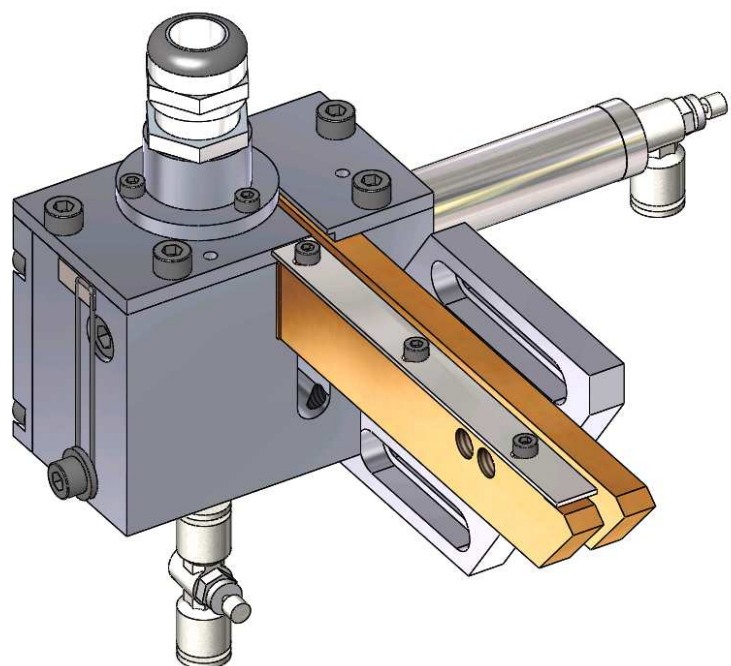


TAYLOR STUDWELDING SYSTEMS LIMITED.

OPERATING MANUAL
FOR
AUTO FEED ESCAPEMENT UNIT



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3	General information
5	Introduction
7	Safety
10	Setting up
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GENERAL INFORMATION

MANUFACTURERS DETAILS



**TAYLOR STUDWELDING SYSTEMS LIMITED
COMMERCIAL ROAD
DEWSBURY
WEST YORKSHIRE
WF13 2BD
ENGLAND**

**TELEPHONE : +44 (0)1924 452123
FACSIMILE : +44 (0)1924 430059
e-mail : info@taylor-studwelding.com**





**TECHNICAL TEL : +44 (0)1924 487703
SALES TEL : +44 (0)1924 487701**

PURPOSE AND CONTENT OF THIS MANUAL

This manual has been written for :

-  **The operator of the welding machine.**
-  **The personnel of the final customer responsible for the installation and operation of the machine.**

This manual contains information on :

-  **Installation and connection**
-  **Operation.**
-  **Technical data.**
-  **Spare parts.**
-  **Accessories.**

GENERAL INFORMATION

FURTHER INFORMATION

Should you require additional technical information, please contact us directly (details on page 3) or our local agent / distributor (details of agents etc. can be obtained from us).

This manual contains important information which is a pre-requisite for safe operation of the equipment. The operating personnel must be able to consult this manual. In the interests of safety, make this manual available to your personnel in good time.

If the equipment is sold / passed on, please hand over this manual to the new owner. Please immediately inform us of the name and address of the new owner, in case we need to contact him regarding the safety of the device.



Please read this manual carefully before installation of the machine.



Please especially observe the safety instructions.

INTRODUCTION

INTRODUCTION

The complete range of Taylor Studwelding Systems Capacitor Discharge and Drawn Arc units are compact, portable Stud Welding equipments. The units are specifically designed to enable a small diameter range of ferrous and non-ferrous weld studs to be welded to light gauge, self-finish or pre-coated materials, and in the case of CD with little or no reverse marking.

The equipment consists of an automatic feed escapement for use with an auto feed welding pistol or SIK2 weld.

Two different processes are available: Capacitor Discharge (CD) and Drawn Arc (DA), these are outlined below.

THE PROCESS (CD)

Capacitor Discharge stud welding is a form of welding in which the energy required for the welding process is derived from a bank of charged capacitors. This stored energy is discharged across the gap between the two surfaces to be welded as they are propelled towards each other. The arc produced heats the two surfaces, melting a thin film of metal on each surface and the propelling force closes the gap between the two faces, thus forming a weld.

In contact welding the stud to be welded is forced by spring pressure on to the plate. At this point the arc gap between the two components is maintained by a small pip on the welding face of the stud. On initiation of the high current pulse from the capacitors, this pip vaporises and an arc is drawn between the workpiece and the stud. The heat from this arc melts the base of the stud and the area of the work piece directly beneath the stud, whilst the spring pressure from the pistol accelerates the stud towards the workpiece. Within 3 to 4 milliseconds the stud hits the workpiece and the arc is extinguished. The kinetic energy contained in the moving stud and the remaining spring pressure, forge the molten parts together to form a weld.

INTRODUCTION

THE PROCESS (DA)

The Drawn Arc process is a long established, well proven method of stud welding. The pistol lifts the stud to be welded away from the workpiece, simultaneously striking an arc between the two. This causes both the stud and the workpiece to melt. After the pre-selected weld time has elapsed, the pistol returns the stud to the molten pool on the workpiece, thus forming the weld. The energy required to perform the weld is derived from a transformer - rectifier in the weld control unit.

Infinitely variable weld time allows for short cycle welding, with or without inert gas purging.

SAFETY

PROTECT YOURSELF AND OTHERS !

Read and understand these safety notices.

1. ELECTRICAL

No portion of the outer cover of the welding controller should be removed by anyone other than suitably qualified personnel and never whilst mains power is connected. **ALWAYS** disconnect the mains plug from the socket.



RISK TO LIFE !!!

BE AWARE ! The CD equipment may contain a sealed power supply module which operates on high frequency inverter principles. Due to the potentially fatal voltages in this module we do not recommend tampering with the module. It can be safely removed and replaced via our factory exchange system.

BE AWARE ! Capacitors store electrical energy. Check for residual charge before carrying out any internal maintenance.

DO NOT ! use any fluids to clean electrical components as these may penetrate into the electrical system

Installation must be according to the setting up procedure detailed on pages 10 to 15 of this manual and must be in line with national, regional and local safety codes.

2. FIRE

During welding small particles of very hot metal are expelled. Ensure that no combustible materials can be ignited by these.

SAFETY

3. PERSONNEL SAFETY

Arc rays can burn your eyes and skin and noise can damage your hearing.

Operators and personnel working in close proximity must wear suitable eye, ear and body protection.

Fumes and gases can seriously harm your health. Use the equipment only in a suitably ventilated area. If ventilation is inadequate, then appropriate fume extraction equipment must be used.

Hot metal spatter can cause fire and burns. Appropriate clothing must be worn.

Clothing made from, or soiled with, combustible materials must NOT be worn. Have a fire extinguisher nearby and know how to use it.

Magnetic fields from high currents can affect heart pacemakers or other electronically controlled medical devices. It is imperative that all personnel likely to come into the vicinity of any welding plant are warned of the possible RISK TO LIFE before entering the area.

4. MAINTENANCE

All cables must be inspected regularly to ensure that no danger exists from worn or damaged insulation or from unsound electrical connections. Special note should be made of the cables close to the pistol, where maximum wear occurs.

As well as producing inconsistent welds, worn cables can overheat or spark, giving rise to the risk of fire.

5. TRAINING

Use of the equipment must be limited to authorised personnel only who must be suitably trained and must have read and understood this manual. This manual must be made available to all operators at all times. Further copies of this manual may be purchased from the manufacturer. Measures must be taken to prevent the use of this equipment by unauthorised personnel.

SAFETY

6. INSTALLATION

Ensure that the site chosen for the equipment is able to support the weight of the equipment and that it will not fall or cause a danger in the course of its normal operation. Do not hang connecting cables over sharp edges and do not install connecting cables near heat sources or via traffic routes where people may trip over them or they may be damaged by the passage of vehicles (forklifts etc.).

7. INTERFERENCE

During welding operations, intense magnetic and electrical fields are unavoidably produced and these may interfere with other sensitive electronic equipment.

As previously mentioned, all personnel wearing heart pacemakers or other electronically controlled medical devices must be kept well away from any welding operations.

The welding equipment should be installed at least 5 metres away from any computer equipment to minimise any possible interaction. Note that cables carrying signals between electronic devices are also capable of picking up interference which may modify the way in which those devices function and therefore should be sited outside the 5 metre zone.

Do not place objects which are sensitive to magnetism near the welding area, wristwatches, credit cards, computer disks etc. may all be rendered useless.

The welding equipment, like all other welding equipment, is itself electronically sensitive and its position relative to other radiation emitting equipment (mobile phones, remote controls, motor speed controllers etc.) must be considered.

8. DISPOSAL

The equipment either wholly or any of its component parts may be disposed of as part of general industrial waste or passed to a scrap merchant. Non of the components used in the manufacture are toxic, carcinogenic or harmful to health.

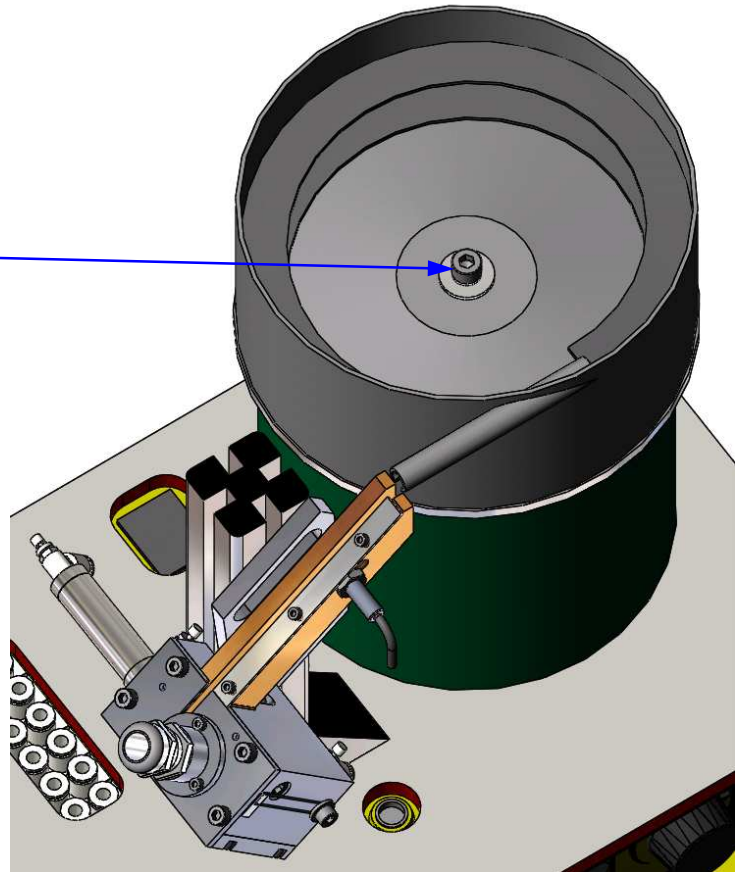
SETTING UP

SETTING UP THE BOWL & ESCAPEMENT

Setup the bowl feed & for the required stud diameter.

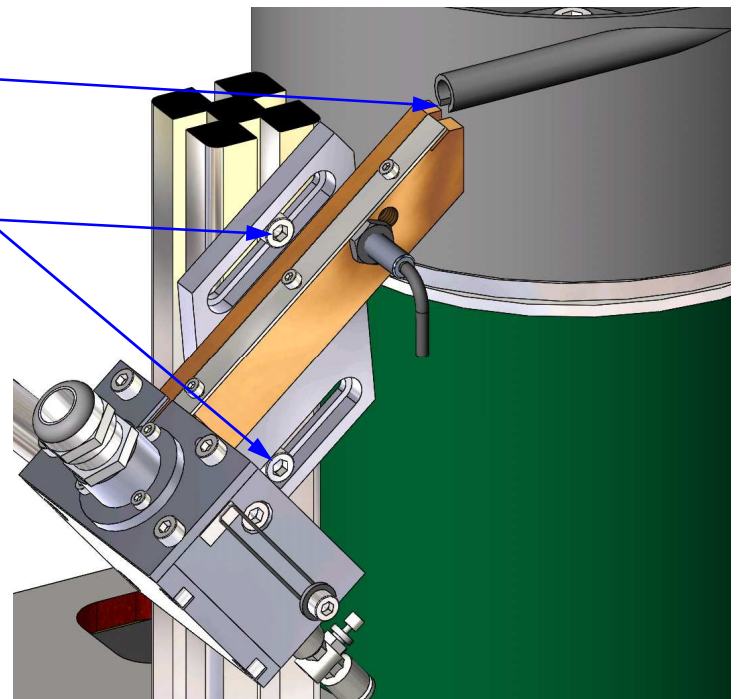
To change the bowl, undo the screw in the centre of the bowl, remove the bowl and replace with the correct one for the stud being used (see page 20 for a list suitable bowls).

bowl mounting screw



Align the output tube of the bowl with the track of the escapement and re-tighten the central screw.

If necessary loosen these 2 screws to move the position of the escapement.

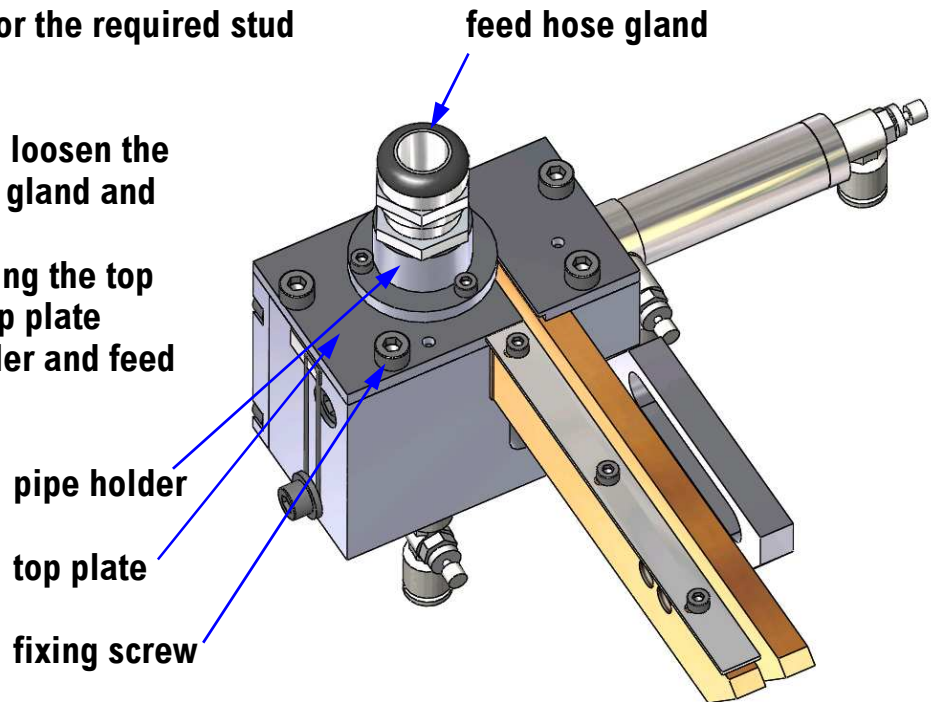


SETTING UP

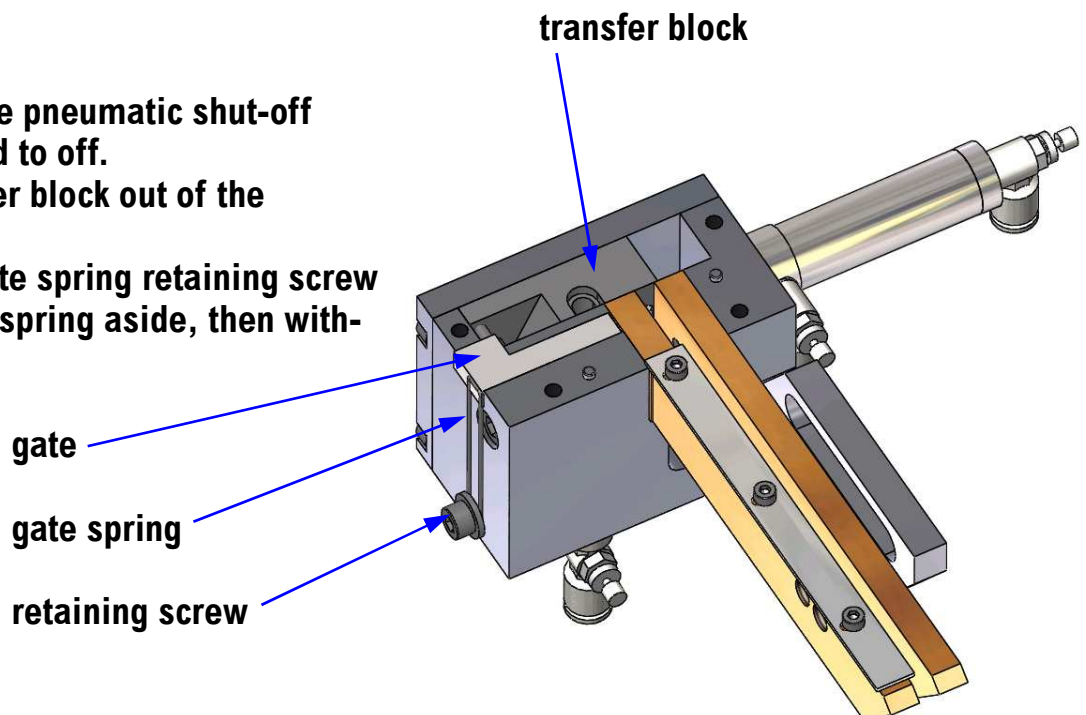
SETTING UP THE BOWL & ESCAPEMENT

Setup the escapement for the required stud diameter.

To change the stud size, loosen the top nut of the feed hose gland and pull out the feed hose. Undo the 4 screws holding the top plate and remove the top plate complete with pipe holder and feed hose gland.



Ensure that the pneumatic shut-off valve is turned to off. Lift the transfer block out of the escapement. Loosen the gate spring retaining screw and move the spring aside, then withdraw the gate.

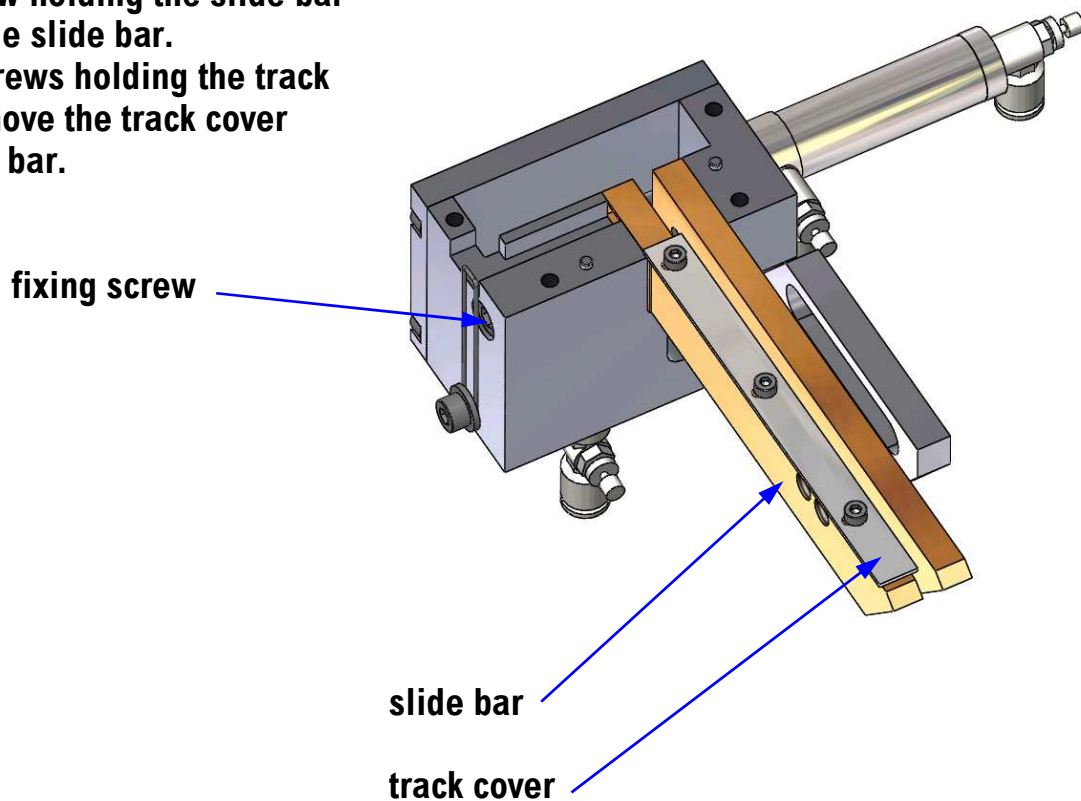


SETTING UP

SETTING UP THE BOWL & ESCAPEMENT

Undo the screw holding the slide bar and remove the slide bar.

Undo the 3 screws holding the track cover and remove the track cover from the slide bar.

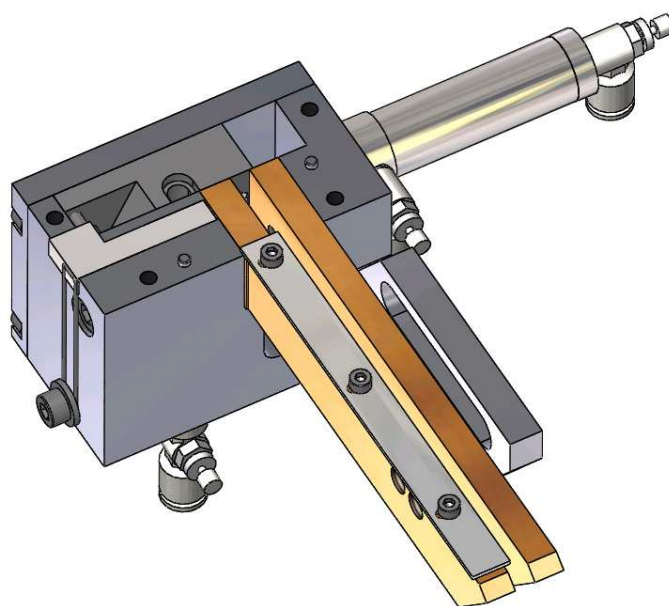


Select the correct transfer block, gate and slide bar for the studs being used, and fit them to the escapement (see pages 19 & 20 for a list of parts).

Make sure that the transfer block and gate are free to move.

Put the gate spring back over the gate and tighten the retaining screw.

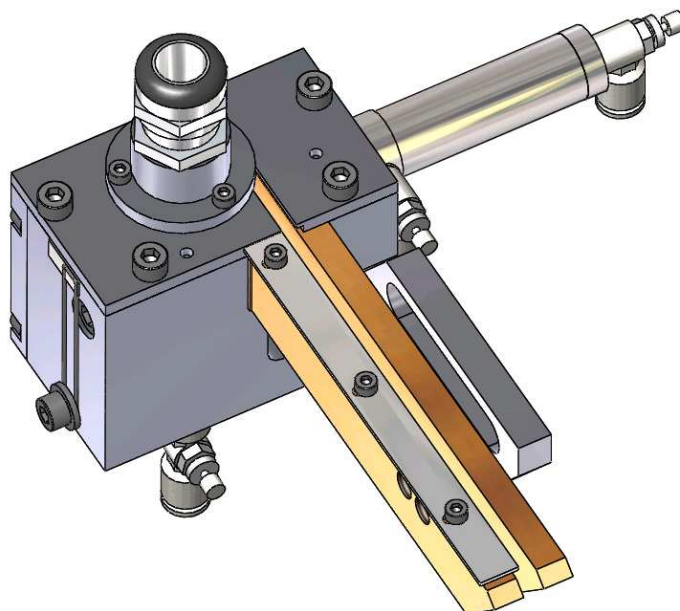
Refit the track cover to the slide bar.



SETTING UP

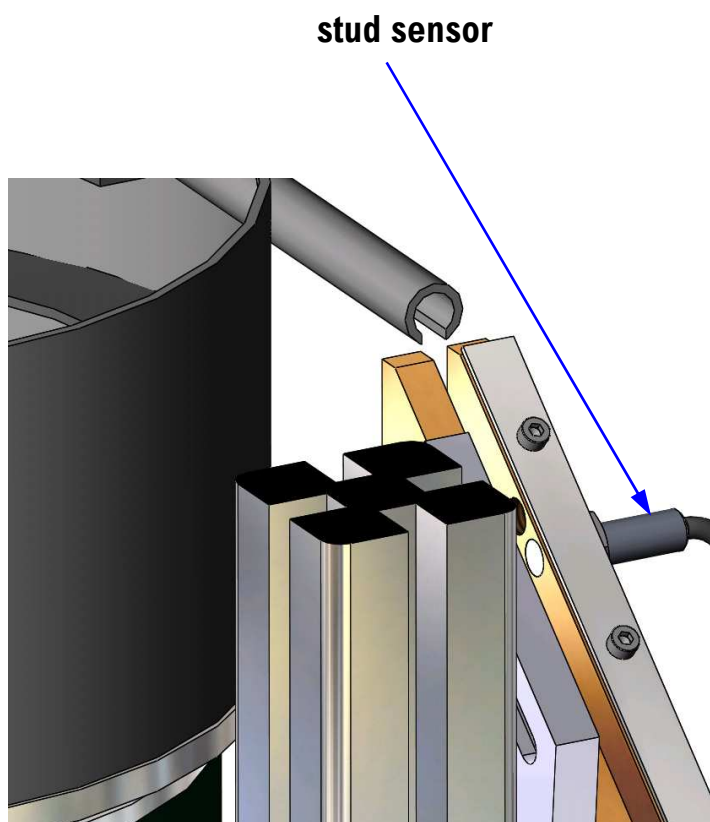
SETTING UP THE BOWL & ESCAPEMENT

Select the correct pipe holder and top plate for the stud being used (see page 19), fit the pipe holder to the top plate and then the top plate to the escapement. Screw the feed holder gland into the pipe holder. Select the correct feed hose (see page 21) and push it in the gland and pipe holder, make sure it is pushed fully home and tighten the gland nut. This only needs to be hand tight.



There are 2 stud sensors. The top one turns the bowl feeder on and off depending on whether it is covered or uncovered. If the bottom is uncovered it stops the system from welding.

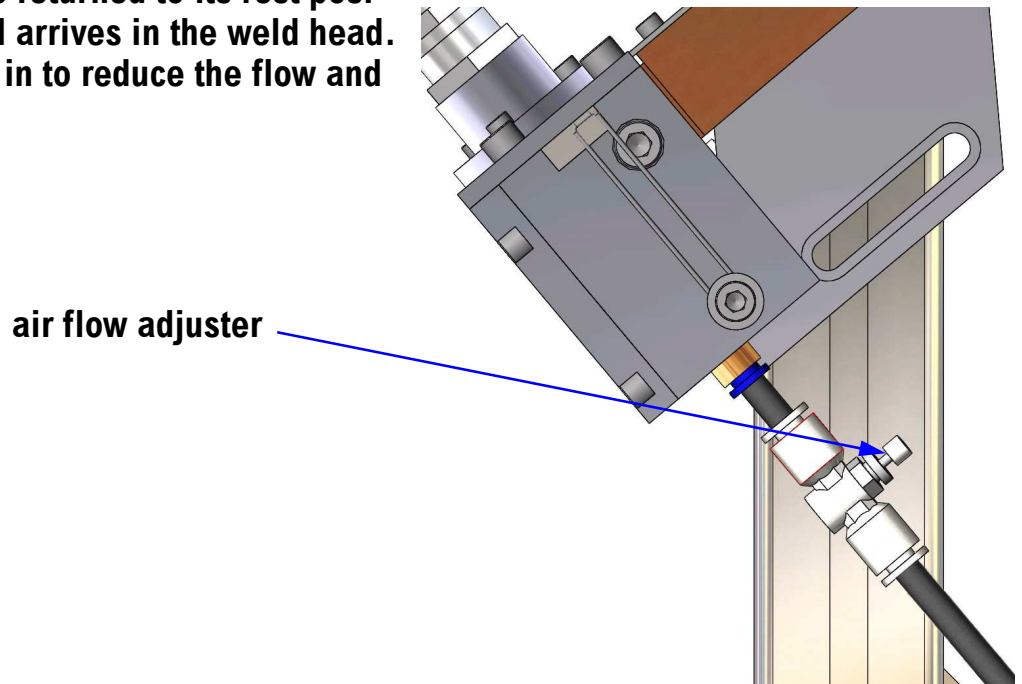
Screw the stud sensors into the slide bar so that the inner faces of the sensorS and slide bar are flush, use the lock nut to hold them in place.



SETTING UP

SETTING UP THE BOWL & ESCAPEMENT

If necessary adjust the stud air flow. If the air flow is too slow the feed piston in the pistol may have returned to its rest position before the stud arrives in the weld head. Screw the adjuster in to reduce the flow and out to increase it.



Adjust the vibration speed to match the feed rate of the bowl and the weld rate of the weld head. This may need to be adjusted as the quantity of studs in the bowl varies, i.e. as the quantity of studs falls, the vibration speed may need to be increased.



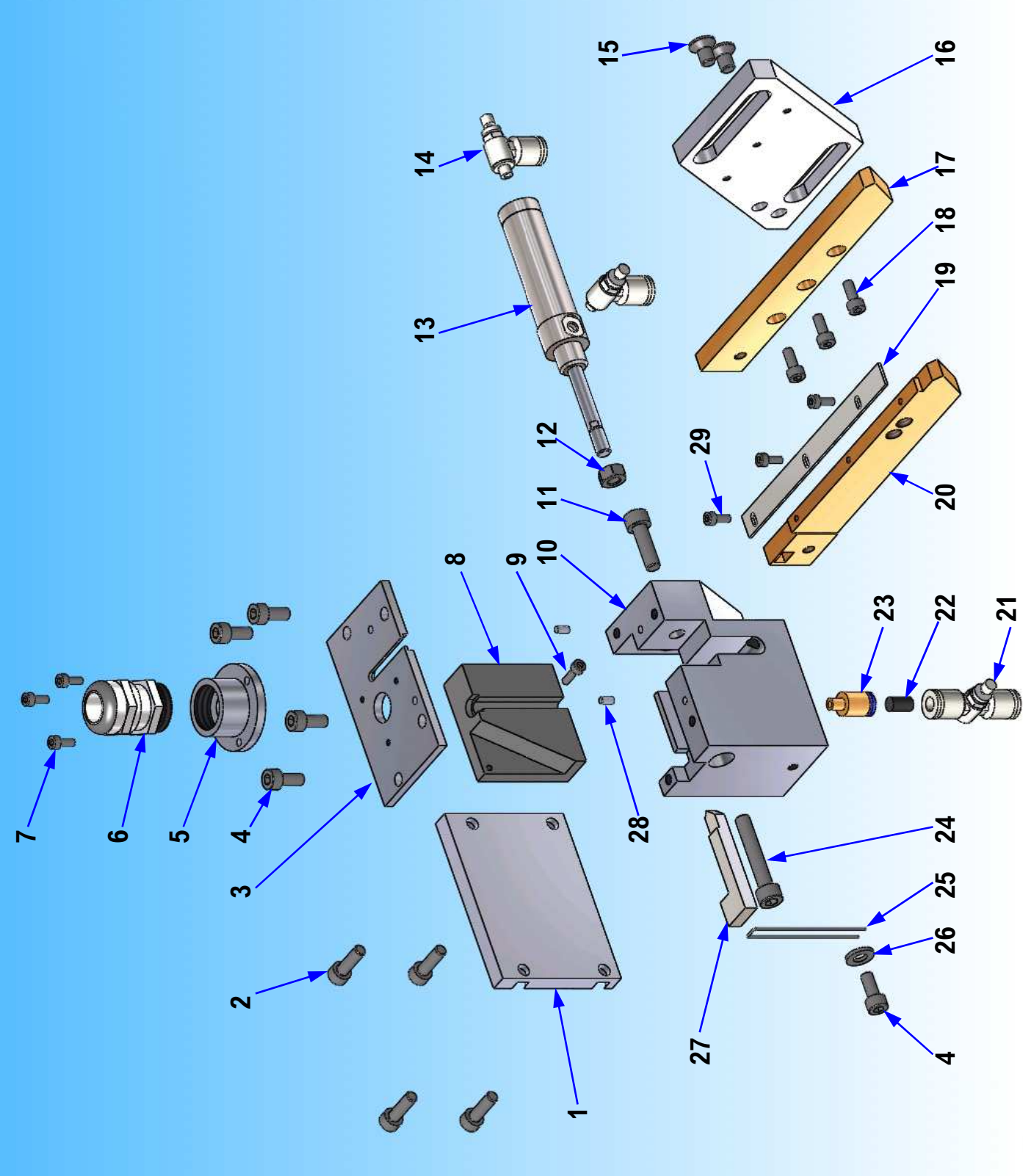
SETTING UP

SETTING UP THE WELD CONTROLLER

Set up the capacitor discharge or drawn arc weld controller as shown in the manual appropriate for that piece of equipment.



ESCAPEMENT COMPONENT EXPLOSION

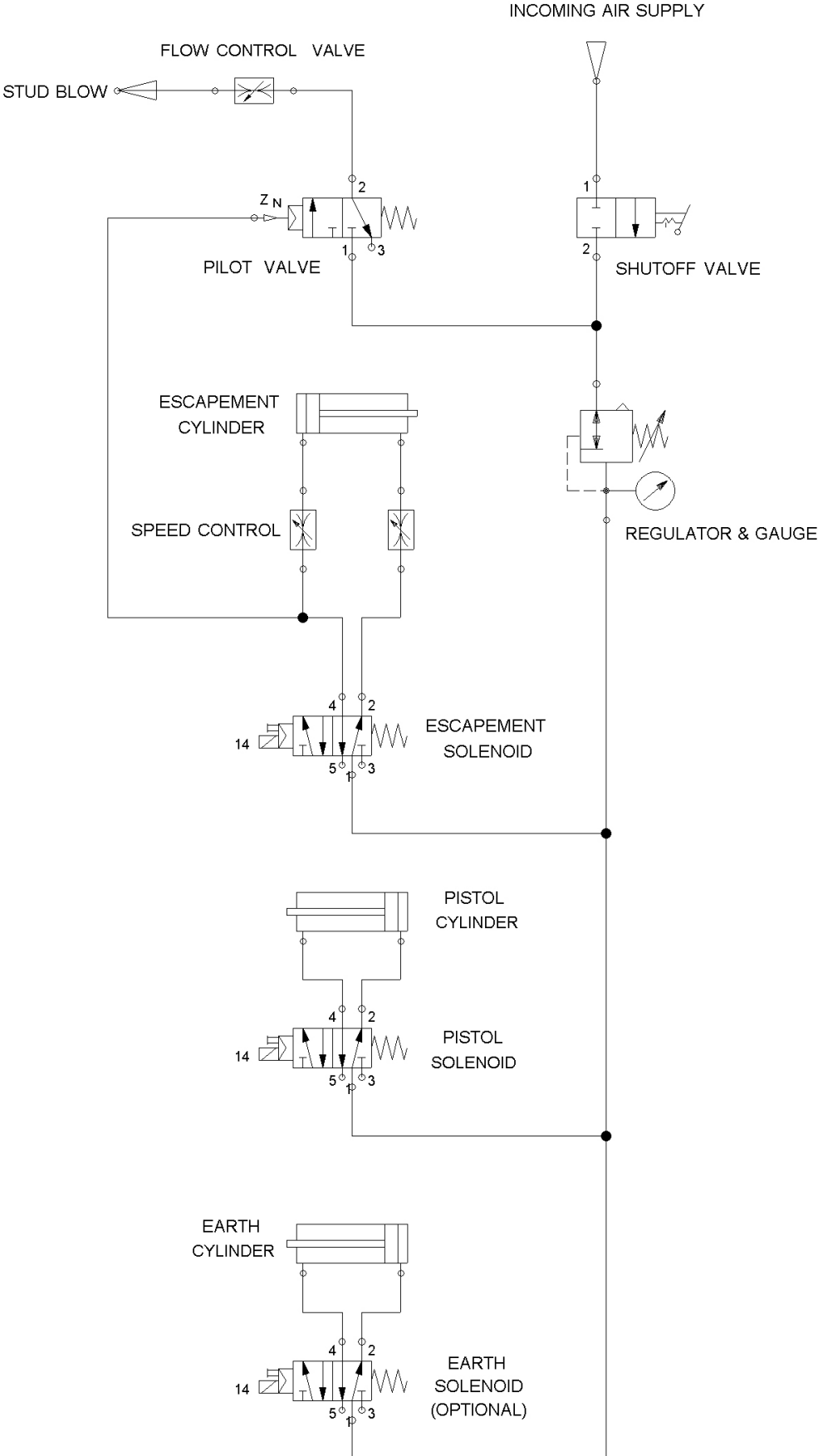


ESCAPEMENT COMPONENT EXPLOSION

ITEM No	QTY	DESCRIPTION	PART No
1	1	BACKPLATE	71-103-861
2	4	SKT CAP HD SCREW M5 x 16 LONG	Z105-05-016
3	1	TOP PLATE M3 TO M10	SEE PAGE 19
4	5	SKT CAP HD SCREW M5 x 12 LONG	Z105-05-012
5	1	PIPE HOLDER M3 TO M10	SEE PAGE 19
6	1	FEED HOSE GLAND	71-103-081 *
7	3	SKT CAP HD SCREW M3 x 8 LONG	Z100-03-008
8	1	SHUTTLE BLOCK M3 TO M10	SEE PAGE 19
9	1	SKT CAP HD SCREW M3 x 10 LONG	Z100-03-010
10	1	MAIN BLOCK	71-103-860
11	1	SKT CAP HD SCREW M6 x 20 LONG	Z100-06-020
12	1	DRIVE NUT	71-103-927
13	1	DRIVE CYLINDER	71-200-209
14	2	PNEUMATIC SPEED CONTROL	71-200-026
15	2	SKT CSK SCREW M6 x 10 LONG	Z120-06-010
16	1	MOUNTING PLATE	71-103-920
17	1	STANDARD RAIL	71-103-862
18	3	SKT CAP HD SCREW M4 x 10 LONG	Z100-04-010
19	1	TRACK COVER	71-103-911
20	1	RAIL M3 TO M10	SEE PAGE 20
21	1	PNEUMATIC SPEED CONTROL	71-200-166
22	0.2m	PNEUMATIC PIPE	71-200-159
23	1	M5 x DIA 6 STRAIGHT FITTING	71-200-210
24	1	SKT CAP HD SCREW M6 x 35 LONG	Z105-06-035
25	1	GATE SPRING	71-103-919
26	1	M6 BRASS WASHER	Z605-05-000
27	1	GATE M3 TO M10	SEE PAGE 20
28	2	ALIGNMENT PIN	71-101-007
29	3	M3 x 6 THUMBSCREW	71-103-912

* For M10 substitute 81-108-019.

PNEUMATIC DIAGRAM

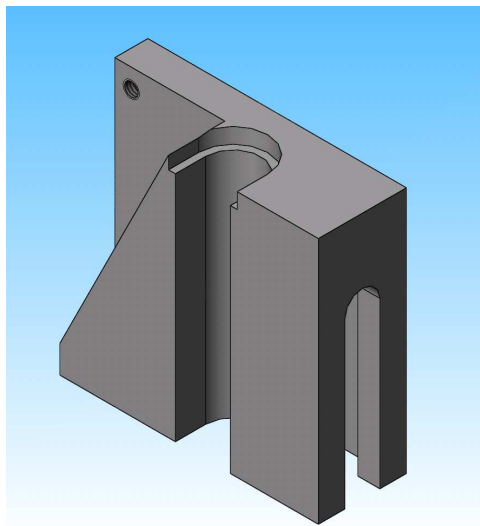


ACCESSORIES

ESCAPEMENT

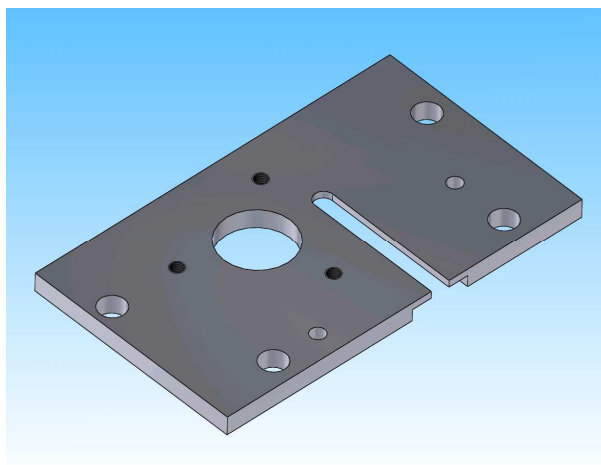
Transfer block

M3	71-103-863
M4	71-103-864
M5	71-103-865
M6	71-103-866
M8	71-103-868
M10	71-103-870



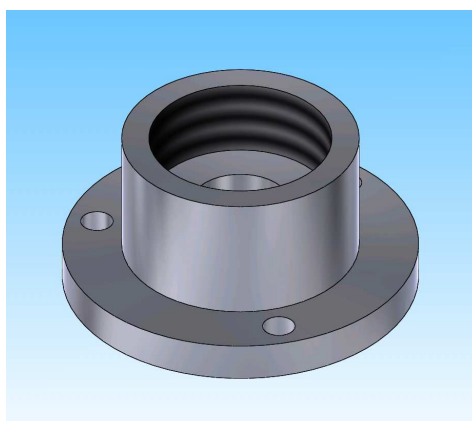
Top plate

M3	71-103-873
M4	71-103-874
M5	71-103-875
M6	71-103-876
M8	71-103-878
M10	71-103-880



Pipe holder

M3	71-103-893
M4	71-103-894
M5	71-103-895
M6	71-103-896
M8	71-103-898
M10	71-103-900

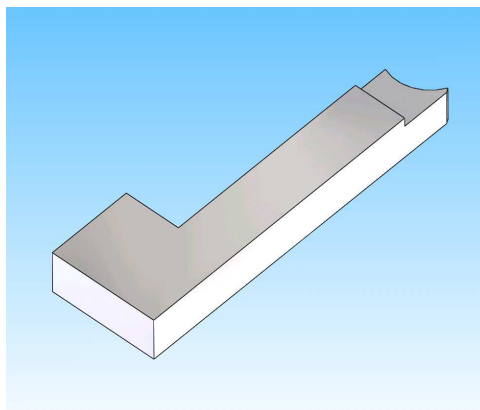


ACCESSORIES

ESCAPEMENT

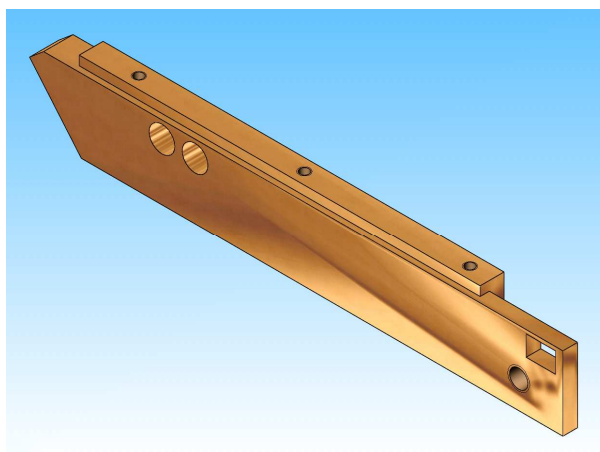
Gate

M3	71-103-903
M4	71-103-904
M5	71-103-904
M6	71-103-906
M8	71-103-908
M10	71-103-901



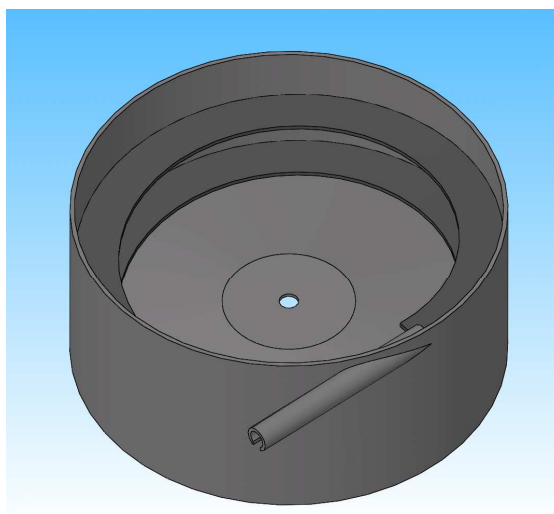
Slide bar

M3	71-103-883
M4	71-103-884
M5	71-103-885
M6	71-103-886
M8	71-103-888
M10	71-103-881



Bowl top

M3	40-20146
M4	40-20151
M5	40-20030
M6	40-20057
M8	40-20286

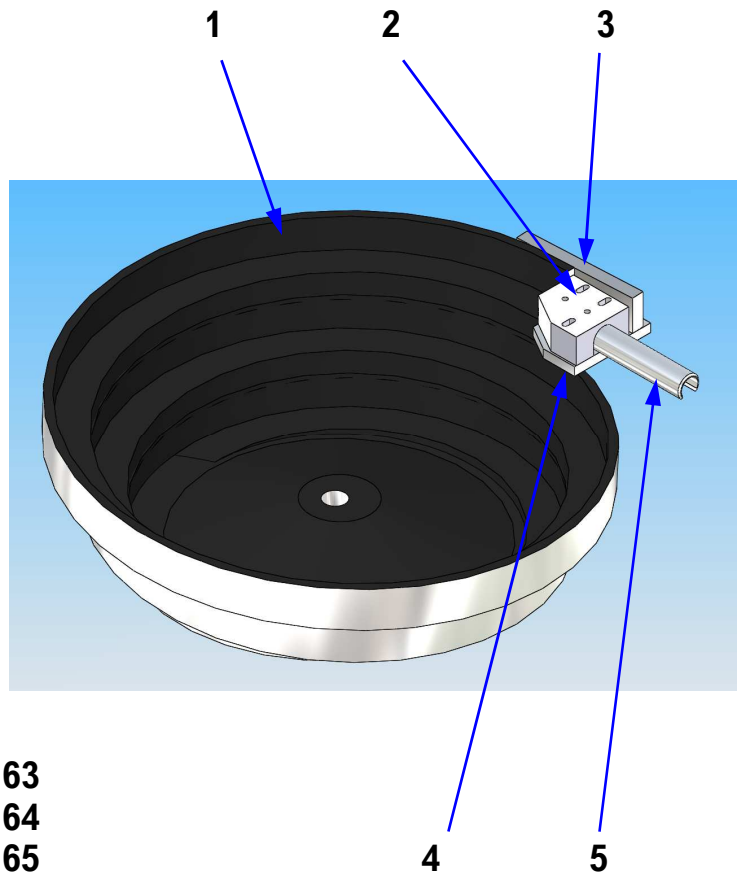


ACCESSORIES

A cast aluminium bowl is available, this has a larger capacity than the standard bowl & can also be used with M10 studs

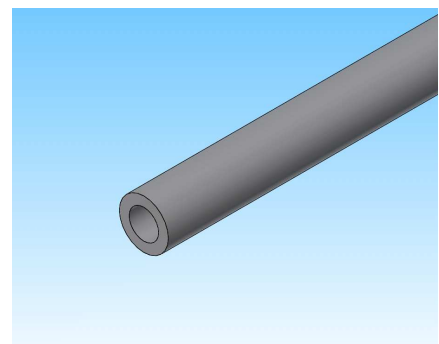
- 1 Cast Bowl 72-103-162
- 2 Tube holder 72-103-172
- 3 Bracket plate 72-103-173
- 4 Tube bracket 72-103-171
- 5 Exit tube:

- M3 Exit tube 72-103-163
- M4 Exit tube 72-103-164
- M5 Exit tube 72-103-165
- M6 Exit tube 72-103-166
- M8 Exit tube 72-103-168
- M10 Exit tube 72-103-170



Feed hose

- M3 40-20863
- M4 40-26667
- M5 40-19989
- M6 40-20901
- M8 40-20928
- M10 40-20929



EC DECLARATION OF CONFORMITY

TAYLOR STUDWELDING SYSTEMS LIMITED

Hereby certifies on it's sole responsibility that the following product :

Stud Feeder Escapement.

Which is explicitly referred to by this Declaration meet the following Directives and Standards :

**Directive 89/336/EEC
Electromagnetic compatibility
Directive 93/68/EEC
CE Marking
European Standard
EN 50 199**

Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above Manufacturer's headquarters.

D. Taylor



Managing Director

