

Publication 817  
October 2015  
Part No. 23671.17



# McCONEL

## ROTARY RAKE

Model: KR 250

Operator & Parts Manual



# IMPORTANT

## VERIFICATION OF WARRANTY REGISTRATION



### DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

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

To register machines go to the McConnel Limited web site at [www.mccommel.com](http://www.mccommel.com), log onto 'Dealer Inside' and select the 'Machine Registration button' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.

Should you experience any problems registering a machine in this manner please contact the McConnel Service Department on 01584 875848.

#### Registration Verification

Dealer Name: .....
Dealer Address: .....
Customer Name: .....
Date of Warranty Registration: ...../...../..... Dealer Signature: .....

#### NOTE TO CUSTOMER / OWNER

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

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

**CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES**

#### TORQUE SETTINGS FOR HYDRAULIC FITTINGS

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

PORT ADAPTORS WITH BONDED SEALS		
BSP	Setting	Metric
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm



# WARRANTY POLICY

## WARRANTY REGISTRATION

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

### 1. LIMITED WARRANTIES

- 1.01. *All mounted machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.  
All Self Propelled Machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months or 1500 hours. Engine warranty will be specific to the Manufacturer of that unit.*
- 1.02. *All spare parts supplied by McConnel Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.*
- 1.03. *The warranty offered by McConnel Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.*
- 1.04. *This warranty does not extend to any product from which McConnel Ltd's serial number plate has been removed or altered.*
- 1.05. *The warranty policy is valid for machines registered in line with the terms and conditions detailed and on the basis that the machines do not extend a period of 24 months or greater since their original purchase date, that is the original invoice date from McConnel Limited.  
Machines that are held in stock for more than 24 months cannot be registered for warranty.*
- 1.06. *This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.*
- 1.07. *Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.*
- 1.08. *Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.*
- 1.09. *Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which McConnel Ltd cannot be held liable, and may have safety implications.*
- 1.10. *If in exceptional circumstances a non McConnel Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnel Ltd's standard dealer cost for the genuine part.*
- 1.11. *Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnel Ltd.*

- 1.12. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:
- 1.12.1. Hoses, exposed pipes and hydraulic tank breathers.
  - 1.12.2. Filters.
  - 1.12.3. Rubber mountings.
  - 1.12.4. External electric wiring.
  - 1.12.5. Bearings and seals
  - 1.12.6. External Cables, Linkages
  - 1.12.7. Loose/Corroded Connections, Light Units, LED's
  - 1.12.8. Comfort items such as Operator Seat, Ventilation, Audio Equipment
- 1.13. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.
- 1.14. Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.

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

## **2. REMEDIES AND PROCEDURES**

- 2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the McConnel web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.
- 2.02. Any fault must be reported to an authorised McConnel Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which McConnel Ltd cannot be held liable.
- 2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by McConnel Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.
- 2.04. All claims must be submitted, by an authorised McConnel Ltd Service Dealer, within 30 days of the date of repair.
- 2.05. Following examination of the claim and parts, McConnel Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnel Ltd and appropriate labour and mileage allowances if applicable.
- 2.06. The submission of a claim is not a guarantee of payment.
- 2.07. Any decision reached by McConnel Ltd. is final.

## **3. LIMITATION OF LIABILITY**

- 3.01. McConnel Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.
- 3.02. McConnel Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.
- 3.03. Except as provided herein, McConnel Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any In direct, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.
- 3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

#### **4. MISCELLANEOUS**

- 4.01. McConnel Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.*
- 4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.*
- 4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.*

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*McConnel Limited*

# CE Declaration of Conformity

Adapted EEC directive  
EG Guideline 2006/42/EF, 89/392/EEC & 98/37/EC

We, **GreenTec A/S**, Merkurvej 25, 6000 Kolding, hereby declare that in terms of its design, method of construction and our execution thereof, the item of machinery described below complies with the basic health and safety regulations of the respective EU Directives. The Machinery Directive is supported by the following harmonized standards:

**Product:** Rotor Rive KR 250

**Product code:** 999347569

**Serial no:**

**Type:** Rotor Rake



- DS/EN ISO 12100 3<sup>rd</sup> edition 2011. Safety of Machinery – General principles for design – Risk assessment and risk reduction.
- DS/EN 953+A1 4<sup>th</sup> edition 2010. Safety of Machinery – Guards-General requirements for the design and construction of fixed and movable guards.
- DS/EN ISO 4413 1<sup>th</sup> edition 2010. Hydraulic fluid power – General rules and safety requirements for systems and their components.

The EC Declaration only applies if the machine stated above is used in accordance with the operating instructions.

On behalf of GreenTec A/S

Date: 26.09.2015

Signature: \_\_\_\_\_

John Christensen (Sales Director)

# CONTENTS

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## **Operator Section**

General Information	1
Introduction	2
Machine Identification	2
Machine Specification / Technical Data	2
Safety Information	4
Safety Decals	10
Vehicle / Tractor Preparation	11
Machine Attachment	12
Maintenance	13

## **Parts Section**

Main Assembly	15
Wheels & Axle Assembly	17
Drive Assembly	19
Tine Arm Assembly	21



## GENERAL INFORMATION

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Read this manual before fitting or operating the machine. Whenever any doubt exists contact your dealer or the McConnell Service Department for assistance.

**Only use Genuine McConnell Parts on McConnell equipment and machines.**

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

### **⚠ DANGER**

**DANGER:** Alerts to a hazardous situation which will result in death or serious injury if not observed carefully.

### **⚠ WARNING**

**WARNING:** Alerts to a hazardous situation which could result in death or serious injury if not observed carefully.

### **⚠ CAUTION**

**CAUTION:** Alerts to a hazardous situation which could result in damage to the machine and/or equipment if not observed carefully.

### **NOTICE**

**NOTICE:** Specific or general information considered important or useful to emphasize.

#### LEFT AND RIGHT HAND:

This term is applicable to the machine when fitted to the tractor and viewed from the rear. This also applies to tractor references.

**Note:** Illustrations in this manual are for instructional purposes only and may on occasion not show some components in their entirety. In some instances an illustration may appear slightly different to that of your particular model, where this occurs the general procedure will be the same. O&OE.

## MACHINE & DEALER INFORMATION

*Record the Serial Number of your machine on this page and always quote this number when ordering parts. Whenever information concerning the machine is requested remember also to state the make and model of tractor to which the machine is fitted.*

Machine Serial Number:	Installation Date:
Machine Model details:	
Dealer Name:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

## INTRODUCTION

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Power Arm mounted rotary rake attachment for clean efficient raking of cut grass and similar type materials. The machine is mounted on a reach arm mower and is hydraulic driven. Raking height is controlled by two heavy duty 'castor' wheels.

The rake teeth comprise of heavy-duty spring tines that will provide a degree of deflection if they should accidentally come into contact with a fixed object or obstruction.

*This machine should only be used to perform tasks for which it was designed – use of the machine for any other function may be both dangerous to persons and damaging to components and is therefore not advisable.*

## MACHINE IDENTIFICATION

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Each machine is fitted with an identification plate with the following information:

1. Machine Model / Part Number
2. Machine Serial No.
3. Machine Weight

When ordering spares or replacement parts from your local dealer it is important to quote both the Part Number and the Serial Number as stated on the identification plate so machine and model can be quickly and correctly identified.



**Machine Identification Plate**

## MACHINE SPECIFICATIONS / TECHNICAL DATA

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**Machine Type:** Reach Arm mounted Rotary Rake

**Working Width:** 2.5m / 8' 2"

**Oil Flow: Max.** 50L/min

**Pressure: Max.** 180 bar

**Weight:** 200 Kg / 441 lbs







**This machine has the potential to be extremely dangerous - in the wrong hands it can kill or maim; it is therefore imperative that both owner and operator of the machine reads and understands the following section to ensure they are fully aware of the dangers that do, or may exist, and their responsibilities surrounding the use and operation of the machine. The operator of this machine is responsible not only for their own safety but equally for the safety of others who may come into the close proximity of the machine, as the owner you are responsible for both.**

**All operators must be fully competent in the use of this machine and also the machine to which it is attached and must read and understand the operation manuals for both machines before attempting to attach or operate this equipment.**

**When the machine is not in use it should be lowered to rest on the ground. In the event of any fault being detected with the machine's operation it must be stopped immediately and not used again until the fault has been corrected by a qualified technician.**

### **POTENTIAL DANGERS ASSOCIATED WITH THE USE OF THIS MACHINE:**

- ▲ *Being hit by debris thrown by rotating components.*
- ▲ *Being hit by machine parts ejected through damage during use.*
- ▲ *Being caught on a rotating power take-off (PTO) shaft.*
- ▲ *Being caught in other moving parts i.e.: belts, pulleys and rotating heads / components.*
- ▲ *Electrocution from Overhead Power Lines (by contact with or 'flashover' from).*
- ▲ *Being hit by the attachment or machine arms as they move.*
- ▲ *Becoming trapped between tractor and machine when hitching or unhitching.*
- ▲ *Tractor overbalancing when machine arm is extended.*
- ▲ *Injection of high-pressure oil from hydraulic hoses or couplings.*
- ▲ *Machine overbalancing when freestanding (out of use).*
- ▲ *Road traffic accidents due to collision or debris on the road.*

## BEFORE USING THIS MACHINE YOU MUST:

- ▲ *Ensure you read all sections of this manual as well as the manual of the specific machine it is attached to.*
- ▲ *Ensure the operator is, or has been, properly trained to use attachment and machine.*
- ▲ *Ensure the operator has been issued with and reads all the operator handbooks.*
- ▲ *Ensure the operator understands and follows the instructions in operator handbooks.*
- ▲ *Ensure the tractor front, rear and sides are fitted with metal mesh or polycarbonate guards of suitable size and strength to protect the operator against thrown debris or parts.*
- ▲ *Ensure tractor guards are fitted correctly, are undamaged and kept properly maintained.*
- ▲ *Ensure that all machine guards are in position, are undamaged, and are kept maintained in accordance with the manufacturer's recommendations.*
- ▲ *Ensure rake tines and their fixings are of a type recommended by the manufacturer, are securely attached and that none are missing or damaged.*
- ▲ *Ensure hydraulic pipes are carefully and correctly routed to avoid damage by chaffing, stretching or pinching and that they are held in place with the correct fittings.*
- ▲ *Always follow the manufacturer's instructions for attachment and removal of the machine(s).*
- ▲ *Check that machine fittings and couplings are in good condition.*
- ▲ *Ensure the tractor meets the minimum weight recommendations of the machine's manufacturer and that ballast is used as necessary.*
- ▲ *Always inspect the work area thoroughly before starting to note obstacles and remove wire, bottles, cans and other dangerous debris.*
- ▲ *Use clear suitably sized warning signs to alert others to the nature of the machine working within that area. Signs should be placed at both ends of the work site. (It is recommended that signs used are of a size and type specified by the Department of Transport and positioned in accordance with their, and the Local Highways Authority, guidelines).*
- ▲ *Ensure the operator is protected from noise. Ear defenders should be worn and tractor cab doors and windows must be kept closed. Machine controls should be routed through proprietary openings in the cab to enable all windows to be shut fully.*
- ▲ *Always work at a safe speed taking account of the conditions i.e.: terrain, highway proximity and obstacles around and above the machine. Extra special attention should be applied to Overhead Power Lines. Some of our machines are capable of reach in excess of 8 metres (26 feet) this means they have the potential to well exceed, by possibly 3 metres (9' 9"), the lowest legal minimum height of 5.2 metres from the ground for 11,000 and 33,000 volt power lines. It cannot be stressed enough the dangers that surround this capability, it is therefore vital that the operator is fully aware of the maximum height and reach of the machine, and that they are fully conversant with all aspects regarding the safe minimum distances that apply when working with machines in close proximity to Power Lines. (Further information on this subject can be obtained from the Health & Safety Executive or your Local Power Company).*

- ▲ *Always disengage the machine, kill the tractor engine, remove and pocket the key before dismounting for any reason.*
- ▲ *Always clear up all debris left at the work area, it may cause hazard to others.*
- ▲ *Always ensure when you remove your machine from the tractor that it is left in a safe and stable position using the stands and/or props if necessary.*

## WHEN NOT TO USE THIS MACHINE:

- ▲ *Never attempt to use this machine if you have not been trained to do so.*
- ▲ *Never use a machine until you have read and understood the operator handbook, are familiar with it, and practiced the controls of machine and attachment.*
- ▲ *Never use a machine that is poorly maintained.*
- ▲ *Never use a machine if guards are missing or damaged.*
- ▲ *Never use a machine on which the hydraulic system shows signs of wear or damage.*
- ▲ *Never fit, or use this attachment on a machine and tractor that does not meet the manufacturer's minimum specification level.*
- ▲ *Never use a machine fitted to a tractor that does not have suitable front, rear and side(s) cab guarding made of metal mesh or polycarbonate.*
- ▲ *Never use the machine if the tractor cab guarding is damaged, deteriorating or badly fitted.*
- ▲ *Never turn the rotating head of a machine to an angle that causes debris to be ejected towards the cab.*
- ▲ *Never start or continue to work a machine if people are nearby or approaching - Stop and wait until they are at a safe distance before continuing. WARNING: On certain machines rotating components may continue to 'freewheel' for after being stopped.*
- ▲ *Never attempt to use a machine on materials in excess of its capability.*
- ▲ *Never use a machine to perform a task it has not been designed to do.*
- ▲ *Never operate the tractor or machine controls from any position other than from the driving seat, especially whilst hitching or unhitching the machine.*
- ▲ *Never carry out maintenance of a machine or a tractor whilst the engine is running – the engine should be switched off, the key removed and pocketed.*
- ▲ *Never leave a machine unattended in a raised position – it should be lowered to the ground in a safe position on a level firm site.*
- ▲ *Never leave a tractor with the key in or the engine running.*
- ▲ *Never carry out maintenance on any part or component of a machine that is raised unless that part or component has been properly substantially braced or supported.*
- ▲ *Never attempt to detect a hydraulic leak with your hand – use a piece of cardboard.*
- ▲ *Never allow children near to, or play on, a tractor or machine under any circumstances.*

## **General safety rules:**

- ▲ *Always read and follow the instructions for the use and maintenance of the machine before carrying out any work operations or servicing tasks.*
- ▲ *Improper use of the machine is both highly dangerous to persons and damaging to the machine components – only use the machine for its designated task.*
- ▲ *Both operators and the maintenance fitters should be familiar with the machine and fully aware of dangers surrounding improper use or incorrect repairs.*
- ▲ *Before starting, checks to tractor, reach arm and this machine must be carried out in regard to functionality, road safety and accident prevention rules.*
- ▲ *Even when using the machine correctly, stones or other objects may be ejected, therefore nobody must stand within the danger area. Special attention must be paid when working near roads or buildings.*
- ▲ *Use tractor's fitted with safety cabs.*
- ▲ *The condition of rake tines and all machine(s) guarding must be checked before beginning the daily work - they must be replaced if damaged or missing before attempting to use the machine.*
- ▲ *During checks or repairs, make sure nobody could start the machine by mistake.*
- ▲ *Never wear loose or fluttering clothes.*
- ▲ *Never carry passengers on the tractor.*
- ▲ *Never carry passengers on the machine.*
- ▲ *Never connect the power takeoff with the engine running.*
- ▲ *Never approach the machine until the rotor has completely stopped.*
- ▲ *Do not enter the working zone of the PTO shaft. It is dangerous to approach the rotating parts of a machine.*
- ▲ *Keep the PTO shaft guard in good condition.*
- ▲ *Before starting, check the surrounding area for the likely presence of children and/or animals.*
- ▲ *Do not stand near the machine when it is operating.*
- ▲ *The PTO shaft must be assembled and disassembled only with the engine stopped and the starting key removed.*
- ▲ *Before connecting the power takeoff, check that the speed and the rotational direction correspond to those of the machine.*
- ▲ *Immediately replace missing or damaged safety decals.*
- ▲ *Before leaving the tractor with the machine attached, proceed as follows:*
  1. *Disconnect the power takeoff,*
  2. *Put the machine steadily on the ground using the tractor's hydraulic lift.*
  3. *Apply the hand brake and, if the ground is steeply sloping, wedge the tractor.*
  4. *Remove the starting key.*

## **Transportation Safety**

- ▲ *In transport, reduce speed, especially on bumpy roads, the weight of the machine may render driving difficult and damage the machine itself.*
- ▲ *Ensure the levers that operate the hydraulic lift are locked, to avoid the lowering of the machine during transport.*
- ▲ *When driving on public roads, respect all road rules in force.*
- ▲ *Never transport the machine with the rotor running, even for short distances.*

## **Operating Safety**

- ▲ *Pay special attention when working with the machine not to touch fixed objects such as drains, walls, shafts, kerbs, guard rails, tracks etc. This may cause the breakage of the components which could be ejected out of the machine.*
- ▲ *If wires, ropes or chains should become entangled in the rotor stop immediately to prevent damage or dangerous situations; stop the rotor and the tractor, take out the starting key. Put working gloves on; clear the rotor with the aid of pliers or shears. Do not try to disentangle by inverting the rotational direction of the rotor.*
- ▲ *Do not use the machine when excessive vibration is experienced, as this may cause breakage and serious damage - find the cause of the vibration and eliminate it before using the machine again.*

## **ADDITIONAL SAFETY ADVICE**

### **Training**

Operators need to be competent and fully capable of operating this machine in a safe and efficient way prior to attempting to use it in any public place. We advise therefore that the prospective operator make use of relevant training courses available such as those run by the Agricultural Training Board, Agricultural Colleges, Dealers and McConnel.

### **Working in Public Places**

When working in public places such as roadsides, consideration should be paid to others in the vicinity. Stop the machine immediately when pedestrians, cyclists and horse riders etc. pass. Restart only when they are at a distance that causes no risk to their safety.

### **Warning Signs**

It is advisable that any working area be covered by suitable warning signs and statutory in public places. Signs should be highly visible and well placed in order to give clear advanced warning of the hazard. Contact the Department of Transport or your Local Highways Authority to obtain detailed information on this subject. The latter should be contacted prior to working on the public highway advising them of the time and location of the intended work asking what is required by way of signs and procedure. – *‘Non-authorized placement of road signs may create offences under the Highways Act’.*

### **Suggested Warning Signs Required**

*‘Road works ahead’ warning sign with a supplementary ‘Hedge cutting’ plate. ‘For 1 mile’ or appropriate shorter distance may be added to the plate.*

*‘Road narrows’ warning signs with supplementary ‘Single file traffic’ plate.*

*White on blue ‘Keep right’ (\*) arrow sign on rear of machine.*

*\* Note – this applies to UK Market machines where traffic passes to the right of a machine working in the same direction as the traffic flow. The direction, use and colour of the arrow sign will depend on the country of use and the Local Highway Authorities regulations in the locality.*



## Use of Warning Signs

- ▲ *On two-way roads one set of signs is needed facing traffic in each direction.*
- ▲ *Work should be within 1 mile of the signs.*
- ▲ *Work only when visibility is good and at times of low risk e.g.: NOT during 'rush-hour'.*
- ▲ *Vehicles should have an amber-flashing beacon.*
- ▲ *Ideally, vehicles should be conspicuously coloured.*
- ▲ *Debris should be removed from the road and path as soon as practicable, and at regular intervals, wearing high visibility clothing and before removing the hazard warning signs.*
- ▲ *Collect all road signs promptly when the job is completed.*

**Safety Gear:** It is recommended that the following personal protective equipment is worn when operating and/or maintaining this machine; Coveralls, safety boots, safety glasses, hearing protection, safety helmet, protective gloves, protective dust mask.



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*Although the information stated here covers a wide range of safety subjects it is impossible to predict every eventuality that can occur under differing circumstances whilst operating this machine. No advice given here can replace 'good common sense' and 'total awareness' at all times, but will go a long way towards the safe use of your McConnel machine.*

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## SAFETY DECALS

In addition to company branding and model identification the following safety decals are displayed – familiarise yourself with, and heed the messages they state, they are there for your safety and guidance. If any of the safety decals go missing or become damaged beyond a readable state they should be replaced at the earliest possible opportunity.



### ⚠️ WARNING

Avoid fluid escaping under pressure. Consult technical manual for services procedures.



### ⚠️ WARNING

Shut off engine and remove key before performing maintenance or repair work.



### ⚠️ WARNING

Danger – flying objects keep safe distance from the machine as long as the engine is running.



### ⚠️ WARNING

Check all nuts are tight every 8 hours; *retighten if required.*



### ⚠️ WARNING

Stay clear of all rotating components as long as engine is running.



### ⚠️ WARNING

Carefully read operator's manual before handling this machine. Observe instructions and safety rules when operating.



### ⚠️ WARNING

Do not remove or open guard when machine is working.



### ⚠️ WARNING

The recommended oil flow has been adjusted by the manufacturer. Never exceed this.

## VEHICLE / TRACTOR PREPARATION

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### **Vehicle Ballast**

It is imperative when attaching 'third-party' equipment to a vehicle that the maximum possible stability of the machine and vehicle combination is achieved – this can be accomplished by the utilisation of 'ballast' in order to counter-balance the additional equipment added.

### **Front Weights**

Front weights may be required for rear mounted machines to place 15% of total outfit weight on the front axle for stable transport on the road and to reduce 'crabbing' due to the drag of the cutting unit when working on the ground.

### **Rear Weights**

Where a machine works to the side of the tractor rear weights may be required to maintain a reasonable amount of rear axle load on the opposing wheel.

All factors must be addressed in order to match the type and nature of the equipment added to the circumstances under which it will be used - factors that effect stability are;

- *Centre of gravity of the tractor/machine combination.*
- *Geometric conditions, e.g. position of the cutting head and ballast.*
- *Weight, track width and wheelbase of the tractor.*
- *Acceleration, braking, turning and the relative position of the cutting unit during these operations.*
- *Ground conditions, e.g. slope, grip, load capability of the soil/surface.*
- *Rigidity of implement mounting.*

### **Suggestions to Increase Stability**

- *Increasing rear wheel track - a vehicle with a wider wheel track is more stable.*
- *Ballasting the wheel; it is preferable to use external weights but liquid can be added to around 75% of the tyre volume – water with anti-freeze or the heavier Calcium Chloride alternative can be used.*
- *Addition of weights – care should be taken in selecting the location of the weights to ensure they are added to a position that offers the greatest advantage.*
- *Front axle locking, check with tractor manufacturer.*

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The advice above is offered as a guide for stability only and is not a guide to vehicle strength. It is therefore recommended that you consult your vehicle manufacturer or local dealer to obtain specific advice on this subject, additionally advice should be sought from a tyre specialist with regard to tyre pressures and ratings suitable for the type and nature of the machine you intend to fit.

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## MACHINE ATTACHMENT

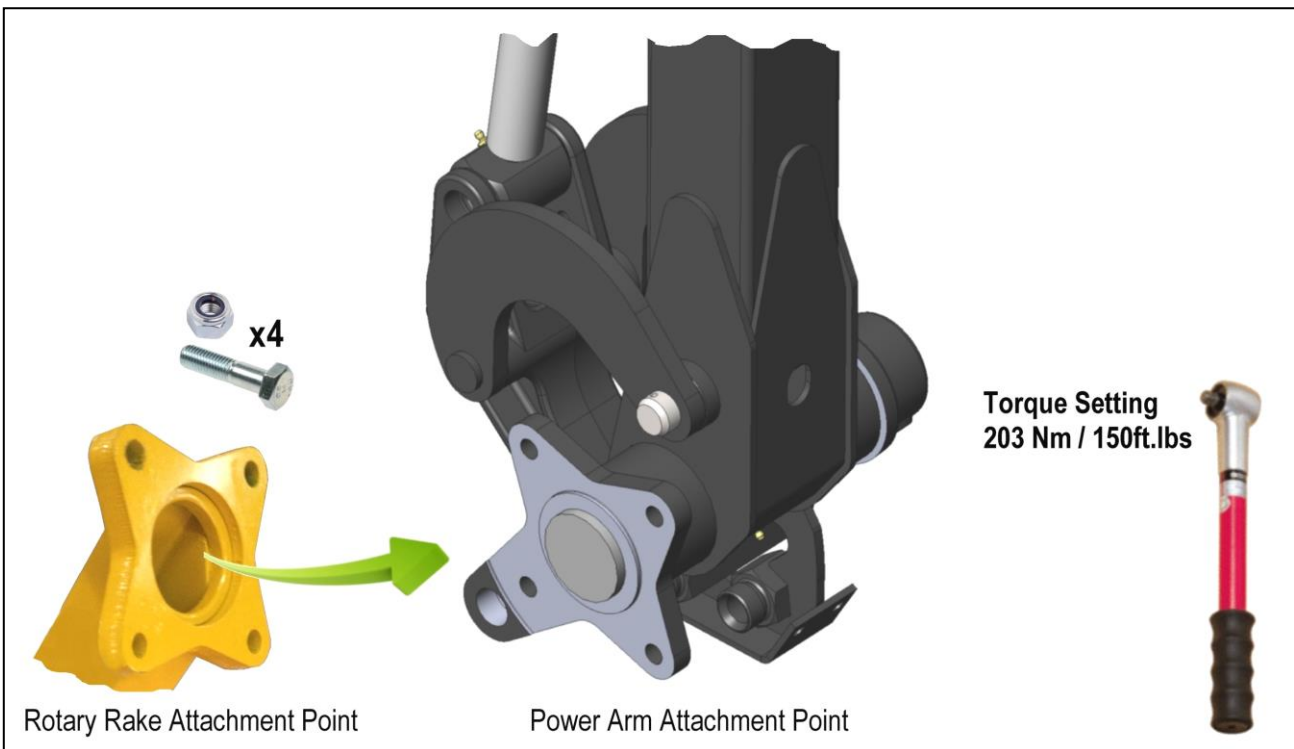
**⚠ WARNING** Attachment of the machine must always be performed on a firm level site that allows sufficient space for the positioning of tractor and Power Arm.

**⚠ DANGER** Keep all persons clear of the machines during the attachment procedure; do not allow anyone to enter the danger zone between the machines.

### Attachment Procedure

With tractor and Power Arm parked adjacent to the machine, carefully manoeuvre the arm set and angling mechanism into a position that allows the machines to be easily and safely connected; secure in position with the 4 nuts and bolts provided. Tighten the bolts in an even sequence to a torque setting of 203 Nm / 150ft.lbs.

Attachment bolts should be checked for tightness on a regular basis and always prior to starting work.



### Hydraulic Connections

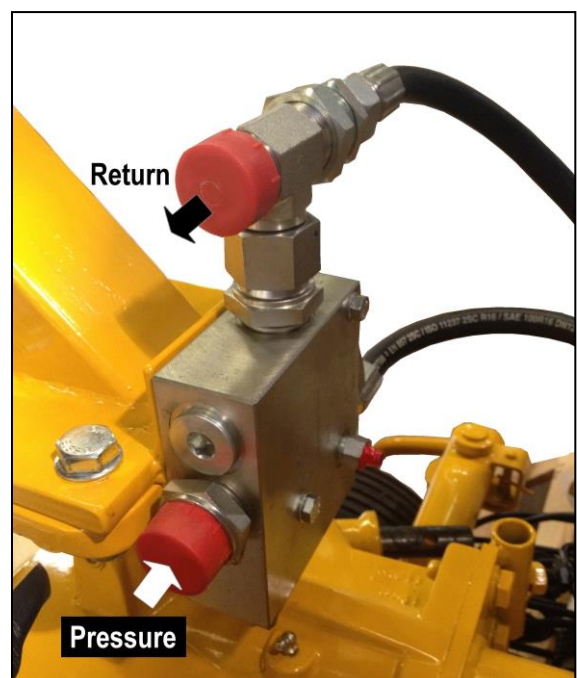
Connect the pressure and return flail hoses of the Power Arm to the pressure and return connections of the Rotary Rake – see *photo opposite for identification and location of the connection points*.

Connection point dust caps should be retained and kept in a safe clean location; always re-fit them when the machine is detached for parking up or storage.

### Operation

When the machine is correctly attached, the ON/OFF function of the rake is operated by the Rotor ON/OFF control on the control unit of the Power Arm's.

Always ensure the machine rotates in the correct work direction.



## MAINTENANCE

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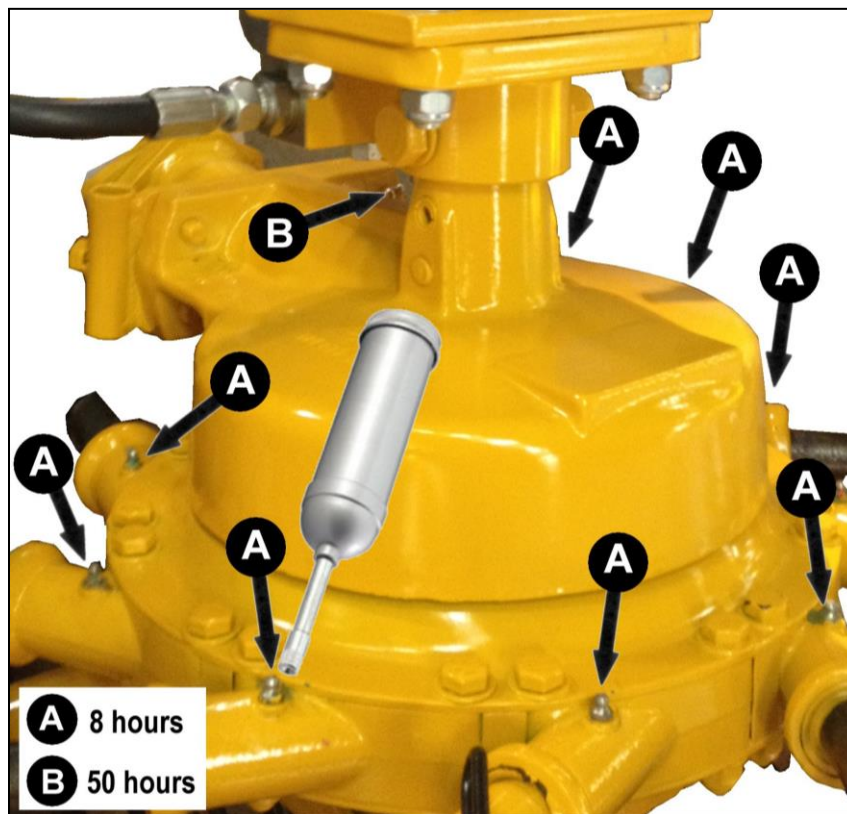
Maintenance of the machine has been kept to a minimum and mainly comprises of regular inspection and general lubrication.

### Machine Inspection

Check the machine prior to work and at regular interval during the working day for any signs of worn, broken or damaged items; components that are excessively worn, broken or damaged must be replaced immediately – continued use of the machine in any of these conditions can lead to further damage and/or may be dangerous to persons.

### Machine Lubrication

Refer below for the location of the machines lubrication points and frequency of lubrication.





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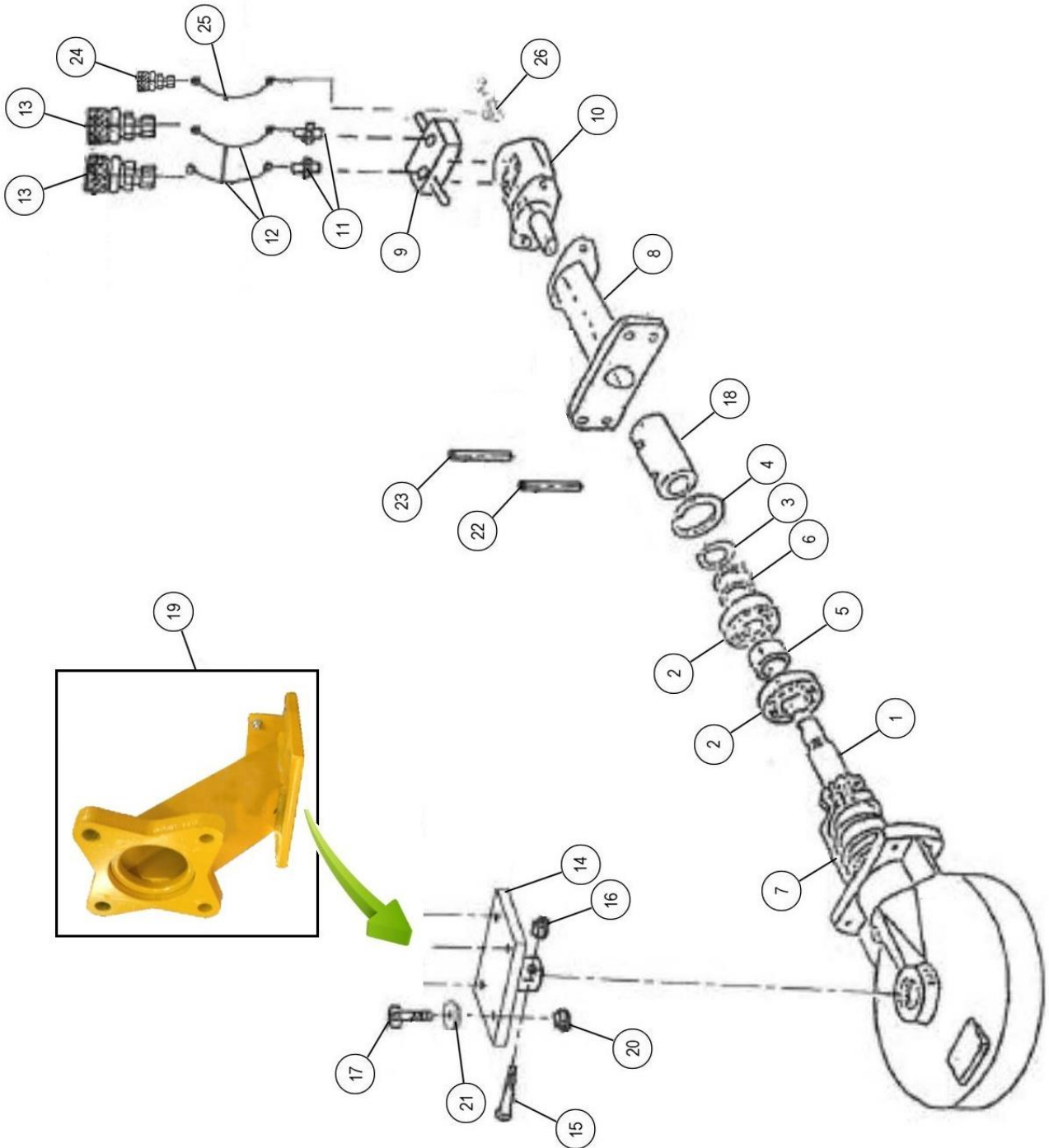
- ***Machine Type***
- ***Serial Number***
- ***Part Number***

*Design improvements may alter some of the parts listed in this manual – the latest part will always be supplied when it is interchangeable with an earlier one.*

# MAIN ASSEMBLY

Model: KR 205 Rotary Rake

# McCONNEL



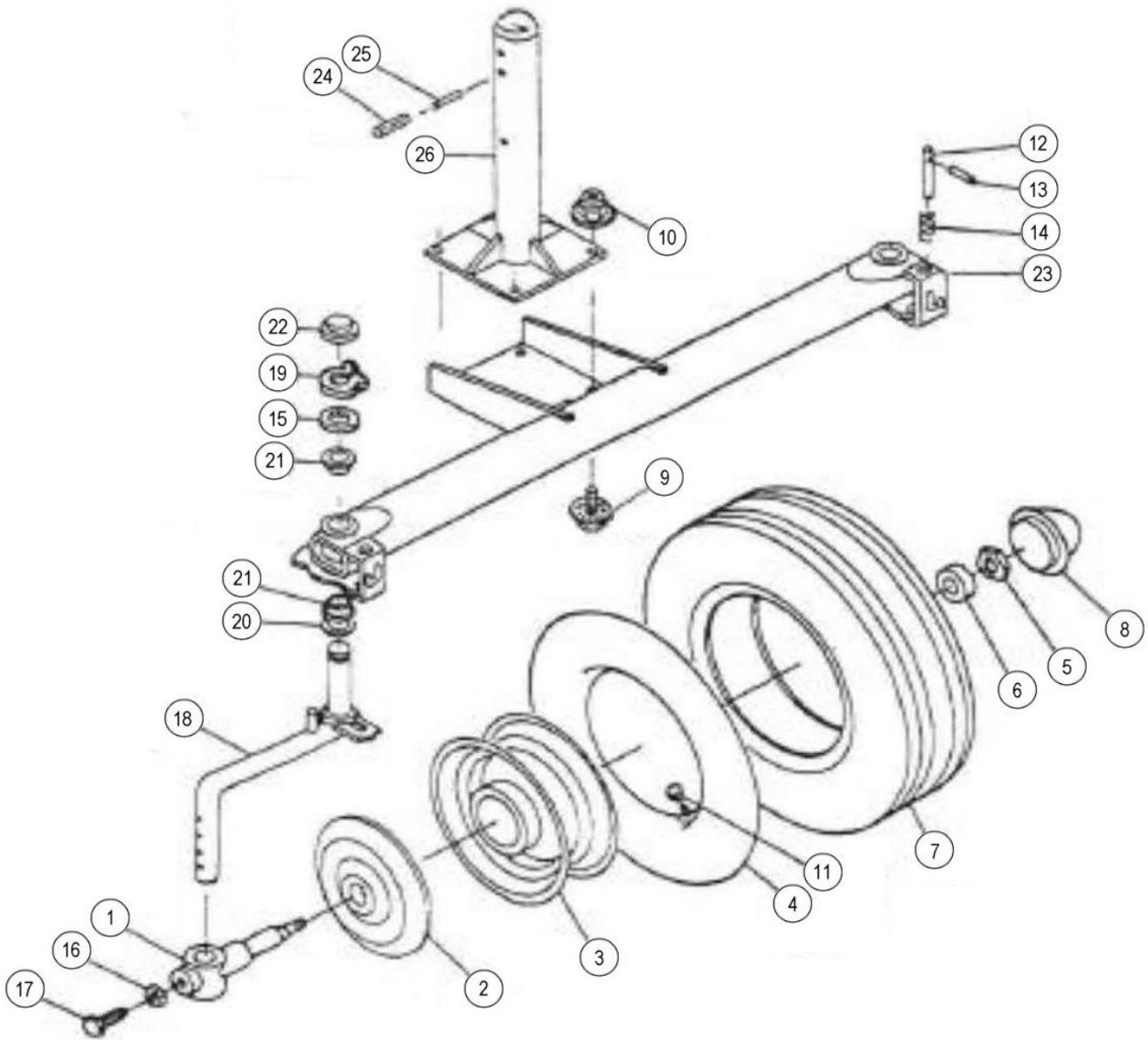
REF.	QTY.	PART No.	DESCRIPTION
			<b>MAIN FRAME ASSEMBLY</b>
1	1	6508001	PINION
2	1	6508002	BEARING
3	1	6508003	CIRCLIP
4	1	6508004	CIRCLIP
5	1	6508005	SPACER SLEEVE
6	1	6508006	SHIM
7	1	6508007	SHIM
8	1	6508008	FLANGE
9	1	6508009	VALVE
10	1	6508010	HYDRAULIC MOTOR
	1	6508011	SEAL KIT FOR HYD. MOTOR 6508010
11	1	6508012	CONNECTOR
12	2	6508013	HYDRAULIC HOSE
13	2	6508014	QUICK RELEASE COUPLING
14	1	6508015	ROUND FLANGE
15	1	6508016	BOLT
16	1	6508017	NUT
17	1	6508018	BOLT
18	4	6508019	COUPLING SLEEVE
19	1	6508020	MOUNTING BRACKET
20	4	6508021	NUT
21	4	6508022	WASHER
22	2	6508023	ROLL PIN
23	1	6508024	ROLL PIN
24	1	6508025	QUICK RELEASE COUPLING
25	1	6508026	HYDRAULIC HOSE
26	1	6508027	CONNECTOR



# WHEELS & AXLE ASSEMBLY

Model: KR 205 Rotary Rake

**McCONNEL**



**WHEELS & AXLE ASSEMBLY****McCONNEL**

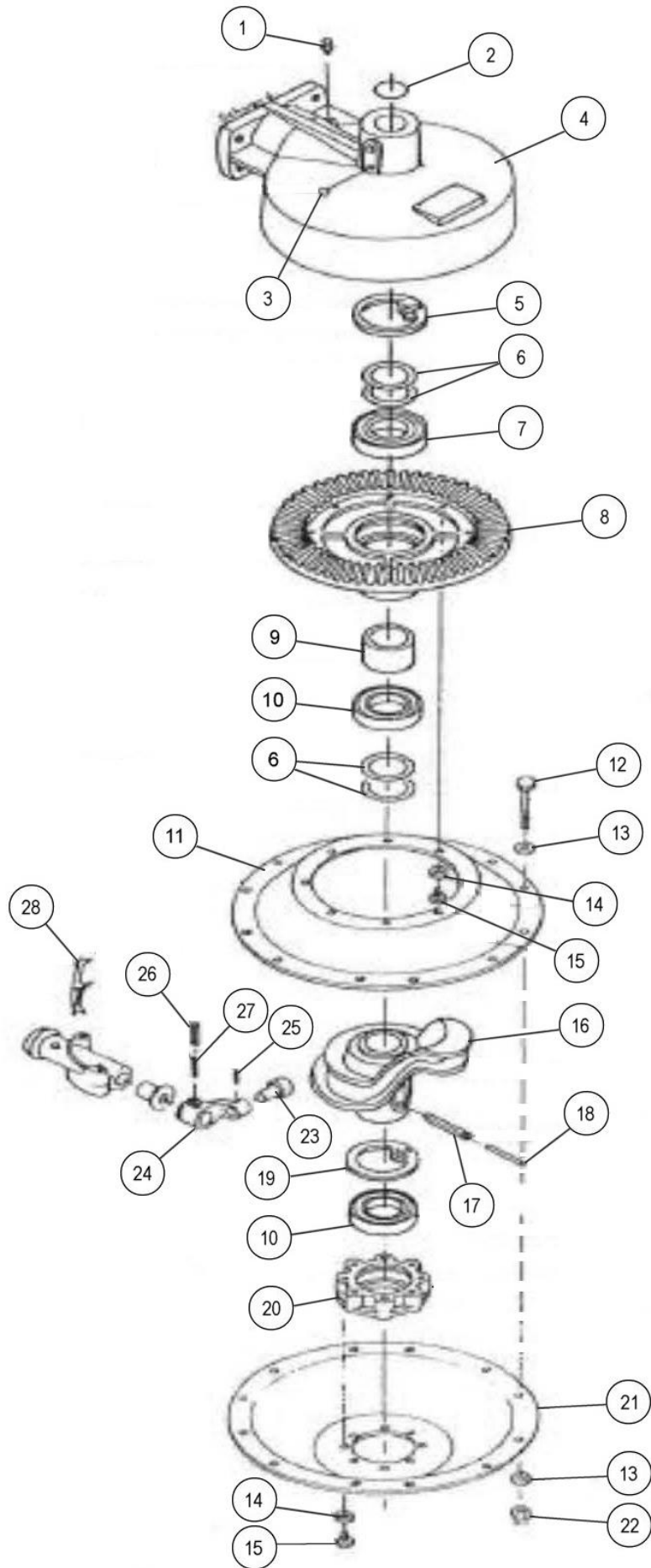
Model: KR 205 Rotary Rake

<b>REF.</b>	<b>QTY.</b>	<b>PART No.</b>	<b>DESCRIPTION</b>
			<b>WHEEL &amp; AXLE ASSEMBLY</b>
1	2	6508028	AXLE
2	2	6508029	WHEEL GUARD
3	2	6508030	WHEEL RIM
4	2	6508031	INNER TUBE
5	2	6508032	HEX NUT
6	2	6508033	BUSH
7	2	6508034	TYRE
8	2	6508035	HUB CAP
9	4	6508036	BOLT
10	4	6508037	NUT
11	2	6508038	VALVE CAP
12	2	6508039	LOCKING BOLT
13	2	6508040	COTTER PIN
14	2	6508041	SPRING
15	2	6508042	DISC
16	2	6508043	HEX NUT
17	2	6508044	HEXAGON BOLT
18	2	6508045	WHEEL PILLAR
19	2	6508046	CIRCLIP
20	2	6508047	DISC
21	4	6508048	NYLON BUSHING
22	2	6508049	PROTECTOR
23	1	6508050	STEERING RACK
24	1	6508051	BUSHING SLEEVE
25	1	6508052	BUSHING SLEEVE
26	1	6508053	STEER COLUMN

# DRIVE ASSEMBLY

Model: KR 205 Rotary Rake

# McCONNEL



**DRIVE ASSEMBLY****McCONNEL**

Model: KR 205 Rotary Rake

<b>REF.</b>	<b>QTY.</b>	<b>PART No.</b>	<b>DESCRIPTION</b>
			<b>DRIVE ASSEMBLY</b>
1	1	6508054	GREASE NIPPLE
2	1	6508055	O RING
3	1	6508056	PLUG
4	1	6508057	HOUSING
5	1	6508058	CIRCLIP
6	<i>as req'd</i>	6508059	SHIM 0,2
	<i>as req'd</i>	6508060	SHIM 0,1
	<i>as req'd</i>	6508061	SHIM 0,5
7	1	6508062	BEARING
8	1	6508063	BEVEL GEAR
9	1	6508064	SPACER SLEEVE
10	2	6508065	BEARING
11	1	6508066	UPPER ROTOR DISC
12	18	6508067	HEX BOLT
13	36	6508068	WASHER
14	18	6508069	WASHER
15	18	6508070	HEX BOLT
16	1	6508071	CONTROL DISC
17	1	6508072	BUSHING SLEEVE
18	1	6508073	BUSHING SLEEVE
19	1	6508074	CIRCLIP
20	1	6508075	HUB CAP
21	1	6508076	LOWER ROTOR DISC
22	18	6508077	NUT
23	9	6508078	SCREW
24	9	6508079	CONTROL CRANK
25	9	6508080	BUSHING SLEEVE
26	9	6508081	BUSHING SLEEVE
27	9	6508082	BUSHING SLEEVE
28	9	6508083	PROTECTOR



**TINE ARM ASSEMBLY****McCONNEL**

Model: KR 205 Rotary Rake

<b>REF.</b>	<b>QTY.</b>	<b>PART No.</b>	<b>DESCRIPTION</b>
			<b>TINE ARM ASSEMBLY</b>
1	27	6508084	BOLT
2	27	6508085	SPRING TINE - RIGHT
	27	6508086	SPRING TINE - LEFT
3	27	6508077	NUT
4	9	6508087	RING BOLT
5	9	6508088	TINE ARM - RIGHT
	9	6508089	TINE ARM - LEFT
	9	6508090	TINE ARM - RIGHT (HEAVY DUTY)
	9	6508091	TINE ARM - LEFT (HEAVY DUTY)
6	18	6508092	NYLON BUSH
7	9	6508093	BEARING HOUSING
8	9	6508091	GREASE NIPPLE
9	9	6508094	TINE ARM HOLDER
10	27	6508095	WASHER
11	27	6508096	TINE FASTENER
12	27	6508097	WASHER





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