

STOMACHER[®] SERVICE AND MAINTENANCE MANUAL



**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

This electronic manual consists of 3 parts.

- 1. The general notes presented here on tackling service and maintenance issues.**
- 2. A set of Stomacher schematics with parts identification annotations.**
- 3. Spare parts number and description list.**

These sections are all on the CD ROM as separate files in .pdf and .doc format.

Please contact SEWARD SERVICE if you have any queries or require advice on any issue:

PHONE +44 (0) 1903 236411

FAX +44 (0) 1903 219233

EMAIL info@seward.co.uk

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

WARRANTY & SERVICE POLICY

All **Seward Stomacher** are protected by a 36 month warranty covering faulty workmanship and materials. In the event of a fault occurring within this period please contact **Seward Customer Service** who will arrange the collection / return of the instrument for warranty repair and/or replacement at Seward's discretion.

The warranty is void if the device has been damaged as a result of unauthorised service, lack of routine maintenance, modification or subject to neglect, misuse, accident, improper installation or operation.

The **Seward Stomacher** has been designed to give durable service with a minimum of maintenance. Construction is of a modular form enabling major sub- assemblies to be readily removed and replaced thereby minimising downtime in the unlikely event of a failure.

Seward Ltd are can provide spare parts but are unable to accept any liability implied or otherwise for the incorrect fitting of such parts or cost incurred in the fitting of any replacement parts by third parties.

SAFETY RECOMMENDATIONS

Internal servicing and maintenance should be performed by suitably qualified, trained and authorised personnel fully conversant with this type of equipment. Prior to commencement of work it is recommended that this manual be studied fully. **Seward Ltd** accepts no responsibility implied or otherwise for any damage, loss or injury as the result of incorrect use, maintenance or interpretation of these instructions.

CAUTION:- High voltages are present on the main PCB, transformer, etc.; at all times whilst the instrument is powered "on". The correct safety procedures should therefore be strictly adhered to during the course of all maintenance work.

RECOMMENDED TOOLS FOR SERVICING

The tools listed below are those considered by Seward to be the most appropriate for service and maintenance of the Stomacher 400.

Hexagon socket ball wrenches	- 2.5 mm, 3.0 mm & 5.0 mm sizes
Open end spanner (extra thin series)	- 19/32" A/F.
Large screwdriver	- 150 mm blade length.
Small electrical screwdriver	- 75 mm blade length.
Ball pien hammer	- 500 gram size.
Pin punch	- 3mm size.
External right angle circlip pliers	- 0 to 12 mm size.
Multi-meter	- any basic model
Starlock dome washer application tool	- 11 mm size.

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

Bush insertion tool

- Contact Seward Ltd

In the event of difficulty obtaining any item please contact **Seward Customer Service**.

The correct use of hand tools to remove fasteners, wiring terminations and other conventional components is assumed

ROUTINE SERVICING

It is recommended that the following routine checks be carried out at six monthly intervals unless local regulations or Codes of Practice require more frequent service intervals. If the instrument is extensively use, i.e.; double shift working, then it is recommended to reduce the service interval to three months.

Functional Check

- Run the instrument and ensure all available functions are working correctly.
- Check speeds and times are within specification.
- Take note of any excessive noise, this may be indicative of worn connectors.

Electrical Check

- Check the security of all terminal/ plug connections.
- It is considered good practise to periodically test the instrument using a portable appliance tester and particularly following any electrical repair.

Mechanical Checks

- Check the security of all fastenings, but avoid over tightening.
- Check paddle clearance, a tapping sound from the paddles striking the inside face of the door is indicative of adjustment being required.
- Clean the paddle faces, residue build-up could cause bag damage.
- Examine the rubber connectors for signs of deterioration, always replace as a pair as necessary.
- Examine the knuckle pivots, checking for bearing wear, replace as necessary.
- Check the paddle shaft bearings, replace if any radial wear is detected.
- Lubricate the paddle shaft bearings; apply two to three strokes from an oil gun containing SA30 to each oil nipple. **DO NOT** over lubricate as this may cause oil to forced past the seals. **DO NOT USE GREASE UNDER ANY CIRCUMSTANCE.**
- Ensure eccentrics are tight on the gearbox output shafts.
- Check the door mechanism linkage for absence of excessive play.
- Check the operation of the door interlock switch.

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

TROUBLE SHOOTING

When experiencing a problem and before consulting the fault diagnosis charts that follow, please ensure that all electrical connection, plugs and sockets are firmly and correctly engaged.

Please be aware that the instrument incorporates an overload protection circuit within the controller and limits the current draw to prevent the risk of overheating or other damage.

Under adverse conditions the motor may take a little more time to build up sufficient torque to start and run at the selected speed. These conditions are:-

1. Upon initial start up following a period of transportation or storage.
2. The instrument has been stored or is in a cold environment i.e. less than 10 C.
3. Overloading the instrument due to the nature of the sample.
4. The paddle shafts are tight in their bearings, possibly following the incorrect replacement of the bearings.

The above can be overcome in the following manner:-

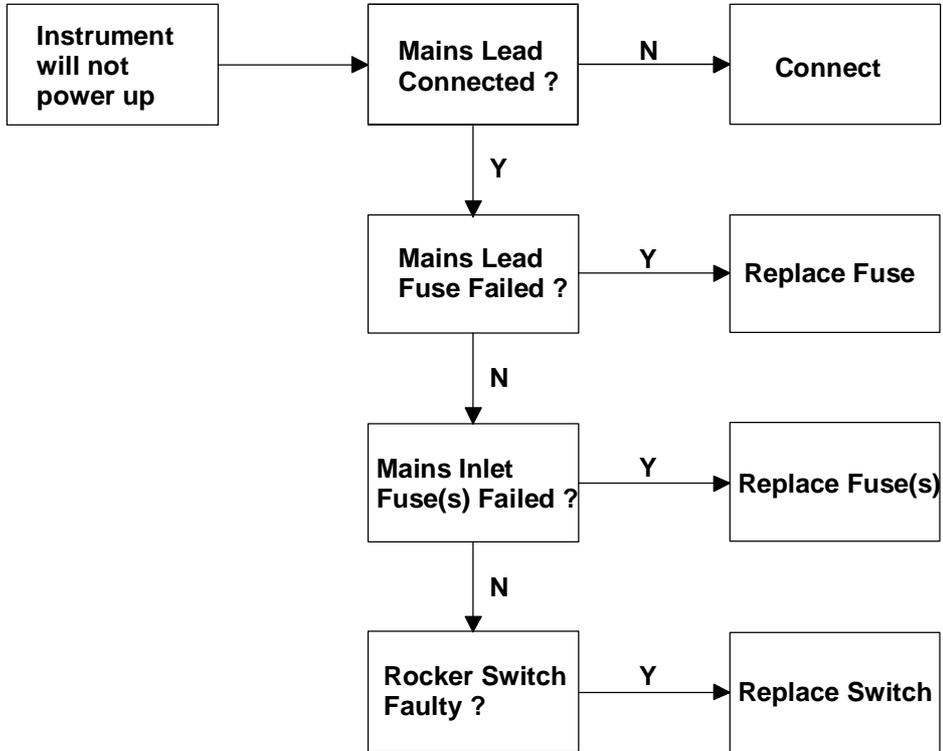
1. Run for 5 to 10 minutes with a number of stop/start cycles
2. Allow the instrument to stand in a warmer environment i.e. above 10 C, for at least 2 hours then run for 5 to 10 minutes with a number of stop/start cycles.
3. Reduce the sample size.
4. Ref.. to section on paddle shaft bearings.

In the event of being unable to reach a diagnosis please contact **Seward Customer Service**.

**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

**FAULT DIAGNOSIS
CHART No. 1**

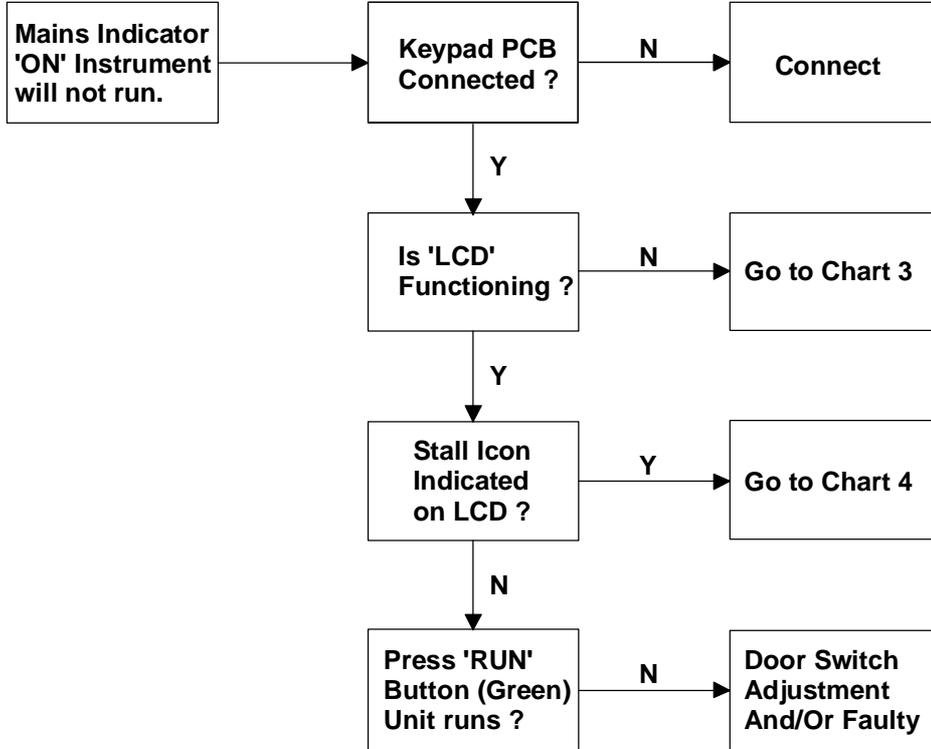
FAULT DESCRIPTION



**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

**FAULT DIAGNOSIS
CHART No. 2**

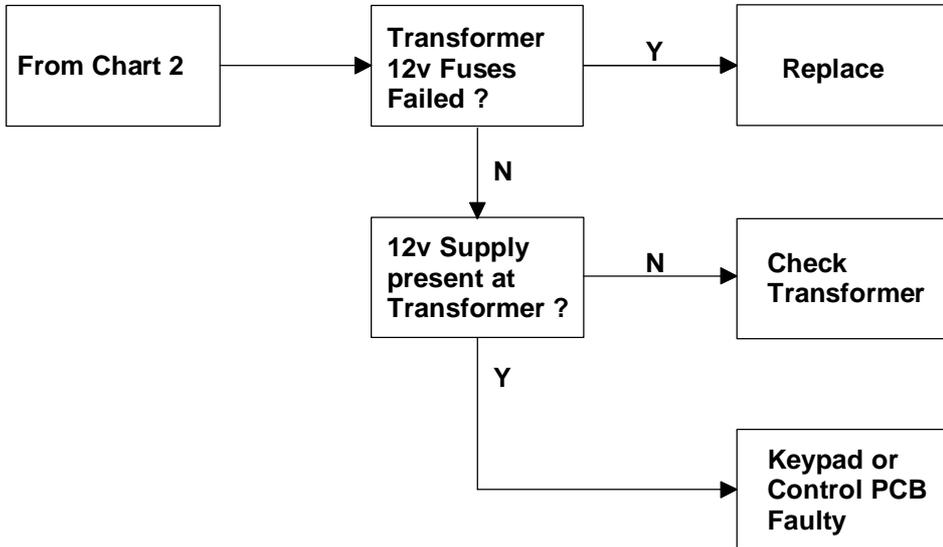
FAULT DESCRIPTION



**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

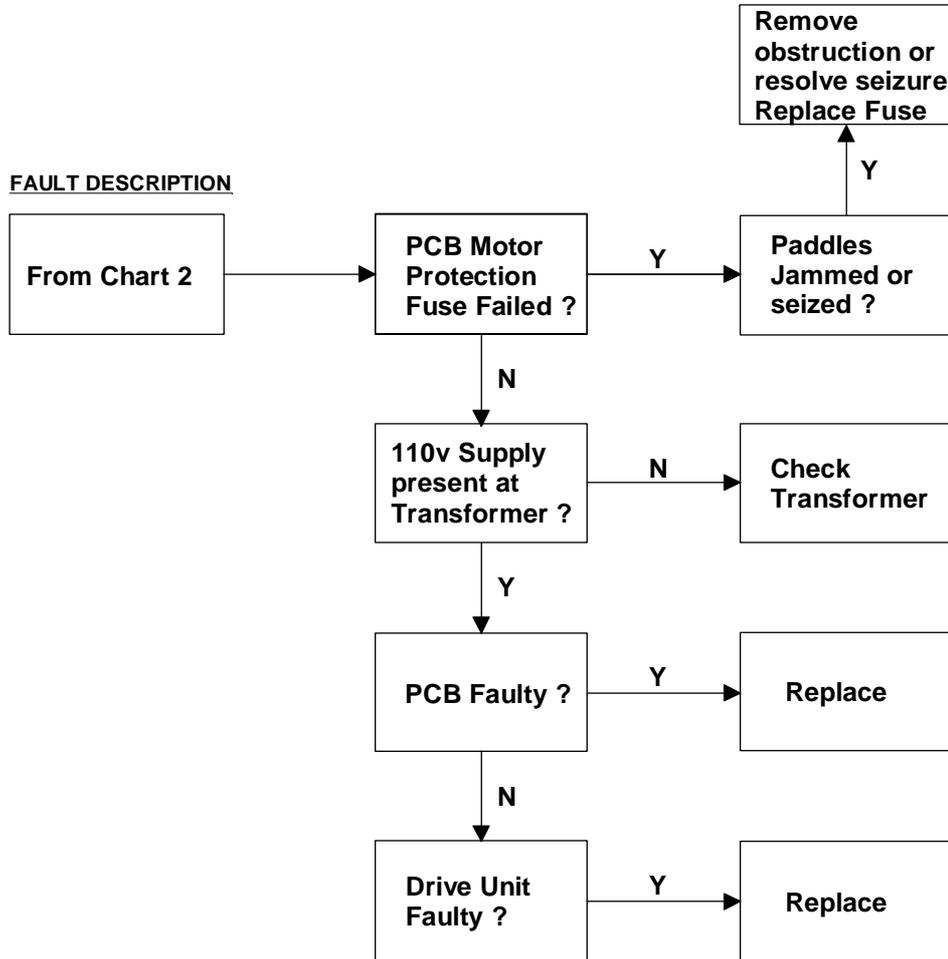
**FAULT DIAGNOSIS
CHART No. 3**

FAULT DESCRIPTION



**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

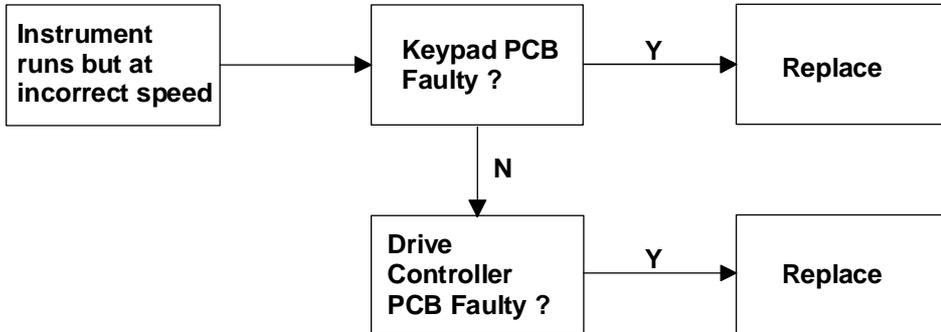
**FAULT DIAGNOSIS
CHART No. 4**



**STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS**

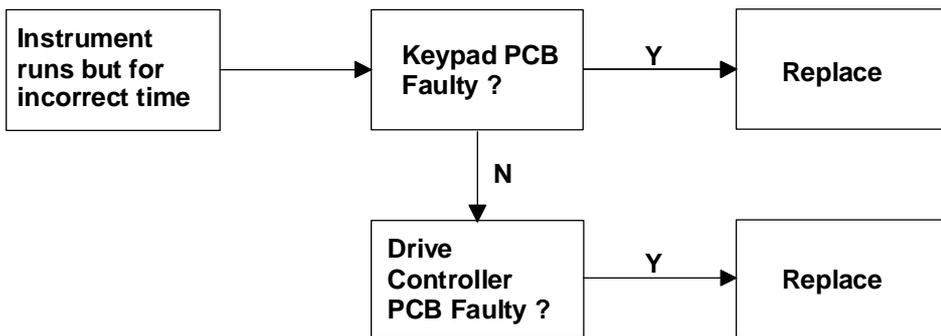
**FAULT DIAGNOSIS
CHART No. 5**

FAULT DESCRIPTION



**FAULT DIAGNOSIS
CHART No. 6**

FAULT DESCRIPTION



STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

STOMACHER ELECTRONIC SERVICE PROCEDURES

To replace the Drive Control PCB remove the rear cover and disconnect the main loom plug and the ribbon cable from the Keypad PCB. Remove the socket cap screws holding the PCB taking care not to cause any damage. Replacement is the reverse procedure, ensure the connectors are fully inserted.

Keypad Display PCB Replacement

To replace the Keypad Display PCB remove the rear cover and disconnect the ribbon cable from the Drive Control PCB. Remove the socket cap screws holding the PCB taking care not to cause any damage. Replacement is the reverse procedure, ensure the connectors are fully inserted.

Transformer & Choke Replacement

Removal and replacement of the transformer and choke is straightforward by the removal of the screw fasteners. The choke terminations are soldered to the loom requiring replacement and removal by this method. It is imperative that the outputs on the transformer are replaced in exactly the same positions as they were prior to dismantling. Refer to block wiring diagram.

Door Interlock Micro Switch Replacement

The door interlock micro switch is actuated by a ramp incorporated into the adjacent rotating link. The switch is retained by two thin brass lock nuts threaded onto the shank of the switch and positioned either side of the main body wall through which the shank passes.

To adjust the switch slacken both lock nuts and rotate the appropriate nut to move the switch in the desired direction. Re-tighten carefully avoiding excessive force, which could damage the thread of the switch body. To remove the switch detach the loom wiring and remove the outside lock nut allowing the switch to be removed from the inside of the instrument.

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

STOMACHER MECHANICAL SERVICE PROCEDURES

General Description

All threads tapped ISO metric course. The door and door links are stainless steel; the rear cover is sheet steel. The paint finish is stoved for durability.

NOTE -Care should be taken not to over tighten any fastener, as this may cause damage to the threads in the casting. If in doubt the recommended tightening torque's listed below should be adhered to:-

Screw Size (mm)	Torque (Nm)
M3	0.95
M4	2.22
M5	4.00
M6	5.40

Door, Handle & Bag Clamp

After long periods of use the paint may wear away from the inside face of the door, this is quite normal and no cause for concern as the door is constructed of stainless steel.

The door is removed by prising off the two starlock dome washers, releasing the links and lifting the door off of it's bottom pivots with a sharp lifting movement.

The bag clamp, complete with door linkage, is removed by undoing the bag clamp fastening that attaches it to the main body. The linkage should not normally require attention.

Drive Unit.

The motor gearbox drive unit is sealed with no requirement or provision for maintenance and if faulty must be replaced as a complete unit. After extreme periods of service it may be necessary to replace the motor brush gear, in this event contact **Seward Customer Service** for advice.

The drive unit is secured to the aluminium motor mounting block by four socket cap screws, **DO NOT SLACKEN**, unless it is necessary to replace the drive unit. The motor mounting block runs in machined guides in the main body to provide paddle clearance adjustment relative to the inside face of the door. The motor block adjusting screw is captive within the motor mounting block and threaded into the main body to facilitate and provide retention of adjustment. The motor mounting block has slotted holes and is retained to the main body by four socket cap screws. These retaining screws must be slackened before attempting to turn the motor block adjusting screw and always re-tighten after adjustment.

To remove the drive it is advised to remove the connector.

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

If the drive unit is released from the motor mounting block, it should be re-aligned using normal engineering methods such as a dial indicator. However, with experience it is possible to re-align by a combination of eye and “double tapping” as described later.

Replacement is the reverse procedure and it is recommended that new spring tension pins be fitted.

Paddles & Connector Assemblies

The flexible connectors are subjected to compression by the Stomaching process and may deteriorate depending on the degree of use and application. Therefore, they should be routinely inspected. We recommend that to ensure optimum performance and to reduce potential down time of the instrument that connectors, if and when replaced, are done so as a pair and that the ball journal bearings and paddle pivot pin bushes are simultaneously replaced.

To replace the connector assembly remove the rear cover, slacken the socket cap screws retaining the motor mounting block to the main body and, with the paddles in maximum stroke position, turn the motor block adjusting screw so the to retract the drive unit fully to the rear of the instrument. Remove one of the circlips from the clevis pivot pin and remove the pin. Release the eccentrics from the gearbox output shafts by driving out the spring tension pins with a pin punch. It is now possible to remove the clevis from the cap end by driving out the spring tension pin and the eccentric by removing the circlip and pressing the eccentric out. The new connector assemblies are supplied with the ball journal bearing fitted. Replacement is the reverse procedure, always fit new spring tension pins. Adjust the paddle clearance as described in 7.6, refit rear cover and test.

The paddles are a stainless steel fabrication and in the event of damage should be replaced, DO NOT attempt to straighten or repair a damaged shaft. When fitting new paddles we recommend that new paddle bushes are also fitted.

Paddles Shaft Bushes

Oilite bushes pressed into the main body support the paddle shafts. These bushes are of sintered construction and are impregnated with lubricant during their manufacture. Oil nipples are provided to allow additional lubrication as detailed in routine maintenance.

If the bushes require replacement it is necessary to remove the rear cover, connector assemblies, drive unit and paddles. Remove the worn bushes using a drift of 8 - 10mm diameter, engaging on the inner end of the bush being removed. Avoid damaging the bore if possible. Insert the first new bush using the insertion tool, contact Seward Ltd, insert the second bush ensure the mandrel of the insertion tool passes through the first bush to ensure bore alignment. Check the fit of each paddle, the paddle should slide easily and smoothly in the bush bores with minimum resistance and NO radial play. Any tightness should be eased by manipulating the paddle shaft in a circular twisting motion, thereby burnishing the bores, until the desired fit is achieved. In extreme cases, use of an expanding reamer rotated backwards (anti-clockwise) to improve the

STOMACHER 80/ 400 CLASSIC/ 400 CIRCULATOR/ 3500 Series
MAINTENANCE INSTRUCTIONS

fit. UNDER NO CIRCUMSTANCES should any material be reamed from the bush as this will cause the bush to “bleed” excessive lubricant.
Re assemble all components, adjust the paddle clearance.

Paddles Clearance Adjustment

After carrying out any of the procedures it will be necessary to check and/or adjust the paddle clearance.

To adjust the paddle clearance, remove the rear cover; slacken the socket cap screws holding the motor mounting plate to the main body. DO NOT slacken the screws holding the drive unit to the motor mounting plate otherwise alignment will be lost. Turn the motor block adjusting screw until each paddle just touches the inside face of the door when the paddles are at their maximum forward stroke position.. If the instrument is run briefly the alternate tapping noise of each paddle touching the door should be just audible. Take up any backlash in the motor block adjusting screw and turn it back one to one and a quarter turns. Tighten the socket cap screws retaining the motor mounting plate and refit the cover. If correctly adjusted the ‘double tap’ of the paddles should be just audible when the front of the door is flexed inwards by hand whilst the instrument is running.