AGMECH ROTARY SPREADER

MANUFACTURERS OF QUALITY MACHINERY

THIS MANUAL COVERS THE FOLLOWING RANGE OF AGMECH ROTARY MANURE SPREADERS

MM400
MM600
MM800
MM1000

OPERATION AND SAFETY MANUAL
PARTS MANUAL

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1. Introduction

Thank you for considering Agmech for your “Manure Spreader” requirements, we are very pleased to be able to offer you our extensive range of locally built machines. These spreaders are capable of many years of reliable operation, and have been the leading European spreader for the last 40 years. We are pleased that our customers appreciate the features that we have added as standard.

What we have aimed to achieve is:
- a functional machine that exceeds your expectation in the field.
- that the engineering, design and ascetics of the machine prove to give you maximum longevity
- the price ensures that the unit is competitive whilst considering ‘like for like’
- that the optional equipment ensures all customers requirements are catered for

The Agmech range of Rotary Manure spreaders are uniquely capable of handling Solids – Semisolid – liquid effluent, giving a consistent spread pattern via the internal spinning rota with flail attachment. They really are one of the easiest machines to operate. With 4 models including 4m³, 6m³, 8m³ and the biggest being 10m³, the horse power requirement ranges from 80hp to 160hp.

All of our spreaders are fitted to a ‘T’ type chassis that integrates with the barrel of the vessel to form a ‘mono-hull’ vehicle which is very strong and efficient to fabricate. The barrels are all rolled from either, 4, 5 or 6mm plate, with 5 or 6mm fully welded reinforced ends supporting the rota for maximum longevity.

With most specifications included as standard the only options are either single axle or tandems axles with tyres to suit and whether manual or hydraulic opening lids, also brakes and road lights can be included at point of sale.

The spreading rota is centrally positioned in the barrel, and has replaceable flail heads on chains to do the spreading, these are a wearing part. The rota is driven by a 3:1 reduction drive which terminates at a wide angle PTO shaft with a 6 spline at the tractor and 20 spline 1¾” shaft at the spreader. The chain reduction has a self tensioning idler sprocket fitted as standard. Easy accessible grease nipples are fitted at both ends under quick release covers. The rota shaft is removable if servicing is required.
2. Safety

Before operation of this machine, please ensure yourself and all additional operators are trained in the correct operating procedures and aware of all safety requirements and potential hazards.

2.1. General Safety Precautions

2.1.1. Take all practical steps to ensure the safety of yourself and others.

2.1.2. Where possible, read and understand the applicable Health and Safety regulations for your area.

2.1.3. Before attempting to operate the machine the operator must be fully trained and familiar with the safe working limits, controls and operator instructions as detailed in this manual.

2.1.4. Ensure all guards remain in place during operation.

2.1.5. Keep clear of all moving parts and be aware of pinch points.

2.1.6. Do not perform any maintenance or repairs without shutting off the tractor beforehand.

2.1.7. Exercise caution whenever working with hydraulics.

2.1.8. You must eliminate if practicable, or otherwise isolate or minimise all significant hazards and report to your Safety Officer or Supervisor IMMEDIATELY every hazard or safety problem that you notice.

2.1.9. If you witness an accident or incident where someone was or could have been injured, you MUST report it as soon as you can.

2.1.10. For serious accidents the entire accident scene must not be interfered with until authorised by an inspector from the appropriate Health and Safety Authority, unless absolutely necessary to save life, property, etc.

2.1.11. If you received an injury while at work it MUST be reported immediately to your Supervisor or Safety Officer. The accident will be recorded on either a form for Record of Accident/Serious Harm or a form for Minor Accident or Near Miss Report. If a work injury is not reported on the day the injury occurs it may not be accepted as a work related injury and which could affect your work accident insurance.
2.2. **Specific safety hazards**

Failure to comply with the following safety requirements could result in serious personal injury or loss of life.

2.2.1. Do not remove drawbar pin without support jack in place and wheels chocked.

2.2.2. No person shall be permitted to ride on the machine at any time.

2.2.3. No person should be in the area between the tractor and the front of the spreader unless the tractor is in neutral with the park brake securely on and the PTO is disengaged.

2.2.4. Do not climb inside the machine for any reason unless the tractor engine has been shut off and the PTO disengaged.

2.2.5. Do not operate the machine without guards on the PTO shaft and drive chain assembly.

2.2.6. Keep well clear of machine at all times during operation.

2.2.7. Keep clear of lid hinges and watch fingers if fitted with a manually opening lid.
Do not climb inside spreader without the PTO disengaged and Tractor shut off.

Do not operate without guards in place.

Keep clear of lid when opening and closing.

Keep well clear of spreader when in operation.

Do not remove drawbar pin without jack down and wheels chocked.
3. Road use

With the increasing size of farms and the greater frequency with which tractors are operated on roads, we here at Agmech feel it is necessary for you to be aware of the basic legislation surrounding the operation of your tractor(s) on public highways. The current legislation is constantly changing with sometimes many interpretations of the rules so the following is an overview of the requirements. This overview is in no way complete and for more precise information you should contact the New Zealand Transport Agency.

3.1. Over dimensional requirements

If the vehicle width exceeds the standard maximum width of 2.5m it is classified as an over dimensional vehicle.

3.1.1. Vehicle width no greater than 3.1m

Day travel
3.1.1.1. Must have flags or panels fitted on each side at the front and rear.
3.1.1.2. Must have headlights on low beam

Night travel
3.1.1.3. Must have hazard panels fitted on each side at the front and rear.
3.1.1.4. Must have amber beacon.

3.1.2. Vehicle width greater than 3.1m

3.1.2.1. Must display OVERSIZE sign front and rear.
3.1.2.2. Must have one class 2 pilot if travelling at night, a pilot may also be required for day time travel depending on the vehicle.

3.2. Signage

3.2.1. Flags
3.2.1.1. Must be fluorescent yellow flags 400mm long x 300mm wide.
3.2.1.2. Should not be used at night, better to use hazard panels.
3.2.1.3. Must only be used if the vehicle is overdimension- take the flag off if the vehicle or load is no longer overdimension.
3.2.1.4. Should be fitted in a way that highlights the widest section of the vehicle.
3.2.2. **Hazard panels**

3.2.2.1. Must be reflective yellow-green with a reflective orange diagonal stripe.

3.2.2.2. Are preferred over flags as the panels are more visible during both day and night.

3.2.2.3. Only the New Zealand style hazard panels are allowed because the law requires these. Red and white hazard panels must be replaced.

3.2.2.4. Only use hazard panels when required to, do not leave them displayed on the vehicle when the vehicle is only standard size.

3.2.2.5. Try to fit the hazard panels in a location which highlights the excess dimensions to other road users.

3.2.3. **OVERSIZE signs**

3.2.3.1. Must be black lettering on yellow-green background

3.2.3.2. May be in two parts: OVER and SIZE

3.2.3.3. Must be visible to both the front and the rear

3.2.3.4. Only use oversize signs when required to. Do not leave them displayed on the vehicle when the vehicle does not require them.

3.2.3.5. The oversize sign must be displayed on the oversize vehicle itself.
3.3. **Lights**

If the vehicle is to be used on the road at any time it is highly recommended that a set of road lights are fitted during production.

3.3.1. **Head lights**: Must have one pair of dipped beam headlamps that illuminate the road in front for 50m.

3.3.2. **Beacons**: Optional but may be fitted to warn road users to the presence of the vehicle.

3.3.3. **Direction indicator lamps**: Must have two direction indicators at the rear.

3.3.4. **Stop lamps**: Must have one or two pairs of stop lamps at the rear, visible from 100m.

3.3.5. **Rear reflectors**: Must have at least two red rear reflectors.

3.3.6. **Registration plate lamps**: Must have at least one lamp sufficient to illuminate the registration plate.

3.3.7. **Forward facing position lamps**: Must have two if the vehicle is wider than 1.5m, visible from 200m.

3.3.8. **Rearward facing position lamps**: Must have one to four lamps, if one it must be to the right of the centre line.

3.3.9. **Work lamps**: Must not be switched on when travelling on the road.

3.3.10. **Obstructed lamps**: If a part of the vehicle, an attachment, a trailer or load obscures a lamp that must be fitted on a vehicle, such as a rear stop lamp, you must fit a replacement lamp in a position where it can be seen by other road users.

3.3.11. **Dirty lamps**: Having a dirty lamp is the same as having no lamp so before operating on the road ensure all lamps are clearly visible and working.

3.4. **Brakes**

3.4.1. While it is not currently a requirement to have brakes fitted to towed agricultural vehicles, with the increasing size of vehicles it is highly recommended.

3.4.2. An agricultural vehicle and any trailer(s) towed must be able to stop within a distance of 7m from a speed of 30km/h.

3.4.3. Make sure the left and right brake pedals are locked together when operating on the road.
3.5. **Towing**

3.5.1. **Towing connection**

3.5.1.1. The drawbar pin must be of a diameter which is appropriate for the tractor or trailer coupling, whichever has the smaller diameter hole.

3.5.1.2. The size of the drawbar pin must not be less than 75% of the larger coupling hole, a spacer bush can be supplied to fit the tow eye if necessary.

3.5.1.3. The drawbar pin must be securely retained in place at all times.

3.5.1.4. Drawbar pins must not be repaired or welded and must be replaced if damaged, deformed, fractured or worn at any one point to below 90% of the original diameter or the manufacturers wear limit, which ever is less.

3.5.1.5. Tow-eyes must not be repaired and must be replaced if worn at any one point beyond 10% of the original diameter or the manufacturers wear limit, which ever is less, or if it is damaged, deformed or fractured.

3.5.2. **Safety chains**

3.5.2.1. A safety chain must be fitted between the tractor and any towed trailers/implements.

3.5.2.2. Implements carried on a three-point linkage are excluded from this requirement.

3.5.2.3. Safety chain tensile strength (load at which it breaks) must be equal to or greater than the gross mass towed.

3.5.2.4. Chain length must be adjustable to eliminate a tight or loose chain and where practicable the chain must be attached to the chassis of the tractor, not the hitch. The tensile strength of the chain must be displayed on the chain via a plate or similar method.

3.5.2.5. Although a single safety chain is the minimum requirement the best practice is to fit two cross over safety chains. Each safety chain must have a tensile strength equal to or higher than the gross mass towed as the chains will not share the load evenly.
4. Operating your spreader

4.1. Selecting a tractor

Once the contents of this manual have been read and understood, familiarise yourself with the spreader and each of the components before selecting a tractor.

When selecting a tractor to operate the spreader please consider the following factors to ensure safe and successful operation;

4.1.1. The terrain and conditions you will be operating in.
4.1.2. The tare weight of the spreader you are using
4.1.3. The approximate payload you will be carrying.
4.1.4. The tare weight of the tractor. The tractor weight will be determined by the available tractor and the operating conditions but as a minimum the tractor should weigh;
   - 1 tonne for every 1.5 tonne of un-braked GTM (Gross Trailer Mass)
   - 1 tonne for every 3 tonne of braked GTM.
4.1.5. Whether the towing tractor and spreader are fitted with foot pedal braking.
4.1.6. Whether you will be travelling on a public highway and therefore the local regulations you will be required to follow.

**Important:** Always consider the climatic conditions of operation, in dry conditions optimum performance can be achieved, whereas in wet conditions the spreader is capable of pushing even big tractors sideways! Always drive to the conditions especially when negotiating hills.
4.2. Connecting up the spreader

The spreader will be fitted with a fixed or swivel tow eye as standard, depending on the model. These tow eyes are rated to European standard of origin and comply with all relevant T.U.V. and D.I.N. compliance codes.

**Important:** Please ensure that you have studied the tractor manufacturer recommended drawbar load rating and the spreader is not going to exceed this.

Assuming that the tractor is fitted with the standard double clevis type drawbar then it is good practice to ensure that the tractor and spreader are permanently attached by fitting cross over safety chains (this may be enforced in some countries), these are not supplied as standard but can be purchased from the manufacturer.

It is also favourable to fit a spacer bush (if required) between the tow eye and drawbar pin, this will prevent unnecessary drawbar pin wear as well as increasing operator comfort by eliminating fore and aft motion. These bushes are not supplied as standard but can again be purchased from the manufacturer.

For attaching the spreader to a standard double clevis drawbar;

4.2.1. Set the height of the spreader drawbar to match the selected tractor using the supplied jack on the spreader.
4.2.2. Make sure you have a suitable drawbar pin and lynch pin/R-clip to fit pin. Always use as a drawbar pin of the maximum size possible.
4.2.3. With the tractor drawbar in the central position, reverse up to the spreader until the drawbar and spreader tow eye overlap.
4.2.4. Fit the drawbar pin and spacer bush if required, lock the drawbar pin in place using a pin or R clip to prevent the drawbar pin from jumping out during operation.
4.2.5. Fit the safety chains between the tractor and spreader drawbar, ensuring there is sufficient slack in each chain when under full steering lock.
4.2.6. Wind the jack fully in, pull the pin holding the jack to the drawbar and transfer the jack to the transport position on the side of the main chassis. Ensure you lock the jack in place using the pin before moving off.
4.2.7. Connect the PTO shaft to the tractor, making sure to connect the safety chains.
4.2.8. Connect the hydraulic hoses to the outlets on the tractor. **Make sure each coupling is clean before connecting.**
4.3. Loading the spreader

The Agmech range of rotary spreaders is designed to handle all types of manure from solid to liquid. The type of material being handled and the available machinery will determine exactly how the spreader is to be loaded. The spreaders have a wide opening to enable any material to be loaded with ease. The following guidelines have been put together to ensure you get the most from your machine.

4.3.1. Position the spreader near the loading area.
4.3.2. Lift the lid, either manually or hydraulically depending on model.
4.3.3. Using your choice of loader/attachment transfer material to the spreader.
4.3.4. Close the lid and commence spreading.

4.4. Spreading

The Agmech rotary spreaders utilise an internal rotor and flail arrangement to give a consistent spread pattern for all materials. The following guidelines have been put together to ensure you get the most from your Agmech rotary spreader.

Once in the paddock which is to be spread;

4.4.1. Engage the tractor PTO.
4.4.2. Begin to drive forward at a constant speed. Adjust the tractor engine revs and forward speed to achieve the desired spread pattern.
   4.4.2.1. High tractor revs and a low forward speed will result in a heavy spread rate, ideal for applying to cultivated paddocks, whereas
   4.4.2.2. Lower tractor revs and a higher forward speed will result in a light spread rate, great for applying manure to grass paddocks which will be eaten by livestock.
4.4.2.3. Note: a minimum PTO speed (tractor rpm) will be required to turn the spreader rotor and achieve an even spread pattern.
4.4.3. Work your way around the paddock, making sure to keep away from waterways.
4.4.4. Once finished spreading, disengage the tractor PTO.
**Important:**

4.4.5. To avoid damage to the PTO shaft, take care when making sharp turns or travelling over undulating ground.

4.4.6. When the spreader has been fully loaded with some materials or left parked for a period of time whilst loaded, the start up requirements may be quite high.

4.4.7. If the tractor happens to stall when engaging the PTO at low engine rpm, be very careful about increasing the tractor rpm as this can put increased stress on the driveline components of both the tractor and the spreader.
5. Maintenance

The following guidelines if followed correctly will allow for many years of successful operation.

Please check all Nuts & bolts prior to use, then after 8 hours of use and finally after 100 hours of operation, this will ensure everything will remain tight. Then seasonal servicing will be sufficient to maintain the feeder.

Greasing intervals have been based on a standard hand lever grease gun. Do not use an air powered grease gun. General multipurpose grease is sufficient although the bearings would benefit from dedicated bearing grease.

5.1. Before daily operation

5.1.1. Visually inspect all components of the spreader for wear or damage. Check the flails are all present.
5.1.2. Check the tyres for wear and tyre pressure.
5.1.3. Check the condition of the drawbar pin/tow eye and safety chains (if fitted)

5.2. Every 40 hours of operation

5.2.1. Lubricate the drive chains with an oil and diesel mix, easily applied with a paint brush or detergent bottle. The drive chains can be accessed by removing the cover on the front of the machine.
5.2.2. Grease the bearings at each end of the main rotor.
5.2.3. Grease the bearings on the PTO input shaft.
5.2.4. Check the tow eye for excessive wear and grease (if fitted with swivel tow eye).
5.2.5. Grease the PTO shaft (yolks and slide)
5.2.6. Grease the jack if fitted with grease nipples.
5.2.7. Grease the wheel bearings if fitted with grease nipples.
5.2.8. Check the condition of the spreader chains and flails.
6. Spare parts

Before ordering any spare parts, determine the model and serial numbers together with the delivery date and include this information with all orders. The model and serial numbers can be found on the side of the drawbar in front of the tub.

YOUR MACHINE IS

MODEL

SERIAL No

DATE OF MANUFACTURE

DATE OF DELIVERY

FREE PHONE 0800 422 533

MODEL No.

SERIAL No.

Box 16590 Christchurch New Zealand
7. Troubleshooting

At Agmech we strive to deliver a solution to meet all your effluent disposal requirements. The following section has been prepared to help you solve any problems you may encounter with your machine. Do not hesitate to call us if you have a specific problem or alternatively if you have found a way to optimise this spreader, which other farmers may benefit from, let us know and there may be a tasty reward.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loud knocking in PTO shaft</td>
<td>Universal joints have run dry</td>
<td>Grease until visible</td>
</tr>
<tr>
<td></td>
<td>Turning too sharp</td>
<td>Increase turning radius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disengage PTO when making sharp turns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make sure spreader is fitted with a wide angle driveshaft</td>
</tr>
<tr>
<td>Tractor stalls when PTO is engaged</td>
<td>Not enough power to overcome start up requirements.</td>
<td>Increase tractor rpm very slightly before engaging PTO</td>
</tr>
<tr>
<td></td>
<td>Spreader rotor is jammed</td>
<td>Check no large foreign objects have entered the spreader</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Try to avoid leaving the spreader parked up whilst loaded.</td>
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<tr>
<td></td>
<td>Bearing has seized</td>
<td>Check all bearings.</td>
</tr>
<tr>
<td>Excessive vibration in spreader</td>
<td>Rotor out of balance</td>
<td>Check all spreader chains are in place</td>
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<tr>
<td></td>
<td></td>
<td>Check the flail ends.</td>
</tr>
<tr>
<td></td>
<td>Bearing has collapsed</td>
<td>Replace bearing</td>
</tr>
<tr>
<td>Not spreading</td>
<td>Flail speed not high enough</td>
<td>Increase tractor rpm</td>
</tr>
<tr>
<td></td>
<td>Chains missing</td>
<td>Check spreader chains and flails</td>
</tr>
<tr>
<td></td>
<td>Drive chain broken</td>
<td>Check the drive chain under the front cover.</td>
</tr>
</tbody>
</table>
8. Terms and conditions of manufacture and supply

Ownership
Agmech Ltd at all times retains ownership in the goods supplied until payment is made for the goods and for any other goods supplied by Agmech Ltd; and if such goods are sold on their own account or as constituents of other goods by the customer prior to payment to Agmech Ltd then the proceeds of such sale shall be the property of Agmech Ltd.
The customer acknowledges that in the event that default is made in payment for any goods supplied for a period of one month, Agmech Ltd may repossess the goods in their original form or as constituents of other goods and sell the same exercising the full rights as owners of such goods. All losses, costs and expenses incurred in recovering and disposing of the goods is to the cost of and at the liability of the customer.
The customer agrees to indemnify Agmech Ltd for the cost of any litigation arising out of Agmech Ltd acting on any instructions for the customer.

Warranty
Agmech Ltd warrants, for a period of 12 months from the date delivery, its new product and parts to be free from defects in material and workmanship.
Agmech Ltd obligation over this warranty is limited to repair or replacement (at its factory or Agents factory) of any part or parts of the said products which shall be returned to Agmech Ltd with transportation charges prepaid and which Agmech Ltd examination shall disclose to its satisfaction to have been defective.
Agmech Ltd undertakes to remedy with reasonable dispatch, any original defects arising from defects in material or workmanship which under proper and normal conditions of use, are revealed within 12 months from date of delivery. In no case shall Agmech Ltd be liable for the cost of labour and travel incurred in replacing and fitting of the defective parts. Labour and installation charges and costs for work carried out under the terms of this warranty are for the customer's account.
Replacement parts provided under the terms of this warranty are covered for the remainder of the warranty period applicable to the product in which they are installed as if such parts were original components of that product.

For all warranty Agmech Ltd require you to contact them directly; no responsibility will be accepted for any defect, unless a written complaint is first received by Agmech Ltd and we have been given the first priority and ample opportunity to rectify the defect. Agmech Ltd makes no other warranty, of any kind whatsoever, express or implied; AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE ABOVE MENTIONED OBLIGATIONS ARE HEREBY DISCLAIMED BY AGMECH LTD EXCLUDED FROM THIS AGREEMENT.
Agmech Ltd neither assumes nor authorises any person to assume for it, any other obligation in connection with the sale of Agmech’s products. This warranty shall not apply to any product nor component thereof which has been repaired or altered outside of an approved factory in any manner so as (Agmech's sole judgment) to affect its serviceability or which has been subject to misuse, negligence, or accident; or to products made by Agmech Ltd which have been operated in a manner contrary to the printed instructions.
Under no circumstances shall Agmech Ltd be liable for loss, damage, cost or repair of consequential damages of any kind in connection with the sale, use and repair of any product purchased from Agmech Ltd.