ST1100N,ST1300N,ST1600N, ST1600,ST2000,ST2400 Slurry Tankers Operators Manual

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'Quality, Strength & Personal Service'

This manual is provided to assist you in getting the best results from your Slurry Tanker and ensure that you do so safely. If you have any queries about the use of the Slurry Tanker contact your dealer before use. Please keep this manual for future reference.

The Fleming range of Slurry Tankers are robustly designed and manufactured to cater for all size of operations. The full length drawbar attached to the axle reduces stress on the tank. The tank is coated internally with a protective coating for extended life. All Fleming Slurry Tankers are fitted with the new series Battioni MEC/M vacuum pump which allows for longer continuous working periods than that recommended for traditional agricultural pumps.

Currently there are four models within the Fleming Slurry Tanker range. The table below specifies the standard equipment which is supplied with the Slurry Tanker range. (See Table 2. for respective capacities).

Table 1. Standard Equipment

Model	Capacity Gallons	Wheels Rec'd	MEC Pump	Hyd Brakes	Lights	Standard Tyres
ST1300N	1300	No	8000M	Yes	Yes	550/65/22.5
ST1600N	1600	No	8000M	Yes	Yes	550/65/22.5
ST1600	1600	Yes	8000M	Yes	Yes	28.1 R26
ST2000	2000	Yes	11000M	Yes	Yes	28.1 R26

1.1 FUNDAMENTAL PRECAUTIONS

On delivery, your dealer gave you an explanation of the operation and maintenance of this Fleming Slurry Tanker. Please read and understand these operating instructions before operating the machine for the first time. It is essential that you observe all safety instructions.

Incorrect use or mishandling of the Slurry Tanker can endanger:

Life and Limb of the operator, other persons or animals within the vicinity of the machine.

The machine and other material assets of the owner or third persons.

The performance of the Slurry Tanker

Anyone who is involved in the commissioning, operation or maintenance of the Slurry Tanker must read and understand these instructions very carefully and observe them at all times.

1.2 AUTHORISED OPERATORS

Youths under the age of 16 must not operate the Slurry Tanker. The owner of the machine must provide the operator with the operating instructions and make sure they have read and understood them. Only then may the Slurry Tanker be put into operation.

The owner must ensure that only authorised persons operate/work on this Slurry Tanker. He is responsible for keeping any third persons or animals out of the working area of the Slurry Tanker.

A SAFE DISTANCE OF AT LEAST 10M MUST BE OBSERVED BY ANY PERSON OR ANIMAL WITHIN THE VICINITY OF THE SLURRY TANKER.

1.3 GENERAL SAFETY AND ACCIDENT PREVENTION REGULATIONS

Before operation make yourself familiar with all elements and controls of the Slurry Tanker as well as their functions.

Ensure the Slurry Tanker is correctly and securely attached to the operating vehicle. The recommended method of attachment is to use the tractor hook hitch.

Always check that the hydraulic brake line is connected and functioning.

NEVER attach to a tractor which would be rendered unstable when the Slurry Tanker is operated at its full capacity. Take note of the maximum load permissible on tractor draw bar.

Table 2. Slurry Tanker Capacities

Model	Unladen Weight (kg)	Approximate Laden Weight (kg)	Capacity (Litres)
ST1300N	2100	8012	5910
ST1600N	2280	9433	7274
ST1600	3340	10020	7274
ST2000	3500	12250	9092

The attaching and detaching of the Slurry Tanker to a tractor must be carried out by only one operator. There should not be any other people in the vicinity of the implement or in the tractor.

When detaching the Slurry Tanker from the tractor always ensure that it is safely positioned on a level surface and that blocks are positioned below each wheel.

NEVER allow children to play on or around tractors and machinery.

NEVER operate the Slurry Tanker unless all safety guards are fitted and are firmly in position. ALWAYS ensure that all guards and covers are replaced after carrying out maintenance or adjustments.

Do not make any sharp turns with PTO shaft in motion.

ALWAYS disengage the PTO before dismounting from the tractor.

Operators should not wear loose fitting clothing when working close to PTO driven equipment. Keep long hair tied back. **NEVER** be in the vicinity of a rotating PTO shaft.

ALWAYS disengage the PTO shaft, apply the hand brake, stop the tractor and remove the key before carrying out any maintenance or adjustments to the Slurry Tanker.

Before operation inspect the area around you. Keep children away. All visitors and unauthorised persons should be kept well away from work area.

NEVER operate the Slurry Tanker with persons standing in the spreading path. There is a danger of serious injury to both livestock and persons within this area. A safe distance of at least 10m must be observed by anyone within the vicinity of the Slurry Tanker.

Take extra care when operating the Slurry Tanker on sloping ground. .

Exercise extreme caution when turning on sloping ground. Especially with a partially filled tanker as the inertia will cause the weight of the contents of the tank to be thrown to one side of the tank. **NEVER** operate on ground where there is a risk of the tractor becoming unstable

NEVER park the tractor and Slurry Tanker on a slope.

NEVER attempt to move the Slurry Tanker manually.

To avoid personal injury keep hands and limbs well away from the moving parts**.**

Under NO circumstances should anyone, authorised or otherwise attempt to use the Slurry Tanker as a means of personal transport. It is designed as a special purpose farm implement and is unsuitable for the safe transportation of passengers. **NEVER** allow anyone especially children to travel anywhere between the tractor and an implement.

Where local laws permit ensure that a flashing amber beacon is mounted on the cab of the tractor and is always used when transporting the Slurry Tanker on the road.

Always ensure that the rear view mirrors on the tractor are adjusted properly and are kept in good order.

SLURRY GASES CAN KILL. Vacate slatted houses of animals and people when mixing is in progress. Do not stand near tank openings or stoop to floor level when mixing. Secure suction hoses to prevent them from falling into the tank. Do not enter a below ground level tank. If unavoidable attach a lifeline held by two persons.

SLURRY GASES CAN BE FLAMMABLE. Never allow naked flames near the tanker or tank openings.

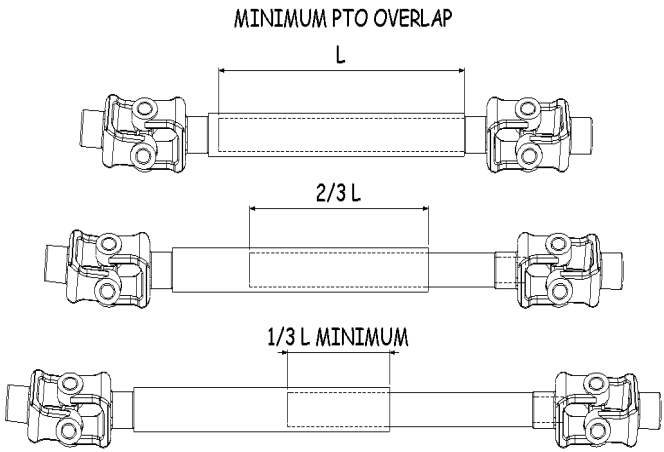
NEVER open the rear door to enter the tanker without first decompressing the tanker and venting all gases. If entering the tanker always have another person standing by.

Before attempting to clear any blockages in the spread plate, ensure the pump lever is in neutral, the tank is depressurised and the rear discharge valve is closed.

NEVER DISTRACT PERSONS WHO ARE USING THIS MACHINE.

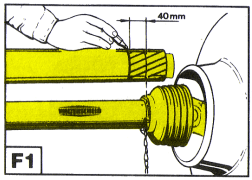
1.4 PTO SHAFT LENGTH

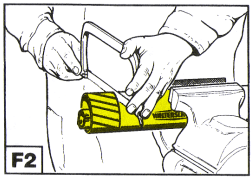
The PTO shaft length may be altered to suit individual tractors. During operation when the PTO is at its maximum extended length there must be a minimum overlap of 1/3 PTO shaft length as shown in the minimum PTO overlap diagram.
The Slurry Tanker should be hitched to the tractor and be checked in various positions to ensure that the PTO drive line is the correct length. Remember that undulating ground can also affect the length of the PTO shaft.

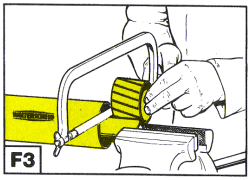


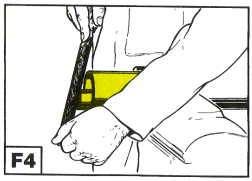
SHORTENING THE PTO SHAFT.

If the PTO is too short with a tendency to separate, then it must be replaced with a longer one.
If the PTO is too long, it should be shortened using the following method.









- Set the tanker at its minimum distance from the tractor. Brake the tractor and switch off the engine.
- Separate the PTO. Attach the female part to the tractor PTO and the male part to the tanker pump PTO. Ensure that the fixing pins have “clicked” into position and are engaged.
- Keeping the two halves of the PTO parallel line them up side by side. Fig 1.
- Match mark where the two halves are to be shortened. Fig 1.
- Taking one half of the PTO cut the shield at the mark. Fig 2.
- Using the cut off piece as a guide (fig 3) cut the shaft.
- Proceed in the same way with the other half of the PTO.
- Trim and de-burr the two cut ends of the PTO and clean off all swarf. Fig 4.
- Grease the two profiles and join the two halves of the PTO together.
- Fit the PTO shaft to the tractor and tanker and check as before that its length is correct ensuring that minimum overlap advice is observed and that the PTO does not bottom when turning.

1.5 GENERAL OPERATING INSTRUCTIONS

Observe all maintenance requirements (See Section 1.7) and ensure operator is competent with machine before commencing operations.

Before using the vacuum pump ensure that the PTO shaft is turning freely and the direction of rotation is the same as indicated by the arrow on the pump. Never turn the vacuum pump shaft in the opposite direction to that indicated as this could damage internal components of the pump.

The Battioni MEC/M new series pump with long life blades may be continuously operated for 15 minutes. However, prolonged uninterrupted working times may cause excessive heating of the pump and damage to the vanes. If it is expected that the pump will be used for a longer period because of the density of the slurry to be processed then dilute or mix the slurry.

Operating pressure should be kept within the range of 0.5 – 0.9 bar to avoid overheating the pump or breaking the vanes. **Do not exceed 0.9 bar**.

Ensure that oil drip feed is at the correct setting.

Regularly check the pump oil level.

Check the wheel nuts and wheel bearings daily for tightness.

Check daily that the discharge valve tongue fully opens. If it does not then remove the top of the valve complete with the ram by loosening the six socket head screws securing the top valve housing to the main body. Clean out any debris in the housing. The valve rod will break if this procedure is not carried out.

The emergency breakaway handbrake should be connected to the tractor every time the Slurry Tanker is used. The connection should be via a rope attached to a solid part of the tractor such as the top link and not to a panel. The rope should be tight enough for the handbrake to be operated if the tanker becomes detached from the tractor but loose enough so that the handbrake is not applied during normal operation.

Never exceed the manufacturers rated towing capacity as stated on the tractor manufacturers plate.

1.6 SLURRY TANKER OPERATION

Filling Procedure.

Read the sections in this manual regarding safety and maintenance.

Attach the suction filling hose to the quick attach fitting located at the rear of the tanker.

Open the manual rear fill inlet valve with the operating handle.

Ensure that the end of the fill pipe is completely submerged before operation.

Ensure the vacuum pump oil drip feed is set to 1 drop every 3 seconds

Set the vacuum pump operating lever in the **Suction** position.

Engage the PTO at low rpm and increase to 350 rpm.

When slurry appears in the sight glass at the rear of the tanker, shut the inlet valve with the operating handle.

Move the vacuum pump operating lever to the **Neutral** position.

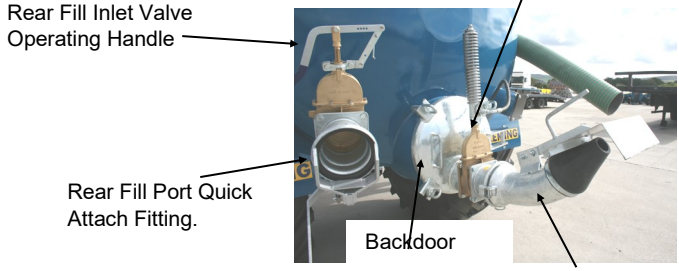
Remove the suction fill pipe.

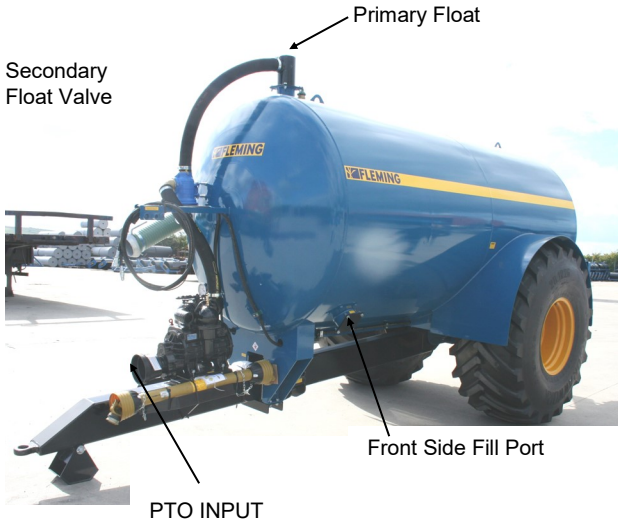
Spreading Procedure.

On arrival at the spreading site set the pump operating lever to the **Pressure** position.

Engage the PTO at approximately 350 rpm while driving forward. Using the hydraulic control, open the gate valve to the discharge unit at the rear of the tanker.

Hydraulic hose & 12v cable carrier
Site Glass
Road Lights
Vacuum Pump
Drawbar Springs
Rear Discharge Hydraulically Operated


Rear Fill Inlet Valve Operating Handle
Rear Fill Port Quick Attach Fitting.
Backdoor
Rear Discharge Unit


Primary Float
Secondary Float Valve
Front Side Fill Port
PTO INPUT

1.7 MAINTENANCE

As a rule, disengage the driving system and stop the engine prior to carrying out maintenance, servicing, cleaning or repair work. **ALWAYS** remove the ignition key.

Chock the machine with appropriate wheel chocks before carrying out any maintenance work.

The manufacturer will not be responsible for any damages or injuries caused by unauthorised repair, alterations or mishandling of the product.

Maintain the product with care. Check periodically for damage that would affect the safe operation of the Slurry Tanker.

Regularly check all bolts and tighten if necessary.

Regularly lubricate the hydraulic cylinder, bearings and drawbar hinge bushes using clean grease.

Only use clean grease complying to Din 51502.

ALWAYS ensure all warning stickers are kept clean and in good condition.

CAUTION paintwork may be damaged if high-powered washers are used when cleaning the Slurry Tanker.

Do not carry out any welding of the tank without opening the back door.

Check tyre pressures daily. An under inflated tyre on one side will cause severe stability problems on undulating ground.

VACUUM PUMP MAINTENANCE.

Periodically check the oil level in the gearbox at the front of the pump. The oil level should be at the top of the see through plug.

Change the gearbox oil after the first 50 working hours and then every 300 working hours. Use EP90 hypoid gear oil.

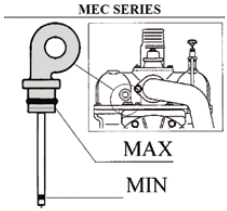
Check daily that the level of the cooling oil is always above the bottom mark on the dip stick. Top up using Battioni Vacuum Pump oil or engine oil SAE20 (SAE30 summer).

Check that the cut out valves (Primary & Secondary Float Valves) are in full working order and that the rubber balls are not soft and spongy. These should be replaced every 12 months.

After every working day flush out the pump with diesel oil. This will prolong the life of the vanes in the pump. To do this set the pump to **Pressure** and suck 1 litre of diesel in through the air intake. As a further precaution suck a small amount of oil into the pump to lubricate it and minimise corrosion.

If the tanker is to be stored unused for a period of time then disconnect the hose that connects the pump to the tank. This will avoid the transfer of corrosive gases from the tank to the pump.

Vacuum Pump



The minimum oil level is indicated by the groove at the bottom end of the dipstick. Maximum is at

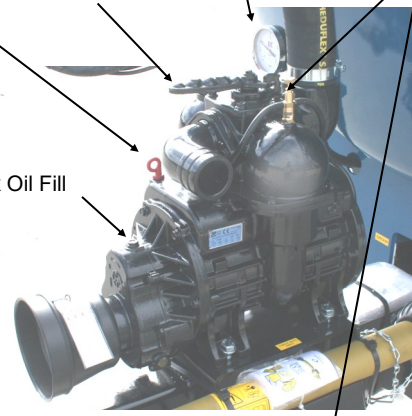
Pressure Gauge

Pump handle.
P - Pressure
N - Neutral
V - Vacuum

Oil Drip Feed

Oil Fill & Oil Level

Pressure Gauge



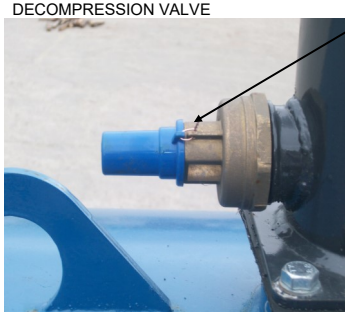
Gearbox Oil Fill

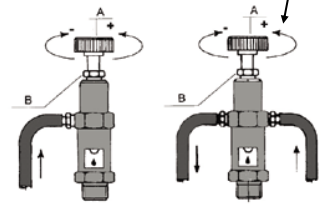
PTO Input

SAFETY RELEASE VALVE

WIRE TIE

DECOMPRESSION VALVE





Oil Drip Feed Adjustment

Loosen locknut 'B' and turn the regulator screw 'A' until a flow rate of one drop every three seconds is obtained. Re-tighten locknut 'B' after adjustment.

WARNING

Pressure release valve comes preset at 0.9 bar and should only be adjusted by a fully qualified service engineer.
The decompression valve is preset at –0.7 bar and this also should only be adjusted by qualified service engineers.
DO NOT USE THE TANKER IF THE SAFETY RELEASE VALVES ARE NOT TIED WITH WIRE AS SHOWN IN THE PICTURES.

MAINTENANCE SCHEDULE:

Grease the following	Initially	8 hours	40 hours	160 hours
PTO shaft universal joints	·	·		
PTO Shaft Male profile	·		·	
Brake Cams	·		·	
Wheel Hub Bearings	·			·

Check	Initially	6 hours	40 hours	160 hours
Oil Drip Feed	·	·		
Vacuum Pump Oil Reservoir level	·	·		
Vacuum Pump Gearbox Oil Level.	·	·		
Gate Valves for blockages	·		·	
Rear Door for leaks	·		·	

Regular Tasks	Initially	6 hours	40 hours	160 hours
Tighten nuts	·	·		
Flush 1 litre of diesel through Vacuum Pump air intake with handle set in the pressure position	·		·	

TYRE PRESSURES

Tyre	BAR	PSI
550/65-22.5	**2**	**29**
28.1 R26	**2**	**29**

RECOMMENDED LUBRICANTS

GREASE

Manufacturer	Recommended	Alternative
Shell	Shell Retinax LX2	Shell Retinax LX
Mobil	Mobil Grease H.P .222	Mobil Grease H.P.
Castrol	Castrol LMX	Spheerol A.P.T.Z.
Texaco	Hytex EP2	
Esso	Unirex EP2	
BP	Energrease LC2	

OIL

Manufacturer	Application	Recommended	Alternative
BATTIONI PAGANI POMPE	Vacuum Pump oil reservoir	Vacuum Pump Oil VPO005BP	SAE20 (SAE30 in summer)
Any of the above	Vacuum Pump gearbox	EP90 Hypoid	

Brake Adjustment

It is highly recommended that brake adjustment is only carried out by qualified service engineers.

For the safe operation of the tanker it is imperative that a routine maintenance schedule is developed for cleaning, inspection, adjustment and lubrication of brake components.

Adjustment of brakes should be carried out as frequently as required to maintain safe operation. When resetting brakes. The hydraulic brake ram should be 38mm – 50mm from the end of its stroke when the brake shoes engage the hub.

At regular intervals remove the brake drums and check linings for wear and the drums for cracks, scoring or any other form of deteriation.

1.8 OVERALL DIMENSIONS

Model	Overall Length (including Sprinkler)	Width over tyres	Height
ST1300N	6.275 metres	2.56 metres	2.65 metres
ST1600N	6.990 metres	2.56 metres	2.65 metres
ST1600	6.990 metres	2.49 metres	2.79 metres
ST2000	7 .00 metres	2.49 metres	2.99 metres

1.9 HYDRAULIC SAFETY

The Slurry Tanker discharge valve and brakes are hydraulically operated. These safety considerations should therefore be adhered to.

CAUTION The hydraulic system is under high pressure.

Ensure that only high-pressure hoses are used to connect supply to the Slurry Tankers hydraulic cylinder(s). Check hoses regularly and renew any that are damaged or worn.

Before working on the hydraulics release the pressure from the hydraulic system and stop the tractor engine.

When connecting hydraulic rams make sure that the hydraulic hoses are coupled correctly. Pressure should be released from the system both on the tractor and on the implement side prior to coupling the hoses to the tractor hydraulics.

CAUTION Hydraulic oil forced out under pressure can break the skin and cause severe injury. In the event of a hydraulic oil leak stop the tractor flow immediately.

DO NOT PUT HANDS NEAR A LEAKING PIPE.

2.0 WHEEL CHANGING PROCEDURE

- It is **compulsory** to employ a professional tyre fitter to carry out any wheel changing maintenance. The tyre fitter must follow these instructions carefully.
- Actuate slurry tanker handbrake before wheel changing commences
- If possible, pump up the wheel before removing it. This means the wheel fitter will only have to jack once. Never stand directly in front of wheel when pumping.
- The slurry tanker must be connected securely to the tractor with wheels chocked to minimise movement before wheel changing processes can begin.
- The slurry tanker must be emptied before any wheel changing maintenance can begin. The tanker can be emptied into another vacant slurry tanker by means of one fill pipe with 2 identical connection ends. Each end of the fill pipe can be connected to the fill points of the 2 separate tankers. When emptying the tanker, it is important to suck into the empty tanker rather than blow from the full tanker.
- When changing a wheel, always position the tanker on a hard, level surface and if carrying out the procedure on a public highway, consider the gradient of the **camber** before jacking or propping.
- Jacking mechanism should have an extension of approximately 400mm to allow enough clearance for tyre to come off and to be put on again when fully inflated. It is also highly recommended to use an air actuated jack so that the tyre fitter can stand well clear of the slurry tanker while Jacking.
- Consult with your professional tyre fitter to determine if the tyre can be fixed without removing it from the slurry tanker.
- If the wheel must be removed, ensure that an axle stand prop is appropriately positioned before the wheel is removed.
- DO NOT PROP WITH DECAYED, UNEVEN TIMBER OR CEMENT BLOCKS. Use appropriate timber as shown below.
- Never enter the danger zone when the wheel is removed.
- Jacking points must be checked at regular intervals and if damaged contact your local dealer immediately.

Fill pipe with identical ends connected to fill points of separate tankers, used to empty tanker that needs wheel changed.

Locations of jacking points are clearly labelled at the back of the tanker.

- Never enter the area directly under the tanker and stand clear of the danger zone when the wheel is removed
- Prop axle with heavy duty axle stands as close as possible to the wheel that is to be removed. Make sure the placing of the axle stand is the very first part of the procedure and make sure the axle stand pins are of correct specification.
- Do not exceed the rated capacity of the axle stand. The weight that will need to be jacked up will not exceed 1450kgs provided the slurry tanker has been emptied properly.
- Do not lift tanker off the ground by top crane hook when changing a wheel.
- Do not use a trolley jack or bottle jack when changing a wheel as they will not have sufficient travel height.

- When jacking wheel, only jack slurry tanker high enough so that wheel is just clearing the ground.

DECLARATION OF CONFORMITY

CONFORMING TO EC Machinery Directive 2006/42/EC

We:

Fleming Agri-Products Ltd
Newbuildings Industrial Estate
Newbuildings
Northern Ireland
BT47 2SX

declare in sole responsibility, that the products

Type: ST1300N,ST1600N,ST1600,ST2000,ST2000C,ST2300 and ST2500 Slurry Tankers

to which this certificate applies, conforms to the basic safety and health requirements of the EC Machinery Directive 2006/42/EC, and the Transposed Harmonised Standards:

BS EN 4254-1 (2015)
BS EN 707 (2018)

Jonathan Lecky
Production Director