

# TAYLOR STUDWELDING SYSTEMS LIMITED

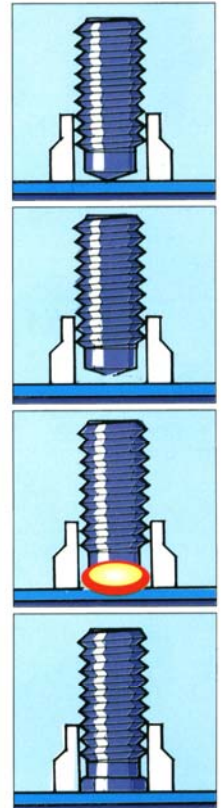


## OPERATING GUIDE

FOR

# TYPE DA7-A

DRAWN ARC PISTOL



A TAYLORMADE DRAWN ARC STUD WELDING PISTOL

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## **USEFUL INFORMATION**

### **MANUFACTURERS DETAILS**

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WEB : www.taylor-studwelding.com

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

You may wish to record the details of your controller below as this information will help with any technical assistance you may require:

<b>PISTOL SERIAL No.</b>	
<b>DATE PURCHASED.</b>	

### **PURPOSE AND CONTENT OF THIS GUIDE**

This guide has been written for :

- The personnel of the end-user responsible for the installation and maintenance of the pistol.
- The operator of the welding pistol.

This guide contains information relating to :

- Installation and connection.
- Operation.
- Technical specifications and parameters.
- Spare parts.

# **USEFUL INFORMATION**

## **FURTHER INFORMATION**

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

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

If the pistol is sold / passed on, please hand over this manual to the new owner and if possible please inform us of the name and address of the new owner, in case we need to contact him regarding the safety of the machine.



PLEASE READ THIS GUIDE CAREFULLY BEFORE INSTALLING OR OPERATING THE PISTOL.



PLEASE OBSERVE CAREFULLY ALL SAFETY PROCEDURES/INSTRUCTIONS.



DUE TO THE POWER REQUIREMENTS AND ELECTROMAGNETIC EMISSIONS PRODUCED DURING NORMAL USE, THIS PISTOL MUST ONLY BE OPERATED IN AN INDUSTRIAL ENVIRONMENT.



NEVER REMOVE ANY PORTION OF THE UNIT HOUSING WITHOUT FIRST ISOLATING THE PISTOL FROM THE CONTROLLER.

# **IMPORTANT SAFETY INFORMATION !**

## **PROTECT YOURSELF AND OTHERS !**

Read and understand these safety notes.

### **ELECTRICAL**

No portion of the outer cover of the welding pistol should be removed by anyone other than suitably qualified personnel and never whilst mains power is connected.



ALWAYS DISCONNECT THE MAINS LEAD BEFORE ATTEMPTING ANY MAINTENANCE.

BEWARE - RISK OF ELECTRIC SHOCK !

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 page 8 of this guide and must be in line with national, regional and local safety codes.

### **FIRE**

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

### **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 risks before entering the area.

### **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.

# **IMPORTANT SAFETY INFORMATION !**

## **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.

## **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 be damaged.

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. None of the components used in the manufacture are toxic, carcinogenic or harmful to health in their "as supplied" condition.

## **INTRODUCTION TO STUDWELDING**

The Taylor Studwelding DA7-A studwelding pistol when matched with an appropriate controller and earth cables is intended for precision stud welding up to 12 mm diameter full base studs. The pistol is lightweight, ergonomic and has been designed to operate with a minimum amount of maintenance.

The energy required to carry out the welding operation is derived from an appropriate studwelding controller.

Taylor Studwelding Systems Ltd controllers are modern, robustly designed and offer maximum reliability combined with an easy to understand operator interface.

### **THE PROCESS**

The process of drawn arc studwelding is long established and well proven. The basic steps are as follows :

- A measured amount of weld stud protrusion is set at the welding pistol.
- Once in position, the pistol lifts the stud away from the work-piece, simultaneously striking an arc between the two.
- Both the tip of the weld stud and the surface of the work-piece melt as the arc is sustained for a pre-determined interval.
- At the completion of the pre-determined interval, the pistol returns the weld stud to the molten pool on the work-piece, thus forming a weld.

The most common and traditional drawn arc welds have a weld duration greater than 100ms and employ the use of a single use ceramic arc shield, commonly referred to as a ferrule. This ferrule helps to protect the arc during the weld and assists in formation of the final fillet. Post welding the ferrule is removed and disposed of.

It is possible to stud weld without a ferrule. When using this method it is recommended practice to employ a suitable shielding gas to reduce the amount of porosity in the completed weld and improve weld quality.

## SETTING UP AND WELDING

As standard, the DA7 pistol comes fitted with short legs and a standard foot adaptor. The pistol has an M10 thread on the weld shaft. This enables the use of European type screw-on chucks, enabling studs up to 12mm in diameter to be welded (see fig.1).

Other arrangements are available as shown in figs. 2 & 3.

In fig.2 an adapter is fitted to the weld shaft to enable standard UK and American taper fitting drawn arc chucks to be used, enabling studs up to 12mm in diameter to be welded. Longer legs are fitted to allow for this.

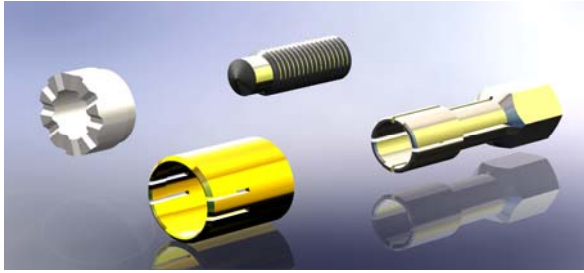
In fig.3 a 35mm gas foot arrangement using long legs and an extended form of screw-on chuck allows for welding, with or without gas.

Please refer to the accessories section of this guide for information regarding chucks and other accessories for the pistol.

The DA7-A pistol is commonly referred to as a “ring lift” pistol. This means the pistol has an internal clutch, allowing for moderate inconsistencies in the length of the studs being welded, without affecting weld quality.



## SETTING UP AND WELDING

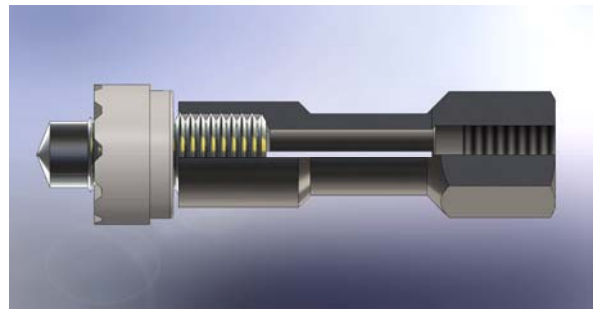


Once you have selected the type and size of stud you wish to weld and obtained the correct chuck (see the accessories section of this guide for a list of available sizes), you will need to set up the chuck and fit it to the pistol.



On the page “An introduction to studwelding”, under the heading “The Process” it explains that a measured amount of stud protrusion is set at the welding pistol.

To ensure that the correct amount of protrusion will be available once the chuck is fitted to the pistol, it is important to set the chuck correctly in the first place. Some chucks have a pre-determined depth (see right) which will only allow a certain amount of the stud to be inserted.



Other chucks have a backstop arrangement that allows the depth of engagement to be adjusted.



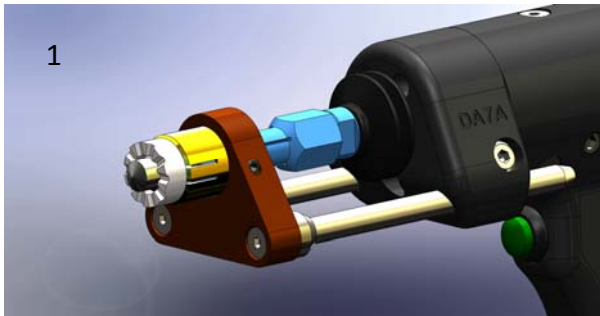
Regardless of which type of chuck is employed, when welding with ceramic ferrules, it is important that sufficient stud length is exposed to allow more than the “burn-off” allowance of the stud to pass completely through the ferrule. Insufficient allowance may result in the leading edge of the chuck hitting the back of the ferrule during welding. This would result in failed welds.



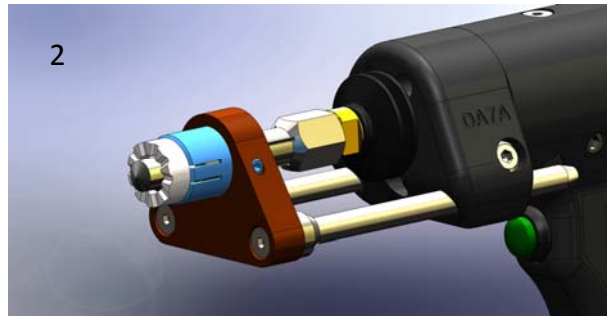
In non-ferrule welding it is only necessary to set the chuck so that sufficient stud length is exposed to prevent damage to the leading edge of the chuck during welding.

Having set up the chuck, you are now ready to fit it into the pistol.

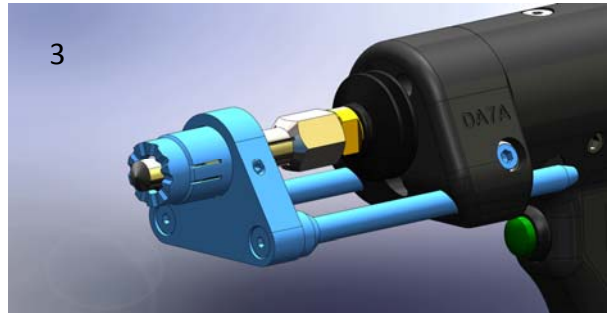
# SETTING UP AND WELDING



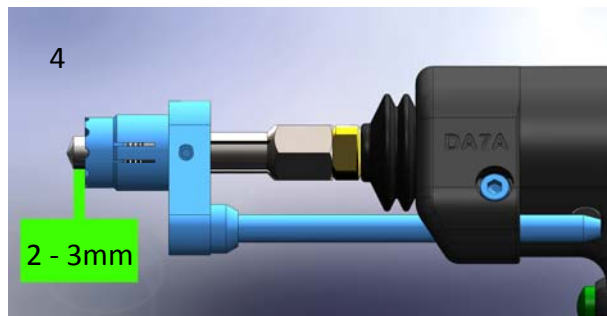
1  
Fit the chuck to the pistol (fig.1) using the appropriate wrench. Be sure to brace the pistol shaft using a 12A/F wrench when tightening or loosening the chuck. Failure to do so may result in damage to the pistol.



2  
Fit the ferrule grip into the foot adapter (fig.2) and secure in place with the set screws in the foot adapter. Do not over-tighten the set screws as this will result in damage to the ferrule grip. Adjust the position of the foot adapter using the cap head screws in the front end cap (fig.3) to set the required stud protrusion (fig.4).



3  
**IMPORTANT !** It is necessary to check/reset the protrusion when changing stud length/diameter.



4  
Adjustment of the pistol lift is achieved by turning the rear end cap of the pistol (fig.5) which has a "click" detent. Clockwise rotation reduces lift and one "click" is approx' equal to a 0.25mm change in lift.

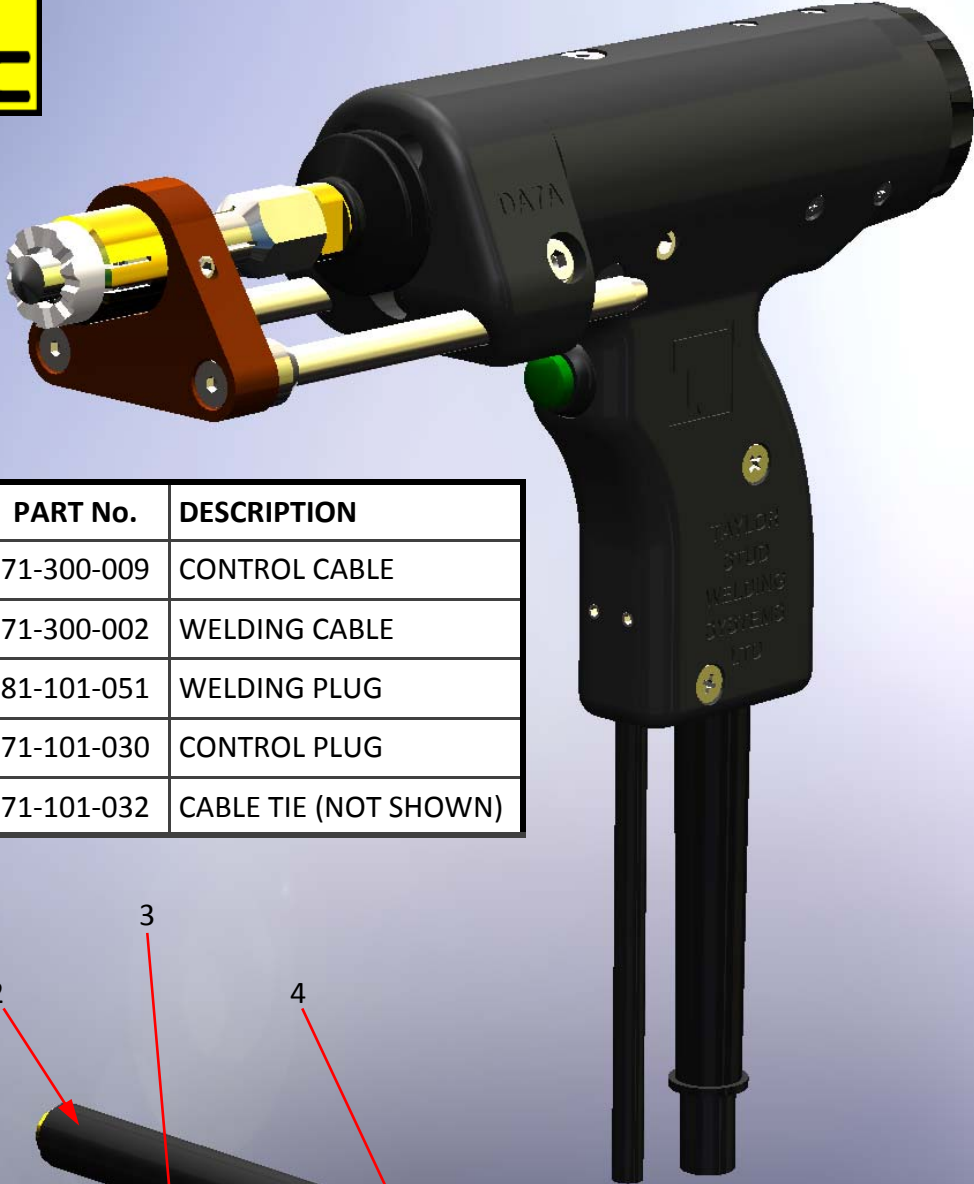


5  
**NOTE!** It is possible to use UK type taper chucks. The pistol will require an adapter (fig.6) to take the chucks and this will need to be fitted to the pistol shaft taking similar care to brace the pistol shaft when locking in place. Once the adapter is fitted, chucks may be inserted (fig.7) and secured by gently tapping into place. Chucks can then be removed using a twist drift through the cross-drilled holes.

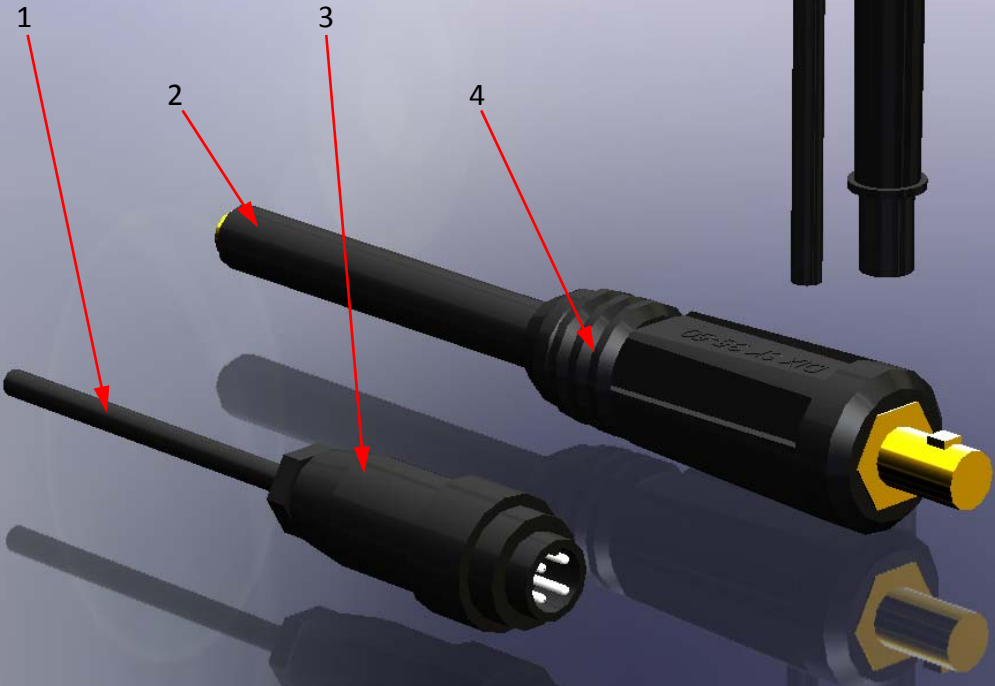


6  
PLEASE NOTE! Information contained in this operating guide is intended to assist in setting up the pistol. The suggested settings are intended as a starting point only. Fine tuning the settings to achieve the most satisfactory results is essential and is the responsibility of the user of the pistol.

**EXPLODED DIAGRAMS & PARTS LISTINGS**

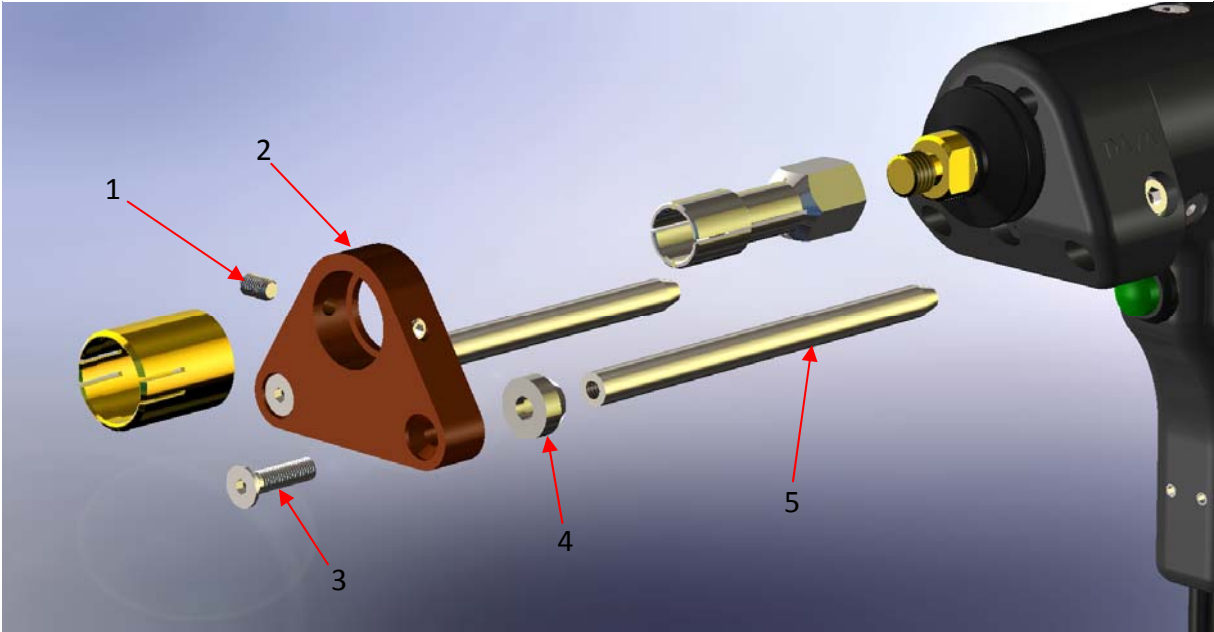


ITEM	QTY.	PART No.	DESCRIPTION
1	4½	71-300-009	CONTROL CABLE
2	4	71-300-002	WELDING CABLE
3	1	81-101-051	WELDING PLUG
4	1	71-101-030	CONTROL PLUG
5	9	71-101-032	CABLE TIE (NOT SHOWN)



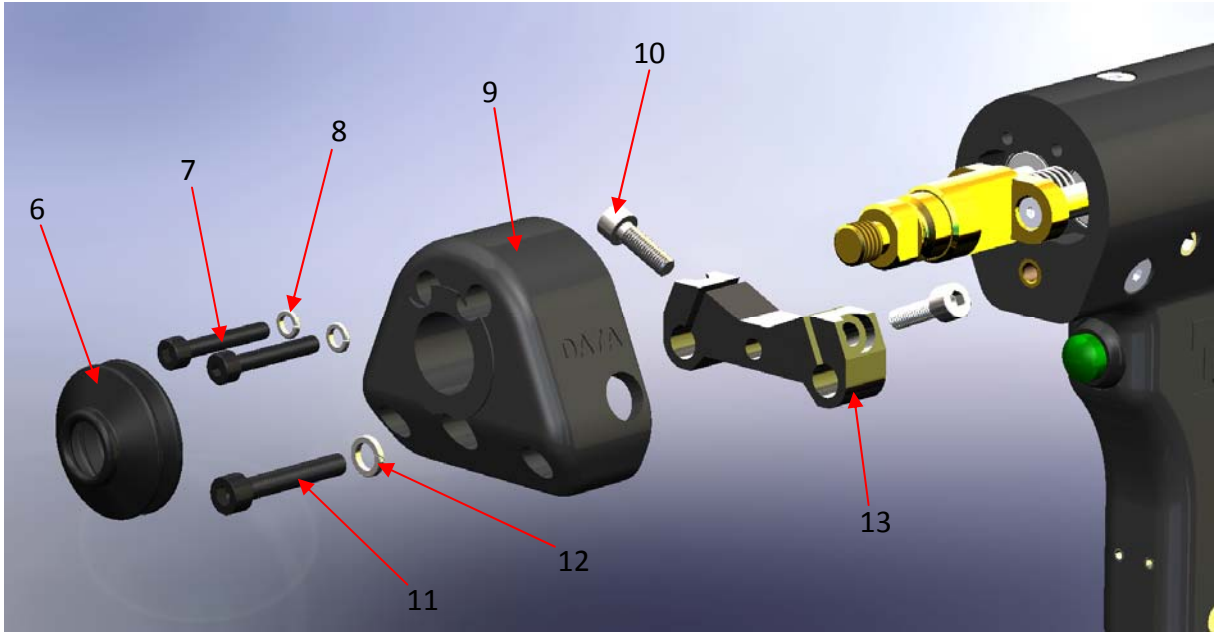
SEE PAGES 12 TO 17 FOR COMPLETE BREAKDOWN OF PISTOL.

# EXPLODED DIAGRAMS & PARTS LISTINGS



ITEM	QTY	PART No.	DESCRIPTION
1	2	Z400-05-006	SET SCREW
2	1	81-101-370	FOOT ADAPTER
3	2	Z120-05-020	CSK SCREW
4	2	81-101-001	FOOT WASHER
5	2	72-103-092	SHORT LEG
6	1	81-101-379	RUBBER COVER
7	2	Z100-04-025	SKT CAP SCREW

ITEM	QTY	PART No.	DESCRIPTION
8	2	Z615-04-000	SPRING WASHER
9	1	81-101-352	FRONT END CAP
10	2	Z105-05-016	SKT CAP SCREW
11	1	Z100-05-030	SKT CAP SCREW
12	1	Z615-05-000	SPRING WASHER
13	1	81-101-362	LEG GRIP INSERT



**EXPLODED DIAGRAMS & PARTS LISTINGS**

BREAKDOWN OF SHAFT  
ASSEMBLY ON PAGE 14

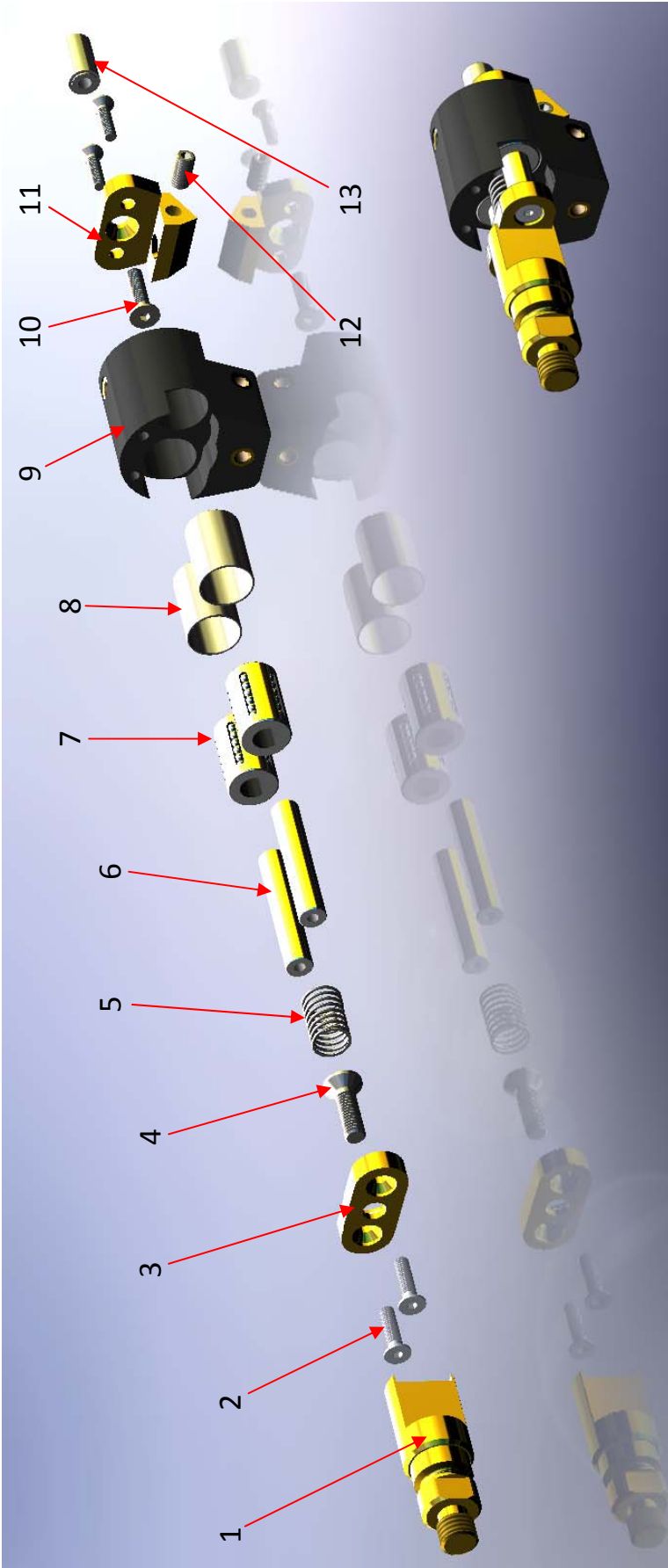


ITEM	QTY	PART No.	DESCRIPTION
1	3	Z125-05-010	CSK SCREW
2	1	Z440-08-005	SET SCREW - NYLON

**IMPORTANT NOTE!**

ITEM 2 COVERS THE SET SCREW SHOWN ABOVE. THIS SET SCREW MUST BE LOOSENED TO ALLOW DISCONNECTION OF THE WELD BRAID PRIOR TO ATTEMPTED REMOVAL OF THE SHAFT ASSEMBLY.

# EXPLODED DIAGRAMS & PARTS LISTINGS



ITEM	QTY	PART No.	DESCRIPTION	ITEM	QTY	PART No.	DESCRIPTION
1	1	81-101-365	SHAFT	7	2	81-101-372	LINEAR BALL BUSHING
2	4	Z125-04-016	CSK SCREW	8	2	81-101-386	BEARING SLEEVE
3	1	81-101-364	SHAFT PLATE	9	1	81-101-354	BEARING BLOCK
4	1	Z125-06-020	CSK SCREW	10	1	Z125-05-020	CSK SCREW
5	1	81-101-377	MAIN SPRING	11	1	81-101-363	PULLER PLATE
6	2	81-101-373	MONOSHAF	12	1	Z400-06-012	SET SCREW
				13	1	81-101-361	LIFTING BOSS

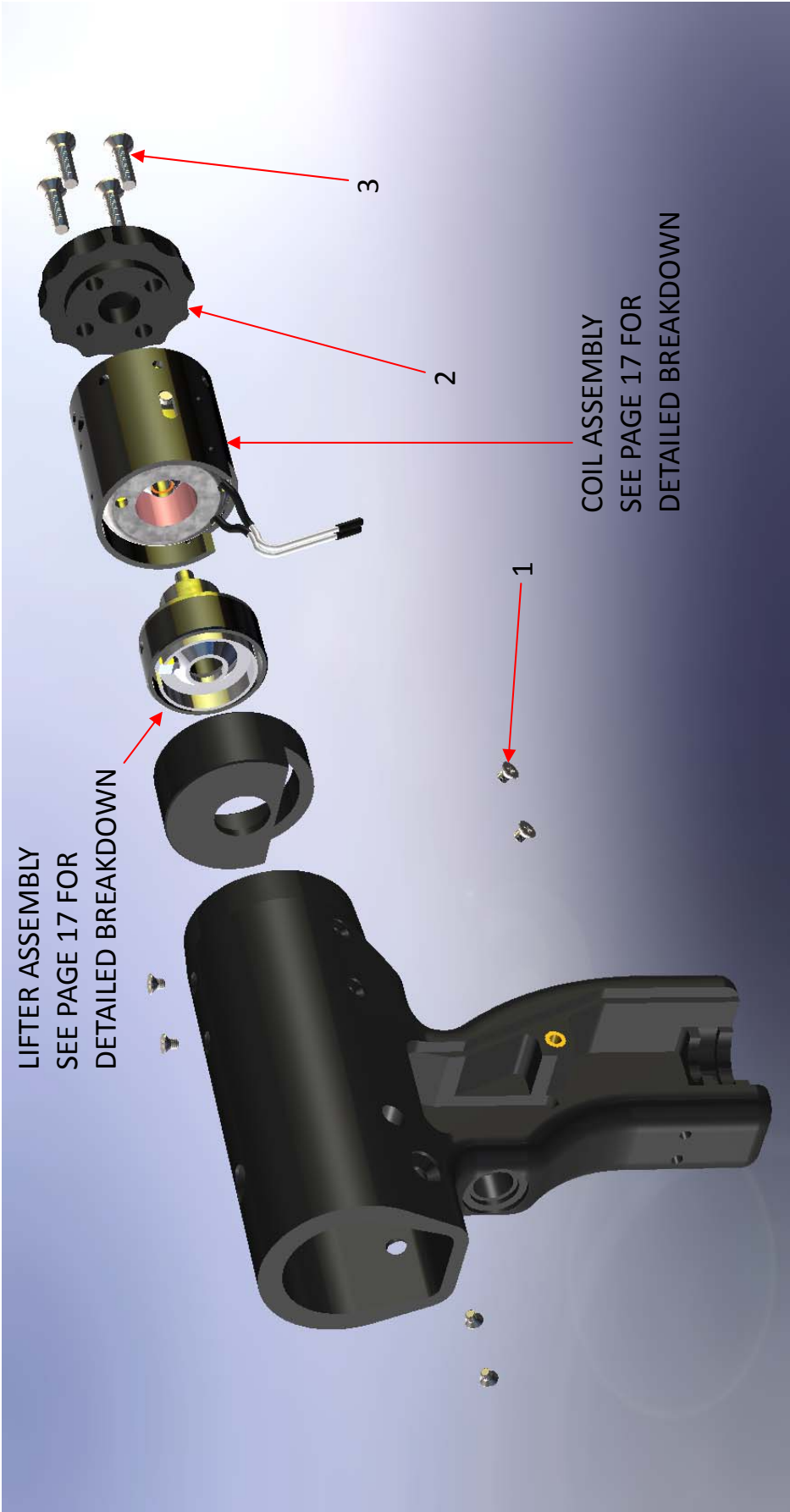
# EXPLODED DIAGRAMS & PARTS LISTINGS

ITEM	QTY	PART No.	DESCRIPTION
1	1	81-101-350	PISTOL BODY
2	1	81-101-279	TRIGGER SWITCH
3	2	Z400-04-008	SET SCREW
4	4½	71-300-009	CONTROL CABLE (m)
5	1	81-101-366	CABLE CONN BLOCK

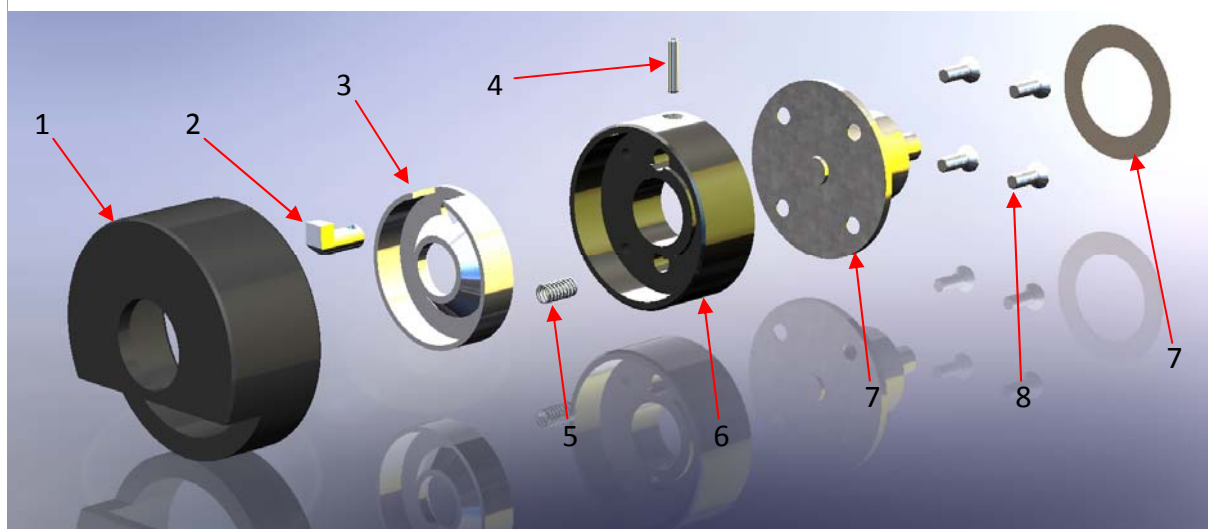
ITEM	QTY	PART No.	DESCRIPTION
6	1	Z120-05-012	CSK SCREW
7	1	81-101-374	BRAID ASSEMBLY
8	1	Z100-06-008	SKT CAP SCREW
9	1	Z615-06-000	SPRING WASHER
10	1	Z605-06-000	PLAIN WASHER
11	1	81-101-351	HANDLE COVER
12	1	Z700-06-022	TERMINAL
13	1	Z205-04-020	CSK SCREW
14	1	Z205-04-010	CSK SCREW
15	4	71-300-002	WELD CABLE (m)
16	1	71-101-034	STRAIN SLEEVE

**EXPLODED DIAGRAMS & PARTS LISTINGS**



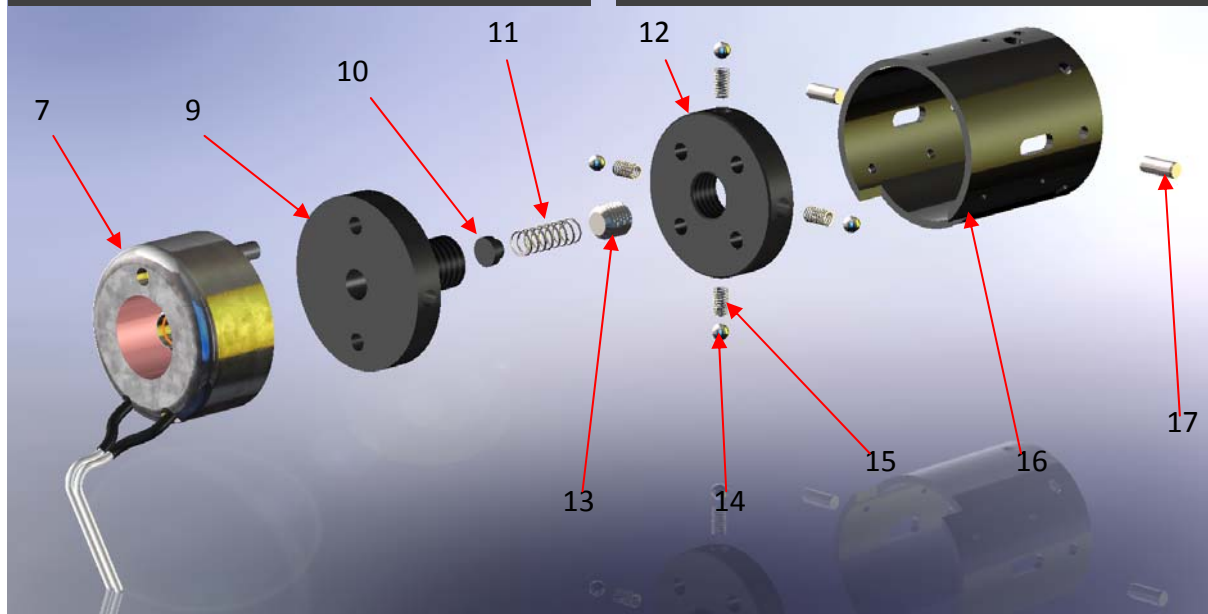
ITEM	QTY	PART No.	DESCRIPTION
1	6	Z120-03-004	CSK SCREW
2	1	81-101-353	REAR END CAP
3	4	Z120-05-020	CSK SCREW

## EXPLODED DIAGRAMS & PARTS LISTINGS



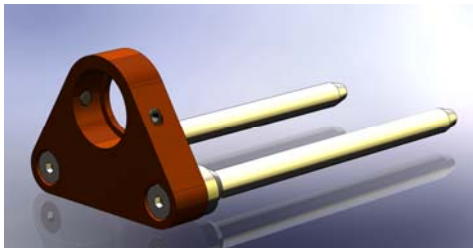
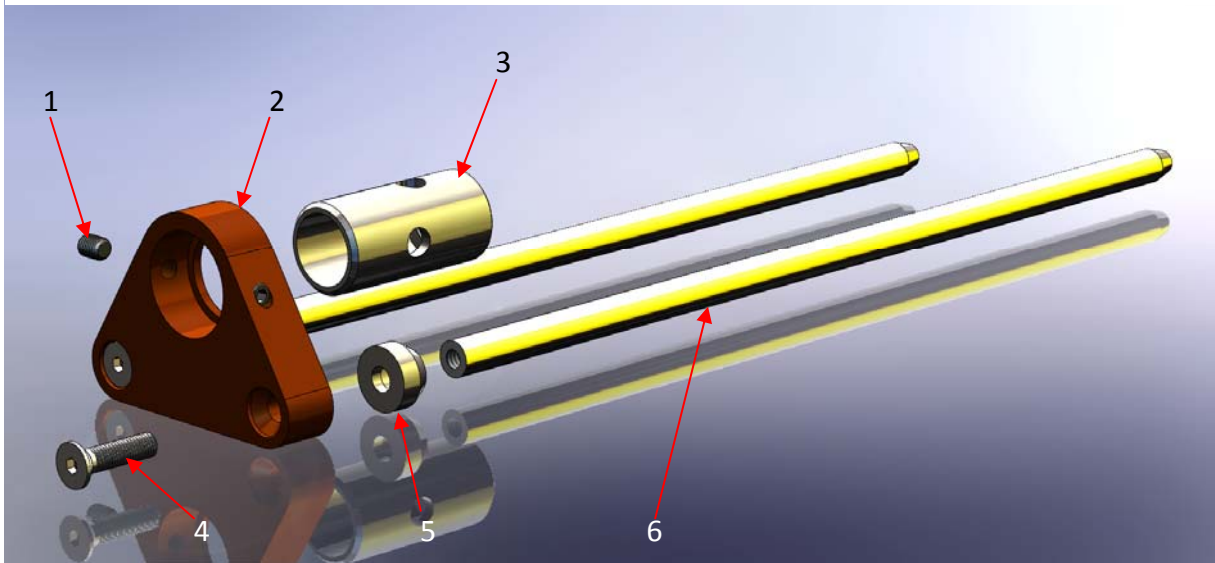
ITEM	QTY	PART No.	DESCRIPTION
1	1	81-101-355	RINGPULL GUIDE
2	1	81-101-319	LIFTING HOOK
3	1	81-101-304	LIFTING RING
4	1	81-101-384	PIN
5	1	81-101-306	SPRING
6	1	81-101-360	RINGPULL
7	1	81-101-369	SEE NOTE #
7	1	81-101-371	SEE NOTE #
8	4	Z205-03-008	CSK SCREW

ITEM	QTY	PART No.	DESCRIPTION
9	1	81-101-357	COIL MOUNT
10	1	81-101-358	SPRING SEAT
11	1	81-101-378	SPRING
12	1	81-101-356	DETENT RING
13	1	Z400-08-008	SET SCREW
14	4	81-101-082	DETENT BALL
15	4	81-101-376	SPRING
16	1	81-101-359	COIL HOUSING
17	2	81-101-385	PIN



**NOTE # PARTS 81-101-369 & 81-101-371 (COIL C/W HYSTERESIS WASHER & MODIFIED POLE PIECE) MUST BE PURCHASED AS A SET AND MAY NOT BE PURCHASED SEPERATELY**

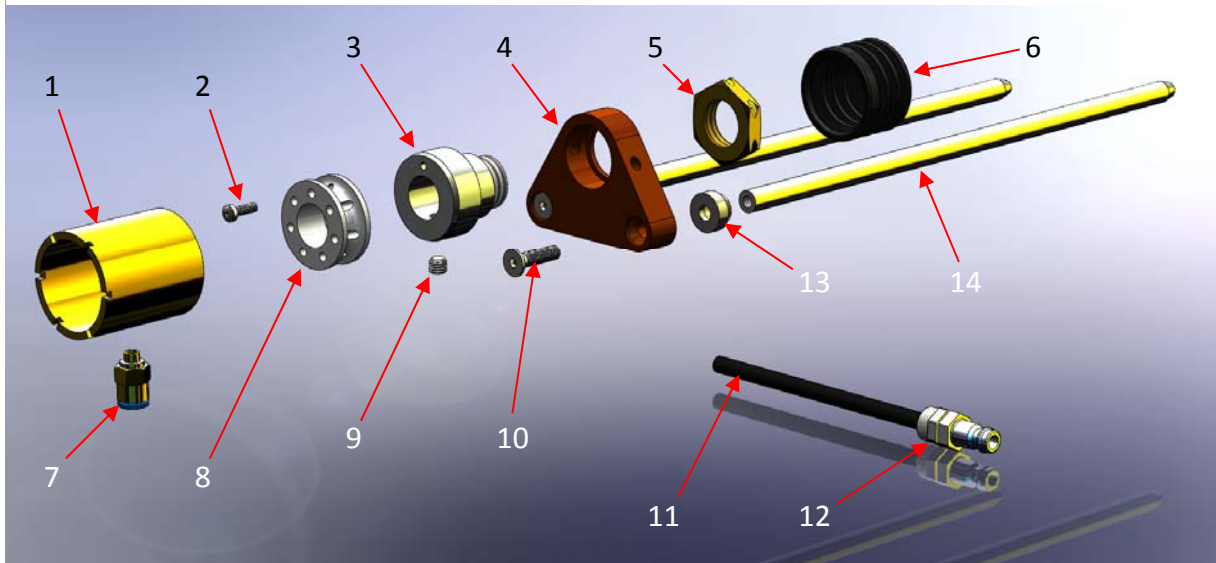
## ACCESSORIES - STANDARD FOOT ASSEMBLIES



COMPLETE ASSEMBLY OF FOOT ADAPTER WITH STANDARD DA7-A LEGS IS AVAILABLE UNDER PART NUMBER : 89-101-349  
PLEASE NOTE! ASSEMBLY DOES NOT INCLUDE UK TAPER CHUCK ADAPTER OR LONGER THAN STANDARD LEGS.

ITEM	QTY	PART No.	DESCRIPTION
1	2	Z400-05-006	SET SCREW
2	1	81-101-370	FOOT ADAPTOR
3	1	81-101-005	UK TAPER CHUCK ADAPTER
4	2	Z120-05-020	CSK SCREW
5	2	81-101-001	FOOT WASHER
6	2	72-103-092	LEG (110 LONG. STANDARD WITH DA7-A)
or	2	81-101-004	LEG (230 LONG. REQUIRED WITH UK ADAPTER)
or	2	89-101-081	LEG (330 LONG. )

## ACCESSORIES - GAS FOOT ASSEMBLY



COMPLETE ASSEMBLY OF FOOT ADAPTER WITH STANDARD DA7-A LEGS IS AVAILABLE UNDER PART NUMBER : 89-101-350  
PLEASE NOTE! ASSEMBLY DOES NOT INCLUDE OPTIONAL DIFFUSER OR LONGER THAN STANDARD LEGS.

ITEM	QTY	PART No.	DESCRIPTION
1	1	81-101-380	35mm GAS SHROUD
2	2	Z200-03-016	SCREW (OPTIONAL)
3	1	81-101-381	SHROUD MOUNT
4	1	81-101-370	FOOT ADAPTOR
5	1	81-101-382	SHROUD MOUNT LOCKNUT
6	1	89-101-244	GAS BELLOWS
7	1	71-200-226	GAS FITTING
8	1	81-101-383	DIFFUSER (OPTIONAL)
9	1	Z400-06-005	SET SCREW
10	2	Z120-05-020	CSK SCREW
11	4½	71-200-043	GAS PIPE
12	1	71-200-067	GAS PLUG
13	2	81-101-001	FOOT WASHER
14	2	81-101-004	LEG (230mm)
or	2	89-101-081	EXTENDED LEG (330mm)

**ACCESSORIES - CHUCKS**  
**EUROPEAN SCREW-ON TYPE**

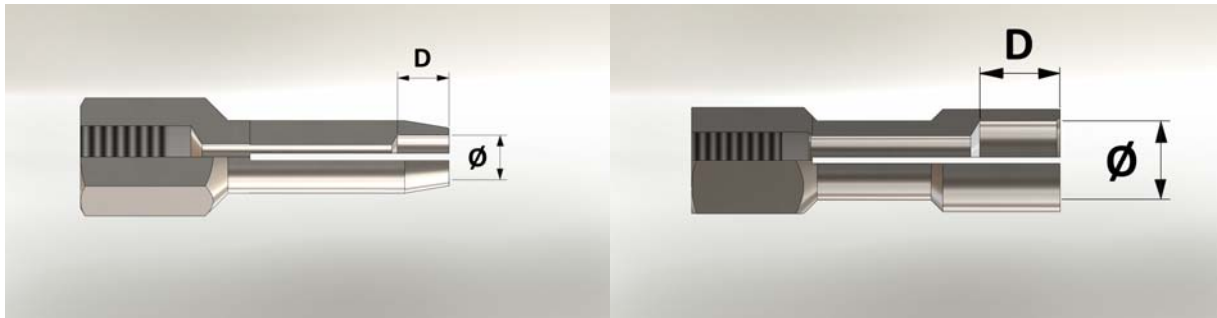


TABLE 1

LISTS OUR STANDARD STOCK RANGE OF CHUCKS.

TABLE 1

Ø	D	PART NUMBER
3	5	89-101-003
4	5	89-101-004
5	6	89-101-005
6	7	89-101-006
8	9	89-101-008
10	11	89-101-010
12	13	89-101-012

TABLE 2

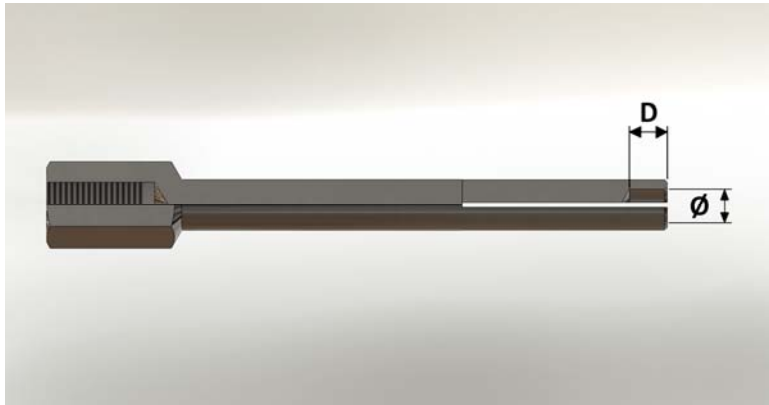
LISTS OUR NON STOCK RANGE OF CHUCKS.  
 NOTE! NON STOCK CHUCKS WILL REQUIRE ADDITIONAL  
 DELIVERY LEAD TIMES AND MAY BE SUBJECT TO  
 MINIMUM ORDER QUANTITY.

TABLE 2

Ø	D	PART NUMBER
4	25	89-101-021
6	15	89-101-022
6	25	89-101-023
8	6	89-101-024
8	25	89-101-025
10	4	89-101-026
10	6	89-101-027
12	6	89-101-028

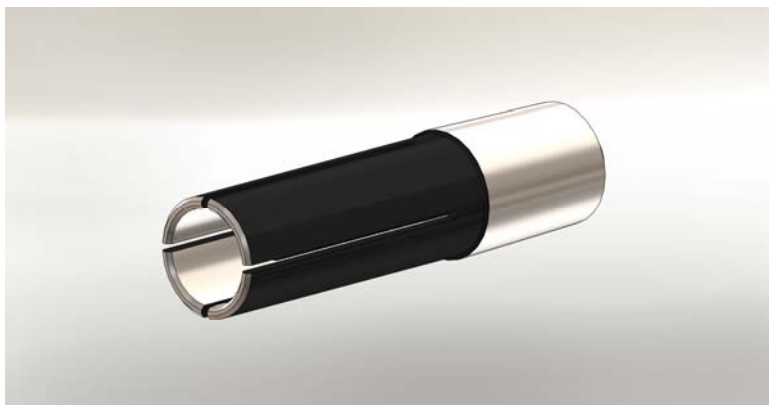
PLEASE NOTE.  
 IF THE CHUCK THAT YOU REQUIRE IS NOT SHOWN HERE,  
 PLEASE CHECK WITH US.

**ACCESSORIES - CHUCKS**  
**EUROPEAN SCREW-ON GAS TYPE**



Ø	D	PART NUMBER
5	4	89-101-035
6	4	89-101-036
6	7	89-101-037
8	4	89-101-038
8	9	89-101-039
10	4	89-101-040
10	11	89-101-041
12	4	89-101-042
12	13	89-101-043

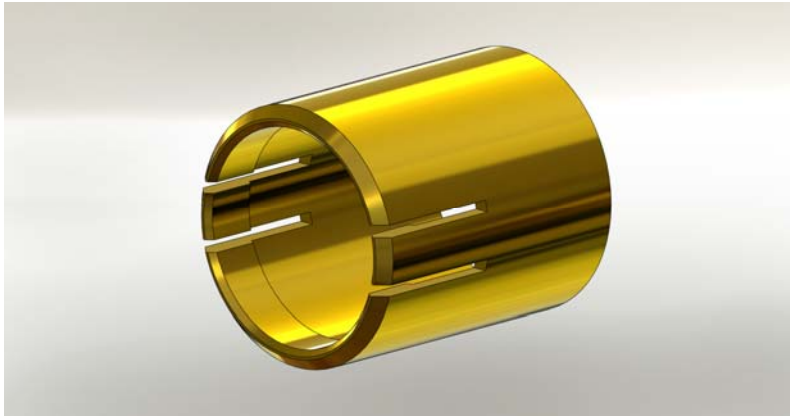
**ACCESSORIES - CHUCKS**  
**UK TAPER FIT - ADJUSTABLE**



Ø	PART NUMBER
M3	89-101-203
M4	89-101-204
M5	89-101-205
M6	89-101-206
M8	89-101-208
M10	89-101-210
M12	89-101-212

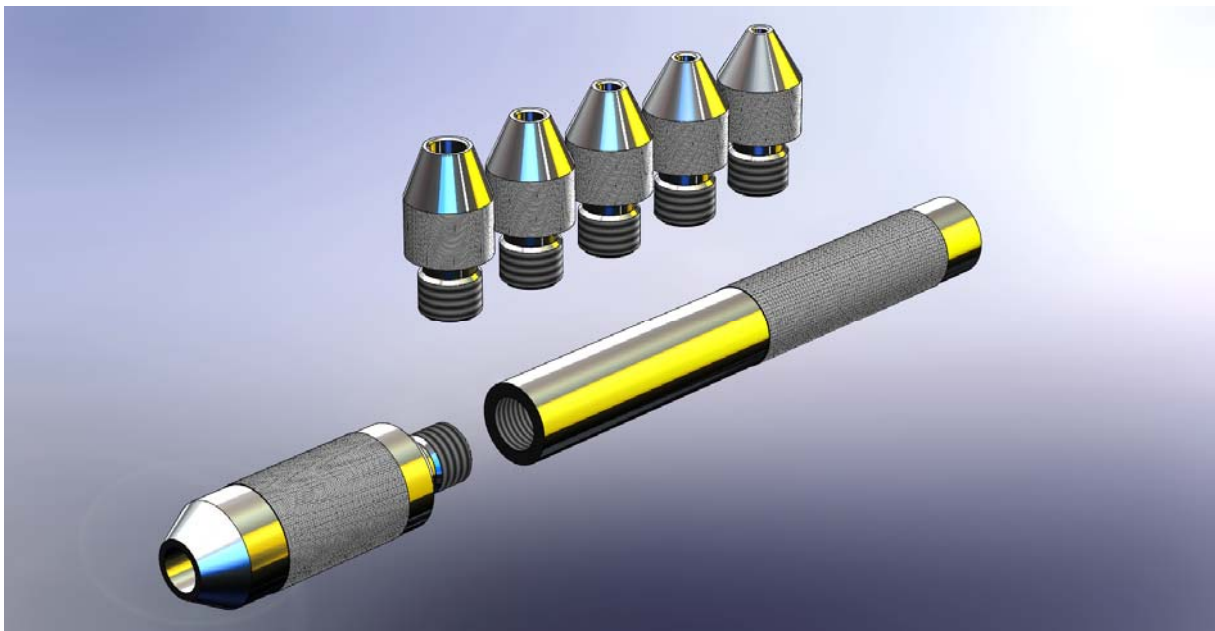
PLEASE NOTE. OTHER CHUCK SIZES ARE AVAILABLE.  
 PLEASE CHECK WITH US IF THE SIZE YOU WANT IS NOT LISTED HERE.

## **ACCESSORIES - FERRULE GRIPS**

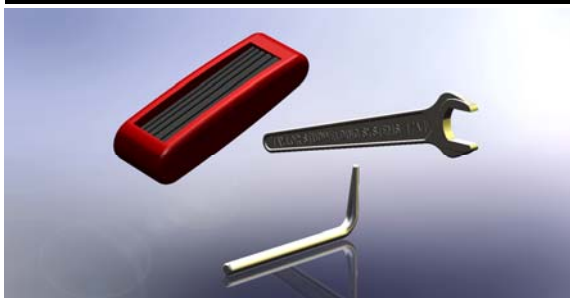


∅	PART NUMBER
M3	89-101-051
M4	89-101-051
M5	89-101-052
M6	89-101-052
M8	89-101-053
M10	89-101-054
M12	89-101-055

## **ACCESSORIES - BENDING BAR & TOOLS**



TOOL	PART No.
KEY SET (2, 2.5, 3, 4, 5, 6, 8)	98-100-003
UK CHUCK EJECTOR TOOL (TWIST DRIFT)	98-100-001
17mm A/F CHUCK SPANNER	98-100-006



ITEM	PART NUMBER
BENDING BAR	79-101-121
M3 NOZZLE	79-101-123
M4 NOZZLE	79-101-124
M5 NOZZLE	79-101-125
M6 NOZZLE	79-101-126
M8 NOZZLE	79-101-127
M10 NOZZLE	79-101-128
COMPLETE SET	79-101-120

# EC DECLARATION

## TAYLOR STUDWELDING SYSTEMS LIMITED

COMMERCIAL ROAD

DEWSBURY

WEST YORKSHIRE

ENGLAND

WF13 2BD

TEL : +44 (0)1924 452123

FAX : +44 (0)1924 430059

EMAIL : sales@taylor-studwelding.com



This is to certify that the machinery listed below is designed and manufactured in conformance with all applicable health and safety regulations.

This statement is invalid if any modifications are carried out on the machinery without the prior written approval of Taylor Studwelding Systems Ltd.

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DESCRIPTION OF MACHINE : Drawn Arc Studwelding Pistol  
TYPE : DA7-A  
PART NUMBER :  
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Applicable EC guidelines and corresponding standards:

- Low voltage guideline 73/23/EEC:

EN60204-1 Safety of machinery - Electrical equipment of machines.

- EMC guidelines 89/336/EEC (electromagnetic compatibility):

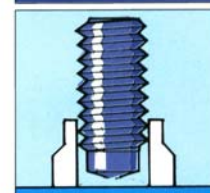
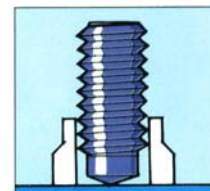
EN50081 Electromagnetic compatibility - Generic emission standard

EN50082 Electromagnetic compatibility - Generic immunity standard

EN50199 Electromagnetic compatibility (EMC) Product standard for Arc welding equipment

- Machine guidelines 89/392/EEC

EN60974-1 Arc welding equipment : Electromagnetic compatibility (EMC) requirements



SIGNED

A handwritten signature in black ink, appearing to read 'D Taylor'.

DAVID TAYLOR  
MANAGING DIRECTOR

**A TAYLORMADE DRAWN ARC STUD WELDING PISTOL**