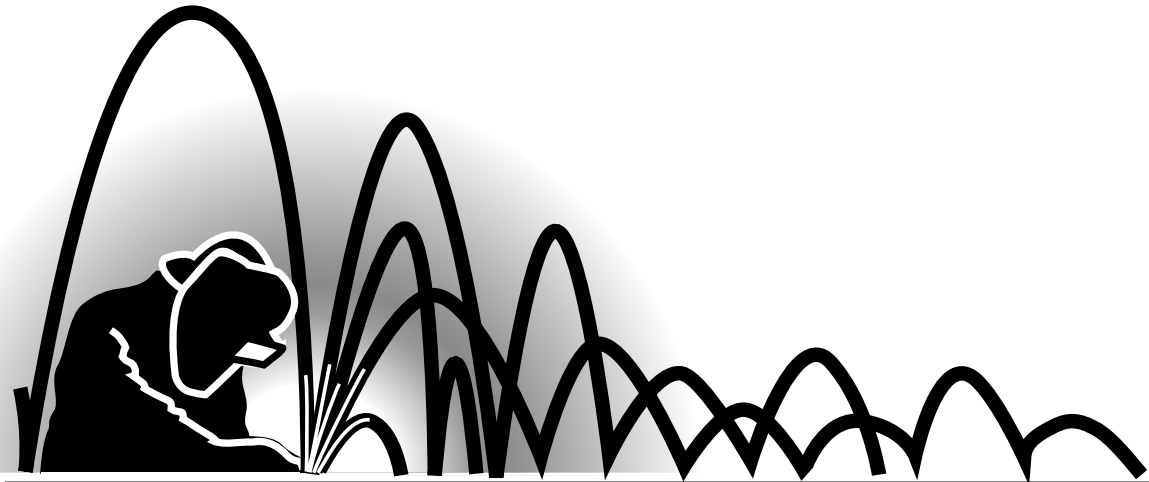


# ***RED-D-ARC*** ***D500K 5+3***



# ***RED-D-ARC*** ***Welderentals***

## ***SERVICE MANUAL***

### ***Red-D-Arc Spec-Built Welding Equipment***

This **RED-D-ARC** welder is built to **RED-D-ARC Extreme Duty** design specifications by Lincoln Electric.

### ***Safety Depends on You***

This welder 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.

***1-800-245-3660***

***North America's Largest Fleet of Welding Equipment***

# ***SERVICE MANUAL***

***D500K 5+3***

## ***General Information Maintenance Schedule & Service Replacement Parts***

**Thank you** for purchasing this ***Red-D-Arc*** welder/generator. The confidence that you show us in purchasing this unit is very valuable to us. We are confident that this purchase will give you the satisfaction that you expect as a customer.

Please follow the instructions in this manual, if there are any questions about it's information or contents, do not hesitate to call our nearest service depot.

Thank you again for purchasing a ***Red-D-Arc*** product.



# Arc Welding Safety Precautions

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.

1. HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed only by qualified people.
2. ELECTRIC SHOCK can kill.  
Protect yourself from possible dangerous electrical shock:
  - a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Never permit contact between "hot" parts of the circuits and bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
  - b. Always insulate yourself from the work and ground by using dry insulation. When welding in damp locations, on metal floors, gratings or scaffolds, and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.
  - c. 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.
  - d. Ground the work or metal to be welded to a good electrical ground.
  - e. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.
  - f. Never dip the electrode in water for cooling.
  - g. 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.
  - h. If using the welder as a power source for mechanized welding, the above precautions also apply for the automatic electrode, electrode reel, welding head, nozzle or semiautomatic welding gun.
  - i. When working above floor level, protect yourself from a fall should you get a shock.
  - j. Also see Items 6c and 8.
3. FUMES AND GASES can be dangerous to your health.
  - 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 on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.
  - b. Do not weld in locations near chlorinated hydrocarbon vapours coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapours to form phosgene, a highly toxic gas, and other irritating products.
  - 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.
  - 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.
  - e. Also see item 9b.
4. ARC RAYS can injure eyes and burn skin.
  - 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.
  - b. Use suitable clothing made from durable, flame-resistant material to protect your skin and that of your helpers from the arc rays.
  - c. Protect other nearby personnel with suitable nonflammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.
5. FIRE OR EXPLOSION can cause death or property damage.
  - a. Remove fire hazards well away from the 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. Have a fire extinguisher readily available.

- 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.
  - 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.
  - 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 vapours 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 F4.1-80 from the American Welding Society.
  - e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
  - f. Also see items 6c and 9c.
6. For Welding in General.
- a. Droplets of molten slag and metal are thrown or fall from the welding arc. Protect yourself with 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 when in a welding area. Use glasses with side shields when near slag chipping operations.
  - b. 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.
  - c. Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance 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.

7. For Gas-Shielded Arc Welding.
- 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.
  - b. Always keeps cylinders in an upright position securely chained to an undercarriage or fixed support.
  - 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.
  - d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.
  - e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
  - f. Valve protection caps should always be in place and handtight except when the cylinder is in use or connected for use.
  - 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.
8. For Electrically Powered Equipment.
- a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
  - b. Make the electrical installation in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.
  - c. Properly ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.
9. For Engine Powered Equipment.
- a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
  - b. Operate the internal combustion engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
  - c. Do not add the fuel near an open flame, welding arc or



when the engine is running. Stop the engine and, if possible, allow it to cool when refuelling 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.

- d. 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.
- e. 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.
- f. 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.
- g. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

For more detailed 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.


## PRODUCT DESCRIPTION

The D500K 5+3 is a portable engine driven DC arc welding power source capable of providing constant current output for stick welding or DC TIG welding.

The D500K 5+3 has a current range of 40-525 DC amps with a 60% duty cycle at 400 amps. The unit is also capable of providing 3 KVA of 120/240 volts of 60 cycle AC auxiliary power.

## PRE-OPERATION MAINTENANCE

### OIL

Upon receipt of the welder, check oil and make sure it is up to full mark on dip stick.  DO NOT OVERFILL.

### FUEL

Fill the fuel tank with the grade of fuel recommended. Make sure fuel valve on the sediment bowl is in the open position.

### RADIATOR

Make sure Radiator is filled with antifreeze mixture.

## WARNING:

- To prevent **EXPLOSION** when:
  - a) Installing a new battery - disconnect the negative cable from the old battery first and connect the negative cable to the new battery last.
  - b) Connecting a battery charger - remove the battery from the welder by disconnecting the negative cable first, then the positive cable and battery clamp. When reinstalling, connect the negative cable last.
  - c) Using a booster - connect the positive lead to the battery first then connect the negative lead to the copper strap on the engine foot.
- To prevent **ELECTRICAL DAMAGE** when:
  - a) Installing a new battery.
  - b) Using a booster.
 Use correct polarity - Negative Ground.
- To prevent **BATTERY DISCHARGE**, if you have an ignition switch, turn it off when engine is not running.
- To prevent **BATTERY BUCKLING**, tighten nuts on battery clamp until snug.

**WARNING:** Use caution as the electrolyte is a strong acid that can burn skin and damage eyes.

## LOCATION/VENTILATION

Always operate the welder with the doors closed. Leaving the doors open changes the designed air flow and may cause overheating.

The welder should be located to provide an unrestricted flow of clean, cool air. Also, locate the welder so that engine exhaust fumes are properly vented to an outside area.

## POLARITY CONTROL AND CABLE SIZES

With the engine off, connect the electrode and work cables of the appropriate size (see the following table) to the studs located on the fuel tank mounting rail. For positive polarity, connect the electrode cable to the terminal marked "Positive". For Negative polarity, connect the electrode cable to the "Negative" stud. These connections should be checked periodically and tightened if necessary.

When welding at a considerable distance from the welder, be sure you use ample size welding cables.

\*Current can also be controlled by remote control.\*



# D500K 5+3 Service Manual

TABLE 2  
RECOMMENDED COPPER CABLE SIZES  
AT 60% DUTY CYCLE

Machines Size in Amps	Cable Sizes for Combined Length of Electrode Plus Work Cable		
	Up to 150 ft.	150 to 200 ft.	200 to 250 ft.
250	1/0	2/0	3/0
300	1/0	2/0	3/0
400	2/0	3/0	4/0

## CONTROL OF WELDING CURRENT

Current is controlled by a "variable reactance coil" or "reactor". This system of controlling amperage output provides an infinite choice of settings. This allows the operator to choose the exact amperage without interfering with arc characteristics, by using a rheostat as a fine control.

This control can be set while welding although it is **not recommended**. There is no maintenance or care for this control. Repairs should be done by a qualified service person only. It is a good practice to move the control handle from one end of the range to the other a few times every week. This procedure will ensure the contact fingers and finger tracks are kept clean and eliminate the build-up of dust between contact surfaces of the reactance.

A high open circuit voltage setting provides the soft "buttering" arc with best resistance to pop-outs preferred for most welding. To get this characteristic set the "Current Range Selector" to the lowest setting that still provides the current you need and set the "Fine Current Adjustment" near maximum. For example: to obtain 175 amps, set the "Reactor Handle" to approximately 175 amps in the coloured area, the same as the rheostat (Job Selector) is pointing. This refers to the silver area called "Large Electrodes" or "High O.C.V." (open circuit voltage) operation.

When a forceful "digging" arc is required, usually for vertical and overhead welding, use a higher "Reactor" setting and lower the O.C.V. by turning the rheostat to the red area called "Overhead and Vertical", "Low O.C.V."

Some arc instability may be experienced with EXX10 electrodes when trying to operate with long arc techniques at settings at the lower end of the open circuit voltage range.

## AUXILIARY POWER

Your D500K 5+3 is equipped with AC auxiliary power.

The AC units provide 120 volt, 60 hertz power with 3 KVA



maximum output (set the Fine Current Adjustment on "100" for maximum auxiliary power). The output circuit is protected with circuit breakers.

A maximum of 26 amps may be drawn from both halves of the 120V receptacle. The 120V receptacle is designed to permit drawing up to 15 amps for one-half of the duplex and the balance from the other half. The total combined continuous current draw from all receptacles must not exceed 3 KVA.

TABLE 3  
SIMULTANEOUS WELDING AND POWER LOADS

If auxiliary power is used simultaneously with welding, the current which can be used while maintaining voltage regulation within 10% is as follows:

Welding Current Amps ....@ NEMA Arc Volts)	Using Only 120V Circuit, Amps	Total Aux. KVA
0	26	3.0
100	16	1.8
150	15	1.7
200	15	1.7
250	14	1.6

Power tools should always be grounded to the welder frame unless they are protected by an approved system of double insulation.

## MAINTENANCE

- Have qualified personnel do the maintenance work. Turn the engine off before working inside the machine. 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.
- Do not put your hands near the engine fan. If a problem cannot be corrected by following the instructions, take the machine to the nearest Red-D-Arc Location.

## GENERAL INSTRUCTIONS

1. Blow out the welder and controls with an air hose at least once every two months. In particularly dirty locations, this cleaning may be necessary once a week. Use low pressure air to avoid driving dirt into the insulation.
2. "Current Range Selector" contacts should not be greased. To keep the contacts clean rotate the current control



through its entire range frequently. Good practice is to turn the handle from maximum to minimum setting twice each morning before starting to weld.

3. Change the crankcase oil every 200 hours using the proper grade of oil as recommended in the engine operating manual.
4. Change the oil filter every oil change (200 hrs.)
5. Fan belts tend to loosen after the first 30 or 40 hours of operation. Check and tighten if necessary. **DO NOT OVER TIGHTEN.**

## COMMUTATOR AND BRUSHES

The generator brushes are properly adjusted when the welder is shipped. They require no particular attention. **DO NOT SHIFT THE BRUSHES** or adjust the rocker setting.

Periodically inspect the commutator, slip rings and brushes by removing the covers. **DO NOT** remove or replace these covers while the machine is running.

Commutators and slip rings require little attention. However, if they are black or appear uneven, have them cleaned by experienced maintenance personnel using fine sandpaper or a commutator stone. Never use emery cloth or paper for this purpose.

Replace brushes when they wear within 1/4" of the pigtail. A complete set of replacement brushes should be kept on hand. Lincoln brushes have a curved face to fit the commutator. Have experienced maintenance personnel seat these brushes by lightly stoning the commutator as the armature rotates at full speed until contact is made across the full face of the brushes. After stoning, blow out the dust with low pressure air.

To seat slip ring brushes, position the brushes in place. Then slide one end of a piece of fine sandpaper between slip rings and brushes with the coarse side against the brushes. With slight additional finger pressure on top of the brushes, pull the sandpaper around the circumference of the rings - in direction of rotation only - until brushes seat properly. In addition, stone slip ring with a fine stone. Brushes must be seated 100%.

**WARNING: Uncovered rotating equipment can be dangerous. Use care so your hands, hair, clothing or tools do not catch in the rotating parts. Protect yourself from particles that may be thrown out by the rotating armature when stoning the commutator.**

Arcing or excessive exciter brush wear indicates a possible misaligned shaft. Have an authorized Field Service Shop check and realign the shaft.

## Grounding

According to the United States National Electrical Code, the frame of this portable generator is not required to be grounded and is permitted to serve as the grounding means for cord connected equipment plugged into its receptacle.

Some state, local or other codes or unusual operating circumstances may require the machine frame to be grounded. It is recommended that you determine the extent to which such requirements may apply to your particular situation and follow them explicitly. A machine grounding stud marked with the symbol  $\frac{1}{\square}$  is provided on the welding generator frame foot. (If an older portable welder does not have a grounding stud, connect the ground wire to an unpainted frame screw or bolt.)

In general, if the machine is to be grounded it should be connected with a #8 or larger copper wire to a solid earth ground such as a metal water pipe going into the ground for at least 10 ft. and having no insulated joints, or to the metal framework of a building which has been effectively grounded. The National Electrical Code lists a number of alternate means of grounding electrical equipment.

## Starting

For engine starting instructions, refer to welder faceplate.

**GLOW PLUGS** are ALWAYS used to help start Kubota diesel engines.

In weather above 10 degrees C, there is no need to preheat. In colder temperatures to negative 5 degrees C, engage glow plugs for 5 seconds. For temperatures below negative 5 C, hold glow plugs on for 10 seconds. Absolute limit of continuous use should not exceed 60 seconds.

In addition, extra care must be taken regarding fuel & oil changes, freezing of water contained in the piping, and of water adhering on the filter.

**NOTE:** Under NO circumstances should ETHER be used!  
(or any starting aid) as PERMANENT ENGINE DAMAGE WILL RESULT.

**\*\*\* ENGINE WARRANTY WILL ALSO BE VOID \*\*\***

## Engine Hour Meter

All engines are equipped with hour meters to determine maintenance intervals.

## Safety Shut-Down System

All engines are equipped with low oil pressure & high temperature shutdown systems.

ENGINES SHOULD NEVER BE OPERATED WITH SHUTDOWN SYSTEM  
DISCONNECTED OR INOPERATIVE.

## General Maintenance

Check battery fluid levels and clean battery posts every 4 months, use only distilled water. Some units are equipped with maintenance-free batteries and do not require any maintenance.

Check all external bolts (engine mounts, generator mounts, etc.) at least once per year and tighten/replace as required.

Main welding generator & exciter brushes should be inspected and/or adjusted by a qualified technician every 2000 hours.

DO NOT HANG WELDING CABLES FROM THE ENGINE MUFFLER,  
If the welder is trailer-mounted, periodically check the mounting pins.

## Engine Coolant/ Radiator

Radiator content 8.2litres

Use a 50% ethylene glycol base antifreeze and 50% water mixture.

This should provide protection to -40 deg. C with permanent type antifreeze coolant.

ALWAYS "pre-mix" the antifreeze with water before pouring into the radiator.

NOTE: NOT pre-mixing will cause gelling in the engine cooling galleries & over-heat the engine.

Check coolant level **DAILY**.

Check for coolant leaks every month and adjust or replace hoses as required.

The operating pressure of the radiator cap is 7 p.s.i.

Pressure wash radiator fins every 12 months or as required to ensure adequate cooling.

Always operate the welder with the doors CLOSED in order to ensure adequate air flow through the radiator. A pusher type fan is standard in order to minimize dirt clogging the radiator.



## Engine Lubrication

Use 12 litres of a high quality better than CC CD SF class 10W 30 or 15W40 grade motor oil.

Check oil level **DAILY**



Change oil every 100 hours under normal conditions.

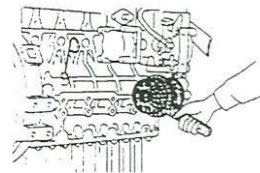
The oil level dipstick is located on the oil filler cap on the side of the crankcase.

When checking oil level, it should be done at least twice to ensure an accurate reading

## Oil Filter

Use Kubota 7000-32091 or 15521-32430, or NAPA 1068

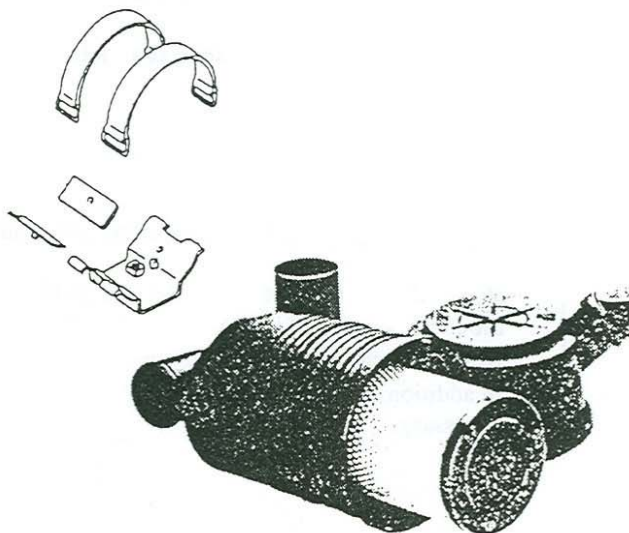
Change oil filter every oil change (100 hours) under normal conditions.



## Air Cleaner

Use Donaldson P821575

An element cannot recover 100% of its efficiency by cleaning. After each cleaning the efficiency will drop 20 to 30%. Replace element after 800 hours of operation under normal conditions.

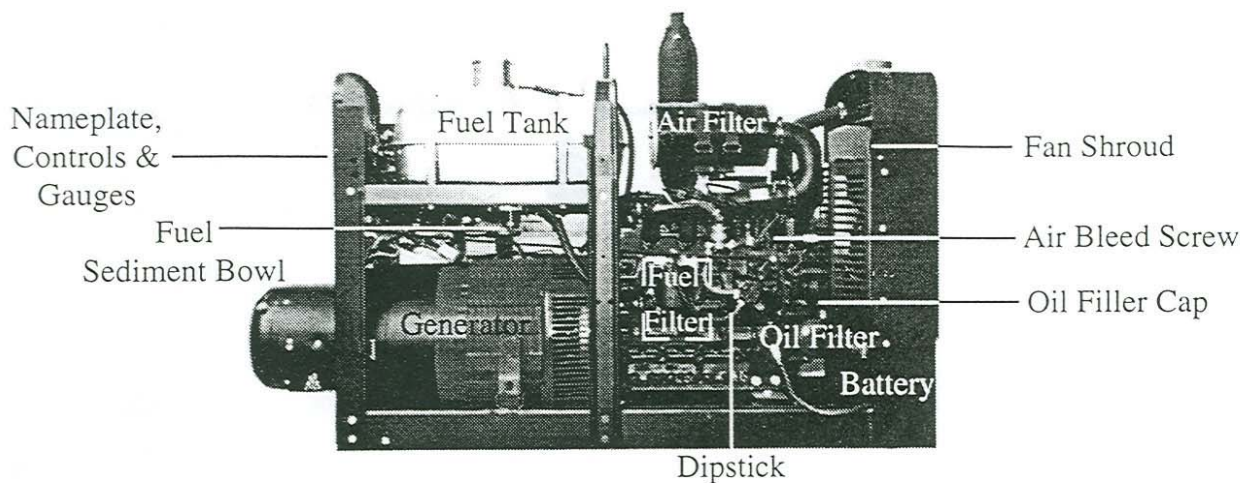


To remove the air filter element for cleaning or replacement, the filter canister must be moved rearward toward the radiator in order to provide clearance with the fuel tank. This is accomplished by disconnecting the rubber canister straps and inlet pipe clamps. The air cleaner cover can then be removed and the element taken out.

## Fan Belt

Use Kubota 15471-97010. The fan belt should be checked every 500 hours and replaced every 2000 hours or sooner if necessary.

**NO OTHER FAN BELTS MAY BE SUBSTITUTED** due to the **UNIQUE** width & shape of the pulleys.



## Fuel

Use clean Diesel fuel #2-D in weather above 14 degrees C (55 Degrees F) and Diesel fuel #1-D below 14 degrees C (55 Degrees F).

NOTE: Do NOT use kerosene as a fuel.

## Fuel Filter

Use only Kubota filter: 16631-43560

Replace every oil change (200 hours) under normal conditions.

WATER can be drained from the fuel system at the fuel sediment bowl (located under the fuel tank) and at the secondary fuel filter (located near the fuel injection pump). Under NO circumstance should the engine be operated with water in the fuel system. In addition, the fuel tank should be checked monthly for foreign matter and cleaned if necessary.

## Bleeding the Fuel System

If you have a SIMPLE STOPPAGE OF FUEL (a valve closed) simply;

- 1) Open the air bleed screw on the fuel injection pump and engage starter until the engine starts. (Be sure to use pre-heat)

If you have AIR IN THE FUEL SYSTEM (tank runs dry/filter change) simply;

- 1) Make sure there is sufficient fuel in the tank to overflow the anti-sediment intake pipe in the fuel tank (about 1/4")
- 2) Ensure the fuel sediment bowl (located on the underside of the fuel tank) is FULL of clean fuel and the flow valve is open.
- 3) Open the air bleed screw on the fuel injection pump & engage starter until the engine starts. (Be sure to use pre-heat)
- 4) When fuel returns to the tank (via the overflow pipe) close the air bleed screw on the injection pump.



## Fuel Consumption

Fuel consumption has been optimized by means of careful design of the combustion chamber, fuel feed & injection systems, and cross-flow cylinder heads. In order to enhance longevity of the engine, the engine turns at a constant 1800 RPM and no engine idler is used.

As a result, there is no waiting time for the welder to achieve operating speed when striking an arc.

Tank Capacity:	56.8 litres (15 U.S. gallons)
Fuel Consumption:	6.78 ltr/hr (1.8 gl/hr) @ Max.(400A @ 40V, 60% duty cycle) 3.72 ltr/hr (1 gl/hr) @ (250A @ 30V, 60% duty cycle) 2.6 ltr/hr (.7 gl/hr) @ No Load
Running Times:	Average = 17-20 hours Minimum = 9 hours

## Replacement Parts

Engine replacement parts are available from authorized Kubota Engine or Tractor dealers.

All other parts are available from any Red-D-Arc location.

## Engine Specifications

Model	Kubota F2803BG1-RDA-1
Type	Vertical, water-cooled 4 cycle diesel
No. of Cylinders	5
Bore & Stroke	87mm x 92.4mm
Displacement	2746 cc (167.58 cu. in.)
SAE Net cont. hp.	41 hp @ 1800 RPM
Operating Speed	1800 RPM
Fuel Injection	Bosch type mini pump
Governor	Centrifugal ball mechanical governor
Rotation	Counter-clockwise (viewed from rear)
Injection Nozzle	Bosch type mini pump
Injection Timing	Before TDC-16 degrees
Injection Pressure	13.73 Mpa (1991 psi)
Compression Ratio	23:1
Starting System	12VDC, 1.4 Kw
Alternator	12VDC, 480W
Lubricating Oil Capacity	12 litres
Noise Level	76dBa at 7 metres
Exhaust Gas	NOx+THC 7.5g/HP-hr or less PM .41g/HP-hr or less CO 2g/HP-hr or less

<u>MODEL</u>	<u>Rated Welding Output</u>	<u>Auxiliary Output</u>
D500K 5+3	400 amps @ 40 volts 98 volts maximum O.C.V.	120 Vac 26 amps 2 duplex outlets 3.0 Kva

**TROUBLESHOOTING****WARNING:**

- Have qualified personnel do the troubleshooting work. Turn the engine off before working inside the machine. 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.
- Do not put your hands near the engine fan. If a problem cannot be corrected by following the instructions, take the machine to the nearest Red-D-Arc Location.

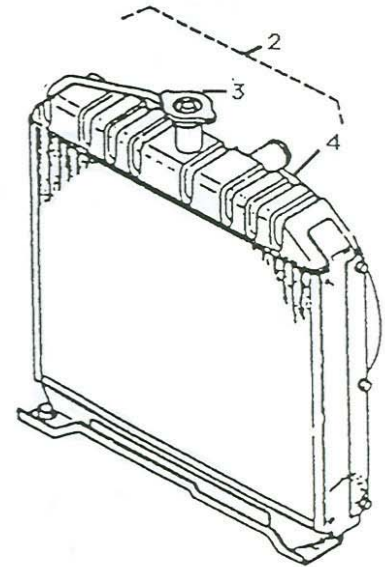
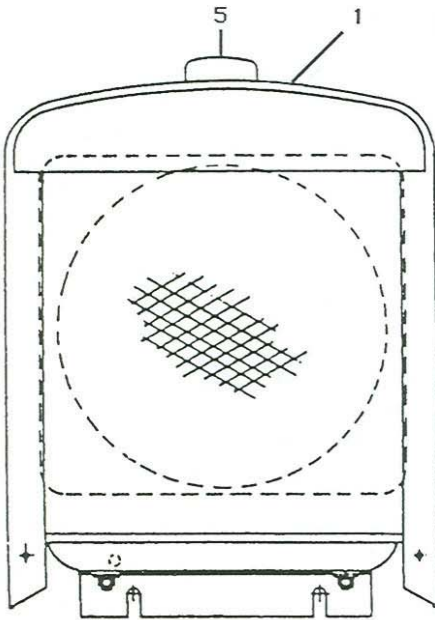
TROUBLE	CAUSES	WHAT TO DO
1. Machine fails to hold the "heat" constantly.	A. Rough or dirty commutator. B. Brushes may be worn down to limit. C. Field circuit may have variable resistance connection or intermittent open-circuit, due to loose connection or broken wire. D. Electrode lead or work lead connection may be poor. E. Wrong grade of brushes may have been installed on generator. F. Field rheostat may be making poor contact and overheating.	A. Commutator should be trued or cleaned. B. Replace brushes. C. Check field current with ammeter to discover varying current. This applies to both the main generator and exciter. D. Tighten all connections. E. Use Lincoln brushes. F. Inspect and clean the rheostat.
2. Welder starts but fails to generate current	A. Generator or exciter brushes may be loose or missing. B. Exciter may not be operating. C. Field circuit of generator or exciter may be open. D. Exciter may have lost excitation. E. Series Field and armature circuit may be open-circuited.	A. Be sure that all brushes bear on the commutator and have proper spring tension. B. Check exciter output voltage with voltmeter or lamp. C. Check for open circuits in rheostat, field leads and field coils. Check rectifier bridge. Fuses & Breakers. D. Flash fields. <sup>(1)</sup> E. Check circuit with ringer or voltmeter.
3. Welding arc is loud and spatters excessively.	A. Current setting may be too high. B. Polarity may be wrong.	A. Check setting and current output with ammeter. B. Check polarity. Try reversing polarity or try an electrode of the opposite polarity.
4. Welding current too great or too small compared to indication on the dial.	A. Exciter output low causing low output compared to dial indications. B. Operating speed too low or high.	A. Check exciter field circuit. B. Adjust speed screw on governor for 1800 rpm operating speed.
5. Arc continuously pops out.	A. Rheostat setting may be too low.	A. Decrease amperage setting at reactor and increase rheostat setting.
6. Engine turns over but won't start.		A. Make sure there is fuel. B. Check radiator level. C. Check oil. D. Check Safety devices.

**FLASHING THE FIELDS <sup>(1)</sup>**

1. Stop the engine welder and remove the cover from the exciter.
2. Turn the "Fine Adjustment Control" (rheostat) to "100" on the dial.
3. Using a 12 volt automotive battery, connect its negative terminal to the negative brushholder. The negative brushholder is the one nearest to the rotor lamination. See the wiring diagram. With the engine NOT running, touch the positive battery terminal to the positive brushholder. Remove the battery from the circuit.
4. Replace exciter cover. Start the welder and the generator voltage should build up.

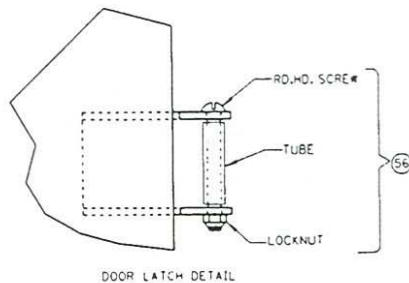
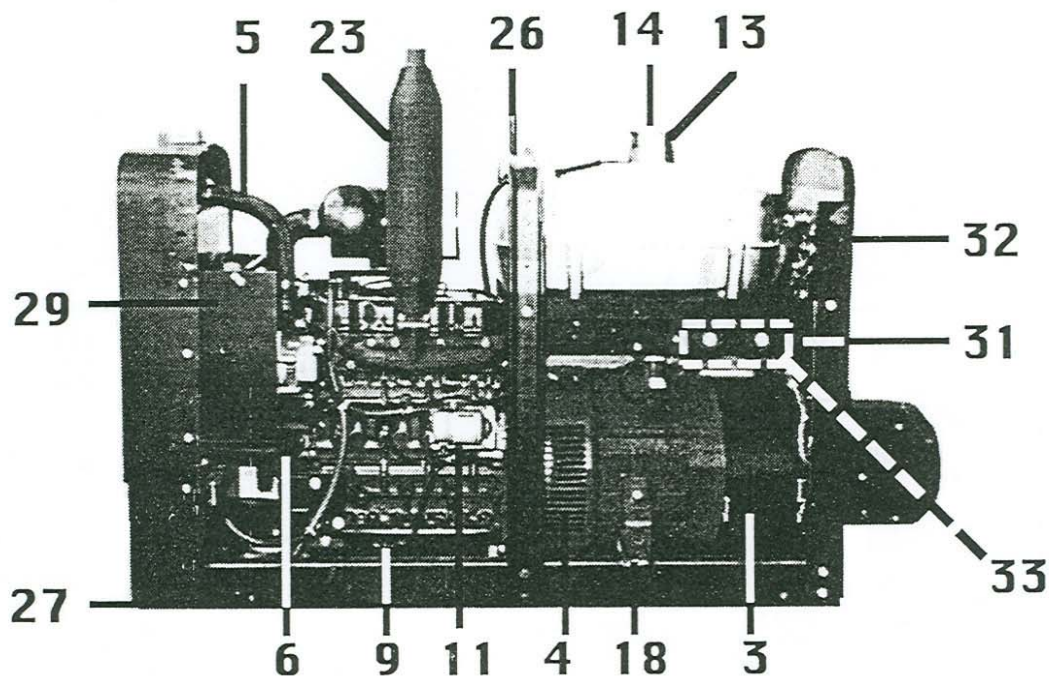
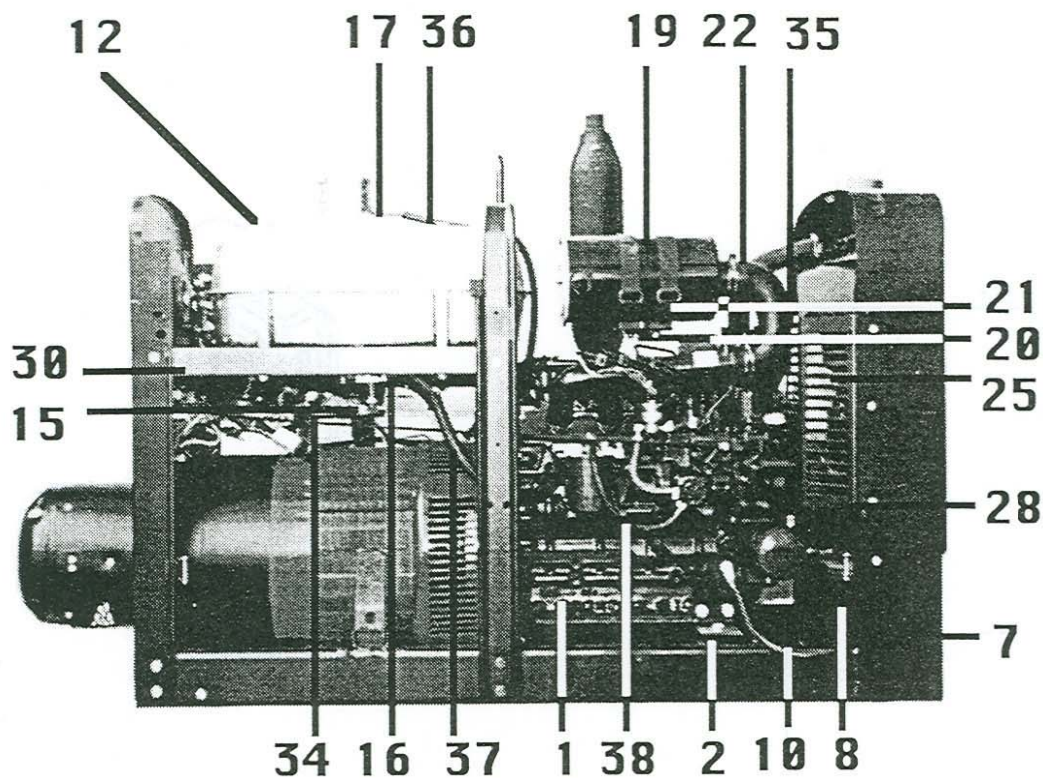


## RADIATOR SHELL AND SCREEN ASSEMBLY



ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
1	Radiator Shell Assembly	1	L3095-100
2	Radiator	1	19418-72061
3	Radiator Cap	1	15021-72632
4	Fan Shroud	1	19418-72331
5	Radiator Cap Cover	1	M8003

MISCELLANEOUS ASSEMBLY





**MISCELLANEOUS ASSEMBLY PARTS LIST**

ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
1	Engine Assembly	1	F2803BG1-RDA-1
2	Engine Mount	2	M-8859-140
3	Generator Assy.	1	G1709-105
4	Coupling Reference Assy.	1	L7345-100
5	Top Radiator Hose	1	15621-72942
6	Bottom Radiator Hose	1	15621-72851
7	Battery Mounting Bracket	1	S12128
8	Battery	1	N+D24C60
9	Positive Battery Cable	1	N&DHAR1060
10	Negative Battery Cable	1	N&DHAR1059
11	Starter Motor	1	15621-6301-2
12	Fuel Tank	1	L3398-19
13	Fuel Tank Gasket	1	S10437-A
14	Fuel Cap	1	S10149
15	Fuel Strainer	1	S6185
16	Hose Connector	1	T13595
17	Hose Connector	8	N+TMH4
18	Generator mount	2	M8859-109B
19	Air Cleaner Assy.	1	G057514
20	Air Filter Mounting Plate	1	32530-13970
21	Air Filter Mounting Bracket	2	67401-54292
22	Air Intake Hose	1	16414-11622
23	Muffler	1	2420117
25	Fan	1	19624-7411-0
26	Lifting Bale & Hook Assembly	1	M6921-100
27	Base	1	9SCL5780-100
28	Left Fan Guard	1	M16993-100
29	Right Fan Guard	1	S11986-100
30	Fuel Tank Rail	1	L3398-19
31	Output Rail	1	M14618-100
32	Front Panel Frame	1	M17602-3
33	Stud Assembly	1	M13900
34	Fuel Shut Off Rod	1	S16098-101

## MISCELLANEOUS ASSEMBLY PARTS LIST

ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
35	Fuel Return Line	1	T10642-1153
36	Fuel Hose (tank to filter)	1	TG2561-103-21
37	Fuel Hose (filter to pump)	1	TG2160-112-4

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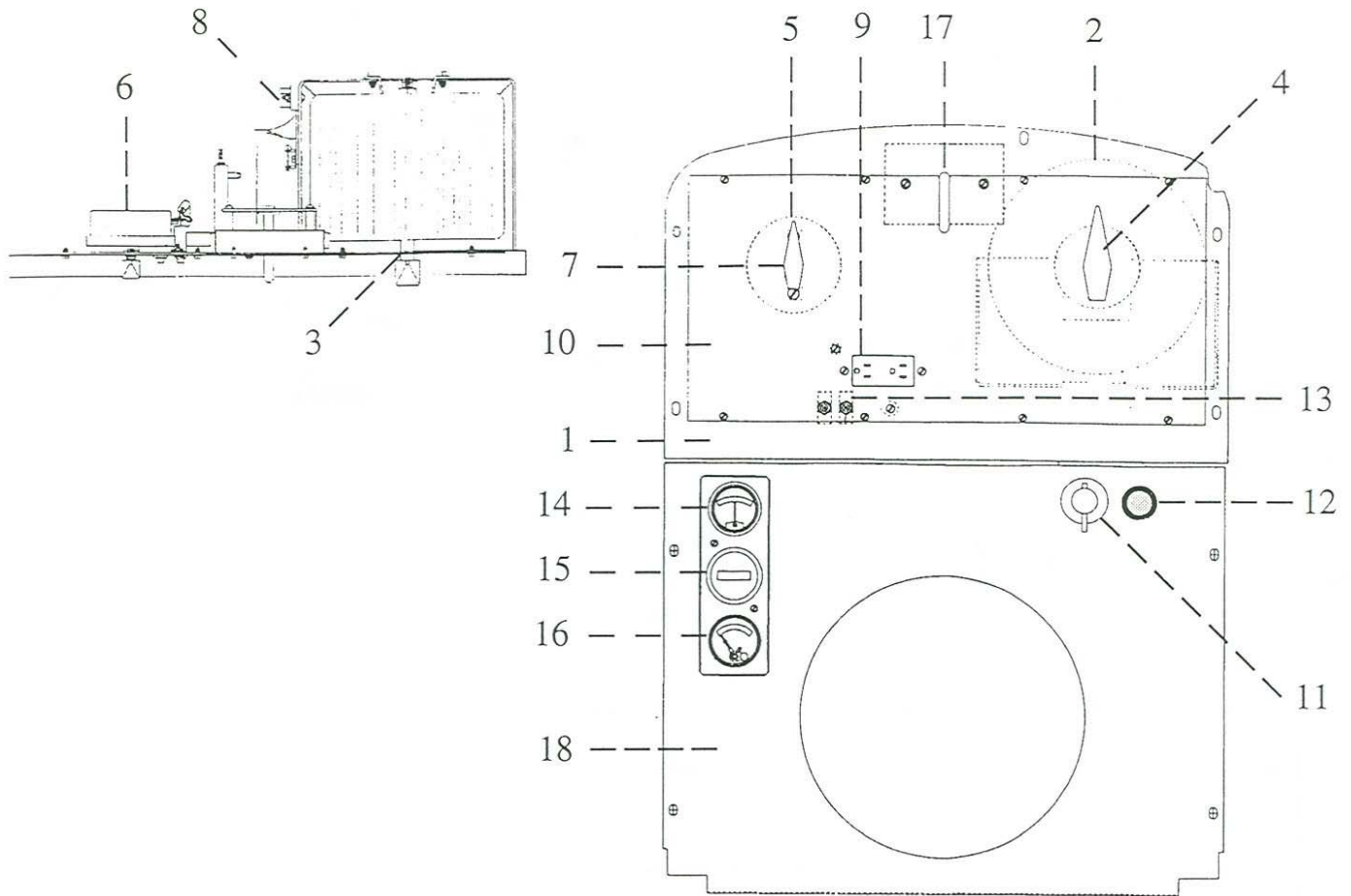
## PARTS NOT ILLUSTRATED

	Roof	1	9SCG3122
	Door	2	L6659-B
	Door Hinge Pin	6	S20295
	Door Hook - Left	2	S10656-1
	Door Hook - Right	2	S10656-2
	Remote / Local Receptacle Assy.	1	M16779-101
	Remote Receptacle - (Female Plug)	1	S20229
	Remote Cable and Plug	1	S20231
	Roof Mounting Angle	4	T9428
	Fuel Tank Support Rails	2	S11873
	Battery Holder Bolt	2	T11888
	Muffler extension pipe	1	NRELBOW

[illegible]

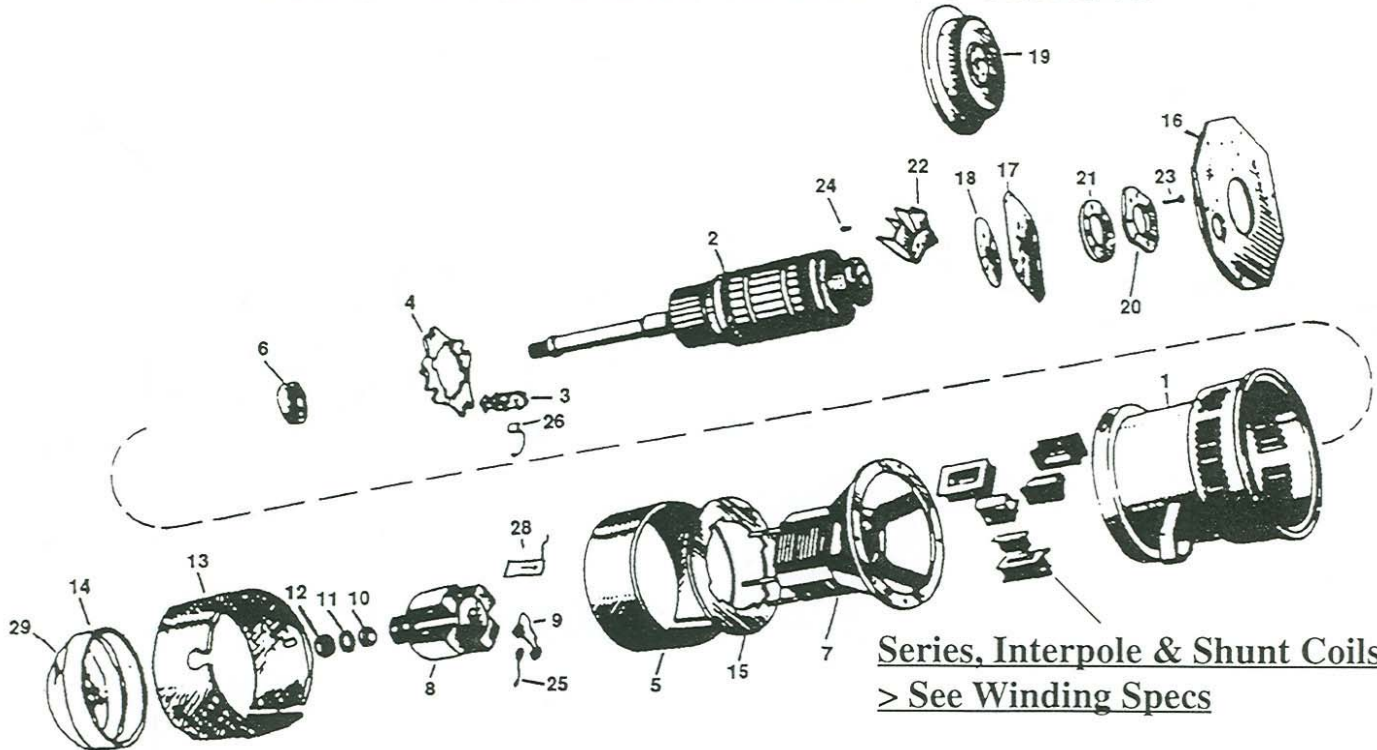


## CONTROL PANEL AND OUTPUT STUDS



-ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.	PART NO.
1	Top Panel	1	M17602-3
2	(Current Range Selector);	1	
3	Variable reactance coil("Reactor")	1	M13335
4	Switch Handle	1	S16664-16
5	(Fine Current Adjustment);	1	
6	Rheostat	1	M5090C
7	Rheostat Handle	1	S16664-13
8	Silicone Bridge Assembly	1	T13637
9	Receptacle Duplex	1	S20143-1
10	Nameplate	1	NR0402181
11	Start Switch	1	32210-3220-0
12	Stop Knob	1	T10889
13	Circuit Breaker - 15 amp	2	T12287-22
14	Amp Meter	1	S7514-4
15	Hour Meter	1	85098
16	Temperature Gauge	1	250-6-S-R215
17	Polarity Switch	1	M7057-1
18	Lower Panel	1	M18739

## WELDING GENERATOR AND COUPLING

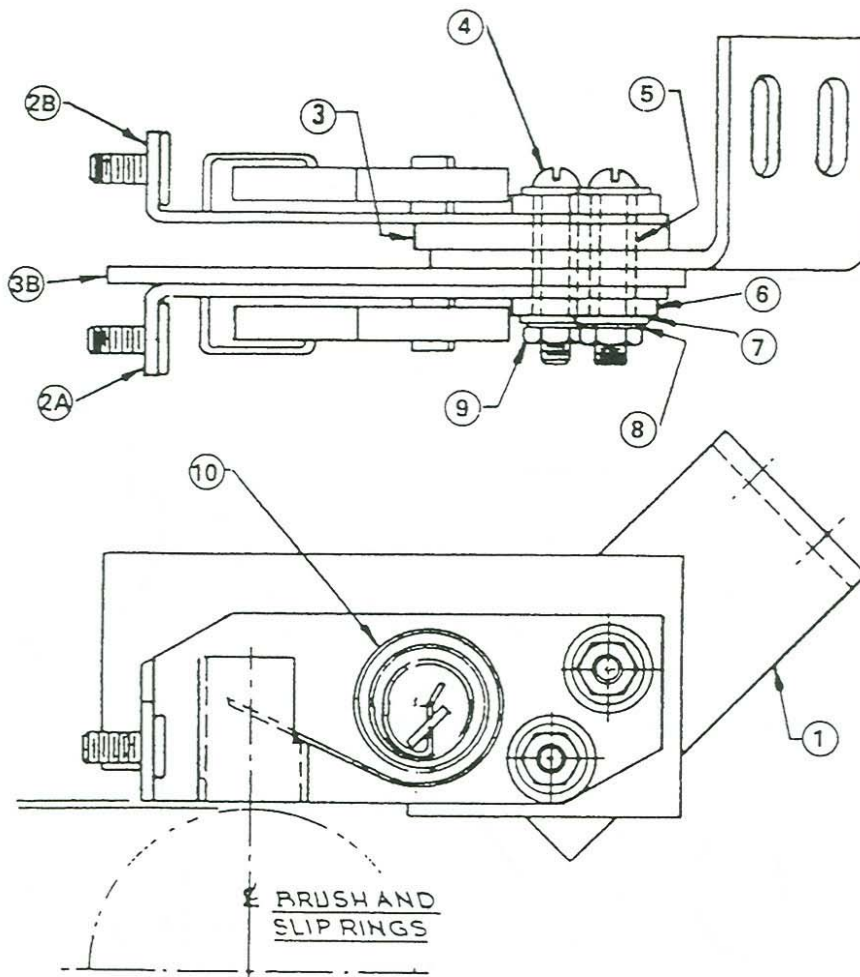


**Series, Interpole & Shunt Coils:**  
> See Winding Specs

ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
1	Stator/Generator	1	G1709-105
2	Armature	1	L2667-27
3	Brushholder	4	M6964-10
4	Rocker (c/w 4 brushholders)	1	S16986-2
5	Generator Cover	1	M5583
6	Bearing	1	M9300-22
7	Exciter Bracket	1	L6795
8	Rotor Assembly	1	M13641-4
9	Alternator Brushholder	1	S17523-1
10	Alternator Sleeve Collar	-	-
11	Locking Washer	1	T7090-1
12	Jam Lock Nut	1	T6225-1
13	Exciter Ext. Wrap	1	L7270-1A
14	Exciter End Cover	1	L7270-1B
16	Housing Plate	1	19859-0462-0
17	Coupling Disk	1	M6730
18	Disc Backing Plate	2	S8042
19	Engine Coupling - Flywheel	2	19626-2501-2
20	Coupling Ring (Outside-Closest to Engine)	1	S14232
21	Coupling Ring (Inside)	1	S14233
22	Blower Segment (sold in sets of 4 only)	1	M10840
23	Hex Head Screws (coupling Rings to Armature Hub)	8	T8833-1
24	Hex Head Screws (blower segments to engine coupling)	8	T8833-2
25	Alternator Brush	2	T14875
26	Generator Brush	8	T12564
28	Alternator Diode & Heat Sink Assembly	1	T13622-1
29	Plastic Plug Button	1	T13597-100

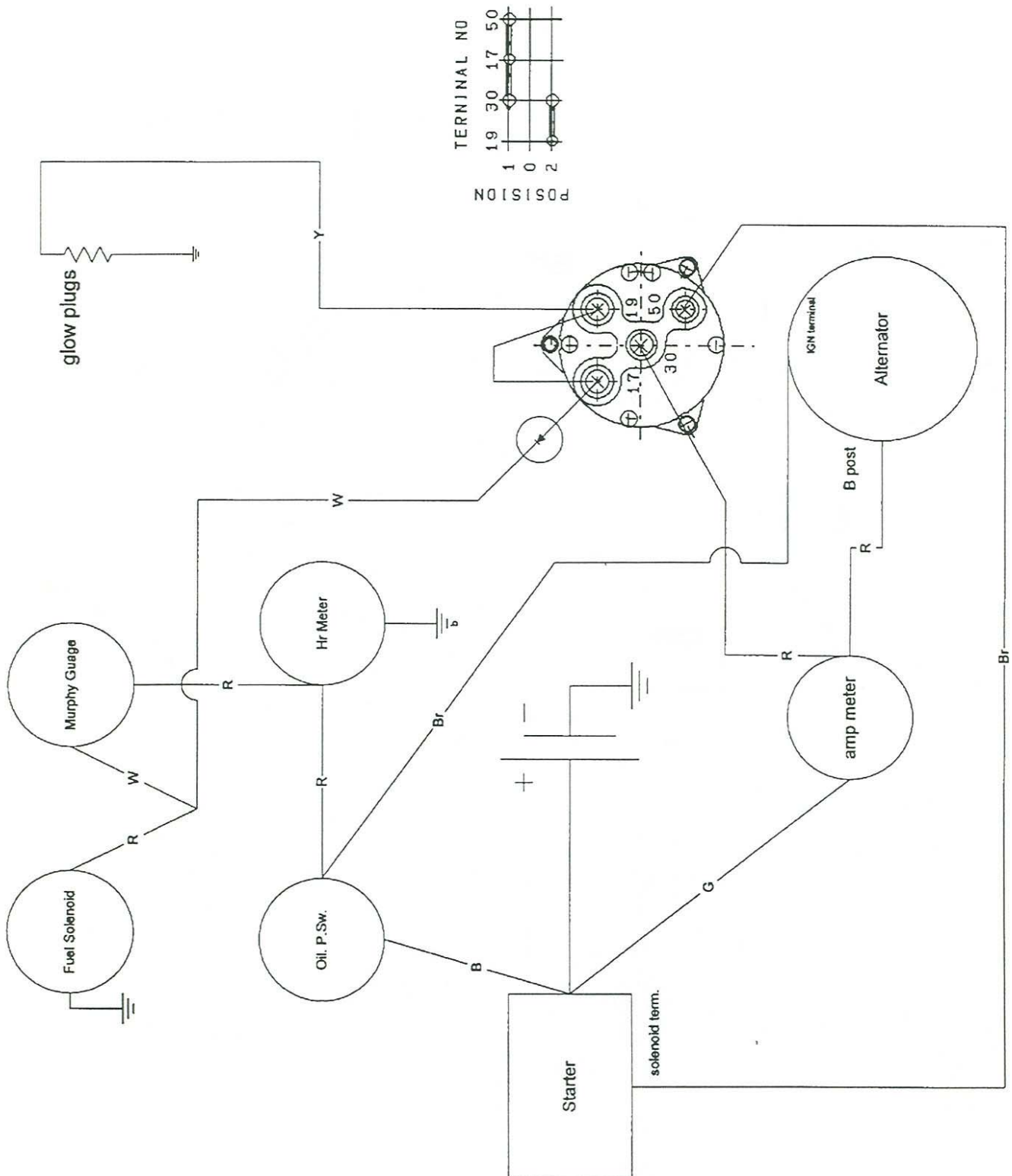


## ALTERNATOR BRUSHHOLDER



ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.	PART NO.
	Alternator Brushholder Assembly, Includes:	1	S17523-1
1	Mounting Bracket	1	S16389
2A	Brushholder	1	S12374A
2B	Brushholder	1	S12374B
3	Insulator	1	T12040
3B	Insulator	1	T14874
4	Round Head Screw	2	10-24x1 1/4
5	Insulating Tube	2	T6675-9
6	Insulating Washer	4	S10773-54
7	Flat Washer	4	S9262-27
8	Lock Washer	2	T9695-1
9	Hex Nut	2	10-24
10	Spring	2	T6887

## ENGINE CONTROL WIRING DIAGRAM





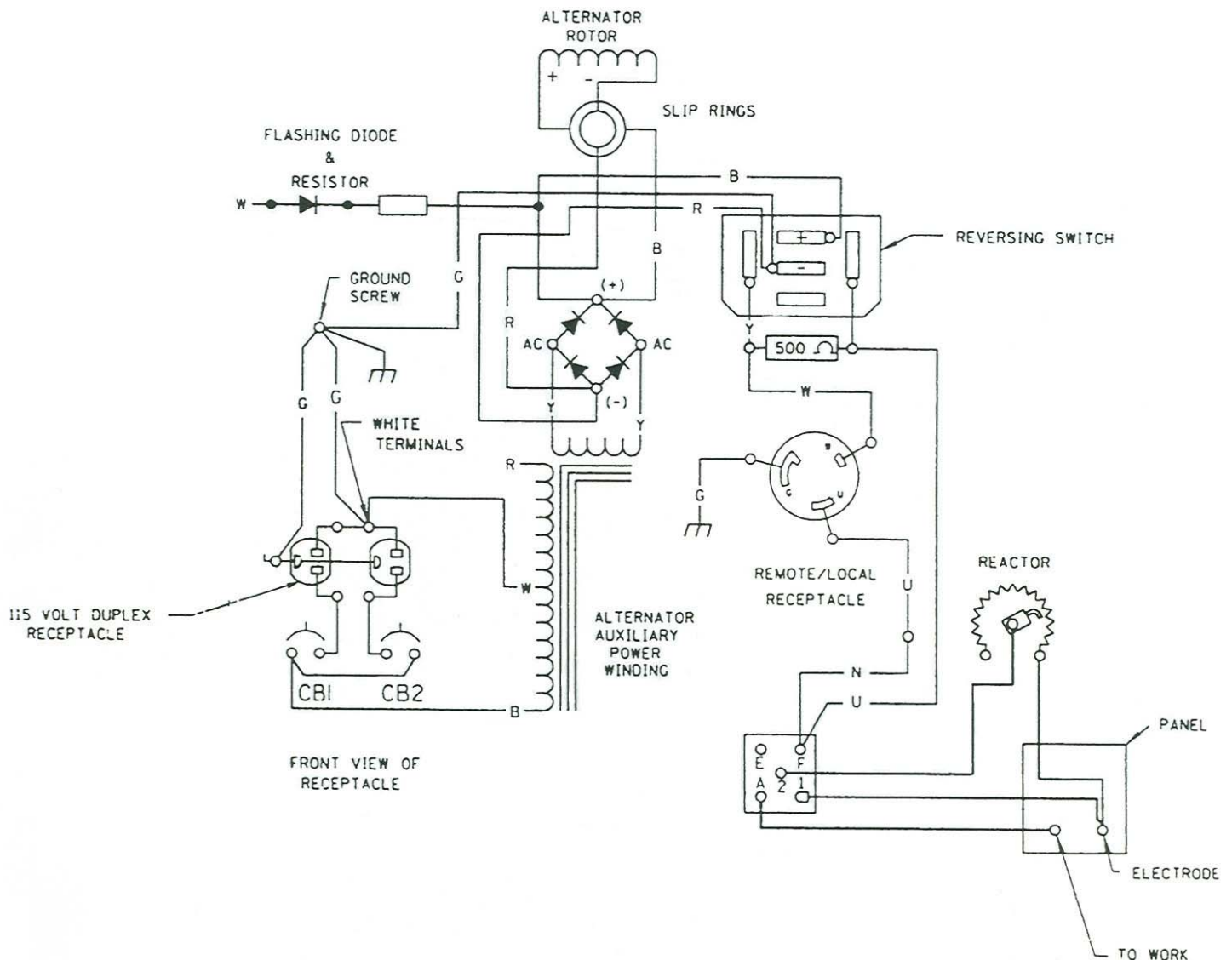
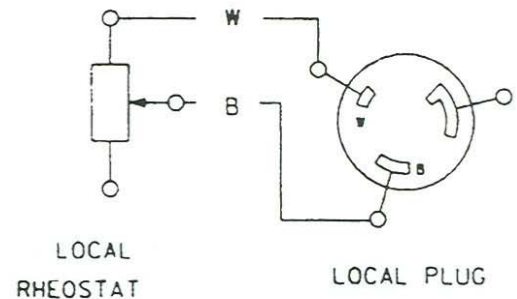
## A.C. AUXILIARY WIRING DIAGRAM

ELECTRICAL SYMBOLS  
PER E1537

CONTROL PANEL COMPONENTS  
SHOWN AS VIEWED FROM REAR  
NEUTRAL BONDED TO FRAME  
NEUTRE RACCORDE AU BATI

### LEAD COLOR CODE

B-BLACK	R-RED
G-GREEN	U-BLUE
N-BROWN	W-WHITE
	Y-YELLOW



***TO ORDER YOUR:***

**KUBOTA  
MODEL F2803-BG1-R.D.A.-1  
DIESEL ENGINE MANUAL  
# 17298-8916-4**

***CALL YOUR LOCAL  
KUBOTA REPRESENTATIVE***



# DIESEL SHOP SERVICE RECORD

MODEL: \_\_\_\_\_ SERIAL#: \_\_\_\_\_ AMP. RATE: \_\_\_\_\_  
ENGINE: \_\_\_\_\_ ENGINE#: \_\_\_\_\_ YEAR: \_\_\_\_\_

MECHANIC											
DATE											
ENGINE HRS.											
FILTERS	OIL										
	FUEL										
	SED. BOWL										
	AIR										
OIL	Check										
	Change										
BATTERY	Service										
	Replaced										
STARTER	Repaired										
	Replaced										
REGULATOR	Repaired										
	Replaced										
	Charging Voltage										
ALTERNATOR	Repaired										
	Replaced										
FAN BELT	Check										
	Replaced										
WATER PUMP	Repaired										
	Replaced										
HOSES	Check										
	Replaced										
THERMOSTAT	Check										
	Replaced										
RADIATOR	Repaired										
	Replaced										
COOLANT	Test										
	Replaced										
FUEL FEED PUMP	Repaired										
	Replaced										
INJECTION NOZZLES	Test										
	Replaced										
GLOW PLUGS	Test										
	Replaced										
SCR	Replaced										
DIODES	Replaced										
OIL SAFETY SWITCH	Check										
	Replaced										
CIRCUIT BREAKERS	Check										
	Replaced										
REMOTE SWITCHES	Check										
	Replaced										
OUTPUT STUDS	Check										
	Replaced										
POT ARC FORCE	Cleaned										
	Replaced										
POT CURRENT	Cleaned										
	Replaced										
P.C. BOARD	Replaced										