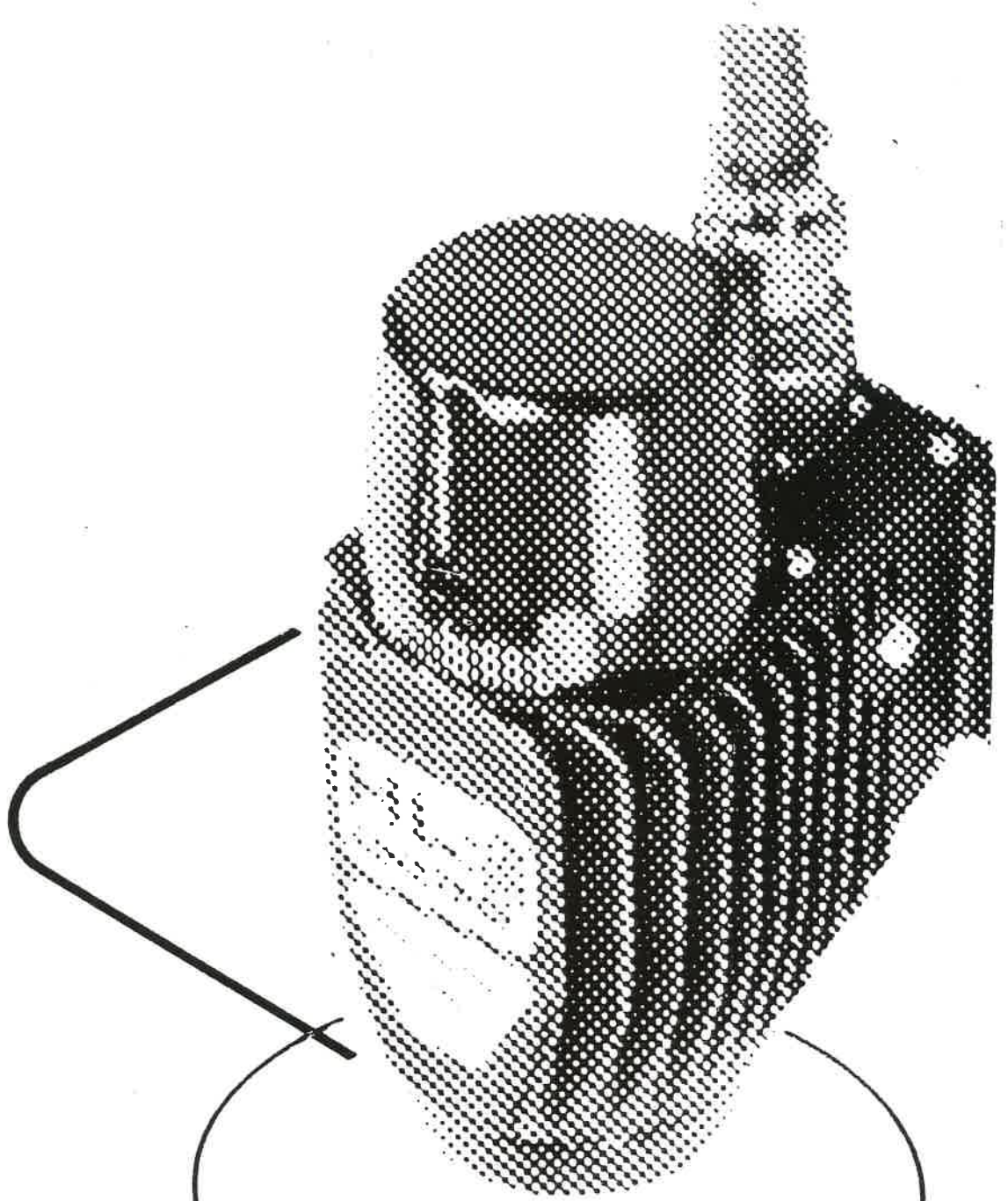


**SHADOW 1500
PROFILE CUTTING MACHINE
MANUAL**



Advanced Cutting Systems Ltd.



ADVANCED CUTTING SYSTEMS LTD

MANUAL

A . D V A N C E D C U T T I N G S Y S T E M S L T D .

SHADOW PROFILING MACHINE

OPERATOR'S HANDBOOK

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I N D E X

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	II	Basic Equipment
	III	Technical Data
	IV	Installation
	V	Operation
	VI	Maintenance
	VII	Spare Parts for Maintenance.

SECTION I

GENERAL DESCRIPTION

The Shadow is a multi-purpose profiling machine capable of taking plasma and/or oxy-propane cutting medias.

The machine can be supplied with up to four cutting heads.

The optical tracing system is the Canadian Westinghouse HL90, a well proven unit giving a standard speed of 1,000 mm/min. with an optional high speed unit available offering a maximum speed of 3,000 mm/min.

Alternative tracing systems are used for larger machines required for plasma cutting speeds.

Once assembled, the Shadow takes the following form:

- the longitudinal track which supports the tracing table
- a main carriage which runs on the longitudinal track and carries the transverse track for the cross carriage
- a cross carriage which moves in a transverse direction to which is fitted the tracing head and the cutting heads
- a hose and cable support track.

IDENTIFICATION OF THE MACHINE

Each machine carries a rating plate on which the type of machine and serial number are given. Please give this information in all correspondence.

The description and characteristics given in this manual and in the associated sales literature are indicative only and non-contractual. The manufacturer reserves the right to improve his products and to make changes without prior notice.

Before using the machine, your attention is particularly drawn to the operating instructions in Section V.

SECTION II

BASIC EQUIPMENT

- 1 Standard tracing head complete with motor drives.
- 3 Rail stands.
- 1 Cross carriage assembly.
- 2 Rails (Drive and Non-drive).
- 1 Tracing table.
- 1 Hose support gantry including 1 set of hoses.
- 1 Manual torch suspension complete with cutting torch and set of nozzles.
- 1 Pack of fixing screws.

OPTIONAL EXTRAS

- High speed tracing head.
- Up to 3 additional torch suspensions complete with cutting torches.

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SECTION IV

INSTALLATION

The assembly and installation of the Shadow is easily carried out by a non-specialist.

Each machine is factory adjusted on assembly, therefore further adjustment needed on commissioning should be limited.

There is no need for any special preparation for siting the machine although a level floor will be of benefit.

ASSEMBLY

- 1). Secure the 2 rails to the 3 rail stands using the M10 caphead screws provided.
- 2). Level the rails using the M12 caphead screws fitted in the rail stand feet.
- 3). Remove one end stop and slide the cross carriage assembly into position. Replace the end stop and secure with the 2 M6 caphead screws.
- 4). Check the level of the cross carriage. Any fine adjustments may be carried out using the non-drive rail check rollers.
- 5). Remove table end stop and slide table into position. Replace end stop.
- 6). Attach the tracer unit to the mounting plate, using the 3 caphead screws provided. Set the tracer at 38 mm from the surface of the drawing table to the line scribed around the lens. Check the height at 5 points. (i.e. table centre and 4 corners).

Any fine adjustments can be made by adjusting the eccentric wheels on the drawing table.
- 7). Insert the one-off mains and two-off motor drive connector plugs into the top of the tracer unit.
- 8). Rawl-drill 10 mm diameter through the four holes provided in each stand and secure, using fixing bolts supplied.
- 9). Ensure all bindings used during transit are removed. Plug the machine into the mains supply and turn on.
- 10). Connect gas supply into aluminium connector block and test for leaks.

ASSEMBLY (Continued)

Gas Supplies

The quality of cutting depends to a large extent on the gas supply circuit:

- check that the gas supply pressure is adequate.
- check that the gas regulators are appropriate to the flow required.
- check that hose joints are leak free, etc.,
- to avoid extensive damage in the event of a flashback (which occurs with incorrect gas settings when oxygen enters the fuel gas hose and burns the gas back to the cylinder) we recommend that flashback arrestors are used.

Cutter Carrier

The Shadow can be fitted with 1, 2, 3 or 4 cutters with their supports.

Cutting tips should be selected according to the application, type of fuel gas and thickness of material being used (See cutting table).

Adjustments

- (a) Position on cross carriage. Slacken the locking screw and use hand wheel for sideways displacement.
- (b) Handwheel of horizontal slider allows the cutters to be precisely aligned for starting the cuts at the plate edge.
- (c) Handwheel for vertical adjustment.
- (d) Up/down cutter adjustment
350 mm.
Can be adjusted when needed for smooth operation by means of the Allen screws provided.
- (e) Tilt adjustment
Allows the cutter to be inclined at an angle for bevelling.
- (f) Mounting a Supplementary Cutter.
Loosen the top lockscrew and slide onto the rail.

SECTION V

OPERATION

Cutting Tips

The cutters provided with this machine can be used for cutting mild steel plate of thicknesses from 3 to 250 mm.

Cutters are supplied with a set of cutting tips. The tips should be selected according to the heating gas to be used and material thickness to be cut.

On each tip is marked, the manufacturer, part number, heating gas, (acetylene-A, propane-P) the size in mm., the thicknesses (mm) to be cut.

USE EACH CUTTING TIP ONLY FOR THE GAS FOR WHICH IT IS DESIGNED.

Maintenance

Cutting tips are precision manufactured and should be kept in first-class condition to obtain the best cutting results. When not in use, they should be returned to their plastic container.

Operating Instruction

1. Extinguish all naked lights, cigarettes, etc. in the vicinity.
2. Check that all gas valves on the cutting heads are closed. Turn on the gas cylinder valves:
 - fuel gas
 - heating oxygen
 - cutting oxygen
3. Check that the cutting tip is suitable for the intended application:
 - type of gas
 - thickness to be cut

4. At each cutter half turn on the fuel gas, light it, slowly turn on the heating oxygen so that the flame turns blue.

Adjust the heating gas to the intensity required, then increase the heating oxygen until the series of blue cones at the base of the flame become very distinct.

5. Apply the flame to the edge of the plate so that the plate rests just below the blue cones. When the metal becomes red hot, slowly turn the cutting oxygen fully on.

When cutting commences, start the tracer.

6. Check that the gas pressures correspond to the cutting table, trimming as necessary. The cutting speed should be such that the sparks beneath the plate angle in advance of the cut. The settings may also be trimmed to improve the cut appearance.

NEVER TURN ON THE OXYGEN BEFORE TURNING ON THE FUEL GAS

USE OF TOO MUCH OXYGEN OR INSUFFICIENT FUEL GAS GIVES RISE TO 'FLASH BACK' CONDITIONS.

ALWAYS TURN OFF THE CUTTING OXYGEN FIRST, THEN HEATING OXYGEN, THEN FUEL GAS.

After use, turn off the gas supplies at the cylinders.

N O T E

THE OPERATOR MUST BE EQUIPPED WITH FILTER GOGGLES (for viewing the flame whilst cutting) HEAT PROOF GLOVES AND SUITABLE PROTECTION AGAINST SPARKS. (These are not included with the machine).

SECTION VI

MAINTENANCE

The Shadow requires little maintenance apart from regular cleaning. To ensure trouble-free operation the following is recommended:

Rails: Every one or two days, clean the rails with white spirit. Dry completely with paper towel, or similar.

- table rails
- main carriage rails
- square section cross carriage rail.

Rollers: Clean once a week. Note that the bearings are lubricated for life. Should it be necessary to use a de-greasing agent on the rollers themselves, this should not be allowed to run into the bearings.

Cutting Heads: Each day, brush off the spatter accumulating on the exposed parts.

Each week, thoroughly clean the horizontal slider and the rack and body of the cutting torch. Lightly oil the sliding parts as for the rails.

Each month, check the play in the movement and adjust as necessary.

Tracer: Refer to tracer manual.

Hoses: Periodically check the condition and replace when defective.

Ensure that all joints are leak-tight.

Clutch: See Drg. S-001 for clutch adjustment.

CUTTING DATA CHART

OXY-PROPANE, BUTANE, NATURAL GAS

Thickness mm.	Tip Size 6290 VVC.	Speed mm/min.
to 4	5/0VVC	550-750
4 - 6	4/0VVC	520-700
6 - 9	000VVC	480-650
9 - 12.5	00VVC	450-630
12.5- 20	0VVC	400-600
20 - 35	0½VVC	360-550
35 - 50	1VVC	250-480
50 - 60	1VVC	220-400
60 - 75	1½VVC	200-310
75 - 100	2VVC	190-280
100 - 125	2VVC	180-240
125 - 150	2½VVC	160-200
150 - 175	3VVC	150-180
175 - 200	4VVC	150-180
200 - 225	5VVC	130-150
225 - 250	5½VVC	110-130
225 - 250	5NH	110-130
250 - 275	6NH	110-130
275 - 300	7NH	100-120
300 - 380	8NH	100-110

CUTTING DATA CHART

OXY-ACETYLENE

Thickness mm.	Tip Size 6290	Speed mm/min.
to 5.	000	500-600
5 - 10	00	400-500
10 - 15	0	350-450
15 - 25	1	300-400
25 - 50	2	300-350
50 - 75	3	250-300
75 - 150	4	150-200
150 - 200	5S	100-150
200 - 300	6S	50-100

PART OF

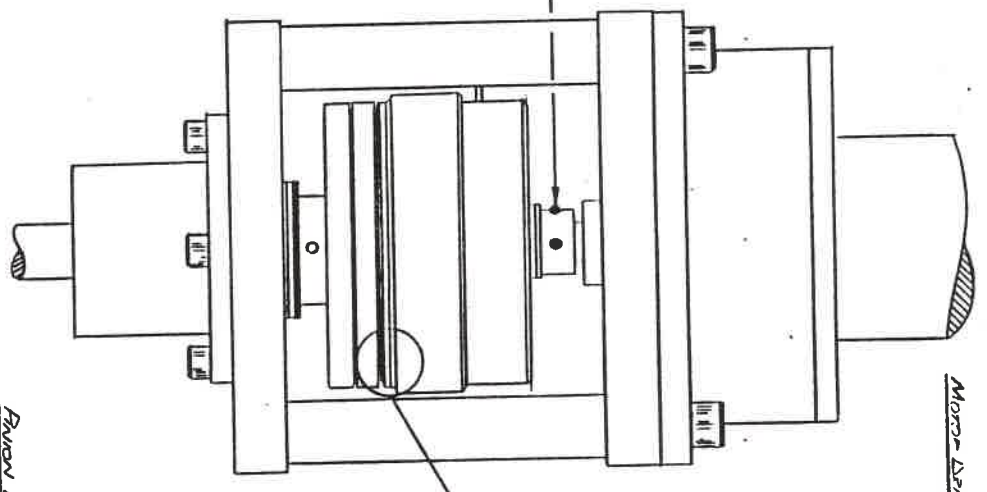
DO NOT SCALE

DRG. No. S-001

LOC ADJUSTING SCREWS.

NOTE:- IF FOR ANY REASON IT IS NECESSARY TO ADJUST THE ELECTRO-MAGNETIC CUTTERS FITTED TO YOUR SERRAW APPLICABLE CUTTING MACHINE, PLEASE OBSERVE THE FOLLOWING POINTS.

- 1) REMOVE UPPER COVERS FROM CLUTCH HOUSING.
- 2) RELEASE THE TOP ADJUSTING SCREWS INDICATED.
- 3) SET THE CLUTCH GAP TO THE DIMENSION GIVEN AT ENLARGEMENT 'A'.
- 4) SECURE ONE ADJUSTING SCREW & TEST RUN DRIVE.
- 5) IF NO FURTHER ADJUSTMENT IS NECESSARY SECURE BOTH SCREWS TIGHTLY WITH LOC-THRE. IF NECESSARY MAKE FURTHER ADJUSTMENTS BEFORE SECURING THE SCREWS.
- 6) REPAIR OR REPLACE OUTER COVERS, ENSURING A GOOD SEAL IS MAINTAINED TO PROTECT THE UNIT FROM DUST CONTAMINATION.



ENLARGEMENT 'A'

0.1mm TO 0.2mm GAP

RIVON DRIVE

ISSUE	DESCRIPTION	APRD DATE	TITLE	DRAWN	TRACED	CHECKED	APPROVED	DATE
	ADVANCED CUTTING SYSTEMS DIV. 24. SERRAW LANE NW. EST. SERRAW LANE. OLD WASHINGTON CHARLESTON, S.C. 29405 TEL: (803) 455-5336		ELECTRO-MAGNETIC CUTTER ADJUSTMENT DETAILS.	JM				6-9-88

DRAWING No. S - 001