

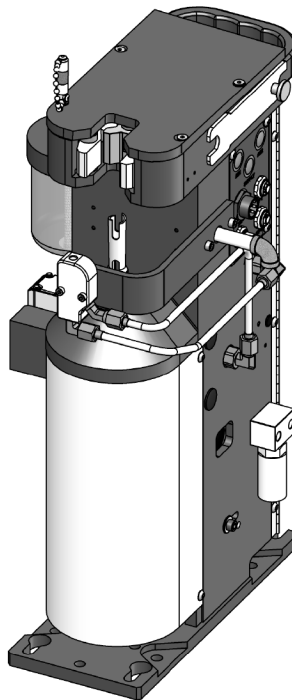
TOUGH GUN® TT3E Reamer

OWNER'S MANUAL

May 2021

OM-TT3E-1.6

Serial #2400xxx | Ethernet Equipped
Robotic Nozzle Cleaning Station, MIG
(GMAW) Welding Peripheral



Tregaskiss.com/TechnicalSupport
1-855-MIGWELD (644-9353) (US & Canada)
+1-519-737-3000 (International)

Thank You for Choosing Tregaskiss

Thank you for selecting a Tregaskiss product. Before installing, compare the equipment received against the invoice to verify that the shipment is complete and undamaged. It is the responsibility of the purchaser to file all claims of damage or loss that may have occurred during transit with the carrier.

The owner's manual contains general information, instructions and maintenance to help better maintain your MIG gun. Please read, understand and follow all safety precautions.

While every precaution has been taken to assure the accuracy of this owner's manual, Tregaskiss assumes no responsibility for errors or omissions. Tregaskiss assumes no liability for damages resulting from the use of information contained herein. The information presented in this owner's manual is accurate to the best of our knowledge at the time of printing. Please reference Tregaskiss.com for updated material.

For customer support and special applications, please call the Tregaskiss Customer Service Department at 1-855-MIGWELD (644-9353) (US & Canada) or +1-519-737-3000 (International), fax 1-519-737-1530, or email at cs@itwmig.com. Our trained Customer Service Team is available between 8:00 a.m. and 5:30 p.m. EST, and will answer your product application or repair questions.

Tregaskiss manufactures premium robotic MIG (GMAW) welding guns, peripherals and consumables. For more information on other premium Tregaskiss products, contact your local Tregaskiss distributor or visit us on the web at Tregaskiss.com.

Subject to Change – The information presented in this manual is accurate to the best of our knowledge at the time of printing. Please visit Tregaskiss.com for the most up-to-date information.

Additional Material – For additional support materials such as spec sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more, please visit Tregaskiss.com.

Scan this QR Code with your smart phone for immediate access to Tregaskiss.com/TechnicalSupport



TABLE OF CONTENTS

SECTION 1 — SAFETY PRECAUTIONS — READ BEFORE USING	1
1-1 Symbol Usage	1
1-2 Arc Welding Hazards	1
1-3 California Proposition 65 Warnings	3
1-4 Principal Safety Standards	3
1-5 EMF Information	3
1-6 Commercial Warranty	4
SECTION 2 — CONSIGNES DE SÉCURITÉ — LIRE AVANT UTILISATION	5
2-1 Symboles utilisés	5
2-2 Dangers relatifs au soudage à l'arc	5
2-3 Proposition californienne 65 Avertissements	7
2-4 Principales normes de sécurité	7
2-5 Informations relatives aux CEM	7
SECTION 3 — PRECAUCIONES DE SEGURIDAD — LEA ANTES DE USAR	8
3-1 Uso de símbolos	8
3-2 Peligros en soldadura de arco	8
3-3 Advertencias de la Proposición 65 del estado de California	10
3-4 Estándares principales de seguridad	10
3-5 Información sobre los campos electromagnéticos (EMF)	10
SECTION 4 — SPECIFICATIONS	11
4-1 System Components	11
SECTION 5 — INSTALLATION	12
5-1 Installing the Reamer	12
5-2 Installing Air Blast	13
5-3 Installing the Wire Cutter	14
5-4 Installing Nozzle Detect	17
SECTION 6 — SETUP	18
6-1 Air Motor Lubricator	18
6-2 Accessing Electrical and Pneumatic Controls	18
6-3 Wiring Interface Connections	19
6-4 Ethernet Module Specifications	20
6-5 Setting Up V-Block	21
6-6 Setting Up Nozzle Heights for Cutter Blade Insertion	22
6-7 Setting Up Nozzle Detect	23

6-8 Setting the IP Address	25
6-9 Data Map	28
SECTION 7 — OPERATION	32
7-1 Understanding L.E.D. Indicators on the Ethernet Module	32
7-2 Program Logic Chart	33
7-3 Manual Operation	36
7-4 Operation through the HMI	37
7-5 Adjusting Flow Control Valves	40
SECTION 8 — MAINTENANCE	41
8-1 Replacing the Spindle Limit Switch	41
8-2 Replacing the Clamp Limit Switch	42
8-3 Replacing the Air Motor	43
8-4 Replacing the Ethernet Module	44
8-5 Replacing the Cutter Blade	45
8-6 Replacing the Drive Belt	45
8-7 Replacing the Solenoid Valves	46
8-8 Replacing the Air Blast Valves	47
8-9 Scheduled Maintenance	48
8-10 Program Updating	49
SECTION 9 — TECHNICAL DATA	51
9-1 Pneumatic Diagrams	51
9-2 Electrical Schematic	53
SECTION 10 — PARTS LIST	54
SECTION 11 — TROUBLESHOOTING	57
11-1 TOUGH GUN TT3E Reamer - Network	57
11-2 TOUGH GUN TT3E Reamer - Mechanical	57
11-3 Lubricator	58
11-4 Filter/Regulator	58
11-5 Air Blast	59
11-6 Nozzle Detect	59
11-7 Software	60
NOTES	61
ADDITIONAL SUPPORT MATERIALS	62

SECTION 1 — SAFETY PRECAUTIONS — READ BEFORE USING



Protect yourself and others from injury – read, follow, and save these important safety precautions and operating instructions.

1-1 Symbol Usage



DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE – Indicates statements not related to personal injury.

 – Indicates special instructions.



This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2 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 section 1-4 Principal Safety Standards on page 3. Read and follow all Safety Standards.



Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.



During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrode or electrical parts.
- Replace worn, damaged, or cracked guns or cables.
- Turn off welding power source before changing contact tip or gun parts.
- Keep all covers and handle securely in place.



FUMES AND GASES can be hazardous.

- Keep your head out of the fumes.
- Ventilate area, or use breathing device. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.



MOVING PARTS can injure.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



WELDING can cause fire or explosion.

- Do not weld near flammable material.
- Do not weld on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (see Safety Standards).
- Watch for fire; keep extinguisher nearby.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.



BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.



- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Principal Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear body protection made from durable, flame-resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.



- Check for noise level limits exceeding those specified by OSHA.
- Use approved ear plugs or ear muffs if noise level is high.
- Warn others nearby about noise hazard.

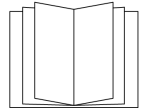
WELDING WIRE can injure.

- Keep hands and body away from gun tip when trigger is pressed.



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 installation, maintenance, and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



1-3 California Proposition 65 Warnings



WARNING: This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov.

1-4 Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute. Website: www.ansi.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1 from Global Engineering Documents. Website: www.global.ihs.com.

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0 from Global Engineering Documents. Website: www.global.ihs.com.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org and www.sparky.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

SR7 2020-02

1-5 EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields may interfere with some medical implants, e.g. Pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passersby or conduct individual 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 workpiece 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 while carrying the welding power source wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

1-6 Commercial 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.

- Bernard® BTB Semi-Automatic Air-Cooled MIG Guns: **1 year**; *Lifetime warranty on straight handles, straight handle switches, and rear strain relief*
- Bernard® W-Gun™ and T-Gun™ Semi-Automatic Water-Cooled MIG Guns: **180 days**
- Bernard® TGX® Chassis and Bernard TGX Ready To Weld MIG Guns: **90 days**
- Tregaskiss® Robotic MIG Guns and Components: **1 year**
- Tregaskiss® Fixed Automatic MIG Guns **1 year**
- Tregaskiss® TOUGH GUN® Reamer: **1 year**
- Tregaskiss® TOUGH GUN® Reamer when factory-equipped with Lubricator: **2 years**
- Tregaskiss® TOUGH GUN® Reamer when factory-equipped with Lubricator and used only with Tregaskiss® TOUGH GARD® Anti-Spatter Liquid: **3 years**
- Tregaskiss® Robotic Peripherals (Clutch, Sprayer, Wire Cutter, Mounting Arms): **1 year**
- Tregaskiss® TOUGH GARD® Anti-Spatter Multi-Feed System: **180 days**

Bernard and Tregaskiss reserve 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 the Bernard and Tregaskiss Customer Service department. Any TOUGH GUN Reamer component part replaced or repaired pursuant to the Warranty herein shall be further warranted for a period of six months after delivery of the replacement.

Bernard and Tregaskiss make no other warranty of any kind, expressed or implied, including, but not limited to the warranties of merchantability or fitness for any purpose. Bernard and 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 Bernard or Tregaskiss.

Genuine Bernard® or 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 Bernard and Tregaskiss personnel. Use as directed.

SECTION 2 — CONSIGNES DE SÉCURITÉ — LIRE AVANT UTILISATION

 Pour écarter les risques de blessure pour vous-même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

2-1 Symboles utilisés

 **DANGER!** – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

 Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.


AVIS – Indique des déclarations pas en relation avec des blessures personnelles.


 – Indique des instructions spécifiques.



Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Reportez-vous aux symboles et aux directives cidessous afin de connaître les mesures à prendre pour éviter tout danger.

2-2 Dangers relatifs au soudage à l'arc

 Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les onsignes de sécurité présentées ci-après ne font que résumer les informations contenues dans la section 2-4 Principales normes de sécurité on page 7. Veuillez lire et respecter toutes ces normes de sécurité.

 L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées. Une personne qualifiée est définie comme celle qui, par la possession d'un diplôme reconnu, d'un certificat ou d'un statut professionnel, ou qui, par une connaissance, une formation et une expérience approfondies, a démontré avec succès sa capacité à résoudre les problèmes liés à la tâche, le travail ou le projet et a reçu une formation en sécurité afin de reconnaître et d'éviter les risques inhérents.

 Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.

UN CHOC ÉLECTRIQUE peut tuer.



- Porter toujours des gants secs et isolants.
- S'isoler de la pièce et de la terre.
- Ne jamais toucher une électrode ou des pièces électriques sous tension.
- Remplacer les pistolets ou câbles de soudage qui sont endommagés, usés ou craquelés.
- Mettre la soudeuse hors tension avant de remplacer un bec contact ou des pièces de pistolet.
- S'assurer que tous les couvercles et poignées sont fermement assujettis.

LES VAPEURS ET LES FUMÉES peuvent être nocives.



- Éloigner sa tête des endroits renfermant des vapeurs.
- Aérer la zone de travail ou porter un appareil respiratoire.
- Pour déterminer la bonne ventilation, il est recommandé de procéder à un prélèvement pour la composition et la quantité de fumées et de gaz auxquels est exposé le personnel.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraissseurs, les flux et les métaux.

Les PIÈCES MOBILES peuvent causer des blessures.



- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

Ne pas souder à proximité de matériaux inflammables.



- Ne pas souder à proximité de matériaux inflammables
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 et AWS A6.0 (voir les Normes de Sécurité).
- Prendre garde aux incendies et toujours avoir un extincteur à proximité.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraissseurs, les flux et les métaux.

L'ACCUMULATION DE VAPEURS peut causer des lésions ou la mort.



- Quand on n'utilise pas le gaz comprimé de protection, fermer le robinet de la bouteille.
- Assurer toujours la ventilation des zones fermées ou utiliser un appareil respiratoire avec alimentation en air.

LE RAYONNEMENT DE L'ARC peut brûler les yeux et la peau.



Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pendant le soudage (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter un équipement de protection pour le corps fait d'un matériau résistant et ignifuge (cuir, coton robuste, laine). La protection du corps comporte des vêtements sans huile comme par ex. des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.



- Laisser refroidir le pistolet avant de le toucher.
- Ne pas toucher d'objets métalliques chauds.
- Abrisser les objets métalliques contre tout contact par les personnes à proximité.

Le BRUIT peut endommager l'ouïe.



Le bruit des processus et des équipements peut affecter l'ouïe.

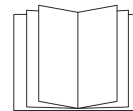
- Vérifier si les niveaux de bruit excèdent les limites spécifiées par l'OSHA.
- Utiliser des bouche-oreilles ou des serre-tête antibruit approuvés si le niveau de bruit est élevé.
- Avertir les personnes à proximité au sujet du danger inhérent au bruit.

LES FILS DE SOUDAGE peuvent provoquer des blessures.



- Éloigner les mains et le corps de la buse du pistolet après avoir appuyé sur la gâchette.

LIRE LES INSTRUCTIONS.



- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.

2-3 Proposition californienne 65 Avertissements



AVERTISSEMENT – Ce produit peut vous exposer à des produits chimiques tels que le plomb, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction

Pour plus d'informations, consulter www.P65Warnings.ca.gov.

2-4 Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute. Website: www.ansi.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1 from Global Engineering Documents. Website: www.global.ihs.com.

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0 from Global Engineering Documents. Website: www.global.ihs.com.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org and www.sparky.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

SR7_fre 2020-02

2-5 Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant issu d'un soudage à l'arc (et de procédés connexes, y compris le soudage par points, le gougeage, le découpage plasma et les opérations de chauffage par induction) crée un champ électromagnétique (CEM) autour du circuit de soudage. Les champs électromagnétiques produits peuvent causer interférence à certains implants médicaux, p. ex. les stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:


1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.

3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.


En ce qui concerne les implants médicaux :


Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 — PRECAUCIONES DE SEGURIDAD — LEA ANTES DE USAR

 **Protéjase usted mismo y a otros contra lesiones — lea, cumpla y conserve estas importantes precauciones de seguridad e instrucciones de utilización.**

3-1 Uso de símbolos

 **PELIGRO!** – Indica una situación peligrosa que, si no se la evita, resultará en muerte o lesión grave. Los peligros posibles se muestran en los símbolos adjuntos o se explican en el texto.

 Indica una situación peligrosa que, si no se la evita, podría resultar en muerte o lesión grave. Los peligros posibles se muestran en los símbolos adjuntos, o se explican en el texto.


AVISO – Indica precauciones no relacionadas a lesiones personales.


 – Indica instrucciones especiales.




Este grupo de símbolos significa ¡Advertencia!, ¡Cuidado! CHOQUE O DESCARGA ELÉCTRICA, PIEZAS QUE SE MUEVEN, y peligros de PARTES CALIENTES. Consulte los símbolos y las instrucciones relacionadas que aparecen a continuación para ver las acciones necesarias para evitar estos peligros.

3-2 Peligros en soldadura de arco

 Se usan los símbolos mostrados abajo por todo éste manual para llamar la atención e identificar a peligros posibles. Cuando usted vea este símbolo, tenga cuidado, y siga a las instrucciones relacionadas para evitar el peligro. La información de seguridad dada abajo es solamente un resumen de la información más completa de seguridad que se encuentra de seguridad de sección 3-4 Estándares principales de seguridad on page 10. Lea y siga todas los estándares de seguridad.

 Solamente personal cualificado debe instalar, utilizar, mantener y reparar este equipo. La definición de personal cualificado es cualquier persona que, debido a que posee un título, un certificado o una posición profesional reconocida, o gracias a su gran conocimiento, capacitación y experiencia, haya demostrado con éxito la capacidad para solucionar o resolver problemas relacionados con el trabajo, el proyecto o el tema en cuestión, además de haber asistido a una capacitación en seguridad para reconocer y evitar los peligros que implica el proceso.

 Durante su operación mantenga lejos a todos, especialmente a los niños.

UNA DESCARGA ELÉCTRICA puede matarlo.



- Siempre use guantes aislantes secos.
- Aíslese usted mismo del trabajo y la tierra.
- No toque electrodo eléctricamente vivo o partes eléctricamente vivas.
- Reemplace antorchas o cables desgastados, dañados o rotos.
- Repare o reemplace aislamiento de la pistola o del cable que esté desgastado, dañado o agrietado.
- Apague la máquina de soldar antes de cambiar los tubos de contacto o piezas de la antorcha.
- Mantenga todas las tapas y asa bien seguras en sitio.

HUMO y GASES pueden ser peligrosos.



- Mantenga su cabeza fuera del humo.
- Ventile el lugar o use un aparato para respirar. El método recomendado para determinar la ventilación adecuada es tomar muestras de la composición y cantidad de humos y gases a los que está expuesto el personal.
- Lea y entienda las Hojas de datos del material (SDS) y las instrucciones del fabricante relacionadas con los adhesivos, metales, consumibles, recubrimientos, limpiadores, refrigerantes, desengrasadores, fundentes y metales.

Las PIEZAS MÓVILES pueden provocar lesiones.



- Aléjese de toda parte en movimiento.
- Aléjese de todo punto que pellizque, tal como rodillos impulsados.

EL SOLDAR puede causar fuego o explosión.



- No suelde cerca de material inflamable
- No suelde en recipientes que han contenido combustibles, ni en recipientes cerrados como tanques, tambores o tuberías, a menos que estén preparados correctamente de acuerdo con la norma AWS F4.1 y AWS A6.0 (vea las normas de seguridad).
- Siempre mire que no haya fuego y mantenga un extinguidor de fuego cerca.
- Lea y entienda las Hojas de datos del material (SDS) y las instrucciones del fabricante relacionadas con los adhesivos, metales, consumibles, recubrimientos, limpiadores, refrigerantes, desengrasadores, fundentes y metales.

EL AMONTONAMIENTO DE GAS puede enfermarle o matarle.



- Cierre el suministro de gas comprimido cuando no lo use.
- Siempre dé ventilación a espacios cerrados o use un respirador aprobado que reemplaza el aire.

LOS RAYOS DEL ARCO pueden quemar sus ojos y piel.



Los rayos del arco de un proceso de suelda producen un calor intenso y rayos ultravioletas fuertes que pueden quemar los ojos y la piel. Las chispas se escapan de la soldadura.

- Use una careta de soldar aprobada que tenga un matiz apropiado de lente-filtro para proteger su cara y ojos mientras esté soldando o mirando (véase los estándares de seguridad ANSI Z49.1 y Z87.1).
- Use anteojos de seguridad aprobados que tengan protección lateral.
- Use pantallas de protección o barreras para proteger a otros del destello, reflejos y chispas, alerte a otros que no miren el arco.
- Use ropa de protección adecuada para el cuerpo, de material durable y resistente a la llama (cuero, algodón grueso o lana). La ropa de protección para el cuerpo incluye guantes de cuero, camisa de trabajo, pantalones sin botamanga (vuelta), botas de seguridad y una gorra; ninguno de estos elementos debe contener compuestos derivados del petróleo.

PARTES CALIENTES pueden causar quemaduras severas.



- Permita que la antorcha se enfríe antes de tocarla.
- No toque metal caliente.
- Proteja a otros del contacto con el metal caliente.

EL RUIDO puede trastornar su oído.



Ruido proveniente de algunos procesos o equipo puede dañar el oído.

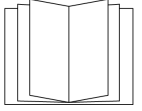
- Chequee los límites del nivel del ruido si exceden aquellos especificados por OSHA.
- Use tapas para los oídos o cubiertas para los oídos si el nivel del ruido es demasiado alto.
- Advierta a otros que estén cerca acerca del peligro del ruido.

EL ALAMBRE de SOLDAR puede causarle heridas.



- Mantenga las manos y el cuerpo lejos del tubo de contacto de la antorcha cuando se haya presionado el gatillo.

LEER INSTRUCCIONES.



- Lea y siga cuidadosamente las instrucciones contenidas en todas las etiquetas y en el Manual del usuario antes de instalar, utilizar o realizar tareas de mantenimiento en la unidad. Lea la información de seguridad incluida en la primera parte del manual y en cada sección.
- Utilice únicamente piezas de reemplazo legítimas del fabricante.
- Los trabajos de instalación y mantenimiento deben ser ejecutados de acuerdo con las instrucciones del manual del usuario, las normas del sector y los códigos nacionales, estatales y locales.

3-3 Advertencias de la Proposición 65 del estado de California



ADVERTENCIA: Este producto puede exponerlo a químicos, incluso plomo, que el estado de California conoce como causantes de cáncer, defectos de nacimiento u otros daños reproductivos.

Para obtener más información, acceda a www.P65Warnings.ca.gov.

3-4 Estándares principales de seguridad

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute. Website: www.ansi.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1 from Global Engineering Documents. Website: www.global.ihs.com.

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0 from Global Engineering Documents. Website: www.global.ihs.com.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org and www.sparky.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

SR7_spa 2020-02

3-5 Información sobre los campos electromagnéticos (EMF)

La corriente que fluye a través de un conductor genera campos eléctricos y magnéticos (EMF) localizados. La corriente del arco de soldadura (y otras técnicas afines como la soldadura por puntos, el ranurado, el corte por plasma y el calentamiento por inducción) genera un campo EMF alrededor del circuito de soldadura. Los campos EMF pueden interferir con algunos dispositivos médicos implantados como, por ejemplo, los marcapasos. Por lo tanto, se deben tomar medidas de protección para las personas que utilizan estos implantes médicos. Por ejemplo, aplique restricciones al acceso de personas que pasan por las cercanías o realice evaluaciones de riesgo individuales para los soldadores. Todos los soldadores deben seguir los procedimientos que se indican a continuación con el objeto de minimizar la exposición a los campos EMF generados por el circuito de soldadura:

1. Mantenga los cables juntos retorciéndolos entre sí o uniéndolos mediante cintas o una cubierta para cables.
2. No ubique su cuerpo entre los cables de soldadura. Disponga los cables a un lado y apártelos del operario.

3. No enrolle ni cuelgue los cables sobre su cuerpo.
4. Mantenga la cabeza y el tronco tan apartados del equipo del circuito de soldadura como le sea posible.
5. Conecte la pinza de masa en la pieza lo más cerca posible de la soldadura.
6. No trabaje cerca de la fuente de alimentación para soldadura, ni se siente o recueste sobre ella.
7. No suelde mientras transporta la fuente de alimentación o el alimentador de alambre.

Acerca de los aparatos médicos implantados:

Las personas que usen aparatos médicos implantados deben consultar con su médico y el fabricante del aparato antes de llevar a cabo o acercarse a soldadura de arco, soldadura de punto, ranurar, hacer corte por plasma, u operaciones de calentamiento por inducción. Si su doctor lo permite, entonces siga los procedimientos de arriba.

SECTION 4 — SPECIFICATIONS

4-1 System Components

Robotic Peripheral for GMAW Welding

Rated Voltage: 24 VDC

Operating Voltage: ±10% of rated voltage

Power Consumption: Max. wattage in operation 5.3 W

Anti-Spatter

Requirements: Water-based anti-spatter liquid must be used. Oil-based anti-spatter solution will compromise performance.

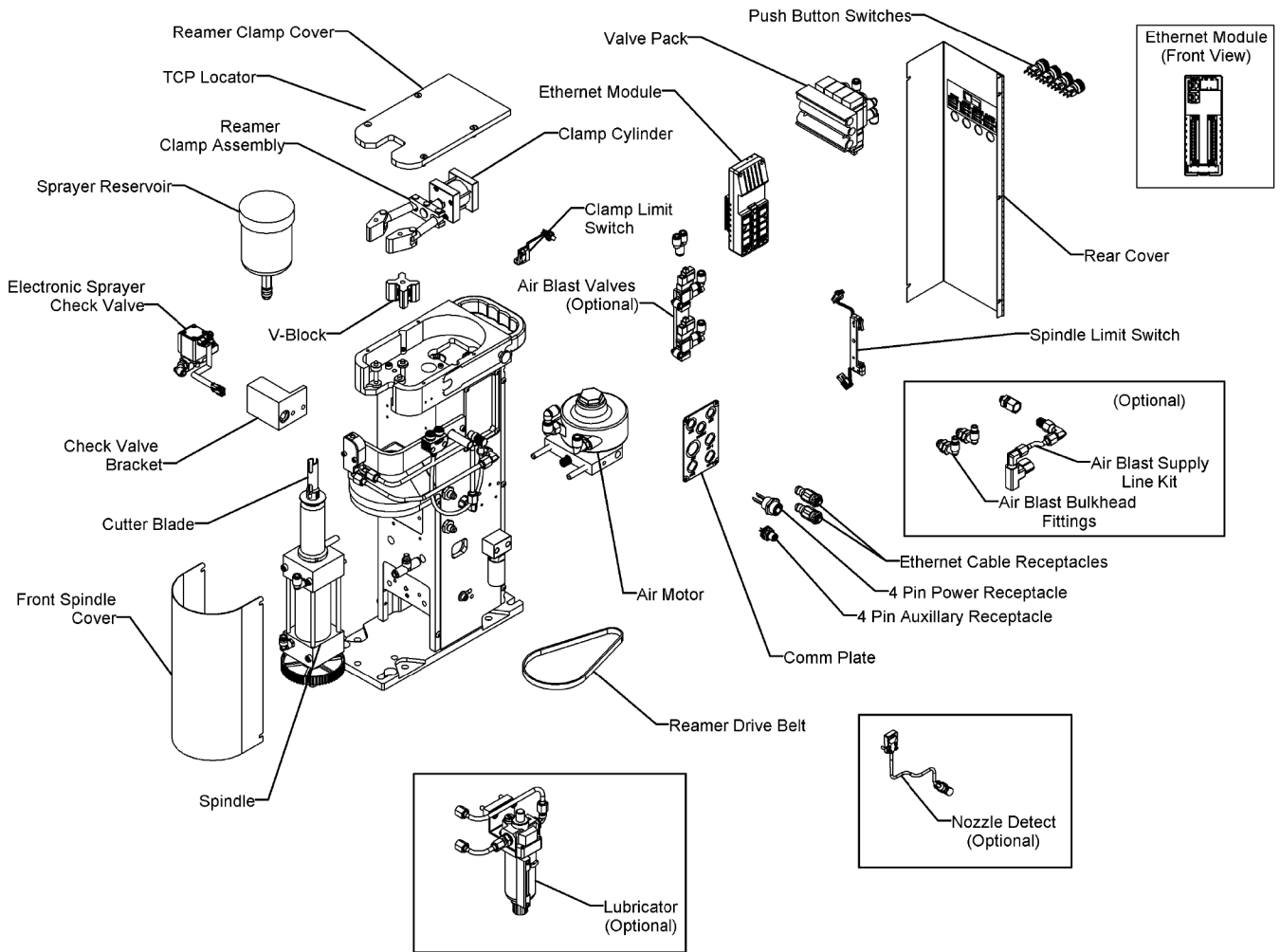
Air Requirements:

Min. 80 to max. 100 psi (5.5 to 7.0 bar) at 16 CFM (450 LPM)

Air Motor (at min. air requirement):

Stall torque at 80 psi (5.5 bar) = 83 in-lbs (9.4 Nm)

For complete parts list, please see Section 10 — Parts List on page 54.



SECTION 5 — INSTALLATION

5-1 Installing the Reamer



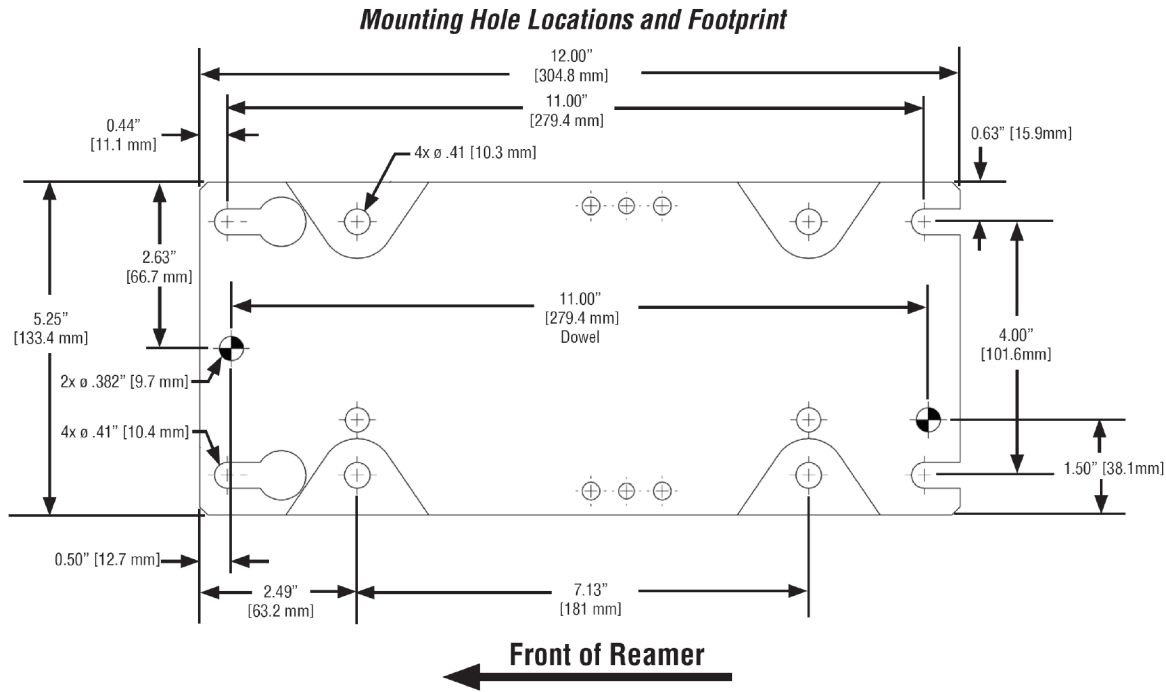
WARNING: Ensure power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

A. To Mount TOUGH GUN TT3E Reamer

The TOUGH GUN Reamer should be installed within the weld cell where it is clear of all tooling and convenient for the robot to access the unit.

1. Affix the reamer base to a sturdy platform using four (4) M10x1.5x25mm bolts (not provided).

Figure 5-A



NOTE: The reamer can be mounted overhead or on an angle as long as debris falls away from the clamp housing.

B. To Connect Air Supply

NOTE: Push RESET button before connecting air line.

1. Use only dry, filtered, lubricated air. **IMPORTANT:** Requirements: 80-100 psi at 16 CFM (5.5-7.0 bar at 450 LPM) at the reamer during operation.
2. Use an air supply line with an inside diameter of 3/8". Connect to a 1/4" NPT elbow located on the side of the reamer.

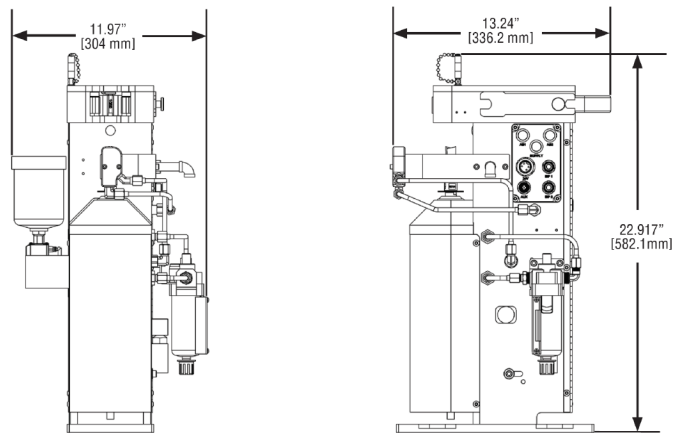


Figure 5-B

5-2 Installing Air Blast



WARNING: Ensure power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

A. Connecting Air Blast

1. If configured with air blast, there will be two air blast ports on the Comm Plate of the reamer.
2. Remove the two plastic plugs from the quick connect fittings (see Figure 5-C).
3. Insert the air blast lines going to the welding gun into the quick connect fitting (see Figure 5-D).

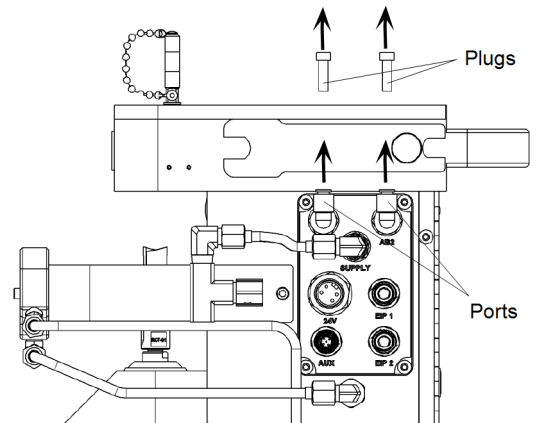
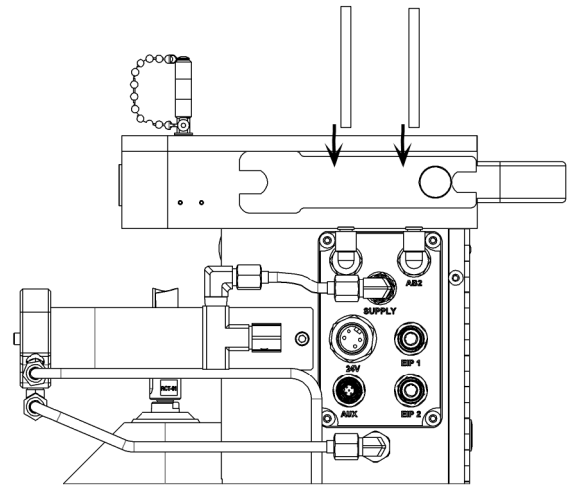


Figure 5-C

B. Programming the Air Blast

Figure 5-D

1. The Ethernet module is pre-programmed to be able to run the air blast option and can support one or two welding gun air blast functions.
2. Using the data map in 6-9 Data Map on page 28, the PLC can be programmed to fire the respective air blast valves in the reamer.



5-3 Installing the Wire Cutter



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

A. Mounting Wire Cutter

1. The wire cutter should be installed within the weld cell where it is clear of all tooling and convenient for the robot to access the unit. The base plate has been designed for mounting on top of the TOUGH GUN Reamer. Be sure to consider movable fixtures and the confines of the robot.
2. Attach the wire cutter base to the top of the reamer, or other sturdy platform, using three (3) M5x0.8x25 mm long bolts in the holes provided.

Figure 5-E

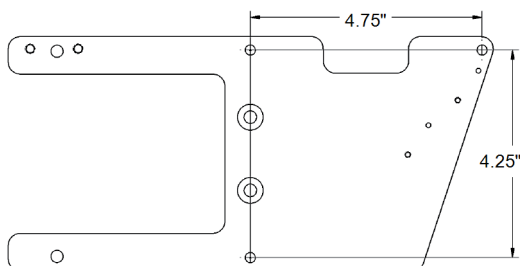
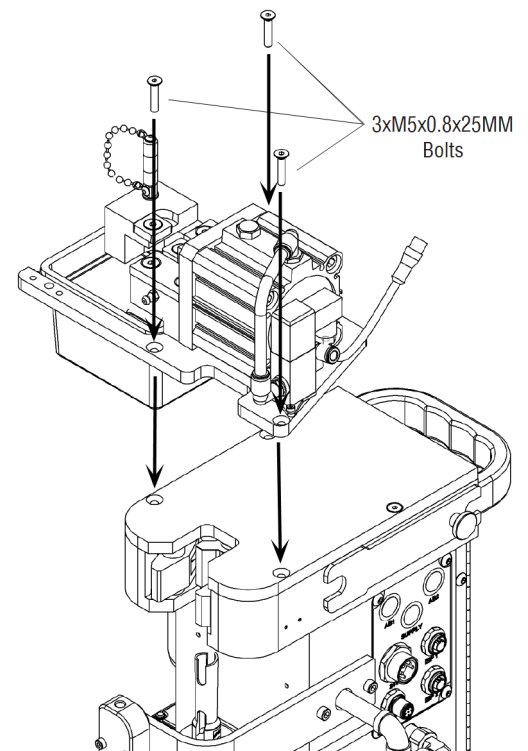


Figure 5-F



B. Connecting Air Supply

1. Use only dry filtered air.
IMPORTANT: Requirements – 80-100 psi at 16 CFM (5.5-7.0 bar at 450 LPM) at the wire cutter.
2. If the air supply line is running directly to the wire cutter, use an air supply line with an inside diameter of 1/4" and connect it to the 1/8" NPT female inlet located on the side of the wire cutter valve.
3. If the air supply is running through the reamer, using the wire cutter air line kit (part # WC-100-18), first connect the "T" fitting onto the 1/4" NPT threaded pipe. Then thread both onto the 90° air supply fitting on the reamer.
4. The 1/4" NPT air fitting will then thread into the side of the "T" fitting.
5. The hose will then fit between the 1/8" NPT female inlet on the wire cutter and the 1/4" NPT air fitting on the reamer air supply line.

Figure 5-H

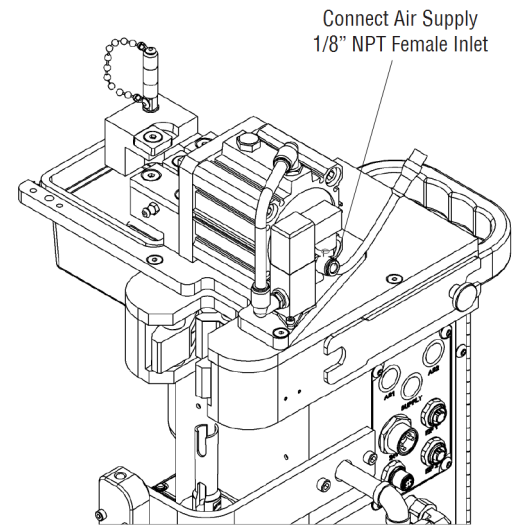


Figure 5-G

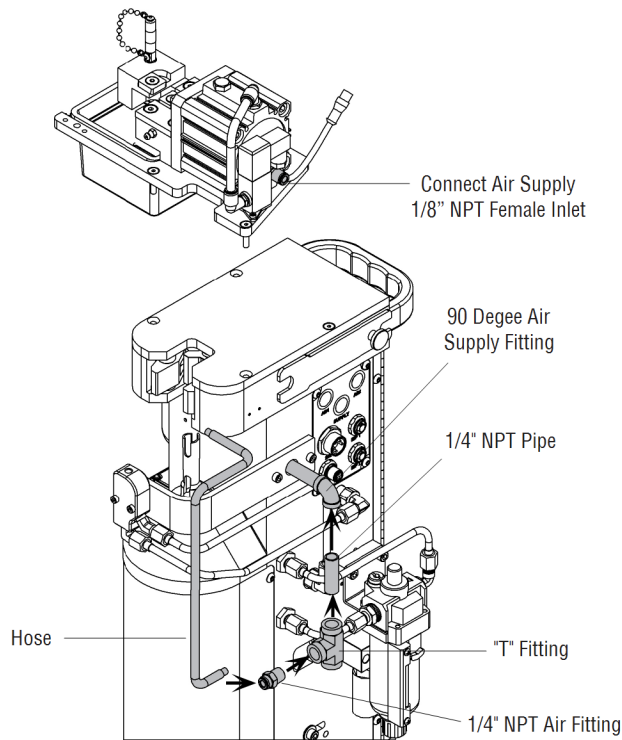
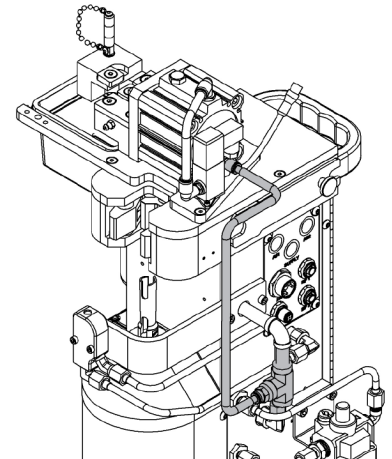


Figure 5-I



C. Connecting Power Supply

Figure 5-J

1. The TOUGH GUN TT3E Reamer Ethernet module can support the wire cutter function and as such, can be connected directly to the reamer.
2. Once mounted to the top of the reamer, take the 4-Pin M12 connector and attach it to the AUX port on the Comm Plate.
3. If the reamer is equipped with a nozzle detect system in addition to the wire cutter, splitter part number TT3E-2343 (see Figure 5-K) will be required and will receive the 4-Pin M12 connector.

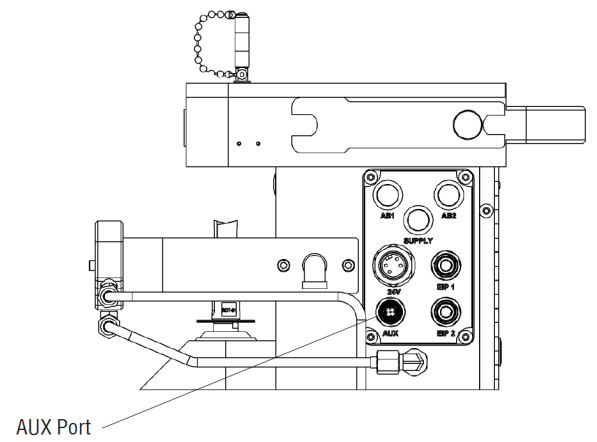
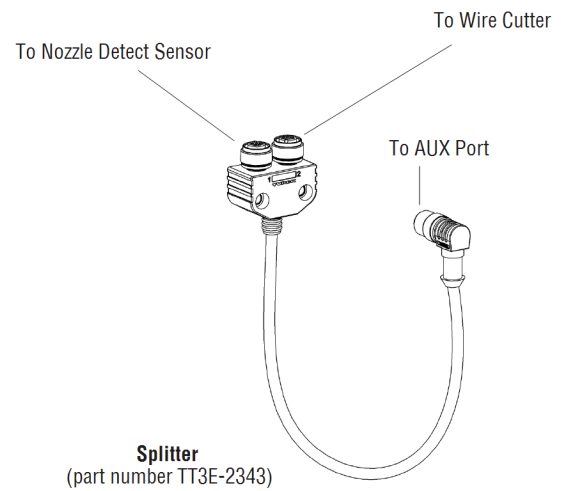


Figure 5-K



5-4 Installing Nozzle Detect



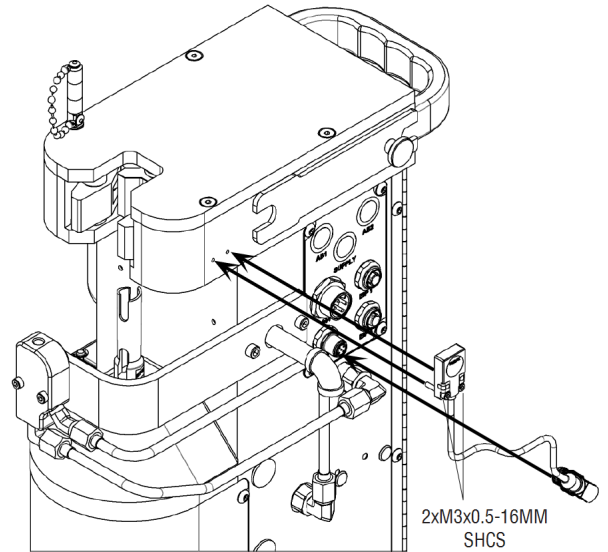
WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

NOTE: This nozzle detect sensor has a sensing range of 5 mm and can detect any metallic part that comes within this sensing range. The accuracy is $\pm \leq 2\%$ (0.1 mm). The circuit is normally open until the sensor detects a metallic part within its sensing range. The green LED on the sensor will always be on if there is power to the reamer.

A. Mounting Nozzle Detect

1. Using two (2) M3x0.5x16 mm SHCS, attach the nozzle detect to the side of the clamp housing in the two threaded holes. Torque to 8-10 in-lbs.
2. Connect the 4-Pin cable to the AUX port on the Comm Plate.
IMPORTANT NOTE: If reamer is equipped with a wire cutter, then splitter part number TT3E-2343 will be required and the nozzle detect will plug into the splitter.

Figure 5-L



SECTION 6 — SETUP

6-1 Air Motor Lubricator



WARNING: The TOUGH GUN Reamer **must be operated with lubricated air** using either the air motor lubricator option or a suitable alternative system installed by the customer. The lubricator should be set to feed one drop of oil for every 50-75 CFM of air going through the motor (approximately 1 drop every 5-10 cycles). The lubricant can be air motor oil or light grade hydraulic oil with a viscosity rating of 150 VC 15-20 (SAE 5W).

6-2 Accessing Electrical and Pneumatic Controls



WARNING: Ensure power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

To access the electronic controls for installation or service of the TOUGH GUN Reamer:

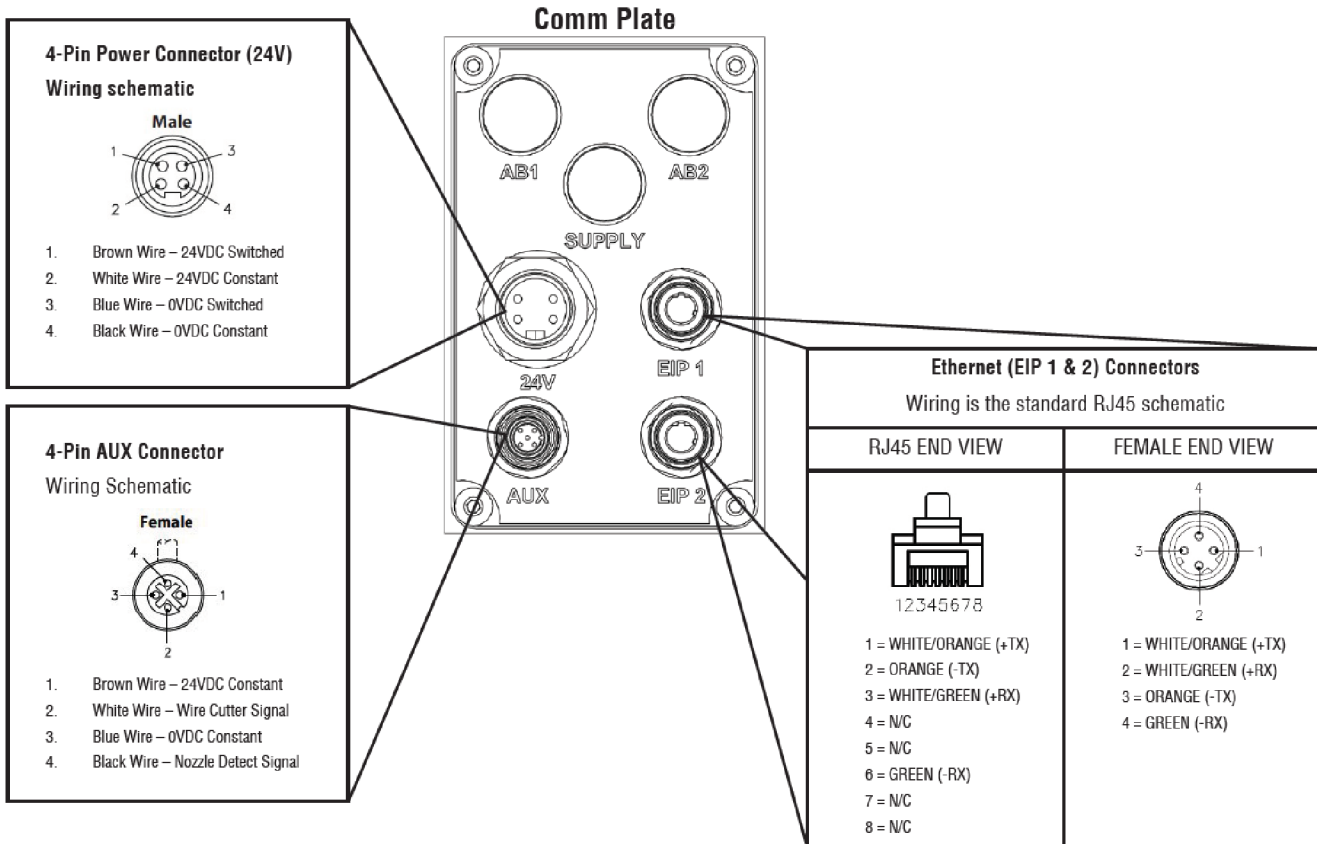
1. Remove reservoir (if equipped) and loosen the two (2) BHCS using a 3 mm Allen wrench to open the hinged rear access door.
2. The rear access door can be completely removed if accessibility is an issue. To do so, using a 3 mm Allen wrench, remove the (3) BHCS which fasten the hinge to the frame.

6-3 Wiring Interface Connections



WARNING: The following connection should only be performed by a qualified technician. Damage to equipment will occur if connections are incorrect.

Figure 6-A



NOTE: These metrics are referenced to the server being monitored, Transmit (TX) FROM this server, and Receive (RX) TO this server

6-4 Ethernet Module Specifications



WARNING: Before setup, ensure that all connections are correct, or damage to the TOUGH GUN Reamer will occur.

The TT3E-2310 is a multiprotocol communication adaptor which supports the following networking standards:

- Ethernet/IP
- PROFINET
- Modbus TCP/IP

The factory default setting is that all communication protocols are enabled. After power-up, a multiprotocol device is listening on all necessary ports to detect which kind of network is in use.

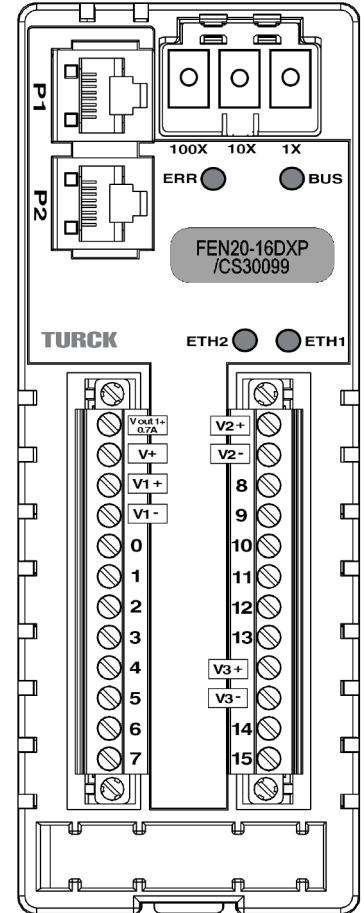
Some key features of the Ethernet module are as follows:

- It is an integrated Ethernet switch;
- 10 Mbps / 100 Mbps supported;
- 3x separate I/O power supply groups that are galvanically separated;
- 24 VDC;
- Up to 1A outputs;
- 2x RJ45 sockets.

The TT3E-2310 wiring / pinout diagram shown in Figure 6-B is as follows:

- V1+ powers I/O 0 to 7
- V2+ powers I/O 8 to 13
- V3+ powers I/O 14 and 15
- Specific I/O functions are listed in 6-9 Data Map on page 28.
- 4x Status LEDs (see for color legend):
 - ERR - Status of the circuits
 - BUS - Connection to a network
 - ETH 1 & 2 - Connection speed / link

Figure 6-B



TT3E-2310 Wiring/Pinout Diagram

TURCK is a registered trademark of Turck Inc. & Hans Turck GmbH & Co. K.G.

6-5 Setting Up V-Block



WARNING: Ensure power and air supply are off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

PRO TIP: Removing and/or installing the top cover will be difficult if the air has not been disconnected. Disconnect the air prior to removing and/or installing the top cover.

1. Remove the four (4) cover screws at the top of the reamer.
2. Lift the clamp cover off completely.
3. Lift and rotate the v-block so the desired size faces outward from between the front jaws.

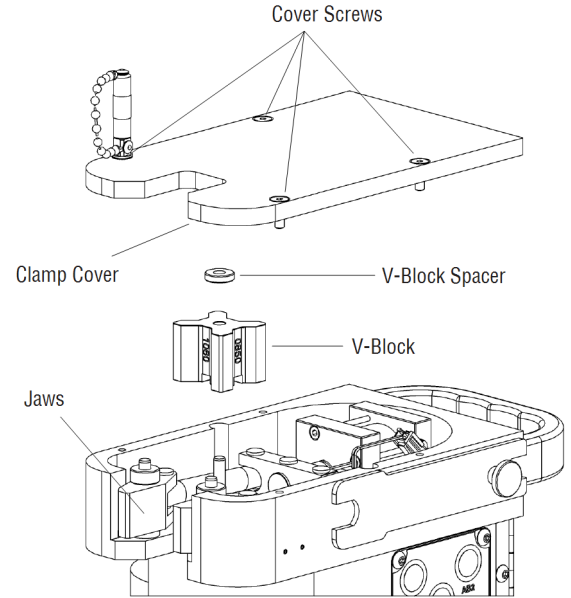
See **V-Block Size Chart** below:

Part #	Nozzle Outside Diameter for each side of V-block			
TR-2150	0.850"	0.938"	*1.062"	1.106"
TR-2161	0.830"	0.978"	25 mm	1.125"
TR-2162	0.780"	0.813"	0.875"	1.000"

**Part stamped as 1060, not according to its O.D. of 1.062".*

Numbers are stamped into the v-blocks. The number refers to the outside diameter of the nozzle (i.e. 0938 = 0.938" O.D.).

Figure 6-C



6-6 Setting Up Nozzle Heights for Cutter Blade Insertion

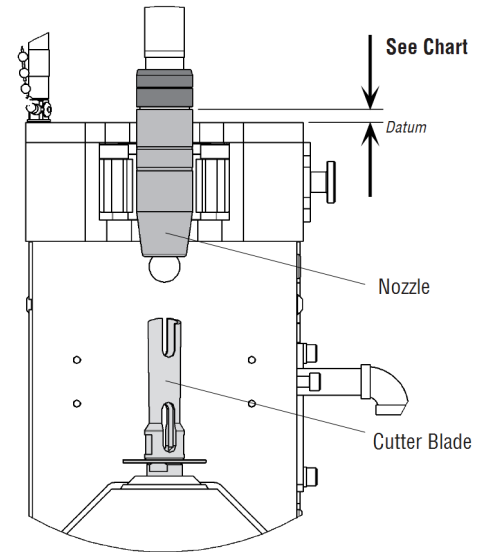


See the chart below in order to find the correct height to set your nozzle for proper cutter blade insertion:

Cutter Blade	Nozzle	Retaining Head					
		404-3		404-20, 404-26, 404-30, 404-32, D-ATSH, D-ATTH		454-1	
RCT-13	3/4" (19.05 mm)	0.110" Below	2.79 mm Below	0.375"	9.53 mm	0.466"	11.84 mm
RCT-01	5/8" (15.88 mm)	0.030"	0.762 mm	0.225"	5.72 mm	0.716"	18.19 mm
RCT-04	1/2" (12.7 mm)	0.219" Below	5.56 mm Below	0.125"	3.18 mm	0.065"	1.65 mm

NOTE: Using the top of the reamer as the datum, the base of the nozzle will either be above or below this datum depending on the nozzle configuration.

Figure 6-D



TOUGH GUN TT3E Reamer

6-7 Setting Up Nozzle Detect



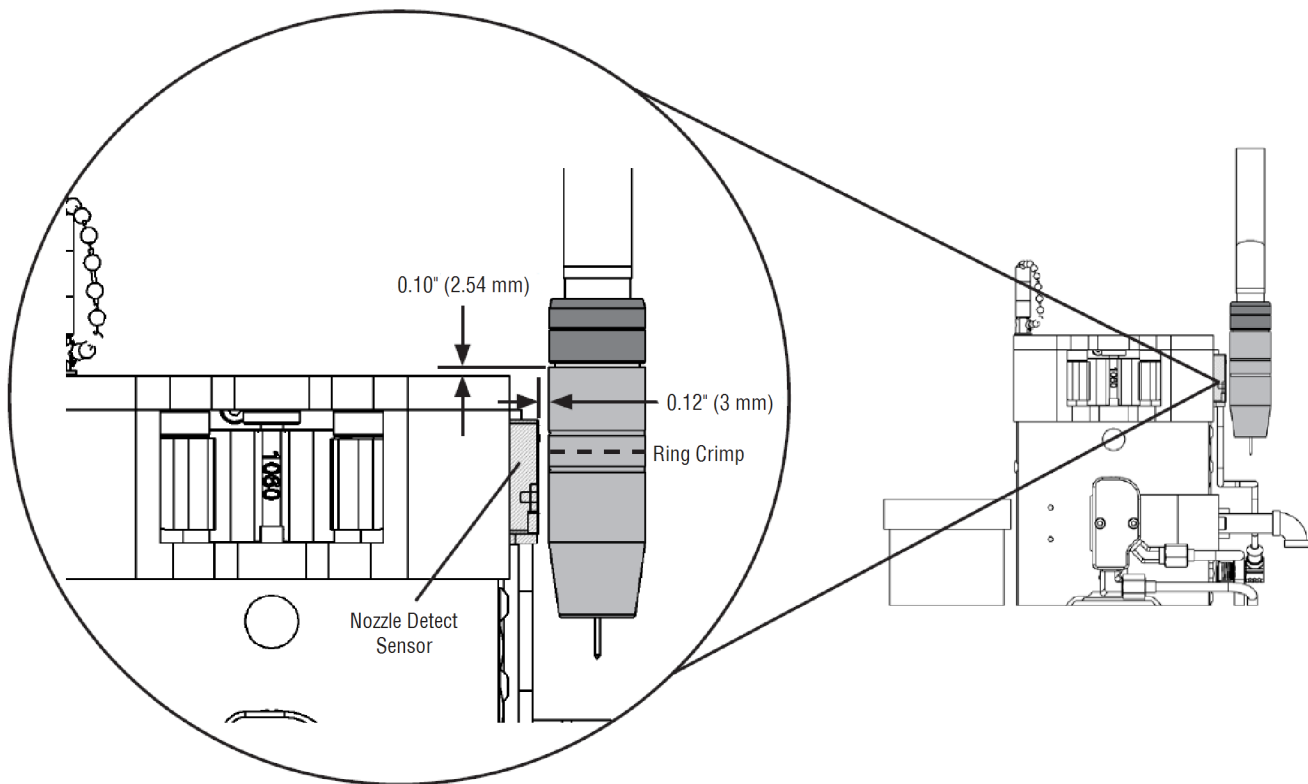
WARNING: Please follow your facility's lockout / tagout procedures.

IMPORTANT: In order for the system to operate properly, the I/O must be monitored. Refer to section 6-9 Data Map on page 28.

A. Setting Up Nozzle Detect

1. With a nozzle on the gun, move the robot into position beside the nozzle detect sensor.
2. Measure the distance from the tangent face of the nozzle to the face of the nozzle detect sensor, ensuring that it is $3 \text{ mm} \pm 1 \text{ mm}$.
3. The ring crimp on the nozzle should be in line with the center of the sensor (yellow circle portion on the face of the sensor). The vertical distance between the top of the reamer clamp housing and the base of the nozzle outer shell should be approx. $0.10''$.

Figure 6-E



B. Testing Nozzle Detect

1. Move robot into position beside the nozzle detect sensor (with a nozzle on the torch). The yellow LED should illuminate.
2. Move robot away from the nozzle detect sensor and remove the nozzle (keeping the retaining head on).
3. Move robot back to the programmed position that was used in Step 1 above. The yellow light should not illuminate, indicating that there is no nozzle on the torch.

Figure 6-F

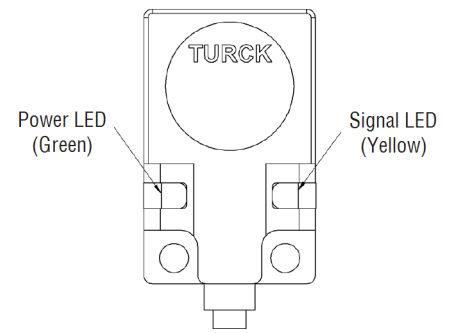


Figure 6-G

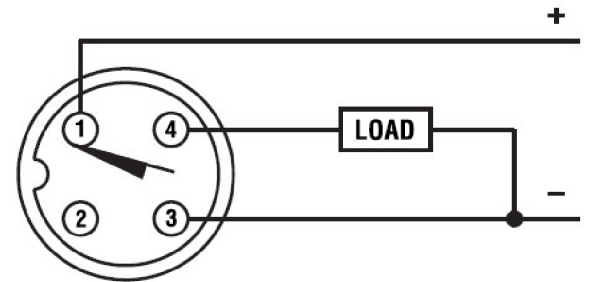
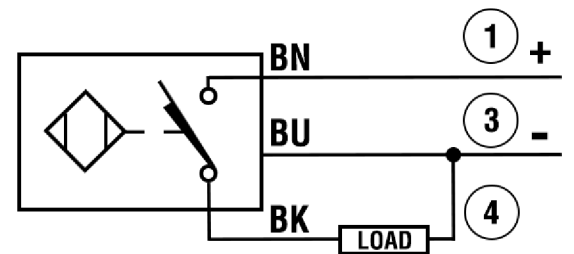


Figure 6-H



6-8 Setting the IP Address

The first step that must be done in order to communicate with the Ethernet module is to change the TCP/IPv4 Properties on the computer being used.

The following must be done:

1. Open Network Connection Status through the Network and Sharing Center (if the computer is using Windows based OS).
2. Select the Properties button (see Figure 6-I).
3. Select Internet Protocol Version 4 (TCP/IPv4) and click the Properties button (see Figure 6-J).

Figure 6-I

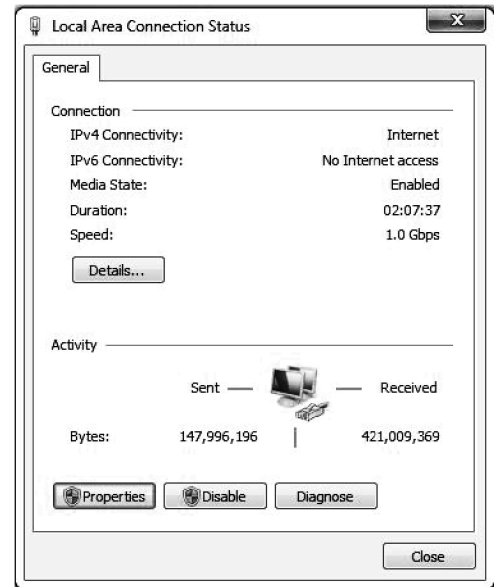
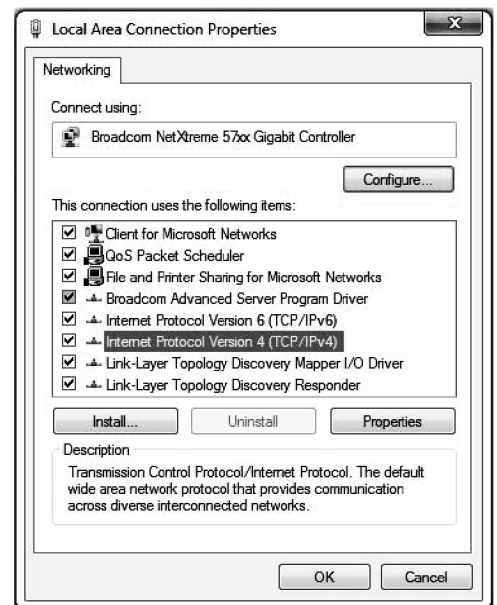


Figure 6-J



4. Once in the Properties window, select the "Use the following IP address" option.
5. The IP address must have the first three octets the same as the Ethernet module.
 - The factory set first three octets are: 192.168.1.
 - The last octet must be between 1 and 254 but cannot be the same as the Ethernet module.
 - The Subnet mask should self-populate, but 255.255.255.0 can be inputted (see Figure 6-K).
6. Once this is completed, communication between the computer and the Ethernet module can occur.

NOTE: To return the computer settings, repeat Steps 1-3 above and then select the "Obtain an IP address automatically" option.

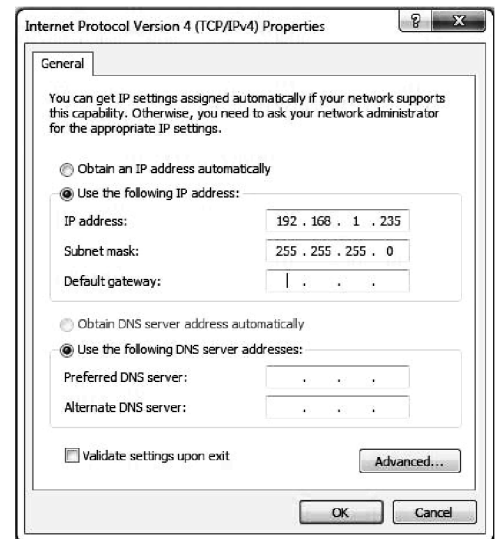


Figure 6-K

The Ethernet module comes from the factory address as 192.168.1.1. However, there are a number of methods that can be used to set/change the IP address of the Ethernet module.

Each method is outlined below:

A. PGM-DHCP Mode (Preferred Method)

1. Ensure that the rotary switches (located at the top of the module underneath the clear plastic cover) on the module are set to 500 PGM or 600 DHCP.
2. Power on the reamer.
3. Use the TURCK IP Address Search Tool to scan for the IP address of the module. **NOTE:** The TURCK IP Address Search Tool can be found online at www.tregaskiss.com/ReamerTT3E. Find the link under the Software tab or <http://pdb2.turck.de/us/DE/products/0000001a000293cb0002003a> (see Figure 6-L).
4. Once the TURCK IP Address Search Tool is installed, run the program and select the "Search" button.
5. Once the Ethernet module shows up on the list, select it and click the "Change" button.
6. The IP address can then be changed to the desired address.
7. Click "Write to device" and the IP address will be stored in the module's EEPROM memory.

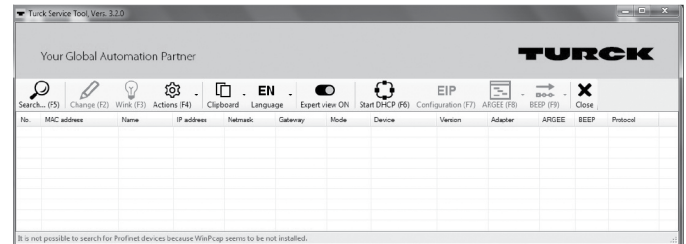


Figure 6-L

B. BOOTP/DHCP Mode

1. Ensure that the rotary switches (located at the top of the module underneath the clear plastic cover) on the module are set to 300 BOOTP or 400 DHCP.
2. Power on the reamer.
3. Using your BOOTP/DHCP software, select the device which you want to address (identified by the MAC address).
4. Create a new entry and assign the IP address to the Ethernet module.
5. The IP address will be saved in the module's EEPROM memory and read from here when the module is powered up.

C. Rotary Switch Method

1. The rotary switches will designate the last octet of the IP address. Rotate the switches to the desired octet (must be between 1 and 254).
2. Power up the reamer.
3. The IP address is now set to the desired octet.

D. Restoring the IP Address to the Default Setting

1. Set all rotary switches to 0.
2. Cycle power.
3. Reamer IP address is now set to 192.168.1.254.

6-9 Data Map



WARNING: I/O 4 is configured to be able to start the reamer cycle without a signal from the PLC. Care must be taken when servicing the reamer so that no accidental short to I/O 4 happens. It is recommended that if servicing the wiring or Ethernet Block, the air supply is turned off.

Below is the Data Map for the TT3E-2310 Ethernet module:

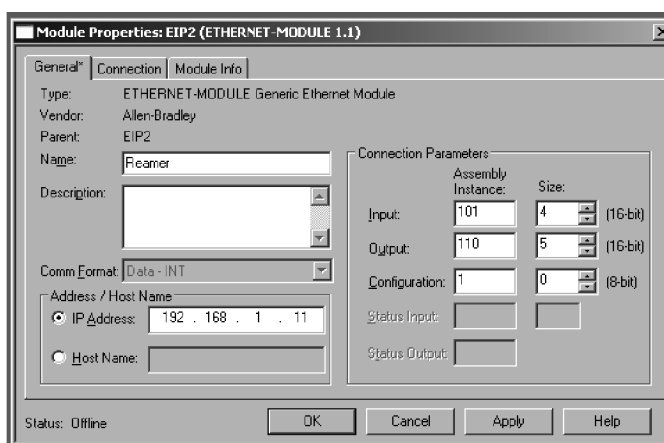
		I/O 15	I/O 14	I/O 13	I/O 12	I/O 11	I/O 10	I/O 9	I/O 8	I/O 7	I/O 6	I/O 5	I/O 4	I/O 3	I/O 2	I/O 1	I/O 0
IN										Upper Limit	Lower Limit		HW Cycle Start		Reset Button	Nozzle Detect	Clamped
OUT			Wire Cut	Air Blast 2	Air Blast 1	Clamp	Spindle	Motor	Sprayer								
OUT	Word	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0		Enable Wire Cut	Air Blast 2	Air Blast 1			Sprayer				Enable DS				Reset	Cycle Start
	1	Startup Motor Dwell from PLC (ms)															
	2	Spindle Advance Dwell from PLS (ms)															
3	Sprayer Duration from PLC (ms)																
IN	0	Wire Cut On	Air Blast 2	Air Blast 1	Clamp On	Spindle On	Motor On	Sprayer On	Upper Limit	Lower Limit		DS Enabled	Clamp Open	Reset Clear	Nozzle Detect	Error	Running
	1	Current Step															
	2	Startup Motor Dwell - Total (ms)															
	3	Spindle Advance Dwell - Total (ms)															
	4	Sprayer Duration - Total (ms)															
	10	Current Program Revision															

A. Programming to the PLC

Download .eds files from our website at www.tregaskiss.com/ReamerTT3E within the *Software* tab, labelled **Omron PLCs** and **All other PLCs**.

To configure the module within the PLC, add the device and use the following **Connection Parameters** (see Figure 6-M).

	Assembly	Instance	Size	
Input:	101	4	(16-bit)	
Output:	110	5	(16-bit)	
Configuration:	1	0	(8-bit)	



The parameters listed above are from the TOUGH GUN TT3E Reamer. For example, the reamer will send 5 outputs (for each word) to the PLC and it will receive 4 inputs (for each word) from the PLC.

NOTE: Name and IP Address shown in Figure 6-M are examples.

B. Programming to a Robot Controller

Using the **Data Map** above, all the I/Os shall be assigned according to what is available on the robot controller. The TOUGH GUN TT3E Reamer is a scanner and should be configured using the following additional information (pulled directly from the Ethernet module's configuration .eds file):

- Vendor Code: 48
- Product Type: 12
- Product Code: 31089
- Input Size (words): 5
- Output Size (words): 4
- Assembly Instance (input): 101
- Assembly Instance (output): 110
- Configuration Instance: 1
- Major Revision: 2
- Minor Revision: 7

NOTE: The screen menus below are taken from a FANUC® controller and should be used as examples only. Customer setups may vary.

Configuration/Setup:

```
I/O EtherNet/IP
Scanner config(Read-only) : 1/1
Description : Tregaskiss Rea>
Name/IP address : 169.254.0.3
Vendor Id : 48
Device Type : 12
Product code : 31089
Input size ( words): 5
Output size ( words): 4
RPI (ms) : 32
Assembly instance(input) : 101
Assembly instance(output) : 110
Configuration instance : 1
```

```
I/O EtherNet/IP
Advanced config(Read-only):
General
I/O Data Type : 16-BIT WORDS
Timeout Multiplier :4
Reconnect : FALSE
Major Revision : 0
Minor Revision : 0
Alarm Severity : STOP
Quick Connect : FALSE
Originator To Target
RPI : 32
Target To Originator
Transport Type : UNICAST
RPI : 32
Connection Type
Type :
O=>I Format : Run/Idle Header
I=>O Format : Modeless

Configuration String Status
Size(bytes) : 0
```

I/O Assignments:

Outputs:

```
I/O Digital Out 3/4 I/O Digital Out 177/512
# RANGE RACK SLOT START STAT. # SIM STATUS
1 DO[ 1- 64] 0 0 0 UNASG DO[ 175] U OFF [E1 Weld ID 15 ]
2 DO[ 65- 176] 89 1 1 ACPLV DO[ 176] U OFF [E1 Weld ID 16 ]
3 DO[ 177- 240] 89 2 1 ACPLV DO[ 177] U OFF [Reamer start cyc]
4 DO[ 241- 512] 0 0 0 UNASG DO[ 178] U OFF [Reset ]
DO[ 179] U OFF [ ]
DO[ 180] U OFF [ ]
DO[ 181] U OFF [ ]
DO[ 182] U OFF [Enable DS ]
DO[ 183] U OFF [ ]
DO[ 184] U OFF [ ]
DO[ 185] U OFF [ ]
DO[ 186] U OFF [Sprayer ]
DO[ 187] U OFF [ ]
DO[ 188] U OFF [ ]
DO[ 189] U OFF [Air Blast 1 ]
DO[ 190] U OFF [Air Blast 2 ]
DO[ 191] U OFF [Enable wire cut ]
DO[ 192] U OFF [ ]
DO[ 193] U OFF [ ]
DO[ 194] U OFF [ ]
DO[ 195] U OFF [ ]
Device Name : EthernetIP
```

Inputs:

I/O Digital In						I/O Digital In			
#	RANGE	RACK	SLOT	START	STAT.	#	SIM	STATUS	145/512
1	DI[1- 64]	0	0	1	ACTIV	DI[141]	U	OFF	[E1 Error 13]
2	DI[65- 144]	89	1	1	ACTIV	DI[142]	U	OFF	[E1 Error 14]
3	DI[145- 224]	89	2	1	ACTIV	DI[143]	U	OFF	[E1 Error 15]
4	DI[225- 512]	0	0	0	UNASSG	DI[144]	U	OFF	[E1 Error 16]
						DI[145]	U	OFF	[Running]
						DI[146]	U	OFF	[Error]
						DI[147]	U	OFF	[Nozzle Detect]
						DI[148]	U	OFF	[Reset clear]
						DI[149]	U	OFF	[Clamp open]
						DI[150]	U	OFF	[DS Enabled]
						DI[151]	U	OFF	[]
						DI[152]	U	OFF	[Lower limit]
						DI[153]	U	OFF	[Upper limit]
						DI[154]	U	OFF	[Sprayer On]
						DI[155]	U	OFF	[Motor On]
						DI[156]	U	OFF	[Spindle On]
						DI[157]	U	OFF	[Clamp On]
						DI[158]	U	OFF	[Air blast 1]
						DI[159]	U	OFF	[Air blast 2]
						DI[160]	U	OFF	[Wire cut On]
						DI[161]	U	OFF	[]

Device Name : EthernetIP

Group Outputs:

I/O Group Out						I/O Group Out						
#	SIM	VALUE	8/100			GO #	RACK	SLOT	START	PT	NUM	PTS
GO[1]	S	0	[E1 Wire feed]			1	89	1	17		16	
GO[2]	S	0	[E1 Weld Cmd 2]			2	89	1	33		16	
GO[3]	S	0	[E1 Weld Cmd 3]			3	89	1	49		8	
GO[4]	S	0	[E1 Weld Cmd 4]			4	89	1	57		8	
GO[5]	S	3	[E1 Program]			5	89	1	65		16	
GO[6]	U	0	[E1 Part ID]			6	89	1	81		16	
GO[7]	U	0	[E1 Weld ID]			7	89	1	97		16	
GO[8]	U	0	[Startup Motor Dw]			8	89	2	17		16	
GO[9]	U	0	[Spindle Advance]			9	89	2	33		16	
GO[10]	U	0	[Sprayer Duration]			10	89	2	49		16	
GO[11]	*	*	[]			11	0	0	0		0	
GO[12]	*	*	[]			12	0	0	0		0	
GO[13]	*	*	[]			13	0	0	0		0	
GO[14]	*	*	[]			14	0	0	0		0	
GO[15]	*	*	[]			15	0	0	0		0	
GO[16]	*	*	[]			16	0	0	0		0	
GO[17]	*	*	[]			17	0	0	0		0	
GO[18]	*	*	[]			18	0	0	0		0	
GO[19]	*	*	[]			19	0	0	0		0	
GO[20]	*	*	[]			20	0	0	0		0	
GO[21]	*	*	[]									

Group Inputs:

I/O Group In						I/O Group In						
#	SIM	VALUE	5/100			GI #	RACK	SLOT	START	PT	NUM	PTS
GI[1]	S	0	[E1 Wire feed]			1	89	1	17		16	
GI[2]	S	0	[E1 Current]			2	89	1	33		16	
GI[3]	S	0	[E1 Voltage]			3	89	1	49		16	
GI[4]	U	0	[E1 Error]			4	89	1	65		16	
GI[5]	U	0	[Current Step]			5	89	2	17		16	
GI[6]	U	0	[Startup Motor Dw]			6	89	2	33		16	
GI[7]	U	0	[Spindle Advance]			7	89	2	49		16	
GI[8]	U	0	[Sprayer Duration]			8	89	2	65		16	
GI[9]	*	*	[]			9	0	0	0		0	
GI[10]	*	*	[]			10	0	0	0		0	
GI[11]	*	*	[]			11	0	0	0		0	
GI[12]	*	*	[]			12	0	0	0		0	
GI[13]	*	*	[]			13	0	0	0		0	
GI[14]	*	*	[]			14	0	0	0		0	
GI[15]	*	*	[]			15	0	0	0		0	
GI[16]	*	*	[]			16	0	0	0		0	
GI[17]	*	*	[]			17	0	0	0		0	
GI[18]	*	*	[]			18	0	0	0		0	
GI[19]	*	*	[]			19	0	0	0		0	
GI[20]	*	*	[]			20	0	0	0		0	
GI[21]	*	*	[]									

SECTION 7 — OPERATION

7-1 Understanding L.E.D. Indicators on the Ethernet Module



LEDs are located on the front of the Ethernet module and can be accessed by opening the rear door of the reamer (see section 6-2 Accessing Electrical and Pneumatic Controls on page 18).

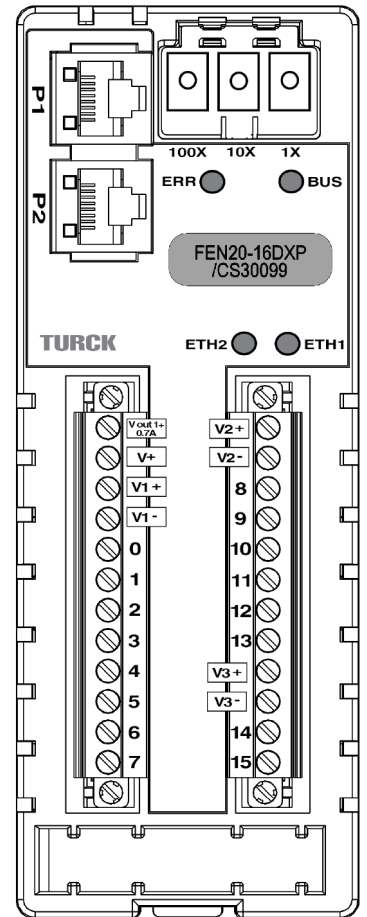
Figure 7-A

LED	Color	Status	Description
ETH1 / ETH2	Green	On	Ethernet link (100 Mbps)
		Flashing	Ethernet communication (100 Mbps)
	Yellow	On	Ethernet link (10 Mbps)
		Flashing	Ethernet communication (10 Mbps)
	N/A	Off	No Ethernet link
BUS	Green	On	Active connection to a master
		Flashing	Ready
	Red	On	IP address conflict or status word is active
		Flashing	Blink/Wink command active
	N/A	Off	Power is off
ERR	Green	On	Diagnostics disabled
	Red	On	Short-circuit
I/O 0 - 15	Green	On	Input / Output is active
	Green	Off	Input / Output is inactive

During normal operation and at the home position, the following LEDs should be illuminated:

1. **ETH1 / ETH2** — Flashing either green or yellow (depending on what connection speed your network is)
2. **BUS** — Flashing green
3. **ERR** — Not illuminated at all
4. **I/O 0, 2, & 6** — Should be illuminated when at the home position

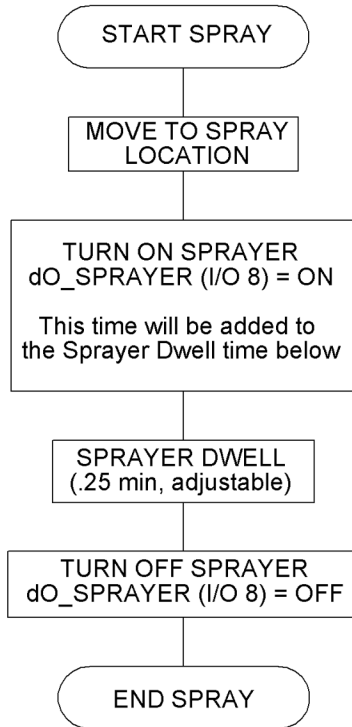
No other LEDs should be illuminated. If there are other illuminated LEDs, consult 11-1 TOUGH GUN TT3E Reamer - Network on page 57



TURCK is a registered trademark of Turck Inc. & Hans Turck GmbH & Co. K.G.

B. Optional Functions Logic

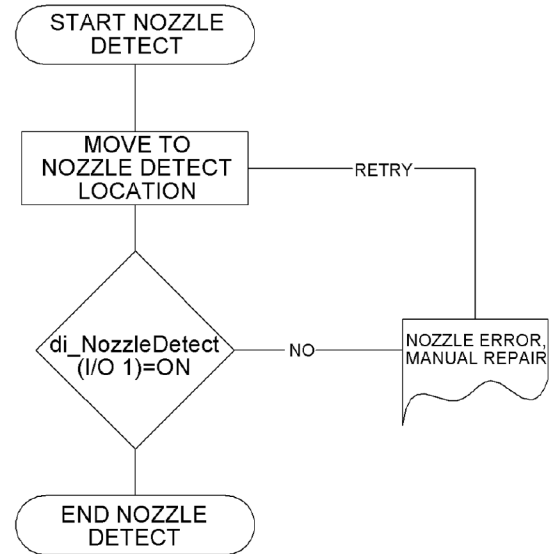
Figure 7-C



EXPLANATION:

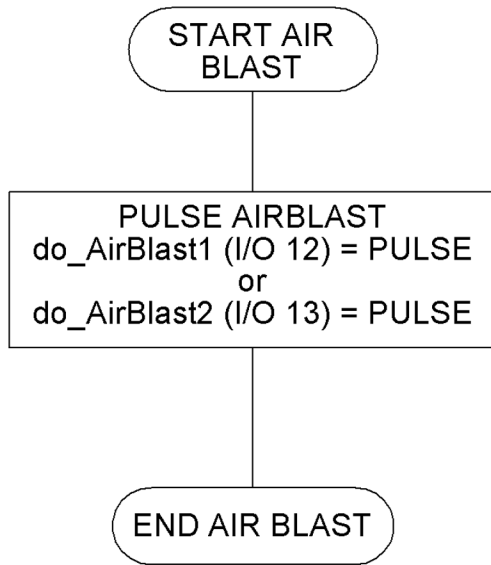
- Robot moves gun to spray location.
- Sprayer is turned on and covers the torch consumables with water-based anti-spatter liquid.
- Sprayer dwell time is adjustable through the HMI.

Figure 7-D

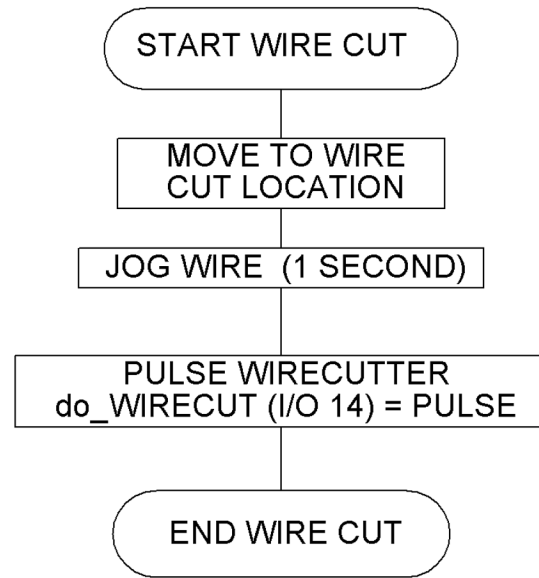


EXPLANATION:

- Robot moves gun to nozzle detect location.
- If the nozzle has come off during the welding process, the switch will not be triggered when the robot is in nozzle detect location.

**EXPLANATION:**

- Air blast can be used within the gun while the robot is moving from location to location, before or after a ream.
- Used to clean off front end, and does so without using up costly welding gas.
- After air blast is used, the system must be purged to ensure proper gases are used when welding starts back up.
- Air blast can be programmed for a certain time period (i.e. 2 seconds) or when the robot is moving between locations.

**EXPLANATION:**

- Robot moves gun to wire cut location.
- Robot controller jogs the wire out of the contact tip past the cutter blades.
- Wire Cutter is fired and cuts the weld wire before the robot continues.

7-3 Manual Operation

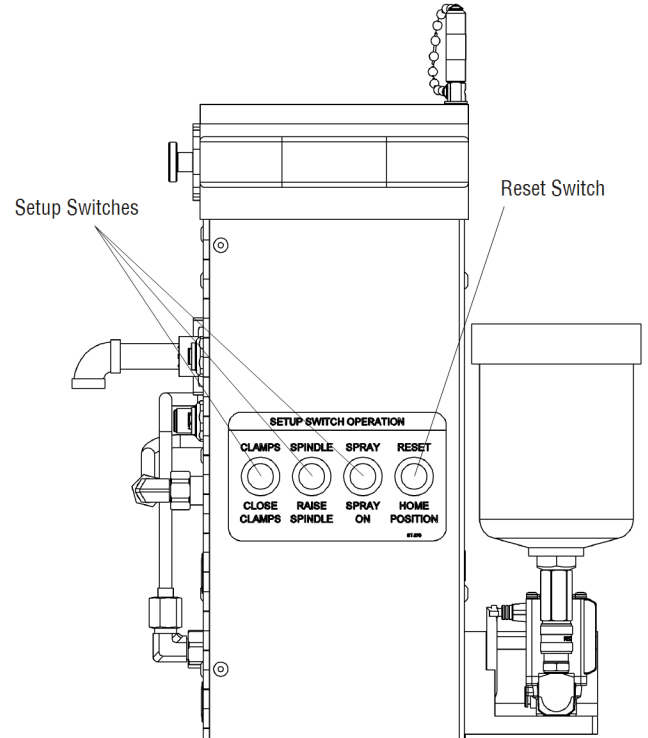


The manual override setup switches allow the confirmation that the spindle, jaw clamping and sprayer air circuits are operational. It also allows for the verification of nozzle placement within the jaws after the nozzle insertion height has been set.

Figure 7-G

To manually operate the TOUGH GUN TT3E Reamer:

1. Press the RESET switch prior to manual operation to reset all circuitry.
2. Locate the setup switches on the rear cover of the reamer.
3. Operate the switches as required.



7-4 Operation through the HMI



The TOUGH GUN TT3E Reamer has a built-in feature that allows the dwell times for the motor start up, spindle advanced and sprayer duration to be changed to user preference.

The reamer also includes the option of Double Stroke. This option will set the reamer up to conduct two sequential plunges into the nozzle bore. All of these options can be accessed through the web browser enabled Human Machine Interface (HMI).

IMPORTANT NOTE: The HMI will only work with an HTML5 enabled browser.

The steps to access the HMI are as follows:

1. Download the **TOUGH GUN TT3E Reamer HMI and Update Program** from www.Tregaskiss.com/ReamerTT3E (under the *Software* tab), and open the local file folder.
2. Select the **_View HMI.html** file and open it in your default web browser (be sure your web browser supports HTML5) (see Figure 7-H).
3. Once opened, enter the IP address of the reamer you wish to operate (see Figure 7-I).

Figure 7-H

Name	Date modified	Type	Size
Earlier_Environments	10/10/2019 2:54 PM	File folder	
_View HMI.html	1/23/2017 6:26 PM	Firefox HTML Doc...	10 KB
_View Program Mode.html	1/23/2017 6:26 PM	Firefox HTML Doc...	11 KB
argee_ajax.js	1/23/2017 6:26 PM	JavaScript File	39 KB
argee_compiler.js	1/23/2017 6:26 PM	JavaScript File	50 KB
argee_conf.js	1/23/2017 6:26 PM	JavaScript File	1 KB
argee_env.js	1/23/2017 6:31 PM	JavaScript File	201 KB
argee_library_loader.js	1/23/2017 6:26 PM	JavaScript File	14 KB
argee_print.js	1/23/2017 6:26 PM	JavaScript File	10 KB
argee_sim.js	1/23/2017 6:26 PM	JavaScript File	52 KB
argee_trace.js	1/23/2017 6:26 PM	JavaScript File	7 KB
argee_v_1_3_import.js	1/23/2017 6:26 PM	JavaScript File	53 KB
BLC_modules.js	1/23/2017 6:26 PM	JavaScript File	101 KB
cache.manifest	1/23/2017 6:26 PM	MANIFEST File	1 KB
Date.js	1/23/2017 6:26 PM	JavaScript File	13 KB
Evaluator.js	1/23/2017 6:26 PM	JavaScript File	36 KB
FEN20_modules.js	1/18/2017 11:20 PM	JavaScript File	13 KB
flowchart.js	1/23/2017 6:26 PM	JavaScript File	29 KB
JsHashMap.js	1/23/2017 6:26 PM	JavaScript File	4 KB
Stack.js	1/23/2017 6:26 PM	JavaScript File	4 KB
TBEN_modules.js	1/23/2017 6:26 PM	JavaScript File	35 KB
TBEN_S1_modules.js	1/23/2017 6:26 PM	JavaScript File	26 KB
Tokenizer.js	1/23/2017 6:26 PM	JavaScript File	19 KB
trlogo.png	3/29/2016 9:28 AM	PNG File	14 KB
utils.js	1/23/2017 6:26 PM	JavaScript File	6 KB

Figure 7-I

HMI Mode
ARGE Device IP Address:
192.168.1.1
Enter HMI Mode

Figure 7-J

Project Title: Tregaskiss Reamer V4.0
Screens
Program Status
Program Setup

4. In the HMI screen, there are two options in the left part of the screen. One for the *Program Status* and one for *Program Setup* (see Figure 7-J). The *Program Status* will give you the real time status of the reamer and the *Program Setup* will allow you to change the dwell times and enable/disable Double Stroke (see Figure 7-K).
5. Once in the Program Setup screen, the right side of the screen will display the various dwell time and Double Stroke options.
6. To enable/disable the Double Stroke, click "Enable Double Stroke from HMI" (see Figure 7-L).

Program Status	
Current Step	
	Resetting
Output Status	
Out10_Enable_Motor	0
Out11_Enable_Spindle	0
Out12_Enable_Clamp	0
Out9_Enable_Sprayer	0
Out13_Enable_Airblast_1	0
Out14_Enable_Airblast_2	0
Out15_Enable_Wire_Cut	0
Input Status	
In1_Clamp_Open	0
In2_Nozzle_Detected	0
In3_Reset_Button	0
In5_Hardware_Cycle_Start	0
In7_Lower_Limit	0
In8_Upper_Limit	0
In9_Sprayer_On	0
In10_Motor_On	0
In11_Spindle_On	0
In12_Clamp_On	0
In13_Airblast_1_On	0
In14_Airblast_2_On	0
In15_Wire_Cut_On	0

Figure 7-L

Program Setup	
Double Stroke Enabled	
Double Stroke from HMI	0
Double Stroke from PLC	0
Double Stroke Enabled	0
<input type="button" value="Enable Double Stroke from HMI"/>	

- To change the dwell times for the motor start up, spindle and sprayer, insert the desired time (in milliseconds) into the white cell and click the corresponding button below it. The respective total dwell time will be updated instantly in the HMI screen (see Figure 7-M, Figure 7-N, and Figure 7-O).

NOTE: There are pre-programmed minimum dwell times that cannot be changed (250ms for Motor Start Up and Spindle Advance, 250ms for Sprayer Duration). The time inputted by the user in the HMI will not be cumulative with these minimum dwell times.

Figure 7-M

Startup Motor Dwell	
Startup Motor Dwell from HMI	0 ms
Startup Motor Dwell from PLC	0 ms
Startup Motor Dwell Actual	250 ms

Change Startup Motor Dwell to:	<input type="text" value="0"/> ms
--------------------------------	-----------------------------------

Figure 7-N

Spindle Advance Dwell	
Spindle Advance Dwell from HMI	0 ms
Spindle Advance Dwell from PLC	0 ms
Spindle Advance Dwell Actual	250 ms

Change Startup Motor Dwell to:	<input type="text" value="0"/> ms
--------------------------------	-----------------------------------

Figure 7-O

Sprayer Duration	
Sprayer Duration from HMI	0 ms
Sprayer Duration from PLC	0 ms
Sprayer Duration Actual	500 ms

Change Sprayer Duration to:	<input type="text" value="0"/> ms
-----------------------------	-----------------------------------

7-5 Adjusting Flow Control Valves

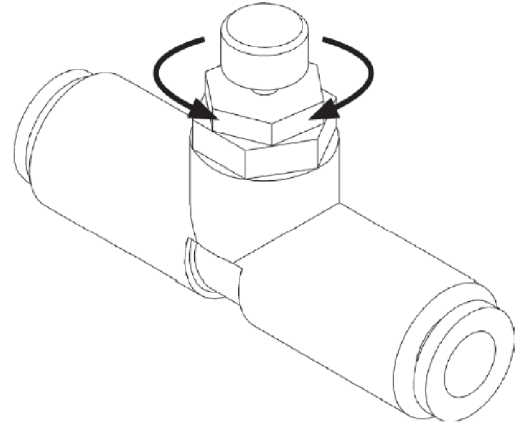


NOTE: The flow control valve provides a smooth and constant feed to the cutter blade. The feed rate is dependent on the amount of spatter accumulated. If a smaller amount of spatter accumulates, the feed rate can be set faster. A feed rate that is set too fast may stall the motor or damage the cutter blade and consumables.

To adjust the flow control valve(s):

1. There is a flow control valve for adjustment of the lift speed of the spindle located behind the spindle shroud cover. The retract speed is fixed. The feed rate may require adjusting for different applications.
2. To **increase** the feed rate of the cutter blade, open the valve in a counterclockwise rotation.
3. To **decrease** the feed rate of the cutter blade, close the valve in a clockwise rotation.
4. Tighten locking nut once desired setting is achieved.

Figure 7-P



SECTION 8 — MAINTENANCE

NOTE: For ease of maintenance, the reamer can be removed from the welding environment and serviced in a proper maintenance area. Being able to move the reamer around will assist in the replacement of some parts, such as the motor, spindle limit switch, solenoid valves, etc.

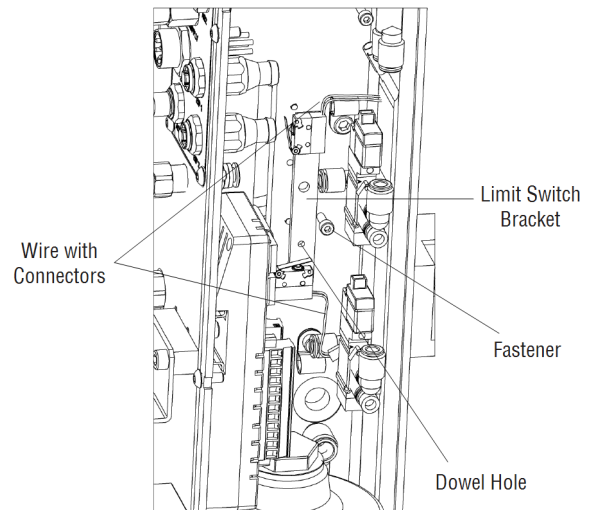
8-1 Replacing the Spindle Limit Switch



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open the rear cover.
2. Disconnect connectors from the wiring harness.
3. Remove the one fastener on the limit switch bracket.
4. Remove assembly and replace with new part. Ensure the actuator is clear of all limit switches when the new assembly is installed.
5. Align the new bracket with the dowel hole on the reamer frame face, then reinstall fastener.
6. Reconnect the connectors into the wiring harness (see section 9-2 Electrical Schematic on page 53).

Figure 8-A



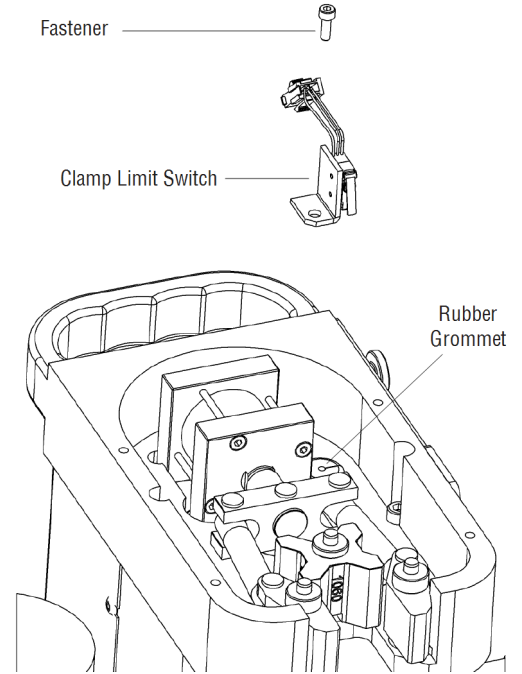
8-2 Replacing the Clamp Limit Switch



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Remove the top plate of the reamer.
2. Open the rear cover.
3. Disconnect the clamp limit switch connector from the wiring harness. The connector is located on the inside of the reamer in the top left hand corner near the valve pack.
4. Remove the rubber grommet from the clamp housing and pull wires out of the grommet through the slit in the grommet.
5. Remove the clamp limit switch fastener and remove assembly.
6. Place rubber grommet onto wires of the replacement clamp limit switch and push grommet back into the hole in the clamp housing.
7. Fasten the new clamp limit switch into position.
8. Reconnect the clamp limit switch connector to the wiring harness (see section 9-2 Electrical Schematic on page 53).
9. Reinstall the top plate and close the rear cover.

Figure 8-B



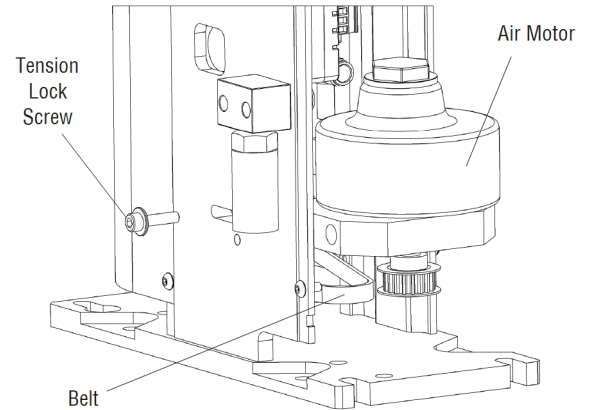
8-3 Replacing the Air Motor



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open the rear cover, or remove it completely by removing the five (5) BHCS using a 3 mm Allen wrench.
2. Remove the tension lock screw located on the side of the reamer frame.
3. Push the motor in to release belt tension, and slide the belt off the front pulley at the same time.
4. Disengage belt from the rear pulley.
5. Release the air lines from the quick disconnect air fittings at the front of the motor.
6. Pull the motor out. **IMPORTANT:** Be careful not to lose the belt tension spring.
7. Reverse the order of the above steps for reassembly.

Figure 8-C



8-4 Replacing the Ethernet Module



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open the rear cover.
2. Grab the Ethernet module and slide it off the DIN rail.
3. With a flat head screw driver, loosen the (4x) screws that secure the connectors to the Ethernet module.
4. Remove the connectors by using the screw driver and slightly prying the connectors free from the Ethernet module.
5. Remove the (2x) RJ45 Ethernet cables from the module.
6. Reconnect the connectors onto the new Ethernet module and tighten the (4x) screws.
7. Reconnect the (2x) RJ45 Ethernet cables to the module.
8. Place the Ethernet module back onto the DIN rail and slide it back into the reamer until it clicks into place.
9. Close the rear cover.

IMPORTANT NOTE: Depending on the mode selected to identify the IP address of the Ethernet module, the module may have to be re-addressed upon power up.

Figure 8-D

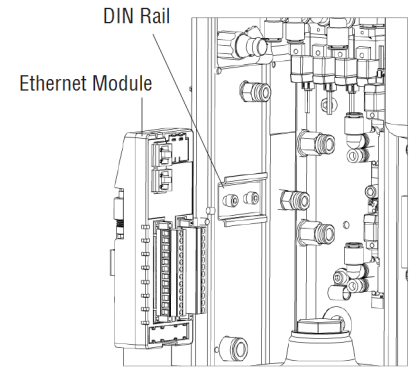
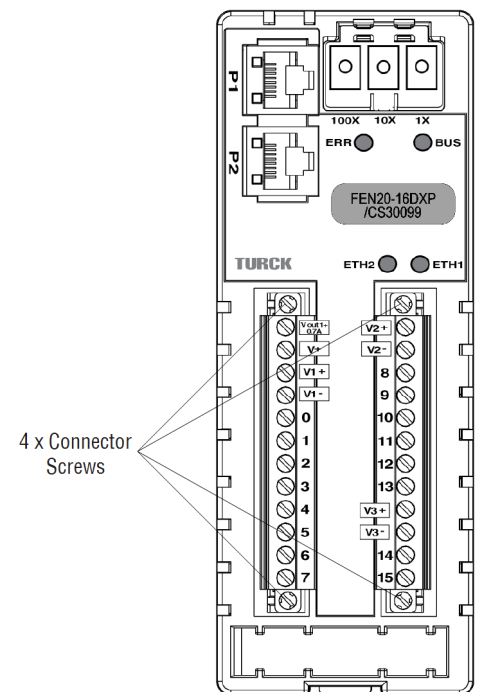


Figure 8-E



8-5 Replacing the Cutter Blade

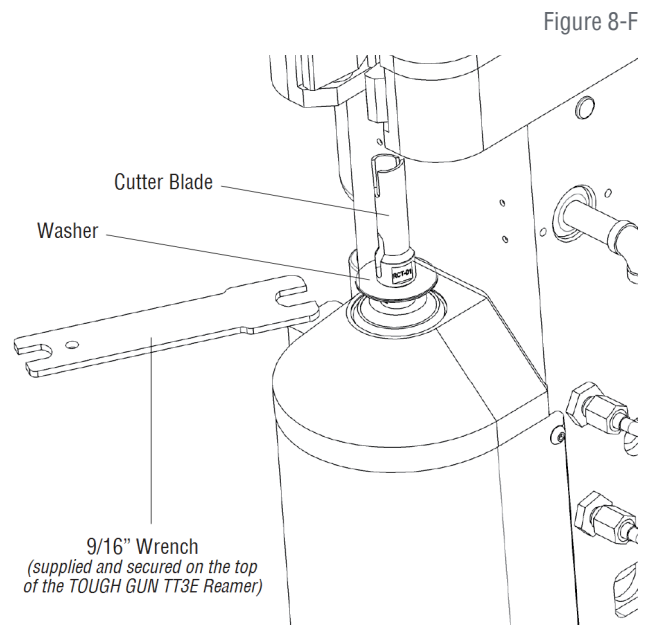


WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

A. To Remove the Cutter Blade

1. Remove the cutter blade by using a 5/8" wrench and the supplied 9/16" wrench to turn the cutter blade counterclockwise when viewed from above.

NOTE: Considerable force may be required to loosen the cutter blade since it tightens naturally as the reamer operates. Rest the 9/16" flat wrench against the reamer frame (below the air connection, and between the sprayer bracket and sprayer supply lines). This prevents slipping while trying to remove the cutter blade.



B. To Install the Cutter Blade

1. The cutter blade is installed by threading it clockwise into the top of the spindle shaft. Reuse the old washer.

NOTE: The application of anti-seize compound to the threads of the reamer will assist in easy removal in the future.

8-6 Replacing the Drive Belt



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open the rear cover.
2. Loosen the tension lock screw.
3. Push the motor in to release belt tension, and slide the belt off the front pulley at the same time.
4. Remove the belt from the rear pulley.
5. Reverse the order of the above steps for reassembly.

8-7 Replacing the Solenoid Valves



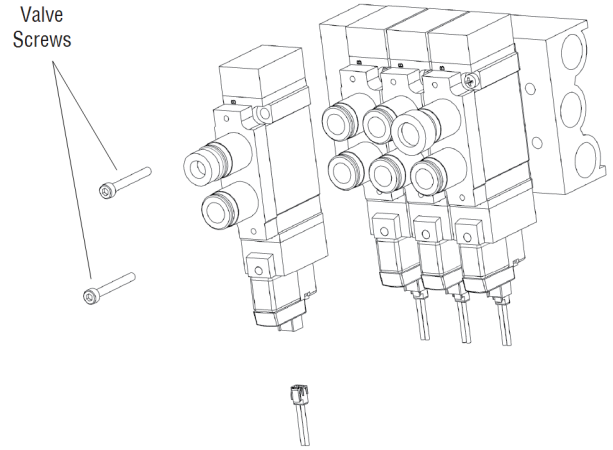
WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open the rear cover.
2. Unplug the electrical connector directly from the bottom of the solenoid valve.
3. Loosen and remove the two (2) solenoid valve screws.
4. Remove the solenoid valve and gasket.

NOTE: New gasket (included with new valve) must be installed when replacing valve.

5. Install the new gasket and valve and tighten screws to 6 in-lbs.
6. Reconnect the electrical connector to the bottom of the solenoid valve.
7. Close the rear cover.

Figure 8-G



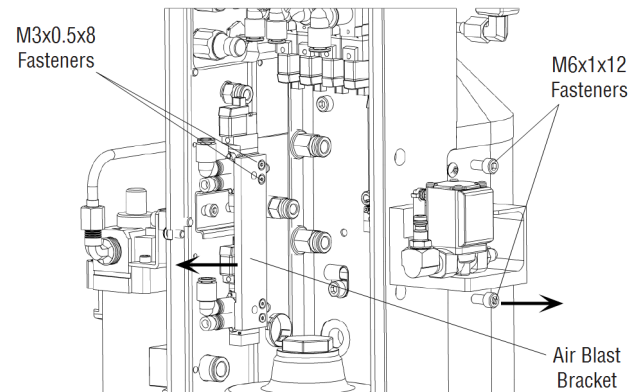
8-8 Replacing the Air Blast Valves



WARNING: Ensure air and power supply is off and disconnected before proceeding. Please follow your facility's lockout / tagout procedures.

1. Open rear cover.
2. Pull the Ethernet module off of the DIN rail and allow it to hang freely.
3. Remove the (2x) air blast bracket fasteners (M6x12) on the outside of the reamer.
4. Carefully remove the bracket assembly from the inside of the reamer and allow it to hang freely.
5. Remove all air lines from their respective quick connect fittings.
6. Unplug the electrical connector from the valve.
7. Remove the valve fasteners (M3x0.5x8) for the respective valve.
8. Install the new valve and secure it to the bracket with the valve fasteners.
9. Reconnect the electrical connector for the valve and reconnect the air lines to the respective quick connect fittings (see section 9-1 Pneumatic Diagrams on page 51).
10. Tighten the air blast bracket assembly back onto the reamer.
11. Replace the Ethernet module back onto the DIN rail and close the rear cover.

Figure 8-H



8-9 Scheduled Maintenance

The **TOUGH GUN TT3E Reamer** will require a periodic maintenance program to ensure a reliable service life, as recommended below:

DAILY	
CHECK	The oil level in the lubricator reservoir. <i>The life of the air motor is dependent on a consistent supply of oil.</i>
CHECK	The air lines and interface cable for leaks and fraying.
CHECK	The alignment of the nozzle, retaining head/diffuser and gun position.
CHECK	The reservoir to ensure it is full of TOUGH GARD or other water-based anti-spatter liquid.
CLEAN	The spindle cover shroud to ensure it is free of spatter.
CLEAN	The reamer clamp jaw and v-block surfaces to ensure proper nozzle alignment.
WEEKLY	
CHECK	The nozzle cutter blade. <i>The service life of the cutter blade is dependent on the type of application. In lighter duties, the blade may last indefinitely but should be inspected weekly for dullness, clogging and possible breakage.</i>
CHECK	The lubricator to ensure it is working and is set up properly (i.e. fill oil, clean / replace filter).
CHECK	The LEDs on the Ethernet module and ensure that communication connection is still good and there are no errors.
CHECK	The sprayer to ensure that the spray coming out of the spray head is normal.
CHECK	The nozzle and retaining head/diffuser (remove from gun) for wear.
CLEAN	The v-block, reamer clamp jaw, and spindle seal with a brush or with compressed air to eliminate blockages.
CLEAN	Wipe clean any debris from the Nozzle Detect Proximity Sensor.
MONTHLY	
CHECK	That the belt tension lock screw is securely tightened.
CHECK	That the belt tension bolt is tightened.
CHECK	The spindle unit for wear.
CHECK	The solenoids and spool them to ensure there are no leaks and that they are operating properly.
CLEAN	The sprayer reservoir to eliminate contamination.
CLEAN	The sprayer head and brush away excess spatter.
CLEAN	Under the top cover.
YEARLY	
INSPECT	The drive belt for any signs of fraying and replace as necessary.
REPLACE	The spindle cap seal and repair any damage to the spindle.
CLEAN	Perform a complete clean-up of the reamer and sprayer.

The **TOUGH GUN Wire Cutter** will require a periodic maintenance program to ensure a reliable service life as recommended below:

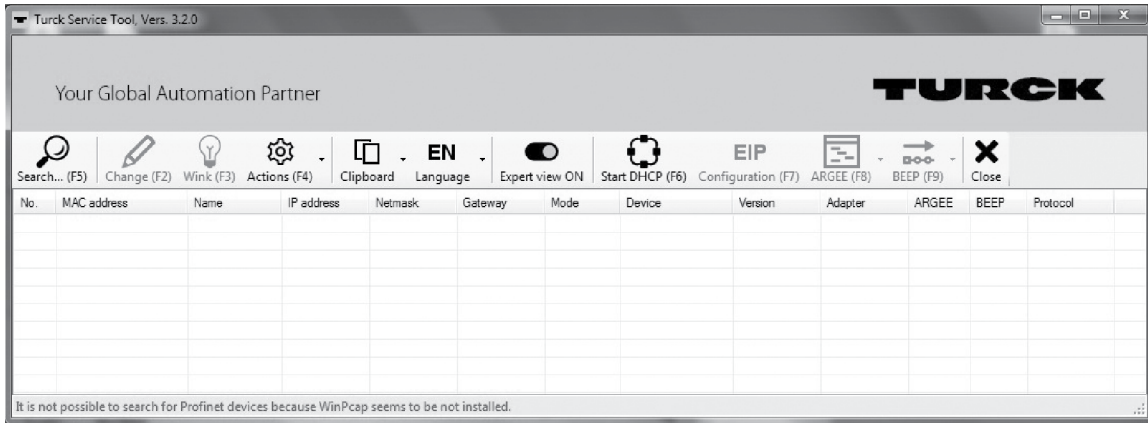
DAILY	
CHECK	The air lines and interface cable for leaks and fraying.
WEEKLY	
CHECK	Check the wire cutter blades for dullness, looseness and possible breakage. <i>The service life of the cutter blades is dependent on the type of application. In lighter duties, the blades may last indefinitely but should be inspected weekly.</i>
EMPTY	The wire catcher basket.
QUARTERLY	
LUBRICATE	The sliding surfaces by applying general purpose grease (NLGI Grade 1-2) through the grease fittings located on the sides of the main body.

8-10 Program Updating

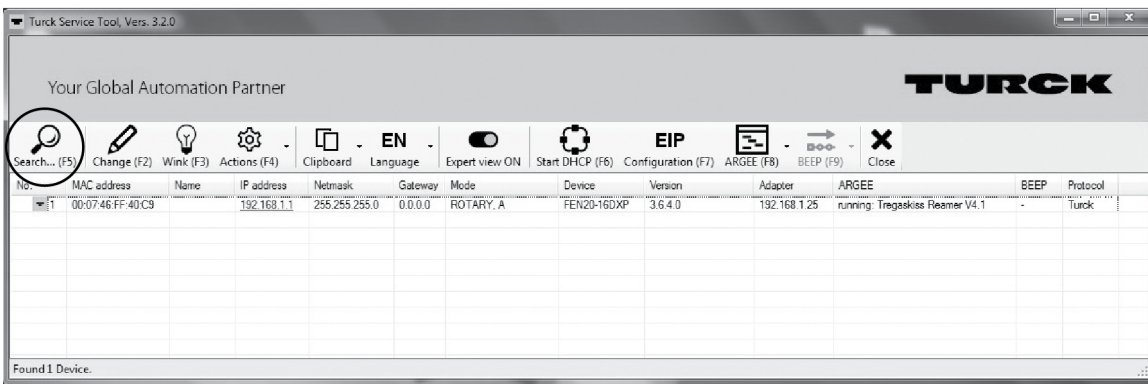
A. Updating ARGEE Software

NOTE: This method will only work for TOUGH GUN TT3E Reamer Robotic Nozzle Cleaning Stations with firmware version 3.6.4.0. The firmware version can be identified by using the TURCK Service Tool under the column labeled "Version".

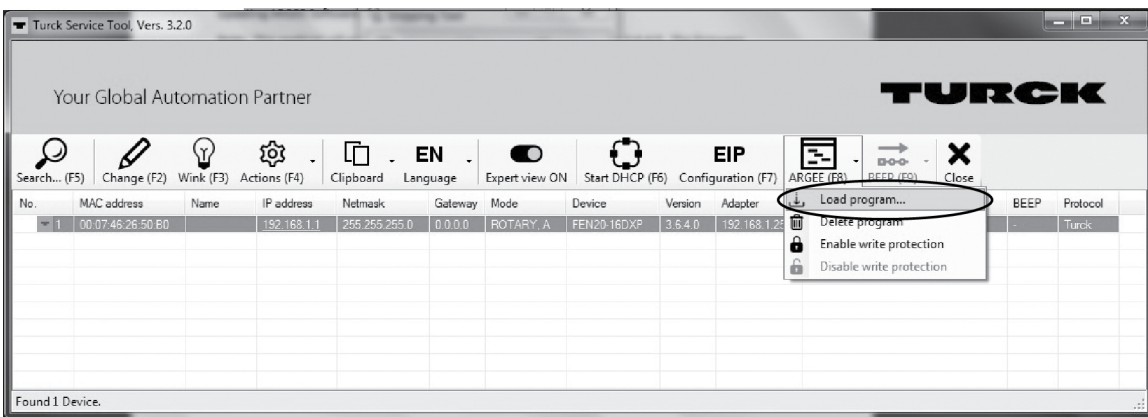
1. Install the TURCK Service Tool from www.Tregaskiss.com/ReamerTT3E (under the **Software** tab).



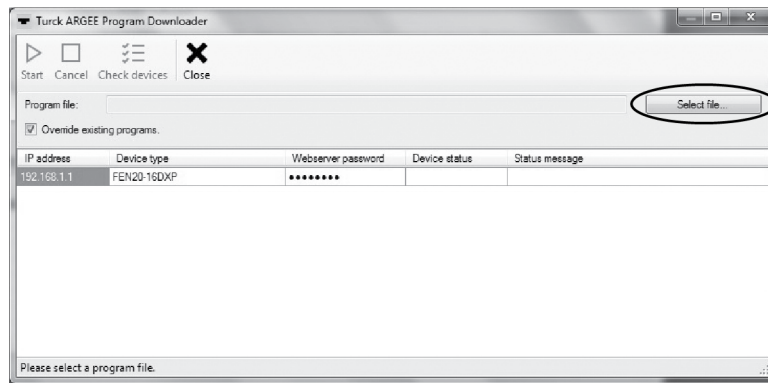
2. Search for all Tregaskiss Reamer units on the network by clicking the "Search" button.



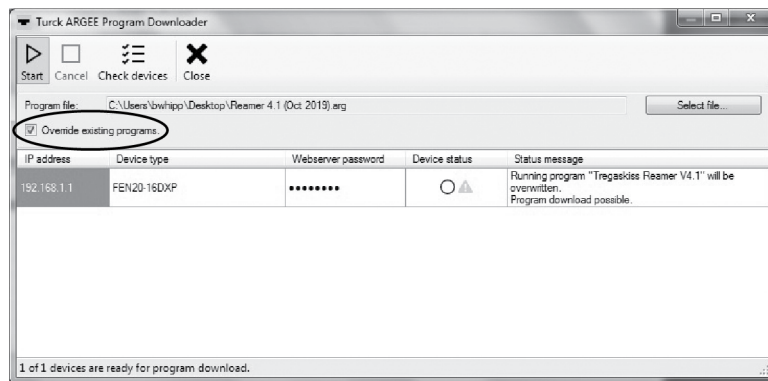
3. Select the reamer from the list and then click the "ARGEE" button in the menu bar.
4. Select the option to "Load Program".



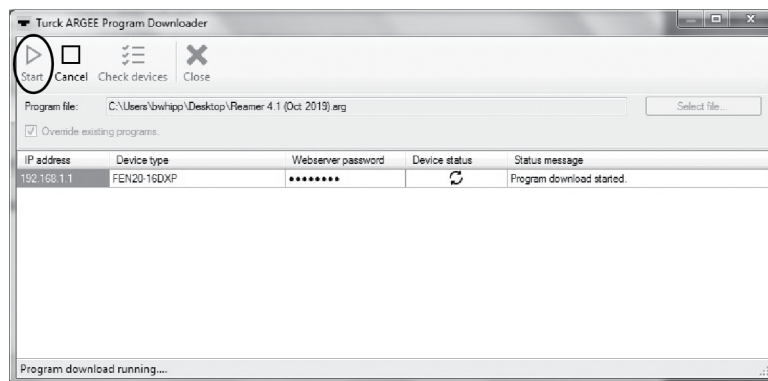
5. Click the "Select File" button and open the ARGEE program you are updating (i.e. Reamer_4.1.arg).



6. Select the box that says "Override existing program".

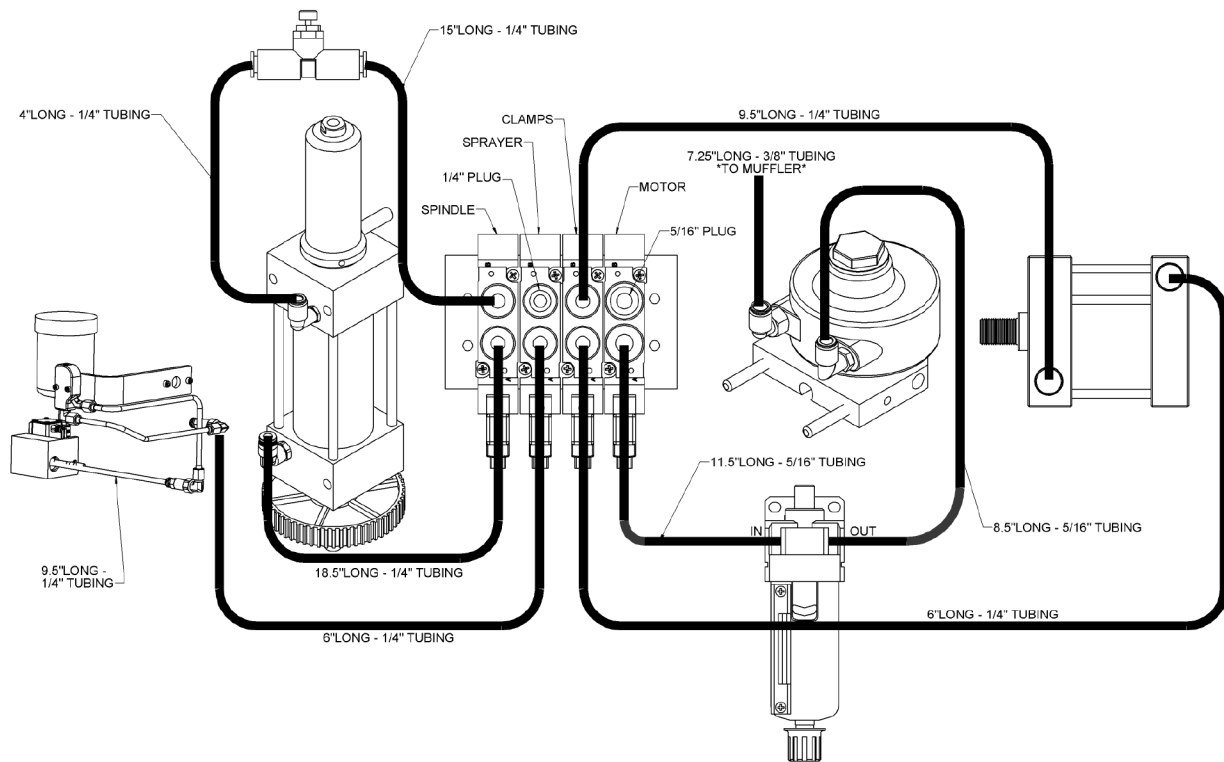


7. Click the "Start" button in the top left of the menu bar. The program will begin to install the new ARGEE program. Wait until the dialogue box indicates that the program has been loaded into the module.

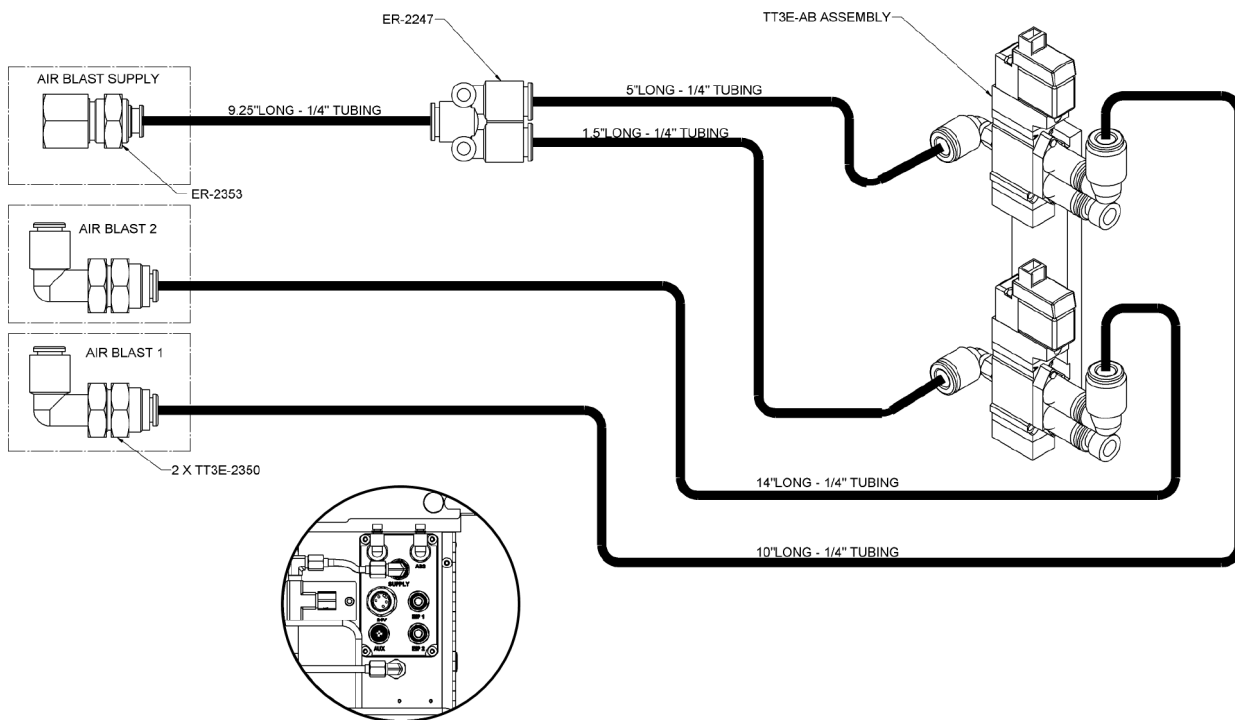


8. The message in the ARGEE column should say "running: Tregaskiss Reamer V4.x", where 'x' represents the ARGEE program version. This confirms that the ARGEE program was loaded successfully.

B. TOUGH GUN TT3E Reamer with Lubricator



C. TOUGH GUN TT3E Reamer with Air Blast



9-2 Electrical Schematic

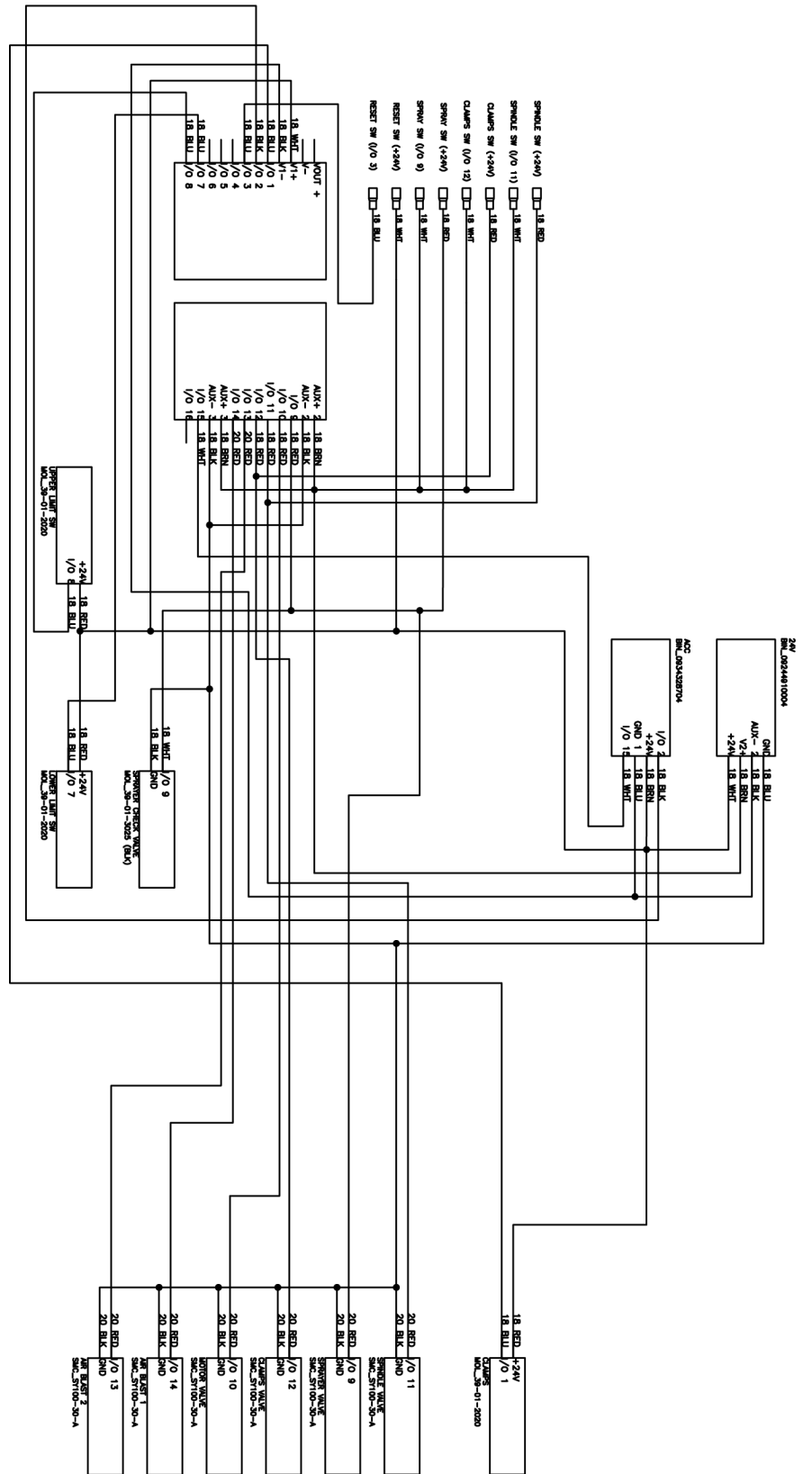
A. TOUGH GUN TT3E Reamer

Depending on the manufacture date of the TOUGH GUN TT3E Reamer units, the serial number will determine what wiring diagram is correct for that specific reamer.

IMPORTANT NOTE:

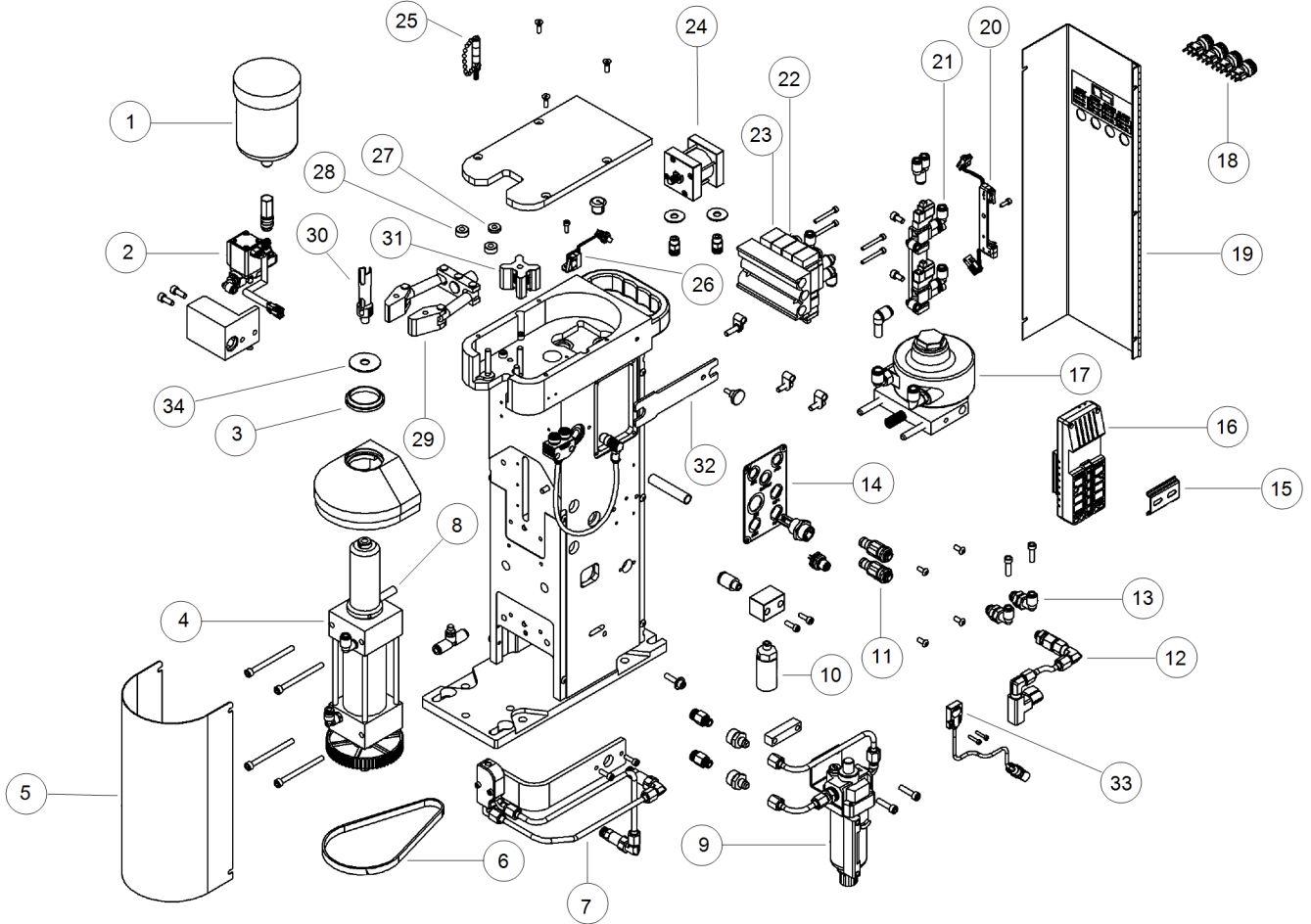
Only Revision G for **serial # TT3E-2500 and up** is shown here.

For all other wiring schematics, please call Tregaskiss Technical Support at 1-855-MIGWELD (644-9353).



SECTION 10 — PARTS LIST

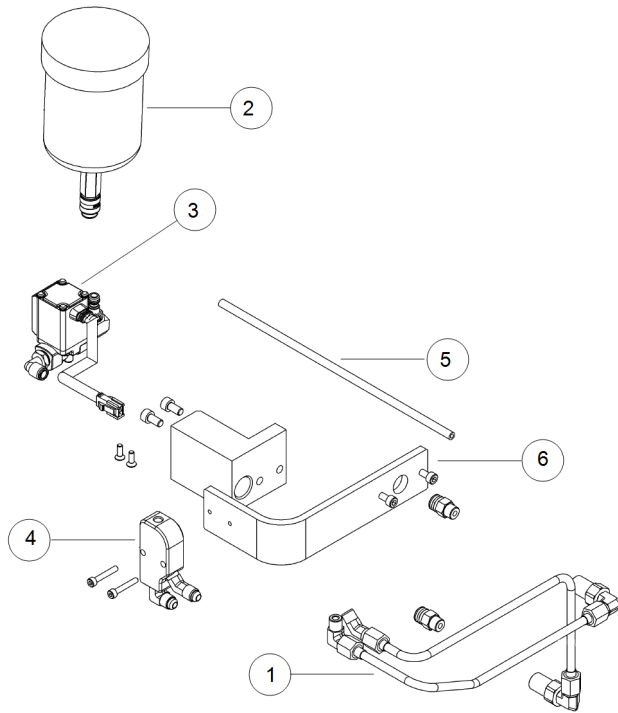
A. TOUGH GUN TT3E Reamer



ITEM	PART #	DESCRIPTION
1	RR-1320	Sprayer reservoir
2	TT3E-500-20	Electronic sprayer check valve
3	TR-2661	Spindle seal
4	TT-2400	Spindle assembly with air fittings (includes Item 8)
5	TT-2670	Front spindle cover
6	TR-2440	Reamer drive belt
7	TT3-001-50	Reamer sprayer subassembly
8	TR-2411	Spindle actuator
9	TT-LUB-SMC	Motor lubricator with bracket
10	TR-2530	Muffler
11	TT3E-2341	Ethernet cable bulkhead
12	TT3E-2700	Air blast supply line kit
13	TT3E-2350	90 degree 1/4" push-to-connect bulkhead fitting
14	TT3E-CP1	Communication plate
15	TT3E-2310-1	DIN rail
16	TT3E-2310	Ethernet module
17	TR-2500	Air motor assembly
18	TT3E-2335	Stainless steel push button switch

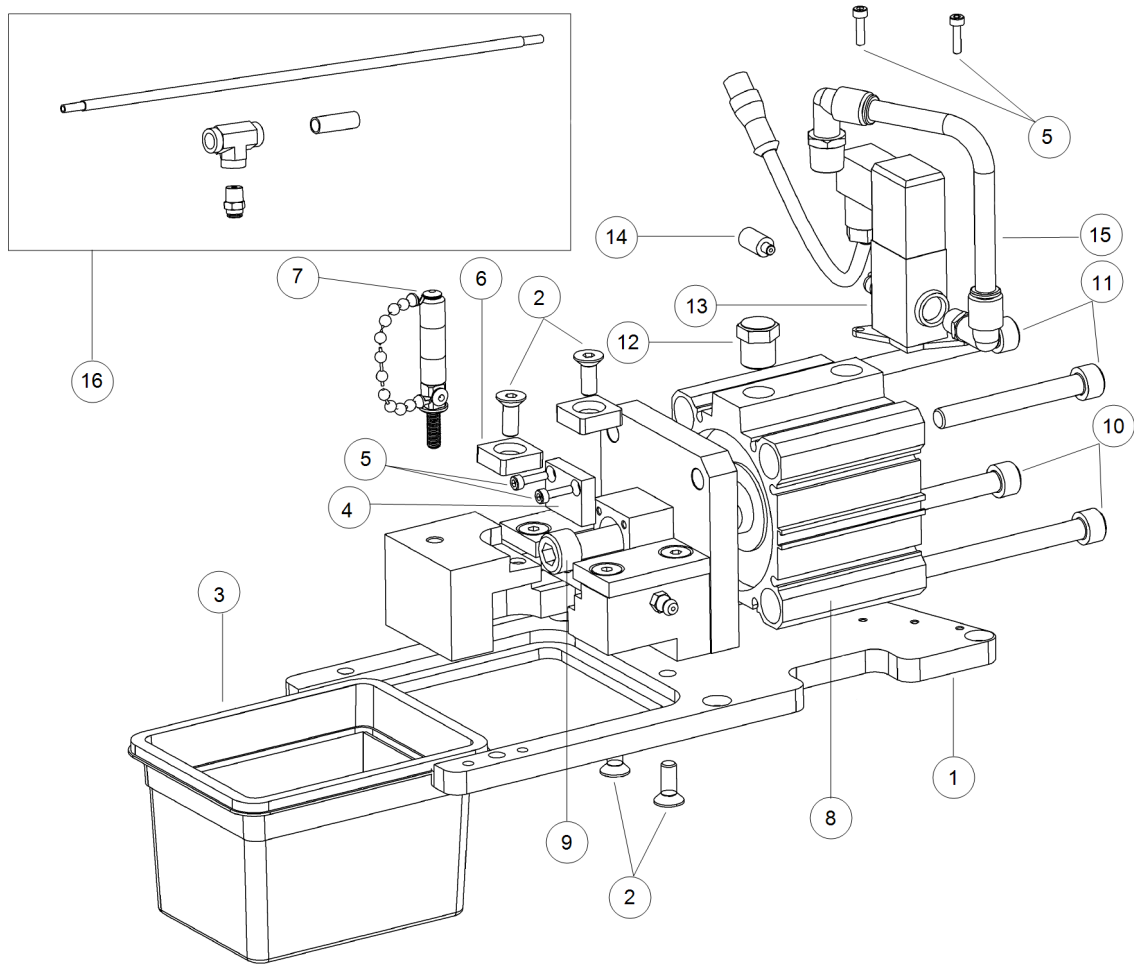
ITEM	PART #	DESCRIPTION
19	TT3E-2680	Rear cover assembly, TT3E
20	TT3E-2322	Spindle limit switch, TT3E
21	TT3E-AB	Air blast solenoid valve
22	R-2246	5/16" solenoid valve
23	R-2241	1/4" solenoid valve
24	TR-2130	Clamp cylinder
25	RR-707-31	TCP locator
26	TT3E-2321	Clamp limit switch, TT3E
27	TR-2128	V-block spacer
28	TR-2127	Upper jaw spacer
29	TR-2120	Reamer clamp assembly
30	See section 6-6	Cutter blade
31	See section 6-5	4-sided v-block
32	TR-2910	TOUGH GUN Reamer wrench
33	TT3E-2344	Proximity sensor - 5mm nozzle detect
34	Not Sellable	M10 x 40mm flat washer
NS	Not Sellable	Wiring harness (not visible)

B. TOUGH GUN Sprayer Assembly



ITEM	PART #	DESCRIPTION
1	TT3-001-5	Sprayer steel line kit
2	RR-1320	Reservoir
3	TT3E-500-20	Sprayer check valve
4	TS-500-15	Spray block with fittings
5	<i>Not Sellable</i>	1/4" sprayer hose
6	SR-500-1	Sprayer bracket

C. TOUGH GUN Wire Cutter (Part # WC-100E)



ITEM	PART #	DESCRIPTION
1	WC-100-8	Wire cutter base plate
2	<i>Not Sellable</i>	M6x1x16mm SCHCS
3	WC-100-20	Wire catcher basket
4	WC-100-27	Backing plate
5	<i>Not Sellable</i>	M3x0.5x12mm SHCS
6	WC-100-7	Blade (includes Item 2)
7	RR-707-31	TCP locator
8	WC-100-31	Cylinder

ITEM	PART #	DESCRIPTION
9	<i>Not Sellable</i>	M10x1.5x25mm SHCS
10	<i>Not Sellable</i>	M8x1.25x55mm SCHCS
11	<i>Not Sellable</i>	M8x1.25x50mm SHCS
12	TR-2221	Breather vent
13	WC-100-24E	Solenoid valve, TT3E Reamer
14	WC-100-26	Muffler
15	WC-100-18	Air line kit
16	WC-100-30	Wire cutter installation kit

SECTION 11 — TROUBLESHOOTING

11-1 TOUGH GUN TT3E Reamer - Network

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Cannot connect to Ethernet module.	<ol style="list-style-type: none"> Loose connection of RJ45 cables. Incorrect TCP/IPv4 properties. Incorrect IP address. Local firewall preventing connection. 	<ol style="list-style-type: none"> Check that connections are secure. Change the properties through the network connection status on the host computer. Set rotary switches to 600 and cycle power. Then use TURCK IP Address Tool to find correct IP address. Work with network administrator.
2. BUS or ERR LEDs red (flashing or solid).	<ol style="list-style-type: none"> IP address conflict. Circuitry is incorrect. 	<ol style="list-style-type: none"> Ensure IP address is not duplicated within the network. Ensure I/O connector blocks are connected to the Ethernet module.
3. ETH1/ETH2 LEDs on but not flashing.	<ol style="list-style-type: none"> No communication between Ethernet module and network. 	<ol style="list-style-type: none"> Connect Ethernet module to network device so that open communication can happen.
4. ETH1/ETH2 LEDs not illuminated.	<ol style="list-style-type: none"> No connection to the network. 	<ol style="list-style-type: none"> <ol style="list-style-type: none"> Ensure Ethernet module is powered. Check that the physical network connections are secure.

11-2 TOUGH GUN TT3E Reamer - Mechanical

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Motor stops during operation.	<ol style="list-style-type: none"> Air supply is incorrect. Excessive spatter buildup. Lubricator not installed or adjusted properly. Water in air lines / motor. Improper nozzle orientation. Motor valve failed. 	<ol style="list-style-type: none"> Set at 80-100 psi at 16 CFM. <ol style="list-style-type: none"> Apply or increase quantity of water-based anti-spatter liquid. Do not use oil-based anti-spatter solution, as this will cause excessive buildup and compromise performance. Increase frequency of gun cleaning or modify welding parameters. Ensure lubricator is installed and adjusted (see section 6-1). Dryer required for air system. Ensure consumables are concentric with cutter. Replace damaged valve.
2. Pneumatic functions not operative.	<ol style="list-style-type: none"> Air lines damaged or obstructed. Air supply is incorrect. Faulty reset switch. Manual switches engaged. Bad valve. No power. 	<ol style="list-style-type: none"> Replace air line(s). Check air supply, set at 80-100 psi at 16 CFM. Repair or replace reset switch. Turn off manual switches. Replace faulty valve. Reconnect power.
3. Broken cutter.	<ol style="list-style-type: none"> Improper cutter being used. Flow control valve set too fast. Gun improperly aligned in reamer. 	<ol style="list-style-type: none"> Use nozzle and cutter blade part numbers to confirm / select the correct cutter blade (see section 6-6). Adjust feed rate, adjust flow control valve. Check v-block / nozzle compatibility (see section 6-5), check nozzle insertion depth (see section 6-6).
4. Reamer stays in UP position.	<ol style="list-style-type: none"> Cutter blade is jammed in gun. Faulty spindle limit switch. Dwell time set too long. 	<ol style="list-style-type: none"> <ol style="list-style-type: none"> Ensure proper alignment to prevent the blade from jamming. Repair or replace damaged components. Repair or replace spindle limit switch. Revise dwell settings in HMI.
5. Cycle does not complete.	<ol style="list-style-type: none"> Faulty clamp limit switch. Missing / broken spindle actuator. 	<ol style="list-style-type: none"> Check and/or replace clamp limit switch. Replace spindle actuator.

6. No air flow / anti-spatter.	<ol style="list-style-type: none"> Output to unit not functioning. Loss of air supply. Faulty solenoid valve. Plugged valve. 	<ol style="list-style-type: none"> Check output signal and cable. <ol style="list-style-type: none"> Check air supply. Check air line and nozzle for blockage. Check valve and replace if required. If using oil-based anti-spatter solution, switch to TOUGH GARD or other water-based anti-spatter liquid.
7. Air flow but no anti-spatter.	<ol style="list-style-type: none"> Vent closed on reservoir. Spool in check valve stuck. Fluid hose blocked. Plugged valve. 	<ol style="list-style-type: none"> Open vent. Repair or replace check valve. Clean or repair fluid hose. If using oil-based anti-spatter solution, switch to TOUGH GARD or other water-based anti-spatter liquid.
8. Spray head plugged.	<ol style="list-style-type: none"> Debris in spray head. 	<ol style="list-style-type: none"> <ol style="list-style-type: none"> Clean spray head. If using oil-based anti-spatter solution, switch to TOUGH GARD or other water-based anti-spatter liquid.

11-3 Lubricator

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Oil fill level low.	<ol style="list-style-type: none"> Oil depleted in bowl. 	<ol style="list-style-type: none"> Refill oil bowl to correct level using air motor oil.
2. Incorrect oil drip rate.	<ol style="list-style-type: none"> Drip rate valve not set properly. Filter element clogged. Steel supply lines clogged. 	<ol style="list-style-type: none"> Set drip rate valve so that one (1) drop of oil occurs every 5-10 ream cycles. Remove bowl assembly and clean filter element. Remove steel supply lines and clean using compressed air. If damaged, replace steel lines.
3. Air leaks between the bowl and the body.	<ol style="list-style-type: none"> Breakage of bowl o-ring. 	<ol style="list-style-type: none"> Replace bowl o-ring. Grease up before assembling.
4. Air leaks from the drainage cock.	<ol style="list-style-type: none"> Foreign matter caught in the threads of the drain cock. Breakage of the seating part of the drain cock. 	<ol style="list-style-type: none"> Remove the drain cock and clean threads. Replace the bowl assembly.
5. Too much drain comes from the piping of the outlet side.	<ol style="list-style-type: none"> Drain level reaches the baffle plate. 	<ol style="list-style-type: none"> Open the drain cock for draining and replace the element.

11-4 Filter/Regulator

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Pressure is not regulated.	<ol style="list-style-type: none"> Opposite flow direction or opposite installation of filter/regulator. Foreign materials caught in the valve seat. 	<ol style="list-style-type: none"> Install piping or filter/regulator correctly as shown in manual. Remove the valve guide to clean the valve and valve seat.
2. Set pressure does not return to zero when pressure handle is loosened.	<ol style="list-style-type: none"> Foreign materials caught in the valve seat. 	<ol style="list-style-type: none"> Remove the valve guide to clean the valve and valve seat.
3. Large air resistance reduces flow rate.	<ol style="list-style-type: none"> Clog of the element. 	<ol style="list-style-type: none"> Clean the element.
4. Air leaks from the bonnet exhaust port.	<ol style="list-style-type: none"> Diaphragm is damaged. Foreign materials caught in the valve seat. Piston o-ring is damaged. 	<ol style="list-style-type: none"> Replace the assembly. Remove the valve guide to clean the valve and valve seat. Replace the piston o-ring or clean. Then grease up the piston o-ring and sliding surface.
5. Air leaks between the bonnet and the body.	<ol style="list-style-type: none"> Loosened bonnet. Diaphragm is damaged. 	<ol style="list-style-type: none"> Fasten the bonnet. Replace the assembly.

6. Air leaks between the bowl and the body.	1. Breakage of bowl o-ring.	1. Replace bowl o-ring. Grease up before assembling.
7. Air leaks from the drainage cock.	1. Foreign matter caught in the valve of the drain cock. 2. Breakage of the seating part of the drain cock.	1. Open the drain cock for a few seconds. 2. Replace the bowl assembly.
8. No drainage when the drain cock is open.	1. Blockage of outlet of the drain cock due to solid foreign matter.	1. Replace the bowl assembly.
9. Too much drain comes from the piping of the outlet side.	1. Drain level reaches the baffle plate.	1. Open the drain cock for draining and replace the element.

11-5 Air Blast

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No air blast when signal is sent to Ethernet module.	1. Loss of air supply. 2. Faulty solenoid valve. 3. Air line(s) damaged or obstructed. 4. Fault in Ethernet module program.	1. Check that connections are secure. 2. Check valve and replace if required. 3. Replace air line(s). 4. Reprogram Ethernet module with the latest program.

11-6 Nozzle Detect

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No LED lights on sensor.	1. Loose connection of power cable. 2. Broken cable. 3. Damaged sensor.	1. Check that the connection is secure. 2. Replace sensor. 3. Replace sensor.
2. No signal from sensor but power LED is illuminated.	1. Nozzle not close enough to sensor. 2. Not checking proper input from reamer.	1. Confirm that robot position is at the correct distance from the sensor (see section 6-7). 2. Refer to section 6-9 to verify proper I/O configuration.
3. Both LEDs are always illuminated.	1. Metallic debris on sensor. 2. Nozzle is too close to sensor.	1. Wipe the face of the sensor clean with a rag. 2. Confirm that robot position is at the correct distance from the sensor (see section 6-7).

11-7 Software

WARNING: When conducting troubleshooting on the TOUGH GUN TT3E Reamer, ensure that all safety and lockout/tagout procedures are followed. Any time service is to be done on a reamer, the reset switch must be pressed to set the program back to its start state.

A testing / troubleshooting program is available for download from www.tregaskiss.com/ReamerTT3E (within the **Software** tab).

This useful tool can help in diagnosing the error(s) that may occur as well as being able to diagnose it remotely.

To run the program from any computer:

1. Download the program named "Reamer Online Tester" from www.tregaskiss.com/ReamerTT3E (within the **Software** tab).
2. Open the .exe file. **NOTE:** If your firewall attempts to block it, allow it and click "Run".
3. When the program opens, you should see the dialogue box shown in Figure 11-A.
4. Type in the IP address for the Ethernet module you wish to connect to and click "Connect". **NOTE:** Multiple units can be connected by simply running the program again and connecting to the other IP addresses.
5. Once connected, the program will display which version of software is currently installed on the module as well as which step it is on within the program logic.
6. The status lights of all the inputs/outputs will be visible through the program, so there is no need to open up the reamer to view the LEDs on the Ethernet module (see Figure 11-B).
7. If "Cycle Start" is pressed, the reamer will run through an entire cycle, stopping only if it encounters an error. The cycle start does not have to be initiated by the PLC. It can be initiated by the test program.
8. If an error is encountered, the step at which it is encountered will be displayed. Using the Program Logic Chart in section Figure 11-C).
9. This software can be used in conjunction with the Troubleshooting tables in sections 11-1 , 11-2 , 11-3 , 11-4 , 11-5 and 11-6 to help in effectively determining and fixing an issue with the reamer.

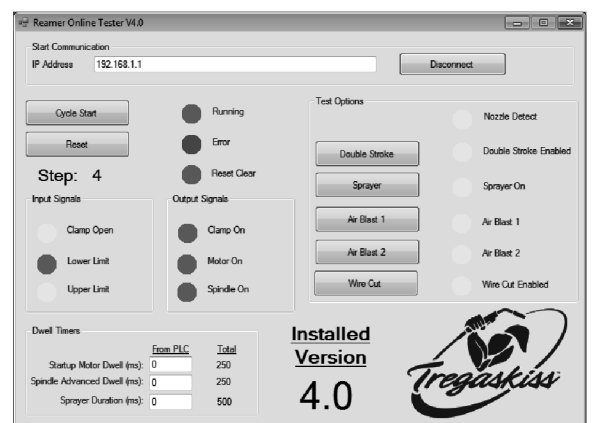
Figure 11-A



Figure 11-B



Figure 11-C



NOTES

ADDITIONAL SUPPORT MATERIALS

For additional support materials such as Spec Sheets, troubleshooting information, how-to guides and videos, animations, online configurators and much more, please visit Tregaskiss. Scan the QR Code with your smart phone for immediate access to Tregaskiss.com/TechnicalSupport.



Scan to view the TOUGH GUN® TT3E Reamer Owner's Manual



Scan to view the TOUGH GUN® TT3 Reamer Spec Sheet



Scan to view the TOUGH GUN® Wire Cutter Owner's Manual



Scan to view the TOUGH GARD® Anti-Spatter Multi-Feed System Owner's Manual



Scan to learn about TOUGH GARD® Anti-Spatter Liquid



Scan to learn about Tregaskiss® Robotic Air-Cooled MIG Guns



Scan to view Tregaskiss® Product Spec Sheets

