

OPERATING MANUAL

SHIELD-ARC® 400AS-50 WITH 12 VOLT ELECTRICS - KA1336



SAFETY DEPENDS ON YOU

Lincoln welders are designed and built with safety in mind. However, your overall safety can be increased by proper installation . . . and thoughtful operation on your part. Read and observe the general safety precautions on page 2 and follow specific installation and operating instructions included in this manual. Most importantly, think before you act and be careful.

THE LINCOLN ELECTRIC COMPANY

(AUSTRALIA) PTY. LTD. A.C.N. 000 040 308
SYDNEY, AUSTRALIA

A Subsidiary of

THE LINCOLN ELECTRIC CO. U.S.A.

Associated Subsidiaries in Australia, Europe, Japan, North and South America.

THE WORLD'S LEADER IN WELDING AND CUTTING PRODUCTS

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| ENGINE SPECIFICATIONS | WELDER SPECIFICATIONS |
|---|---|
| <p>Model Perkins D3.1524 Diesel</p> <p>Power 28kW @ 1500 r.p.m.</p> <p>Capacity 2.5 litres (152 cu.in.)</p> <p>Lubrication High pressure forced feed from rotary type oil pump</p> <p>Cooling Water Cooling with circulation by centrifugal pump</p> <p>Governor Mechanical, on injection pump</p> <p>Fuel Tank Capacity 64 litres (14 gallons). Sufficient for well over one day's operation under severe conditions.</p> <p>Starting 12V battery and alternator</p> | <p>Model Shield-Arc® 400AS-50 (KA1336)</p> <p>Rated Output 400amps at 36 arc volts and 80% duty cycle 300 amps at 32 arc volts and 100% duty cycle</p> <p>Welding Current Range 45-450 amps D.C.</p> <p>Speeds No Load 1500 r.p.m. Full Load 1450 r.p.m.</p> <p>Weight (dry, approx.) Without Trailer 800 kg. With Unsprung Trailer 895 kg.</p> <p>Auxiliary Power * 5000 watts, 240 volts, 50 Hz., 100% duty cycle 2500 watts, 115 volts, 50 Hz., 100% duty cycle * Available while welding. (Refer table next page for welder/auxiliary power ratio.) N.B. If 240 volt and 115 volt supply are being used simultaneously the total current drawn should not exceed 20 amps.</p> |

OPERATING INSTRUCTIONS

IMPORTANT NOTE ABOUT "RUNNING IN" YOUR DIESEL ENGINE

All diesel engines require some additional care for about the first 50 hours operation. While maximum load can be applied to a new engine as soon as it is put into service and the coolant temperature has reached at least 60°C, care should be taken that the engine is not run at very light loads (say less than 2.4 kVA, or a 10 amp radiator) for extended periods, as this can lead to glazing of the cylinder bores. Do not operate at high speeds without a load, and do not overload the engine. Cylinder glazing can lead to excessive oil consumption and smoky exhaust, while overloading during the first few hours can lead to excessive wear and shorten the life of the engine.

ENGINE OPERATION

On receipt of 400 AS-50, remove "Gold Seal" or "Carecard" label from engine, add ownership details, and mail to nearest Perkins Distributor. The Distributor will return a plastic Carecard which must be retained and presented should warranty service be required. Note that the Carecard is accepted world-wide.

Before attempting to start the engine, the following should be carried out:

1. Ensure the crankcase oil level is at the "Full" mark on the dipstick. Use only the grade oil recommended by the engine manufacturer in accompanying Engine Manual.

N.B.: Many oil companies market a product which meets the recommended MIL-L-46152 (SE CC) and the heavy duty and turbocharged engine specification MIL-L-2104C (SE CD). These oils are not recommended for use in this welder, particularly in the initial 50 hours of operation.

2. Fill the radiator and fuel tank (always use clean fuel). Be sure to add Alfoc 2000 to radiator as per container instructions. This is required for corrosion resistance.

3. In the case of a new engine or an engine which has been standing idle for any length of time, it is important to bleed the fuel system. Always use the manual primer on the lift pump to circulate fuel in the system. Extensive use of the electric starter for this purpose may lead to electrical component damage. Refer to the engine instruction manual for the correct procedure.

4. Fill the dry charged battery. See page 6.



**FOR ENGINE
powered equipment**

BEFORE STARTING THE ENGINE

Caution: Operate internal combustion engine in open, well ventilated areas or vent the exhaust fumes outdoors.

Whenever starting the engine, be sure any welding loads are removed and any A.C. auxiliary loads either turned off or the plugs pulled. If the load is left connected it may prevent the generator from building up to full voltage.

To start the welder

Ensure stop cable is fully in, then turn the start switch to the "H" position for 15-20 seconds, then turn further in the clockwise direction to the "start" position. If the engine does not start after 30 seconds, return the switch to the "H" position for 10 seconds and then return to the "start" position. Then engage the starter motor again for a maximum period of 30 seconds. If the engine still does not start, allow at least 10 minutes for the starter motor and other electrical components to cool before repeating the starting procedure. As soon as the engine starts, the start switch should be released and allowed to return to the "on" position. If the engine is warm and has only been stopped for a short period, restart by turning switch directly on to the "start" position and releasing when the engine starts.

NOTE: The "H" position is midway between the "on" position and the "start" position. A definite spring loaded location can be felt at the "H" position. If the oil pressure gauge does not show normal oil pressure (200/420kPa) 10 seconds after starting, stop the engine and consult the engine instruction manual.

Warning: Failure to return the key switch to "on" position, or turning to "start" position while engine is running will cause component electrical damage.

To stop the engine

Pull the stop cable out and hold in this position until the engine has stopped. Turn the key switch to "off" position. The engine speed has been pre-set in the factory for optimum welder performance and the fuel pump and governor then sealed. This setting should not be altered, to

do so will void the warranty. For normal running, lubricating and maintenance instructions, consult the engine instruction manual. For correct cooling air flow, the welder should be operated with the doors closed.

WELDER OPERATION



ELECTRIC SHOCK can kill.

GENERAL

Connect the electrode and ground cables to the studs marked on the welder output panel. The studs are marked "Positive" and "Negative". Some types of electrode require electrode positive and others negative. Therefore consult the instructions for the particular electrode being used to determine which lead is to be attached to the "Positive" and which to the "Negative" stud.

When welding at a considerable distance from the machine, care should be taken that ample size welding cables are used. Small size cables for long distances reduce output at the point of welding.

SETTING THE CONTROLS

The welder is equipped with Dual Continuous Control of the welding output. To meet the varied requirements of present day welding it is highly desirable to be able to vary the voltage and current separately. Dual Continuous Control means that it is possible to get the proper welding current throughout the range to the machine in two or more ways. There are two controls which determine the output of the generator:

1. Continuous Current Control –
to vary the welding amperage
2. Job Selector –
to vary the open circuit voltage of the generator.

JOB SELECTOR

The Job Selector is both the fine current adjustment and the voltage control of the welder. With this control it is possible to obtain the exact current necessary. Also by means of this control the open circuit voltage can be varied to suit different welding applications.

The Job Selector dial is divided into four sections. The section marked "Large Electrodes" provides a high open circuit voltage. The section marked "Normal Welding Range" gives medium high open circuit voltage. The section marked "Overhead and Vertical" gives a medium low open circuit voltage. The section marked "Special Applications" provides a low open circuit voltage and is used with a minimum setting on the Continuous Current Control.

CONTINUOUS CURRENT CONTROL

The Current Control provides the major adjustment of welding current to suit any particular application. The dial

reads continuously in a clockwise direction from maximum to minimum and has three graduated concentric dials corresponding to the respective sections of the Job Selector dial. When the Job Selector is set on the "Over Head and Vertical" section of its dial, the approximate welding current is indicated by the "Overhead and Vertical" scale on the Current Control dial.

Do not change the Current Control setting while welding.

HOW TO SET THE CONTROLS

Assume you want to make a vertical up weld using a 4.0mm electrode at about 135 amps. A snappy digging arc (medium low open circuit voltage) is required to give the best control of the arc in the whipping technique that must be used.

1. Set the Job Selector to the section of the dial marked "Overhead and Vertical".
2. Set the Current Control to read 135 amps on the scale marked "Overhead and Vertical".
3. Strike the arc.
4. If the arc is too weak, move the Job Selector counter-clockwise to increase the current. If a still higher current is desired, turn up the Current Control 10 or 20 amps. In the final adjustment, be certain the Job Selector is still set in the same range to get the snappy arc recommended for vertical welding.



FOR ELECTRICALLY powered equipment

AUXILIARY POWER

These machines are fitted with two standard 3 pin 240 volt 15 amp auxiliary power outlets and two 3 pin 115 volt auxiliary power outlets. Auxiliary power is available while welding - refer Table below for relative loadings. Both 240 volt and 115 volt supplies can be used simultaneously, provided the total current drawn does not exceed the current in the Table. The outlets are located on the control panel of the 400AS-50. Total power available is 5,000 watt, 240 volt, 50 Hz. A.C. at 100% duty cycle or 2,500 watt, 115 volt, 50 Hz. A.C. at 100% duty cycle.

| Welder Output (Amps) | Maximum permissible Auxiliary Power Load (Amps) |
|----------------------|---|
| 400-450 | 5 |
| 350-400 | 10 |
| 300-350 | 15 |
| 300 or less | 20 |

Important: The 400AS-50 auxiliary power circuits are not connected to the welder frame, and earth leakage protection is not required (refer AS2790-1989, Clause 6.1.9.(a) and Comment 1), however connected equipment should be double insulated, or fitted with an effective earth wire.

USE OF WELDERS AS STAND-BY POWER UNITS



FOR ELECTRICALLY powered equipment

Welders with 240 volt, 50 Hz. auxiliary A.C. outlets can be used as stand-by power units.

To avoid the possibility of electric shock and/or damage to

the welding machine, connections and alterations must be made by a licensed electrician, who can determine how the machine can be adapted to the particular installation and comply with the local Supply Authority regulations.

It is also important that an adequately rated isolation switch is used to ensure that the stand-by power unit and the Authorities' Supply are not connected on parallel.