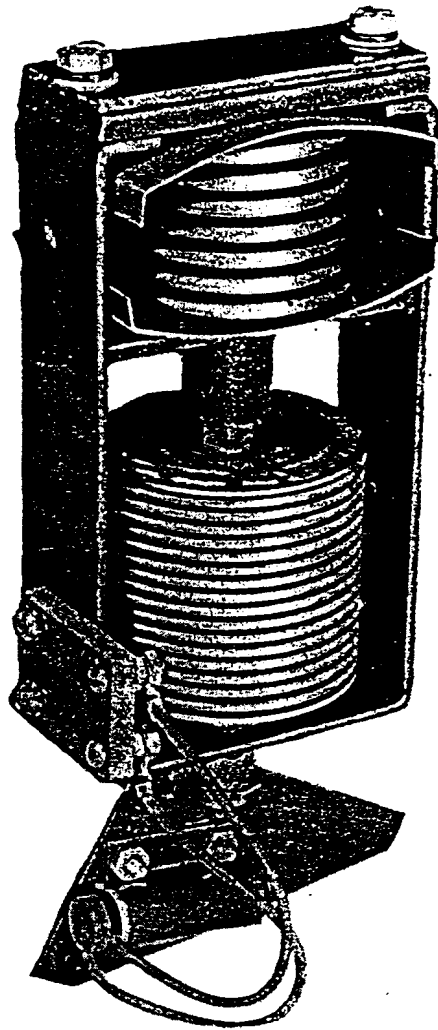




INSTALLATION AND OPERATING MANUAL

Lincoln Engine Idlers



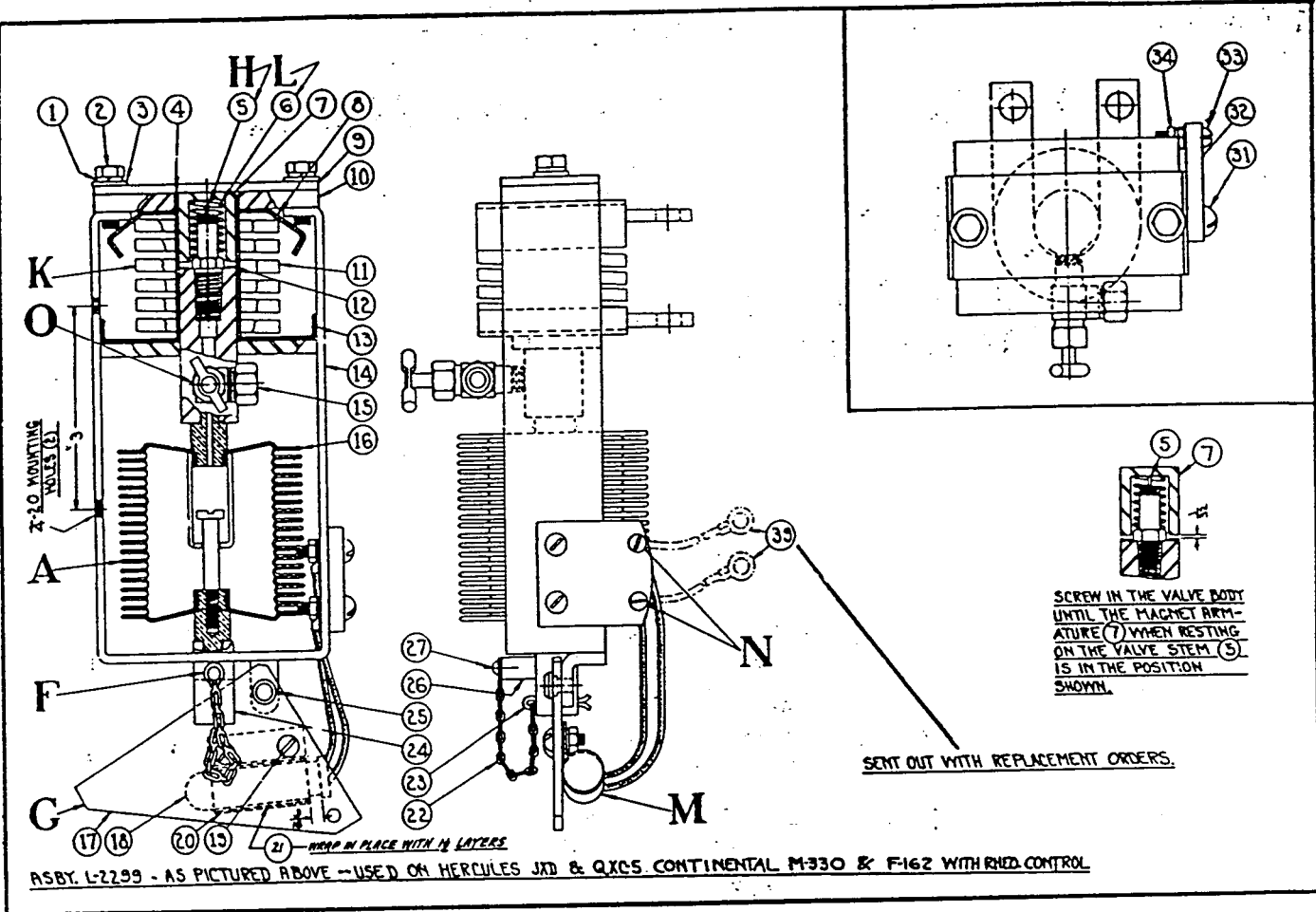
This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

TYPES: L-2299
L-2299-D

THE LINCOLN ELECTRIC COMPANY

The World's Largest Manufacturer of Arc Welding Equipment

Cleveland 17, Ohio

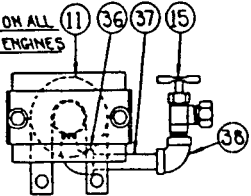


L-2299

SPECIAL APPLICATIONS

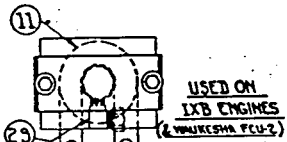
L-2299A

USED ON ALL BUDA ENGINES



SAME AS L-2299 EXCEPT COIL IS TURNED AROUND AND PIPE FITTINGS ARE ADDED

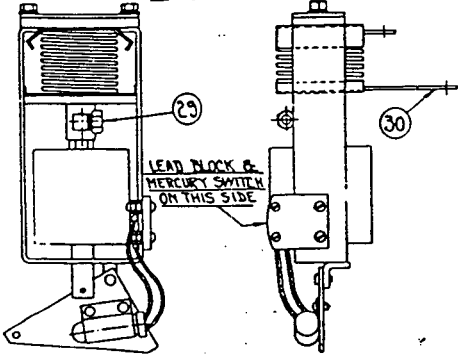
L-2299B



USED ON IXB ENGINES (& WAIKESHA FCU-2)

SAME AS L-2299 EXCEPT COIL IS TURNED AROUND AND ITEM 29 IS USED IN PLACE OF ITEM 15

L-2299C



SIMILAR TO L-2299 EXCEPT FOR SPECIAL COIL AND WITH LEAD BLOCK & MERCURY SWITCH INSTALLED AS SHOWN. USED ON HERCULES IXA ENGINES.

L-2299-D - CANCEL
ITEMS 18, 19, 20,
21, 31, 32, 33, 34,
35 & 39 (USE ON
CONTINENTAL F-162
ENGINES WITH SPEED
CONTROL.

REPLACEMENT PARTS

ITEM	PART NO.	DESCRIPTION	QTY. USED
1	1/4 Std.	Lock Washer	2
2	1/4-20x3/4	Hex. Hd. Cap Screw	2
3	T-1095	Plain Washer	2
4	T-6800	Plunger Guide	1
5	Schroder # 6000	Coil	1
	T-4252-2	Stop	1
6	T-6272	Plunger Spring	1
7	T-4799	Plunger	1
8	T-7871	Insulation	1
9	T-4797	Plunger Stop	1
10	T-4798	Guide Support	1
	S-4613	Coil, IKA Only	1
11	S-8641	Coil, BLD Only	1
	S-4812	Coil, All Others	1
12	T-5245	Stainless St. Washer	1
13	T-7871	Insulation	1
14	M-9944	Frame	1
15	T-9074	Shut-off Cock	1
16	S-2867	Bellows	1
17	S-4504	Lever	1
18	T-9130	Mercury Switch	1
19	10-24x1/2	Ad. Hd. Mach. Screw, C.P.	2
	10-24	Hex. Nut, C.P.	2
20	3/16	Lock Washer	2
21	T-7741	Switch Clip	1
22	1/4 Friction Tape		As Req'd.
23	#000x2-1/2 Lg.	Safety Chain	1
24	1/8x1	Caster Pin	1
25	T-7739	Lever Coupling	1
26	T-7742	Rivet	1
27	T-7743	Locking Pin	1
28	S-8025-27	Drive Screw	1
29	T-9076	"Weatherhead" Elbow	1
30	S-4613	Coil	for 2299 only
31	#10-24x1/2	Ad. Hd. Mach. Screw	2
32	T-7740	Lead Block	1
33	10-24x5/8	Ad. Hd. Cad. Plt. Series Scr.	2
34	10-24	Hex Nut	4
36	1/8 Std.	Street Ell	1
37	T-7589-8	Nipple	1
38	1/8 Std.	Elbow	1
	S-5614-78	IXB Only	1
39	S-5614-1	Washers & Buds	2
	S-5614-4	Hercules JXD & QXCS	2

Valve core for item 5 is a standard fine valve core such as Schroder 6000.

When ordering parts specify numbers in circles, also give sheet number.

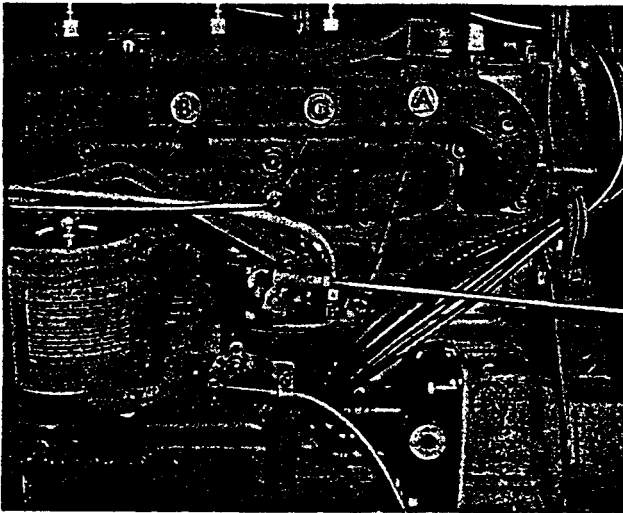
INSTRUCTIONS FOR USE OF LINCOLN ENGINE IDLER

Do not confuse this idling device with the engine governor which is also required. The governor keeps the engine operating at approximately the same speed regardless of load. The idling device causes the engine to decrease to idling speed when no welding is being done.

Installation on "Build Your Own" Welders

Mount the idler to the rear of the carburetor near the generator in a vertical position with the mounting holes facing the rear so that as the bellows contracts, it will pull the linkage and carburetor throttle arm toward the idler, thus causing the engine to idle.

For correct engine regulation, a governor is required which will govern engine speed.



Engine Idler Installation on Lincoln 200 Ampere Engine Driven Welder Using Carburetor.

- A. Arm from Carburetor to Governor.
- B. Connecting Link between Throttle and Idler.
- C. Tubing between Manifold and Idler Bellows.

Most carburetors have a throttle arm which moves toward the fly-wheel to close. If the throttle arm moves toward the crank end to close, it should be turned around so it will close toward the fly-wheel.

Connect the throttle arm of the carburetor to some convenient point in front of the carburetor by means of a spring (not shown in photograph) which is strong enough to pull the throttle wide open when the engine is not running.

The throttle opening spring should be adjusted to pull the throttle wide open quickly when the arc is struck. The link between idler and carburetor should be adjusted in length so that the carburetor throttle is fully closed to the idle speed position when the latch pin is inserted to hold the bellows in the up, or collapsed position.

If intake manifold has no opening to which to attach the tubing from manifold to idler bellows, a hole with 1/8" pipe tap must be made so that the elbow supplied with the idler can be inserted.

Operation

The operation of the idler is as follows: (letters used will refer to details on L-2299 on opposite page).

The device consists of a metal bellows (A), operating from engine vacuum, which serves to close the throttle (a spring on the carburetor holds throttle open in operation) and an armature and spring (L) operating a relief valve (H). A control lever (G) is arranged to permit automatic operation or setting of the engine to idle or run at governed speed. Magnet Coil (K) is connected in series with the welding current. Connect coil between an output stud and the generator lead originally on this stud.

In operation, with latching pin removed, if the operator is not welding but the engine is running, the bellows (A) will be collapsed by the suction of the engine intake and the throttle will be held closed. The throttle should be adjusted to let engine idle at about 950 to 1050 rpm.

Since there is no current flowing, the magnet armature is held up by the spring and the vacuum relief valve (H) remains closed. As soon as the operator touches his electrode to his work, the magnet coil (K) operating through the armature and spring (L) opens the vacuum relief valve (H), permitting the bellows to expand and allowing the engine throttle to open. The vacuum relief valve remains open as long as there is current passing through the welding circuit and thus the engine throttle is held open by its spring. When the operator ceases to weld, the vacuum relief valve closes and the bellows contracts, closing the throttle. The time of closing of the throttle may be regulated by the regulating needle valve (O) and can be set between 2 and 20 seconds. This valve should be opened until the timing is as desired.

On the control lever (G) is a tilting switch (M) which is used to short out the welder field rheostat when the engine idles at low speed. This is necessary so that with the welder voltage reduced and the operator using long leads for welding, there will be sufficient current through coil (K) to operate the engine idler. Connections from terminals (N) are made across the rheostat terminals, i.e., one wire on each side of rheostat. Do not connect these terminals in series with the welder field.

(Note: When speed control is used for varying current, instead of rheostat control, this paragraph does not apply.)

Control lever (G) may be made to hold engine throttle closed by raising handle to closed position and pressing in latching pin (F) to hold it in position. To hold throttle open, push lever down to open position and lock with latching pin. The latching pin must be pulled out for automatic operation.

For easier engine starting it is advisable to push the lever (G) to the closed position.

Replacement of vacuum relief valve (H). This is a standard automobile tire valve and may be replaced by removing plunger. This should be done if the operation becomes unreliable due to dirt in the valve.

Trouble Shooting Guide

A few of the common troubles and remedies are listed below to help get the maximum results from this idler.

- (1) If the engine fails to pick up speed when arc is struck:

This may be due to dirt in the vacuum relief valve or line, or the mercury switch may not be shorting the rheostat. Turn the rheostat to maximum and if the engine picks up speed, the trouble is probably in the mercury switch or connections.

- (2) If there is too much welding current at the arc immediately after engine picks up:

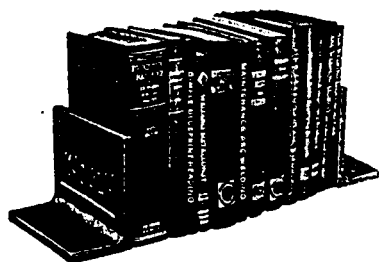
This is usually because the mercury switch does not return quickly to open position (bellows fully extended). Check for dirt in the vacuum relief valve. Sometimes the throttle opening spring is too weak and does not fully tilt the mercury switch, allowing the rheostat to remain shorted too long when the engine picks up to welding speed.

- (3) If engine stalls when arc is struck:

This may occur because the carburetor is set too lean and cannot handle the sudden opening of the throttle when the arc is struck.

* Carburetors can be secured which have two throttle arms operating on the same shaft. If this type is used, then the governor should be connected to one arm and the engine idler to the other arm.

LEADING BOOKS ON ARC WELDING



As a service to its users, the Lincoln Electric Company publishes the following books. Order directly from The Lincoln Electric Company, Cleveland 17, Ohio.

"Procedure Handbook of Arc Welding Design and Practice", 9th Edition. Over 1200 pages and over 1300 drawings, diagrams and photographs; 8 sections of accurate concise information; 1 section of 32 pages of reference data and tables; bound in durable, semi-flexible simulated leather, gold-embossed; and indexed. \$2.00 in U.S.A., \$2.50 elsewhere.

"New Lessons in Arc Welding", 61 lessons based on the practical course in arc welding given at The Lincoln Electric Company plant. Consists of 320 pages with over 450 illustrations and drawings. Price complete \$1.00, postage prepaid in the U.S.A.; \$1.50 elsewhere.

"Simple Blue Print Reading", 4th edition, with particular reference to welding and welding symbols. Consists of 201 pages with 122 illustrations. Price \$1.00, postage prepaid in the U.S.A.; \$1.50 elsewhere.

"Weldability of Metals" A 141 page book; explains factors determining weldability; details welding procedures for steels, nickel, iron alloys, copper, aluminum and hardfacing. This information is reprinted from the "PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE" in order to make available at minimum cost this frequently requested information on how to weld various ferrous and non-ferrous metals. Price 50¢ per copy in U.S.A., postage paid; 75¢ elsewhere.

The following books are published by the James F. Lincoln Arc Welding Foundation. Make checks or money orders payable to this Foundation.

"Metals and How to Weld Them", a non-technical explanation of the structure of metals and their properties explains how this knowledge of metals is important in using good welding methods and solving welding problems. Proper steps for welding all common metals are detailed. Over 250 pages, clearly illustrated. Price \$2.00 in U.S.A., \$2.50 elsewhere, postpaid.

"Studies in Arc Welding" Comprehensive Abstracts of papers submitted in the Foundation's Second \$200,000 Industrial Progress Award Program. Price \$1.50, postage prepaid in the U.S.A., \$2.00 elsewhere.

"Design for Welding" Detailed reviews of 90 papers from the Foundation's \$200,000 Award Program. 1050 pages. Price \$2.00, postage prepaid in U.S.A., \$2.50 elsewhere.

MOVIES

"Prevention and Control of Distortion in Arc Welding" by Walt Disney Productions. An education color-sound film, which explains through the cartoon figure, Mr. Shrink, the causes and cures of distortion in arc welding. Full details in Bul. 709, free on request.

"Magic Wand of Industry Arc Welding" A fast-moving technicolor-sound movie staged in practically every major industry to tell the story of arc welding. For showing to business groups, schools, plants. Full details in Bul. 694, free on request.

"Designing Machinery for Arc Welding" Sound-color motion picture describes functional approach to machine design. With animation. Solves typical problems in design of welded machine parts. Described in Bul. 724.

"Design for Arc Welded Structures" Color, sound movie explains how welded design permits new freedom of planning, reduces steel tonnage, simplifies detailing, fabrication and erection. Full details in Bul. 719.

ARC WELDING ACCESSORIES AND SUPPLIES

The Lincoln Electric Company manufactures a complete line to meet your welding needs. The following items may be obtained from your nearest Lincoln Dealer, Lincoln Salesman, Lincoln Field Service Shop or The Lincoln Electric Company, Cleveland 17, Ohio.

Manual Welders for all types of AC and DC operation.

Automatic Power Sources, Heads and Controls for every AC and DC automatic welding application.

Lincoln Electrodes for every welding application.

Electrode Holders to handle any size of electrode in all current ranges.

Electrode and Ground Cables for use on every size welding unit.

Protective Welding Lenses in all commonly used shade numbers.

Shielding Gas in all types and sizes of both *Face and Head Shields*.

Cable Lugs, Ground Clamps and Detachable Connectors to fit any welding cables.

Steel, welded construction Undercarriages for each standard Lincoln Welder.

Flux and Wire Electrodes for automatic welding.

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