HOBART

OWNER'S MANUAL

IMPORTANT: Read these instructions before installing, operating, or servicing this product.

Specifications covered by this manual:

TECHNICAL MANUAL NO. TM-462
for MODEL CT-300 AC/DC

300 Ampere AC/DC "CYBER-TIG" Welder

5159D-1	5283D-3	5301D-1
5159D-2	5283D-4	5301D-2
5159D-3	5289D-1	5301D-3
5159D-4	5289D-2	5301D-4
5283D-1	5289D-3	
5283D-2	5289D-4	

DO NOT DESTROY

HOBART BROTHERS COMPANY, TROY, OHIO 45373, U.S.A.
Manufacturers of Arc Welding Systems/Aircraft Ground Power Equipment/Industrial Battery Chargers

HOBART

HOW TO USE THIS MANUAL - This manual, identified by a "TM-" prefixed number, usually covers just the underlined specification number in the listing below; in which case, the diagrams at the rear of this manual cover only that particular spec. number. If none of the spec. numbers are underlined, they're all covered.

EQUIPMENT IDENTIFICATION - The unit's specification, model, and serial numbers appear on a nameplate, usually attached to its control panel. A "specification number" starts out with a "series number" (first 4-digit number, with a possible letter suffix) which does not cover a complete unit. A "dash number" (-1, -2, etc.) must follow the "series number" to make a complete "specification number". For example: 1234A-1, 1234A-2, etc.

TECHNICAL MANUAL NO. TM-462
for MODEL CT-300 AC/DC

300 Ampere AC/DC "CYBER-TIG" Welder

This manual covers units displaying any one of the following specification numbers, with exceptions as noted in the first paragraph above.

5159D-1	5283D-3	5301D-1
5159D-2	5283D-4	5301D-2
5159D-3	5289D-1	5301D-3
5159D-4	5289D-2	5301D-4
5283D-1	5289D-3	
5283D-2	5289D-4	

Issued: Mar 24/76

Revised: July 15/91

Important!

This listing is of special importance to the performance of this unit. Refer to the appropriate section of this manual for details.

- Clean internal components on a regular schedule.
- Make sure unit and workpiece are always well grounded.

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Revised May 24/76
Revised Feb 7/78

ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

⚠ WARNING

ARC WELDING can be hazardous.

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

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.

ELECTRIC SHOCK can kill.

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

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

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.

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

Welding or Cutting Operation	Electrode Size Metal Thickness or Welding Current	Filter Shade No.	Welding or Cutting Operation	Electrode Size Metal Thickness or Welding Current	Filter Shade No.
Torch soldering	—	2	Gas metal-arc welding (MIG)		
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 (TIG)	All	12
Medium	1 to 6 in., 25-150 mm	4 or 5	Atomic hydrogen welding	All	12
Heavy	Over 6 in., 150 mm	5 or 6	Carbon arc welding	All	12
Gas welding			Plasma arc welding	All	12
Light	Under 1/8 in., 3 mm	4 or 5	Carbon arc air gouging		
Medium	1/8 to 1/2 in., 3-12 mm	5 or 6	Light		12
Heavy	Over 1/2 in., 12 mm	6 or 8	Heavy		14
Shielded metal-arc welding	Under 5/32 in., 4 mm	10	Plasma arc cutting		
(stick) electrodes	5/32 to 1/4 in., 4 to 6.4 mm	12	Light	Under 300 Amp	9
	Over 1/4 in., 6.4 mm	14	Medium	300 to 400 Amp	12
			Heavy	Over 400 Amp	14

FUMES AND GASES can be hazardous to your health.

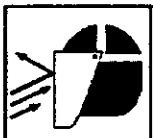
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

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.

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.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



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.

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 hazardous.

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.

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.

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.

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.

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.

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 can 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 cables around the body.
4. Keep welding power source and cables as far away from body as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

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

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.

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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.

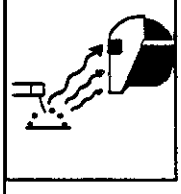
La norme Z49.1 de l'American National Standard, intitulée "SAFETY IN WELDING AND CUTTING" présente les pratiques sécuritaires à suivre. Ce document ainsi que d'autres guides que vous devriez connaître avant d'utiliser cet équipement sont présentés à la fin de ces instructions de sécurité.

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

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.



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.

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

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

LES VAPEURS ET LES FUMEES SONT DANGEREUSES POUR LA SANTE.

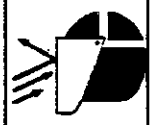
Le soudage dégage des vapeurs et des fumées dangereuses à respirer.

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.
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.

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.



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.

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.

MISE EN GARDE

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.

LE CARBURANT PEUR CAUSER UN INCENDIE OU UNE EXPLOSION.

Le carburant est hautement inflammable.

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

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.

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

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.

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.

HOBART

TM-462

CERTIFICATION NOTICE

HIGH FREQUENCY STABILIZER

Serial No. _____

Model No. _____

This equipment may be reasonably expected to meet radiation limits of ten microvolts per meter at one mile, provided installation, operation, and maintenance is in accordance with the instructions of the manufacturer.

Hobart Brothers Company

Troy, Ohio

USER CERTIFICATE

The above equipment has been installed in accordance with manufacturer's instructions, and is being operated and maintained as outlined in these instructions.

USER: _____

Date: _____

THIS CERTIFICATION NOTICE MUST BE POSTED NEAR THE WELDER!

Instructions

NOTE: This equipment cannot be operated without the programmer. Both this instruction manual and the programmer instruction manual should be read before attempting to install, wire, or operate the equipment.

RECEIPT OF EQUIPMENT - Check the equipment received against the Hobart Brothers Company invoice to make certain that the shipment is complete and undamaged. If the equipment has been damaged in transit, notify the carrier (railroad, trucking company, etc.) at once and file a claim for damages. If you require assistance with a damage claim, furnish Hobart Brothers Company full information about the claim. If the shipment is in error, contact: Order Department, Hobart Brothers Company, Troy, Ohio 45373.

Give the MODEL, SPECIFICATION, and SERIAL numbers of the equipment, and a full description of the parts in error. Refer to the PARTS LIST section of this manual for an explanation of the specification numbers.

Generally, it is good practice to move the equipment to the site of installation before uncrating. Use care in uncrating in order to avoid damage to the equipment when bars, hammers, etc., are used. Lifting eyes which extend through the top of the cabinet have been provided to facilitate handling with a crane or hoist.

Check that the following items correspond to the unit ordered.

1. Correct welder console with single-phase AC, and correct input voltage/current rating.
2. Correct optional meter panel.
3. Standard high-frequency starter or optional arc booster.
4. Jumper "dummy" plug on the programmer remote control connector.
5. Correct optional remote control.
6. Correct optional accessories such as casters, carts, etc.
7. Front panel knobs, handles, connectors, etc., in place and not damaged.
8. All screws and panels securely in place.
9. Correct programmer instruction manual and welder instruction manual.
10. Remove one of the side panels and inspect the interior for loose or damaged components.

Best results with this equipment will be obtained ONLY if the responsible operating and maintenance personnel have access to and are familiar with these instructions and the programmer instructions. Additional copies may be obtained at small cost per copy by writing to: Hobart Brothers Company, Troy, Ohio 45373.

Give the SPEC, SERIAL, and MODEL numbers of your equipment and the number of copies needed.

NOTE: The programmer has its own identification plate.

LOCATION - For best operating characteristics and longest unit life, take care in selecting an installation site. When installing the equipment, avoid locations exposed to high humidity, dust, high ambient temperature or corrosive fumes. Moisture condenses on machine parts and electrical controls, causing corrosion which can seriously affect operation and efficiency. Dust and dirt cause extra wear on all moving parts. Therefore, use care to locate the equipment so that excess moisture, dust, or corrosive fumes will not be drawn into the unit.

Adequate air circulation is needed at all times in order to assure proper operation. Provide a minimum of 12 inches (305 mm) of free air space at both front and rear of the unit. Make sure that the ventilator openings are not obstructed.

DESCRIPTION OF THE "TIG" PROCESS - "Inert Gas Metal Arc Welding, Non-Consumable" is the descriptive name of the welding process whereby the arc is maintained between a non-consumable metal electrode (usually tungsten) and the work -- the arc zone being shielded by an inert gas such as argon or helium. Various trade names, such as "Heliarc", "Heliweld", "Argoweld" (and perhaps others) are frequently used when referring to this particular process. For simplicity and uniformity, any reference to the process in this manual will be made with the term "TIG".

This process can be used for making clean, sound welds on most metals and alloys, irrespective of their composition. In many instances, it provides the only suitable method for joining certain metals. Cleaning is reduced to a minimum and frequently is eliminated, both before and after welding. Flux is unnecessary in this process.

Because of certain inherent characteristics of the TIG welding process, special consideration must be given to the design of a welding machine which will best serve the requirements of the process. This Hobart inert gas welder has been designed and built with these requirements in mind. It will give long satisfactory service producing welds that are correct and sound if it is properly installed, used, and maintained.

Welding currents for the TIG process depend upon the size of the tungsten electrode used, the material being welded, welding speed, size and shape of the material, and other factors. Following is a rough guide for usable current ranges for various tungsten electrode sizes:

Electrode Diameter	Welding Current		
	A.C.	D.C. - Straight Polarity	D.C. - Reverse Polarity
.020		5-35	
.040	15-60	30-100	
1/16	60-100	70-150	10-20
3/32	100-160	150-225	15-30
1/8	140-220	200-275	25-40
5/32	200-275	250-350	40-55
3/16	250-400	300-500	80-125
1/4	300-500	400-650	80-125

Tungsten Electrode Sizes
Table 1

The inert gas flow should be controlled accurately with a regulator and flow meter. No specific recommendations for rates of flow can be given as this depends entirely on the welding conditions and the torch and nozzle used. Correct argon flow is usually between 8 and 35 cubic feet (226 to 990 liters) of gas per hour; and helium flow is between 18 and 85 cubic feet (510 to 2410 liters) per hour.

More specific information concerning the torch configurations available and the gas flows for each, can be obtained from the manufacturer of the torch equipment.

INSTALLATION - Because high frequency stabilized arc welders inherently radiate power at frequencies which may interfere with radio communication; including commercial, police, and aviation broadcasts; their operation is subject to control by the Federal Communications Commission.

Some general information on radio frequency radiation from high frequency stabilized arc welders is given below:

DIRECT RADIATION FROM WELDER - The manufacturer controls direct radiation from the welder by proper design of the unit. If the user complies with the installation and operation instructions furnished by the manufacturer, direct radiation from the welder will be relatively low.

DIRECT RADIATION FROM WELDING CABLES - The initial radiation, due almost entirely to the welding cables acting as an antenna, decreases rapidly with the distance from the cables. This radiation can be kept to a minimum by making the welding cables as short as possible.

The frequency spectrum emitted by a particular unit can be altered substantially by changing the length or position of the welding cables and by differences in loading caused by operation with the electrode arcing to the work.

RADIATION FROM POWER LINES - High frequency voltage which is conducted from the welder to the power line may cause radiation from the line itself. This radiation can be kept to a minimum by careful design of the unit and, in some cases, by the use of line filters.

In a welder that has been certified by the manufacturer, the radiation from the power line is generally small when compared to the direct radiation from the welding cables.

RE-RADIATION - Radiation from the welding cables can be readily picked up by ungrounded metallic objects or unshielded wiring in the immediate vicinity, conducted some distance, then re-radiated. Usually this is the most troublesome source of interference.

This type of radiation can be kept to a minimum by installing the welder in accordance with the installation procedures outlined in this instruction manual.

WIRING IN THE WELDING AREA VICINITY - The term "welding area" refers to the area in which the welding machine, the welding cables, and the weld work are located.

Ungrounded metallic objects in close proximity to the welding area can act as antennae which will pick up, conduct, and re-radiate the high frequency generated by the welder. Therefore, no unshielded conductors shall be located within 50 feet (15,250 mm) of the welding area. This means that all electrical power or lighting wiring within 50 feet of the welding area shall be enclosed in grounded rigid metallic conduit, copper braid, or some other material having an equivalent shielding efficiency, or shall consist of lead-covered cable. (Ordinary flexible helically wrapped metallic conduit is generally not suitable.) The shielding or cable covering shall be grounded at 50-foot (15,250 mm) intervals. Good electrical bonding shall be maintained between conduit sections.

Wiring, other than electrical power and lighting wiring within 50 feet (15,250 mm) of the welding area, shall be shielded and the shields shall be grounded. (This includes wiring located within 50 feet of the welder in a vertical or vertical-diagonal direction.)

The foregoing procedure shall apply even if:

1. The welding area is not a fixed location.

2. There are exposed wires off the premises but within 50 feet (15,250 mm) of the welding area.

WIRING CHANGES - All changes in power and lighting wiring shall be made by a qualified electrician. Any shielding or relocation of telephone or signal wires must be done by the service company concerned or with their specific permission.

USE IN METAL BUILDINGS - Where the welding area is enclosed within a metal building, proper precautions must be taken to insure that the building is properly grounded. This can be accomplished by placing several good electrical grounds around the periphery of the building. Refer to following grounding procedure.

The installation procedures described in this publication shall be observed even if the welder is operated within a shielded structure.

GROUNDING - The frame of this welder should be grounded for personnel safety. Where grounding is mandatory under state or local codes, it is the responsibility of the user to comply with all applicable rules and regulations. Where no state or local codes exist, it is recommended that the National Electrical Code be followed. Refer to Table 2 for wire sizes.

The work or work table must also be grounded by using a cable attached to a driven ground or water pipe as described below. See Figures 1, 2, and 3.

The requirements and recommendations for grounding apply to rubber tire mounted equipment. In addition to the usual function of protecting personnel against the hazard of electrical shock due to fault in the equipment, grounding serves to discharge the static electrical charges which tend to build up on the surfaces of tire mounted equipment. These static charges sometimes cause painful shock to personnel, and in some instances, lead to the erroneous conclusion that an electrical fault exists in the equipment.

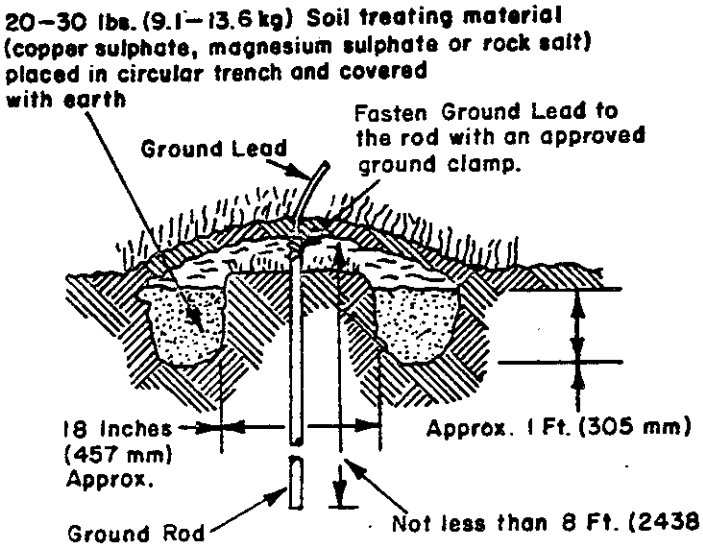
Use an input-power cable assembly which includes a grounding conductor to connect this equipment to the input power supply. When included in the cable assembly, the grounding conductor will be green or green with a yellow stripe, or bare. Connect the grounding conductor to the equipment grounding terminal, if provided, and if not, to the equipment frame, taking care to see that good electrical contact is made between conductor and frame. Connect the other end of the grounding conductor to the system ground.

If, for any reason, an input cable which does not include a grounding conductor is used, the equipment may be grounded with a separate conductor if permitted under applicable code, or by special permission of the jurisdictional body responsible for enforcement of the code. Minimum size and color coding requirements must be in accordance with any applicable state or local code, or the National Electrical Code.

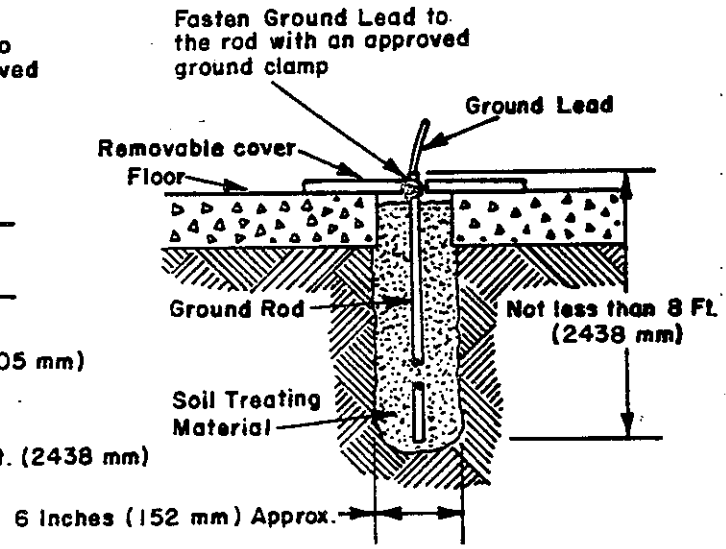
If metallic armored cable or conduit is used, the metal sheathing or conduit must be effectively grounded as required by state or local code, or the National Electrical Code.

If a system ground is not available, the welder frame must be connected to a driven ground rod (see Figures 1 and 2) or to a water pipe that enters the ground not more than 10 feet (3,048 mm) from the welder. Refer to the WIRE AND FUSE SIZE CHART, Table 2, for selection of the proper ground wire.

NOTE: The ground wire must be as short as possible in order to produce the most efficient installation.



Outside Ground
Figure 1



Inside Ground
Figure 2

Treating an Outside Ground - The soil treating materials are placed in a circular trench around the rod, but not in direct contact. The crystals are gradually dissolved by surface waters and the solution is carried into the most useful area of earth surrounding the electrode (rod). Flood the trench several times when making original installation. See Figure 1.

Treating an Inside Ground - Reduce the diameter of the hole to 6 inches (152 mm), pour soil treating material in around the rod. Add enough water to dissolve 8 pounds (3.62 kg) of soil treating material. Flood the hole every 6 months and replace the soil treating material when it is all dissolved. See Figure 2.

CONNECTION TO LINE VOLTAGE - Refer to Table 2 for wire sizes required. The power supply wires serving the welder shall be completely enclosed for a distance of at least 50 feet (15,250 mm) (in any direction) from the welder in solid metallic conduit or closely braided copper sheathing. This shielding shall be connected to the ground at the extreme end of the shielding. (See Figure 3.) The shielding shall be solidly connected to the welder case so as to make good electrical contact and there shall be no gaps in the shielding run. (Ordinary flexible helically wrapped metal conduit is generally not suitable.)

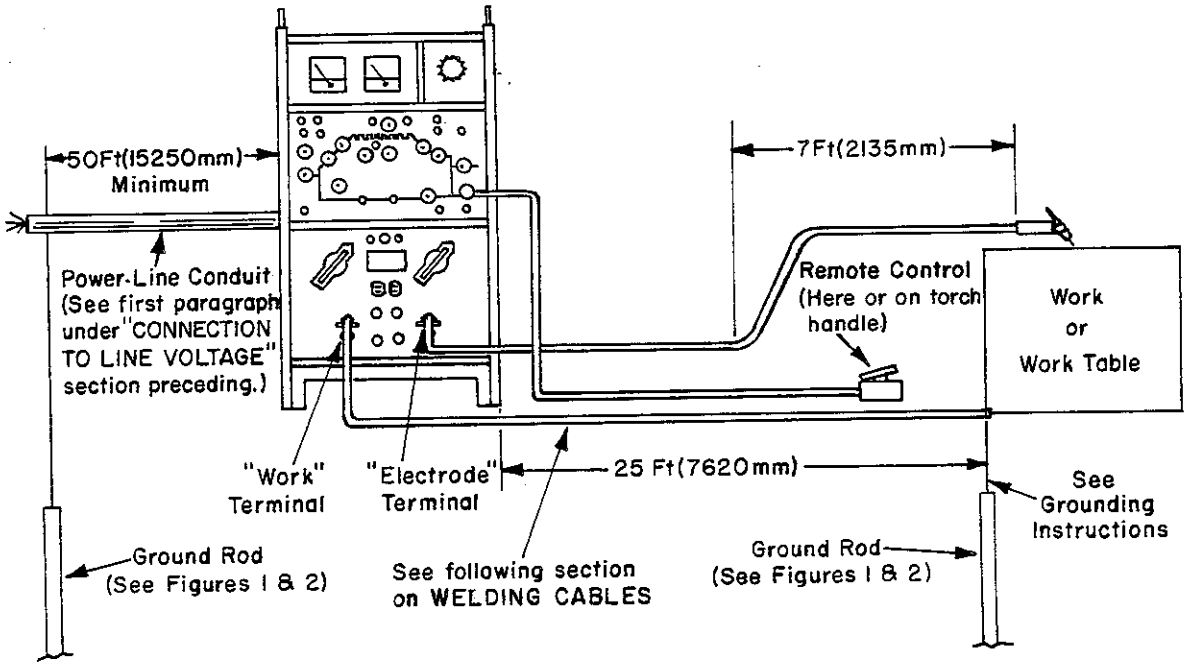
This welder operates on a single-phase, AC input. See nameplate of welder to determine welding voltage and frequency. Make certain that the welder is connected for the power supply voltage available. See voltage changeover connection diagram in the back of this book or inside the welder. The input power cables should be connected to the power supply through a fused disconnect switch (furnished by the customer). Refer to the identification nameplate on the welder to determine the rating of the machine, then consult the local power company for wire and fuse size code. If no code exists, use the size of wire and fuse listed in Table 2 following.

WARNING - When 3-conductor, rubber-covered cable is used, the grounding wire must be green in color.

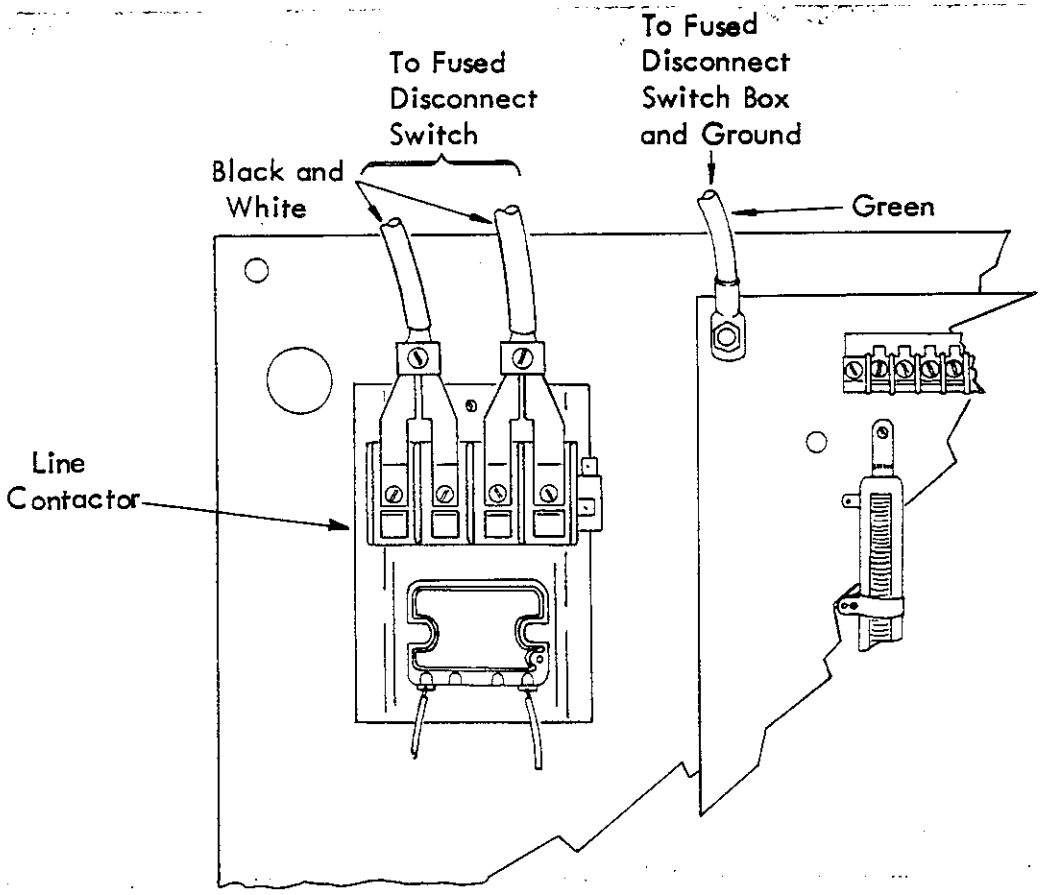
When flexible armored cable or conduit is required by local codes, install it properly to insure an adequate ground of the equipment. With the machine frame grounded, the operator is always assured full protection, even in the unlikely event of insulation failure, or of accidental ground of the power supply.

CAUTION: The flow of cooling air through the welder is carefully directed by baffles. Never operate the welder with any panels removed or open, as serious damage to the components may result.

CAUTION: Make certain that the ground cable attached to the work is connected securely at both the work and at the machine and that the cable is in good condition.



Wiring Precautions
Figure 3



Single-Phase Input Connections
Figure 4

WARNING: The fused disconnect switch: Open or place in the OFF position and remove the fuses. To avoid an accident, make the electric power connections to the welder first, then to the fused disconnect switch. This will prevent an accidental application of power while the welder is being connected.

1. Remove the top cover from the welder.

2. The line contactor for input power connections is mounted on the back of the vertical panel or chassis. See Figure 4.

3. The welder electric ground terminal is on another smaller vertical panel parallel to and mounted on the main vertical panel. The ground terminal is about three inches (76 mm) from the line contactor.

4. Run the power cable through the hole at the rear of the welder. Loosen the cable clamp as required to accommodate the cable.

5. Remove about 10 inches (254 mm) of the outer insulation that holds the wires of the cable together.

6. Strip approximately 1/2 inch (12.7 mm) of insulation from the end of each wire.

7. Install the green wire securely to the grounding terminal.

8. Install the other wires to the line contactor as illustrated in Figure 4.

9. Pull the cable back through the hole sufficiently to remove excessive slack, but not enough to permit the cable to be under tension.

10. Secure the cable with the cable clamp. The cable clamp should be sufficiently tight to prevent any movement when it is pulled.

CAUTION: Do not tighten the cable clamp enough to damage cable insulation or wires.

11. Replace welder top cover and securely fasten in place.

Line Voltage	Line Current	3 Wires in Conduit		3 Wires in Air		Fuse Size
		Line Wire Size	Ground Wire Size	Line Wire Size	Ground Wire Size	
208	110	#2	#6	#4	#8	150
220-230	100	#3	#6	#6	#8	150
380	58	#6	#8	#8	#8	80
440-460	50	#8	#8	#10	#8	70
500	44	#8	#8	#10	#8	60
575	40	#8	#8	#10	#8	60

Input Wiring and Fuse Size Chart
Table 2

Connections to the Fused Disconnect Switch

1. Connect the black welder cable wire to the terminal in the fused disconnect switch that leads through the fuse and the switch to the black input power wire.

2. Connect the white welder cable wire to the terminal in the fused disconnect switch that leads through fuse and switch to the white input power wire.

3. Connect the green welder cable wire to the fused disconnect switch ground and to an external ground.

> NOTE: If the ground is properly installed, the power wiring to the fused disconnect switch can be wired without regard to color; that is, white to black to white, etc. However, to avoid confusion or error in the future, adherence to the standard color code is recommended.

WELDER ADJUSTMENTS - Keep spark gaps set at 0.008 inch (0.203 mm). Set high frequency control to lowest possible setting consistent with good welding.

WELDER PANELS - When the equipment is in operation, all access doors and covers shall be closed and properly fastened. Except for those changes and adjustments covered in the manufacturer's instructions, the equipment must not be modified in any way. Modification may affect radiation and thus void the manufacturer's certification.

WELDING CABLES

1. The torch cable and the work cable must each be 25 feet (7620 mm) or less in length and run together at floor level wherever possible except the last 7 feet (2,140 mm) at the torch or "whip" end. (See Figure 3.) Use No. 1 gauge copper cables.

2. The leads for the remote switch or gun trigger must also be 25 feet (7,620 mm) in length or less and must be brought out close to and parallel to welding cables.

CERTIFICATION NOTICE - In order to comply with F.C.C. regulations after the unit has been installed in accordance with the preceding instructions, the user must post the certification notice at the location of the welder. A convenient form is enclosed in the front of this book which may be used for this purpose after it has been properly filled out.

INDIVIDUAL INSTALLATION CERTIFICATION

1. The user may waive any of the requirements outlined in these special installation requirements if he desires to exercise the option of having an installation test survey made. This survey shall be made by a competent engineer in accordance with the test procedure requirements set forth in Part 18 of the Federal Communications' Rules and Regulations.

2. Certification may cover a unit installation or may be included in the certification of a complete plant.

RESPONSIBILITY FOR INTERFERENCE - In the event this equipment causes interference, it is the user's responsibility to take steps in eliminating the interference.

INPUT VOLTAGE CHANGEOVER - Refer to the voltage changeover diagram at back of this manual. Closely follow accompanying instructions.

> WARNING: Before proceeding, place fused disconnect switch in "OFF" position and remove the fuses.

Remove the top from the welder to gain access to the phase sensing transformer for its voltage changeover. Be sure panels are securely refastened in place after the changeover is accomplished.

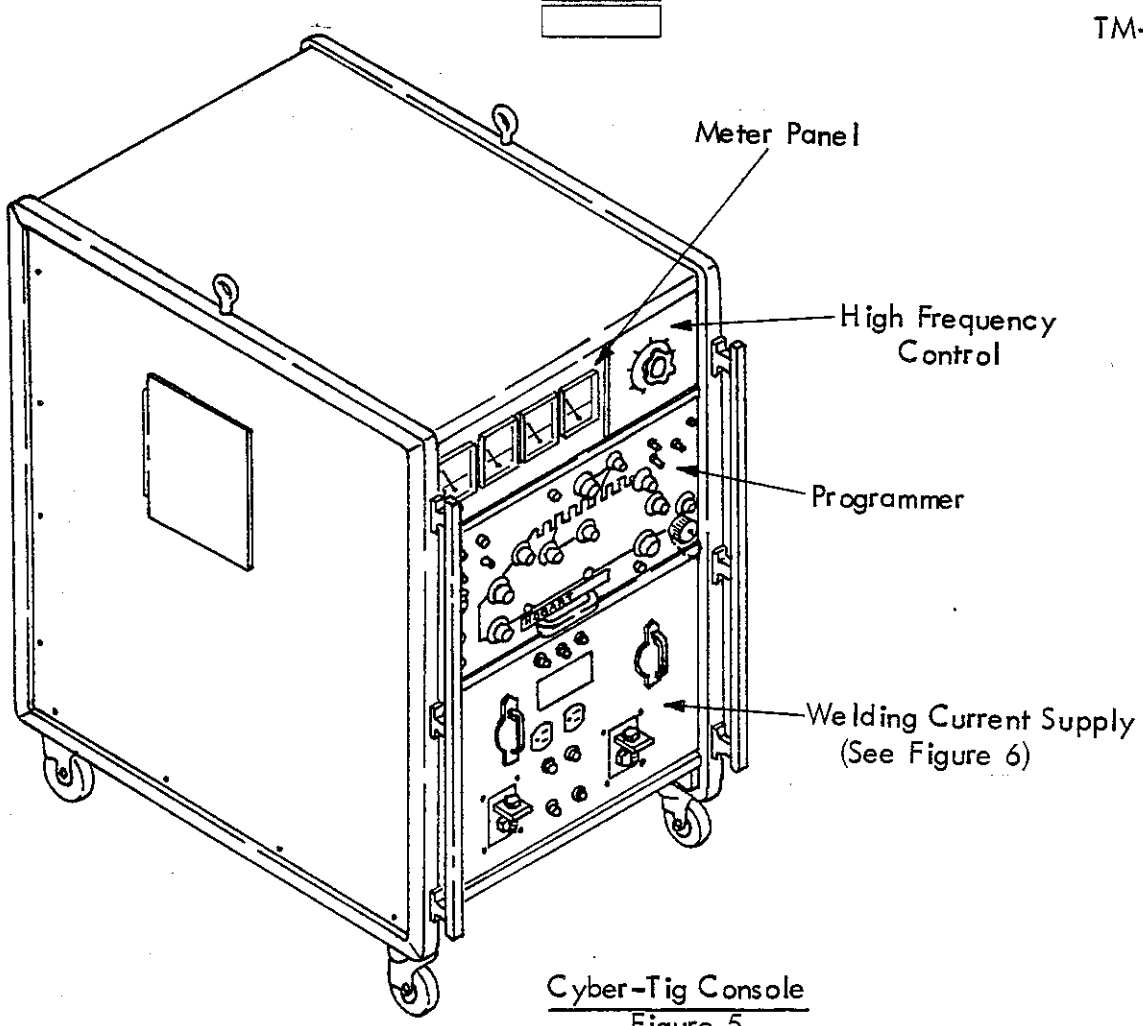
PROGRAMMER AND REMOTE CONTROL CONNECTIONS - Refer to Figure 3 as a rough guideline, but be sure to use the programmer instruction manual to determine the exact connection procedure.

DESCRIPTION OF EQUIPMENT - (See Figure 5.) The single-phase AC/DC welder requires a single-phase power input. It has a duty cycle of 60%. The output current of the welder can be either AC, straight polarity DC, or reverse polarity DC. The maximum no-load voltage rating is 80 volts. Refer to the nameplate on the front panel for the power input frequency, voltage, and current.

The optional meter panel has four meters - for monitoring AC or DC welding voltage or current. Other components of this circuitry are accessible through a small door on the left side of console. For greater detail on the high frequency circuit, refer to the programmer instruction manual.

The programmer is a self-contained unit which slides in or out of the console like a drawer, for easy adjustment or service of internal components, or for changing types of programmers. Any remote controls in use connect to plugs on the front control panel. The programmer controls welding current parameters, plus water and gas flow as described in greater detail in the programmer instruction manual.

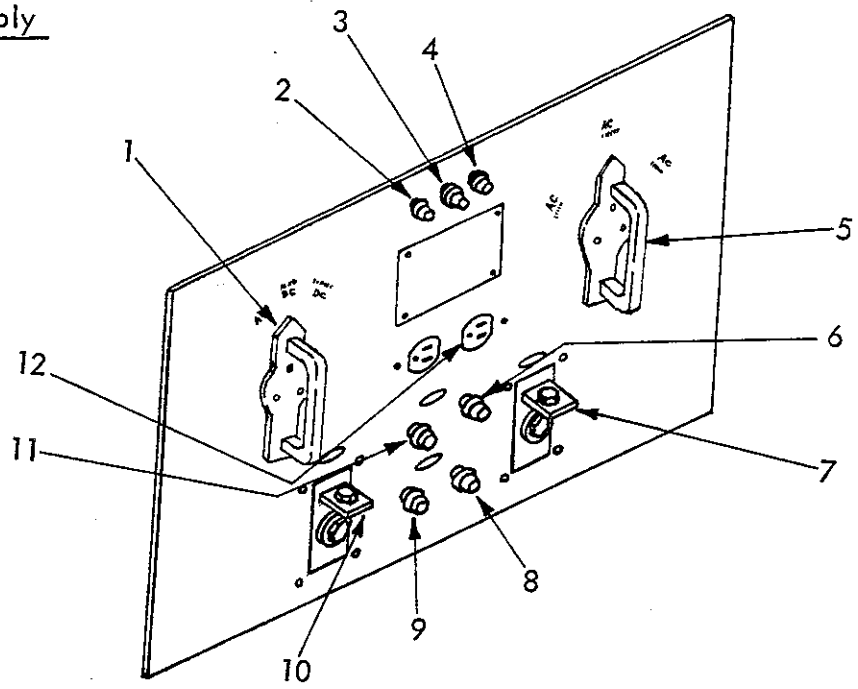
The welding current supply, located in the bottom half of console, serves as connection point for the welding cables, plus water and gas hoses when used. It also serves to limit maximum current output, to select welding mode (AC or DC), to reverse DC polarity, to provide fuses to protect programmer, and to provide 115-V AC auxiliary power outlets. See Figure 6.



Cyber-Tig Console
Figure 5

CONTROLS AND CONNECTORS

Welding Current Supply



Control Panel
Figure 6

Welding Current Supply (Continued) (Refer to Figure 6)

1. AC-DC Polarity Switch - Three-position rotary switch that selects polarity and mode of operation (AC or DC).

2. Fuse - 5 Ampere - Provides overload protection for the programmer.

3. Fuse - 15 Ampere - Provides overload protection for the programmer.

4. Fuse - 5 Ampere - Provides overload protection for the programmer.

5. Range Switch - Three-position rotary switch that selects maximum current for AC or DC welding: 50 Amps, 100 Amps, or 300 Amps.

6. Gas-from-Cylinder Connector - Provides connection for input gas from the gas cylinder.

7. "Electrode" Terminal - Provides electric connection between welder power supply and the torch electrode.

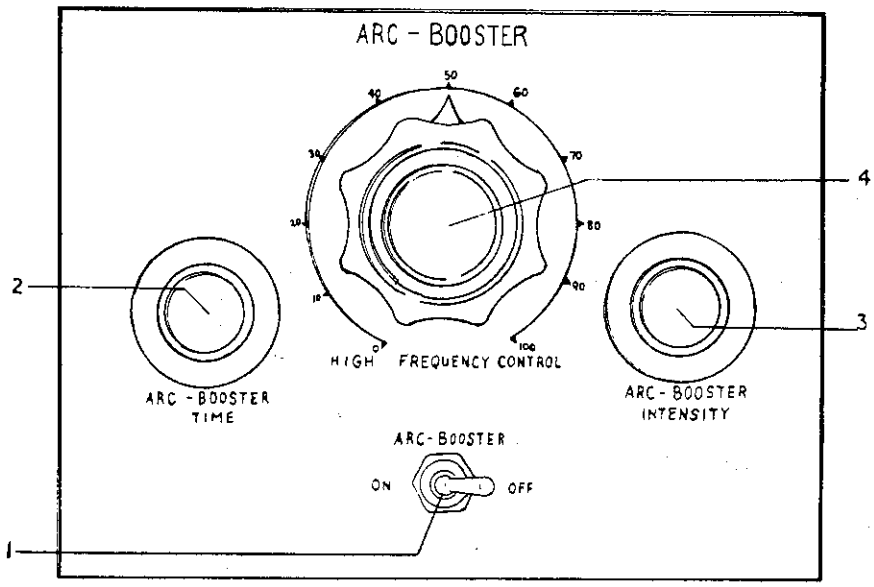
8. Water-from-Supply Connector - Provides connection for input water from the water supply.

9. Water-to-Torch Connector - Provides connection for feeding water to the torch.

10. "Work" Terminal - Provides electric connection to the work.

11. Gas-to-Torch Connector - Provides connection for feeding inert gas to the torch.

12. 115-V AC Convenience Outlets - Provides 115-V AC output for auxiliary equipment.



Arc-Booster (OPTIONAL) on Front Panel
Figure 7

1. Arc-booster ON-OFF Switch - Two-position toggle switch that selects between regular (OFF) and Arc-Booster operation (ON). For continuous operation of the high frequency circuit during AC welding, this switch should be OFF.

2. Arc-booster Time Control Potentiometer - Single-turn potentiometer that controls time duration arc-booster is in the circuit. 0 to 2.5 seconds.

3. Arc-booster Intensity Control Potentiometer - Single-turn potentiometer that controls arc-booster current as desired for the work involved. 2 to 10 amps. This current may be added to by current from HOT START CONTROL.

4. High Frequency Control Potentiometer - Single-turn potentiometer that controls intensity of high frequency. Operates in same manner as standard high frequency intensity control.

Control Settings - To operate the Arc-Booster, set the front panel controls to the desired positions.

CAUTION: High voltage is present at welding terminals prior to arc initiation. Arc booster not recommended for manual welding and is not to be used for AC welding.

PREPARATION FOR USE

COOLING WATER CONNECTIONS - Refer to Figure 8 when making connections to a "Circoolator". Refer to Figure 9 when making connections to the city (factory) water supply. In both cases, the cooling water exits the torch through the hollow electric cable.

NOTE: All water fittings have left-hand threads.

CAUTION: The use of Teflon thread sealing tape is recommended on the threaded water fittings, except for the torch cable connection to the welder electrode terminal. The only thread sealant allowed on this torch cable connection is electrical joint compound. This compound is available from Hobart Brothers Company in 5 oz. (147.8 c^3) tubes (Hobart part no. 903170).

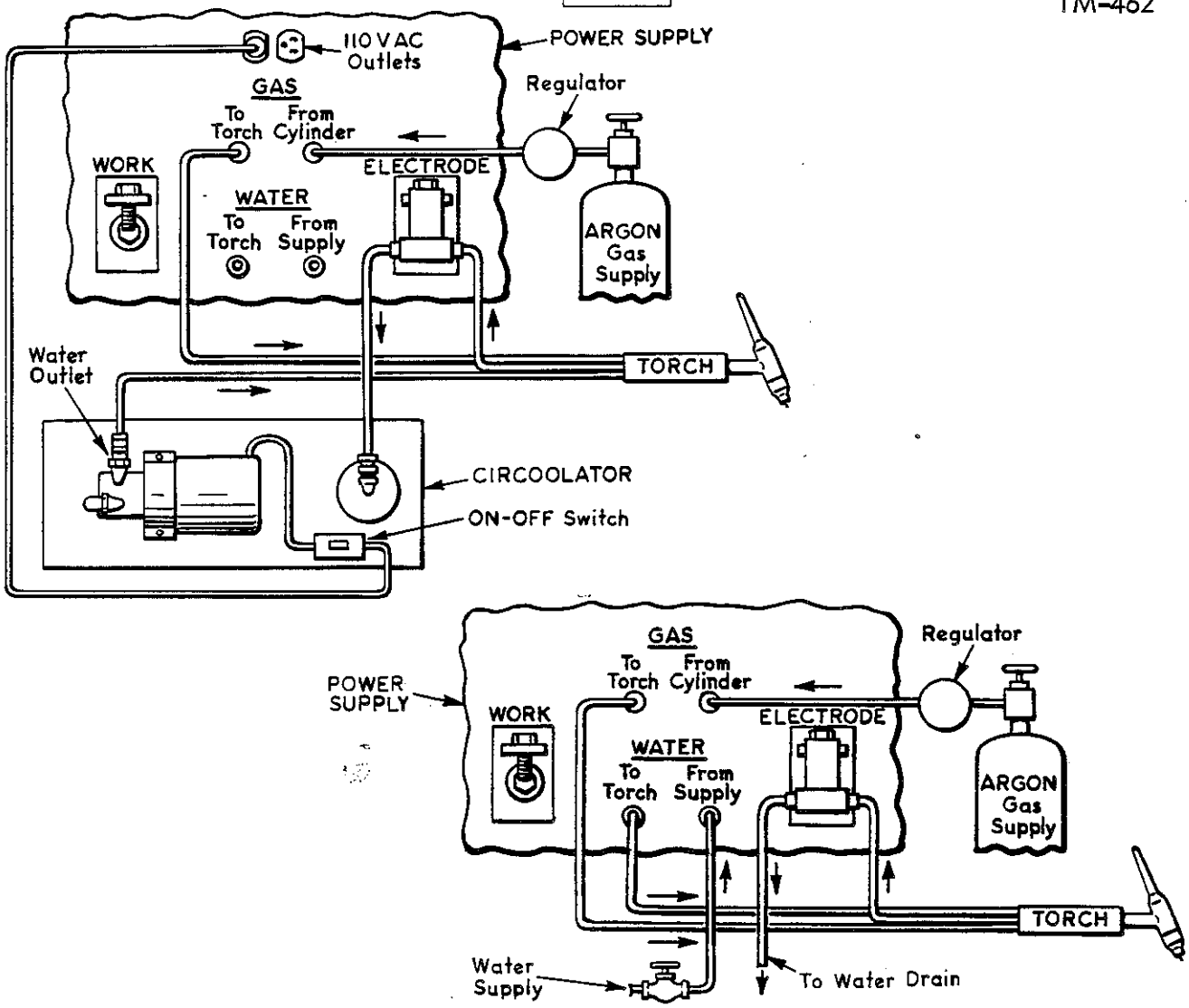
SHIELDING GAS CONNECTIONS - Refer to Figure 8 when making connections to a "Circoolator" cooled torch. Refer to Figure 9 when making connections to a city water cooled torch. Refer to Figure 10 when making connections to a gas cooled torch. Only in the case of the gas ("air") cooled torch does the gas flow to the torch through the hollow electric cable.

NOTE: All gas fittings have right-hand threads.

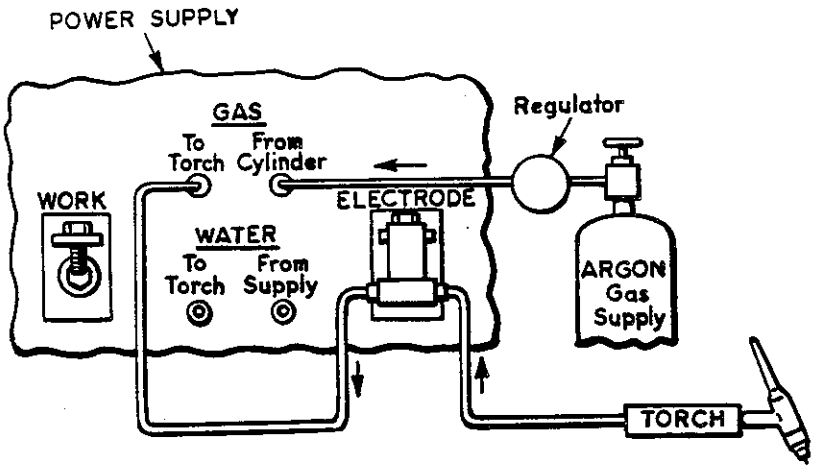
Shielding gas loss due to poor connections results in gas waste and possibly poor welds.

ELECTRICAL CONNECTIONS TO TORCH AND WORKPIECE - The "torch" and "work" power cables, plus the remote or torch switch cables, must each be 25 feet (7620 mm) in length or less. All of these cables should be routed together at floor level wherever possible, except the last 7 feet (2140 mm) at the torch ("whip") end (see Figure 3). Use No. 1 gauge copper wire for the welding power cables. Refer to Figures 8, 9, or 10.

NOTE: Make sure all connections are clean and tight. Thread sealant may be used as specified in the CAUTION note in the preceding section entitled: COOLING WATER CONNECTIONS. Keep both welding cables as short as possible and as far away as practical from other power lines and metallic objects.



City (Factory) Water Supply Cooled Torch
Figure 9



INSTALL PROGRAMMER - Install in the welder console in accordance with the programmer instruction manual - if it hasn't been factory installed. Make sure that all fasteners holding the programmer in place, plus all the fasteners securing the welder enclosure panels, are securely tightened.

OPERATION - Refer to programmer instruction manual. Thoroughly read the SAFETY WARNINGS at the front of this manual.

NOTE: Set the high frequency control to the lowest possible setting consistent with good welding.

MAINTENANCE

LUBRICATION - The fan motor is permanently lubricated and will never need oil or grease. No other points require lubrication.

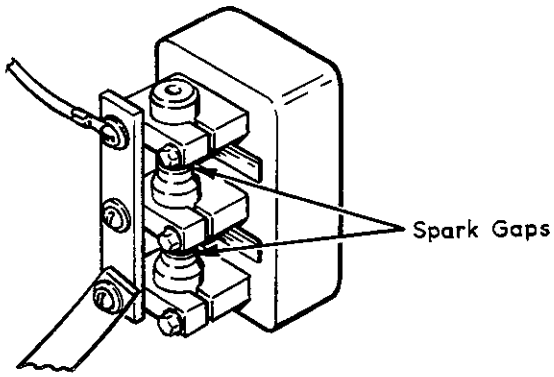
INSPECTION AND CLEANING - For uninterrrupted, satisfactory service from this welder, it is necessary to keep the machine clean, dry, and well ventilated. Dirt and dust may be blown or wiped from the inside of the welding machine.

WARNING: Disconnect line voltage from the unit before attempting any servicing inside unit. Turn fused disconnect switch to "OFF" and remove its fuses.

Be sure to wipe the fan blades clean. All electrical connections should be checked and tightened at regular intervals to eliminate unnecessary losses and to avoid subsequent trouble from overheating or open circuits.

CAUTION: The flow of air through the welder is carefully directed by baffles. Never operate the welder with any of the side or top panels removed or open, as serious damage to the rectifiers might result.

SPARK GAPS - Set to 0.008 inches (0.20 mm) or less. Check gap frequently, as gap erosion is normal. Resurface gap faces as necessary to permit accurate gap spacing. Gain access to these gaps by removing a small panel on left side, near the rear of welder console. See Figure 11.



Spark Gaps
Figure 11

REPLACEMENT OF SILICON RECTIFIERS - The silicon rectifier is composed of silicon diodes, some of which are positive (+) base and some negative (-) base. In general, diodes mounted on the same plate are of the same polarity. Should it become necessary to replace a diode, great care must be taken to replace it with one of like polarity.

An absolutely sure means of identification is to note the small arrow on the side of the diode. If the arrow points toward the stud, the diode is referred to as a "positive base". If the arrow points toward the lead (cable) end of the diode, the diode is referred to as a "negative base".

When ordering replacement diodes, make certain to indicate whether the diode to be replaced is positive or negative base. Part numbers will indicate this, but for absolute surety, indicate polarity as well. Consult your Hobart dealer for proper diode tightening torques.

HIGH FREQUENCY OR PULSING CIRCUITS TROUBLESHOOTING - Refer to programmer instruction manual.

TROUBLESHOOTING - The following chart contains information which can be used to diagnose and correct unsatisfactory operation or failure of the various components of the welder. Each symptom of trouble is followed by a list of possible causes and the procedure necessary to correct the trouble.

TROUBLE	CAUSE	REMEDY
Fan will not start	Power switch OFF	Place power switch in ON position.
	Power lines dead	Check voltage.
	Broken power lead	Repair.
	Wrong line voltage	Check power supply.
	Incorrect input power connections at welder, linkages or jumpers on overload panel	Check connections against wiring diagrams.
	Blown line fuses	Replace, check for cause.
	Blown fuse on front panel	Replace, check for cause.
	Fan motor failed	Replace.
	Control transformer failed	Replace.
	Loose connections at contactor, terminal strip, control transformer, or switch SW-1	Reconnect.
Contactor will not close (also see Fan will not start)	Nothing in remote control receptacle	Plug in remote control or local operation plug.
	Broken lead at contactor	Repair.
	Mechanical obstruction on contactor	Remove obstruction.
	Failed pre-purge timer (units with pre-purge timer only)	Replace.
	Loose connections at control transformer, terminal strip, remote control receptacle, weld timer, pre-flow timer, or contactor coil	Reconnect.

TROUBLE	CAUSE	REMEDY
Contactor hums	Dirt on contact faces of line switch magnet	Clean faces of magnet.
	Improper alignment of stationary and movable yokes on starting switch	Correct alignment.
	Broken shading coil	Replace.
Contactor operates and blows fuse	Wrong line voltage	Check nameplate of welder for line voltage to use, check line voltage.
	Links on overload panel incorrectly connected	Check wiring diagram for link positions, connect links correctly.
	Fuse too small	Install proper size fuses. (See wire and fuse size chart in Installation Section of this manual.)
	Diode failed	Replace diode. See Maintenance section of this manual
	Short circuit in primary connections	Remove short circuits.
	Transformer failed	Repair or replace.
Welder delivers welding current but soon shuts down	Wrong overload relay elements	Check with renewal part recommendation.
	Overload relay elements set incorrectly	Check with welder distributor.
	Welder overloaded	Reduce load - overload can be carried only for a short time.
	Duty cycle too high	Do not operate continually at overload currents.
	Power leads too long or too small in cross section	Replace with larger diameter cable. See wire and fuse chart in Installation Section of this manual.

TROUBLE	CAUSE	REMEDY
Welder delivers welding current but soon shuts down (Cont'd.)	Ambient temperature too high	Operate at reduced loads when temperature exceeds 100°F (38°C).
	Ventilation blocked	Check air intake and exhaust openings for obstruction and remove any found.
	Fan not operating	Check bearings, disconnect leads and apply motor nameplate voltage to check.
Contactor operates but welder will not deliver current	Electrode cable or holder may be grounded	Use only cable and holder with sound insulation.
	Range switch or polarity switch not centered on arrow	Set exactly on arrow.
	Water pipe connected to TIG torch terminal	Remove. Run cable from torch lug to TIG torch terminal.
	Transformer winding open	Have transformer repaired.
	Transformer secondary failed	Have transformer repaired.
	Diode failed	Replace diode. See Maintenance section of this manual.
Welding arc is loud and spatters excessively (stick electrode welding).	Current setting too high	Check setting and output with ammeter, or reduce current.
	Polarity wrong	Check polarity, try reversing polarity.
	Incorrect rod used on AC	Use AC or AC/DC rod for AC welding.
	Filter coil short circuited	Replace filter.
Welding arc sluggish	Current too low	Check output and current recommended for electrode being used.

TROUBLE	CAUSE	REMEDY
Welding arc sluggish (Cont'd.)	Poor connections	Check all electrode holders, electrode cable and work cable connections.
	Cables too long or too small in diameter	Check cable voltage drop, use larger cable.
	Low line voltage	Check power source. Notify power company if necessary.
Selector switch does not control polarity or permit adjustment between AC and DC welding	Loose or broken connection	Reconnect, check both ends of each lead to selector switch.
Welder operates but welding current falls off	Electrode or ground cable connections loose at welder, ground or work Also see "welder delivers welding current but soon shuts down".	Clean and tighten all connections, check ground return circuit.
Arc difficult to strike	Loose connection	Check connection.
	Wrong type electrode	Use proper electrode.
Operator gets shock when welder case is touched	Case of welder not grounded	Ground welder case.
Operator gets shock when ground cable, or work table is touched	Work table and work not grounded	Ground work and work table to plant ground.

TROUBLE	CAUSE	REMEDY
Weld metal will not flow, arc is erratic on AC-TIG welding	Arc is played on weld puddle	Point torch in direction of weld, not directly into weld puddle.
	Current too high	Reduce current.
	Arc length too long	Reduce arc length.
	Gas cup on torch too small	Increase size of gas cup.
	Insufficient gas flow	Increase gas flow.
	Helium inert gas used	Use argon gas if possible.
	Ballast resistor failed	Replace.
	Welding speed too slow	Increase speed of travel with torch.
	High frequency weak	See high frequency checking procedure in Programmer Module Manual.
	High frequency rheostat not set properly	Adjust for best welding conditions.
	Wrong spark gap setting	Adjust spark gap as recommended in first part of MAINTENANCE section.
Arc is unstable on AC-TIG welding	High frequency rheostat set improperly	Set for stable arc.
	Spark gaps set incorrectly	Set to recommended spacing.
	Welding cable too long	Move welder closer to work.
	Ballast resistor shorted or failed	Repair or replace.
	High frequency too weak	See high frequency check list. Also see "Arc is unstable".

TROUBLE	CAUSE	REMEDY
Arc is unstable	Dirt, grease, or oil on work piece	Degrease and clean to bare metal by chemical or abrasive means if necessary.
	Joints too narrow. Arc jumps from side to side	Increase spacing of work pieces or shorten arc length. Reduce high frequency setting.
	Electrode too large; arc moves around on electrode	Use smaller electrode or grind point. A polished electrode sometimes helps.
	Arc too long	Shorten arc length
	Also see "Torch spits tungsten into work".	
Torch "spits" tungsten into work	Tungsten is balled for AC-TIG welding either with reverse polarity DC or high AC current	Ball by grinding only.
	Current too high	Decrease current.
	Current too high after arc is struck on AC-TIG welding	Use foot rheostat to gradually increase current after arc is established, or hold 1/2" long a few seconds after striking.
	Arc length too long	Shorten arc.
	Tungsten too small	Increase size of tungsten.
	Sharp point ground on tungsten	As rated current of tungsten is approached, reduce sharpness of point.
	Post purge time too short, causing air contamination of tungsten	Increase post purge time until tungsten stays bright after gas shuts off.

TROUBLE	CAUSE	REMEDY
Torch "spits" tungsten into work (Cont'd.)	Tungsten touching work, causing contamination of tungsten and work	Break off end of tungsten.
	Leaky "0" rings in torch or leaky hoses in gas line	Replace.
	Hoses previously used to carry oil, acetylene or other gases	Use new hoses.
Weld is dirty	Dirty work metal	Clean work metal with degreasing compound, soap and water compound, or wire brush.
	Dirty filler rod	Keep filler rod in location where it will not become dirty.
	High frequency set improperly	Adjust high frequency rheostat for most favorable operation conditions.
	High frequency too weak	Increase setting of high frequency rheostat, see high frequency check list at end of maintenance section.
	Insufficient gas flow	Increase gas flow. Check for pinched hoses.
	Leaky gas hoses	Replace.
	Hoses previously used to carry oil, acetylene, or other gases, causing scum on weld	Use new hoses.
	Loose connections in gas system	Tighten.

TROUBLE	CAUSE	REMEDY
On DC-TIG straight polarity welding, high frequency jumps gap between electrode and work, but DC power does not follow to initiate the arc	Use of pure tungsten	Use thoriated tungsten on DC straight polarity welding.
	Controls set for soft start	Set for normal start. Adjust start control to prevent burn through.
	Use of helium gas	Use argon gas for best arc initiating properties.
	Electrode held very near work after high frequency has begun jumping	After high frequency spark jumps, withdraw torch slightly.
	Tungsten too large	Use smaller tungsten or grind point.
	Torch fuse blown	Replace, check to see if water is flowing. Reduce current if overloading torch.
	Tungsten used too long a time	Break off 1/4".
High frequency and arc extend from side of tungsten	Rough tungsten	Use ground and polished tungsten.
Arc unstable at low current welding on DC straight polarity TIG	High frequency switch set to START (high frequency cuts out)	Set to CONTINUOUS (high frequency is continuous).
	Arc extends from side of tungsten	Use ground and polished tungsten.
	Arc length too long	Use shortest arc length possible.
	Arc wanders	See trouble category - "Arc Wanders".

TROUBLE	CAUSE	REMEDY
Arc crater at end of weld	Torch withdrawn before arc is extinguished	Snap torch back quickly. An alternate solution is to cut off the current with the remote switch before the torch is withdrawn from the work. Still another solution is to use the remote rheostat control to reduce the current before withdrawing the electrode from the work and filling in the crater in this manner.
Arc wanders	Tungsten contaminated by carbon	Break off end of tungsten and grind clean. Do not use carbon block for striking arc.
	Arc blow	Change position of ground clamp
	Air drafts	Shield arc from air drafts.
	Electrode too large; arc moves around on electrode	Use smaller electrode or grind point. A polished electrode sometimes helps. Grind point on electrode.
	Joint too narrow; arc jumps from side to side	Increase spacing of work pieces or shorten arc length. Reduce high frequency setting.
Tungsten discolors after weld	Insufficient gas post purge	Increase setting of post purge time.
	Post purge timer sticks	Replace or clean contacts.
	Gas valve sticks	Replace.
	Loose connections in gas system	Tighten.
	Insufficient gas flow	Increase.
	Leaky hoses	Replace.

TROUBLE	CAUSE	REMEDY
Water to torch flows too slowly or not at all	Insufficient water pressure	Increase water pressure.
	Water shut off	Turn on water.
	Water valve sticks	Replace water valve.
	Water hose pinched	Remove object pinching hose.
Water or gas will not shut off	Post purge timer set too high	Decrease post purge timer setting.
	Post purge timer contacts stick	Replace timer or clean contacts.
	Valves stuck open	Replace valves.
High frequency but no power	Work cable hooked to ELECTRODE terminal	Connect to WORK terminal.
	Fuse in torch blown	Replace fuse.
Poor weld on AC-TIG weld discolored	Water in torch, due to leaky "0" rings	Replace "0" rings.
Porous welds	Post purge too long or cold water flows continuously; causes condensation in inert gas section of torch; will not happen with Circoolator; water is at room temperature.	Shorter post purge or use Circoolator for cooling water.
	Leaky "0" rings in torch	Replace "0" rings.
Porous welds on aluminum alloys	Hydrogen entrapment	Make certain work and filler metal are clean and dry. Remove oxide film before welding. Avoid welding in a humid place. Increase gas flow.
	Too high welding temperature welding speed too slow	Reduce current and weld as fast as possible.

TROUBLE	CAUSE	REMEDY
Porous welds on aluminum alloys (Cont'd.)	Magnesium used as alloying material	Avoid welding aluminum alloys with high magnesium content.
	Impurities in base metal; for example, calcium	Use higher grade material.
	Weld solidifies rapidly	Use materials which solidify slowly. Reduce welding speed.
Weld has low tensile strength (aluminum)	Metallurgical changes due to weld heat	Heat treat.
Weld cracking (aluminum)	Welding speed too slow	Increase speed.
	Current too high	Reduce current.
	Skip welding	Use continuous welds on aluminum and its alloys.
	Welding so that welds intersect	Weld at low current and fast speed, or redesign piece to avoid intersection of welds.
	Cold working	Do not weld cold worked aluminum alloys and do not cold work after welding.
	Also see "Porous welds on aluminum alloys".	
Intermittent timer and relay operation	5 amp fuse blown	Replace fuse.
Weak high frequency and no welding power	Torch fuse blown	Replace; check to see if water is flowing. Reduce current if overloading torch.

TROUBLE	CAUSE	REMEDY
High frequency will not cut off after arc is struck and high frequency switch is in START position	Voltage control relay (VCR) contacts stuck	Free contacts and clean them.
High frequency does not come on in AUTO position	VCR relay circuit defective	Replace defective part.
	Pins loose on connector at rear of drawer	Tighten pins.
	Wires loose on connector at top of high frequency panel	Tighten loose wires.
Output of machine is at minimum (3 amps) regardless of current setting	Pins loose on connectors at rear of drawer or at SCR Gater	Tighten pins.
	Feedback resistor open	Replace resistor.
	2CR relay contacts not operating properly	Replace relay.
	Amp-traps blown	Replace amp-trays after checking for shorted SCR's, shorted diode or shorted reactor control coil.
	SCR Gater defective	Replace SCR Gater.
	Line voltage incorrect	Check nameplate of welder for line voltage to use, check line voltage.
	Links on overload panel incorrectly connected	Check wiring diagram for link positions, connect links correctly.
No open circuit voltage	Range and selector switch not in detent position	Set switch on detent.
	Pre-purge timer not working	Replace timer.

TROUBLE	CAUSE	REMEDY
No open circuit voltage (Cont'd.)	Line contactor not energizing	Repair line contactor or circuit.
	1CR relay not energizing	Plug in remote control or local operation plug.
Low open circuit voltage	Open diodes in output rectifier	Replace diodes. See MAINTENANCE section of this manual.
Output of machine will not reach maximum rated load	Line voltage incorrect	Check nameplate of welder for line voltage to use, check line voltage.
	Links on overload panel incorrectly connected	Check wiring diagram for link positions, connect links correctly.
	Maximum current calibration control misaligned	Realign maximum current.
	Amp-trap failed	Replace amp-trap.
	SCR failed	Replace SCR.
	SCR Gater failed	Replace SCR Gater.
	Control coil on reactor has shorted turns	Repair or replace reactor.
	Wrong size electrode and ground cable used	Use correct size cables.
Output of machine won't reach minimum rated load	Line voltage incorrect	Check nameplate of welder for line voltage to use, check line voltage.
	Links on overload panel incorrectly connected	Check wiring diagram for link positions, connect links correctly.
	Minimum current calibration control misaligned	Realign minimum current.

TROUBLE	CAUSE	REMEDY
Output of machine won't reach minimum rated load (Cont'd.)	Load turns on reactor shorted	Repair or replace reactor.
Output current goes to maximum regardless of current setting	Open circuit in pick-up coils	Replace defective coil.
	Wires loose on pick-up coils	Tighten wires.
	Pins loose on connectors to drawer or SCR Gater	Tighten pins.
	SCR Gater defective	Replace SCR Gater.

Parts List

EQUIPMENT IDENTIFICATION - An identification plate on the unit's control panel shows its model number, serial number, and specification number. Whenever ordering parts or making inquiries, furnish all these numbers.

NOTE: A "specification number" must have a "dash number" suffix (-1, -2, -3, etc.) in order to be a complete number.

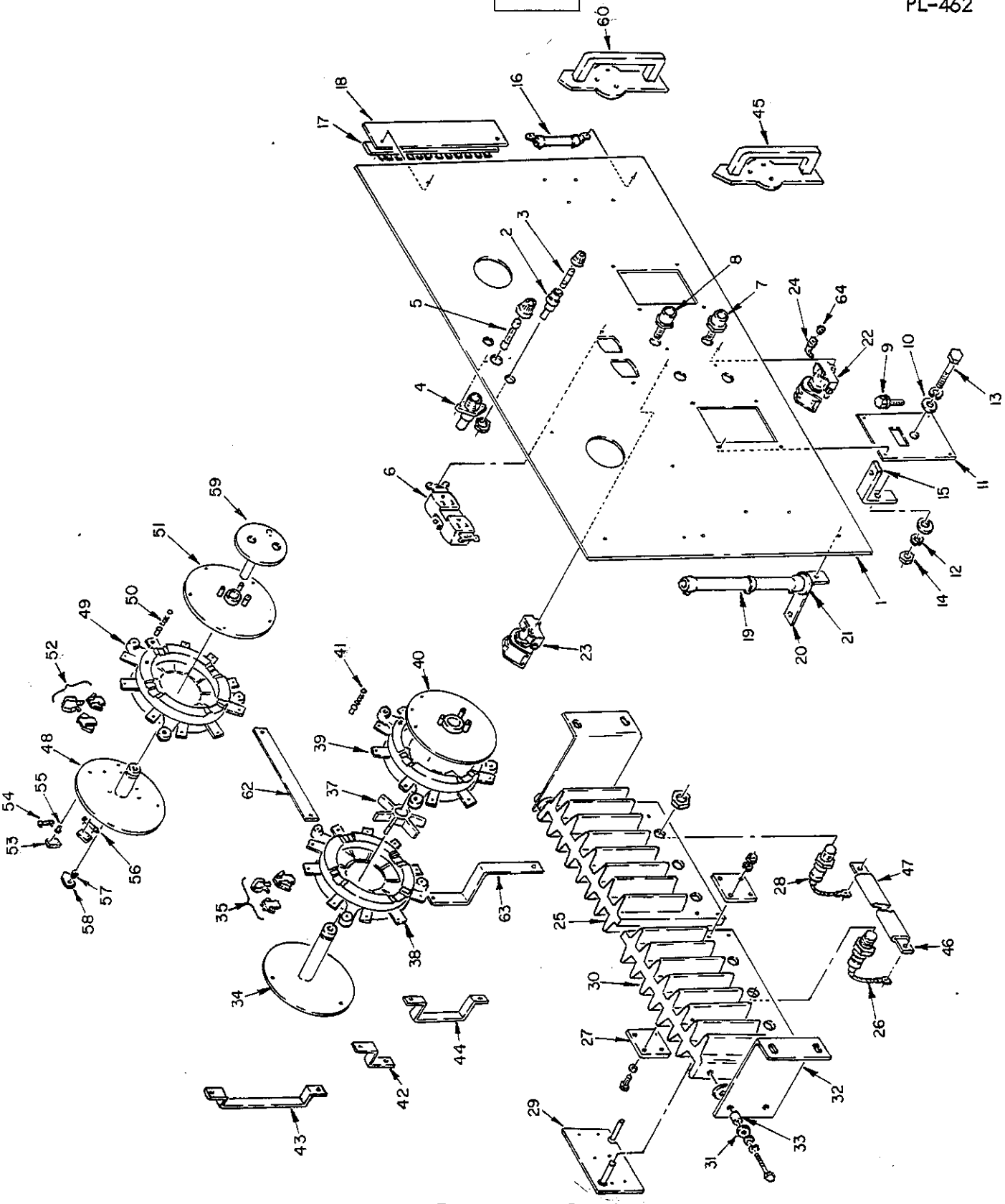
HOW TO USE THIS PARTS LIST - The part name listings may be indented to show part relationships as indicated in the following example.

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
1-		123456	Assembly (not shown)	1	
	1	234567	. A detail of assembly	1	
	2	345678	. A sub-assembly	1	
	3	456789	. . A detail of sub-assembly (Item 2)	1	
	4	567891	. . A sub-assembly of Item 2	1	
	5	678910	. . . A detail of sub-assembly (Item 4)	1	

Locate the specification number below that appears on your unit, and note the "APPLICATION CODE" letter adjacent to it.

Specification No.	Application Code	Specification No.	Application Code
5159D-1	A	5289D-1	J
5159D-2	B	5289D-2	K
5159D-3	C	5289D-3	L
5159D-4	D	5289D-4	M
5283D-1	E	5301D-1	N
5283D-2	F	5301D-2	O
5283D-3	G	5301D-3	P
5283D-4	H	5301D-4	R

After locating the desired part in the following figures and parts lists, if the "Application Code" column says "All", proceed to order the part. If there are several part numbers after the same "Item No.", order only the part number corresponding to the "Application Code" letter that you selected above.



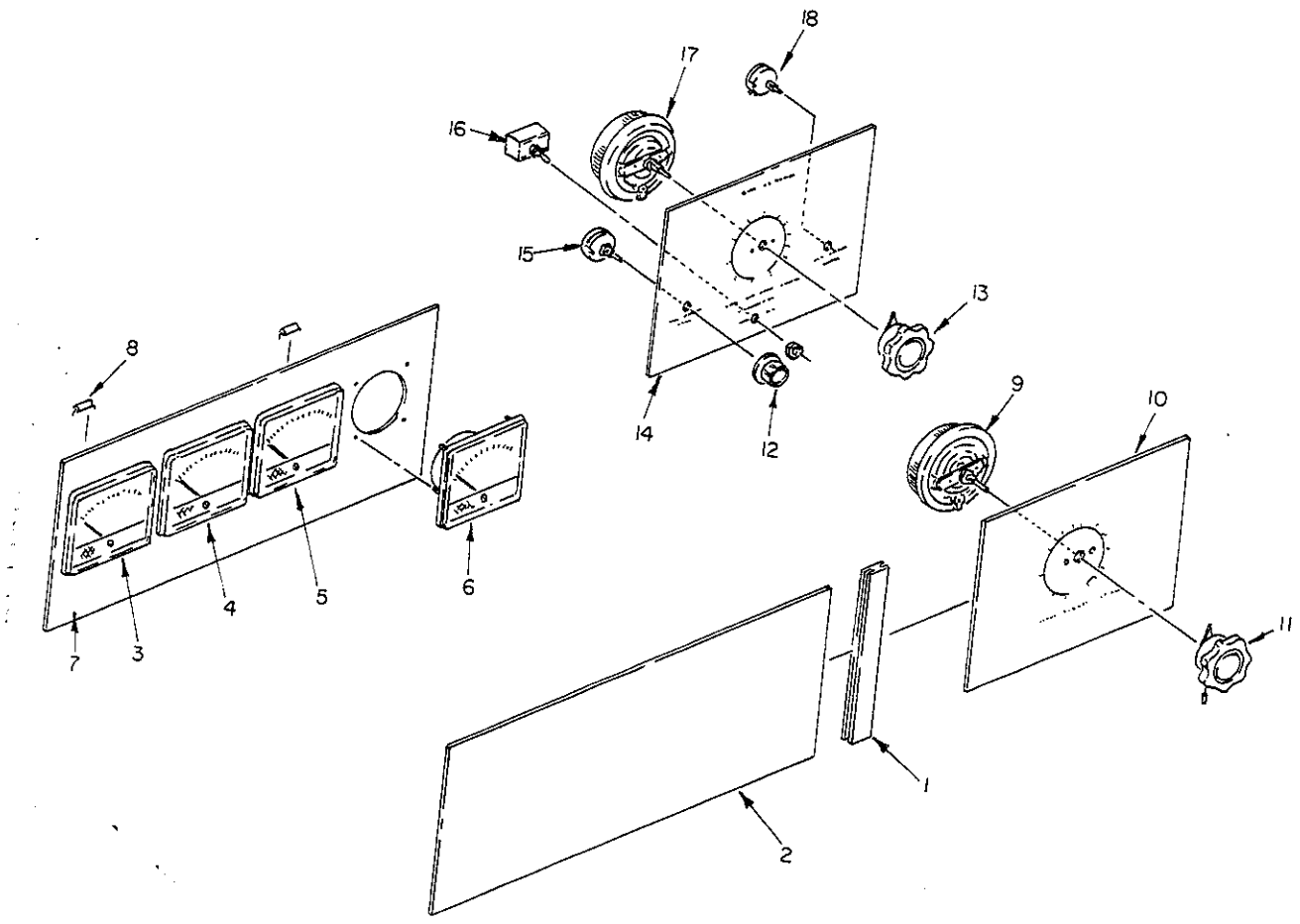
Front Bottom Panel
Figure 1

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
1-		364097-1	Panel - Front Bottom	1	ACEGJLNP
		364097-2	Panel - Front Bottom	1	BDFHKMOR
	1	364089	. Panel - Front	1	All
	2	402658	. Holder - Fuse	2	All
	3	W-11166-2	. Fuse - 5 Amp.	2	All
	4	402151	. Holder - Fuse	1	All
	5	W-10502-17	. Fuse	1	All
	6	402670	. Receptacle	1	All
	7	370851	. Adapter - Water, Left Hand	2	All
	8	370447	. Adapter - Gas, Right Hand	2	All
	9	W-11100-3	. Screw - 1/2-13 x 1-1/4 HHC ST.	2	All
	10	W-11242-12	. Washer - 1/2 FL. ST.	6	All
	11	362677	. Board - Terminal	2	All
	12	W-11254-8	. Washer - 1/2 LK. ST.	4	All
	13	W-11100-5	. Screw - 1/2-13 x 1-3/4 HHC. ST.	2	All
	14	W-11278-1	. Nut - 1/2-13 Hex ST.	2	All
	15	5CW-974	. Bus - Stud Cable	2	All
	16	W-9746-8	. Resistor	1	All
	17	402480-3	. Block - Terminal	1	All
	18	362862	. Label - Terminal Strip	1	All
	19	W-2974-C	. Resistor - Variable, Ohmite	2	All
	20	AAW-3981	. Bracket - Mtg.	2	All
	21	16DA-3493	. Washer - Insulating	1	All
	-	361048	. Transformer - Current	1	BDFHKMOR
	-	363201	. Shunt - Current	1	BDFHKMOR
	22	402882-1	. Valve - Solenoid, Water	1	All
	23	402882-2	. Valve - Solenoid, Gas	1	All
	24	W-10892-1	. Elbow - Street, 90° Brass	4	All
		362314-1	. Rectifier - Output Silicon Assy	1	All
	25	8RT-697A-2	. . Heat Sink - Rect.	1	All
	26	W-10931-3	. . Diode - Positive	2	All
	27	8RT-701	. . Plate - Mtg.	2	All
	28	W-10933-3	. . Diode - Negative	2	All
	29	363986	. . Suppressor - Surge Assy	1	All
	30	8RT-697A-1	. . Heat Sink - Rect.	1	All
	31	A-25	. . Washer - Rocker Arm	8	All
	32	362086	. . Bracket - Mounting	2	All
	33	6FW-5651	. . Bushing - Insulating	4	All
		362869-3	. Switch - Polarity (for Replacement, Switch only, Less bus bars, Order 362869-1)	1	All
	34	351316	. . Plate - Rear	1	All

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	PL-462 Units per Assembly	Application Code
1-	35	366798	. . Contact Set (2 Contacts and 1 Spring)	6 sets	All
	36		Deleted		
	37	366589	. . Hub - Driving	1	All
	38	SW-215-8	. . Ring - Contact, Rear	1	All
	39	SW-215-2	. . Ring - Contact, Front	1	All
	40	366588	. . Plate - Front	1	All
	41	AW-459	. . Catch - Friction Ball	1	All
	42	362952	. . Bar - Bus	1	All
	43	361402	. . Bar - Bus	1	All
	44	361400	. . Bar - Bus	2	All
	45	362726	. Handle - Switch	1	All
	46	363095-3	. Bar - Bus	1	All
	47	360255-16	. Sleeving - Fiberglass	2	All
	-	362868	. Label - Terminal	1	BDFHKMOR
	-	402480-1	. Block - Terminal	1	BDFHKMOR
		364099	. Switch - Range	1	All
	48	364098	. . Plate - Rear	1	All
	49	SW-215-2	. . Ring - Contact	1	All
	50	AW-459	. . Catch - Friction Ball	1	All
	51	SW-260	. . Plate - Front	1	All
	52	366798	. . Contact Set (2 Contacts and 1 Spring)	3 sets	All
	53	HF-2514	. . Switch - Micro	2	All
	54	363676-1	. . Resistor - 75 OHMS, 10 Watt	1	All
	55	363672	. . Spacer - Switch	4	All
	56	363676-2	. . Resistor - 50 OHMS, 10 Watt	1	All
	57	361768	. Bushing - Spacer	1	All
	58	403990	. Actuator - Sw.	1	All
	59	361415	. Shaft - Actuator	1	All
	60	362726	. Handle - Sw.	1	All
	61		Deleted		
	62	364101	. Bar - Bus	1	All
	-	W-9407-91	. Cable - #2 Assy	1	All
	-	W-9760-83	. Cable - #6 Assy	1	All
	-	W-9760-84	. Cable - #6 Assy	1	All
	-	W-9360-221	. Cable - 1/0 Assy	1	All
	63	362953	. Bar - Bus	1	All
	-	W-9760-112	. Cable - #6 Assy	1	All
	-	364915	. Bar - Bus	1	All
	-	404040-1	Nameplate - Ident.	1	All
	64	402128-10	Protector - Plastic	4	All
	-	8RT-323	Insert - Barbed	2	NOPR
	-	8RT-324	Nut - Water	1	NOPR
	-	8RT-325	Nut - Gas	1	NOPR

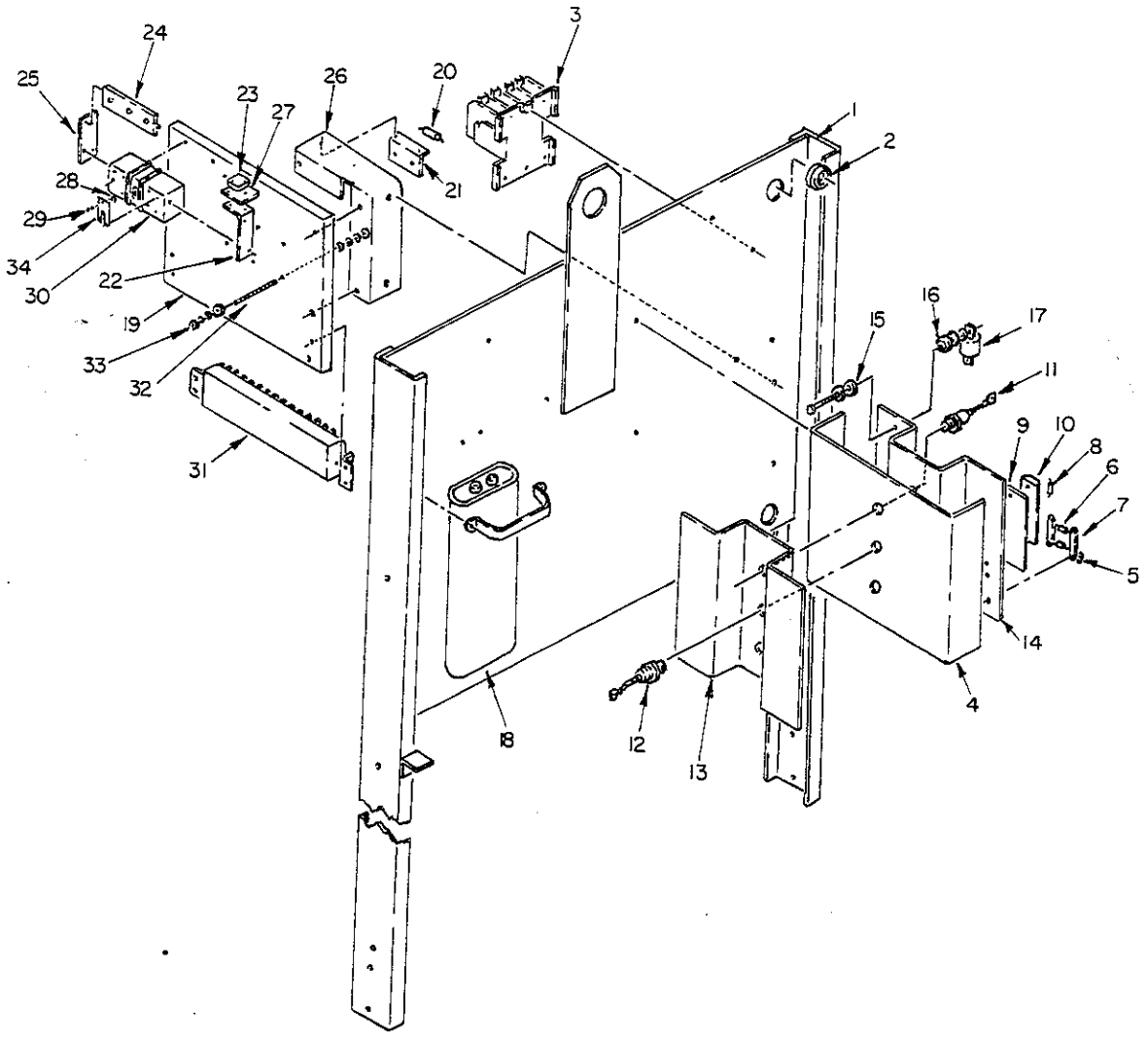
- Not Illustrated

Jan 20/81 - Revised



Front Meter Panel Group
Figure 2

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
2-	1	362989	Spacer - Front Panel	1	All
	2	362598	Panel - Front, Meter	1	ACEGJLNP
		362633	Panel - Front, Meter	1	BDFHKMOR
	3	404451-1	. Meter - D.C. Volt, 0-100V	1	BDFHKMOR
	4	404449-1	. Meter - D.C. Ammeter, 0-400 Amp.	1	BDFHKMOR
	5	404447-1	. Meter - A.C. Volt, 0-100V	1	BDFHKMOR
	6	404445-1	. Meter - A.C. Ammeter, 0-400 Amp.	1	BDFHKMOR
	7	362600	. Panel - Meter	1	BDFHKMOR
	8	400382	. Capacitor	2	BDFHKMOR
		362758	Panel - High Frequency Adj.	1	ABEFJKNO
	9	402219	. Rheostat	1	ABEFJKNO
	10	362685	. Panel - Front	1	ABEFJKNO
	11	AAW-835A	. Knob - Rheostat	1	ABEFJKNO
		363118	Panel - High Frequency Adj.	1	CDGHLMPR
	12	400248	. Knob	2	CDGHLMPR
	13	AAW-835A	. Knob - Rheostat	1	CDGHLMPR
	14	362630	. Panel - Front Arc Booster	1	CDGHLMPR
	15	401428-1	. Potentiometer	1	CDGHLMPR
	16	403050-1	. Switch	1	CDGHLMPR
	17	16DA-2177-4	. Rheostat	1	CDGHLMPR
	18	W-9712-8	. Rheostat	1	CDGHLMPR



Lifting Yoke Assembly
Figure 3

Fig. No.	Item No.	Part. No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
3-	1	365048	Yoke - Lifting Assy	1	All
	2	402037-23	Grommet - Rubber	2	All
	3	404377	Contactor - Line	1	All
		362907	Heat Sink - Assy	1	All
	4	362999	. Heat Sink	1	All
	5	400706	. Lug - Terminal	1	All
	6	401943-1	. Capacitor - .022 MFD 600V	2	All
	7	8TRY-63-2	. Strip - Terminal	2	All
	8	363573	. Capacitor - 100 WV D.C., .047 MFD	2	All
	9	402807	. Label - Terminal Strip	1	All
	10	400589-1	. Strip - Terminal , 5 Station	1	All
	11	402799-3	. S.C.R. - Westinghouse, 25 I.D.	2	All
	12	402833-3	. Diode - 410 D.R.	1	All
	13	363056	. Heat Sink	1	All
	14	363000	. Heat Sink	1	All
	15	400891-1	. Bushing - Nylon	4	All
	16	400891-2	. Bushing - Nylon	4	All
	17	Y-1890-3	. Amp Trap - 110 Amp.	2	All
	18	8TW-130	Capacitor - P.F.	2	All
		362608-1	Board - Overload, Assy	1	ABCD
		362608-2	Board - Overload, Assy	1	EFGH
		362608-3	Board - Overload, Assy	1	JKLM
		362608-4	Board - Overload, Assy	1	NOPR
	19	362609	. Board - Terminal	1	All
		366046	. Bracket - Mtg. Assy	1	All
	20	404274-1	. . Capacitor - Across Line	1	All
	21	366041	. . Bracket - Mtg.	1	All
	-	1CZ-188-0	. . Terminal - Solder	2	All
	-	363134-2	. Lead - Connecting	1	All
	22	361899	. Bracket - Left	1	All
	23	402677	. Switch - Micro	1	All
	24	361897	. Bar - Actuating	1	All
	25	361896	. Bracket - Right	1	All
	-	363094-1	. Lead	1	All
	-	363094-2	. Lead	1	All
	26	361900	. Bracket - Overload Panel	1	All
	27	361895	. Insulator	1	All
	28	W-11287-2	. Nut - 6-32 x 5/8 Rd. Hd. MH. St.	1	All
	29	W-11110-5	. Screw - #6-32 x 5/8 Rd. Hd. MH. St.	1	All
	30	361901	. Block - Drilling	1	All
	31	405171	. Block - Terminal , 15 Station	1	All
	-	363161	. Bar - Bus	2	ABCDEFGHJKLM
	32	W-9552-14	. Rod - Threaded	4	All

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
3-		403019	. Label - Terminal Strip	1	ABCD
		403021	. Label - Terminal Strip	1	EFGH
		403020	. Label - Terminal Strip	1	JKLM
		403078	. Label - Terminal Strip	1	NOPR
	33	W-11281-3	. Nut - Brass	28	ABCD
		W-11281-3	. Nut - Brass	36	EFGHJKL MNOPR
-		W-9552-1	. Rod - Threaded	4	ABCD
		W-9552-1	. Rod - Threaded	6	EFGHJKL MNOPR
	34	430534	Element - Heat, L. H.	1	All
		430535	Element - Heat, R. H.	1	All
-		363161	Link - Changeover	2	ABCDEFGH JKLM
-		363212	Cable - Changeover	2	NOPR

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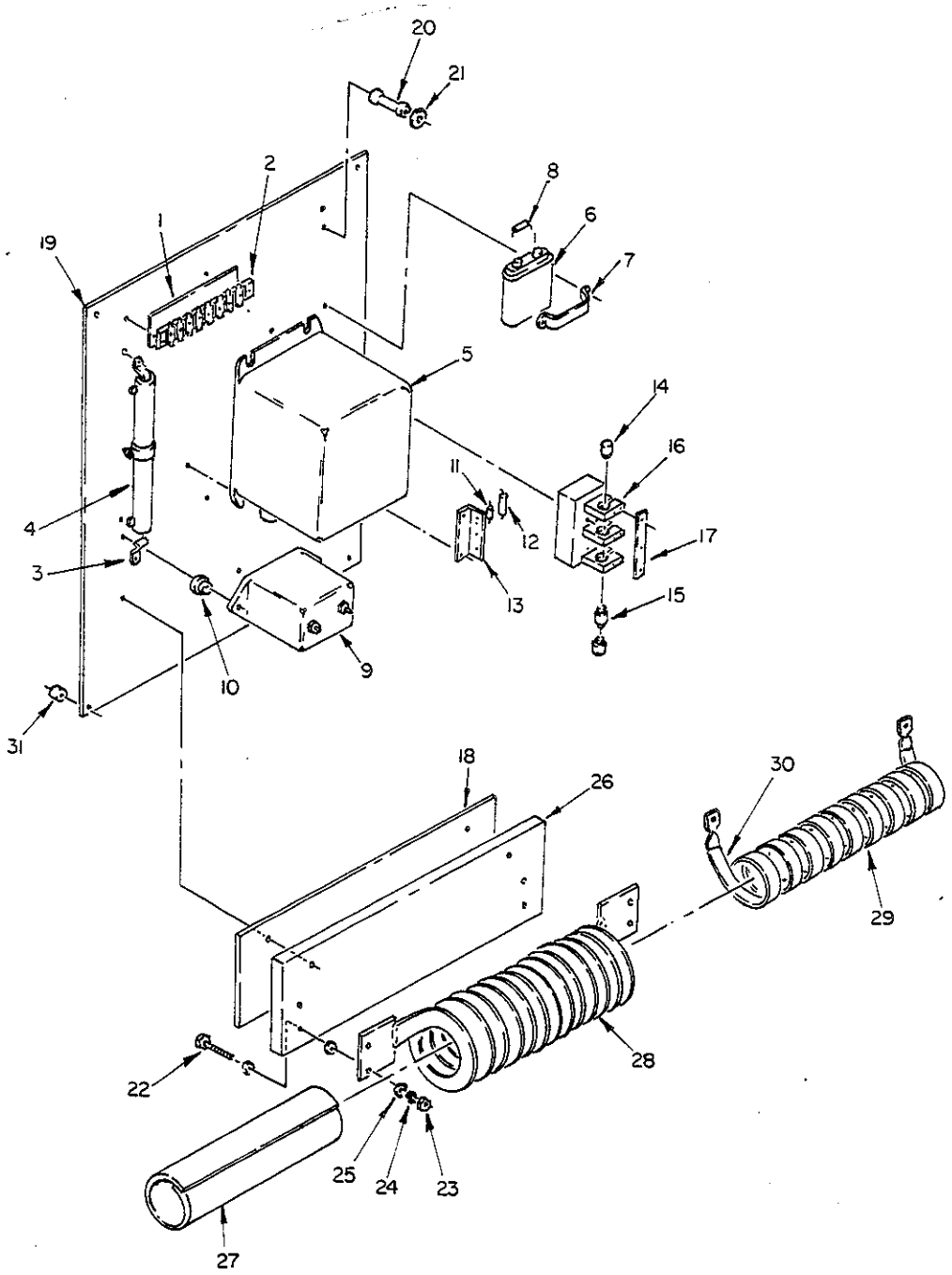
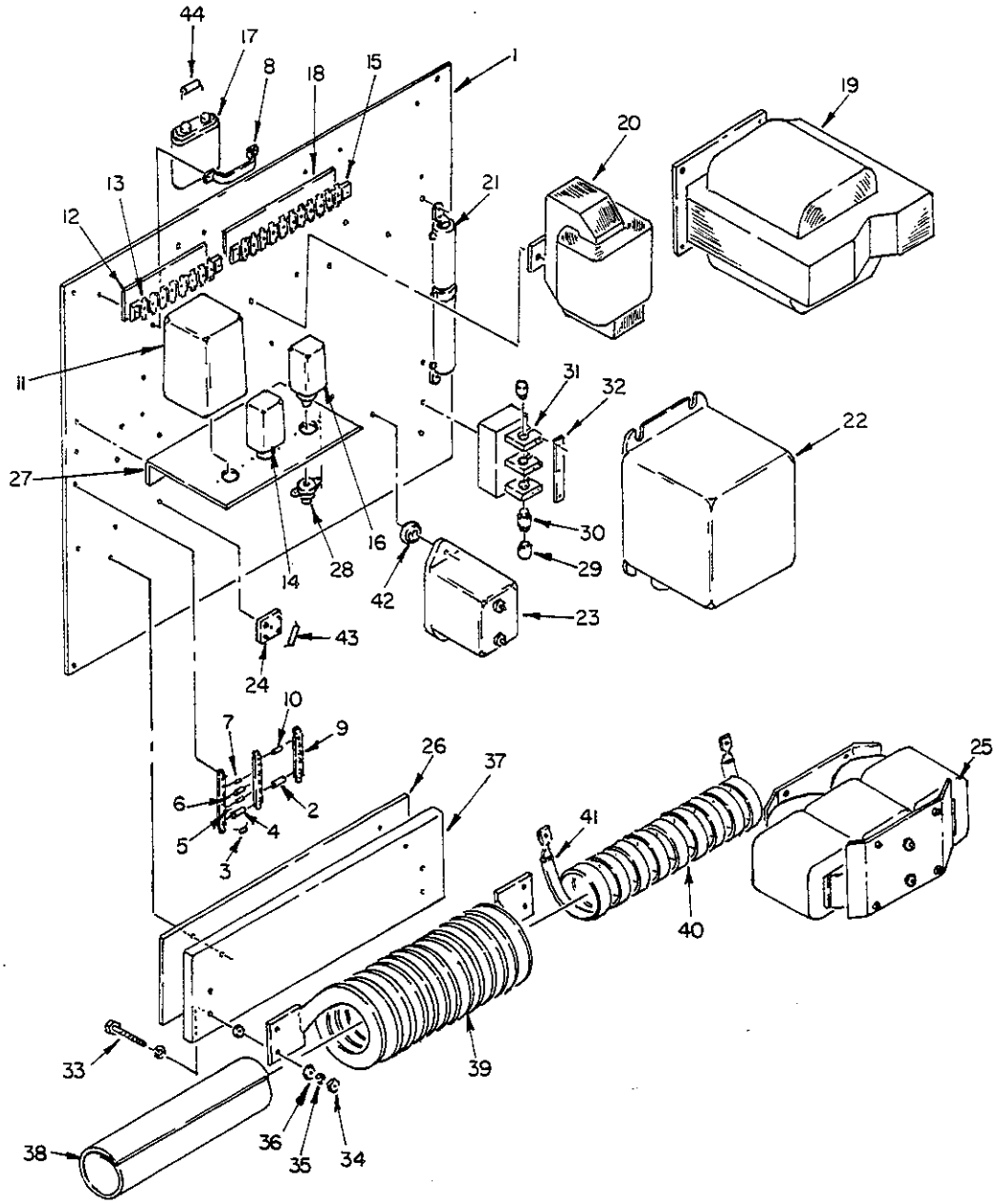


High Frequency Panel
Figure 4

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
4-		362735-1	Panel - High Frequency, Assy	1	ABEFJK
		362735-2	Panel - High Frequency, Assy	1	NO
	1	402801	. Nameplate - Terminal	1	All
	2	402480-1	. Strip - Terminal	1	All
	3	400078	. Bracket - Mtg.	2	All
	4	W-2974-E	. Resistor	1	All
	5	AATW-140-1	. Transformer	1	ABEFJK
		AATW-140-5	. Transformer	1	NO
	6	402802	. Capacitor	1	All
	7	402879	. Clamp - Capacitor	1	All
	8	362909	. Resistor	1	All
	9	FTW-328-0	. Capacitor	1	All
	10	8RT-654	. Washer - Rubber Cushioning	2	All
	11	401427-2	. Capacitor	1	All
	12	W-9026-10	. Resistor	1	All
	13	363988	. Bracket - Mtg. Assy	1	All
		FTW-413	. Spark Gap - Assy	1	All
	14	FTW-410	. . Electrode - End	2	All
	15	FTW-411	. . Electrode - Center	1	All
	16	FTW-412	. . Base	1	All
	17	FTW-415	. . Strap	1	All
	18	362703	. Board - Mtg. Coil	1	All
	19	362734	. Panel - High Freq.	1	All
	20	364899	. Resistor - 200 OHM, 10W	1	All
	21		. Washer - #8 Flat Brass	1	All
		362742	. Coil - High Freq.	1	All
	22	W-11114-6	. . Screw - 1/4-20 x 1-1/2 RHMS	4	All
	23	W-11280-2	. . Nut - 1/4-20 Hex Jam Steel	8	All
	24	W-11254-4	. . Washer - 1/4 Lock Steel	8	All
	25	W-11242-5	. . Washer - 1/4 Flat Steel	4	All
	-	W-11160-2	. . Washer - 1/4 Lock ET	4	All
	26	362704	. . Board - Insulating Coil	1	All
		363386	. . Coil - High Frequency Sub-Assy	1	All
	27	355224-16	. . . Insulation - Coil	1	All
	28	362957	. . . Coil - High Freq., Outside	1	All
	29	362958	. . . Coil - High Freq., Inside	1	All
	30	360255-2	. . . Sleeving - Fiberglass	1	All
	31	12CW-600	Spacer	4	All

- Not Illustrated

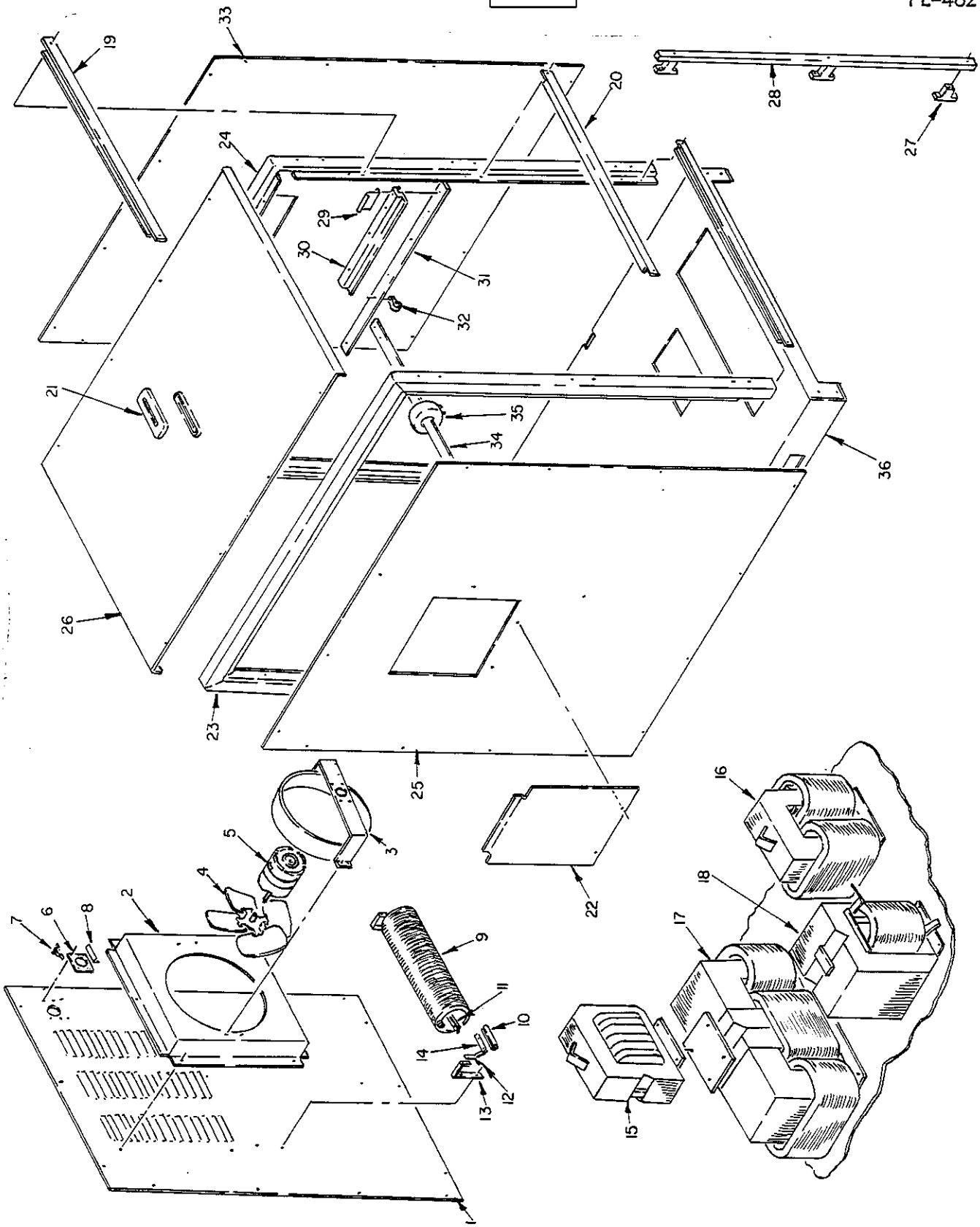


High Frequency Panel
Figure 5

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
5-		362641-1	Panel - High Frequency Assy	1	CDGHLM
		362641-2	Panel - High Frequency Assy	1	PR
	1	362699	. Panel	1	All
	2	W-9026-11	. Resistor	1	All
	3	401943-1	. Capacitor	1	All
	4	W-9026-1	. Resistor	1	All
	5	401429-3	. Zener - 51V, 1 Watt	1	All
	6	W-9714-1	. Resistor	1	All
	7	1CZ-93B	. Diode	1	All
	8	TRY-174-3	. Clamp - Capacitor	1	All
	9	8TRY-63-7	. Terminal - 8 Station	3	All
	10	W-9714-25	. Resistor	1	All
	11	362533	. Timer - Assy	1	All
	12	402801	. Label - Terminal Strip	1	All
	13	402480-1	. Block - Terminal	1	All
	14	16DA-4004A-8	. Relay	1	All
	15	402480-3	. Block - Terminal	1	All
	16	402810-1	. Relay	1	All
	17	TRY-154-1	. Capacitor	1	All
	18	403006	. Label - Terminal	1	All
	19	362636	. Transformer - Assy	1	All
	20	363113	. Choke - Filter Assy.	1	All
	21	W-2974-E	. Resistor - Variable	1	All
	22	AATW-140-1	. Transformer	1	CDGHLM
		AATW-140-5	. Transformer	1	PR
	23	FTW-328-0	. Capacitor - Mica	1	All
	24	404065-1	. Rectifier - Silicon	2	All
	25	361374-3	. Reactor	1	All
	26	362703	. Board - Insulating Coil	1	All
		362700	. Bracket - Mtg. Socket Assy	1	All
	27	362695	. . Bracket - Mtg.	1	All
	28	16DA-4052-0	. . Socket	2	All
	-	16DA-4052-1	. . Socket	1	All
		FTW-413	. Spark-Gap - Assy	1	All
	29	FTW-410	. . Electrode - End	2	All
	30	FTW-411	. . Electrode - Center	1	All
	31	FTW-412	. . Base	1	All
	32	FTW-415	. . Strip	1	All
		362742	. Coil - High Frequency Assy	1	All
	33	W-11114-6	. . Screw - 1/4-20 x 1-1/2 RHMS	4	All
	34	W-11280-2	. . Nut - 1/4-20 Hex Jam Steel	8	All
	35	W-11254-4	. . Washer - 1/4 LK. St.	8	All
	36	W-11242-5	. . Washer - 1/4 Flat Steel	4	All

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
5-	-	W-11160-2	. . Washer - 1/4 Lock IET.	4	All
	37	362704	. . Board - Insulating Coil	1	All
		363386	. . Coil - High Frequency Sub-Assy	1	All
	38	355224-16	. . . Insulation - Coil	1	All
	39	362957	. . . Coil - High Frequency, Outside	1	All
	40	362958	. . . Coil - High Frequency, Inside	1	All
	41	360255-2	. . . Sleeving - Fiberglass	1	All
	42	8RT-654	. Washer - Rubber	2	All
	43	365929	. Capacitor - Assy	2	All
	44	362909	. Resistor - Assy	1	All

- Not Illustrated



Frame and Transformer Group
Figure 6

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
6-	1	365050	Panel - Rear	1	All
	2	363690	Shroud - Fan	1	All
	3	12TW-590	Bracket - Mtg. Fan	1	All
	4	8RT-609	Fan	1	All
	5	12TW-595-1	Motor - Fan	1	All
		8 RT-300	Connector - Strain Relief	1	All
	6	8RT-299	. Insulator - Hole	1	All
	7	8RT-302	. Clamp	1	All
	8	8RT-296	. Bracket	1	All
		363044	Resistor - Ballast, Assy	1	All
	9	363121	. Coil	1	All
	10	AAW-2628	. Insulator - Porcelain	21	All
	11	363112-1	. Brace - Mtg.	2	All
	12	AAW-2212	. Support - Center	2	All
	13	363381	. Bar - Mounting	1	All
	14	363112-2	. Brace - Mounting	2	All
	15	363066	Transformer - Control	1	ABCD
		362561	Transformer - Control	1	EFGH
		362642	Transformer - Control	1	JKLM
		363208	Transformer - Control	1	NOPR
	16	363906	Transformer - Welding	1	ABCD
		363915	Transformer - Welding	1	EFGH
		363921	Transformer - Welding	1	JKLM
		363914	Transformer - Welding	1	NOPR
	17	362564	Reactor - Welding	1	ABCDEFGHJKLM
		363226	Reactor - Welding	1	NOPR
	18	362579	Choke - Filter	1	All
	19	362982	Support - Meter Panel	1	All
	20	362963	Support - Panel, Lower Front	2	All
	21	12CW-2170	Grommet - Lifting Yoke	1	All
	22	362814	Cover - Side Panel	2	All
	23	365042	Side - Left Assy	1	All
	24	365043	Side - Right Assy	1	All
	25	365046	Panel - Side, Left	1	All
	26	365051	Panel - Top	1	All
	27	372100	Leg - Handle	6	All
	28	362725	Guard - Frame Front	2	All
	29	363504	Guide - Drawer	2	All
	30	363502	Slide - Drawer	2	All
	31	365056	Support - Drawer	2	All
	32	W-10051-10	Clamp - Cable	3	All
	-	W-10051-4	Clamp - Cable	1	All
	33	365045	Panel - Side Right	1	All

Fig. No.	Item No.	Part No.	Nomenclature 1 2 3 4 5 6 7	Units per Assembly	Application Code
6-	34	362972	Bracket - Mtg. Trans.	1	All
	35	363585	Coil - Pickup	2	All
	36	365027	Base	1	All
	-	360384	Insulator	1	All
	-	403599	Label - Cyber Tig	2	All
	-	12RT-493	Mount - Clamp	2	All
	-	403821-1	Clamp - Lead	2	All
	-	400891-1	Bushing - Plastic	2	All
	-	400891-2	Bushing - Plastic	2	All

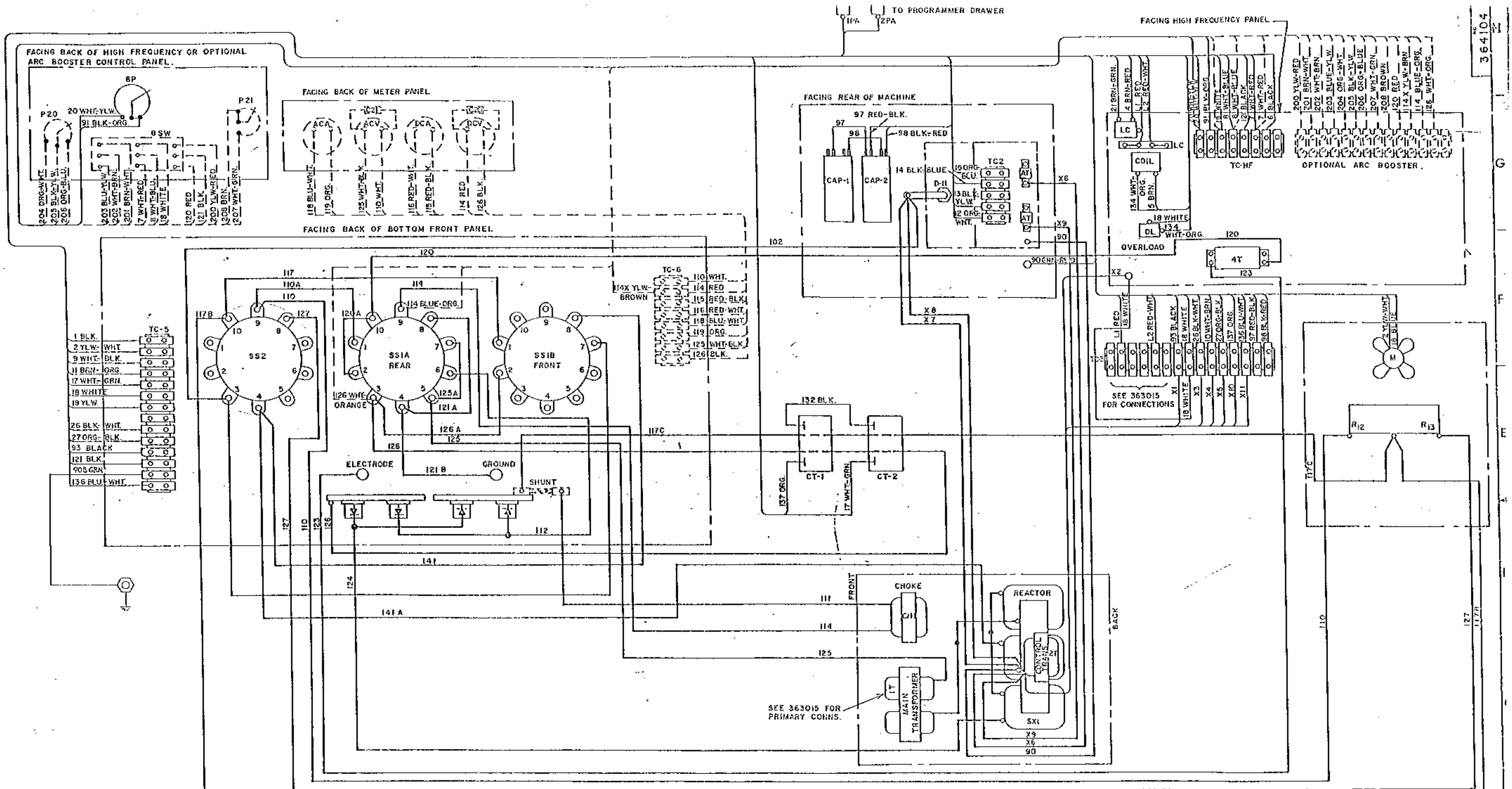
- Not Illustrated

Diagrams

1. Note the model and specification number shown on the equipment nameplate.
2. Locate these numbers in the model and specification number columns below.
3. Use only those diagrams and instructions that are applicable. See following pages.

Model No.	Spec. No.	Connection Diagram	Arc Booster Schematic Diagram	Voltage Changeover Diagram	Front Panel Connection Diagram	Outline Dimension
CT-300 AC/DC	5159D-1	364104		366443	364103	366714
	5159D-2	364104		366443	364103	366714
	5159D-3	363183	363164	366443	364103	366714
	5159D-4	363183	363164	366443	364103	366714
	5283D-1	364104		366444	364103	366714
	5283D-2	364104		366444	364103	366714
	5283D-3	363183	363164	366444	364103	366714
	5283D-4	363183	363164	366444	364103	366714
	5289D-1	364104		366445	364103	366714
	5289D-2	364104		366445	364103	366714
	5289D-3	363183	363164	366445	364103	366714
	5289D-4	363183	363164	366445	364103	366714
	5301D-1	364104		366446	364103	366714
	5301D-2	364104		366446	364103	366714
	5301D-3	363183	363164	366446	364103	366714
	5301D-4	363183	363164	366446	364103	366714

NOTE: See Programmer instruction manual for the power source schematic diagram.



LEGEND

ACA	OPTIONAL AC AMMETER	P20	OPTIONAL ARC BOOSTER, INTENSITY CONTROL
ACV	OPTIONAL AC VOLTMETER	P21	OPTIONAL ARC BOOSTER, TIME CONTROL
AT	AMP TRAP, 100 AMP	8SW	OPTIONAL ARC BOOSTER, ON-OFF SWITCH
C20, C21	BYPASS CAPACITOR		
CAP1, CAP2	POWER FACTOR CAPACITOR		
CH1	CHOKE		
COIL	LINE CONTACTOR COIL		
CT1	CURRENT TRANSFORMER		
DCA	OPTIONAL DC AMMETER		
DCV	OPTIONAL DC VOLTMETER		
LC	LINE CONTACTOR (AUXILIARY CONTACTS)		
M	FAN MOTOR		
OL	OVERLOAD CONTACTS		
1PA, 2PA	PROGRAMMER PLUG		
8P	HIGH FREQUENCY CONTROL		
R12, R13	BALLAST RESISTOR		
SS1, SS2	SELECTOR SWITCH		
SX1	REACTOR		
1T	MAIN WELDING TRANSFORMER		
2T	CONTROL TRANSFORMER		
4T	HIGH FREQUENCY TRANSFORMER		

WHERE USED: 5159D CT-300 AC/DC — SPECS

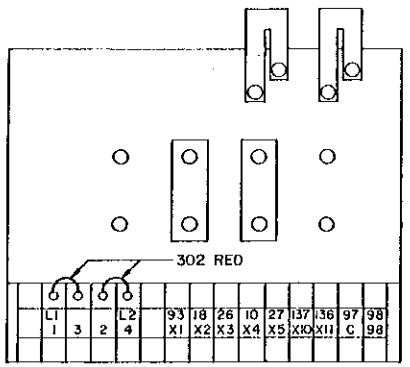
DIA., CONN., POWER SUPPLY

DRAWN: BLK 6-14-71 — CHECKED: REB

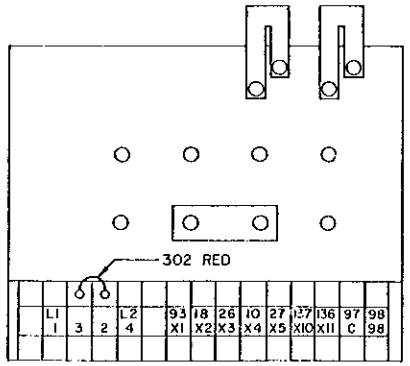
ACCESS NO. 1180-08

HOBART BROS. CO. TROY, OHIO — 364104

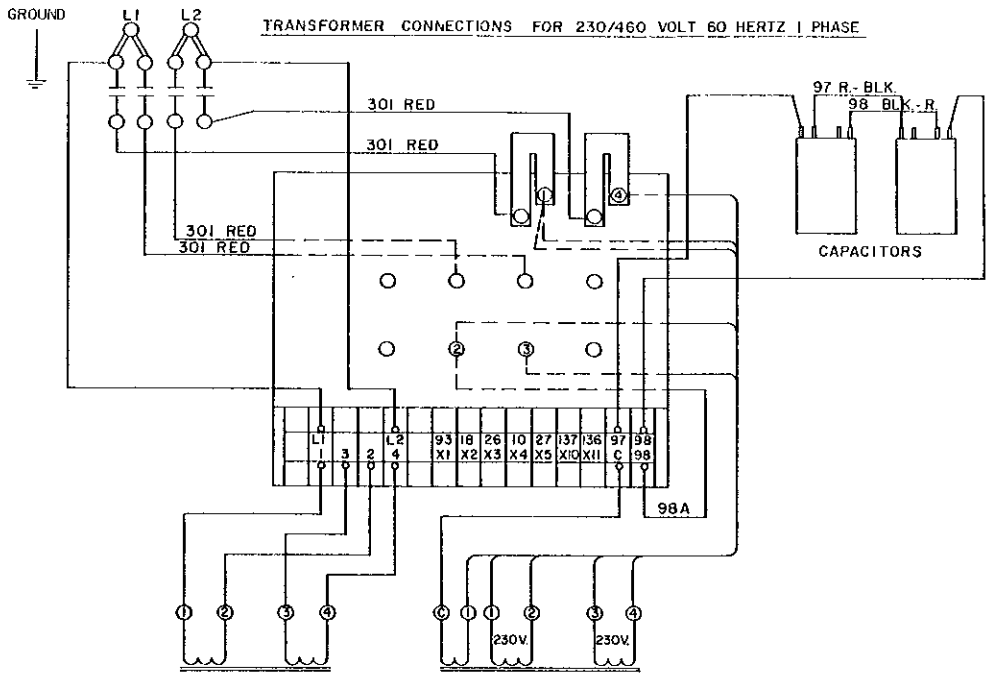
230V LINK CONNECTIONS



460V LINK CONNECTIONS



TRANSFORMER CONNECTIONS FOR 230/460 VOLT 60 HERTZ 1 PHASE



CONTROL TRANSFORMER PRIMARY MAIN TRANSFORMER PRIMARY

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. REMOVE COVER FROM VOLTAGE CHANGEOVER PANEL.
2. CHECK THE NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
3. CONNECT THE LINKS AS SHOWN ON THE SMALL DIAGRAM AT LEFT FOR THE PROPER LINE VOLTAGE.
4. CONNECT THE JUMPER WIRES ON THE TERMINAL STRIP TO THE POSITION SHOWN ON THE SAME SMALL DIAGRAM.
5. REPLACE THE COVER OF THE VOLTAGE CHANGEOVER PANEL.
6. CHECK YOUR LOCAL CODES FOR PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODE EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
7. CONNECT THE SINGLE PHASE POWER LINE TO THE TOP OF THE WELDER LINE SWITCH AS IN THE DIAGRAM AT RIGHT. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
8. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".
9. FOR WIRE CHART SEE 363163 (REF).

MICROFILMED

OUTSIDE DISTR.
DISTRIBUTION TABLE

PROTECTIVE FINISH

CHANGE RECORD

No.	INDEX	DATE	No.	INDEX	DATE
1	Z 2440	6 25 65	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ.	USED ON
S-5159C	1	---

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.
SURFACE TEXTURE

FRACTIONS	DECIMALS .00 ± .01 .000 ± .003	ANGLES ± 30'
±		

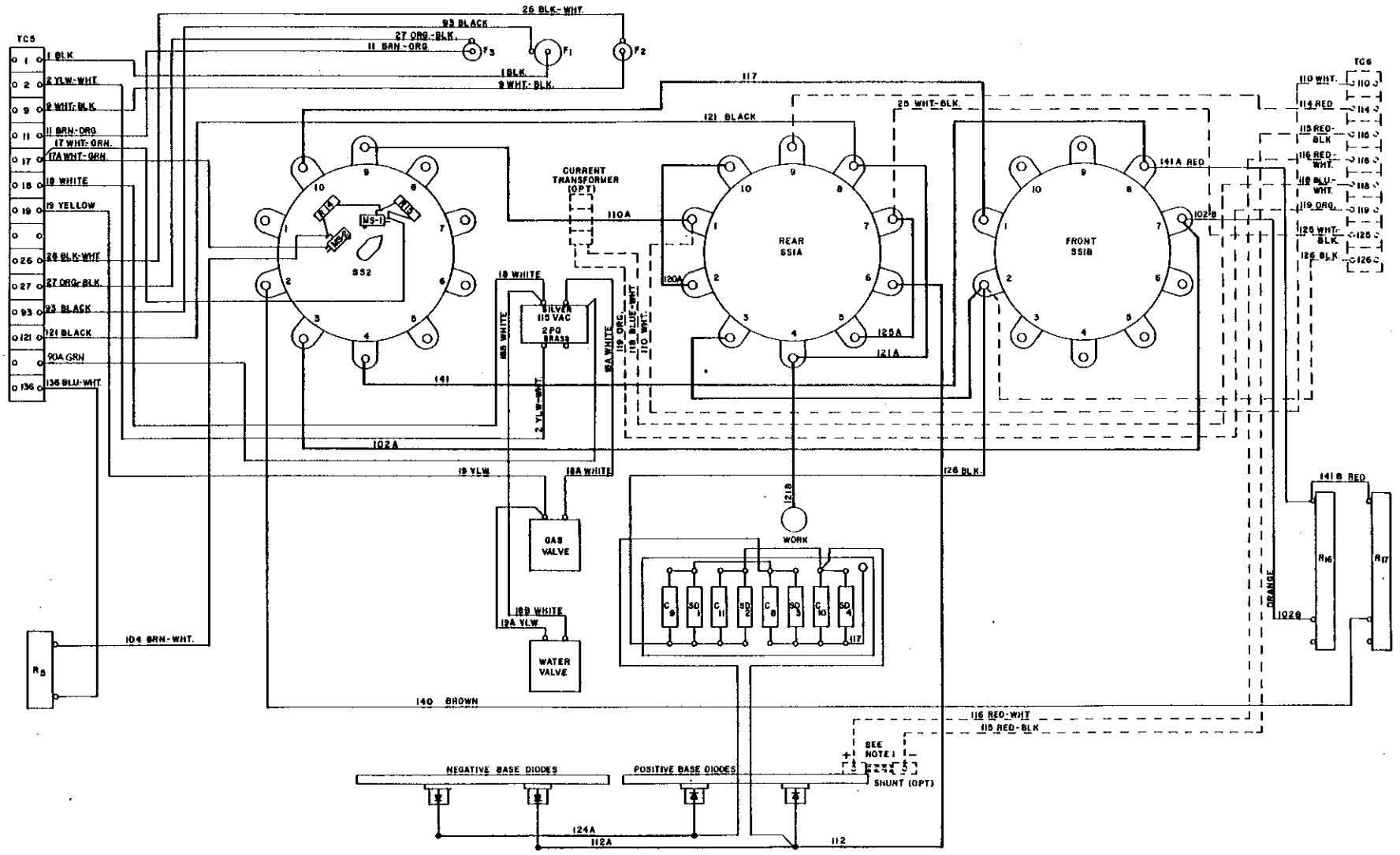
ACTIVITY: NOT ACTIVE	REPLACED BY	NXR	ACCESS NO. 1180-06
MATERIAL NO.	MATERIAL SPEC.	REPLACES	QUANTITY/UM.

TITLE DIAGRAM, CHANGEOVER, PRIMARY
INDEX DATA 230/460V, 1 PH., 60 HZ.

DESIGNED REB	DRAWN DML	DATE 9-9-75	SCALE
CHECKED [illegible]	DATE 9-27-75	APPROVED REB	REPRO FROM
RECORDS [illegible]	DATE 9-27-75	INDEXED	M.F.

HOBART BROS. CO. TROY, OHIO 45373 U.S.A.
SIZE C
DWG. NO. 366443

FORM NO. 424070

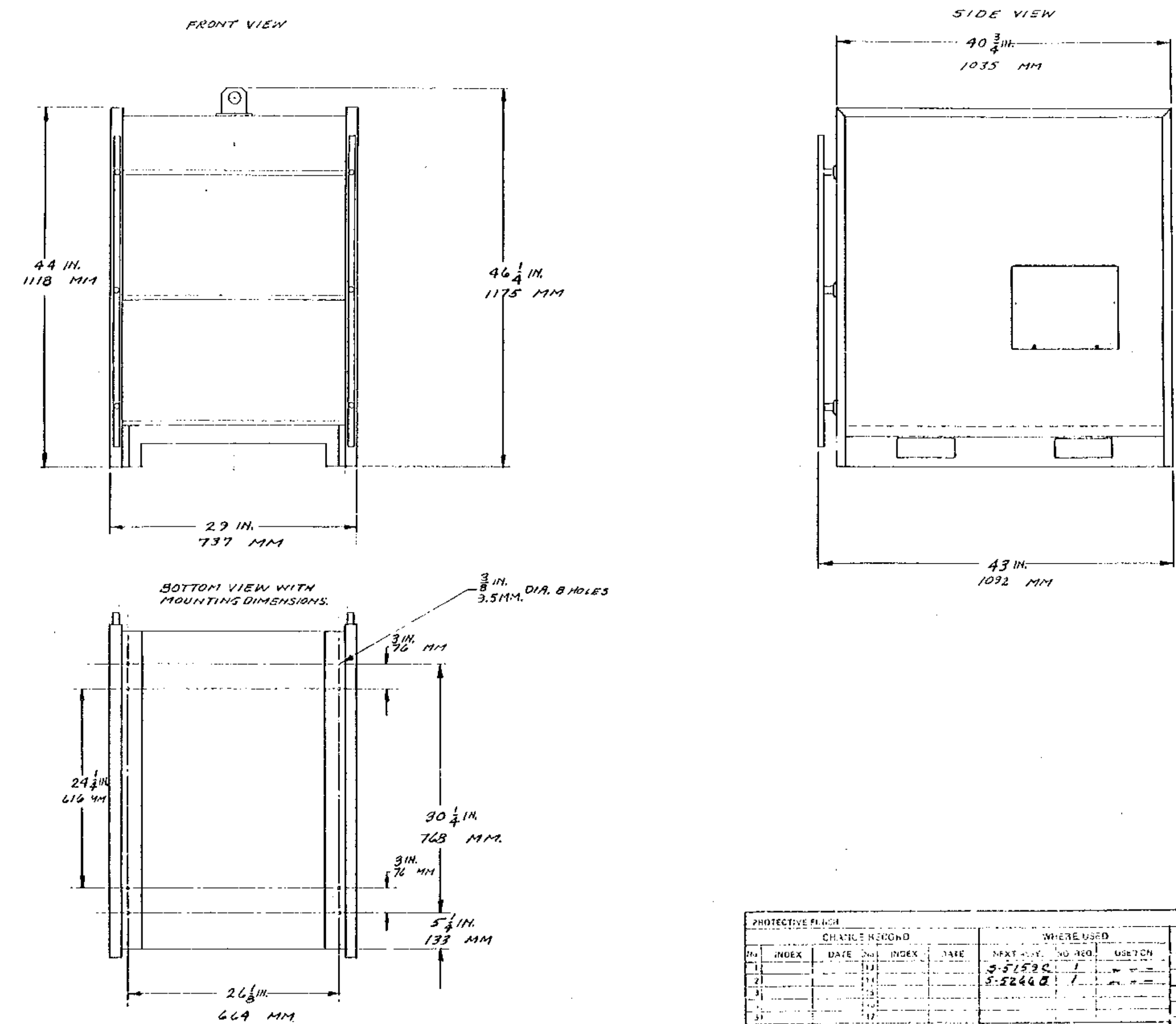


NOTE 1 WHEN METER KIT 65 INSTALLED IN THE FIELD REMOVE BUS BAR #111 (FROM FILTER CHOKE) AND CONNECT IT TO NEGATIVE SIDE OF SHUNT. CABLE #112C CONNECTS TO THE POSITIVE SIDE OF SHUNT.

HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

TITLE DIAGRAM, CONN., FRONT BOTTOM PANEL

REV.	DWG. NO.
4	364103



FILMED

XR

ACCESS NO. 2590-08

WHERE USED: NEXT ASSY. 5-5159C, 5-5244B; NO. REQ. 1, 1

TITLE: OUTLINE DIMENSIONS, CYBER-TIG

DRAWN: BAM — CHECKED: HEG — DATE: 12-18-75 — SCALE: EIGHTH

CHECKED: DLW — DATE: 12-19-75

RECORDS: DAC — DATE: 12-23-75

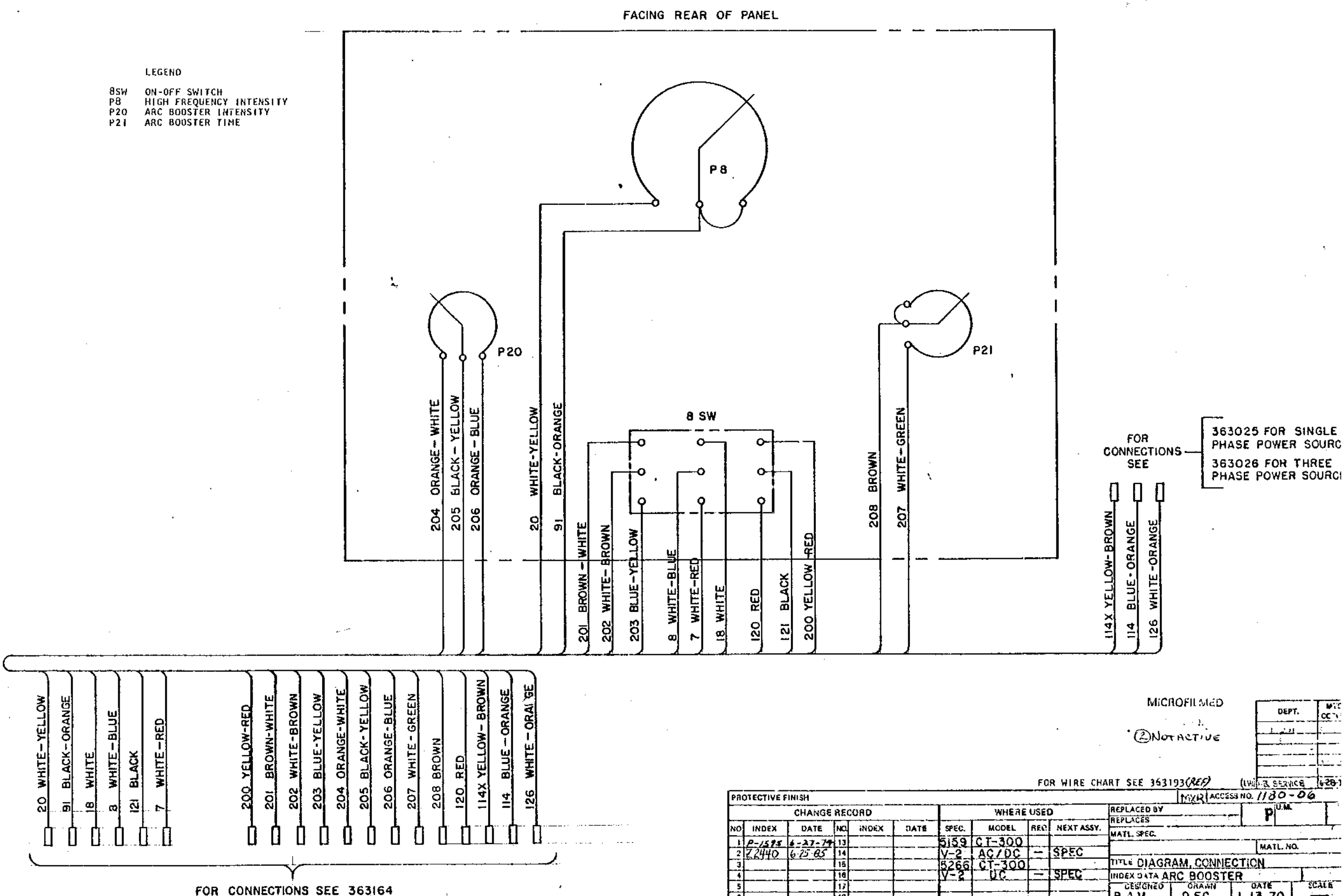
HOBART BROS. CO. TROY, OHIO 45373 U.S.A.

SIZE: C — DWG. NO. 366714

FORM NO. 424070

LEGEND

8SW	ON-OFF SWITCH
P8	HIGH FREQUENCY INTENSITY
P20	ARC BOOSTER INTENSITY
P21	ARC BOOSTER TIME



MICROFILMED

②NOT ACTIVE

FOR WIRE CHART SEE 363193(REF)

PROTECTIVE FINISH										
CHANGE RECORD						WHERE USED				
NO	INDEX	DATE	NO	INDEX	DATE	SPEC.	MODEL	REQ	NEXT ASSY.	
1	P-1595	6-27-74	13			5159	CT-300			
2	Z2440	6-25-65	14			V-2	AC/DC	—	SPEC	
3			15			5266	CT-300			
4			16			V-2	DC	—	SPEC	
5			17							
6			18							
7										
8										
9										
10										
11										
12										

UNLESS OTHERWISE SPECIFIED

TOLERANCE TO BE: FRACTIONS: — DECIMALS: .00 ±.01, .000 ±.003, ANGLES: ± 30'

DO NOT SCALE DRAWING. REMOVE ALL BURRS AND SHARP EDGES. UNDER CUTS TO BE 3/32 WIDE AND .008-.010 UNDER FINISH DIAMETER. SURFACE TEXTURE

(WIRE SERVICE) 628-1

MXR ACCESS NO. 1180-06

REPLACED BY

REPLACES

MATL. SPEC.

U.M. P

MATL. NO.

TITLE DIAGRAM, CONNECTION

INDEX DATA ARC BOOSTER

DESIGNED	DRAWN	DATE	SCALE
B A M	D E C	1-13-70	—
CHECKED	APPROVED	DATE	SEPIA FRN
	BAM	5-18-70	
RECORDS	DATE	INDEX	MF

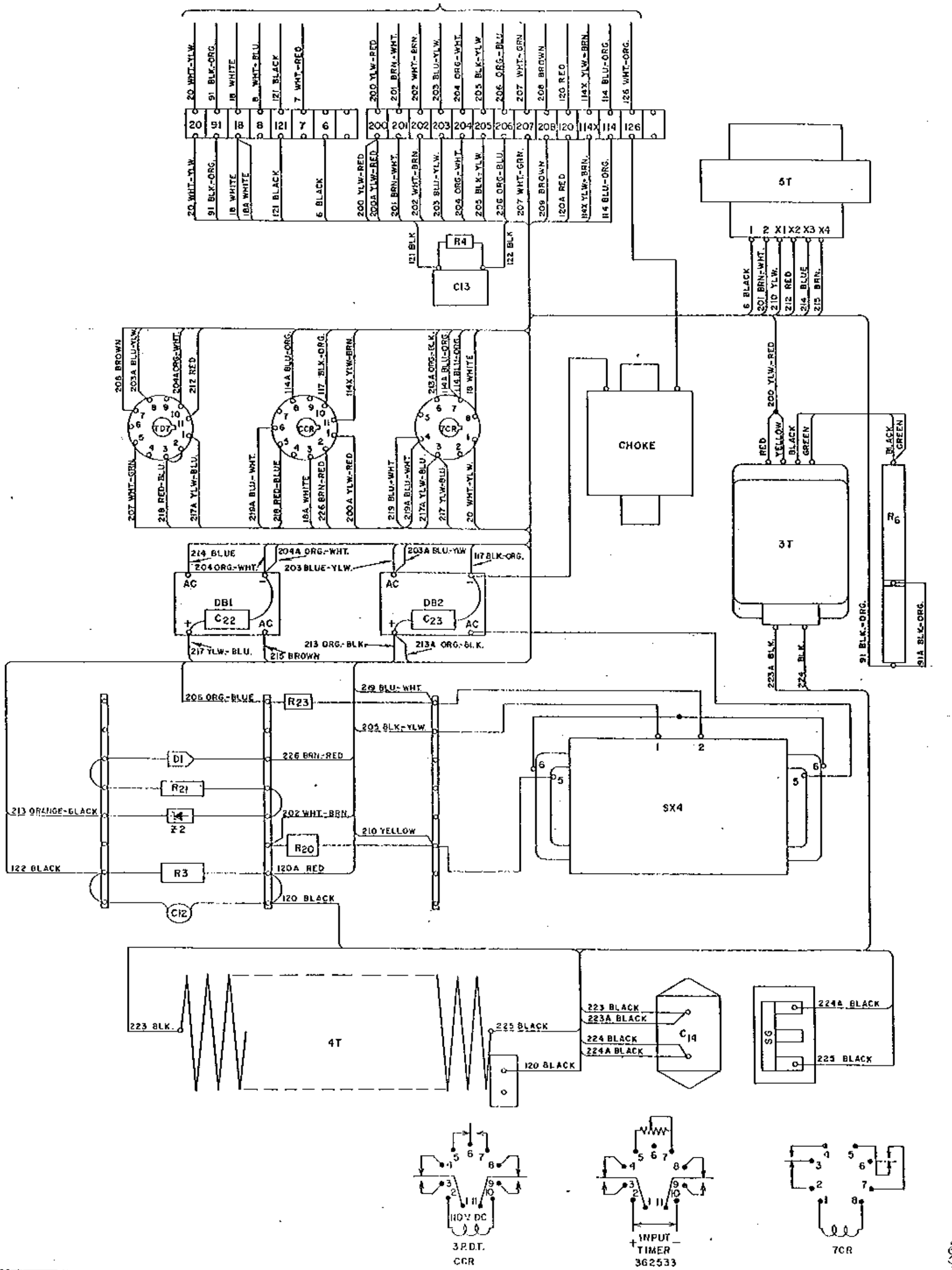
HOBART BROS. CO. TROY, OHIO — SIZE C — DWG. NO. 363183

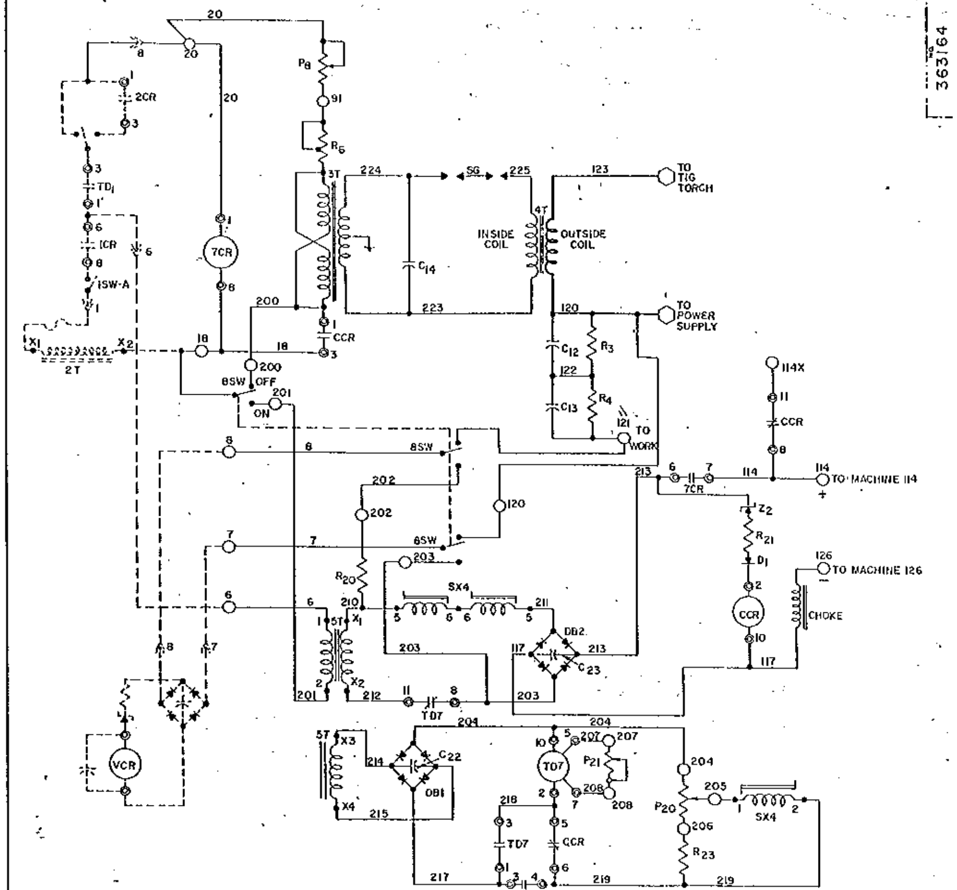
DEPT.

CHANGED 363183 ON #18

7 6 5 4 3 2 1

SEE DIAGRAM 363183





SCHEMATIC

LEGEND

C12	CAPACITOR, .022 MFD. 600 WVDC
C13	CAPACITOR, 3 MFD. 660 VAC
C14	CAPACITOR, .003 MFD. 7000 WVDC
C22	CAPACITOR, .047 MFD. 400 WVDC
C23	CAPACITOR, .047 MFD. 400 WVDC
CCR	RELAY, 2PDT, 115V DC COIL
CHOKE	REACTOR FILTER
7CR	RELAY, 2PDT, 115V AC COIL
D1	DIODE, 200V, 2 AMP
DB1	DIODE BRIDGE, 16 AMP
DB2	DIODE BRIDGE, 16 AMP
P8	RHEOSTAT, 400 OHM, 100 WATT
P20	RHEOSTAT, 50 OHM, 25 WATT
P21	POTENTIOMETER, 10,000 OHM, 2 WATT
R3	RESISTOR, 4 OHM, 10 WATT
R4	RESISTOR, 10,000 OHM, 2 WATT
R6	RESISTOR, 100 OHM, 100 WATT, ADJ.
SG	SPARK GAPS
SX4	REACTOR CONTROL
3T	TRANSFORMER, HIGH VOLTAGE
4T	TRANSFORMER, R.F. OUTPUT TRANS.
5T	TRANSFORMER CONTROL
TD7	TIME DELAY, 24V DC INPUT
Z2	DIODE ZENER, 51 V, 1 WATT

FOR WIRE CHART SEE, 363346 (REF)

AMSTERDAM

WHERE USED: 5266 CYBER TIG | SEE SPECS

REPLACED BY / REPLACES 363164 DATED 12-22-69

TITLE DIA., CONN., ARC BOOSTER

DRAWN: B. KNIFE 5-21-70

WAC

BAM 5-28-70

363164

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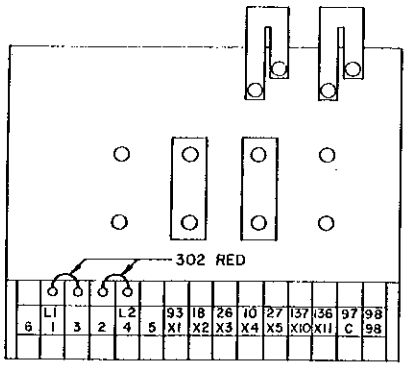
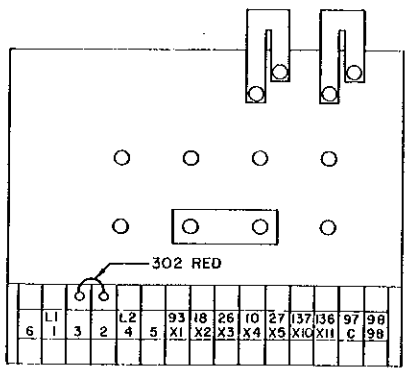
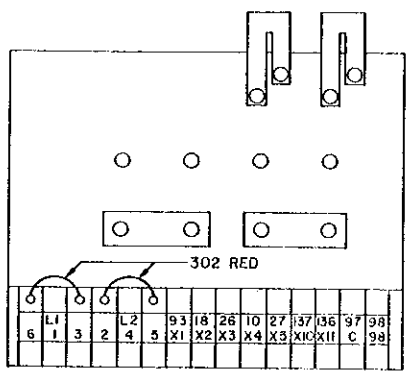
230V LINK CONNECTIONS



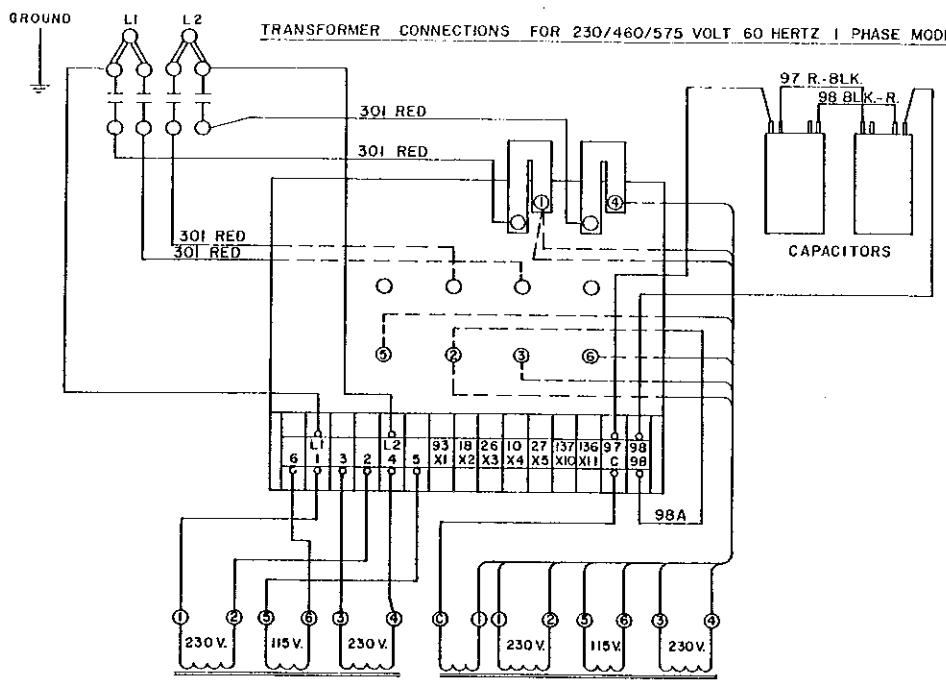
460V LINK CONNECTIONS



575V LINK CONNECTIONS



TRANSFORMER CONNECTIONS FOR 230/460/575 VOLT 60 HERTZ 1 PHASE MODELS



INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. REMOVE COVER FROM VOLTAGE CHANGEOVER PANEL.
2. CHECK THE NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
3. CONNECT THE LINKS AS SHOWN ON THE SMALL DIAGRAM AT LEFT FOR THE PROPER LINE VOLTAGE.
4. CONNECT THE JUMPER WIRES ON THE TERMINAL STRIP TO THE POSITION SHOWN ON THE SAME SMALL DIAGRAM.
5. REPLACE THE COVER OF THE VOLTAGE CHANGEOVER PANEL.
6. CHECK YOUR LOCAL CODES FOR PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODE EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
7. CONNECT THE SINGLE PHASE POWER LINE TO THE TOP OF THE WELDER LINE SWITCH AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
8. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".
9. FOR WIRE CHART SEE 363163 (REF).

MICROFILMED

CHANGE RECORD						WHERE USED			ACTIVITY	MXR	ACCESS NO. 1180-06
NO.	INDEX	DATE	NO.	INDEX	DATE	NEXT ASSY.	NO. REQ.	USED ON		REPLACED BY / REPLACES / QUANTITY/U.M.	
1	Z 2440	6-25-65	13			S-5283C	1	---	MATERIAL NO.	MATERIAL SPEC.	
2			14								
3			15								
4			16								
5			17								
6			18								
7			19								
8			20								
9			21								
10			22								
11			23								
12			24								

PROTECTIVE FINISH

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.
SURFACE TEXTURE
FRACTIONS ± ——— | DECIMALS .00 ± .01, .000 ± .003 | ANGLES ± 30'

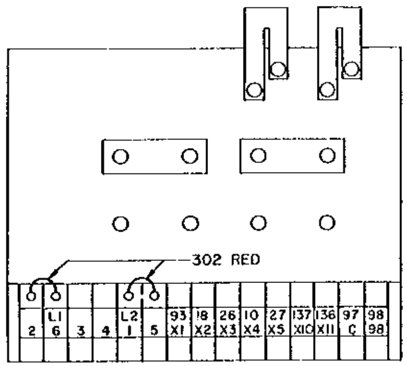
TITLE DIAGRAM, CHANGEOVER, PRIMARY
INDEX DATA 230/460/575 V, 1 PH, 60 HZ.

DESIGNED	DRAWN	DATE	SCALE
REB	DML	5-12-75	
CHECKED	DATE	APPROVED	REPRO FROM
REB	5-27-75	REB	
RECORDS	DATE	INDEXED	M.P.
	5-28-75		

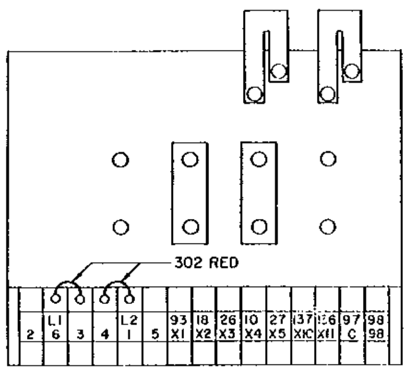
HOBART BROS. CO. TROY, OHIO 45373 U.S.A.
SIZE C
DWG. NO. 366444

FORM NO. 424070

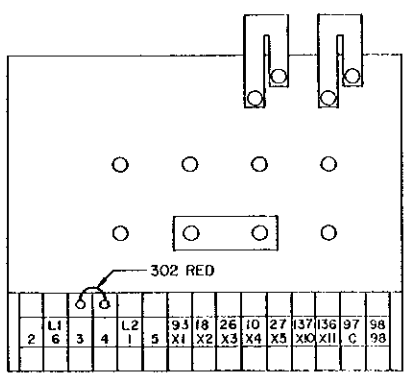
208V LINK CONNECTIONS



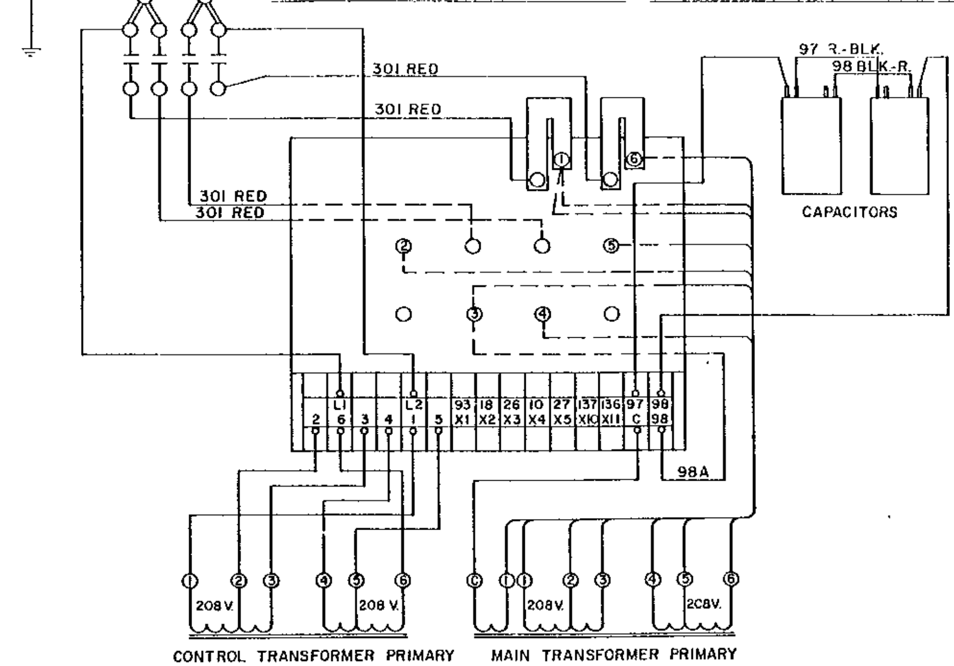
230V LINK CONNECTIONS



460V LINK CONNECTIONS



TRANSFORMER CONNECTIONS FOR 208/230/460 VOLT 60 HERTZ 1 PHASE MODELS



INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. REMOVE COVER FROM VOLTAGE CHANGEOVER PANEL.
2. CHECK THE NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
3. CONNECT THE LINKS AS SHOWN ON THE SMALL DIAGRAM AT LEFT FOR THE PROPER LINE VOLTAGE.
4. CONNECT THE JUMPER WIRES ON THE TERMINAL STRIP TO THE POSITION SHOWN ON THE SAME SMALL DIAGRAM.
5. REPLACE THE COVER OF THE VOLTAGE CHANGEOVER PANEL.
6. CHECK YOUR LOCAL CODES FOR PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE WELDER. IF NO CODE EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
7. CONNECT THE SINGLE PHASE POWER LINE TO THE TOP OF THE WELDER LINE SWITCH AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
8. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".
9. FOR WIRE CHART SEE 363163 (REF).

MICROFILMED

PROTECTIVE FINISH

CHANGE RECORD

No	INDEX	DATE	No	INDEX	DATE
1	Z2440	6-25-80	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ.	USED ON
S-5289C	1	- - -

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.
SURFACE FEATURE

FRACTIONS	DECIMALS	ANGLES
± —	.00 ± .01 / .000 ± .003	± 30'

ACTIVITY: NOT ACT. 6
MXR
MATERIAL NO.
MATERIAL SPEC.
REPLACED BY
ACCESS NO. 1180-06
REPLACES
QUANTITY/U.M.

TITLE DIAGRAM, CHANGEOVER, PRIMARY
INDEX DATA 208/230/460V., 1 PH., 60 HZ.

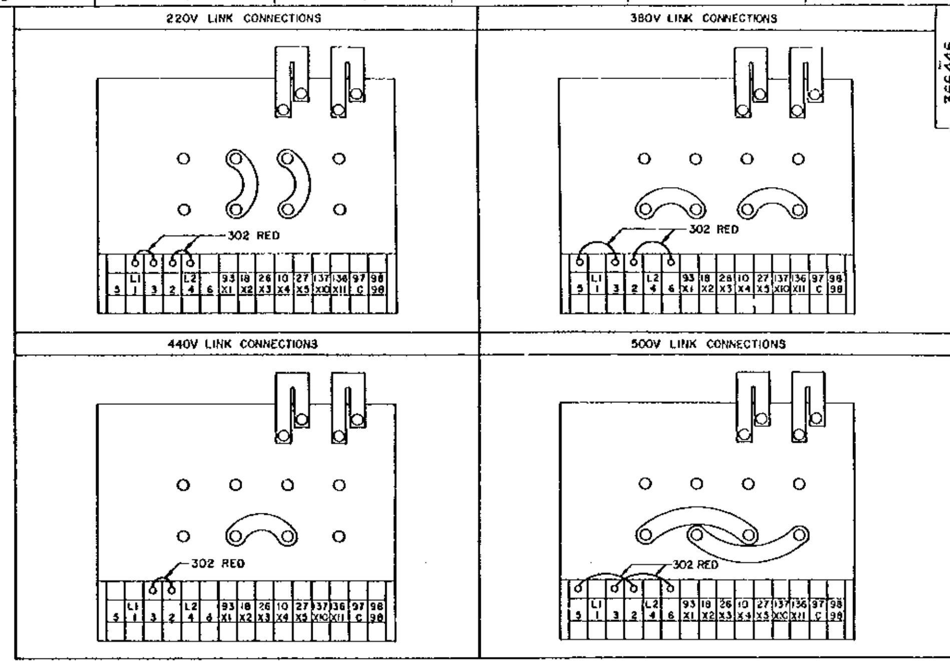
DESIGNED	DRAWN	DATE	SCALE
REB	DML	5-15-75	
CHECKED	DATE	APPROVED	REPRO FROM
	5-27-75	REB	
RECORDS	DATE	INDEXED	M.F.
	5-5-75		

HOBART BROS. CO. TROY, OHIO 45373 U.S.A.
SIZE C
DWG. NO. 366445

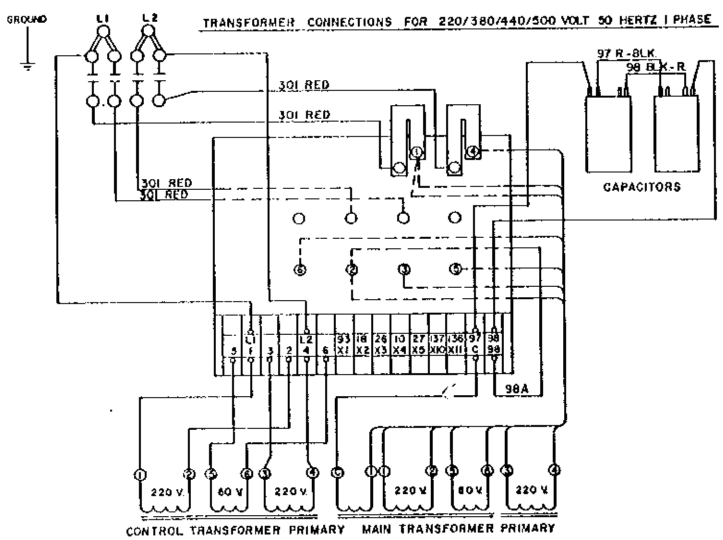
FORM NO. 424070

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. REMOVE COVER FROM VOLTAGE CHANGEOVER PANEL.
2. CHECK THE NAMEPLATE OF THE WELDER TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
3. CONNECT THE LINKS AS SHOWN ON THE SMALL DIAGRAM AT RIGHT FOR THE PROPER LINE VOLTAGE.
4. CONNECT THE JUMPER WIRES ON THE TERMINAL STRIP TO THE POSITION SHOWN ON THE SAME SMALL DIAGRAM.
5. REPLACE THE COVER OF THE VOLTAGE CHANGEOVER PANEL.
6. CHECK YOUR LOCAL CODES FOR PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON "INSTALLATION" SECTION OF THE MANUAL.
7. CONNECT THE SINGLE PHASE POWER LINE TO THE TOP OF THE WELDER LINE SWITCH AS IN THE DIAGRAM BELOW. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
8. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".
9. FOR WIRE CHART SEE 363163 (REF).



TRANSFORMER CONNECTIONS FOR 220/380/440/500 VOLT 50 HERTZ 1 PHASE



MICROFILMED

PROTECTIVE FINISH					
CHANGE RECORD			WHERE USED		
No.	INDEX	DATE	NEXT ASSY.	NO. REQ.	USED ON
1		4-1-75	S-33010	1	
2	Z3440	6-25-75			

ACCESS NO. 1180-08

TITLE DIAGRAM, CHANGEOVER, PRIMARY
220/380/440/500V, 1 PH, 50/60 Hz

DESIGNED REB · DRAWN OML · DATE 5-16-75
CHECKED · DATE 5-27-75 · APPROVED RCO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DO NOT SCALE DRAWING. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.

HOBART BROS. CO. TROY, OHIO U.S.A. · SIZE D · DWG. NO. 366446

366446

ATTENTION!!!

PLEASE FILL OUT AND RETURN THE WELDER REGISTRATION CARD BELOW.

Cut Along Dotted Line

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 12 TROY, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

Hobart Brothers Company
600 West Main Street
Troy, Ohio 45373-9933

HOBART BROTHERS CO. — WELDER REGISTRATION CARD

Serial No. _____

Owner's Name _____

Address _____

City _____ State _____

Date Received _____ In Satisfactory Order? _____

Obtained From: Factory ☐ Dealer or Distributor ☐

IMPORTANT! Fill out at once in ink and return to Hobart Brothers. Immediate return of this card registers warranty date.

425141

HOBART®

"POWER PROTECTION" 3 YEAR WARRANTY

1. **General:** Hobart's products are warranted for three (3) years following date of shipment to the original user with the exceptions of items listed in paragraphs 2 through 8.

2. **Parts and Labor For:** Motor driven guns; High frequency/Capacitor Discharge units; Running gears/Trailers; Field options, are warranted for one (1) year.

3. **Expendable Items:** Primary and secondary switch contacts, cable connectors, carbon brushes, fuses, bulbs, filters, nozzles, contact tips, liners, cutting tips and wire feed rolls are worn or consumed in the normal process of welding or cutting and are therefore warranted only if found to be defective prior to use.

4. **Replacement parts:** Replacement and exchange parts are warranted for the remainder of the original equipment warranty or for a period of ninety (90) days, whichever is greater.

5. **Semiautomatic Items:** Mig welding guns and cables and plasma cutting torches, tig torches and cables and remote controls and accessory kits are warranted for ninety (90) days.

6. **Engines, Tires, and Batteries:** Hobart does not warrant items furnished by Hobart but manufactured by others, including without limitation, gasoline or diesel engines, engine electrical equipment, batteries, and tires. Such items are warranted directly by the manufacturer, and Hobart may periodically inform customers of such warranty coverage; however, Hobart does not guarantee the accuracy or completeness of its information regarding such warranties.

7. **Exclusive Remedies:** In case of Hobart's breach of warranty or any other duty with respect to the quality of any product or service, the sole and exclusive remedies therefore shall be:

> As to **PRODUCTS**, (1) repair, (2) replacement, or (3) where authorized by Hobart, payment of or credit for the purchase price (less reasonable depreciation based on its actual use) upon return of the product, and as to **SERVICES** (including repair under warranty), the sole and exclusive remedies therefore shall be payment or credit for Hobart's actual charge therefore or, in the absence of any actual charge, the customary or reasonable charge for such services, and if such breach also involves impairment of Hobart products, the remedies available for breach of warranty with respect to the product.

8. **Modification and Misuse:** This warranty does not apply to products which have been modified in any way by any party other than Hobart; nor to products which have not been installed and operated in accordance with applicable industry standards; nor to products which have been used other than under the usual conditions for which designed; nor to products that have not received proper care, lubrication, protection, and maintenance under supervision of competent personnel. Use of a product after discovery of a defect voids all warranties.

DISCLAIMER OF WARRANTIES

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, EXCEPT AS SPECIFICALLY PROVIDED IN THE EXPRESSED WARRANTIES SET FORTH ABOVE. ALL PRODUCTS ARE SOLD "AS IS". HOBART MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

WARNING

At all times, safety is an important consideration in the installation, servicing, and operation of the product, and skilled, qualified technical assistance should be utilized at all times. Specific recommendations are included in "Safety in Welding and Cutting", American National Standard No. Z-49-1.

Hobart Brothers Company
Troy, Ohio 45373 U.S.A.

October 1989
910516