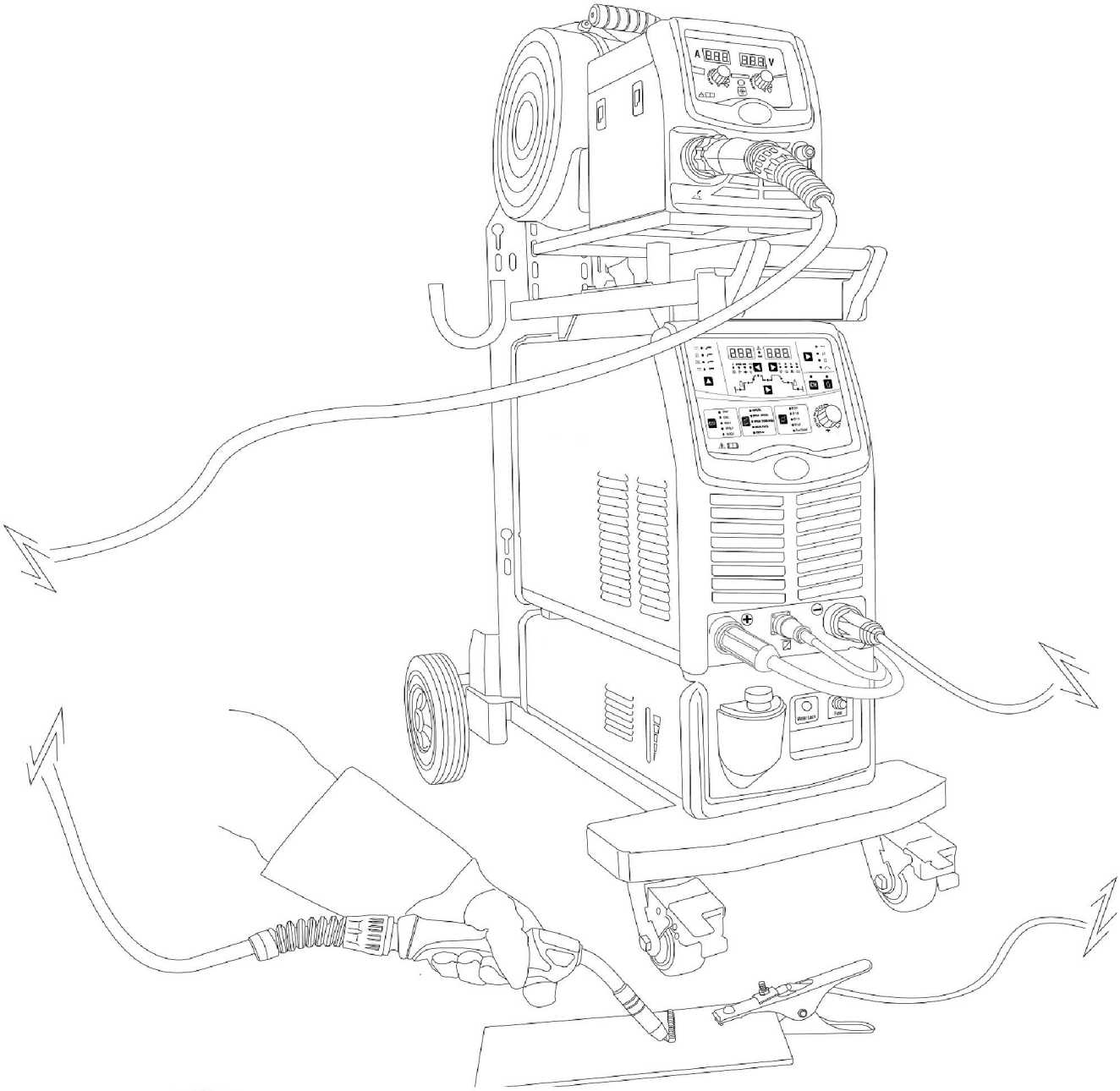
WILKINSON STAR

Setting up and Troubleshooting MIG Wire Drive Systems and MIG Welding Torches



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Disclaimer

Whilst every effort has been made to ensure that the information contained within this setup and troubleshooting guide is complete and accurate, no liability can be accepted for any errors or omissions.

SECTION 1 - Troubleshooting a MIG Wire Feed System

Introduction

Accurately delivering the welding wire through a MIG machines wire feeding system and MIG torch to the weld pool along with transferring the current to the wire is paramount in maintaining good welding conditions.

It's not uncommon from time to time to experience wire feeding issues when MIG welding, there are a number of areas which cause operators problems and most of these problems can usually be identified and rectified easily and can be improved with regular visual checks, servicing and following good setup procedures.

MIG wire feed systems use a relatively simple mechanical system to deliver the welding wire to the weld pool and the current to the wire.

For troubleshooting purposes, we have divided the wire feeding system into 2 basic areas based on function, the wire feed unit and the MIG torch, failures within either of these areas will result in poor welding performance.

PLEASE NOTE:

This troubleshooting and setup guide has been designed to assist the operator on the correct setup and operation of a MIG wire feed system and welding torch with the aim to either prevent or eliminate wire feeding problems. Therefore please take the time to read this guide along side the machines operating manual supplied with your product, especially any and all operator safety precautions. They will help to avoid potential hazards that may exist when working with this area of the product.

The below section is a quick guide check list for those operators who are quite familiar with a MIG machine wire drive system.

Quick Guide to Checking Your MIG Wire Drive System for Feeding Issues!

- Check the spool of wire for damage (plastic or wire type) especially the wire basket type as these easily warp in shape if badly handled.
- Check the welding wire is coming off the wire spool smoothly and not catching, snagged, twisted or kinked as it leaves the reel when either welding or when manually feeding the wire through the torch.
- Check the spool holder tension is set correctly and when the torch trigger is 'released' and welding stops (along with the feed motor) the spool of wire doesn't over run causing excessive wire to unravel off the reel.
- Depending on the drive system (2-roll or 4-roll), check that the inlet, intermediate and inner outlet guide tubes installed on the wire drive assembly are correctly sized for the welding wire being used, not worn and are fitted correctly (i.e. snug fit up against but not touching the rollers).
- Check the installed drive rollers are the correct size and configuration so that they match the welding wire size and material type being used.
- Check that the pressure roll drive assembly pressure is correctly set i.e. not too lose or too tight. Too lose and the welding wire will 'slip' through the drive rolls and too tight and you risk distorting the shape of the wire along with 'flaking' of the wire which will clog up the liner in the MIG torch.
- Check that the correct sized MIG tip is fitted that matches the wire size installed. Please consider when welding with Aluminium wire, usually an oversized tip (identified with an A) would be used.
- Ensure the correct liner is fitted in the MIG torch? Check that the liner type matches the wire size and is suitable for the welding wire installed, this is just as important as it being installed correctly.
- Is the liner worn? If the liner has been used for some time then we recommend replacing it!

For a more detailed description of a MIG wire drive system and to further assist troubleshooting please read the following pages 4 to 8.

Troubleshooting a MIG Wire Feed System

Welding Wire Delivery

Regardless, if you are using 5kg, 10kg or 15kg spools or large drums of welding wire, the mechanical feedability of the wire plays an important role in determining arc quality and weldability.
You should begin troubleshooting the system by ensuring the reel is not damaged or that the welding wire is not obstructed anywhere along its path from the wire spool to the contact tip and everywhere in-between.
The images above show examples of wire reels placed onto spool holders of MIG machines.

Installing the Wire Spool

- Depending on machine type, remove the wire spool hub retaining nut or clip.
- As per example shown, place the wire spool onto the spool holder, generally ensuring that you load it so the welding wire will feed off the bottom of the spool* (as the above machine images show, so the wire spool rotates counter clockwise). When fitting the wire spool, make sure to align the spool alignment pin on the hub with the mating hole in the wire spool.
- Replace the wire spool hub retaining nut or clip to lock the wire spool in place.

Please use care when handling the spooled wire as it will try to "unravel" when loosened from the spool. Ensure you grasp the end of the wire firmly, not letting go of it until you have located the welding wire into and through the drive assembly (ensure your reel is not damaged and that your wire is not rusty).

* Some manufactures have the wire drive assembly located at the top of the compartment or even angled meaning that the wire spool might be required to be fitted with the wire running off the spool from the top (as shown right).

Spool Holder Hub Tension

The wire spool holder incorporates a friction brake which is adjustable to optimise braking of the wire reel, it is very important not to under or over-tighten the spool holders hub tension, which allows the spool of welding wire to rotate smoothly.
The hub tension is simply a means to keep the wire from de-coiling off the spool when the operator stops welding. The tension should be just tight enough to keep the wire from de-coiling when you stop feeding a full spool at maximum wire feed speed.

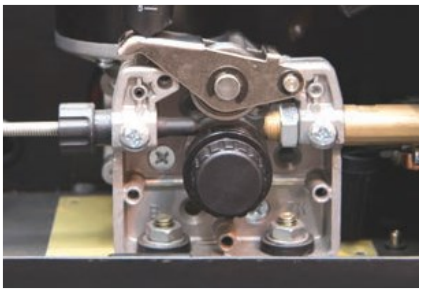
Over-tightening the tension will force the wire feed motor to work harder to pull the wire off the spool and this will lead to welding problems and excessive wear on the motor.
To adjust the tension and depending on your machine setup, remove the wire spool hub retaining nut or clip which keeps the spool of wire in place which then reveals the spool holders tension nut, adjustment can be made by turning the nut clockwise to tighten the brake or anti-clockwise to loosen the brake.

Please Note:
Excessive tension on the spool holder brake will cause rapid wear of the wire feed parts, over heating of the motor electrical circuits and possibly an increased incidence rate of wire burnback to the contact tip.

Troubleshooting a MIG Wire Feed System

Wire feed drive system

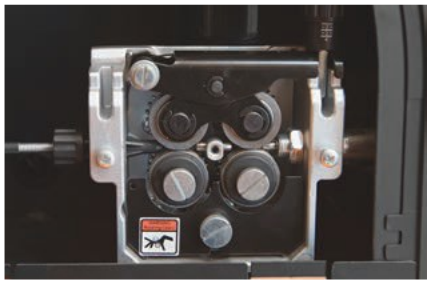
A conventional wire drive feed system comes as either a 2-roll or 4-roll drive which normally has a set of rolls where the lower is grooved and the upper roller has a flat surface (some drive systems or roller set ups may have top and bottom rolls that are grooved).
The upper roller assembly of the drive system will have a tensioning arrangement to allow the user to adjust the pressure placed onto the welding wire to help feed the wire through the MIG torch.



Example shown above - 2 Roll drive system

A 4-roll drive system will provide a smoother and more reliable feed of the wire over a 2-roll drive system.

Please see the two examples shown right of a 2-roll and 4-roll systems, these can vary in design depending on the manufacturer of the machine.



Example shown above - 4 Roll drive system

Wire Feed Rollers

Feed rolls are designed to match the welding wire type and size being used and there are 3 main types of rollers 'V' grooved, 'U' grooved and knurled (FCW) rollers which come in various sizes typically being 0.6mm, 0.8mm, 1.0mm, 1.2mm and 1.6mm.
The examples shown below are dual groove feed rolls (which often offer 2 different sized grooves on one roll, in all cases shown below its 1mm/1.2mm) single grooved rolls are also available.

V Groove Roller

Are used for hard wires such as steel, stainless steel where the wire shape is not easily deformed due to tensioner pressure.

U Groove Roller

Are used for soft wires such as aluminium. This type of wire can easily deform its shape making poor current pick up at the contact tip.

Knurled Roller (FCW)

Are used on tubular 'flux' cored wires which are easily deformed in shape.

All feed rolls have the relevant wire size and type stamped on the side of said roller (1.00mm V' as an example). On rollers with two grooves, it quite common that each groove will be for different wire sizes i.e. 0.6/0.8mm V or 1mm/1.2mm U, usually the outer (visible when installed) has the stamped wire size groove in use (but this can vary depending on manufacturer and roller type).
There are various designs of fixing feed rolls in place (depending on manufacturer) although generally drive rolls are removed by first releasing the upper pressure arm, unscrewing the feed roll retainer cap and sliding the roller from the shaft.
Feed rollers are installed by putting the feed roller onto the drive gear shaft and checking either that a locating pin arrangement is lined up or rotating the roller, gears are located correctly so that the retaining cap can be screwed back to hold the roller in place.

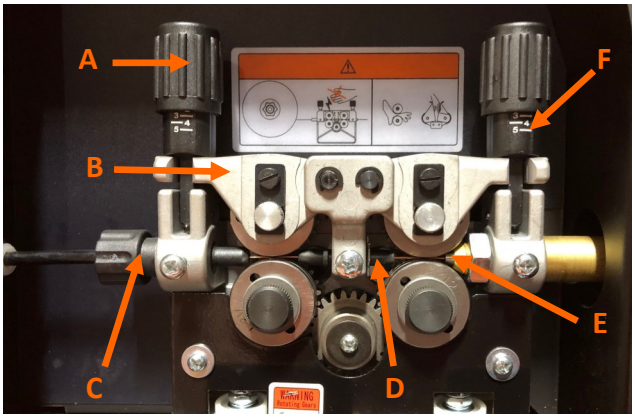
Please Note:

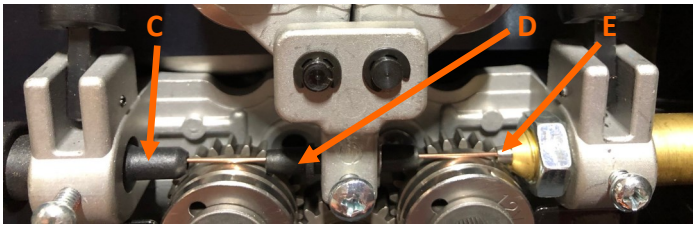
If your MIG machine design doesn't match our examples as shown, then check your machines operating manual.

Troubleshooting a MIG Wire Feed System

Inlet, Intermediate and Outlet Wire Guides

The inlet, intermediate and 'inner' outlet guides fitted should be of the correct type and size for the welding wire being used. Check regularly to ensure they do not show any wear or defects, which is often caused by wire/roller misalignment or improper guide sizes.





A - Pressure arm tensioner
B - Upper pressure arm
C - Inlet wire guide
D - Intermediatory wire guide
E - Inner outlet wire guide
F - Pressure arm tension scale

These guides are usually locked in place with a screw arrangement which when loosened will allow the guides to be adjusted so that you fit them snugly up to the roller to ensure the wire leaves or enters the guide efficiently. A badly fitted guide especially the inner outlet guide can cause the wire to 'birds nest'.

Manual Feeding the Wire Through the Feed Drive Block

The below procedure may vary due to differences in wire drive designs including whether it's a 2-roll or 4-roll drive system you have, the below procedure example matches the images shown above.

- Loosen the pressure tensioner knob and swing the lever down (A).
- Move the upper pressure roller arms by swinging them up (B).
- Take the welding wire from the spool, making sure the end of the wire is straight and free of any burrs.
- Pass the end of wire through the inlet wire guide (C) and over the feed roller making sure the correct type of drive rollers are installed.
- Pass the MIG wire through the intermediate guide ('D' if it's a 4 roll drive) and then pass over the second drive roll and into and through the inner outlet guide (E) and out past the MIG torch adaptor.
- Before fitting the MIG torch, please see 'MIG Torch and Liner' section.
- Close the upper pressure roller arms (B).
- Swing the upper adjustment lever up and back into place (A).
- Use the pressure adjusting knob (A) to assist with pressuring the top pressure roller onto the welding wire, clockwise to tighten and counter clockwise to loosen. Use the tension scale (F) to help set.

Why Setting the Appropriate Drive Roller Pressure is Important

Incorrect drive roll pressure is an all to common problem with wire feeding systems. Too loose, you have poor wire feed through the MIG torch and into the weld pool. Too tight, you can crush the wire, flake off the wire coating, deform the wire, wear out rollers and bearings along with potentially damaging the motor and motor drive circuits.

Flaked 'wire' coating will also cause these small flakes to enter the inner outlet guide and the MIG torch liner, creating more friction and affecting the feed of the wire to the weld pool.

Deformed wire can also wear grooves into the copper contact tip affecting the electrical conductivity between tip and wire, again causing poor wire feed as well wearing out the feed roller grooves.

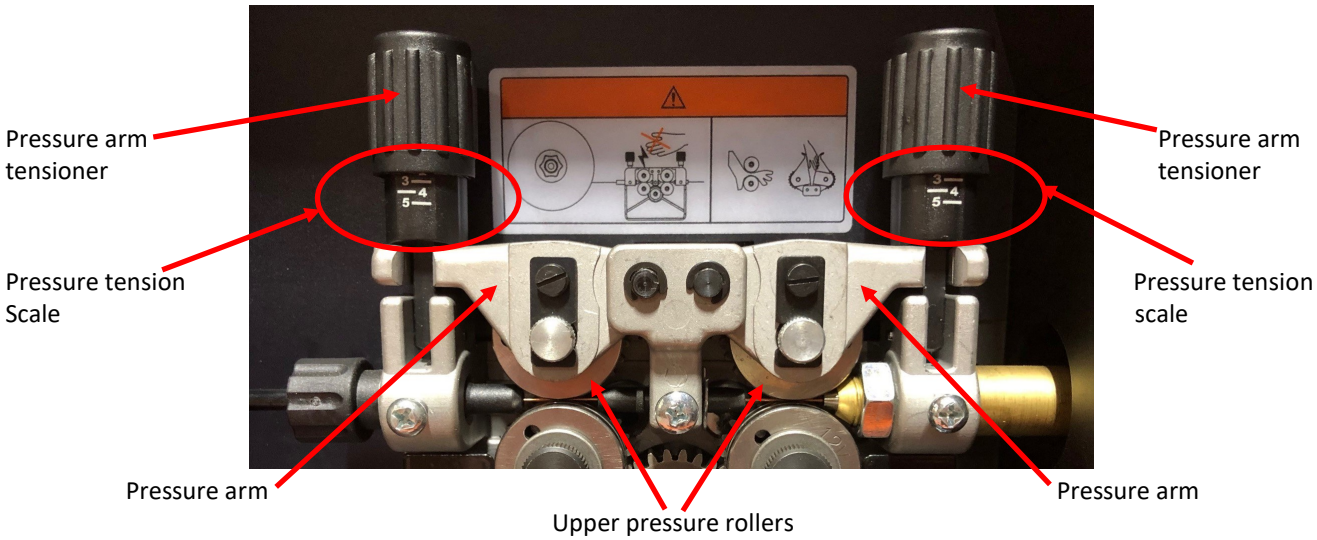
Over-tightened drive roll tension causes all of these problems in addition to placing excessive pressure on the bearings, drive shaft, gear box and drive motor. All potentially affecting the wire feed and weld characteristics.

All too often we have seen where a MIG torch liner or contact tip is faulty/blocked up creating too much friction, rather than check the system correctly, the operator will simply increase the tension of the pressure rollers to force the wire through which results in failures in the drive system or even poorer welding characteristics.

Troubleshooting a MIG Wire Feed System

Setting the Correct Upper Feed Roller Pressure

Wire feed roll pressure or wire feed roller tension is how tightly the rollers grip the MIG welding wire to feed through the MIG machines feed assembly and then MIG torch.
There isn't a clear cut setting to the exact pressure needed to ensure proper drive roll pressure,
As previously stated, drive roll tension should be adjusted so that it is not too tight or too loose.
To recap, if the tension is too light the rollers will slip and wire will not be fed through at the correct rate of speed and will be fed erratically, this will potentially cause the wire to burn back to the copper MIG tip.
If the tension is too much, then unnecessary pressure is placed on the wire feed motor and there is an increased risk of damaging the 'roundness' of the installed MIG welding wire (especially with softer wires).
If the surface of the wire is damaged, this can in turn wear the torch liner and tip.



Procedure to Adjust and Set the Tension

- Ensure the MIG torch is in place, correctly set up and tested (see MIG torch section).
- Using the wire inch button or torch trigger switch, feed the welding wire out through the contact tip to about 10cm.
- Now completely slacken right off the upper pressure roller tension by rotating the pressure arm tension knob(s).
- Now, press the wire inch button (or MIG torch trigger) and increase the roller tension until the wire starts to feed out again of the torch tip and then release the torch trigger (or wire inch button).
  If you have a 4 roll drive system then ensure you equally adjust both pressure arm tensioner knobs using the tension scale as a guide.
- Then grip the wire between your thumb and first finger ensuring you have a firm squeeze and set the tension to the point where you can just stop the wire coming though (as its now slipping on the rollers).
- Now increase the tension another half turn.
- Again, while gripping the wire as described above, press the torch trigger and check to see if the wire is slipping at the rollers, if it is then tension adjuster another half turn and then repeat if necessary.

Please Note:

If your machine is fitted with a wire inch button, please use this option when feeding the wire though the MIG torch, as using the MIG torch switch option will make any exposed welding wire live also gas will flow if the gas regulator or cylinder vales are open, so you may want to turn the gas supply off.

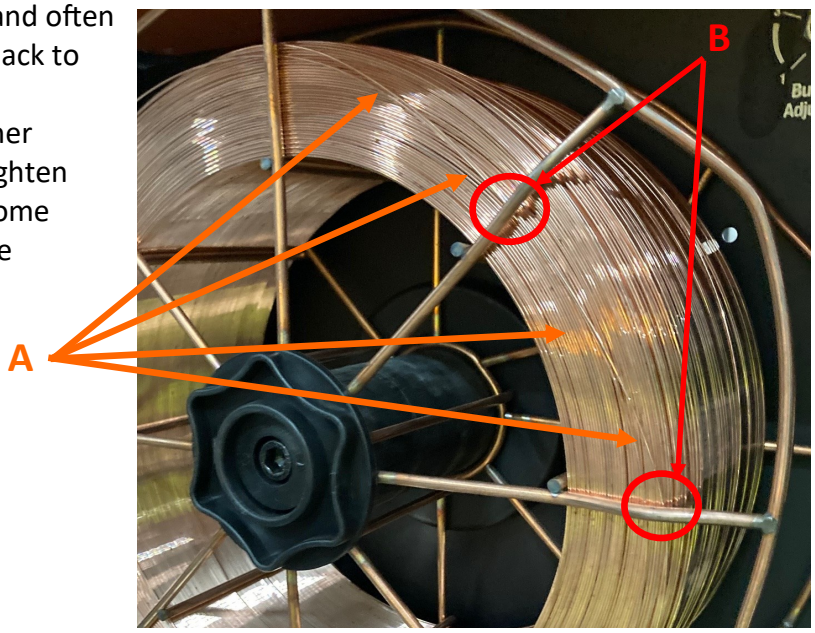
Wire Drive System - Additional Points to Note!

When changing drive rolls and carrying out any maintenance on a MIG welding machine, its good practice to disconnect the machine from the electrical power supply, if in doubt contact or consult with a qualified technician.

Regularly clean the grooves of the drive rolls, this can be done by using a small wire brush. Also wipe off, or if fitted clean the grooves on the upper feed rolls.
Its also good practice to use low flow 'clean and dry' compressed air to clean out the drive roll assembly area and the fitted guide tubes of any small metal particles and dust.

Please Note:

Never fit damaged reels of wire, the images shown below are of a wire spool which was damaged prior to being fitted to a MIG machine. The operator soon experienced welding issues noted with the welding condition and the wire burning back to the contact tip.
Due to the damage on the wire basket, during welding as the wire was being pulled off the reel it was soon noted that the wire (A) was dropping into the gaps (B) between the tightly wound wire and the wire basket allowing the wire to jam causing intermittent wire feed, placing added stress on the motor circuit and drive system and often burning the wire back to the contact tip.
Quite often and incorrectly the operator rather than change the reel of wire will 'wrongly' tighten up the upper roller tension to try and over come this feeding issue causing added stress on the drive assembly and excessive wear on the drive system in general.



SECTION 2 - Troubleshooting a MIG Welding Torch

Introduction

Accurately delivering the welding wire through the MIG welding torch to the weld pool along with transferring the current to the wire via the contact tip is key in delivering good welding conditions.
The MIG torch from time to time could offer wire feeding issues and these problems are easily identified, rectified and avoided if visually checked regularly, serviced or simply set up correctly.
For troubleshooting purposes, we divided the wire feeding system into 2 basic areas based on function, the wire feed unit (section 1, page 3) and the MIG torch. Failures within either of these areas will result in poor welding performance.

PLEASE NOTE:

This troubleshooting and setup guide has been designed to assist the operator on the correct setup and operation of a MIG wire feed system and welding torch with the aim to either prevent or eliminate wire feeding problems. Therefore please take the time to read this guide along side the machine operating manual supplied with your product, especially any and all operator safety precautions. They will help you to avoid potential hazards that may exist when working with this area of the product.

The below section is a quick guide check list for those operators who are quite familiar with a MIG welding torch.

Quick Guide to Checking Your MIG Torch for Wire Feeding Issues!

- As detailed in the previous section, check the drive roll tension, drive roll size, drive roll type and drive roll groove condition for wear and tear and all other aspect of the MIG machine drive system (as covered in section 1).
- Check that the MIG torch contact tip is not worn or badly discoloured, replace as necessary.
- Check the contact tip size matches the welding wire installed. If the tip is too small, the wire will not feed. If the tip is too large, wire feeding and electrical conductivity may be negatively affected.
- Check that the liner size matches the welding wire being used, a liner that is too small for the wire will not feed well. If the liner is too big, the wire may have too much freedom to twist and fold on itself inside of it, again causing poor or no feed.
- Check that the correct liner type is installed, for most wires, steel liners work well. However, some wires, such as aluminium, require a Teflon or nylon liner to help ensure smooth feeding characteristics.
- Check liner condition, a worn liner will be detrimental to smooth wire feeding. Replace the liner if it is worn, damaged or aged.
- Check the MIG torch power cable condition for no damage or ‘crushes’ along its length.
- Wire condition: Not all wire manufacturers put out the same quality product. Some wires may have been wound badly or have thin/thick spots as well as contaminants that can cause poor wire feeding.

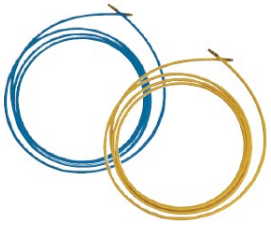
For a more detailed description of the MIG welding torch and how to further assist troubleshooting please read the following pages 10 to 14.

SECTION 2 - Troubleshooting a MIG Welding Torch

The MIG Torch

The welding torch is one of the most critical parts of a MIG welding system.
In addition to directing the wire to the joint the MIG torch fulfils two important functions. It transfers the welding current to the wire via the contact tip and the shield nozzle directs the shield gas around the arc and weld pool.
There are various makes and types of MIG welding torches although the two most common types of hand torches are air/gas cooled and water cooled (as shown right).

The Liner



A liner guides your welding wire inside and through the MIG torch lead, to ensure smooth wire feed out of the torch contact tip. From time to time you will need to change your liner before you feed your wire through, as MIG torch liners, much like the feed rollers come in specific sizes and types based on the material type and size of welding wire you are using. A liner is considered a consumable part and does wear.

The Contact Tip

The welding current is transferred to the wire through the contact tip whose inner bore is slightly greater than the wire diameter. Contact tips come in specific sizes and types based on the material type and size of welding wire you are using.
If the internal bore becomes worn and enlarged it affects current pick up. Therefore, tips should be inspected regularly and changed as soon as excessive wear is noted.
Copper alloy (chromium and zirconium additions) is used for contact tips, it's harder than pure copper and has a longer life especially when used in spray and pulsed MIG modes. A contact tip is considered a consumable part and will wear.

Please Note:

* Aluminium wire requires a slightly "over sized" contact tip, for example a 1mm aluminium wire would require a contact tip marked as "1mm A" or similar depending on its manufacturer.
* If the contact tip is worn (or is too large), this will result in wire arcing out inside the tip, causing wire jamming.

Quick Guide to Fitting a Torch Liner and Front End Consumables!

- Ensure your MIG torch is completely unravelled and as straight as possible.
- Remove the MIG torch 'front end' consumable parts.
- Remove the 'euro end' liner retaining nut.
- Carefully remove by pulling out the existing conduit liner.
- Once you have selected the correct replacement liner taking into account wire material type, wire size and liner length, carefully feed in the new liner down the torch lead and all the way until it exit's the torch neck.
- Refit the liner retaining nut and screw only 1/2 way down.
- Cut the excess liner off to about the length of the where the tip adaptor sits past the end of the torch neck (please consider this is a generic guide and your torch consumable setup may vary slightly).
- Ensure you select and fit the correct contact tip based on the wire size and type you are using and replace the 'front end' consumable parts.
- Fully screw down the liner retaining nut and tighten it. This will then compress the liner inside the torch cable assembly preventing it from moving away from the rear of the tip adaptor ensuring it doesn't move giving a smooth wire feed during use.

For a more detailed description of the MIG welding torch and how to further assist troubleshooting please read the following pages 11 to 13.

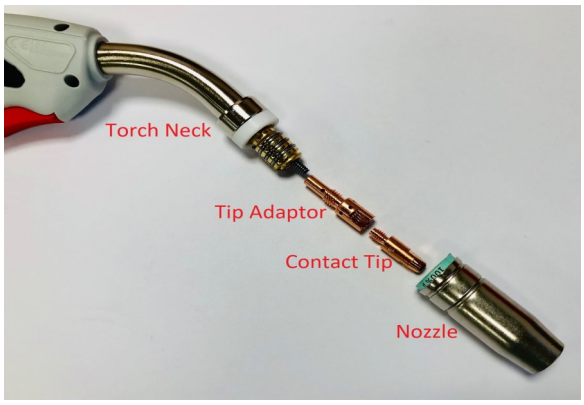
Quick Guide to Fitting the Liner and Front End Consumables

Setting up a MIG Torch

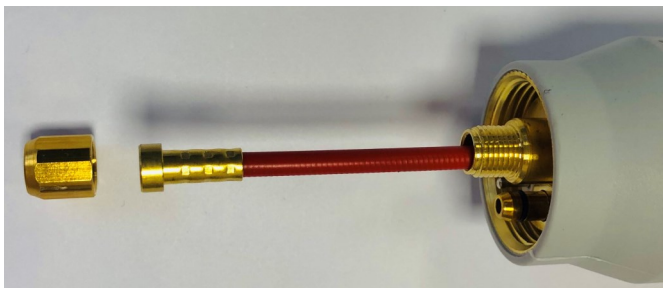
Wear, lack of preventative maintenance and incorrect setup are often the biggest causes of MIG wire feeding problems. If you've heard of the expressions ‘prevention is always better than cure’ or ‘solve the problem before it is a problem’ then its probably too late and your experiencing wire feed issues already and as a result poor welding characteristics.

If you have already checked the MIG wire drive system section as previously described then you’re probably going to need to check and replace your liner and contact tip, this is something you should do from time to time as these items are consumable.

(1) Remove MIG torch front end parts, Nozzle, contact tip and tip adaptor.



(2) Remove the liner retaining nut and then carefully pull out and completely remove the liner.



(3) Carefully unravel the new conduit liner, ensuring you choose the correct liner based on wire diameter (the colour of the liner usually indicates wire size), material type of welding wire being used (see below types of liners) and liner length (to match MIG torch length usually in sizes of 3m, 4m or 5m).

Steel liner for most hard wires (not suitable for soft wires like Aluminium).

Teflon are used for Soft wires like Aluminium as they reduce friction and eliminate wire shaving.

Nylon based liner are again used for aluminium wires * and are ideal for push pull torches.

* In some cases Nylon or Carbon liners will be used with stainless type hard wires to help reduce possible cross contamination that may present itself when using a steel liner with stainless type welding wires.

(4) Carefully feed in the new steel or Teflon liner in ‘short’ forward movements down the torch lead and all the way to exit the torch neck.

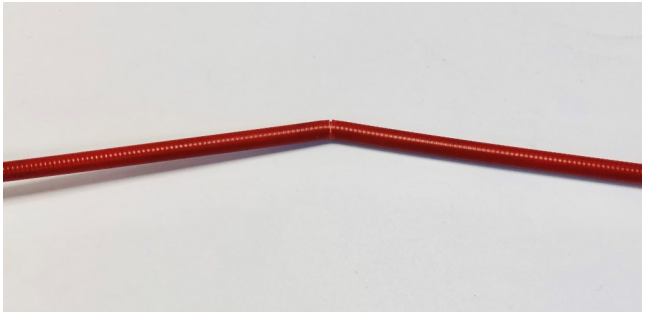
Please note:

Depending on the manufacturer and model of your MIG torch, you might find that mating the liner up to the tip adaptor is different as shown in the image to the right, if this is the case please consult with your MIG torch operating instructions.

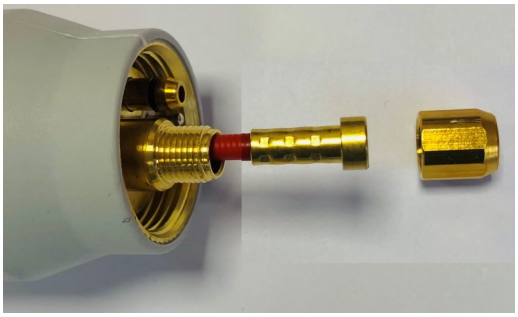
It’s important to remember that the liner ultimately sits snug up against the rear of the tip adaptor or contact tip to ensure a smooth wire feed through the adaptor and contact tip.

Quick Guide to Fitting the Liner and Front End Consumables

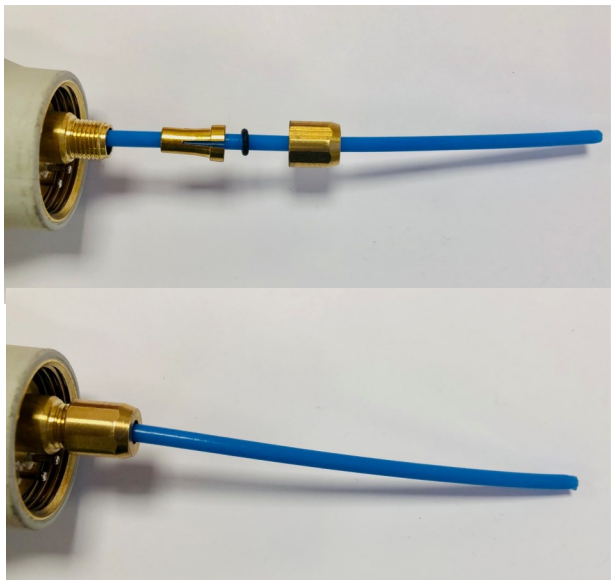
(5) Be carefully when handling or pushing any liner type down into the MIG torch cable that you do not damage or kink the liner as per examples below which will effect the feeding of the MIG wire.



(6) When welding with hard wires (steel) use and fit, a **steel liner**, once fitted then screw the brass retaining nut half way up the thread, now fit the tip adaptor ensuring that you snip the liner cleanly (as point 4 shows) so the liner will fit tightly up against the inside rear of the tip adaptor once fitted, then fully tighten the retaining nut. Ensure as previously stated that the feed rollers are set up correctly for hard wire and your ready to go.



(7) When welding with soft wires (Aluminium) use and fit a **Teflon liner,** please ensure you also fit the supplied liner collet and liner O-ring as shown right before fitting the liner retaining nut.
Now fit in place all the front end consumables and then lightly tighten up the retaining nut, this will allow the liner collet to start to compress onto liner Itself. Before you fully tighten the nut, push the liner into the MIG torch and then fully tighten the retaining nut, this will ensure that the liner will fit tightly up against the inside rear of the tip adaptor.

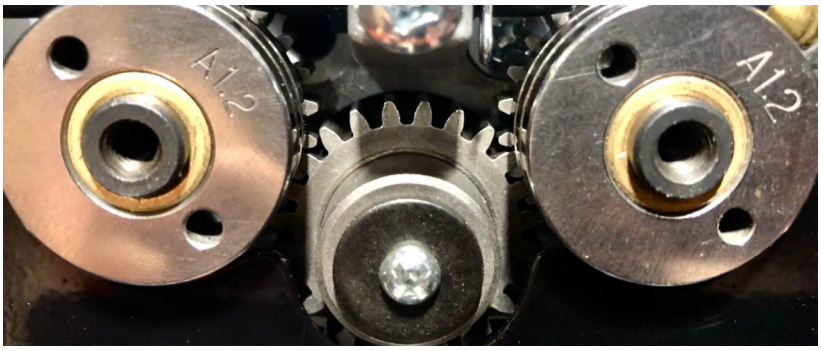


Please Note:
Do not tighten the retaining nut too tight as it could possibly crush the installed liner.

(8) The next step is to ensure that the MIG wire feed system is set up correctly for the type of liner fitted and the below points give a little insight for the correct setup for teflon and nylon liners.

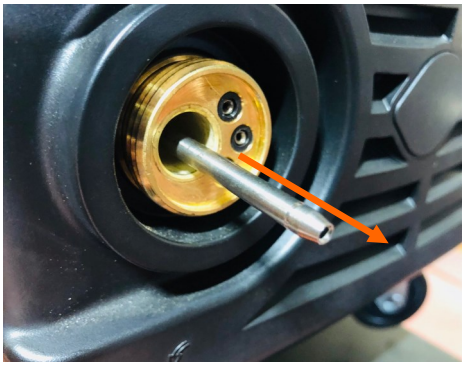
(9) Install U groove drive roller of the correct size for the diameter of soft wire (aluminium) being used.

Please Note:
Some feed rolls might show an 'A' rather than a 'U' as shown in the example to the right (indicating they are suitable for Aluminium wire only).
For aluminium welding quite often the pressure roller will also have a 'U' groove to ensure wire distortion when under pressure and feeding doesn't occur.



Quick Guide to Fitting the Liner and Front End Consumables

(10) Loosen the inlet guide tube retaining screw (if your system has this type of securing method) and remove the inner outlet guide tube (sometimes long nose pliers are required to reach and pull this guide out.

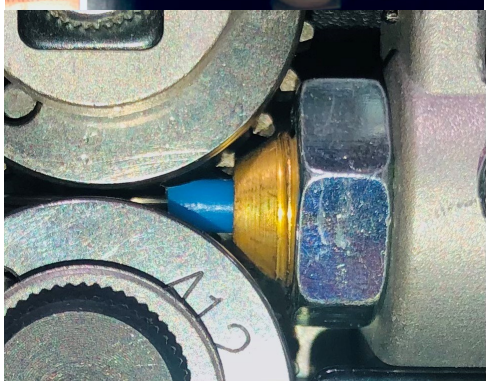


(11) Carefully feed the teflon liner into the inlet guide tube hole of the Euro outlet adaptor.

Please Note: Depending on the manufacture of your MIG machine, when using a teflon/nylon or carbon liner you may need to use a thin walled tube sleeve which is slid over the liner to ensure that the liner fits snug inside the torch euro outlet guide.

(12) Take the extended teflon liner all the way up to and over the first drive roll, the tighten the MIG torch securely into the MIG machine euro receptacle.
Then using a Stanley type knife, cut the extended teflon liner with the knife just in front of the drive roller as shown right.

(13) Some operators when cutting the teflon liner will chamfer cut The top and bottom of the liner so it fits snugly in the 'V' when the rollers are closed (as shown right), this ensures that when the wire leave the rollers it enters the liner with the minimum of distance.



Please Note:
Ensure the liner is not touching the rollers when they are closed together, if the liner is cut too long it may get squashed between the rollers causing wire feeding issues.

(14) Please ensure you have fitted the correct sized contact tip that matches the wire diameter being used. When welding with aluminium wire its common practice to use a slightly oversized tip, these contact tips often have an 'A' stamped on them, for example, '1.2A' or A1.2.

Please Note:
This guide and the information given is generic, your machine, MIG torch or consumable set up may vary from what's shown and described in this document.

MIG Torch Setup - Additional Points to Note!

- When changing drive rolls and carrying out any maintenance on a MIG welding set, its good practice to disconnect the machine from the power supply, if in doubt contact or consult with a qualified technician.
- When changing your MIG torch liner, it's best to keep the torch entirely straight and go slowly, as you don't want to kink the new liner being fitted.
- Some teflon, nylon or carbon liners can have a steel section which is designed to sit at the torch handle end of your MIG torch specifically within the torch neck up to the tip adaptor, this can help reduce wear at that part of the liner.
- Some operators will remove the contact tip and tip adapter from the end of the torch first before feeding the wire through although generally a correctly fitted liner and well snipped welding wire should allow the wire to pass through the liner and contact tip with out fault.
- When welding, always try to keep the MIG torch cable as loosely looped (or straight) as possible, this will minimise the chances of kinking the wire inside and reduce friction within the liner, slipping of the wire at the rollers along with adding mechanical stress on the drive system.
- The contact tip is often a common source of interruptions in the electrical current. The welding current needs to pass through this connection to the wire, so it's crucial kept tight to the tip adaptor ensuring it makes good contact with the welding wire.

Please Note:
An indication of a loose connection is a discoloured contact tip where it makes its connection to the tip adapter. If this occurs, replace the tip with a new one and ensure that it is tightly fastened to the tip adapter.

Failure to set up your feed system will sometimes cause your wire to 'birdnest' out and around the drive system as per below, this is especially noted with aluminium (soft) wire and is generally caused by over tensioning the upper drive roll, not installing the inner outlet guide tube correctly, incorrectly fitted or worn liner or contact tip.

Welding Machine Maintenance

The following recommendations require sufficient professional knowledge on electrical aspects and comprehensive safety knowledge. Make sure the input power and cable of the machine is disconnected from the electricity supply and wait for 5 minutes before any machine covers or panels are removed.

In order to guarantee that your MIG welding machine works efficiently and safely, it should be maintained regularly.
Operators should understand the maintenance methods and means of MIG welding machine operation. The below guide and contents of this booklet should enable the operator to carry out simple visual examinations to reduce the fault rate and repair times of the MIG welding machine, so to lengthen the operating life of your MIG welding machine.

Period	Maintenance checks
Daily examination	• Visually check the overall condition of the MIG welding machine and its accessories, mains cables, welding cables and connections along with the machine panels for damage or wear. • Visually check the wire drive system and wire spool for any defects, damage or wear. • Visually check the MIG welding torch for damage or consumable wear. • Visually check the gas regulator and gas hoses for damage. • Check for any warnings LEDs and that machine operation is good. **This work should be carried out daily by the machine operator and any items found damaged or worn should be immediately replaced and/or reported immediately to your supervisor.**
Monthly examination	• Disconnect from the mains supply and wait for at least 5 minutes before removing any covers. • Check internal connections and tighten if required. • Clean the inside of the machine with a soft brush and vacuum cleaner. • Take care not to remove any cables or cause damage to components. • Ensure that ventilation grills are clear and cooling fans rotate freely. • Carefully replace the covers and test the machine thoroughly. **This work should be carried out by a suitably qualified competent person.**
Yearly examination	• Carry out an annual service to include safety check in accordance with the manufacturers standard (EN 60974-1). **This work should be carried out by a suitably qualified competent person.**

Please Note:
A good indication of a poor electrical connection is heat.
After your MIG machine has been welding for a while, check all connection points and welding cables for heat (often you can smell the rubber burning if too hot). If either the connections or cables feel hot, it is a likely indication that there is too much electrical resistance in the circuit. This could be caused by loose or faulty connections, cables that are too small for the application or an internal break in a cable.
A cable that is too small for the application will likely be hot along its entire length, where as a break in the cable will result in a specific point along the cable becoming hot.

* **Always ensure the mains power is disconnected before working on the machine.**
* **Always wait 5 minutes after switching off the mains power before removing any covers or panels.**
* **Owners of equipment should keep a suitable maintenance records of the periodic inspections tests**

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