



DRAPER[®]
Expert

TURBO, TURBO/EVAP SMOKE DIAGNOSTIC MACHINES

94078, 94079



These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR: TURBO & TURBO/EVAP SMOKE DIAGNOSTIC MACHINE

Stock No: 94078, 94079.

Part No: SDM-TURBO, SDM-TURBO/EVAP.

1.2 REVISIONS:

Date first published October 2019.

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://drapertools.com/manuals>

Draper Tools Limited
Hursley Road
Chandler's Ford
Eastleigh
Hampshire
SO53 1YF
UK

Website: drapertools.com

Product Help Line: +44 (0) 23 8049 4344

General Fax: +44 (0) 23 8026 0784

1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

WARNING! – Information that draws attention to the risk of injury or death.

CAUTION! – Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

Copyright © Draper Tools Limited.

Permission is granted to reproduce this publication for personal and educational use only. Commercial copying, redistribution, hiring or lending is prohibited.

No part of this publication may be stored in a retrieval system or transmitted in any other form or means without written permission from Draper Tools Limited.

In all cases this copyright notice must remain intact.

2. CONTENTS

1	TITLE PAGE	
1.1	INTRODUCTION	2
1.2	REVISION HISTORY	2
1.3	UNDERSTANDING THIS MANUAL	2
1.4	COPYRIGHT NOTICE	2
2	CONTENTS	
2.1	CONTENTS.....	3
3	WARRANTY	
3.1	WARRANTY.....	4
4.	INTRODUCTION	
4.1	SCOPE.....	5
4.2	SPECIFICATION	5
4.3	HANDLING AND STORAGE	5
5.	HEALTH AND SAFETY INFORMATION	
5.1	GENERAL SAFETY WARNINGS.....	6
5.2	HIGH ADJUSTABLE PRESSURE / TURBO MODE SAFETY.....	6
5.3	LOW UNADJUSTABLE PRESSURE / EVAP MODE SAFETY	6-7
5.4	AIR INTAKE ADAPTOR USAGE	7
6.	TECHNICAL DESCRIPTION	
6.1	IDENTIFICATION	8
7.	UNPACKING AND CHECKING	
7.1	PACKAGING	9
7.2	WHAT'S IN THE BOX.....	9
8.	SET UP	
8.1	FILL / ADD SMOKE PRODUCING FLUID	10
8.2	INSTALL HOOK.....	10
8.3	CONNECT TO POWER	10
8.4	TOGGLE MODE SELECTION SWITCH	10
8.5	SET UP FOR EVAP/LOW PRESSURE TESTING	11
8.6	SET UP FOR TURBO/HIGH PRESSURE TESTING	11
9.	TEST FOR LEAKS	
9.1	TURN SMOKE ON	12
9.2	VERIFY REPAIR	12
10.	USING INTAKE ADAPTOR	
10.1	INSTALL AIR INTAKE ADAPTOR.....	13
11.	MAINTENANCE	
11.1	CHECK FLUID LEVEL	14
11.2	DRAIN SMOKE HOSE	14
12.	TROUBLESHOOTING	15
13.	DISPOSAL	
13.1	DISPOSAL.....	16
14.	EXPLANATION OF SYMBOLS	
14.1	EXPLANATION OF SYMBOLS	17
	DECLARATION OF CONFORMITY	ENCLOSED

3. WARRANTY

3.1 WARRANTY

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact

Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.

Telephone Sales Desk: (023) 8049 4333 or Product Help Line (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This warranty period covering parts & labour is 12 months from the date of purchase except where tools are hired out when the warranty period is 90 days from the date of purchase. This warranty does not apply to any consumable parts, or normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This warranty applies in lieu of any other warranty expressed or implied and variations of its terms are not authorised.

Your Draper warranty is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the warranty period.

Please note that this warranty is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4. INTRODUCTION

4.1 SCOPE

These machines will assist in locating leaks in vacuum lines as well as manifolds, EGR valves, oil seals, gaskets, solenoids, o-rings, ducting, throttle shafts, diaphragms, canisters, and more.

4.2 SPECIFICATION

Stock No.	94078	94079
Part No.	SDM-TURBO	SDM-TURBO/EVAP
Rated Voltage	12V DC	12V DC
Output pressure	3-20psi	3-20psi
Output pressure EVAP mode	N/A	0.75psi
Operating Temperature.....	0°F to 140°F (-17°C to 60°C)	0°F to 140°F (-17°C to 60°C)
Generator Temperature Protection	239°F (115°C)	239°F (115°C)
Vapour Output Hose	3m(10ft).....	3m(10ft)
Operating Modes.....	Smoke 5 min cycle/ Air cycle.....	Smoke 5 min cycle/ Air cycle
Weight (net).....	4kg	4.5kg

4.3 HANDLING AND STORAGE

Care must still be taken when handling and lifting. Dropping this machine will have an effect on the accuracy and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: and if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH AND SAFETY INFORMATION

5.1 GENERAL SAFETY WARNINGS

To prevent personal injury or damage to vehicles and/or the test tool, read this instruction manual first and observe the following safety precautions at a minimum whenever working on a vehicle:

- When the power switch is depressed, battery current / voltage is conducted directly therefore the tool should NOT be used around flammables such as gasoline or its vapours. A spark could ignite these vapours.
- Equipment operates on vehicle battery power.
- Always perform automotive testing in a safe environment.
- All diagnostic work should be performed with the engine off.
- Do not leave a vehicle unattended while equipment is connected or testing.
- Keep a fire extinguisher suitable for gasoline/chemical/electrical fires nearby.
- Keep the machine dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the test tool, when necessary.

5.2 HIGH ADJUSTABLE PRESSURE / TURBO MODE SAFETY

The procedures in this section are intended to be basic guidelines for users to practice using the (TURBO / High Pressure mode).

The Dual Mode Diagnostic Leak Locator is designed to be used in conjunction with the Air Intake Adaptor, or threaded sensor port adaptors, also provided is a cooling system adaptor to test the intake, exhaust, and cooling systems of boosted engines.

DO NOT USE TURBO / HIGH PRESSURE IN EVAP SYSTEM

SAFETY PRECAUTIONS

- All diagnostic work should be performed with the engine off
- For use only by professional technicians
- Ensure that the vehicle is secure and stable
- Do not leave a vehicle unattended while equipment is operating
- Always wear proper safety protection
- This safety guide is not intended to take the place of common sense and good judgment.
- If machine is left running for a long time, the temperature of smoke generated becomes over 239 °F (115°C) the machine will automatically cut out from smoke mode, please press the SMOKE 5 Minutes/AIR key to start again after a 10-20 minutes cool down period.

5.3 LOW UNADJUSTABLE PRESSURE / EVAP MODE SAFETY

(Stock No. 94079 only)

The procedures in this section are intended to be basic guidelines for users to practice using the (EVAP / Low Pressure mode).

- Use this equipment in the manner specified by the vehicle manufacturer
- Understand operating procedures
- Follow all safety precautions

SAFETY PRECAUTIONS

- All diagnostic work should be performed with the engine off
- Do not leave a vehicle unattended while equipment is connected or operating

5. HEALTH AND SAFETY INFORMATION

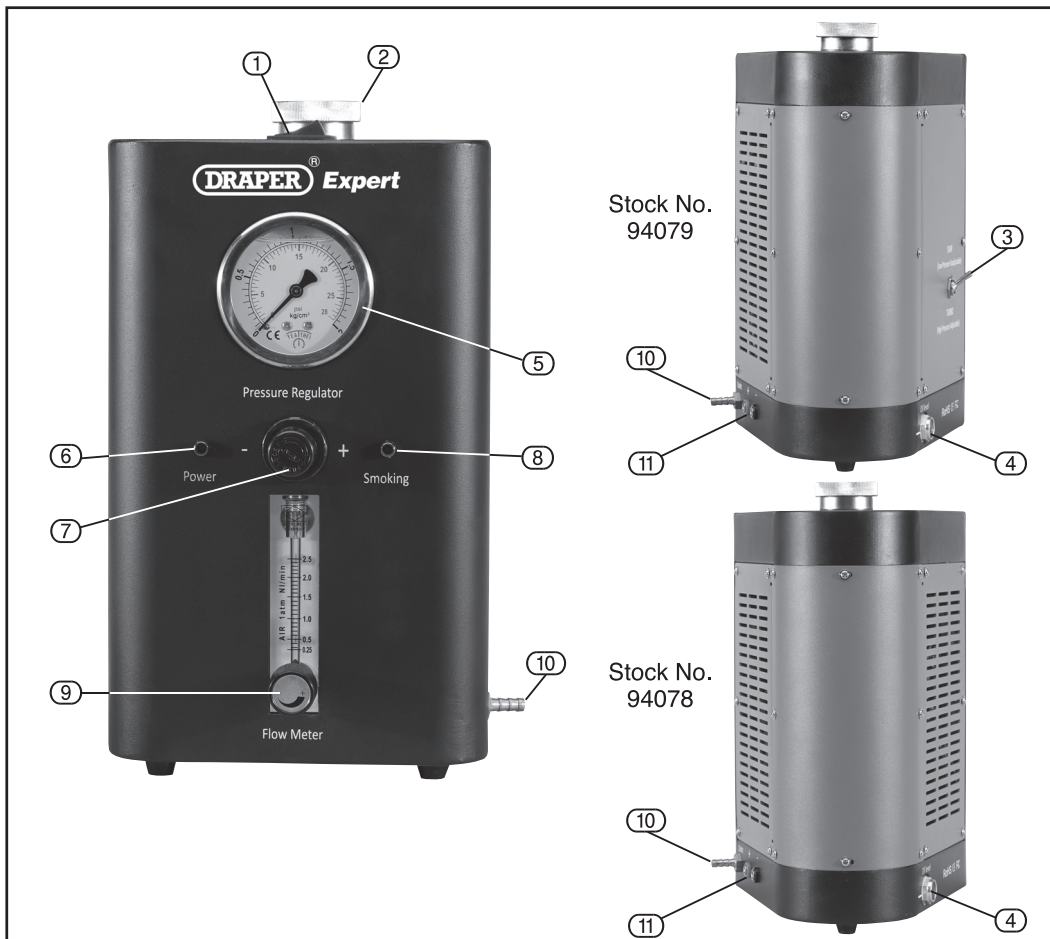
- Equipment operates on battery power
- In the low unadjustable pressure mode the system pressure is 0.75 PSI / 0.05 Bar.
- Do not perform tests near a source of spark of ignition
- When working with the fuel system, work in a well-ventilated area
- If machine is left running for a long time, the temperature of smoke generated becomes over 239 °F (115°C) the machine will automatically cut out from smoke mode, please press the SMOKE 5 Minutes/AIR key to start again after a 10-20 minutes cool down period.

5.4 AIR INTAKE ADAPTOR USAGE

- Refer to the vehicle manufacturer for the correct test procedures and pressures.

6. TECHNICAL DESCRIPTION

6.1 IDENTIFICATION



- ① Smoke / air mode selection toggle switch.
- ② Smoke fluid filler cap.
- ③ Pressure selection toggle switch turbo / EVAP (Stock no. 94079 only).
- ④ Oil level window.
- ⑤ Test pressure gauge.
- ⑥ Power indicator.
- ⑦ Adjustable pressure regulator.
- ⑧ Smoke / air light indicator.
- ⑨ Flow meter with flow control valve.
- ⑩ Smoke outlet.
- ⑪ Battery power supply ports.

7. UNPACKING AND CHECKING

7.1 PACKAGING

Carefully remove the product from the packaging and examine it for any sign of damage that may have happened during shipping. Lay the contents out and check them against the parts shown below. If any part is damaged or missing, please contact the Draper Help Line (the telephone number appears on the Title page) and do not attempt to use the product.

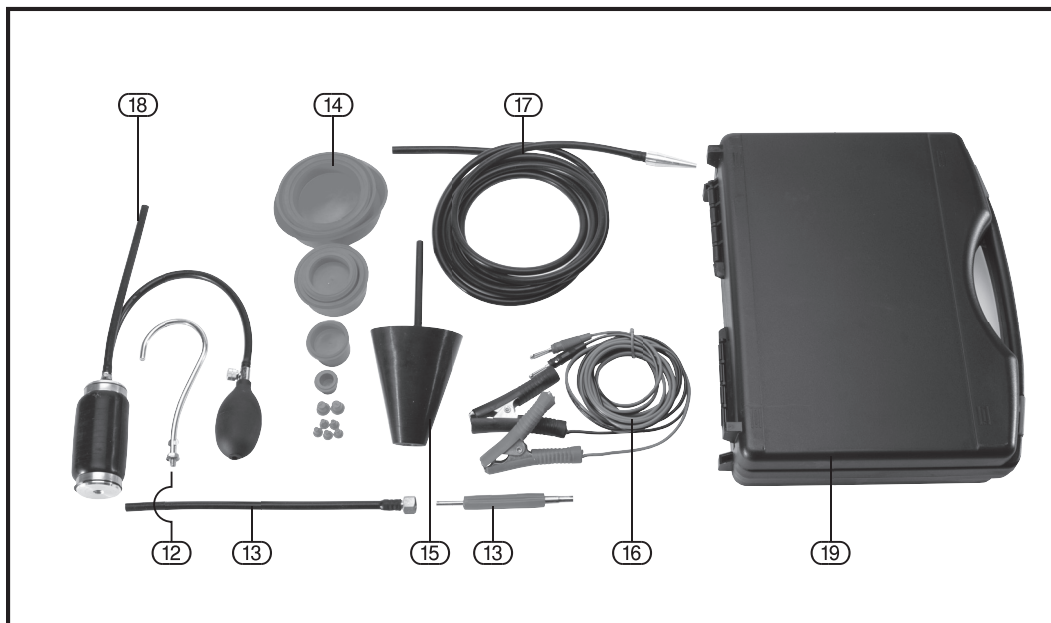
The packaging material should be retained at least during the warranty period: in case the machine needs to be returned for repair.

Warning!

- Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.
- If any of the packaging is to be thrown away, make sure they are disposed of correctly, according to local regulations.

7.2 WHAT'S IN THE BOX

As well as the main product, there are also several other parts not fitted or attached to it:



- (12) Hook.
- (13) EVAP Service Tool Kit (stock No.94079 only).
- (14) Cap Plug Kit.
- (15) Standard Cone Adaptor.
- (16) Battery cable.
- (17) Smoke Outlet hose.
- (18) Air Intake Adaptor.
- (19) Accessory Storage Case.

8. SET UP

8.1 FILL/ADD SMOKE PRODUCING FLUID - FIG. 1

1. Remove fluid fill cap (2).
2. Pour mineral oil into fluid fill port.
3. Watch the fluid window. (4) Fill fluid to below the MAX label.
4. Replace fluid fill cap.

NOTE: 30ml maximum.

NOTE: Never use dyes, solvents or other contaminants in intake or exhaust systems because they may coat and/or harm critical sensors, catalysts or filters.

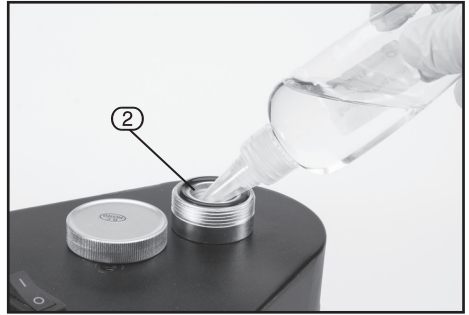


FIG.1

8.2. INSTALL HOOK - FIG. 2

Screw the hook (12) into the top of the machine. Use the hook to hang the machine under the bonnet or chassis.



FIG.2

8.3 CONNECT TO POWER - FIG. 3

- Connect red lead (+) to battery's positive terminal.
- Connect black lead (-) to chassis ground.
- Green power indicator lamp (6) illuminates when power connected.

NOTE: Never connect the machine to vehicle when the engine is running

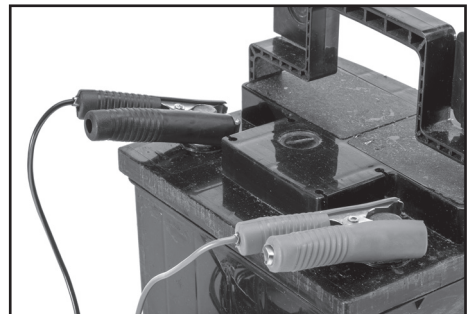


FIG.3

8.4 TOGGLE MODE SELECTION SWITCH - FIG. 4

Toggle up for EVAP/Low pressure unadjustable (The default position)

Toggle down for Turbo/high pressure adjustable

NOTE: ONLY dual mode machine Stock No.94079 has pressure selection toggle switch (3).

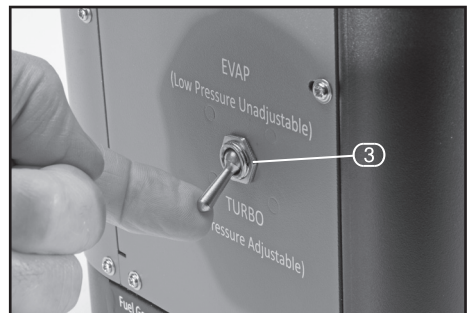


FIG.4

8. SET UP

8.5 SET UP FOR EVAP/LOW PRESSURE TESTING - FIG.5

- a. Turn flow control knob (9) anti-clockwise to release air pressure.
- b. Flow meter indicates flow and measures leak size.

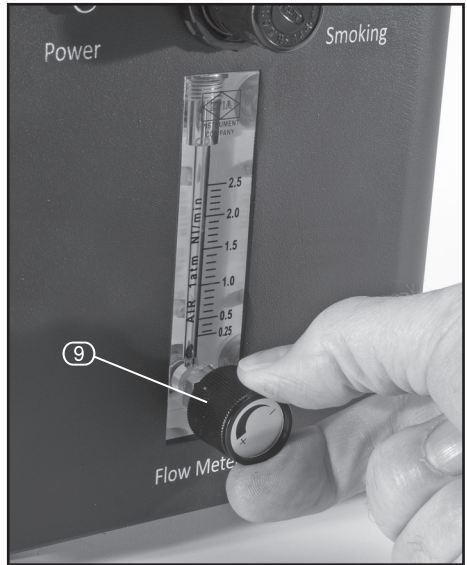


FIG.5

8.6 SET UP FOR TURBO/HIGH PRESSURE TESTING - FIG.6

- Turn flow control valve (9) off.
- Set desired test pressure.
 1. PULL (7) to unlock
 2. Turn to adjust pressure
 3. PUSH to lock
- Attach smoke hose to installed adaptor of system being tested.
- Turn flow control valve (9) to release pressure/smoke.

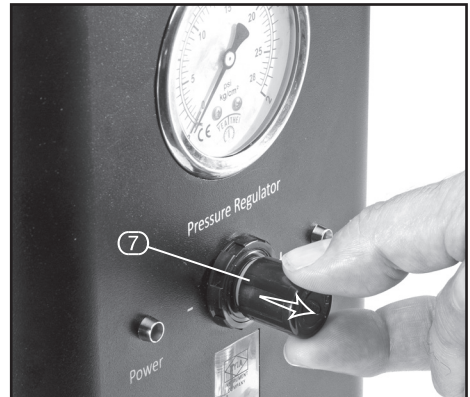


FIG.6

NOTE: Adjustable pressure regulator only affects high pressure testing.

9. TEST FOR LEAKS

9.1 TURN SMOKE ON - FIG.7

SMOKE/AIR MODE SWITCH ①

SMOKE 5 MINS: Smoke will only last for 5 minutes (Red Light ⑧): Smoke is generated) The smoke will then stop and the machine will switch to air mode, after 10-20 mins cool down period, the smoke mode can be switched on again.

AIR: Only air blown (No Red Light ⑧): No smoke generated).

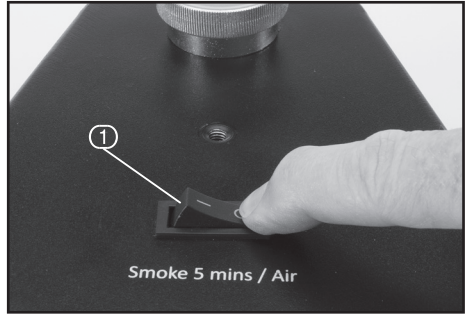


FIG.7

9.4 VERIFY REPAIR

Perform leak test to verify repair(s)

PRESSURE GAUGE FOR LEAK DETECTION (ONLY TURBO MODE) - FIG.8

Pressure holds: No leaks, repair is complete.

Pressure decreases: Leak(s) exist, use a light to locate the leaks and repair it.



FIG.8

FLOW METER FOR LEAK DETECTION (TURBO MODE, AND EVAP MODE) - FIG.9

No flow: Flow meter scale is zero, no leaks, repair is complete

Has flow: Flow meter scale is not zero, leak(s) exist, use the light to locate the leaks and repair it.

NOTE:

Not all systems are designed to be 100% sealed.

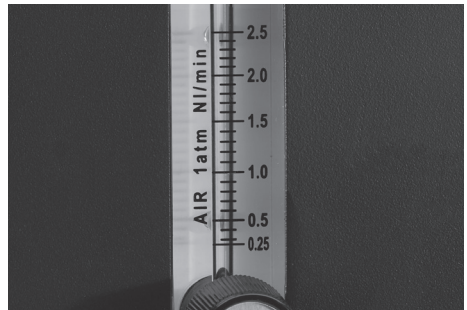


FIG.9

10. USING INTAKE ADAPTOR

10.1 INSTALL AIR INTAKE ADAPTOR

Install air intake adaptor (18) fully into ducting or tubing.

NOTE: Make sure there are no obstructions or sharp edges that might puncture bladder when inflated.

NOTE: Air intake adaptor must insert completely inside ducting / tubing.

Insure air intake adaptor is firmly installed and properly secure.

Fig.10 Proper Installation.

Fig.11 Improper Installation.

Close the pressure relief valve (18.1).

Pump the hand pump (18.2) till the intake opening is tightly sealed.

Now the system is sealed and ready to test, introduce air/smoke into the system by plugging the smoke nozzle into tube opening (18.4).

ONLY AFTER system under test is fully depressurised, release internal pressure of air intake adaptor slowly.

Clean the adapter for storage, avoid contact with corrosive liquids.

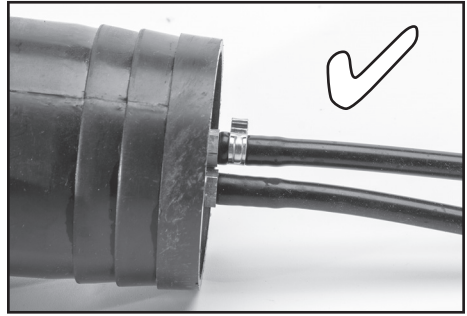


FIG.10

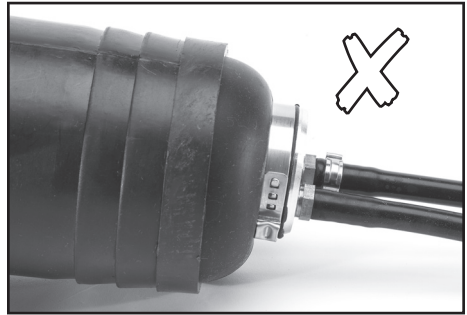


FIG.11



FIG.12

11. MAINTENANCE

11.1 CHECK FLUID LEVEL

Remove fill cap from fluid fill port.

Pour smoke producing fluid into fill port (9) until fluid level is near to the MAX label.

Replace fill cap.

Check fluid level.

11.2 DRAIN SMOKE HOSE

Elevate the machine.

Allow the entire smoke hose to hang downward.

Place a container beneath the nozzle to capture fluid.

Process takes approximately 5 minutes.

12. TROUBLESHOOTING

Problem	Remedy
No Power Light	<ol style="list-style-type: none">1. Ensure power is properly Connected.
No Air Flow.	<ol style="list-style-type: none">1. Check the air pump.2. Open the flow control valve.3. Check hoses are not kinked or pushed into machine
No Enough Smoke.	<ol style="list-style-type: none">1. Check Fluid Level.2. Open the flow control valve clockwise.3. Check hoses are not kinked or pushed into machine.4. Check the Smoke light, if light is off and Smoke and air mode switch is '-'. Please wait 10-20 minutes then start again.
Poor Smoke Density or Volume	<ol style="list-style-type: none">1. Insufficient Smoke Producing Fluid: Refill.2. Flow Control Valve is partially closed.3. Smoke Output Hose is kinked.
High Test Pressure Reading	<ol style="list-style-type: none">1. Smoke Output Hose is kinked.

13. DISPOSAL

13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not dispose of WEEE* as unsorted municipal waste.



* *Waste Electrical & Electronic Equipment.*

14. EXPLANATION OF SYMBOLS

14.1 EXPLANATION OF SYMBOLS



Read the instruction manual.



12volt car battery needed.



WEEE –

Waste Electrical & Electronic Equipment.

Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish.

NOTES

CONTACTS

Draper Tools Limited, Hursley Road,
Chandler's Ford, Eastleigh, Hampshire. SO53 1YF. U.K.

Help line: (023) 8049 4344

Sales Desk: (023) 8049 4333

Internet: drapertools.com

E-mail: sales@drapertools.com

General Enquiries: (023) 8026 6355

Service/Warranty Repair Agent:

For aftersales servicing or warranty repairs, please contact the
Draper Tools Help line for details of an agent in your local area.

YOUR DRAPER STOCKIST

DBMC1019

©Published by Draper Tools Limited.

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical photocopying, recording or otherwise without prior permission in writing from Draper Tools Ltd.