Operation & Service Manual

Pump # 7738

12MS-8 Turbine • Water Lubricated • Vertical Application

Technical Services Department

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Batescrew Pumps & Valves Australia

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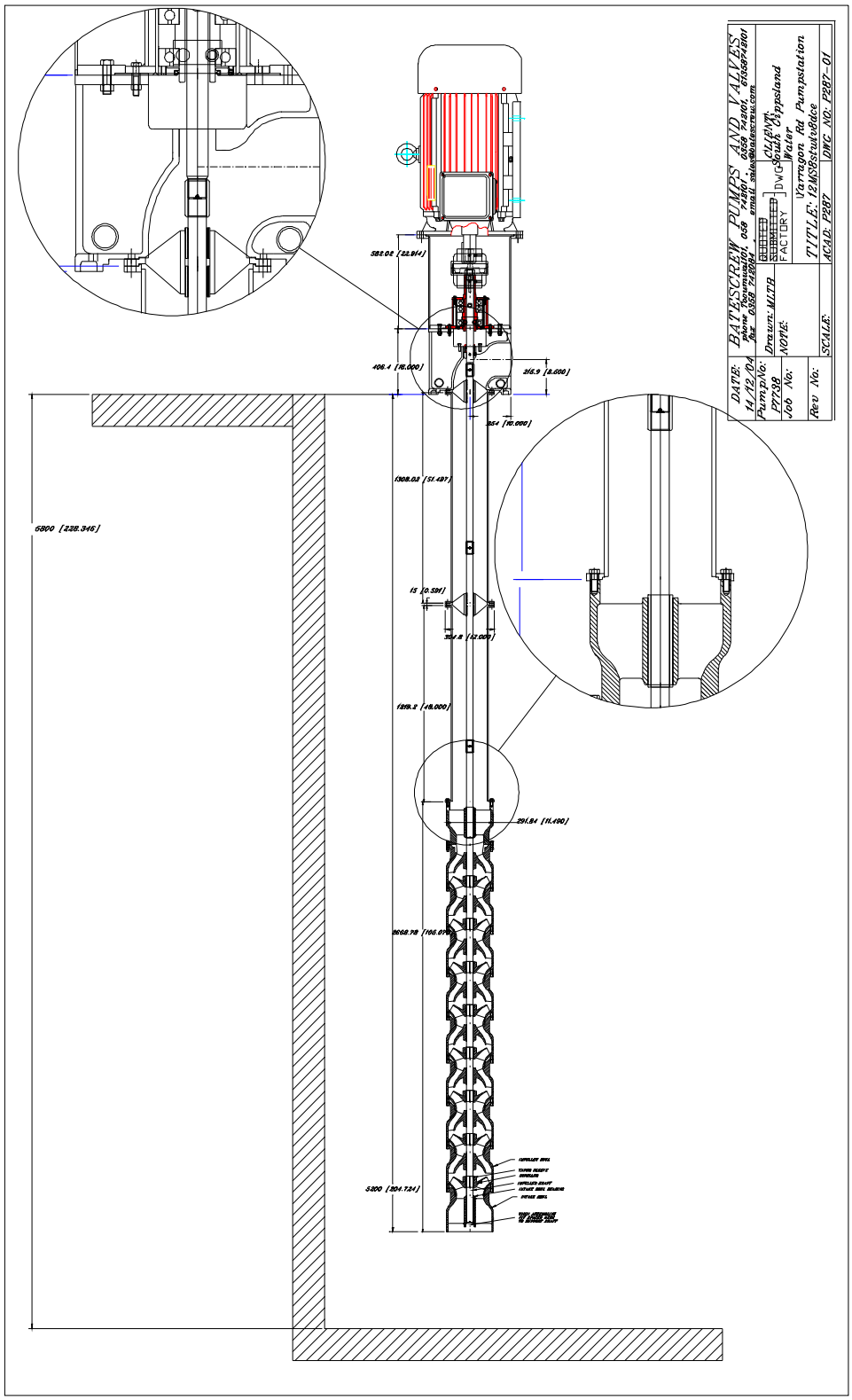
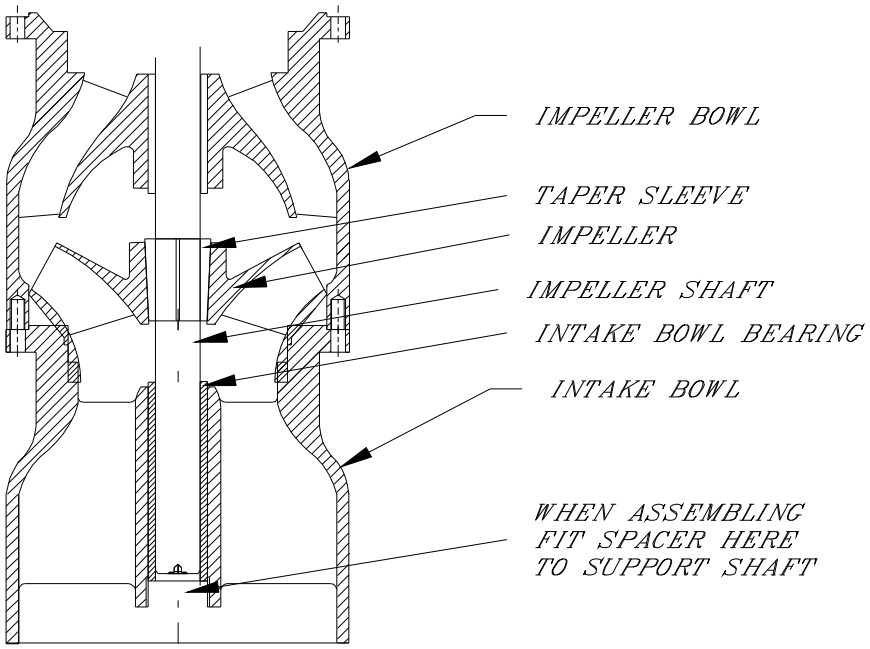
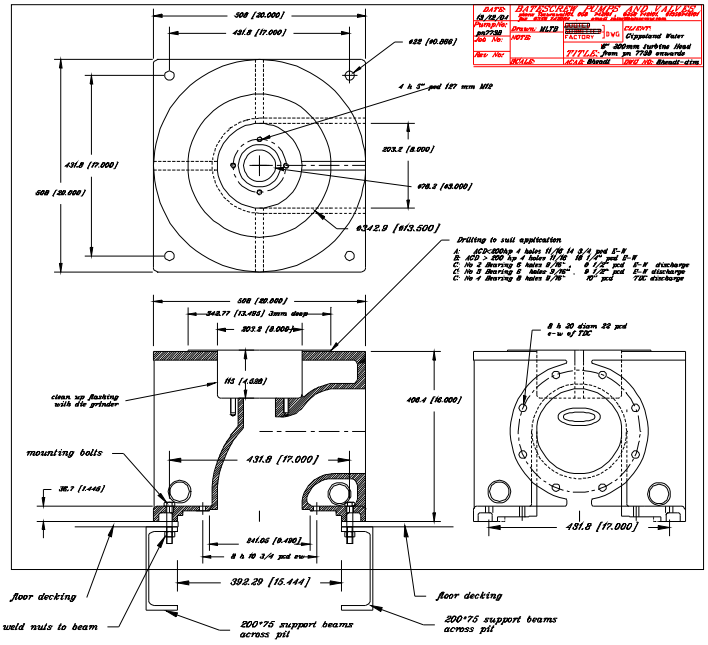
1. COMPONENT


BATESCREW PUMPS AND VALVES
DATE: 14.12.04
Pump No: PP298
Job No:
Rev No:
Drawn: MJTB
NOTE:
SCALE:
FACTORY
TITLE: 12MS9stuv8dce
Varnagon Rd Pumpstation
Scale
Water Uppsland
ACAD: P287
DWG NO: P287-01
582.02 [22.914]
406.4 [16.000]
216.9 [8.539]
354 [13.937]
1308.03 [51.497]
5900 [232.346]
15 [0.591]
304.8 [12.000]
1219.2 [48.000]
291.84 [11.490]
2668.78 [105.070]
5200 [204.724]

Component Parts (wet end)

2.





Batescrew 12MS-8 8 Stage Vertical Mounted Pump

3 Description

This pumpset is a DIRECT COUPLED, Vertical Application Pump.
The pumpset was designed for pumping waste water from a pit into an outfall pipeline.
Potential Flow Rates from 50 l/s @ 48mtrs to 120 l/s or Heads to 88mtrs

3.1 Strainer

3.2 Wet End Assembly

3.3 Column Assembly

3.4 Discharge Head

3.5 Mechanical Seal

3.6 Extension Drive (not required)

3.7 Thrust Bearing

3.8 Drive Coupling

3.9 Motor Stool

3.10 Discharge Pipe

3.11 Motor

3.1 Strainer (NO STRAINER SUPPLIED WITH THIS PUMP – BUILT INTO SUMP)
The strainer protects the impeller and stator from entry of foreign bodies.
The design of the strainer should be such as to have minimal effect on water flow whilst allowing the capture of possibly damaging material (Typically 25mm pass is used).
All pumps should be fitted with a protective strainer. On re-lift pumps the strainer should generally be fitted to the sump intake. It should be checked for damage and cleaned regularly.

WARNING: Damage to pumps from intake of foreign bodies is not covered by warranty
The pump requires a solid base upon which it may be mounted and well anchored support points for the support rails.
The cross rails must be of sufficient cross section to carry the total weight of the pump and motor when the pump is full of water.
The intake must have adequate supply so as not to allow the pump to run dry.
If in doubt as to the supply characteristics of your inlet line ring Batescrew Technical Assistance for help.

3 Description

3.2 Wet End Assembly

Consisting of eight stages, having 12" impeller bowls, impeller shaft, taper lock sleeves, impellers, inlet bowl with a bottom bearing, and discharge-to-column adaptor.
Rotation is provided via the stainless steel drive shaft connected to impellers by taper lock sleeves. (PUMP ROTATION IS ANTI CLOCKWISE)
Shaft and impeller(s) are located in position horizontally by the bottom bearing and vertically by the top adjusting nut.
Impeller are balanced for vibrationless operation and should turn freely (with no roughness). If vibration or noise during running is encountered the pump may have been damaged, the factory should be contacted and repairs made as soon as possible.
Any further damage caused by running a vibrating or damaged pump is not covered by warranty.

3.3 Column Assembly.

The column acts as a pipeline for the flow of water, it is also the support for the pump and shaft bearings. Shaft bearings are positioned every 4' (1.2m) along the column and are lubricated by pumped product.

The pump must never be run dry, as the rubber bush bearings will be destroyed.

Cast Iron columns sections, epoxy coated with two-pack food grade 'Jotun', are in lengths of 4 ft (1.2m), flanged with two pack epoxy coating. Line shaft is stainless steel, joined by sacrificial mild steel muff couplings.

3.4 Discharge Head

Fitted to the top of the column, the Discharge Head unit acts as the mounting point for column support, it also contains a machined face for the thrust bearing and motor stool attachment.
The discharge head turns the water flow through 90 degrees, to align with the discharge pipe.
Ports for the water-cooled thrust bearing are built into the discharge head.

3.5 Mechanical Seal

This pump is running a tungsten/tungsten/viton mechanical seal
This seal is a long life mining industry standard seal that is preset for life.
The seal may give a small weep when first started but should take up immediately and not leak when the pump is running.
Seal pressure is achieved by the locking collar positioning on the pump shaft.
Once factory set this should not require any further adjustment.
It is strongly recommended that the seal never be run dry.

3 Description

3.6 Drive Extension (NO EXTENSION IS REQUIRED FOR THIS PUMP)

The drive extension serves to place drive and mounting some distance above the discharge head. Drive extension columns are smaller in diameter than pump columns as they do not handle water flow.

3.7 Thrust Bearing.

Line shaft thrust is carried by the thrust bearing assembly, mounted above the discharge head.
The thrust bearing is a grease lubricated water-cooled type.
Greasing of the thrust bearing is required every six months. Over greasing causes grease to issue from the shaft seals and may damage the bearings themselves.
The bearing is designed to run warm (40 to 70 degrees C).

3.8 Drive Coupling

Drive connection between the thrust bearing and the electric motor is via a rubber cross drive HRC coupling.
This gives quiet, vibration free running whilst allowing for minor misalignments.
No servicing is required of the coupling

Always check the motor direction by running the motor before joining the coupling halves together. No warranty covers damage by reverse rotation.

THE MOTOR DRIVE DIRECTION MUST BE ESTABLISHED BEFORE CONNECTING THE COUPLING HALVES TOGETHER.

3.9 MOTOR STOOL

The motor stool is designed to direct couple a flange-mounted motor to the pump
The stool has registers to correctly align the motor shaft to the pump shaft.

3.10 Discharge Pipe

The outlet is fitted with a standard BATESCREW flange.

3.11 Motor

The correct motor for this pump is a 160 kw 4 pole 315-frame flange mounted, suitable for use with VSD driver.

4 Assembly and Installation

4 Assembly and Installation

4.1 Pre-Installation

Before any installation can be performed the site must be prepared.

The Pump will require:

* A sound well constructed mounting pad at the top of the sump.
* Two cross rails of sufficient strength for pump support.
* Confirmation of inlet ability to supply the flow rate required.
* Relevant permits and clearances have been obtained.
* Lifting device or crane to lift pump into well.

4.2 Assembly

This pump has been shipped from the factory complete, no assembly is required prior to installation. The motor has been supplied separately and will need to be fitted.

NOTE: It is the responsibility of the installer to check motor running direction prior to installation; failure to do so may cause severe pump, thrust bearing and motor damage, thus voiding warranty.

* Check that all parts are present and in good order.
* Check the pump dimensions, to be sure that pump length from base of the mount plate to the centerline of the discharge head is correct for the pit.

4.3 Setting the Impeller (This pump has been shipped with the impeller preset)

* Ensure that the locking grub screw in the top nut does not interfere with the thread of the top shaft by backing it completely out.
* Tighten the top nut down against the thrust bearing top face, thus raising the drive shafts and attached impellers (ensure that the drive key is in place in the thrust assy.).
* Once the nut has contacted the thrust bearing, continue until the impeller has been pulled up firm against the stator seal plate in the wet end of the pump. This is indicated by the pump seizing.
* Back off the top nut one full turn, and note that the nut drive shaft drops, lowering the impellers thus giving wet end clearance again and enabling the pump to turn freely.
* The pump should now be free to turn by hand. When the adjustment has been completed, re-insert the Allen screw into the top nut, making sure that it only seats over the drive keyway.

4 Assembly and Installation

4.4 Installation

* Using a suitable lifting sling and crane, attach the sling to the discharge head lifting lugs in a way that allows the pump to hang true when lifted.
* Raise the pump, being careful that it hangs correctly.
* Lower the pump into the sump until the discharge head is just clear of the support rails.
* Insert the four bolts through the head and into the holes in the mount rails.
* Lower the pump to sit on the cross rails.
* Tighten all bolts and nuts locking the pump into place.
* You may now remove the crane and slings.
* Attach the discharge pipe work to the pump discharge.
* Install the motor half coupling to the drive motor.
* Install the rubber drive cross to the pump half coupling on the thrust bearing.
* Install the motor to the motor stool, making sure the half couplings are not joined.
* Run the drive motor disconnected from the pump to ensure direction of rotation is correct.
* Only when you are sure the direction is correct, slide the two half coupling together.
* Make sure water is present in the sump
* Check that the discharge is connected correctly and that the delivery point is ready to accept water.

IT IS RECOMMENDED THAT A NO-FLOW SENSOR BE INSTALLED IN THE DISCHARGE, TO STOP THE PUMP IN THE EVENT OF NO WATER SUPPLY.

4.5 Testing

* Check by hand that the pump turns freely with no noise or roughness.
* Check sufficient water supply is available in the sump.
* Check that all persons and animals are clear of the pump and that all safety devices are connected and in place, especially all intake guards and covers, make sure all inlet and outlet valves are open.
* Start the pump and check for correct direction of rotation.
* Monitor the pump for noise or vibrations and slowly increase the speed until full speed is achieved.
* Run the pump for 30 seconds and check for smooth operation and lack of noise.
* Check all bolts and connections and restart the pump.
* Check the pump at regular intervals for leaks or noises.
* Fill out pump user's register.
*

THIS WARNING IS IMPORTANT

DO NOT RUN THE PUMP WITHOUT WATER AS DAMAGE WILL OCCUR.

5 Operation

5.1 Start-Up

* Safely secure the pump site (especially from children).
* Always check that safety covers are fitted.
* Check all personnel and animals are clear of intakes and outlets including channels.
* Carry out service procedures as outlined in the maintenance section.
* Check the WATER SUPPLY level is adequate.
* Start the pump.
* Check that the pump is pumping correctly.
* Monitor pump for noise/vibrations; slowly increase speed until full speed is achieved.
* Check that seal leaks take up, if not, find the cause of leakage and readjust or repair.

5.2 During Operation

* Check the pump every couple of hours for unusual noises or vibrations.
* Watch for seal leakage and adjust/repair if needed.
* Grease bearings once a month on systems running continuously.
* Check motor temperature regularly to ensure motor is not overloading and overheating.

5.3 Shut Down

* Turn the pump off and check that any non return valves have functioned.
* Shut all inlet and outlet gates.
* If bearings have not been greased then grease nipples whilst they are warm.
* Clean and secure site.
* Note any defects and have them made good whilst pump is idle.
* Fill out pump user's register.

This operation direction outlines the recommended procedure for starting, run and to close down your pumpset. It by no means covers every application and every eventuality. Batescrew design and build pumps with performance and safety in mind but it is solely the responsibility of the operator to maintain and operate the equipment in a safe and appropriate manner, bearing in mind today's changing occupational health requirements.

6 Removal, Disassembly and Assembly

The disassembly of the pump may be for any number of purposes, for convenience it is assumed here that the disassembly is for complete overhaul.

6.1 Disassembly (PUMP REMOVAL)

* Remove the DRIVE MOTOR and store it in a safe place.
* If the cable length or the pump site will not allow for the motor to be removed with the cables attached, then call an electrician and have the motor disconnected.
* Remove the discharge adaptor bolts at the discharge flange of the head.
* Remove the (4) bolts and nuts from discharge head to the mount rails.
* Attach secure lifting chains and a crane, with 3 tone capacity at this distance, to the lifting lugs on the discharge head. Lift the pump vertically out of the pit.
* Take the pump to a safe secure location for repair.
* Cover the pump hole with a false floor for safety.

6.2 Disassembly (PUMP DISSASEMBLY)

* Lay the pump onto a set of pump stands for disassembly.
* Mark the motor stool, extension drive stool, discharge head and mount plates, so that correct orientation can be established when reinstalling them.
* Remove the motor stool to head bolts and nuts and remove the motor mount stool.
* Note the number of threads protruding from the pump shaft top nut and store the data.
* Remove the locking grubscrew and, counting the number of turns, remove the top nut.
* Remove the pump half coupling from the thrust bearing and remove the drive key.
* Remove the bolts securing the thrust bearing to the head & remove the bearing.
* Remove the top shaft and muff coupling. (If you are unable to unscrew a coupling, strike opposite sides of the coupling at the same time with two 2kg hammers, loosening the coupling on the shaft.)
* Remove bolts holding the seal seat holder to the head and remove the Mech seal.
* Remove bolts joining the pump head to the top column and top-bearing carrier.
* Remove the discharge head.
* Remove the top-bearing carrier from the top column and shaft.
* Support the pump under the bottom column and remove the column-to-column bolts from the two columns, then remove the top column.
* Unscrew the line shaft from the muff coupling and remove it and the coupling.
* Remove the center-bearing carrier from the column and shaft.
* Remove the bolts holding the bottom column to the wet end and remove the bottom column.
* Unscrew the line shaft from the muff coupling and remove the line shaft.
* Lift the wetend assembly to a clean workspace.
* Clean all parts and disassemble all lube tubes to check bearings.

6 Removal, Disassembly, and Assembly

6.2 Disassembly of Impeller Assembly.

It is recommended that the wet end rebuild be performed by BATESCREW at the factory.

* Impellers are attached to the shaft by taper lock sleeves.
* Remove the bolts attaching the inlet bowl to the impeller bowl & remove the intake bowl.
* While supporting the shaft from moving at the top end, use a taper driver (which will fit inside impeller) to drive the sleeve out of the impeller, working from the bottom..

Note the exact positions of the impeller and sleeve on the shaft, as they must be returned to these positions when reassembled.

* Remove the impeller from the bowl and shaft.
* Remove flange bolts between the bottom impeller bowl to second impeller bowl.
* Remove the second impeller using the taper driver.
* Repeat the process until the wet end is completely disassembled.
* Remove all of the impeller bowl bushes and inlet bowl bearings and seals for replacement.
* Clean and inspect all parts, replacing any that looks suspect. Check shafts and bushes for wear, (If in doubt contact Batescrew Technical Service Department, phone 0358742101 or fax 0358742084, for correct advice.)
* Do not use generic parts, performance may be degraded.

6.3 Assemble wet end

* The correct position of the impellers on the impeller shaft is critical to assembly and must have been noted during disassembly; if not call BATESCREW for help.
* Fit the bottom impeller to the impeller shaft at it's original position, by positioning the impeller and taper on the shaft at the correct location and then, using a slide type driver, drive the taper into the impeller, locking both to the shaft.

Be careful that the bottom impeller is positioned correctly on the shaft.

* Fit the new bushes and seals to the stator and intake bell (bottom bearing holder).
* Apply rubber grease to the bowl and intake bearings for initial lubrication.
* Sit the intake bowl on a solid surface, intake down, then place the impeller and shaft into the bowl, with a spacer in the intake bush to support the shaft so that the impeller is sitting just clear of the intake bowl body by the slightest margin.
* Install the bottom impeller bowl and bolt it to the intake bowl.
* Place the next impeller onto the shaft and in the impeller bowl. Insert its taper sleeve and drive home with the slide hammer..
* Install the next impeller bowl and bolt it to the previous one.
* Repeat the above process until the wet end has been assembled.
* Rotate the shaft and impellers, checking for interference in the impeller rings or other tightness.

6 Removal, Disassembly and Assembly

6.4 Reassemble Pump

* Reverse the procedure you used to dissemble the pump and follow the assembly procedure.
* Muff couplings must be screwed equally onto each shaft, the machined shaft ends must be touching each other in the muff couplings, so that correct alignment is maintained. If this is not done vibrations and early pump failure will result.
* Check each shaft for bends, wear, corrosion and damage to machined ends or threads.
* Only replace shafts with Original parts that are machined to fine tolerances, the use of incorrectly finished shafts will destroy the pump and may cause irreparable damage.
* Use the correct lubricants and sealants from the list as you assemble.
* Align all parts to the specifications given in the table on the following page.
* Check after fitting each stage, for signs of tightness or roughness that would indicate incorrect alignment or faulty assembly.
* Adjust the top nut to the original position and, if the pump is still loading up, adjust a further one turn of the nut. If this does not give correct Impeller positioning you may have not aligned the impeller back onto the shaft in the correct position. You may need to dismantle the pump and correct this. If you need help ring BATESCREW Technical Department.

Before reconnecting the drive, always check the direction of rotation is correct, as stated in original installation. A drive turning in the wrong direction will destroy your pump. Always check, even if you believe it has not been altered. Just in case!

7 Alignment and Positioning Data

Alignment and Positioning	NOTES
Column to flange alignment	Align OD.of each flange with 150mm ruler on the outside of the flange, in four positions
Lube tube to lube tube	Must butt up tightly, with evenly spaced joiners.
Shaft to shaft in muff couplings	Must butt up tightly and be evenly spaced in coupling.
When assembling	Rotate shaft after each component is attached, to assure alignment is correct.
Shaft inside lube tube	Must be in the centre at all times, If not you have a bent shaft, lubricant between shafts/couplings, non original or damaged shafts.
Straightness of shafts	Shafts be set on V blocks and checked for straightness. 0.003" per 4ft (0.07mm per 1200mm)
Bush clearance on shaft	0.003" per 1" of diameter, plus 0.004"

7. - (TOLERANCES)

PART NAME	TOLERANCE
LIP SEAL	
TOP ROLLER BEARING	Ref. skf
BOTTOM ROLLER BEARING	Ref. skf
TENSION NUT LIP SEAL	-1.5 mm
TENSION NUT BUSH	0.15 mm
LUBE TUBE JOINER BUSH	0.15 mm
LUBE TUBE ADAPTER BUSH	0.15 mm
STATOR BUSH	0.15 mm
STATOR LIP SEAL	0.15 mm
THROTTLING BUSH	0.15 mm
BELL MOUTH BUSH	0.15 mm
IMPELLER to IMPELLER. RING	1.50 mm

8 Lubrication Chart and Service Schedule

Recommended Oils and Greases **PARTS**	**RECOMMENDED LUBRICANT**
Oil lubrication tank	Not required
Grease Nipples	Mobil grease HP
Thrust Bearing	Mobil grease HP

Clean gearbox cooling air intake.	Not required
Fill oil tank	Not required
Grease nipples	Once every 3 months on continuous running. Once every 6 months on intermittent running. One pump only in each nipple.
Check drive coupling	Once a year
Check attaching nuts and bolts	Once a month
Check pump for vibrations, noise etc	Once a day on continuous use or every start up on intermittent use
Check inlet screen	Once a week

LOCATION	**LUBRICANT / SEALANT**
On the shaft inside lipseal	SILICON grease
On bolts & inside nuts	COPPER based grease
Between flange faces	Lockite high pressure sealer
On shaft inside couplings	Rubber grease

9. Trouble Shooting

Pumpset is hard to turn	
Cause	**Remedy**
Top shaft nut not properly adjusted	Refer to Batescrew
Lineshaft bearing not lubricated	Check adequate oil flow from drip feeder
Line shaft bent	Remove and repair or replace
Sand blocking impeller assembly	Remove and clear sand
Misalignment in pump	Remove and refer to 'Overhaul' section
Water in oil tank	Pump seal failure (refer to 'Overhaul' manual)
Misalignment of lay shaft	Check & Adjust
Object inside pump jamming impeller	Remove and repair or replace
PTO shaft bearing seized.	Check & replace
Misaligned angle drive, gland or tension nut	Adjust or Align

Pumpset vibrations	
Cause	**Remedy**
Drive coupling misaligned or damaged	Realign or replace
Drive or mounting bolt loose	Tighten or replace
Gearbox mount misaligned	Realign mount or meplace
Gearbox damaged	Repair gearbox
Impeller damaged or fouled	Remove pump and repair/replace or clear
Damaged or worn line shaft bearings	Remove pump and repair
Intake partially blocked	Clear intake
Vortexing water flow entering pump	Reduce speed to see if it stops
Insufficient submergence	Install in a deeper hole
Pumpset worn out	Remove (refer 'Overhaul' section)
PTO shaft bearing failure	Repair
Foundation not sufficient under pumpset	Remove and reinstall correctly

9. Trouble Shooting

Pump is producing insufficient or varying flow rates	
Cause	**Remedy**
Intake blocked	Remove pumpset and clear Intake
Pump starving for water	Provide more submergence for pump
Submerged eddy currents	Ensure more even flow to pumpset
Drive coupling failure	Replace coupling
Gearbox seizing	Repair gearbox, check oil level
Broken line shaft	Remove and repair
Muff coupling disconnected	Remove and replace/repair
Drive speed to slow	Check motor and speed
Static water level has dropped	Repair/deepen sump
Impeller loose on shaft	Remove and replace/repair
Discharge line closed or blocked	Open valve or clear obstruction
Column holed or blocked	Remove and replace/repair
Impeller or stator damaged or worn	Remove and replace/repair
Excessive head	Check discharge head: ref. specifications
Density or quality of pumped material poor	Check supply cleanliness
Discharge gasket leaking badly	Replace gasket or clamp joiner

10. Tools

Although no special tools are needed, some operations are easier and safer with appropriate tools.

* Impeller slide hammer

This is a machined slide that fits over the impeller shaft and is used to insert and release taper sleeves in impellers. Accurate impeller positioning can be difficult without this tool and an impeller is easily damaged when removed by any other means.

* Stillson wrench 18" (2 sets).
* Medium size podger bar.
* Feeler gauge set.
* Set square.
* Socket sets.
* Imperial and Metric ring spanners.
* Emery cloth.
* Lifting jib or crane.
* Vee Blocks and dial gauge

Medium size brass hammer.
Imperial and Metric Allen key set.
Spirit level.and string line.
Hook wrench 32-76 mm.
Screw drivers.
Fine cut file.
Cleaner and cloth
Chain and block & tackle set.
Chain Tongs

11. Pump Specifications

PUMP TYPE	TURBINE	**PUMP SERIAL #**	7738	**PUMP SIZE**	12MS-8
MOUNT TYPE	VERTICAL	**DRIVE TYPE COUPLING TYPE**	DIRECT HRC230	**DESIGNED FLOW**	120L/S
MOTOR TYPE	WEG 21 315SM	**MOTOR SERIAL #**		**DESIGNED HEAD**	87.7 m TOTAL
MOTOR HP RATING	160 KW	**PRODUCTION DATE**	12/2004	**DESIGNED RPM PUMP SPEED**	1500 RPM
PUMP (DOR)	ACW	**INSTALLATION DATE**	6/2005	**DESIGNED HP**	140KW DRAWN

BATESCREW PUMPS AND VALVES SERVICE HISTORY. PUMP # 7738

DATE INSTALLED

12. Service Records Log

DATE	MOTOR HRS	COOLING FINS CLEANED	DRIVE COUPLING CHECKED	INTAKE STRAINER CLEANED	PUMP VIBRATION CHECK	BOTTOM BEARING GREASED	TOP BEARINGS GREASED	GLAND CHECK	COMMENT

12. Service Records Log: CONT

DATE	MOTOR HRS	COOLING FINS CLEANED	DRIVE COUPLING CHECKED	INTAKE STRAINER CLEANED	PUMP VIBRATION CHECK	BOTTOM BEARING GREASED	TOP BEARINGS GREASED	GLAND CHECK	COMMENT

13. WARRANTY

WARRANTY.

The Company undertake that the goods manufactured by the Company shall be of first class materials and of sound workmanship, and that the company will make good or replace any defective parts therein, which under proper use, may appear within six months of dispatch from the company's works, and which have proven to be due solely to the use of defective materials or bad workmanship.
Provided always that such parts are promptly returned free to the company's works unless otherwise arranged and any defective parts to the Company's property.
The repaired or new parts will be returned to the site.
Any goods not of the Company's manufacture, included in this tender, are sold under such warranty only as the makers give us, and we are able without legal expense to enforce, but are not guaranteed by us in any way whatsoever.
The warranty does not cover malfunction resulting from misuse, negligence, alterations, accident, or lack of performance of normal maintenance service, loss of time, inconvenience, loss of use of equipment, or other consequential damages.
The warranty does not exclude any condition, or warranty implied by the trade practices act. 1974, or any state legislation, but in all other respects, the warranty is in lieu of other warranties, expressed or implied, and all other obligations or liabilities. No promise, representation, or statement, by any employee, representative, or agent of the Company, or by any other person, shall add to, vary, or modify this warranty, or give use to any obligation on the part of the company.
Further, no promise, representation, or statement by any employee, representative, or agent of the Company, relating to the suitability of the equipment for any purpose shall bind the company or give rise to any obligation on the behalf of the Company.

PUMP RECORD SHEET.				DATE	15 Dec 04	PUMP,NO: **7738**
CLIENT:	**South Gippsland Water**			PUMP SIZE:	**12MS8stvwl2.5Mt dc e**	
	(Brian Mcillree)			JOB NO:	**6002**	
PHONE NO:	**0356820427**			QUOTE NO:	**LC100393**	
FAX NO:	**0356821199**			ORDER NO:	**04001129**	ACC NO
ADDRESS:						DATE ORDE15 Dec 04
DELIVERY ADDRESS					Drawing Number	
CARRIER & DETAILS:	**to be arranged**					
CONSIGNMENT NO:					CARRIER NO:	
DATE OF DELIVERY:	25 Oct 04	SOLD BY:	**LC**		AGENT:	
	VERTICAL APPLICATION 90 deg					ROTATION **ACW**
ELECTRIC			Direct Coupled		1584gpm at 288.39ft at 1501 rpm 75%	
NO OF STAGES	**8**	IMPELLER;	**12MS**		TRIM:	**Full**
STRAINER		TYPE			LOCKING PLATE	
B.B.H. LUBRICATION		**water**			Top STATOR Lube	**water**
COLUMNS		**9" cast iron flanged**			Bottom Stators lube	**water**
		botom column 1308mm special fl 1 end top column 1219mm				
HEAD		**8" Cast iron head**		MOUNT PLATE	**on head**	
IMPELLER SHAFT		**1 1/2" x 2790mm**		THREAD SIZE		
LINESHAFT		**1 1/2" 431 s/s * 2420mm**				
INTERMEDIATE TOP SHAFT						
INTERMIEDIATE TOP SHAFT						
TOP SHAFT		**1 3/4" 431 S/S x Len Req**				
MUFF COUPLINGS		**1 1/2" nf lh**				
CENTRE BEARING HOLDERS		9" Fabricated			NUMBER	**2**
		No 4 Bearing air cooled X 1 3/4" sleeve				
	DISCHARGE PIPE					
FLANGE PUMP END				FLANGE PIPE END		
LENGTH					ANGLE	
MATERIAL					PAINT	
GASKET & BOLTS SET						
Notes:	Bottom column, bottom flange 12"o/d 11-1/2" f/reg 10-3/4" pcd 12 x 1/2" holes					
	Top column, top flange 12"o/d 9-1/2"m/reg 10-3/4" pcd 8 x 11/16 holes					
	Middle flanges to be 12"od f/reg on top col m/reg on bot col 10-3/4" pcd 8 x 11/16 holes					
	C B H special steel ones to fit 1-1/2" shaft m&f reg					
	All bolts to be stainless steel					
	No 4 bearing to be sleeved for 1-3/4" shaft - air cooled					
	1-1/2" top nut & 1-3/4" tun/tun mech seal					
	Motor must be suitable for VSD drive					
	direct coupled using HRC 230 coupling					
	Rain hats supplied with motor					
	Epoxy paint & hard coat					
	ELECTRIC MOTOR (we supply)					
MAKE	**WEG**	HP	**160KW**	SPEED	**1450**	FRAME **315SM**
		MOUNTING TYPE		**FLANGED**		
					shaft 85MM dia	
					Key 22w x 7 dia (coupling)	

14. Data Sheets and Parts Lists Cont.

BATESCREW PUMPS RECORD SHEET		PUMP NO 7738	DATE	15 Dec 04	
South Gippsland Water		12MS8stvwl2.5Mt dc e	JOB NO:	6002	
NUMBER	**DESCRIPTION**	**SIZE**		**NO OF**	**KG**
12MS31	**INLET BOWL WATER LUBE**	12MS W/L		1	44
RB-1500	**IN/BOWL BUSH W/L**	1-1/2" RUBBER		2	0.3
12MS3201	**NOSE CONE W/L TYPE**	12MS W/L TYPE		1	3
10m35SS	**BOLTS (S/S)**	10mm x 35mm 304 S/S		12	0.6
12MSBC	**BOTT/SAND COLLAR (BR)**	12MS BOTT/SAND/COLL		1	0.5
4-14-2	**GRUB SCREW (S/S)**	8mm x 8mm S/S		2	
12MS-7-2	**TAPER SLEEVE (S/S)**	12MS x 1-1/2" B S/S		8	0.6
12MCBITA	**IMPELLER TRIM "A" (BR)**	12MS FULLTRIM		8	10.5
12MS-8-1	**IMPELLER BOWL W/L**	12MS W/L IMP/BOWL		8	39
RB-1500	**IMP/BOWL BUSH W/L**	1-1/2" RUBBER		8	0.15
10m35SS	**BOLTS (S/S)**	10mm x 35mm 304 S/S		84	0.6
12MSC	**OUTLET BOWL (W/L)**	12MS OUT/BOWL W/L		1	44
4-14-2	**OUT/BOWL BUSH W/L**	1-1/2" RUBBER		2	0.3
10m50SS	**BOLTS & NUTS (S/S)**	10mm x 50mm 304 S/S		12	0.72
12MS2T	**IMPELLER SHAFT 12MS 8ST**	1-1/2"S/S x 2790LH		1	0
	BOT COLUMN 9" CAST IRON	Col C/I fl 1308 long (special fl bot end)		1	
10m35SS	**BOLTS S/S (OB/COL)**	10mm x 35mm 304 S/S		12	0.6
	TOP COLUMN 9" CAST IRON	Col C/I fl 1219 long (special fl top end)		1	
	CBH STEEL	Manufactured CBH for 1-1/2" shaft		2	
16m65SS	**BOLTS & NUTS (COL/CBH/COL)**	16mm x 65mm S/S BOLT & NUT		8	
3	**DISCHARGE HEAD**	8" c.i. *90 deg water		1	
16m65SS	**BOLTS &NUTS (HE/CBH/COL)**	16mm x 65mm S/S BOLT & NUT		8	
	LINESHAFT S/S	1-1/2" 431S/S x 2420L/H		1	
	MUFF COUPLING	1-1/2" L/H		2	
	TOP SHAFT 1-3/4" S/S	1-3/4" S/S x Len Req 1-1/2"top nut		1	
112TN12NF	**TOP NUT&CRUB SCREW B/D**	1-1/2"x12TPI x10mmC/S		1	
	MECH SEAL	1-3/4" TUN/TUN MECH SEAL		1	
	SEAL SEAT	1-3/4" x 2-1/4" x 1-1/4" Long		1	
	GRUB SCREWS	10mm x 10mm S/S		2	
	SEAL MOUNT PLATE	6"O/D x 1-3/4" I/D x 20mm PL		1	
10m35SS	**BOLTS (SEAL PL/HEAD)**	10mm x 35mm 304 S/S		4	
N4BA	**COMPLETE**	No4 Air cooled		1	
	S/S BEARING SLEEVE	No4 BEARING TO 1-3/4" SHAFT		1	
	BOLTS & NUTS (No4/HEAD)	12mm x 50mm S/S Bolt & Nuts		8	
	MOTOR STOOL	no51,No4/WEG 315/8" Cast Head		1	
16m60G	**DISCH HEAD/STOOL BOLTS**	16mm x 60mm GAL B&N		8	
	PUMP 1/2 COUPLING	HRC230 2 3/4" bore - 1/2 x 1/4 key		1	
	RUBBER COUPLING	HRC230		1	
	MOTOR 1/2 COUPLING	HRC230 85 bore - 22 x 7 key		1	
	ELECTRIC MOTOR	WEG 160KW TEFC 4 POLE		1	
20m65G	**MOTOR /STOOL BOLTS**	20mm x 65mm GAL B&N		8	
	NAME PLATE	P/N 7738 J/N 6002 8ST 12MS			

15 IMPELLER CURVE