

# X-Tractor 1G

For use with equipment having Code Number: **10205**  
**10206**

## Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT. And, most importantly, think before you act and be careful.



## OPERATOR'S MANUAL



## WARNING

**ARC WELDING can be hazardous.**

**PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.**

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

**BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.**



### ELECTRIC SHOCK can kill.

1.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

1.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

**In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

1.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".

1.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

1.e. Ground the work or metal to be welded to a good electrical (earth) ground.

1.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

1.g. Never dip the electrode in water for cooling.

1.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

1.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

1.j. Also see Items 4.c. and 6.



### ARC RAYS can burn.

2.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

2.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

2.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



### FUMES AND GASES can be dangerous.

3.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep

fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

3.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations.

The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

3.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

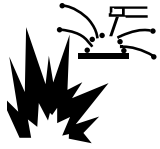
3.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

3.e. Also see item 7b.

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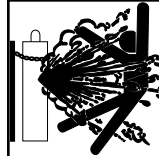
### WELDING SPARKS can cause fire or explosion.

4.a. Remove fire hazards from the welding area.

If this is not possible, cover them to prevent the welding sparks from starting a fire.

Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

- 4.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 4.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 4.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 4.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 4.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 4.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 4.h. Also see item 7c.



### CYLINDER may explode if damaged.

5.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

- 5.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 5.c. Cylinders should be located:
  - Away from areas where they may be struck or subjected to physical damage.
  - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 5.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 5.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 5.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 5.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



### FOR ELECTRICALLY powered equipment.

- 6.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 6.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 6.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

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## FOR ENGINE powered equipment.

7.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



7.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



7.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.



7.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

7.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

7.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

7.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



7.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



## ELECTRIC AND MAGNETIC FIELDS may be dangerous

8.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

8.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

8.c. Exposure to EMF fields in welding may have other health effects which are now not known.

8.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

8.d.1. Route the electrode and work cables together - Secure them with tape when possible.

8.d.2. Never coil the electrode lead around your body.

8.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

8.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

8.d.5. Do not work next to welding power source.

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## PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté spécifiques qui paraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

### Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
  - a. Les circuits à l'électrode et à la pièce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
  - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
  - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
  - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
  - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
  - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas où on reçoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soleil, donc:
  - a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
  - b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
  - c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.
5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans latéraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à un endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumées toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

## PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

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*Thank You* — for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ... as much pride as we have in bringing this product to you!

**Please Examine Carton and Equipment For Damage Immediately**

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Name & Number \_\_\_\_\_

Code & Serial Number \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Whenever you request replacement parts for or information on this equipment always supply the information you have recorded above.

**Read this Operators Manual completely** before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

**⚠ WARNING**

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

**⚠ CAUTION**

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

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### Technical Specifications- X-tractor 1G

<b>INPUT</b>		
<b>Sales Spec</b>	<b>Input Voltage</b>	<b>Input Current</b>
K179-4	120V, 1 $\phi$ 50/60 Hz	13.5 A
K179-5	220V, 1 $\phi$ 50/60 Hz	6.0 A

<b>VACUUM SPECIFICATIONS</b>
Air Flow I.C.F.M.
50 C.F.M. (85 m <sup>3</sup> / h) @ 65" WG

<b>FILTER TYPE</b>
Paper / Disposable or Manually Cleaned

<b>OPERATING SOUND LEVEL</b>
77 dB(A) @ 3.0 Ft.

<b>AUTOMATIC CONTROL CIRCUIT</b>
slows motor to 1/2 speed when not welding

<b>PHYSICAL DIMENSIONS</b>		
<b>HEIGHT</b>	<b>DIAMETER</b>	<b>WEIGHT</b>
29.0" (737 mm)	13.9" (352 mm)	45 lbs (20.5 kg)

### X-TRACTOR 1G





Read this entire installation section before you start installation.

## SAFETY PRECAUTIONS

Do not attempt to use this equipment until you have thoroughly read all installation, operating and maintenance information supplied with your equipment. They include important safety precautions and detailed operating and maintenance instructions.

### ⚠ WARNING



#### ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as internal wiring.
- Turn the input power off at the fuse box or by unplugging the power cable before working on this equipment.
- Have a qualified person install and service this equipment.



#### MOVING PARTS can injure.

- Do not operate with covers open or filter removed.
- Keep away from moving parts.

Only qualified personnel should install, use or service this equipment.

## GENERAL DESCRIPTION

The arc welding smoke exhaust unit will provide the vacuum needed for one X-Tractor or Flux-Cored Fume gun, collect visible particles that enter and discharge the filtered air. This vacuum does not filter out gases. The X-Tractor 1G is particularly valuable for light duty, intermittent operation where frequent location changes and low equipment costs are of prime importance. The unit weighs 45 pounds and contains a reusable filter element that collects the particulate matter. The filter can be cleaned and reused.

A control circuit connected to the wire feeder slows the motor to 1/2 speed when welding stops. With proper maintenance, the average motor life is 2,000 hours.

The smoke exhaust system consists of a vacuum motor mounted on a canister with a filter mounted inside the canister. See Figure 1 for nominal vacuum motor output characteristics. The vacuum motor is attached to the lid of the canister. A cover over the

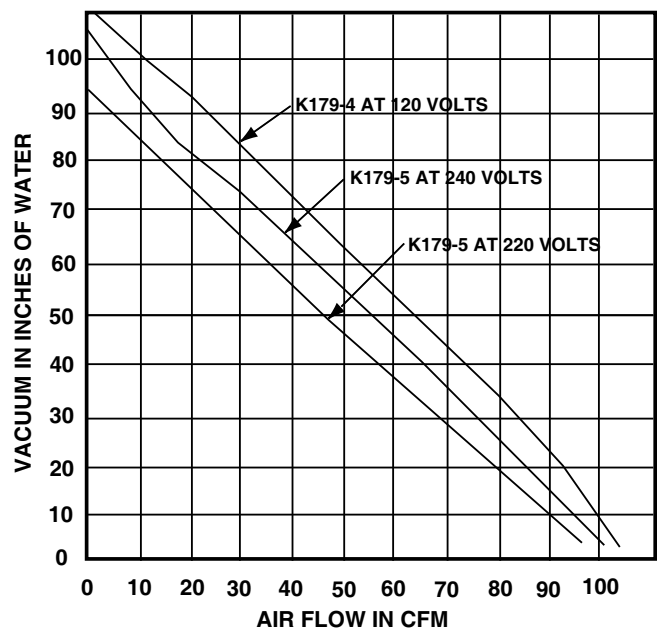
motor provides both a drip-proof covering and a mounting support for the switch and other electrical components. A baffle is built into the cover to prevent re-circulation of the motor cooling air. The switch turns the unit on and lights a pilot light. A relay and resistors permit the motor to run at half speed when not welding to increase motor life. This allows enough air flow to cool the gun when not welding and reduces the motor's starting current. Operable from either 115 volts AC or DC, the relay is energized when the operator pulls the gun trigger.

The filter, made of a paper media, is attached to the inside of the canister lid. Filters for these units are similar to those used for large engine air cleaners. The inlet pipe is fastened to the bottom of the canister and is mounted tangentially to the inside diameter. A baffle is mounted above the inlet pipe. When smoke and sparks enter the canister, the sparks and heavier smoke particles are retained in the bottom of the canister by a centrifugal action. The centrifugal action and baffle prevent sparks from damaging the filter media.

A muffler is standard to suppress the noise level of the vacuum motor when operating at full speed. A hose adapter is provided to allow easy connection of the vacuum to any 1-3/4" (45 mm) exhaust hose. Lincoln Electric has 1-3/4" hoses for both regular duty (PVC flexhose S19947-) and heavy duty (Reinforced rubber S14927-8) applications.

## TYPICAL VACUUM MOTOR OUTPUT CHARACTERISTICS

FIGURE 1



X-TRACTOR 1G



The X-Tractor 1G includes a relay which automatically accelerates the vacuum motor to full speed when welding starts and slows it to half speed when welding stops. This system increases motor life and decreases operating noise. The relay requires 115 volt AC or DC power. To operate, connect the control cable leads #31 and #4 to the welding power source contactor control circuit. On earlier K179 units, the control leads were tagged #1 and #4.

**Specific connections for Lincoln equipment are as follows:**

**R3S and SAM:**

Connect the leads to #31 and #4 on power source terminal strip. On earlier machines where a #1 appears on the terminal strip, connect the lead #31 to terminal #1 and lead #4 to terminal #4.

**DC-400, DC-600, DC-1000, DC-1500 or when a K240 contactor kit is used:**

Connect the leads to #31 and #4 at power source or at K240 contactor kit.

**SAF-600 or SA-800:**

Connect lead #31 to #1 and #4 to #4 on the power source terminal strip.

**When using a DC-250, CV or CVI type power source (or when the power source is in an inaccessible location), the control leads must be connected to the wire feeder as follows:**

**LN-6:**

Connect lead #31 to #1 and #4 to #4 on the terminal strip inside the LN-6 control box at the wire feed unit.

**LN-7, LN-8 & LN-9:**

Connect the leads to the auxiliary equipment contacts #7 and #32A inside the wire feeder control box. To do this, change the connectors on the end of the X-Tractor leads to the lugs taped to the ends of the leads. Refer to appropriate IM manual for terminal location and lead routing information. Either lead can go to either contact terminal.

Plug the K179-4 power cable into 120 volts, 50 or 60 hertz, single phase grounded 14 amp supply. Connect the K179-5 to 220 or 240 volts, 50 or 60 hertz, single phase grounded 6 amp supply. (NOTE: No plug is supplied with the 220 volt unit.)

When connecting to Flux-Cored Fume guns, X-Tractor guns, or Suction Heads, connect the supplied adapter to any 1-3/4" (45 mm) exhaust hose. Lincoln Electric has 1-3/4" hoses for both regular duty (PVC flexhose S19947-) and heavy duty (Reinforced rubber S14927-8) applications. Then connect the supplied adapter to the X-Tractor 1G and connect the hose to the suction device.

Read and understand this entire section before operating your X-Tractor 1G.

## SAFETY INSTRUCTIONS

Do not attempt to use this equipment until you have thoroughly read all operating and maintenance manuals supplied with your equipment and any related welding machine it will be used with. They include important safety precautions, operating and maintenance instructions and parts lists.

### WARNING



#### **ELECTRIC SHOCK can kill.**

- Do not touch electrically live parts such as output terminals or internal wiring.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.



#### **WELDING SPARKS can cause fire or explosion.**

- Keep flammable material away.
- Do not weld upon containers which have held combustibles.



#### **ARC RAYS can burn.**

- Wear eye, ear and body protection.



#### **FUMES AND GASES can be dangerous.**

- Although the removal of the particulate matter from welding smoke may reduce the ventilation requirement, concentrations of the clear exhausted fumes and gases may still be hazardous to health. Avoid breathing concentrations of these fumes and gases. Use adequate ventilation when welding. See ANSI Z49.1, "Safety in Welding and Cutting", published by the American Welding Society.

Only qualified personnel should operate this equipment.

## ADDITIONAL SAFETY PRECAUTIONS

Always operate this equipment with the filter installed and covers in place as these provide maximum protection from moving parts and insure proper vacuum operation and cooling air flow.

## OPERATING INSTRUCTIONS

Turn the power switch on and the unit is ready for welding. When operator pulls the gun trigger, the vacuum motor will speed up to provide proper vacuum for smoke removal.

**NOTE:** New filters will leak smoke for the first few minutes of operation.

To insure proper smoke removal, the filter (M12284-1) typically requires replacement with a new or cleaned element after welding with 75 to 150 pounds of Innershield® electrode depending on the type of electrode used and the efficiency of smoke pickup. (When using the MIG welding process, the amount of electrode between cleanings can be substantially higher.)

To replace the filter, turn the unit off, disconnect the power cord and remove the clamping ring from the top. Lift the top and the filter from the canister. Remove the wing nut on the bottom of the filter and install a new or cleaned element. Make certain that the large flat washer is placed under the wing nut.

Used filters can be cleaned and reused. See the Maintenance Section for cleaning instructions.

Clean accumulated material from bottom spark trap every 300 to 400 pounds of electrode.

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## SAFETY PRECAUTIONS

### ⚠ WARNING

- Have a qualified technician do the maintenance and troubleshooting work.
- Turn the equipment off and disconnect from main power before working on the machine.
- Remove covers only when necessary and replace them when the maintenance requiring their removal is complete.
- Always use the greatest care when working near moving parts.

Read the Safety Precautions throughout this manual and the welder instruction manual before working on this machine.

Keep all equipment covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from fans and all other moving parts when operating or repairing this equipment.

## ROUTINE AND PERIODIC MAINTENANCE

### Replacing the Filter

To insure proper smoke removal, the filter (M12284-1) typically requires replacement with a new or cleaned element after welding with 75 to 150 pounds of Innershield® electrode depending on the type of electrode used and the efficiency of smoke pickup. (When using the MIG welding process, the amount of electrode between cleanings can be substantially higher.)

To replace the filter:

- Turn the unit off.
- Disconnect the power cord.
- Remove the clamping ring from the top.
- Lift the top and the filter from the canister.
- Remove the wing nut on the bottom of the filter and install a new or cleaned element. Make certain that the large flat washer is placed under the wing nut.
- Reassemble in reverse order.

**NOTE:** Used filters can be cleaned and reused.

**NOTE:** New filters will leak smoke for the first few minutes of operation.

### Emptying the Spark Trap

The spark trap should be checked each time a filter is changed. Clean accumulated material from bottom spark trap every 300 to 400 pounds of electrode.

### Cleaning of Cartridge Type Filters

#### ⚠ WARNING

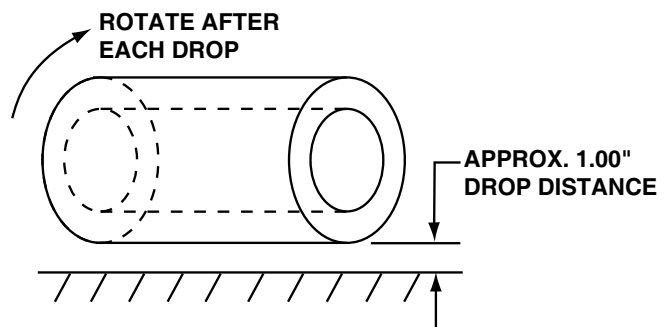
- The dust and particulate matter collected by these filters can be dangerous to your health. Take necessary precautions so you and your fellow workers do not breathe the dust and particulate matter. Wear a suitable respirator and, when cleaning filters, do it under a force-ventilated hood such as a welding or paint hood.

<sup>a</sup> Properly dispose of collected material.

#### Clean per the following instructions:

- Gently brush the collected material off the outside of the filter.
- Loosen dust by successively dropping filter approximately one inch on a hard surface while rotating 10-20° after each drop. Do not drop filter on its corner.

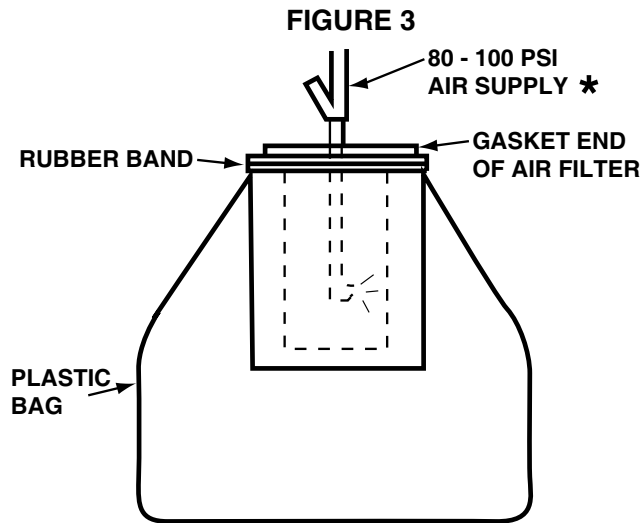
FIGURE 2



- Enclose filter in a plastic bag several times larger than the size of the filter. Secure the bag to the gasket end of the filter. (A rubber band is effective.) Blow air through filter using compressed air. Air supply must be 80-100 psi and the nozzle should be kept at least one inch away from the filter element.

X-TRACTOR 1G





\*If air supply is limited to 30 psi, use a booster air gun that increases dynamic pressure and still retains a 30 psi static pressure such as Guardair Booster Air Gun, Model 57530XB made by Union Engineering Corporation.

4. After Step 3, repeat the procedure in Step 2 for several minutes to remove material loosened by the air.
5. All the material removed should be carefully put into the plastic bag used in Step 3 for disposal.

With reasonable care in handling, these filters can easily be reused five or six times. The limiting factor in their service life is the point where the element is fractured or torn, permitting the continuous passage of smoke. Using a fractured or torn filter may seriously shorten the life of the vacuum unit.

## Electrical Maintenance

### **⚠ WARNING**

Have a qualified electrician do the maintenance and troubleshooting work. Turn OFF the arc welding power source and disconnect control leads #31 and #4 at power source or wire feeder. Remove the power cable plug from its receptacle or turn the input power off using the disconnect switch at the fuse box.

Check motor brushes after 1,000 hours of operation or about every six months. Brushes worn to 1/4 inch long should be replaced. Brush part number is S14688-D. Two brushes are required per motor. Instructions for checking and/or replacement of the brushes are as follows:

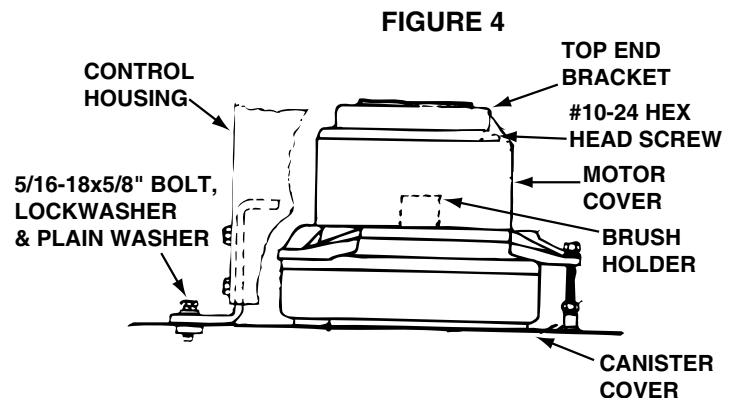
- a. **Tools Needed:** 4" flat blade screwdriver  
3/8" open end or box wrench  
1/4" socket or nut driver/  
1/2" socket  
5/16" socket or nut driver  
4" socket extension and ratchet.

### b. Removal of Housing Assembly - See Figure 4.

1. Turn off the input power being supplied to the X-Tractor unit and the arc welding power source being used.
2. Remove three 5/16"-18 x 5/8" bolts, lock-washers and plain washer that hold control housing to canister cover using a 1/2" socket and 4" extension. Do not remove the acorn nuts on the top cover.
3. Lift housing approximately 6" and tip to one side.
4. Remove motor leads from terminal strip using a 4" flat blade screwdriver.
5. Use a 3/8" wrench to remove the outer 10-24 nut from the grounding screw. Remove the green motor lead from grounding screw.
6. Remove the housing from unit.

### c. Replacement of Brushes

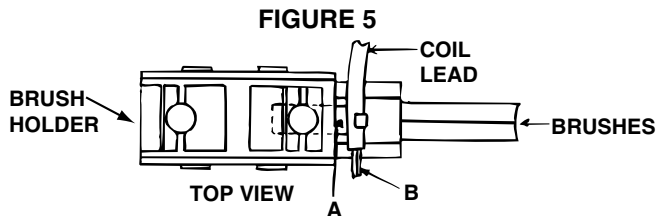
1. To insure optimum commutation on reassembly, mark the relative location of the screw heads in the slots and remove the two #10-24 x 2 screws from the top end bracket of the vacuum motor using a 5/16" socket or nut driver.



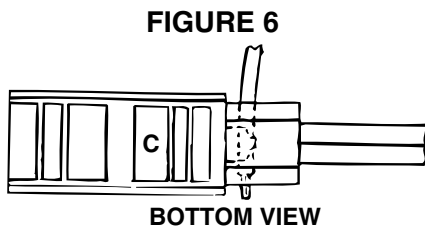
## X-TRACTOR 1G



2. Lift off the top end bracket from the motor. Be careful not to lose the bearing pre-load spring washer. Lift the cylindrical motor cover up from the motor, slide back on the leads and tilt away from motor.
3. Locate brushes on opposite sides of the commutator. Using a 1/4" socket or nut driver, remove two #8-32 hex head screws from each brush holder retaining bracket and remove brackets.
4. Move brush holder assemblies away from commutator in order to remove coil leads from brush holders.



5. Place a screwdriver in area A to pry lead from brush holder assembly. Do not pry or pull on bare section of lead denoted by B in Figure 5.
6. To install new brushes, push tab on each coil lead into the slot on either side of brush holder. Do not bend the bare section of lead (B).
7. Place each brush assembly in position on bottom motor housing with coil lead on top.



8. The brush assembly will be properly positioned when the raised round locator in the brush area of the bottom housing fits into the indented section on the brush assembly that is marked "C" in Figure 6. The brass portion of the brush holder will be approximately 1/8" from the commutator.
9. With the brush assembly in position, place brush hold down bracket over each brush holder. Start the four #8-32 hex head screws by hand to avoid cross-threading. Tighten screws with a 1/4" socket or nut driver.

10. Place motor cover over motor. Make sure the bearing spring washer is on top of the armature bearing and positioned to fit into bearing seat in the top end bracket.
11. Position the top end bracket so the bolt slots are directly over the threaded holes in motor frame. Place the #10-24 x 2.0" screws through the slots and install loosely using a 5/16" socket or nut driver. Rotate the top end bracket to align heads of the screws with the marks at the slots made in Step c.1 and tighten.

#### d. Replacement of Housing Assembly

Attach motor leads and install housing assembly in the reverse order of Step b.

#### e. Run-in of Brushes

After replacing brushes, run smoke exhaust unit on low idle for 30 minutes. Unit is on low idle when power cable is energized, power switch is on, and control (#31 and #4) cable is not connected.

See S17238 included with replacement motor for instructions for complete vacuum motor replacement.

## HOW TO USE TROUBLESHOOTING GUIDE

### **WARNING**

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

**Step 1. LOCATE PROBLEM (SYMPTOM).**

Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

**Step 2. PERFORM EXTERNAL TESTS.**

The second column labeled "POSSIBLE AREAS OF MISADJUSTMENT(S)" lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

**Step 3. RECOMMENDED COURSE OF ACTION**

If you have exhausted all of the items in step 2. Contact your Local Lincoln Authorized Field Service Facility.

### **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

#### X-TRACTOR 1G



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
No Smoke Pickup	<ol style="list-style-type: none"> <li>1. Be sure all tubing connections are tight and there are no punctures in hose.</li> <li>2. Control relay not connected. Control leads #31 and #4 must be energized for full power.</li> <li>3. Filter needs cleaning.</li> <li>4. Plugged or damaged welding gun. Refer to appropriate IM manual for gun maintenance.</li> </ol>	Contact your <b>Local Lincoln Authorized Field Service Facility</b> for technical troubleshooting assistance.
Motor won't operate in any mode.	<ol style="list-style-type: none"> <li>1. Verify power to the unit.</li> <li>2. Check motor brushes and replace if necessary.</li> </ol>	

**⚠ CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

**X-TRACTOR 1G**





# ***X-TRACTOR 1G***

## **PARTS MANUAL**

**Codes: 10205 & 10206**

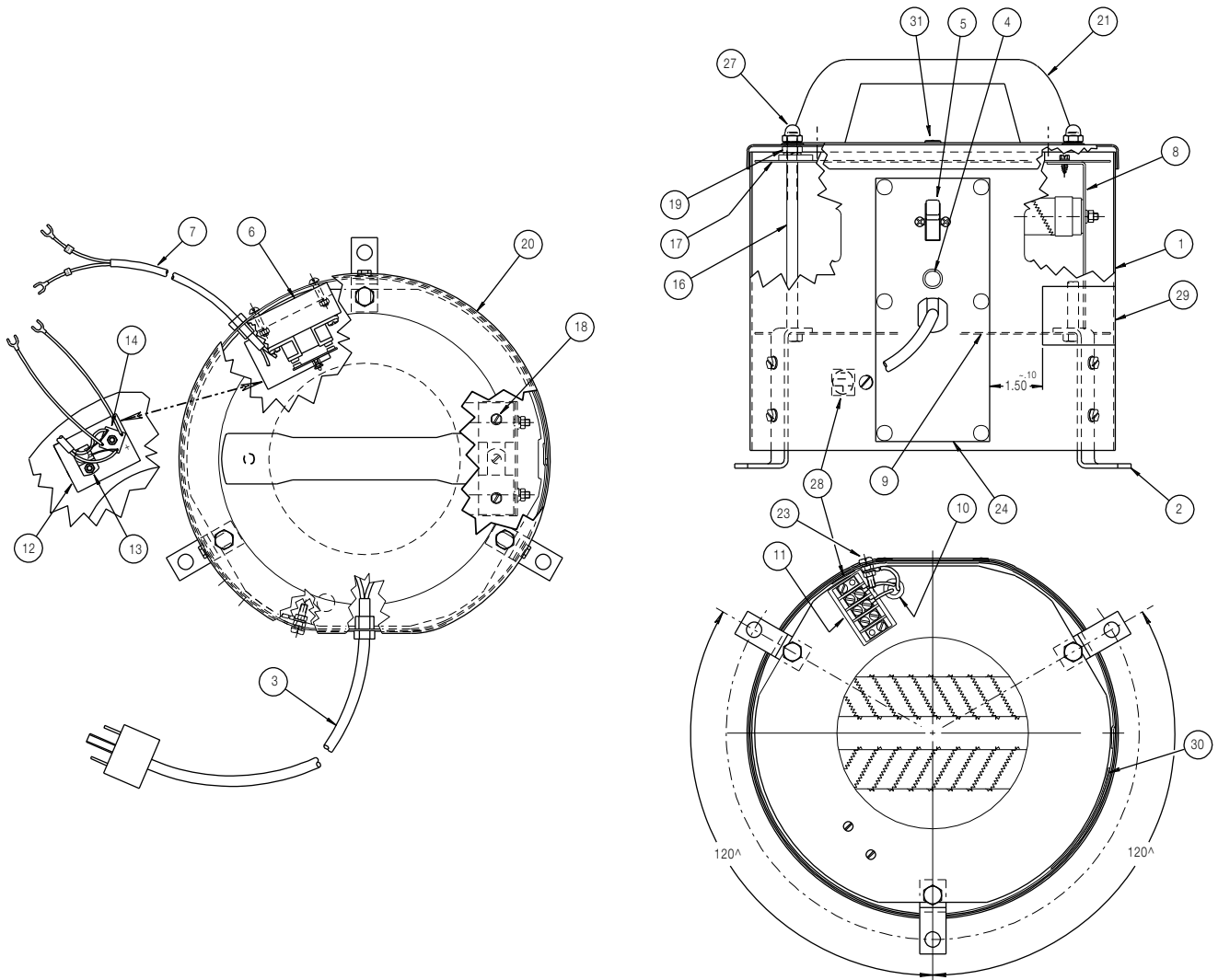
**NOTE:** This Parts Manual is provided as an informative guide only, when ordering parts always refer to the Lincoln Electric Parts List.

**X-TRACTOR 1G**



P-147-E

MAGNUM X-TRACTOR CONTROL CASE ASSEMBLY



L6694-3  
2-19-93E

**NOTE:** This Parts Manual is provided as an informative guide only, when ordering parts always refer to the Lincoln Electric Parts List.

X-TRACTOR 1G



Item	Description	Part No.	No. Req'd.
1	Shell Assembly	M14360-1	1
2	Support Bracket	S17227-1	3
3	Lead Grommet	T9274-3	1
	Cable Asbly. (115V)	S14687	1
	Cable Asbly. (220/240V)	S14687-1	1
4	Pilot Light and Terminal Asbly. (115V)	T13429	1
4	Pilot Light and Terminal Asbly. (220/240V)	T13429-1	1
5	Toggle Switch	S9264	1
6	Relay	S14705	1
7	Relay Cable	S17226	1
	Lead Grommet	T9274-2	1
8	Resistor	S10404-7A	2
	Resistor Mounting Stud	T9781-20	2
	Resistor Mounting Bracket	S17304	2
9	Baffle	M12523-3	1
10	Bushing	T12380-2	1
11	Terminal Strip	S13323-5	1
	Terminal Strip Insulation	T13188	1
12	Insulation	T13441	1
13	Thyrector Diode	T13640-14	1
	Diode Clamp	T12563-4	1
14	Rectifier	T12986	1
16	Hex Head Screw	5/16-18x5.75	3
17	Baffle Assembly	S17232	1
18	Self Tapping Screw	S8025-4	4
19	Lock Washer	E106A-14	3
	Hex Jam Nut	5/16-18	3
20	Cover Assembly	M12286-2	1
21	Lifting Handle	M15446	1
	Plain Washer	S9262-121	1
	Lock Washer	T9860-3	1
23	Thread Cutting Screw	S9225-36	1
	Lock Washer	T9695-1	1
	Hex Nut	#10-24	2
24	Nameplate	S20312-1	1
	Fastener Button	T14659-1	6
	Self Tapping Screw	S8025-73	2
25	Lincoln Welder Decal	S11893-2	1
27	Acorn Nut	T13167-1	2

**P-147-E.1**  
**MAGNUM X-TRACTOR CONTROL CASE**  
**ASSEMBLY**

Item	Description	Part No.	No. Req'd.
	Lock Washer	T9860-3	2
	Plain Washer	S9262-121	3
28	Decal (Ground)	T13260-4	1
29	Decal (Warning) (115V)	T13470	1
29	Decal (Warning) (220/240V)	T13086-20	1
31	Fastener Button	T14659-1	1

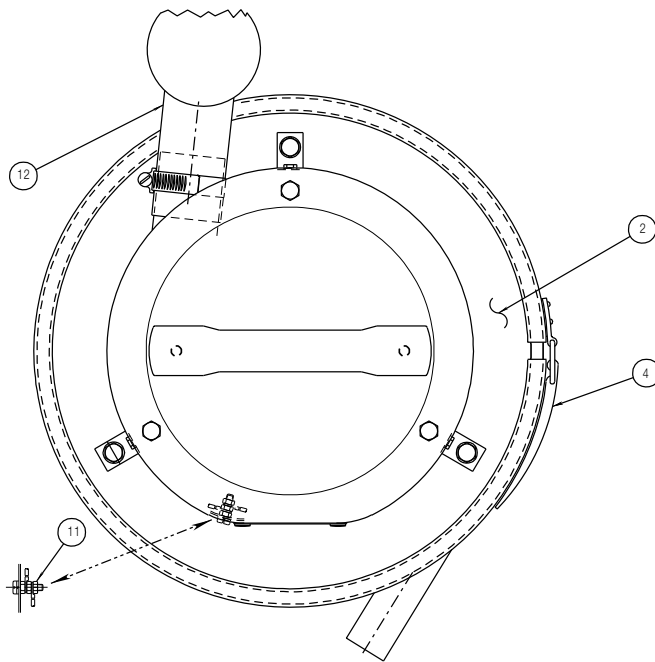
**NOTE:** This Parts Manual is provided as an informative guide only, when ordering parts always refer to the Lincoln Electric Parts List.

**X-TRACTOR 1G**

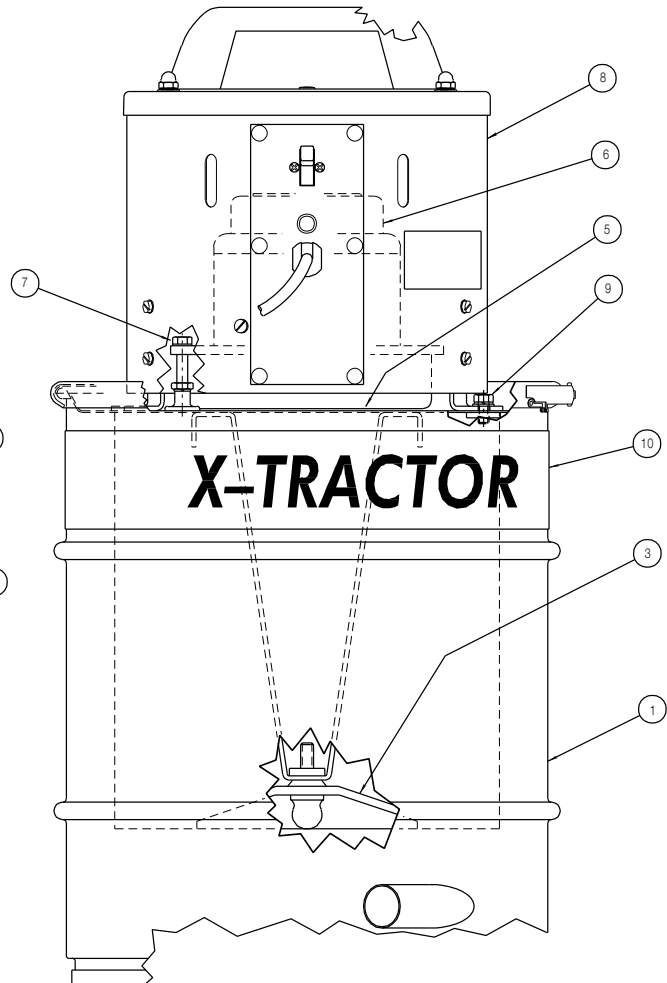


## P-147-D

## MAGNUM X-TRACTOR GENERAL ASSEMBLY



L6694-3  
9-4-92D



Item	Description	Part No.	No. Req'd.
1	Canister and Tube Asbly.	S14801-1	1
2	Canister Cover	M12285-1	1
3	Air Filter	M12284-1	1
	Thumb Screw	T9078-10	1
4	Gasket	L5066-C	1
	Locking Ring	L5066-F	1
5	Rubber Washer	T11135-12	1
6	Vacuum Motor (115V)	S14968-2	1
6	Vacuum Motor (220/240V)	S14968-3	1
	Motor Brush	S14688-D	2
7	Hex Head Screw	5/16-18x1.75	3
	Lock Washer	E106A-14	6
	Plain Washer	S9262-30	3
	Hex Nut	5/16-18	3

Item	Description	Part No.	No. Req'd.
8	Control Case Asbly.	See P147-E	1
9	Hex Head Screw	5/16-18x.625	3
	Plain Washer	S9262-30	3
	Lock Washer	E106A-14	3
10	Lincoln Welder Decal	S11893-2	1
10	Decal (X-Tractor)	M16530	1
11	Hex Nut	#10-24	1
12	Muffler	M12253	1
	Clamp	S10888-21	1
	Hose Adapter	S20591-6	1

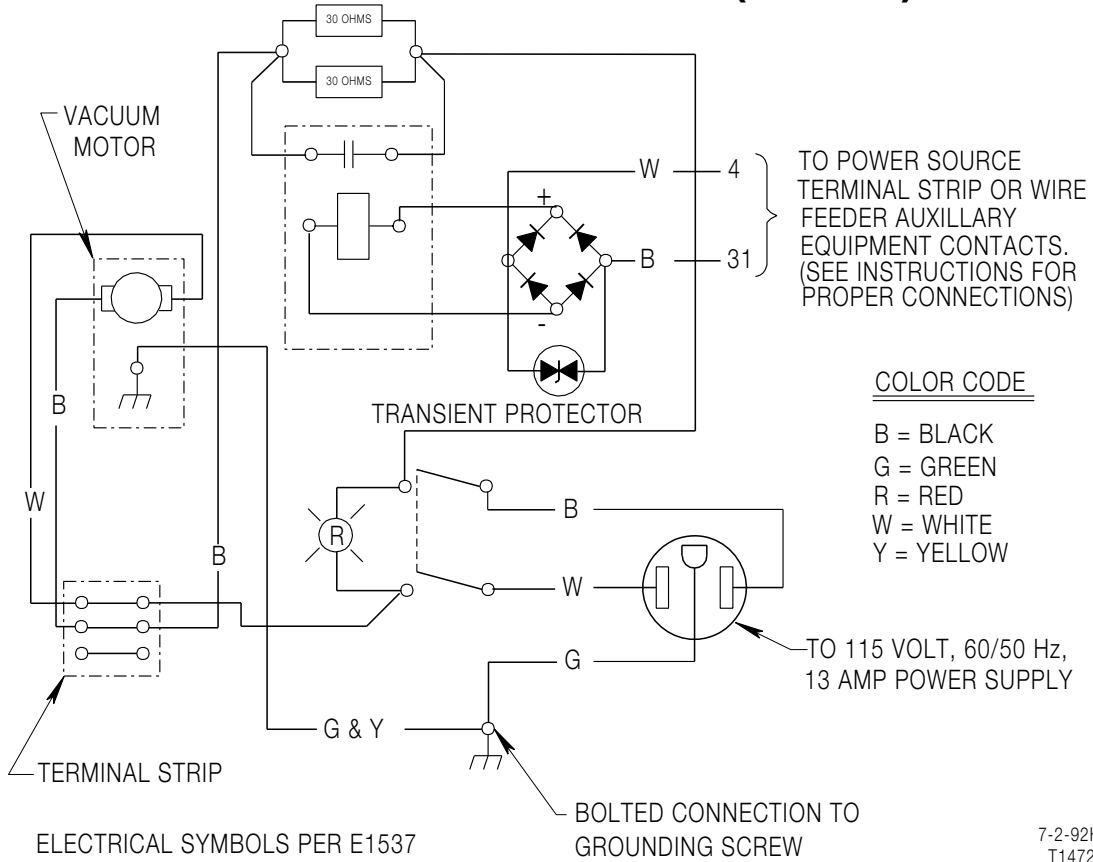
3-10-95

**NOTE:** This Parts Manual is provided as an informative guide only, when ordering parts always refer to the Lincoln Electric Parts List.

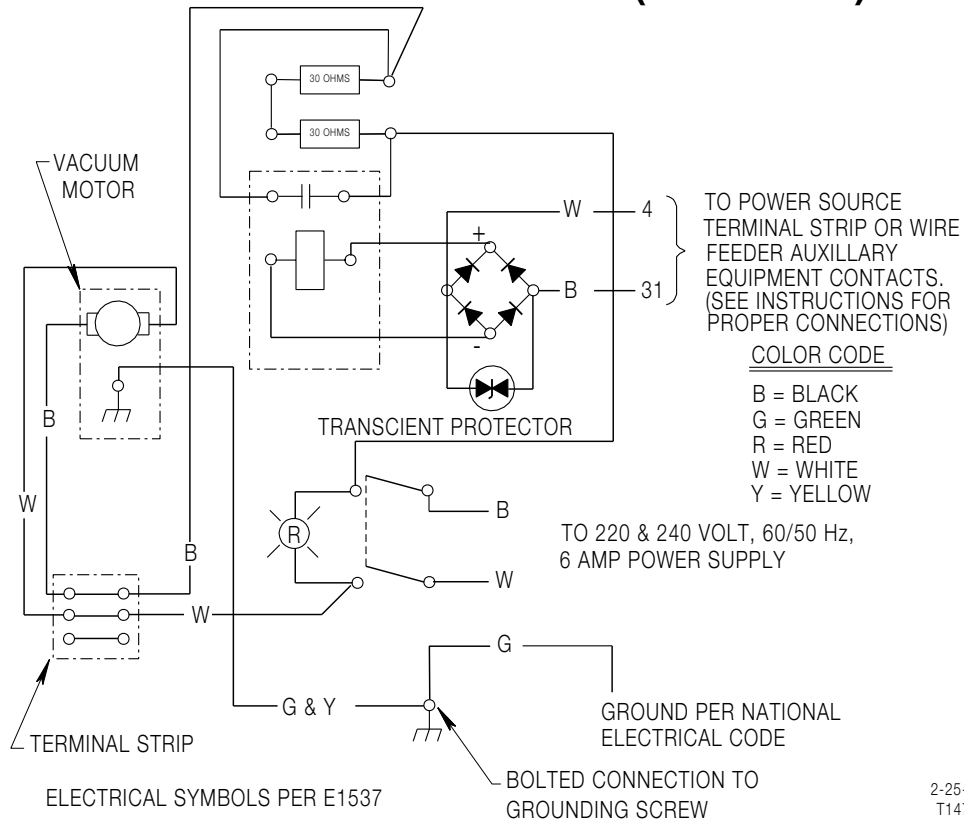
## X-TRACTOR 1G



# K179-4 LINCONDITIONER (115 V.)



# K179-5 LINCONDITIONER (220/240V)



X-TRACTOR 1G



			
<b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>● Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>● Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>● No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>● Aislese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>● Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>● Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>● Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>● Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>● Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>● Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>● Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>● Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>● Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>● Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>● 施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● 燃えやすいものの側での溶接作業は絶対にしてはなりません。</li> </ul>	<ul style="list-style-type: none"> <li>● 目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>● 皮肤或湿衣物切勿接触带电部件及焊条。</li> <li>● 使你自已與地面和工件絕緣。</li> </ul>	<ul style="list-style-type: none"> <li>● 把一切易燃物品移離工作場所。</li> </ul>	<ul style="list-style-type: none"> <li>● 佩戴眼、耳及身體勞動保護用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>● 전도체나 용접봉을 젖은 형갑 또는 피부로 절대 접촉치 마십시오.</li> <li>● 모재와 접지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 인화성 물질을 접근 시키지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجلد الجسم أو بالملابس المبللة بالماء.</li> <li>● ضع عازلا على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> <li>● Keep your head out of fumes.</li> <li>● Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn power off before servicing.</li> </ul>	<ul style="list-style-type: none"> <li>● Do not operate with panel open or guards off.</li> </ul>	<b>WARNING</b>
<ul style="list-style-type: none"> <li>● Los humos fuera de la zona de respiración.</li> <li>● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul style="list-style-type: none"> <li>● No operar con panel abierto o guardas quitadas.</li> </ul>	Spanish <b>AVISO DE PRECAUCION</b>
<ul style="list-style-type: none"> <li>● Gardez la tête à l'écart des fumées.</li> <li>● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>	<ul style="list-style-type: none"> <li>● Débranchez le courant avant l'entretien.</li> </ul>	<ul style="list-style-type: none"> <li>● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	French <b>ATTENTION</b>
<ul style="list-style-type: none"> <li>● Vermeiden Sie das Einatmen von Schweißrauch!</li> <li>● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>	<ul style="list-style-type: none"> <li>● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>	<ul style="list-style-type: none"> <li>● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>	German <b>WARNUNG</b>
<ul style="list-style-type: none"> <li>● Mantenha seu rosto da fumaça.</li> <li>● Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>	<ul style="list-style-type: none"> <li>● Não opere com as tampas removidas.</li> <li>● Desligue a corrente antes de fazer serviço.</li> <li>● Não toque as partes elétricas nuas.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha-se afastado das partes moventes.</li> <li>● Não opere com os painéis abertos ou guardas removidas.</li> </ul>	Portuguese <b>ATENÇÃO</b>
<ul style="list-style-type: none"> <li>● ヒュームから頭を離すようにして下さい。</li> <li>● 換気や排煙に十分留意して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切ってください。</li> </ul>	<ul style="list-style-type: none"> <li>● パネルやカバーを取り外したままで機械操作をしないで下さい。</li> </ul>	Japanese <b>注意事項</b>
<ul style="list-style-type: none"> <li>● 頭部遠離煙霧。</li> <li>● 在呼吸區使用通風或排風器除煙。</li> </ul>	<ul style="list-style-type: none"> <li>● 維修前切斷電源。</li> </ul>	<ul style="list-style-type: none"> <li>● 儀表板打開或沒有安全罩時不準作業。</li> </ul>	Chinese <b>警告</b>
<ul style="list-style-type: none"> <li>● 얼굴로부터 용접가스를 멀리하십시오.</li> <li>● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 보수전에 전원을 차단하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 판넬이 열린 상태로 작동치 마십시오.</li> </ul>	Korean <b>위험</b>
<ul style="list-style-type: none"> <li>● ابعد رأسك بعيداً عن الدخان.</li> <li>● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>● اقطع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>	<ul style="list-style-type: none"> <li>● لا تشغيل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.</li> </ul>	Arabic <b>تحذير</b>

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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