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# McCONEL

# Trailers

## *Operator's Handbook*





# EC DECLARATION OF CONFORMITY

*Conforming to EEC Machinery Directive 98/37/EC\**

We,

**McCONNEL LIMITED,**

Temeside Works, Ludlow, Shropshire SY8 1JL.

*Declare under our sole responsibility that:*

The product (type) Agricultural Trailers - Implements.....

.....

Product Code .....

Serial No. & Date ..... Type .....

Manufactured by the above company/\* .....

.....

*(\* insert business name and full address if not stated above)*

Complies with the required provisions of the Machinery Directive 98/37/EC, \* previously Directive 89/392/EEC as amended by Directives 91/368/EEC, 93/44/EEC and 93/68/EEC.

The machinery directive is supported by;

- BS EN ISO 12100:2003 Safety of Machinery. This standard is made up of two parts; Part 1 Terminology, methodology, Part 2 Technical Specifications.
- BS EN 1050 Safety of machinery - Principles of risk assessment.
- BS EN294:1992, BS EN349, BS EN811, BS EN1853:1999 & ISO 17900:2002.
- and other national standards associated with its design and construction as listed in the Technical File.

The Machinery Directive is fully implemented into UK law by means of the Supply of Machinery (Safety) Regulations 1992 (SI 1992/3073) as amended by The Supply of Machinery (Safety) (Amendment) Regulations 1994 (SI 1994/2063).

Signed John Frank.....

*on behalf of McCONNEL LIMITED*

*Responsible Person*

*Status:* Chief Design Engineer

*Date:* April 2005



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# SAFETY INFORMATION

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## ALWAYS READ THE MANUAL FIRST.

***It is the Owners responsibility to ensure that all operators of this equipment are suitably qualified to do so and have read this manual and fully understood all aspects relating to its safe use. It is the Operator's responsibility to ensure not only their own safety but also the safety of those in close proximity to this equipment.***

- ▲ NEVER permit inexperienced persons or children to operate this equipment.
- ▲ NEVER use this equipment for tasks it was not designed for.
- ▲ NEVER work beneath the raised trailer body unless it has been securely propped.
- ▲ NEVER load a trailer in excess of its stated capacity – undue stress on components can be caused such as tyres, drawbar, chassis etc.
- ▲ NEVER operate a trailer at speed especially when fully laden.
- ▲ NEVER raise a trailer for tipping when persons are in the tipping zone of the trailer – keep onlookers and bystanders at a safe distance.
- ▲ AVOID 'jack knifing' when reversing - the tractors tyres may be damaged by the drawbar.
- ▲ ALWAYS look behind a trailer before reversing to ensure it is safe to do so – WATCH OUT FOR CHILDREN!
- ▲ ALWAYS ensure tyres are inflated to the correct pressure – check regularly.
- ▲ ALWAYS inspect tyres regularly to check for damage or wear and to remove stones from the tread.
- ▲ ALWAYS ensure the trailer brakes are correctly adjusted and that the brake cables and shoes are in good working condition.
- ▲ ALWAYS inspect hydraulic hoses regularly to check for signs of wear or damage – replace hoses immediately if they are damaged.
- ▲ ALWAYS check that nuts and bolts are kept tight, especially wheel nuts – these should be checked daily before use.
- ▲ ALWAYS distribute the load evenly in a trailer to ensure stability of the unit.
- ▲ BEWARE of overhead electric power lines especially when raising a trailer.

# **INFORMATION RELATING TO TRAILER USAGE**

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## **CARRIAGE OF PASSENGERS ON FARM TRAILERS**

The Health and Safety Executive (HSE) investigated three deaths and 31 serious injuries between 1986 and 1999 that were a direct result of carrying passengers on farm trailers. Whenever people are transported around the farm, the vehicle they are being carried on must be suitable for the purpose and a safe system of work (safe working practices) must be followed.

This information is aimed at anyone who uses a trailer to move people around on a farm and sets out the features, related to the circumstances of use, a trailer should have if it is used for carrying passengers.

It only considers on-farm use (ie away from the public highway). Travelling on the public highway with passengers on a trailer may be an offence under road traffic legislation. If you intend doing this you should consult the police to establish any further precautions you should take. Remember that parts of the road traffic legislation apply to any area to which the public have access (eg farm driveways with a public footpath).

### **Towing vehicle**

The tractor or other towing vehicle:

- Must be maintained in effective working order, in particular the steering, the brakes (both parking and service) and the tyres;
- Should have the facility to operate trailer brakes, preferably direct from the service brakes, but where this is not possible then from the hydraulic services;
- Should be correctly and securely coupled to the trailer being used. In particular, the hitch of the tractor should be compatible with the trailer drawbar connection (eg hook and eye, clevis to drawbar) and all necessary securing pins should be in place.

The driver of the towing vehicle should be a mature, competent, and responsible person. Adequate training should have taken place to ensure competence and care should be taken to ensure that the driver is sufficiently mature, particularly if they are less than 18 years old. Remember that young people may require greater training and supervision.

### **Trailer**

- The trailer should be in sound condition and maintained in effective working order, including in particular the tyres and brakes, the floor and sides of the trailer and the connection to the tractor (eg pick-up ring or drawbar).
- It should not be possible for a driver or a passenger to contact the wheels (or tracks) from any position in which they may be riding (ie on either the towing or towed vehicle).
- Brakes (either hydraulic or air) should be fitted on at least one axle of the trailer. They should be connected directly to the tractor's service brakes. If this is not possible, they should be readily operated from the normal driving position (eg the tractor seat).
- Tail-lighting systems, in full working order, should be fitted to both the towing and trailed vehicles, especially direction indicators. (These are the vehicle's normal 'road-going' lights.)



- When passengers are to be carried after dark, provide effective lights that will illuminate the access/egress areas and the area of the trailer used by passengers. (This is additional lighting to aid visibility on the trailer.) Hand-held lights or torches are not suitable for this.
- Do not use trailers in circumstances where overturn is foreseeable.

### **Trailers in regular use for workers or for carrying members of the public**

The following advice applies to trailers used for regularly transporting workers (such as labour gangs) or for carrying members of the public (eg on student farm tours, to PYO fields, school visits etc):

- Seating should be provided which provides back support and is secured to the trailer floor. It should allow all passengers, including children, to sit with their feet on the trailer floor. Seating should preferably face outwards or forwards. If this is not the case (ie passengers face inwards) back support can be provided by the trailer sides (including rear and front).
- Back support should be at 'sitting shoulder height' - 600 mm above the seat for an average man. This will vary for children (depending on age) and may be as little as 350 mm for the average four year old.
- Trailer edges should be protected to prevent passengers from falling. Any headboards, tailboards, sides or guard rails should be secured in position. All sides/guard rails should be strong enough to support an adult's weight without damage or permanent distortion. (Guard rails etc should be able to withstand a minimum horizontal force of 1000 N.) In the case of guard rails/sides which passengers lean on when seated, the rail should be able to support the weight of the total number of people who are likely to lean on them. Solid headboards, tailboards or sides should be at least 920 mm high. If the edges are protected by a guard rail it should be not less than 920 mm or more than 1070 mm high. There should be an intermediary rail between 460 mm and 535 mm, and a toeboard not less than 75 mm high should be fitted at the exposed edges. Any opening provided for access should provide a similar level of protection when closed during transport.
- If young children are carried (eg under-school-age children travelling with casual workers, or school children on a tour) then the sides should be infilled (eg with weld mesh or similar).
- There should be a safe means of access to and egress from the trailer. This could consist of a fixed ladder or steps, with the lowest rung or step no more than 550 mm above ground level. There should be a secure handhold at the top between 920 mm and 1070 mm above the trailer floor level to help people mounting or dismounting from the trailer. The access position should be behind the trailer wheels.
- If a portable ladder is used, it should be rigid and strong enough for the purpose and secured in position before being used. (It should accompany the trailer when it is being used to transport passengers.)
- Nothing other than the passengers and their personal tools and effects should be carried on the trailer, ie there should be no goods, equipment or loads in transit.
- Trailers that are regularly used for carrying passengers should be clearly marked with the maximum number of people that can be carried.

## **Trailers used for workers on an exceptional basis**

For trailers used to carry workers to or from a worksite on a one-off basis, the above criteria should be applied as far as possible. If they cannot reasonably be met, then the minimum standards to be achieved are:

- People should be able to sit down (either on seating or on the floor of the trailer) and any seating should be secured to the trailer floor. If bales form the seats, they should ideally be placed in the centre of the trailer so that people can sit back to back, and they should be secured in position by ropes or other effective means.
- There should be a headboard, tailboard and sides to prevent people falling. The sides, headboard and tailboard should be to a height at least 470 mm above the surface upon which a person is sitting.
- No one should ride standing in the trailer unless the sides are sufficiently high that it is safer to do so (eg in a high-sided grain trailer where sides are around standing chest height and provide a secure handhold).
- No one should ride seated on the top edges of sides/headboard/tailboard or with their legs hanging over the side of the trailer.
- No one should be carried on a laden or partially laden trailer if movement of the load could cause injury either directly (eg by crushing) or indirectly (eg by causing a fall). If people do ride on a load they should be sitting and the sides of the trailer should be at least 470 mm higher than the load.
- Means of access should be provided. This can be either permanently attached steps/ladders or a portable ladder that can be secured in position. Means of access provided by manufacturers on new trailers are acceptable to meet this requirement.

## **Safe system of work**

- A responsible person should travel on the trailer to control and help the passengers. (More than one person may be required if the passengers are groups of children.) The driver should not carry out this task as well as his driving duties.
- For school parties the teacher or parental supervisor should not be the only responsible person travelling on the trailer - farm staff should also be on board.
- The responsible person should ensure that the number of passengers does not exceed the capacity of the trailer.
- If the only passengers are workers, one of them should be appointed as the responsible person. There should be an effective and efficient system of communication provided between the responsible person and the driver, clearly understood by both parties, for starting and stopping travel (eg two-way radio, bell signal etc). The driver should not move the trailer without first receiving instructions or signals from the responsible person to do so.
- All passengers, including the responsible person, should remain seated during the journey. No one should be allowed to mount or dismount from the trailer while it is moving.
- Mounting and dismounting from the trailer should take place in a quiet and safe area, away from other traffic, if possible. (If not, then suitable barriers should be provided to prevent people, especially young children, from running into danger.)

- If workers are to be carried to a worksite on an empty trailer that will subsequently be loaded and returning with a load, alternative arrangements will have to be made for the workers' return journey.
- The driver should drive within speeds which will not jolt the passengers or cause them to be thrown around and should avoid any sudden speed changes.

### **Legal requirements**

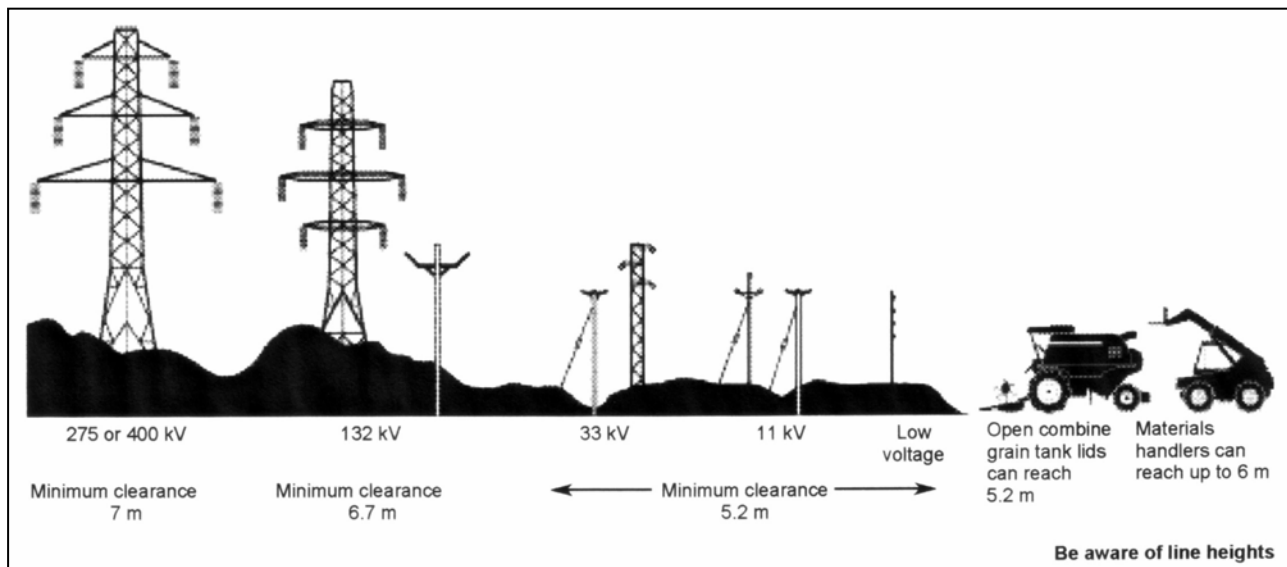
The Health and Safety at Work etc Act 1974 (section 3) requires employers and the self-employed to take reasonably practicable precautions in relation to the safety of non-employees who may be affected by the work activity.

The Provision and Use of Work Equipment Regulations 1998' (PUWER 98) put duties on employers, the selfemployed and workers in relation to work equipment. The regulations that have specific requirements on carrying passengers on trailers are:

- **Regulation 4:** requires work equipment to be suitable for the purpose for which it is used. This can be achieved either by the original design of the equipment or by proper modification to make it fit for purpose;
- **Regulation 9:** requires the driver of the towing vehicle to be adequately trained;
- **Regulation 25:** requires any equipment used for carrying people to be suitable for the purpose and requires that there are features to reduce the risk from contact with the wheels or tracks as low as reasonably practicable;
- **Regulation 26:** states that where there is a risk of injury in an overturn the risk is controlled by various means including stabilising the equipment or by providing a roll-over protective structure.

*References: Safe use of work equipment Provision and Use of Work Equipment Regulations 1998.*

# WORKING SAFELY NEAR OVERHEAD POWER LINES



## INTRODUCTION

About five people are killed every year in accidents involving overhead power lines (OHPLs) during agricultural work. Machinery (like combines, tipping trailers, boom sprayers, loaders); equipment (such as irrigation pipes and ladders); and activities (eg stacking) are often involved. Contact with the lines does not need to be made. Electricity can flash over when machinery or equipment gets close to overhead lines. Most incidents involve high-voltage lines supported on wooden poles, but the dangers of other power lines such as those supported on steel towers or steel poles and concrete structures cannot be ignored. This information sheet outlines the steps you can take to reduce the risks when working near overhead power lines. Remember the Electricity at Work Regulations 1989 apply to work activities carried out near power lines.

## PLANNING PRECAUTIONS

- **Consult your local electricity company and /or the National Grid Company for lines on steel towers operating at 275 and 400 kV.** (The operating voltage will be displayed on a sign attached to the tower.) They will provide free information and advice about precautions and safe working procedures which can be followed near power lines.
- **Find out** the maximum height and maximum vertical reach of your machines and those used by contractors.
- **Find out** the routes of **all** overhead lines on your land or near your boundaries. Mark them on the farm map. The electricity company will give you this information.
- **Make sure** you have information about all the lines on your land - if not, contact the owners of those lines.
- **Make sure** you have details of the maximum working heights permitted under each span of overhead line on your farm and adjacent to each structure. Mark these on the farm map.

The farm map can be used as a reference when planning cropping or other work, instructing machine operators and contractors, or buying new equipment.

In cases where there is a significant risk, it is sensible to discuss the following measures with the electricity company:

- **Access:** creating alternative access points and routes - *this is often the cheapest option.*
- **Divert lines:** benefits can arise from burying lines or changing routes - *an option particularly suited to farmyards.*
- **Barriers and goalposts:** by erecting goalposts and barriers, machines which have to pass beneath lines can be limited to a safe height – *an option especially suited to gateways and tracks.*

## **USE OF MACHINERY**

Accidents can be prevented if the following operations are **not** carried out within a horizontal distance of at least 9 m from power lines on wooden poles or at least 15 m from lines on metal towers. These distances should be measured from the line of the nearest conductor to the work, projected vertically downwards onto the floor, and perpendicular to the route of the line. The operations are:

- Stacking bales or potato boxes;
- Folding sprayer booms;
- Tipping trailers or lorries;
- Operating materials handlers;
- Working on top of combines or other high machinery.

## **WORKING SAFELY**

Key elements of safe systems of work are:

### ***Training***

Everybody who works near overhead power lines with a machine or equipment needs to know what the dangers of overhead lines are, the precautions to follow and what to do if they do contact a power line.

### ***Visitors***

Contractors are at risk when they work on farms where overhead lines are present. Make sure they know where the lines are and tell them the precautions they need to take. Routes can be marked with safety signs to warn all visitors of the dangers.

## **EMERGENCY ACTION IF THERE IS AN ACCIDENT**

- **Never touch an overhead line - even if it has been brought down by machinery, or has fallen. Never assume lines are dead.**
- **When a machine is in contact with an overhead line, electrocution is possible if anyone touches both the machine and the ground. Stay in the machine and lower any raised parts in contact or drive the machine out of the lines if you can.**
- **If you need to get out to summon help or because of fire, jump out as far as you can without touching any wires or the machine - keep upright and away.**
- **Get the electricity company to disconnect the supply. Even if the line appears dead, do not touch it - automatic switching may reconnect the power.**

## TRAILER ATTACHMENT

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The laden weight of this trailer is considerable therefore the hitch has been designed for use with a 'pick up' type hitch only and not a 'clevis' type drawbar – these instructions are therefore based on the 'pick up' hitch.

### LOWERING THE HOOK

*Note: If a selector valve is fitted to the tractor ensure that for all trailer applications the lever is in the 'Linkage' position.*

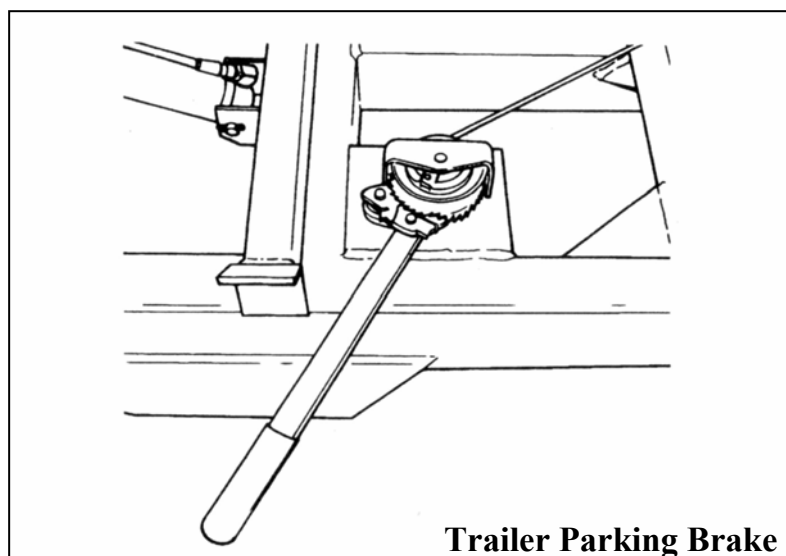
- With the draft lever in the 'UP' position, move the position control lever to the 'CONSTANT PUMPING' position.
- Pull the release lever to disengage the latch mechanism and move the position control lever through the quadrant to the 'DOWN' position, at the same time releasing the latch.
- Reverse the tractor up to the trailer until the hook is immediately below the ring of the trailer drawbar.

### RAISING THE HOOK

- With the draft lever in the 'UP' position and the hook in position under the ring of the trailer drawbar, move the position control lever through the quadrant into the 'UP' position – *ensure that the hook and ring engage correctly.*
- Move the position control lever to the 'CONSTANT PUMPING' position until the latch mechanism automatically and audibly engages the catches, then return the control lever to the 'TRANSPORT' position.
- Attach the trailers hydraulic and electrical services to the tractor – ensure that these are routed correctly and are free from straining, pinching or chaffing.

*Refer to your tractors handbook for further information on this subject.*

Ensure the trailer is held firm by the tractor's brakes before releasing it's parking brake. The trailer is now ready for transportation to the work site.



**Trailer Parking Brake**

# HYDRAULICS

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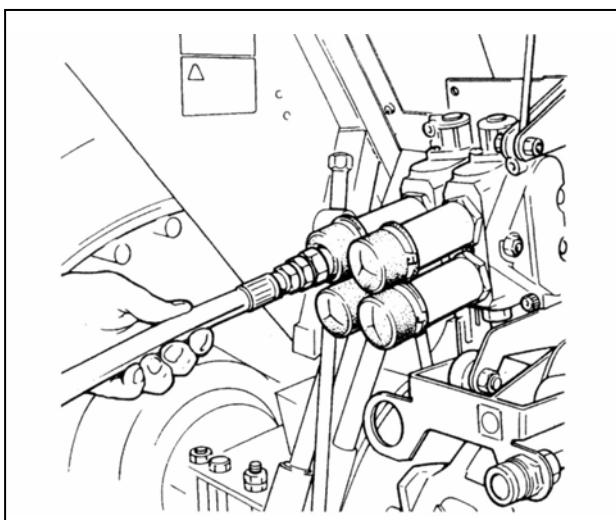
## TIPPING

**NOTE:** *The method of coupling the trailer hydraulic pipe to the tractor hydraulic system depends entirely upon the equipment fitted to the tractor. A brief description of the methods of connecting the pipe and utilising the tractor controls for tipping the trailer is outlined. Nevertheless, the operator is strongly advised to consult the appropriate tractor Operator Instruction Book for detailed instructions on the use of the tractor controls.*

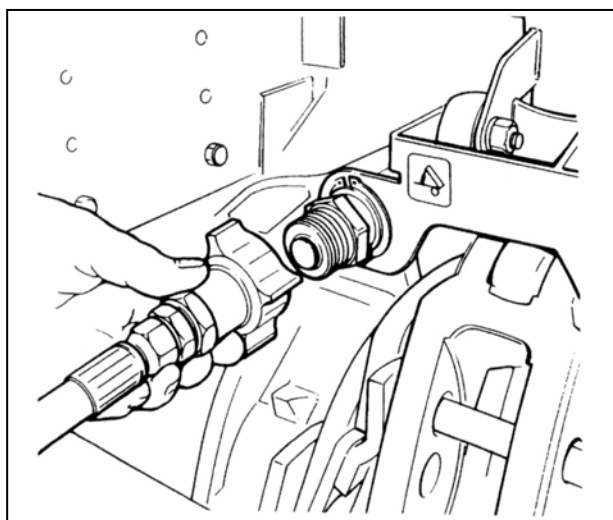
The trailer hydraulic tipping pipe can be connected to either an auxiliary hydraulic quick release coupling (preferred method) or a trailer tipping pipe connection supplied with oil from the standard hydraulic lift pump.

If the tractor auxiliary hydraulics are to be used for tipping the trailer, the connection is made by pushing the trailer portion of the coupling into the tractor spool valve connection.

If the tractor tipping pipe is to be used for tipping the trailer, the trailer hose will push directly into the coupling if the tractor is fitted with a quick release connector. If the tractor is fitted with a screw on connector then an adaptor will be necessary.



Hydraulic Tipping Hose Connection to Tractor



Hydraulic Tipping Hose Connection using an Adaptor at Tractor end

**NOTE:** *Owing to the large quantity of oil required to tip the trailer it is recommended that the auxiliary hydraulics, with combined flow, are used to give increased tipping speed.*

**CAUTION:**

The tractor transmission oil level must be at the 'HIGH' mark on the dipstick.  
The coupling must be thoroughly cleaned before any connection is made.

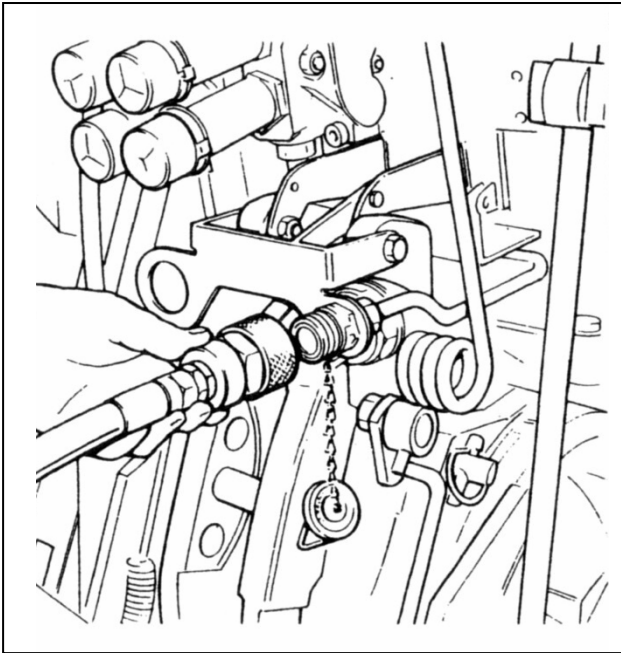
**AUXILIARY HYDRAULICS**

If the trailer hose is to be coupled to the auxiliary hydraulic spool valve on the tractor, always use one of the upper connections labelled 1 or 3 and ensure that the spool is set on 'SINGLE ACTING'. To tip the trailer move the appropriate lever backwards, to lower the trailer move the lever forwards.

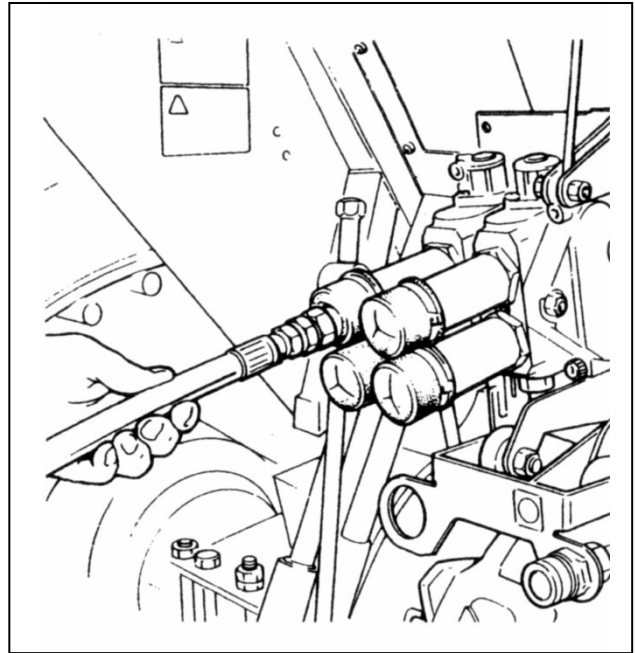
For combined flow operation, move the selector to the external flow position.

**STANDARD HYDRAULICS**

To tip the trailer with the trailer hydraulic hose connected to the trailer tipping pipe on the tractor, set the position control in the 'CONSTANT PUMPING' position and the draft lever into the 'UP' position. To lower the trailer, move the draft lever into the 'DOWN' position. If a selector valve is fitted, the lever should be left in the 'LINKAGE' position for trailer tipping pipe use, or to the external flow position if auxiliary hydraulic spool valves used.



Hydraulic Brakes



Auxiliary Hydraulics

**TIPPING THE TRAILER**

**NOTE:** As up to 23 litres (5.1 gals) of oil will be required to tip a double ram trailer to it maximum and up to 8 litres (1.7 gals) for a single ram, always ensure that the transmission oil level is at the 'HIGH' mark on the dipstick. This will apply for most makes of tractors – Consult your tractor handbook for information on this subject.



## HYDRAULIC BRAKES OPERATING PROCEDURE

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### **IMPORTANT:**

***We recommend that ABS Brake Units fitted to our trailers are powered using an ISO socket only and not via the brake light circuit. For tractors not fitted with ABS we can supply an 'ABS Power Kit' that enables the ABS system to be powered from the tractor's ignition switch. For further information or advice on this subject contact the McConnell Sales Office or McConnell Service Department.***

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The instructions below address three methods of connecting up the hydraulic hoses and utilising the tractor controls for operation of the braking system. It is always advisable for the operator to consult the individual tractors handbook in order to obtain specific information on the tractor controls as this can vary between different makes and models.

### **WARNING:**

**If the gross weight of the trailer exceeds 14230 Kg (14 ton) the brakes MUST ALWAYS be operated from the tractor footbrake pedal.**

## **TRACTOR – TRAILER HYDRAULIC BRAKES**

- Remove the brake hose from trailer stowage position.
- Remove the cap from the hydraulic trailer brake quick release coupler at the rear of the tractor.
- Fit the hose quick release coupler on to the brake coupler and release the knurled cover to secure.
- Latch the tractor brake pedals together. The trailer brakes will operate whenever the tractor brakes are applied.

## **AUXILIARY HYDRAULICS**

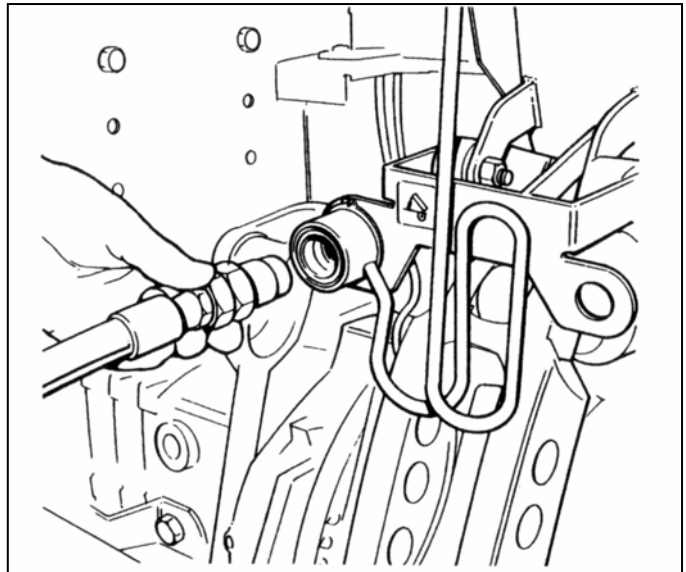
### **WARNING:**

**Before operating the trailer brakes in work a check must be made to ensure that the lever movement has the correct effect on the brakes.**

- Connect the trailer brake hose, using a suitable adaptor, to the auxiliary hydraulic connection at the rear of the tractor.
- Screw the control valve knob 'FULLY OUT' to ensure the service is single acting - *refer to your tractors handbook for further information.*
- To operate the brakes – pull the spool valve lever back.
- To release the brakes – push the spool valve lever forwards.

## STANDARD HYDRAULICS – Selector valve fitted using pressure control.

- Using an appropriate adaptor connect the hydraulic braking system hose to the trailer tipping pipe connection point on the rear of the trailer.
- Move the position control lever to the 'TRANSPORT' position and the draft control lever to the fully 'UP' position and ensure the lower links are fully raised.
- Place the selector valve lever in the 'LINKAGE' position.
- Move the position control lever into the pressure control sector and set on 'LOW'.
- Progressive braking is achieved by moving the lever from the 'LOW' position 'fully off' to the 'HIGH' position 'fully on'.



Hydraulic Braking to Tipping Connection on Tractor

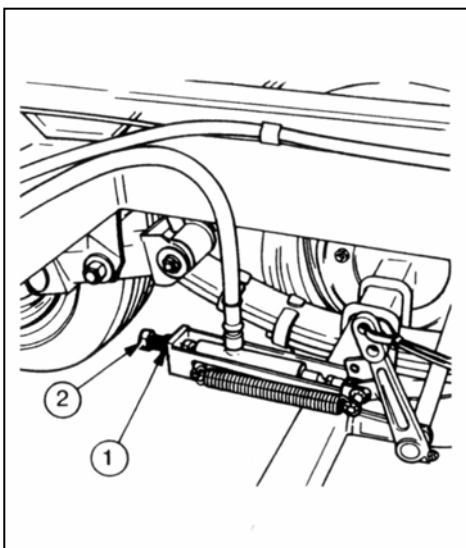
## BRAKE ADJUSTMENT

**NOTE:** The trailer brakes must be regularly maintained to achieve efficient braking as required in the United Kingdom by the Motor Vehicles (Construction and Use) Regulations, as outlined in the 1984 No. 1809 Statutory Instrument ref: Regulation 101.

### WARNING:

If it is necessary to work under the raised body of the trailer to adjust the brakes ALWAYS ensure that the trailer body is safely and securely supported at all times.

## HYDRAULIC CAM OPERATED BRAKES



### Adjustment Procedure

Initial brake adjustment for lining wear is made by releasing the locknut (1) on the bolt (2) located directly behind each brake ram. The bolt (2) should then be turned in a clockwise direction to a point where the brake is just applied, and then turned back in an anti-clockwise direction two full turns and locknut (1) retightened. - the point at which the brake is just applied can best be detected by jacking up the wheel and rotating it by hand.

When the full extent of the brake adjustment has been used up the brake lever can be moved on to its next spline, the adjusting bolt screwed back out and the brakes reset as stated in the procedure above.

## OPERATION

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Tipping of a trailer body must only be performed on stable terrain and only when all persons/bystanders are clear of the dumping zone – NEVER permit inexperienced persons or children operate this equipment.

During tipping there will be a transfer of weight via the drawbar to the tractor – care should be taken whilst tipping as ‘stuck loads’ will put upward load on the tractor hook.

**WARNING:**

**Incorrect or improper use of this equipment is extremely dangerous - failure to operate this equipment with care and attention may lead to machinery damage and/or personal injury or death.**

The trailer is designed for use with agricultural produce – when coupled to an appropriate tractor the unit must not be driven at speeds in excess of 20mph.

Always adhere to the manufacturers recommended weight limits.

Tipping operation of the trailer should only be performed on firm level ground.

Operate only with a tractor or prime mover of adequate size and weight that complies fully with the construction and use regulations.

Keep ‘full load’ pressure off rear door(s) when tipping to eliminate risk of damage.

All trailers fitted with a grain chute in the rear door should only be part tipped when loaded and the grain chute is in operation.

It is recommended that a one-piece rear door be used for discharging root crops.

Always apply the parking brake before disconnecting the trailer from the tractor.

Never attempt to move a trailer when it is in the fully raised position.

Never leave a trailer in the raised position when unattended.

Keep all bystanders at a safe distance when manoeuvring or raising a trailer.

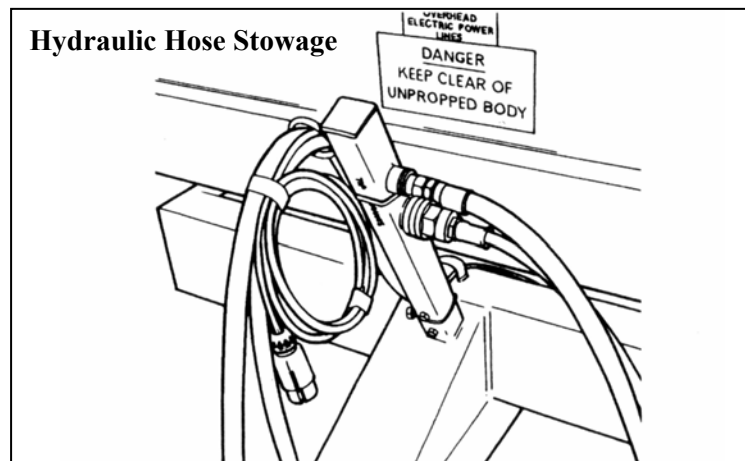
Never use a trailer to perform a task it was not designed to do.

## DETACHING THE TRAILER

### CAUTION:

**Never disconnect a tractor from a trailer when the trailer is in the raised position.**

- Select a firm level site on which to park the trailer.
- Apply the trailer's parking brake – *ensure that the multi-stroke brake handle has been operated enough times to lock it in position.*
- Disconnect the electrical services from the tractor to the trailer and stow neatly off the ground where they are away from risk of damage or exposure to damp.
- Disconnect the hydraulic hoses from the tractor's hydraulic connection and attach the couplings to the stowage positions on the trailer body – *see illustration below.*  
*If the couplings are difficult to withdraw it may be due to residual back pressure in the system – if so stop the tractor engine and operate the spool valve lever a few times to relieve the back pressure.*



- With the draft lever in the 'UP' position move the position control lever to the 'CONSTANT PUMPING' position.
- Pull the release lever to disengage the latch mechanism and move the position control lever through the quadrant to the 'DOWN' position, releasing the latch lever at the same time.
- Ensure the hook is completely disengaged from the ring before driving the tractor away from the trailer.
- Raise the hook by moving the position control lever to the 'CONSTANT PUMPING' position – once the latch mechanism is engaged return the control lever to the 'TRANSPORT' position.

## MAINTENANCE

Regular attention to tyres, springs and braking system are essential on this equipment to ensure safe and efficient use.

### WHEEL NUTS TORQUES

All wheel nuts should be checked for tightness on a regular basis – refer to the chart below for torque settings:

*NOTE: Never use impact wrenches for tightening wheel nuts as the inertia torque can reach uncontrollable levels – impact wrenches should only be used for removing wheel nuts.*

Socket size (mm)	Number of wheel studs	Thread size (mm)	Tightening torque (Nm)
24 – 28 – 30	6 – 8	M18x1.5	270
30	8	M20x1.5	350
30 - 32	10	M22x1.5	450

**WARNING: Wheel nuts may loosen on recently fitted wheels as a result of settling, therefore wheel nuts should be checked after the first trip under load and this procedure repeated each and every time a wheel is removed.**

### GENERAL TORQUES

The following torque figures apply to other general applications on trailers:

Size	Torque (Nm)	Torque (lb.ft)
M16 grade 4.6 bolt	95	70
M20 grade 8.8 bolt	476	351
M18 colaert 'U' bolt	226	167

### SPRINGS

Due to the laminated construction of leaf springs on trailers with sprung axles and drawbars, there is a tendency for 'settlement' and 'bedding in' to occur during the initial loaded use of the trailer. It is therefore ESSENTIAL that the 'U' bolts securing the leaf assemblies are checked for tightness after the first day of use and frequently during the first week. Subsequent checks for tightness must be made at intervals not greater than three months.

Generally a bolt is considered sufficiently tight if it is tightened with a standard spanner exerted with full manual effort.

### LUBRICATION

It is recommended that grease nipples and moving parts are greased on a weekly basis using one of the following suggested greases:

BP	.....	<i>Energrease LS-EP2</i>
Caltex	.....	<i>Molytex EP2</i>
Castrol	.....	<i>Castrol LMX</i>
Esso	.....	<i>Esso Beacon 2, Esso Beacon EP2</i>
Mobil	.....	<i>Mobilux EP2, Mobilgrease HP222</i>
Shell	.....	<i>Farm Grease Universal, Retinax LX</i>
Texaco	.....	<i>Multifak All Purpose EP 2</i>
Total	.....	<i>Totalfarm Multipurpose, Multis, Multis EP2</i>

## TYRES

Always ensure that tyres are inflated to the manufacturers recommended pressure as follows:

Tyre size/specification	Pressure (bar)	Pressure (lbf/in <sup>2</sup> )
6.00 x 9 - 10PR	6.5	94
7.50 x 16 - 10PR	4.5	65
10.75 x 15 - 10PR	5.2	75
10/80 x 12 – 8 PR	3.1	45
11.50 x 15 – 10PR	4.5	65
11.50 x 15 – 12PR	4.5	65
12.50 x 15 – 14PR	4.5	65
15.70 x 18 – 12PR	4.3	62
16.00 x 20 – 12PR	4.1	60
16.00 x 20 – 14PR	5.2	75
16.00 x 20 – 16PR	5.5	80
23 x 8.50 – 12 6PR	3.5	51
200/60 – 14.5 10PR	6.7	98
280/60 – 15.5 6PR	3.0	44
10.5/80 – 15.0 10PR	4.7	68
10.5 x 16 Radial	4.8	70
10.5 x 18 Radial	4.8	70
12.0 x 18 Radial	4.8	70
15R 22.5 Radial	4.1	60
18R 22.5 Radial	4.1	60

## HYDRAULIC WORKING PRESSURES

Hydraulic Brakes: 1740 PSI (120 bar) Minimum  
2175 PSI (150 bar) Maximum

Hydraulic Tipping: 2000 PSI (138 bar) Minimum  
2500 PSI (172 bar) Maximum

## PRE-STORAGE MAINTENANCE

After use and prior to storage the following pre-storage maintenance should be carried out:

- Wash down with a high-pressure hose.
- Retouch any damaged paintwork.
- Inspect and replace or repair damaged or worn parts (including decals).
- Check all nuts and bolts for correct tightness.
- Grease all nipples.
- Coat any 'bright' parts with anti-rust compound or heavy grease before prolonged storage.
- Storage of the trailer should preferably be under cover in a clean dry environment away from livestock and strong fertilisers, which can cause deterioration.

## MATERIAL CONVERSION CHART

Refer to the chart below for help in calculating the amount of space required for the transportation of certain agricultural materials.

Material	Kg/m <sup>3</sup>	lb/cu.ft.
Barley	620	39
Beet Pulp Nuts	604	38
Brewers Grains	1110	70
Bricks	1987	125
Carrots	636	40
Cement	1431	90
Clay	1764	111
Concrete	2289	144
Soil (loose)	1113	70
Fertiliser (bulk)	1017	64
Manure	922	58
Onions	556	35
Peat	985	62
Potatoes	699	44
Rubble	1049	66
Sand (dry)	1319	83
Silage (maize)	524	33
Slurry	1780	112
Stone (crushed)	2544	160
Straw (big bale)	254	16
Sugar Beet	556	35
Wheat	763	48