractor size of 110 kW is required due to the concentrated weight on the 3-point linkage & the increased distance to the lower linkage. This allows a longer PTO shaft to be fitted, giving a safer combined result.

NOTE: Use good quality oil

Ensure that the tractor has clean, good quality, hydraulic/universal oil to avoid problems later on. Also, the hydraulic filters on the tractor should be changed regularly, according to the manufacturer's service instructions. Avoid dirt getting into the hydraulic couplings.

The following items on the tractor are required for attaching to the machine:

1. Drawbar hitch* suitable for a vertical load of at least 1 100 kg and a D value of at least 50 kN (**C460/C470/C490**) or a 3-point linkage CAT 2 (**C430**)
2. ½" female quick-release for hydraulic power supply of minimum 20 l/min @ 180 bar
3. ½" female quick-release for return line (must be free flow to tank)
4. 12 V / 7-pin socket for lighting
5. 12 V, 20 A socket or battery power cable
6. 1 ⅜", 6-spline PTO shaft (set to a speed of 540 rpm)
7. Suitable location to attach safety chain. The safety chain must be attached in such a way that if the coupling breaks, the hitch or drawbar cannot make contact with the ground.

* *Depending on country of use*

5.2 Control box installation

The electronic control box must be located inside the tractor cab in the operator's field of vision and within easy reach. Secure the control unit in the tractor cab, using the V-brackets and fasteners provided. Ensure that the cable to the machine is not under tension and not near sharp edges, etc. The electric power supply is obtained from the socket of the tractor.

Alternatively, connect the supplied fused electric power lead to the tractor battery ensuring to route away from sharp edges and hot surfaces. The control box is not waterproof, it must be protected from rain. *(See 'Electronic control system')*

CAUTION: Only connect control box to a 12 V power supply

Do not use any other electric power supply for the electronic control system, otherwise damage may occur.

5.3 Attaching to drawbar (C460/C470/C490)

The drawbar is to be attached so that the machine is horizontal to the ground. Machines are set up for hitching to the tractor drawbar. Once the tractor is attached to the drawbar, attach the PTO shaft. Depending on the country of use a safety chain may also be required. Raise the drawbar stand. Detach in reverse order of attachment.

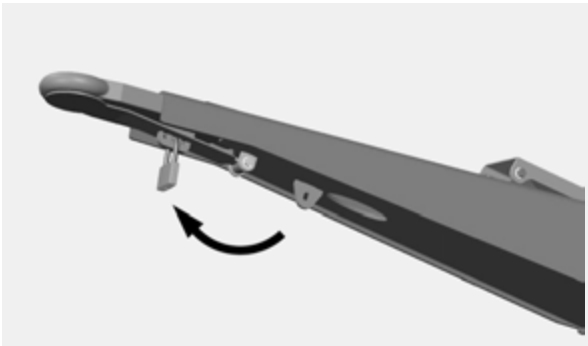
Drawbar

Machine to be horizontal to the ground

CAUTION: Tractor drawbar and coupling device must be compatible

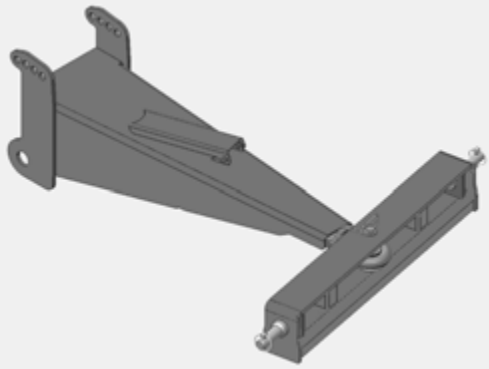
Check that the tractor drawbar is compatible with the coupling device on the machine. If in doubt consult your **McHale** dealer.

5.3.1 Drawbar lock

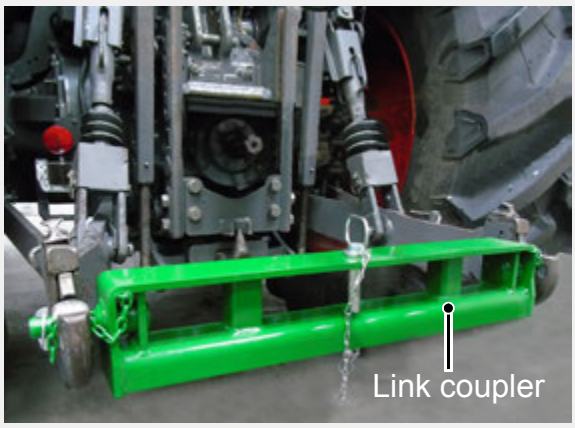


There is a drawbar lock on all hitch-eye drawbars, for when the machine is not in use. To lock the drawbar, open the lock and swing the plate forward to cover the hitch eye and lock it in this position. To unlock the drawbar, reverse the above procedure.

5.3.2 Short drawbar option

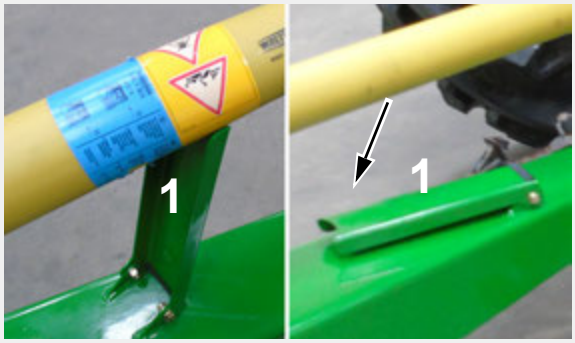


1. The short drawbar option assists manoeuvrability when operating in tight corners. The hitch eye is moved back and connects to the tractor lift arms through a link coupler, providing a tighter swing radius.



2. Attach the link coupler to the tractor. Ensure that the lower link arms are adjusted equally in height. If you are using tractor quick couplers, secure the lower link balls onto the CAT 2 link coupler, using linch pins. The lower link stabilisers may need to be adjusted width wise to suit the link coupler. Attach the link coupler onto the lower link arms, ensuring they are latched securely on the quick couplers. If quick couplers are not being used, secure the link coupler to the lower link arms directly, using linch pins. The lower link stabilisers will have to be loosened to make the above connections and then tightened to ensure there is no lateral movement.

3. Attach the link coupler to the short drawbar. First, check that the hitch eye lock on the drawbar is in the unlocked position. Next, line up the tractor, with the link coupler attached, to the machine drawbar and reverse slowly, adjusting the link arm height until the drawbar hitch-eye is engaged centrally in the link coupler. The hitch pin can now be fitted and secured using the linch-pin provided. Fasten the drawbar safety chain to a secure point on the tractor.



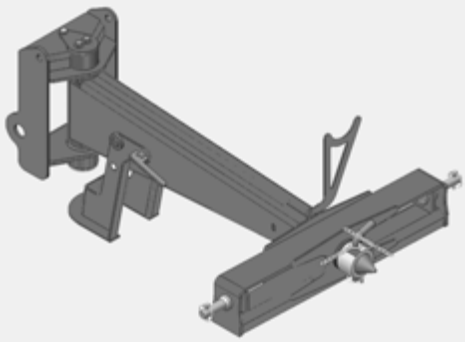
4. Connect the PTO shaft to the tractor and move the PTO shaft stand (1) into the transport position, by swinging it down, as shown. The PTO shaft stand (1) must be used to support the PTO shaft every time it is disconnected from the tractor.

5. Once the PTO shaft has been connected, the lower link arms cannot be elevated beyond a certain point. Raise the lower link arms slightly and secure the drawbar stand in the transport working position. The drawbar stand is to be used every time the machine is disconnected from the tractor. Ensure that the lights are connected.

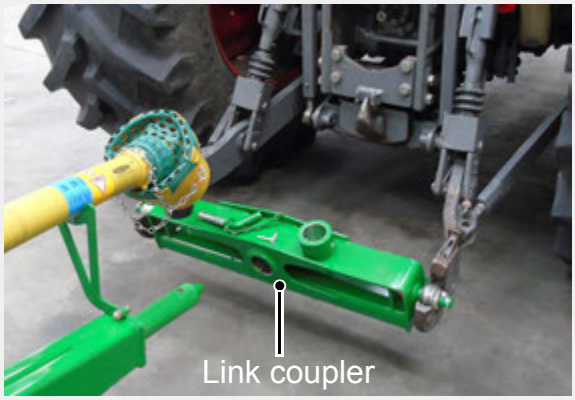
CAUTION: Do not raise the lower link arms once the PTO is connected

Once the PTO shaft has been connected, the lower link arms cannot be elevated beyond a certain point. Otherwise the link coupler will make contact with the PTO shaft causing irreparable damage.

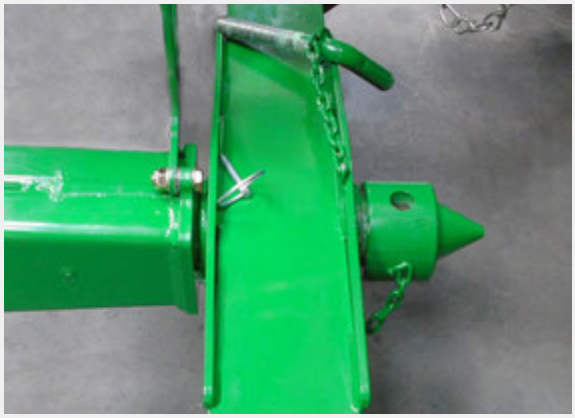
5.3.3 Swing drawbar option



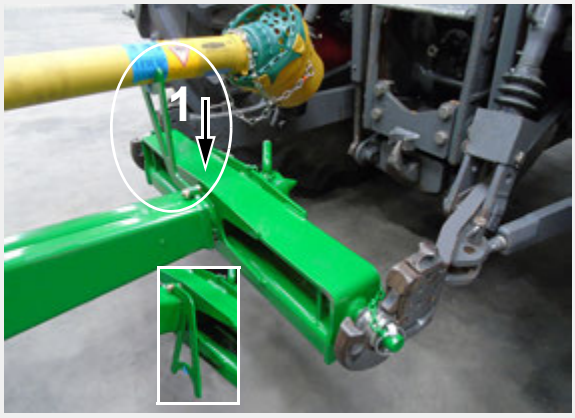
1. The swing drawbar option assists manoeuvrability when operating in really confined areas. The main pivot is moved back onto the machine chassis and this coupled with an articulating connection through the tractor lift arms, provides a really small turning radius.



2. Attach the link coupler to the tractor. Ensure that the lower link arms are adjusted equally in height. If you are using tractor quick couplers, secure the lower link balls onto the CAT 2 link coupler, using linch pins. The lower link stabilisers may need to be adjusted width wise to suit the link coupler. Attach the link coupler onto the lower link arms, ensuring they are latched securely on the quick couplers. If quick couplers are not being used, secure the link coupler to the lower link arms directly, using linch pins. The lower link stabilisers will have to be loosened to make the above connections and then tightened to ensure there is no lateral movement.



3. Attach the link coupler to the swing drawbar. Line up the tractor, with link coupler attached, to the machine drawbar and reverse slowly, adjusting the link arm height until the drawbar pivot shaft is fully engaged, centrally, in the link coupler. The collar and pin can now be fitted and secured, on the pivot shaft, using the linch pin provided. Fasten the drawbar safety chain to a secure point on the tractor.



4. Connect the PTO shaft to the tractor and move the PTO shaft stand (1) into the transport position, by swinging it down, as shown. The PTO shaft stand (1) must be used to support the PTO shaft every time it is disconnected from the tractor. Once the PTO shaft has been connected, the lower link arms cannot be elevated beyond a certain point.

5. When the drawbar has been safely connected to tractor and the machine weight taken off, the drawbar stand (2) can be rotated up, into the transport position, by removing the cross pin and linch pin. Align the alternate hole and replace the cross pin and linch pin. The drawbar stand is to be used every time the machine is disconnected from the tractor. Ensure the lights are connected.

CAUTION: Do not raise the lower link arms once the PTO is connected

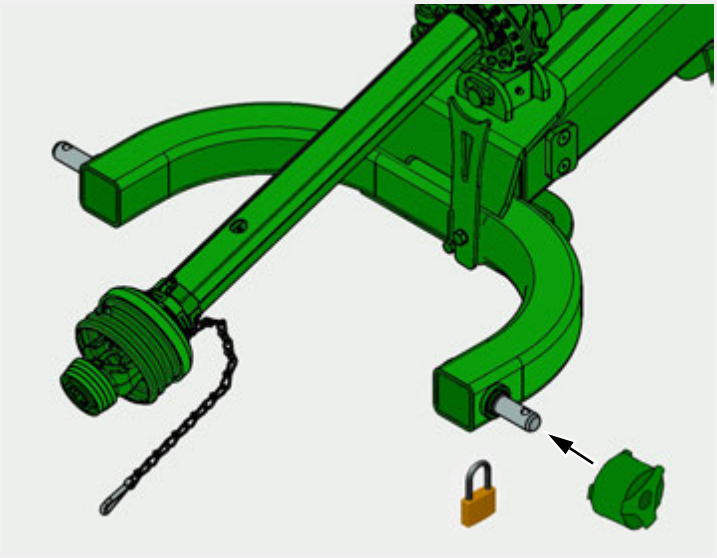
Once the PTO shaft has been connected, the lower link arms cannot be elevated beyond a certain point. Otherwise the link coupler will make contact with the PTO shaft causing irreparable damage.

5.4 Preventing unauthorised use

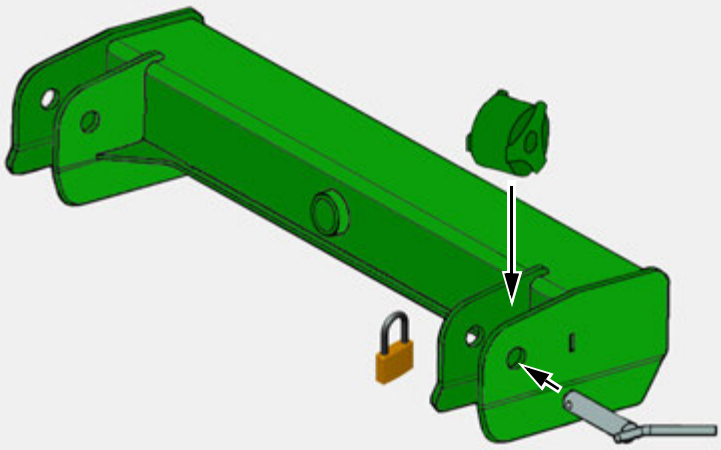
To prevent unauthorised use, **McHale** recommend using the padlock and the locking device provided. Both items are stored in the tool box on the machine and should be fitted to the drawbar coupling when the machine is not in use.

Linkage attachments (Cat. 2 and Cat. 3)

- Place lock out device on headstock pin
- Secure with padlock through the linch pin hole
- Linch pin can also be secured with the padlock to prevent loss
- Once the padlock is locked, the machine should be secure



- Place lock out device in between clevis
- Thread pin through and secure with padlock in the linch pin hole
- Linch pin can also be secured with the padlock to prevent loss
- Once the padlock is locked, the machine should be secure



5.5 Attaching to 3-point linkage (C430)

Ensure both lower link arms are adjusted equally in height. If you are using tractor couplers, secure the lower link balls onto the CAT 2 pins on the machine, using linch pins. Line up the tractor and reverse slowly until the lower link arms are aligned under the CAT 2 pins on the machine. Then, raise the lower link arms until they are latched securely on the quick couplers.

If quick couplers are not being used, line up the tractor with the machine and reverse slowly until the lower link arms are aligned within the link arm slots. Then adjust the height until they are in line with the locating holes and secure using the CAT 2 pins and linch pins.

Once the lower link arms are secure, the top link can be attached and adjusted to ensure that the machine is both secure and level during operation. The lower link stabilisers may require adjusting to make above connections and then tightened to ensure there is no lateral movement.

Once the tractor is attached to the 3-point linkage, attach the PTO shaft. Before connecting the PTO shaft to the tractor, raise the machine so that the PTO stubs of both the machine and tractor are horizontal to each other. First, fit the PTO shaft to the machine and then check if the PTO can be connected to the tractor stub. If not, then the PTO shaft is too long and must be altered. Depending on the country of use, a safety chain may also be required.

Ensure the lights are connected. Detach in reverse order of attachment.

CAUTION: Complete a full inspection before travelling on the road

The lighting system of the machine must be connected to the tractor and must be in a fully functioning condition. Always practice safety first!

5.6 Attaching the machine to a 540 rpm PTO

All mechanical functions are related to the correct PTO speed. Follow the instructions as supplied with the PTO unit for correct assembling of the PTO shaft to the tractor. *(See 'PTO shaft adjustment & maintenance')*. Ensure PTO cover guards are prevented from rotating, by securing the chain to the tractor.

CAUTION: Standard PTO of 540 rpm, maximum = 610 rpm

The machine should be driven with a standard PTO speed of 540 rpm. The maximum PTO speed allowed = 610 rpm. A PTO speed above 610 rpm is likely to cause damage to machine components. Do not use any faster PTO speed other than specified above!

WARNING: Measure distance between PTO stub shafts first

Never connect a PTO shaft on a new machine/tractor combination without first measuring the shortest distance between PTO stub shafts, otherwise severe damage can occur.

5.7 Making connections to the tractor

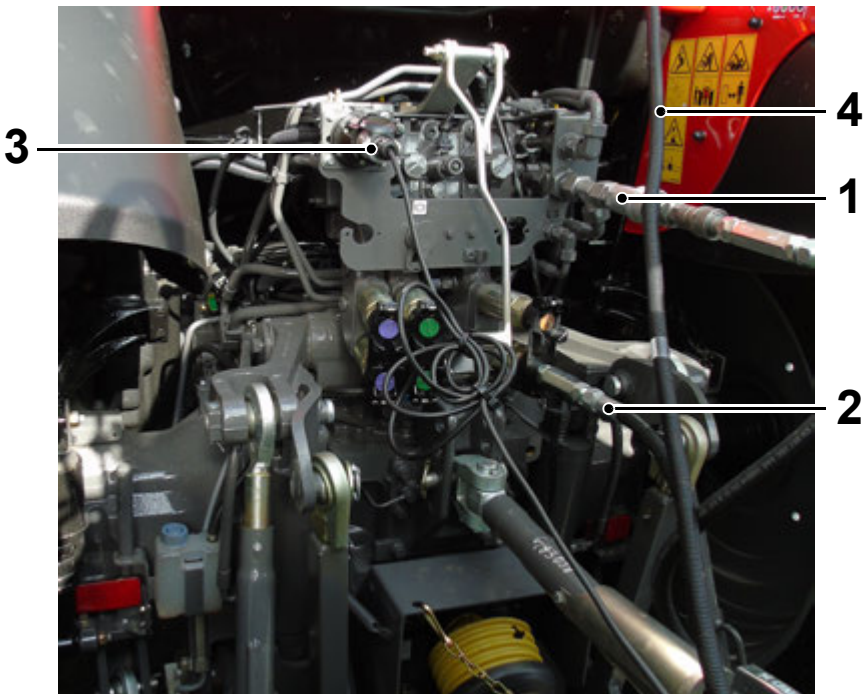
WARNING: Turn off tractor and remove key before connecting hydraulic hosing

When connecting hydraulic hosing to the tractor, ensure that the tractor engine is turned off and that the ignition key is removed. Ensure that all hydraulic connections are correctly tightened.

The following connections to the machine are required for attachment behind the tractor:

1. ½" male quick-release for feed line
2. ½" male quick-release for return line (The return line must have a free flow to the tank)
3. 12 V / 7-pin lighting socket
4. 12 V, 20 A socket (machine loom to control box shown)

See the following image for possible hosing layout. Ensure that the machine operator is familiar with all tractor connections and fittings.



Possible layout of hydraulic hosing and electric looms

5.8 Connecting the control box

The control box is to be connected to a 12 V, 20 A power supply using the supplied power lead. A good power supply is critical for proper machine operation as the electronic control box is the main interface between the operator and the machine.

CAUTION: Only connect control box to a 12 V power supply

Do not attempt to connect control box to a 24 V power supply, as machine component damage will result.

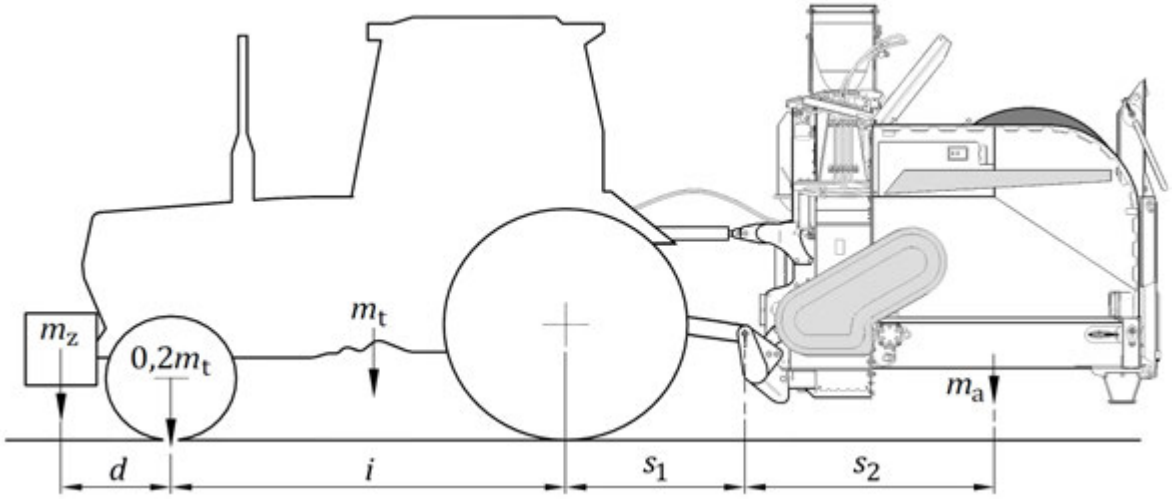
5.9 Machine and tractor stability (C430)

In order to ensure the stability of the combination of the machine and tractor, it may be necessary to add ballast to the tractor. If there is insufficient ballast the machine-tractor combination may become unstable. The ballast requirement (m_z), which should be at least 20% of the unladen mass of the tractor on the front axle, can be calculated using the Formula.

$m_z \geq (m_a \times (s_1 + s_2) - 0.2 \times m_t \times i) / (d + i)$		
Where:	m_a = 3,250 kg	s_2 = 1.54 m

NOTE: Reference tractor operator manual

Tractor's operator manual will need to be referenced to obtain the relevant figures.



Key:	
m_t	Unladen mass of the tractor (kg)
m_a	Mass of machine and bale on the rear linkage (kg)
m_z	Front ballast (kg)
d	Distance from centre of gravity of front ballast to front axle centre (m)
i	Tractor wheelbase (m)
s_1	Distance from the rear axle centre to the centre of the lowest points of the three point linkage (m)
s_2	Distance from the centre of the lowest points of the three point linkage to the centre of gravity of the machine and bale (m)

WARNING: The above calculations are a guide only

Travelling over rough or sloping ground may require additional ballast to ensure machine-tractor stability.

5.10 Lighting system

The 7-pin plug of the lighting system on the machine must be connected to the 7-pin socket on the tractor.

NOTE: Check lighting system before travelling on the road

Before travelling on a public road, the operator must ensure that the complete (tractor and machine) lighting system is in a fully functioning condition.

6

Machine requirements & preparation

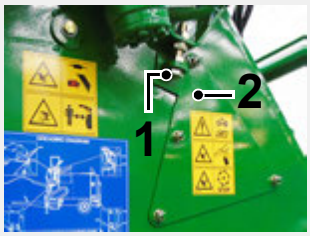
6.1 Chopper unit knife setting

CAUTION: Use protective gloves

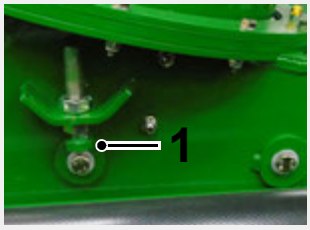
Use protective gloves for any manual work in this area!

Knife adjustment should be carried out in the following way:

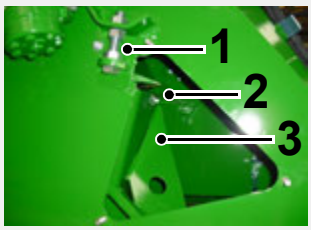
1. Switch off the control box.
2. Shut down the tractor, remove the key and apply the parking brake.
3. Select neutral on the blower fan gearbox.
4. Remove the knife inspection plate.
5. Loosen the rear knife lock bolt.
6. Use the adjuster bolts, front and rear, to set the knife height between 1 mm and 2 mm from the fan blade tips. Check the gap at the centre of the knife.
7. Tighten the lock nuts on the adjuster bolts, front and rear, to fix the knife setting.
8. Tighten the rear knife lock bolt.
9. Refit knife inspection plate.



1. Knife adjuster bolt
2. Knife inspection plate



1. Rear knife lock bolt



1. Knife adjuster bolt
2. Knife to fan blade gap 1 mm to 2 mm
3. Fan blade

6.2 Gearbox oil

The gearbox is located to the front of the machine.

WARNING: Ensure the tractor is shut down before changing oil

Ensure that the tractor engine has been shut down, the key has been removed from the ignition and the brakes have been applied before changing oil.

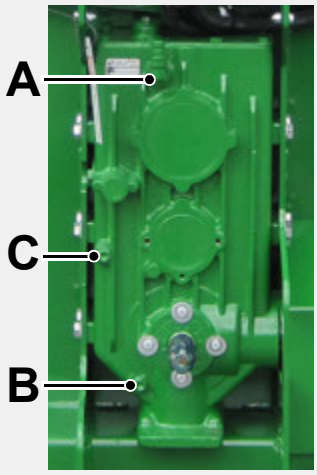
NOTE: Oil must be drained & filled after the first 5 hours of use

After the first 5 hours of use, the gearbox oil must be completely drained and filled with SAE 80W/90 grade oil.

ENVIRONMENT: Safe disposal of oil

Respect the environment! Never spill oil or grease on the ground, never pour them down the drain and never discard them where they can pollute the environment. Always take waste materials to a recycling centre.

To drain and add oil to the gearbox, carry out the following procedure:



1. Remove the drain plug (B), using a 17 mm spanner, and drain oil into a suitable container. This is best carried out while the oil is still warm, i.e. soon after use. Replace the drain plug (B), tighten and dispose of waste oil responsibly.
2. Remove the breather (A) and plug (C) using a 17 mm spanner. Add approx. 5 litres of SAE 80W/90 grade oil or until oil begins to flow from the sight-level hole (C) when the correct quantity of oil is added
3. Replace the level plug (C) and breather (A) and tighten carefully.

After this, replace the oil once per season or once per 500 hours, whichever comes first.

NOTE: Do not overfill gear oil

Do not overfill the oil, as this will result in overheating and oil leakage.

6.3 Tyre inflation pressures (C460/C470/C490)

CAUTION: Check the tyre pressure weekly

Check the machine tyres weekly for the pressures outlined in the following table.

Details	Type	Pressure	Part No.
260/70-15.3 122 A8 (Vredestein)	Flotation+	3.1 bar (45 psi)	CWH00011*
340/55-16 133 A8 (Vredestein)	Flotation+	3.1 bar (45 psi)	CWH00022

*Not available for the C490

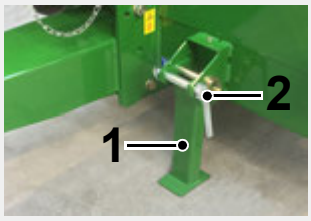
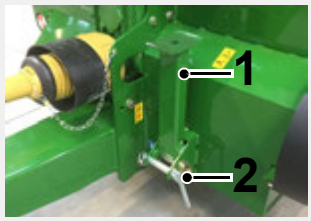
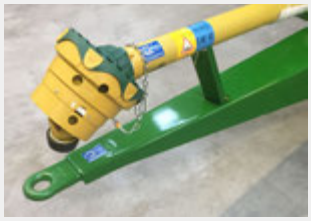
6.4 Drawbar & PTO stand usage (C460/C470/C490)

The drawbar stand is to be used every time the machine is disconnected from the tractor.

CAUTION: All stands must be rested on a solid footing

The stand must be rested on a solid footing, on level ground, using wheel chocks if necessary.

Ensure that the stand lock pin (2) is properly secured in the hole provided to prevent the stand from collapse. Then place the PTO shaft stand in an upright position in order to hold the PTO shaft in position. While using the machine, ensure that the drawbar stand (1) is fully elevated with lock pin (2) in position and the PTO stand lowered.

Storage position		Transport position	
	**Drawbar stand down**		**Drawbar stand up**
	**PTO stand up**		**PTO stand down**

NOTE: The PTO stand must be down once the machine is attached to the tractor to prevent damage to the PTO shaft.

6.5 Machine adjustment

WARNING: Adjustment to be made by qualified persons only

This work should only be carried out by qualified persons or your **McHale** dealer!

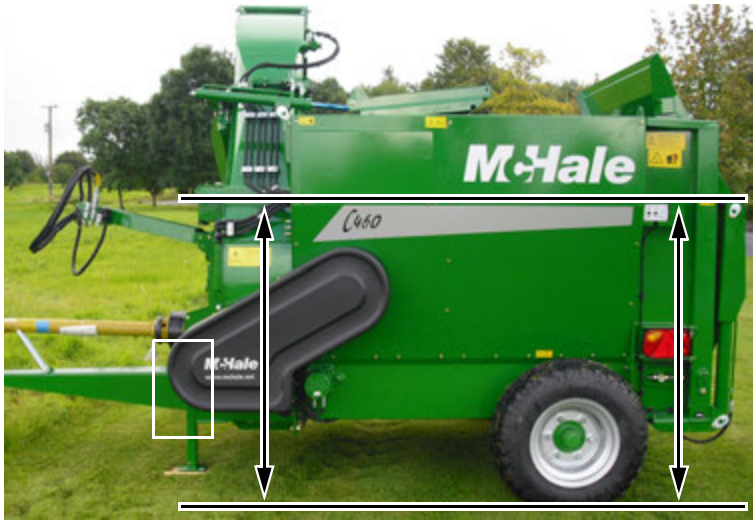
Ensure that the tractor engine has been shut down, the ignition key removed and the brakes applied. The machine should be stabilised with the wheels chocked and the front end of the machine (under the blower unit) supported on jacks or axle stands or drawbar stand. The drawbar should be adjusted so that the machine is level and horizontal to the ground when in the working position, see below.

To adjust, loosen the lower hinge bolts (B), but do not remove. Ensure that the drawbar hitch eye is supported during this operation. Remove the two upper bolts (A), then the drawbar can be adjusted to different height positions by repositioning bolts (A) in alternating hole positions until desired setting is achieved. Tighten both sets of M20 bolts A and B to a suitable torque value. *(See 'Tightening torque values')*

WARNING: Drawbar/linkage bolts must be inspected every two weeks

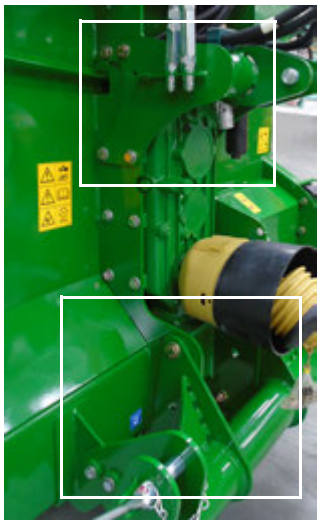
These drawbar/linkage bolts must be inspected once every two weeks and re-torqued, if necessary.

Adjust bolts



Machine to be horizontal to the ground

The **C430** linkage machine should also be level and horizontal to the ground when in the working position and this is normally achieved by adjusting the top link, keeping PTO offset angles to a minimum. Ensure that all bolts, on both the upper and lower linkage brackets (as shown), are tightened to a suitable torque value. *(See 'Tightening torque values')*



Tighten bolts

Machine to be horizontal to the ground

6.6 PTO shaft adjustment & maintenance

(See 'Adjusting the PTO shaft to the tractor')

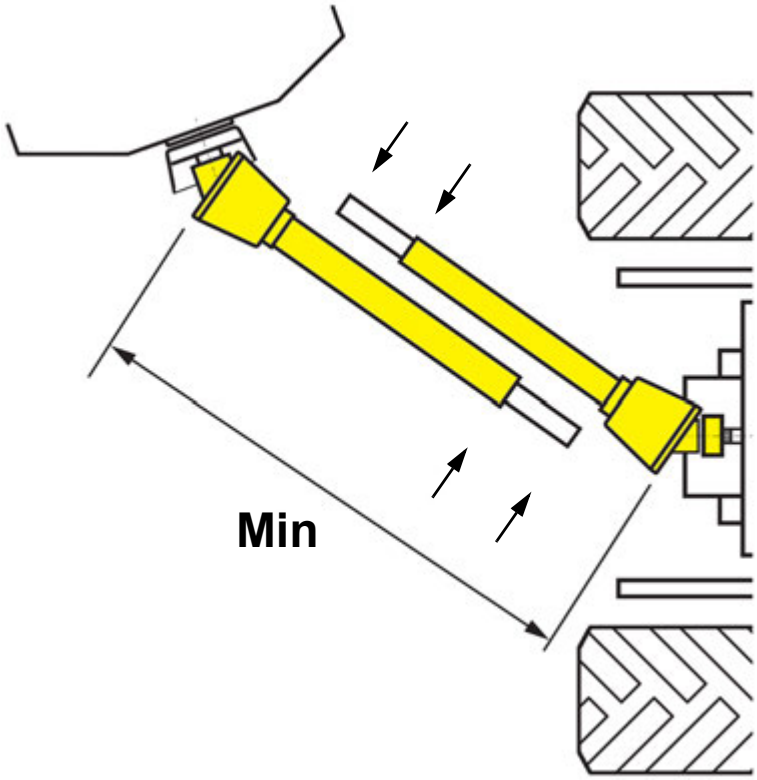
CAUTION: Ensure the tractor is shut down

Ensure that the tractor engine has been shut down, the key removed and the brakes applied before carrying out the following procedure.

WARNING: Measure distance between PTO stub shafts first

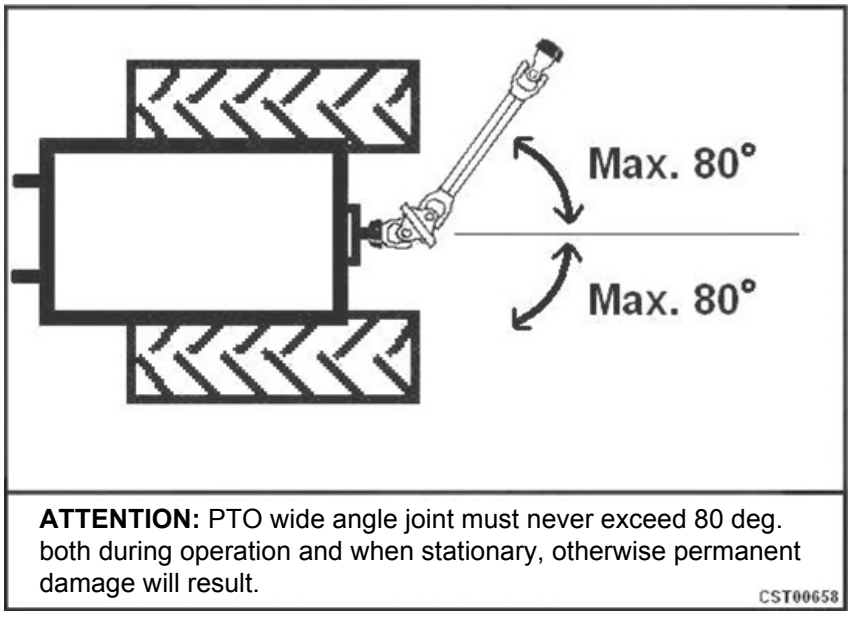
Never connect a PTO shaft on a new machine/tractor combination without first measuring the shortest distance between PTO stub shafts, otherwise severe damage can occur.

For the **C460/C470/C490**, the length of the PTO shaft is suitable for all known tractor conditions. However the PTO shaft must be checked/altered to suit the tractor combination it is being fitted to. First, fit the PTO shaft to the machine and then check if the PTO can be connected to the tractor stub. If not, then the PTO shaft is too long and must be altered. Typically the shortest distance on a trailed machine is when the tractor is turned at the maximum angle from the machine. Operating on very hilly ground can also reduce this further. The shortest distance on a linkage machine is when the PTO stubs of both tractor and machine are aligned horizontally. *(See 'Adjusting the PTO shaft to the tractor')*



After measuring carefully, the PTO shaft halves should be cut equally so that the PTO shaft assembly is kept as long as possible, whilst just allowing enough room for its removal. This will ensure that a maximum overlap (ideally 200 mm minimum) is maintained, when extended.

Maximum 80° angle of movement should never be exceeded, otherwise permanent damage will result.

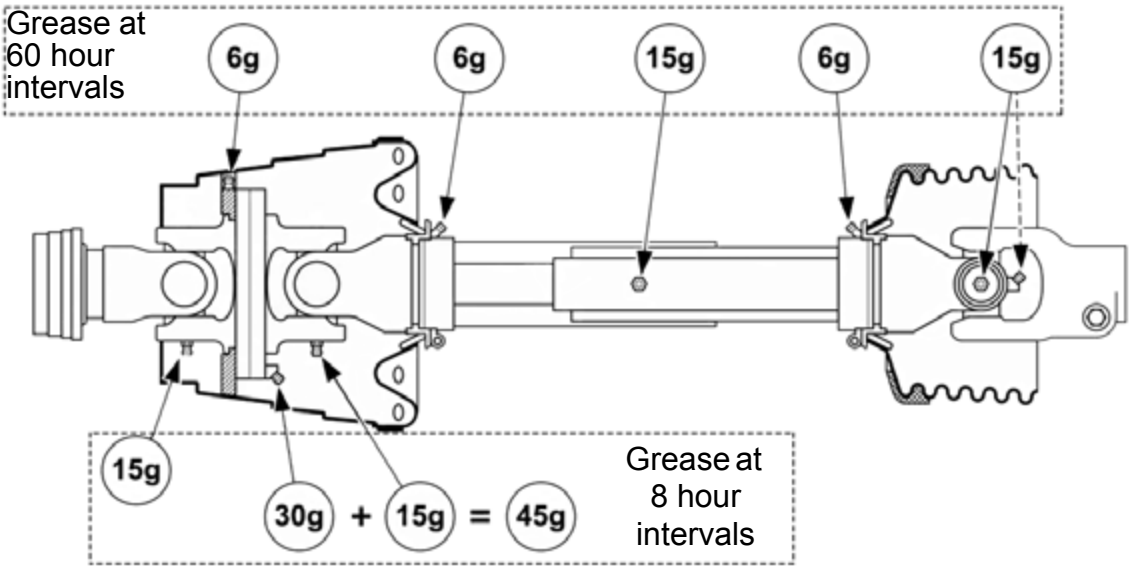


(C460/C470/C490 only)

NOTE: Grease point intervals

The lower 3 PTO shaft grease points are to be greased at 8 hour intervals. All other grease points are to be serviced at 60 hour intervals.

The recommended quantities of grease in grams for each grease point are shown.



For the **C430** linkage machine, the PTO shaft must be altered to suit the tractor combination it's being fitted to. After measuring carefully, the PTO shaft halves should be cut equally so that the PTO shaft assembly is kept as long as possible, whilst just allowing enough room for its removal, when in a horizontal position. This will ensure that a maximum overlap (ideally 200 mm minimum) is maintained, when extended, as the machine is lowered fully. The angle of operation should never exceed 25° misalignment, otherwise permanent damage will result. *(See 'Adjusting the PTO shaft to the tractor')*

CAUTION: Ensure safety chains are attached to machine and tractor

Ensure the safety chains on the PTO cover sleeves are attached to both machine and tractor to prevent them from spinning.

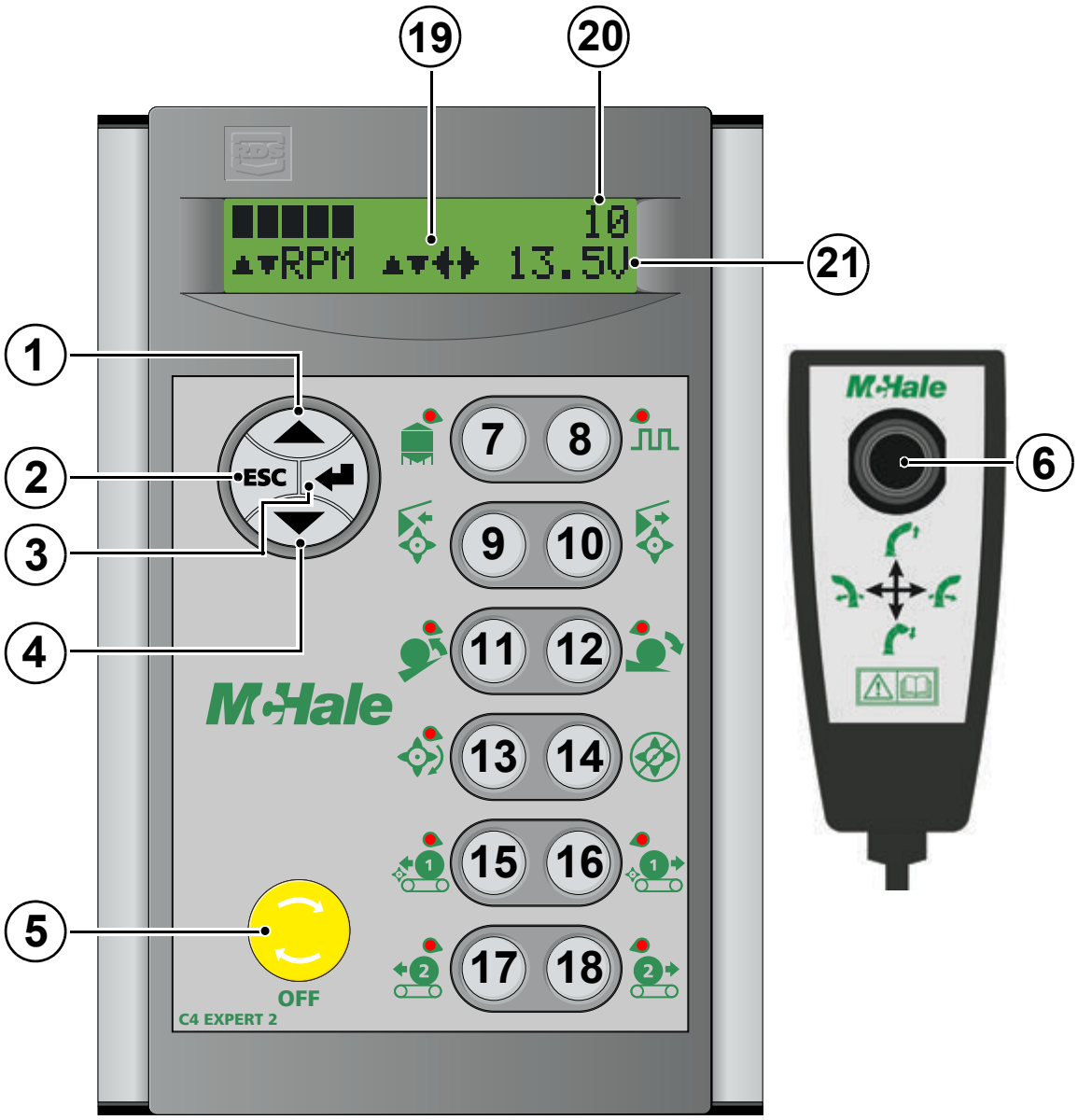
WARNING: Ensure PTO guarding is in good condition

Never use the machine if the PTO guarding is missing or damaged. Entanglement in rotating drive line can cause serious injury or death. Always stop the engine and ensure that driveline has stopped before making connections, adjustments or cleaning out PTO driven equipment.

7

Electronic control system

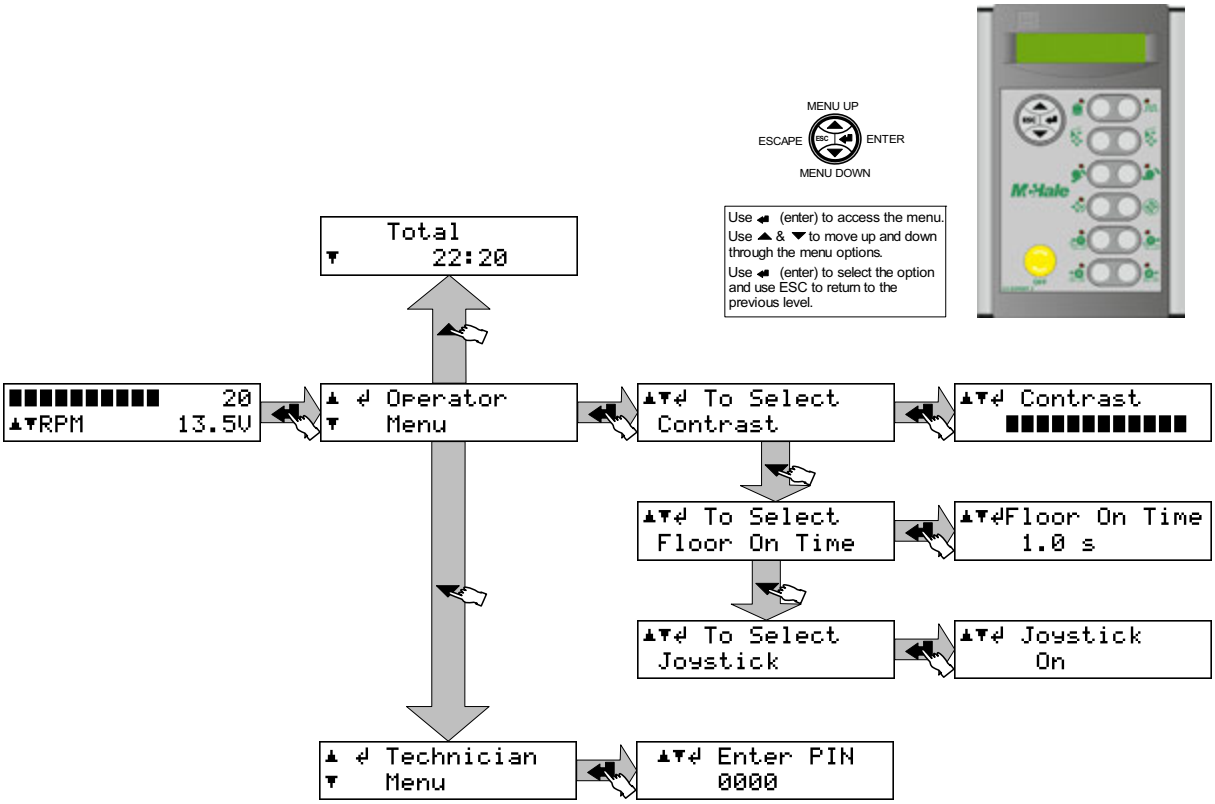
(Software Version EX318-014)



7.1 Control box functions

No.	Function	Description
1	Up arrow	Increases floor speed and other functions
2	Escape	Menu escape and also clears warnings
3	Enter	Menu enter and select
4	Down arrow	Decreases floor speed and other functions
5	Power switch	Rotate to switch On, press to switch Off
6	Chute joystick	Chute control - left, right, up and down
7	Additive On/Off	LED illuminates when additive is set to On
8	Pulsed floor On/Off	LED illuminates when pulsed floor mode is set to On
9	Rotor comb out	Moves comb forward
10	Rotor comb in	Moves comb rearward
11	Loading door up	LED illuminates when loading door up is operated from the auxiliary control box
12	Loading door down	LED illuminates when loading door down is operated from the auxiliary control box
13	Rotor engage	LED illuminates when rotor is engaged
14	Rotor disengage	LED is off when rotor is disengaged
15	Floor forward	LED illuminates when floor forward is latched on or is operated from the auxiliary control box
16	Floor reverse	LED illuminates when floor reverse is operated from the auxiliary control box
17	Floor 2 forward **(C490 only)**	LED illuminates when floor 2 is operated from the auxiliary control box
18	Floor 2 reverse **(C490 only)**	LED illuminates when floor 2 reverse is operated from the auxiliary control box
19	Chute direction indicators	Up or down or left or right arrows are shown when the chute is operated using the joystick
20	Floor speed setting	Floor speed shown as bar graph and numerical value. Adjustable from 1-20 and MAX hydraulic flow
21	Supply voltage	Displays supply voltage

7.2 Electronic control box setup



Total

Displays the total working time in hours and minutes. The total only increases when functions are operated. It does not include time when the machine is left idle with the control unit switched on.

Contrast

Extremes of temperature and light may affect the contrast of the display, which is adjustable from the contrast menu. Use the up and down arrows to adjust the setting.

Floor On Time

Sets the time that the floor stays on for, when set to ‘Pulsed Mode’. Use the up and down arrows to adjust the setting. *(See ‘Pulsed mode’)*

Joystick

Sets the joystick to On or Off. Use the up and down arrows to adjust the setting. *(See ‘Alternative chute control’)*

Technician Menu

The technician menu is reserved for **McHale** engineers only. A pin code needs to be entered to access the menu.

7.3 Control box features

1. Increase floor speed

Press the up arrow to increase the floor speed. The speed is adjustable from 1-20. Always start at a low speed and adjust upwards slowly. Never start the floor at high speed. The rotor can be overloaded if the speed is set too fast on start-up. Set to MAX for maximum hydraulic flow.
The up arrow is also used to increase other menu settings.

2. ESC

Press ESC when in the operator menu to return to the main working screen.

3. Enter

Press Enter to access the operator menu. Then use up and down arrows to scroll through the settings. Press Enter again to select a setting. Press the up or down arrows to adjust the selected setting. Press ESC to return to the working screen.

4. Decrease floor speed

Press the down arrow to decrease the floor speed.
The down arrow is also used to decrease other menu settings.

5. Power switch

Turn clockwise to switch on the control unit. Press to switch off. When switched off all hydraulic functions are disabled. Caution: The PTO can still be active!

WARNING: Shut down PTO and tractor if carrying out adjustments
When maintenance or repair work has to be carried out on the machine, the hand brake must be applied, engine shut down with ignition key removed. The PTO shaft must be removed from the PTO stub, with the hydraulic and electric power supply disconnected. It is forbidden to open any safety guards or carry out any work on the machine unless the specified precautions have been carried out.

6. Chute control joystick

- The chute is joystick controlled to allow adjustment of chute height and direction.
- Push the joystick up to raise the chute which will direct material further away.
- Pull the joystick down to lower the chute which will spread material closer to the machine. The chute may be lowered to blow material on to the feeding slide for better control when spreading feed along a barrier.
- Move the joystick left to rotate the chute to the left.
- Move the joystick right to rotate the chute to the right.
- The chute can be rotated 270°, which allows material to be spread on the left and right, and behind the machine. The operator must ensure that there are no people or animals in the direct path of, or near the path of the material

being discharged from the machine. Do not operate the machine when people are within a 25 m radius of it.

Alternative chute control

It is possible to operate the chute if the joystick is unavailable. When the joystick is set to Off then button 7 is no longer used for the additive. Instead, it is used to enable/ disable chute control.

1. Set joystick to Off in the operator menu
2. Press button 7 to enable chute control. The LED flashes On/Off when the chute control is enabled.
3. Use buttons 9, 10 11 and 12 to operate the chute as follows:

Button	Function
9	Rotates the chute to the left
10	Rotates the chute to the right
11	Rotates the chute upwards
12	Rotates the chute downwards

Press button 7 again to disable the chute control. The LED switches off and the buttons' functions 9,10,11 and 12 return to normal.

7. Additive

Press button 7 to switch the additive on. The LED illuminates when additive is set to On. If the additive is switched on, then an extra output is powered on whenever the floor is moving forward. There is a spare connection on the wiring loom that switches on at 12 V and the maximum current draw allowable is 3 Amps.

8. Floor pulsed mode

Press button 8 to switch pulsed mode On/Off. The LED illuminates when pulsed mode is set to On.

9. Rotor comb out

Press button 9 to move the comb towards the front of the machine.

10. Rotor comb in

Press button 10 to move the comb towards the rear of the machine.

11. Loading door up

Press button 11 to raise the loading door.

12. Loading door down

Press button 12 to lower the loading door.

13. Rotor engage

Press button 13 to engage the rotor. The rotor engages automatically. The LED illuminates when the sensor detects the rotor has been engaged.

14. Rotor disengage

Press button 14 to disengage the rotor. The rotor disengages automatically. The red LED switches off when the sensor detects the rotor has been disengaged.

15. Floor forward

Press button 15 to move the floor forward. If the rotor is engaged then pressing button 15 latches the floor On in the forward direction. Press button 15 again to switch it off.

If the rotor is disengaged then button 15 must be pressed and held to operate the floor in the forward direction. There are two modes for operating the floor in the forward direction:

1. Constant speed mode
2. Pulsed mode

The default mode is constant speed mode. Press button 8 to switch pulsed mode On/Off. The LED illuminates when pulsed floor mode is set to On.

Constant PWM mode

In this mode the floor switches on at a constant speed. The floor speed can be increased using the up arrow and decreased using the down arrow.

Pulsed mode

In this mode the floor pulses On/Off at a constant rate. The On time is adjustable in the operator's menu using the Floor On Time setting.

The Off time is set using the up and down buttons and displayed on screen as a bar graph and numerical indicator. The higher the setting the shorter the Off time and the higher the volume of crop that's fed into the rotor.

There is a floor movement indicator which acts as a visual aid to show the floor movement speed and direction.

16. Floor reverse

Press button 16 to reverse the floor.

17. Floor 2 forward (C490 only)

Press and hold button 17 to move the second floor forward. Floor 2 operates as 'hold to run' and is completely independent of the main floor.

18. Floor 2 reverse (C490 only)

Press and hold button 18 to reverse the second floor. Floor 2 operates as 'hold to run' and is completely independent of the main floor.

7.4 Auxiliary control box

The C4 Series machines are each equipped with an auxiliary control box located at the rear of machine which functions as a floor and loading door controller.

Auxiliary control box C430/C460/C470

Function enable button

1. Floor control switch

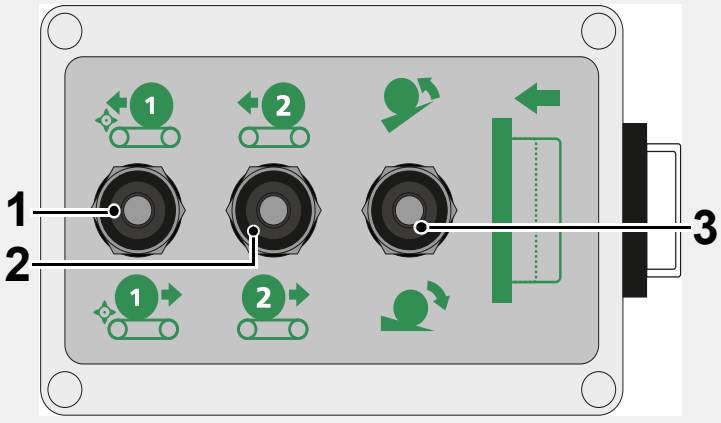
Push the switch up, to move the floor forwards (towards the rotor). Pull the switch down to move the floor rearward (away from the rotor). The function enable button must also be pressed for this switch to operate.

2. Floor 2 control switch

There is an extra switch on the C490 auxiliary control box to operate Floor 2 in forward and reverse. The function enable button must also be pressed for this switch to operate. Floor 2 is completely independent of the main floor and is only used to transfer material in the rear section of the machine.

3. Loading door switch

Push the switch up to raise the loading door up. Pull the switch down to lower the loading door down. The function enable button must also be pressed for this switch to operate.

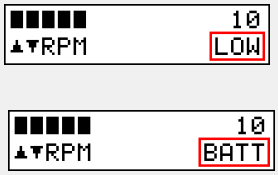


Auxiliary control box C490

Function enable button

All switches are ‘hold to run’ and each function stops as soon as the switch is released.

7.5 Warning messages

 	If the voltage supply drops below 10.5 V then ‘LOW’ and ‘BATT’ flash alternatively on the bottom right of the display

8

Road traffic safety & operation

8.1 Before travelling on any public roadway

CAUTION: Complete a full inspection before travelling on the road

Ensure that a full inspection is completed every time before attempting to go on to a public roadway, always think and practice safety!

The following should be inspected every time, before travelling on a public road:

- Ensure that the tyres are set to the correct pressure as per safety decals and according to the specifications.
- Any bale in the bale chamber should be secured so it cannot move during transportation and the loading door must be closed securely.
- The machine must be safely cleared of all loose forage. To carry this out, firstly turn off the tractor and fully isolate the machine by disconnecting all of the connections to the tractor unit.
- The PTO shaft must be fixed securely to the tractor PTO stub shaft.
- The lighting system of the machine must be connected to the tractor and must be in a fully functioning condition.
- The electronic control box must be switched off or disconnected from the power supply. *(See 'Control box functions')*
- The hydraulic supply must be turned off and protected from accidental activation by disconnecting the hydraulic feed line. Support all loose lines in a safe manner.
- Attention must be paid to the maximum travel speed limit of 40 km/h.
- Ensure that all the national road traffic regulations relating to the country are fulfilled i.e. the use of safety chains is mandatory in EU countries when air brakes are not installed. The safety chain must be attached in such a way that if the coupling breaks, the hitch or drawbar cannot make contact with the ground.
- The drawbar stand must be rotated upwards and secured in the transport working position. *(See 'Drawbar & PTO stand usage (C460/C470/C490)')*

8.2 Road transportation

- Close the back loading door securely and ensure all panels are in position.
- Ensure any bale or partial bale inside the chamber is secured and will not move during transportation.
- Clear the machine of loose forage, plastic, netting or mud.
- Always ensure that the chute and slide extension are fully retracted.
- Ensure safety chains on PTO cover sleeves are attached to both machine (as shown) and tractor to prevent them from spinning.
- Unlock the stand and swing it upwards into the transport position and secure carefully using the lock-pin provided. (**C460/C470/C490**)
- Ensure that the 7-pin light connector is attached to the tractor socket, and the light fixtures are locked into the travel position. Confirm that all lights are functioning correctly before travel.
- The safety chain must be attached securely to the tractor.

Drawbar stand transport position (C460/C470/C490)

9

Bale chopper operation & adjustments

Detailed instructions on how to operate the machine are outlined in the following pages. These should be used along with learning the precise functionality of each button on the control box. *(See 'Control box functions')*. The following guidelines are given on the basis that both of these chapters are fully understood:

1. Load a bale on to the machine. *(See 'Loading a bale')*
2. Position the comb to suit crop type. *(See 'Distribution')*. Ensure there is clearance between the bale and the rotor.
3. Disengage the rotor drive fully. *(See 'Control box functions')*
4. Select a suitable gear for fan rotation to suit either feeding or bedding.
5. Engage the PTO slowly and increase the PTO speed as required.
6. Set the chute height (and slide extension) for feeding, or to begin bedding.
7. Engage the rotor drive. Ensure the 'Rotor Engaged' LED is illuminated.
8. Set the floor speed to the minimum value. Never start the floor at a high speed.
9. Switch on the floor forward conveyor and ensure the 'Floor Forward' LED is illuminated. The floor movement indicator disc will also rotate.
10. Increase the floor forward speed slowly.

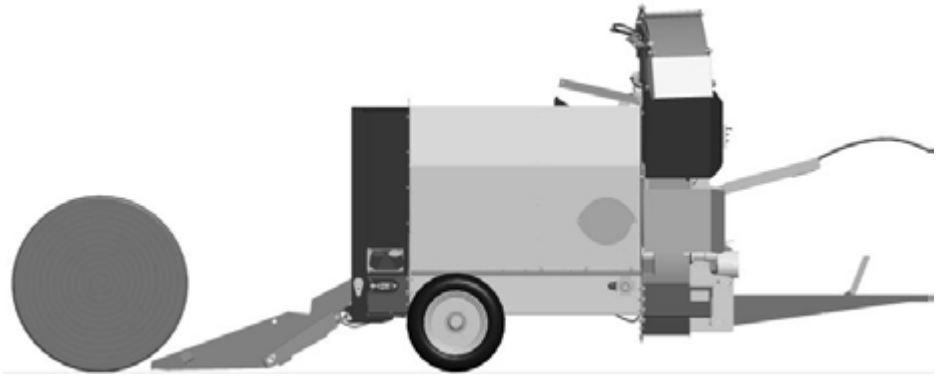
CAUTION: Do not speed up the floor conveyor excessively

Speeding up the floor conveyor excessively will cause a blockage. Check that the floor indicator is rotating.

11. Select the appropriate tractor travel speed.
12. Adjust the floor forward conveyor speed, as required, ensuring that the floor indicator is rotating.
13. Re-set the chute height and direction to give desired results.
14. The 270° chute orientation allows full coverage both sides even in buildings without a through passage. *(See 'Chute rotation')*
15. The product flow rate can be altered by changing the engine rpm (affecting PTO and hydraulic flow), floor conveyor speed along with tractor speed.

9.1 Loading a bale

1. To load a round bale from the ground, firstly the bale must be placed on a flat level surface and supported from behind to prevent sliding. Next, align the machine with the bale. The leading edge of the door must be lowered to between 10 and 30 mm from the ground. Then reverse the loading door under the bale and elevate the door (and bale) to a horizontal position as shown before removing plastic or netting. Then close the loading door completely to transfer the bale into the chamber.

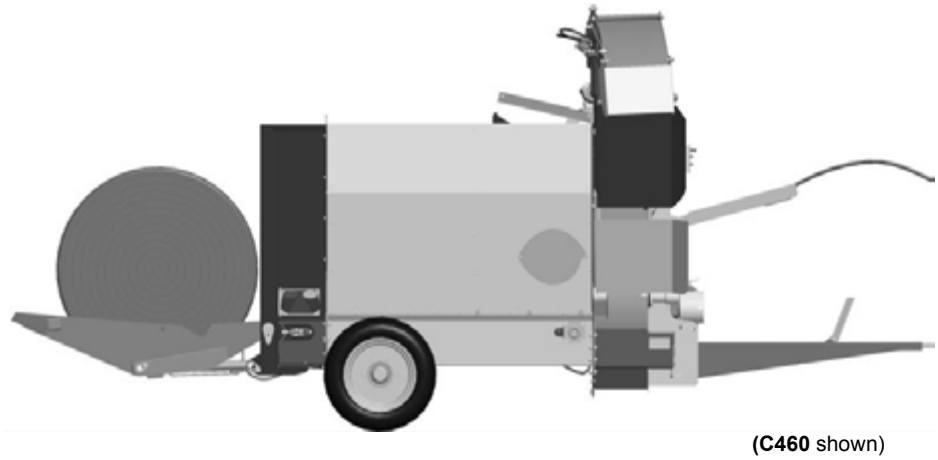


(C460 shown)

2. To load using a loader, lower the loading door so the top edge of the door sides are horizontal. Carefully lower the bale onto the door. Do not drop the bale from a height and do not press the loader down on the bale when positioned on the loading door, as this may cause damage to the machine. Now remove plastic and/or netting before closing the loading door completely to transfer the bale into the chamber.

NOTE: Unrolling a bale naturally uses less power and reduces blockages

Loading a round bale so it can unroll naturally, uses less power and makes it much easier for the machine to spread forage or straw without blockage.

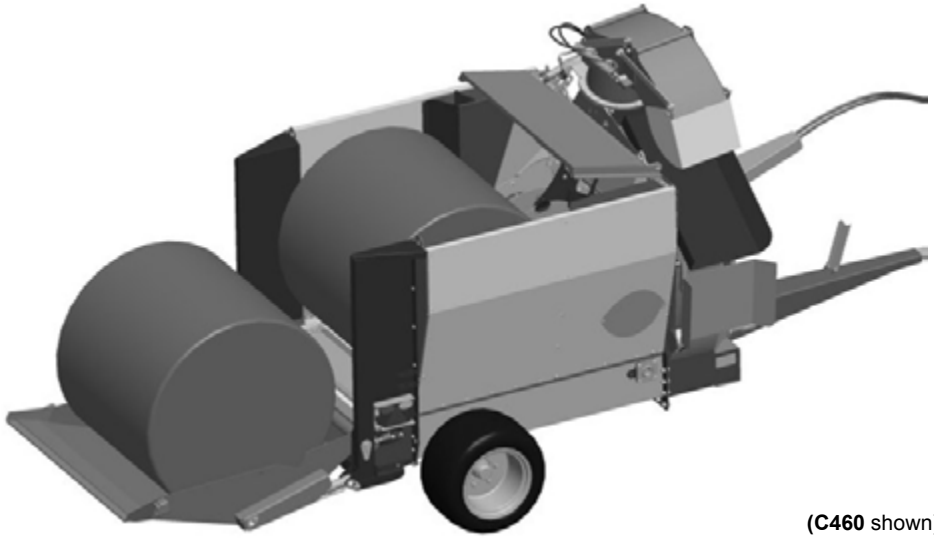


(C460 shown)

WARNING: Never carry a bale on the door of the C430!

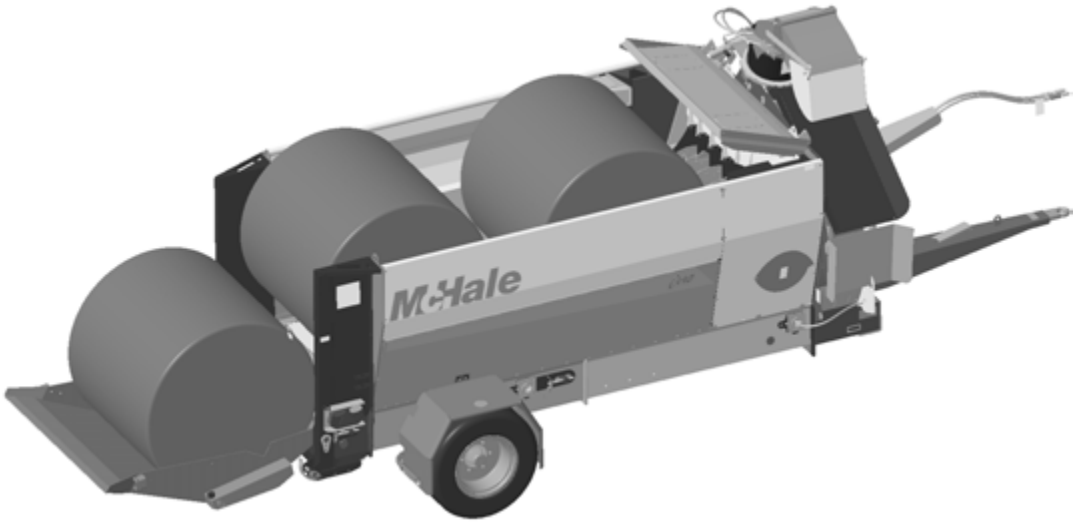
Never carry a bale on the door of the C430. The C430 is designed to carry a single bale within the chamber only!

3. It is possible to load a second bale (1.2 m diameter max.) on to the loading door. (**C460/C470**)



(**C460** shown)

4. The **C490** is designed to hold two bales and can carry a third bale (1.2 m diameter max.) on the loading door.

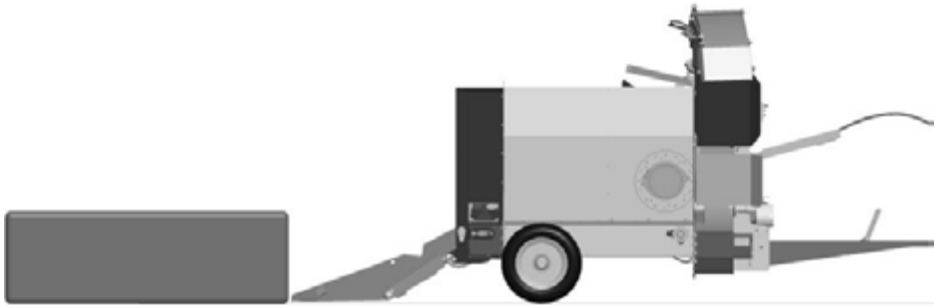


(**C490** shown)

NOTE: The loading door must be closed before travelling on a public road

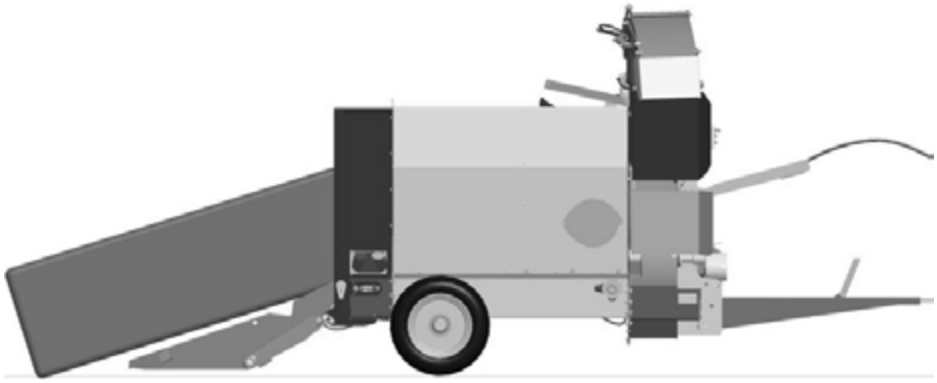
A bale must never be positioned on the open loading door while travelling on a public road. The loading door must be closed securely with hydraulic supply turned off or disconnected.

5. Loading large square bales from the ground. Place the bale against a solid backstop on a flat level surface. Line up the machine and reverse the loading door back under the bale. The leading edge of the door must be between 10 and 30 mm from the ground.



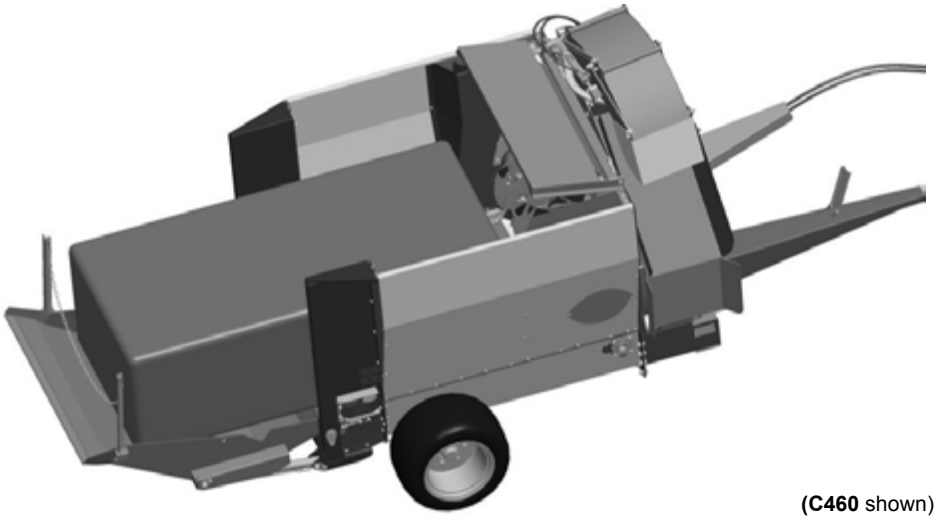
(**C460** shown)

6. Reverse the loading door under the bale until the door is between 400 and 600 mm from the backstop.



(**C460** shown)

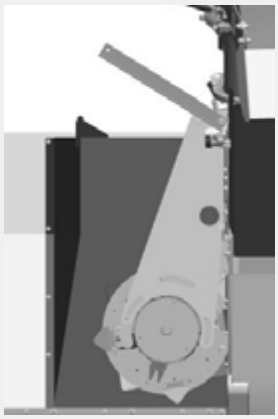
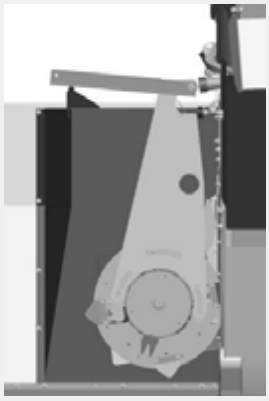
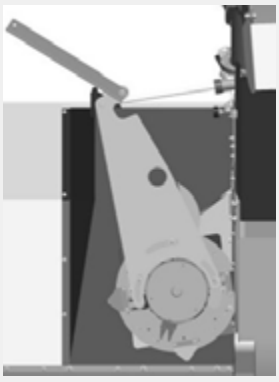
7. Elevate the loading door so the top edge of the door sides are horizontal. Move the floor forward to bring the bale into the bale chamber. Leave clearance between the bale and the rotor. Fit the square bale retaining chain and post into the door brackets provided. Remove any string, netting or plastic.



(**C460** shown)

8. Loose crop must always be loaded using a loader; with the loading door closed fully. Avoid contact between the loader and any part of the machine.

9.2 Distribution

	**1.** Comb retracted forwards. Beater position suitable for spreading straw bedding.
	**2.** Comb extended a short distance. Beater position suitable for short cut silage and maize.
	**3.** Comb extended fully backwards. Beater position suitable for long difficult to cut feed crops.

Positions shown are suggested guidelines. Operator may need to use varying positions to suit individual crop conditions.

If experiencing difficulty with the distribution of clamp silage, there are side insert kits available to order. *(See 'Clamp silage side insert kits')*

9.3 Chute elevation

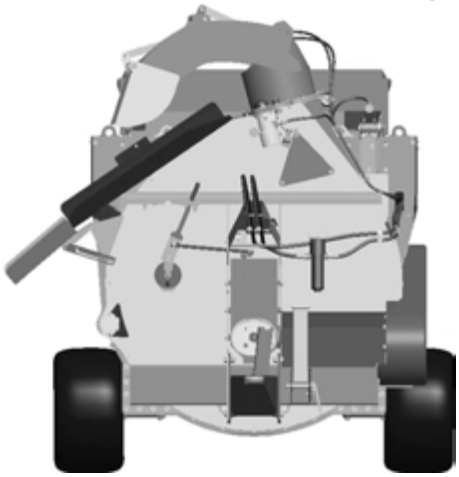
WARNING: Beware of stones in baled straw for bedding!

Never distribute bedding or feed crop towards people or livestock. Bales may contain stones that can act as missiles and cause serious injury or even death! Keep people and livestock well away from the work zone!

To distribute feed along a barrier, keep the chute slightly elevated but allowing forage to land on the main distribution slide.

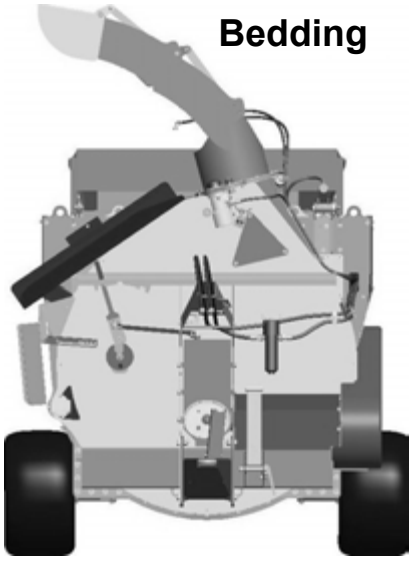
Adjust the slide extension to allow forage to land a suitable distance away from the machine.

Feeding



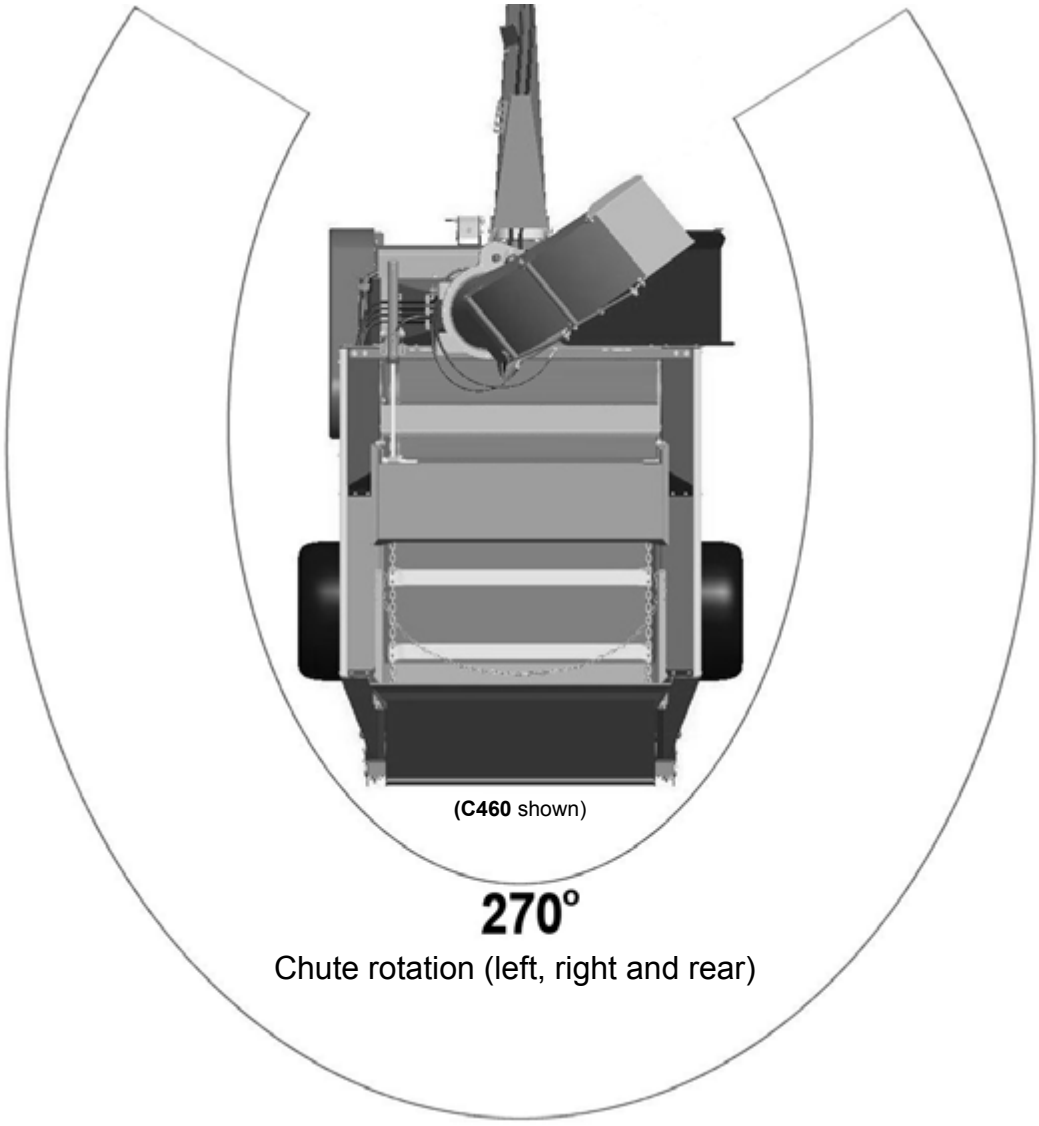
To distribute bedding the chute is raised to a suitable height to reach the area in which the bedding is required.

Bedding



9.4 Chute rotation

Crop can be distributed 270° to the left, right and rear sides of the machine as shown. If bedding in a blind spot, especially to the rear, ensure there are no people or livestock in that area. Keep people and livestock well away from the work zone!



Chute rotation (left, right and rear)

Chute rotation

WARNING: Beware of stones in baled straw for bedding!

Never distribute bedding or feed crop towards people or livestock. Bales may contain stones that can act as missiles and cause serious injury or even death! Keep people and livestock well away from the work zone!

9.5 Gear selection

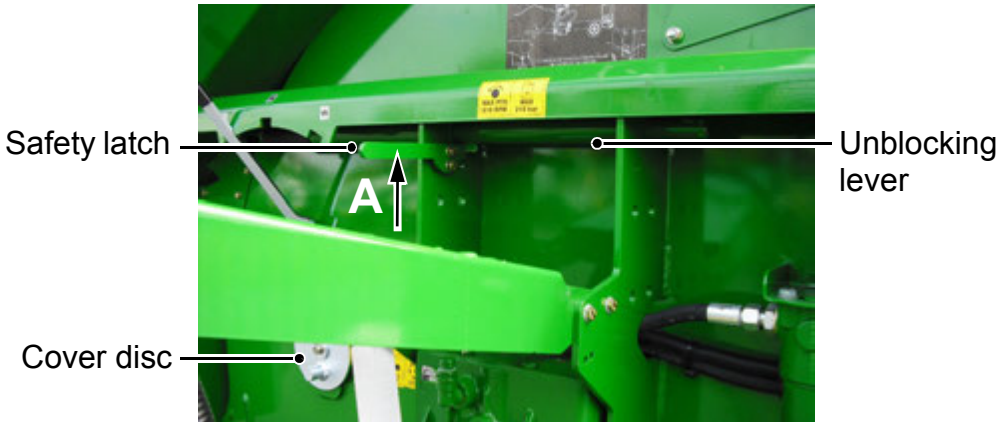
Gear selection (shown in neutral)

	The hare represents high speed fan rotation for use when distributing bedding. (move the gear selection lever to the left position)
	N represents Neutral. The fan is disengaged. In neutral, the unique unblocking system can be used. The cover disc can be rotated to expose the jack-back point. (move the gear selection lever to the central position)
	The tortoise represents low speed fan rotation for use when distributing feed or when distributing bedding in small areas. (move the gear selection lever to the right position)

9.6 Clearing a fan blockage

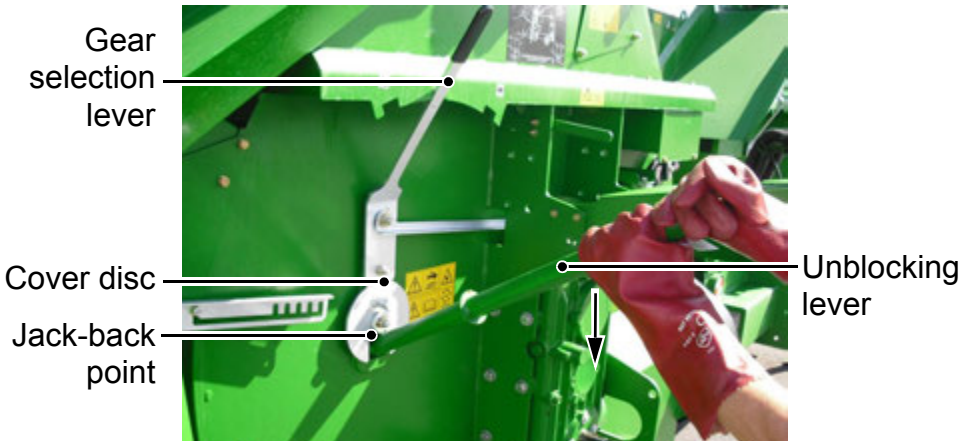
WARNING: Shut down PTO and tractor if carrying out adjustments
When maintenance or repair work has to be carried out on the machine, the hand brake must be applied, engine shut down with ignition key removed. The PTO shaft must be removed from the PTO stub, with the hydraulic and electric power supply disconnected. It is forbidden to open any safety guards or carry out any work on the machine unless the specified precautions have been carried out.

If a clump of crop or foreign object has become entangled in the fan, first remove the unblocking lever from its storage position. This lever is stored above the gear selection, at the front of the machine. To release the unblocking lever, raise the safety latch (A), whilst rotating the lever counter-clockwise 180°. Then, slide/retract the lever to the left to release it.



Safety latch and unblocking lever

Select neutral by moving the gear selection lever to the central position. Rotate the cover disc (180°) until you can insert the unblocking lever and pull down, as shown below, to jack the fan backwards until the blockage is cleared. Never put fingers into the jack back point! Once the fan is rotating freely, remove the unblocking lever and place it back into its storage position securely, using the reverse order of removal and spin the cover disc 180° shut and select the required fan gear.



Clearing fan blockage

WARNING: Never open cover while the fan is still rotating!

Never rotate the cover disc into this ‘open’ position while the fan is still rotating, even slowly!

WARNING: Never ever reach down the chute for any reason!!!

Never reach down the chute to remove a blockage or for any other reason. Given the weight and diameter of the fan, the shearing action between the fan blades and knife at the base of the chute, very serious injury could occur. There is a very high risk of mutilation or severing fingers or hands!

9.7 Knife section

The knife sections are mounted with the flat (non-chamfered) sides facing their respective comb finger for optimum shred. They can be reversed, from one side of the disc to the other, before sharpening so both cutting edges are utilised.

Sharpen knife sections on the flat side to reduce the thickness and restore the cutting edge.

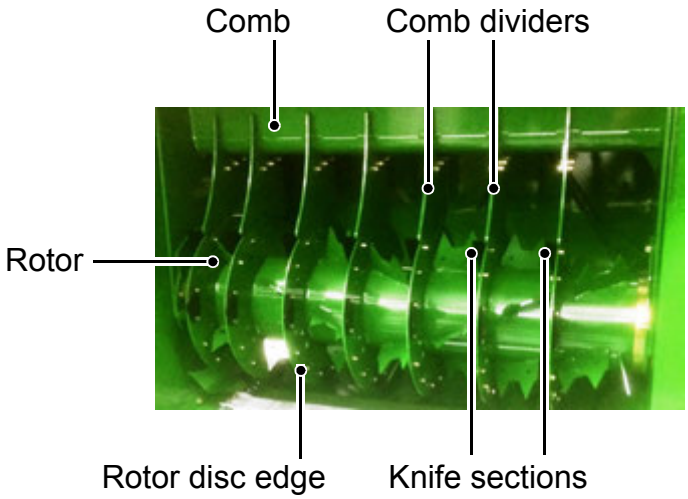
WARNING: Always wear protective clothing and gloves

Always wear suitable protective clothing and gloves when sharpening blades or handling sharp objects.

9.8 Comb adjustments

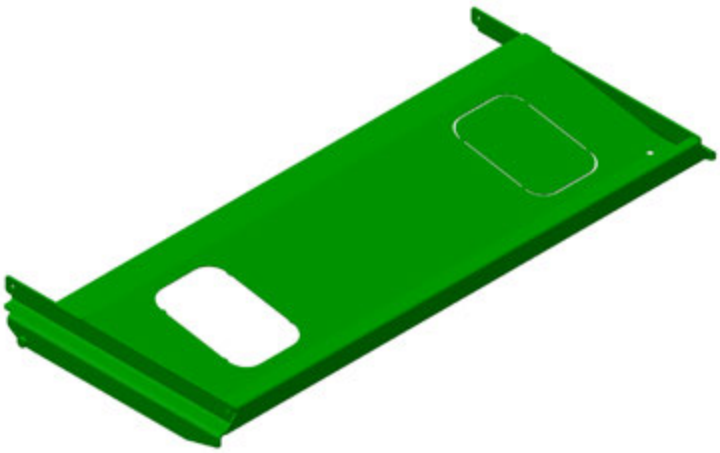
9.8.1 Adjusting the comb fingers

The clearance between the comb fingers and the disc edges of the rotor must be between 2 and 6 mm. Ensure comb fingers and sections do not make contact.



9.8.2 Pre-cut comb cover

The comb cover has been pre-cut to allow operators seeking better visibility to cut out one or two viewing holes if desired.



Comb cover

9.9 Adjusting the rotor drive belt tension

WARNING: Work to be carried out by qualified persons!

This work should only be carried out by qualified persons or your **McHale** dealer!

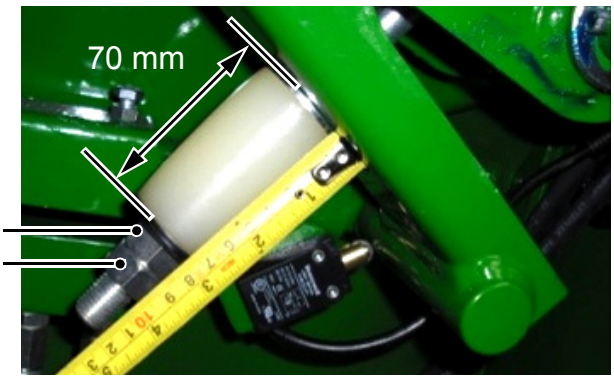
Ensure the rotor is in the ON position before beginning. Engage the rotor drive. Ensure the 'Rotor On' LED is illuminated. Then shut down power to the unit.

Shut down tractor, remove key, apply parking brake, and prevent any machine movement, using wheel chocks if necessary. Disconnect the electrical machine loom from the control box, along with hydraulic hoses and the PTO shaft.

Remove the cover guard over the rotor drive belt on the front left hand side of the machine. The elastomeric spring on the belt tensioner should measure 70 mm in length.

If not, adjust as follows using two 24 mm A/F spanners:

1. While holding the upper nut with one spanner, loosen the lower nut with the other and back off a few threads.
2. Either tighten or loosen the upper nut until the spring measures 70 mm and screw the lower nut back up.
3. Lock the two nuts together to secure in place.



Finally reposition the cover guard and tighten mounting screws securely.

NOTE: The belt tension can also be verified or adjusted from underneath without removing the cover guard!

9.10 Adjusting floor conveyor chain tension

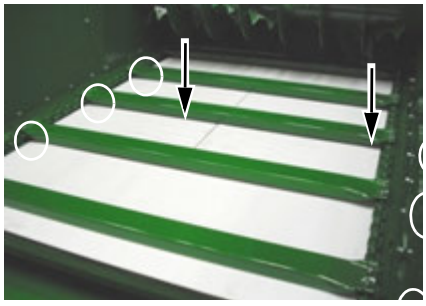
WARNING: Work to be carried out by qualified persons!

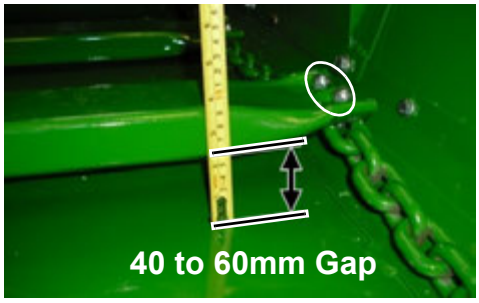
This work should only be carried out by qualified persons or your **McHale** dealer!

Ensure the loading door is in the open position before beginning for ease of access. Press button 12 on the control box to open fully, then turn off power. Shut down tractor, remove key, apply parking brake, and prevent any machine movement, using wheel chocks if necessary. Disconnect the electrical machine loom from the control box, along with hydraulic hoses and the PTO shaft.

NOTE: Replace all U-bolts once a year

McHale recommends that all floor U-bolts should be replace once a year. If the machine is getting a lot of use, the U-bolts may break, causing further unnecessary damage!

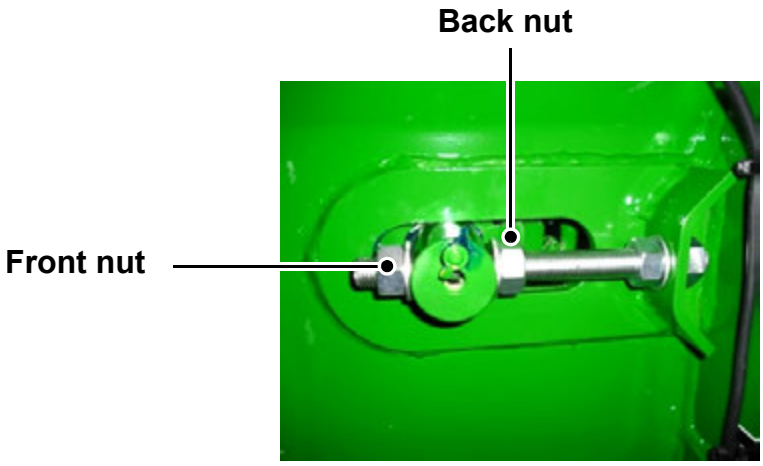




Before carrying out this adjustment, the floor conveyor must be cleaned thoroughly, otherwise a false reading will occur if dirt and debris are present around chains. Select the middle bar along the floor length (arrows) then grab bar on either the left or right hand end and lift up off the floor. Measure the gap underneath, which should measure between 40 and 60 mm in height.

If not, it should be adjusted at the rear as follows; using two 24 mm A/F spanners.

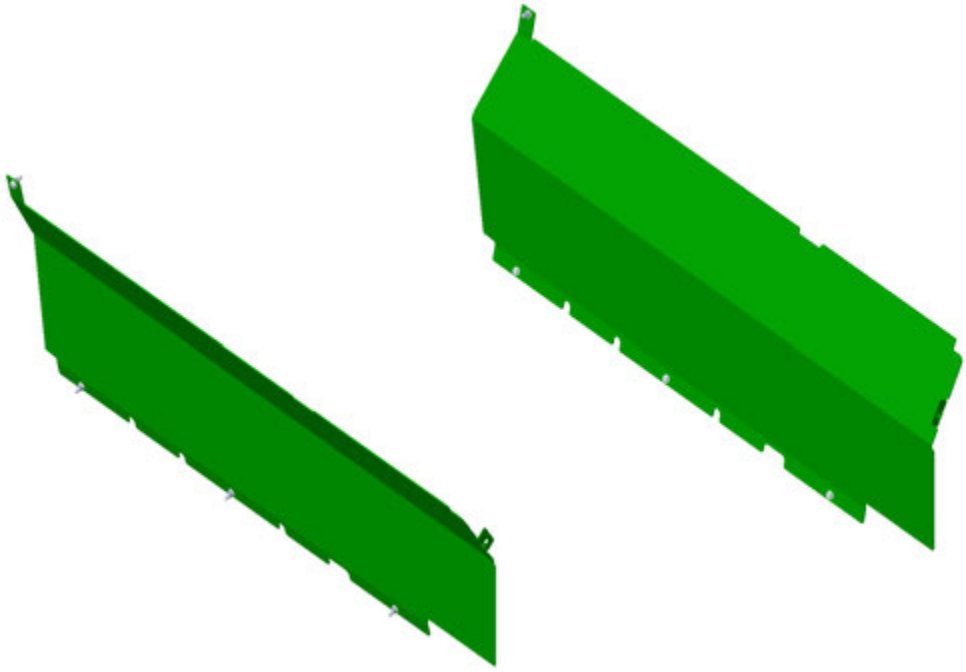
1. If gap is too large, loosen the back nut and back off a number of threads. Then tighten front nut until desired gap is achieved. Re-tighten back nut.
2. If gap is too small, loosen the front nut and back off a number of threads. Then tighten back nut until desired gap is achieved. Re-tighten front nut.
3. The adjustment must be carried out on both left and right-hand sides, but should be kept almost identical.



Left-hand adjustor shown

9.11 Clamp silage side insert kits

For operators wishing to facilitate the distribution of clamp silage there are model-specific side insert kits available to order.



Part No.	Description
KST00125	Clamp silage side insert kit for C460
KST00126	Clamp silage side insert kit for C470
KST00127	Clamp silage side insert kit for C490

10

Machine maintenance

To maintain the machine in good working order it is necessary to carry out preventative maintenance regularly. The following section gives details of how this may be carried out and how often it will be required.

Replace any electrical or hydraulic devices immediately, at the first sign of malfunction or failure, as these components affect the functionality, sequencing and thus safety of operation. Never use a machine where a malfunction exists! Contact your **McHale** dealer to achieve a solution. Always think ‘Safety First’!

WARNING: Wear proper safety equipment & follow all instructions

Ensure to wear proper safety equipment at all times when working with the machine, such as gloves, eye protection, etc. and follow all safety decals and instructions.

WARNING: Inspections in the ‘Danger Zone’ during machine operation require a second trained operator at the controls

Entering the ‘Danger Zone’ while the machine is running is not recommended. If it is to be carried out, a fully trained operator shall be at the controls. The tractor hand brake shall be applied and the electronic control box shall be in manual mode. The operator shall remain in communication with the inspector throughout. If communication is lost with the inspector, or they move within 1.1 m of moving parts or parts that have the potential to move, all tractor power shall be turned off immediately.

10.1 Maintenance intervals

The following intervals should be adhered to, in order to ensure a long and efficient life for the machine and maximum safety of personnel. They assume constant working during the season.

First 5 working hours

- Check all nuts and bolts for tightness and tighten, if necessary.
- Check and correct, if necessary, the air pressure in the tyres. (**C460/C470/C490**)
- Drain and change gearbox oil. *(See ‘Gearbox oil’)*
- Check drive belt tension and adjust as necessary.
- Check floor chain and adjust as necessary.

Every day

- Check wheel nuts. (**C460/C470/C490**)
- Check all guards and safety devices.
- Check road traffic equipment.
- Check for any oil leaks and damaged pipes.
- Grease 3 x heavy duty grease points on PTO shaft.

Every week

- Grease 5 x standard duty grease points on PTO shaft. *(See 'PTO shaft adjustment & maintenance')*
- Check for correct air pressure in the tyres. (**C460/C470/C490**)
- Grease all ram pivots.

Every month

- Grease rotor bearings.
- Grease cross shaft.
- Grease belt tensioner pivots.
- Check drive belt tension and adjust as necessary.
- Check floor chain and adjust as necessary.
- Check sufficient oil level in the gearbox.
- Check torque of main drawbar/linkage bolts.

Every year

- Clean and lubricate all moving parts.
- Drain and change gearbox oil. *(See 'Gearbox oil')*
- Replace all the U-bolts on the floor slats.

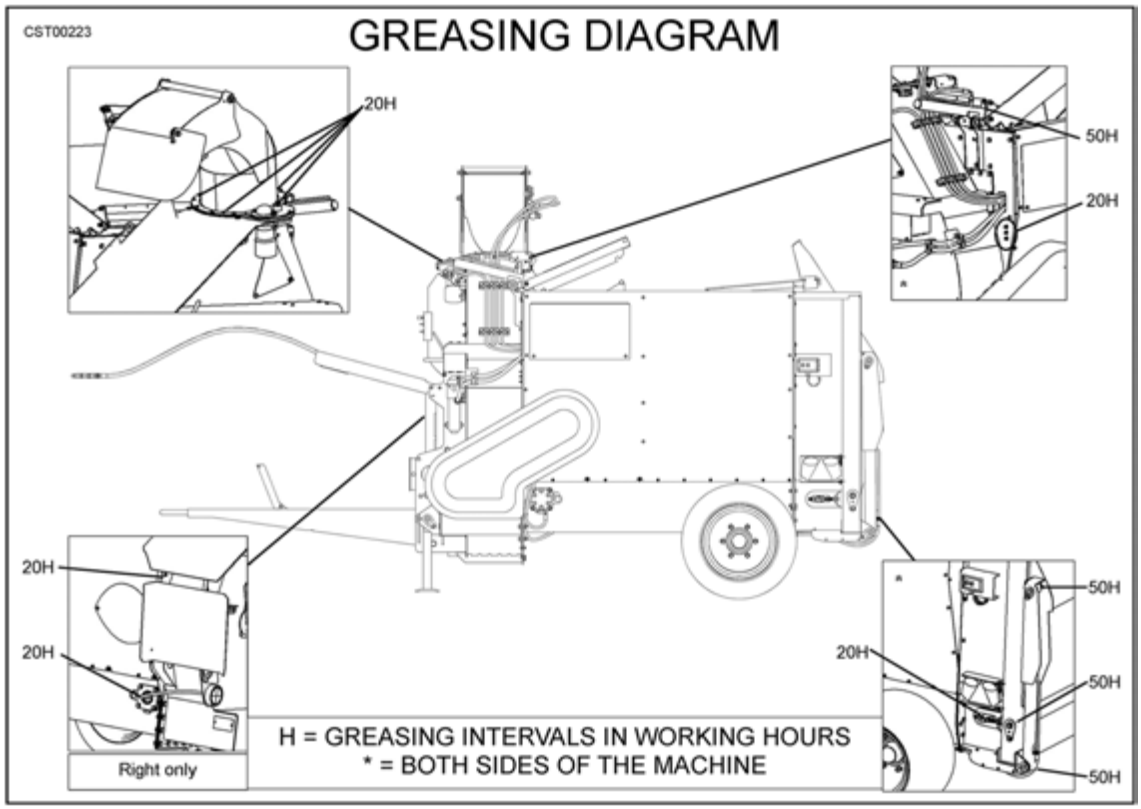
At the end of the season the machine should be washed and cleaned.

Carefully clean all machine sections, inside and out. Dirt and foreign objects are likely to draw moisture and cause rusting of steel components. **McHale** recommend that the machine be blown down with an air line, as opposed to a pressure washer, due to the dangers involved with pressure washing and to protect the overall paint work on the machine. If, despite our advice, a pressure washer is used then take extreme caution and operate from ground level only. Do not point pressurized water at or near electrical components, pivots points, valves or bearings. Never climb onto any part of the machine, while pressure washing, due to the fact that all metal surfaces become extremely wet and slippery and always ensure that the tractor has been shut down, with the ignition key removed.

Any damaged paintwork should be touched up. Any maintenance or repairs should be carried out at this stage. The electronic control box is not waterproof, so it must always be stored in a dry environment. All exposed hydraulic cylinder rods should be greased. The pick-up and the cutting device area as well as the bale chamber should be cleaned and lubricated. *(See 'Storage')*

WARNING: Wear proper safety equipment & follow all instructions

Ensure to wear proper safety equipment at all times when working with the machine, such as gloves, eye protection, etc. and follow all safety decals and instructions.



Greasing diagram (C460 shown)

Additional greasing needs to be carried out as shown. This decal is mounted on the front of the machine. *(See 'Safety instruction decal locations')* (CST00315 - **C430** / CST00223 - **C460/C470/C490**)

ENVIRONMENT: Health and safety rules for the environment

It is vitally important to observe health and safety rules in order to avoid unnecessary environmental damage or danger to anybody near the machine. This especially applies to the responsible disposal of oil. Never spill pollutants (oil, grease, filters, etc.) on the ground, never pour them down the drain and never discard them where they can pollute. Never throw away or burn waste net or plastic. Burning plastics is toxic as they release dioxins and furans. To inhale dioxins or to be exposed to its fumes can cause deadly results. Respect the environment! Always take waste materials to a recycling centre.

10.2 Tightening torque values

It is important that the correct torques for fasteners are adhered to. Below are tables of recommended torques for these. These are to be used unless torques are otherwise specified. These values are for general use only. Check tightness of all fasteners periodically. Torque values are in Nm (Newton metres).

Nuts and bolts		**Black, Phosphated or Galvanized**		
Grade marking		8.8	10.9	12.9
	Dimensions	**Metric standard thread**		
Hex. bolts	M4	2.7	3.8	4.6
DIN 931	M5	5.5	8	9.5
DIN 933	M6	10	14	16
	M8	23	33	40
Socket head	M10	45	63	75
Cap screws	M12	78	110	130
DIN 912	M14	122	175	210
	M16	195	270	325
Hex. nuts	M18	260	370	440
DIN 934	M20	370	525	630
	M22	510	720	870
	M24	640	900	1,080
	M27	980	1,400	1,650
	M30	1,260	1,800	2,160
	Dimensions	**Metric fine thread**		
Hex. bolts	M8 x 1	25	35	42
DIN 960	M10 x 1.25	48	67	80
DIN 961	M12 x 1.25	88	125	150
	M12 x 1.5	82	113	140
Hex. nuts	M14 x 1.5	135	190	225
DIN 934	M16 x 1.5	210	290	345
	M18 x 1.5	300	415	505
	M20 x 1.5	415	585	700
	M22 x 1.5	560	785	945
	M24 x 2	720	1,000	1,200
	M27 x 2	1,050	1,500	1,800
	M30 x 2	1,450	2,050	2,500
NOTE:	For nuts and bolts from different materials and/or surface finishes a torque value must be used that is lower than the value stated above.			

11

Storage

11.1 End of season

- Carefully clean all machine sections, inside and out. Dirt and foreign objects are likely to draw moisture and cause rusting of steel components. **McHale** recommend that the machine be blown down with an air line, as opposed to a pressure washer, due to the dangers involved with pressure washing and to protect the overall paint work on the machine. If, despite our advice, a pressure washer is used then take extreme caution and operate from ground level only. Do not point pressurized water at or near electrical components, pivots points, valves or bearings. Never climb onto any part of the machine, while pressure washing, due to the fact that all metal surfaces become extremely wet and slippery and always ensure that the tractor has been shut down, with the ignition key removed.
- Remove the control box from the tractor and store in a dry, safe environment.
- Grease the beater and rotor knives to prevent rusting, use extreme caution when carrying out this operation, always wear protective clothing and gloves!
- Lubricate all pivot points and apply a thin layer of grease to all adjustment bolt threads and exposed ram rods.
- Any components from which paint has become worn should be touched up or coated with grease to prevent rusting.
- Remove all dirt from all chains and blow dry using compressed air.
- Apply grease to all bearings, ram-pivots, and PTO shaft.
- Use the padlock provided to lock the hitch eye cover in place.

11.2 Start of season

- Fully review this operators instruction manual.
- Check and fill gearbox oil level, if necessary. *(See 'Gearbox oil')*
- Grease and lubricate all pivot points.
- Tighten all bolts, nuts and setscrews. *(See 'Tightening torque values')*
- Check air pressure in tyres and adjust if necessary. (**C460/C470/C490**)
- Connect control box and inspect for correct operation of all functions. *(See 'Control box functions')*
- Inspect and modify, if necessary, all machine adjustments. *(See 'Bale chopper operation & adjustments')*
- Remove the grease from the beater and rotor knives. Use extreme caution when carrying out this operation, ensure to wear protective gloves and clothing!

12

Troubleshooting

12.1 Troubleshooting overview

This section has been compiled by **McHale** service personnel in conjunction with **McHale** importers and dealers.

It outlines some common problems which can occur and acts as a quick reference section or check list to resolve the problem. It is important to note that it outlines the common problems and to this effect it is not exhaustive.

Should you experience additional problems which you need help with; please do not hesitate to contact your **McHale** dealer.

Symptom	Reason	Solution
Functions not working	Free flow return not being used	Ensure correct free flow return connection to tractor
Intermittent functions	Poor power supply	Ensure good 12 V supply direct from the battery
Material blocking chute or not feeding out well	Gearbox speed or floor speed too fast	Use slow speed

13

Certification & Warranty

13.1 Declaration of Conformity

The Declaration of Conformity is provided by **McHale**. It certifies the new machine under all the relevant provisions of the EC machinery directive and the national laws and regulations adopting this directive.

The declaration gives a description of the machine and its function, along with the model and serial number details. *(See 'Declaration of Conformity')*

By any alteration of the machine, the Declaration of Conformity, as well as the CE sign on the machine, loses its validity.

13.2 PDI form

The PDI (pre-delivery inspection) form is filled out on the commissioning of every new machine, by the **McHale** dealer. The following checks are completed and signed off:

- All parts and accessories are provided to the customer, with the machine
- Machine is reassembled correctly
- Tyre pressure is correct
- Hydraulics, electrics and lighting are working
- New owner has been instructed on how to operate & maintain the machine

The PDI is included in this operator manual. *(See 'Pre-delivery inspection form')*

13.3 Change of ownership pre-checks

The PDI (pre-delivery inspection) form that is filled out on the commissioning of every new machine, should also be used during the transfer of ownership of a **McHale** machine. The same check list must be completed and any areas requiring attention addressed before the re-sale of the machine should occur. Pay particular attention to all safety related areas. Take time to familiarise the new owner with machine operation, maintenance and all its safety features.

13.4 Limited Warranty

Limited Warranty conditions are supplied with each **McHale** product. They cover the terms & conditions associated with abnormal failure under normal working conditions. *(See 'McHale Limited Warranty')*

Declaration of Conformity

DECLARATION OF CONFORMITY

We hereby certify that the machinery stipulated below complies with all the relevant provisions of the EC Machinery Directive 2006/42/EC and the national laws and regulations adopting this directive. Modifications to the machine, without prior approval from the undersigned, will render this declaration null and void.

Machine description and function: Bale shredder for shredding bales of agricultural fodder for animal feed and/or bales of straw for animal bedding.

Model: (C4) _____ **Serial Number:** _____

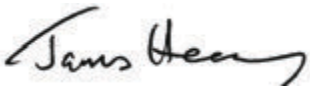
Name of manufacturer: **McHale** Engineering
Address: Ballinrobe, Co. Mayo, Ireland, F31 K138

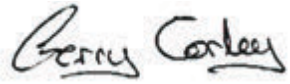
Is also in conformity with the provisions of the following other EU directives:
2014/30/EU - Electromagnetic compatibility (EMC)

Technical file compiled by: James Heaney
c/o **McHale** Engineering
Ballinrobe, Co. Mayo, Ireland, F31 K138

Harmonized standards applied:

EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 4254 - 1	Agricultural machinery - Safety - Part 1: General requirements
EN 703	Agricultural machinery - Silage loading, mixing and/or chopping and distributing machines - Safety
EN 15811	Agricultural machinery - Fixed guards and interlocked guards with or without guard locking for moving transmission parts

Signed: 
Date: ..... **Place:** Ballinrobe, Co. Mayo, Ireland, F31 K138
Name: James Heaney
Position: Design Office Manager

Signed: 
Date: ..... **Place:** Ballinrobe, Co. Mayo, Ireland, F31 K138
Name: Gerry Corley
Position: Quality Manager

QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

Pre-delivery inspection form

PRE-DELIVERY INSPECTION (PDI)

Dealer:.....	**Model: C4 Series Bale shredder**
Full address:.....	Serial No:.....
.....	Date Delivered:.....
Fitter:.....	Date Inspected:.....
Customer:.....	
Full Address:.....	Tel:.....
.....	Mobile:.....
.....	E-mail:.....

ENSURE THAT THE TRACTOR IS OF THE CORRECT SPECIFICATION FOR THIS MACHINE.
REFER TO THE OPERATOR INSTRUCTOR MANUAL BEFORE MAKING ANY ADJUSTMENTS!

This machine must be registered on www.mchale.net by the Dealer in order to qualify for Warranty!

1. **Check that all accessories are with the Owner/Operator. Check Operators Instruction Manual and Parts Lists.**		9. **Ensure that continuous flow of the tractor auxiliary valve is set to operate with 30 l/min max.**	
2. **Ensure machine is re-assembled correctly. (Refer to all assembly instructions supplied)**		10. **Check all manual functions on the machine (using control unit on electronic machines).**	
3. **Ensure that the wheels are correctly fitted (i.e. valve to the outside). Torque wheel nuts correctly. (C460/C470/C490)**		11. **Run machine at low speed and check for smooth operation of all moving parts.**	
4. **Check for correct tyre type, tread and pressure. (Tyre inflation pressure is 3.1 bar (45 psi)) (C460/C470/C490)**		12. **Check that all electrics and lights function correctly.**	
5. **Ensure the drawbar or linkage is fitted correctly before coupling the machine to the tractor. Torque all bolts.**		13. **Use extreme caution when working around sharp blades and tine-points.**	
6. **When hitched to tractor check that the machine is parallel with the ground. Adjust drawbar or linkage, if necessary. Attach 7-pin plug for lighting system.**		14. **The operator must be fully aware of all hazards, controls (electric & hydraulic), all functions & safety devices of both the machine and the tractor.**	
7. **Connect hydraulic hosing to tractor and ensure proper hydraulic setup. Note: Ensure free-flow return to tank.**		15. **Ensure that the owner/operator reads the operator instruction manual and understands fully all safety & operating aspects of the machine, as described.**	
8. **On electronic machines ensure control-unit power is 12 V direct from battery or a malfunction may occur.**		16. **Instruct operator on machine maintenance i.e. check chain tensions, adjustments, also areas to be greased daily along with other routine functions.**	

I am satisfied that the above checks have been carried out, and that the machine is complete with all accessories and manuals.

Signed:..... **(Dealer)** **Date:**.....

Signed:..... **(Owner)** **Date:**.....

A signed copy of this form is to be retained by both the Dealer and the Customer!

McHale Limited Warranty

McHale Engineering, Ballinrobe, Co. Mayo, Ireland (hereinafter called 'the company') warrants to the original retail purchaser that new products sold and registered with the company, shall be, at the time of delivery, free from defects in material and workmanship, and that such equipment is covered under Limited Warranty providing the machine is used and serviced in accordance with the recommendations in the operator's manual.

This Limited Warranty covers the equipment for 10,000 bales, or a period of one year starting from the date the equipment is commissioned, whichever comes first.

The online submission of the pre-delivery inspection (PDI) form by the dealer (importer) is taken as evidence of the delivery of the machine to the original retail purchaser. This is compulsory, and is required to record the machine in the **McHale** warranty system.

These conditions are subject to the following exceptions:

- Parts of the machine which are not of **McHale** manufacture, such as tyres, PTO shafts, slip clutches, hydraulic cylinders, etc. are not covered by this Limited Warranty, but are subject to the warranty of the original manufacturer. Warranty claims applying to these types of parts must be submitted in the same way as if they were parts manufactured by **McHale**. However, compensation will be paid in accordance with the warranty agreement of the manufacturer concerned.
- This Limited Warranty does not apply to failure through normal wear and tear, to damage resulting from negligence or from lack of inspection, from misuse, from lack of maintenance and/or if the machine has been involved in an accident, lent out or used for purposes other than those for which it was intended by the company.
- This Limited Warranty will not apply to any product that has been altered or modified in any way without the express permission of the company, or if parts not approved by **McHale** are used in repair.
- The company take no responsibility for any additional costs, including loss of oil and/or consumables incurred during the failure and repair of a product.
- The company cannot be held responsible for any claims or injuries to the owner or to the third party, nor to any resulting responsibility.
- Also, on no account can the company be held liable for incidental or consequential damages (including loss of anticipated profits) or for any impairment due to failure, a latent defect or a breakdown of a machine.

The customer will be responsible for the following costs:

- Normal maintenance such as greasing, maintenance of oil levels, minor adjustments, etc. as specified in the operator's manual.
- Labour charges other than originally agreed, incurred in the removal and replacement of components.
- Dealer's travel time and travel costs to and from the machine.
- Parts defined as normal wear items such as, but not limited to PTO shafts, chains, tyres, bearings, belts, blades, knives, tines, tine bars, slip clutches, nylon chain runners and slides, etc. that are not covered under the Limited Warranty.

The importer will be responsible for the following costs:

- All warranty labour charges.

The warranty is dependent on the strict observance of the following:

- The machine has been put in service by the **McHale** dealer according to our instructions.
- The online pre-delivery inspection (PDI) form has been correctly completed by the dealer.
- A printed version of the PDI form has been signed and dated by the original retail purchaser. This copy is to be stored by the dealer and made available to **McHale** when requested.
- The warranty claim is submitted using the **McHale** online claims system.
- The warranty claim must be submitted by the original retailing **McHale** dealer only.
- The decision of the company in all cases is final.
- Warranty parts must be held by the dealer for a period of two years from the date the warranty claim is submitted to **McHale**, or until a return request has been issued within the two years.
- When **McHale** issue a return request, parts must have the claim number written clearly on each individual part. These parts must be free from dirt and oil. If a part is returned in an unfit state, the claim will be refused.
- If damaged parts have been returned to the company and warranty is refused, the dealer is allowed a period of one month from the date of receiving our notification to request the return of the damaged parts to the dealer site.

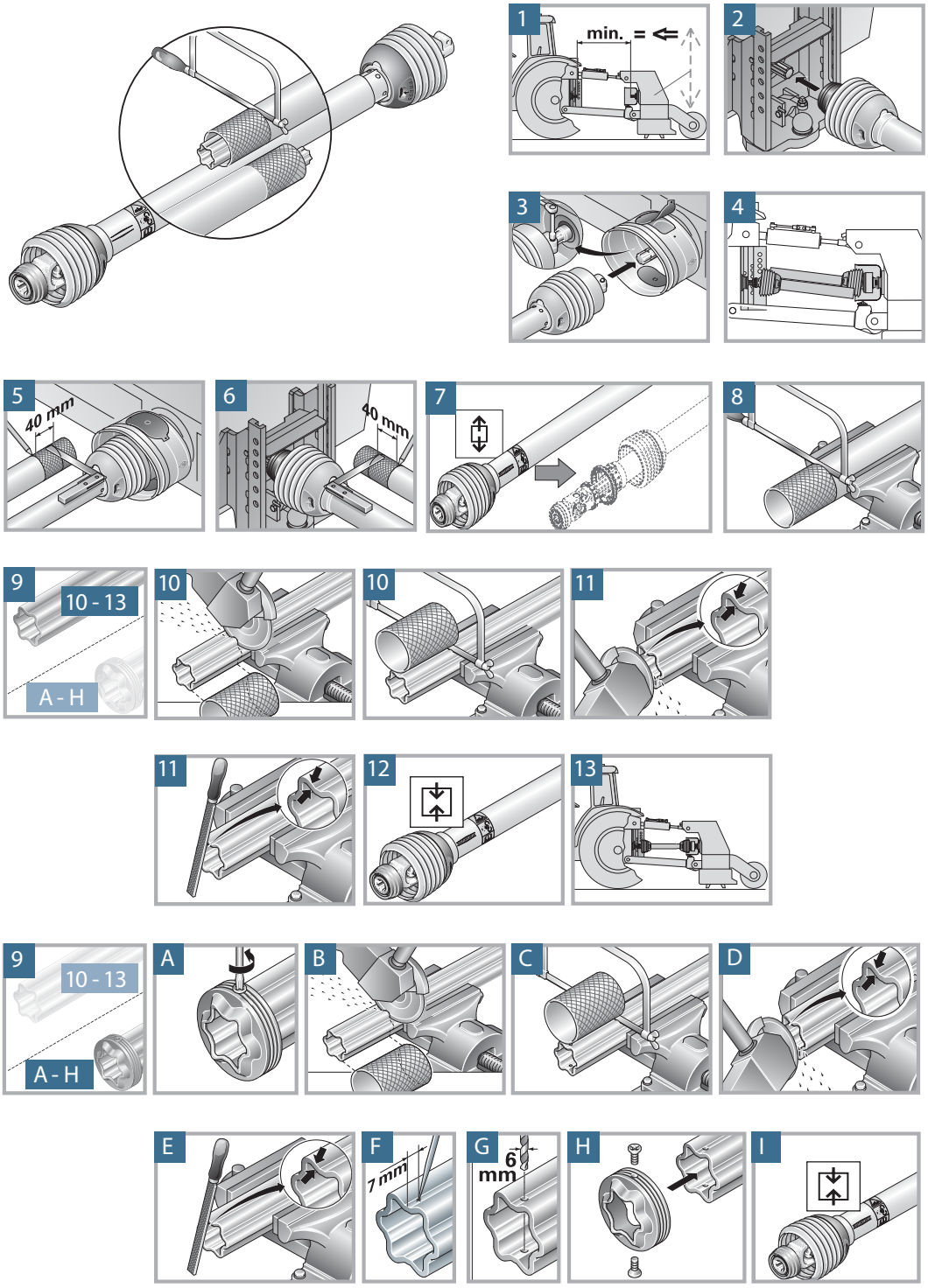
Further conditions - limits of application and responsibility:

- This Limited Warranty cannot be assigned or transferred to anyone without the prior written consent of the company.
- **McHale** dealers have no right or authority to assume any obligation or take any decision on the company's behalf, whether expressly or tacitly.
- Technical assistance given by the company or its agents for repairing or operating equipment does not lead to any responsibility on the company's behalf and cannot under any circumstances bring novation or derogation to the conditions of the present Limited Warranty.
- The company reserves the right to incorporate changes in its machines without prior notice and without obligation to apply these changes to machines previously manufactured.
- The present Limited Warranty excludes any other responsibility, whether legal or conventional, express or implied, and there are no warranties extending beyond those defined herein.

14

Appendix

14.1 Adjusting the PTO shaft to the tractor



14.2 Unit conversion tables

Length

mm	cm	m	km	inch (in)	foot (ft)	yard (yd)	mile (mi)
1	0.1	0.001	0.000001	0.03937	0.003281	0.001094	6.21e-07
10	1	0.01	0.00001	0.393701	0.032808	0.010936	0.000006
1000	100	1	0.001	39.37008	3.28084	1.093613	0.000621
1000000	100000	1000	1	39370.08	3280.84	1093.613	0.621371
25.4	2.54	0.0254	0.000025	1	0.083333	0.027778	0.000016
304.8	30.48	0.3048	0.000305	12	1	0.333333	0.000189
914.4	91.44	0.9144	0.000914	36	3	1	0.000568
1609344	160934.4	1609.344	1.609344	63360	5280	1760	1

Area

mm^2	cm^2	m^2	in^2	ft^2	yd^2
1	0.01	0.000001	0.00155	0.000011	0.000001
100	1	0.0001	0.155	0.001076	0.00012
1000000	10000	1	1550.003	10.76391	1.19599
645.16	6.4516	0.000645	1	0.006944	0.000772
92903	929.0304	0.092903	144	1	0.111111
836127	8361.274	0.836127	1296	9	1

Volume

cm^3 (ml)	m^3	litre (l)	in^3	ft^3	US gal	Imp. gal	US barrel
1	0.000001	0.001	0.061024	0.000035	0.000264	0.00022	0.000006
1000000	1	1000	61024	35	264	220	6.29
1000	0.001	1	61	0.035	0.264201	0.22	0.00629
16.4	0.000016	0.016387	1	0.000579	0.004329	0.003605	0.000103
28317	0.028317	28.31685	1728	1	7.481333	6.229712	0.178127
3785	0.003785	3.79	231	0.13	1	0.832701	0.02381
4545	0.004545	4.55	277	0.16	1.20	1	0.028593
158970	0.15897	159	9701	6	42	35	1

Mass

gram (g)	kg	tonne	US ton	Imp. ton	pound (lb)	ounce (oz)
1	0.001	0.000001	0.000001	9.84e-07	0.002205	0.035273
1000	1	0.001	0.001102	0.000984	2.204586	35.27337
1000000	1000	1	1.102293	0.984252	2204.623	35273.96
907200	907.2	0.9072	1	0.892913	2000	32000
1016000	1016	1.016	1.12	1	2240	35840
453.6	0.4536	0.000454	0.0005	0.000446	1	16
28	0.02835	0.000028	0.000031	0.000028	0.0625	1

Flow rate

l/sec	l/min	m^3/h	ft^3/min	ft^3/h	gal/min	US brl/day
1	60	3.6	2.119093	127.1197	15.85037	543.4783
0.016666	1	0.06	0.035317	2.118577	0.264162	9.057609
0.277778	16.6667	1	0.588637	35.31102	4.40288	150.9661
0.4719	28.31513	1.69884	1	60	7.479791	256.4674
0.007867	0.472015	0.02832	0.01667	1	0.124689	4.275326
0.06309	3.785551	0.227124	0.133694	8.019983	1	34.28804
0.00184	0.110404	0.006624	0.003899	0.2339	0.029165	1

Pressure

bar	psi	kPa	MPa	kgf/cm^2	mm Hg	atm
1	14.50326	100	0.1	1.01968	750.0188	0.987167
0.06895	1	6.895	0.006895	0.070307	51.71379	0.068065
0.01	0.1450	1	0.001	0.01020	7.5002	0.00987
10	145.03	1000	1	10.197	7500.2	9.8717
0.9807	14.22335	98.07	0.09807	1	735.5434	0.968115
0.001333	0.019337	0.13333	0.000133	0.00136	1	0.001316
1.013	14.69181	101.3	0.1013	1.032936	759.769	1

Speed

m/s	m/min	km/h	ft/s	ft/min	mi/h
1	60	3.6	3.28084	196.8504	2.237136
0.01667	1	0.060007	0.054692	3.281496	0.037293
0.2778	16.66467	1	0.911417	54.68504	0.621477
0.3048	18.28434	1.097192	1	60	0.681879
0.00508	0.304739	0.018287	0.016667	1	0.011365
0.447	26.81464	1.609071	1.466535	87.99213	1

Torque

Nm	kgfm	ftlb	inlb
1	0.101972	0.737561	8.850732
9.80665	1	7.233003	86.79603
1.35582	0.138255	1	12
0.112985	0.011521	0.083333	1

Temperature conversion formulas

Degree Celsius (°C)	(°F - 32) x 5/9	(K - 273.15)
Degree Fahrenheit (°F)	(°C x 9/5) + 32	(1.8 x K) - 459.67
Kelvin (K)	(°C + 273.15)	(°F + 459.67) ÷ 1.8