Fliegl Concrete Mixer

Models SS and Favorite

Operators Manual and Parts List

Kilworth

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Contents

1. Introduction

This operators manual is one of the most important parts of the Fliegl Concrete Mixer as it will enable any operator to get optimum performance from the machine with minimum risk of injury or damage to the machine.

Throughout this manual your attention will be drawn to possible hazardous situations by the use of the following symbol:

Wherever you see this symbol take careful note of the information that follows. It is for your benefit.

2. Purpose of the Fliegl Mixer

The Fliegl SS Pan Mixer is a positive action mixer with a rolled high grade steel drum and 3 to 5 mixing legs, depending on model.
It is intended for use mounted on a standard agricultural tractor, forklift truck, telescopic handler, wheel loader, backhoe loader or skid steer loader and can be installed into stationary mixing / batching plants.
It can be used to mix concrete, mortar, floor screed, compost, peat, fodder and top dressing / fertiliser.

3. Specifications

Model	**401 SS**	**602 SS**	**802 SS**	**1002 SS**
Max Capacity	400 litres	600 litres	800 litres	1000 litres
Weight (empty)	390 kg	520 kg	630 kg	760 kg
Tractor Power	40 hp	55 hp	75 hp	100 hp
Oil Flow (option)	40 l/min	50 l/min	50 l/min	60 l/min
Electric Motor	7.5 kw	11 kw	11 kw	18.5 kw
Hourly Output	7 m3	10 m3	12 m3	15 m3
Forklift/loader	1.5 tonne	2.0 tonne	2.5 tonne	4.0 tonne

4. Safety and Hazards

 General notes on Safety at work.

1. Inspect all parts of the machine any time you intend to put it into work.
2. Check all bolts, nuts and fixings. They must be tight.
3. Beware of bystanders when operating the Mixer. Keep any persons not necessary to complete the job well away, particularly when filling and emptying the mixer.
4. Keep all guards fixed securely in place.
5. Never get off the tractor/forklift without:
   disconnecting the PTO/hydraulic drive
   lowering the mixer to the ground
   applying the parking brake
   switching off the engine and removing the key.
6. Always be ready to disconnect the mixer drive and switch off the engine should a hazardous situation occur.
7. Always be sure any new operator has a thorough understanding of the mixer and that they follow the safety precautions. **All** operators must read this manual.
8. Ensure that the tractor/forklift can handle the weight of the mixer when full in complete safety. Pay particular attention when working on slopes.
9. Cement is a dangerous chemical. Protect yourself from contact with cement dust at all times. Contact your cement supplier for further information on handling cement.
10. Do not stand on the mixer whilst the rotor is turning.
11. Do not go under the mixer unless it is properly supported.

5. Assembly

The Mixer may be transported with 3 parts unfitted:

1] The Loader bucket support bar. Drop this into the 2 support tubes on the outside rim of the mixer.

2] The splash guard. Bolt this curved plate to the outer rim at the front of the mixer using the 4 bolts provided.
3] The outlet chute. Fit the chute under the outlet gate using the 2 bolts provided. Ensure the lip at the back of the chute is located in the two support brackets under the floor of the mixer before fitting the bolts.

6. Tractor mounted versions

The following information applies to tractor mounted versions only. For information relevant to hydraulic or electric versions see later sections.

6.1 Fitting Mixer to Tractor

Reverse the tractor up to the mixer and connect the bottom link pins. For the top link connection use the large link chain provided. **Do not use the standard tractor top link as this will be too long.** The mixer is designed to be as close to the tractor back wheels as possible so making the top link very short.
Set the length of the chain so that when the mixer is lifted, and the discharge chute is at the desired height, it is horizontal to the ground. Initially it may be necessary to try the chain on different mounting points on the mixer and/or tractor. Mounting the chain on the lowest hole on the tractor and the highest hole on the mixer will cause the mixer to tip forward more as it is lifted.

WARNING

Two top link chains are provided with 1002SS models. Both chains must be fitted at all times.

6.2 Checking PTO shaft length.

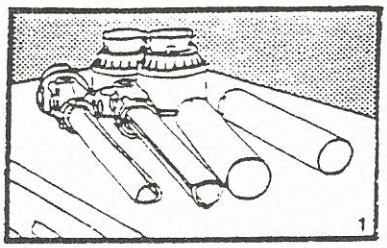
CAUTION

When fitting the mixer to a tractor for the first time always check the length of the PTO shaft. Failure to do can cause serious damage to tractor and machine.

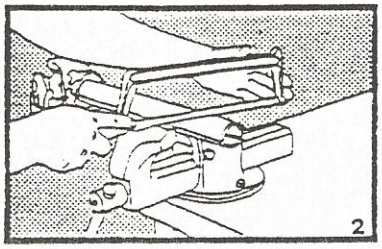
When connecting the PTO shaft for the first time it will be necessary to check that the shaft length is correct as follows:

SHORTENING OF THE P.T.O. SHAFT

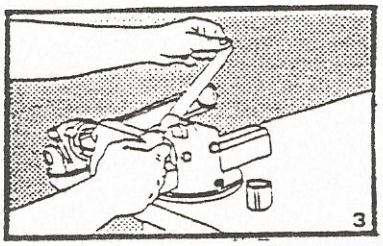
Due to the different types of tractors, the PTO shaft may need to be shortened; please follow these steps after having determined the right length of the shaft.



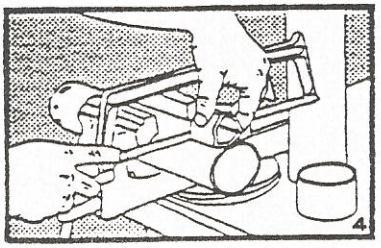
1. REMOVE PLASTIC PROTECTION



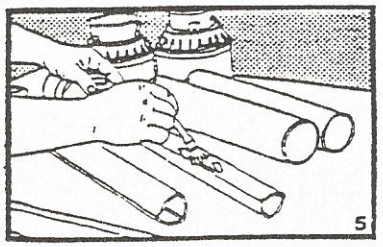
2. CUT THE EXCESS LENGTH OF BOTH TUBES



3. DEBURR AND CLEAN THE SAW-DUST OFF ENDS OF TUBES



4. CUT THE PLASTIC PROTECTION TO THE SAME LENGTH YOU HAVE CUT THE JOINTS



5. PUT GREASE ON THE MALE JOINT SECTION AND REASSEMBLE PROTECTION

1] Before fitting the shaft, set the height of the mixer so that the shaft would be at its shortest length. This will normally be when the shaft is horizontal or when the mixer is fully raised.

2] Separate the two halves of the shaft and connect the section fitted with the shear bolt to the mixer. Connect the other section to the tractor and hold them side by side.

WARNING

Stop the tractor engine, apply hand brake and remove ignition key before connecting the PTO shaft to the tractor.

3] Measure the clearance between the end of the tube section and the yoke (see Figure 1). This should be at least 25mm (1 inch). If the clearance is less than 25mm then the shaft will need to be shortened as shown in Appendix 1. The tube overlap should be at least 150mm (6 inches). If the overlap is less than 6 inches then a longer shaft is required.

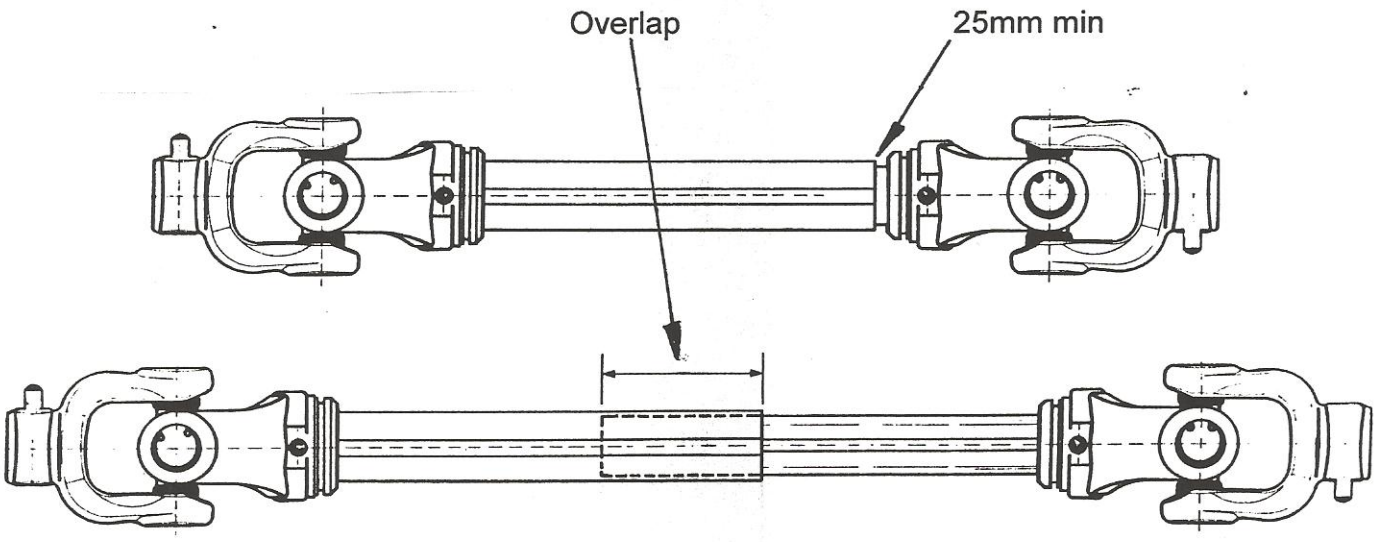


Figure 1 PTO Shaft

6.3 Connection of PTO shaft

Once the correct length of the PTO shaft has been established fit the shaft between the

tractor and mixer. Fit the section with the shear bolt to the mixer. Lightly grease the tubes before sliding them together. Fit the other end to the tractor power take off **(540 rpm max).**

WARNING

Stop the tractor engine, apply hand brake and remove ignition key before connecting PTO shaft to tractor.

Raise the mixer carefully up and down to check the shaft clearance and angles. The angle of the shaft should not exceed approximately 30 degrees when operating.

CAUTION

Check the clearance between the PTO shaft and the front part of the mixer drum, particularly when lowering the mixer to the ground. If the shaft contacts the drum short legs can be fitted to the mixer or the mixer can be sat on blocks. Lower link point extensions are also available if shaft angle is a problem.

6.4 Preparation for work

- Check oil level in gearbox (see Maintenance section)
- Grease all grease points (see Maintenance section)
- Check and adjust floor and wall scrapers (see Maintenance section)

6.5 Operating Instructions

Loading

Lift the mixer until it is horizontal (see 6.1 Fitting to Tractor) and start the PTO. The recommended speed of the PTO is **250 - 300 rpm.** Do not exceed 400 rpm as there is a risk of shear bolt failure and/or reduction in mix quality.

Load in the sand and gravel using a front loader or backhoe bucket etc. through the mesh safety grid. **Do not remove the grid.**

Add the cement and water. For further information on quantities see the Concrete Mixing Guide at the end of this manual.

 **CAUTION**

Never fill the mixer with the PTO disengaged. Attempting to start the mixer when full can cause serious damage to the PTO shaft or gearbox.

Do not overfill the mixer. Not only does this cause a significant reduction in mix quality but also causes the shear bolt to break.

 **WARNING**

Cement is a dangerous chemical. Wear protective clothing when handling cement and a mask to prevent inhalation of dust. Contact your cement supplier for advice on handling.

Mixing

Mixing takes 1 to 3 minutes depending on the type of ingredients and can take place while the tractor is driven to the emptying point. **Do not disengage the PTO at any time while mixing.** Try not to mix for longer than 5 minutes as this can have an adverse effect on the quality of the concrete.

Emptying

Leave the PTO running at normal mixing speed while emptying the mixer. Pull the lever at the rear of the mixer to open the discharge gate. The mixer should empty in approx 30 seconds. If a significant amount of concrete is left in the mixer then the floor scrapers may need some adjustment. See "adjusting scrapers" in the maintenance section.

6.6 Shear bolt failure

Should the PTO shaft shear bolt fail the mixer will need to be emptied before attempting to restart. With stiff mixes this may require moving the concrete towards the outlet with a shovel.

Once the mixer is reasonably empty, fit a new shear bolt to the PTO shaft. The shear bolt is located at the mixer end of the shaft. The shear bolt specification is M8 / 55 **grade 8.8** high tensile **shanked** bolt. Do not fit a bolt of a higher grade. Run the mixer empty before refilling again.

 **WARNING**

Do not go underneath an unsupported mixer to remove the PTO shaft. Lower the mixer to the ground or support it on firm blocks.

If the shear bolt fails check the following:

- The mixer is not being overloaded (see mixing chart)
- The mixer is not stopped and restarted when full
- The speed of the mixer is being kept constant. Use the hand throttle to control the tractor engine speed. Large fluctuations in speed cause excessive strain on the drive train.
- The correct shear bolt is fitted.

7. Hydraulic versions

The following information applies to hydraulically driven mixers only.
Hydraulically driven mixers are fitted with a motor drive kit which allows the mixer to be driven by the oil supply from a fork lift or other loader, such as a telescopic handler.

7.1 Fitting to the Forklift

The mixer frame incorporates 2 slots which accept pallet forks up to 180mm wide, depending on model. Drive the forks carefully into the slots.

 **CAUTION**

When fitting for the first time, check the clearance between the hydraulic drive motor and the pallet forks back plate. If the motor contacts the backplate space the mixer away from the backplate. Bolt on spacers are available from Kilworth.

Secure the mixer to the forklift in order to prevent it sliding off the forks. Chains are provided for this purpose.

 **WARNING**

Never attempt to use the mixer without the restraining chains fitted.

7.2 Connecting Hydraulics

The drive motor requires a flow and return of oil from the forklift (see the Specifications section for details of oil flow required). If the forklift does not have a spare double acting service it may be possible to use the side shift circuit as this is not required when operating the forklift (see note below). See your dealer or contact Kilworth for further information. The hoses on the forklift should terminate in ½ inch BSP female quick release fittings at the fork back plate.

Note:
Where extra hoses are fitted to the forklift they **must** pass over the reel at the top of the mast and terminate at the fork back plate.
If the mixer is fitted to a telescopic handler a hose reel may have to be fitted if the handler does not have an oil supply to the back plate as standard. In some cases it may be possible to use the supply to the hydraulically operated pins on the quick hitch system. Contact Kilworth for advice.

Once a supply of oil is established connect the quick release fittings together. Check that the mixer is completely empty and operate the oil service. Check the direction of rotation of the mixing rotor. If it is incorrect stop the oil supply and either operate the lever in the opposite direction or swap the hoses over at the quick release fittings. Once the mixer is turning correctly mark the hoses for future reference.

WARNING

Hydraulic oil under pressure can pierce the skin and cause serious injury or death. Always release pressure from the system before any maintenance or adjustments. Wear gloves and eye protection.

7.3 Preparation for work

- Check oil level in gearbox (see Maintenance section)
- Replenish all grease points (see Maintenance section)
- Check and adjust floor and wall scrapers (see Maintenance section)

7.4 Operating Instructions

Loading
Set the mixer horizontal and start the mixing rotor. If used in conjunction with a batching

plant lift the mixer as close as possible to the outlet point in order to reduce dust. Load in the required amount of sand and gravel through the mesh grid.**Do not remove the grid.** Add the cement and water plus any other additives. For further information on quantities see the Concrete Mixing Guide at the end of this manual.

CAUTION

Never fill the mixer with the mixing rotor drive disengaged. Attempting to start the mixer when full can cause serious damage to the hydraulic motor or gearbox.

CAUTION

Do not overfill the mixer. Not only does this cause a significant reduction in mix quality but also causes the hydraulic motor to stall and the relief valve to blow.

WARNING

If loading the mixer from a batching plant requires lifting it well above ground level be aware of the shift in centre of gravity as the mixer fills- the forklift will be much more unstable with a raised and loaded mixer. Lower the mixer to just above the ground before attempting to move the forklift. Check that the forklift is capable of handling the mixer when full.

WARNING

Cement is a dangerous chemical. Wear protective clothing when handling cement and a mask to prevent inhalation of dust. Contact your cement supplier for advice on handling.

Mixing

Mixing takes 1 to 3 minutes depending on the type of ingredients and can take place while the forklift is driven to the emptying point. **Do not disengage the hydraulic drive at any time while mixing.** Try not to mix for longer than 5 minutes as this can have an adverse effect on the quality of the concrete.

Emptying

Leave the hydraulic motor running at normal mixing speed while emptying the mixer. Pull the lever at the rear of the mixer to open the discharge gate. The mixer should empty in approx 30 seconds. If a significant amount of concrete is left in the mixer then the floor scrapers may need some adjustment. See "adjusting scrapers" in the Maintenance section.

7.5 Mixing rotor stalling

Should the mixing rotor stall and the hydraulic relief valve operate the mixer will need to be emptied before attempting to restart. With stiff mixes this may require moving the concrete/screed towards the outlet with a shovel.

WARNING

Disengage the hydraulic oil supply, fully depressurise the system and lower the mixer to the ground before lifting the safety grid.

Once the mixer is reasonably empty and any obstruction has been removed engage the hydraulic drive and run the mixer empty before refilling again.

If the rotor continues to stall check the following:

- The mixer is not being overloaded (see mixing chart)
- The mixer is not stopped and restarted when full
- The speed of rotation of the mixer is being kept constant. Large fluctuations in speed cause excessive strain on the drive train
- The relief valve on the forklift is not set below **180 bar** (2600 psi)

8. Electric Versions

The information in section 8 applies to electrically driven mixers only.
In the case of the electrically powered mixers the mixing rotor is turned by a 3 phase electric motor of 380-415V, 7.5 to 18.5Kw depending on model (see Specifications section).The speed of the motor is approximately 1500 rpm. A four stage gearbox brings the mixing rotor to the correct speed. Starting is via a star / delta type starter.

8.1 Installation

Position the mixer on solid, even ground and secure it in position.
The motor should be connected to a suitable 3 phase supply by a qualified electrician. The circuit should include the star / delta starter and an isolator.Instructions for the wiring of the starter and motor are supplied separately. Rated currents for each motor type are as follows:

Mixer model	Motor Power	Rated Current
401SS	7.5 kw	13A
602/802SS	11.0 kw	20A
1002SS	18.5 kw	33A

8.2 Operating instructions

Loading
Start the mixer only when it is empty. Fill the mixer through the top safety grid as the rotor is turning.

CAUTION

Never fill the mixer with the rotor stationary. Under no circumstances should attempts be made to start the mixer when it is partially or fully loaded as this will cause damage to the electric motor and gearbox.

CAUTION

Do not overfill the mixer. Not only does this cause a significant reduction in mix quality but also causes the electric overload device to trip.

WARNING

Cement is a dangerous chemical. Wear protective clothing when handling cement and a mask to prevent inhalation of dust. Contact your cement supplier for advice on handling.

Mixing

Mixing takes 1 to 3 minutes depending on the type of ingredients. **Do not stop the mixing rotor at any time while mixing.**

Emptying

Empty the mixer while the rotor is turning. Pull the lever at the rear of the mixer to open the discharge gate. The mixer should empty in approx 30 seconds. If a significant amount of concrete is left in the mixer then the floor scrapers may need some adjustment. See "Adjusting scrapers" in the Maintenance section.

8.3 Mixing Rotor stalling.

Should the mixing rotor stall and the electric overload cut out the mixer will need to be emptied before attempting to restart. With stiff mixes this may require moving the concrete/screed towards the outlet with a shovel.

WARNING

Fully isolate the electric supply before opening the top safety grid.

Once the mixer is reasonably empty and any obstruction has been removed reconnect the electric supply and start the mixer. Run empty for a few minutes before refilling again.

If the rotor continues to stall check the following:

- The mixer is not being overloaded (see mixing chart)
- The mixer is not stopped and restarted when full
- The overload device in the star/delta starter is set to the correct setting
- The electric supply is maintaining the correct voltage when under load

9. Maintenance

9.1 Cleaning

After every job thoroughly wash out the mixer using plenty of water. Do not allow concrete to harden in the mixer. It is good practice to wash the mixer thoroughly every ½ hour or so when using it continuously.

9.2 Adjusting scrapers

Floor scrapers

Each spring mixing leg is fitted with an adjustable scraper. The height of the scrapers should be set such that when the mixer revolves empty, the scrapers just lightly contact the floor of the mixer. If the spring leg judders as the rotor turns then the scrapers are too low.

To adjust the scrapers loosen the single bolt at the back of the scraper (19mm spanner). A sharp blow to the top of the scraper with a hammer may be required if it has not been moved for some time. Set the scraper as required and tighten the bolt. Make sure the scraper is parallel to the floor of the mixer after tightening (see Figure 2).

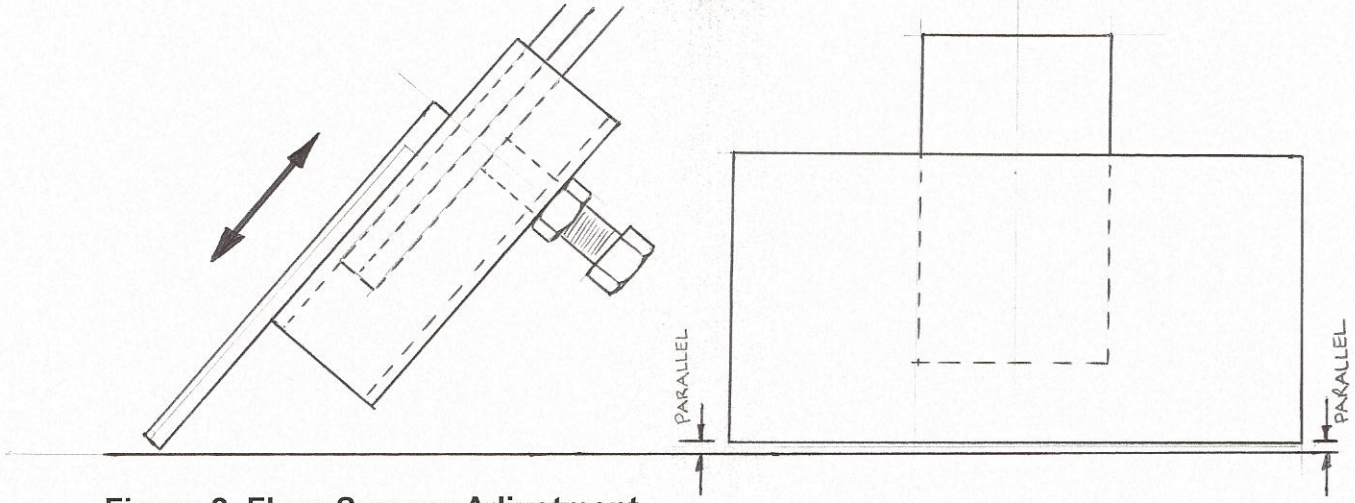


Figure 2. Floor Scraper Adjustment

Wall Scraper

The wall scraper is radially adjustable so that the distance between the scraper and the side wall of the mixer can be set as required. It is not recommended that the scraper is set as close as possible to the wall of the mixer as this will cause accelerated wear of the side wall and scraper.

The recommended method of adjustment is as follows: (see Figure 3)

Set the distance between wall and scraper to the average diameter of the gravel plus 4 mm. For example, if the stone is approximately 10mm in diameter (average) then set the scraper to 10mm + 4mm = 14mm from the side wall. This setting will give the best compromise between wear and cleaning of the side wall.

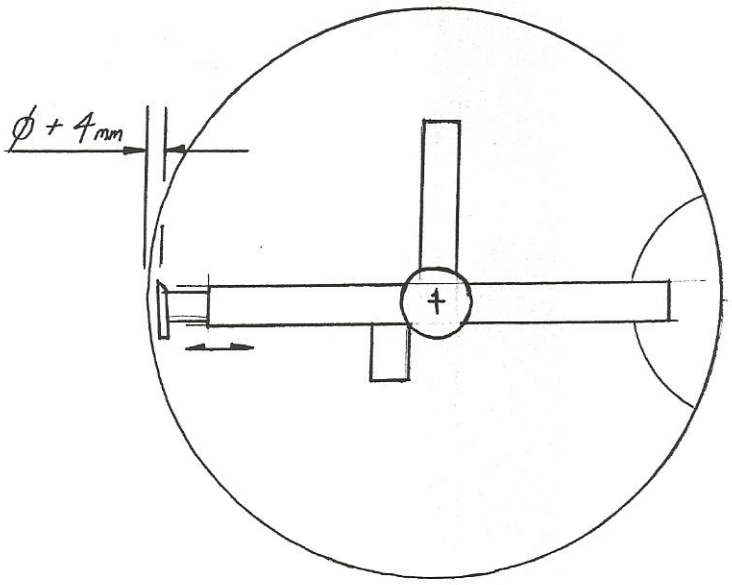


Figure 3. Wall Scraper Adjustment

9.3 Routine Maintenance

Every 8 working hours:

- Check scrapers for adjustment and wear.
- Grease all points as per **figure 4** below.
- Grease PTO shaft (tractor mounted versions only).
- Check oil level in gear box. The electric mixers use a twin gearbox system so oil levels in both chambers must be checked separately. Use a good quality EP90 grade gear oil to top up.

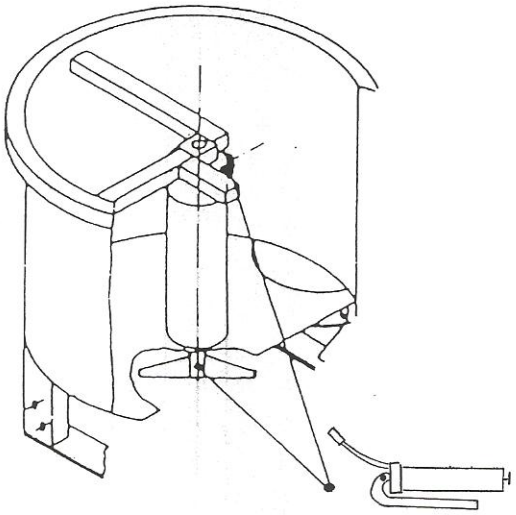
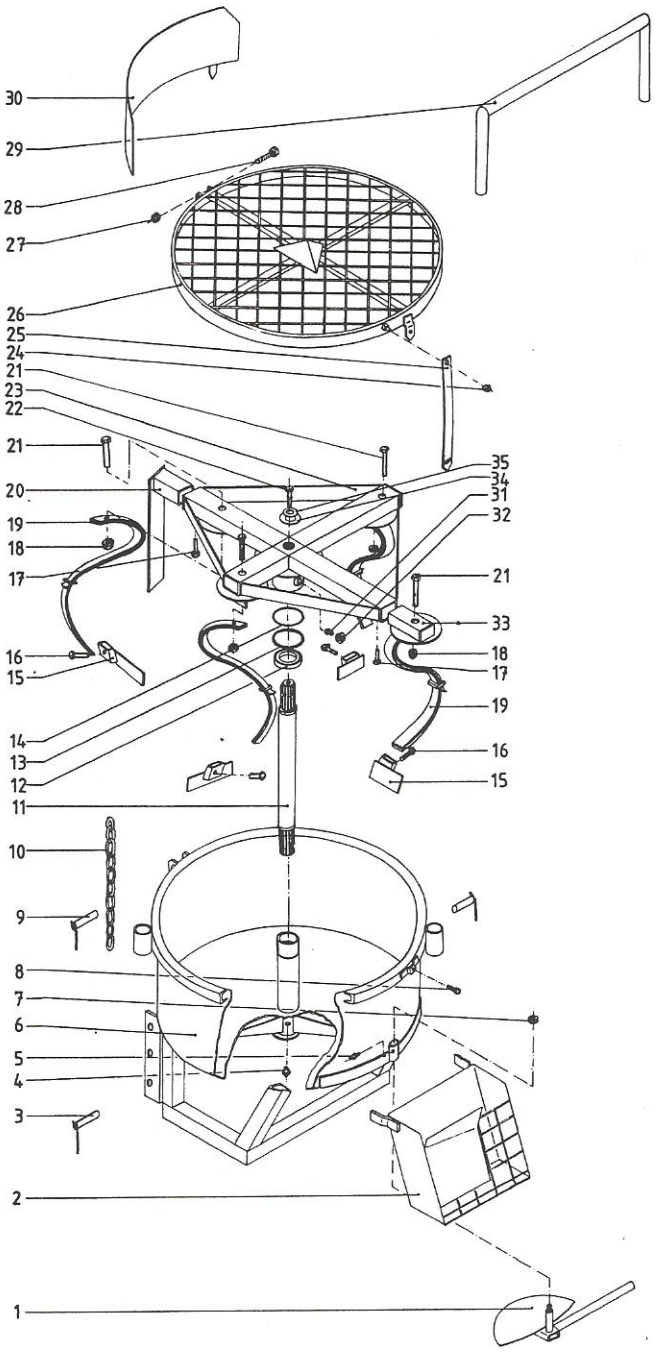


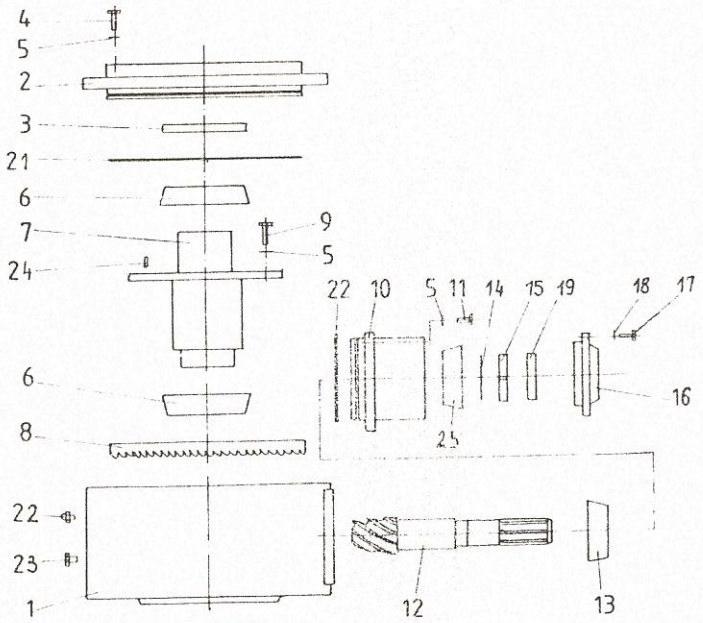
Figure 4. Grease Points

10. Spare Parts



Item	Description		Part No.
1	Outlet Gate		F1001
2	Discharge Chute		F1002
3	Lower Link Pin		F1003
4	Grease Nipple		F1004
5	Grease Nipple		F1004
6	Mixer Body	401SS	F1406
		602SS	F1606
		802SS	F1806
		1002SS	F1106
7	Nut		F1007
8	Bolt		F1008
9	Top Link Pin		F1009
10	Top Link Chain		F1010
11	Shaft		FS2032
12	Bearing		FS2046
13	Circlip		FS2048
14	O Ring		FS2047
15	Scraper	Std	F1015A
		Offset	F1015B
		Inner	F1015C
		Outer	F1015D
16	Screw		F1016
17	Screw		F1017
18	Nut		F1007
19	Spring Leg		F1019
20	Wall Scraper		F1020
21	Bolt		F1021
22	Bolt		F1022
23	Mixing Rotor	401	F1423
		602	F1623
		802	F1823
		1002	F1123
24	Nut		F1024
25	Stay		F1025
26	Safety Grid	401	F1426
		602	F1626
		802	F1826
		1002	F1126
27	Nut		F1024
28	Bolt		F1028
29	Loader Bar		F1029
30	Splash Guard		F1030
31	Grease Nipple		F1004
32	Plug		F1032
33	Extending Arm		F1033
34	Special Washer		F1034

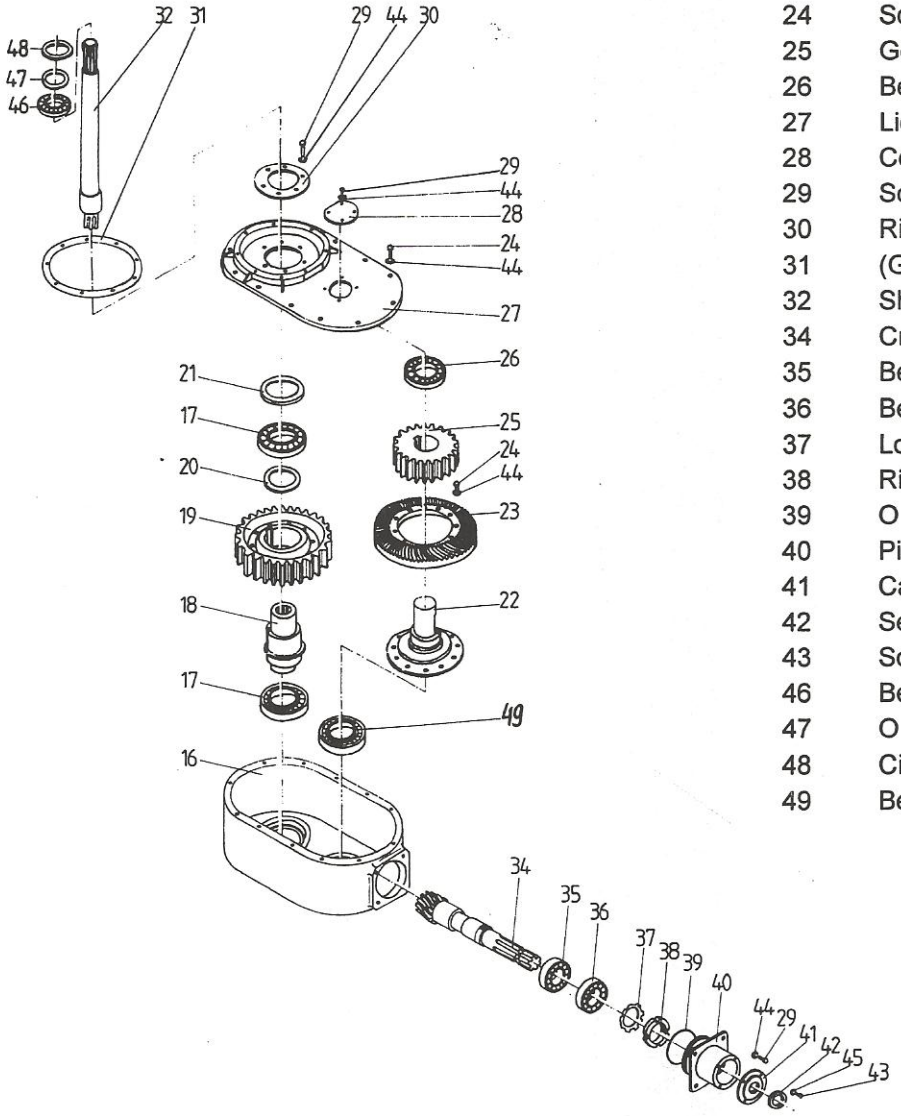
Getriebe-Typ FS 80/1



bei Mischmeister 401 SS

1 Gehäuse
2 Deckel
3 Simmerring 70/110/12
4 Schraube M 10x35
5 Scheibe
6 Kegelrollenlager 30214
7 Lagerteil für Kegelrad
8 Zahnrad „treibendes Kegeirad"
9 Schraube M 10x35
10 Antriebsgehäuseteil
11 Schraube M 10x25
12 Antriebswelle
13 Kegelrollenlager 32209
14 Sicherungsblech
15 Nutmutter
16 Deckel
17 Schraube M 6
18 Scheibe
19 Simmerring 35/52/10
20 O-Ring
21 O-Ring groß
22 Entlüftung
23 Schraube-Öl Ein- und Ablaß-Schraube
24 Paßstift
25 Kegelrollenlager 32208

FS 150/2 Gearbox
602SS to 1002SS Models



Item	Description	Part No.
16	Casing	FS2016
17	Bearing	FS2017
18	Shaft	FS2018
19	Gear Z=39	FS2019
20	Shim	FS2020
21	Seal	FS2021
22	Shaft	FS2022
23	Crown Wheel/Pinion	FS2023
24	Screw	FS2024
25	Gear Z=18	FS2025
26	Bearing	FS2026
27	Lid	FS2027
28	Cover	FS2028
29	Screw	FS2029
30	Ring	FS2030
31	(Gasket)	FS2031
32	Shaft	FS2032
34	Crown Wheel/Pinion	FS2023
35	Bearing	FS2035
36	Bearing	FS2036
37	Locking Collar	FS2037
38	Ring Nut	FS2038
39	O Ring	FS2039
40	Pinion Housing	FS2040
41	Cap	FS2041
42	Seal	FS2042
43	Screw	FS2043
46	Bearing	FS2046
47	O Ring	FS2047
48	Circlip	FS2048
49	Bearing	FS2049

Concrete Mixing Guide

This guide assumes the concrete is to be used on the farm. However the information given can be adapted for other uses.

Choose a mix according to the following:

1) For strip footings, trench fill foundations, stanchion bases, oversite concrete and blinding under slabs use a C7.5P mix (this replaces the old 1:3:6 mix).

When mixing by volume the proportions for C7.5P are 2 parts cement, 5 parts damp sand, 8 parts coarse aggregate.

When mixing by weight the quantities per bag of cement (50kg) are 190kg of damp sand and 270kg coarse aggregate.

Use ordinary Portland cement and 20mm maximum sized aggregate. Add sufficient water to produce a medium workability (see note on Water).

2) For most floors, slabs for farm yard manure and areas regularly used by vehicles and animals but not exposed to de-icing salts use a C20P mix (this replaces the old 1:2:4 mix).

When mixing by volume the proportions for C20P are 3 parts cement, 5 parts damp sand, 9 parts coarse aggregate.

When mixing by weight the quantities per bag of cement (50 kg) are 115kg damp sand and 195kg coarse aggregate.

Use ordinary Portland cement and 20mm maximum sized aggregate. Add sufficient water to produce a medium workability - medium to high if the concrete must be tamped by hand (see note on Water).

3) For all concrete in silos, brewers grain stores, parlours and dairies, floors used by small wheeled lift trucks or other handling equipment, walls, infill to cavity walls and retaining walls, suspended floors, beams and lintels use a C25P mix (this replaces the old 1:1.5:3 mix).

When mixing by volume the proportions for C25P are 3 parts cement, 4 parts damp sand, 7 parts coarse aggregate.

When mixing by weight the quantities per bag of cement (50kg) are 90kg damp sand and 170kg coarse aggregate.

Use ordinary Portland cement and 20mm maximum sized aggregate. Add sufficient water to produce a medium workability

(see note on Water).

Water Content

The amount of water used will depend on the types of aggregates and the moisture already contained within them and on the concrete workability needed for the job.

Use just enough water to enable you to compact the concrete thoroughly; this is especially important with the higher grades of concrete, C20P and especially C25P, which must be really well compacted. An over wet, sloppy mix will be porous and much less durable than one that has the same cement content but is no wetter than it needs to be for good compaction. You can use a stiffer, drier mix when mechanical vibrators are used instead of manual tamping beams.

When mixing "on site" you will have to judge the workability for yourself unless equipment is available to carry out a slump test (medium workability = slump of 50mm +/- 25mm). A good test for medium workability is the "boot test". Dump a small mound of concrete from the mixer; it should be a firm mound, not sloppy. Two or three taps with the sole of your boot should produce a close knit surface.

Concrete exposed to de-icing salt

Damage from salt and frost can be minimised by using "air entrained" concrete. Add air entraining agent to the mix as per manufacturers instructions with a target of 5% entrained air.

Concrete mix – Cement quantity.

Filling depth of machine.	Concrete mix specification C7.5P	C20P	C25P
400 litre Mixer			
40cm = 0.4 cbm (MAX)	83kg(1.6)	117kg(2.3)	143kg(2.9)
30cm = 0.3 cbm	62kg(1.2)	88kg(1.8)	107kg(2.1)
20cm = 0.2 cbm	42kg(0.8)	59kg(1.2)	72kg(1.4)
600 litre Mixer			
49cm = 0.6 cbm (MAX)	125kg(2.5)	175kg(3.5)	215kg(4.3)
40cm = 0.5 cbm	104kg(2.1)	145kg(2.9)	180kg(3.6)
30cm = 0.37 cbm	77kg(1.5)	108kg(2.2)	132kg(2.6)
20cm = 0.25 cbm	52kg(1.0)	73kg(1.5)	90kg(1.8)
800 litre Mixer			
46cm = 0.8 cbm (MAX)	167kg(3.3)	235kg(4.7)	285kg(5.7)
40cm = 0.7 cbm	146kg(2.9)	205kg(4.1)	250kg(5.0)
30cm = 0.52 cbm	108kg(2.2)	152kg(3.0)	185kg(3.7)
20cm = 0.35 cbm	73kg(1.5)	102kg(2.0)	125kg(2.5)
1000 litre Mixer			
40cm = 1.0 cbm (MAX)	208kg(4.2)	296kg(6.0)	357kg(7.1)
35cm = 0.87 cbm	180kg(3.6)	257kg(5.1)	310kg(6.2)
30cm = 0.75 cbm	156kg(3.1)	221kg(4.4)	268kg(5.4)
20cm = 0.5 cbm	104kg(2.1)	148kg(3.0)	179kg(3.6)

cbm = cubic metres

Figures in brackets = no. of bags of cement (50kg bags)

Concrete Mix Specification for 600 Favorit Mixer

		Quantity of Cement		
Volume of Concrete required	**Filling depth of mixer**	**ST3 Mix**	**ST4 Mix**	**ST5 Mix**
0.5 Cubic Metres	40cm (max)	138kg (5.5 bags)	147 kg (6 bags)	166 kg (6.5 bags)
0.25 Cubic Metres	21cm	69kg (2.75 bags)	73kg (3 bags)	83kg (3.5 bags)

Concrete Mix Specification for 800 Favorit Mixer

		Quantity of Cement		
Volume of Concrete required	**Filling depth of mixer**	**ST3 Mix**	**ST4 Mix**	**ST5 Mix**
0.75 Cubic Metres	40cm (max)	207kg (8.25 bags)	220 kg (8.8 bags)	250 kg (10 bags)
0.50 Cubic Metres	27cm	138kg (5.5 bags)	147 kg (6 bags)	166 kg (6.5 bags)

Notes:

- Figures in brackets = number of 25kg bags
- ST4 replaces old C20P mix
- ST5 replaces old C25P mix
- Please read this table in conjunction with the following BCA fact sheet 16.

A NEW GENERATION OF CONCRETE MIXES FOR THE FARM

Table 1. Recommended concrete mixes[1]

Application	Designated mix	Standard or other mix[2]
Concrete in or on non-aggressive soils[4]		
Unreinforced foundations	Gen 3[3]	ST 4
Reinforced foundations	RC 30	ST 5
Oversite concrete	Gen 2	ST 3
Blinding under slabs	Gen 1	ST 2
Mass concrete (non-structural)	Gen 2[3]	ST 3
Column bases	RC 30	ST 5
Foundations in sulfate-bearing soils[4]		
Class 2 sulfate condition	FND 2	
Class 3 sulfate condition	FND 3	
Class 4 sulfate condition	FND 4	
Floors and roads		
Livestock floors	RC 35	ST 5
Stable floors	RC 45	Mix B
Crop store floors	RC 35	ST 5
Floors (and walls) for silage	RC 45[5]	Mix B
Sugar beet storage areas	RC 40[6]	Mix A
Workshop floors and floors subject to small-wheeled forklift trucks	RC 40	Mix A
Brewers' grains stores	RC 45[5]	Mix B
Mushroom sheds	RC 40	Mix A
Toppings for floors such as parlours and dairies	RC 45[7]	Mix B
Floors (and walls) for manure and slurry stores	RC40[5]	Mix A
External yards and roads (no de-icing salt)	Gen 4	ST 5
External yards and roads subject to even occasional de-icing salts	PAV 1[8]	
Other applications		
Cavity infill in blockwork	RC 40[9]	Mix C[9]
Reinforced concrete[10]		
Mild exposure	RC 30	
Moderate exposure	RC 35	
Severe exposure	RC 40	
Very severe exposure	RC 45	
Most severe exposure	RC 50	

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Designated mixes

The 1992 edition of the Ministry of Agriculture's leaflet *Standard Costs, Part 1: Specification,* introduces new concrete mixes for farm use. All these mixes are taken from a revised British Standard, BS 5328 : 1991. *Concrete.*

Most concrete is now ordered from ready-mix plants, so the most important range of new mixes are the **designated mixes.** These are quality assured mixes supplied by ready-mixed concrete plants covered by QSRMC – Quality Scheme for Ready-Mixed Concrete – or similar schemes.

QSRMC was introduced a few years ago by the ready-mixed concrete industry and has been recently upgraded. About 90% of all the ready-mixed concrete used in the UK is now provided by plants which are covered by this scheme.

Only plants operating within QSRMC or similar schemes may supply designated mixes. This means that they are independently inspected to ensure that their product meets the appropriate specification, so it is not necessary to test the concrete on site. You can have confidence that the mix supplied is the one you ordered. The new mixes are easy to specify, they are designed to be fit for their end use and, most importantly, they are economical.

Standard mixes

Where designated mixes cannot be supplied, or you have to mix the concrete yourself, you can use another range of mixes, called **standard mixes.** These replace the prescribed mixes, such as C20P and C25P, which have been in use for some time, but which caused some confusion over the meaning and importance of the letter P in their 'names'.

Standard mixes are specified by using the letters ST followed by a number from 1 to 5. No confusion should arise once these numbers have become familiar.

A full range of applications and the new mixes suitable for each is given in Table 1, (see page 1) which must be read with the accompanying notes.

Mix proportions

For most applications there is a standard mix equivalent to the quality assured designated mix. Where no equivalent mix is published in the British Standard, other mixes – Mix A, Mix B and Mix C – which provide comparable performance, are listed in Table 1 and in the *Standard Costs Specification* publication as detailed in Table 2. This table also shows the mix proportions to use when mixing on site, to produce concrete equivalent to the standard mixes indicated.

When using mixes with high cement contents such as Mix C, which has a cement content over 400 kg/m^3, there is a risk of the concrete cracking due to high early temperatures or other internal effects of chemical reactions in the concrete.

With all reinforced concrete there is a risk of corrosion of the steel if the aggregate contains too much salt – if unwashed beach sand is used, for example. Do not use unwashed beach material for reinforced concrete, or for concrete containing other embedded metal such as holding-down bolts.

Notes accompanying Table 1

1. All concrete should be placed in position as quickly as possible after delivery. The concrete should be compacted, finished and protected against harmful effects of the weather, e.g. rain, freezing and rapid drying out. Use medium workability (75 mm slump) for all concrete except where variations are indicated in this table.

2. Mixes in this column can be site mixed or supplied by ready-mixed concrete suppliers. Volume batched standard mixes will only be relevant to site mixing.

3. 40 mm aggregate may be used in mass concrete or large foundation bases. High workability (125 mm slump) concrete may be used for trenchfill foundations.

4. Local Authority Building Control Officers can give guidance on likely soil conditions. They will describe the soil as non-aggressive or as Class 2, 3 or 4 sulfate conditions.

5. Equivalent to C35A. Meets the requirements of BS 8007 demanded by the Control of Pollution Regulations 1991.

6. Where the concrete is subject to even occasional de-icing salt, designated mix PAV 1 is recommended. Mix A should only be used if no salt will be carried in on the underside of vehicles.

7. Use low workability mixes for acid resistance and abrasion resistance.

8. Not applicable to site mixing as it contains an air entraining agent, to give freeze-thaw resistance, which cannot be added in small quantities on site.

9. Use 10 mm aggregate and high workability (125 mm slump) concrete for this application.

10. The 'exposure condition' is defined in BS 5328 and will be determined by the engineer responsible for the design.