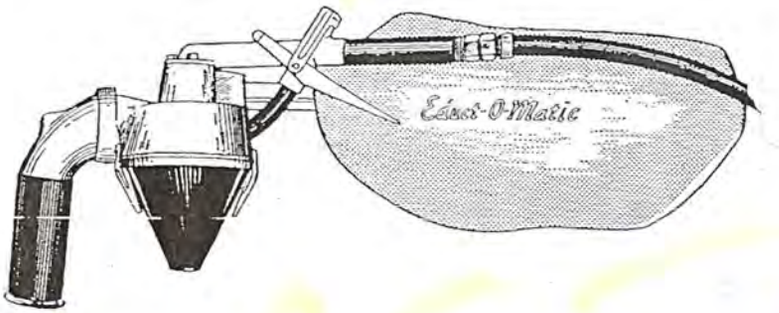


EDUCT-O-MATIC

Operating principles

INTRODUCTION

The Educt-O-Matic combines a continuous blast and recovery cycle with instantaneous control in a light, portable, and efficient unit. This is made possible by a very compact design in which the maximum simplicity of operation is achieved. The several phases of the cycle of operation include abrasive feed, blast, recovery, separation and exhaust.

BLAST ACTION

The business end or blast head part of the gun is shown in section in Figure 1. The blast head is connected by means of a swivel joint to the main body of the machine. Compressed air is carried into the blast head through an air hose connected with a special swivel fitting. The air passes through the innermost of three concentric passages in the swivel joint. It discharges through the blast jet into the blast nozzle creating suction in the abrasive feed passage by eductor action. The abrasive flowing into the blast nozzle is entrained by the air stream and blasted against the surface. The open end of the adapter boot is always held against the surface being blasted to prevent the abrasive from escaping.
The swivel connection between the blast head and the main body makes it possible to direct the blast in any direction by rotating the blast head while holding the main body of the machine in its normal upright position. The rubber adapter boot is flexible enough to fit over irregular and curved

surfaces or welding beads etc. Special adapters are provided for corners and edges. The rubber adapter boot also serves to protect the tungsten carbide nozzle from damage by impact.

RECOVERY ACTION

Around the outside of the blast cone of the adapter boot is a region under vacuum through which the spent abrasive and debris is drawn away from the surface. This flow passes through the outermost of the three concentric passages of the swivel joint into the main body of the gun. Within the main body of the gun (see Figure 2), the abrasive is centrifugally separated from the suction stream by cyclonic action. The abrasive drops down from the main body through a screen into the abrasive container where it is ready to repeat its cycle. A baffle is located above the screen to control the cyclonic action of the main body and prevent turbulence within the abrasive container. The air and lighter particles of dust flow in a spiral pattern inwardly to the centre of the main body and up out through the top.
The main body must be held in a generally upright position to maintain the abrasive within the container.

EXHAUST ACTION

Suction for the recovery system is provided by a suction jet located in the upper part of the main body. It discharges out through the exhaust tube into the dust bag drawing along the air and dust of the suction stream. It operates on the eductor principle just as the blast nozzle does, however, air rather than abrasive is the material being entrained.
The Educt-O-Matic derives its name from the fact that its cycle of operation depends on the blast and suction jets both of which operate on the "eductor" principle.

ABRASIVE FEED

The abrasive feed path has been kept very short to reduce losses. The abrasive is drawn into the abrasive hose at the bottom of the abrasive container. It flows up into the swivel joint through the rubber swivel connector which forms the intermediate concentric passageway (see Figure 1), and then directly into the blast nozzle.
When the abrasive container is removed from the machine the upper end of the abrasive hose is pulled out of the main body. It is important to push it all the way in when replacing the container.

CONTROL VALVE ACTION

The control valve provides instantaneous control of both the blast and suction. The air supply hose is connected to the valve at the pipe nipple and the valve has two outlets — one through a hose to the blast jet within the blast head, and the other to the suction jet within the main body.

The valve is double acting, having two seats. In order for air to pass to the blast jet both the primary and secondary seats must be open, but for air to travel to the suction jet only the primary seat needs to be open.

As the valve handle is lifted the valve stem first opens the primary seat only. For about the first 3/16 inch of travel of the valve stem only the primary seat is open so that only the suction will operate and the machine actually performs like a vacuum cleaner. When the unit is operated in this manner it will suck up any abrasive placed on the surface so that it can be loaded automatically.

As soon as the valve is opened farther or all the way, both seats are open and both blasting and suction takes place. The valve may be closed at any time by the operator to stop blasting. It is possible to prevent the loss of any abrasive when stopping by momentarily holding the valve open in the suction position long enough to recover the abrasive which happens to be within the blast head at that time.

Operating instructions for the Educt-O-Matic

AIR CONNECTION TO EDUCT-O-MATIC

Use of air filter and moisture trap is recommended to prevent clogging of passageways.

Check air supply. For normal use, pressure shouid be maintained at 80—100 psi. at the Educt-O-Matic unit.

Connect flexible air hose to unit. At least a 1/2" — but preferably 3/4" air line should be used up to unit.

Turn air on at source when ready to use. Control valve regulates air but air should be turned off at source when unit is not used for a period of time.

HANDLING EDUCT-O-MATIC

The Educt-O-Matic is held with the right hand gripping the control valve handle and the left hand holding the rubber surface adapter boot of the blast head. The main body of the unit is held so that abrasive container points generally downward.

LOADING EDUCT-O-MATIC

The Educt-O-Matic is loaded either by releasing container latches and adding abrasive directly into container or preferably by placing about half a litre of abrasive onto a surface and sucking it into the machine through the rubber surface adapter boot. Suction is applied by opening the air control valve part way only. Care should be taken as opening valve further starts blasting.

BLASTING WITH EDUCT-O-MATIC

The blast head is swivelled to allow the open end of the surface adapter boot to be held against the surface to be blasted. Blasting is begun when the air control valve is opened all the way. The Educt-O-Matic cleans a path as the adapter boot is moved over the surface. The adapter boot should always be kept against the surface to seal the area being blasted and prevent abrasive from escaping.

When blasting is to be stopped the air valve is closed. To recover abrasive which would drop from nozzle area as blasting is stopped, the air control valve should momentarily be held part way open in the suction position before closing completely.

The abrasive supply may be checked by opening the abrasive container. It may be added to or replaced if found necessary. The dust bag may be emptied by first loosing the thumb screw and removing the exhaust tube

and bag from unit. The bag is then opened by removing the slide clamp (see Figure 3).

CAUTION:

1. Never open air valve unless adapter boot is sealed against a surface to be cleaned. Looking into nozzle end while air is connected is like looking into a loaded gun barrel!
2. Turn off air at source if Educt-O-Matic is not in use.
3. Always clean abrasive from mating surfaces before assembling any parts.

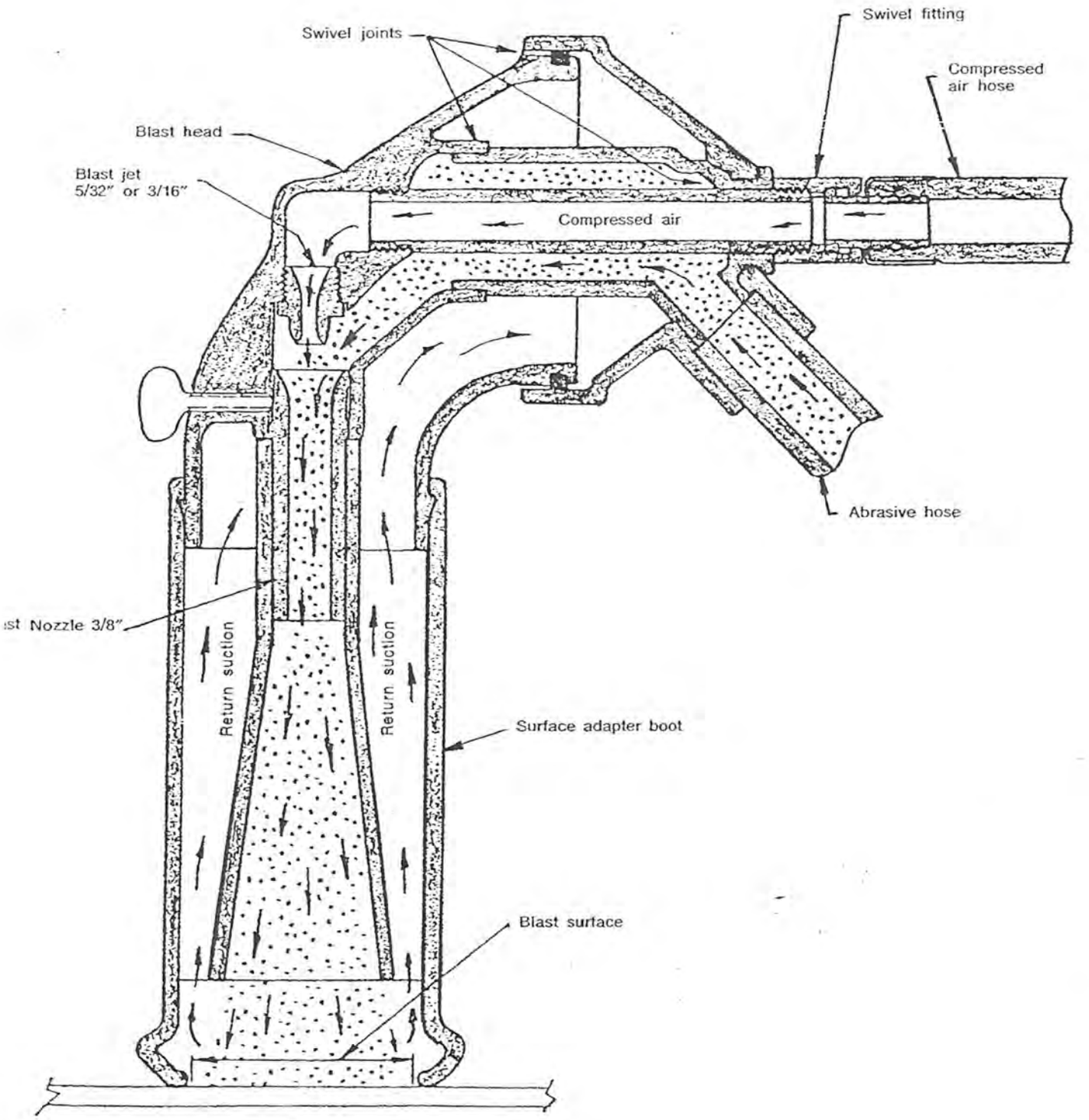


Fig. 1

Blast head flow pattern of EDUCT-O-MATIC portable blast cleaner.

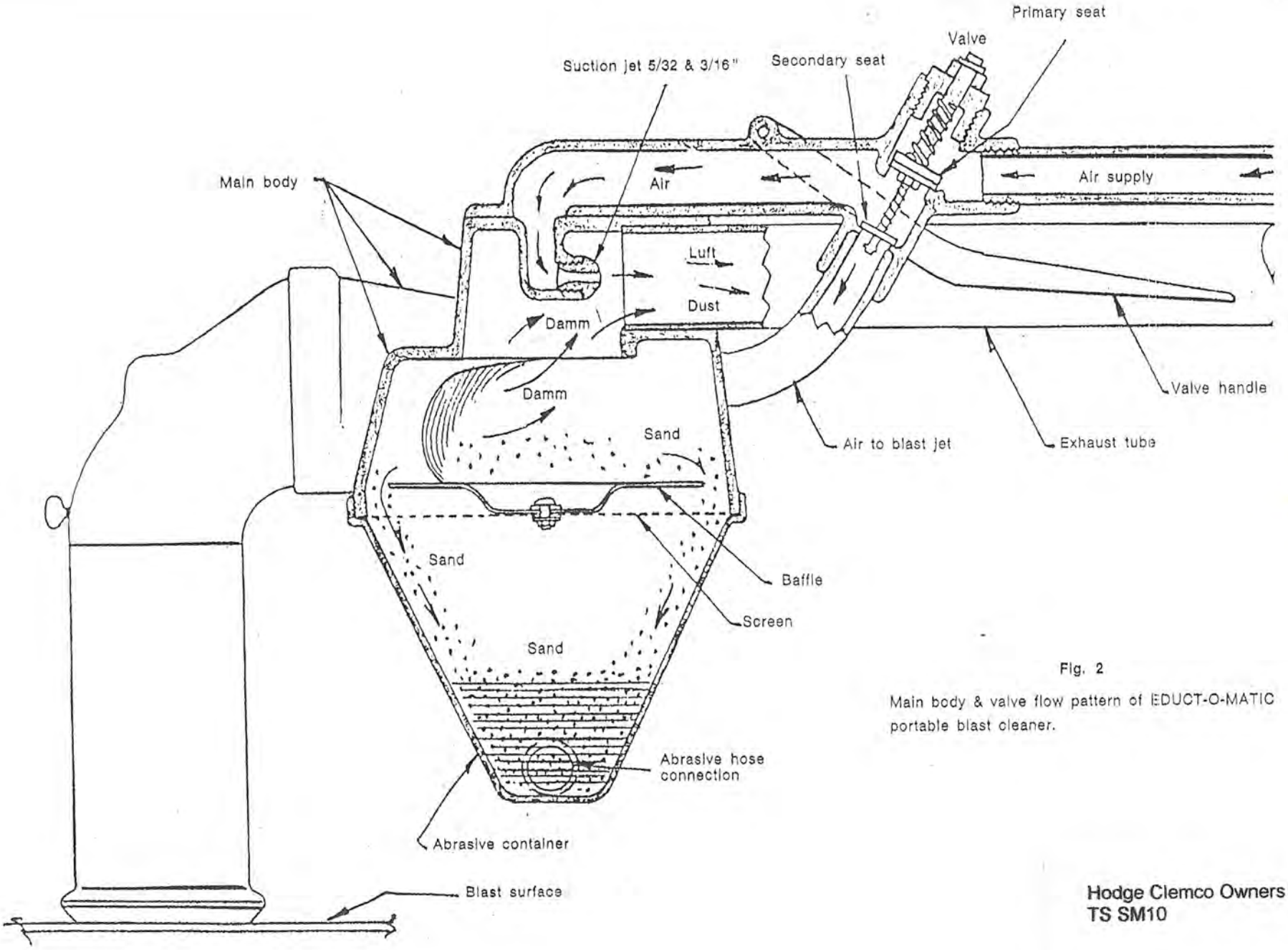


Fig. 2

Main body & valve flow pattern of EDUCT-O-MATIC portable blast cleaner.

Maintenance

Dust Bag should be emptied periodically depending on general use of unit. Loosen thumb screw to remove bag from unit. Slide off clamp and shake. Before replacing tube into socket clean mating parts.

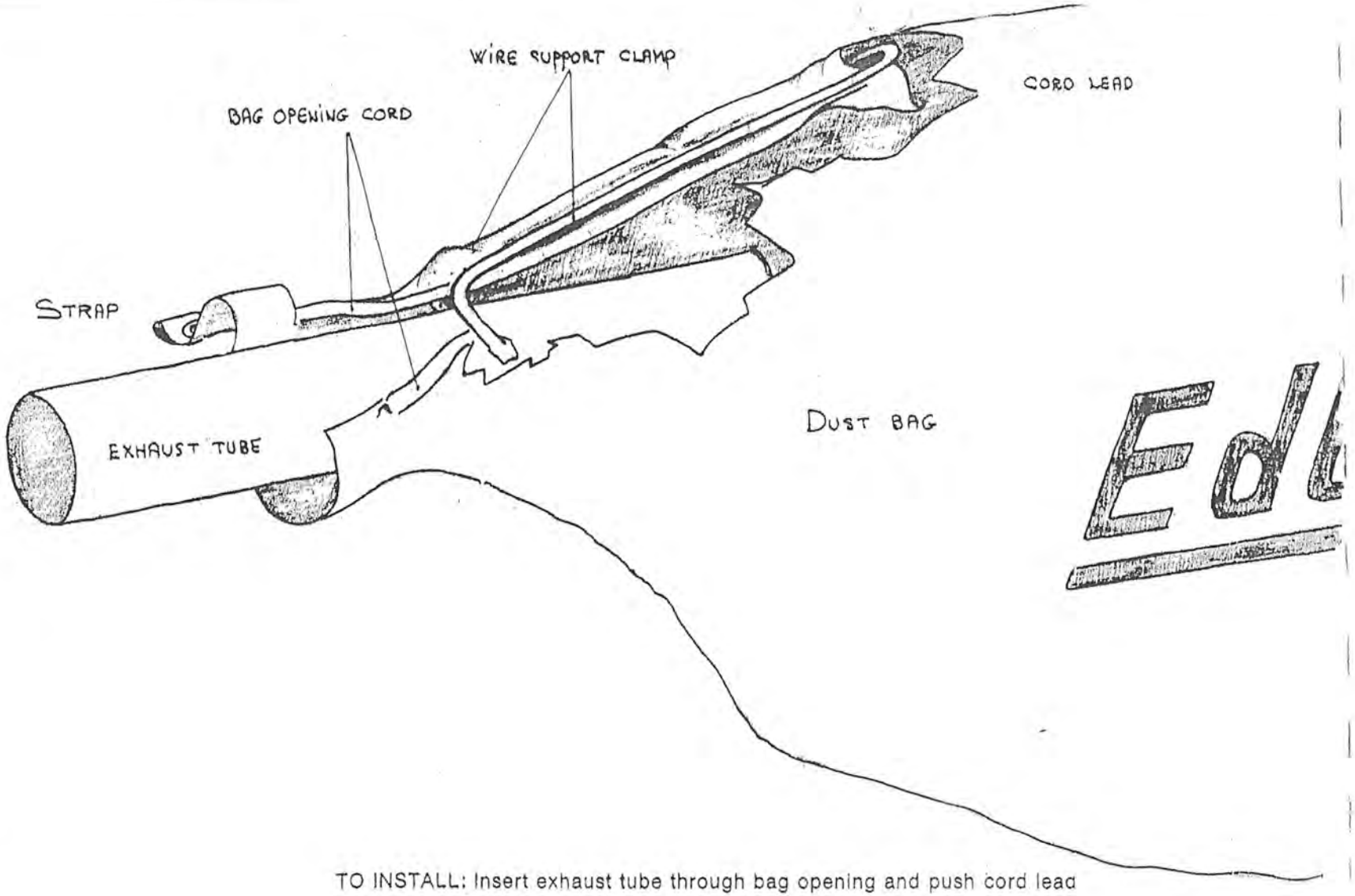
Rubber surface adapter boot should be inspected for wear periodically and replaced if worn excessively. Adapter boot is easily snapped on and off.

Blast sleeve should also be inspected for wear periodically and replaced when necessary. It is removed by loosening thumb screw. When replacing, clean mating parts and never tighten thumb screw more than finger tight.

To remove abrasive container loosen snap latches and remove top end of abrasive hose from main body. Before replacing container clean any abrasive from sealing surfaces.

To inspect flow paths through swivel joint and blast head, loosen air hose swivel nut and remove blast head. Clean abrasive from all mating parts before replacing.

Special care should be taken to clean all parts free of abrasive before any assembly is made to avoid damage to mating surfaces.



TO INSTALL: Insert exhaust tube through bag opening and push cord lead of bag opening through space between wire support clamp and tube. Then pull bag over clamp in direction indicated by arrow. Wrap elastic strap around exhaust tube and snap to seal closed.

TO REMOVE: Unsnap elastic strap and push exhaust tube into bag by pulling bag over wire support in direction opposite to arrow.

Parts list for the Educt-O-Matic

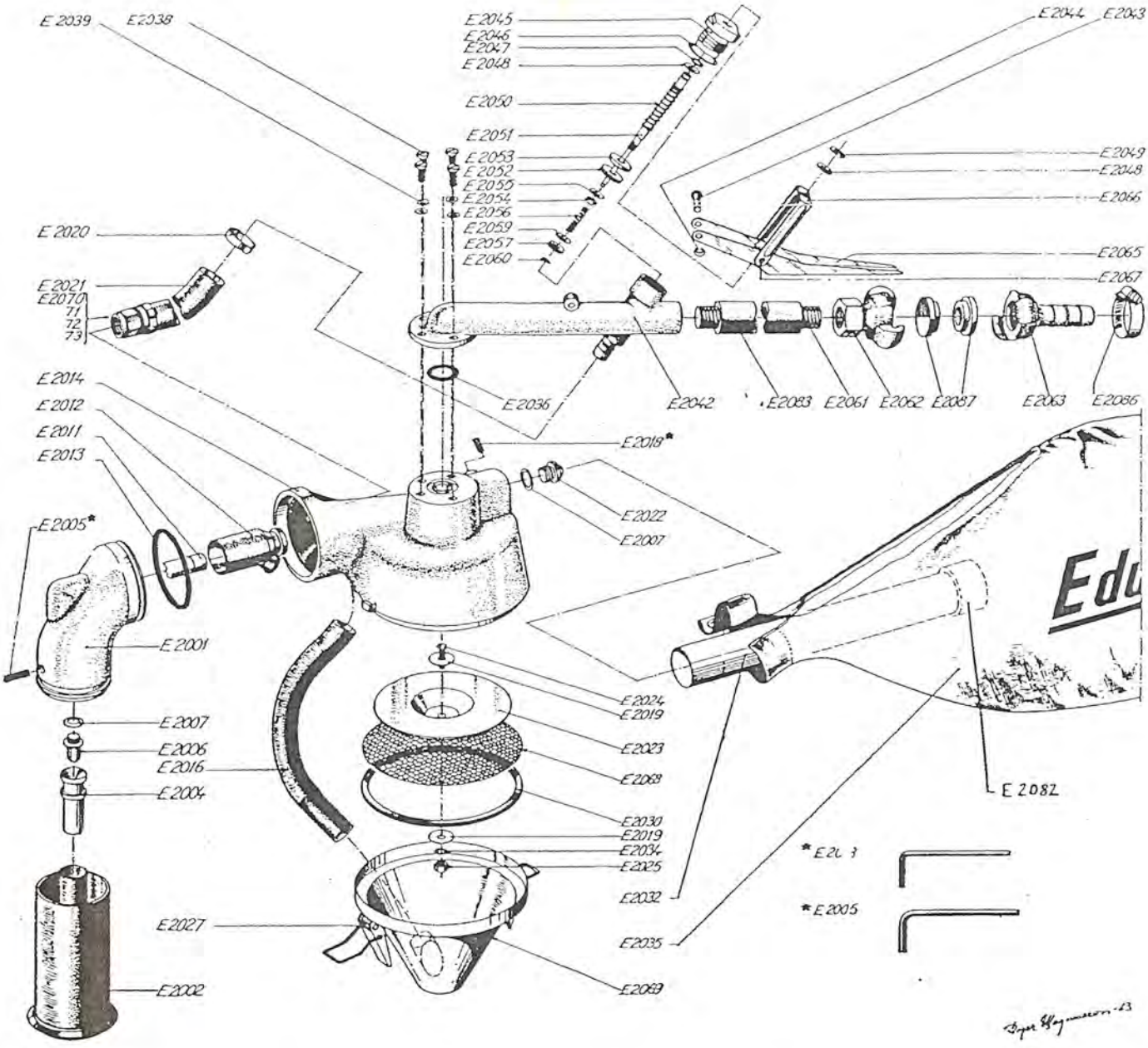
Part No.	
E-2001	Blast Head
E-2002	Standard Adapter
E-2004	Blast Nozzle
E-2005	Thumb Screw
E-2006	Blast Jet
E-2007	Jet Gasket
E-2008	Valve Assembly
E-2011	Blast Head Nipple
E-2012	Swivel Connector
E-2013	O-Ring
E-2014	Main Body
E-2016	Abrasive Hose
E-2018	Thumb Screw
E-2019	Baffle Washer
E-2020	Hose Clamp
E-2021	Air Hose Assembly
E-2022	Suction Jet
E-2023	Baffle
E-2024	Baffle Screw
E-2025	Baffle Nut
E-2027	Locking Device
E-2030	Screen Gasket
E-2032	Exhaust Tube
E-2035	Dust Bag
E-2036	Valve Body O-Ring
E-2038	Screw
E-2039	Washer
E-2042	Valve Body
E-2043	Handle Pin
E-2044	Snap Ring

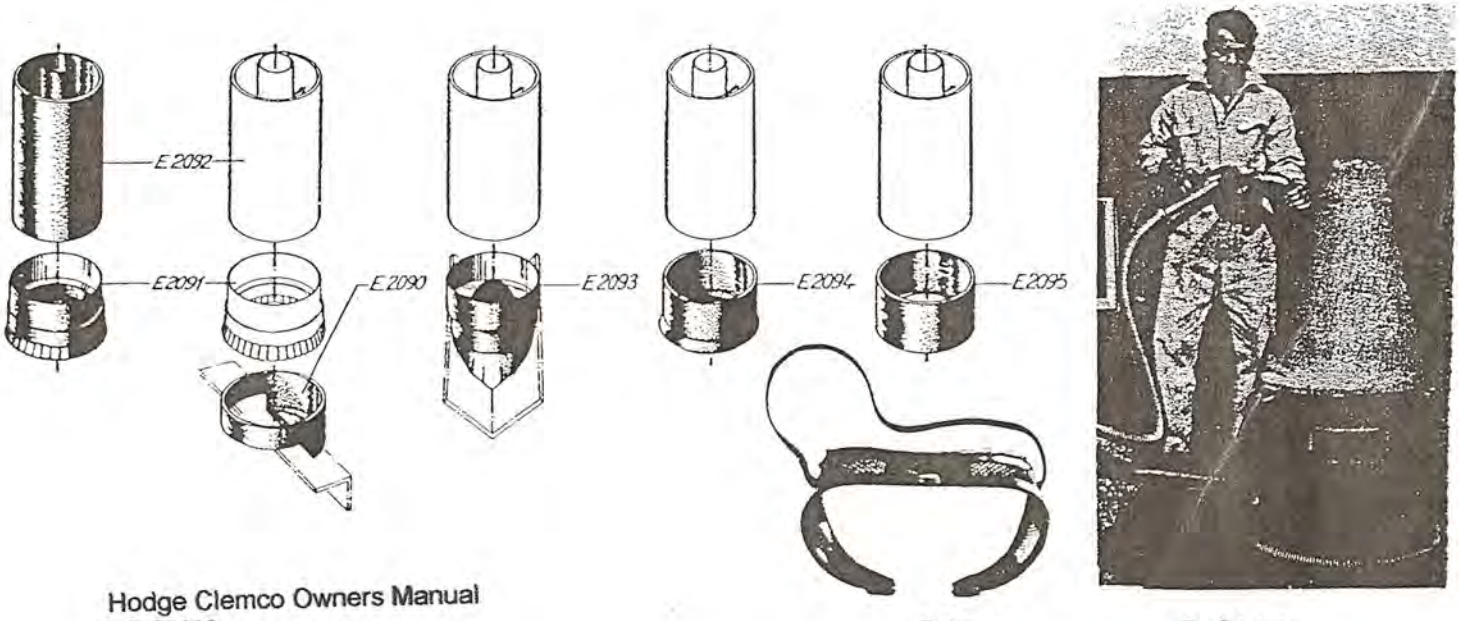
Part No.	
E-2045	Valve Bushing
E-2046	Valve Bushing Gasket
E-2047	O-Ring
E-2048	Washer
E-2049	Snap Ring
E-2050	Primary Valve Spring
E-2051	Valve Stem
E-2052	Primary Valve Seat
E-2053	Guide Washer
E-2054	Nut
E-2055	Washer
E-2056	Second.Valve Spring
E-2057	Second.Valve Seat
E-2059	Washer
E-2060	Snap Ring
E-2061	Pipe Nipple
E-2062	Coupling w.int.thread
E-2063	Idem with nipple, 3/4"
E-2063-1	Idem with nipple, 1/2"
E-2065	Valve Handle Assembly
E-2068	Screen
E-2068-1	Screen Assembly
E-2069	Abrasive Container with lock and hose
E-2070-73	Swivel Nut Assembly
E-2082	Rubber Bushing
E-2083	Rubber Tube
E-2086	Hose Clamp
E-2087	Gasket
E-2089	Rubber Coating, 400 gr

ATTACHMENTS

E-2090	Edge Attachment
E-2091	Serrated Attachment
E-2091-1	Round Brush
E-2092	Master Adapter
E-2093	Angle Attachment
E-2093-1	Angle Brush
E-2094	Flat Lip Attachment
E-2095	Blank End Attachment
E-2098	Dust Hose w. Fitting
E-2099	Hose Clamp
E-2101	Air Hose 1/2" with couplings
E-2102	Protective Goggles

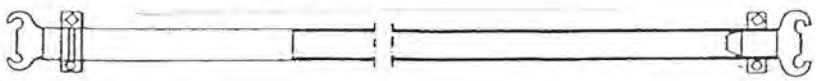
E-2110	Dust Collector Ass.
E-2111	Dust Collector excl. of Top and Hose
E-2112	Filter Top
E-2113	Coupling
E-2114	Rubber Plate
E-2115	Screw & Nut f.E-2114
E-2116	Rubber Fitting
E-2117	Pipe with Bushing for Dust Hose E-2098
E-2118	Dust Hose Ass. for Collector
E-4002	Water Trap





E-2102

E-2110



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