VS 212

PORTAFEED®

CC/CV SEMIAUTOMATIC SOLID STATE CONTROLLED WIRE FEEDER

Art # A-07123_AB

Operating Manual

Revision: AH **Issue Date:** March 3, 2011 **Manual No.:** 0-4845

Operating Features:

15-100 DC | CC CV | 800 IPM | VS

WE APPRECIATE YOUR BUSINESS!

Congratulations on your new Thermal Arc product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency call 1-800-752-7621, or visit us on the web at **www.Thermalarc.com.**

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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Thermal Arc is a Global Brand of Arc Welding Products for Thermadyne Industries Inc. We manufacture and supply to major welding industry sectors worldwide including; Manufacturing, Construction, Mining, Automotive, Aerospace, Engineering, Rural and DIY/Hobbyist.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

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.

Portafeed VS 212 CC/CV Semiautomatic Solid State Controlled Wire Feeder
Instruction Manual Number 0-4845 for:
Part Numbers: W3512001, W3512002 and W35120L2

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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 semi-automatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

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

WARNING

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

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

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

WARNING

FUMES AND GASES can be hazardous to your health.

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

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

WARNING

WELDING can cause fire or explosion.

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

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

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

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

WARNING

FLYING SPARKS AND HOT METAL can cause injury.

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

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

WARNING

CYLINDERS can explode if damaged.

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

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

WARNING

Engines can be dangerous.

WARNING

ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

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

WARNING

ENGINE FUEL can cause fire or explosion.

Engine fuel is highly flammable.

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

WARNING

MOVING PARTS can cause injury.

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

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

WARNING

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

Batteries contain acid and generate explosive gases.

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

WARNING

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

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

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

WARNING

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

NOTE

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

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

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

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

ABOUT PACEMAKERS:

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

1.02 Principal Safety Standards

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

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

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

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

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

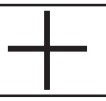
Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

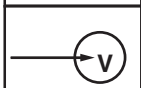
Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

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

1.03 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
	Amperage
	Voltage
	Hertz (cycles/sec)
	Frequency
	Negative
	Positive
	Direct Current (DC)
	Protective Earth (Ground)
	Line
	Line Connection
	Auxiliary Power
 115V 15A	Receptacle Rating- Auxiliary Power

	Single Phase
	Three Phase
	Three Phase Static Frequency Converter-Transformer-Rectifier
	Remote
	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
t	Spot Time
t1	Preflow Time
t2	Postflow Time
	2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.
	4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.
t	Burnback Time
IPM	Inches Per Minute
MPM	Meters Per Minute
	Art # A-04130

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'equipement. Toute personne n'ayant pas suivi un entraînement intensif en soudage et coupage ne devrait pas tenter de souder. Certaines pratiques concernent les équipements raccordés aux lignes d'alimentation alors que d'autres s'adressent aux groupes électrogènes.

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

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

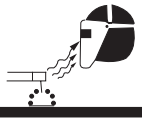
1.05 Dangers relatifs au soudage à l'arc

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'entrainement et toutes les pièces métalliques en contact avec le fil de soudage sont sous tension. Un équipement inadéquatement installé ou inadéquatement mis à la terre est dangereux.

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



AVERTISSEMENT

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

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

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

AVERTISSEMENT

LES VAPEURS ET LES FUMEES SONT DANGEREUSES POUR LA SANTE.

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

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

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

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

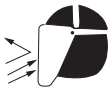
7. Ne soudez des tôles galvanisées ou plaquées au plomb ou au cadmium que si les zones à souder ont été grattées à fond, que si l'espace est bien ventilé; si nécessaire portez un respirateur à adduction d'air. Car ces revêtements et tout métal qui contient ces éléments peuvent dégager des fumées toxiques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

AVERTISSEMENT

LE SOUDAGE PEUT CAUSER UN INCENDIE OU UNE EXPLOSION

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

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



AVERTISSEMENT

LES ETINCELLES ET LES PROJECTIONS BRULANTES PEUVENT CAUSER DES BLESSURES.

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

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

AVERTISSEMENT

LES BOUTEILLES ENDOMMAGEES PEUVENT EXPLOSER

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

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

AVERTISSEMENT

LES MOTEURS PEUVENT ETRE DANGEREUX

LES GAZ D'ECHAPPEMENT DES MOTEURS PEUVENT ETRE MORTELS.

Les moteurs produisent des gaz d'échappement nocifs.

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

AVERTISSEMENT

LE CARBURANT PEUR CAUSER UN INCENDIE OU UNE EXPLOSION.

Le carburant est hautement inflammable.

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

AVERTISSEMENT

DES PIECES EN MOUVEMENT PEUVENT CAUSER DES BLESSURES.

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

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

AVERTISSEMENT

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

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

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

AVERTISSEMENT

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

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

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

1.06 Principales Normes De Securite

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

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

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

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

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

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

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

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

1.07 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
	Intensité de Courant
	Tension
	Hertz (cycles/sec)
	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
	Tri-Phase Statique Fréquence Convertisseur Transformateur-Redresseur
	Distant
X	Facteur de Marche
%	Pourcentage
	Panneau/Local
	Soudage Arc Electrique Avec Electrode Enrobé (SMAW)
	Soudage á L'arc Avec Fil Electrodes Fusible (GMAW)
	Soudage á 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

	Déroulement 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
	Duréc du Pulse
	Durée de Pré-Dèbit
	Durée de Post-Dèbit
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-dèbit, relailez pour initier l'arc. Appuyez pour arrêter l'arc, et mainteuir pour pré-dèbit.	
	Probléme de Terre
IPM	Pouces Par Minute
MPM	Mètres Par Minute
	Art # A-07639

1.08 Declaration Of Conformity

CE

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

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

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

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

National Standard and Technical Specifications

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

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

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

Manufacturers responsible representative:

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

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.

Move the equipment to the installation site before un-crating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to un-crate the unit.

2.04 General

The PORTAFEED® VS 212 is a portable, solid state controlled, voltage sensing wire feeder that operates on arc voltage and can be used with most constant voltage (CV) and constant current (CC) DC-type power sources. The only connection required between the power source and the wire feeder is the welding cable.

The unique design of this wire feeder allows operation in a constant wire feed speed mode when used with CV power sources, and in a voltage sensing wire feed speed mode (wire feed speed varies with respect to arc voltage) when used with CC power sources.

The PORTAFEED VS 212's steel-reinforced, flame-retardant case totally encloses the solid state control circuitry, welding wire, and wire drive system. A hinged, latched door allows quick and easy access to the contactor, welding wire, and feedhead assembly that features quick change, gear-driven drive rolls.

PORTAFEED VS 212 comes with:

- Robust injection molded case
- Changeable MIG gun cartridge system
- Digital display (models W3512002 and W35120L2)
- Heavy duty contactor
- Internal parts storage
- Power cable and drive rolls
- Gas valve solenoid

The PORTAFEED VS 212, includes the following features:

1. An on/off rocker switch
2. A wire feed speed control knob
3. A welding gun holder
4. A carrying handle
5. A contactor
6. A gas valve
7. A CC/CV mode switch
8. An input circuit breaker for complete system protection
9. An electronic controlled protection circuitry to protect against an undervoltage, an overvoltage, a voltage spike, a shorted or locked motor, a shorted contactor coil, and a shorted gas valve
10. An electronic controlled dynamic brake
11. An electronic controlled current limit to motor
12. An electronic controlled start circuit for improved arc starting
13. A low voltage gun trigger circuit for operator safety
14. A drive roll kit
15. In addition to these standard features, model numbers W3512002 and W35120L2 also include a digital display for wire feed speed/amps and arc voltage, with arc time and memory hold.
16. Trigger Hold Switch

The PORTAFEED VS 212 has been designed to comply with IEC 60974-1 (CE), CSA NRTL/C, and NEMA EW 3 standards.

2.05 Product Specifications

Portafeed VS212 Specifications	
Input Voltage Range	15-100 VDC
Maximum Input Current	10 Amps
Wire Speed Range (dependent on arc voltage)	50-800 IPM (1.27 - 20.32 MPM)
Wire Sizes	0.024 - 5/64'' (0.6 - 2.0 mm)
Max Wire Spool Capacity	12'' (304.8 mm) 44 Lbs. (20 kg)
Drive Rolls	2 (Both Gear Driven)
Welding Current (I)	425A at 60% Duty Cycle
Welding Gun Inlet Size (Std) Tweco Style #4	5/8'' (16mm) Nominal
Maximum Shielding Gas Inlet Pressure	100 psi (6.9 bar)
Degree of Protection	IP23C
Weight (Less wire)	44 lbs (20 kg)
Approvals	IEC 60974-5 (CE) CSA NRTL/C (pending) NEMA EW3

Table 2-1 Specifications

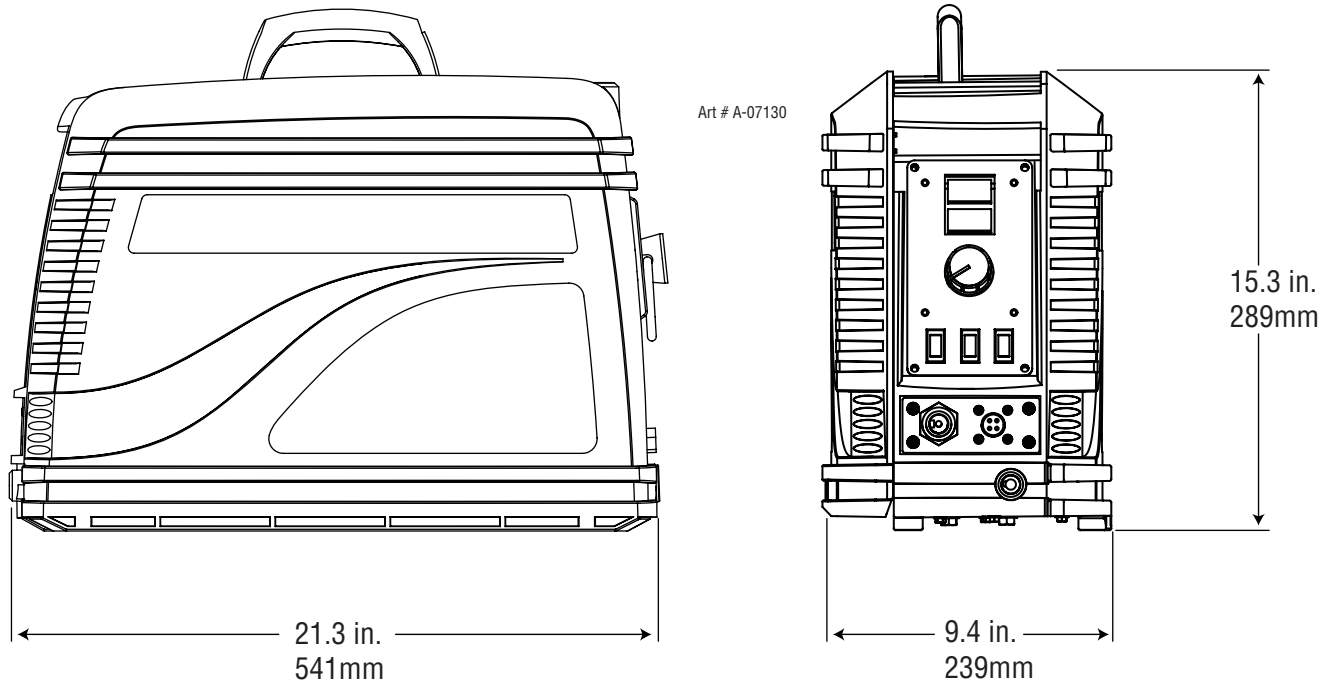


Figure 2-1: Dimensional Information

2.06 Features/Benefits

Robust injection molded case
Long lasting and unbreakable.

Changeable MIG gun cartridge system
Patent Pending. No external MIG gun adapters needed for other style guns with the integrated cartridge system.

Digital display (models W3512002 and W35120L2)
Monitor wire speed, amps, volts, arc time and meter hold. Makes parameter set-up easy.

Heavy duty contactor
Longer life on higher amperage applications.

Internal parts storage
On the job storage for drive rolls, tips, nozzels, etc.

Machined feed head & tension arms
Insures wire alignment tolerances of ±002".

Inch switch & purge switch
'Cold' inching of wire at set wire feed speed and purging of gas without running wire.

Gun trigger hold (2T/4T)
Allows standard or latched gun trigger.

Heavy duty, removable voltage sensing lead
Allows storage of lead with less lead breakage.

MIG gun holder
A place to hold your MIG gun while not welding.

Lifting eye
Allows for hanging or moving of the feeder over the work area.

Gas valve solenoid
Controls 'on/off' flow of shielding gases.

Wire speed high/low range
Gives a finer dial control of larger diameter flux cored wires.

Ready to weld
Supplied with 2ft (.7m) power cable, Tweco connectors and .045in (1.2mm) drive rolls for hard/tubular wire. Geared top & bottom drive rolls. Excellent traction on the wire.

Quick change drive rolls
Change the drive rolls without tools.

2.07 Front Panel Controls And Connections

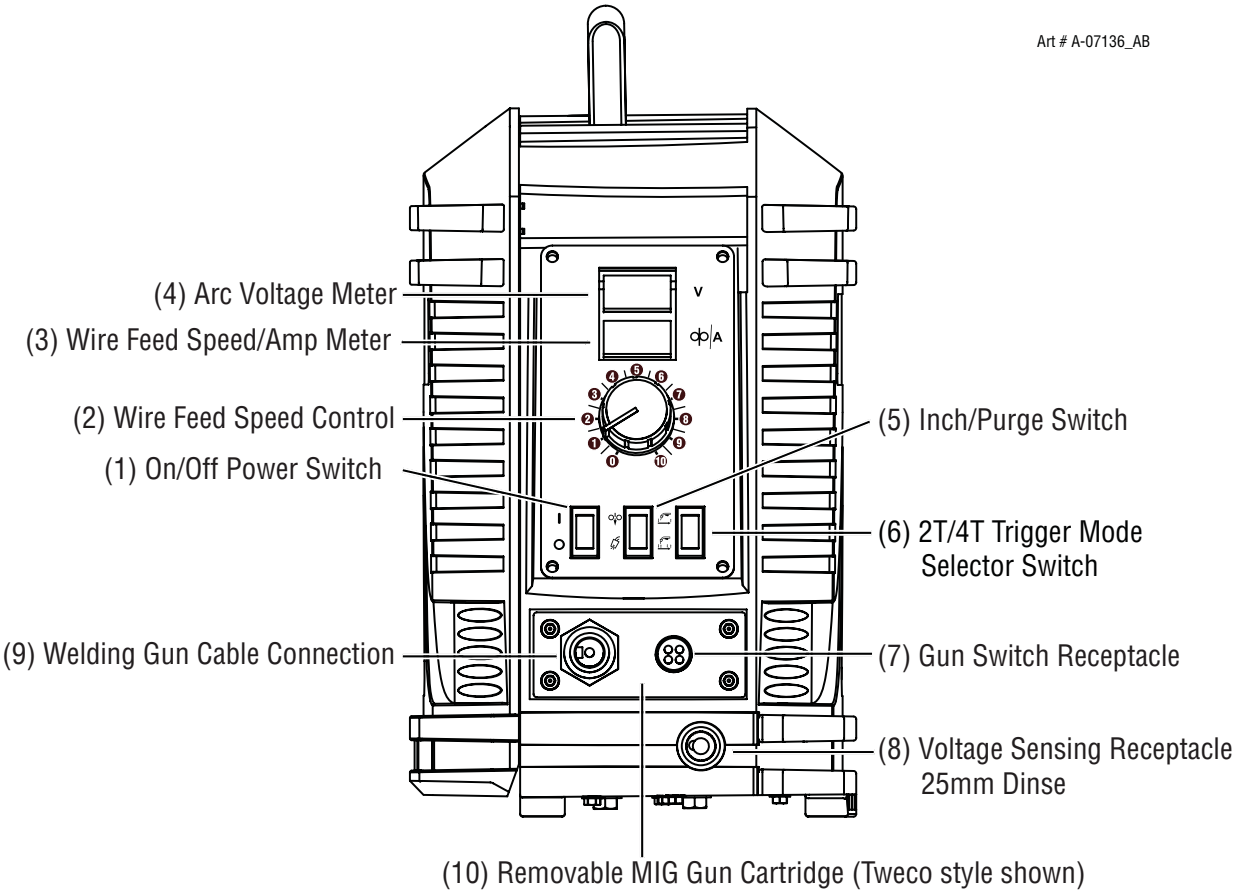


Figure 2-2: Front Panel Controls and Connections

1. **POWER ON/OFF SWITCH:** This switch controls input power only to the wire feeder and not to the power source.
2. **WIRE FEED SPEED CONTROL:** This knob controls the wire feed speed. The wire feed speed control can be adjusted during setup or actual welding.
3. **WIRE FEED SPEED/AMP METER:** The wire feed speed meter displays the actual wire feed speed output of the wire feeder. This meter can be changed to display the actual amperage output of the power source by adjusting the DIP switches located on the edge of the display board inside the unit. Refer to Section 4.07 for details.
4. **ARC VOLTAGE METER:** The arc voltage meter displays the actual voltage output of the power source.
5. **INCH/PURGE SWITCH:** Depressing the INCH portion of the switch will feed wire at a speed set by the WFS control. The wire will not be electrically hot when using the INCH switch. Depressing the PURGE portion of the switch will allow shielding gas to flow out of the welding gun without feeding wire.
6. **TRIGGER HOLD SWITCH:** This switch selects either 2 Step or 4 Step gun switch mode.
7. **GUN SWITCH RECEPTACLE:** The gun switch receptacle accepts the welding gun control wires. The gun switch receptacle is where a gun switch closure is inputted to the wire feeder.
8. **VOLTAGE SENSING RECEPTACLE:** This receptacle serves as the voltage sensing point for the wire feeder and must be connected to the work piece through the voltage sensing lead for proper operation. If the voltage sensing lead from the wire feeder and the weld cable from the power source are not connected to the work piece, the wire feeder will not work.
9. **WELDING GUN CABLE CONNECTION:** The welding gun cable is connected to the wire feeder at this point. Connections must be tight; otherwise, arcing or overheating could result.
10. **REMOVABLE MIG GUN CARTRIDGE (**Patent Pending): The whole cartridge is interchangeable to accept competitive types of MIG gun connections. No external adapters required. See Appendix 2 and 3 for installation information and to select the adapter for other MIG Gun styles, ie. Miller®, Lincoln® or Euro.

2.08 Rear Panel Controls And Connections

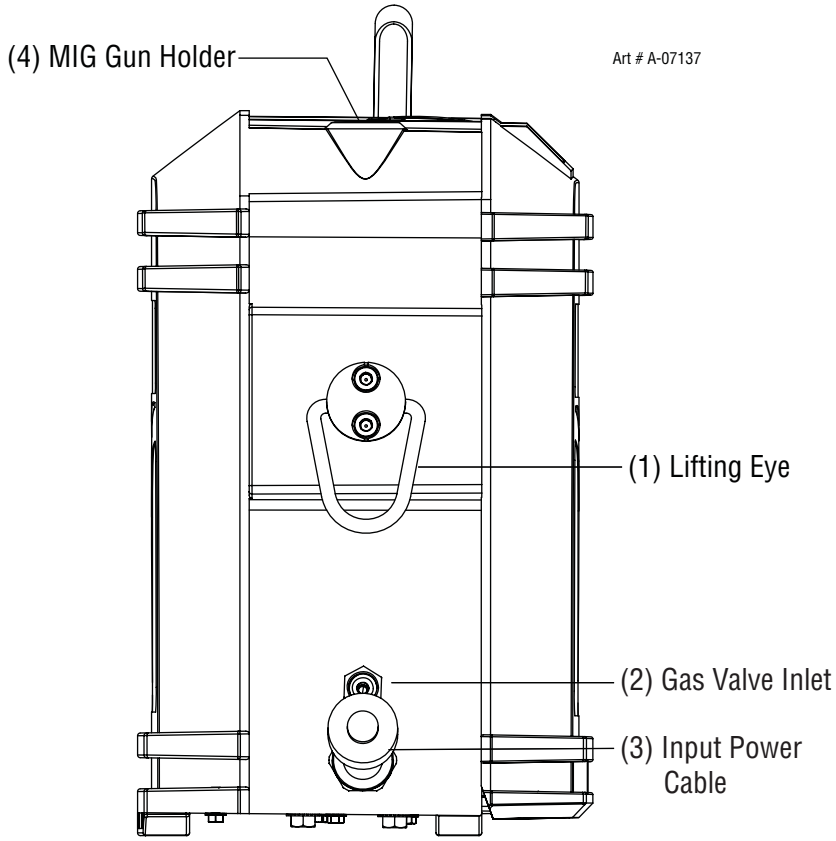


Figure 2-3: Rear Panel Connections

1. **LIFTING EYE:** Allows for hanging or moving of the feeder over the work area.
2. **GAS VALVE INLET:** This is where the shielding gas hose (if used) is connected to the wire feeder.
3. **INPUT POWER CABLE:** Provides an inlet and secure fixture for the power cable from the welding power source.
4. **WELDING GUN HOLDER:** This is an insulated holder used to hold the welding gun when not welding.

2.09 Internal Controls And Connections

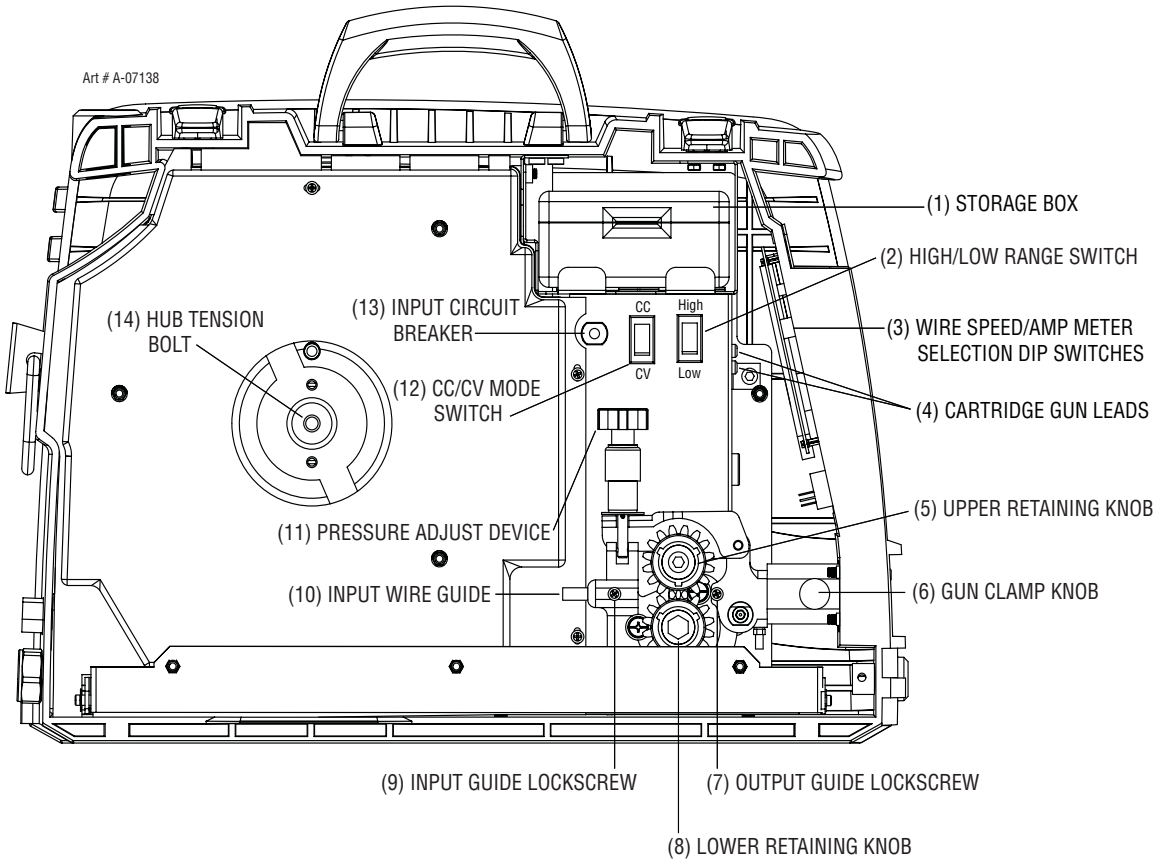


Figure 2-4: Internal Controls and Connections.

1. **STORAGE BOX:** On the job storage for drive rolls, tips, nozzels, etc. To remove, lift up to release velcro and slide it up and over the side retainers.
2. **HIGH/LOW RANGE SWITCH:** Gives a finer dial control over the wire speed, which is especially useful with larger diameter flux-cored wires.
3. **WIRE SPEED/AMP METER SELECTION DIP SWITCHES:** Set these switches to change the lower meter display from wire speed to amperage output of the power source. Refer to Section 2.08, item 3 and section 4.07 for DIP switch setting information.
4. **CARTRIDGE GUN LEADS:** These two spade terminals provide the MIG gun switch connection.
5. **UPPER RETAINING KNOB:** This knob is used to secure the bearing feed roll. Remove this knob to change the bearing feed roll.
6. **GUN CLAMP KNOB:** Tighten this knob to secure the welding gun to the wire feeder.
7. **OUTPUT GUIDE LOCKSCREW:** Tighten this screw to secure the output wire guide.
8. **LOWER RETAINING KNOB:** This knob is used to secure the drive feed roll. Remove this knob to change the drive feed roll.
9. **INPUT GUIDE LOCKSCREW:** Tighten this screw to secure the input wire guide.
10. **INPUT WIRE GUIDE:** This guide is required to direct the welding wire from the wire spool to the drive feed roll.
11. **SPRING TENSION KNOB:** Use the spring tension knob to adjust the amount of force the bearing feed roll exerts on the welding wire.

12. **CC/CV MODE SWITCH:** The CC position provides a voltage sensing wire feed speed mode of operation for use with constant current (CC) power sources. The CV position provides a constant wire feed speed mode of operation for use with constant voltage (CV) power sources.

NOTE

This switch does not select a CC or CV mode of operation. The mode of operation is set by the type of power source being used.

13. **INPUT CIRCUIT BREAKER:** This circuit breaker provides complete system protection for the wire feeder in the case of a fault or overload condition.

14. **HUB TENSION BOLT:** The hub tension bolt is used to adjust the wire spool tension which acts as a mechanical brake to assist in the stopping of the welding wire at the completion of a weld.

2.10 Power Source Compatibility

Since the PORTAFEED VS 212 operates on arc voltage, it will work with most constant current (CC) or constant voltage (CV) DC type power sources.

When connected to a PORTAFEED VS 212, the maximum allowed open circuit voltage (OCV) of the power source is 100 VDC. Open circuit voltages exceeding 100 VDC will damage or shorten the life of the unit.

NOTE

Because of the high open circuit voltage associated with most CC power sources, it is recommended to place the PORTAFEED VS 212 power switch in the OFF position when not welding. This procedure will prolong the life of electrical components connected to the power input lines.

When using the PORTAFEED VS 212, there must be at least 15 VDC between the output terminals of the power source during standby and while welding. Otherwise, the unit will not have enough input voltage to operate properly.

A contactor is a standard component of the PORTAFEED VS 212 and allows the welding wire to remain electrically cold until the gun switch trigger is depressed. This contactor is rated for 425 amps of welding current at a 60% duty cycle. If the weld current or duty cycle rating is exceeded, the contactor will be damaged or its life shortened.

Compatible Thermal Arc Power Sources
ArcMaster 400S, 300MST, 400MST, 400MSTP
Fabstar® 4030
PowerMaster® Series
Excel-Arc® Series
Scout, Raider 10000 (engine driven)

SECTION 3: INSTALLATION

3.01 Connections

CAUTION

Make sure all connections are tight; otherwise, arcing or overheating could result.

WARNING

ELECTRIC SHOCK CAN KILL! DO NOT touch the metal portions of the voltage sensing lead when the power source output is on.

1. Using the supplied adapter, connect a weld cable from the power source to the power cable connection on the rear of the VS 212.
2. Connect a weld cable from the power source to the work connection.
3. Connect the voltage sensing lead from the wire feeder to the work connection.
4. Make the proper gas line connection from the gas supply to the wire feeder gas valve (if gas will be used).
5. Attach the welding gun to the wire feeder.
6. Connect the welding gun control leads to the wire feeder gun switch terminals located on the front of the wire feeder.

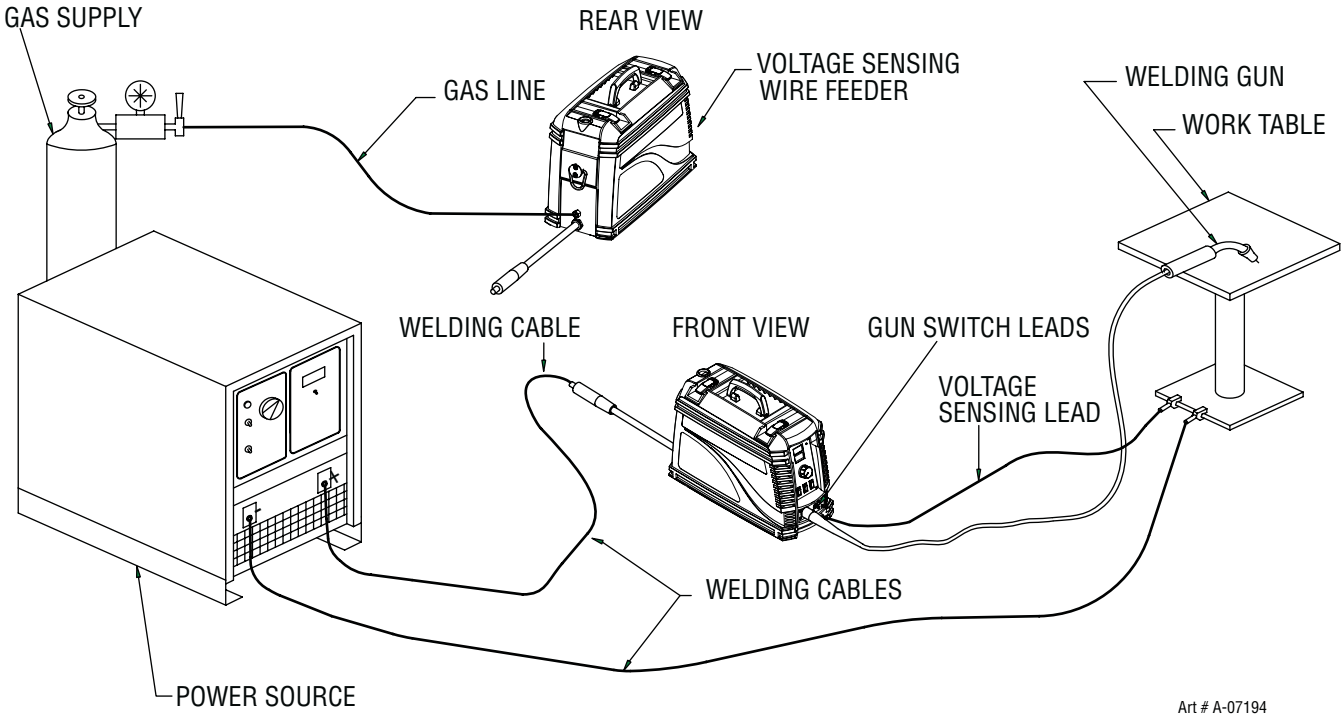


Figure 3-1: System Hook-up Outline

3.02 Installation Of Wire Spool

NOTE

The wire spool hub supplied with the unit is provided for mounting a 44 pound (20 kg) spool of wire. Optional adapters are available allowing a 10 (4.5 kg) or 15 (6.8 kg) pound spool of wire or a 14 (6.4 kg) pound coil of wire to be used.

1. Remove the wire spool hub nut by turning counterclockwise.
2. Slide the spool of wire over the wire spool hub.
3. Make sure that the alignment pin on the hub enters the hole in the backside of the wire spool.
4. Replace the wire spool hub nut and turn clockwise to a snug position.

NOTE

Install the welding wire spool so the wire feeds from the bottom of the spool into the input wire guide.

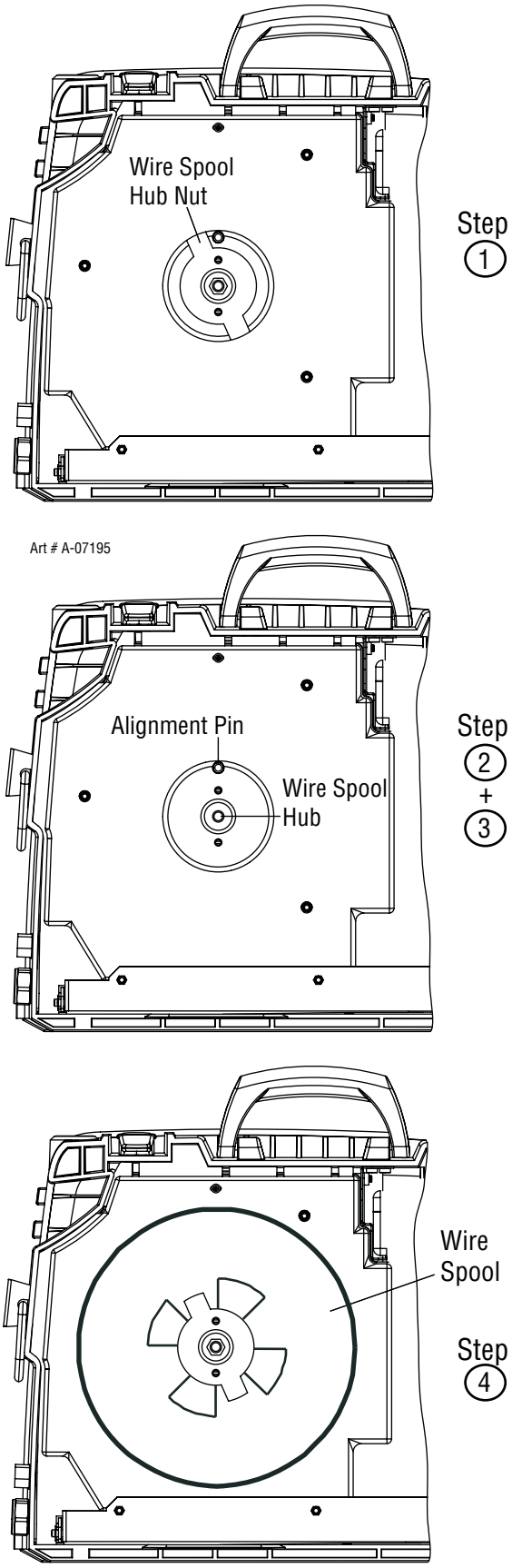


Figure 3-2: Wire Spool Installation

3.03 Adjustment Of Spool Tension

Adjust the wire spool tension so the wire will feed freely into the input wire guide. However, the spool of welding wire must not coast when wire feeding stops. To adjust the wire spool tension, tighten or loosen the hub tension bolt accordingly.

NOTE

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

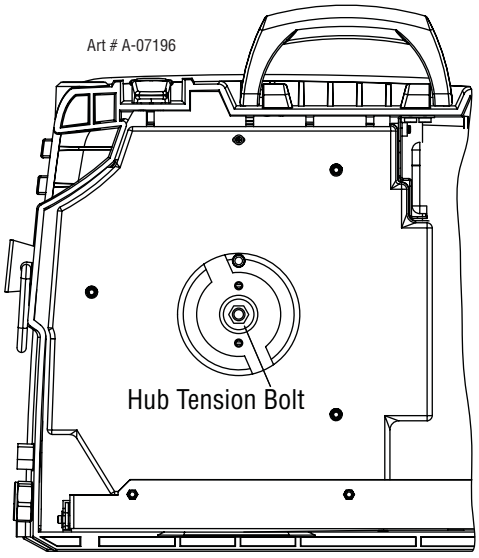


Figure 3-3: Hub Tension Bolt

3.04 Input And Output Wire Guide Installation

1. Install the input wire guide (the longer one) by loosening the input guide lockscrew and inserting the guide into the hole in the feedhead assembly. The recessed end of the guide should be towards the wire spool. Adjust the guide so that it is clear of the feed rolls and tighten the input guide lockscrew.
2. Install the output wire guide (with the conical end towards the feed rolls) in the same manner as the input guide. The conical end of the guide should be as close to the feed rolls as practical. Tighten the output guide lockscrew.

NOTE

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

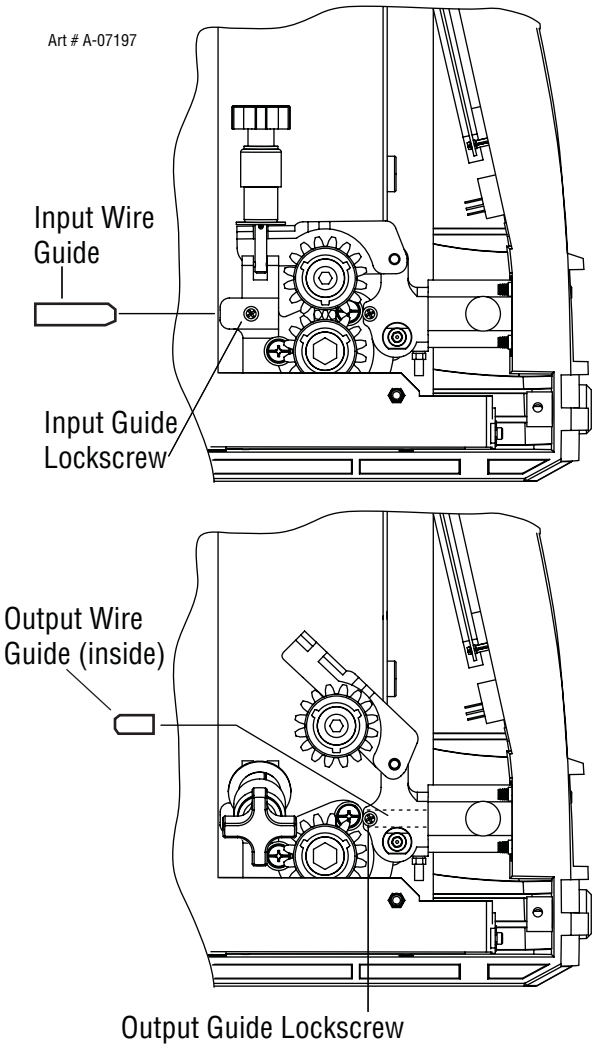


Figure 3-4: Wire Guide Installation

3.05 Selection And Installation Of Feed Rolls

Refer to feed roll kit chart in the Appendix chapter for the proper selection and ordering of feed roll kits. Kit includes a bearing roll, a drive roll, an input wire guide, and an output wire guide for a specific wire type and size.

NOTE

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

Bearing feed rolls are installed by unscrewing the upper retaining knob and removing the idler gear. The bearing feed roll retaining knob is then removed from the idler gear, and the bearing feed roll is placed over the lobes on the idler gear. The bearing feed roll retaining knob is replaced, and this assembly is returned and secured with the upper retaining knob.

Drive feed rolls are installed by removing the lower retaining knob, placing the drive feed roll over the lobes on the drive gear, and securing with the lower retaining knob.

NOTE

Installation of all styles of feed rolls for this feeder is identical.

WARNING

The welding wire is electrically Hot if wire is fed by depressing gun switch. Electrode contact to work piece will cause an arc with gun switch depressed.

3.06 MIG Gun Compatibility And Installation and Removal

The Portafeed VS 212 wire feeder is designed to be used with most MIG welding guns. Model numbers W3512001 and W3512002 come configured from the factory to work with all Tweco guns. Model number W35120L2 comes configured from the factory to work with Lincoln gas-less guns. Refer to the Section 2.11 "Available Options" for the ordering information of other MIG gun adapter cartridges.

1. To install the welding gun, loosen the gun clamp knob and insert the welding gun cable end into the feedhead until it stops.
2. Tighten the gun clamp knob and connect the welding gun control wires to the gun switch receptacle.
3. To remove, loosen the gun clamp knob and pull the gun cable end out.

NOTE

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

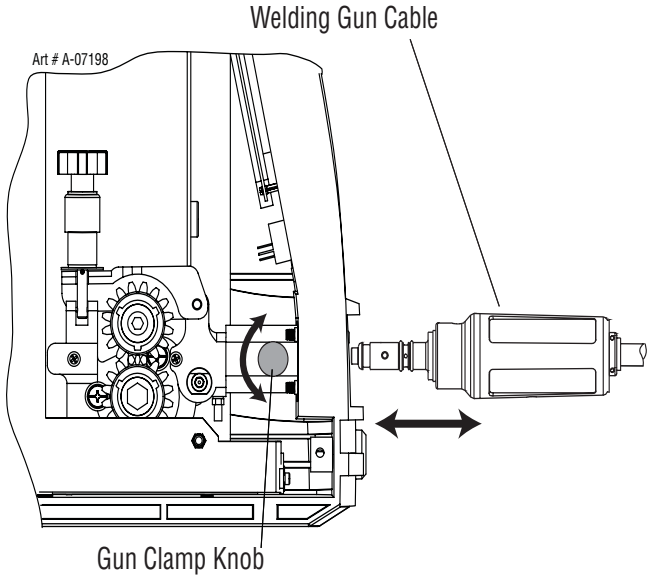


Figure 3-5: Installing Welding Gun

3.07 Threading Wire Into Feedhead

Refer to Figure 3-6.

WARNING

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

CAUTION

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

1. Place end of the welding wire into the input wire guide. Feed it through the guide and over the drive roll groove closest to the feedhead casting.
2. Pass the wire through the output wire guide and into the welding gun assembly.
3. Lock in position with the spring tension knob. To adjust the amount of force the bearing feed roll exerts on the welding wire, turn the spring tension knob clockwise for increased force or counterclockwise for decreased force.

NOTE

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

4. Turn the welding machine and wire feeder ON, and set the wire feed speed control to midrange (refer to Figure 3-7). Remove contact tube from welding gun. Refer to Gun Manual. Press the gun switch or INCH switch until wire feeds out past the gun nozzle. Place contact tube over the wire and screw into place and tighten. Cut wire off at about 1/4 inch (6 mm) from the nozzle.

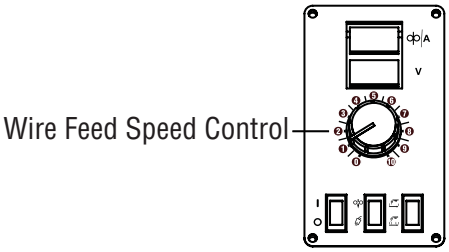


Figure 3-7: Wire Feed Speed Control

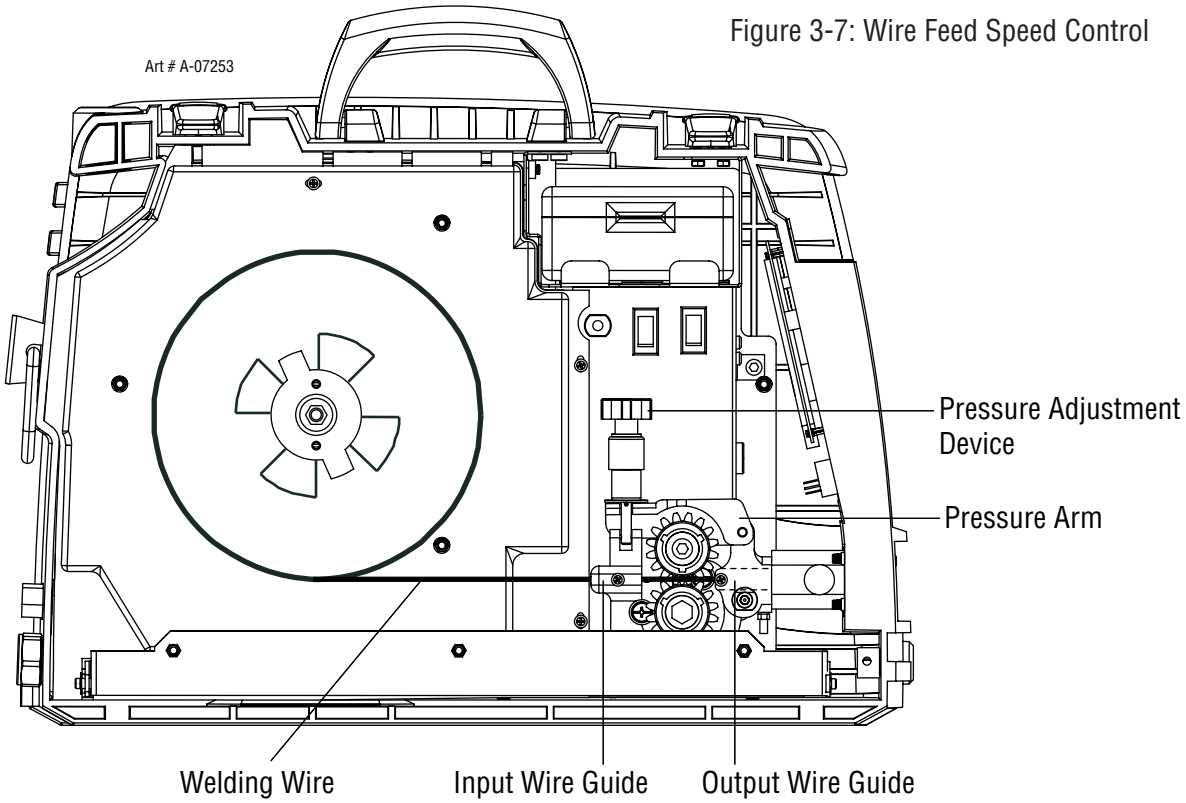


Figure 3-6: Wire Threaded Through Guides and Locked In Position

NOTES

SECTION 4: OPERATION

4.01 Prewelding Procedure

Follow all installation instructions for the welding power source, the welding gun, and the VS 212 CC/CV wire feeder before attempting to weld.

1. Make sure all necessary connections have been made (refer to Connections in the Installation chapter of this manual).
2. Turn ON the power source and the wire feeder.
3. Set the CC/CV mode switch on the wire feeder to the proper position (refer to paragraph 12, CC/CV Mode Switch on page 2-9 and figure 4-1).

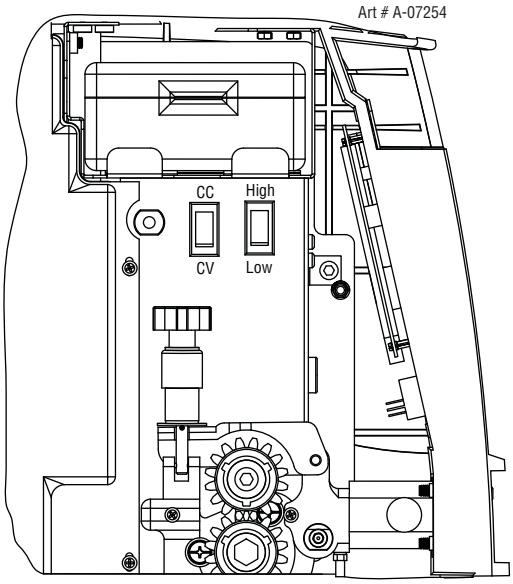


Figure 4-1: CC/CV Switch Location

4. If shielding gas will be used, depress the purge switch (if equipped) or gun switch and adjust the flow of gas.

WARNING

If the gun switch is depressed, the wire feeder will feed electrically hot welding wire. If this hot welding wire touches the work piece, a welding arc will be established.

5. Depress the inch switch (if equipped) or gun switch and adjust the wire feed speed to the desired value by means of the wire feed speed control. The wire feed speed control can be adjusted during setup or while welding.

WARNING

If the gun switch is depressed, the wire feeder will feed electrically hot welding wire. If this hot welding wire touches the work piece, a welding arc will be established.

6. Adjust the voltage control (on a CV machine) or current control (on a CC machine) to the desired value. The voltage or current control can be adjusted during setup or while welding.
7. If using a CV power source, the output contactor on the power source will have to be energized. In most cases, this will require a jumper to be added to the power source or a switch on the power source to be turned on. Read the power source owner's manual for proper connections or settings required.

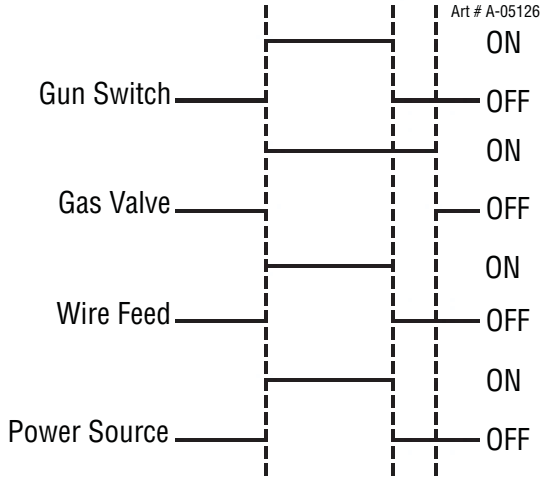


Figure 4-2: Functional Timing Diagram

4.02 Welding Procedure

WARNING

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

Refer to Functional Timing Diagram on the previous page.

1. To start the weld, position the welding gun above the work piece and depress the gun switch trigger. The solid state control then enables the gas valve, wire feed motor, and power source.
2. To end the weld, release the gun switch trigger while pulling the welding gun away from the work piece. The solid state control then disables the gas valve, wire feed motor, and power source.

NOTE

After the weld is completed, it is recommended to pull the welding gun away from the work while releasing the gun switch. This allows the welding arc to partially extinguish at the work piece which reduces the arcing at the contactor contacts. Using this procedure will lengthen the life of the contactor contacts especially when welding at high amperage.

3. At the end of the work day or when welding has been completed, it is recommended that the gas be SHUT OFF at the cylinder, and the wire feeder and power source be turned OFF.

4.03 Welding In CC Mode vs. CV Mode

1. **Welding in CC Mode:** When welding with a constant current (CC) power source, changes in wire feed speed will affect welding voltage.

   To adjust the amount of welding current from the CC power source, a control knob on the power source or an optional control knob on the wire feeder will have to be adjusted.

   The solid state control of a “slow run-in” circuit automatically reduces the initial wire feed speed when operating with a CC power source. This initial reduction in wire feed speed will compensate for the high open circuit voltage associated with CC power sources and improve arc starting performance.

B. **Welding in CV Mode:** When welding with a constant voltage (CV) power source, changes in wire feed speed will affect welding current. Changes in wire feed speed can be obtained by adjusting the wire feed speed control knob.

   To adjust the amount of welding voltage from the CV power source, a control knob on the power source or an optional control knob on the wire feeder will have to be adjusted.

4.04 Theory Of Operation

Refer to the Connection and Schematic Diagram in theAppendix chapter of this manual.

Input power is supplied through the on/off switch (S1) and input circuit breaker (CB1) to the bridge rectifier (CR1). CR1 ensures that the proper polarity input voltage is fed into the PC boards independent of the welding polarity.

When the gun switch on the welding gun is pulled, a short is provided on the gun switch receptacle (J4) causing the wire feed motor (B1) to turn feeding wire, the gas valve (L1) to open allowing gas flow, and the contactor (K1) to close making the welding wire electrically hot.

When the gun switch on the welding gun is released, the short on the gun switch receptacle is removed causing the wire feed motor to stop feeding wire, the gas valve to close stopping gas flow, and the contactor to open making the welding wire electrically cold.

4.05 Adjusting Burnback Time

Burnback time is set at the factory, but the motor control printed circuit board contains a component that permits adjustment of burnback time.

Burnback time relates to the amount of welding wire remaining at the end of the welding gun after the welding process ends. Increasing burnback time results in less wire remaining at the end of the welding gun at the end of the weld. Decreasing burnback time results in more wire remaining at the end of the welding gun after the welding process ends.

WARNING

ELECTRIC SHOCK CAN KILL. Make certain the power source and wire feeder are both turned OFF before beginning the procedure.

1. Using a nut driver or socket, remove the wire spool hub .
2. Remove the internal cover (refer to Figure 4-3).

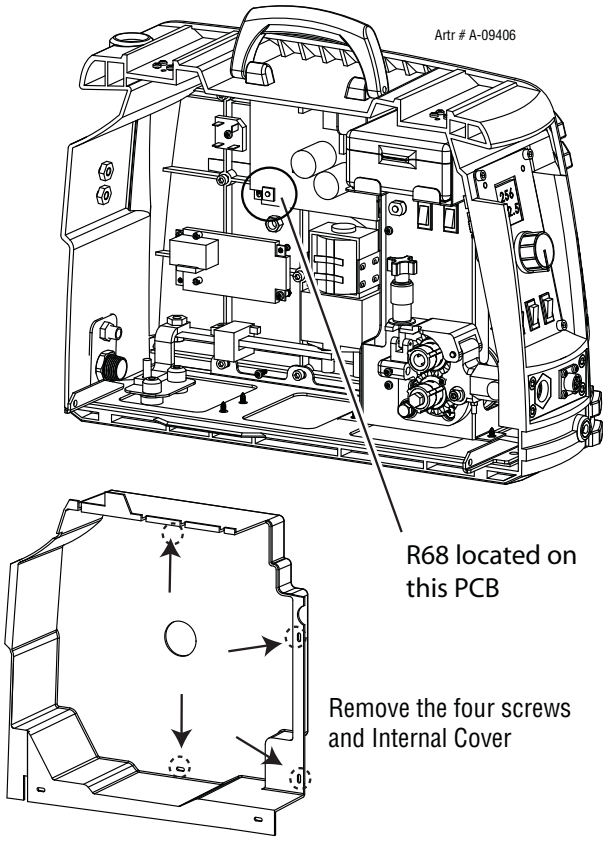


Figure 4-3: Accessing PCB for Burnback

3. Locate component R68 (Burnback) on the motor control printed circuit board (refer to Figure 4-3). The best procedure is to make only slight adjustments until the amount of burnback is acceptable. Component R68 has a single turn (300°) range of adjustment.

   To increase burnback time, adjust component R68 clockwise.

   To decrease burnback time, adjust component R68 counterclockwise.
4. Replace the internal cover.
5. Replace the wire spool hub (refer to 3.03 Adjustment Of Spool Tension in Section 3 of this manual).

4.06 Wire Feed Speed Ranges

The range of the wire feed speed adjustment knob on the front panel can be set to either High or Low. The High/Low switch is located on the inside panel next to the CC/CV switch. Refer to figure 4-4.

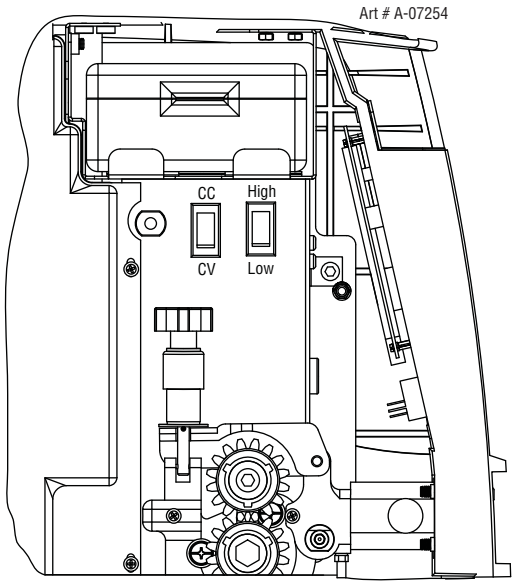


Figure 4-4: High/Low Switch Location

The low setting provides greater knob sensitivity, but over a narrower range. The high setting provides less sensitivity but yields a wider range.

The ranges are as follows:

Low 50 - 400 ipm (1.27 - 10.16 mpm)

High 50 - 800 ipm (1.27 - 20.32 mpm)

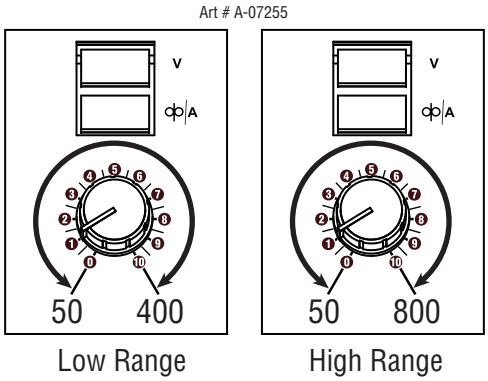


Figure 4-5: Low and High Feed Speed Ranges

4.07 Changing Meter Functions

The Portafeed VS 212 has two digital meters on the front panel. The top meter always displays the welding power supply's voltage output. However, the lower meter can be set to display either the wire feed speed *or* the welding power supply's current output. Furthermore, when it is set to display the wire feed speed, an additional setting can be made to display this parameter in either inches per minute (ipm) or in meters per minute (mpm). Refer to Figure 4-6.

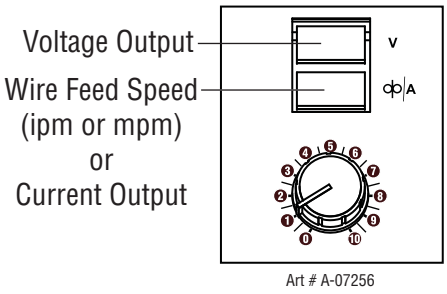


Figure 4-6: Digital Meter Functions

Changing The Lower Meter Functions:

1. Open the VS 212 case door.

NOTE

The power does not need to be turned off to change these settings.

2. Locate the 4 white DIP switches on the side of the meter display's printed circuit board. The LEFT/RIGHT diagram in Figure 4-7 indicates the factory default positions of the lower meter DIP switches.

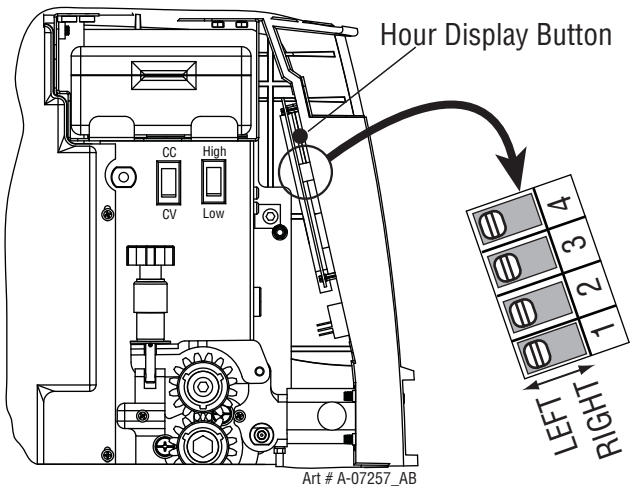


Figure 4-7: Meter DIP Switches

3. Using Table 4-1 as a reference, carefully slide each white DIP switch left or right to change the meter to the desired function.

DIP Switch #	1	2	3	4
LEFT Position	Hold Function "Off"	Wire Feed Speed Displayed	Wire Feed Speed in IPM	Currently Not In Use
RIGHT Position	Hold Function "On" (refer to 4.07)	Output Current Displayed	Wire Feed Speed in MPM	Currently Not In Use

Table 4-1: Lower Meter Switch Settings

4.08 Meter Hold Function

The meter hold function is enabled when DIP switch number 1 is set to the "RIGHT" position as defined in the tabe above. When this function is activated, the meter's displays are retained for 5 seconds after the last welding operation has ended. This provides the time needed for the operator to remove his welding shield and read the meters before the display goes blank.

4.09 Operation Hours Display

The total number of arc hours that the VS 212 has been operating can be displayed by pressing and holding the small black button located directly above the 4 DIP switches shown in Figure 4-7. The reading is displayed over both meters as follows:

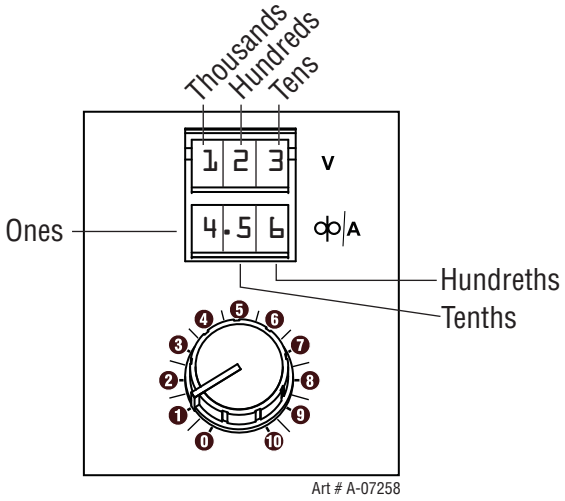


Figure 4-8: Displaying Operation Hours

For example, the above display would be read as:

1,234.56 hours

4.10 Protection And Safety Circuits

The following protection and safety circuits come standard with this wire feeder and are designed to protect (by disabling the wire feeder) against unfavorable operation and/or equipment damage.

1. **Undervoltage Protection:** If the input voltage drops below the specified voltage range for an extended period of time, an electronic circuit will activate, and the wire feeder will not operate. The undervoltage protection circuit will automatically deactivate when the input voltage enters an acceptable range.
2. **Overvoltage Protection:** If the input voltage rises above the specified voltage range for an extended period of time, an electronic circuit will activate, and the wire feeder will not operate. The overvoltage protection circuit will automatically deactivate when the input voltage enters an acceptable range.
3. **Input Current Protection: I**f the input current rises above the specified maximum input current for an extended period of time, the input circuit breaker will trip, and the wire feeder will not operate. The input circuit breaker will have to be manually reset if it were to trip.

4. **Motor Overcurrent Protection:** If the drive motor becomes locked or shorted, an electronic circuit will activate, and the motor will not operate. If this circuit activates, a light on the motor control printed circuit board labeled [Fault 2] will turn on. The motor overcurrent protection circuit will have to be manually reset by placing the power switch on the wire feeder in the off position for at least 60 seconds.

CAUTION

If this protection circuit activates and the drive motor is not locked, the drive motor is most likely shorted and will have to be replaced (refer to 'Troubleshooting Guide' section of this manual).

5. **Contactor And Gas Valve Overcurrent Protection:** If the contactor or gas valve becomes shorted, an electronic circuit will activate, and both the contactor and gas valve will not operate. If this circuit activates, a light on the 12 V driver printed circuit board labeled [Fault 1] will turn on. The contactor and gas valve overcurrent protection circuit will have to be manually reset by placing the power switch on the wire feeder in the off position for at least 60 seconds.

CAUTION

If this protection circuit activates, the contactor or gas valve is most likely shorted and one or both will have to be replaced (refer to section 5.06 Troubleshooting Guide in this manual).

SECTION 5: SERVICE

5.01 Cleaning Of The Unit

About every 6 months, remove the interior panel cover to expose the printed circuit boards and other components. Using a vacuum cleaner or clean, dry, compressed air of not more than 25 psi (172 kPa, 1.72 bar) pressure, vacuum or blow out the interior of the wire feeder. While the interior panel cover is removed, check all electrical components for loose connections and correct if necessary.

5.02 Cleaning Of The Feed Rolls

About every 3 months, clean the grooves on the feed rolls using a small wire brush. If the feed roll has a smooth surface, wipe off the feed roll with a clean, dry cloth. After cleaning the feed rolls, tighten the upper and lower feed roll retaining knobs accordingly.

5.03 Troubleshooting Guide

1. **Scope:** The troubleshooting guide is intended to be used by qualified service technicians. The troubleshooting guide contains information which can be used to diagnose and correct unsatisfactory operation or failure of the various components of the wire feeder. Each symptom of trouble is followed by a list of probable causes and the procedure necessary to correct the problem.
2. **Safety:** To ensure safe operation and service, read this entire manual before attempting to service or repair this machine. The service technician may be asked to check voltage levels while the machine is turned ON; to assure safety, use care and follow all instructions accordingly!

5.04 Troubleshooting Hints

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

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

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

5.05 Common Symptoms

WARNING

ELECTRIC SHOCK can kill.

· Follow all safety precautions.

· Do not touch live electrical parts.

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

· Only qualified technicians are to service the machine.

WARNING

This machine contains static sensitive devices.

· Use static proof bags to store electronic components.

· Use grounded wrist strap.

· Use qualified personnel when testing or handling device.

NOTE

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

Use only genuine replacement parts.

1. Unit is completely inoperative - nothing functions.

A. Make sure all connections have been made to both the power source and wire feeder.

B. Make sure both the power source and wire feeder are turned ON.

C. Check 18 ga. wire connection on rear bus bar of the contactor for loose or faulty connections.

D. Check for a damaged power switch.

E. Check for a damaged or tripped circuit breaker.

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

A. Incorrect voltage/current and/or wire feed speed settings.

1) Make sure all connections to the wire feeder are tight.

2) Make sure feed rolls are tight.

B. Check for too little or too much pressure on the feed rolls.

1) Refer to spring tension knob in section 2.09 Internal Controls and Connections in this manual.

2) Check for correct feed roll size for welding wire being used.

3) Check to see if wire spool tension is too great.

4) Refer to hub tension bolt in section 2.09 Internal Controls and Connections in this manual.

C. Check for restriction in welding gun and/or contact tip.

D. Check for correct gun liner and contact tip sizes for welding wire being used.

3. Wire wraps around the feed rolls.

A. Check for too much pressure on the feed rolls.

1) Refer to spring tension knob in section 2.09 Internal Controls And Connections in this manual.

B. Check alignment of input and output guides.

C. Check for correct gun liner and contact tip sizes for welding wire being used.

D. Worn or damaged contact tip.

4. Wire does not feed with gun switch depressed.

A. Check power supply input to the VS 212 and cable connection.

B. Check for continuity of the welding gun trigger leads with the trigger depressed.

1) If no continuity, repair or replace the welding gun.

C. Check for a locked or shorted motor.

D. An electronic protection circuit may have activated.

1) Reset by placing power switch in the off position for at least 60 seconds.

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

A. Check Trigger Hold switch (see section 2.08).

B. Check for shorted welding gun trigger leads while the gun switch on the welding gun is released.

1) If shorted, repair or replace the welding gun.

6. Wire feeds but no gas flows.

A. Check to see if the gas cylinder is empty or the valve closed.

1) Make sure proper gas flow rate has been set.

B. Check for a possible restriction in the gas line or gas valve.

1) Check to see if the welding gun nozzle is plugged.

7. Gas flows all the time or leaks.

A. Make sure all connections are tight.

B. Check for foreign material inside the gas valve.

8. Wire feeds, contactor closes, but welding wire is not hot - there is no arc.

A. Make sure all connections have been made to both the power source and wire feeder.

B. Make sure the cable between the contactor and feedhead is properly connected.

1) If using a CV power source, make sure the output contactor has been energized.

2) Refer to section 4.01 Prewelding Procedure in this manual.

C. Work lead not connected.

9. Meters do not function.

A. Check meters (M1 and M2) and plug J2 on the motor control PC board for loose, faulty, or reversed connections.

SECTION 6:
PARTS LIST

6.01 Equipment Identification

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

6.02 How To Use This Parts List

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

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

PART NUMBERS:

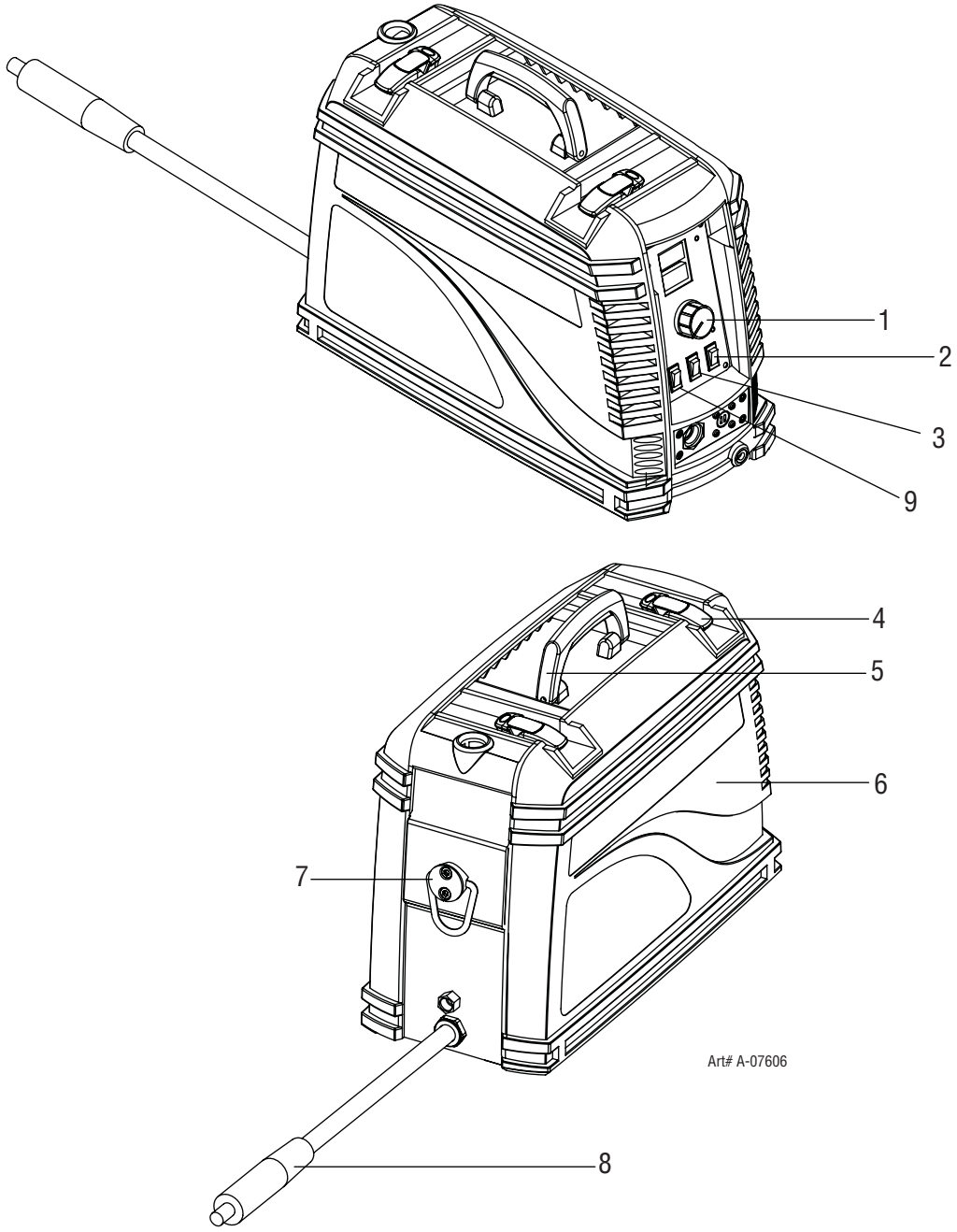
W3512001 (with Tweco MIG cartridge and without digital meters)

W3512002 (with Tweco MIG cartridge and with digital meters)

W35120L2 (with Lincoln gas-less MIG cartridge and with digital meters)

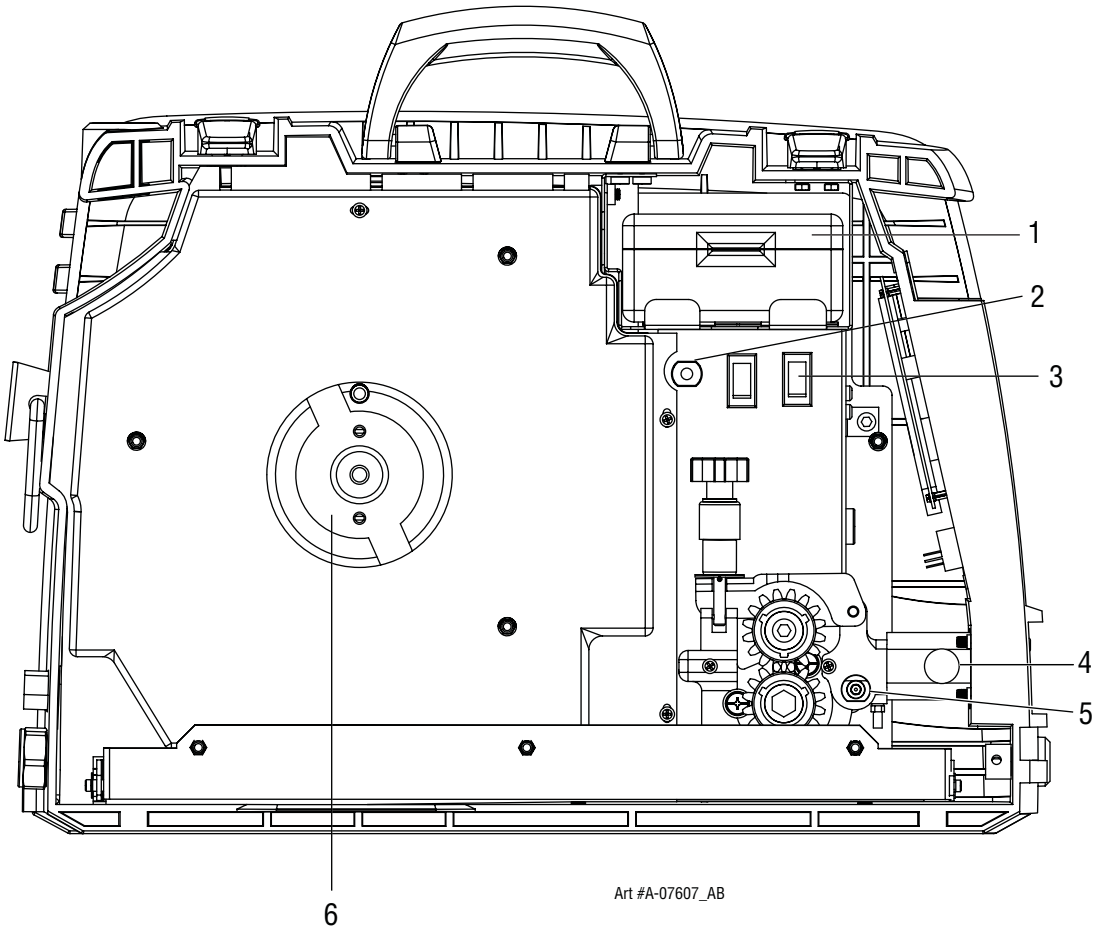
6.03 External Replacement Parts

Item #	Qty	Description	Part Number
1	1	Control Knob	870696PKD
2	2	Rocker Switch, Single Pole, Black	870359PKD
3	1	Rocker Switch, Single Pole,Momentary, Black	870863PKD
4	2	Door Latch Assembly, VS 212	871621PKD
5	1	Assembly, Handle, VS 212	870972PKD
6	1	Assembly, Door, VS 212	870953PKD
7	1	Lifting Eye, VS 212	870974PKD
8	1	Power Input Pigtail Assembly, VS 212	871032PKD
9	1	Rocker Switch, Single Pole, Black. On/off	870359PKD



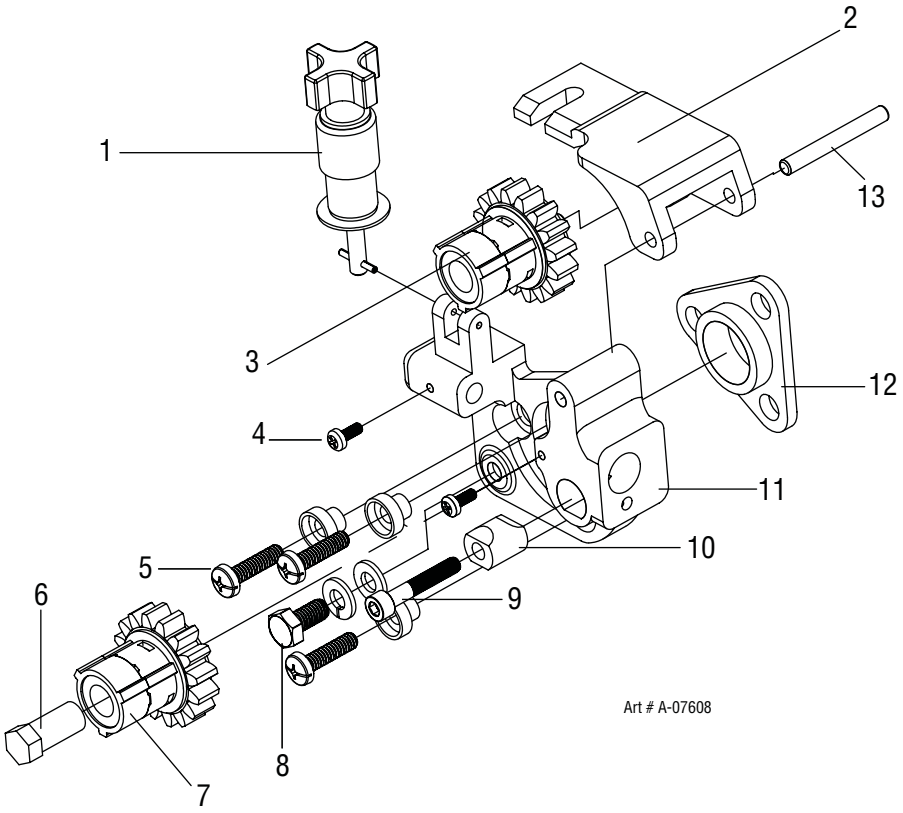
6.04 Internal Replacement Parts

Item #	Qty	Description	Part Number
1	1	Case, Internal Parts Storage	870865PKD
2	1	Circuit Breaker PB 10A	7978049PKD
3	2	Rocker Switch, Single Pole, Black On/Off	870359PKD
4	1	SC Thumb 1/4" UNC Narrow Head	7950348PKD
5	1	Clamp, Gun Tube	171362PKD
6	1	Wire Spool Hub Assembly	871616PKD



6.05 Wire Feeder Replacement Parts

Item #	Qty	Description	Part Number
1	1	Tension Rod Subassembly	870933PKD
2	1	Pressure Arm, Machined, Two Roll (see note 2)	870679PKD
3	1	Idler Gear Assembly	871001PKD
4	2	M4x10 Pan Head Screw	See note 1
5	3	M6x1 Pan Head, 30 MM long	See note 1
6	1	Gear Retainer	870733PKD
7	1	Drive Gear Assembly	870560PKD
8	2	M8 X 16 Hex Head Cap Screw	See note 1
9	1	M6x1 Socket Head Cap Screw, 35MM Long	See note 1
10	1	Clamp, Gun Tube (see note 2)	171362PKD
11	1	Feedplate, 2 Roll, Machined (see note 2)	870558PKD
12	1	Insulator, Motor (see note 2)	870695-001PKD
13	1	Dowel Pin, #6x50, Pressure Arm hinge (see note 2)	870509PKD



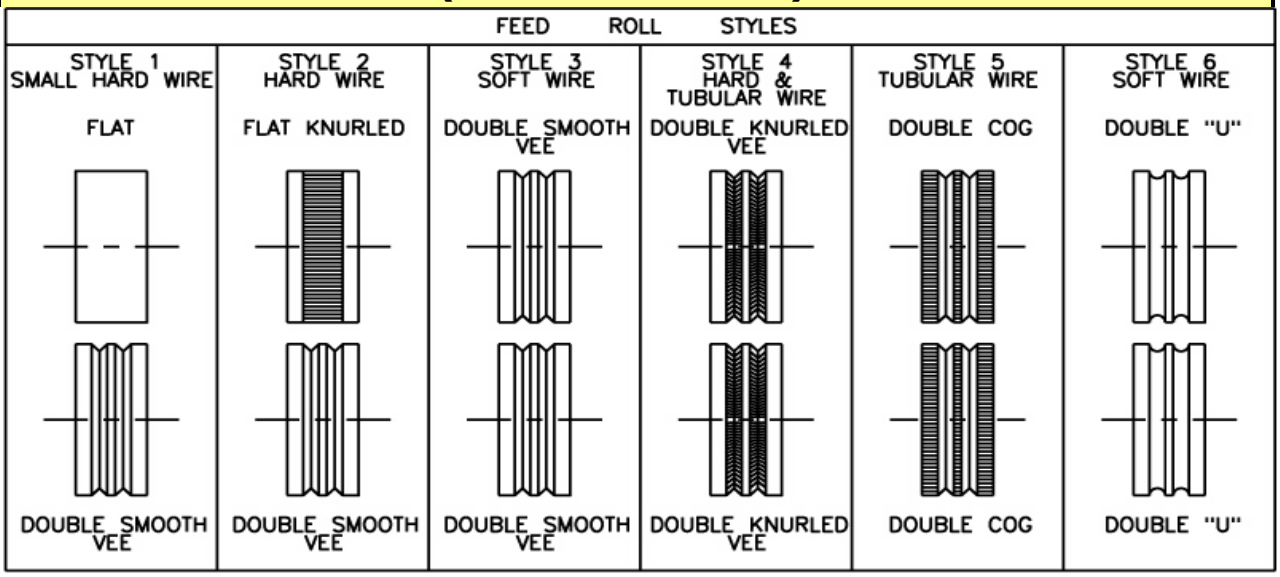
NOTES:

1. This part may be purchased at a local hardware store.

2. This part is shown for reference purposes only. It is not available individually.

APPENDIX 1:
DRIVE ROLL KITS

DRIVE ROLL KITS (#375980-Series) 2 ROLL



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

Notes: 1) One Kit is supplied standard with each wire feeder.

2) Drive Roll Kits include: Drive Rolls; Input, Output , #375980-092 Guides

3) Narrow 30° "V"

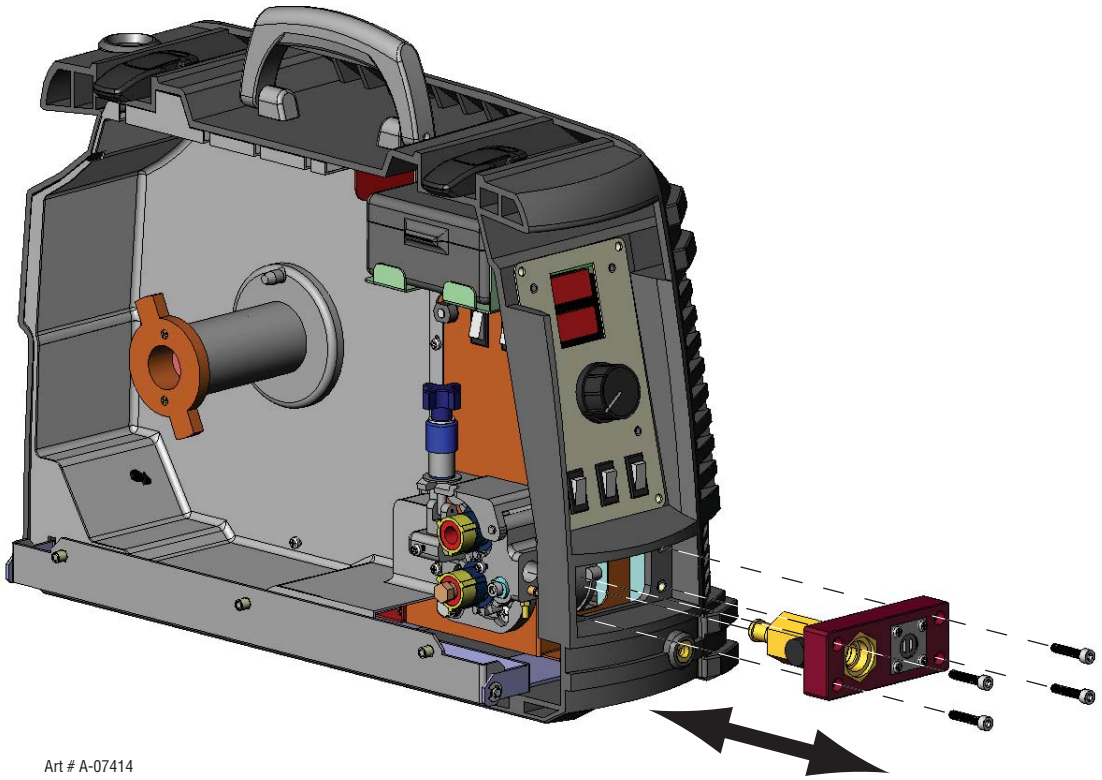
APPENDIX 2:
OPTIONS AND ACCESSORIES

Product	*Part No.*	*Description*
Drive Roll Kits	375980-XXX	One kit (#375980-092) is supplied standard with each wire feeder, see drive roll kit chart to select a different drive roll style
Wire Spool / Coil Adapters		
10 lb (4.5kg), 8" spool	375585-001	
15 lb (6.8kg), 8" spool	375864-001	
14 lb (6.4kg) coil,	375942A	
Wire Feeder Cart	W4000001	Low profile, large caster cart
Roll Cage	W4003001	Protective tube steel roll cage
MIG Gun Adaptor		Integrated cartridge to accept other style MIG guns.
Tweco® #4	W4004001	
Miller®	W4005001	
Lincoln® (gasless)	W4006001	
Lincoln®	W4006002	
Euro-style	W4007001	

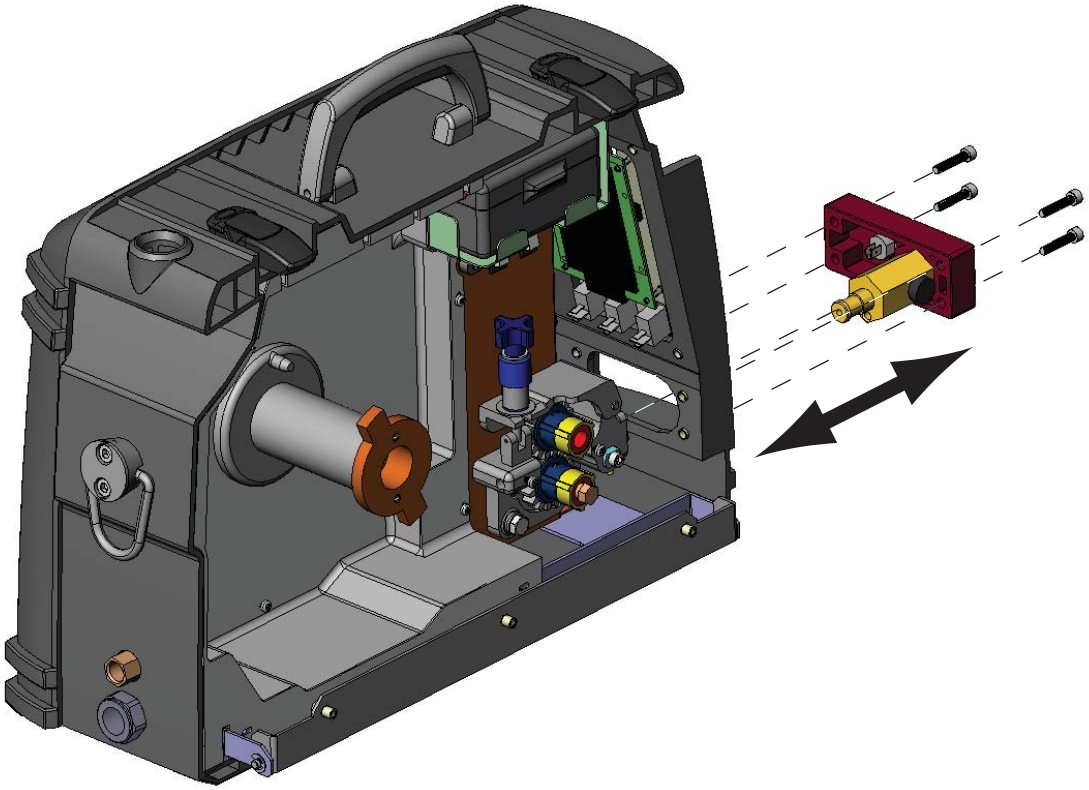
APPENDIX 3:
MIG GUN CARTRIDGE SYSTEM

Removable Gun Cartridge System (Patent Pending)

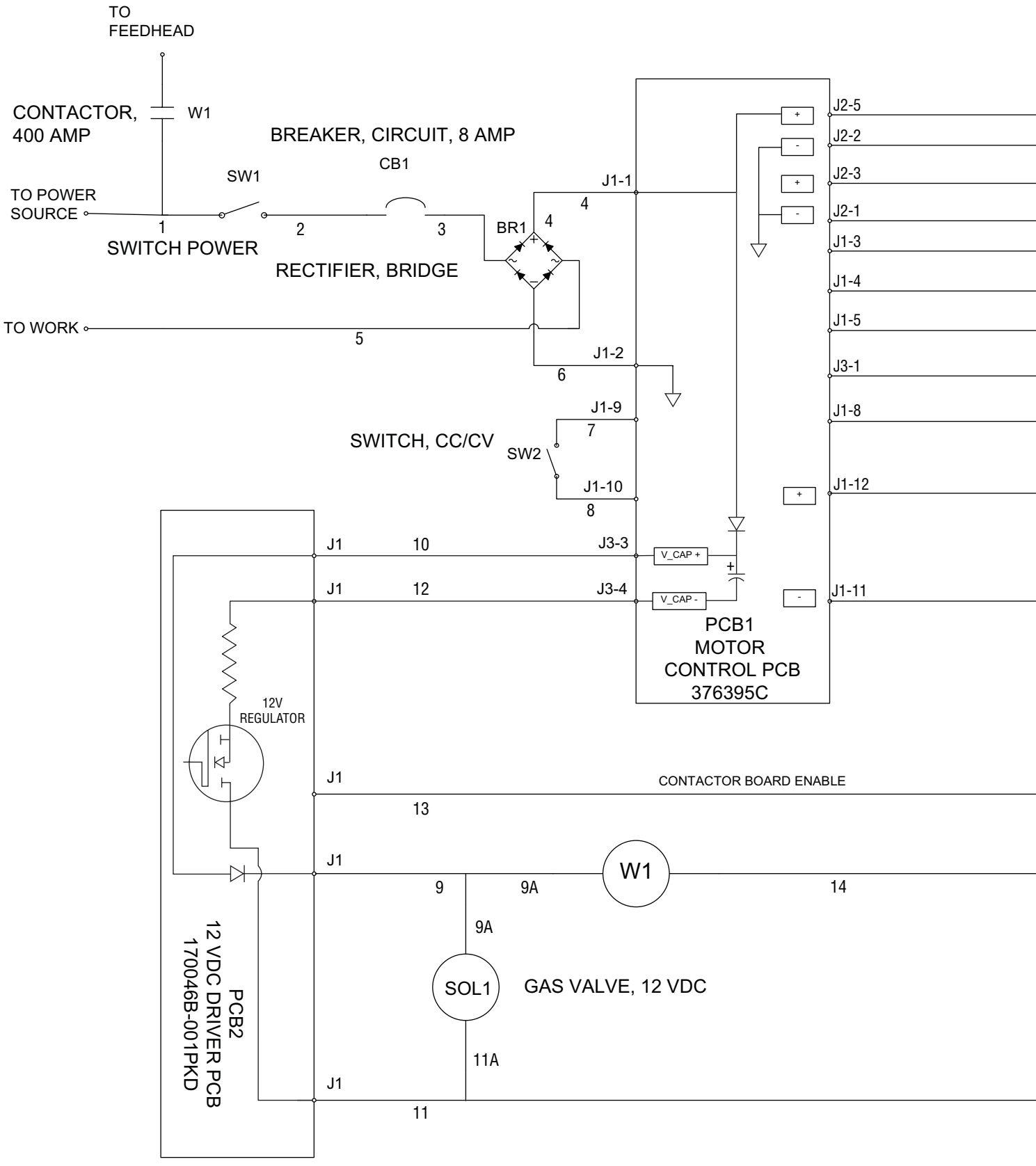
The MIG gun cartridge can easily be removed and replaced with a different cartridge that will fit other brands of MIG guns (Miller®, Lincoln®, Euro). Refer to Appendix 2 for specific models.



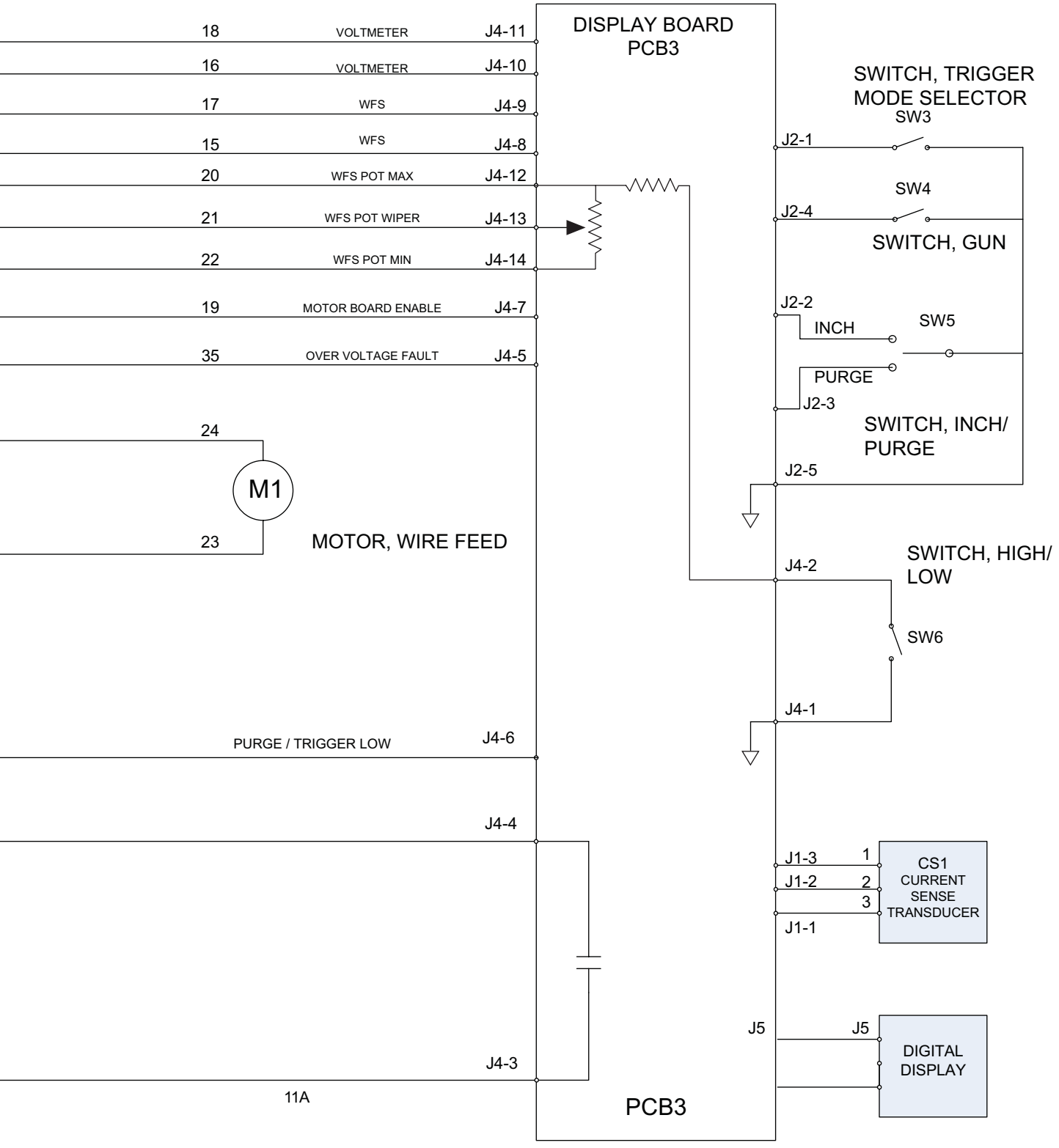
Art # A-07414



APPENDIX 4: SYSTEM SCHEMATIC



Art # A-07595_AB



Art # A-07595_AB

VS 212 SCHEMATIC DIAGRAM

Statement of Warranty

(as of March 15, 2009)

LIMITED WARRANTY:

THERMADYNE warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the THERMADYNE products as stated below, THERMADYNE shall, upon written notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with THERMADYNE's specifications, instructions, recommendations and recognized standard industry practice, and not been subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at THERMADYNE's sole option, of any components or parts of the product determined by THERMADYNE to be defective.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY:

THERMADYNE shall not under any circumstances be liable for special, indirect or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, business interruption or loss of profit, or claims of customers of distributor (hereinafter the "Purchaser") for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of THERMADYNE 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 THERMADYNE whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

THIS WARRANTY BECOMES INVALID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY THERMADYNE PRODUCT.

THIS WARRANTY IS INVALID IF THE PRODUCT IS SOLD BY NON-AUTHORIZED PERSONS.

This warranty is effective for the time stated in the Warranty Schedule beginning on the date that the authorized distributor delivers the products to the Purchaser.

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized THERMADYNE repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid 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 supersedes all previous THERMADYNE warrantiesWarranty SCHEDULE

Warranty SCHEDULE

(as of March 15, 2009)

The warranty is effective below for the time stated in the Warranty Schedule beginning on the date that the authorized distributor delivers the products to the purchaser. THERMADYNE reserves the right to request documented evidence of date of purchase.

ENGINE DRIVEN WELDERS	Parts / Labor
Scout®, Raider®, Explorer™	
Original Main Power Stators and Inductors	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
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.	See the Engine Manufacturers' Warranty for Details
GMAW/FCAW (MIG) WELDING EQUIPMENT	**Parts / Labor**
Fabricator® 140, 180, 190, 210, 251, 281; Fabstar® 4030; PowerMaster® 350, 350P, 500, 500P, 320SP, 400SP, 500SP; Excel-Arc® 6045; Wire Feeders: Ultrafeed®, Porta-feed®	
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	**Parts / 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	**Parts / 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 Recirculators	1 year / 1 year
SMAW (Stick) WELDING EQUIPMENT	**Parts / Labor**
Dragster™ 85; 95S	
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
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	**Parts / Labor**
FirePower® MIG Welders	5-2-1 years / NA
Water Recirculators	1 year / 1 year
Plasma Welding Torches	180 days / 180 days
Gas Regulators (Supplied with Power Sources)	180 days / NA
MIG and TIG Torches (Supplied with Power Sources)	90 days / NA
Replacement Repair Parts	90 days / NA
MIG, TIG and Plasma Welding Torch Consumable Items	NA / NA

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