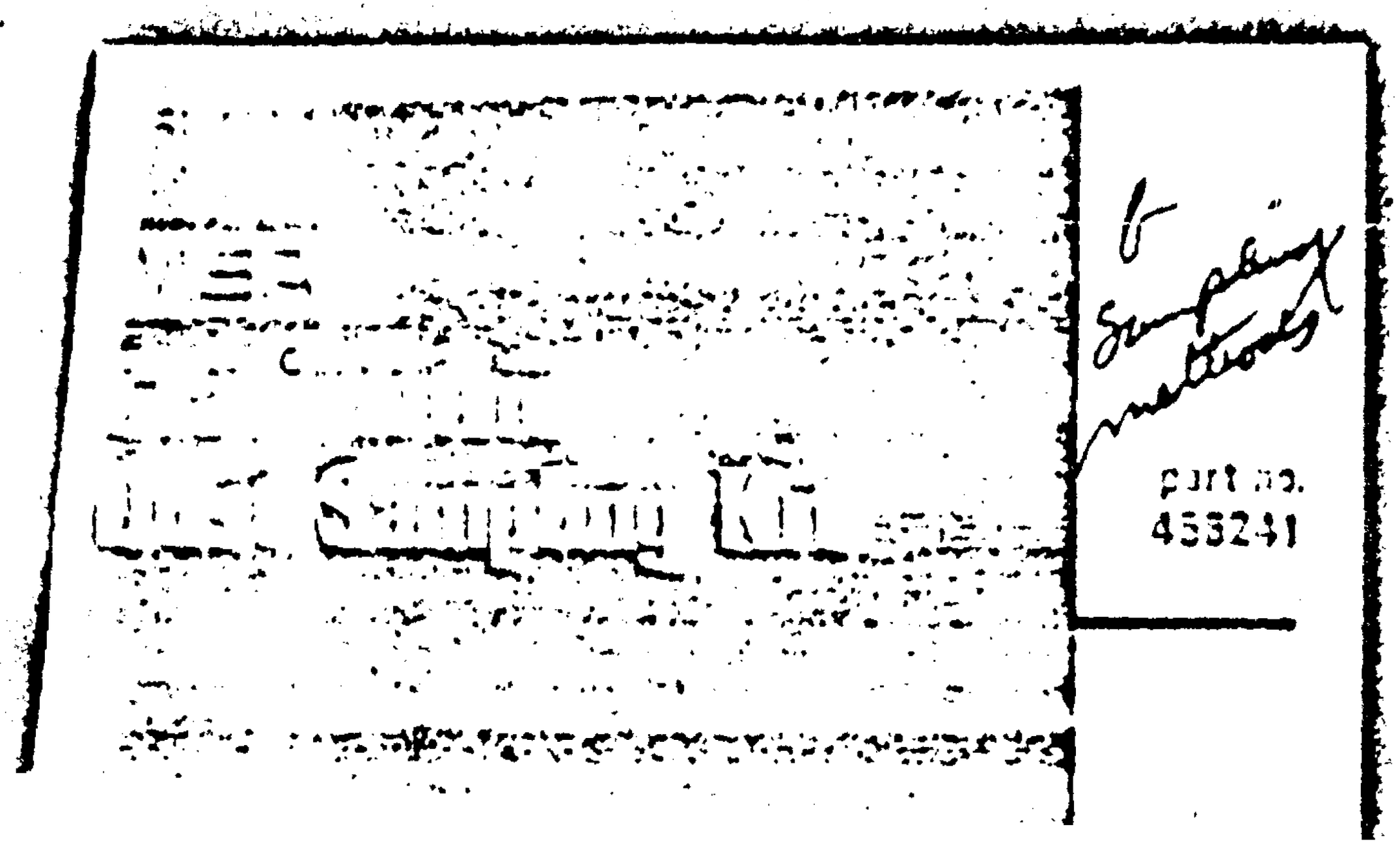
FILE NAME: James Hardie (JH)

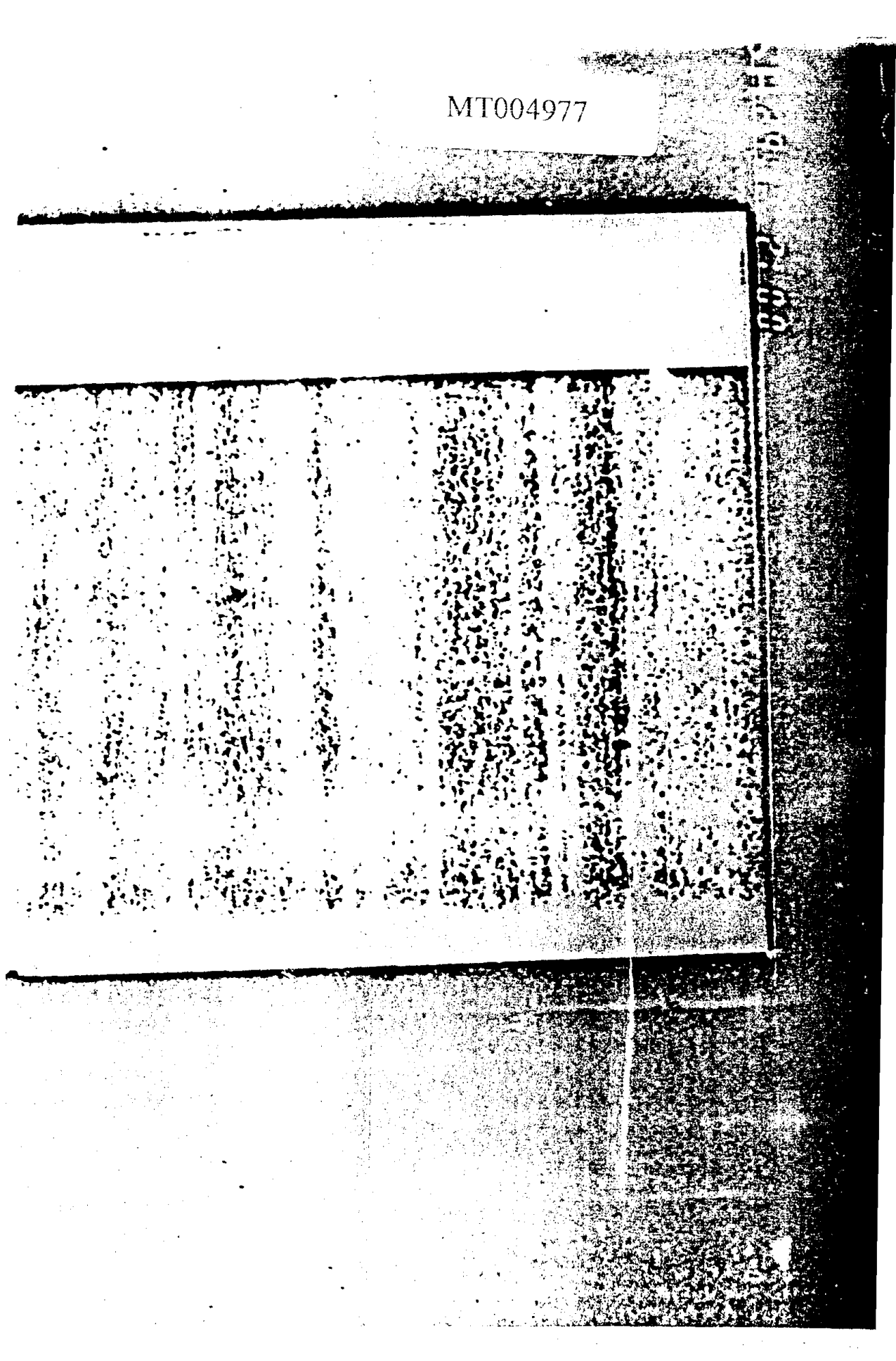
DATE: 0000

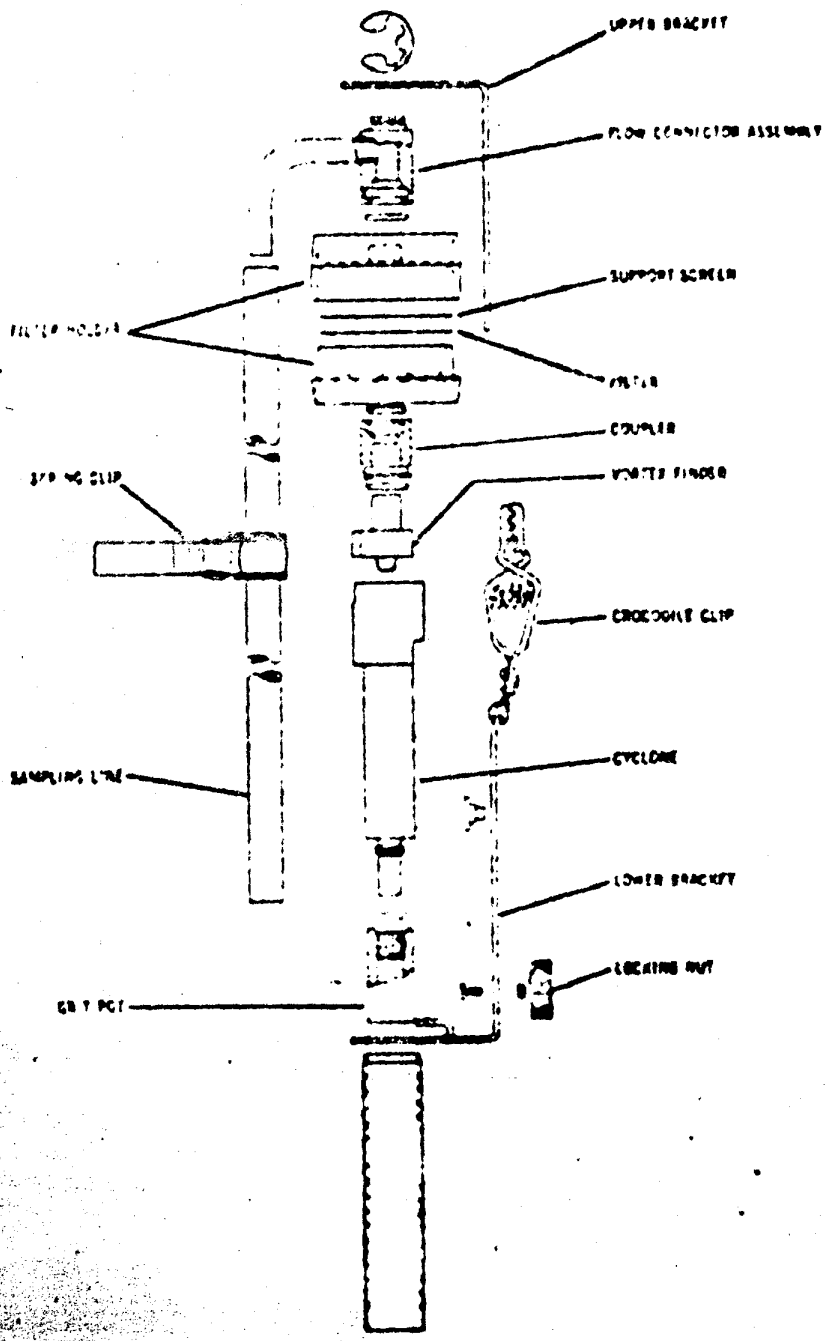
DOC#: JH004

DOCUMENT DESCRIPTION: MSA Dust Sampling Kit Manual


6 sampling methods
part no.
453241

MT004977





CYCLONE/FILTER HOLDER ASSEMBLY

MT004978

INTRODUCTION

The MSA Gravimetric Dust Sampling Kit is designed to permit evaluation of the respirable dust exposure of individual underground coal miners and other types of industrial workers.

Since all airborne dust inhaled does not enter the lungs, the dust of hygienic significance is that portion which reaches the terminal airways of the lungs. This portion, called the respirable fraction, contains no particles larger than 10 microns and an increasingly greater percentage of particulates as particle size decrease to about 100% of particles 2 microns and smaller.

The "heart" of the MSA Gravimetric Dust Sampling Kit is the cyclone/filter holder assembly which is designed to simulate the human respiratory tract in its selectivity for the respirable fraction of dust particles. This "personal sampler", which is attached to the clothing in the area of the breathing zone of the worker, is essentially a 2-stage device. The first stage, a 10 millimeter nylon cyclone assembly, discards the larger (above 10 micron) size particles. The second stage consists of a pre-weighed membrane filter mounted in a holder that collects the respirable fraction of the dust. At the end of the appropriate sampling period the filter is weighed again to the nearest 0.01 milligram using, for example, the MSA Cahn Electrobalance, Model RTL, Part No. 393241, and concentrations are expressed as milligrams of dust per cubic meter of air sampled.

The personal sampler continuously samples air from the workers breathing zone during the full working shift (8 hours). The atmosphere is drawn through the device at a predetermined flow rate by the Portable Pump, Model G, which carries U.S. Bureau of Mines approval in explosive atmospheres. The pump is precalibrated for three flow rates: 2.0 l.p.m., 1.7 l.p.m., 1.4 l.p.m.

The components of this kit meet the gravimetric dust sampling requirements of the U. S. Bureau of Mines and the U. S. Public Health Service.*

INSTRUCTIONS

WEIGHING AND INSERTING FILTER

NOTE: All parts to be used must be clean, dry and free of dust. The filter weighing and inserting must be done in a dust-free atmosphere.

1. Invert a blue plastic plug into the hub of the male (inlet) section of a filter holder.

2. Invert a red plastic plug into the hub of the female (ribbed base) section of a filter holder.

3. Place one perforated support screen in the female section of a filter holder.

4. Remove one filter from box and weigh on balance. (NOTE: Always handle filters using tweezers and grasping filter at outer edge only. Do not touch filters with fingers.) Record the initial filter weight.

5. Remove weighed filter from balance and place on top of support screen. Immediately invert male section of filter holder into loaded female section and press into place by means of the press-pry tool. (This may be accomplished by placing press-pry tool on top of loaded filter holder and intermittently pressing with heel of hand while turning filter holder with fingers of other hand. Examine carefully to ensure that male section is making uniform contact along its entire sealing edge with the filter).

6. Mark identifying number on top of filter holder and record along side of initial filter weight.

7. Remove one white cellulose band from jar and slide into position around circumference of filter holder. After band has dried and shrunk into position, transfer the identification number from the top of the filter holder to the white band with a felt-tip marking pen or similar device. (Replace screw cap tightly on jar of bands to prevent spillage or loss of solution).

* Personal Respirable Dust Sampling Procedure
Robert B. Walker — R&T, U. S. Dept. H. & W., P.H.S.

MT004979

INSERTING FILTER HOLDER

1. Rotate knurled locking nut on back of holder assembly one-half turn counterclockwise to loosen.

2. Lift upper bracket; pivot to side and remove stopper.

3. Remove the blue and red plastic plugs from the inlet and outlet hubs of a "freshly" loaded filter holder. Insert inlet hub (filter side) downward into the coupler.

4. Lift upper bracket, pivot into position above filter holder and press downward so that outlet hub (support screen side of filter holder enters the flow connector assembly. Place thumb and [illegible] on horizontal surfaces of lower and upper brackets respectively and press together until parts "bottom". Rotate knurled locking nut clockwise and tighten securely.

PLACEMENT OF EQUIPMENT

1. Attach loaded holder assembly to lapel or collar by means of crocodile clip.

2. Connect free end of sampling line to sample inlet fitting of pump.

3. Depress the switch located on top of the pump to turn the unit "on" and with the flowmeter vertical turn valve stem to select desired sample flow rate:

   2.0 liters/min. — ball float centered on orange band.
   1.7 liters/min. — ball float centered on red band.
   1.4 liters/min. — ball float centered on yellow band.

4. Immediately note and record starting time of test.

5. Attach pump to belt by means of belt loop in a position that will not hinder working efforts. Sampling line may be kept close to body by attaching spring clip to clothing.

6. During the test period check the flowmeter float position periodically (every 30 — 60 minutes) to assure that the proper flow rate is being maintained. Adjust flowmeter if necessary.

7. At end of test period depress pump switch to shut unit off. Immediately note and record the time.

REMOVAL OF EQUIPMENT

1. Remove pump from belt. Disconnect sampling line from sample inlet fitting of pump.

2. Unfasten clips from clothing to remove holder assembly.

3. Remove filter holder from holder assembly as follows:

a. Rotate knurled locking nut one-half turn counterclockwise to loosen.

b. Grasp filter holder with one hand while lifting upper bracket of holder assembly with other hand to disengage flow connector assembly from outlet hub; pivot upper bracket to side.

c. Hold coupler in place while lifting filter holder to disengage inlet hub from coupler.

4. Return stopper to previous position atop coupler; pivot upper bracket into position above stopper; press brackets together (thereby clamping stopper in) and tighten locking nut securely.

4. Place the blue plastic plug in the outlet hub and the red plastic plug in the inlet hub of the "used" filter holder. (This permits the determination of which filter holders have been used since the colored plugs have been reversed from their original positions).

NOTE: Keep used filter holders separate from "clean" ones so as to prevent accidentally reusing a filter thus ruining both tests.

REMOVING AND REWEIGHING FILTER

1. Wipe outside of filter holder with damp cloth to remove dust prior to opening.

2. Cut the cellulose band at the joint between the two sections of the filter holder using

MT004980

the tweezer tips. Do not remove band. Remove top (male) section of filter holder by prying open with pressdpry tool.

3. Remove filter as follows. Push a small rod (opened paper clip) up the outlet hole (female section) thereby raising support screen and filter to a level where the filter may be grasped (at the unexposed edge) using the tweezers. Care should be taken not to loose any of the dust sample. The opened paper clip may be used as support on the underside of the filter when placing the filter on the balance.

If the filter sticks to the top (male) section of the filter holder — work one edge of tweezers between filter and holder. Clamp tweezers onto filter and gently lift filter off taking care not to tear the filter nor lose any of the dust sample. Place filter on balance as described above.

((Brush any dust remaining on the inside of the filter holder onto the filter for weighing))

4. Check filter identification number on cellulose band and record weight in log book.

DETERMINATION OF DUST CONCENTRATION

1. Subtract initial filter weight from final filter weight and record difference in milligrams.

2. Divide weight difference by sample volume (in cubic meters).

3. The result is the respirable dust concentration in milligrams per cubic meter (mg/m^3) of air sampled.

MAINTENANCE

PUMP AND CHARGER

1. After each use recharge pump battery in accordance with information on instruction card (Pt. No. 697703).

2. Wipe pump and charger with damp cloth to remove dust.

FILTER HOLDERS

1. It is suggested that each filter holder be used only once then discarded, however, they may be used up to a maximum of four times (do not reuse if rims are damaged during filter removal) provided they are cleaned as follows prior to each additional use:

a. Wash filter holder parts and plastic plugs using a mild detergent in water. Rinse parts repeatedly with tap water; use distilled water for final rinse.

b. Dry all parts in a dust free atmosphere.

CYCLONE ASSEMBLY

1. Remove grit pot (take care not to lose "O" ring) and vortex finder. Empty contents of grit pot.

2. Use small brush, Pt. No. 625416, to clean inner bores and mating surfaces of cyclone and vortex finder.

3. Wipe all parts externally with damp cloth.

4. Allow sufficient time for parts to dry then reassemble (make sure grit pot seals on "O" ring).

COUPLER

Clean inside of coupler with small brush; outside with damp cloth.

HOLDER ASSEMBLY

After each use wipe holder assembly (and sampling line assembly) with damp cloth to remove dust.

MT004981

REPLACEMENT PARTS LIST

Part No.	Description
4[illegible]	Gravimetric Dust Sampling Kit * 350.
4[illegible]	Pump, Portable, Model G
4[illegible]	Charger, Battery, Model G Pump
4[illegible]	Holder Assembly Complete with Cyclone & Sampling Line Assemblies * 35
4[illegible]	Holder Assembly
6[illegible]	Filter Holders, Pkg. of 12
6[illegible]	Filters, Box of 50
*[illegible]	Screen, Support
6[illegible]	Sands, Cellulose, Jar of 60
*[illegible]	Brush, Double end, Nylon
*[illegible]	Tweezers
*[illegible]	Tool, Press-Fit
[illegible]	Kit, Supplementary Parts (* includes 1 each; ● includes 3)
4[illegible]	Case, Carrying
4[illegible]	Cyclone Assembly
4[illegible]	Sampling Line Assembly
9[illegible]	Booklet, Instruction
9[illegible]	Card, Instruction (Pump and Charger, Model G)

MT004982