

TECHNICAL GUIDE

TOUGH GUN™ Tandem Robotic MIG Guns

- **SAFETY & WARRANTY INFORMATION**
- **INSTALLATION**
- **MAINTENANCE GUIDE**
- **TECHNICAL DATA**
- **OPTIONS**
- **EXPLODED VIEW & PARTS LIST**
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Effective September 2010 –
QUICK LOAD™ Liners Standard
on all TOUGH GUN™ Robotic MIG Guns

*Certified ISO 9001:2008
Please read instructions prior to use.
Save this manual for future reference.*

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THANK YOU...

...for selecting a TOUGH GUN™ Tandem Robotic MIG Gun from Tregaskiss. Manufacturing operations demand extremely dependable robotic equipment. With this in mind, the TOUGH GUN MIG Gun was designed and engineered to be a reliable tool to support high production within a robotic cell. As the name implies, the TOUGH GUN MIG Gun is made from durable materials and components engineered to perform in a rugged welding environment. Your TOUGH GUN MIG Gun is completely assembled and ready to weld, and has undergone numerous quality checks to ensure high performance.

The instructions and illustrations in this technical guide make it easy for you to maintain your TOUGH GUN MIG Gun. **Please read, understand, and follow all safety procedures.** Keep this Technical Guide booklet as a handy reference when ordering complete guns, parts and special options. **For technical support and special applications, please call the Tregaskiss Technical Service Department at 1-855-MIGWELD (644-9353) or fax 1-877-737-2111.** Our trained technicians are available between 8:00 a.m. and 5:00 p.m. EST and will answer your application or repair questions.

Tregaskiss employees build TOUGH GUN MIG Guns for the world's welding professionals. We are always striving to improve our products and services, and would appreciate receiving your suggestions or comments. Please contact us immediately if you experience any safety or operating problems.

WARRANTY

Product is warranted to be free from defects in material and workmanship for the period specified below after the sale by an authorized Buyer. Should there be a defect please refer to our Return Merchandise Policy.

PRODUCT	WARRANTY PERIOD
TOUGH GUN™ MIG Guns and Components	180 days
TOUGH GUN Reamer	1 year
TOUGH GARD™ Spatter Cleaner	1 year
TOUGH GUN Robotic Peripherals (Clutch, Sprayer, Wire Cutter, Mounting Arms)	1 year
Low-Stress Robotic Unicables (LSR Unicables)	2 years

Tregaskiss reserves the right to repair, replace or refund the purchase price of non-conforming product. Product found not defective will be returned to the Buyer after notification by Customer Service.

Tregaskiss makes no other warranty of any kind, expressed or implied, including, but not limited to the warranties of merchantability or fitness for any purpose. Tregaskiss shall not be liable under any circumstances to Buyer, or to any person who shall purchase from Buyer, for damages of any kind, including, but not limited to any, direct, indirect incidental or consequential damages or loss of production or loss of profits resulting from any cause whatsoever, including, but not limited to, any delay, act, error or omission of Tregaskiss.

Genuine Tregaskiss parts must be used for safety and performance reasons or the warranty becomes invalid. Warranty shall not apply if accident, abuse, or misuse damages a product, or if a product is modified in any way except by authorized Tregaskiss personnel.

GENERAL SAFETY

Before installation or operation of TOUGH GUN MIG Guns, please read the safety precautions listed below.

1. Do not touch live electrical parts. The following should be checked to prevent electrical shock:
 - a. Faulty or damaged equipment is repaired or replaced.
 - b. Equipment is off when not in use.
2. Ensure that all safety devices, guards, shields or barriers are properly in place and connected correctly before allowing operation of the equipment.

CSA Standard W117.2 CODE FOR SAFETY IN WELDING AND CUTTING obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

ANSI Standard Z49.1 CODE FOR SAFETY IN WELDING AND CUTTING obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

CALIFORNIA PROPOSITION 65 WARNING

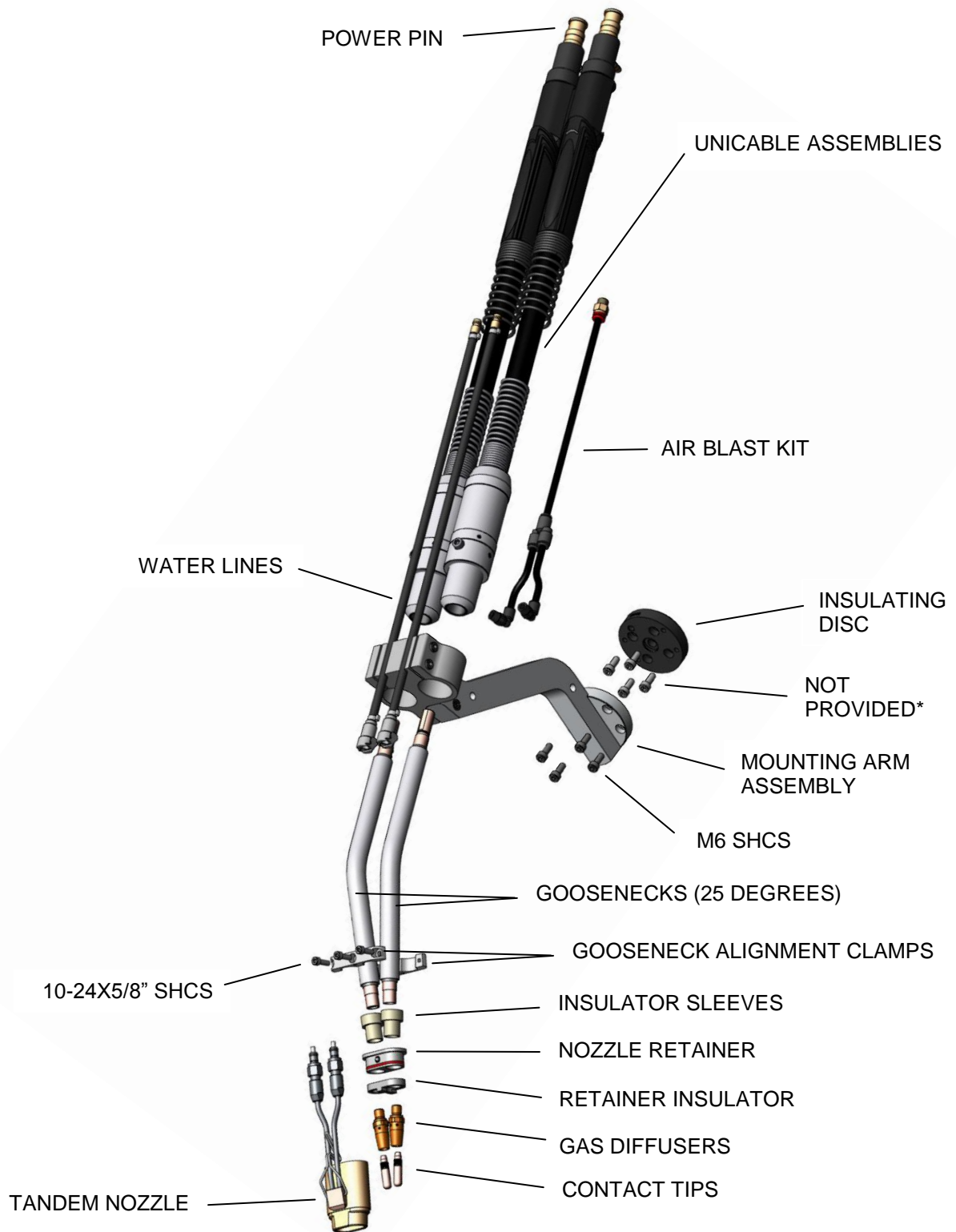
This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer.

This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after use.*

(California Health & Safety Code Section 25249.5 at seq.)



1.0 – COMPLETE ASSEMBLY OVERVIEW



For complete parts list, please proceed to **Section 6.0 – EXPLODED VIEW AND PARTS LIST**.

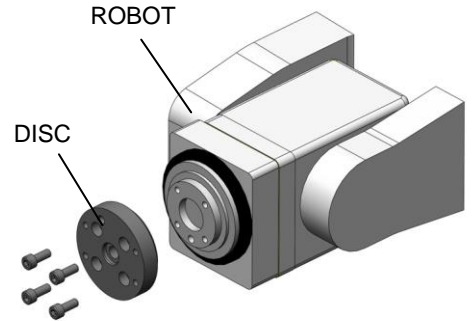
* Check with robot manufacturer for correct fastener.

2.0 – INSTALLATION

2.1 INSTALLING THE GUN TO THE ROBOT

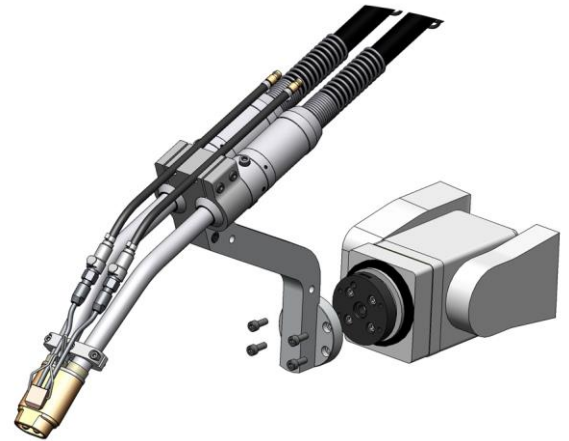
STEP 1: Attaching the Insulating Disc to the Robot

- **NOTE:** Fasteners are not provided since the size varies by robot.
- **NOTE:** The use of a dowel is recommended and varies by robot manufacturer.
- Install the disc to the robot with fasteners.
- Torque to 45 in.-lbs. (5 Nm).



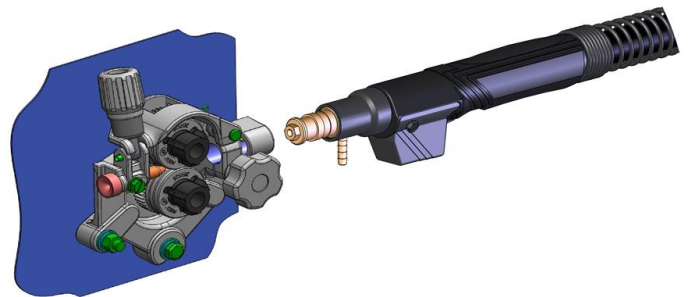
STEP 2: Attaching the Gun Assembly to the Insulating Disc

- Install the arm assembly to the disc on the robot with 6 mm SHCS (provided).
- Torque to 45 in.-lbs. (5 Nm).



2.2 CONNECTING GUN TO WIRE FEEDER

- Plug gun into feeders and lock in place (see your feeder manual for details).



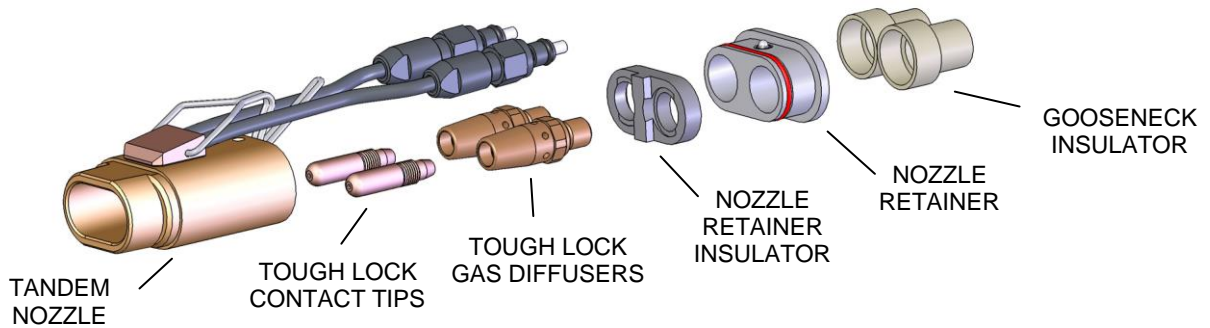
3.0 – MAINTENANCE

3.1 NOZZLE AND CONTACT TIP SYSTEMS

IMPORTANT:

- Gooseneck insulators **MUST** be in place before welding to properly insulate gooseneck armor.
- Check all parts to ensure that connections are tight before welding.
- **DO NOT** use pliers to remove or tighten the gas diffusers or scoring may result.

Tandem Consumables



Removal and Replacement

Nozzle

- It is recommended that the water supply be turned off before removing nozzle.
- Disconnect nozzle water lines from quick connect couplers.
- Flip nozzle clasp from nozzle retainer.
- Slide nozzle off.
- When installing the nozzle, ensure that it is fully seated.

TOUGH LOCK™ Contact Tips

- Thread the contact tip into the retaining head.
- Torque to 30 in.-lbs. (3.5 Nm).
- The Tregaskiss Tip Tool (Part # 450-18 – for heavy-duty tips) or a pair of weld pliers are the optimal tools for contact tip installation.
- **CAUTION:** Be careful when tightening each contact tip to avoid collision with the other contact tip.

TOUGH LOCK Gas Diffusers

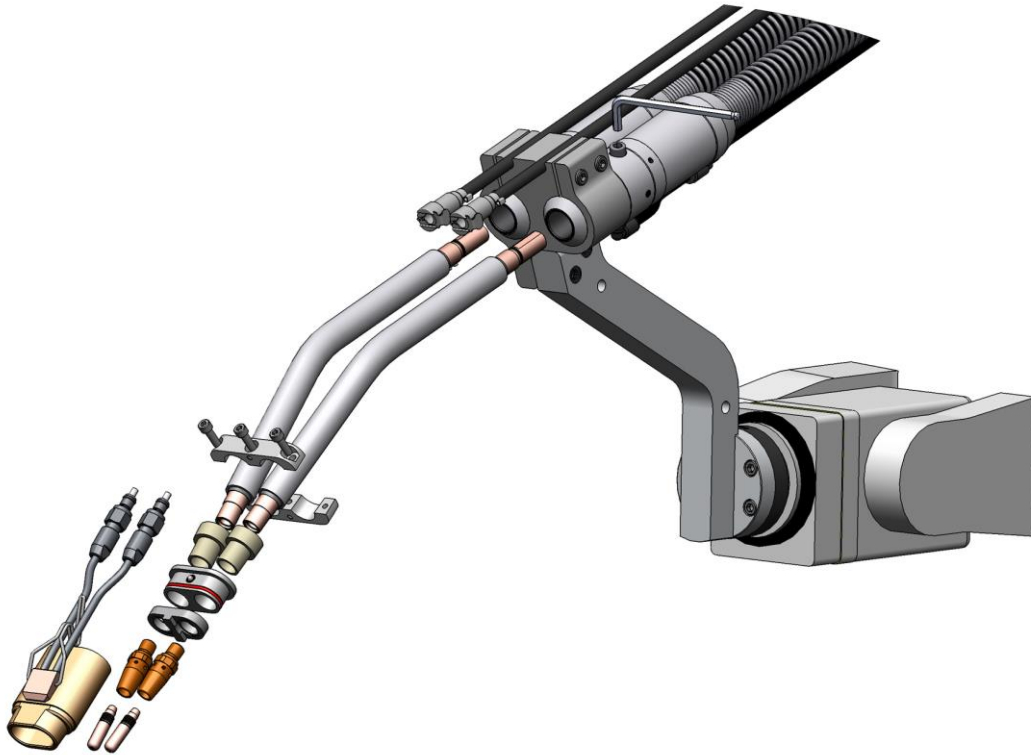
- **IMPORTANT:** Hold nozzle retainer insulator in place before removing second gas diffuser to prevent it from slipping off the gun.
- Loosen / tighten gas diffusers with a 9/16" (14 mm) wrench.
- Torque to 80 in.-lbs. (9 Nm).

Nozzle Retainer and Insulators

- After removal of the consumables and loosening of the gooseneck alignment clamps, simply slide the retainer and insulators on or off the gooseneck.

3.2 GOOSENECK REPLACEMENT

Please refer to M077-A Technical Guide Addendum for detailed gooseneck replacement instructions complete with photos.



GOOSENECK REMOVAL

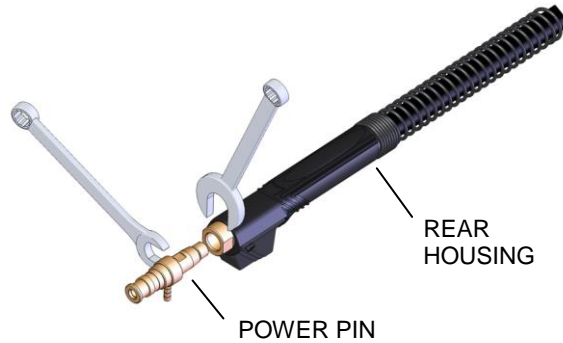
1. Turn water supply off and disconnect nozzle water lines.
2. Flip nozzle clasp and slide nozzle from gun.
3. Remove gas diffusers using 9/16" (14 mm) wrench. Hold nozzle retainer insulator in place while removing second gas diffuser.
4. Slide nozzle retainer insulator from the gun.
5. Remove QUICK LOAD™ Liners from goosenecks using pliers.
6. Remove 10-24X5/8" SHCS on gooseneck clamp using a 5/32 Allen key to remove clamp.
7. Use 5 mm Allen key to loosen the M6 gooseneck locking screws on gun housing by 1/4 turn to slide off gooseneck insulators and nozzle retainer.
8. Use a 5 mm Allen wrench to loosen the M6 gooseneck locking screws on gun housing by another 1/2 turn to allow goosenecks to be pulled free of the gun.

GOOSENECK REPLACEMENT

1. Insert gooseneck into gun housing ensuring key on gooseneck is aligned with key way. **NOTE:** Marks on goosenecks should be flush with gun housing. Tighten M6 screw (max. 60 in.-lbs. or 7 Nm). Repeat for second gooseneck.
2. Slide gooseneck insulators and nozzle retainer on goosenecks.
3. Reinstall gooseneck clamp by locating it properly on the goosenecks. Ensure that the screw dimples on the clamp are oriented toward the front of the neck. **IMPORTANT:** Insert and tighten middle screw first, then left screw and right screw.
4. Reinstall the QUICK LOAD Liner (See **Section 3.4 QUICK LOAD™ LINER REPLACEMENT**).
5. Slide on nozzle retainer insulator.
6. Thread on gas diffusers and tighten securely.
7. Slide nozzle into place and lock nozzle on with clasp.
8. Reconnect nozzle water lines and turn water supply back on.

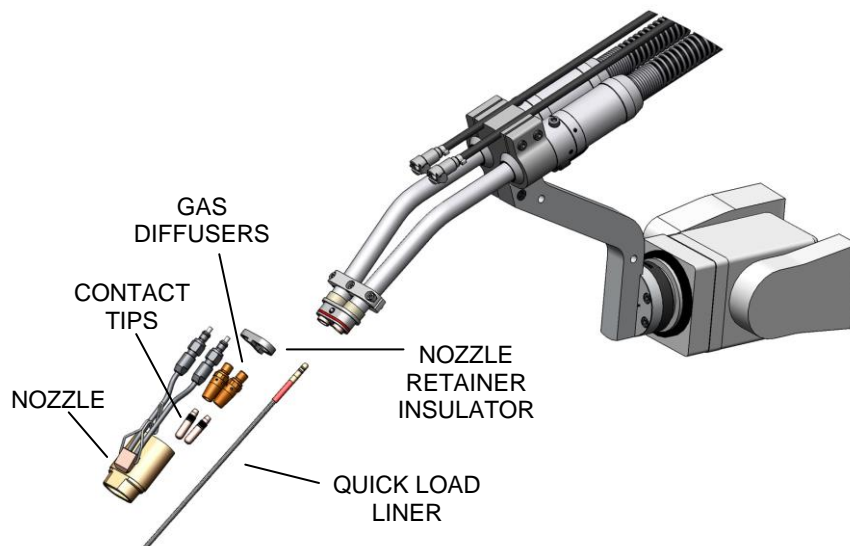
3.3 DIRECT POWER PIN REPLACEMENT

- Thread power pin into rear housing.
- Tighten the power pin into the rear housing using a 3/4" (19 mm) wrench on the rear housing and a 1" wrench on the power pin. Torque to 18 ft.-lbs. (24.4 Nm).
- **IMPORTANT:** The thread-in two-piece power pin has a taper to seat and lock the power pin in the rear handle block. Tighten the power pin in the block with a wrench to ensure that pin remains in place.
- Install liner (See **Section 3.4 QUICK LOAD LINER REPLACEMENT**).



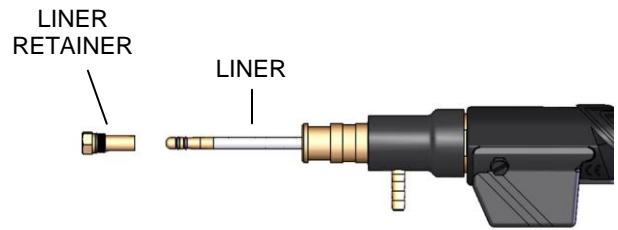
3.4 QUICK LOAD™ LINER REPLACEMENT

1. Turn water supply off and disconnect nozzle water lines.
2. Follow steps 2 through 4 in **GOOSENECK REMOVAL** in **Section 3.2 GOOSENECK REPLACEMENT**.
3. Remove existing QUICK LOAD Liners by pulling them out through the gooseneck using pliers.
4. Insert the new QUICK LOAD Liners through the gooseneck using the welding wire as a guide (push the liner in short bursts to help to prevent kinking).
5. Once the liner stops feeding, give it an extra push to ensure it is inserted completely.
6. Push liner back into gun and hold in place. Using liner gauge, trim conduit liner with 3/4" (20 mm) stick out.
7. Feed wire through liner.
8. Follow steps 5 through 7 in **GOOSENECK REPLACEMENT** in **Section 3.2 GOOSENECK REPLACEMENT**.
9. Reconnect nozzle water lines and turn water supply back on.



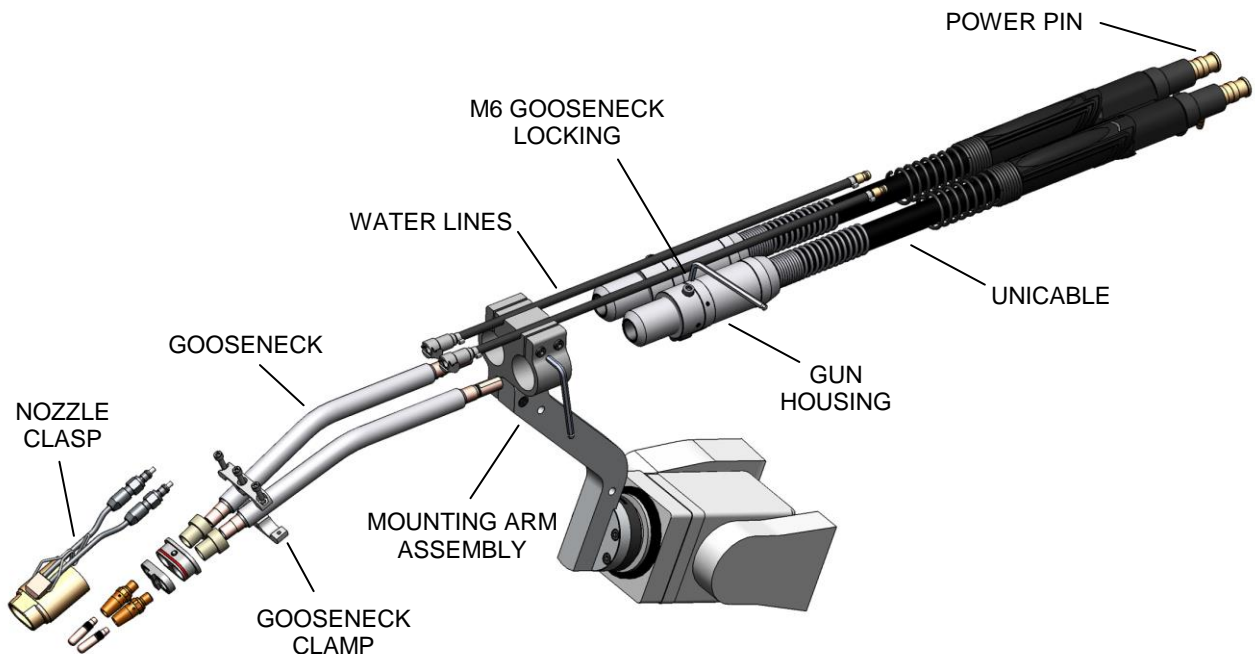
Replacing the QUICK LOAD Liner Retainer (not required for every liner change)

1. Turn water supply off and disconnect nozzle water lines.
2. Follow steps 2 through 4 in **GOOSENECK REMOVAL** in **Section 3.2 GOOSENECK REPLACEMENT**.
3. Remove existing QUICK LOAD Liners by pulling them out through the gooseneck using pliers.
4. Remove retainers from the power pin at the rear of the gun. This may require removal of a power pin cap depending on your power pin style.
5. Install the QUICK LOAD Liners from the back of the MIG gun with liner retainers attached.
6. Reinstall the power pin cap (if applicable).
7. Push liners back into gooseneck and hold in place. Using liner gauge, trim conduit liner with $\frac{3}{4}$ " (20 mm) stick out.
8. Feed wire through liner.
9. Follow steps 5 through 7 in **GOOSENECK REPLACEMENT** in **Section 3.2 GOOSENECK REPLACEMENT**.
10. Reconnect nozzle water lines and turn water supply back on.



3.5 UNICABLE ASSEMBLY REPLACEMENT

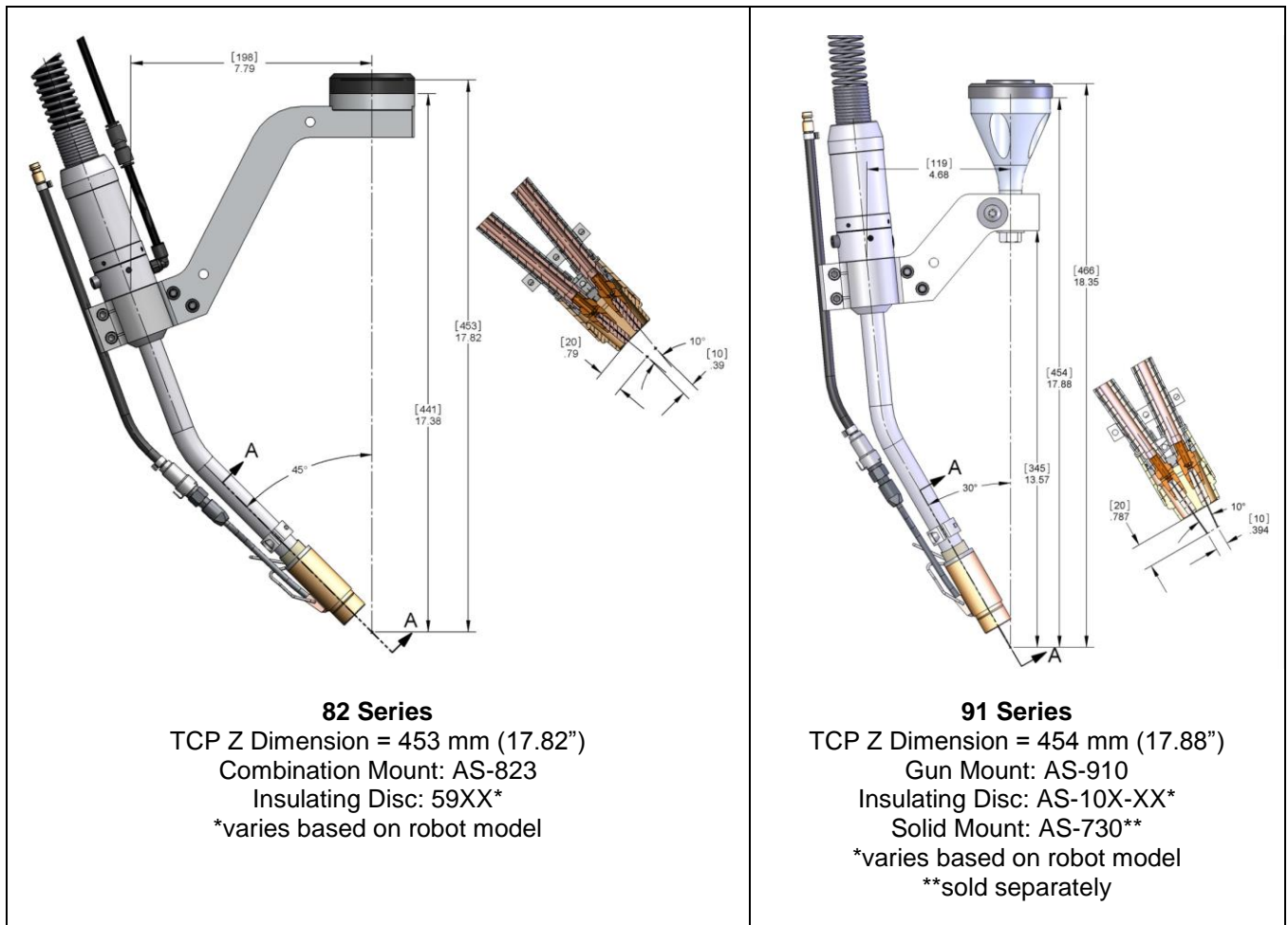
1. Follow steps 1 through 8 in **GOOSENECK REMOVAL** in **Section 3.2 GOOSENECK REPLACEMENT**.
2. Use a 5 mm Allen key to loosen the M6 screws on the mounting arm assembly to allow on unicables to be pulled free from the mounting arm.
3. Remove the power pins from the rear of the unicable (see **Direct Power Pin Replacement** section).
4. Take the power pin removed from the old unicables and install them on the new unicables (see **Direct Power Pin Replacement** section for details).
5. Insert the unicables into the mounting arm assembly and tighten the M6 screws using a 5 mm Allen key.
6. Follow steps 1 through 8 in **GOOSENECK REPLACEMENT** in **Section 3.2 GOOSENECK REPLACEMENT**.



4.0 – TECHNICAL DATA

4.1 GUN CONFIGURATIONS

IMPORTANT: Both gun configurations have a standard CTWD dimensions: 10 mm arc spacing at a 20 mm CTWD at angle of 10°.



4.2 GUN AMPERAGES

MODEL	60% DUTY CYCLE - MIXED GASES OR 100% DUTY CYCLE - CO ₂
TOUGH GUN Tandem	800 amp

5.0 – RECOMMENDED ACCESSORIES

5.1 TOUGH GUN™ REAMER NOZZLE CLEANING STATION FOR TANDEM GUNS

PART NUMBER: TTL-05-11

By minimizing spatter accumulation, the TOUGH GUN Reamer extends the life of robotic MIG guns and consumables, resulting in increased uptime and lower operating costs.

Safe and Accurate Setup:

- External setup switches allow independent operation of the sprayer, clamp and spindle during manual setup.
- Cutter blade lifts into position but does not spin when activated by the spindle setup switch.

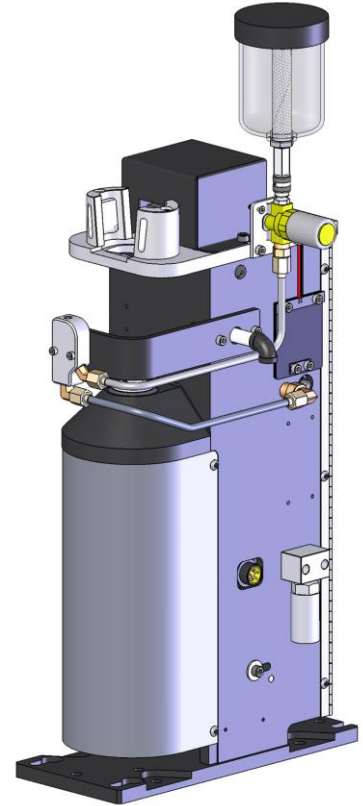
Improved Reliability:

- All pneumatic valves are internally mounted.
- Seals protect points of entry.
- Protected external setup switches.
- Electric Check-Valve ensures more consistent operation.

Maintenance-Friendly:

- Quick-Change Base Plate allows easy and accurate removal and replacement of reamer.
- Convenient carry handle.
- Quick-disconnect wiring – valves can be replaced without rewiring.

For more information on this product, please visit www.tregaskiss.com or contact your Tregaskiss representative.



5.2 TOUGH GUN GOOSENECK INSPECTION KIT FOR TANDEM

PART NUMBER: GS-107

Tregaskiss offers a Gooseneck Inspection Kit for Tandem goosenecks. Simply purchase the GS-107 kit, manufacture a base plate (based on a Tregaskiss design available upon request from Tech Services) and mount the kit to the base. This tool is designed to adjust Tandem goosenecks to a consistent Tool Center Point (TCP).

Benefits:

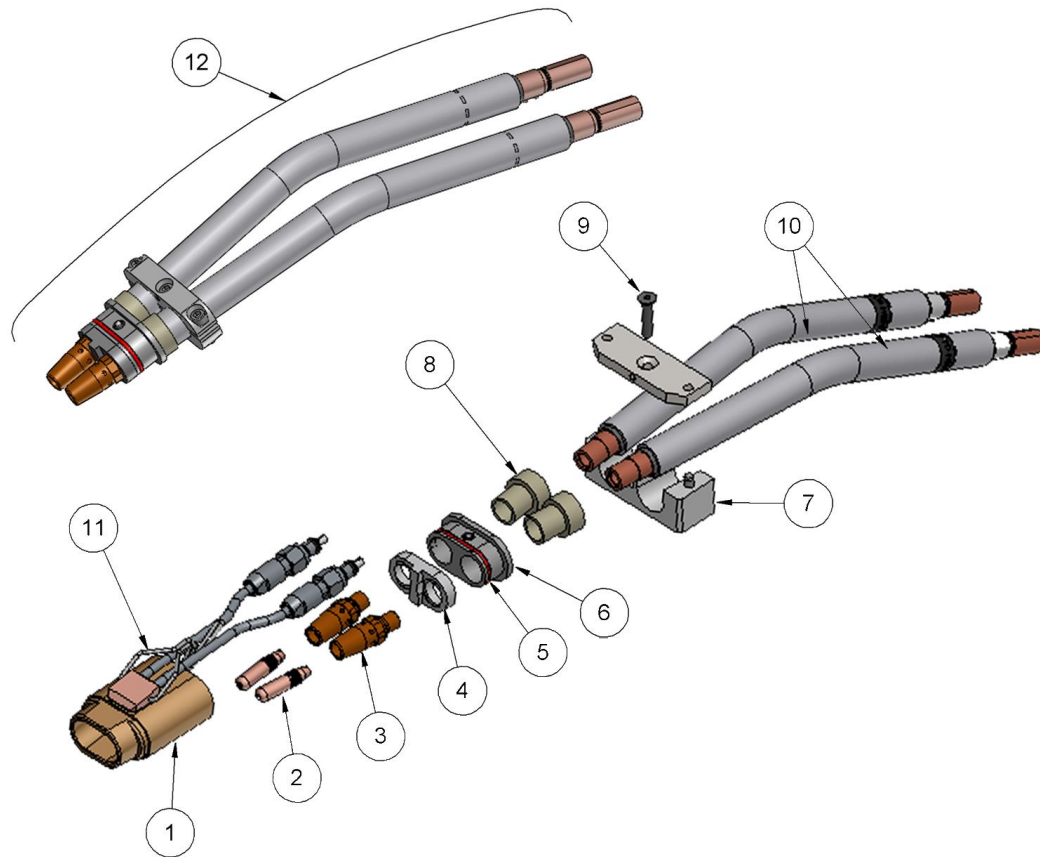
- Realigns gooseneck to Tool Center Point (TCP).
- Prolongs the life of your necks – readjust a bent neck instead of replacing it.
- Prevents costly rework due to missed weld joints.
- Prevents downtime for reprogramming the robot to match a bent neck.

For more information on this product, please visit www.tregaskiss.com or contact your Tregaskiss representative.



6.0 – EXPLODED VIEW AND PARTS LIST

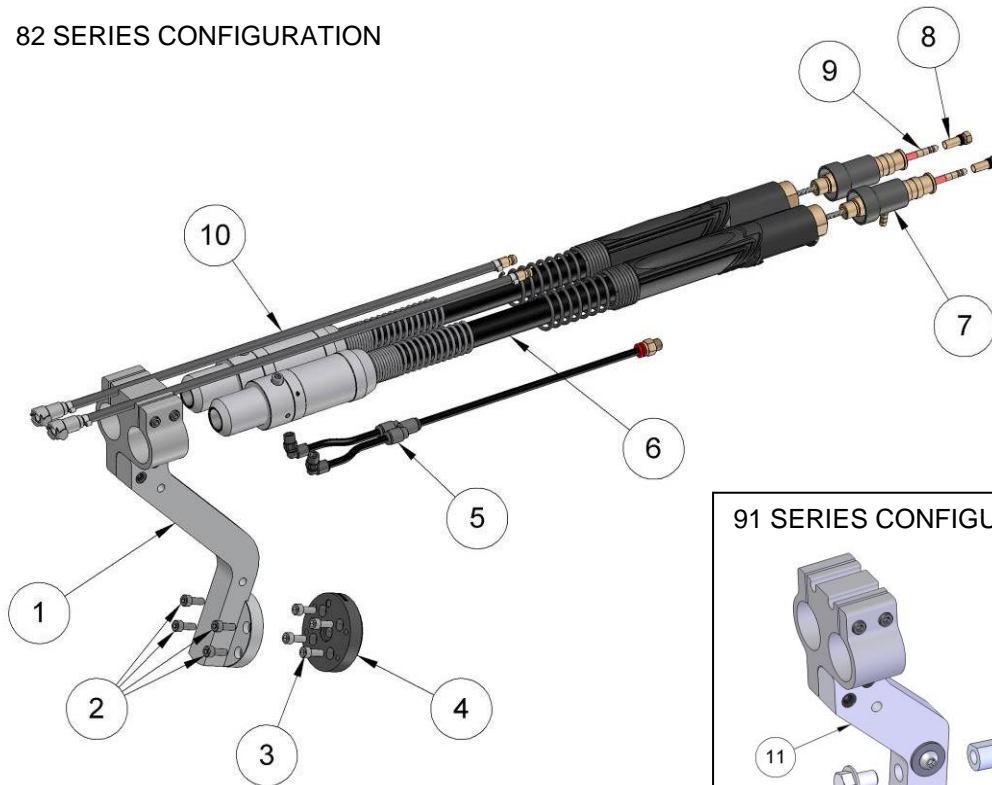
FRONT END



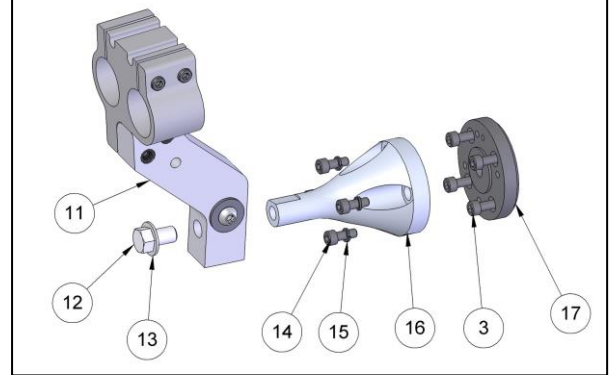
ITEM	PART#	DESCRIPTION
1	910-15	TANDEM NOZZLE (INCLUDES ITEM 11)
2	403-27-1.0	TOUGH LOCK CONTACT TIP FOR 1.0 mm WIRE
3	910-6	TANDEM GAS DIFFUSER
4	910-2	TANDEM RETAINER INSULATOR
5	810-4-2	O-RING
6	910-14	TANDEM NOZZLE RETAINER
7	910-8	TANDEM GOOSENECK CLAMP ASSEMBLY
8	810-9	TANDEM INSULATOR SLEEVE
9	NON-SELLABLE	M5X0.8-25 SCHCS
10	910-25	TANDEM GOOSENECK (25 DEGREE)
11	810-15-1-4	CLASP FOR TANDEM NOZZLE (PACK OF 10)
12	910-25S	TANDEM GOOSENECK ASSEMBLY MODULE (INCLUDES 810-9, 910-14, 910-2, 2 X 910-25, 910-6 AND 910-7)

BACK END

82 SERIES CONFIGURATION



91 SERIES CONFIGURATION



ITEM#	PART#	DESCRIPTION
1	AS-823	TANDEM COMBINATION MOUNT – 82 SERIES
2	NON-SELLABLE	M6X1-16mm LONG SHCS
3	NOT SUPPLIED	SHCS-SIZE VARIES BY ROBOT
4		INSULATING DISC
	59D01	MOTOMAN : K6SB, K10, SK16X, UP6, UP20, MRV6 ABB : IRB 1400 M97A and IRB 2400L
	59D02	MOTOMAN : SK6, SK16 FANUC : 100, 100i, 120i, S-6, M710-20 ABB : IRB 6, 1400, 1500, 2000 AND 2400 OTC : MRV-6, EX-V6, EX-V6L, EX-V16, DR 4400 DAIHEN : DR-4000, DR-4200 MILLER : MRV-2
	59D03	PANASONIC : VR-008A, VR-006A, VR-005C, VR-006ALII, AW-010A, AW-8010 AW-005A&C&CL AW006A, VR-006AL
	59D04	ABB : IRB-2400/10 , IRB-2400/16 , IRB-440L
5	910-A	TANDEM AIR BLAST KIT
6	913-6XX	TANDEM POWER CABLE - (SPECIFY 04', 06', 08', or 10')
7		POWER PINS
	214-1	MILLER POWER PIN (SHORT ROBOTIC)
	214-7	LINCOLN POWER PIN (SHORT ROBOTIC)
	214-14	PANASONIC POWER PIN (WITH GAS BARB FITTING)
	214-30	PANASONIC POWER PIN (WITH PUSH-LOCK FITTING)

ITEM#	PART#	DESCRIPTION
8	415-26	QUICK LOAD™ LINER RETAINER
9	415-XX-XXQ	QUICK LOAD LINER
10	910-10-150	TANDEM WATER LINE ASSEMBLY - 15'
11	AS-910	TANDEM GUN MOUNT - 91 SERIES
12	NON-SELLABLE	HEX BOLT 7/16-20
13	NON-SELLABLE	WASHER 7/16
14	NON-SELLABLE	M6X1-16MM LONG SHCS
15	NON-SELLABLE	M6 SPRING WASHER
16	AS-730	SOLID ARM MOUNT
		INSULATING DISC
17	AS-101-2	MOTOMAN : SK6, SK16 FANUC : 100, 100i, 120i, S-6, M710-20 ABB : IRB 6, 1400, 1500, 2000 AND 2400 OTC : MRV-6, EX-V6, EX-V6L, EX-V16, DR 4400 DAIHEN : DR-4000, DR-4200 MILLER : MRV-2
	AS-106-4	PANASONIC : VR-008A, VR-006A, VR-005C, VR-006ALII, AW-010A, AW-8010 AW-005A&C&CL AW006A, VR-006AL

7.0 – ORDERING INFORMATION

The following TOUGH GUN Tandem models are available for ordering:

PART #	DESCRIPTION	CABLE LENGTH
LN8204-1.0Q	82 SERIES CONFIGURATION	4'
LN8206-1.0Q	82 SERIES CONFIGURATION	6'
LN8208-1.0Q	82 SERIES CONFIGURATION	8'
LN8210-1.0Q	82 SERIES CONFIGURATION	10'
PA9104-1.0Q	91 SERIES CONFIGURATION	4'
PA9106-1.0Q	91 SERIES CONFIGURATION	6'
PA9108-1.0Q	91 SERIES CONFIGURATION	8'
PA9110-1.0Q	91 SERIES CONFIGURATION	10'

8.0 – STANDARD PARTS

NOZZLE	CONTACT TIPS	DIFFUSERS	RETAINER	RETAINER INSULATOR	INSULATOR SLEEVES	GOOSENECKS	LINERS
910-15	403-27-1.0	910-6	910-14	910-2	810-9	910-25	415-116-6Q



For Technical Support:

Canada & U.S.A. Phone: 1-877-737-3111

International Phone: +1-519-737-3000

Email: techservices@tregaskiss.com

www.tregaskiss.com

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