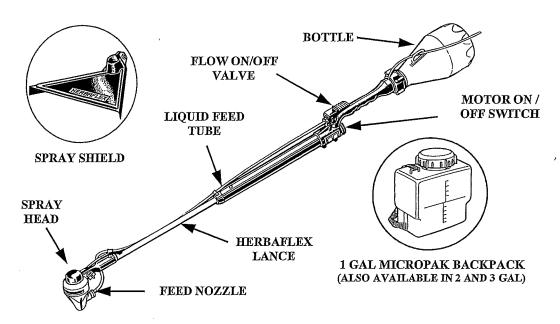
Microfit Herbaflex

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DESCRIPTION

The MICROFIT HERBAFLEX, part of the modular MICROFIT system, is a handheld, shrouded, spinning disc, Controlled Droplet Application (CDA) sprayer. It is powered by four torch (D-cell/R20) batteries, with one set of good quality batteries giving over 30 hours spraying time. It is designed to apply herbicides in adjustable narrow bands of between 4 and 18 inches at low volumes (1 to 3 gallons per acre). A governed electric motor spins the atomiser disc at a constant 2,800 rpm to produce uniform spray droplets of around 200 micron - large enough to minimise any risk of spray drift. Liquid is fed by gravity through colour coded feed nozzles. The MICROFIT HERBAFLEX can be used to apply bands of herbicides around buildings, fence lines, borders and pathways as well as for treatment between crop rows. The weight of the machine ready to spray with the 5 pint bottle full is 9 lb.



Specially designed Micron *Micropak* backpacks and a shoulder strap are available for use with the MICROFIT HERBAFLEX. Other optional extras include an atomiser cone housing (B 120) which allows a wider (up to 2½ feet) band to be sprayed and a spray shield (for use with the standard A90 atomiser cone housing only).

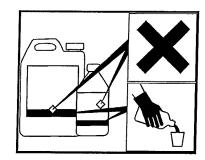
SAFETY

Using agrochemicals is a hazardous process. Operators should comply with all relevant legislation and/or regulations governing the use of agrochemicals and should use appropriate personal protective equipment (see 'OPERATOR PROTECTION'). **Never** use the MICROFIT HERBAFLEX in potentially explosive atmospheres or spray flammable liquid through it.

The MICROFIT HERBAFLEX can be used with most conventional herbicides, as well as specific CDA formulations (only available in some countries) to provide a closed transfer system to improve operator safety.

Always read the product label carefully to discover:-

- approved applications
- maximum dose rates
- maximum number of treatments
- operator protection required
- necessary environmental protection measures



N.B. 'Dose rate' refers to the amount of chemical product applied per hectare.

<u>Never</u> eat, drink, or smoke when working with agrochemicals. After using agrochemicals or handling equipment wash your hands thoroughly. Keep people (especially children) and animals out of areas being sprayed.

<u>Always</u> store agrochemicals safely to protect people and animals, and to safeguard the environment (take special care to avoid water pollution). See 'SPRAYING' section for guidelines on safe use of the MICROFIT HERBAFLEX in operation.

OPERATOR PROTECTION

<u>Always</u> wear the protective clothing items listed on the product label for mixing and filling. The <u>minimum</u> protective clothing required for <u>spraying</u> with the MICROFIT HERBAFLEX is:

- rubber gloves
- boots/shoes and long trousers
- eye protection
- long sleeved shirt



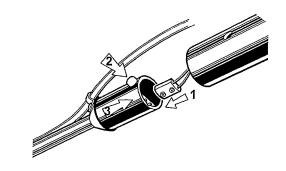




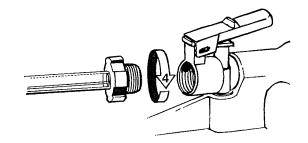
PREPARING FOR SPRAYING

The sprayer is supplied as a separate POWERPACK and HERBAFLEX spray lance.

Fit the HERBAFLEX spray lance to the POWERPACK, by first pushing the electrical plug (1) on the POWERPACK into the socket, then depressing the white button (2) on the lance assembly and pushing the lance into the POWERPACK (3) until the button locates in the hole provided in the POWERPACK.

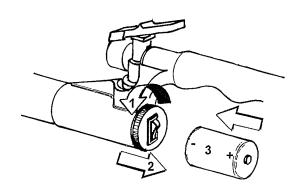


Screw the union nut (4) into the flow control valve.

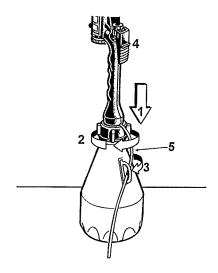


Insert four batteries (D cell/R20) into the POWERPACK, negative, i.e. flat end first:

Press and rotate the switch holder anticlockwise (1) and remove (2). Insert batteries (3). Refit the switch holder by pushing in and turning clockwise.



Two types of spray liquid reservoir are available for use with the MICROFIT system; a 5 pint spray bottle which comes as standard or 1, 2 and 3 gallon *Micropak* backpacks which make it possible to treat larger areas between refills.



Fitting a backpack

Instructions on assembling the Micron *Micropak* backpacks are contained in the tanks.

Screw the backpack connector (1) into the bottle holder (2) ensuring the 'O' ring (3) is in place. Seal the air vent tube (4) with the screw provided (5) to prevent liquid leaking from the tube. The screw <u>must</u> be removed from the air vent tube if using the 5 pint bottle.

Fit the tube (6) to the in-line siphon tap (7). Then fit the tube to the hose barb on the backpack connector (1).

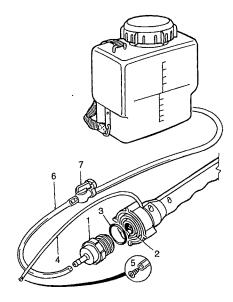


Fitting the spray bottle

To fit the bottle to the POWERPACK, fill the bottle to the required level and place it on a level surface.

Fit the POWERPACK into the bottle (1) ensuring that the bottle handle (3) is in line with the flow control valve (4).

Tighten the bottle securing cap (2) and pass the air bleed tube (5) through the bottle handle (3). This is important to ensure that the air bleed system functions correctly.



Flow control

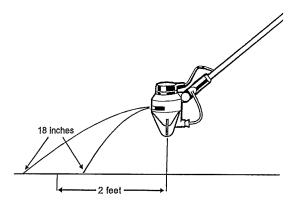
To open the flow control valve press the lever (1) down for treating small areas. For continuous spraying press the lever down and forward into the locked position (2). To close the flow control valve and stop the liquid flowing, pull back the lever and release. N.B. For safety in transit, the valve can be locked in the off position by slightly raising the lever and then sliding it forward (3).

BEFORE SPRAYING FOR THE FIRST TIME

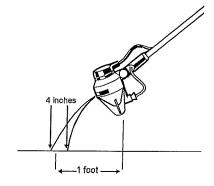
Before spraying for the first time use soap and water only to familiarise yourself with the sprayer and check the spray pattern produced.

Put around a pint of water in the bottle or backpack and add a few drops of liquid detergent such as household washing up liquid. The detergent is important to reduce the surface tension in the liquid feed tube and helps ensure an even flow. With the sprayer in the spraying position, check for leaks. Switch on the sprayer and then open the flow control valve. If using a *Micropak* backpack also open the in-line siphon tap. Again, check for leaks.

When spraying, the spray head should be held 2-3 inches above the ground or top of weed canopy with the lance at an angle of 35-40° to the ground. Spray on one spot for around 10 seconds, preferably on a clean dry surface e.g. concrete where you will be able to see the spray pattern produced.



If the spray head is horizontal the spray should project forward about 2' and produce a pattern or band around 18" wide using the standard atomiser cone housing (A 90).



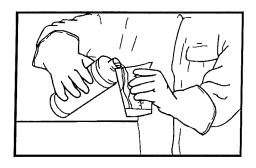
If the head is angled downwards the band width will be reduced. The angle of the spray head should not exceed 45° otherwise dripping will result.



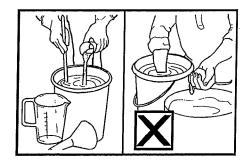
Changing the angle of the spray head will adjust the band width produced. To change the angle of the spray head slacken the adjustment nut (1), alter the angle of the head (2), retighten the nut and check the new band width produced.

MIXING AND FILLING AND CALIBRATION

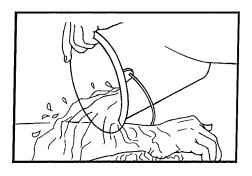
Mixing and filling is generally the most hazardous process in the spraying operation. <u>Always</u> follow the label instructions. <u>Always</u> use a filter (fitted in the Micron *Micropak* backpacks) and use a funnel if filling a container with a small neck. <u>Only</u> mix enough spray for the area to be treated thereby avoiding the need for disposal of unused spray mix.



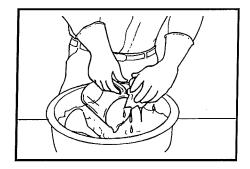
<u>Always</u> wear gloves when handling agrochemicals and equipment.



<u>Always</u> use the correct equipment when mixing and measuring.



<u>Always</u> wash off any skin contamination.



<u>Always</u> clean all equipment after use.

With the MICROFIT HERBAFLEX herbicides are usually applied in around 2 gallons total spray volume per acre, with the exception of glyphosate which can be applied at volumes as low as 1 gallon per acre. These are lower volumes than recommended for high volume application with knapsack sprayers. In general use the minimum dose rate recommended on the label for the intended treatment and add water to make up to the volume required for application with the MICROFIT HERBAFLEX.

For example, if the label recommends applying a minimum of 2 pints of product made up to 20 gallons of water per acre with a knapsack sprayer, use 2 pints of product made up to 2 gallons for application with the MICROFIT HERBAFLEX.

<u>Do not</u> use herbicide concentrations greater than the maximum recommended on the label (unless specific training or recommendations have been given) if the label:

- a) specifically prohibits use of 'Reduced Volumes' i.e. increased concentrations:
- b) has a <u>statutory</u> requirement for use of personal protective equipment when using the diluted product at high volumes (N.B. this will appear in the statutory box on the label); or
- c) carries one of the following hazard ratings: 'very toxic', 'toxic' or 'corrosive' or carries the warning 'risk of serious damage to the eyes' e.g. paraquat (Gramoxone) which is classified as toxic should not therefore be used through the MICROFIT HERBAFLEX at concentrations greater than recommended on the label.

Micron will not generally recommend using spray mixes more than ten times the maximum concentration recommended for high volume application with knapsack sprayers. The safest product and lowest dose rate appropriate for the treatment should be used at all times.

To prepare the spray mix, select the dose rate of product to be applied per hectare (from the product label) and mix in a suitable container.

Examples of mixing spray - for 1 acre

a) Glyphosate (360 g/l): 1.6 pints add water: 6.4 pints

Total volume: 8.0 pints

i.e. 1 part glyphosate: 4 parts water

e.g. 1 pint glyphosate + 4 pints water in 5 pint bottle

b) 2,4-D (500 g/l): 2.4 pints add water: 13.6 pints

Total volume:

16.0 pints

i.e. 3 parts 2,4-D: 17 parts water

e.g. 12 oz 2,4-D + 4 pints, 4 oz water in 5 pint bottle

Never use leaking equipment. Take care to avoid spillage of the spray mix

Calibration

The formula below gives the relationship between *flow rate*, *total spray volume*, *walking speed* and *band width* (or swath width):

Flow rate (oz/min) = 0.02 x total spray volume (gal/acre) x walking speed (mph) x band width (inches)

The *total spray volume* is the volume of spray mixture (chemical plus water) which is applied per unit area. Use a *total spray volume* of 1 gallon per acre for Roundup (and other glyphosate based herbicides) and 2 gallons per acre for other herbicides.

As a general rule a normal average *walking speed* is around 2 miles per hour (mph).

The *band width* is determined by the angle of the spray head to the ground (see 'BEFORE SPRAYING FOR THE FIRST TIME')

The *flow rate* is determined by the colour of the feed nozzle fitted. Using the table below select and fit the nozzle which will give the appropriate *flow rate* for the chemical which you are using.

| | | Flow rate (oz/min) | | | | | |
|---------------|---------|--------------------|---------|------------|------------|------------|--|
| | | | | | | | |
| Feed nozzle | White | Brown | Blue | Yellow | Orange* | Red* | |
| Thin liquids | 1.0 | 1.5 | 2.0* | Do not use | Do not use | Do not use | |
| Thick liquids | 0.3-0.5 | 0.5-1.0 | 1.0-1.3 | 1.3-1.5 | 1.5-2.0* | 2+* | |

(* Supplied for use with the atomiser cone housing B120 only - do not use with the atomiser cone housing A90 as this will result in flooding of the cone.)



The actual flow rate can be checked holding the MICROFIT HERBAFLEX in the spraying position (see 'TO START SPRAYING'). Remove the feed nozzle from the atomiser cone housing and allow the liquid to flow into a suitable container (such as the measuring cup provided with the sprayer).

Unless using the atomiser cone housing B120 (see 'OPTIONAL EXTRAS') flow rates above 1.5 oz per minute should not be used.

This means that for the application of most conventional herbicides formulations only either the WHITE or BROWN nozzles should be used

Use the table below as a guide as to which nozzle to use for your particular application.

| e.g. | Volume Application Rate (gal/acre) | Band Width (inches) | Flow Rate (oz) | Nozzle | Walking Speed (mph) |
|------------|---------------------------------------|---------------------|-------------------|--------|---------------------|
| Roundup | 1 | 18 | 0.72 | White | 2.0 |
| | 1 | 18 | 1.08 | White | 3.0 |
| | 1 | 12 | 0.72 | White | 3.0 |
| Other | 2 | 18 | 1.44 | Brown | 2.0 |
| | 2 | 18 | 1.08 | White | 1.5 |
| Herbicides | 2 | 12 | 0.9 | White | 2.0 |
| | 2 | 12 | 1.44 | Brown | 3.0 |

If the sprayer is new it may be noticed that with the white or brown nozzle fitted, air trapped in the liquid feed tube reduces the flow rate. If this occurs, clear the air by gently tapping the tube and, if necessary, flushing it through with a strong soap solution to reduce the surface tension in it. Once a steady flow is established measure the volume dispensed in one minute. If necessary fit a different feed nozzle and remeasure the flow rate.

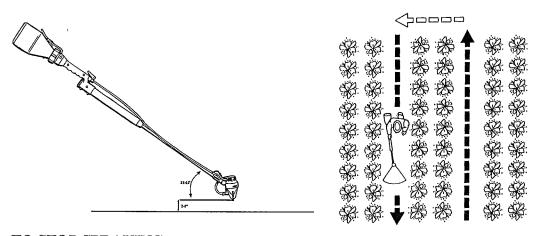
TO START SPRAYING

Before spraying for the first time check the operation of the sprayer using water and a little detergent only. (see 'BEFORE SPRAYING FOR THE FIRST TIME').

Check the wind speed and direction (below 3 mph is safest). Take special care to avoid drift by keeping the spray head as low as possible. <u>Never</u> spray into the wind and avoid walking into the spray.

The MICROFIT HERBAFLEX is normally held at an angle of around 35° to 40° to the ground. **Do not** spray with the MICROFIT HERBAFLEX held on the shoulder, since spray may contaminate the operator. N.B. the machine will not spray if the spray head is above the level of liquid in the container.

Hold the spray head 2-3" above the ground or weed foliage. Switch on the sprayer, and listen to check that the atomiser disc starts spinning; then open the flow control valve. There may be a slight delay before spray is emitted while liquid flows down the tube to the feed nozzle. Start walking immediately the spray liquid is emitted. It is best to hold the MICROFIT HERBAFLEX slightly to one side so as to avoid walking over the treated area. Always keep the spray head away from the body to avoid direct contamination by the spray.



TO STOP SPRAYING

Close the flow control valve and wait for a few moments until the spray liquid in the bottom of the cone is sprayed out and then switch off the sprayer. When the atomiser disc has stopped spinning lift the spray head so that it is above the bottle and the sprayer is at an angle of 45° and then open the flow control valve to drain any remaining liquid in the feed tube back into the bottle. If using a backpack, raise the feed tube above the level of liquid in the tank. Never raise the spray head until the atomiser disc has stopped spinning. Then close the flow control valve and, if using a backpack, the in-line siphon tap (this isolates the liquid in the backpack and means it can be disconnected from the sprayer).

AFTER SPRAYING

1. Dispose of any surplus spray mix according to the product approval. Store products safely, locked up and out of the reach of children.

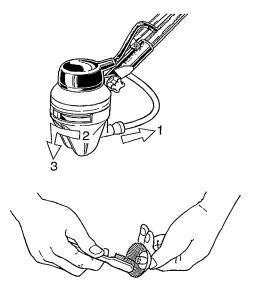


2. It is <u>essential</u> to clean the sprayer and bottle or backpack thoroughly using water and detergent after use. <u>Never</u> immerse the spray head in water or under a tap, since this will destroy the electric motor.



A water and detergent mix should be put in the bottle, swilled around, and then sprayed out onto the treated area or an area of waste ground. The sprayer and bottle should be wiped down externally using a cloth.

3. Periodically remove the atomiser cone housing and remove and clean the atomiser disc.



To do this first remove the feed nozzle by pulling it out of the bottom of the atomiser cone housing (1). Then remove the atomiser cone housing by rotating it an eighth of a turn clockwise (as viewed from above) to unlock the bayonet keyhole fitting (2) and pull it away from the bottom of the motor housing (3).

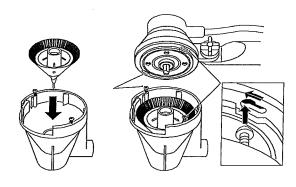
The atomiser disc can be removed from the atomiser cone housing and cleaned in soapy water using a soft brush.

To refit the atomiser disc

When refitting the atomiser disc it is important to ensure that it is correctly located in the atomiser cone housing and motor housing to avoid damage.

<u>First</u>, lower the atomiser disc into the atomiser cone housing ensuring that the disc shaft seats on the ball in the bottom of the atomiser cone assembly.

Then fit the motor housing, taking care to ensure that the motor drive shaft is correctly inserted into the slot on the top of the atomiser disc. Push the screws into the bayonet keyhole slots in the motor housing and twist to lock the assembly together.



Check that the atomiser disc is correctly fitted by shaking the spray head. If the disc can be heard rattling this means that it is fitted correctly and will spin freely.

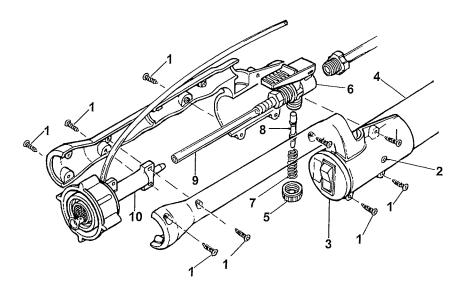
Refit the nozzle, ensuring that the sealing o-ring is in place and in good condition.

FLOW CONTROL VALVE MAINTENANCE

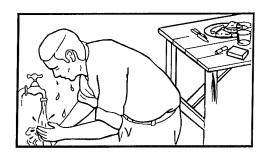
Disconnect the HERBAFLEX spray lance from the POWERPACK and remove the 5 pint bottle.

Remove the 9 screws (1) that hold the two halves of the POWERPACK handle together - <u>do not</u> remove the small screw (2) that secures the handle (3) to the battery case (4). Separate the handle to gain access. Unscrew the serrated cap (5) at the base of the flow control valve (6) and then remove the spring (7) and plunger (8). Then disconnect the flow control valve (6) and feed tube (9) from the bottle holder (10).

Clean all components in warm soapy water and re-assemble in reverse order.



After working with agrochemicals, or handling spraying equipment, <u>always</u> thoroughly wash hands and exposed skin. All protective clothing should be washed separately from other clothing and stored. Contaminated gloves should be washed





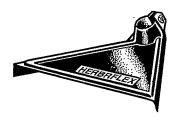
STORAGE

Before storing the MICROFIT HERBAFLEX for long periods disassemble the sprayer. Remove the bottle or backpack and unscrew the union nut from the flow control valve then depress the white button on the POWERPACK assembly and remove the HERBAFLEX spray lance. Remove the batteries from the POWERPACK to avoid corrosion. Check that electrical contacts are clean and dry. Store in a dry place away from direct sunlight. Batteries should be stored in a dry cool place.

OPTIONAL EXTRAS

Spray shield

In some instances where it is essential to minimise any spray drift a spray shield can be used. This should only be used with the standard atomiser cone housing A90.



To fit the spray shield, remove the head adjustment wing-nut and screw. Slip the shield over the spray head so that it sits around the top of the motor housing. Fit the screw, washers and wing-nut provided with the spray shield to secure it and set the angle of the spray head.

Atomiser cone B120 (for wider swaths)

If wider swaths (up to 2.5') are needed an atomiser cone housing with a wider opening (B120) should be used. This is supplied with a set of feed nozzles (yellow, orange and red) which give the higher flow rates needed for treating using wider swaths. (see 'MIXING, FILLING AND CALIBRATION')

This should be fitted as described in 'AFTER SPRAYING - To refit the atomiser disc.'

TROUBLESHOOTING

Atomiser disc spins but does not spray or sprays irregularly. Check:

- the feed nozzle. If the feed nozzle is blocked remove and soak in soapy water
- Never blow through the nozzle with your mouth.
- that the feed nozzle gives a flow rate within the operating range.
- the air vent tube for blockage if using the 5 pint bottle. Clean if necessary.
- the filter gauze in the POWERPACK handle. Clean if necessary.
- the atomiser disc is clean and undamaged. Clean or replace.
- the flow control valve for blockage (see 'FLOW CONTROL VALVE MAINTENANCE').
- the in-line siphon tap for blockage if using a backpack. Clean if necessary.

Atomiser disc fails to spin or spins unevenly. Check:

- that the batteries are fitted correctly.
- the condition of the batteries. Replace if necessary.
- that electrical terminals and contact points are clean and that electrical wires are not broken or corroded
- the motor for corrosion or obvious signs of wear. Replace if necessary.
- the plug is in the socket.
- the atomiser disc and atomiser cone housing are fitted correctly (see 'AFTER SPRAYING to refit the atomiser disc').

Battery condition can be checked with a torch (or a torch light bulb and electrical wire).

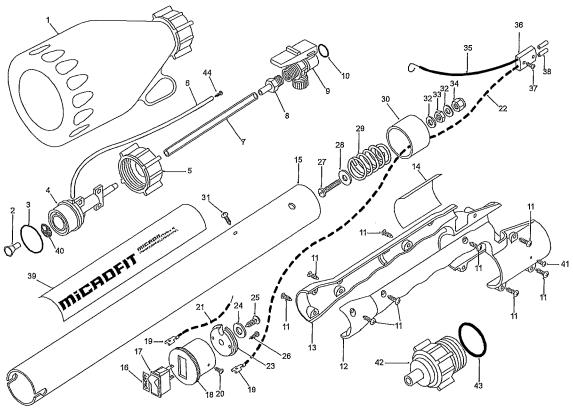
Spray liquid spills from the atomiser cone during spraying:

- angle of the spray head to the ground is too great reduce the angle
- flow rate too high fit feed nozzle with lower flow rate and reduce walking speed accordingly

Safety Notes:

- a) Acoustic information: the sound pressure level at the operator's ear does not exceed 70 dB(A).
- b) <u>Vibration</u>: the weighted RMS acceleration value at the hands when using this machine does not exceed 2.5 m/sec².

POWERPACK PARTS LIST/DIAGRAM



| • | | | | | | | | |
|------|---------|---------------------------------------|------|---|---------|----------------------------------|------|--|
| ITEM | PART NO | O. DESCRIPTION | QTY. | ITEM | PART NO | . DESCRIPTION | QTY. | |
| 1 | 4390 | BOTTLE, 2½ LITRE + CAP | 1 | 26 | 4939 | SCREW, NO. 4 X 1/2" S/T (AB) | 2 | |
| 2 | 5063 | AIR BLEED DEFLECTOR | 1 | 27 | 4318 | SCREW, 2,BA X 1" PANHEAD | 1 | |
| 3 | 5148 | 'O' RING | 1 | 28 | 3168 | WASHER, 1/4", FLAT | 1 | |
| 4 | 4904 | BOTTLE HOLDER + FILTER (5037) | 1 | 29 | 3070 | BATTERY SPRING | 1 | |
| 5 | 4940A | BOTTLE SECURING CAP + 'O' RING | 1 | 30 | 4315 | CENTRE CONNECTOR | 1 | |
| 6 | 3374/40 | (5148) | 1 | 31 | 3456 | SCREW, NO. 6 X 1/4", S/T (B) | 2 | |
| - | | TUBE 3/16 O.D., NYLON - 0.40M | 1 | 32 | 4877 | WASHER, 2 BA FLAT | 2 | |
| 7 | 4309/14 | TUBE, 5MM I.D. X 8MM O.D. PVC - 0.14M | 1 | 33 | 3673 | NUT, 2 BA | 1 | |
| 8 | 4912A | CONNECTOR HOSE, 12 MM | 1 | 34 | 4420 | NUT, 2 BA, NYLOC | 1 | |
| 9 | 4917 | VALVE C/W 'O' RING | 1 | 35 | 4134/20 | WIRE, 1.00 MM2, BLACK - 0.20M | 1 | |
| 10 | 5057 | 'O' RING | 1 | 36 | 5095A | PLUG ELECTRICAL, RADIUSED/FLAT | 1 | |
| 11 | 4806 | SCREW, NO. 6 X 5/8", PLASTITE | 9 | 37 | 5109 | SCREW, 3 X 6 MM, PT | 2 | |
| 12 | 4899L | HANDLE, LEFTHAND | 1 | 38 | 5104 | CONNECTOR SOCKET | 2 | |
| 13 | 4899R | HANDLE, RIGHT HAND | 1 | 39 | 5130 | LABEL, MICROFIT | 1 | |
| 14 | 4957 | LABEL, BATTERY | 1 | 40 | 5037 | FILTER | 1 | |
| 15 | 5108 | BATTERY CASE, 0.445M | 1 | 41 | 5170 | SCREW, NO. 4 X 3/16" S/T (B) | 1 | |
| 16 | 4958 | LABEL, ON/OFF | 1 | | | | | |
| 17 | 4918 | SWITCH | 1 | BACKPACK CONNECTOR KIT - Part No. 5087A, comprising of: | | | | |
| 18 | 4906A | SWITCH END PIECE + SCREWS | 1 | 42 | 5087 | BACKPACK CONNECTOR, | | |
| 19 | 5050 | TAG, 1/4" FLAG | 2 | 43 | 5111 | 'O' RING | 1 | |
| 20 | 4758 | SCREW NO. 4 X 5/16", S/T (AB) | 2 | 44 | 4622 | SCREW, NO. 6 X 1/4" S/T (B) | 1 | |
| 21 | 4368/8 | WIRE, 1.00 MM2, RED - 0.08M | 1 | | | | | |
| 22 | 4368/62 | WIRE, 1.00 MM2, RED - 0.61M | 1 | OPTIONAL EXTRAS (not shown): 5404B MICROPAK BACKPACK, 5 LITRE COMPLETE 5207B MICROPAK BACKPACK, 10 LITRE COMPLETE | | | | |
| 23 | 4905 | SWITCH COVER | 1 | | | | | |
| 24 | 4954 | WASHER, 1/4 X 1/2" BRASS | 1 | 5505B | | PPAK BACKPACK, 15 LITRE COMPLETE | | |
| 25 | 4802 | SCREW, NO. 14 X 1/2" S/T (AB) | 1 | 5107A | | SHOULDER COMPLETE | | |
| | | | | 21017 | BIMI | , DIO CLIDER COMMEDITA | | |

HERBAFLEX LANCE PARTS LIST/DIAGRAM

