ELECTROBRAZE
By
FARWEST CORROSION CONTROL COMPANY

Operation and Basic Maintenance Manual

ZE7000/INV/HD - Pin Brazing Gun

Offered by Farwest Corrosion Control Company

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INDEX

CE

Electrobraze Pin Brazing Equipment is CE marked to indicate compliance with the Electromagnetic Compatibility Directive (2004/108/EC)

Compliance is achieved by working to BS EN 61 000-6-2 EMC immunity, BS EN 61 000-6-4 EMC emission, BS EN 61 000-3-2 EMC emission, BS EN 61 000-3-3, EMC emission respectively.

SERVICING

This manual contains safety, operation and routine maintenance instructions. It does not contain service, disassembly and service assembly instructions. Electrobraze Limited recommend that servicing of all electric, electro-mechanical and hydraulic tools, other than routine maintenance, must be performed by an authorised and certified dealer.

SAFETY PRECAUTIONS

Tool operators and maintenance personnel must always comply with the safety precautions given in this manual and on the safety decals and tags attached to the equipment. These safety precautions are provided for your safety and the safety of your colleagues. Review them carefully before operating the equipment and performing general repairs and maintenance.

Supervisory personnel should adopt additional precautions relating to the specific work and job specific or "local safety precautions" should be added to the "Local Safety Regulations" section of this manual on Page 4.

GENERAL SAFETY PRECAUTIONS

- Minimum distance for bystanders must be at least 10 feet from operator and all grinding preparation and bonding processes
- Operator must be familiar and have carried out an appropriate Risk Assessment of the environment before commencement of all Pin Brazing and associated operations.
- Operator should be under the supervision of a qualified instructor or be certified by Electrobraze Limited (or an Electrobraze Limited approved agent) and have carried out training during a period of no longer than 12 months prior to commencement of Pin Brazing Operations.
- Always wear safety equipment such as eye protection, hearing protection, safety shoes and suitable overalls or safety clothes for grinding and welding work.
- Do not inspect or clean the tool while the battery or other power source is connected as any accidental arcing can cause serious injury.
- Ensure battery charging IS only done in a dry environment. Attaching the battery charger in the rain or near standing water presents the potential for an electric shock hazard. Read the safety and operation manual provided with the battery charger before use.
- Do not exceed the rated limits of the equipment or use the tool for applications for which it has not been designed.
- Always utilize genuine Electrobraze Limited components when servicing the equipment or replacing parts
- Operators must ensure that all prequalification testing has been thoroughly carried out and approved by the specifying authority before commencement of use of this equipment and its associated equipment or consumables.

LOCAL SAFETY REGULATIONS

Enter any local safety regulations here. Keep these instructions within this manual, ensure all operator personnel are made aware of these instructions and keep this manual in a location accessible to the operator and maintenance personnel.

PIN BRAZING OPPERATION

1 - Charging of Battery Unit

When being used for the first time, **please ensure that your Electrobraze Battery Unit has been fully charged for at least 24 hours**. **The battery pack must then be kept on charge at all times when not in use, in storage or in transit utilising a pre-approved Electrobraze Mains or in-vehicle Battery Pack Charger.** Note that these charger units are equipped with a "float" mode, which will not overcharge the Battery Pack.

Electrobraze Pin Brazing Guns are not cross-compatible with any other Pin Brazing Manufacturers Power Supply or Battery Unit. Electrobraze Battery Units and Electrobraze Pre-approved Power Inverters are the only suitable means of ensuring your Pin Brazing Gun and connection type will perform properly and not cause damage. Attaching Any Electrobraze Pin Brazing Gun to an alternative power supply may permanently damage your Pin Brazing Gun, substrate material and other equipment being used. It may also result in serious injury or death of the operator.

- **Welding Generator / Inverter Power Supply**

When utilising a Welding Generator or Inverter power supply, this must be adjusted as follows: 250Amps, Negative DC Earth, 40V. Results may vary due to power supply, but amps should be fine adjusted in either direction in order to facilitate a braze time between 1.5 and 2 seconds only.

2 - Preparation of Surface

WARNING – Eye protection must be worn before commencing any grinding operation

The steel surface to be brazed must be prepared to a bright finish and be oil free and as dry as possible. Please ensure that any moisture left behind by a chemical degreasing agent is thoroughly removed before brazing, as this may be flammable.

We recommend that the surface be prepared using a pre-approved Electrobraze grinding machine and abrasive mounted point or carbide "burr". However, any suitable surface preparation tool able to remove sufficient surface material to provide the necessary bright metallic finish, with no residual contamination or impregnation of contaminates into the substrate material, should be acceptable. Surface preparation area required for direct and threaded Brazing is a bright metallic section approximately 0.75" (20mm) diameter. Surface preparation area is also required for attachment of the provided earth or ground device. The location for the ground should be wherever practical and appropriate (depending on Earth Device type) while attached to the same substrate section. The location of the ground attachment should be as far away from Pin Brazing operations as practical.

Once prepared, the surface must be brazed within one hour before oxidation re-occurs.

PIN BRAZING GUN

Remove the Pin Brazing Gun form the enclosure, ensuring that the Brazing Gun is clean, dry and free from oil, grease or similar.

Note: If the Pin Brazing Gun is being used for the first time, it should be in full working order and show no signs of being previously used. If this is not the case, contact your dealer immediately.

1 - Pre-Loading Checks

- Ensure that all screws and fixings are tight and in place. Missing fasteners must be replaced.
- Ensure that all bolt-on items, including Handle Butt, Folding Fore-grip (optional), LED Torch and Mount (optional), Integral Earth Return System (optional), Sling and Sling Mounting (optional) are all properly secured
- Carefully depress the Ejector Pin (Fig. 1) to ensure that the solenoid core is free from obstruction. **Do not force the ejector button as damage may occur to the ejector pin assembly inside the electromagnet**.

Fig 1 

Fig 2 

Fig 3 

- If the ejector button will not compress fully, remove and replace the copper Contact Nozzle at the front of the gun. See Pin Brazing Gun Maintenance – Section 2.
- Depress the trigger switch (Fig. 2) to ensure this moves freely into the closed position. This should automatically spring open once released.
- Attach the required Pin Holder Collet to the gun with the provided hex wrench/key. This is achieved by first removing the Ferrule Holder and loosening the single screw inside the 5mm aperture detailed in Fig. 3.
    - Attach the required Ferrule Collet and secure into the housing using the 3 Socket Set Screws detailed in Fig. 6. **DO NOT OVER TIGHTEN SCREWS** as this may damage the internal threads. **Later model guns have a push-in fit Collet (Fig. 6A) designed to self-centralize during adjustment**
- **M10 or M12 Threaded Pin use** requires the Cap Head screws (located at the rear of the front nozzle) to be removed and the entire front stainless steel nozzle to be slid forward 0.25" (5mm). There are 3 pre-drilled holes for relocation of the housing. Fig. 5.

Fig 5

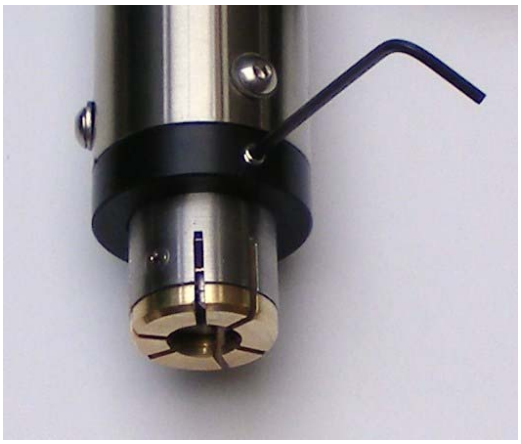


Fig 6

4 - Loading and Adjustment

- Select the required Brazing Pin. Ensure the Fuse Wire is not damaged or bent and the factory "kinked" end of the fuse is intact. Insert the Pin as fully as possible into the Pin Collet (Fig. 7 - Ferrule holder removed for clarity of image only) ensuring the Fuse Wire is threaded through the fuse wire guide bush located within the Pin Collet Housing.
    - Note: The Pin should be a very tight fit. If this is not the case then the Pin Collet must be removed and adjusted accordingly by evenly compressing the jaws closer together or alternatively prying them further apart.

Fig 6A 

Fig 7 

Fig 8 

- Insert the compatible Ceramic Ferrule into the Ferrule Holder.
    - Note: The Ceramic Ferrule should be a very tight fit (Fig. 8). If this is not the case then the Ferrule Holder must be removed and the Collet adjusted accordingly by evenly compressing the jaws closer together or alternatively prying them further apart.

5 – Adjustment and Calibration

- Press the Pin against the prepared bright metallic substrate surface. If making a cable attachment, insert the pin through the eye of the pre-selected Cable Lug or Tab and then against the substrate surface. Fully depress the Pin Brazing Gun Solenoid until the Ceramic Ferrule is pressed against the Substrate (or the predetermined attachment Lug or Tab). Hold steady and make sure the Pin Brazing gun and Ferrule are sitting flush against the substrate (Fig. 10) or cable lug (Fig. 9).

Fig 9  Fig 10 

- Check the Adjustment Level at the rear of the Pin Brazing Gun. Without releasing the Solenoid, rotate the Adjustment Bezel (Fig. 11) at the rear of the gun accordingly until, when depressed, the Copper Marker tube at the base of the spring is aligned with the rear brass bushing (Fig. 12).

Fig 11  Fig 12 

- Once set, the brazing gun is now ready for normal pin brazing operation. Depending on any varying braze characteristics (usually due to environmental temperature extremes), the gun can be adjusted or fine tuned as required by rotating the Adjustment Bezel up to one-third of a rotation either side of the above setting. Rotate counter-clockwise for a longer braze time or alternatively clockwise for a shorter time. **Note that the Bezel can also be rotated beyond any notable resistance when turning in order to counter the presence of any Ferrule "hang-up".**

PIN BRAZING

- Attach the Earth Device Cable to the NEGATIVE (-) pole on the Pin Brazing Battery Pack. Push and twist tight.
- Attach the Earth Device Magnet to the Cable. Push and twist tight.
- Ensure that the Earth Device magnet plates are clean and free from pitting or damage so solid contact is made to the substrate.
- Firmly attach the Magnet to the pre-prepared, bright metallic surface of the structure that is to be connected by the Pin Braze method.

Note: The Earth Device location must be as far away as practical as to ensure it does not become damaged by the Pin Brazing arc or spatter.

- Attach the Pin Brazing Gun cable to the POSITIVE (+) pole on the Pin Brazing Battery Pack. Push and twist tight.
- Attach the Pin Brazing Gun cable (free end) to the POSITIVE (+) connector on the rear of the Pin Brazing Gun. Push and twist tight.

WARNING: The Pin Brazing Gun is now live and care must be taken to not depress the trigger accidentally.

- Press the Pin against the prepared bright metallic substrate surface once more. If making a cable attachment, insert the pin through the eye of the pre-selected Cable Lug or Tab and then against the substrate surface. Fully depress the Pin Brazing Gun Solenoid until the Ceramic Ferrule is pressed against the Substrate (or the pre-selected attachment Lug or Tab).
- Hold Steady and make sure the Pin Brazing gun and Ferrule are sitting flush against the substrate or Lug.
- Check that the Adjustment Bezel is aligned with the copper marker tube at the rear of the gun.
- Hold steady and click the trigger into the closed position when ready. **ALWAYS MAINTAIN PRESSURE ON THE TRIGGER**. The Pin Brazing Process is automatically timed and should last approximately 2 seconds while the trigger is depressed.

Note: Operator must remain perfectly still during the Pin Brazing process.

WARNING: Do not look directly at arc. Attention must be maintained to the work surface so it is recommended that operator wears a minimum Shade-5 safety goggle.

- Once the Pin Braze process is complete, release the trigger, which should automatically click into the open position. Hold the Pin Braze gun in place and steady for 3 seconds before pulling the Pin Brazing Gun vertically (straight up) away from the attached Brazing Pin.
- Push the Ejector Button and eject the remaining section of fuse wire material from inside the Brazing Pin Collet Housing. **REMEMBER – DO NOT FORCE THE BUTTON**.
- Scrape away and dispose of the remaining Ceramic Ferrule.

WARNING – The Ceramic Ferrule will be very hot so use and an appropriate glove or tool to remove

Note: - Each Ferrule must only be used for one Pin Braze

- Direct Pin Brazing Test - Take a 1-pound hammer and test the connection by tapping the disposable shank away. The shank should freely break away from the connection leaving Tab/Lug attached secure.

Note: Do not strike the connection directly. Only strike the shank for removal purposes.

- Threaded Stud Test – Take a 1 pound Nylon/soft hammer and tap the base of the stud 3 times taking care not to damage the threads.

PIN BRAZING GUN MAINTENANCE

1 -Switch Contacts

Note: Over time, Contacts will become charred and pitted. These must be inspected regularly at the end of each shift week or 100 connections, whichever comes first.

WARNING: Contacts with excessive pitting or wear will cause defective Brazing results and may result in damage to your Pin Brazing Gun. Damaged Contacts should always be replaced (as a pair).

Switch Contacts are accessible by removing the Positive (Male) "DINSE" Socket from the Trigger and Switch Housing in the Lower Barrel of the Pin Brazing Gun (Allen Key Provided) (Fig. 13)

Fig 13 

Fig 14 

Inspection

- Remove the 3 securing Socket Cap Screws (Allen Key Provided) at the rear of the Trigger Switch Housing in the Lower Barrel of the Pin Brazing Gun.
- Pull out the "DINSE" Socket and Housing Bushing.
- Inspect and clean the Flat Contact using Emery cloth or a flat file. Remove from the housing if necessary (14mm Box Spanner provided). Turn counter-clockwise to loosen. (Fig. 14)
- Once cleaned, the Contact can be re-installed and fully tightened into the "DINSE" Socket Mount.
- Flat Contact should be set so that circuit is complete when trigger is 50% closed.

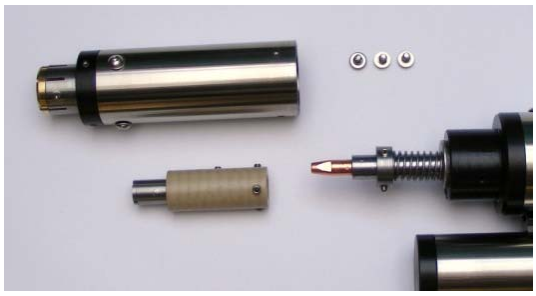
Note: The contacts can be adjusted forward on their mounting threads in order to make up for any wear. Brass spacer washers may be packed behind the contacts to enable these to be tightened.

- Using the 14mm Box Spanner, remove the Domed Contact located within the Lower Gun Barrel (turning counter-clockwise to loosen). Clean or replace as instructed above. Avoid distorting the convex shape or form of the Domed Contact through excessive cleaning.

2 - Copper Contact Tip

Should the contact Tip (Fig. 15) become damaged or blocked by spatter or wear, it must be replaced.
Note: Never attempt to repair the damaged nozzle.

Fig 15 

Fig 16 

DO NOT ALLOW MAIN SHAFT TO ROTATE!

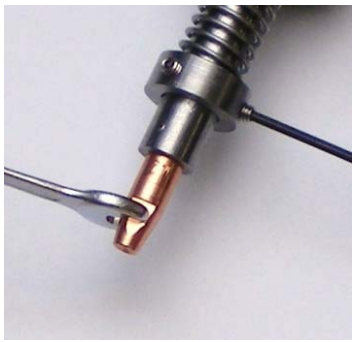
Fig 17 

Fig 18 

- Expose the nozzle by first removing the entire front Cylinder section of the Pin Brazing Gun (Fig. 16). Remove the Heat Shield and Pin Holder completely (Fig. 18) by loosening the 3 screws (Allen Key Provided) at the base of the Heat Shield.
- Remove the Copper Contact Nozzle by using the 6mm Open Ended Spanner, turning counter-clockwise to loosen. (Fig. 17)

WARNING – Do not allow the Center Shaft to rotate, as this will damage the inner Electromagnet Coil. This should be supported for leverage using the provided Allen Key (Fig. 17)

- Inspect the Heat Shield and Pin Holder (Fig. 18) for damage and replace if necessary.
- Screw a new Contact Tip into position and tighten fully against the main shaft (Spanner Provided) ensuring no gap or threads are visible between the two components. Reassemble Heat Shield and depress fully against the steel Return Spring Compression bushing, before tightening 3 screws and reattaching the Brazing Gun Front Cylinder.

4 – Cables and Sockets

WARNING: Before attempting any Pin Brazing Operation check all cables, sockets and plugs for security, wear, exposed wires etc. Failure to do so could result in fire, personal injury or permanent damage to your Pin Brazing Equipment.

Brazing Gun Cable should be cleaned and inspected for damage. Cable insulation should be in good condition and no exposed copper wires should be seen. Loose Plugs and Sockets should also be replaced. Repairs should not be attempted.

EARTH DEVICE

Earth Device Cable should be cleaned and inspected for damage. Cable insulation should be in good condition and no exposed copper wires should be seen. Loose Plugs and Sockets should also be replaced. Repairs should not be attempted.

1 - Earth Device Clamp – Various Earth Device Clamps are available and must be replaced when worn or damaged.

- Magnetic Earth Devices can be cleaned and de-pitted using a flat hand file only.
- Magnetic Plates may need securing screws tightening periodically.

Note: To increase the life of your cable accessories, attempts should be made to clean all cables and respective Earth Device mechanisms including contact plates after use and before storage.

Notes:

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WARRANTY

Farwest Corrosion Control Company and Electrobraze Limited (UK) (hereinafter called "Electrobraze"), subject to the exceptions contained below, warrants new Equipment a period of one year from the date of sale to the first retail purchaser, or for a period of 2 years from the shipping date from Electrobraze, whichever period expires first. Product shall be free of defects in material and/or workmanship at the time of delivery, and will, at its option, repair or replace any Equipment or Part, which is found upon examination by an Electrobraze authorised body or by Electrobraze to be DEFECTIVE IN MATERIAL AND/OR WORKMANSHIP.

EXCEPTIONS FROM WARRANTY:

NEW PARTS: New parts, which are obtained individually, are warranted to be free of defects in material and/or workmanship at the time of delivery and for a period of 6 months after the date of first usage or 2 years after the date of delivery, whichever period expires first. Warranty for new parts is limited to replacement of defective parts only. Labor is not covered.

FREIGHT COSTS: Freight costs to return parts or equipment to Electrobraze, if requested by Electrobraze for the purpose of evaluating a warranty claim for warranty credit, are covered under this policy if the claimed part or parts are approved for warranty credit. Freight costs for any part or parts, which are not approved for warranty credit, will be the responsibility of the individual.

GRINDING ACCESSORIES: Accessories such as Carbide Burrs, Abrasive discs and Grinding Wheels are warranted to be free of defects in material and or workmanship at the time of delivery only.

ITEMS PRODUCED BY OTHER MANUFACTURERS: Components, which are not manufactured by Electrobraze such as Batteries, are warranted by their respective manufacturers.
a. Costs incurred to remove an Electrobraze manufactured component in order to service an item manufactured by other manufacturers.

ALTERATIONS & MODIFICATIONS: Alterations or modifications to any Equipment or part. All obligations under this warranty shall be terminated if the new Equipment or part is altered or modified in any way, including the removal of Identification, Trade Mark or Warning labels.

NORMAL WEAR: Any failure or performance deficiency attributable to normal wear and tear such as Equipment bushings, retaining pins and screws, component wear, bumpers and grips, retaining rings and plugs, rubber bushings, compression springs, electrical contacts, Collets, Chucks and other consumable holders, switches, plugs, cables and sockets etc

INCIDENTAL/CONSEQUENTIAL DAMAGES: To the fullest extent permitted by applicable law, in no event will Electrobraze be liable for any incidental, consequential or special damages and/or expenses.

FREIGHT DAMAGE: Damage caused by improper storage or freight handling.

LOSS TIME: Loss of operating time to the user while the tool(s) is out of service.

IMPROPER OPERATION: Any failure or performance deficiency attributable to a failure to follow the guidelines and/or procedures as outlined in the tool's operation and maintenance manual.

MAINTENANCE: Any failure or performance deficiency attributable to not maintaining the Equipment or tool(s) in good operating condition as outlined in the Operation and Maintenance Manual.

REPAIRS OR ALTERATIONS: Any failure or performance deficiency attributable to repairs by anyone, which in Electrobraze's sole judgement caused or contributed to the failure or deficiency.

MIS-APPLICATION: Any failure or performance deficiency attributable to mis-application. "Mis-application" is defined as usage of products for which they were not originally intended or usage of products in such a matter, which exposes them to abuse or accident, without first obtaining the written consent of Electrobraze. PERMISSION TO APPLY ANY PRODUCT FOR WHICH IT WAS NOT ORIGINALLY INTENDED CAN ONLY BE OBTAINED FROM ELECTROBRAZE.

WARRANTY REGISTRATION: ELECTROBRAZE ASSUMES NO LIABILITY FOR WARRANTY CLAIMS SUBMITTED FOR WHICH NO EQUIPMENT REGISTRATION IS ON RECORD. In the event a warranty claim is submitted and no equipment registration is on record, no warranty credit will be issued without first receiving documentation, which proves the sale of the tool or the tools' first date of usage. The term "DOCUMENTATION" as used in this paragraph is defined as a bill of sale, or letter of intent from the first retail customer. A WARRANTY REGISTRATION FORM THAT IS NOT ALSO ON RECORD WITH ELECTROBRAZE WILL NOT BE ACCEPTED AS "DOCUMENTATION".

NO ADDITIONAL WARRANTIES OR REPRESENTATIONS

This limited warranty and the obligation of ELECTROBRAZE there under is in lieu of all other warranties, expressed or implied including merchantability or fitness for a particular purpose except for that provided herein. There is no other warranty. This warranty gives the purchaser specific legal rights and other rights may be available, which might vary depending upon applicable law.