



190

FABRICATOR MIG WELDING MACHINE



Art # A-07329

Operating Manual

Revision No: A1
Operating Features:

Issue Date: July 29, 2009

Manual No.: 0-4838



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This Operating Manual has been designed to instruct you on the correct use and operation of your Thermal Arc product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

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Above all, we are committed to develop technologically advanced products to achieve a safer working environment within the welding industry.



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.

Fabricator 190 MIG Welding Machine
Instruction Manual Number 0-4838 for:
Package System Part Number W1001500
Power Source Part Number 707559

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82 Benning Street
West Lebanon, New Hampshire, USA 03784
(603) 298-5711

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Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Equipment Serial #: _____

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SECTION 1: 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



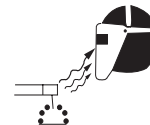
WARNING

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.

FABRICATOR 190 WELDING MACHINE

- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
- 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.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
- 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.
- 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.
- 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.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks or drums.
- 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.
- Do not use welder to thaw frozen pipes.
- 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/ANSI Z49.1:1999					
Welding or Cutting Operation	Electrode Size Metal Thickness or Welding	Filter Shade	Welding or Cutting Operation	Electrode Size Metal Thickness or Welding	Filter Shade
Torch Soldering	All	2	Gas Tungsten Arc Welding		
Torch Brazing	All	3 or 4	Light	Under 50 Amp	10
Oxygen Cutting			Medium	50 to 150 Amp	12
Light	Under 1 in., 25 mm	3 or 4	Heavy	150 to 500 Amp	14
Medium	1 – 6 in., 25 – 150 mm	4 or 5	Atomic Hydrogen Welding		
Heavy	Over 6 in., 150 mm	5 or 6	All		12
Gas Welding			Carbon Arc Welding		
Light	Under 1/8 in., 3 mm	4 or 5	All		14
Medium	1/8 – 1/2 in., 3 – 12 mm	5 or 6	Carbon Arc Gouging		
Heavy	Over 1/2 in., 12 mm	6 or 8	Light		12
Shielded Metal-Arc Welding (Stick) Electrodes			Heavy		14
Light	Under 5/32 in., 4 mm	10	Plasma Arc Welding		
Medium	Under 5/32 to 1/4 in., 4 to 6.4mm	12	Light	Under 20 Amp	6 to 8
Heavy	Over 1/4 in., 6.4 mm	14	Light	20 to 100 Amp	10
Gas Metal Arc Welding			Medium	100 to 400 Amp	12
Light	Under 60 Amp	7	Heavy	400 to 800 Amp	14
Light	60 to 160 Amp	11	Plasma Arc Cutting		
Medium	160 to 250 Amp	12	Light	Under 300 Amp	9
Heavy	250 to 500 Amp	14	Medium	300 to 400 Amp	12
			Heavy	400 to 800 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 known 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 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
	Voltage Input

	Wire Feed Function
	Wire Feed Towards Workpiece With Output Voltage Off.
	Welding Gun
	Purging Of Gas
	Continuous Weld Mode
	Spot Weld Mode
	Spot Time
	Preflow Time
	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.	
	Burnback Time
IPM	Inches Per Minute
MPM	Meters Per Minute
Art # A-04130	

FABRICATOR 190 WELDING MACHINE

1.04 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'équipement. 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.

1.05 Dangers relatifs au soudage à l'arc



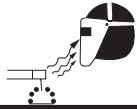
AVERTISSEMENT

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'entraînement 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'OUÏE.

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 FUMÉES SONT DANGEREUSES POUR LA SANTÉ.

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 inadéquate, portez un respirateur à adduction d'air approuvé.
4. Lisez les fiches signalétiques et les consignes du fabricant relatives aux métaux, aux produits consommables, 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 OCULAIRES POUR LA PROTECTION DES YEUX EN COUPAGE ET SOUDAGE (selon AWS à 8.2-73)

Opération de coupage ou soudage	Dimension d'électrode ou Epaisseur de métal ou Intensité de courant	Nuance de filtre oculaire	Opération de coupage ou soudage	Dimension d'électrode ou Epaisseur de métal ou Intensité de courant	Nuance de filtre oculaire
Brassage tendre au chalumeau	toutes conditions	2	Soudage à 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 à l'arc sous gaz avec électrode de tungstène (GTAW)	toutes conditions	12
moyen	de 1 à 6 po. (25 à 150 mm)	4 ou 5	Soudage à l'hydrogène atomique (AHW)	toutes conditions	12
épais	plus de 6 po. (150 mm)	5 ou 6	Soudage à l'arc avec électrode de carbone (CAW)	toutes conditions	12
Soudage aux gaz			Soudage à 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 à 1/2 po. (3 à 12 mm)	5 ou 6	mince		12
épais	plus de 1/2 po. (12 mm)	6 ou 8	épais		14
Soudage à l'arc avec électrode enrobées (SMAW)	moins de 5/32 po. (4 mm)	10	Coupage à l'arc Plasma (PAC)		
	5/32 à 1/4 po. (4 à 6.4 mm)	12	mince	moins de 300 amperes	9
	plus de 1/4 po. (6.4 mm)	14	moyen	de 300 à 400 amperes	12
			épais	plus de 400 amperes	14

FABRICATOR 190 WELDING MACHINE

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 aduction d'air. Car ces revêtements et tout métal qui contient ces éléments peuvent dégager des fumées toxiques au moment du soudage.

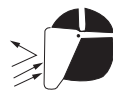


AVERTISSEMENT

LE SOUDAGE PEUT CAUSER UN INCENDIE OU UNE EXPLOSION

L'arc produit des étincelles 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 brûlantes 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 une 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 des 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. Enchaînez 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 boyaux 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 PEUT CAUSER UN INCENDIE OU UNE EXPLOSION.

Le carburant est hautement inflammable.

1. Arrêtez le moteur avant de vérifier le niveau de 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 PIÈCES 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 ÉTINCELLES PEUVENT FAIRE EXPLODER UN ACCUMULATEUR; L'ÉLECTROLYTE D'UN ACCUMULATEUR PEUT BRÛLER 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 accumulateur.
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 BRÛLANT SOUS PRESSION PEUVENT BRÛLER 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.

1.06 Principales Normes De Sécurité

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.

FABRICATOR 190 WELDING MACHINE

1.07 Graphique de Symbole

Seulement certains de ces symboles apparaîtront sur votre modèle.

	Sous Tension
	Hors Tension
	Tension dangereuse
	Augmentez/Diminuer
	Disjoncteur
	Source AC Auxiliaire
	Fusible
A	Intensité de Courant
V	Tension
Hz	Hertz (cycles/sec)
f	Fréquence
	Négatif
	Positif
	Courant Continue (DC)
	Terre de Protection
	Ligne
	Connexion de la Ligne
	Source Auxiliaire
115V 15A 	Classement de Prise-Source Auxiliaire

1	Mono Phasé
3	Trois Phasé
3~	Tri-Phase Statique Fréquence Convertisseur Transformateur-Redresseur
	Distant
X	Facteur de Marche
%	Pourcentage
	Panneau/Local
	Soudage Arc Electrique Avec Electrode Enrobé (SMAW)
	Soudage à L'arc Avec Fil Electrodes Fusible (GMAW)
	Soudage à L'arc Avec Electrode Non Fusible (GTAW)
	Decoupe Arc Carbone (CAC-A)
	Courant Constant
	Tension Constante Ou Potentiel Constant
	Haute Température
	Force d'Arc
	Amorçage de L'arc au Contact (GTAW)
	Inductance Variable
	Tension

	Déroutement du Fil
	Alimentation du Fil Vers la Pièce de Fabrication Hors Tension
	Torch de Soudage
	Purge Du Gaz
	Mode Continu de Soudure
	Soudure Par Point
	Durée du Pulse
	Durée de Pré-Débit
	Durée de Post-Débit
Détente à 2-Temps Appuyez pour dèruarer l'alimentation du fils et la soudure, le relâcher pour arrêter.	
Détente à 4-Temps Maintenez appuyez pour pré-débit, relailez pour initier l'arc. Appuyez pour arrêter l'arc, et mainteuir pour pré-débit.	
	Problème de Terre
IPM	Pouces Par Minute
MPM	Mètres Par Minute

Art # A-07639

SECTION 2: INTRODUCTION

2.01 How To Use This Manual

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

2.03 Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual.

Include all equipment identification numbers as described above along with a full description of the parts in error.

FABRICATOR 190 WELDING MACHINE

2.04 General Information

The Fabricator 190 is a semiautomatic Gas Metal Arc Welder (GMAW/FCAW-commonly MIG) with an integrated wire feed unit. The Fabricator 190 is designed and manufactured to meet the requirements of CSA and IEC 60974-1 standards.

The Fabricator 190 gives excellent performance on mild steel, stainless steel, aluminum, silicon bronze and some hard facing wires with Argon based shielding gases. The Power Supply also gives excellent results on mild steel using Carbon Dioxide shielding gas.

The Fabricator 190 is supplied as a complete, ready-to-weld package including a wheel base, cylinder tray, MIG gun, work lead, and flow regulator. The following instructions detail how to correctly set up the welder and give guidelines on gaining the best production efficiency from the Power Supply. Please read these instructions thoroughly before using your Fabricator welder.

2.05 Safety

The following basic safety rules should always be followed:

Ensure the machine is correctly installed, if necessary, by a qualified electrician.

Ensure the Power Supply is grounded correctly (electrically) in accordance with local regulations.

Excessive heat in the welding cables may cause fire. Never weld with poor electrical connections, damaged welding cables or exceed the welding cable current rating as this will produce excessive heat and may cause a fire.

Always wear the correct protective clothing for protection from sparks, molten particles and arc rays.

When welding in confined spaces, always ensure adequate ventilation and constant observation of the operator.

Keep combustible materials away from the welding area. Have a suitable fire extinguisher handy.

Never watch the welding arc with naked eyes. Always use and wear a welding mask fitted with the correct filter lens.

Do not stand on damp ground when welding.

For more complete safety advice, please read Section 1.

2.06 Protective Filter Lenses

Protective filter lenses are provided to reduce the intensity of radiation entering the eye thus filtering out harmful infrared, ultraviolet radiation and a percentage of the visible light. Such filter lenses are incorporated within face shields. To prevent damage to the filter lenses from molten or hard particles an additional hard clear glass or special plastic external cover lens should be used. This cover lens should always be kept in place and replaced before the damage impairs your vision while welding.

2.07 Welding Protection

Approximate range of welding current	Filter lens required for MIG
Up to 150	Shade 10
150-250	Shade 11
250-300	Shade 12
300-350	Shade 13
Over 350	Shade 14

Filter Lens Size Versus Welding Current

It is recommended to use a welding helmet, conforming to the local relevant Standards when electric arc welding. Use a welding helmet in serviceable condition with the correct filter lens. Refer to Table 2-1 above and AWS table in Section 1.01 of this manual.

2.08 User Responsibility

This equipment will perform as per the information contained herein when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Defective equipment (including welding leads) should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated, should be replaced immediately. Should such repairs or replacements become necessary, it is recommended that such repairs be carried out by appropriately qualified persons approved by Thermal Arc. Advice in this regard can be obtained by contacting Thermal Arc.

This equipment or any of its parts should not be altered from standard specification without prior written approval of Thermal Arc. The purchaser of this equipment shall have the sole responsibility for any malfunction which results from improper use or unauthorized modification from standard specification, faulty maintenance, damage or improper repair by anyone other than appropriately qualified persons approved by Thermal Arc.

2.09 Duty Cycle

Duty Cycle is the amount of arc-on time (actual welding or cutting time) during any 10 minute period that a machine can operate at it's rated output without damaging internal components. For example, the Fabricator 190 is designed for 15% duty cycle at 190 amps. This means that it has been designed and built to provide the rated amperage, 190 amps, for 1 minute and 30 seconds out of every 10 minute period. During the other 8 minutes 30 seconds of the 10 minute period the Fabricator 190 must idle and be allowed to cool. The thermal cutout will operate if the duty cycle is exceeded.

2.10 MIG Gun Specifications

MIG Gun Specifications	
Gun Catalog Number	10217P
Gun Type	TWECO Weldskill 200 Amp
Gun Cable Length	10ft (3m)

2.11 Options and Accessories

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

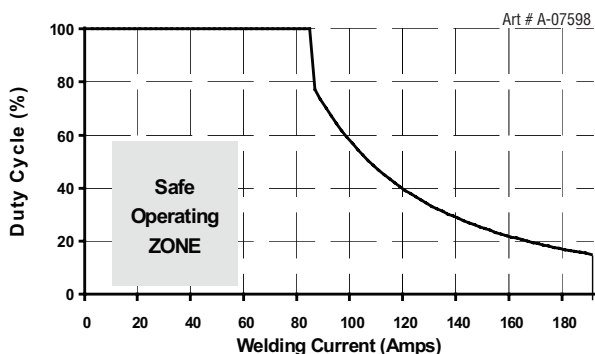


Figure 2-1: Fabricator 190 Duty Cycle Curve

FABRICATOR 190 WELDING MACHINE

2.12 Power Supply Specifications

Package System Part Number	W1001500
Power Source Part Number	707559
Power Source Weight	123lb (56kg)
Power Source Dimensions HxWxD (including wheels and cylinder carrier)	33 x 16.3 x 34.7" (838 x 414 x 866mm)
Number of Phases	1Ø
Frequency	60 Hz
Flexible Supply Cable Size	10ft (3m) 10AWG x 3
Supply Plug	NEMA 6-50P
Nominal Input Voltage	230V ± 10%
Rated Input Current @ 100% Duty Cycle	* 11A
Rated kVA @ 100% Duty Cycle	* 2.5 kVA
Maximum Input Current @ 190A Output @230V	34A
Generator Requirements	10 kVA
Supply VA @ Maximum Output	7.9 kVA
Recommended Primary Circuit Size	50A
Recommended Minimum Primary Fuse Size	** 30A
Open Circuit Voltage Range	26 – 60V DC
Welding Arc Voltage Range	15.8 – 25V DC
Output Current Range	30 – 190A DC
Rated Output Duty Cycle	190A/23.4V @ 15%
100% Duty Cycle Output Rating	85A DC at 19V
Duty Cycle Period	10 minutes
Number of Output Voltage Values	8
Electrode Wire Type and Diameter Mild / Stainless Steel Aluminum Flux Cored	.023" (0.6mm) – .035" (0.9mm) .030" (0.8mm) – .045" (0.9mm) .030" (0.8mm) – .045" (1.2mm)
Wire Feed Speed Range	80 – 700 ipm (2 – 18 m/min)
Wire Spool Size Diameter	8" / 12" (200mm / 300mm)
Burn-back Timer Range Burn-back Time Factory Set to:	0 – 0.6 seconds 0.16 seconds
Spot Timer Range	0.5 – 4.5 seconds
Thermal Protection	Self-resetting thermostat fitted to rectifier and transformer
Operating Temperature Range	32° to 104°F (0° to 40°C)

* The Rated Input Current should be used for the determination of cable size & supply requirements.

2.13 Wire Drive Specifications

Wire Drive Specifications				
Control Circuit Supply	30VA @ 24VAC			
Wire Drive Motor Supply	40VA @ 2 to 24VDC (Intermittent Duty)			
Wire Speed Range	80 to 700 IPM (2 to 18 m/min)			
Wire Diameters Material	.023" (0.6mm)	.030" (0.8mm)	.035" (0.9mm)	.045" (1.2mm)
Mild Steel	•	•	•	
Stainless Steel	•	•	•	
Aluminum		•	•	
Flux Cored		•	•	•
Wire Spool Capacity	44 lb, 33 lb, 10 lb, 8" and 12" wire spool sizes			

2.14 Fabricator 190 Package System Contents

Fabricator 190 Package System Contents
Fabricator 190 Power Source with Integrated Wirefeeder
Factory Fitted Wheeling Kit
Factory Fitted Single Cylinder Rack
Factory Fitted Primary Power Cable 10 AWG, 10ft (3m) with Plug NEMA 6-50P
Work Lead 10ft (3m) with work clamp
Regulator/Flowmeter – Argon Mix Gases
Tweco Weldskill MIG Gun 200 Amp, 10ft (3m)
Fitted Feed Roll for .023" - .030" (0.6 – 0.8mm) solid wire

SECTION 3: INSTALLATION

3.01 Environment

The Fabricator 190 is NOT designed for use in environments with increased hazard of electric shock.

Examples of environments with increased hazard of electric shock are:

In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;

In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or

In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.

Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

3.02 Location

Be sure to locate the Power Supply according to the following guidelines:

In areas, free from moisture and dust.

In areas, free from oil, steam and corrosive gases.

In areas, not subjected to abnormal vibration or shock.

In areas, not exposed to direct sunlight or rain.

Place at a distance of 1ft (300mm) or more from walls or similar that could restrict natural air flow for cooling.

The minimum ground clearance for these products is 5.5" (140mm).

3.03 Ventilation

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

FABRICATOR 190 WELDING MACHINE

3.04 Mains Supply Voltage Requirements

The Mains supply voltage should be within $\pm 10\%$ of the rated Mains supply voltage. Too low a voltage may cause poor welding performance or the wirefeeder malfunction. Too high a supply voltage will cause components to overheat and possibly fail. The Fabricator 190 is supplied with a 10 AWG x 3 supply lead.

Install a power outlet for each Power Supply and fit fuses as per the machine specifications.



Thermal Arc advises that your Fabricator be electrically connected by a qualified electrical trades-person.

The Fabricator 190 Power Supply is factory connected for the following input power supply voltage:

Input Power Supply Lead Size	Lead Current Rating	Lead Length	Machine Voltage Setting	Duty Cycle
10 AWG x 3	40 Amps	10ft (3m)	230V	190A @ 15%

Table 3-1: Factory Fitted Input Power Supply Leads Fitted to the Fabricator 190

3.05 Alternative Mains Supply Voltages



The Fabricator 190 input power supply lead should be replaced with leads as specified in Table 3-2 when the Fabricators input power supply voltage is changed.

The Power Supply is suitable for use on the following input power supply voltages:

Input Power Supply Voltage Setting	Primary Input Power Lead Size	Lead Length	Input Power Outlet Size	Fuse Size	Duty Cycle
208V 1Ø	10AWG (5mm2)	3M	50 Amps	45 Amp	250A @ 30%
230V 1Ø	10AWG (5mm2)	3M	50 Amps	45 Amp	250A @ 30%

Table 3-2: Mains Supply Lead Sizes for Alternative Mains Supply Voltages

National Electrical Code Standards permit the rating of the fuse or thermal circuit breaker protecting the circuit conductors to be double the standard rating for any circuit used exclusively for an electric arc welder. Check local requirements for your situation in this regard.

Changing the Voltage Selection

- 1. Disconnect the power supply from the main power source.
- 2. Refer to Figure 3-1. The power supply comes wired for 230V. Locate the black input power wire secured to the input voltage selection block. Loosen the set screw for both voltage locations.

- 3. Remove the black wire from the current location and Insert the uninsulated wires into the new voltage location. Secure by tightening the set screw onto the uninsulated portion of the wires. Secure the first set screw as well.

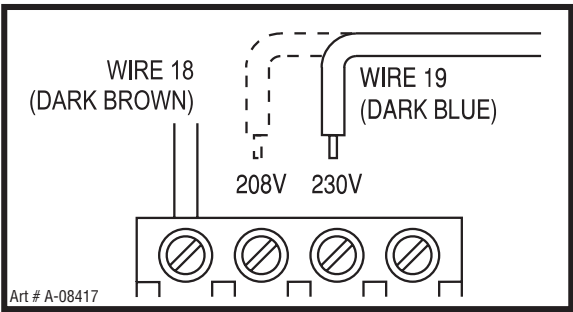


Figure 3-1: Voltage selections for Fabricator 190

3.06 Quick Set Up

**CAUTION**

To obtain adequate air flow and cooling for the Power Supply components, the four wheels must be fitted. Alternatively, the Power Supply may be raised 5.5" (140 mm) from the floor using supports that do not restrict airflow.

NOTE

The steps in this subsection are intended for individuals experienced in the set up of this type welder. More detailed setup instructions are in the 3.06 and following subsections.

1. Connect the work lead to the negative (-) socket (positive + for Self Shielded Flux Cored Wire)
2. Connect the *GUN* lead to the positive (+) socket (negative - for Self Shielded Flux Cored Wire)

NOTE

See Section 3.11 "Polarity Changeover" for more detail and exceptions!

3. Position a gas cylinder on the rear tray and secure to the Power Supply cylinder bracket with the chain provided. If this arrangement is not used then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.

**WARNING**

If the gas cylinder is not secured to the cylinder tray, the power supply must be kept from moving to avoid over-extending the gas hose which can result in personal injury, damage to the power supply, flowmeter and gas cylinder.

4. Fix the cable stowage hook to the Power Supply cylinder bracket with the bolts provided.
5. Fit the gas Regulator/Flowmeter to the gas cylinder and connect the gas hose from the rear of the Power Supply to the Flowmeter outlet.
6. The machine is fitted with a .023"/.030" vee groove feed roll suited for hard wire. Change this feed roll if required to fit your chosen wire size.

7. Fit the electrode wire spool to the wire reel hub located behind the electrode wire compartment door.
8. Fit the TWECO Weldskill MIG gun and trigger wires through/to the front of the unit.
9. Remove the contact tip from the gun.
10. With the gun lead reasonably straight, feed the wire through the wire drive rolls and gun.
11. Fit the appropriate contact tip and replace insulator and nozzle.

FABRICATOR 190 WELDING MACHINE

3.07 Installation of Shielding Gas (GMAW) Process

Refer to Figure 3-2.

NOTE

Shielding Gas is not required if the unit is used self shielded FCAW (flux cored arc welding) wires

Cylinder positioning

Chain the cylinder to a wall or other support to prevent the cylinder from falling over. If an optional portable mounting is used, follow the instructions provided with it.

Cracking

Remove the large metal cap on top of the cylinder by rotating counter clockwise. Next remove the dust seal. Position yourself so the valve is pointed away from you and quickly open and close the valve for a burst of gas. This is called “Cracking” and is done to blow out any foreign matter that may be lodged in the fitting. (Fig 3-2.)



CAUTION

Never “crack” a fuel gas cylinder valve near other welding works, sparks or open flames. Ensure surrounding area is well ventilated

Regulators – fitting to cylinders

Screw the regulator into the appropriate cylinder. The nuts on the regulator and hose connections are right hand (RH) threaded and need to be turned in a clockwise direction in order to tighten. Tighten with a wrench.



CAUTION

Match regulator to cylinder. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

Regulators – fitting to welder.

Blow out the hose before connecting to the regulator and rear of welding power source – to remove dust, talc, etc. The nut on the hose connection is right hand (RH) threaded and needs to be turned in a clockwise direction in order to tighten.

Adjusting Regulator

Adjust control knob of regulator to the required flow rate, indicated on gauge dial. (Refer to Figure 3-1 and data charts Approx. 20 CFH.

The gas flow rate should be adequate to cover the weld zone to stop weld porosity. Excessive gas flow rates may cause turbulence and weld porosity.

Argon or argon based gas flow rates:

- Workshop welding: 20-30 CFH
- Outdoors welding: 30-40 CFH

Helium based or CO2 gas flow rates:

- Workshop welding: 30-40 CFH
- Outdoors welding: 40-50 CFH

NOTE

All valves downstream of the regulator must be opened to obtain a true flow rate reading on the outlet gauge. (Welding power source must be triggered) Close the valves after the pressure has been set.

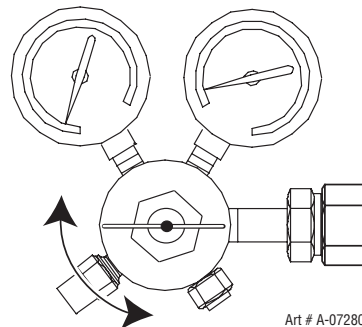
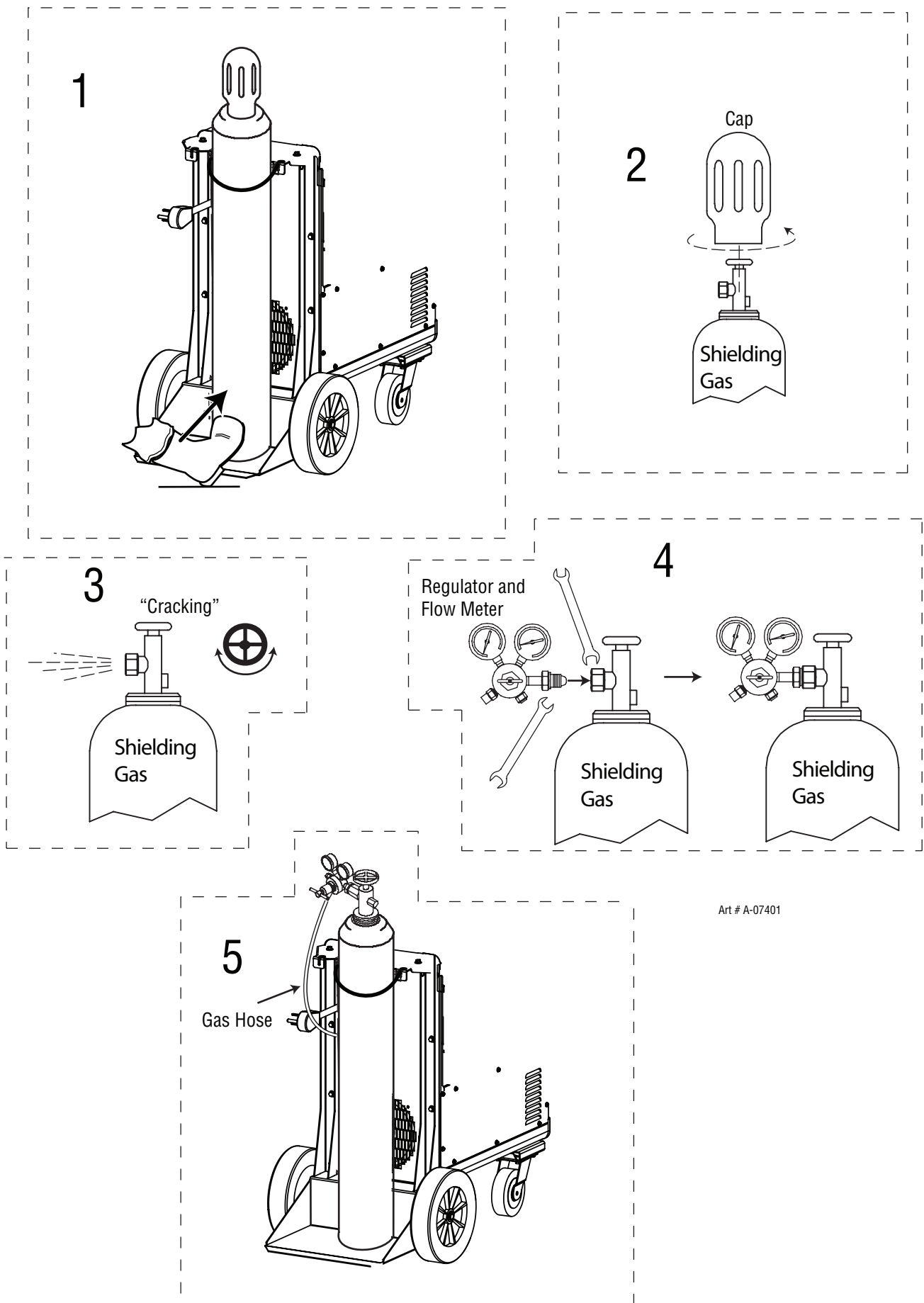


Figure 3-1: Adjusting Flow Rate

Refer to section 4.10 for suggested gas / filler metal combinations.

NOTE

The regulator/flow meters used with argon based and carbon dioxide shielding gases are different. The regulator/flow meter supplied is for argon based shielding gases. If carbon dioxide is to be used a suitable carbon dioxide regulator/flow meter will need to be fitted.



Art # A-07401

Figure 3-2: Gas Cylinder Installation

FABRICATOR 190 WELDING MACHINE

3.08 Attaching the Gun and Cable Assembly to the Power Source

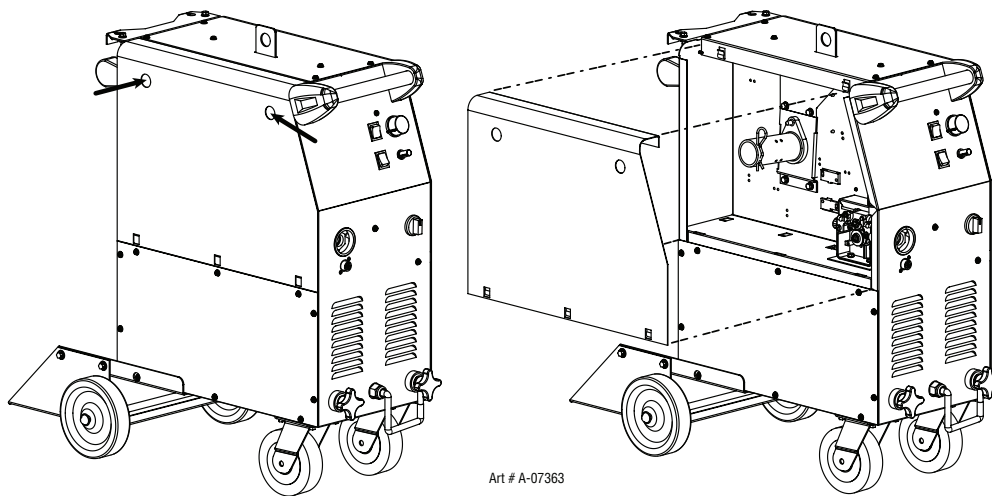
The Fabricator 190 is supplied with a Tweco Weldskill gun 190 10217 air-cooled torch. The Weldskill gun is designed with an ergonomic handle and fewer parts to cause performance problems. The Weldskill gun uses standard readily available Tweco consumable parts.

- 1) Remove the door panel to the machine by inserting your left and right index fingers into the two holes marked with arrows in Figure 3-3 and firmly pull it towards you.
- 2) Route the gun cable through the access hole in the front panel. Refer to Figure 3-4.
- 3) Loosen the thumbscrew and insert the gun cable end as far as it will go. Tighten thumbscrew. Refer to Figure 3-5.
- 4) Insert the trigger plug into its receptacle and thread its retainer on securely by hand.

NOTE

Lubricate the O-ring on the quick-connect fitting with grease (Dow company #4 compound or equivalent).

- 4) To remove the gun, reverse these directions.



Art # A-07363

Figure 3-3: Door Panel Removal

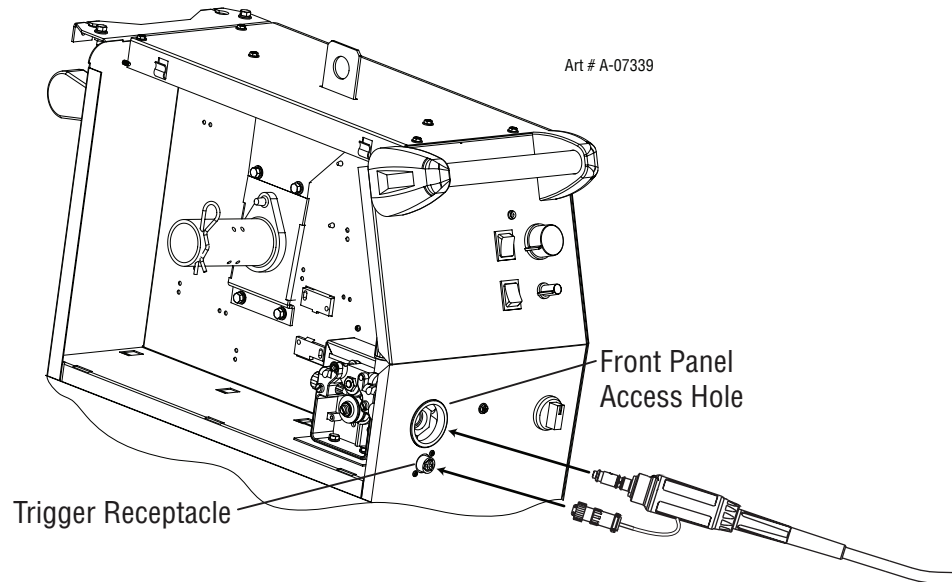
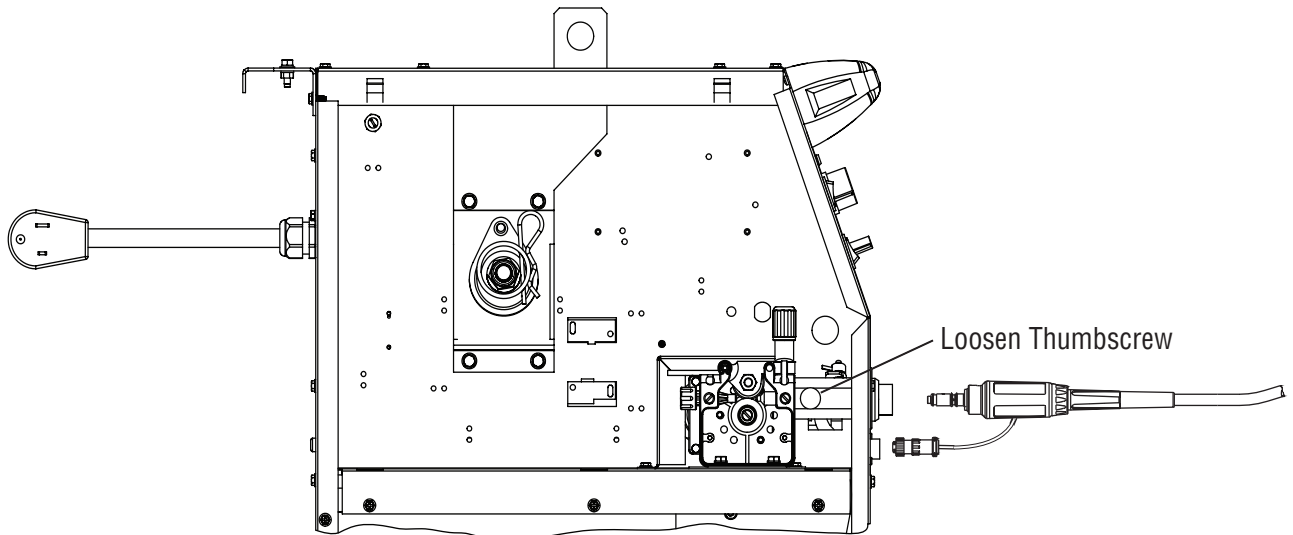


Figure 3-4: Route Gun Cable Through Access Hole and Connect Trigger



Art: A-07601

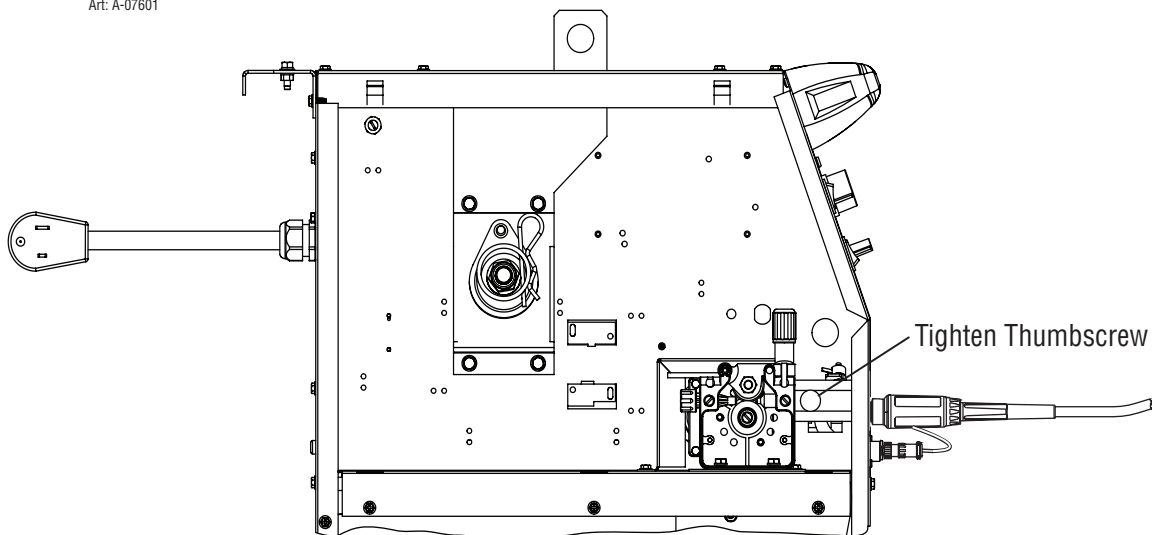


Figure 3-5: Mount Gun Cable to Adapter Socket

3.09 Feedrolls

A feedroll consists of two different sized grooves. As delivered from the factory, the feedroll is installed for .023" (0.6mm).

When the feedroll is installed, the visibly marked size refers to the groove which will be in use.

The groove closest to the motor is the one to thread the wire through.

This also applies to optional feedrolls which are available for this machine.

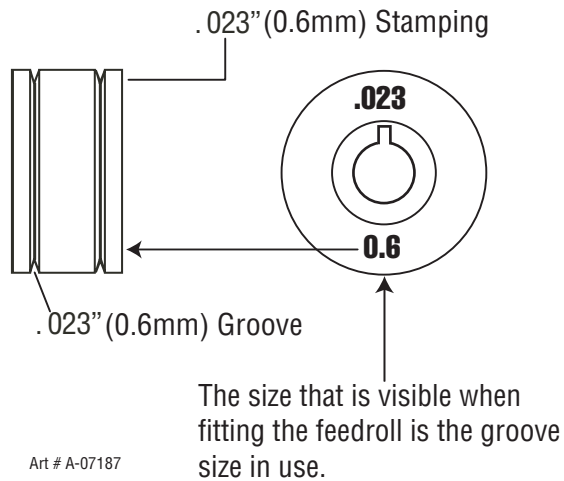


Figure 3-6: Feedroll Example

Refer to the Options and Accessories list in the Appendix section of this manual for information on additional feed roll kits.

3.10 Installing Wire Spool

Installation of 8" (203mm) spool

1. Remove the spool retaining pin (6) from spool hub (7).
2. Fit the spool (5) onto the spool hub (7).
3. Ensure that the drive pin engages the mating hole in the spool.
4. Push the spool retaining pin (6) into place in the spool hub (7).

NOTE

Nut is tightened until a slight force is required to turn the spool

Installation of 12" (300mm) spool

Installation of a 12" (300mm) spool is the same as the 8" (203mm) spool except that the Spool Retaining Pin will go into the outer holes of the Spool Hub.

1. Nut
2. Flat Washer (X3)
3. Wave Washer (X2)
4. Spool 8" (203mm)
5. Spool Retaining Pin
6. Spool Hub (using inner holes)
7. Friction Washer

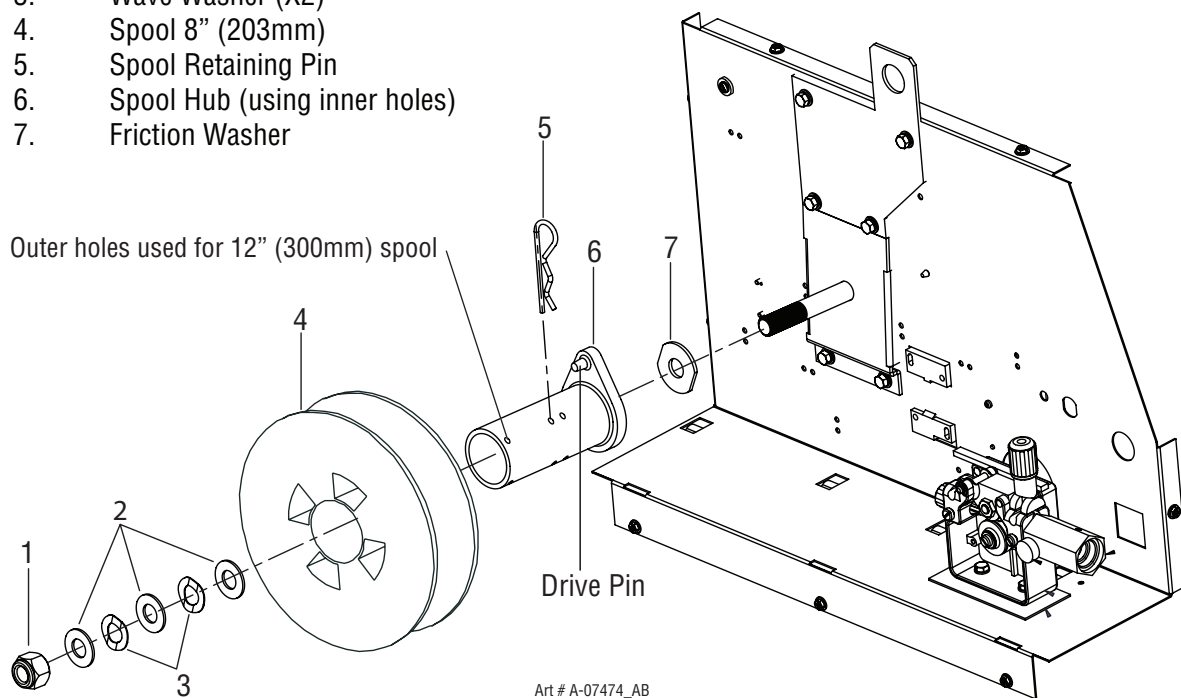


Figure 3-7: Spool Installation

FABRICATOR 190 WELDING MACHINE

3.11 Inserting Wire into the Feedhead and Welding Gun



WARNING

ELECTRIC SHOCK CAN KILL! Make certain the machine is unplugged from the power receptacle. Do not plug machine in until told to do so in these instructions

Slide the wire spool onto the hub, loading it so that the wire will feed off the spool as the spool rotates counter clockwise.

Make sure the drive pin on the spool hub lines up with the hole in the spool.

When the spool of wire is in place, replace the spool retaining pin.

NOTE

The Hub tension has been pre-adjusted at the factory. However is adjustment is required, simply turn the spool nut counter clockwise to reduce tension, and clockwise to increase tension

CAUTION

Use care in handling the spooled wire as it will tend to “unravel” when loosened from the spool. Grasp the end of the wire firmly, and don’t let go of it. Make sure the end of the wire is free of any burrs and is straight.

1. Loosen Pressure Adjust Device knob (Fig. 3-8)
2. Open Pressure Adjust Device (Fig. 3-9)
3. Open Pressure Arm (Fig. 3-9)
4. Place end of wire into the Inlet Wire Guide, feeding it over the Feedroll. Make certain the proper groove is being used. (Fig. 3-10)
5. Pass the wire into the outlet guide then into the MIG Gun. (Fig. 3-10)
6. Close the Pressure Arm. (Fig. 3-9)
7. Close the Pressure Adjust Device. Tighten the Pressure Adjust Device knob to a “snug” condition. (Fig. 3-9)
8. Figure 3-10 shows the result with wire installed.

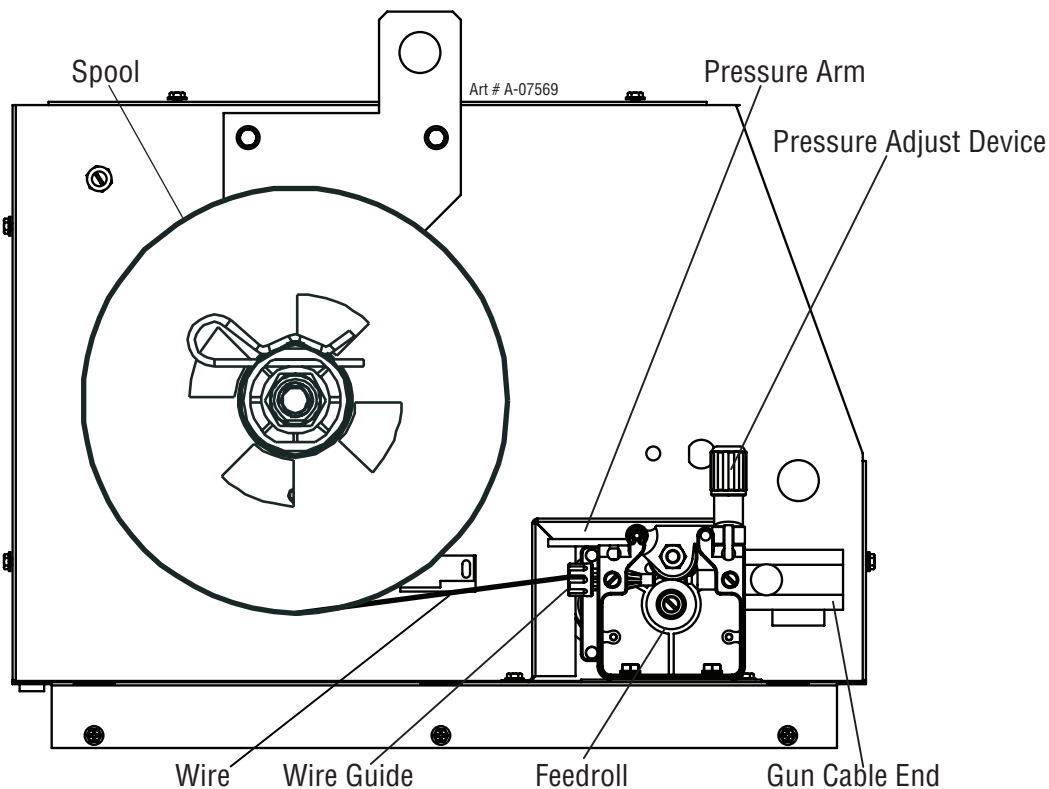


Figure 3-8: Inner Workings of Device

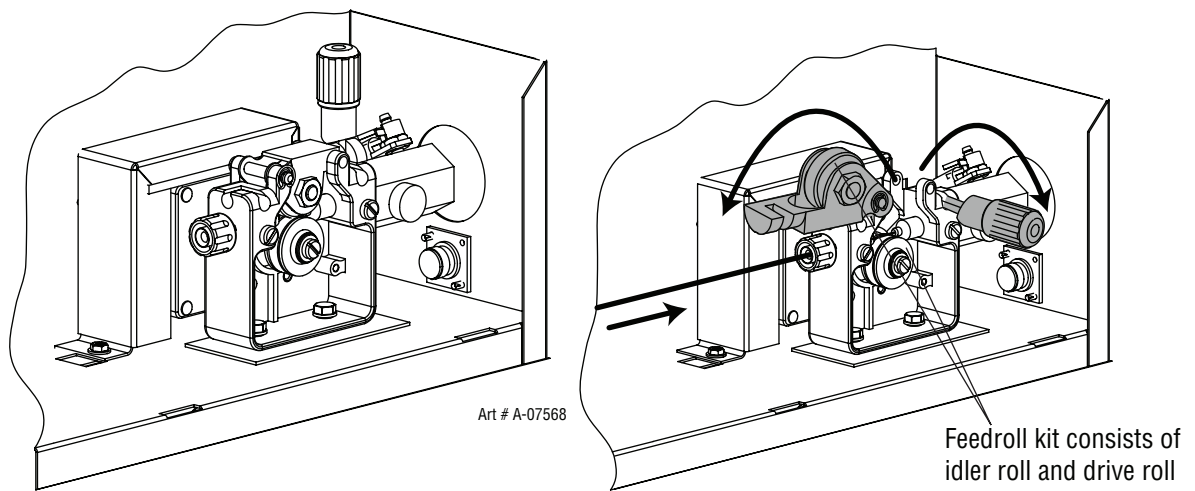


Figure 3-9: Opening Pressure Arm and Inserting Wire

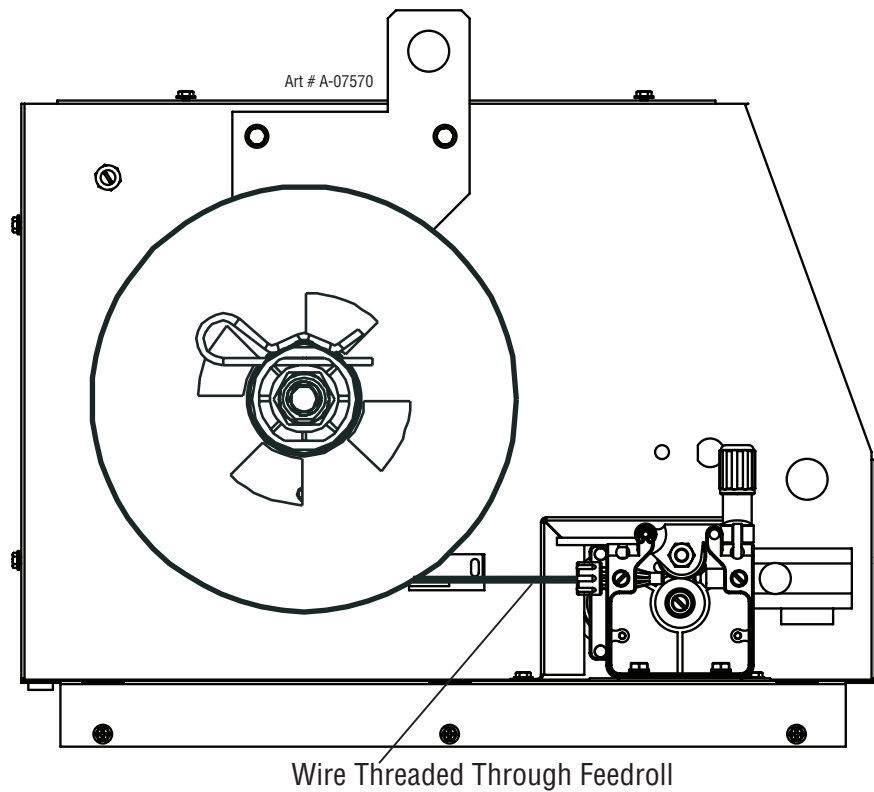


Figure 3-10: Wire Installed

3.12 Polarity Changeover



WARNING

ELECTRIC SHOCK CAN KILL! Make certain the machine is unplugged from the power receptacle. Do not plug machine in until told to do so in these instructions

As delivered from the factory, the output polarity is connected for DCEP (reverse polarity).

PROCESS	POLARITY	CABLE CONNECTIONS	
		CABLE TO GUN	CABLE TO WORK
1. GMAW* – Steel, Stainless Steel, Aluminum & gas shielded Flux Cored electrode wires	1. D.C. Electrode Positive (DCEP) – Reverse Polarity	1. Connected to (+) Pos. output terminal	1. Connected to (-) Neg. output terminal
2. FCAW* – Gasless Flux Cored electrode wire	2. D.C. Electrode Negative (DCEN) – Straight Polarity	2. Connected to (-) Neg. output terminal	2. Connected to (+) Pos. output terminal
* Exception: Contact your filler metal supplier for the recommended polarity.			

Table 3-4: Process Cable Connections

Changing polarity process.

- Locate the two terminal knobs at the bottom of the machine. Refer to Figure 3-11.
- Remove both terminal knobs by rotating counter-clockwise. Refer to Figure 3-11.
- Set up the desired lead polarity as per Table 3-4 and as shown in Figure 3-12 by placing the loose end of the polarity cable on the appropriate terminal.
- Connect (or re-connect) the work cable to the vacant terminal
- Replace both terminal knobs.

NOTE

Ensure terminal knobs are tightly secured and that there is no connection between positive and negative terminals.

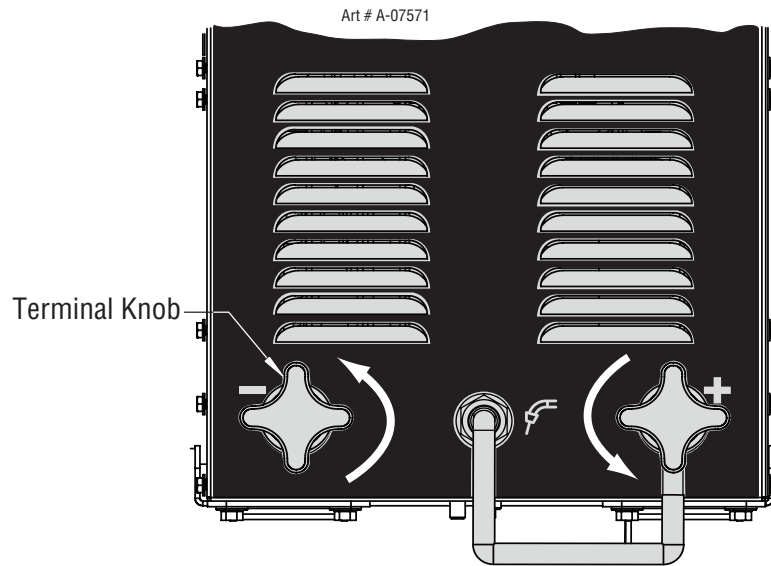


Figure 3-11: Remove Terminal Knobs

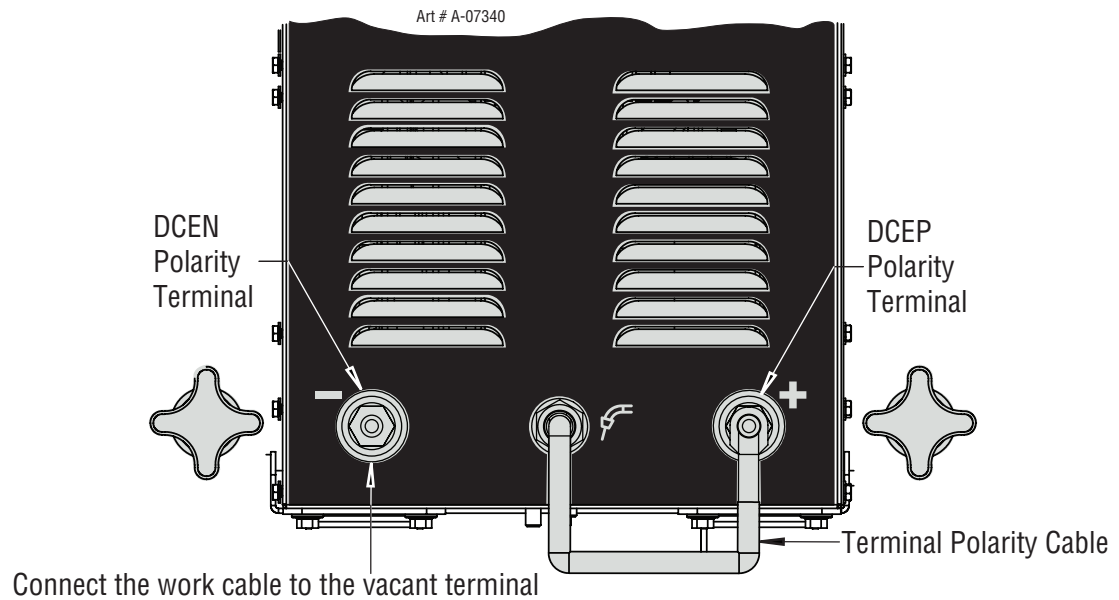


Figure 3-12: Terminal Polarity Setting

SECTION 4: OPERATION



WARNING

The electrode wire will be at welding voltage potential while it is being fed through the system.

4.01 Inside Panel

1. **Burnback Control Knob:** Burnback time is the difference between the wirefeed motor stopping and switching off of the welding current. The Burnback time allows the electrode wire to burn out of the molten metal weld pool. The Burnback time is factory set for optimum performance. Turn the Burnback knob clockwise to increase the time and counter-clockwise to decrease it. The adjustable range is 0 to .6 seconds. Refer to Figure 4-1.
2. **Wirefeeder Drive Roller Pressure Adjustment:** The idler roll applies pressure to the drive roll via screw adjustable spring pressure. The pressure adjust device should be adjusted to a minimum pressure that will provide satisfactory wire feed without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn-back jam, the conduit liner should be checked for kinks and clogging by metal flakes and slag. If this is not the cause of slipping, the feedroll pressure can be increased by rotating the pressure adjust device clockwise. The use of excessive pressure may cause rapid wear of the feed roll, motor shaft and motor bearings.
3. **Wire Reel Brake:** The spool hub incorporates a friction brake which is adjusted during manufacture for optimum braking. If it is considered necessary, adjustment can be made by turning the large nut inside the open end of the spool hub. Clockwise rotation will tighten the brake. Correct adjustment will result in the spool circumference continuing no further than $\frac{3}{4}$ " (20mm) after release of the Gun trigger switch. The wire should be slack without becoming dislodged from the spool.



CAUTION

Excessive tension on the brake will cause rapid wear of mechanical wire feed parts, overheating of electrical components and possibly an increased incidence of wire Burnback into the contact tip.

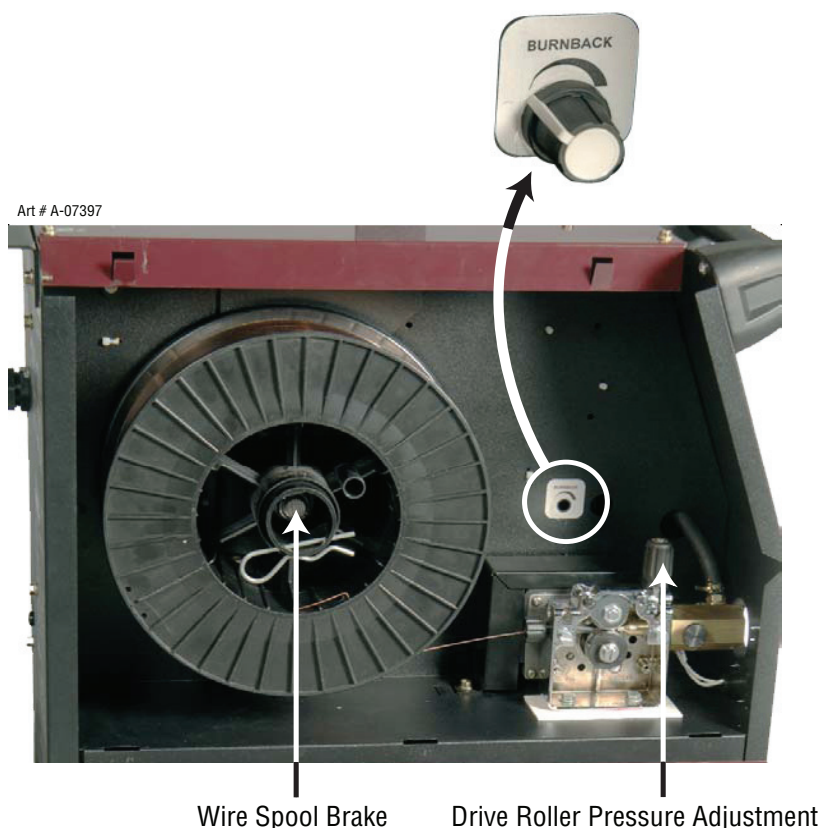


Figure 4-1: Inside Panel

FABRICATOR 190 WELDING MACHINE

4.02 Power Supply Front Panel

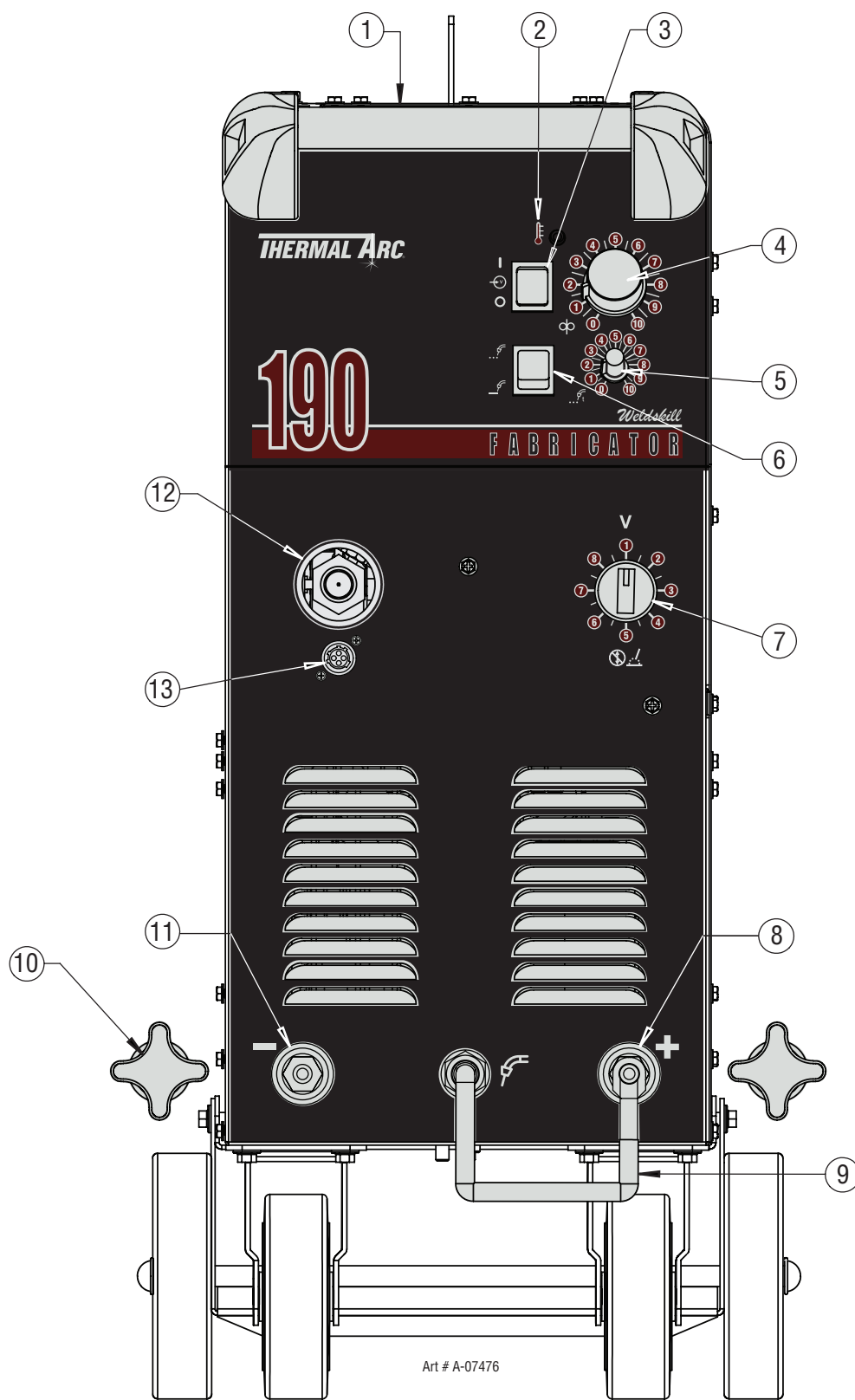


Figure 4-2: Fabricator 190 Front Panel

1. Handle Bar

- 2. Thermal Overload Indicator:** The critical component for thermal protection are the rectifier stack and the transformer, which are fitted with thermal overload protection devices. If the overload is activated then the machine should be left to cool for approximately 15 minutes before resuming welding. If the Power Source is operated within its duty cycle, the thermal overload will not activate. Refer to section 2.10 for an explanation of duty cycle and section 2.13 for the power supply specifications.



WARNING

When the On/Off Power Switch Indicator is lit, the machine is connected to the primary input supply voltage and the internal electrical components are at primary input voltage potential.

- 3. On/Off Power Switch:** The indicator light is provided to indicate when the Fabricator 190 is connected to the Input Power Supply Voltage. With the switch in the Off position  the auxiliary power and the fan are turned off and the switch is illuminated to indicate that the primary power is still present.
- 4. Wirespeed Control:** The Wirespeed Control knob controls the wire feed speed which is adjustable from 80 to 800 IPM.
- 5. Spot Timer Control:** The spot time duration is set by the Spot Timer Control knob, and is only activated with the mode selector switched to Spot position. When the Mode Selector switch is switched to the Spot position, the Spot Timer Control knob controls the duration of a single spot weld. The timer is adjustable from .5 to 4.5 seconds.
- 6. Mode Selector Switch:** The Mode Selector switch selects the method of welding.



CONTINUOUS: This mode of welding is used to weld two or more components together with a continuous weld. When the MIG gun trigger switch is depressed welding commences. When the MIG gun trigger switch is released welding ceases.



SPOT: This mode of welding is used to weld two plates together at a desired location by melting the top & bottom plates together to form a nugget between them. The spot time period is set by the Spot Timer Control knob.

- 7. Output Voltage Control Switch:** The Output Voltage Control Switch sets the voltage level to the welding terminals. The output voltage is increased when the switch is rotated in the clockwise direction.



CAUTION

The Output Voltage Control switch MUST NOT BE SWITCHED during the welding process.

- 8. Positive Welding Current Terminal:** Welding current flows from the Power Supply via this heavy duty terminal. Shown with terminal knob removed. The knob must be firmly secured before attempting to weld.
- 9. Gun Polarity Lead:** This lead selects the welding voltage polarity of the electrode wire. Attach it to the positive welding terminal (+) when using steel, stainless steel or aluminum electrode wire. Attach the Gun Polarity Lead to the negative welding terminal (-) when using gasless flux cored electrode wire. If in doubt, consult the manufacturer of the electrode wire for the correct polarity.
- 10. Positive and Negative Welding Terminal Knobs** Welding current flows from the Power Supply via the heavy duty terminals. The knobs must be firmly secured before attempting to weld.



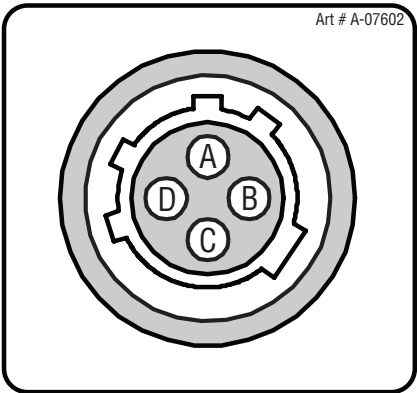
CAUTION

Loose welding terminal connections can cause overheating and result in failure of the terminals.

- 11. Negative Welding Current Terminal:** Welding current flows from the Power Supply via this heavy duty terminal. Shown with terminal knob removed. The knob must be firmly secured before attempting to weld.
- 12. Gun Connector:** This is the receptacle into which the MIG gun is connected. It accepts a #4 Tweco style gun.
- 13. Gun Trigger Switch Amphenol Receptacle:** The Gun Trigger 4-pin receptacle is used to connect the two wires from the MIG gun to the Fabricator 190. Only pins A and B are used for this. To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise. Refer to Figure 4-3.

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13.Torch Trigger Receptacle (continued)



Socket Pin	Function
A	Gun Switch
B	Gun Switch (contact closure provided between pins A and B to energize the contactor).
C	Not Used
D	Not Used

Figure 4-3: Torch Trigger Receptacle Pin-out

4.03 TWECO Weldskill MIG Gun

The TWECO Weldskill MIG Gun fitted to the FABRICATOR 190 offers robust construction, unparalleled reliability and easy replacement of consumable parts. The TWECO Weldskill MIG Gun has an operating capacity in excess of the capacity of the FABRICATOR and can be expected to give trouble free service.

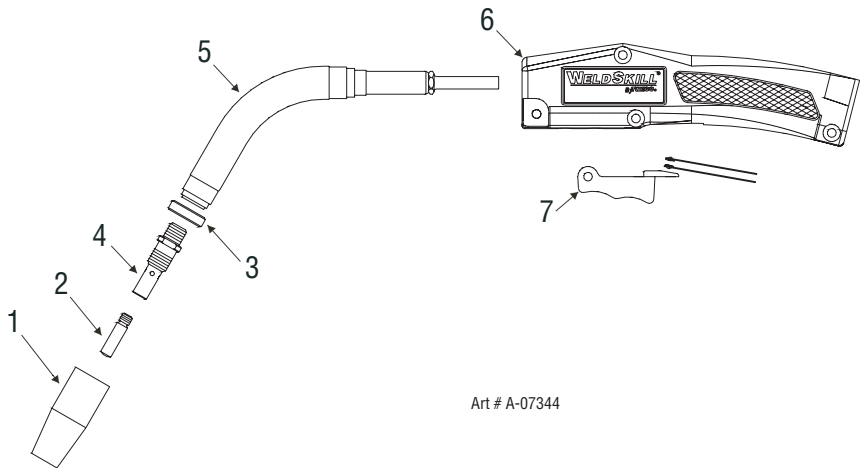


Figure 4-4: TWECO Weldskill MIG Gun

TWECO Weldskill 150A Fabgun MIG Gun — Original Parts Installed		
Item	Description	"P" Series Part No.
1	NOZZLE 1/2"	WS21-50
2	CONTACT TIP .035"	WS11-35
3	NOZZLE INSULATOR	63J-3
4	GAS DIFFUSER	WS51
5	CONDUCTOR TUBE	WM150J45
6	HANDLE ASSEMBLY	TA1-80
7	TRIGGER SWITCH ASSEMBLY	WM91

TWECO MIG guns may be fitted to many different types of MIG welding Power Supplies so that your whole shop can be converted to TWECO. Not only will this give greater reliability (and hence greater productivity) but it will reduce stockholding of consumable parts.

Contact your Thermal Arc distributor to order TWECO replacement parts, options and accessories. For assistance in locating a Thermal Arc distributor, contact the Thermadyne office listed in the inside rear cover that is nearest to you.

Gun Consumable Parts

Refer to the appendix section of this manual for the list of consumable items, including nozzles, contact tips, gas diffusers and conductor tubes.

4.04 Installing A New Wire Conduit

Removal

1. Be sure the MIG gun cable is arranged in a straight line and free from twists when installing or removing a wire conduit.
2. Unscrew and remove the MIG Gun Nozzle and Contact Tip using a pair of slip-joint pliers. Remove the Insulator.
3. Unscrew the Gas Diffuser from the Conductor Tube using a 7/16-inch (11mm) open end wrench across the flats.
4. Loosen the allen screw in the Connector Plug using a 5/64-in. allen wrench and pull the old Wire Conduit out of the cable assembly from the connector plug end.

Installation

1. Inspect the two O-ring gas seals on the Connector Plug for cuts or damage.
2. Start from the Connector Plug end of the assembly and begin pushing the Wire Conduit through the Connector Plug, cable assembly and into the gun. If the Wire Conduit should lodge along the way, gently whip or work the cable assembly to aid forward movement.
3. When the Wire Conduit stop meets the end of the Connector Plug and the new raw end extends through the end of the Conductor Tube on the welding gun, the allen screw in the Connector Plug must be securely tightened onto the Wire Conduit to prevent its backward movement.

NOTE

When the Wire Conduit is fully inserted into the cable assembly and the conduit stop is firmly against the Connector Plug, the "raw end" of the Wire Conduit will protrude out of the open end of the gun Conductor Tube. Trim the Wire Conduit as shown in Figure 4-5. The trimmed end which seats in the Gas Diffuser must be filed and reamed smooth on the inside and outside radii so wire feed will not be obstructed.

FABRICATOR 190 WELDING MACHINE

3. Replace the Gas Diffuser and Insulator.
4. Replace the Contact Tip and Nozzle.



CAUTION

Do not over-tighten the allen screw as this will distort the Wire Conduit and lead to wire feedability problems.

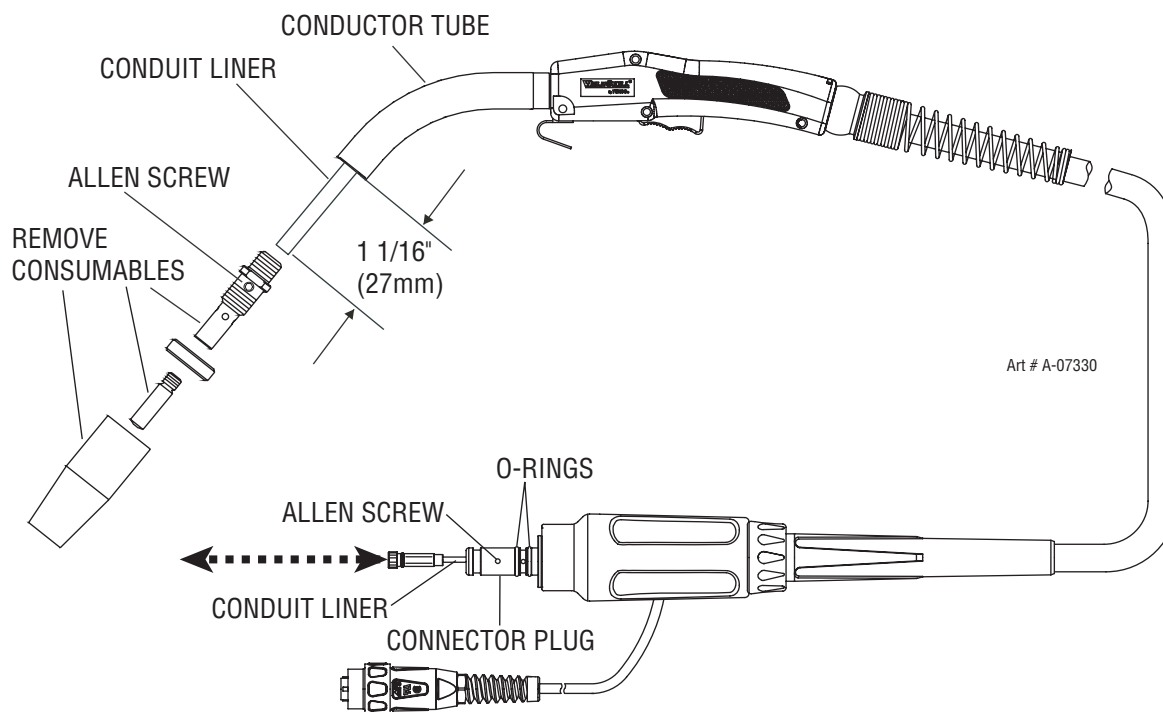


Figure 4-5: Conduit Installation and Trim Length

4.05 MIG Gun Maintenance

Remove dust and metallic particles from the gun conduit by forcing clean, dry compressed air into the conduit once a week. This will minimize wire feeding problems.

4.06 Basic Welding Technique

Setting of the Power Supply

The setting of the Fabricator requires some practice by the operator, the welding Power Supply having two control settings that have to balance. These are the Wire Speed control and the Voltage Control switches. The welding current is determined by the Wire Speed control, the current will increase with increased Wire Speed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the welding current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with little change in welding current.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wire Speed to achieve the same current level.

A satisfactory weld cannot be obtained if the wire speed and voltage switch settings are not adjusted to suit the electrode wire diameter and dimensions of the work piece.

If the Wire Speed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the electrode wire, causing spatter. The correct setting of voltage and Wire Speed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

Travel Speed

Speed at which a weld travels influences the width of the weld and penetration of the welding run.

Position of MIG gun

The angle of MIG gun to the weld has an effect on the width of the weld run. Refer to Figure 4-6.

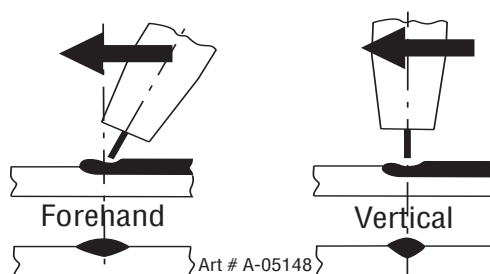


Figure 4-6: MIG Gun Angle

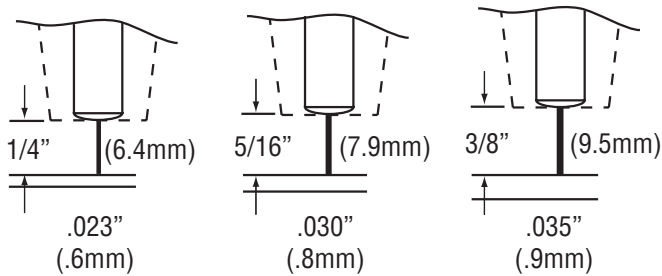
FABRICATOR 190 WELDING MACHINE

Distance from the MIG Gun Nozzle to the Work Piece

The electrode stick out from the MIG gun nozzle should be between 5/64" (2.0mm) to 13/64" (5.0mm). This distance may vary depending on the type of joint that is being welded.

Art # A-07186

Solid Wire



Flux Cored Wire

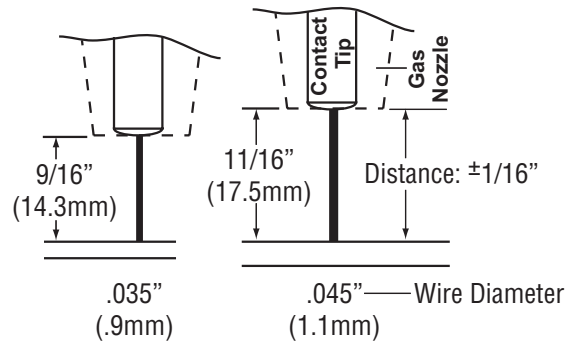


Figure 4-9: Optimum Contact Tip to Work Distances

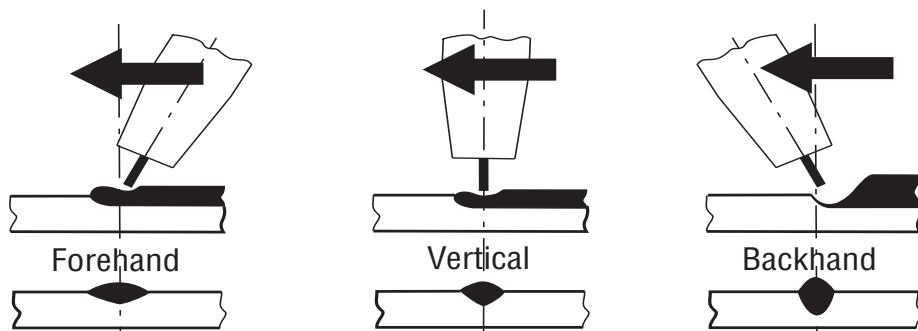
Electrode Wire Size Selection

The choice of electrode wire size in conjunction with shielding gas used depends on:

- Thickness of the metal to be welded,
- Type of joint,
- Capacity of the wire feed unit and power supply,
- The amount of penetration required,
- The deposition rate required,
- The bead profile desired,
- The position of welding and
- Cost of the electrode wire.

Advantages of MIG welding forehand:

- Allows superior visibility of the weld zone
- Flatter weld bead
- Shallower penetration



Art # A-07185

Figure 4-7: Advantages of forehand welding

4.07 Technical Tips

Reduce Porosity in the Weld Metal

- Weld in still air to ensure gas coverage
- Clean the dirty, oil, paint, oxidization or grease from the metal to be welded
- Eliminate any gas leaks in the hose
- Make sure the gas cylinder is not empty with a flow rate of about 25cfh

Electrode Wire Burns Back to the Contact Tip

- Wire feed speed is too low
- MIG gun liner is blocked with dust or metallic dust
- Bent MIG gun liner
- Damage or worn inlet or outlet wire guides in the wire drive system

Irregular Weld Beard Shape

- Incorrect or worn feed roller size
- Incorrect size or worn contact tip
- Bad work lead contact to work piece

No Strength in the Weld Joint

- Wire feed speed (welding current) is too low
- Incorrect gas for the material being welded
- Joint preparation too narrow or gap too tight

Cracks Develop in the Weld Metal

- Arc voltage is too high
- The weld cooling rate is too fast
- The stresses in the welded metal are too high
- Weld penetration is too narrow and deep

4.08 Spot Welding Operation

Fit an optional spot welding nozzle to the MIG gun for consistent spot welding operations. Refer to Figure 4-8 and the Spot Welding Nozzles table below. The Fabricator will operate effectively using .030" (0.8mm) electrode wire when spot welding. Penetration depth is limited when using .023" (0.6mm) electrode wire for spot welding. Set the controls as follows for maximum penetration when spot welding:

Output Voltage Control Switch to 8

Wirespeed Control to between 5 to 8

Mode Selector Switch to  Spot

Adjust the Spot Time control knob for the desired weld penetration

Voltage Selector Switches and Wirespeed Control

Select higher Voltage Selector switch positions and set the Wirespeed Control between 354 to 590 ipm (9 to 15 meters/minute) for maximum penetration.

Mode Selector Switch

Set the MODE SELECTOR switch to SPOT.

Spot Time

Adjust the SPOT TIME control shaft for the desired weld or 'ON' time for spot welding.



21-62-FAS

Art # A-07675

Figure 4-8: Spot Welding Nozzle

SPOT WELDING NOZZLES	
TYPE	MINI & NO. 1 150 AMP
Flat Arc Spot	21-62-FAS 1210-1520 (5/8" Bore)
Inside Corner Arc Spot	N/A
Outside Corner Arc Spot	N/A
Automotive Stud Nozzle	21-62 SAS 1210-1524

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4.09 Welding Setting Selection Guide

Material Type	Wire Type	Shielding Gas and Flow Rate	Wire Size (Diameter)
Steel	Solid (or hard) ER70S-6	100% CO ₂ 25cfh	.023" (0.6mm)
			.030" (0.8mm)
			.035" (0.9mm)
		75% Ar 25% CO ₂ 25cfh	.023" (0.6mm)
			.030" (0.8mm)
			.035" (0.9mm)
		92% Ar 8% CO ₂ 25cfh	.023" (0.6mm)
			.030" (0.8mm)
			.035" (0.9mm)
Steel	Flux Core E71 T-11 E71 T-GS	None Required	.030" (0.8mm)
			.035" (0.9mm)
Aluminum	Aluminum 4043 ER 5183 ER 5356 ER	100% Ar 25cfh	.030" (0.8mm)
			.035" (0.9mm)
Stainless Steel	Stainless Steel ER 308 ER 308L ER 308LSi	90% He 7.5% Ar 2.5 CO ₂ 35cfh	.023" (0.6mm)
			.030" (0.8mm)
			.035" (0.9mm)

Art # A-07448

Voltage Step

Wire Speed

THICKNESS

22 ga. (0.8mm)
20 ga. (0.9mm)
18 ga. (1.2mm)
16 ga. (1.6mm)
1/8" (3.2mm)
3/16" (5.0mm)
1/4" (6.4mm)
5/16" (8.0mm)

— —	3 2.25	3 2.75	4 3	— —	— —	— —	— —
— —	2 1	3 2	3 2.25	4 2.75	— —	— —	— —
— —	— —	3 2	3 2	4 2.5	— —	— —	— —
1 2	1 2.5	2 3	2 3.25	3 3.75	4 4.75	6 6.5	— —
1 1	2 1.25	2 2	3 2.5	4 2.75	4 4	5 4.5	6 6
— —	— —	2 1.5	3 2	4 3	5 4.25	6 5	6 4.75
1 2	1 2.5	2 3	2 3.25	7 10	— —	— —	— —
1 1	2 1.25	2 2	3 2.5	7 6.25	7 6.25	8 7.5	8 10
— —	— —	2 1.5	3 2	7 4.25	7 4.5	8 6	8 6
— —	— —	1 2.25	1 2.25	4 2.75	5 3.5	5 5.5	7 5.75
— —	— —	— —	2 1.25	4 2.5	5 3.75	6 5	6 5
— —	— —	1 4	1 4	2 5	4 7	6 7	— —
— —	— —	— —	1 2.75	3 4	5 4.5	6 4.75	7 5.5
2 2.5	2 2.5	3 3	4 2.75	4 3.5	5 3.75	— —	— —
2 1.5	2 1.5	3 1.75	4 2	5 3	6 5.75	7 6.25	— —
— —	— —	3 1.5	3 1.75	4 2.75	5 3.25	6 4	— —

SECTION 5: SERVICE

5.01 Routine Maintenance & Inspection

The only routine maintenance required for the Fabricator is a thorough cleaning and inspection, with the frequency depending on the usage and the operating environment.



WARNING

Disconnect the Fabricator from the Input power supply voltage before disassembling.

Special maintenance is not necessary for the control unit parts in the Power Supply. If these parts are damaged for any reason, replacement is recommended.



CAUTION

Do not blow air into the Power Supply during cleaning. Blowing air into the Power Supply can cause metal particles to interfere with sensitive electronic components and cause damage to the Power Supply.

To clean the Power Supply, disconnect it from the mains supply voltage then open the enclosure and use a vacuum cleaner to remove any accumulated dirt and dust. The Power Supply should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.

Troubleshooting and repairing the Fabricator should be carried out only by those who are familiar with electrical equipment.



WARNING

Do not attempt to diagnose or repair unless you have had training in electronic measurement and troubleshooting techniques.



Warning!
Disconnect input power before maintaining.

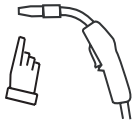
Maintain more often
if used under severe
conditions

Each Use

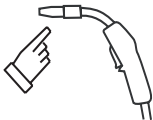
Visual check of
regulator and pressure



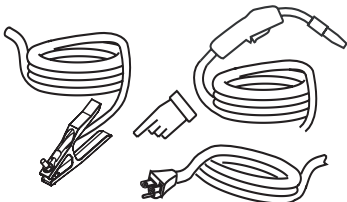
Visual check of torch
Consumable parts



Weekly



Visually inspect the torch
body and consumables



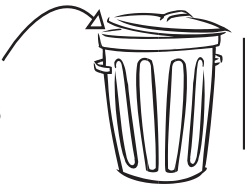
Visually inspect the
cables and leads.
Replace as needed



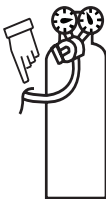
Visually inspect the Wire
feed mechanisms

3 Months

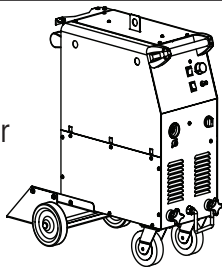
Replace all
broken parts



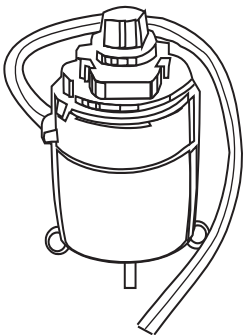
Gas and
air lines



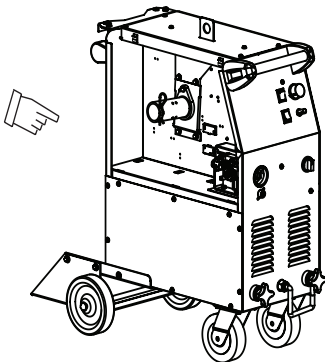
Clean exterior
of power
supply



6 Months



Visually check and
use a vacuum to carefully
clean the interior



Art # A-07362

5.02 Basic Troubleshooting

The basic level of troubleshooting is that which can be performed without special equipment or knowledge, and without removing the covers from the Power Supply.

If major components are faulty, then the Power Supply should be returned to an Accredited Thermal Arc Service Agent for repair.

5.03 Solving Problems Beyond the Welding Terminals

The general approach to fix Gas Metal Arc Welding (GMAW) problems is to start at the wire spool then work through to the MIG torch. There are two main areas where problems occur with GMAW:

1. Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal.

Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points:

1. *Gas cylinder contents and flow meter.*
 - a. Ensure that the gas cylinder is not empty and the flow meter is correctly adjusted to 20-25CFM (15 litres per minute).
2. *Gas leaks*
 - a. Check for gas leaks between the regulator/cylinder connection and in the gas hose to the Power Source.
3. *Internal gas hose in the Power Source.*
 - a. Ensure the hose from the solenoid valve to the MIG torch adaptor has not fractured and that it is connected to the MIG torch adaptor.
4. *Welding in a windy environment.*
 - a. Shield the weld area from the wind or increase the gas flow.
5. *Welding dirty, oily, painted, oxidized or greasy plate.*
 - a. Clean contaminates off the plate

6. *Distance between the MIG torch nozzle and the work piece.*

- a. Keep the distance between the MIG torch nozzle and the work piece to a minimum.

7. *Maintain the MIG torch in good working order.*

- a. Ensure that the gas holes are not blocked and gas is exiting out of the torch nozzle. Refer to WARNING below
- b. Do not restrict gas flow by allowing spatter to build up inside the MIG torch nozzle.
- c. Check that the MIG gun O-rings are not damaged.



WARNING

Disengage the drive roll when testing for gas flow by ear.

FABRICATOR 190 WELDING MACHINE

2. Inconsistent wire feed

Wire feeding problems can be reduced by checking the following points:

1. *Wire spool brake is too tight.*
 - a. Feed roller driven by motor in the cabinet will slip.
2. *Wire spool brake is too loose.*
 - a. Wire spool can unwind and tangle.
3. *Worn or incorrect feed roll size.*
 - a. Use 'U' groove feed roll matched to the aluminum wire size you are welding. Use 'V' groove feed roll matched to the steel wire size you are welding. Use 'knurled V' groove feed roll matched to the flux cored wire size you are welding.
4. *Misalignment of inlet/outlet guides.*
 - a. Wire will rub against the misaligned guides and reduces wire feedability.
5. *Liner blocked with swarf.*
 - a. Slag is produced by the wire passing through the feed roll, if excessive pressure is applied to the pressure adjustment device. Slag can also be produced by the wire passing through an incorrect feed roll groove shape or size. Slag is fed into the conduit where it accumulates thus reducing wire feedability.

6. *Incorrect or worn contact tip.*

- a. The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the electrode wire jamming in the contact tip. When using soft electrode wire such as aluminum it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft electrode wires should be used.

7. *Poor work lead contact to work piece.*

- a. If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.

8. *Bent conduit.*

- a. This will cause friction between the wire and the conduit thus reducing wire feedability.

5.04 Welding Problems

FAULT	CAUSE	REMEDY
A. Undercut.	1. Welding arc voltage too high.	Reduce voltage by reducing the output voltage control switch position or increase the wire speed.
	2. Incorrect torch angle	Adjust angle
	3. Excessive heat input	Increase the torch travel speed and/or reduce welding current by reducing the output voltage control switch position or reducing the wire speed.
	4. Weld speed too fast	Reduce weld speed.
B. Lack of penetration.	1. Welding current too low	Increase welding current by increasing wire speed and increasing voltage selection switch position.
	2. Joint preparation too narrow or gap too tight	Increase joint angle or gap
	3. Shielding gas incorrect	Change to a gas which gives higher penetration
	4. Weld speed too fast	Reduce weld speed.
C. Lack of fusion.	1. Voltage too low	Increase voltage by increasing output voltage control switch position.
	2. Weld speed too fast	Reduce weld speed.
D. Excessive spatter.	1. Voltage too high	Lower voltage by reducing the voltage selection switch or increase wire speed control.
	2. Voltage too low	Raise voltage by increasing the output voltage control switch or reduce wire speed control.
	3. Weld speed too fast	Reduce weld speed.
E. Irregular weld shape.	1. Incorrect voltage and current settings. Convex, voltage too low. Concave, voltage too high.	Adjust voltage and current by adjusting the voltage selection switch and the wire speed control.
	2. Wire is wandering	Replace contact tip
	3. Incorrect shielding gas	Check shielding gas.
	4. Insufficient or excessive heat input	Adjust the wire speed control or the output voltage control switch.
	5. Weld speed too fast	Reduce weld speed.

Table 5-1a: Welding Problems and Solutions

FAULT	CAUSE	REMEDY
A. Weld cracking	1. Weld beads are too small	Decrease travel speed
	2. Weld penetration narrow and deep	Reduce current and voltage and increase Mig torch travel speed or select a lower penetration shielding gas.
	3. Excessive weld stresses	Increase weld metal strength or revise design
	4. Excessive voltage	Decrease voltage by reducing the voltage selection switch.
	5. Cooling rate too fast	Slow the cooling rate by preheating part to be welded or cool slowly.
	6. Weld speed too fast	Reduce weld speed.
B. Cold weld puddle.	1. Faulty rectifier unit	Have an Accredited Thermal Arc Service Agent to test then replace the faulty component.
	2. Loose welding cable connection.	Check all welding cable connections.
	3. Low Primary Voltage	Contact supply authority
	4. Weld speed too fast	Reduce weld speed.
C. Arc does not have a crisp sound that short arc exhibits when the wirefeed speed and voltage are adjusted correctly.	1. The MIG torch has been connected to the wrong voltage polarity on the front panel.	Connect the MIG torch to the positive (+) welding terminal for solid wires and gas shielded flux cored wires. Refer to the electrode wire manufacturer for the correct polarity.
	2. Weld speed too fast	Reduce weld speed.

Table 5-1b: Welding Problems and Solutions (continued)

5.05 Power Supply Problems

FAULT	CAUSE	REMEDY
A. Indicator light in the ON/OFF Power Switch is illuminated but welding arc can not be established.	1. The ON/OFF Power Switch is off.	Switch the ON/OFF Power Switch on.
B. Primary input supply voltage is ON. Indicator light in the ON/OFF Power Switch is not lit and welding arc can not be established.	1. Primary fuses has blown or primary circuit breaker has tripped.	Get a qualified electrician to replace the primary fuses or reset the circuit breakers.
	2. Two amp circuit breaker in the wirefeed compartment has tripped.	Reset the circuit breaker in the wirefeed compartment.
C. Primary input indicator light in the ON/OFF Power Switch is not lit and welding arc can be established.	1. Indicator light is open circuit.	Have an Accredited Thermal Arc Service Agent replace the ON/OFF Power Switch.
D. Primary input supply voltage is ON and indicator light in the ON/OFF Power Switch is lit but when the gun trigger switch is depressed nothing happens.	1. Gun trigger switch leads are disconnected.	Reconnect gun trigger switch leads.
E. Primary input supply voltage is ON, no wire feed but gas flows from the MIG Gun when the gun trigger switch is depressed.	1. Electrode wire stuck in conduit liner or contact tip (burn-back jam).	Check for clogged / kinked MIG Gun conduit or worn contract tip. Replace faulty component(s).
	2. Faulty control PCB or Tweco Gun	Have an Accredited Thermal Arc Service Agent investigate the fault.
F. Wire feeds when the gun trigger switch is depressed but arc can not be established.	1. Poor or no work lead connection.	Clean work clamp area and ensure good electrical contact.
G. Wire feed and shielding gas ceases but the MIG gun trigger switch is still depressed.	1. The Mode Selector switch is set to Spot 	Set the Mode Selector switch is set to Continuous  .
H. Jerky wire feed	1. Worn or dirty contact tip	Replace
	2. Worn feed roll	Replace
	3. Excessive back tension from wire reel hub.roll.	Reduce brake tension on spool hub
	4. Worn, kinked or dirty conduit liner	Clean or replace conduit liner
	5. Low Swing Arm pressure	Increase the Swing Arm pressure.
I. No gas flow	1. Gas hose is cut or pinched	Replace or repair.
	2. Gas passage contains impurities	Disconnect gas hose from the rear of Fabricator then raise gas pressure and blow out the impurities.
	3. Gas regulator turned off	Turn on.
	4. Empty Cylinder	Refill cylinder.
J. Gas flow continues after the gun trigger switch has been released.	1. Gas valve has jammed open due to impurities in the gas or the gas line.	Have an Accredited Thermal Arc Service Agent repair or replace gas valve.

Table 5-2: Power Supply Problems

NOTES

APPENDIX 1: OPTIONS AND ACCESSORIES

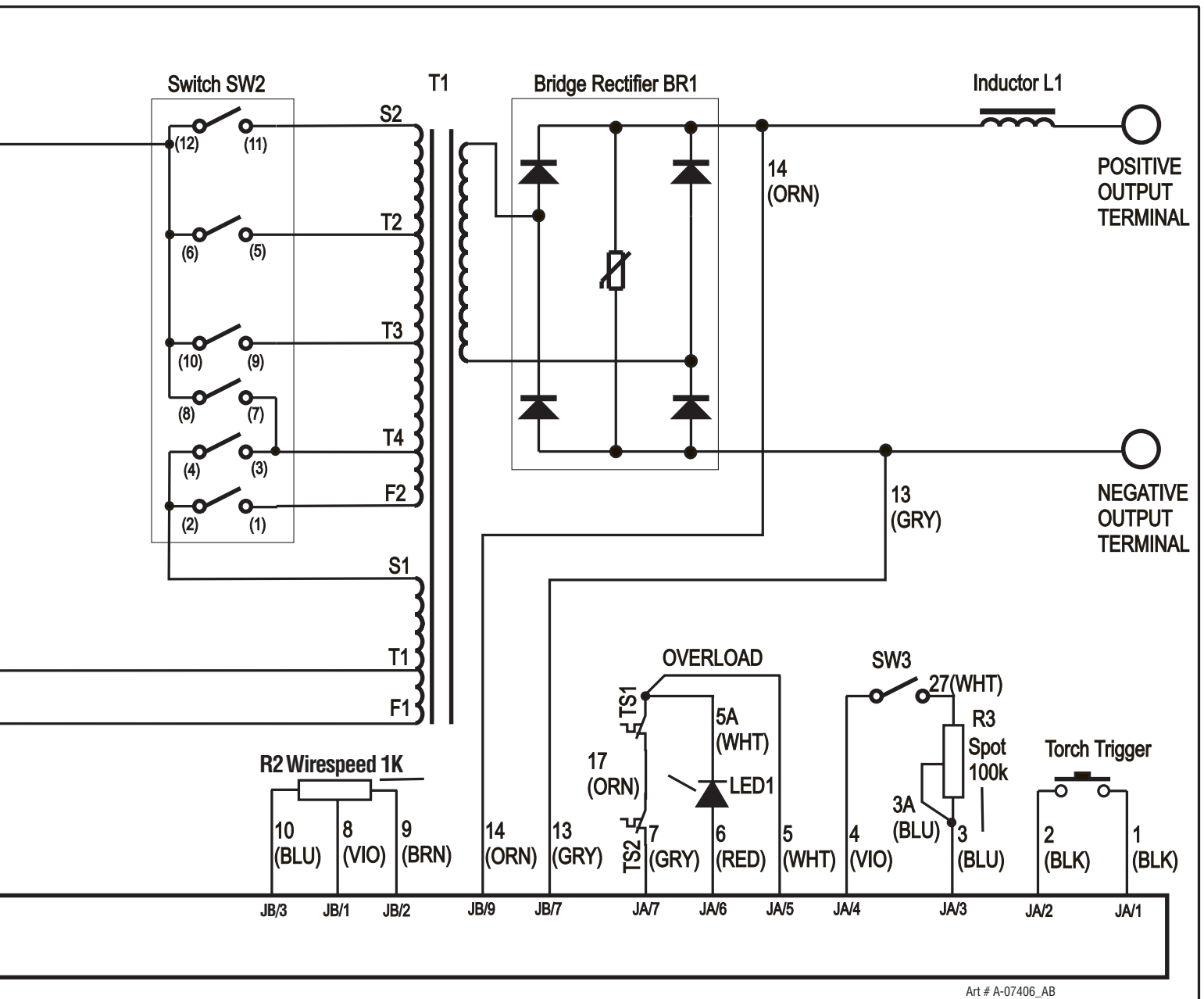
For Tweco/Victor Inquiries and Orders:

Call 1-800-318-6819 Consumable Parts Management Group

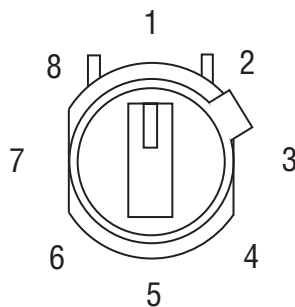
EQUIPMENT OPTIONS	PART NO	Description
GUNS		
Tweco® WeldSkill 10ft	10217P	Gun Assembly with 10ft cable (supplied with package), 200 Amp @ 30% (150 Amp @ 60%)
Tweco® No. 2 10ft	210-3035	Gun Assembly with 10ft cable 250 Amp @ 60%
Tweco® No. 2 12ft	212-3035	Gun Assembly with 12ft cable 250 Amp @ 60%
Tweco® Spraymaster 10ft	MS210-3545	Gun Assembly with 10ft cable 250 Amp @ 80%
Tweco® Spraymaster 12ft	MS212-3545	Gun Assembly with 12ft cable 250 Amp @ 80%
ACCESSORIES		
MIG gun control lead & 4 pin plug	MSAK-354	Connection lead between TWECO MIG guns & Fabricator 190 Medalist™ 1400 Series, HRF Flowmeter Regulator, Argon-Argon/CO2 mix gases
Victor Regulator/Flowmeter Mixed Gases	0781-2723	Medalist™ 1400 Series, HRF Flowmeter Regulator, CO2 gas
Victor Regulator/Flowmeter CO2	0781-2725	
CONSUMABLES		
Drive Roll Kits		
Drive Roll .023"-.030"/.035" (0.6-0.8/0.9mm)	7977036	V grooved for hard wire
Drive Roll .035"-.045" (0.9-1.2mm)	7977660	V grooved for hard wire
Drive Roll .030"-.035" (0.8-0.9mm)	7977731	U grooved for soft wire
Drive Roll .040"-.045" (1.0-1.2mm)	7977264	U grooved for soft wire
Drive Roll .030"-.035" (0.8-0.9mm)	7977732	V grooved knurl for cored wire
Drive Roll .045"-.1/16" (1.2-1.6mm)	704277	V grooved knurl for cored wire
Contact Tips		
	11-23	.023" (0.6mm)
	11-30	.030" (0.8mm)
	11-35	.035" (.09mm)
	11-40	.040" (1.0mm)
	11-45	.045" (1.2mm)
Nozzles		
	21-37	3/8" (9.5mm)
	21-50	1/2" (12.7mm)
	21.62	5/8" (16mm)
Conduits		
	42-23-15	.023", 15 ft.(7.6m)
	42-3035-15	.030-.035", 15ft. (4.5m)
	42-4045-15	.040-.045", 15ft. (4.5m)
	42N-3545-15	.035-3/64", 15ft. (4.5m) for Aluminum wire

APPENDIX 2: POWER SUPPLY CIRCUIT DIAGRAM





FABRICATOR 190 SYSTEM SCHEMATIC



SWITCH 2							
SWITCH POSITION	1 2	3 4	5 6	7 8	9 10	11 12	
1	X					X	
2		X				X	
3	X		X				
4		X	X				
5	X				X		
6		X			X		
7	X			X			
8		X		X			

LIMITED WARRANTY

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

March 2008

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.

March, 2008

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 Manufacturers Warranty for Details	
GMAW/FAW (MIG) WELDING EQUIPMENT	WARRANTY PERIOD	LABOR
Fabricator 131, 181; 190, 210, 251, 281, 140, 180; 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



GLOBAL CUSTOMER SERVICE CONTACT INFORMATION

Thermadyne USA

2800 Airport Road
Denton, Tx 76207 USA
Telephone: (940) 566-2000
800-426-1888
Fax: 800-535-0557
Email: sales@thermalarc.com

Thermadyne Canada

2070 Wyecroft Road
Oakville, Ontario
Canada, L6L5V6
Telephone: (905)-827-1111
Fax: 905-827-3648

Thermadyne Europe

Europe Building
Chorley North Industrial Park
Chorley, Lancashire
England, PR6 7Bx
Telephone: 44-1257-261755
Fax: 44-1257-224800

Thermadyne, China

RM 102A
685 Ding Xi Rd
Chang Ning District
Shanghai, PR, 200052
Telephone: 86-21-69171135
Fax: 86-21-69171139

Thermadyne Asia Sdn Bhd

Lot 151, Jalan Industri 3/5A
Rawang Integrated Industrial Park - Jln Batu Arang
48000 Rawang Selangor Darul Ehsan
West Malaysia
Telephone: 603+ 6092 2988
Fax : 603+ 6092 1085

Cigweld, Australia

71 Gower Street
Preston, Victoria
Australia, 3072
Telephone: 61-3-9474-7400
Fax: 61-3-9474-7510

Thermadyne Italy

OCIM, S.r.L.
Via Benaco, 3
20098 S. Giuliano
Milan, Italy
Tel: (39) 02-98 80320
Fax: (39) 02-98 281773

Thermadyne International

2070 Wyecroft Road
Oakville, Ontario
Canada, L6L5V6
Telephone: (905)-827-9777
Fax: 905-827-9797

World Headquarters

Thermadyne Holdings Corporation
Suite 300, 16052 Swingley Ridge Road
St. Louis, MO 63017

Telephone: (636) 728-3000

FAX: (636) 728-3010

Email: sales@thermalarc.com

www.thermalarc.com

