A 2000

ULTRAFEED®

VARIAC CONTROLLED WIRE FEEDER

Art # A-07354

Service Manual

Version No: AC.01 **Issue Date:** May 30, 2006 **Manual No.:** 0-4893B

Operating Features:

115 V | 50/60 Hz | 650 IPM | CV

THERMAL ARC®

WARNINGS

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Ultrafeed A 2000 Wire Feeder
Service Manual Number 0-4893B for:
Part # W3200001

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Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Equipment Serial #: _____

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SAFETY INSTRUCTIONS AND WARNINGS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment

connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions. **HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.**

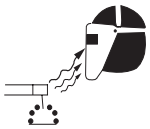
1.01 Arc Welding Hazards

WARNING

ELECTRIC SHOCK can kill.

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

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.



WARNING

ARC RAYS can burn eyes and skin; NOISE can damage hearing. Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.

3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

WARNING

FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breath the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WARNING

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

Eye protection filter shade selector for welding or cutting (goggles or helmet), from AWS A6.2-73.

Welding or cutting	*Electrode Size*	*Filter*	*Welding or cutting*	*Electrode Size*	*Filter*
Torch soldering		2	**Gas metal-arc**		
Torch brazing		3 or 4	Non-ferrous base metal	All	11
Oxygen Cutting			Ferrous base metal	All	12
Light	Under 1 in., 25 mm	3 or 4	Gas tungsten arc welding	All	12
Medium	1 to 6 in., 25-150 mm	4 or 5	(TIG)	All	12
Heavy	Over 6 in., 150 mm	5 or 6	Atomic hydrogen welding	All	12
Gas welding			Carbon arc welding	All	12
Light	Under 1/8 in., 3 mm	4 or 5	Plasma arc welding		
Medium	1/8 to 1/2 in., 3-12 mm	5 or 6	**Carbon arc air gouging**		
Heavy	Over 1/2 in., 12 mm	6 or 8	Light		12
Shielded metal-arc	Under 5/32 in., 4 mm	10	Heavy		14
	5/32 to 1/4 in.,	12	**Plasma arc cutting**		
	Over 1/4 in., 6.4 mm	14	Light	Under 300 Amp	9
			Medium	300 to 400 Amp	12
			Heavy	Over 400 Amp	14

WARNING

FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

WARNING

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WARNING

Engines can be dangerous.

WARNING

ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

WARNING

ENGINE FUEL can cause fire or explosion.

Engine fuel is highly flammable.

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fueling. If possible, check and add fuel to cold engine before beginning job.
4. Do not overfill tank — allow room for fuel to expand.
5. Do not spill fuel. If fuel is spilled, clean up before starting engine.

WARNING

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.

WARNING

SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.

WARNING

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure.

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals know to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety code Sec. 25249.5 et seq.)

NOTE

Considerations About Welding And The Effects of Low Frequency Electric and Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "...there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields and interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures.

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding power source and cables as far away from body as practical.

ABOUT PACEMAKERS:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

1.02 Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1.03 Precautions De Securite En Soudage A L'arc

MISE EN GARDE

LE SOUDAGE A L'ARC EST DANGEREUX

PROTEGEZ-VOUS, AINSI QUE LES AUTRES, CONTRE LES BLESSURES GRAVES POSSIBLES OU LA MORT. NE LAISSEZ PAS LES ENFANTS S'APPROCHER, NI LES PORTEURS DE STIMULATEUR CARDIAQUE (A MOINS QU'ILS N'AIENT CONSULTE UN MEDECIN). CONSERVEZ CES INSTRUCTIONS. LISEZ LE MANUEL D'OPERATION OU LES INSTRUCTIONS AVANT D'INSTALLER, UTILISER OU ENTRETENIR CET EQUIPEMENT.

Les produits et procédés de soudage peuvent sauser des blessures graves ou la mort, de même que des dommages au reste du matériel et à la propriété, si l'utilisateur n'adhère pas strictement à toutes les règles de sécurité et ne prend pas les précautions nécessaires.

En soudage et coupage, des pratiques sécuritaires se sont développées suite à l'expérience passée. Ces pratiques doivent être apprises par étude ou entraînement avant d'utiliser l'equipement. Toute personne n'ayant pas suivi un entraînement intensif en soudage et coupage ne devrait pas tenter de souder. Certaines pratiques concernent les équipements raccordés aux lignes d'alimentation alors que d'autres s'adressent aux groupes électrogènes.

La norme Z49.1 de l'American National Standard, intitulée "SAFETY IN WELDING AND CUTTING" présente les pratiques sécuritaires à suivre. Ce document ainsi que d'autres guides que vous devriez connaître avant d'utiliser cet équipement sont présentés à la fin de ces instructions de sécurité.

SEULES DES PERSONNES QUALIFIEES DOIVENT FAIRE DES TRAVAUX D'INSTALLATION, DE REPARATION, D'ENTRETIEN ET D'ESSAI.

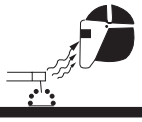
1.04 Dangers relatifs au soudage à l'arc

AVERTISSEMENT

L'ELECTROCUTION PEUT ETRE MORTELLE.

Une décharge électrique peut tuer ou brûler gravement. L'électrode et le circuit de soudage sont sous tension dès la mise en circuit. Le circuit d'alimentation et les circuits internes de l'équipement sont aussi sous tension dès la mise en marche. En soudage automatique ou semi-automatique avec fil, ce dernier, le rouleau ou la bobine de fil, le logement des galets d'entrainement et toutes les pièces métalliques en contact avec le fil de soudage sont sous tension. Un équipement inadéquatement installé ou inadéquatement mis à la terre est dangereux.

1. Ne touchez pas à des pièces sous tension.
2. Portez des gants et des vêtements isolants, secs et non troués.
3 Isolez-vous de la pièce à souder et de la mise à la terre au moyen de tapis isolants ou autres.
4. Déconnectez la prise d'alimentation de l'équipement ou arrêtez le moteur avant de l'installer ou d'en faire l'entretien. Bloquez le commutateur en circuit ouvert ou enlevez les fusibles de l'alimentation afin d'éviter une mise en marche accidentelle.
5. Veuillez à installer cet équipement et à le mettre à la terre selon le manuel d'utilisation et les codes nationaux, provinciaux et locaux applicables.
6. Arrêtez tout équipement après usage. Coupez l'alimentation de l'équipement s'il est hors d'usage ou inutilisé.
7. N'utilisez que des porte-électrodes bien isolés. Ne jamais plonger les porte-électrodes dans l'eau pour les refroidir. Ne jamais les laisser traîner par terre ou sur les pièces à souder. Ne touchez pas aux porte-électrodes raccordés à deux sources de courant en même temps. Ne jamais toucher quelqu'un d'autre avec l'électrode ou le porte-électrode.
8. N'utilisez pas de câbles électriques usés, endommagés, mal épissés ou de section trop petite.
9. N'enroulez pas de câbles électriques autour de votre corps.
10. N'utilisez qu'une bonne prise de masse pour la mise à la terre de la pièce à souder.
11. Ne touchez pas à l'électrode lorsqu'en contact avec le circuit de soudage (terre).
12. N'utilisez que des équipements en bon état. Réparez ou remplacez aussitôt les pièces endommagées.
13. Dans des espaces confinés ou mouillés, n'utilisez pas de source de courant alternatif, à moins qu'il soit muni d'un réducteur de tension. Utilisez plutôt une source de courant continu.
14. Portez un harnais de sécurité si vous travaillez en hauteur.
15. Fermez solidement tous les panneaux et les capots.



AVERTISSEMENT

LE RAYONNEMENT DE L'ARC PEUT BRÛLER LES YEUX ET LA PEAU; LE BRUIT PEUT ENDOMMAGER L'OUIE.

L'arc de soudage produit une chaleur et des rayons ultraviolets intenses, susceptibles de brûler les yeux et la peau. Le bruit causé par certains procédés peut endommager l'ouïe.

1. Portez une casque de soudeur avec filtre oculaire de nuance appropriée (consultez la norme ANSI Z49 indiquée ci-après) pour vous protéger le visage et les yeux lorsque vous soudez ou que vous observez l'exécution d'une soudure.
2. Portez des lunettes de sécurité approuvées. Des écrans latéraux sont recommandés.
3. Entourez l'aire de soudage de rideaux ou de cloisons pour protéger les autres des coups d'arc ou de l'éblouissement; avertissez les observateurs de ne pas regarder l'arc.
4. Portez des vêtements en matériaux ignifuges et durables (laine et cuir) et des chaussures de sécurité.
5. Portez un casque antibruit ou des bouchons d'oreille approuvés lorsque le niveau de bruit est élevé.

AVERTISSEMENT

LES VAPEURS ET LES FUMEES SONT DANGEREUSES POUR LA SANTE.

Le soudage dégage des vapeurs et des fumées dangereuses à respirer.

1. Eloignez la tête des fumées pour éviter de les respirer.
2. A l'intérieur, assurez-vous que l'aire de soudage est bien ventilée ou que les fumées et les vapeurs sont aspirées à l'arc.
3. Si la ventilation est inadequate, portez un respirateur à adduction d'air approuvé.
4. Lisez les fiches signalétiques et les consignes du fabricant relatives aux métaux, aux produits consummables, aux revêtements et aux produits nettoyants.
5. Ne travaillez dans un espace confiné que s'il est bien ventilé; sinon, portez un respirateur à adduction d'air. Les gaz protecteurs de soudage peuvent déplacer l'oxygène de l'air et ainsi causer des malaises ou la mort. Assurez-vous que l'air est propre à la respiration.
6. Ne soudez pas à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir avec des vapeurs et former des gaz hautement toxiques et irritants.

SELECTION DES NUANCES DE FILTRES OCULAIRS POUR LA PROTECTION DES YEUX EN COUPAGE ET SOUDAGE (selon AWS á 8.2-73)

Opération de coupage ou soudage	Dimension d'électrode ou Epiasseur de métal ou Intensité de courant	Nuance de filtre oculaire	Opération de coupage ou soudage	Dimension d'électrode ou Epiasseur de métal ou Intensité de courant	Nuance de filtre oculaire
Brassage tendre au chalumeau	toutes conditions	2	Soudage á l'arc sous gaz avec fil plein (GMAW)		
Brassage fort au chalumeau	toutes conditions	3 ou 4	métaux non-ferreux	toutes conditions	11
Oxycoupage			métaux ferreux	toutes conditions	12
mince	moins de 1 po. (25 mm)	2 ou 3	Soudage á l'arc sous gaz avec électrode de tungstène (GTAW)	toutes conditions	12
moyen	de 1 á 6 po. (25 á 150 mm)	4 ou 5	Soudage á l'hydrogène atomique (AHW)	toutes conditions	12
épais	plus de 6 po. (150 mm)	5 ou 6	Soudage á l'arc avec électrode de carbone (CAW)	toutes conditions	12
Soudage aux gaz			Soudage á l'arc Plasma (PAW)	toutes dimensions	12
mince	moins de 1/8 po. (3 mm)	4 ou 5	Gougeage Air-Arc avec électrode de carbone		
moyen	de 1/8 á 1/2 po. (3 á 12 mm)	5 ou 6	mince		12
épais	plus de 1/2 po. (12 mm)	6 ou 8	épais		14
Soudage á l'arc avec électrode enrobees (SMAW)	moins de 5/32 po. (4 mm)	10	Coupage á l'arc Plasma (PAC)		
	5/32 á 1/4 po. (4 á 6.4 mm)	12	mince	moins de 300 amperès	9
	plus de 1/4 po. (6.4 mm)	14	moyen	de 300 á 400 amperès	12
			épais	plus de 400 amperès	14

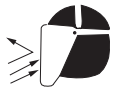
7. Ne soudez des tôles galvanisées ou plaquées au plomb ou au cadmium que si les zones à souder ont été grattées à fond, que si l'espace est bien ventilé; si nécessaire portez un respirateur à adduction d'air. Car ces revêtements et tout métal qui contient ces éléments peuvent dégager des fumées toxiques au moment du soudage.

AVERTISSEMENT

LE SOUDAGE PEUT CAUSER UN INCENDIE OU UNE EXPLOSION

L'arc produit des étincellies et des projections. Les particules volantes, le métal chaud, les projections de soudure et l'équipement surchauffé peuvent causer un incendie et des brûlures. Le contact accidentel de l'électrode ou du fil-électrode avec un objet métallique peut provoquer des étincelles, un échauffement ou un incendie.

1. Protégez-vous, ainsi que les autres, contre les étincelles et du métal chaud.
2. Ne soudez pas dans un endroit où des particules volantes ou des projections peuvent atteindre des matériaux inflammables.
3. Enlevez toutes matières inflammables dans un rayon de 10, 7 mètres autour de l'arc, ou couvrez-les soigneusement avec des bâches approuvées.
4. Méfiez-vous des projections brulantes de soudage susceptibles de pénétrer dans des aires adjacentes par de petites ouvertures ou fissures.
5. Méfiez-vous des incendies et gardez un extincteur à portée de la main.
6. N'oubliez pas qu'une soudure réalisée sur un plafond, un plancher, une cloison ou une paroi peut enflammer l'autre côté.
7. Ne soudez pas un récipient fermé, tel un réservoir ou un baril.
8. Connectez le câble de soudage le plus près possible de la zone de soudage pour empêcher le courant de suivre un long parcours inconnu, et prévenir ainsi les risques d'électrocution et d'incendie.
9. Ne dégelez pas les tuyaux avec un source de courant.
10. Otez l'électrode du porte-électrode ou coupez le fil au tube-contact lorsqu'inutilisé après le soudage.
11. Portez des vêtements protecteurs non huileux, tels des gants en cuir, une chemise épaisse, un pantalon revers, des bottines de sécurité et un casque.



AVERTISSEMENT

LES ETINCELLES ET LES PROJECTIONS BRULANTES PEUVENT CAUSER DES BLESSURES.

Le piquage et le meulage produisent des particules métalliques volantes. En refroidissant, la soudure peut projeter du éclats de laitier.

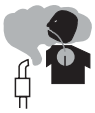
1. Portez un écran facial ou des lunettes protectrices approuvées. Des écrans latéraux sont recommandés.
2. Portez des vêtements appropriés pour protéger la peau.

AVERTISSEMENT

LES BOUTEILLES ENDOMMAGEES PEUVENT EXPLOSER

Les bouteilles contiennent des gaz protecteurs sous haute pression. Des bouteilles endommagées peuvent exploser. Comme les bouteilles font normalement partie du procédé de soudage, traitez-les avec soin.

1. Protégez les bouteilles de gaz comprimé contre les sources de chaleur intense, les chocs et les arcs de soudage.
2. Enchainez verticalement les bouteilles à un support ou à un cadre fixe pour les empêcher de tomber ou d'être renversées.
3. Eloignez les bouteilles de tout circuit électrique ou de tout soudage.
4. Empêchez tout contact entre une bouteille et une électrode de soudage.
5. N'utilisez que des bouteilles de gaz protecteur, des détendeurs, des boyauxs et des raccords conçus pour chaque application spécifique; ces équipements et les pièces connexes doivent être maintenus en bon état.
6. Ne placez pas le visage face à l'ouverture du robinet de la bouteille lors de son ouverture.
7. Laissez en place le chapeau de bouteille sauf si en utilisation ou lorsque raccordé pour utilisation.
8. Lisez et respectez les consignes relatives aux bouteilles de gaz comprimé et aux équipements connexes, ainsi que la publication P-1 de la CGA, identifiée dans la liste de documents ci-dessous.



AVERTISSEMENT

LES MOTEURS PEUVENT ETRE DANGEREUX

LES GAZ D'ECHAPPEMENT DES MOTEURS PEUVENT ETRE MORTELS.

Les moteurs produisent des gaz d'échappement nocifs.

1. Utilisez l'équipement à l'extérieur dans des aires ouvertes et bien ventilées.
2. Si vous utilisez ces équipements dans un endroit confiné, les fumées d'échappement doivent être envoyées à l'extérieur, loin des prises d'air du bâtiment.

AVERTISSEMENT

LE CARBURANT PEUR CAUSER UN INCENDIE OU UNE EXPLOSION.

Le carburant est hautement inflammable.

1. Arrêtez le moteur avant de vérifier le niveau e carburant ou de faire le plein.
2. Ne faites pas le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
3. Si c'est possible, laissez le moteur refroidir avant de faire le plein de carburant ou d'en vérifier le niveau au début du soudage.
4. Ne faites pas le plein de carburant à ras bord: prévoyez de l'espace pour son expansion.
5. Faites attention de ne pas renverser de carburant. Nettoyez tout carburant renversé avant de faire démarrer le moteur.

AVERTISSEMENT

DES PIECES EN MOUVEMENT PEUVENT CAUSER DES BLESSURES.

Des pièces en mouvement, tels des ventilateurs, des rotors et des courroies peuvent couper doigts et mains, ou accrocher des vêtements amples.

1. Assurez-vous que les portes, les panneaux, les capots et les protecteurs soient bien fermés.
2. Avant d'installer ou de connecter un système, arrêtez le moteur.
3. Seules des personnes qualifiées doivent démonter des protecteurs ou des capots pour faire l'entretien ou le dépannage nécessaire.
4. Pour empêcher un démarrage accidentel pendant l'entretien, débranchez le câble d'accumulateur à la borne négative.
5. N'approchez pas les mains ou les cheveux de pièces en mouvement; elles peuvent aussi accrocher des vêtements amples et des outils.
6. Réinstallez les capots ou les protecteurs et fermez les portes après des travaux d'entretien et avant de faire démarrer le moteur.

AVERTISSEMENT

DES ETINCELLES PEUVENT FAIRE EXPLOSER UN ACCUMULATEUR; L'ELECTROLYTE D'UN ACCUMULATEUR PEUT BRULER LA PEAU ET LES YEUX.

Les accumulateurs contiennent de l'électrolyte acide et dégagent des vapeurs explosives.

1. Portez toujours un écran facial en travaillant sur un accumu-lateur.
2. Arrêtez le moteur avant de connecter ou de déconnecter des câbles d'accumulateur.
3. N'utilisez que des outils anti-étincelles pour travailler sur un accumulateur.
4. N'utilisez pas une source de courant de soudage pour charger un accumulateur ou survolter momentanément un véhicule.
5. Utilisez la polarité correcte (+ et –) de l'accumulateur.

AVERTISSEMENT

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT BRULANT SOUS PRESSION PEUVENT BRULER LA PEAU ET LES YEUX.

Le liquide de refroidissement d'un radiateur peut être brûlant et sous pression.

1. N'ôtez pas le bouchon de radiateur tant que le moteur n'est pas refroidi.
2. Mettez des gants et posez un torchon sur le bouchon pour l'ôter.
3. Laissez la pression s'échapper avant d'ôter complètement le bouchon.

1.05 Principales Normes De Securite

Safety in Welding and Cutting, norme ANSI Z49.1, American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33128.

Safety and Health Standards, OSHA 29 CFR 1910, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33128.

National Electrical Code, norme 70 NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, document P-1, Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, norme CSA W117.2 Association canadienne de normalisation, Standards Sales, 276 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, norme ANSI Z87.1, American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme 51B NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1.06 Declaration Of Conformity

CE

Manufacturer: Thermadyne Corporation
Address: 82 Benning Street
West Lebanon, New Hampshire 03784
USA

The equipment described in this manual conforms to all applicable aspects and regulations of the 'Low Voltage Directive' (European Council Directive 73/23/EEC as amended by Council Directive 93/68/EEC) and to the National legislation for the enforcement of this Directive.

The equipment described in this manual conforms to all applicable aspects and regulations of the "EMC Directive" (European Council Directive 89/336/EEC) and to the National legislation for the enforcement of this Directive.

Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.

National Standard and Technical Specifications

The product is designed and manufactured to a number of standards and technical requirements. Among them are:

- CSA (Canadian Standards Association) standard C22.2 number 60 for Arc welding equipment.
- UL (Underwriters Laboratory) rating 94VO flammability testing for all printed-circuit boards used.
- CENELEC EN50199 EMC Product Standard for Arc Welding Equipment.
- ISO/IEC 60974-1 (BS 638-PT10) (EN 60 974-1) (EN50192) (EN50078) applicable to plasma cutting equipment and associated accessories.
- For environments with increased hazard of electrical shock, Power Supplies bearing the S mark conform to EN50192 when used in conjunction with hand torches with exposed cutting tips, if equipped with properly installed standoff guides.
- Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process. This is to ensure the product is safe, when used according to instructions in this manual and related industry standards, and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

Thermadyne has been manufacturing products for more than 30 years, and will continue to achieve excellence in our area of manufacture.

Manufacturers responsible representative:

Steve Ward
Operations Director
Thermadyne Europe
Europa Building
Chorley N Industrial Park
Chorley, Lancashire,
England PR6 7BX

NOTES

SECTION 2: INTRODUCTION

2.01 How To Use This Manual

This Service Manual applies to just the part numbers listed on page i.

To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words **WARNING**, **CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING

A WARNING gives information regarding possible personal injury.

CAUTION

A CAUTION refers to possible equipment damage.

NOTE

A NOTE offers helpful information concerning certain operating procedures.

Additional copies of this manual may be purchased by contacting Thermal Arc at the address and phone number in your area listed in the inside back cover of this manual. Include the Service Manual number and equipment identification numbers.

Electronic copies of this manual can also be downloaded at no charge in Acrobat PDF format by going to the Thermal Arc web site listed below and clicking on the Literature Library link:

http://www.thermalarc.com

2.02 Equipment Identification

The unit's identification number (or part number), model, and serial number usually appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as the gun and cable assemblies are identified only by the part number printed on the shipping container. Record these numbers on the bottom of page i for future reference.

2.03 Symbol Chart

Note that only some of these symbols will appear on your model.

	On
	Off
	Dangerous Voltage
	Increase/Decrease
	Circuit Breaker
	AC Auxiliary Power
	Fuse
A	Amperage
V	Voltage
Hz	Hertz (cycles/sec)
f	Frequency
	Negative
	Positive
	Direct Current (DC)
	Protective Earth (Ground)
	Line
	Line Connection
	Auxiliary Power
115V 15A	Receptacle Rating- Auxiliary Power

1 ~	Single Phase
3 ~	Three Phase
	Three Phase Static Frequency Converter-Transformer-Rectifier
	Remote
X	Duty Cycle
%	Percentage
	Panel/Local
	Shielded Metal Arc Welding (SMAW)
	Gas Metal Arc Welding (GMAW)
	Gas Tungsten Arc Welding (GTAW)
	Air Carbon Arc Cutting (CAC-A)
	Constant Current
	Constant Voltage Or Constant Potential
	High Temperature
	Fault Indication
	Arc Force
	Touch Start (GTAW)
	Variable Inductance
V	Voltage Input

	Wire Feed Function
	Wire Feed Towards Workpiece With Output Voltage Off.
	Welding Gun
	Purging Of Gas
	Continuous Weld Mode
	Spot Weld Mode
t	Spot Time
t1	Preflow Time
t2	Postflow Time
	2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.
	4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.
t	Burnback Time
	Disturbance In Ground System
IPM	Inches Per Minute
MPM	Meters Per Minute

Art # A-04130

2.04 General Information

The ULTRAFEED A 2000 is a semiautomatic, Variac controlled wire feeder capable of a 100% duty cycle. The system offers both load and line voltage compensation helping to maintain a constant wire feed speed, even with changes in the input voltage and/or load. The wire feeder comes complete with a wire spool support assembly.

The ULTRAFEED A 2000's sheet metal box totally encloses the solid state control circuitry. A hinged, latched feedhead cover allows quick and easy access to the feedhead, featuring tool-less quick change feed rolls.

The ULTRAFEED A 2000 comes with an abundance of standard features including:

- an on/off rocker switch
- a circuit breaker for total system protection
- a wire feed speed control
- an inch switch
- a gas purge switch
- electromechanical brake for precise wire stopping
- two quick change, gear-driven feed rolls

The ULTRAFEED A 2000 has been designed to comply with CSA NRTL/C, NEMA EW 3, and IEC 60974-1 standards.

UltraFeed A 2000 Specifications	
Input Voltage:	115 VAC
Input Frequency:	50/60 Hz
Input Voltage Tolerance	±10%
Maximum Input Current	1.5 Amps
Wire Speed Range for All Filler Wire Sizes	30 - 650 ipm .76 - 16.6 m/min
Wire Sizes	0.024 - 5/64" / 0.6 - 2.0 mm
Maximum Wire Coil/Spool Weight	60 lb. / 27 kg
Feed Rolls	2 (Gear Driven)
Welding Current (I)	450 A @ 100% Duty Cycle
Welding Gun/Torch Size (Tweco #4 Std)	5-8" (15.9mm) nominal
Maximum Shielding Gas Inlet Pressure	100 P.S.I. / 6.9 Bar
Weight (Less Wire)	30 lbs. / 13.5 kg
Dimensions HxWxD	10.3 x 12.4 x 19 in. 262 x 315 x 483 mm
Approvals	NEMA EW 3
	IEC 60974-1 (CE)

Table 2-1: Product Specifications

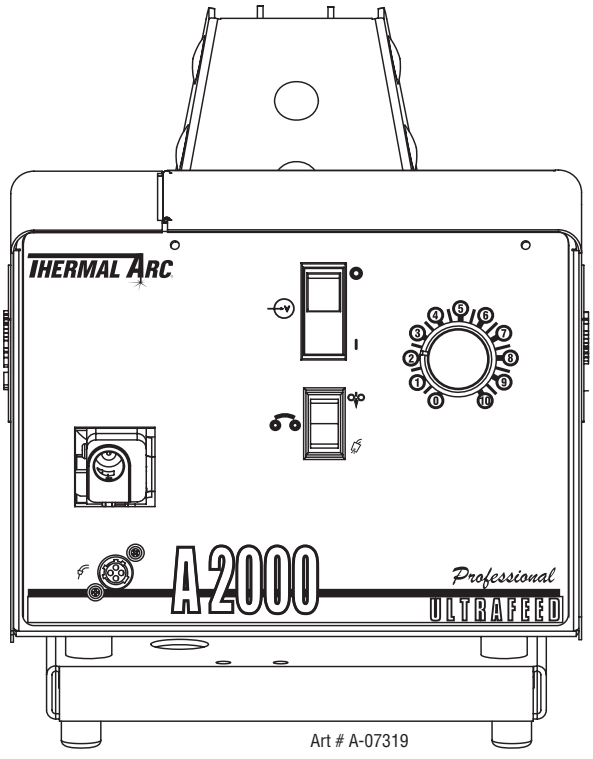


Figure 2-1: ULTRFEED A 2000 Front View

2.05 Features and Benefits

Ready to weld
Supplied with 6ft (2m) control cable with 19-pin male amphenol plug and .030, .035, .045 in (0.8, 0.9, 1.2mm) drive rolls for hard wire.

Inch & purge switches
Cold wire inch and gas purge.

Precision wire alignment
Machined feed head and tension arms ensure wire alignment tolerances ± .002”.

Geared top & bottom drive rolls
Optimized wire traction for improved feedability.

Quick change drive rolls
No tools required.

Speed control fitted

Variac speed control ensured lower operating and repair cost with improved reliability.

Electromechanical brake

Electromechanical control of the motor brake offers precise stopping of the wire.

Circuit breaker fitted
Built-in input circuit breaker provides total system protection.

Welding gun quick disconnect
Quick and easy connection and disconnection of the welding gun.

2.06 Options and Accessories

Refer to the Appendix 2 section in the back of this manual for the list of available options and accessories for this product.

SECTION 3: INSTALLATION

3.01 Connections

Refer to the System Outline drawing in the Appendix of this manual for details.

1. Make the proper welding cable connections between the power source and wire feeder and between the power source and work connection.
2. Connect the control cable from the feeder to the power source. Control cable extensions are available. Refer to the Appendix 2 section in the back of this manual for the list of available options and accessories for this product.

NOTE

An optional 870000-001 adapter cable will be required for connection to a power source with only a 5 pin amphenol connection and AC voltage outlets. An optional 870093B-001 adapter cable will be required for connection to a power source with only a 14 pin amphenol connection. These options are only applicable to 19 pin plug units.

3. Make the proper gas line connection from the gas supply to the wire feeder gas valve (if gas will be used).
4. Attach the welding gun to the wire feeder.
5. Connect the welding gun control leads to the wire feeder gun switch terminals located on the front of the feeder.

3.02 Grounding

To assure operator safety in the case of a fault condition, the frame of the power source (welding machine) must be grounded. The wire feeder sheet metal frame is grounded only through pin G (for 19 pin plug) of the control cable that connects to the power source. Therefore, if the power source frame is not grounded, then, the wire feeder sheet metal frame is not grounded, and a shock hazard could possibly develop. Follow the instructions found in the power source Owner's Manual for correct grounding methods.

3.03 EMI Considerations

Electromagnetic interference (EMI) is common in today's complex industrial environment. At times, EMI levels can become great enough to affect the operation of the machinery. To help reduce and safeguard against EMI levels in the welding area, follow these simple guidelines:

1. Firmly secure all sheet metal panels on the power source and wire feeder. Repair or replace heavily corroded or damaged panels and/or fasteners.
2. Keep the welding cables and control cables as short as possible.
3. Route the '+' and '-' welding cables from a particular power source together.
4. Keep the welding cables as straight as possible; avoid coiling up the cables.
5. Route the control cable away from the welding cables.

NOTE

Grounding of the workpiece may reduce emissions in some, but not all circumstances. To prevent the risk of injury or damage to other electrical equipment when grounding the workpiece, take care to follow all local laws and regulations.

3.04 Installation Of Welding Wire Spool

Refer to Figure 3-1.

NOTE

The wire spool hub supplied with the unit is provided for mounting a 12 inch diameter spool of wire. Optional adapters are available allowing an 8 in diameter spool of wire or a 14 pound coil of wire to be used.

1. Remove the wire spool hub nut by turning counterclockwise.
2. Orient and slide the spool of wire over the wire spool hub so that the wire will feed off the bottom of the spool as the spool rotates counter clockwise. Make sure that the alignment pin on the hub enters the hole in the backside of the wire spool.
3. Replace the wire spool hub nut and turn clockwise to a snug position.

NOTE

The wire must feed from the bottom of the spool. If it comes off, the top the spool will have to be removed and turned around.

3.05 Adjustment Of Spool Tension

Adjust the wire spool tension so that the wire will feed freely into the input wire guide. However, the spool of welding wire must not “coast” when wire feeding stops. To adjust the wire spool tension, tighten or loosen the hub tension bolt accordingly (Refer to Figure 3-1).

NOTE

Excessive tightening of the hub tension bolt will result in a shorter motor life.

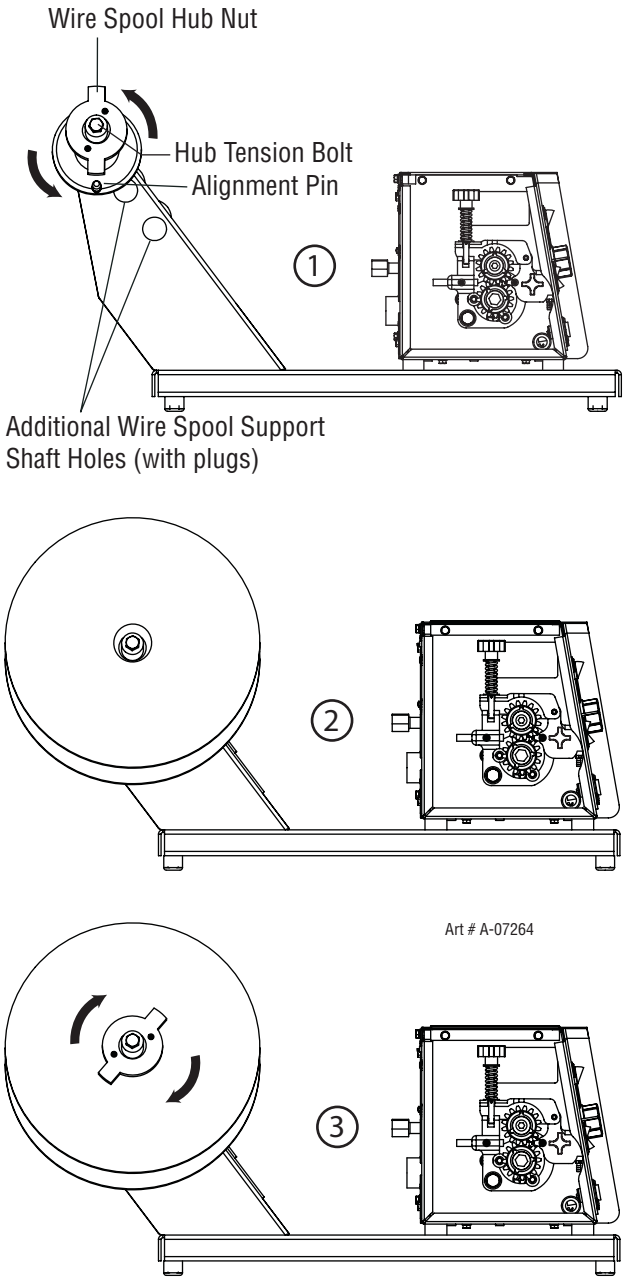


Figure 3-1: Installing Welding Wire Spool

3.06 Input And Output Wire Guide Installation

Refer to Figure 3-2.

Install the input wire guide (the longer one) by loosening the input guide lockscrew and inserting the guide into the hole in the feedhead assembly. The recessed end of the guide should be towards the wire spool. Adjust the guide so that it is clear of the feed rolls and tighten the input guide lockscrew.

Install the output wire guide in the same manner, with the conical end toward the feed rolls. The tip of the conical end should be as close to the feed rolls as practical. Tighten the output guide lockscrew.

NOTE

Before tightening the input and output guide lockscrews, install the drive roll to help in the alignment of the wire guides.

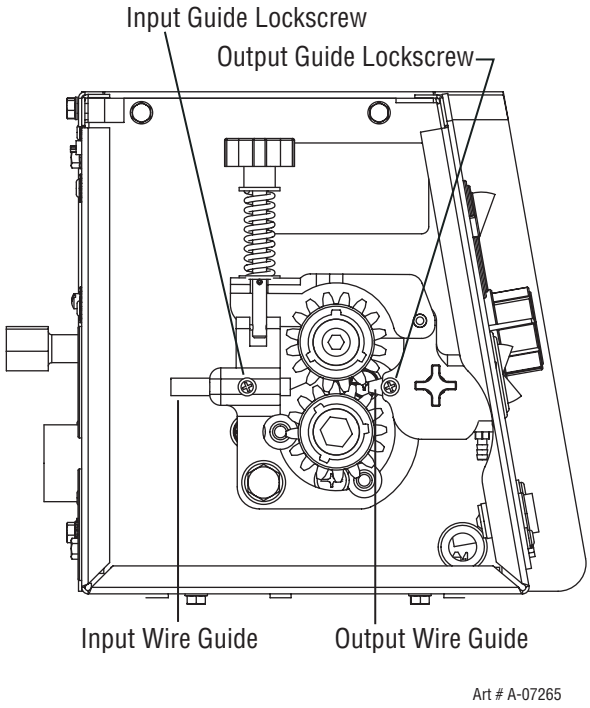


Figure 3-2: Wire Guide Installation

3.07 Selection And Installation Of Feed Rolls

NOTE

Refer to feed roll kit drawing (supplied in the Appendix A-1) to order feed roll kits. Kit includes 2 drive rolls, an input wire guide and an output wire guide for a specific wire type and size.

Style 1: Feed rolls consist of flat smooth top rolls and double smooth, vee grooved bottom rolls. They feed .024 - .068" hard and tubular wire.

Style 2: Feed rolls consist of top and bottom flat knurled top rolls and a double smooth, vee grooved bottom rolls. They feed .030 - .045" hard and tubular wire.

Style 3: Feed rolls consist of top and bottom double smooth, vee grooved drive rolls. This style supports 0.035 to 1/16” soft wire.

Style 4: Feed rolls consist of top and bottom double knurled, vee grooved grooved drive rolls. They feed .045 - 5/64" hard and tubular wire.

Style 5: Feed rolls consist of top and bottom double cog top and bottom rolls. They feed .045 - 5/64" tubular wire.

Style 6: Feed rolls consist of top and bottom double U-grooved top and bottom feed rolls. They feed .035 - 1/16" soft wire.

NOTE

All grooved feed rolls have their wire size or range stamped on the side of the roll. On rolls with different size grooves, the outer (visible when installed) stamped wire size indicates the groove in use.

REMOVING OR INSTALLING FEED ROLLS

Refer to Figure 3-3

1. Twisting the feed roll retainer cap and align the retaining knob splines with the drive gear splines.
2. Place the new feedroll onto the drive gear splines and push it abainst the edge of the gear
3. Twist the feedroll retainer cap about 1/4 turn so that the splines rest against the face of the feedroll.

NOTE

The retainer caps can often be very tight and may require pliers to turn.

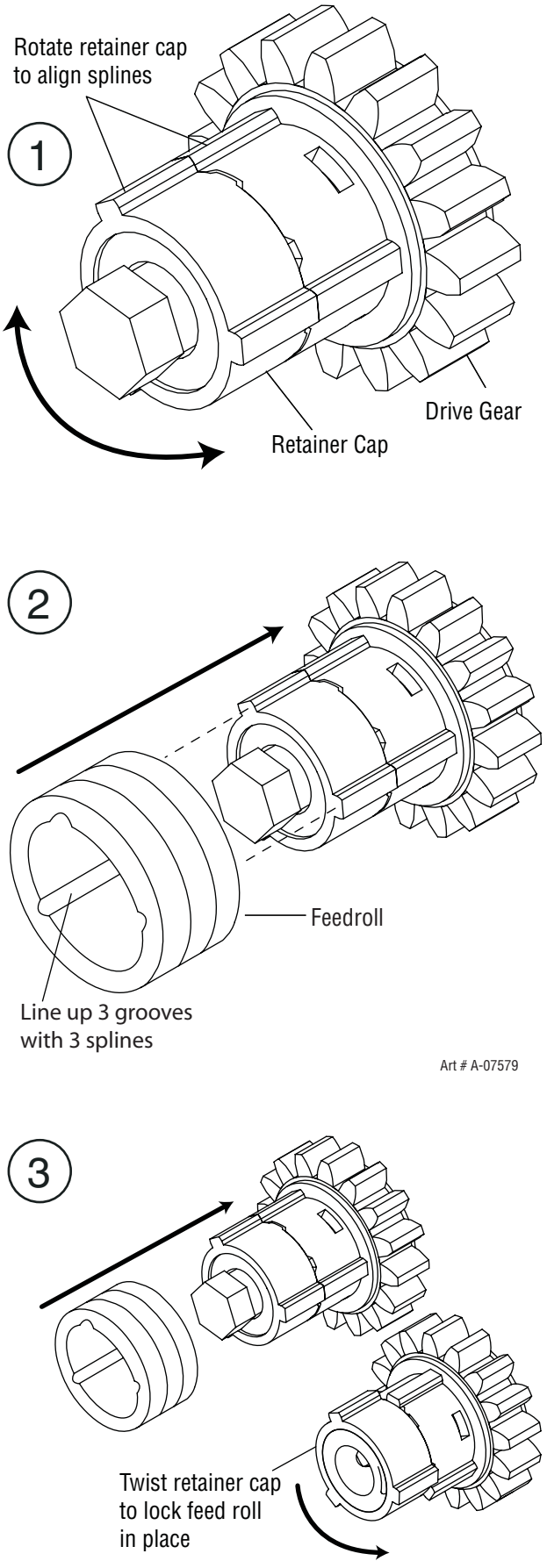


Figure 3-3: Feed Roll Installation

3.08 Welding Gun Compatibility And Installation

Refer to Figure 3-4.

The ULTRAFEED A 2000 wire feeder is designed to be used with most welding guns. In some cases, a special adapter may be required.

To install the welding gun, simply loosen the gun clamp knob and insert the welding gun into the feedhead until it stops. Tighten the gun clamp knob and connect the welding gun control wires to the gun switch receptacle.

NOTE

Before inserting the welding gun into the feedhead, make sure the gun clamp knob does not extend into the feedhead; otherwise, the welding gun cannot be properly inserted.

NOTE

Check for gas leaks. If leaking gas, gun is not all the way into the feedhead.

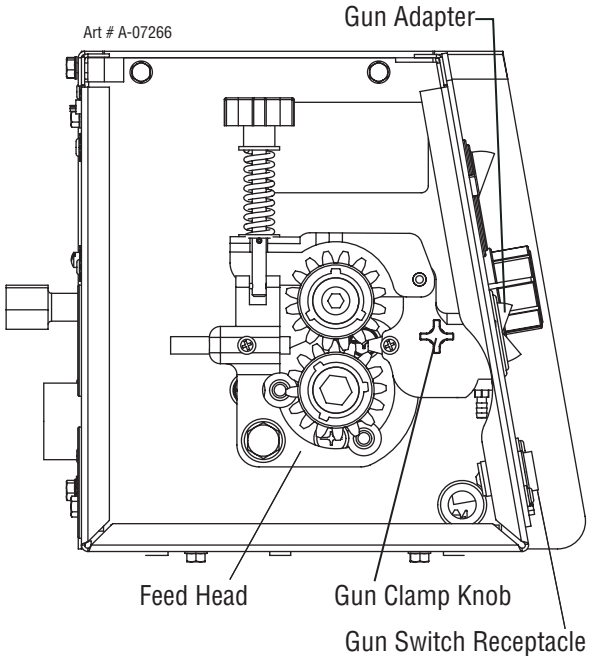


Figure 3-4: Welding Gun Installation

3.09 Threading Wire Into Feedhead

Refer to Figure 3-5.

WARNING

ELECTRIC SHOCK CAN KILL! Make certain the power source and wire feeder are turned OFF. Do not turn the power ON until told to do so in these instructions.

CAUTION

Use care when handling the spooled wire as the wire tends to "unravel" when loosened from the spool. Grasp the end of the wire firmly, and don't let it get away from you. Make sure that the end of the wire is straight and free of burrs.

1. Place end of the welding wire into the input wire guide. Feed it through the guide and over the drive roll groove closest to the feedhead casting.
2. Loosen the spring tension knob and pull the tension lever toward you to unlock the pressure arm.
3. Lift the pressure arm up and pass the wire through the output wire guide and into the welding gun assembly (refer to welding gun manual).
4. Close the pressure arm, and lock in position with the tension lever. To adjust the amount of force the roll exerts on the welding wire, turn the spring tension knob clockwise for increased force or counterclockwise for decreased force.

NOTE

If the force applied to the wire is too great, the welding wire will "bird nest" in the feedhead and not feed properly.

5. Turn the welding machine and wire feeder ON, and set the wire feed speed control to midrange (Refer to Figure 4-1). Remove contact tube from welding gun. Refer to the Gun Manual. Press the gun switch or INCH switch until wire feeds out past the gas diffuser. Thread the contact tube over the wire and lock into place and tighten. Cut wire off at about 1/4 inch (6 mm) from the nozzle.

WARNING

The wire is electrically "HOT" if wire is fed by depressing the gun switch. Wire contact with the workpiece will cause an arc with the gun switch depressed. Feed motor will run feeding "HOT" wire.

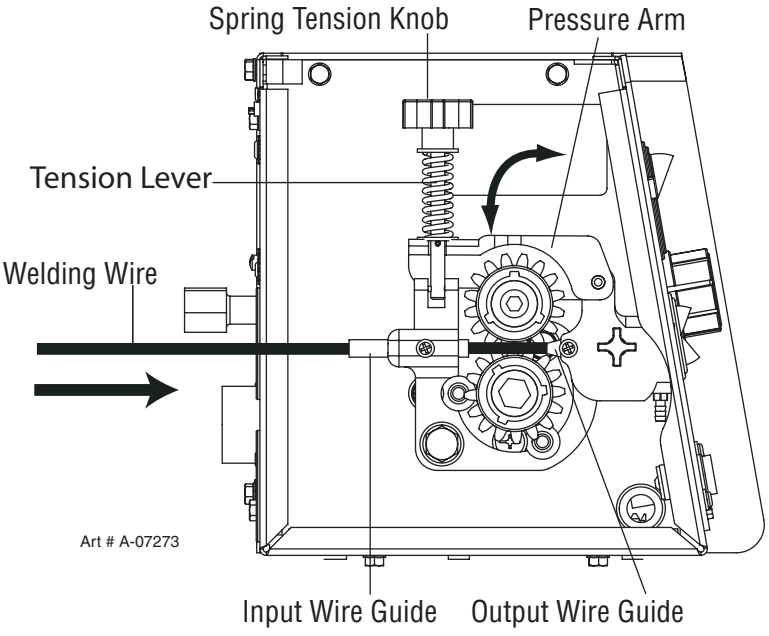


Figure 3-5: Threading Wire Into Feedhead

SECTION 4: OPERATION

4.01 Prewelding Procedure

Follow all installation instructions for the wire feeder, the welding power source, and the welding gun before attempting to operate the ULTRAFEED A 2000.

1. Make sure all necessary connections have been made (Refer to “Connections” in the Installation chapter of this manual).
2. Turn ON the power source and the wire feeder.
3. Push the PURGE switch of the feeder and adjust the flow of shielding gas.
4. Push the INCH switch of the feeder and adjust the wire feed speed to the desired value by means of the wire feed speed control.

WARNING

If the gun switch is depressed, the electrode (welding wire) is electrically “hot”. Do not permit it to touch any metal or a welding arc may be established which may be injurious to someone’s eyes (flash) or skin (burn).

5. Adjust the voltage of the power source to the desired value. The gun switch must be triggered to close power source contactor.

WARNING

In semiautomatic or automatic wire welding, the welding wire, wire reel (if used), input guide, feed rolls, output guide, feedhead, and welding gun metal parts are all ELECTRICALLY “HOT”.

4.02 Front Panel

1. **GUN SWITCH RECEPTACLE:** The gun switch receptacle accepts the welding gun control wires. The gun switch receptacle is where a gun switch closure is inputted to the wire feeder.
2. **INCH/PURGE SWITCH:** Depressing the INCH switch (which is in the up position) will feed wire at a speed set by the WFS control. The wire will not be elecrically hot when using the INCH switch. Depressing the PURGE switch (which is in the down position) will allow shielding gas to flow out of the welding gun without feeding wire.
3. **POWER ON/OFF SWITCH:** This switch only the wire feeder and not the power source (welding machine). It is used as an on/off switch and also serves as a circuit breaker.

NOTE:

If the circuit breaker trips, it turns the power switch to the OFF position. A short cooling period must be allowed before an attempt is made to reset the unit by placing the switch in the ON position.

4. **Wire Feed Speed CONTROL:** This knob controls wire feed speed. The wire feed speed can be adjusted during setup or actual welding.

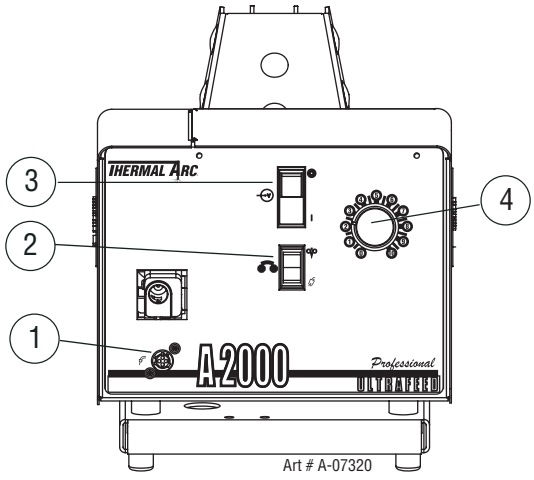


Figure 4-1: Front Panel Controls and Connections

4.03 Rear Panel Controls &Connections

1. **CONTROL CABLE SOCKET:** The control cable connects to the power source at this 19-pin connector (of which 5 pins are used). It contains the signals required to allow the welding power source and the wire feeder to work together as a system. (Refer to Fig 4-2 and 4-3).

WARNING

The protective earth ground (pin G) of the control cable is established only when the power source is properly grounded. See the power source owner's manual for proper grounding methods. Also refer to page 3-1.

Control Cable Pin	Function
A	Contactor Hot Relay Closure To Energize
B	Contactor Neutral Power Source
C	Not Used
D	Not Used
E	120 VAC Hot
F	120 VAC Neutral
G	Protective Earth Ground
H	Not Used
J	Not Used
K	Not Used
L	Not Used
M	Not Used
N	Not Used
P	Not Used
R	Not Used
S	Not Used
T	Not Used
U	Not Used
V	Not Used

Table 4-1: 19-Pin Control Cable Connections

CAUTION

The relay contacts between pins A and B have a maximum rating of 1/3 Horsepower (HP), 115 VAC or 10A, 230 VAC.

If the power source only has a 5 pin amphenol and AC voltage outlets, an 870000-001 adapter cable will be required for proper hookup with the ULTRAFEED A 2000 wire feeder.

If the power source only has a 14 pin amphenol, a 870093B-001 adapter cable will be required for proper hookup with the ULTRAFEED A 2000 wire feeder. Refer to Appendix 2 Options and Accessories.

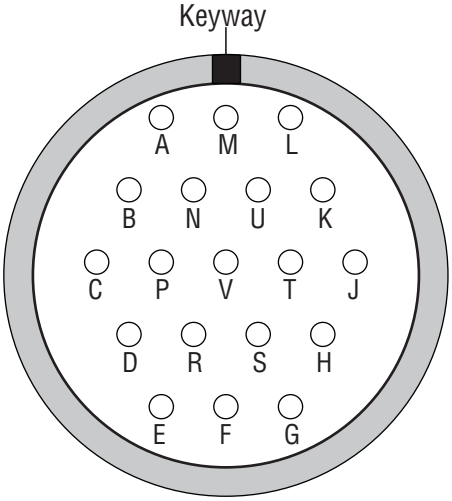


Figure 4-2: Rear Panel 19 pin connections

2. **GAS VALVE INLET:** This is where the shielding gas hose is connected to the wire feeder. The gas valve controls the "on/off" flow of shielding gas through the welding gun.
3. **WIRE FEED ACCESS:** This is where the welding wire feeds through the sheet metal housing to the wire feeder.
4. **WELDING CURRENT LEAD ACCESS:** This is where the welding current lead from the power supply feeds through the sheet metal housing.

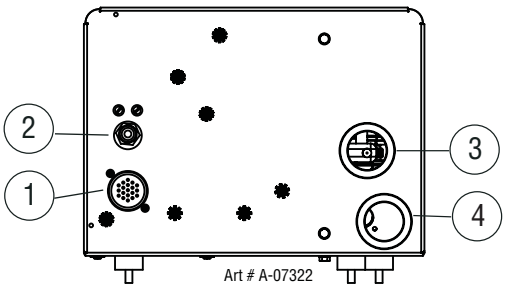


Figure 4-3: Rear Panel Connections

4.04 Feedhead Components

1. **INPUT GUIDE LOCKSCREW:** Tighten this lockscrew to secure the input wire guide.
2. **SPRING TENSION KNOB:** Use the spring tension knob to adjust the amount of force the feed rolls exert on the welding wire.
3. **FEEDROLL GEAR / KNOB :** This knob is used to secure the feedroll to the pressure arm. Rotate the knob to change the feedroll.
4. **PRESSURE ARM:** This arm pivots off the front of the feedhead to allow access to the wire guides and wire path.
5. **GUN CLAMP KNOB:** This knob is used to tighten the welding gun into the feedhead.
6. **WELD CABLE CONNECTION:** This is where the power source welding cable is connected to the feeder. Make sure this connection is tight or arcing could occur.
7. **INPUT WIRE GUIDE:** This guide is required to direct the welding wire from the wire reel to the drive roll.
8. **OUTPUT WIRE GUIDE:** This guide is required to direct the welding wire from the drive roll to the welding gun cable.
9. **WIRE SPOOL HUB NUT:** The wire spool hub nut is used to secure the spool of welding wire.
10. **HUB TENSION BOLT:** The hub tension bolt is used to adjust the wire spool tension which acts as a mechanical brake to assist in the stopping of the welding wire when the gun switch is released.

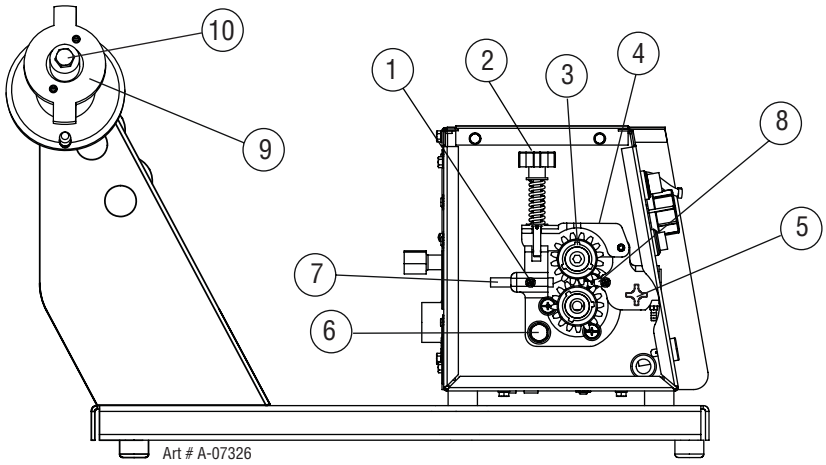


Figure 4-4: Feedhead Components

4.05 Power Source Compatibility

The Ultrafeed A 2000 wire feeder will work with any Thermal Arc CV or CC/CV power source. If the Thermal Arc power source only offers a 5 pin amphenol connector and AC voltage outlets, a 870000-001 adapter cable will be required to connect between the 19 pin control cable of the wire feeder and the 5 pin amphenol connector and AC voltage outlets of the power source.

If the Thermal Arc power source only offers a 14 pin amphenol connector, a 870093B-001 adapter cable will be required to connect between the 19 pin control cable of the wire feeder and the 14 pin amphenol connector of the power source.

The Ultrafeed A 2000 will also work with most competitive power sources that provide 115 VAC and require a relay closure to become energized.

4.06 Power Source Compatability Details

Power Source Compatibility Details	
Machine	**Details**
PowerMaster 500	Fully Compatible
PowerMaster 500P	Fully Compatible
ExcelArc 6045	Fully Compatible
ExcelArc 8065	Fully Compatible
Fabstar 4030	Fully Compatible
Arc Master 300 MST	Fully Compatible
Arc Master 400 MST	Fully Compatible
Arc Master 400 MSTP	Fully Compatible

Figure 4-5: Power Source Compatability

SECTION 5: MAINTENANCE

5.01 Cleaning The Unit

Periodically, clean the inside of the wire feeder and feedhead assembly by using a vacuum cleaner or clean, dry, compressed air of not more than 25 psi/172 kPa/1.72 bar pressure. After cleaning the unit, check all electrical components for loose or faulty connections and correct if necessary.

5.02 Cleaning The Feed Rolls

Clean the grooves on the lower drive roll frequently. This cleaning operation can be done by using a small wire brush. Also, wipe off or clean the grooves on the upper roll. After cleaning the feed rolls, tighten the feed roll retaining knobs accordingly.

5.03 Feedhead Maintenance

The only point of maintenance in the feedhead assembly is the motor brushes. Inspect these about every 300 hours of operation. When these brushes are worn to about 1/8" (3.2 mm), new brushes should be installed.

CAUTION

Neglect in brush maintenance may cause damage to the drive motor commutator resulting in a shorter motor operating life.

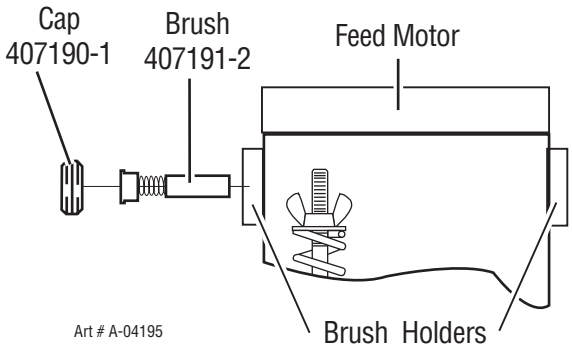


Figure 5-1: Brush Maintenance

5.04 System Maintenance

Scope

The troubleshooting guide is intended to be used by qualified service technicians. The troubleshooting guide contains information which can be used to diagnose and correct unsatisfactory operation or failure of the various components of the wire feeder. Each symptom of trouble is followed by a list of probable causes and the procedure necessary to correct the problem.

Safety

To ensure safe operation and service, read this entire manual before attempting to service or repair this machine. The service technician may be asked to check voltage levels while the machine is turned ON. To assure safety, use care and follow all instructions accordingly.

5.05 Gas Valve Maintenance

Foreign material inside the valve body is the major cause of gas valve failure or improper operation. Foreign material usually enters the valve body when disconnected gas lines are allowed to come in contact with the floor or ground before being connected or reconnected to the gas valve.

In general, sluggish operation and/or gas leakage are signs the gas valve needs to be cleaned internally. To clean the gas valve internally, follow these steps:

NOTE

Before disassembly of the gas valve, take note of the orientation of inlet (marked IN) and outlet ports with respect to electrical connections. The reassembled gas valve should have the same orientation.

1. Remove input power from the wire feeder, and depressurize the gas valve.
2. Remove the gas valve from the wire feeder.
3. Remove the (2) bracket screws and bracket from the yoke of the gas valve.
4. Slip the yoke (containing coil) off the plugnut/core tube subassembly.
5. Remove the plugnut/core tube subassembly with the body gasket attached.
6. Remove the core assembly and core spring.
7. All parts should now be inspected for foreign material and cleaned with a lint-free cloth. Do not nick or scratch any internal parts of the gas valve.
8. Reassemble the gas valve in reverse order of disassembly paying careful attention to Figure 5-2.

NOTE

Tighten (2) bracket screws evenly to insure proper body gasket compression. Torque bracket screws to 20 inch-pounds (2.3 Newton Meters).

9. Assemble the gas valve to the wire feeder.

NOTE

It may be necessary to apply pipe compound sparingly to the gas adapter male threads only. Do not apply compound to female threads of gas valve or first two threads of male fittings. Also, make sure the inlet port (marked IN) side of the gas valve is connected to the main gas supply; otherwise, the gas valve will leak.

After maintenance, operate the gas valve a few times to be sure of proper operation. If the gas valve continues to show signs of improper operation, replace the gas valve assembly.

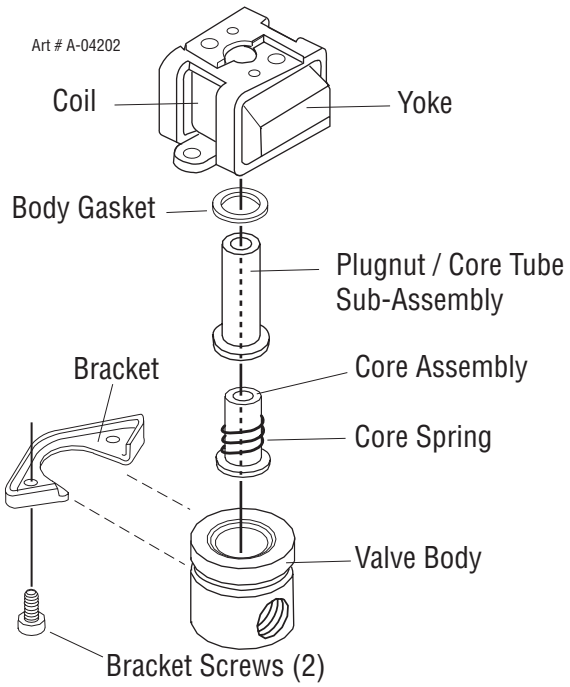


Figure 5-2: Gas Valve Assembly

SECTION 6: TROUBLESHOOTING

6.01 Troubleshooting Hints

Examine connections for proper assembly and contact before replacing an electrical component or printed circuit board. Wire lugs should be in tight contact with the lead's conductor and should be crimped to the lead's insulation. The mating surfaces of the connection should be clean and free of oxidation.

Faulty connections or wiring problems are often the cause of an equipment malfunction!

Do not pull on wires to disassemble connections. Firmly grasp each lug or connector when disconnecting. Pulling on wires for disassembly can damage the integrity of the connection and cause future malfunctions.

Prior to disassembly or servicing of the machine, note the wiring and connections in the machine. Reassembling should place the wires in the same location and routing as received from the factory. Keep wires and leads away from hot parts and sharp objects.

All signals referenced in the following troubleshooting guide can be measured with a digital multimeter (DMM).

6.02 Troubleshooting Guide

NOTE

Refer to the Connection Diagram and the Schematic Diagram in the Appendix chapter of this manual for graphical assistance in disassembling and troubleshooting the wire feeder.

WARNING

ELECTRIC SHOCK can kill.

Follow all safety precautions.

Do not touch live electrical parts.

Turn OFF input power before servicing the machine unless otherwise noted.

Only qualified technicians are to service the machine.

WARNINGS

PC boards and their components are static sensitive devices.

Use static proof bags.

Use grounded wrist strap.

Only qualified personnel should test or handle these devices.

NOTE

Refer to the Appendix 3 Connection and Schematic Diagrams in the Appendix Section of this manual for graphical assistance in disassembling and troubleshooting the wire feeder.

The acceptable tolerance (in most cases) on resistance and voltage measurements made with the DMM is ±10%.

Use only genuine replacement parts.

A. Unit is completely inoperative - nothing functions

1. *Make sure all connections have been made to both the power source and wire feeder.*
   a. See Connections section of this manual.
2. *Make sure both the power source and wire feeder are turned ON.*
3. *Make sure ground fault protection circuit has not activated.*
   a. If the ground fault protection has activated, input power will have to be reset before normal operation can resume.
4. *Check for a damaged control cable (P1) that connects between the power source and wire feeder.*
5. *Check for a tripped circuit breaker (S2).*
   a. If the circuit breaker trips, it turns the power switch (S2) to the OFF position. A short cooling period must be allowed before an attempt is madeto reset the unit by placing switch S2 in the ON position.
6. *Check for a damaged power on/off switch (S2).*
7. *Check on/off switch (S2), terminal block (TB1), variable transformer (T1), and stepdown transformer (T2) for loose or faulty connections.*
   a. With input power supplied to the wire feeder and the on/off switch ON, measure the AC voltage from TB1-1 to TB1-2. The measured voltage should be 120 VAC.
   b. If not, check for an .activated. protection device in the power source.

B. Wire feed motor operates but wire does not feed or feeds erratically

1 *Check for incorrect voltage and/or wire feed speed settings.*
2. *Make sure all connections to the wire feeder are tight.*
3. *Make sure feed rolls are of the correct size and properly installed.*
4. *Check for too little or too much pressure on the welding wire.*
   a. See spring tension knob in the Interior Components section of this manual.
5. *Check to see if wire spool tension is too great.*
   a. See Adjustment Of Spool Tension section of this manual.
6. *Check for restriction in welding gun and/or contact tip.*
7. *Check for the correct size welding gun liner and contact tip for welding wire being used.*
8. *Check for failed insulator on drive gear assembly - motor shaft turning inside insulator*
   a. Replace drive gear assembly.

C. Wire wraps around the feed rolls

1. *Check for too much pressure on the welding wire.*
   a. See spring tension knob in the Interior Components section of this manual.
2. *Check for proper alignment of the input and output wire guides.*
3. *Check for the correct size welding gun liner and contact tip for welding wire being used.*

D. Wire does not feed with gun switch depressed

1. *Check to see if the feed rolls are mechanically restricted.*
2. *Move the WFS control knob (on the front panel) off the minimum setting.*
3. *Check the continuity of the welding gun trigger leads with the trigger depressed.*
   a. If no continuity, repair or replace the welding gun.
4. *Check all components for loose or faulty connections.*
5. *With the wires removed from resistor (R1), measure the resistance. The measured resistance should be in the range of 4.6 to 6.6 ohms.*
   a. If not, replace resistor (R1).
6. *With input power supplied to the wire feeder and the on/off switch ON, check the following items:*
   a. Measure the AC voltage across the secondary of the stepdown transformer (T2). The measured voltage should be 24 VAC.

      If not, replace the stepdown transformer (T2).
   b. Depress the welding gun trigger; relay (K1) should operate.

      If not, replace relay (K1).
   c. With the WFS control set to maximum, measure the AC voltage from the wiper of the variable transformer (T1) to TB1-2. The measured voltage should be 120 VAC.

      If not, replace the variable transformer (T1).
7. *Check wear on motor brushes.*
   a. See Feedhead Maintenance in the Maintenance chapter of this manual.
8. *Replace bridge rectifier (CR1) if necessary.*

E. Wire feed motor continues to run after gun switch has been released

1. *Check the continuity of the welding gun trigger leads with the trigger released.*
   a. If shorted, repair or replace the welding gun.
2. *Check for a shorted gun switch receptacle (J1), terminal block (TB1), or inch/purge switch (S1).*
3. *Check to see if relay (K1) is functioning properly.*

F. No wire feed speed (WFS) control

1. *Check for a loose WFS control knob.*
2. *Check variable transformer (T1), bridge rectifier (CR1), and terminal block (TB1) for loose or faulty connections.*
3. *With input power supplied to the wire feeder and the on/off switch ON, measure the AC volt-age from the wiper of the variable transformer (T1) to TB1-2. The measured voltage should change from 0 to 120 VAC while adjusting the WFS control knob from minimum to maximum.*
   a. If not, replace the variable transformer (T1).

G. Wire feeds but no gas flows

1. *Check to see if the gas cylinder is empty or the valve closed.*
2. *Make sure the proper gas flow rate has been set.*
3. *Check for a possible restriction in the gas line or gas valve.*
4. *Check to see if the welding gun nozzle is plugged.*
5. *Check gas valve (L1), terminal block (TB1), and inch/purge switch (S1) for loose or faulty connections.*
6. *With input power supplied to the wire feeder and the on/off switch ON, measure the AC volt-age across the gas valve terminals with the welding gun trigger depressed. The measured voltage should be 24 VAC.*
   a. If 24 VAC is present on the gas valve terminals and gas does not flow, replace the gas valve (L1).

H. Gas Flows all the time or leaks

1. *Make sure all connections are tight.*
2. *Check for foreign material inside the gas valve.*
    a. See Gas Valve Maintenance in the Maintenance chapter of this manual.

I. Wire feeds but there is no arc

1. *Make sure all connections have been made to both the power source and wire feeder.*
    a. See Connections section of this manual.
2. *Check for a damaged control cable (P1) that connects between the power source and wire feeder.*
3. *Check relay (K1), inch/purge switch (S1), and terminal block (TB1) for loose or faulty connections.*
4. *With input power supplied to the wire feeder and the on/off switch ON, depress the welding gun trigger. Make sure .all. relay (K1) contacts are properly operating.*
    a. If not, replace relay (K1).

J. Wire does not feed with inch switch depressed or gas does not flow with purge switch depressed

1. *Check inch/purge switch (S1) and terminal block (TB1) for loose or faulty connections.*
2. *Check for a defective inch/purge switch (S1).*

SECTION 7: PARTS LIST

7.01 Equipment Identification

All identification numbers as described in the Introduction chapter must be furnished when ordering parts or making inquiries. This information is usually found on the nameplate attached to the equipment. Be sure to include any dash numbers following the Part or Assembly numbers.

7.02 How To Use This Parts List

The Parts List is a combination of an illustration and a corresponding list of parts which contains a breakdown of the equipment into assemblies, subassemblies, and detail parts. All parts of the equipment are listed except for commercially available hardware, bulk items such as wire, cable, sleeving, tubing, etc., and permanently attached items which are soldered, riveted, or welded to other parts. The part descriptions may be indented to show part relationships.

To determine the part number, description, quantity, or application of an item, simply locate the item in question from the illustration and refer to that item number in the corresponding Parts List.

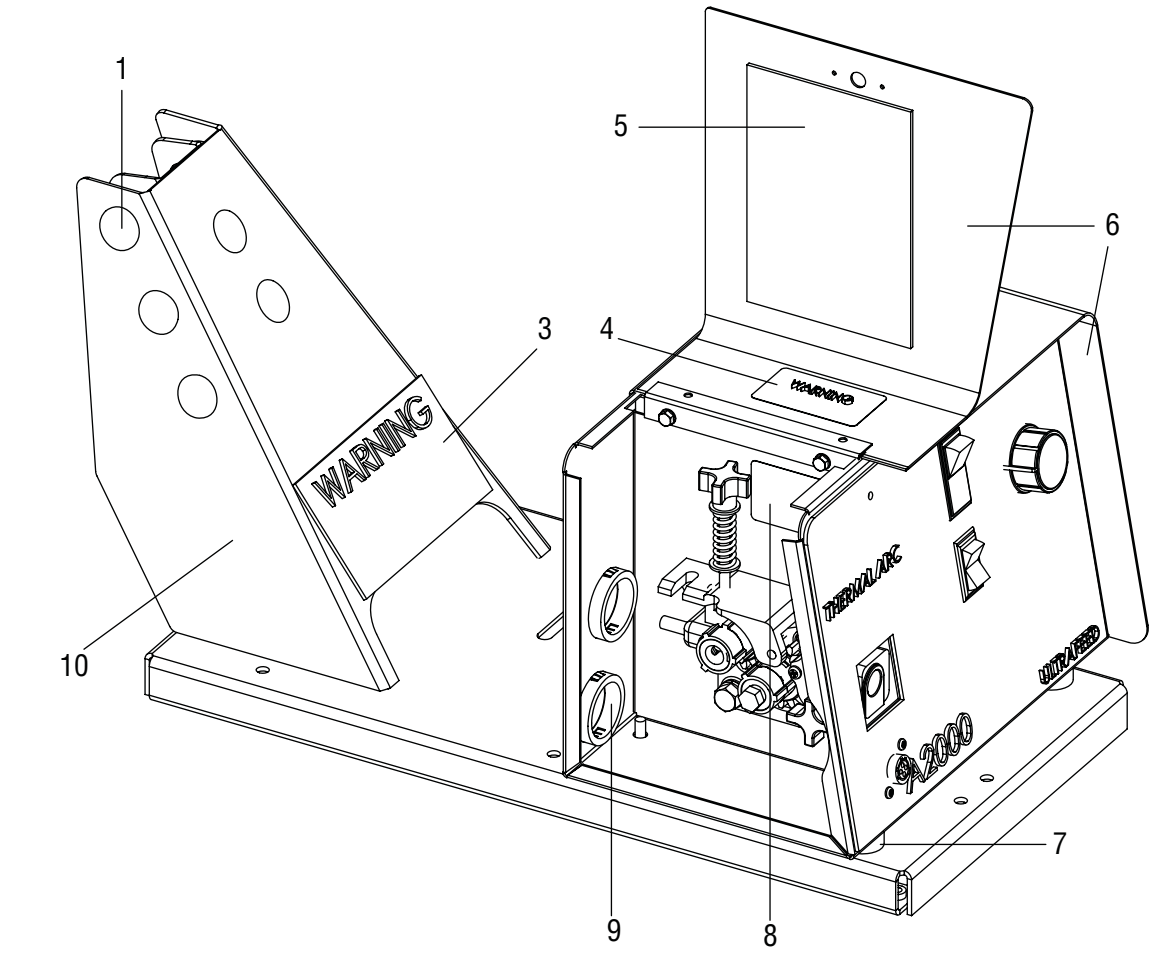
PART NUMBER:

W3200001

7.03 External Components and Labels

Item	Qty.	Ref. Des.	Description	Part Number
1	8		Plug, Black Nylon Snap, WF	870716PKD
3	1		Label, Precaution, Arc Equip	204036
4	1		Label, Electric Shock US, WF	407099
5	1		Label, Feeder, WF	170101
6	1		Cover,Assy,VA2000/A2000	871242PKD
7	4		Spacer, Threaded M6 Rubber, WF	870729PKD
8	1		Label,Moving Parts, WF	406636
9	2		Bushing, Snap, WF	405362-002
10	1		Base Assembly,VA2000/A2000	870731WBLKPKD
12	1		Spool, Hub Assembly, WF	870987PKD
13	1		Spool, Hub Locking Nut, WF	170201-002
14	1		Screw,Hex HD,3/8"-16x1",STZP	See Note
15	1		Hub, Spool Spacer, WF	405449
16	1		Spring,Spool Hub	400562-027
17	1		Spacer, Spool Tension, WF	375683
18	1		Hub, Wire Spool	405376
19	1		Shaft, Wire Spool, WF	375176

Note: This part may be purchased locally.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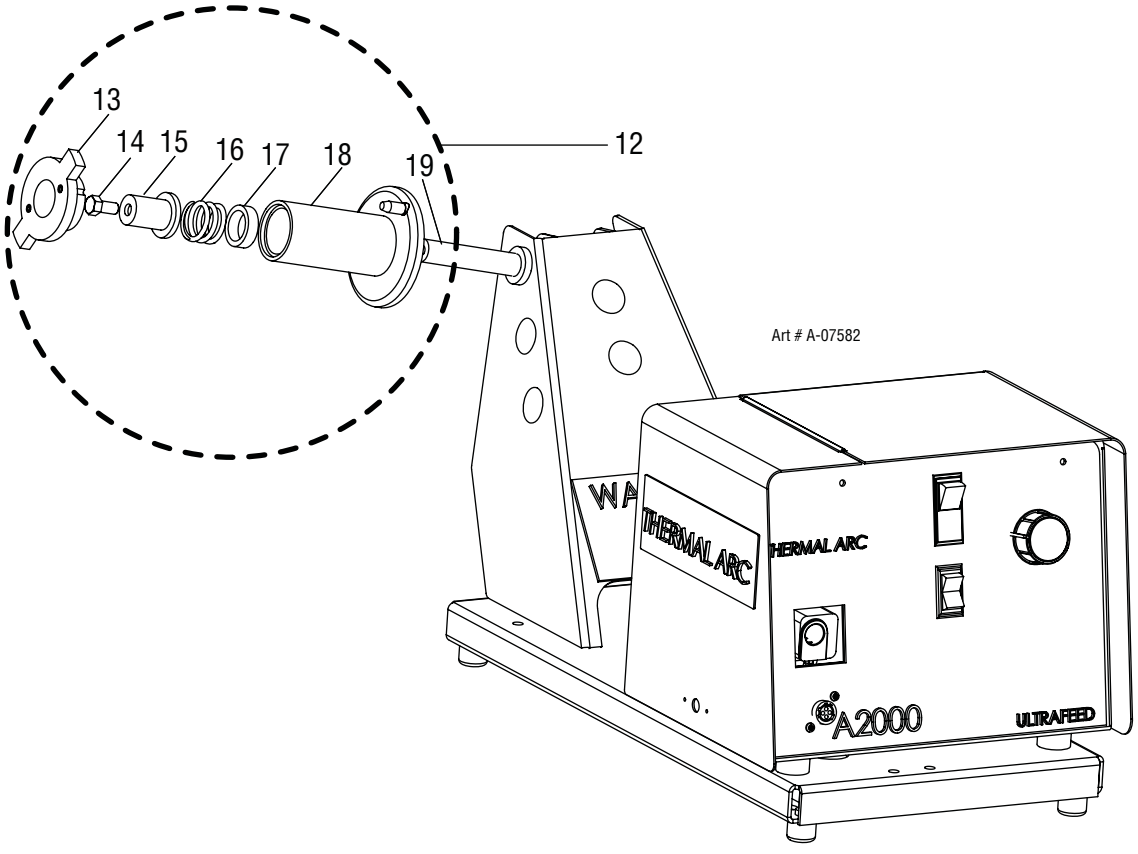
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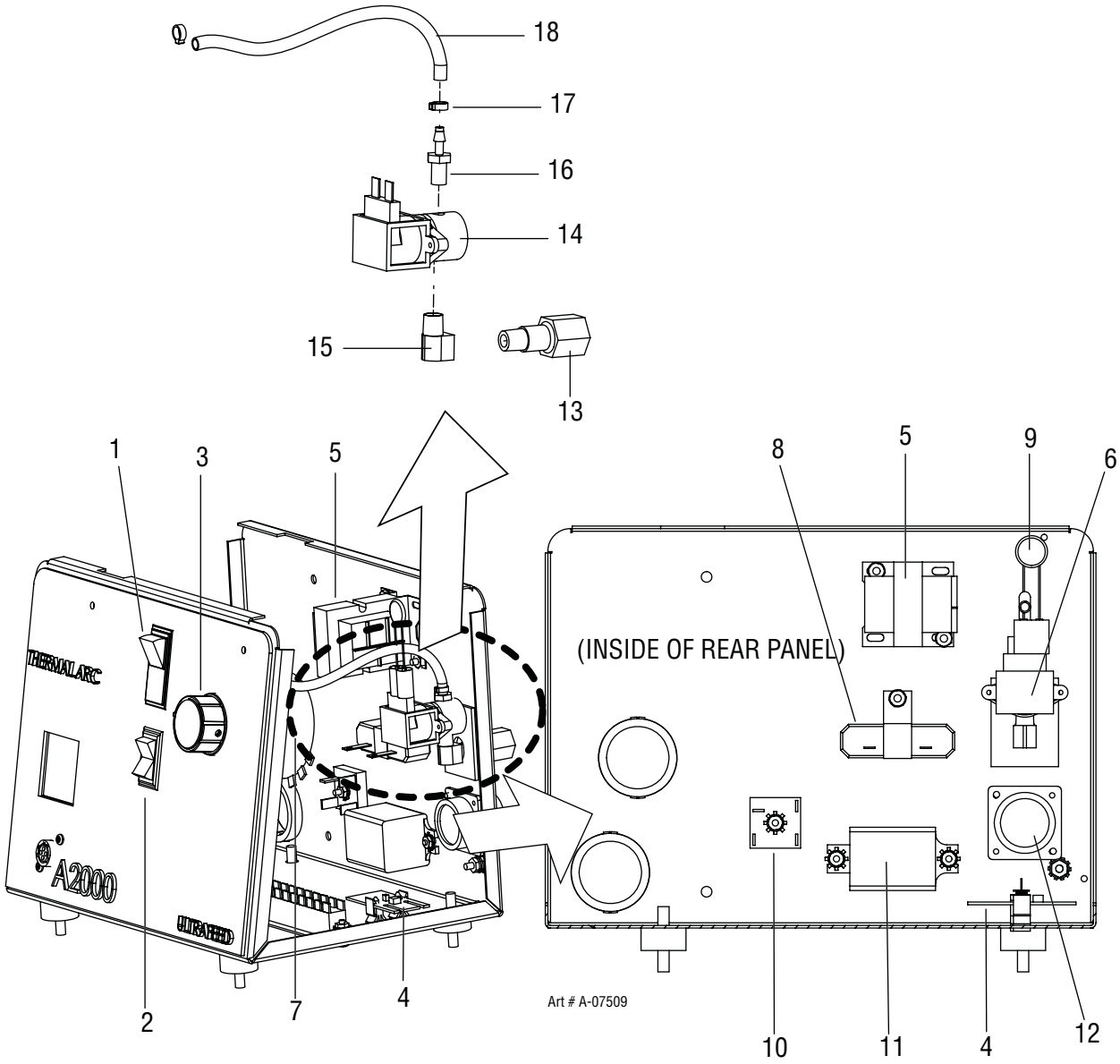
THERMAL ARC
THERMAL ARC
A2000
ULTRAFEED

7.04 Electrical Components

Item	Qty.	Ref. Des.	Description	Part Number
1	1	S1	Switch, Rocker, 1.5 Amps, WF	870032-001
2	1	S2	Switch, 4PDT,(Inch, Purge), WF	407135-001
3	1		Knob,Control,1/4" IDx1.6"	870696PKD
4	1		PCB, Ground Circuit, WF	375581
5	1	T1	Transformer,Control,120V-24V	16DA3134
7	1		Transformer, Powerstat, WF	400244
8	1		Resistor,5.6 Ohm,30W, WF	405626-003
9	1		Suppressor, W/Lug AY., WF	202258-001
10	1		Rectifier, Bridge, 35A, 800V	409554-002
11	1		Relay, Enclosed, WF	403056-011
12	1		Wire Harness, A2000, WF	870980PKD
13	1		Adaptor, Gas RH 1/8NPT-5/8, WF	7978024PKD
14	1	L1	Valve, Solenoid, 24VAC, WF	404162-008
15	1		Fitting, Elbow street 90, WF	7978025PKD
16	1		Fitting, Barbed, Polypro, WF	203846-002
17	2		Wire Tie, Nylon, 4"	See Note
18	1		Tube, Water or Gas, WF	16DA3304-017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(INSIDE OF REAR PANEL)
THERMALARC
A2000
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Art # A-07509
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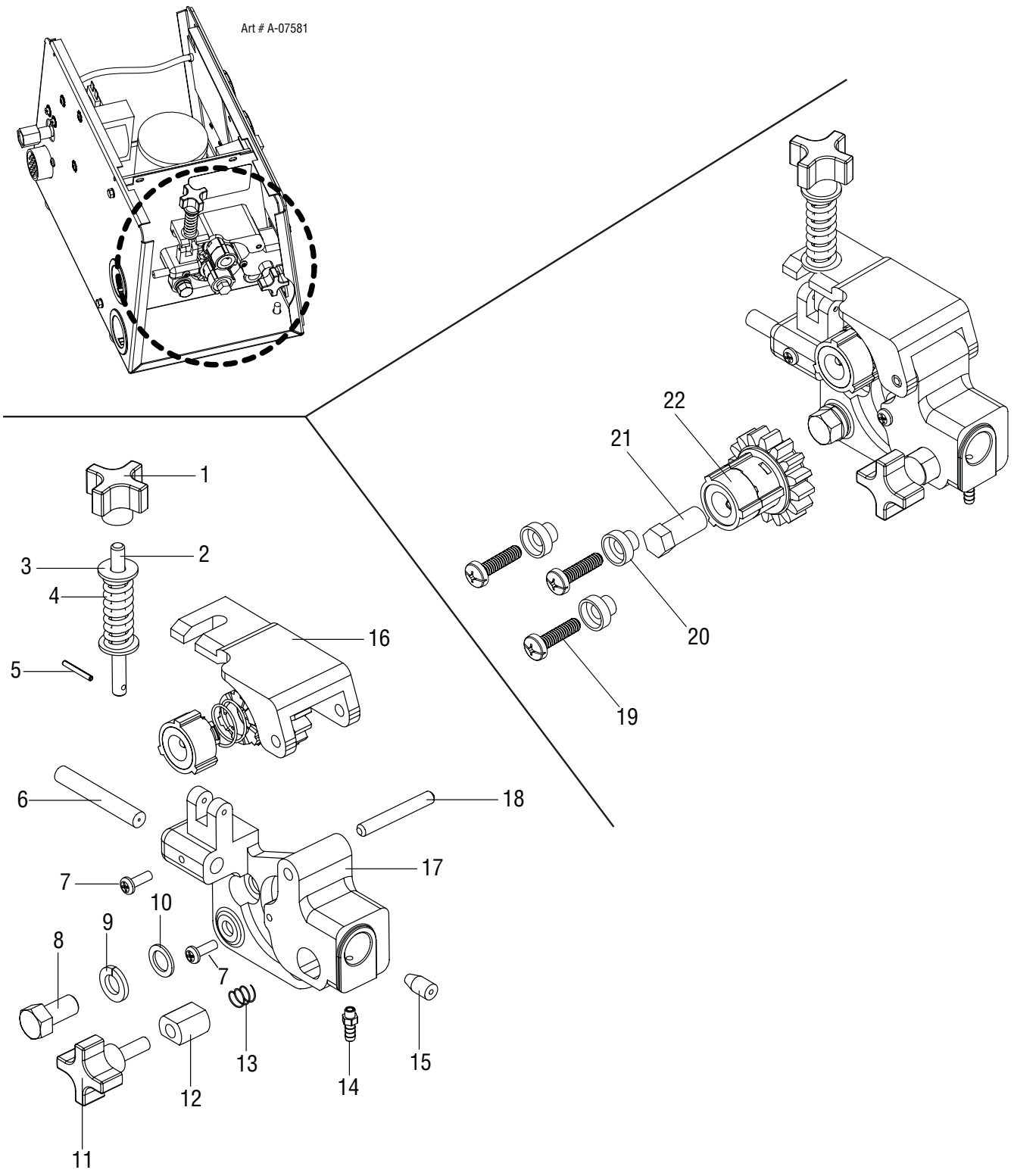
7.05 Feedhead Components

Item	Qty.	Ref. Des.	Description	Part Number
1	1		Knob,Control,1/4" IDx3/4"	870082
2	1		Rod,Tension Arm,2R & 4R Plate	870425
3	1		Washer, 1/4" Flat, WF	See Note
4	1		Spring,Pressure Adj,2R Plate	400562-033
5	1		Pin, Roll, 3/32" ODx1/2"	7962029PKD
6	1		Guide,Input,.030-.045,2R Plate	377941
7	2		Screw,PHCR,#8-32x1/2",STZP	See Note
8	1		Screw,Hex HD,3/8"-16x3/4,STZP	See Note
9	1		Washer, 3/8",Lock, WF	See Note
10	1		Washer, 3/8",Flat, WF	See Note
11	1		Knob, Clamp, 2R Plate	171380
12	1		Clamp, MIG gun,2R Plate	171362
13	1		Spring,Clamp,2R Plate	400562-048
14	1		Gas Nipple, #10-32 UN,2R Plate	375298
15	1		Guide,Output, 2R Plate	375655
16	1		Pressure Arm, 2R M/C, WF	870679PKD
17	1		Feed Plate, 2 Roll,Tweco#4	870932PKD
18	1		Pin,#6x50mm,2R & 4R Plate	870509
19	3		Screw,PHCR,1/4"-20x3/4",STZP	See Note
20	3		Insulator,Screw mtg,2R Plate	171374
21	2		Retainer, Drive Gear,2R Plate	870733PKD
22	1		Gear, Drive Roll, 2R Plate	870560PKD

Note: This part may be purchased locally.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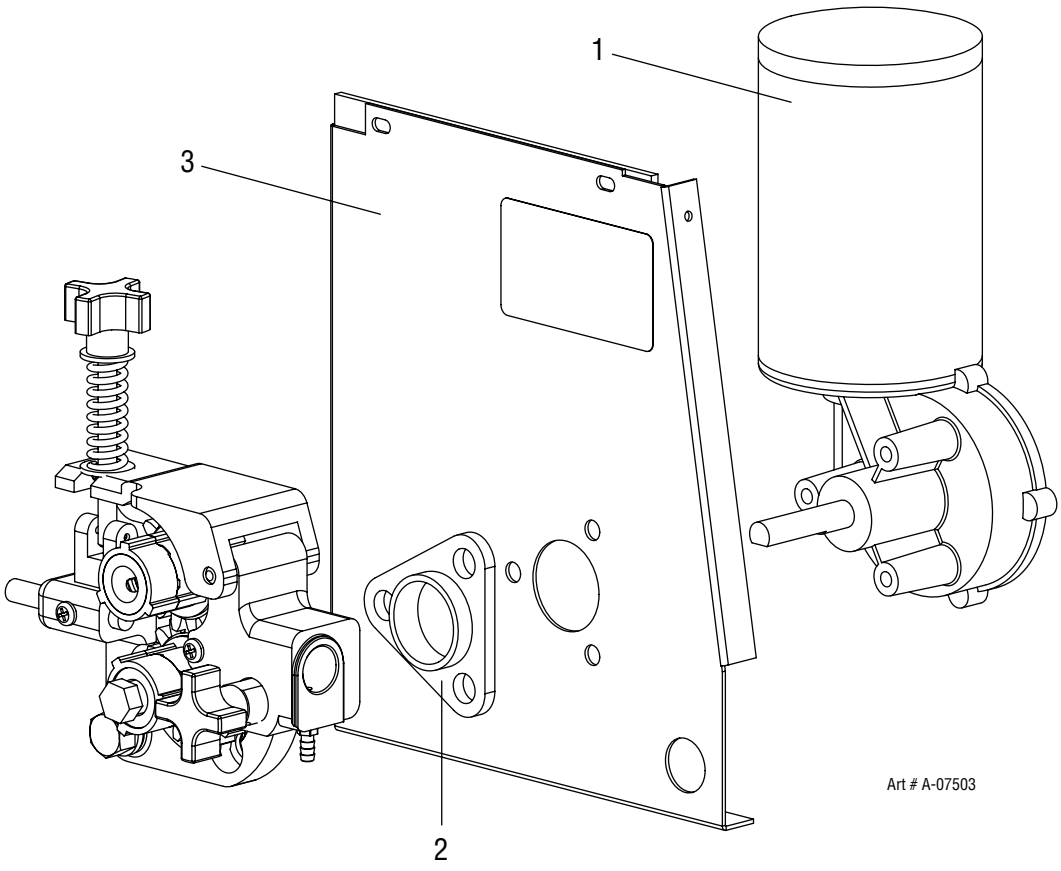
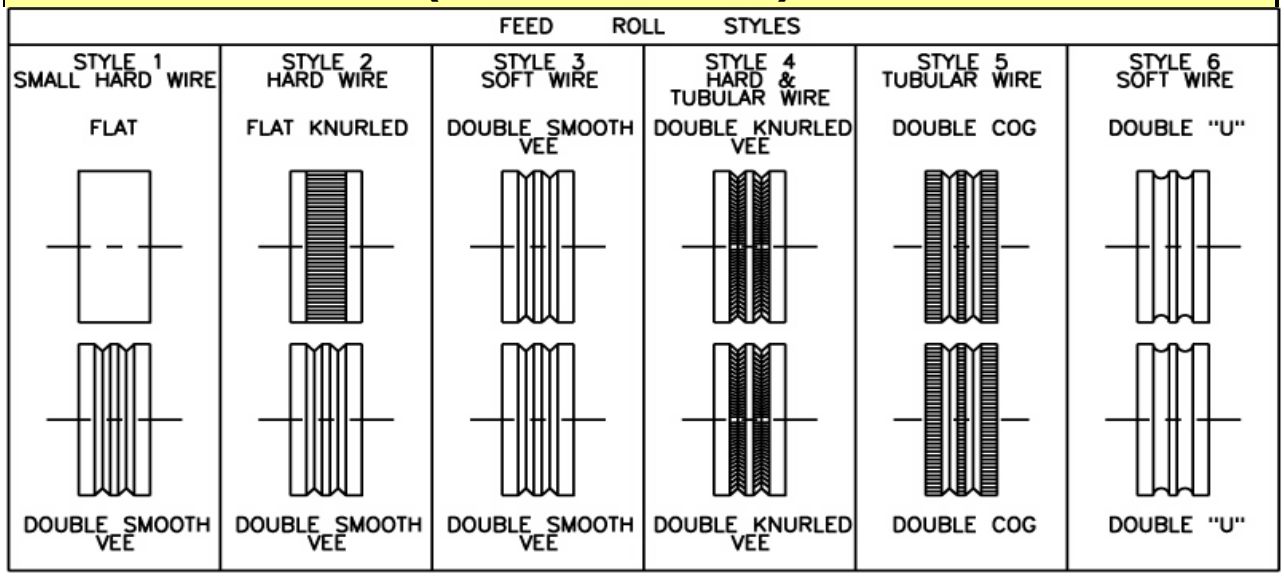
7.06 Feed Drive Motor

Item	Qty.	Ref. Des.	Description	Part Number
1	1	B1	Motor, Feed Drive, 20 VDC, WF	204994-002
2	1		Insulator,Motor,28.7 ID,2R Plate	870695-002PKD
3	1		Plate, MTG, Feedhead, WF	870122CLAPKD



APPENDIX 1: FEED ROLL KITS

FEED ROLL KITS (#375980-Series) 2 ROLL



	Style 1	Style 2	Style 3	Style 4	Style 5	Style 6
Top	Flat	Flat Knurled	Double Smooth "V"	Double Knurled "V"	Double Cog	Double "U"
Bottom	Double Smooth "V"	Double Smooth "V"	Double Smooth "V"	Double Knurled "V"	Double Cog	Double "U"
Wire Type	Hard	Hard	Soft/Hard/Tubular	Hard/Tubular	Tubular	Soft (Aluminum)
Wire Size						
.024" / 0.6mm	375980-031	-	-	-	-	-
.030", .035" / 0.8, 0.9mm	375980-001	375980-003	375980-010	-	-	-
.030", .035", .045" / 0.8, 0.9, 1.2mm	375980-028*	375980-029	-	-	-	-
.035" / 0.9mm	375980-040*	-	-	-	-	375980-032
.035", .045" 3/64" / 0.9, 1.2, 1.2mm	-	-	375980-030	-	-	-
.045" / 1.2mm	375980-002*	375980-004	-	375980-092	375980-022	-
3/64 / 1.2mm	-	-	375980-011	-	-	375980-033
.052" / 1.3mm	375980-090*	-	375980-012	-	-	-
.052", 1/16" / 1.3, 1.6mm	-	-	-	375980-017	375980-023	-
1/16" / 1.6mm	375980-005*	-	-	-	-	375980-034
.068" / 1.7mm	-	-	-	-	-	-
5/64" / 2.0mm	375980-006*	-	-	375980-018	-	-

Notes: 1) One Kit (# 375980-028) is supplied standard with each wire feeder.

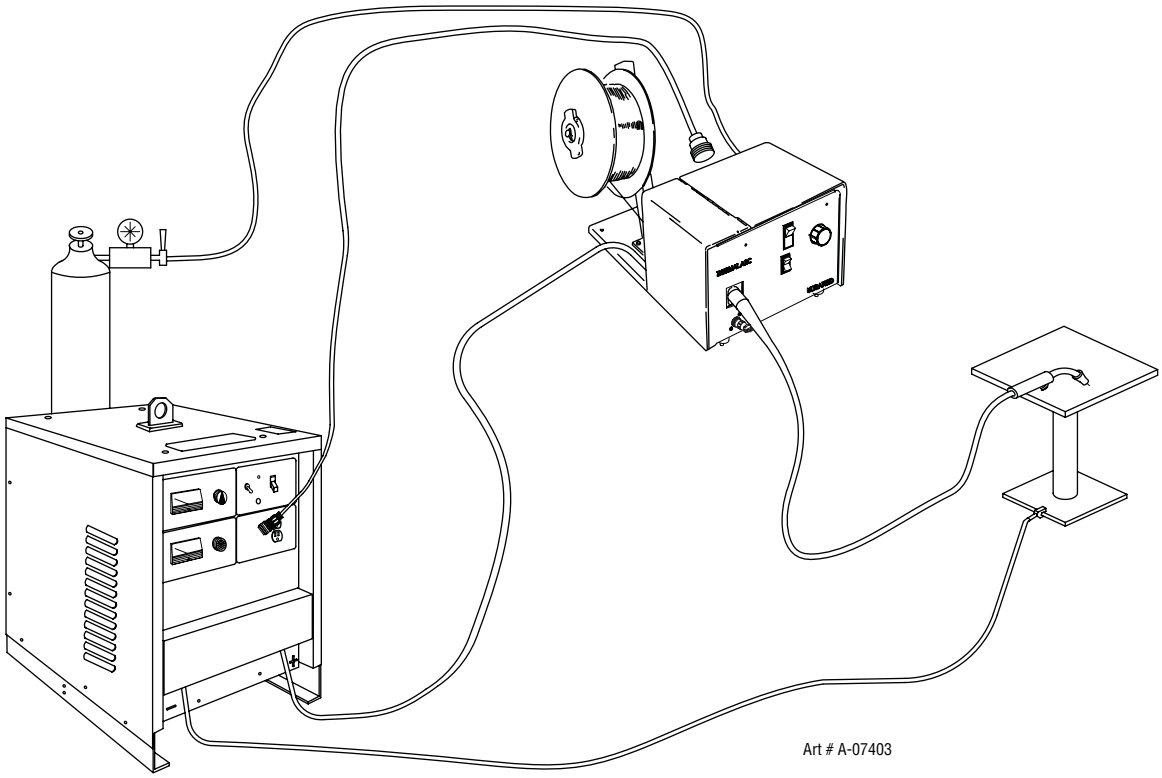
2) Feed Roll Kits include: Drive Rolls; Input & Output Guides

3) Narrow 30° "V"

APPENDIX 2: OPTIONS AND ACCESSORIES

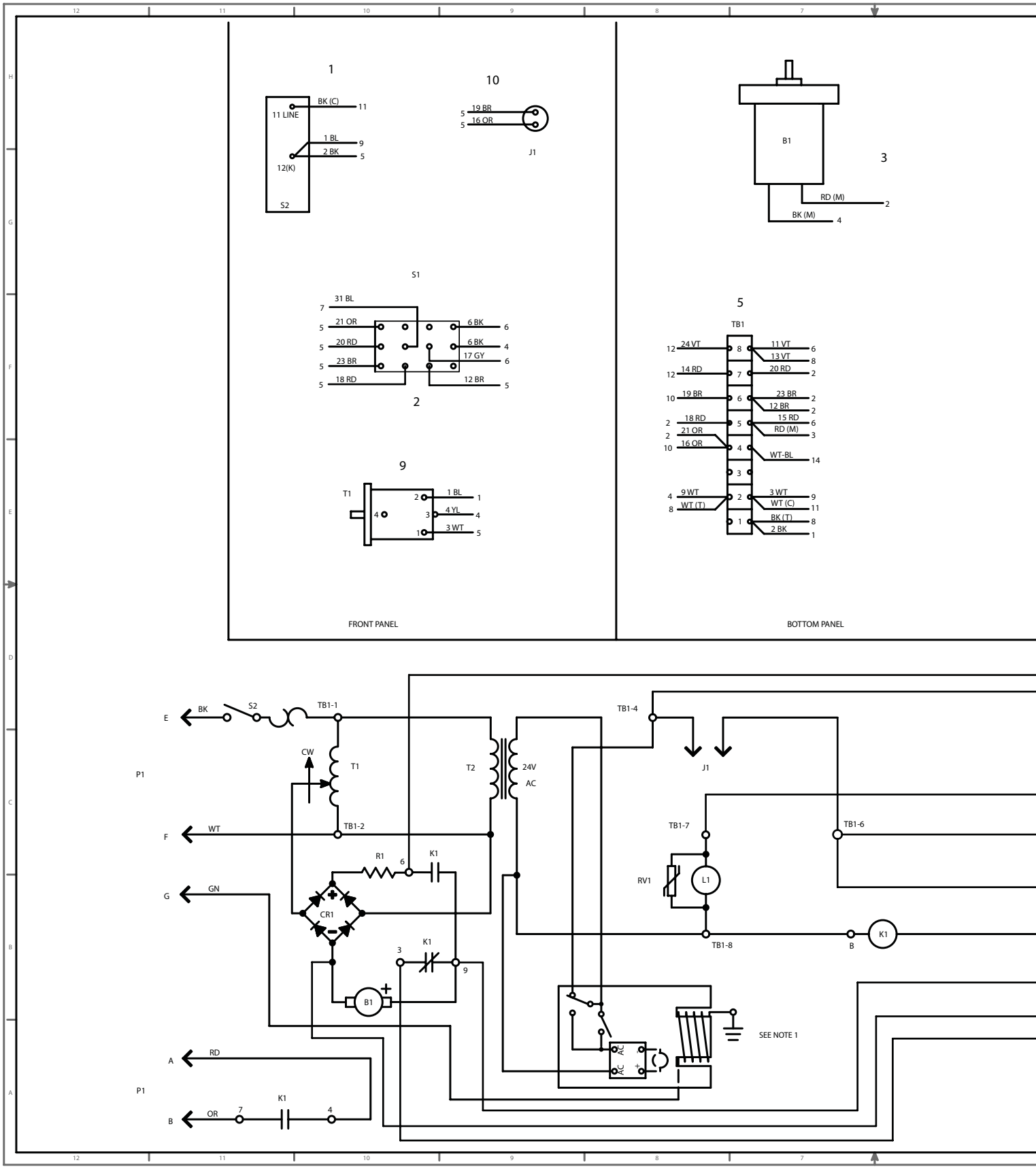
Product	Part No.	Description
KITS		
Ground Fault Interrupt Kit	870081	
ACCESSORIES		
Drive Roll Kits	375980-028	One kit (#375980-028) is supplied standard with each wire feeder, see drive roll kit chart to select a different drive roll style
Control Cable		Control cable from wire feeder to power source (A 6ft. control cable, #374878-006 is supplied with the wire feeder)
6 ft (1.8m)	374878-006	
15ft (4.5m)	374878-015	
25ft (7.6m)	374878-025	
50ft (15.2m)	374878-050	
100ft (30.5m)	374878-100	
Interconnect Cable Assembly		Complete interconnect assembly from wire feeder to power source, includes control cable, welding power cable and gas hose in a sheathed cover.
6 ft (1.8m)	W4009200	
15ft (4.5m)	W4009201	
25ft (7.6m)	W4009202	
50ft (15.2m)	W4009203	
Wire Spool Adaptor		
10 lb (4.5kg), 8” spool	375585-001	
15 lb (6.8kg), 8” spool	375864-001	
Spool Cover		
30 lb (13.6kg) spool	375582A-004	
60 lb (27.2kg) spool	375733A-001	
Wire Reel Kit	870059	
Wire Coil Adaptor		
14 lb (6.4kg) coil	375942A	
60 lb (27.3kg) coil	407142A	
Wire Feeder Cart	W4000001	
Lift Eye Kit	W4002001	Electrically isolated
MIG Gun Holder Kit	171463	
MIG Gun Adaptor Kits		
Tweco® #5	870395	
Miller®	870397	
Euro-style	171449	
Cable Adapters		
19 pin wire feeder to 5 pin power source	870000-001	For older style power sources
19 pin wire feeder to 14 pin power source	870093B-001	For Miller® or 14 pin style power sources

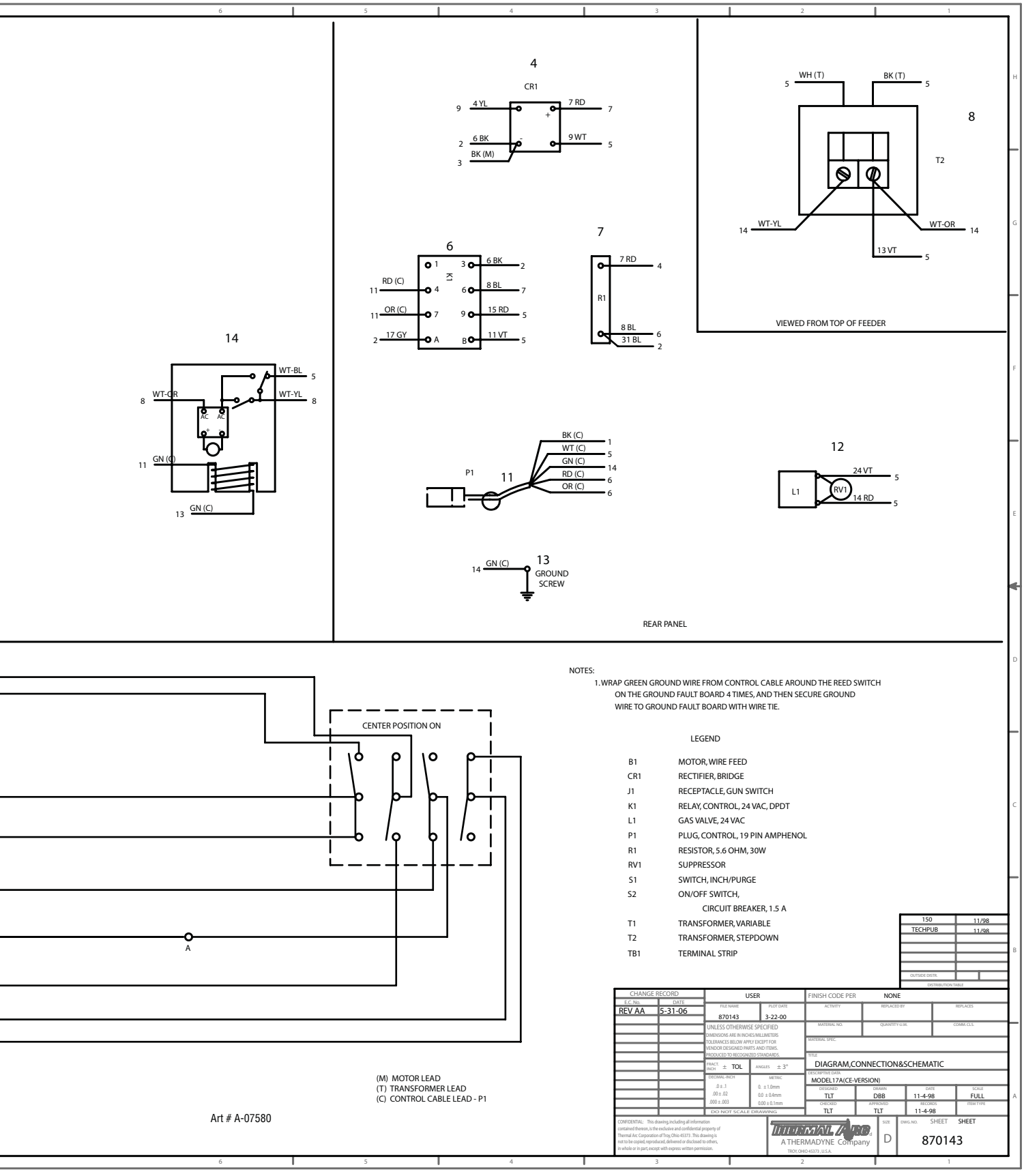
APPENDIX 3: SYSTEM OUTLINE



Art # A-07403

APPENDIX 4: WIRE DIAGRAM





(M) MOTOR LEAD
(T) TRANSFORMER LEAD
(C) CONTROL CABLE LEAD - P1

Art # A-07580

NOTES:

1. WRAP GREEN GROUND WIRE FROM CONTROL CABLE AROUND THE REED SWITCH ON THE GROUND FAULT BOARD 4 TIMES, AND THEN SECURE GROUND WIRE TO GROUND FAULT BOARD WITH WIRE TIE.

LEGEND

B1	MOTOR, WIRE FEED
CR1	RECTIFIER, BRIDGE
J1	RECEPTACLE, GUN SWITCH
K1	RELAY, CONTROL, 24 VAC, DPDT
L1	GAS VALVE, 24 VAC
P1	PLUG, CONTROL, 19 PIN AMPHENOL
R1	RESISTOR, 5.6 OHM, 30W
RV1	SUPPRESSOR
S1	SWITCH, INCH/PURGE
S2	ON/OFF SWITCH, CIRCUIT BREAKER, 1.5 A
T1	TRANSFORMER, VARIABLE
T2	TRANSFORMER, STEPDOWN
TB1	TERMINAL STRIP

DISTRIBUTION TABLE	
150	11/98
TECHPUB	11/98
OUTSIDE DISTR.	

CHANGE RECORD	
E.C. No.	DATE
REV AA	5-31-06

USER
FILE NAME: 870143
PLOT DATE: 3-22-00
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES/MILLIMETERS
TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS.
PRODUCED TO RECOGNIZED STANDARDS.
FRACT INCH ± TOL. ANGLES ± 3°
DECIMAL-INCH: .0 ± .1; .00 ± .02; .000 ± .003
METRIC: 0. ± 1.0mm; 0.0 ± 0.4mm; 0.00 ± 0.1mm
DO NOT SCALE DRAWING

FINISH CODE PER: NONE
ACTIVITY | REPLACED BY | REPLACES
MATERIAL NO. | QUANTITY U.M. | COMM. C.L.S.
MATERIAL SPEC.
TITLE: DIAGRAM,CONNECTION&SCHEMATIC
DESCRIPTIVE DATA: MODEL17A(CE-VERSION)

DESIGNED	DRAWN	DATE	SCALE
TLT	DBB	11-4-98	FULL
CHECKED	APPROVED	RECORDS	ITEM TYPE
TLT	TLT	11-4-98	

THERMAL ARC A THERMADYNE Company
TROY, OHIO 45373 , U.S.A.

SIZE D | DWG. NO. 870143 | SHEET SHEET

LIMITED WARRANTY

This information applies to Thermal Arc products that were purchased in the USA and Canada.

April 2006

LIMITED WARRANTY: Thermal Arc®, Inc., A Thermadyne Company ("Thermal Arc"), warrants to customers of authorized distributors ("Purchaser") that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the warranty period stated below, Thermal Arc shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with Thermal Arc's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or damage, correct such defects by suitable repair or replacement, at Thermal Arc's sole option, of any components or parts of the product determined by Thermal Arc to be defective.

This warranty is exclusive and in lieu of any warranty of merchantability, fitness for any particular purpose, or other warranty of quality, whether express, implied, or statutory.

Limitation of liability: Thermal Arc shall not under any circumstances be liable for special, indirect, incidental, or consequential damages, including but not limited to lost profits and business interruption. The remedies of the purchaser set forth herein are exclusive, and the liability of Thermal Arc with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by Thermal Arc, whether arising out of contract, tort, including negligence or strict liability, or under any warranty, or otherwise, shall not exceed the price of the goods upon which such liability is based.

No employee, agent, or representative of Thermal Arc is authorized to change this warranty in any way or grant any other warranty, and Thermal Arc shall not be bound by any such attempt. Correction of non-conformities, in the manner and time provided herein, constitutes fulfillment of thermal's obligations to purchaser with respect to the product.

This warranty is void, and seller bears no liability hereunder, if purchaser used replacement parts or accessories which, in Thermal Arc's sole judgment, impaired the safety or performance of any Thermal Arc product. Purchaser's rights under this warranty are void if the product is sold to purchaser by unauthorized persons.

The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date Thermal Arc delivered the product to the authorized distributor.

Warranty repairs or replacement claims under this limited warranty must be submitted to Thermal Arc via an authorized Thermal Arc repair facility within thirty (30) days of purchaser's discovery of any defect. Thermal Arc shall pay no transportation costs of any kind under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the Purchaser. All returned goods shall be at the Purchaser's risk and expense. This warranty dated April 1st 2006 supersedes all previous Thermal Arc warranties. Thermal Arc® is a Registered Trademark of Thermal Arc, Inc.

WARRANTY SCHEDULE

This information applies to Thermal Arc products that were purchased in the USA and Canada.

April 2006

ENGINE DRIVEN WELDERS	WARRANTY PERIOD	LABOR
Scout, Raider, Explorer		
Original Main Power Stators and Inductors	3 years	3 years
Original Main Power Rectifiers, Control P.C. Boards	3 years	3 years
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, power switch semi-conductors	1 year	1 year
Engines and associated components are NOT warranted by Thermal Arc, although most are warranted by the engine manufacturer	See the Engine's Warranty for Details	

GMAW/FCAW (MIG) WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
Fabricator 131, 181; 190, 210, 251, 281; Fabstar 4030; PowerMaster 350, 350P, 500, 500P; Excelarc 6045. Wire Feeders; Ultrafeed, Portafeed		
Original Main Power Transformer and Inductor	5 years	3 years
Original Main Power Rectifiers, Control P.C. Boards, power switch semi-conductors	3 years	3 years
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, electric motors.	1 year	1 year

GTAW (TIG) & MULTI-PROCESS INVERTER WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
160TS, 300TS, 400TS, 185AC/DC, 200AC/DC, 300AC/DC, 400GTSW, 400MST, 300MST, 400MSTP		
Original Main Power Magnetics	5 years	3 years
Original Main Power Rectifiers, Control P.C. Boards, power switch semi-conductors	3 years	3 years
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, electric motors.	1 year	1 year

PLASMA WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
Ultima 150		
Original Main Power Magnetics	5 years	3 years
Original Main Power Rectifiers, Control P.C. Boards, power switch semi-conductors	3 years	3 years
Welding Console, Weld Controller, Weld Timer	3 years	3 years
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, electric motors, Coolant Recirculator.	1 year	1 year

SMAW (Stick) WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
Dragster 85		
Original Main Power Magnetics	1 year	1 year
Original Main Power Rectifiers, Control P.C. Boards	1 year	1 year
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, power switch semi-conductors	1 year	1 year
160S, 300S, 400S		
Original Main Power Magnetics	5 years	3 years
Original Main Power Rectifiers, Control P.C. Boards	3 years	3 years
All other original circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, power switch semi-conductors	1 year	1 year

GENERAL ARC EQUIPMENT	WARRANTY PERIOD	LABOR
Water Recirculators	1 year	1 year
Plasma Welding Torches	180 days	180 days
Gas Regulators (Supplied with power sources)	180 days	Nil
MIG and TIG Torches (Supplied with power sources)	90 days	Nil
Replacement repair parts	90 days	Nil
MIG, TIG and Plasma welding torch consumable items	Nil	Nil

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