

Tregaskiss® Hercules™ Robotic MIG Gun

OWNER'S MANUAL

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Robotic, Water-Cooled, Conventional MIG
(GMAW) Welding Gun



[Tregaskiss.com/TechnicalSupport](https://www.tregaskiss.com/TechnicalSupport)
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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 or peripheral. 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.

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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 iii, and in welding power source Owner's Manual. 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 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 leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

HOT PARTS can burn.

- Allow gun to cool before touching.
- Do not touch hot metal.
- Protect hot metal from contact by others.



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.

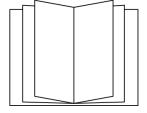
WELDING WIRE can injure.

- 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. Website: www.aws.org.

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

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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 whilst 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.

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 donnés ci-après sont utilisés dans tout le manuel pour attirer l'attention sur les dangers possibles et pour indiquer le type de danger dont il s'agit. Quand on voit le symbole, prendre garde et suivre les directives correspondantes pour éviter le danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les Normes de sécurité principales, et dans le Guide d'utilisation de la source de courant de soudage. Lire et suivre toutes les 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 FUMÉES ET LES GAZ peuvent être dangereux.



- Garder la tête hors des fumées.
- 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 nettoyeurs, les consommables, les produits de refroidissement, les dégraissants, 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.

Le SOUDAGE peut provoquer un incendie ou une explosion.



- 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 dégraissateurs, les flux et les métaux.

L'ACCUMULATION DE GAZ risquent de provoquer des blessures ou même la mort.



- Fermer l'alimentation du gaz comprimé en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

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 une protection corporelle en cuir ou des vêtements ignifugés (FRC). La protection du corps comporte des vêtements sans huile, comme 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.
- Abriter 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 bouches-oreilles ou des serre-tête antibruit approuvés si le niveau de bruit est élevé.

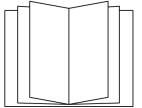
- Avertir les personnes à proximité au sujet du danger inhérent au bruit.

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 remplacement provenant du fabricant.
- 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.

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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.

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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

 Los símbolos mostrados abajo se usan en todo este manual para llamar la atención a e identificar los posibles peligros. Cuando vea el símbolo, preste atención y siga 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 en los estándares de seguridad, y la fuente de alimentación para soldadura del Manual del usuario. Lea y siga todas las normas 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 solda 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 para soldar aprobada equipada con un filtro de protección apropiado para proteger su cara y ojos de los rayos del arco y de las chispas 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 protección para el cuerpo hecha de cuero o de prendas resistentes a las llamas (FRC). Entre la protección para el cuerpo se incluye la ropa sin aceite, como guantes de cuero, una camisa gruesa, pantalones sin vuelta, calzado alto y una gorra.

PARTES CALIENTES puedan 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.

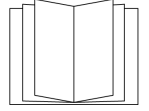
- Chequee los límites del nivel del ruido si exceden aquellos especificados por OSHA.
- Use tapas para los oídos o cubiertas para los oídos si el nivel del ruido es demasiado alto.
- Advierta a otros que estén cerca acerca del peligro del ruido.

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.aws.org.

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

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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 médico 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 — PRODUCT WARRANTY

4-1 Product Warranty

Limited Warranty

Tregaskiss' Products shall, from the date of original purchase (or, solely with respect to Low Stress Robotic Unicables packaged with any Tregaskiss® Robotic MIG Gun, from the date the product goes into production for its intended use) and for the period set forth below, be free from defects in material and workmanship. To obtain repair or replacement of any Product, the covered Product must be delivered, transportation pre-paid by Purchaser, to the address specified by Tregaskiss on its Returned Materials Authorization, with: (i) written proof of warranty coverage (e.g., Purchaser dated purchase order); (ii) serial number on product (if any); (iii) the Product's installed location within Purchaser's facility and usage of the Product; and (iv) written specification of any alleged defect(s). In the event the foregoing materials are not timely provided to Tregaskiss by claimant, warranty coverage will be determined by Tregaskiss, in its sole discretion. For the avoidance of doubt, the warranty period for any Product or part/component of any Product that is replaced or repaired by Tregaskiss under the foregoing warranty is not extended or renewed at the time of such replacement or repair. **The Warranty against defects does not apply to: (1) consumable components or ordinary wear items; (2) products which are improperly altered, modified, stored, installed, operated, handled, used or neglected or use of the Products with equipment, components or parts not specified or supplied by Tregaskiss or contemplated under the Product documentation; or (3) Products which have not been operated, maintained, and repaired pursuant to Product documentation provided by Tregaskiss. Purchaser shall pay Tregaskiss for all warranty claim costs incurred by Tregaskiss (including inspection, labor, parts, testing, scrap and freight) due to warranty claims submitted by Purchaser which are not covered by Tregaskiss' warranty.**

- 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® Automatic MIG Guns: **1 year**
- Tregaskiss® TOUGH GUN® Reamer:
 - When factory-equipped with lubricator: **2 years** when factory-equipped with lubricator
 - When (i) factory-equipped with lubricator and (ii) used exclusively with Tregaskiss® TOUGH GARD® Anti-Spatter Liquid: **3 years** when both (i) and (ii)
- Tregaskiss® TOUGH GUN® Robotic Peripheral (Clutch, Sprayer, Wire Cutter, Arms): **1 year**
- Tregaskiss® Low-Stress Robotic Unicables (LSR+ Unicables): **6 months**

Service Warranty

Tregaskiss warrants the Services shall conform to any mutually agreed upon specifications or statements of work. Purchaser's sole remedy, and Tregaskiss's sole liability, for a breach of the foregoing warranty is for Tregaskiss, at its option, to re-perform the Services or credit Purchaser's account for such Services.

Limitation of Liability and Remedies

TREGASKISS WILL NOT BE LIABLE, AND PURCHASER WAIVES ALL CLAIMS AGAINST TREGASKISS FOR INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, DOWN TIME, LOST PROFITS OR COMMERCIAL LOSSES, WHETHER OR NOT BASED UPON TREGASKISS' NEGLIGENCE OR BREACH OF WARRANTY OR STRICT LIABILITY IN TORT OR ANY OTHER CAUSE OF ACTION. IN NO EVENT WILL TREGASKISS' LIABILITY IN CONNECTION WITH THE AGREEMENT OR SALE OF TREGASKISS' PRODUCTS OR SERVICES EXCEED THE PURCHASE PRICE OF THE SPECIFIC PRODUCTS OR SERVICES AS TO WHICH THE CLAIM IS MADE.

SECTION 5 — SPECIFICATIONS

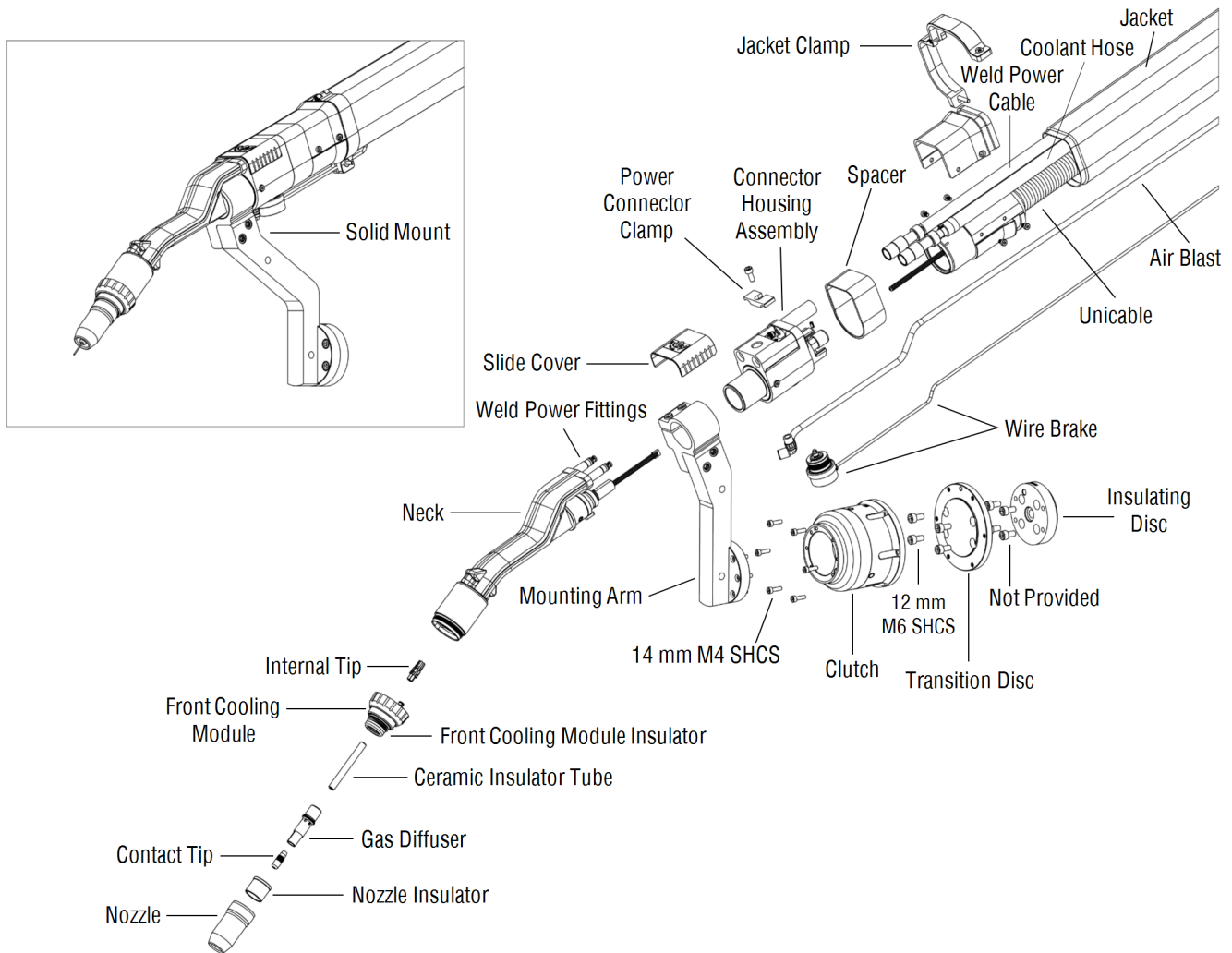
5-1 System Components

Robotic MIG Gun for GMAW Welding

Duty Cycle Rating:

- 100%: 600 amps with Mixed Gases

For complete parts list, please see 10-1 Hercules Robotic MIG Gun Parts List on page 21.



SECTION 6 — INSTALLATION

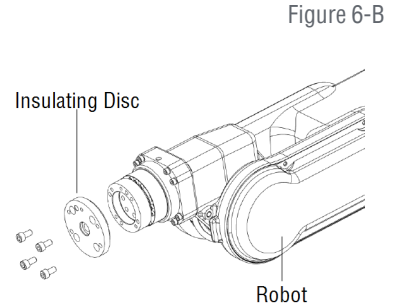
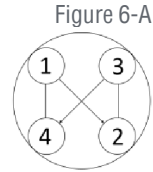
6-1 Installing Gun to Robot (Solid Mount Only)



A. Installing Insulating Disc to Robot

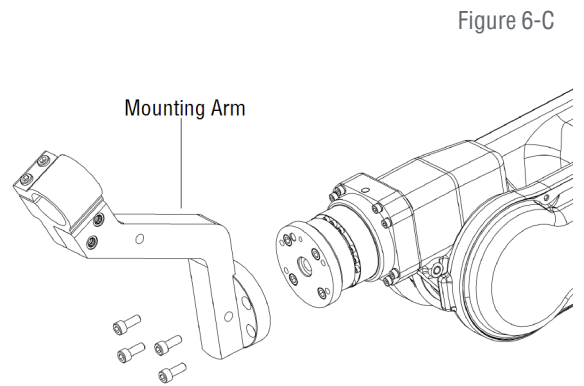
NOTE: Transition disc is required for all through-arm style robots.

1. Bring robot to service position.
2. Align the dowel in the insulating disc with the dowel hole in the wrist and fully seat the disc on the robot wrist.
NOTE: Dowel not provided.
3. Install the disc to the robot with fasteners using the supplied tightening pattern (see Figure 6-A). **IMPORTANT:** Do not use the fasteners to pull the face of the insulating disc to the face of the robot wrist, as damage will occur.
NOTE: Fasteners are not provided since the size varies by robot.
4. Torque to 45 in-lbs (5 Nm).



B. Installing Mounting Arm to Insulating Disc

1. Align dowel on mounting arm with the dowel hole in insulating disc and seat it by hand.
2. Install the mounting arm to the disc on the robot with 6 mm SHCS (provided) using the supplied tightening pattern (see Figure 6-A). **IMPORTANT:** Do not use fasteners to pull the mounting arm to the face of the insulating disc, as damage will occur.
3. Torque to 45 in-lbs (5 Nm). **IMPORTANT:** Do not overtighten.



C. Installing Gun to Gun Mount

Figure 6-D

1. Pull slide cover forward to expose neck bolt.
2. Using a 5 mm Allen wrench, loosen bolt 1/4 turn to free the neck assembly.
3. Pull neck away from cable assembly.
4. With the 5 mm Allen wrench, loosen clamp bolts in mounting arm clamp.
5. Fully insert cable portion of gun into the clamp, aligning the key on the gun with the keyway on the clamp.
6. Tighten the clamp bolts to secure the gun cable in place. Torque bolts to 60 in-lbs (7 Nm) using the 5 mm Allen wrench.
7. Ensure jump liner is installed properly (see section B. Changing the Jump Liner on page 11). **NOTE:** Verify o-rings on fittings and neck are coated with O-Lube.
8. Reinsert neck opposite of removal. Ensure that the neck is fully seated before tightening neck retainer bolt.
9. Tighten the clamp bolts to secure the gun cable in place. Torque bolt to 60 in-lbs (7 Nm) using the 5 mm Allen wrench.
10. Push slide cover back into place.

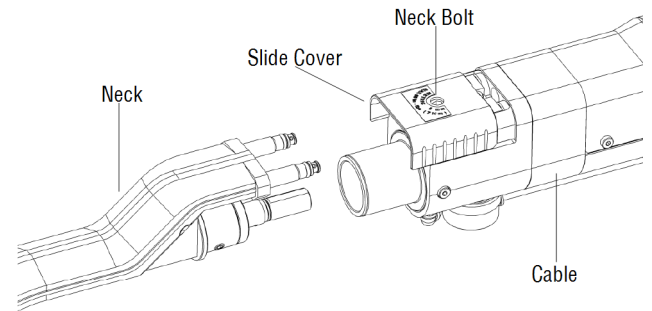
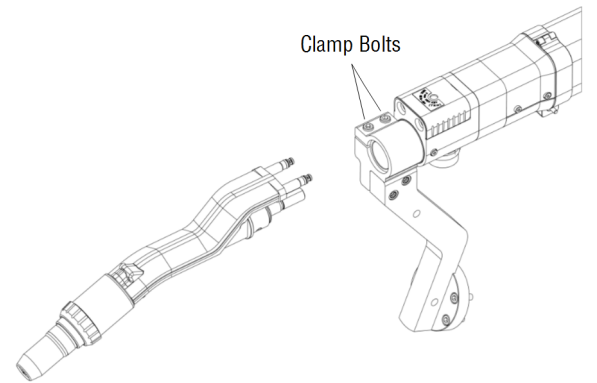


Figure 6-E



6-2 Installing Gun to Robot (Clutch Mount Only)



A. Installing Insulating Disc to Robot

NOTE: Transition disc is required for all through-arm style robots.

1. Bring robot to service position.
2. Align the dowel in the insulating disc with the dowel hole in the wrist and fully seat the disc on the robot wrist.
NOTE: Dowel not provided.
3. Install the disc to the robot with fasteners using the supplied tightening pattern (see Figure 6-F). **IMPORTANT:** Do not use the fasteners to pull the face of the insulating disc to the face of the robot wrist, as damage will occur.
NOTE: Fasteners are not provided since the size varies by robot.
4. Torque to 45 in-lbs (5 Nm).

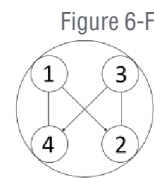


Figure 6-F

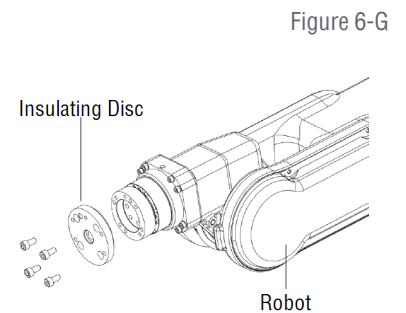
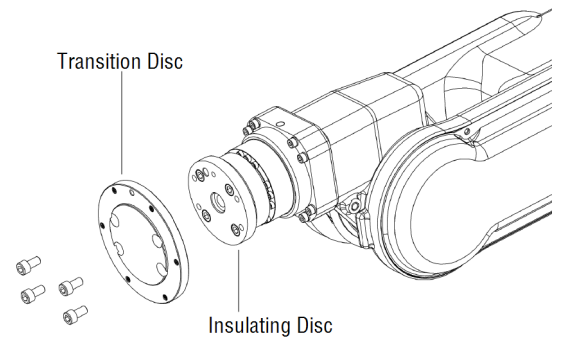


Figure 6-G

B. Installing Transition Disc to Insulating Disc

Figure 6-H

1. Align dowel on transition disc with dowel hole in insulating disc and seat it by hand.
2. Install transition disc to insulating disc on the robot with 6 mm SHCS (provided) using the supplied tightening pattern (see Figure 6-F). **IMPORTANT:** Do not use fasteners to pull the transition disc to the face of the insulating disc, as damage will occur.
3. Torque 6 mm SHCS to 45 in-lbs (5 Nm).



C. Installing Clutch to Transition Disc

1. Align dowel on clutch with the dowel hole in transition disc and seat it by hand.
2. Install clutch to insulating disc on the robot with 4 mm SHCS (provided) using the supplied tightening pattern (see Figure 6-I). **IMPORTANT:** Do not use fasteners to pull the clutch to the face of the transition disc, as damage will occur.
3. Torque to 45 in-lbs (5 Nm).

Figure 6-I

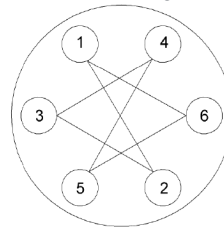
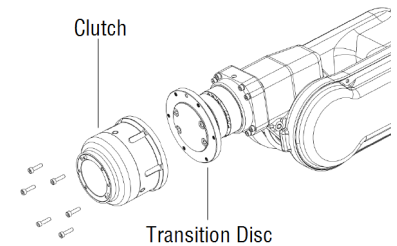


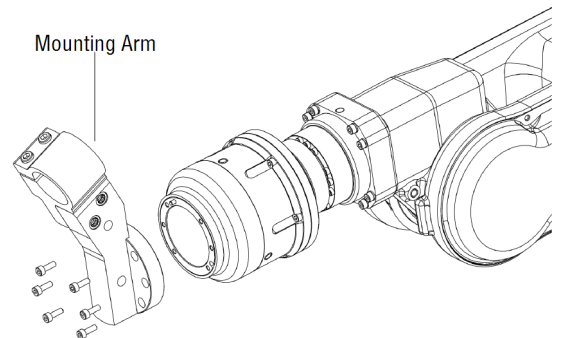
Figure 6-J



D. Installing Mounting Arm to Clutch

Figure 6-K

1. Align dowel hole on mounting arm with the dowel on the clutch and seat it by hand.
2. Install the mounting arm to the disc on the robot with 4 mm SHCS (provided) using the supplied tightening pattern (see Figure 6-I). **IMPORTANT:** Do not use fasteners to pull the mounting arm to the face of the insulating disc, as damage will occur.
3. Torque to 45 in-lbs (5 Nm).



E. Installing Gun to Mounting Arm

1. Pull slide cover forward to expose neck bolt.
2. Using a 5 mm Allen wrench, loosen bolt 1/4 turn to free the neck assembly.
3. Pull neck away from cable assembly.
4. With the 5 mm Allen wrench, loosen clamp bolts in mounting arm clamp.
5. Fully insert cable portion of gun into the clamp, aligning the key on the gun with the keyway on the clamp.
6. Tighten the clamp bolts to secure the gun cable in place. Torque bolts to 60 in-lbs (7 Nm) using the 5 mm Allen wrench.
7. Ensure jump liner is installed properly (see section B. Changing the Jump Liner on page 11). **NOTE:** Verify o-rings on fittings and neck are coated with O-Lube.
8. Reinsert neck opposite of removal. Ensure that the neck is fully seated before tightening neck retainer bolt.
9. Tighten the clamp bolts to secure the gun cable in place. Torque bolt to 60 in-lbs (7 Nm) using the 5 mm Allen wrench.
10. Push slide cover back into place.

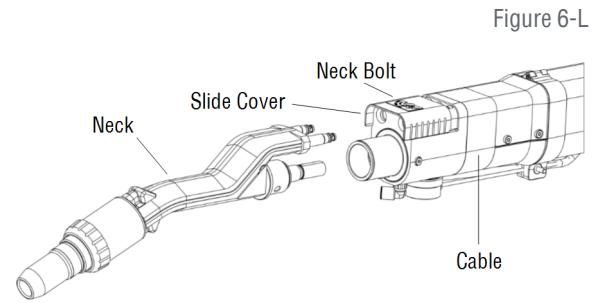
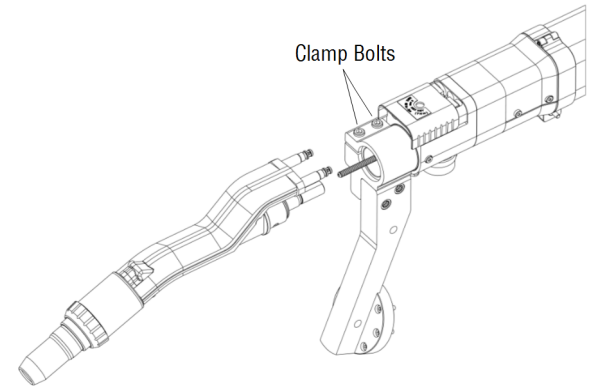


Figure 6-M



6-3 Installing Gun to Hercules™ Drive Wire Feeder



NOTE: Be sure to align any features to allow for proper installation.

1. Plug gun into feeder and lock in place (see your feeder manual for details). Connect external gas if required.
2. Connect voltage sense cable (see your feeder manual for details) between unicable with the Hercules Drive.
3. **FOR CLUTCH INSTALLATIONS ONLY:** Connect clutch cable with either the provided connections (cut and splice required) or one of our jumper cables (sold separately and available only for select robot models).

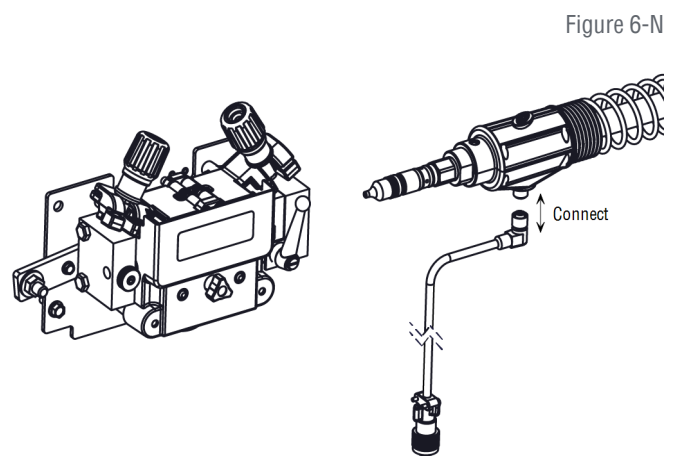


Figure 6-N

6-4 Installing Coolant/Power Lines to Junction Box



1. Loosen (4) screws holding top of junction box in place using Phillips #2 screwdriver and remove top.
2. Thread power cable fitting (larger diameter line) into TIG block by hand to ensure no cross-threading. Tighten using an 11/16" wrench on the power/coolant hose and a 1" wrench on the TIG block side. **NOTE:** Both coolant hoses are a reverse/left-hand thread.
3. Thread coolant fitting (smaller diameter line) into union fitting by hand to ensure no cross-threading. Tighten using 11/16" wrenches.
4. Cycle the cooler (refer to the Hercules™ Cooler owner's manual) to ensure no leaks are present in the system prior to closing the enclosure.
5. Ensure the lines entering/exiting the junction box are seated properly and will not be pinched after the top is reapplied to the box.
6. Place the top back onto the box and secure using the (4) screws that were removed in Step 1. **NOTE:** Use Miller® low conductivity pre-mixed coolant* for your coolant hoses (part # 043810).

⚠ IMPORTANT: It is required that the circulation of coolant be maintained throughout the system for a **minimum of 60 seconds after welding** is complete to properly cool all gun components to a safe level and prevent damage to the gun.

7. A flow switch (Miller part # 195461) is recommended for installation on your cooling circuit to prevent startup without coolant flowing through the system. **NOTE:** If using a Miller Continuum™ system, a flow switch is already included.

⚠ IMPORTANT NOTE: Warranty does not cover situations where the water has not been circulating during operation or where the circulation of coolant has not been maintained throughout the system for a **minimum of 60 seconds after welding** is complete.

*Miller coolants contain a base of ethylene glycol and deionized water to protect against freezing to -37°F (-38°C) or boiling to 227°F (108°C).

Figure 6-0

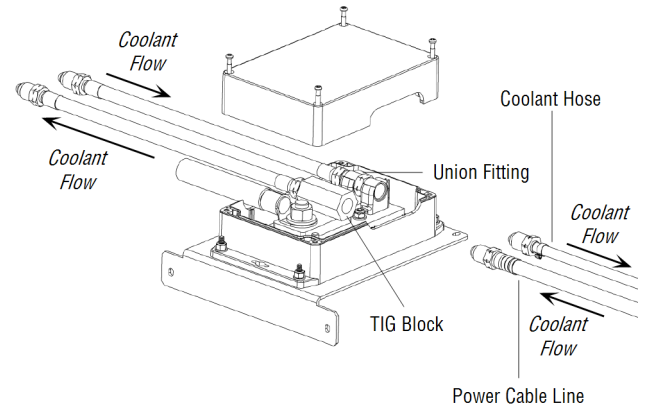
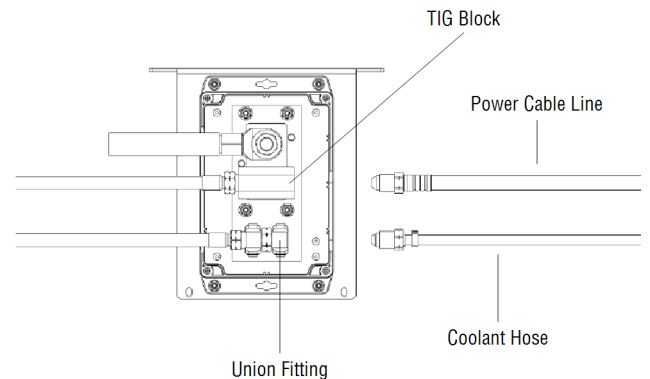


Figure 6-P



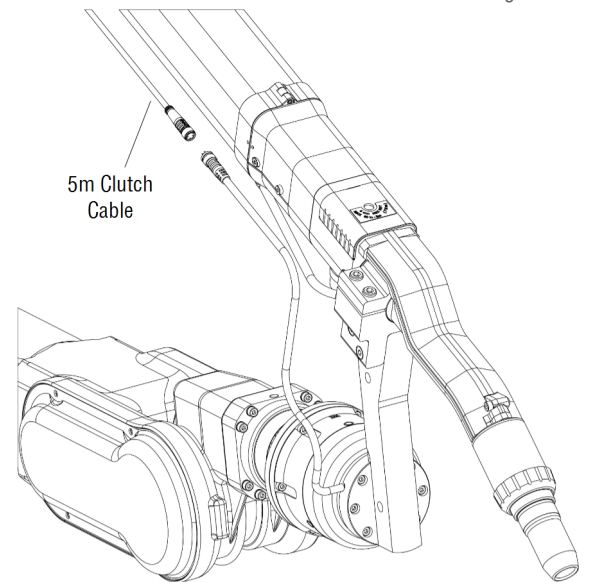
6-5 Installing Clutch Cable to Gun



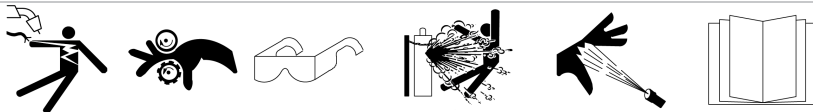
NOTE: The clutch cable runs external to the gun.

1. Uncoil the 5m clutch cable that will run the length of the gun back to the robot.
2. Attach the connector of the clutch cable together with the connector of the longer cable.
3. Separate the hooks and loops (Velcro®) of the jacket installed on the gun from the power pin end as far as it will go toward the front end, short of undoing the jacket clamp.
4. Place the 5m cable into the jacket, leaving enough slack in the line at the front end to sufficiently accommodate movement of the clutch and articulation of the robot wrist when the jacket is reinstalled.
5. Close the jacket first by routing the cable as close to the front as possible, then folding the hooks and loops onto themselves from that point backward until you reach the end.
6. Connect the free end of the cable to the robot.

Figure 6-Q



6-6 Connecting Wire Brake and/or Air Blast



A. Air Blast



IMPORTANT NOTE: Air blast must be used for optimal performance. Porosity may occur if not used.

1. Route air blast air line to designated control valve in your facility (not provided).
2. 80-100 psi air supply required for proper operation.

B. Wire Brake

1. Route wire brake air line to designated control valve in your facility (not provided).
2. 40-60 psi air supply required for proper operation.

NOTE: It is important to use a separate air regulator for wire brake than from other pneumatic connections to ensure proper air pressure is used.

SECTION 7 — REPLACEMENT

7-1 Changing Consumables

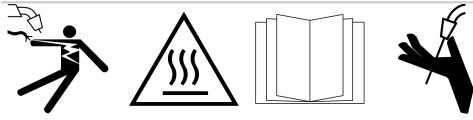
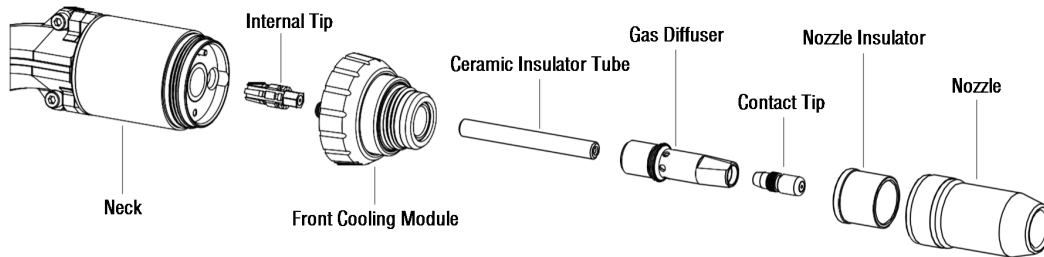


Figure 7-A



IMPORTANT NOTES:

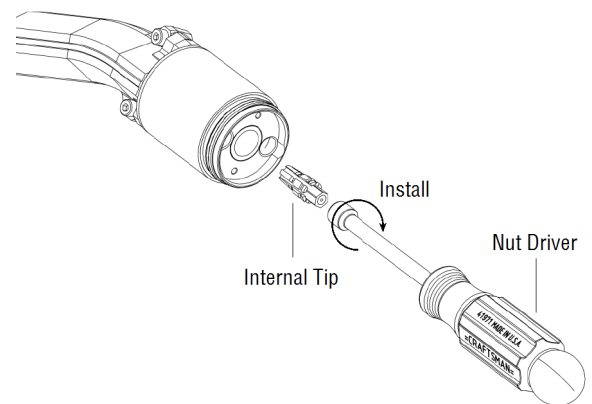
WARNING: Do not use tools to tighten front cooling module or nozzle, as damage to components will occur.

- Check all parts to ensure connections are tight before welding.
- The gas diffuser **MUST** be tightened with a 3/8" wrench to prevent the front end from overheating.
- **DO NOT** use pliers to remove or tighten the gas diffuser or scoring may result.
- **DO NOT** force the internal tip to thread in if there is resistance, as cross-threading may occur.
- When reinstalling the front cooling module, ensure it is tightened properly to ensure proper electrical connection.
- Install front cooling module and nozzle securely by hand.

A. Changing the Internal Tip

1. Remove the front cooling module from the torch, including nozzle, insulators and other front-end components, by rotating the hand nut of the module counterclockwise until fully unthreaded.
2. Insert the 1/4" nut driver (provided) over the hexagonal body of the spent internal tip inside the cooling housing. Turn counterclockwise until the internal tip is completely unthreaded.
3. Take the new internal tip and install opposite of the removal directions above, being careful not to cross-thread. Torque to 30 in-lbs (3.5 Nm). **Do not overtighten.**
NOTE: Thread size of internal tip is 3/8-24 UNF 2A.
4. Reinstall front-end components.

Figure 7-B



B. Changing the Nozzle

1. Remove the nozzle and nozzle insulator, unthreading by hand in counterclockwise rotation.
2. When reinstalling the nozzle, ensure that the nozzle insulator is fully seated into the nozzle and the nozzle outer shell is fully threaded on.

C. Changing the Contact Tip

1. Thread the contact tip into the gas diffuser.
2. Torque to 30 in-lbs (3.5 Nm).
3. The Tregaskiss Tip Tool (part # 450-18) or a pair of weld pliers are optimal for contact tip installation.

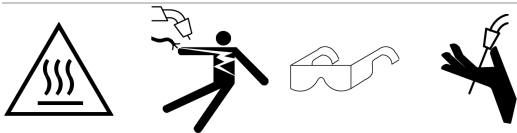
D. Changing the Gas Diffuser

1. Thread the gas diffuser onto neck with a 3/8" wrench.
2. Torque to 70 in-lbs (7.9 Nm).
IMPORTANT: DO NOT use pliers to remove or tighten gas diffuser, as scoring may result.

E. Changing the Ceramic Insulator Tube

1. Remove front-end consumables ensuring separation of the diffuser from the front module (see Figure 7-A).
2. Place the new ceramic insulator tube into the diffuser, then carefully thread the diffuser/tube to the front module.
3. Reinstall remaining front-end consumables.

7-2 Changing the Front Cooling Module



1. Remove the nozzle, ceramic insulator, front tip and diffuser (see section).
2. Loosen hand nut on cooling module and remove.

NOTES:

- Tighten securely to ensure proper electrical connection when reinstalling the front cooling module.
IMPORTANT: O-rings should be coated with O-Lube prior to each re-install.
 - Use caution not to cross-thread between the module and neck and/or gas diffuser.
 - Check coolant fittings for contaminants and/or blockages.
 - Inspect the front cooling module to ensure insulators are in place and free of damage. If system is run without coolant, components may malfunction and damage will occur.
NOTE: Tighten securely by hand. **Do no use tools to tighten, as damage to the components will occur.**
3. Align dowel and water fittings on front cooling module to the brass neck interface. Push front cooling module firmly to seat onto neck prior to threading the hand nut.
 4. Reinstall consumables.
NOTE: Orientation of dowel is not critical.

Figure 7-C

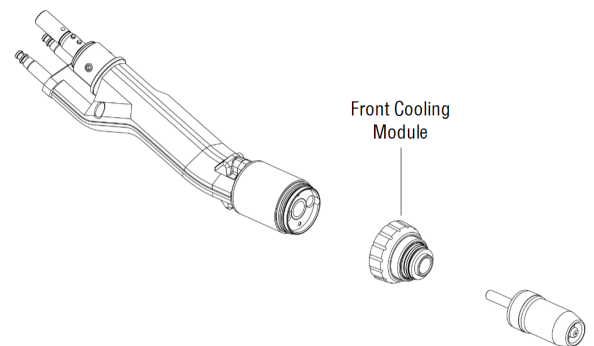
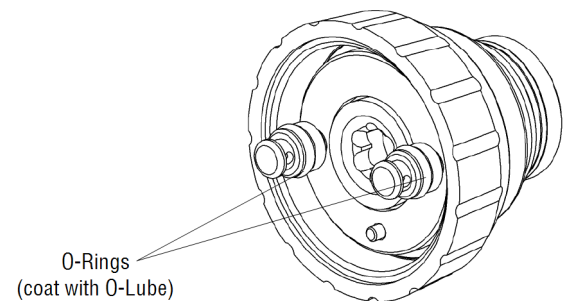


Figure 7-D



7-3 Changing the Neck



1. Pull slide cover forward to expose neck bolt.
2. Using a 5 mm Allen wrench, loosen bolt 1/4 turn to free the neck assembly.
3. Pull neck away from cable assembly.
4. Ensure jump liner is installed properly into the neck (see section 1-1). **NOTE:** Ensure o-rings on fittings and neck are coated with O-Lube.
5. Reinsert neck opposite of removal.
6. Ensure neck is fully seated before tightening neck retainer bolt.
7. Push slide cover back into place.

IMPORTANT NOTE: If a crash has occurred with the robot and/or neck:

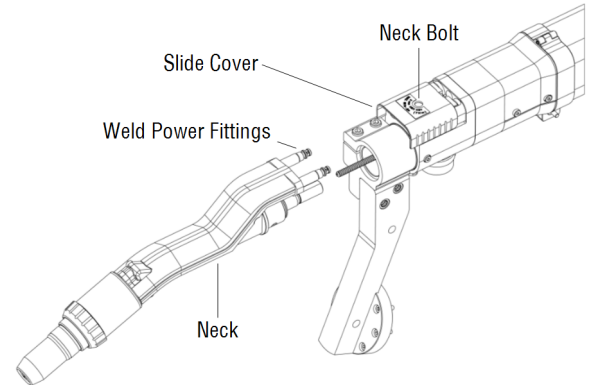
- Ensure all components are aligned and are functioning properly.
- Check the neck on a neck checking fixture (part # G-405CAH) if available.
- Check for leaks.
- Inspect neck cover for damage.
- Check for damage to the bolt insulators holding the coolant chamber to the neck.

⚠ IMPORTANT: If components are damaged, the assembly may not function properly and parts may become live.

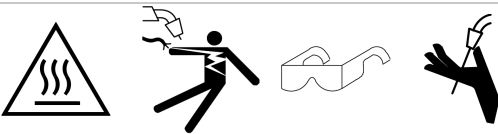
- Be careful to avoid dropping neck, as damage may occur to the front thread that holds the front cooling module.

NOTE: The front thread of neck that receives the front cooling module is M39 x 1.5 metric thread.

Figure 7-E



7-4 Changing the Liner



IMPORTANT NOTES:

- Ensure power supply is off before proceeding.
- DO NOT allow the gun to hang from the control cable/voltage sense lead while plugged into the feeder.
- When cutting the liner, ensure all burrs are removed from the end to ensure the liner will seat properly.

A. Changing the Liner

⚠ IMPORTANT: DO NOT allow gun to hang from cable(s), as damage may occur.

1. Disconnect the clutch cable (if equipped) while plugged into the feeder.
2. Disconnect control cable from gun or feeder.
3. Loosen the power pin from the wire feeder assembly.
4. Remove the guide cap from the power pin.
5. Remove and discard the old liner.
6. Ensure the wire brake and guide are properly installed into the gun.
7. Insert the new liner through the power pin until it seats properly into the wire brake guide inside of the gun (see Figure 7-G). Rotate liner back and forth to ensure liner is fully seated.
8. Accurately mark the new liner at the point where it exits the power pin (see Figure 7-H).
9. Measure the distance between the mark on the liner and the inside of the brass liner retainer.
10. Pull the liner back out and cut the excess (the measurement from Step 9) off the front of the liner (see Figure 7-I).
11. Be sure to remove all burrs from the liner after cutting.
12. Reinstall the liner fully into the gun and screw the guide cap back onto the power pin.

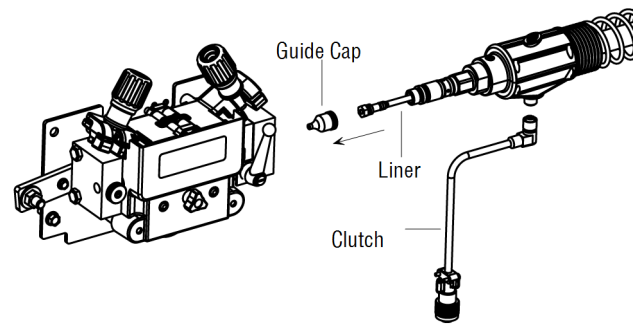


Figure 7-F

Figure 7-G

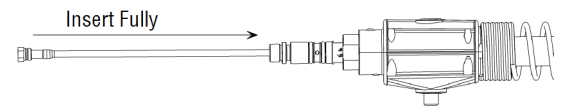


Figure 7-H

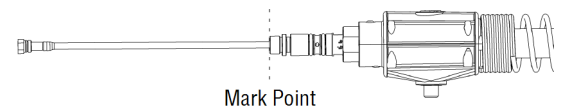


Figure 7-I

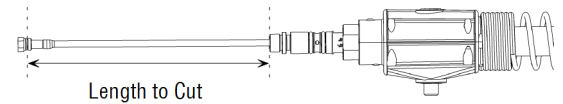
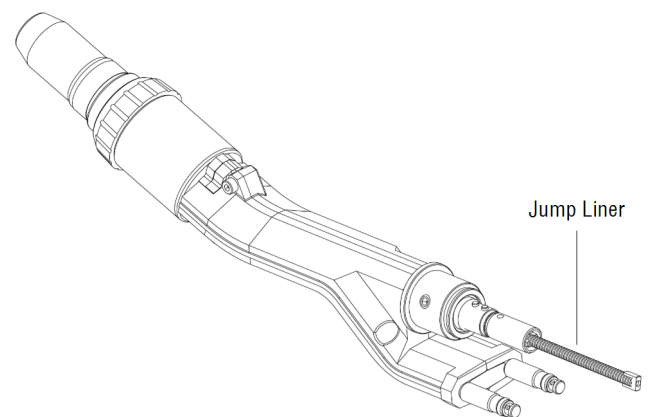


Figure 7-J

B. Changing the Jump Liner

1. Remove neck from gun (see section 7-3 Changing the Neck on page 10).
2. Pull spent jump liner from neck and push out to start.
NOTE: If you are unable to get a good grip on the jump liner, the front-end consumables can be removed for easier access (see section 7-1 Changing Consumables on page 8).
3. Blow out the inside of the neck.
4. Slide the new jump liner into ID. Rotate back and forth while inserting to ensure it is fully seated.
NOTE: Jump liner brass guide should be flush with back of neck when properly inserted.
5. Re-install neck to gun.



7-5 Changing the Power Pin

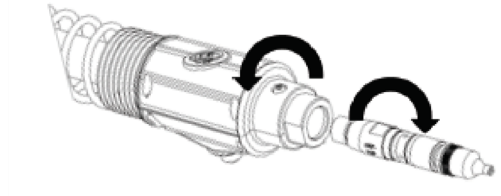


IMPORTANT: The thread-in two-piece power pin incorporates a taper to seat and lock the power pin into the rear handle block. Make sure power pin is tightened in the block with a wrench to ensure pin is secure and will not come loose.

NOTE: The rear handle and screws do not have to be removed when installing the two-piece power pins.

1. Thread power pin into rear handle block.
2. Tighten the power pin into the rear block using a wrench on the rear block and a wrench on the power pin.
3. Install liner (see section 7-4 Changing the Liner on page 10).
4. Install gun to feeder (see section 6-3 Installing Gun to Hercules™ Drive Wire Feeder on page 5).
5. Reinstall cable(s).

Figure 7-K



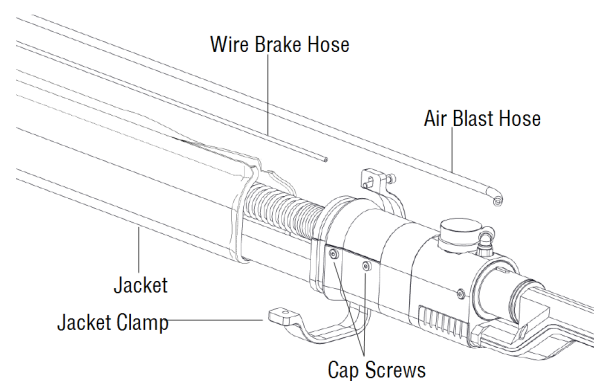
7-6 Changing the Unicable



A. Changing the Coolant Lines/Power Cable

1. Disconnect air blast and wire brake hoses from front of gun.
2. Remove the jacket clamp from the rear of the gun housing and remove the jacket (see Figure 7-L).
3. Loosen the (4) cap screws holding the connector assembly clamp housing into place and remove.
4. Move the slide cover forward to expose the copper power connector clamp holding the coolant lines in place.
5. Remove neck (see section 7-3 Changing the Neck on page 10).
6. Unscrew the cap screw holding the power connector clamp in place.
7. Feed the voltage sense lead in through the hole in the housing and remove the copper power connector clamp.
8. Pull both coolant lines out.

Figure 7-L



IMPORTANT NOTE: If not replacing the unicable, proceed to section C, steps 5-14.

B. Changing the Unicable

1. Grasp cable connector cover subassembly firmly in hand and rotate assembly 1/4 turn counterclockwise, then pull straight back.
2. Pull spacer from assembly.
3. Unlock power connection between the cable and front housing using a 5 mm Allen wrench and pull the cable back (see Figure 7-N).

Figure 7-M

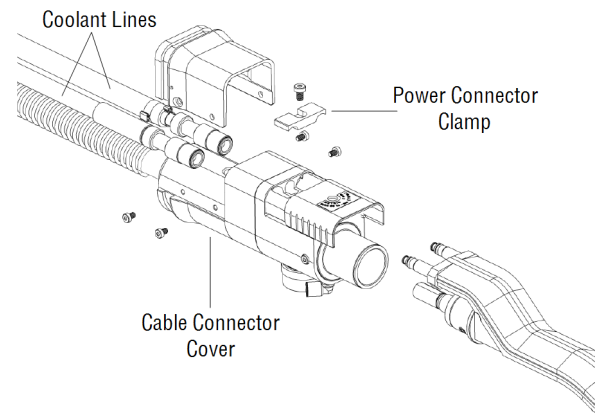
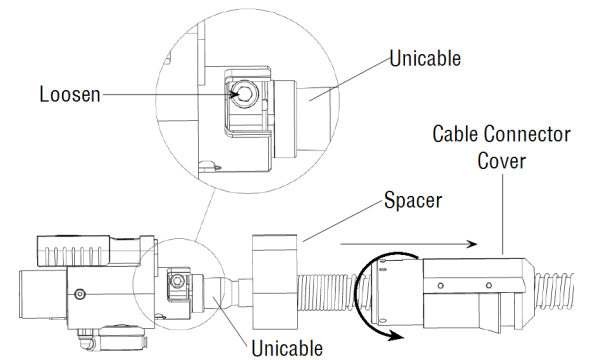


Figure 7-N



C. Reinstalling the Unicable and Coolant Lines/Power Cable

Figure 7-0

1. Install spacer onto connector housing.
2. Slide the unicable onto the connector stud on the back of the connector.
3. Fasten the 5 mm SHCS to lock the unicable in place (see Figure 7-0).
4. Install the cable connector cover in a clockwise rotation.
5. Insert coolant lines through the bores of the housing.
6. Feed voltage sense lead through hole in housing (see 'A' in Figure 7-P).

⚠ WARNING: This step is critical or else the voltage sense lead will be sheared.

7. Position copper power connector clamp over both coolant lines, locking them in place.
8. Position eyelet of voltage sense lead into recess on power connector clamp and slide cap screw back through both.
9. Torque bolt to 20 in-lbs (2.3 Nm). **WARNING:** Do not overtighten.
10. Move the connector assembly clamp housing in place and install the (4) cap screws.
11. Reinstall the neck (see section 7-3 Changing the Neck on page 10), making sure the o-rings are properly lubricated beforehand.
12. Move the slide cover forward, back into position.
13. Reconnect air blast and wire brake hose connections.
14. Reinstall jacket and clamp.

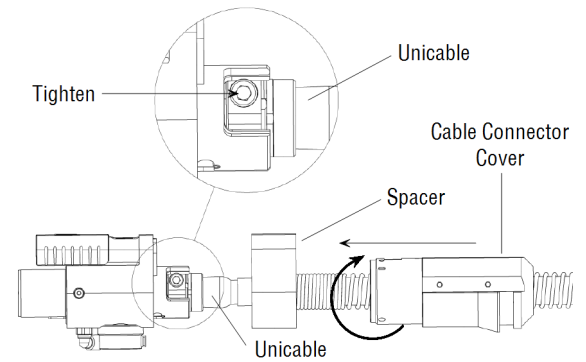
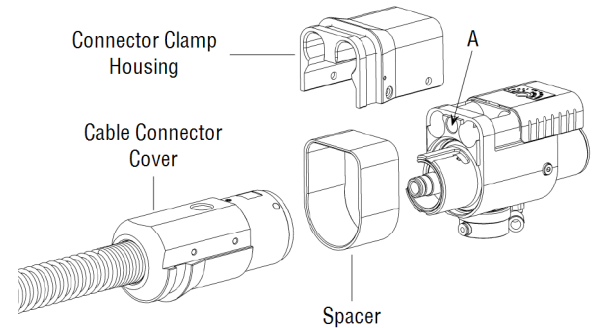


Figure 7-P



7-7 Changing the Jacket and Clamp



1. Place jacket over uncable with end that has cutout facing the end where the clamp seats (see Figure 7-Q).
2. Evenly join the hooks and loops together down the length of the gun.
3. Ensure lip of jacket is properly aligned in recess of the housing.
4. Place hinge of clamp on flat underside of the torch with the thicker side facing the front of the gun. The thicker side of the clamp will cover the lip of the jacket in recess of the housing.
NOTE: Line up the two orientation alignment marks on the side of the clamp to ensure correct position (see Figure 7-S).
5. Secure jacket clamp in place with the locating hole on both the clamp and the body aligned next to each other.
NOTE: Do not clamp anything but the jacket under the clamp. Air blast and wire brake cables should run external to clamp and be routed into the jacket 1-2" behind the clamp.
6. Rotate jacket so that the cutout section faces the top contour where the clamp comes together. **NOTE:** Cutout section is a relief for when the clamp comes together so that bunching does not occur.
7. Bring halves together as tight as possible by hand, then begin threading in cap screw by hand.
8. Once cap screw is threaded in, tighten the remainder using an Allen wrench.
9. Torque to 20 in-lbs (2.3 Nm).

Figure 7-Q

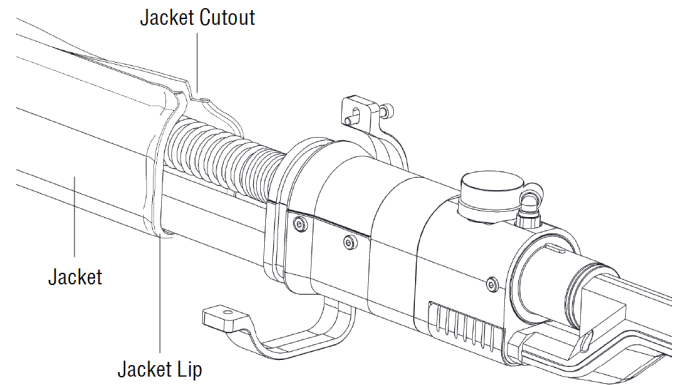
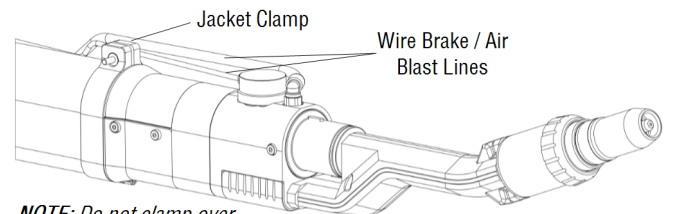
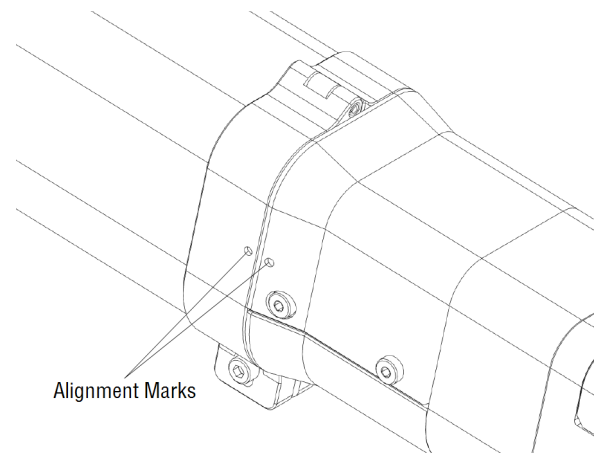


Figure 7-R



NOTE: Do not clamp over wire brake and air blast lines

Figure 7-S



7-8 Replacing the Wire Brake



1. Remove front-end consumables and neck, including jump liner.
2. Retract wire into unicable.
3. Shut off the air supply and disconnect 1/8" air supply at the wire brake pushing unit.
4. Unthread and remove the wire brake pushing unit to allow the wire guide to be released. **NOTE:** Be aware that the guide may fall out when removing the wire brake pushing unit.
5. Carefully slide the wire guide out of the gun body using the wire guide tool.
6. Inspect for wear and swap for proper wire size as required.
7. Reinstall appropriate wire guide using the wire guide tool with the flats oriented.
8. Align the hole with the pushing unit pin.
9. Thread in the pushing unit.
10. Reinstall consumables and neck, including the jump liner.
11. Feed wire through the neck.
12. Reconnect the air lines and turn on the air pressure.
13. Activate wire brake via the robot controller and attempt to pull additional wire out from the gun. **NOTE:** The wire should no longer move.
14. Trim to correct stickout.

Figure 7-T

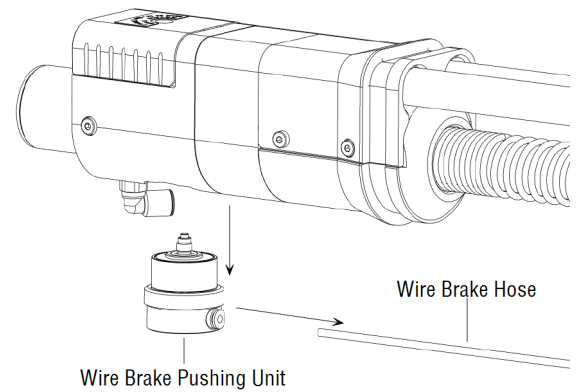
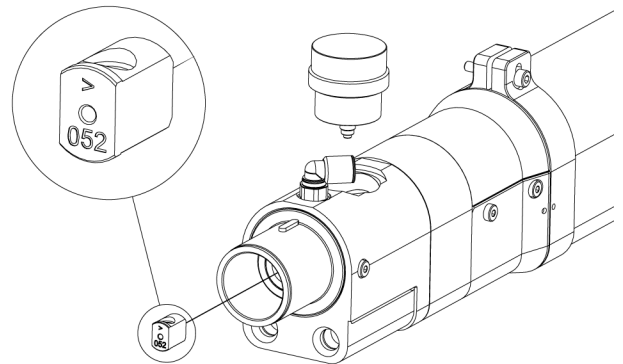


Figure 7-U



7-9 Changing the Neck Cover



IMPORTANT NOTES:

- **⚠** Ensure neck cover is sound and properly installed, otherwise electrical shock may be possible and/or misalignment of parts may occur.
- If torch has crashed, check that neck is properly seated to the gun, otherwise poor conductivity and flow of coolant may occur.
- Neck cover replacement is possible on the robot; however, it is recommended to uninstall the neck from the gun.

1. Remove neck from gun (see section 7-3 Changing the Neck on page 10).
2. Remove (3) SHCS holding old covers together and pull halves of cover apart.
3. Verify that tube spacer block is properly positioned prior to install neck covers. Channels on spacer block will line up with flanges on fittings and copper lines (see Figure 7-W).
4. Line up flanges on fittings with channels in new cover.
NOTE: After application of cover, the spacer block will be flush with the back of the cover where the lines exit.
5. Reinstall (3) SHCS until cover halves are securely together.
NOTE: Do not overtighten.

Figure 7-V

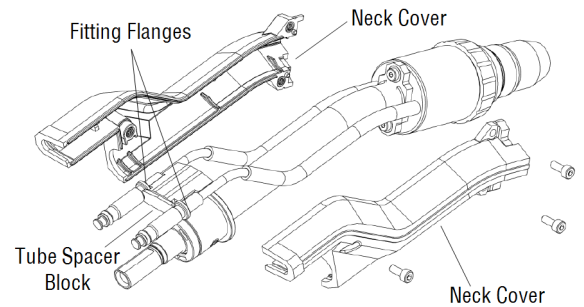
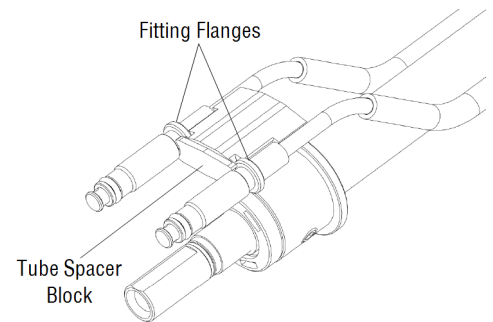


Figure 7-W



SECTION 8 — OPERATION AND MAINTENANCE

8-1 Operation Checklist

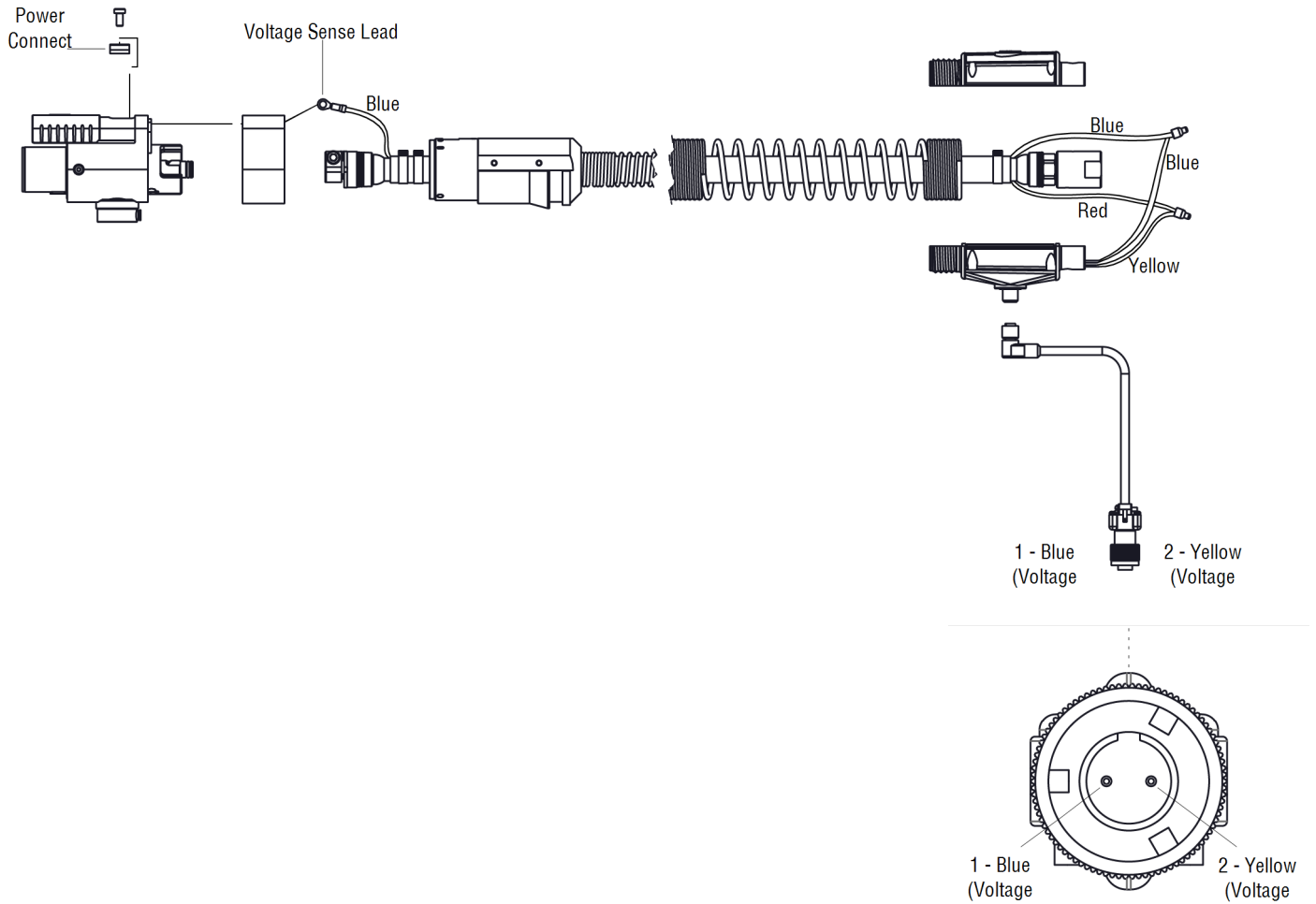
- All front-end consumables and components (internal tip, contact tip, diffuser, nozzle, front cooling module and neck) are tightened into place (see 7-1 Changing Consumables on page 8).
- Nozzle ceramic insulator is installed into nozzle.
- Ceramic insulator tube is installed between the diffuser and the front cooling module.
- Jump liner is installed in neck assembly.
- Liner is installed in gun and cut to the proper length (see 7-4 Changing the Liner on page 10).
- Wire brake components are properly installed.
- Air blast line must be connected and air must be actively cycling between parts to ensure contaminants are being directed away from the front-end components.

8-2 Maintenance Checklist

- Check for loose power connections to avoid overheating and poor weld quality.
- Check for adequate gas flow. Poor weld quality may occur if proper gas flow is not achieved during welding.
- Check for kinks in air and water supply lines and cables.
- Check o-ring connections and coolant lines for leaks and proper flow throughout the coolant system. Poor weld quality, slip hazards, and/or overheating may occur if product is leaking.
- Check for proper liner length at installation. Poor wire feeding, burn-back, and bird-nesting may occur if the welding wire does not have a clear and proper path.
- Always use the air blast feature between cycles. Keeping the system free of contaminants during welding is critical to preventing porosity.
- Check all consumable items (insulator tube, internal tip, contact tip, gas diffuser, nozzle) for wear and excessive spatter buildup, as weld quality will be affected.

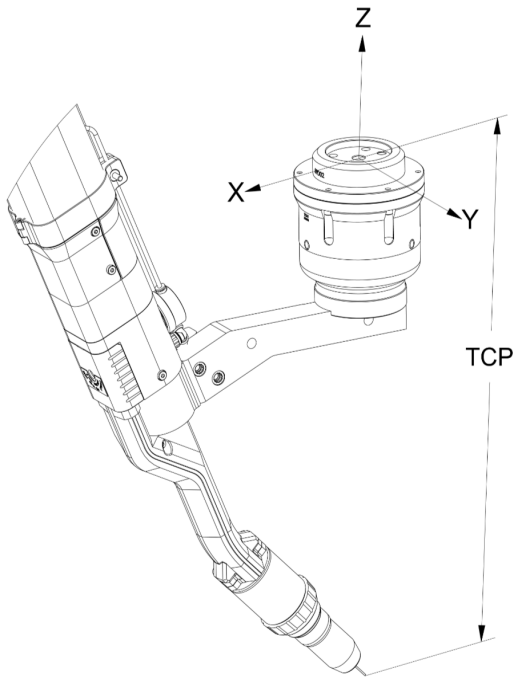
SECTION 9 — TECHNICAL DATA

9-1 Wiring Diagram

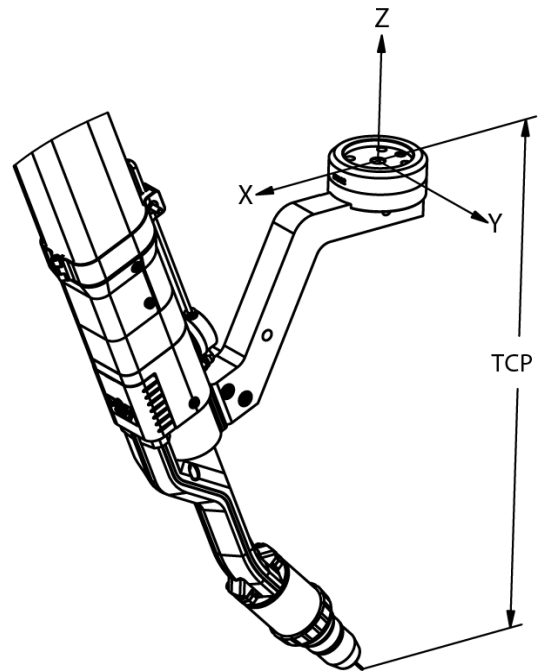


9-2 Center of Mass Coordinates

CLUTCH MOUNT



SOLID MOUNT



Standard Configurations - Clutch Mount

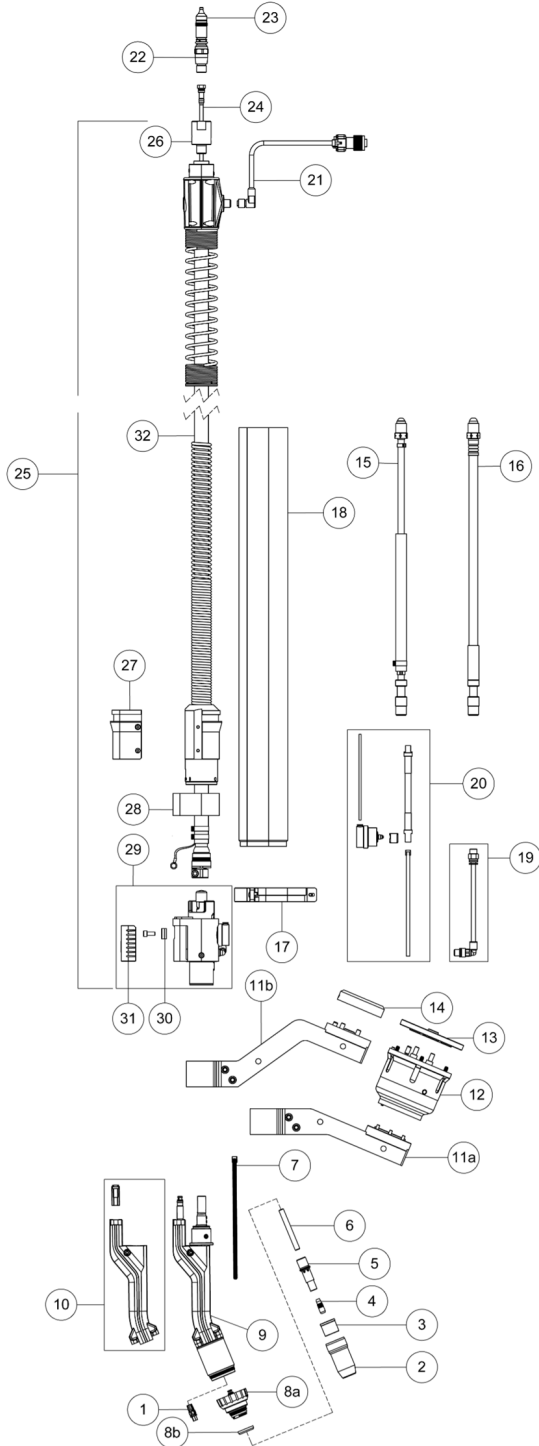
22 Degree	X	Y	Z	Weight
400 mm TCP (Neck Part # GHA-22L1)	161.48 mm	-.83 mm	43.51 mm	5.55 kg

Standard Configurations - Solid Mount

22 Degree	X	Y	Z	Weight
400 mm TCP (Neck Part # GHA-22L1)	182.85 mm	-.90 mm	-73.27 mm	4.48 kg

SECTION 10 — PARTS LIST

10-1 Hercules Robotic MIG Gun Parts List



ITEM	PART #	DESCRIPTION
1	See SP-HRC	Internal Tip
2	N-H58T3***	Nozzle, Standard Duty (Long)
3	P-HA16-XX^	Nozzle Insulator
4	See SP-HRC	Contact Tip
5	D-HTL2***	Gas Diffuser
6	P-HA22***	Ceramic Insulator Tube
7	P-HA17	Jump Liner
8a	P-HA02	Front Cooling Module
8b	P-HA02-8	Front Cooling Module Insulator
9	GHA-22L1	Neck
NS	P-HA03-3-2	Viton o-ring; 2 mm wide, 36 mm O.D., 32 mm I.D. (see Item 5 in section 10-2 Front Cooling Module Parts List on page 22)
10	GHA-22L1C	Neck Cover Kit (includes tube spacer)
11a	CAHC2203	Mounting Arm, Clutch Mount, 400 mm TCP
11b	CAHS2202	Mounting Arm, Solid Mount, 400 mm TCP
12	TCA1	Robotic Safety Clutch (COMING SOON)
NS	AS-715-21	TA Clutch Cord Intermediate (included in Item 12)
NS	AS-708-14-2	Clutch Cordset, Main, 5 m (included in Item 12)
13	See SP-HRC	Transition Disc (Clutch Mount only)
14	See SP-HRC	Insulating Disc (for clutch and solid mount)
15	P-HA09-XXX*	Coolant Hose (ordered in half-foot increments)
16	P-HA10-XXX*	Weld Power Cable (ordered in half-foot increments)
17	P-HA12	Jacket Clamp
18	P-HA13-XXX*	Jacket (ordered by gun length)
19	508-A	Air Blast Kit
20	WB-599-116	Wire Brake Kit, 1/16" wire
21	284375	Control Cable (Miller® Part)
22	214-1	Power Pin, Miller
23	214-116	Power Pin Cap, Miller
24	See SP-HRC	Conventional Liner
25	CXXX-HA01*	Cable Assembly (ordered by gun length) (includes Items 25-31)
26	414-600	Adaptor
27	P-HA07	Clamp Body/Cover
28	P-HA06	Spacer
29	P-HA04	Connector Housing Assembly
30	P-HA08	Power Connector Clamp
31	P-HA11	Slide Cover
32	P-HA20-XXX*	Unicable (ordered by gun length)

^ XX represents quantity: "10", "25" or "100"

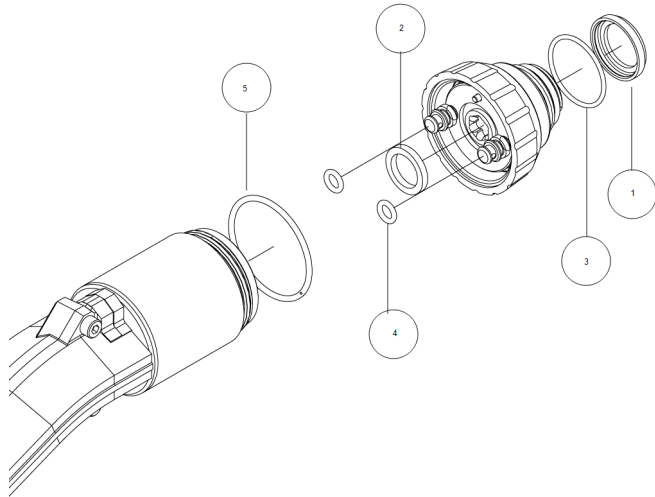
^^ XX represents quantity: "05", "10" or "100"

* XXX represents required length: "040" = 4 ft, "045" = 4.5 ft, etc.; see SP-HRC for assistance.

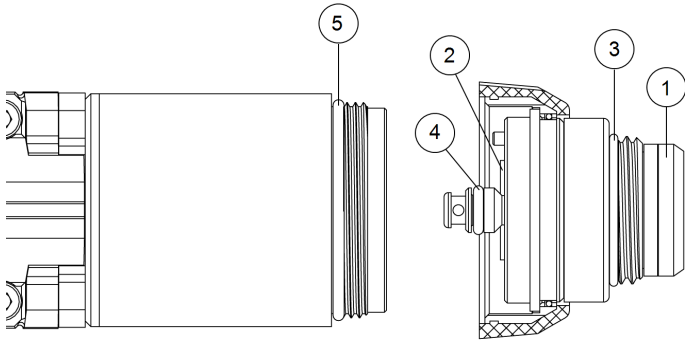
** NS indicates "Not Shown" in the exploded view diagram

*** For MIG guns manufactured after May 2024

10-2 Front Cooling Module Parts List



ITEM	PART #	DESCRIPTION
1	P-HA02-8	Front insulator
2	P-HA02-10-2	Buna-N square o-ring; 2.5 mm wide, 18 mm O.D., 13 mm I.D.; qty. 2
3	P-HA02-12-2	Viton o-ring; 1.5 mm wide, 24 mm O.D., 21 mm I.D.; qty. 2
4	P-HA02-11-10	#008 Viton o-ring for cooling module and neck fittings; qty. 10
5	P-HA03-3-2	Viton o-ring; 2 mm wide, 36 mm O.D., 32 mm I.D.; qty. 2



SECTION 11 — TROUBLESHOOTING

11-1 Troubleshooting Table

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Electrode does not feed.	<ol style="list-style-type: none"> 1. Feeder damaged. 2. Improper / worn drive roll. 3. Drive roll tension misadjusted. 4. Burn back to contact tip. 5. Bird nest. 6. Wrong size liner. 7. Buildup inside of liner. 8. Missing components on front module. 	<ol style="list-style-type: none"> 1. Replace feeder. 2. Clean or replace drive roll. 3. Adjust tension at feeder. 4. See 'Contact tip burn back' in Troubleshooting Table. 5. Trim and remove excess wire, check drive roll tension, wire level in barrel, consumable installation and/or liner for debris or wear. Re-feed wire through gun. 6. Replace with correct size. 7. a. Replace liner or clean out with compressed air, check condition of electrode. b. Check that air blast is connected and functioning properly. 8. Ensure front-end components, specifically the ceramic insulator tube, and consumables are in place.
2. Contact tip burn back.	<ol style="list-style-type: none"> 1. Improper voltage and/or wire feed speed. 2. Erratic wire feeding. 3. Improper tip stickout. 4. Improper electrode stickout. 5. Faulty ground. 	<ol style="list-style-type: none"> 1. Adjust parameters. 2. See 'Erratic wire feeding' in Troubleshooting Table. 3. Adjust nozzle / tip relationship by replacing the nozzle. 4. Adjust wire stickout to 3/4". 5. Replace cables and/or connections.
3. Tip disengages from the gas diffuser.	<ol style="list-style-type: none"> 1. Worn gas diffuser. 2. Improper tip installation. 	<ol style="list-style-type: none"> 1. Replace tip and/or gas diffuser. 2. Install as per section 7-1 Changing Consumables on page 8.
4. Erratic arc.	<ol style="list-style-type: none"> 1. Worn contact tips. 2. Buildup inside of liner. 3. Inconsistent CTWD. 	<ol style="list-style-type: none"> 1. Replace contact tips. 2. Replace liner, check condition of electrode. 3. Adjust CTWD to be uniform throughout each weld.
5. Erratic wire feeding.	<ol style="list-style-type: none"> 1. Buildup inside of liner. 2. Wrong size liner. 3. Improper drive roll size. 4. Worn drive roll. 5. Feeder malfunction. 6. Worn contact tip. 	<ol style="list-style-type: none"> 1. Replace liner, check condition of electrode. 2. Replace with new liner of proper size. 3. Replace with proper size drive roll. 4. a. Replace with new drive roll. b. Repair worn drive roll. 5. Swap feeders to troubleshoot the root cause. 6. Inspect and replace.
6. Extreme spatter.	<ol style="list-style-type: none"> 1. Improper machine parameters. 2. Improper tip installation. 3. Improper shielding gas coverage. 4. Contaminated wire or workpiece. 	<ol style="list-style-type: none"> 1. Adjust parameters. 2. Adjust nozzle / tip relationship. 3. a. Verify shielding gas coverage. b. Verify gas mixture. 4. Clean wire and workpiece.

7. Porosity in weld.	<ol style="list-style-type: none"> 1. Gas diffuser damaged 2. Gas solenoid faulty. 3. No gas. 4. Flow improperly set. 5. Gas ports plugged. 6. Ruptured gas hose. 7. Worn, cut or missing o-rings. 8. Loose fittings. 	<ol style="list-style-type: none"> 1. Replace gas diffuser. 2. Replace solenoid. 3. <ol style="list-style-type: none"> a. Install full tanks. b. Check supply. c. Check for hose leaks. 4. Adjust flow. 5. <ol style="list-style-type: none"> a. Clean or replace gas diffuser. b. Clean nozzle. 6. Repair or replace cable or line. 7. Replace o-rings. Ensure o-rings are properly coated with O-Lube. 8. Tighten gun and cable connections to specified torque. See Section 7 — Replacement on page 8.
8. Gun running hot.	<ol style="list-style-type: none"> 1. Exceeding duty cycle. 2. Loose or poor power connection. 3. Coolant lines loose or kinked. 4. Low coolant level. 	<ol style="list-style-type: none"> 1. Decrease parameters to within gun rating. 2. <ol style="list-style-type: none"> a. Clean, tighten or replace cable grounding connection. b. Tighten gun and cable connections to specified torque. See Section 7 — Replacement on page 8. 3. Tighten or unkink coolant lines. 4. Inspect and refill as required.
9. Liner is discolored.	<ol style="list-style-type: none"> 1. Short circuit to electrode. 2. Broken copper stranding in power cable. 	<ol style="list-style-type: none"> 1. Isolate electrode reel from feeder and drive block. Consult feeder manufacturer's manual. 2. Replace unicable.
10. Voltage sense erratic or not working.	<ol style="list-style-type: none"> 1. Damaged lead. 2. Control cable not properly connected. 3. Eyelet lead on power connector clamp not properly fastened into place. 	<ol style="list-style-type: none"> 1. Fix lead and ensure it is properly insulated. 2. Check to make sure control cable is properly attached. 3. Check under slide cover to ensure bolt is holding eyelet lead properly.
11. Coolant not circulating.	<ol style="list-style-type: none"> 1. Neck cover removed. 2. Schrader valves damaged or blocked (neck and cable). 3. Copper coolant lines of neck damaged in robotic crash. 4. Return coolant line pinched. 5. Front cooling module not properly fastened in place. 6. Neck not seated properly. 7. Coolant lines not connected. 	<ol style="list-style-type: none"> 1. Install cover to properly align fittings. 2. Check fittings and clean or replace as required. 3. Check for damage. A new neck may be required. 4. Reroute coolant line to avoid pinch point. A new line may be required. 5. Turn front cooling module hand nut to tighten. 6. Ensure neck is fully seated and tighten bolt to hold in place. 7. Connect coolant lines.
12. Wire brake not holding.	<ol style="list-style-type: none"> 1. Improper air pressure. 2. Air line disconnected. 3. Wire brake cylinder malfunction. 4. Wire brake not properly installed. 	<ol style="list-style-type: none"> 1. Check air pressure and lines for problems with supply. 40-60 psi air supply required for proper operation. 2. Reconnect air line. 3. Inspect and replace if required. 4. Install wire brake properly.

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.



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