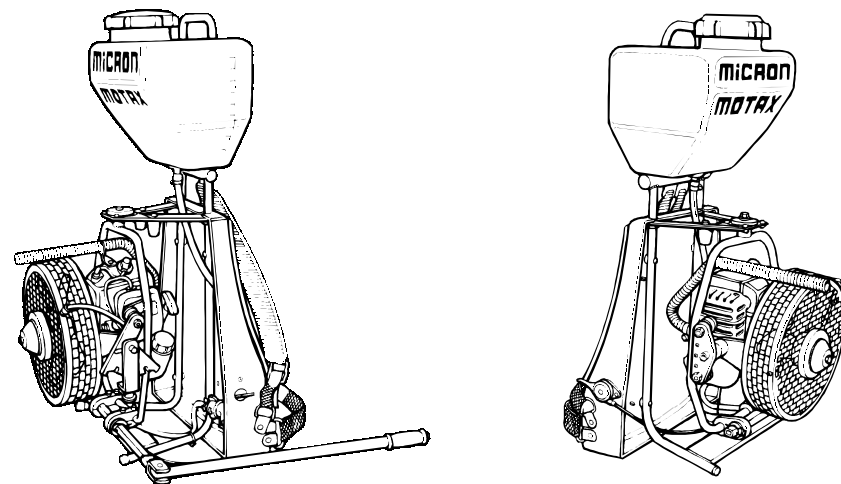


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## DESCRIPTION

The MOTAX 33 is an air-assisted, spinning disc, Controlled Droplet Application (CDA) sprayer for the foliar application of insecticides and fungicides in outdoor bush and tree crops, such as coffee and other row crops. Designed to be carried on the operator's back, the sprayer weighs 12.5 kg when empty and has a spray tank with a working volume of 8 litres which typically gives around one hour of spraying. Spray liquid is fed by gravity. The sprayer is powered by a two stroke 33 cc petrol engine (developing 1.2 hp at 6500 rpm) which drives an integrated fan/atomiser unit producing small uniform droplets which are blown into the crop foliage by the fan. The unique design of the MOTAX means that the spray is projected behind and away from the operator, minimising the risk of operator contamination. The MOTAX can be used for the application of water-miscible formulations (eg. ECs and WPs) generally at total spray volumes of between 30 - 70 litres per hectare.



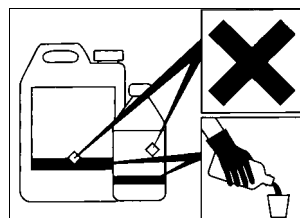
## SAFETY

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

The MOTAX can be used with most conventional insecticides and fungicides.

**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.**

**Never** 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.

**Always** store agrochemicals safely to protect people and animals, and to safeguard the environment (take special care to avoid water pollution). See 'SPRAYING' sections for guidelines on safe use of the MOTAX in operation.

### NOTE:

- ♦ Petrol is highly flammable.
- ♦ Store fuel in containers specifically designed for this purpose.
- ♦ Refuel outdoors and **do not** smoke while refuelling.
- ♦ Add fuel before starting the engine. **Never** remove the cap of the fuel tank or add petrol while the engine is running or when the engine is hot.
- ♦ If petrol is spilled **do not** attempt to start the engine but move the machine away from the area of spillage and avoid any source of ignition until petrol vapours have dissipated.
- ♦ Replace all fuel tank and container caps securely.
- ♦ **Never** store equipment with petrol in the tank inside a building where fumes

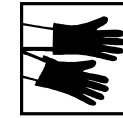
## TROUBLESHOOTING

FAULT FINDING CHART		
Atomiser assembly and feed system		
Problem	Likely cause	Remedy
Fails to spray or sprays in-	Spray solution run out or	Check spray liquid and replenish if neces-
	Blocked nozzle or filter	Remove and clean nozzle and filter (see 'TO CHANGE AND CLEAN THE FEED NOZZLE' and 'TO CLEAN THE IN-LINE FIL-
	Air vent in spray tank filler	Remove cap and check air vent. Remedy if
Atomisation poor	Engine speed too low	Refer to engine fault finding section
	Disc damaged	Replace disc (see 'TO CLEAN THE ATOM-
Engine speed normal but slow speed of disc rotation	Clutch slipping	Refer MOTAX to service agent
Excessive vibration	Fan blades loose or damaged Rubber engine mounts dam-	Replace as necessary
Engine		
Problem	Procedure	
Engine fails to start	Check that fuel tank is filled with good clean mixture Check fuel system for signs of obvious damage - kinks, leaks etc. in pipes and that all connections are secure Check that spark plug connections are secure and that plug is in good condition	
Engine starts but subsequently stalls	Check carburettor settings Check condition of spark plug	(see engine 'Operator's Handbook' supplied with the sprayer)
Engine runs slowly or erratically	Check choke lever setting Check and clean air filter Ensure that fuel mixture is correct Check carburettor setting Check that engine is not	

## OPERATOR PROTECTION

**Always** wear the protective clothing items listed on the product label for mixing and filling. The **minimum** protective clothing recommended for **spraying** with the MOTAX is:

- ◆ respirator
- ◆ long sleeved shirt
- ◆ rubber gloves and boots
- ◆ long trousers
- ◆ face shield
- ◆ ear protectors



### NOTE:

**Acoustic information:** the sound pressure level at the operator's ear is 98 dB(A).

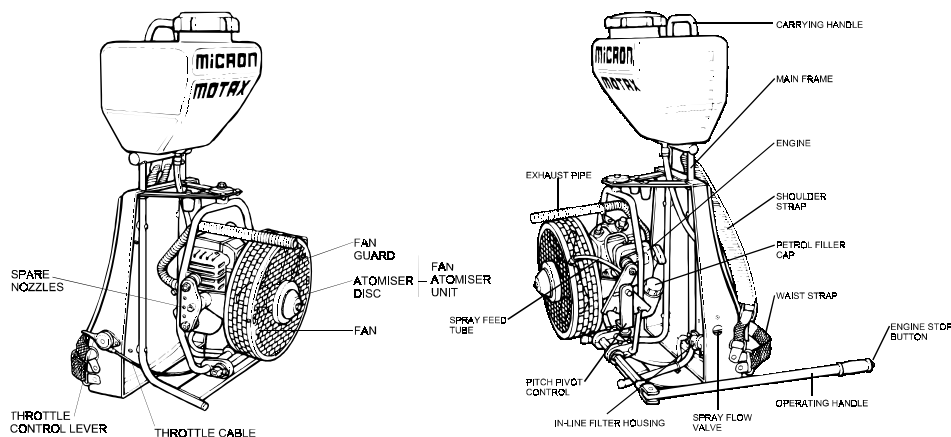
Using the machine in an enclosed/confined space may cause this level to increase by up to 6dB (A). The sound power level of the machine is 106 dB(A). Suitable ear protectors **must** be worn when using this machine.

### Never:

- ◆ touch the edge of the atomiser disc whilst the engine is running.
- ◆ insert anything through the fan guard whilst the engine is running.
- ◆ wear loose clothing, e.g. scarves and ties, or any item which could be drawn into the fan.
- ◆ leave the engine running in a small room or unventilated area. Exhaust gas contains carbon monoxide which is odourless, and invisible but poisonous.
- ◆ touch the exhaust pipe - it may be hot.

Ensure that fuel mixture does not get onto plants. It can cause severe scorch damage. Regularly check the fuel tank, carburettor and choke/air filter housing for leaks.

## PREPARING FOR SPRAYING



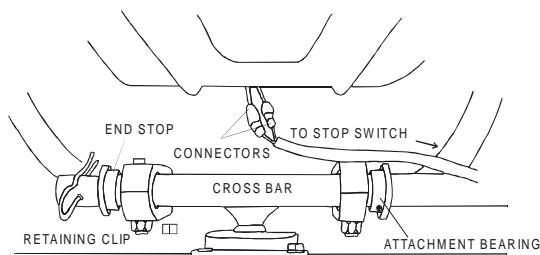
### a) CONTROLS

It is important that you familiarise yourself with the controls of the sprayer before using it for the first time. All references to left and right are with respect to the operator with the machine mounted on the back.

#### Operating Handle

Moving the operating handle backwards and forwards during spraying allows the air-blast and hence spray to be directed from side to side. The engine stop button is located in the end of the operating handle.

The operating handle can be fitted either on the right or left of the sprayer. To change the position of the handle, disconnect the two wires leading to the stop switch at the connectors located underneath the fuel tank.



Remove the retaining clip and plastic end stop from the cross bar of the operating handle and withdraw the bar from the cross bar attachment bearings.

Replace the cross bar so that the handle is on the opposite side of the sprayer and refit the end stop and retaining clip.

## MOTAX PARTS LIST (cont.)

(\* not illustrated)

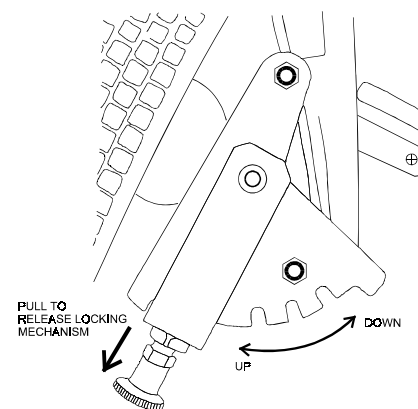
Item	Description	Part	Qty	Item	Description	Part	Qty
67	Bearing replacement kit	5645A	1	100	Hand grip outer	5695	1
68	Screw, M6 x 30	5727	1	101	Hand grip inner	5696	1
69	Nut, M10 (locking)	5617	1	102	Grommet	5665	1
70	Washer, M10, shakeproof	5618	1	103	Forked bracket	5697	1
71	Fan assembly (complete)	5728A	1	104	Bolt, M5 x 35	5679	1
72	Atomiser disc	5732	1	105	Nut, M5, nyloc	5112	1
73	Slinger	5688	1	106	Washer, M5, flat	5682	1
74	Flow valve, 1/4 BSP, M/F	5810	1	107	Screw, No. 6 x 3/8	4646	2
75	Tube (tank to valve)	5670/	1	108	Cross bar	5698	1
76	Hose clip, size E	5689	1	109	End stop	5674	2
77	Clip, Unex, No. 17	5811	1	110	Screw, No. 4 x 5/16	4758	2
78	clip, Unex, No. 27	5812	1	111	R-Clip (handle fixing)	5671	1
79	Elbow, 1/4	5678	1	112	Bearing (cross bar)	5693	2
80	Filter housing	5659	1	113	Screw, M5x 40	5179	2
81	Filter cap, quick release	5660	1	114	Nut, M5, nyloc	5112	2
82	Washer, sealing	5729	1	115	Washer, M5, flat	5682	2
83	Hosetail	5512	1	116	Screw, M6 x 40	5619	2
84	Strainer, slotted, equiv. to 50	5744	1	117	Nut, M6, nyloc	3690	2
85	Nut, M6, locking	3691	1	118	Washer, M6, flat	5722	2
86	Socket	5813	1	120	Label, Motax	5705	1
87	Adaptor	5814	1	121	Label, patent	5706*	1
88	Hosetail, 3/8 BSP x 012	5809	1	122	Serial no. plate	5708	1
89	Adaptor	5692	2	124	Label, ear defenders	T6109	1
90	Tube (filter to atomiser)	4993/	1	125	Label, ON/OFF	5731	1
91	Hose clip, size B	5737	2	126	Spanner, 2BA x 4BA (nozzle)	5713*	1
92	Elbow (feed tube connection)	5656	1	127	Spanner, 3/16 x 1/4 (feed	5714*	1
93	Nut, tubing	5657	1	128	Spanner, multimetric (disc)	5715*	1
94	Olive	5658	1	129	Cable c/w connectors	5730A	1
95	Cable tie (liquid supply tube)	5648	5	130	Filter, fine (alternative)	5733	1
96	Handle	5653	1	131	Washer, M12, flat	5716*	4
97	Stop switch	5664	1	132	Label, Cenecafe	5899	1
98	Switch insert	5694	1	133	Washer, 5/16" x 7/8", flat	4757*	1
99	Screw, No. 4 x 3/16	3026	1	134	Washer, 1/4" id, flat	3168*	1

## MOTAX PARTS LIST 01/98

(\* not illustrated)

Item	Description	Part	Qty	Item	Description	Part	Qty
1	Mainframe	5580	1	34	Washer, M6, flat	5722	8
2	End plug	5613	4	35	Pitch pivot lever	5624	1
3	Backform	5709	1	36	Quadrant plate, 5 position	5824	1
4	Bolt, M5 x 30	5681*	4	37	Pivot block	5622	1
5	Washer, saddle	5612	4	38	Indexing unit	5602	1
6	Nut, M5, nyloc	5112	4	39	Nut, M12 x 1.5 (locking)	5603	2
7	Washer, flat	5682*	4	40	Rollpin, 5 x 25	5604	1
8	Tank	5586	1	41	Spacer, pitch pivot	5724	1
9	Cap (complete)	5208A	1	42	Engine, Kawasaki, TGO 33D	5591	1
10	Seal, cork (cap)	5346	1	43	Exhaust extension	5711	1
11	Air bleed valve body	5448	1	44	Exhaust clamp	5672	1
12	Ball, 3/16 diam, polypropyl-	5210	1	45	Throttle cable	5675	1
13	Filter bowl (tank)	5449	1	46	Throttle lever	5611	1
14	R-clip (tank fixing)	5671*	1	47	Screw, M5 x 16	4915	2
15	Backpad (c/w eyelets)	5640A	1	48	Nut, M5, nyloc	5112	2
16	Retaining clip	5614	4	49	Washer, M5, flat	5682	2
17	Waist strap R.H. (female)	5719A	1	50	Fanguard assembly	5725	1
18	Waist strap L.H. (male)	5720A	1	51	Screw, M6 x 40	5619	4
19	Shoulder strap	5721A	2	52	Washer, M6, shakeproof	5620	4
20	Screw, M6 x 20	4623	4	53	Fanguard front plate	5578	1
21	Nut, M6, nyloc	3690*	4	54	Atomiser cowl	5623	1
22	Washer, M6, flat	5722*	4	55	Screw, No. 4 x 5/16	4758	4
23	Yaw frame	5583	1	56	Nut, angle	5595	4
24	Yaw stops	5649	2	57	Screw, No. 8 x 1/2	4677	4
25	Screw, M5 x 25	5029	2	58	Feed tube (complete)	5628	1
26	Nut, M5, square	5723*	2	59	Screw, M4 x 10	5244	4
27	Mount, anti-vibration, yaw	5599A	2	60	Nut, M4, nyloc	5245	4
28	Screw, M5 x 16	4915	8	61	Feed nozzle, red (diam.	5699	1
29	Washer, M5, flat	5682*	8	62	Feed nozzle, black (diam	5700	1
30	Nut, M5, nyloc	5112	8	63	Feed nozzle, grey (diam. 1.45)	5701	1
31	Circlip	5615	2	64	Feed nozzle, green (diam.	5702	1
32	Mount, anti-vibration, pitch	5631	4	65	Clutch/bearing housing	5601	1
33	Nut, M6, nyloc	3690	8	66	Fanshaft	5676	1

### Pitch Pivot Control

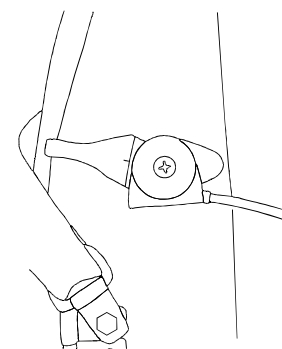


Reconnect the two wires leading to the stop switch.

The pitch of the fan/atomiser unit and hence angle of spray can be altered using the pitch pivot control, situated on the right hand side of the sprayer. This can be set to five positions selected according to the height of the crop and the angle of slope.

To alter the pitch of the fan/atomiser unit with the sprayer mounted on the back, position the unit using the operating handle so that it is possible to reach behind and grasp the pitch pivot adjustment knob. Pull this downwards to free the locking mechanism. Move either forwards or backwards according to the setting desired and release the

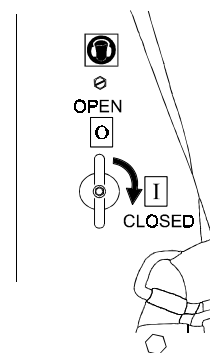
### Throttle Control



The throttle control lever is situated on the left hand side of the plastic back-moulding. To increase the engine speed, the lever should be pushed upwards. To decrease the engine speed pull the lever downwards.

N.B. When the throttle control lever is in the idle position, the fan/atomiser unit should not spin.

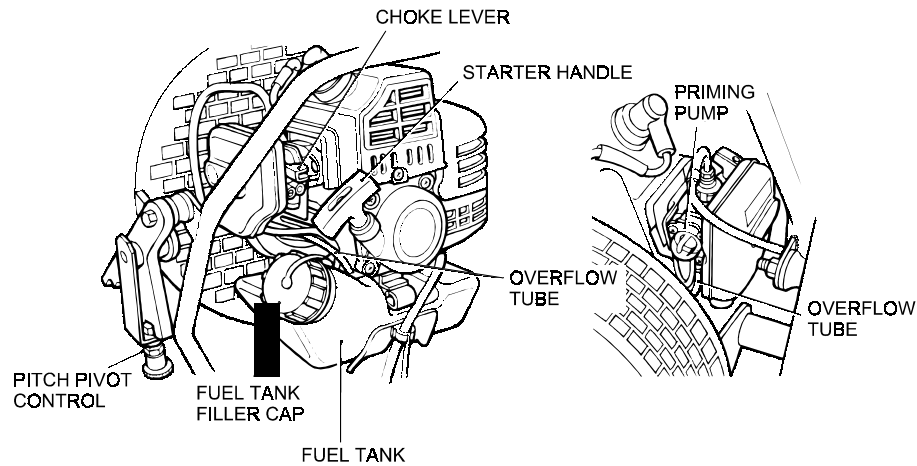
### Spray Flow Valve



The spray flow valve is situated on the right hand side of the back-moulding. To open the spray flow valve lift the lever until it is vertical. To close the valve, return the lever to the horizontal position.

N.B. - Apart from during calibration, the spray flow valve should **never** be opened unless the engine is running at full speed with the fan/atomiser unit spinning as this may result in operator contamination.

## b) PREPARING THE ENGINE



### Fuel mixture

The engine is lubricated by two stroke oil which is added to regular grade petrol. A 1:25 (oil : petrol) mixture should be used to ensure optimum running - i.e. use 40 ml of oil made up with one litre of petrol.

Thoroughly mix the oil and petrol in a clean container. **Do not** use multigrade or other special purpose oils. These oils are not blended for use with two stroke engines.

**Do not** use a stale or dirty oil mixture. Deterioration can occur during storage especially when kept in a dirty container or stored in a warm place.

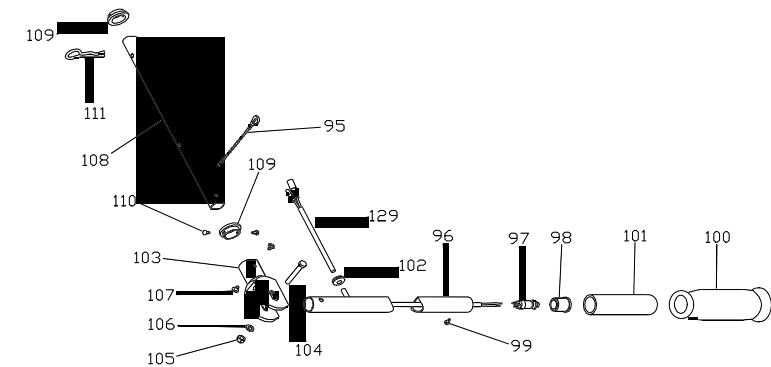
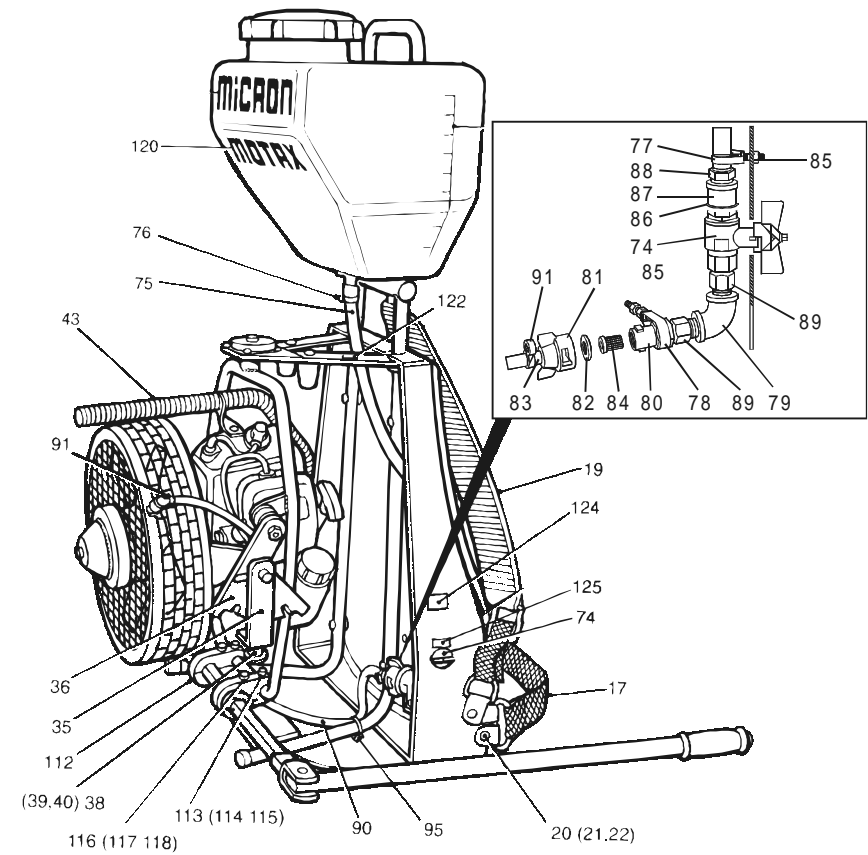
### Filling the fuel tank

Ensure that the fan/atomiser unit is in the mid position (see 'CONTROLS').

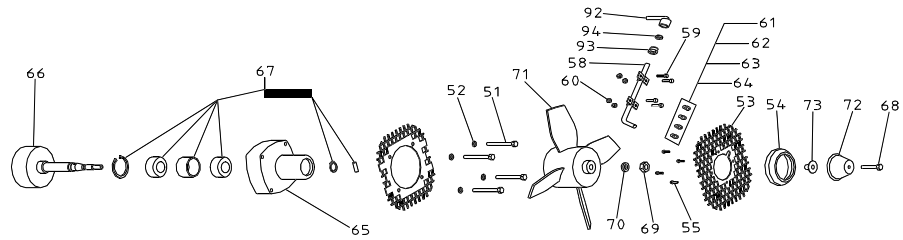
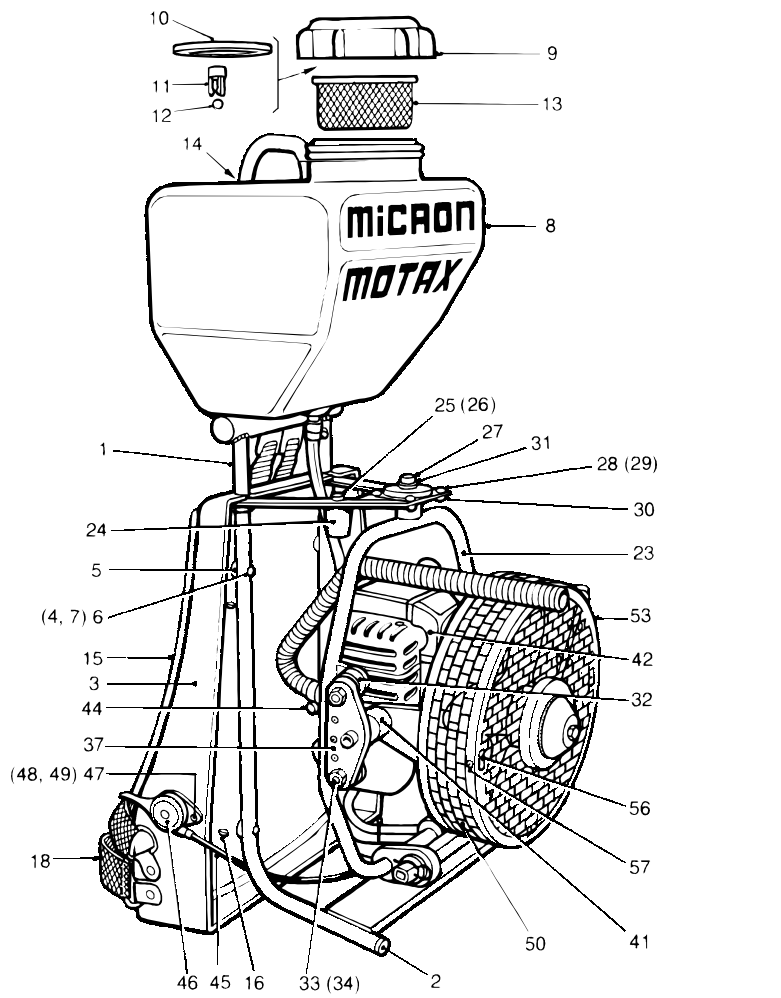
Wipe any dirt from the fuel tank neck and cap before removing. Use either a petrol can with a spout or a clean funnel fitted with a fine filter gauze. Fill the tank to the bottom of the filler neck, taking care not to overfill.

Replace the cap securely, taking care not to overtighten.

## PARTS DIAGRAM



**PARTS DIAGRAM**



**STARTING THE ENGINE**

N.B. If using the sprayer after storage carry out pre-season checks (see 'STORAGE AND MAINTENANCE')

Before starting the engine make sure that you fully familiar with all the controls of the sprayer.

**Always** remove any loose items of clothing before starting the engine.

Place the sprayer on a flat surface with the fan/atomiser unit in the mid position.

1. Ensure that the choke lever is in the fully closed position (i.e. UP).
2. Move the throttle control lever to the half open position.
3. To prime the carburettor, slowly push the priming pump two or three times until fuel without any air bubbles can be seen flowing down the overflow pipe back into the tank.
4. With one hand on the carrying handle and the operating handle held steady, give the starter cord a rapid and vigorous pull until the engine starts. If the engine fires and stops with the choke closed, partially open the choke and try starting again. When the engine is running, open the choke fully.

**Important:**

**Do not** pull the starter cord all the way.

Allow the rope to rewind slowly.

If the engine will not start, refer to 'TROUBLESHOOTING'

**To stop the engine**

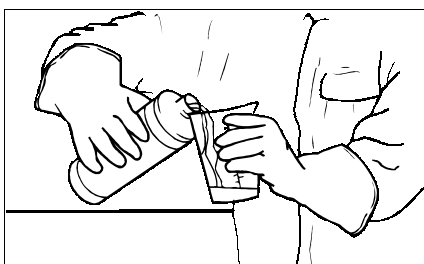
Stop the engine by pressing the red button located in the end of the operating handle.

**Always** ensure that the spray flow valve is in the closed position before stopping the engine.

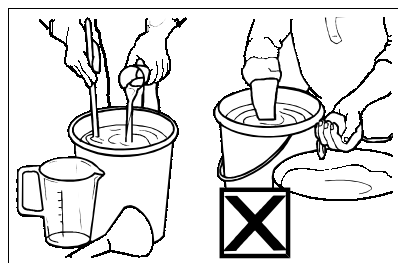
**Important:** Before spraying for the first time with the MOTAX, sprayer operation should be checked using water only (see 'BEFORE SPRAYING').

## MIXING AND FILLING

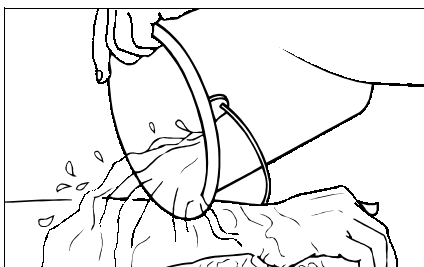
Mixing and filling is generally the most hazardous process in the spraying operation. **Always** follow the label instructions. To avoid the need for disposal of unused spray mix **only** mix enough spray for the area to be treated.



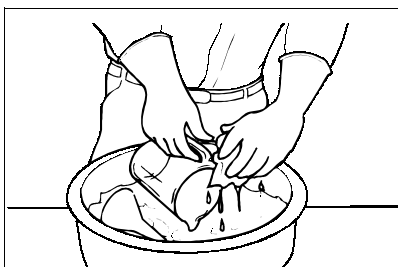
**Always** wear gloves when handling agrochemicals and equipment



**Always** use the correct equipment when mixing and measuring.



**Always** wash off any skin contamination



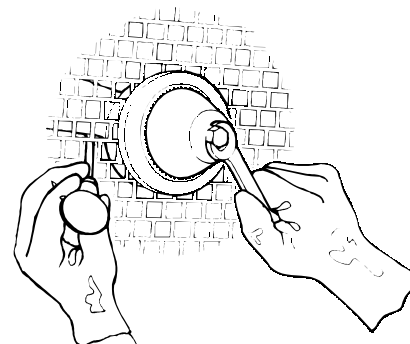
**Always** clean equipment after use

Insecticides and fungicides are generally applied with the MOTAX at 30-70 litres total spray volume per hectare. For example, the label may recommend using 2 litres of product made up to 100 litres with water for each hectare using a conventional sprayer. If you want to spray at 30 l/ha (total spray volume) with the MOTAX you should still use 2 litres of product but make this up to 30 litres with water - **i.e. the amount of insecticide is the same but the amount of water is reduced.**

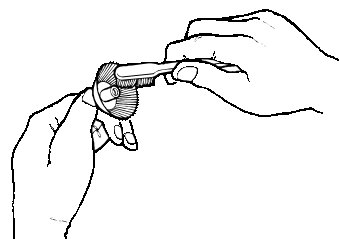
**Do not** use product concentrations greater than the maximum recommended on the label (unless specific training or recommendations have been given) if the label:

- a) specifically prohibits use of 'Reduced Volumes' i.e. increased concentrations;

## TO CLEAN THE ATOMISER DISC

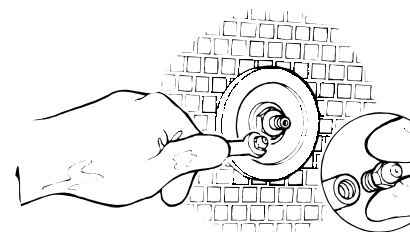


To clean the atomiser disc it must firstly be removed. This is done by inserting a screwdriver through the fan-guard to prevent the fan-atomiser assembly from rotating and removing the disc retaining bolt (10mm) using the multi metric spanner provided with the sprayer. The atomiser disc can then be pulled from its shaft.



The atomiser disc should be cleaned from time to time using a soft brush to ensure that the grooves are not clogged. This will need to be done after each spray operation if wettable powders are being used through the MOTAX.

## TO CHANGE AND CLEAN THE FEED NOZZLE



Remove the atomiser assembly (see 'TO CLEAN THE ATOMISER DISC').

Remove the feed nozzle as shown using the spanner provided (2BA x 4BA).

The nozzle can be cleaned in water, using a brush or soft wire if necessary to unblock it.

Refit the appropriate nozzle and, if necessary, check the flow rate (see 'CALIBRATION').

Nozzles are stored on the pivot block on the opposite side of the sprayer to the pitch

**STORAGE AND MAINTENANCE**

Before storage for any length of time (e.g. between seasons) :

Ensure that the spray tank, feed system and atomiser disc are clean and dry.

Remove all fuel from the fuel system by draining the tank and then running the engine until all the remaining fuel in the carburettor is used up and the engine stops.

Remove the spark plug and pour in about 2-5 ml of new engine oil through the spark plug hole, pull the starter cord several times and replace the spark plug.

Pull the starter cord again until the piston is felt coming on its compression stroke - i.e. halfway up the cylinder with both the intake and exhaust ports closed. This will prevent damp air from entering the cylinder.

Wipe down the engine with an oil or kerosene impregnated cloth and store the sprayer in a clean, dry place.

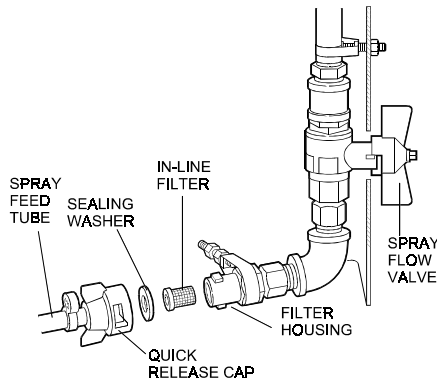
**Maintenance - every day before use:**

- ◆ Check the atomiser disc for damage. Ensure that the retaining bolt is tight and that the disc spins freely.
- ◆ Check the plumbing system for leaks and ensure that all hose clips are tight.
- ◆ Check fan blades and fan guard for signs of damage.

**Maintenance - every season before using for the first time (or more often if the MOTAX is being subjected to heavy use):**

- ◆ Check rubber engine mounts and stops for signs of deterioration and damage.
- ◆ Check wiring for signs of wear and damage.
- ◆ Check all nuts and bolts and tighten if necessary.

**TO CLEAN THE IN-LINE FILTER**



The in-line filter is located on the inside of the back form on the right hand side of the sprayer. Turn the yellow quick release cap a half turn anti-clockwise to disconnect and remove the filter from the housing. Rinse the filter in clean water and refit, ensuring that the sealing washer is in place and the filter cap is properly relocated and locked into position.

Check for leaks

- b) has a statutory 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'.

Micron do not generally recommend using spray mixes more than ten times the maximum concentration recommended for high volume application. At high concentrations some products can be phytotoxic to crops. Thus, if in doubt, first spray a small test area. **Do not** use more than the minimum recommended label dosage rate i.e. where the label recommendation gives a range of dose rates of, for example, 2 to 3 litres/hectare use no more than 2 litres/hectare. The safest product and lowest dose rate appropriate for the treatment should be used at all times.

To prepare the spray mix with water-based mixtures 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 hectare (for 1,000 m<sup>2</sup> i.e. 0.1 ha, divide quantities by

**E.g. Insecticide dose rate 2 l/ha, applied at volume rate of 30 l/ha**

insecticide	2 litres
water	<u>+ 28 litres</u>

**i.e. 1 part insecticide to 14 parts water**

**or 0.5 litre insecticide + 7 litres water in tank**

**To fill the spray tank**

When mixing and filling always ensure that suitable protective clothing is worn (see 'OPERATOR SAFETY').

Although the MOTAX spray tank holds approximately 10 litres, it is recommended that no more than 8 litres of spray mix is used at a time, to avoid the risk of spillage and the operator carrying excess weight. Ideally, there should be sufficient spray mix in the tank to outlast a full tank of petrol (which will give around 40-50 minutes running time). This eliminates the problem of the operator continuing to run the sprayer after the spray tank has been emptied.

Ensure that the sprayer is stable and on a flat surface with the spray flow valve in the closed position (see 'CONTROLS').

Remove the cap of the spray tank, leaving the filter in place and pour half the amount of clean water to be used into the sprayer, followed by the measured amount of chemical and finally the remainder of the water, avoiding splashing.

Replace the cap tightly and mix well by gently shaking the spray. If wettable powders or other formulations which may be relatively difficult to dissolve or disperse are used, then mixing should be carried out in a bucket prior to filling the sprayer, taking care to avoid any splashing.

Finally, wipe down the outside of the sprayer with a clean damp cloth, taking particular care to make sure that there is no chemical on the backrest or straps. Check for leaks. **Never** use leaking equipment. Take care to avoid spillage when filling or lifting the tank

### CALIBRATION

The workrate when using the MOTAX will be dependent on the particular situation. When initially familiarising yourself with the sprayer using water (see 'BEFORE SPRAYING'), it should be possible to get an idea of what walking speed is practical in a field situation.

The table below indicates the relationship between spray volume, flow rate and walking speed for the MOTAX as per the following formulae:

**a) Formula for calculating required flow rate:-**  

$$\text{Flow rate (ml/min)} = 6 \times \frac{\text{spray pass interval (m)}}{\text{total spray volume (l/ha)}} \times \text{walking speed (m/s)}$$

If making a single spray pass up each inter-row alley, treating two rows at a time then the spray pass interval will be the distance between rows. If two passes are made per inter-row alley, then the spray pass interval will be half the distance between the rows.

**b) Formula to calculate the volume applied from a known flow rate:-**  

$$\frac{\text{Measured flow rate (ml/min)}}{\text{Area sprayed in one minute (m}^2\text{)}} \times 10 = \text{spray volume (l/ha)}$$

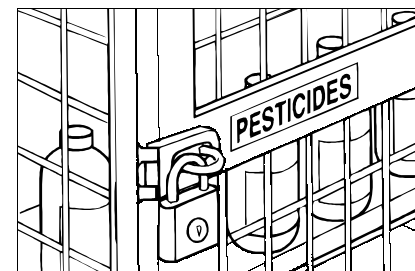
Nozzles are colour coded according to their orifice diameter. The following table is a guide to flow rates through various nozzles using water only.

Nozzle colour	Red	Black	Grey	Green
Nozzle orifice size (mm)	1.00	1.25	1.45	1.75
Flow rate (ml/min) *	100	150	200	300

\* flow rates measured with water only.

### AFTER SPRAYING

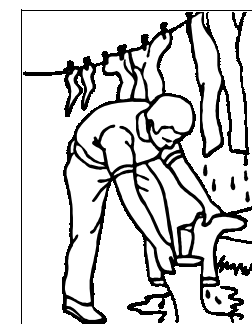
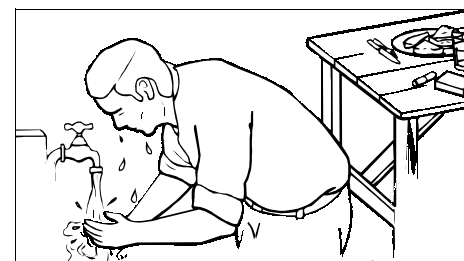
1. Dispose of any surplus spray mix according to the product label. Store products safely, locked up and out of the reach of children.



2. It is essential to clean the sprayer and tank thoroughly after use. Half fill the spray tank with water and a little detergent. Replace the lid and agitate the sprayer for several seconds. Pour out the washings and dispose of in the same way as any surplus spray mix. Refill the sprayer with more water and spray out into the already treated crop area for several minutes to ensure that the feed nozzle and atomiser unit are thoroughly cleaned. Empty the sprayer as above.

Periodically, the atomiser disc should be removed and cleaned (see 'TO CLEAN THE ATOMISER DISC')

3. After working with agrochemicals or handling spraying equipment always thoroughly wash your hands and exposed skin. All protective clothing should be washed inside and out and stored separately from other clothing.



At the end of each spray pass, turn the spray flow valve to the closed position and adjust the throttle to idle. Make sure that you are clear of the end of the row before doing this to ensure that the last bushes in the row are adequately covered.

If the rows are aligned up and down hill, then it may be necessary to adjust the angle of the fan/atomiser unit, before beginning the next row. If this is done, visually check the new pitch angle before continuing.

At the start of the next row, increase the engine speed to full throttle and open the spray flow valve.

If for any reason the engine stops during spraying, then immediately close the spray flow valve.

### TO STOP SPRAYING

**First** close the spray flow valve.

**Then** close the throttle and press the red stop button in the end of the operating handle keeping it depressed until the engine stops.

In the event of an emergency, the stop button should be used to stop the engine and then the spray flow valve closed as soon as possible. The sprayer can be quickly removed by unclipping the quick release belt buckle and lifting the plastic buckle tabs on the shoulder straps.

When calibrating, liquid flow rates should always be measured with the actual spray mix as these may differ from those obtained using water due to differences in liquid viscosity.

### To check the flow rate

Ensure that you are wearing the appropriate protective clothing.

**Never** check the flow rate with the engine running.

Choose and fit the feed nozzle that is likely to be required (see 'TO CHANGE AND CLEAN THE FEED NOZZLE'). With the fan/atomiser unit in the down position, open the spray flow valve fully (see 'CONTROLS'). When the liquid flow is steady place a jug or measuring cylinder under the atomiser disc to collect and measure the liquid dispensed over a period of one minute. If the flow rate is very different from that required, change the feed nozzle and repeat the above process. Alternative nozzles are stored on the pitch pivot block on the opposite side of the sprayer to the pitch pivot control. If the flow rate is close to that required, adjust walking speed accordingly to give the desired volume application rate.

**Example:** Required spray volume = 30 l/ha; Spray pass interval = 1.5m  
Flow rate measured = 150 ml/min

$$\begin{aligned} \text{Walking speed (m/s)} &= \frac{\text{Flow rate (ml/min)}}{6 \times \text{spray pass interval (m)} \times \text{total spray volume (l/ha)}} \\ &= \frac{150}{6 \times 1.5 \times 30} \\ &= 0.55 \text{ m/s} \end{aligned}$$

i.e. 0.55 m/s or 33m in one minute (0.55 x 60)

Mark out a distance of 33 m and practice walking it in one minute using the sprayer under operating conditions (see 'BEFORE SPRAYING').

## BEFORE SPRAYING

Before spraying for the first time, familiarise yourself with the controls and operation of the MOTAX using water only. On subsequent occasions, it is important to ensure that the sprayer is in good condition and that routine daily and seasonal maintenance is carried out as appropriate (see 'STORAGE AND MAINTENANCE').

**Always** wear the appropriate protective clothing (see 'OPERATOR PROTECTION')

Plan your work to ensure that supplies of chemical and fuel are available in the field where they are needed.

## TO START SPRAYING

With the spray flow valve closed, start the engine and reduce the throttle to idle so that the fan/atomiser unit is not spinning (see 'CONTROLS' and 'STARTING THE ENGINE').

Lift the sprayer onto your back and pull the loose ends of the shoulder straps to tighten them so that they are comfortable. Fasten the buckle on the waist belt and tighten to comfort by pulling the ends.

Go to the planned starting point of the spray operation. Begin spraying at the downwind edge of the crop, working progressively upwind. **Never** spray against the wind.

Adjust the angle of the fan/atomiser unit according to the height of the crop and slope of the land using the pitch pivot control (see 'CONTROLS'). This should generally be done only at the start of a row or if the slope or height of crop changes markedly as you progress between rows. The sprayer is not designed for this adjustment to be made on a continuous basis whilst spraying.

Check that there are no people or animals behind you or in the area to be sprayed.

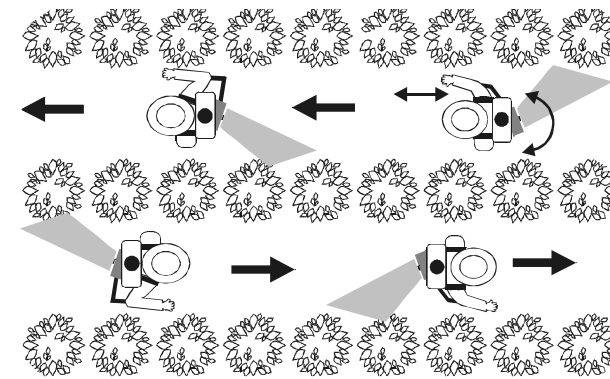
**Firstly** open the throttle fully, by pushing the throttle lever upwards.

**Then** open the spray flow valve (see 'CONTROLS') N.B. Apart from when measuring the flow rate during calibration, the spray flow valve should **never** be opened unless the engine is running at full throttle as this may result in operator contamination. Look behind to check that a spray cloud is being formed.

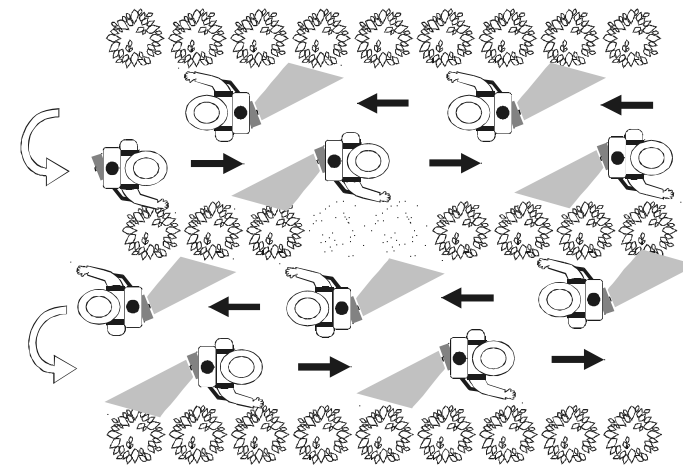
Walk through the crop at the calculated speed. From time to time look behind to check that the sprayer is performing satisfactorily.

## METHOD OF WORKING

The method of working will depend on the crop being sprayed and the insect pest or disease target.



For crops with a row spacing of less than two metres, or those in which the foliage closes between the rows it **may** be possible to spray two rows with a single spray pass by moving the operating handle backwards and forwards to oscillate the fan/atomiser unit from side to side as you progress.



If the row spacing or crop density means that only a single row can be covered per pass, then the operating handle should be held steady so that the fan/atomiser unit is pointed to one side, aimed at the row to be sprayed and a second pass made to treat the adjacent row.

In crops with sparse foliage or those under one metre (which are effectively being sprayed from the top, rather than the side) a single spray pass from one side may be sufficient to cover the entire plant. If not, then the opposite side of the plant should