No matter the task, the new TIP TIG is up to the challenge, and then some. It offers far more power than the previous model, yet is delightfully simple to use. The redesigned wire feeder is as stunning to look at as it is to weld.

TIP TIG. Everything you want modern welding to be. Now even better.

We are very pleased that you have chosen to place your trust in our product. We place great value in ensuring that you draw great pleasure, benefit and work enhancement from your use of the TIPTIG Hot Wire Unit.

For that reason, we would like you to read through the operators manual thoroughly before installing and starting to use the TIPTIG Hot Wire Unit.

It will help you to familiarize yourself with your new product as rapidly as possible and to use it more efficiently.

This manual details the TIPTIG Hot Wire Unit, providing you with assistance and support in installing and getting started, as well as demonstrating how to use it safely and effectively.

We wish you the best of luck.

TIP TIG
The TIP TIG process is a dynamic GTAW process that combines our patented vibratory effect of the wire in part with a hotwire current applied to the wire prior to entering the weld puddle.

- The vibratory effect is created by a linear forward/backward mechanical motion created by the custom wire feeder system.
- The Hotwire current is created by a secondary power source within the Tip Tig unit.

**How is the TIP TIG Process Operated?**

- The TIP TIG process is operated by using a standard solid core MIG spool, a conventional TIG power supply with a minimum of 250 amps with HF start and trigger hold function because the TIP TIG process doesn’t use a foot petal.
- The TIP TIG process can be operated in all welding positions both manually or combined with our automated equipment such as the TIP TIG Tractor, TIP TIG Orbital and TIP TIG Oscillator.

**Weld Process Benefits from TIP TIG?**

- The wire entering the weld pool is mechanically and electrically superimposed from the TIP TIG process which creates a high speed vibration and preheating of the weld wire while entering the weld puddle.
- The vibratory effect and the preheating of the wire create a more fluid weld puddle allowing for improved sidewall wetting and significant deposition rate increases as well as porosity off gassing.
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Protect yourself and others from injury—read and follow these precautions.

### I - I  Symbol Usage

Instead of the examination mark, the danger sign often shows the source of the danger in question. The yellow highlighted text contains details of how to prevent personal injury or substantial damage to property.

Failure to comply with the instructions given may pose risk of injury—or even danger of life!

**NOTICE—** Indicates statements not related to personal injury.

### I - II  Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-V. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

**ELECTRIC SHOCK can kill.**

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

Don't touch live electrical parts.

Wear dry, hole-free insulating gloves, and body protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the ground.

Do not use AC output in damp areas, if move, movement is confined, or if there is a danger of falling.

Use AC output ONLY if required for the welding process.

If AC output is required, remote output control is present on unit.

Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying, or when there is a high risk of unavoidable or accidental contact with the work piece or ground.

Disconnected input power or stop engine before installing or servicing this equipment. Lockout/tag out input power according to OSHA 29 CFR 1910.147 (see Safety Standards).

Properly install and ground this equipment according to the Owner's Manual and national, state, and local codes.

Always verify the supply ground-check and be sure that input power cord ground wire is properly connected to ground terminal in disconnected box or that cord plug is connected to a properly grounded receptacle outlet.

When making input connections, attach proper grounding conductor first—double-check connections.

Keep cords dry, free of oil and grease, and protected from hot metal and sparks.

Frequently inspect input power cord for damage or bare wiring—replace cord immediately if damaged—bare wiring can kill.

Turn off all equipment when not in use.

Do not use worn, damaged, undersized, or poorly spliced cables.

Do not drape cables over your body.

If earth grounding of the work piece is required, ground it directly with a separate cable.

Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain according to manual.

Wear a safety harness if working above floor level.

Incorrectly installed or improperly grounded equipment is a hazard.

Do not touch live electrical parts.

Wear dry, hole-free insulating gloves, and body protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the ground.

Do not use AC output in damp areas, if move, movement is confined, or if there is a danger of falling.

Use AC output ONLY if required for the welding process.

If AC output is required, remote output control is present on unit.

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Frequently inspect input power cord for damage or bare wiring—replace cord immediately if damaged—bare wiring can kill.

Turn off all equipment when not in use.

Do not use worn, damaged, undersized, or poorly spliced cables.

Do not drape cables over your body.

If earth grounding of the work piece is required, ground it directly with a separate cable.

Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain according to manual.

Wear a safety harness if working above floor level.

Keep all panels and covers securely in place.

Clamp work cable with good metal-to-metal contact to work piece or worktable as near the weld as practical.

Insulate work clamp when not connected to workspace to prevent contact with any metal object.

**SIGNIFICANT DC VOLTAGE exists in Inverter welding power sources AFTER removal of input power!**

Turn OFF inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

**HOT PARTS can burn.**

Do not touch hot parts. Bare handle.

Allow cooling period before working on equipment.

To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.
I - III Additional Symbols For Installation, Operation, And Maintenance

**FIRE OR EXPLOSION** hazard.
Do not install or place unit on, over, or near combustible surfaces.
Do not install unit near flammables.

Do not overload building wiring - be sure power supply system is properly sized, rated, and protected to handle this unit.

**MOVING PARTS** can injure.
Keep away from moving parts such as fans.
Keep all doors, panels, covers, and guards closed and securely in place.

Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary. Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.

**FALLING EQUIPMENT** can injure.
Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
Use equipment of adequate capacity to lift and support unit.

If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
Follow the guideline in the Applications Manual for the Revised NIOSH Lifting Equation (publication No. 94-110) when manually lifting heavy parts or equipment.

**READ INSTRUCTIONS**
Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.

Use only genuine replacement parts from the manufacturer.
Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.

**H.F. RADIATION** can cause interference.
High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.

The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
If notified by the FCC about interference, stop using the equipment at once.

Have the installation regularly checked and maintained.
Keep high-frequency source doors and panels tightly shut, keep sparks gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

**OVERUSE** can cause OVERHEATING.
Allow cooling period, follow rated duty cycle.
Reduce current or reduce duty cycle before starting to weld again.
Do not block or filter airflow to unit.

**FLYING SPARKS** can injure.
Wear a face shield to protect eyes and face.
Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.

Sparks can cause fires - keep flammables away.

**STATIC (ESD)** can damage PC boards.
Put on grounded wrist strap BEFORE handling boards or parts.
Use proper static-proof bags and boxes to store, move, or ship PC boards.

**MOVING PARTS** can injure.
Keep away from moving parts.
Keep away from pinch points such as drive rolls.

**WELDING WIRE** can injure.
Do not press gun trigger (button) until instructed to do so.
Do not point gun toward any part of body, other people, or any metal threading welding wire.
I - IV  CALIFORNIA PROPOSITION 65 WARNINGS

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer.

(California Health & Safety Section 25249.5 et.seq.)

I - V  Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes
ANSI Standard Z49.1 from Global Engineering Documents
(www.global.ihs.com)

Safety in Welding, Cutting, and Allied Processes
CSA Standard W117.2 from Canadian Standards Association
(www.csa-international.com)

OSHA, Occupational Safety and Health Standards for General Industry
Title 29, Code of Federal Regulations (CFR) Part 1910, Subpart Q
and Part 1926, Subpart I from Government Printing Office
(www.osha.gov)

I - VI  EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g., pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers-by or individuals risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to work piece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.
General safety instructions

The recognized technical rules and applicable standards and regulations were followed and applied in the development and manufacture of the TIPTIG High Speed Hot Wire Unit.

The TIPTIG High Speed Hot Wire Unit is designed and manufactured such that, if used in accordance with its designed purpose, any potential danger is largely avoided.

Ing. Siegfried Plasch nonetheless feels obliged to detail the following safety precautions which you should undertake in order to avoid any residual risk.

Follow the operating instructions!

Caution! When using TIPTIG Hot Wire Unit, the following fundamental safety precautions must be taken in order to protect against electric shock, potential injury and fire risk. Read and follow the instructions for use, cleaning, care and maintenance given in this Technical Manual before beginning work. Keep the Technical Manual within easy reach of the machine operator and pass it on to new operators as and when appropriate.

The TIPTIG High Speed Hot Wire Unit is only for commercial and industrial use. Any other use of this machine must be authorized in writing by the manufacturer - Ing. Siegfried Plasch. Only personnel that have trained for use and servicing of welding equipment may operate this machine.

The operator for this equipment must carefully read and fully understand all the information contained within before the unit can be put into operation!

The information contained in this manual has been given the manufacturer's best knowledge. However, the manufacturer can't be held liable for the use of this information.

Ing. Siegfried Plasch reserves the right to make any changes to this machine and/or operations manual without prior notice.

Check function!

Before beginning work, check that the guards and the TIPTIG Hot Wire Unit itself are in good working order. Check the torch and machine for damage and make sure that all parts in good working order!

Look out for damage!

All parts must be correctly fitted and all conditions to met ensure trouble-free operation of the machine. If the machine is damaged in any way, it must no longer be used. In such cases, ensure that the machine is professionally repaired. Identify the defect and mark the machine clearly so that it is not used until such time as the repair has been carried out.

Maintain good order!

Maintain good order in your work area! Disorder in a work area can cause accidents. Secure your workplace when leaving it.
Installation and servicing of the TIPTIG Hot Wire unit welding machines and components may only be performed in accordance with the national rules and regulations of the respective organization operators safety. Never come into contact with any metal parts that are under stress or use with bare hands or wet clothing. During welding operation always wear safety gloves, welding helmet with correct filter! Be especially careful that anything, such as clothing that comes in contact with the work area including the welding torch, welding ground clamp and welding machine are always dry. Never work in wet clothing! When working with metal in the work area or in areas with high voltage always be sure that all metal parts are isolated. Always use dry gloves and wear rubber soled shoes! Also, make sure that you are standing on a dry, isolated underlay! Do not use any worn or damages welding cable! Make sure that any welding cables are not overloaded! Turn off the TIPTIG Hot Wire Unit and the welding machines if it is not in use for long periods of time! Do not leave the welding cable coiled up and do not wrap it around any parts of the equipment casing! When leaving the TIPTIG Hot Wire Unit and the welding unit, make sure that it has been turned off and never leave it running unattended! Make sure that the welding ground is connected close by the welding area to the work piece! Poor Welding ground connections, or poor grounding taken from parts of the building or remote points decrease efficiency. Furthermore the risk of electrical damage to equipment will increase! Make sure that welding voltage can not come into contact with any chains or steel ropes from equipment such as powered lifts and cranes!

Wear suitable work wear and personal safety gear!

Damaging effect of the rays generated by the electrical arc and from any hot metals can lead to severe burns to unprotected skin and eyes. To protect your eyes and body from damaging sparks and rays always use welding helmets with the proper certified filter lens. Also, wear the proper protective clothing etc., even if you are only observing the welding process. Any person in the vicinity of the work area must be advised not to look directly into the arc and that metal sparks could be sent through the air. Protect your skin and hair with leather gloves and a welding helmet/mask from the rays and metal sparks emitted. Protect the personnel in the surrounding work area from the welding rays and hot sparks with approved anti-flame retardant gear. Gas tanks under pressure are a potential danger. Follow all safety measures as suggested by gas suppliers and the safety procedures imposed by safety inspectors! Make sure that gas tanks are in a safe place and cannot fall over!
SAFETY PRECAUTIONS - READ BEFORE USING

Do not use the welding equipment close to flammable liquids or gases!

Danger from electrical energy! There is electrical equipment inside the TIPTIG Hot Wire Unit. Check the machine for external damage before beginning work. Check especially if wires and cables are damaged.

Do not continue working with the equipment if it is damaged. **Pull the plug!** In the event of repairs and maintenance work, or when the equipment is not in use, always disconnect the mains power supply plug from wall socket.

**WARNING!** Work on the electrical equipment may only be carried out by a qualified electrician. Only original spares may be used. Failure to comply with this requirement may result in users suffering accidents.

Use only original parts! **WARNING!** Use only spares as specified in this Manual. The use of non-approved parts may pose a risk of injury to you.
Make sure the correct power supply is connected!

The TIPTIG Hot Wire Unit must be connected to a socket outlet fitted with a properly installed ground contact. Before connecting the TIPTIG Hot Wire Unit, make sure the main power cable and the plug are undamaged. Make sure the main voltage matches the specifications on the rating plate. The TIPTIG Hot Wire Unit may only be connected to a voltage of 115/120VAC /50/60Hz. The power circuit must be fuse-protected to a maximum of 16A.

**Recommendation:** To protect you against electric shock, the circuit should be protected by an GFI circuit-breaker (ground fault circuit-breaker).

The TIPTIG Hot Wire Unit can now be operated as detailed in the "Operator control" section.

Using in tanks and container structures!

Don't take the TIPTIG Hot Wire Unit into a tank or container structure!

It's possible to take only the TIPTIG Feeder into any tank and container structure!

You have only to separate the TIPTIG Feeder from the TIPTIG Trolley!

In this case the operating supply voltage is only 32 VAC!
<table>
<thead>
<tr>
<th>Miller Electric</th>
<th>Lincoln Electric</th>
<th>Fronius</th>
<th>ESAB</th>
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<td>Maxstar 280DX, 350, 400, 700, 800</td>
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<td>Magic wave, 3000, 4000, 5000</td>
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<td>Powerwave S350, S500 MP</td>
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<td>MP PipeWorks / PipeWorks Field Pro</td>
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MILLER MAXSTAR CONNECTION GUIDE

NOTE: DO NOT PLUG THE TIP TIG ONTO BACK OF POWERSUPPLY
USE SEPARATE 115V RECEPTACLE
MILLER MAXSTAR / DYNASTY

BASIC SETTINGS

POLARITY  (DC) - Steel Alloys, Stainless Steel, Nickel, Copper, Titanium
(AC) - Aluminum, Magnesium

PROCESS - TIG HF IMPULSE is the standard selection for High Frequency Starts

OUTPUT - RMT 2T HOLD – is used in replace of a foot pedal to engage and hold the arc while welding.

AMP - Main Amperage Set

INERT GAS USED - 100% Argon used with a regular at 25-35 CF for most welding.

ADVANCED SETTINGS

PULSER – Not Recommended.

SEQUENCER - The TIP TIG Process does not require a foot pedal. The Sequencer settings is where you can control your start and stop settings in replace of the foot pedal.

INITIAL AMPERAGE (AMP VALUE)
INITIAL SLOPE TIME (TIME VALUE)
FINAL SLOPE TIME (TIME VALUE)
FINAL AMPERAGE (AMP VALUE)

GAS/DIG - PreFlow and PostFlow provide shielding before and after the starts and stops and are set in seconds.
DO NOT PLUG THE TIP TIG INTO THE BACK OF YOUR POWERSUPPLY AS THE HF INTERFERS WITH THE TIP TIG EQUIPMENT. USE A SEPARATE 120V OUTLET.
INSTALLATION TO MILLERPOWER SOURCE

Remove the 4 black screws on the top of your Miller power supply.

Mounting Kit PN#10000085
Set mounting hardware in place and install.

Adjust feet and position TIP TIG on top of resting pads as shown.
GETTING STARTED SET AND TEST HOTWIRE AMPS

Make sure the interconnect cable is installed to the primary power supply and that the TIP TIG Unit is plugged into 120V.

Turn on the Primary Power Supply and Pump On.

Turn on Argon Gas and set to 25.

Turn the TIP TIG power switch located at the rear of the unit on.

The Hotwire Power Switch is located inside the unit near the weld wire location.

When first Powered On, The LED Indicator light will flash several times then become solid.

The Hot Wire Unit is activated

If welding Aluminum. DO NOT USE HOTWIRE....Power Off Hotwire

The Hot Wire Unit is activated.

The Hot Wire Amp Range is from 60 to 95. **PRESET AT 80AMPS**

60 Amps for .030 DIA Wire
80 Amps for .035 DIA Wire
95 Amps for .045 DIA Wire

Install torch, set and test hotwire amps.
Install test cable as shown. Make sure torch is installed with the 5pin bayonet connector at this point.
Put on DC AMPS
Put meter clamp around test cable.
Press wire feed button on torch.
Set amperage to .030”, .035”, .045” setting

.030 = 60AMP
.035 = 80AMP
.045 = 95AMP

Make adjustment with flat head screw driver in the above location.
• Always Use a Good Quality Weld Wire.
• The preferred wire diameter is .030”, .035”, .045” based on wire type and availability.
• Plastic Reels are preferred over the Wire Steel Reels.
• Wire Steel Reels may **Bend or Break Causing Wire Feed Problems**.
• With TIP TIG the Wire Cast and Helix are Important for good Feedability.
• Use standard 10LB, 33LB, 40LB Wire Spools on 8” and 12” DIA.
Tungsten Electrodes Sizes to Amperage Ranges

3/32” (.093”) 2.4 mm = 60 - 250
1/8” (.125”) 3.2 mm = 100 - 400
5/32” (.156”) 4.0 mm = 160 - 500
With the TIP TIG Process, you will be welding with more wire so your weld current will be higher than normal. 150 – 350 amps is typical. You will have much longer arc on times. How the tungsten is sharpened will have dramatic effect on the weld duty cycle attained.

For manual TIP TIG welds you want an included angle of “25 degree” with a flat on the tungsten tip. This provides a wider arc plasma suited for most TIG welds.

For better penetration at high travel rates, you will need a included angle of “35 degree”. This angle provides a narrow, more concentrated arc plasma better suited for automation.

![Diagram of tungsten tips with angles](image-url)
When installing a wire spool, make sure the drive wheels are set to the correct wire diameter.

Each drive wheel is reversible. The number shown on the front side of the drive wheel indicates the correct wire size used.

Available Drive Roll Sizes (.8-1.0) (.9)(1.0-1.2)(1.2) (1.2-1.6)

When removing or installing the torch, make sure the TIP TIG TEFLON OUTLET TUBE is installed inside the main connection terminal as shown below.

The TIP TIG TEFLON OUTLET TUBE is 3.5” Long.

The purpose of the TIP TIG TEFLON OUTLET TUBE is to keep the wire centered from the action of the wire feeder's forward and backwards motion and acts as the outlet guide for the wire.
Make sure the Inlet Guide and the Outlet Guide are as close to the drive rolls as possible. This will greatly reduce any wire feed issues.

When installing the TIP TIG BRASS GUIDE, please ensure that the Brass guide is as close to the drive rolls without making contact with them. Refer to the correct diagram above.
1. Remove all liner consumables so the torch is bare.
2. Make sure the correct drive rolls are installed.
3. Set the wire feed speed to 100.
4. Use a file to round off wire before inserting in into the TIP TIG.
5. Run the wire until it is about 12 inches past the handle.
6. Install liner and guide blocks...Make all settings as shown below.
7. Orientate the guide block to the desired position.
8. Run 15 inches of wire to ensure the wire cast has been straightened.
9. Set tensioners to around 3 and you are ready to weld.
10. Run the wire out for 30 seconds with the wire speed at 30 produce 45 linear inches of wire.
11. Adjust tension to achieve 45” of wire +/- 5 in 30 seconds
TIPTIG FOUR ROLL WIRE DRIVE OVERVIEW
<table>
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<th>Pos</th>
<th>Qty</th>
<th>Description</th>
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<td>TIPTIG Feed plate rear</td>
<td>88807202</td>
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<td>TIPTIG Feed roll shaft</td>
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<td>TIPTIG Pressure adjustment unit</td>
<td>88807222</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>TIPTIG Tapered pin</td>
<td>88807224</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>TIPTIG Quick change carrier gear</td>
<td>88807226</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>TIPTIG Circlip</td>
<td>88807228</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>TIPTIG Quick-change feed roll</td>
<td>see list</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>TIPTIG Quick change pressure roll</td>
<td>88807230</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>TIPTIG Machine screw</td>
<td>88807232</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>TIPTIG Wire guide set blue</td>
<td>88807234</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Suggested Interval</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed Rolls</td>
<td>Every 500 Hrs. or as needed</td>
<td>Inspect, Clean or Replace</td>
</tr>
<tr>
<td>Wire Guides</td>
<td>Every 500 Hrs. or as needed</td>
<td>Inspect, Replace</td>
</tr>
<tr>
<td>Quick-Change Gears</td>
<td>Every 3000 Hrs. or as needed</td>
<td>Inspect, Replace</td>
</tr>
</tbody>
</table>

Table 4  Maintenance Plan
NEW!!

TIPTIG EXTREME

Hotwire 18 Water Cooled Torch
Standard Length 14ft (4.25m)
Duty cycle 400A/100%

To Start the Weld process
Step 1 – Press Up Button to Start Arc
Step 2 – Press Down Button to Start Wire

To Stop the Weld Process
Step 3 – Press Down Button to Stop Wire
Step 4 – Press Up Button to Stop Arc
TIP TIG FRONT CONNECTION

TIP TIG FEEDER
1 – 77700046 / 77700048
Main Torch Connection Terminal
2 – 88800457
5 Pin Female Bajonet Connector
3 – 77700162
Current / Water Connection G3/8 RH
4 -88800430
Gas Connection G1/4 RH
5 – 88800431
Water Inlet Connection G3/8 LH
6 – 88800426
Hotwire Terminal 25

TIP TIG TORCH
1 - Torch Connection
2 - 7 Pin Male Bajonet Connector (NEW)
3 - Current / Water Connection G3/8 RH
4 - Gas Connection G1/4 RH
5 - Water Inlet Connection G3/8 LH
6 - Hotwire Terminal SK25
1) 120 VAC POWER TERMINAL 88800458
2) TIP TIG COMMUNICATION CONNECTION 0902160007
3) TIP TIG 0-10V (AUTOMATION ONLY) 0942200007
4) LH WATER FITTING 3/8” 88800431
5) RH WATER FITTING 3/8” 88800430
6) GAS FITTING 1/4” 88800429
7) Electro Negative Terminal 77700050
8) Hotwire Terminal 88800454
TIP TIG REAR POWER CONNECTION

- MAIN POWER
- HOTWIRE FUSE 120V
- FEEDER FUSE 32V

TIP TIG ELECTRONICS AND POWER
TIP TIG INSIDE OVERVIEW

Oscillator Motor  Feed Motor  Transformer

Control Board  Hotwire Unit
TIP TIG TRANSFORMER
TIP TIG CONTROL BOARD

A = Wire Feed Speed
   B = Frequency Adjustment
   B = Weld Amps (In Equipped)

I = Toggle between 2 Stroke and 4 Stroke

Hotwire = On / Off

= Manual Wire Feed

Software Upgrade Port
TIPTIG Hot Wire Unit can be used for TIG/PLASMA/LASER techniques.

TIPTIG Hot Wire Unit is suitable for Hot and Cold Wire Welding.

All filler diameters can be used (0.030in-0.063in).

For Aluminum it's recommended 0.045in (0.063in).

Use the welding machines with the water cooler running. If not you will damage the torch.

**Display value**

- **feeding speed**: The display value - multiplied by 2.5 is the result in inches!
  
  Example: Factor 100 = 250inches/min (6.4m/min)!

- **frequency**: The value is as shown as factor!
  
  For all applications use 230!!

- **start delay**: The value is shown as factor!
  
  Useful for tack weld!

- **wire retract delay**: The value is shown as a factor!
  
  Is an option - normally not used!

- **spot time**: The value is shown as factor!
  
  Only for spot weld!
  
  To use spot time it's needed to adjust the mode spot function.

**Mode 4 - step**

- Generally select 4- stroke mode for hand welding > see page 8

**Mode 2 - step**

- 2- stroke mode mostly used for tack welding

**UP/DOWN Function Wire Feed Speed**

- If a remote control or an UP/DOWN torch is used, it's possible to adjust wire speed + - 33% from the setup of wire feed value

**Option UP/DOWN Function AMPS**

- If a remote control or an UP/DOWN torch is used, it's possible to adjust amps + -!
  
  This option belongs to the feature of the welding machine!
TIP TIG ELECTRONICS AND POWER

TIP TIG FEEDER HAND VERSION 1.6 CIRCUIT DIAGRAMM

X1
0 V AC
32 V AC

Filter 1

Filter 3

Filter 2

Oscillator Motor

X2

Socket 2 poly.No. 2 Oscillator motor
Socket 3 poly.No. 7 Start/Stop TIP TIG Hot Wire Unit
Socket 4 poly.No. 1 4 Wire feed motor+ 32VAC supply
Socket 5 poly.No. 3 Start/Stop TIP TIG Feedur
Socket 2 poly.No. 8 not in use
Socket 4 poly.No. 5 4 not in use

X1 (7 pol. screw socket) TIP TIG back side

Pin 1 0 VAC Power supply TIP TIG
Pin 2 32 VAC Power supply TIP TIG
Pin 3 Start/Stop TIP TIG Hot Wire Unit
Pin 4 Start/Stop TIP TIG Hot Wire Unit
Pin 5 Start/Stop Welding machine
Pin 6 Start/Stop Welding machine
Pin 7 GND for HF protection must be connect to the HF shielding (T770093)

X2 (5 pol. bayonet socket) TIP TIG front side (Torch connection)

Pin 1 Start/Stop Welding machine
Pin 2 Start/Stop Welding machine
Pin 3 not in use
Pin 4 Start/Stop TIP TIG Feeder
Pin 5 Start/Stop TIP TIG Feeder

TIP TIG Wire feed motor 24V DC 70W (T7700811)
TIP TIG Oscillator motor 0R55x40 24V DC 70W (T7700132)
TIP TIG HF Filter 1,2,3 (HP) (T7700980)
TIP TIG HF Shielding, connected at the wire feed motor (T770093)
TIP TIG Resistor 350 Ohm, 2 Watt

Ing. Siegfried Plassch, Austria
01.03.2010
WARRANTY INFORMATION
TIP TIG FEEDERS, TIPTIG HOTWIRE MODULES, TIP TIG POWERSUPPLYS

All TIP TIG systems have been calibrated from the manufacturer and are in compliance.

Within the warranty period of 12 Months from the date of purchase, TIP TIG USA will replace any warranted parts or components that fail due to such defects in material or workmanship. TIP TIG USA must be notified in writing within thirty (30) days of such defect or failure, at which time TIP TIG USA will provide information on the warranty claim procedures to be followed.

TIP TIG USA shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American location.

TIP TIG USA shall not bear the costs of transportation.

12 Month Parts and Labor
• Transformer
• Hotwire Unit
• PC Board
• Feed and Oscillator Motor
• Water Fitting and Bulkhead Connection
• Linear Motion Slide and Extenders
• Torches (Upon Initial Delivery Only)

What is Not Covered Under the Warranty
Consumable components; such as contact tips, nozzles, insulators, rings, collets, gas lenses, back caps, liners, tungsten, universal tip guides or any torch accessory is not covered under the manufactures warranty.

Causes for Warranty to be Voided
Damage, fault or failure due to alteration or repairs made by anyone other than Tip Tig USA shall void the warranty

For TIPTIG Service please call:
856-312-8166

TIP TIG USA 155 E 9th Ave Suite A Runnemede, NJ 08078
## WP18 SC LARGE CONFIGURATION

### TIP TIG Extreme HW Torch SC18 4.0M
10002461

### TIP TIG 18SC Torch Body Replacement
99903360

### Gas Lens
- 3/32” 99900524
- 1/8” 99900526
- 5/32” 99900528

### Collets
- 3/32” 99901031
- 1/8” 99901032
- 5/32” 99901033

### Ring
- Outside F 77700630
- Inside B 77700631

### Standard Insulator
- Ring 77700214
- Nozzle 77700605

### HD Insulator
- Ring 1 77700208
- Ring 2 77700209
- Nozzle 77700210

### Nozzles
- #6 3/8” 77700530  #6XL 3/8” 77700575
- #8 1/2” 77700532  #8XL 1/2” 77700576
- #10 5/8” 77700533  #10XL 5/8” 77700577
- #12 3/4” 77700534  #12XL 3/4” 77700578
- #6L 3/8” 77700570  #6XXL 3/8” 77700585
- #8L 1/2” 77700571  #8XXL 1/2” 77700586
- #10L 5/8” 77700572  #10XXL 5/8” 77700587
- #12L 3/4” 77700573  #12XXL 3/4” 77700588

### Back Caps
- Small 77700240
- Med 77700241
- Large 77700242

### Tip Holder
- 39 Deg Fillet 77700686
- 42 Deg Butt 77700685

### Liner
- Bronze Liner 77700566-A

### Insulator
- Fiber Sleeve 60000215-A

### Tips Regular
- Cooper .035” 77700536
- Cooper .045” 77700537
- Cooper .068” 77700538

### Narrow Groove Tips
- .035” 77700536B
- .045” 77700537B
Gas Lens
- 3/32” 99900024
- 1/8” 99900026
- 5/32” 99900028

Collets
- 3/32” 99901031
- 1/8” 99901032
- 5/32” 99901033

Ring
- 77700631

Ring Insulator
- 77700214

Nozzle Insulator
- 77700252

Nozzles
- #5 5/16” 99902050
- #6 3/8” 99902052
- #7 7/16” 99902054
- #8 1/2” 99902056
- #5L 5/16” 99902060
- #6L 3/8” 99902062
- #7L 7/16” 99902064
- #8L 1/2” 99902066

Back Caps
- Small 77700240
- Med 77700241
- Large 77700242

Tip Holder
- 39 Deg Fillet 77700686
- 42 Deg Butt 77700685

Liner
- Bronze Liner 77700566-A

Insulator
- Fiber Sleeve 60000215-A

Tips Regular
- Cooper .035” 77700536
- Cooper .045” 77700537
- Cooper .068” 77700538

Narrow Groove Tips
- .035” 77700536B
- .045” 77700537B
Step 1- Install the Ring Insulator
Step 2- Install the Ring for Universal Tip Holder
Step 3- Install the Nozzle Insulator

Step 4- Install the Gas Lens by hand, then tighten slightly with pliers as shown.
Step 5- Install the Gas Nozzle
Step 6- Install the Collet
Step 7- Install the Tungsten

Step 8- Install the Back Cap and tighten to secure the tungsten in place.
Tip / Liner Assembly

Includes:
- Contact Tip
- .035, .045 Liner
- Fiberglass silicone Sleeve

42 (RED) Deg Tip Holder for PIPE Applications
Also Available in 39 (BLUE) Deg Tip Holder for PLATE Applications

7.5” Liner Assembly will work on Regular and Large Nozzle Sizes
Loosen the Set Screw inside the Tip Holder

Install the weld repellant tape as shown.

Install the Tip Assembly into the Tip Holder and tighten.

Install the Tip Assembly Shaft.
Step 9- Install the Assembly Holder Block to the Ring and secure with screw.
Step 10- Attach Hotwire Cable to Assembly Holder Block with screw.

Radius of Tip Assembly needs to have a uniformed radius as shown for best wire feeding results.

Step 11- Push in Liner Assembly to Hull Adapter on torch
Step 12- Connect Adjustment Shaft to Assembly Holder Block and tighten screws.
**Open Root Geometries**

- PASS 1 OPEN ROOT (.035 Wire)
  - 125 to 145 amps - 25 to 35 WFS

- CLOSED ROOT (.035 Wire)
  - 170 to 200 amps - 20 to 30 WFS

  The heavier the wall, the greater the amperage, as it acts as a heat sync.

  Amperage also depends on the operator and his WFS and travel speed.

  When rooting the pipe, you must stay on the leading edge of the puddle and maintain this throughout the process.

**Pass 2 Fill**
- 200 to 250 amps - 45 to 60 WFS

**Pass 3 or Pass 3 - 4 Cap**
- 170 to 200 amps - 30 - 40 WFS

**2G Fixed, 5G Fixed, 6G Incline Fixed use lower settings.**

**1G Rotating use higher settings.**

**Closed Root Geometries**

- F = 1/16
- O = 1/16
- A = 75

- F = 3/32
- O = 3/32
- A = 75

- F = 1/8
- O = 1/8

Semi-automatic HP GTAW Training Techniques
To Use With 5G Pipe Coupon (6”-XXS)

WELD COUPON PREPARATION
When you grind the coupon lands, use a 6” grinder with a ¼” thick blade, while pressing down flat to achieve a near perfect land. Finish with a file. Land size should be close to 3/32”.

WELD COUPON TACKS
Fit coupons using a 3/32” wire for the gap. Tack coupon with 4 tacks, the bottom tack will be approximately 1” long with the other 3, a ½” long. Feather all of the tacks, with the ½” tacks ground considerably more, to be able to consume them, if the welder is able to run past them when coming up the wall. Only feather the 1” tack on the ends, because you will need the extra metal in the center to start on.

TORCH SET-UP AND WELDING OF ROOT WELD BEAD
Start with a #8 cup.

Tungsten stick-out will be determined by positioning torch vertical to the top tack, and loosen tungsten until it hits the tack, then tighten it.

Position the wire feed guide even with the cup. Run wire out past the tungsten, and set a 7/64” to 3/32” gap between the wire and the tungsten by loosening the 2 thumb screws located at the rear of the wire feeder block rod. An Allen wrench can be used as a feeler gauge.

While holding torch vertical, twist feeder block until wire is in a vertical line with the tungsten. Set machine to parameters located on the parameter limit sheets.

Position the tungsten at the center of the bottom tack. (This machine has an upslope, to give you time for last second adjustments.) Press the power on switch and weave tungsten across tack until achieving full power. Continue weaving while holding the torch in the same place until tack becomes fluid. Press wire on switch, and start welding while rocking the cup in a Z type weave. Hold on the sides, and move across center rapidly. Your progression will be slower on the bottom, and faster on the sides and top. Torch angle will be determined by the tungsten tip riding barely above the puddle. If you have to stop at a tack, walk up onto the center of the tack, turn wire off, then the power.
Reverse direction of torch while power down-slopes. This will keep you from consuming the feather edge. If you stick or dip your tungsten tip, you will need to stop and change out the tungsten. You will need to feather end of weld before resuming weld.

**TORCH SET-UP AND WELDING OF HOT PASS BEAD**

First you will need to determine if a #10 or #12 cup is needed. Position the cup horizontally from the side of the pipe. Tilt the back end of the torch down approximately 10 to 20 degrees. You need to have a minimum gap of ¼” from the bottom of the cup to the center of the root weld. If there is less distance than that, you will need to change to a #12 cup.

Tungsten stick-out will be determined by positioning torch horizontal to the side if the root weld. Tilt the back end of the torch approximately 10 to 20 degrees and the tungsten will need to touch the weld. Run wire out past the tungsten, and set a 1/8” gap between the end of the tungsten, and the wire.

Set machine to parameters located on the parameter limit sheets. Start welding at the bottom, proceeding upward, while holding at the sides, and moving rapidly across the center.

Remember the tungsten needs to barely ride above the puddle.
TORCH SET-UP AND WELDING OF FILLER PASSES
It will be the same as for hot passes except that when a #12 cup gets close to bottoming out at the center of the previous weld, and the bottom of the cup, you will need to change back to a #10 cup. This will be after the hot pass, or first filler pass. Cup size of the remainder of weld passes will be determined by welder preference, and or geometry of the previous weld bead placement. Set machine to parameters located on the parameter limit sheets.

Note: Cup sizes will differ with welder preference, but for this training, we will start with these sizes.

Techniques To Use With 5G Pipe Coupon (6” Sch. 80)
This will be the same as welding 6”-XXS except you will start with a #6 cup for the root. Then progress to a # 8 cup for the hot pass, a # 10 cup for the filler, and a # 12 cup for the cap. For the cap you might want to increase the wire to tungsten distance from 3/32” to 7/64”.

Note: Cup sizes will differ with welder preference, but for this training, we will start with these sizes.
TIPTIG Manual Semi-Automatic GTAW Process
Open Root Technique

WELD COUPON PREPARATION

When grinding the coupon root face, use a 4” grinder with a ¼” thick blade, while pressing down flat to achieve a near perfect land. Finish with a file. Root face size should be close to 3/32” and Pipe Bevel 37.5.
Fit coupons using a 3/32” tig weld wire for the gap. Tack coupon with 4 tacks, the bottom tack will be approximately 1” long with the other 3, a ½” long. Feather all of the tacks, with the ½” tacks ground considerably more, to be able to consume them, if the welder is able to run past them when coming up the wall. Only feather the 1” tack on the ends, you will need the extra metal in the center to start on.
TORCH SET-UP

Start with #6 or #8 cup.

Tungsten stick-out will be determined by positioning torch vertical to the top of the pipe, and loosen tungsten until it reaches the top of the root face, then secure the tungsten.
Position the wire feed guide (contact tip) even with the cup. Run wire out past the tungsten, and set a 7/64” to 3/32” gap between the wire and the tungsten by loosening the 2 thumb screws located at the rear of the wire feeder block. While holding torch vertical, twist feeder block until wire is in a vertical line with the tungsten.

Position the tungsten at the center of the bottom tack. Press the power on switch and weave tungsten across tack until achieving full power. Continue weaving while holding the torch in the same place until tack becomes a molted puddle. Press wire on switch, and start welding while rocking the cup in a Z type weave. Hold on the sides, and move across center rapidly. Your progression will be slower on the bottom, and faster on the sides and top.

Torch angle will be determined by the tungsten tip riding barely above the puddle. If you have to stop at a tack, walk up onto the center of the tack, turn wire off, then the power. Reverse direction of torch while power down-slopes. This will keep you from consuming the feather edge. If you stick or dip your tungsten tip, you will need to stop and change out the tungsten. You will need to feather end of weld before resuming weld.
Please test all parameters before start of any work!

Baseline Start Up Parameters:

TIP TIG Hand Hotwire Welding Wire Ø 0.035 and Ø 0.045in

Tungsten Selection

<table>
<thead>
<tr>
<th>Wire Ø 0.035</th>
<th>Wire Ø 0.045</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 - 150</td>
<td>150 - 175</td>
</tr>
<tr>
<td>175 - 200</td>
<td>200 - 225</td>
</tr>
<tr>
<td>225 - 250</td>
<td>250 - 275</td>
</tr>
<tr>
<td>275 - 300</td>
<td>300 - 325</td>
</tr>
<tr>
<td>325 - 350</td>
<td>350 - 375</td>
</tr>
<tr>
<td>375 - 420</td>
<td></td>
</tr>
</tbody>
</table>

Wire Speed (Factor)

<table>
<thead>
<tr>
<th>Wire Ø 0.035</th>
<th>Wire Ø 0.045</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 - 40</td>
<td>75 - 120</td>
</tr>
<tr>
<td>50 - 70</td>
<td>150 - 195</td>
</tr>
<tr>
<td>75 - 90</td>
<td></td>
</tr>
</tbody>
</table>

Materials: All (except Aluminum)

Hotwire current: 80A

Amps (A)

Welding Techniques
<table>
<thead>
<tr>
<th>Trouble</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC Board will not power / LED Display Blank</td>
<td>Check 120V AC Input Power Supply from power cord plug end.</td>
</tr>
<tr>
<td></td>
<td>Check fuse on rear panel.</td>
</tr>
<tr>
<td></td>
<td>Check 120V AC at transformer with meter</td>
</tr>
<tr>
<td></td>
<td>Check 32V AC at transformer with meter</td>
</tr>
<tr>
<td></td>
<td>Remove front panel PC board. Test PLUG 14 (BR/BL) for 32V AC</td>
</tr>
<tr>
<td>Feeder Motor will not operate when button</td>
<td>Check to make sure PC Board has voltage.</td>
</tr>
<tr>
<td>pressed on torch.</td>
<td>Check fuse on rear panel.</td>
</tr>
<tr>
<td></td>
<td>Continue the test using a torch that is properly working.</td>
</tr>
<tr>
<td></td>
<td>Check PLUG 14 (BK/RD) for 5 - 32V DC</td>
</tr>
<tr>
<td></td>
<td>Press Wirefeed button on torch.</td>
</tr>
<tr>
<td></td>
<td>If voltage is present, continue to next step</td>
</tr>
<tr>
<td></td>
<td>If voltage is not present, check torch button</td>
</tr>
<tr>
<td></td>
<td>Check HF Filter input for 5 - 32V DC</td>
</tr>
<tr>
<td></td>
<td>Press Wirefeed button on torch.</td>
</tr>
<tr>
<td></td>
<td>If voltage is present, continue to next step</td>
</tr>
<tr>
<td></td>
<td>If voltage is not present, check torch button</td>
</tr>
</tbody>
</table>

*If all of the above checks show voltage, PC Board is faulty and needs to be replaced.*
<table>
<thead>
<tr>
<th>Trouble</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Cont. Check HF Filter output for 5 - 32V DC  
Press Wirefeed button on torch.  
If voltage is present, continue to next step  
If voltage isn't present, filter is faulty |

**If all of the above checks show voltage, Wirefeed Motor is faulty and needs to be replaced.**

| Oscillator Motor will not operate when button pressed on | Check to make sure PC Board has voltage.  
Check fuse on rear panel.  
Continue the test using a torch that is properly working.  
Check PLUG 2 (BK/RD) for 24V DC  
Press Wirefeed button on torch.  
If voltage is present, oscillator motor faulty  
If there is still no voltage, bad PC board. |

| No Hotwire Input Power | Check to make sure On/Off switch on front panel is on.  
Check to make sure GREEN LED is on.  
Check 120V AC at transformer with meter  
Check the wire termination behind the front on/off switch for 120V AC power.  
Check the lower 2 wires first which confirms 120V AC power from transformer.  
Check the upper 2 wires second which confirms 120V AC power flowing thru the on/off switch.  
If voltage isn't present, switch is faulty |

**If all of the above checks show voltage, Hotwire is faulty and needs to be replaced.**
Check to make sure On/Off switch on front panel is on.  
Check to make sure GREEN LED is on.  
Connect probe from the female hotwire dinse connection on the interconnect cable to the female dinse panel mount as shown below.

With the 5 pin connector from the torch plugged into the wirefeed connection press the wire feed button, the output voltage will be 12V

Next you will see that we made a cable for testing output.  
This cable has a small and large dinse male connector.  
Connect to the same locations shown above with this special cable.

Clamp your meter around the cable  
With the 5 pin connector from the torch plugged into the wirefeed connection press the wire feed button, and set the POT to 80 amps

You should see your AMP setting on your meter  
Adjust you POT to ensure proper function and that the amperage changes

If no adjustment is seen, replace POT

Check to make sure all dinse connections are properly installed  
Check to make sure Hotwire ground is connected to power supply

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hotwire Output</td>
<td>Check to make sure On/Off switch on front panel is on.</td>
</tr>
<tr>
<td>Amperage / Voltage</td>
<td>Check to make sure GREEN LED is on.</td>
</tr>
<tr>
<td></td>
<td>Connect probe from the female hotwire dinse connection on the interconnect cable to the female dinse panel mount as shown below.</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>Adjust you POT to ensure proper function and that the amperage changes</td>
</tr>
<tr>
<td></td>
<td>If no adjustment is seen, replace POT</td>
</tr>
<tr>
<td></td>
<td>Check to make sure all dinse connections are properly installed</td>
</tr>
<tr>
<td></td>
<td>Check to make sure Hotwire ground is connected to power supply</td>
</tr>
<tr>
<td></td>
<td>If all of the above checks show no amperage, Hotwire is faulty and needs to be replaced.</td>
</tr>
<tr>
<td>Trouble</td>
<td>Remedy</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wire Feeding Issues</td>
<td>Worn drove rolls or pressure device not set properly. Replace or adjust as needed</td>
</tr>
<tr>
<td></td>
<td>Drive rolls not matched properly to wire size. Correct drive rolls</td>
</tr>
<tr>
<td></td>
<td>Wire not riding true inside drive rolls. Adjust</td>
</tr>
<tr>
<td></td>
<td>Incorrect radius for bronze liner on gun. Liner should be 7.5&quot; from the handle with the hull device shown just below the WP18 torch body.</td>
</tr>
<tr>
<td></td>
<td>Wire to tip size not matched properly. Try the next larger tip size.</td>
</tr>
<tr>
<td></td>
<td>Worn or defective bronze liner. Replace</td>
</tr>
<tr>
<td></td>
<td>Liner in torch defective. Replace</td>
</tr>
<tr>
<td></td>
<td>Tension on pressure device not set correctly. Adjust pressure to correct wire slippage</td>
</tr>
<tr>
<td></td>
<td>Wire Spool too tight. Adjust pressure at hub to correct drag of wire.</td>
</tr>
<tr>
<td></td>
<td>Make sure outlet tube and brass guide are concentric in feeder assembly.</td>
</tr>
<tr>
<td>No Hi Frequency</td>
<td>Power supply not set to TIG HF.</td>
</tr>
<tr>
<td></td>
<td>Bad torch ground.</td>
</tr>
<tr>
<td></td>
<td>Check to make sure there isn’t a short on the gun side where the torch body is not properly shielded.</td>
</tr>
<tr>
<td></td>
<td>Bad ground inside TIP TIG feeder. Check that ground lugs do not have interference with chassis. Correct as needed.</td>
</tr>
<tr>
<td>Tungsten burnback</td>
<td>Wrong polarity set. Correct</td>
</tr>
<tr>
<td></td>
<td>Positive to ground and hotwire. Negative to TIG cable.</td>
</tr>
<tr>
<td>Preventative Maintenance</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Daily</strong></td>
<td></td>
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</tbody>
</table>
| Drive Roll Alignment     | Check for excessive wear and wire alignment inside the groove.  
                          | Re-align upper drive rolls or replace drive rolls to the appropriate wire size.  |
| Inlet and Outlet Guides  | Check for excessive wear and wire alignment inside the groove.  
                          | Outlet guide should move freely between the brass guide and the torch connection.  
                          | Adjust or replace as needed.  |
| Wire Pressure Device     | Drive rolls should move freely. Tension should start as 3 then adjust +/- as needed.  
                          | The pressure arms should latch and unlatch smoothly.  
                          | Adjust or replace as needed.  |
| Coolant Levels           | Make sure the power supply is full with coolant before use.  
                          | Add coolant as needed.  |
| Water / Gas Connections  | Check for any cracked or worn fittings on the front and back of feeder.  
                          | Replace as needed.  |
| Wire Spool Hub           | Check wire spool hub tension. Too much tension will cause the wire to slip.  
                          | Adjust the tension so the spool stops the instant the wire is turned off.  |
| **Every 3 Months**       |
| Air clean                | Use compressed air to blow out the inside of the feeder.  |
| Oscillator Connecting Rod| Check the connecting rod attached to the oscillator motor for wear and excessive noise.  
                          | Remove 4 screws on the face of the PC Board. Visually inspect and check rod for excessive wear and visual damage. Replace as needed.  |
| Bulkhead Dinse Connections| Remove side panel on hotwire module. Check to make sure all dinse connections are tightly secured to the panel mounts.  
                          | Tightly secure connections to the panel mount.  |