

Air Assisted Vehicle Mounted ULV and LV Sprayer



**Operator's Manual & Parts Catalogue** 



# AU8115MS AIR ASSISTED VEHICLE MOUNTED ULV & LV SPRAYER

## Operator's Manual and Parts Catalogue

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## 1. INTRODUCTION

This manual contains all information required to ensure successful application of products for agricultural, public health and pest control using the AU8115MS vehicle mounted sprayer. Full instructions and operation details are included along with all necessary information required to maintain and repair the equipment and to identify any spare parts.

The AU8115MS sprayer is designed for a wide range of agricultural, public health and pest control spray tasks. It can be mounted in the rear of any pick-up truck or other suitable vehicle, with all controls installed in the cab of the vehicle for maximum operator safety.

The sprayer is designed around the proven Micronair AU8000 sprayhead. This uses a rotary atomiser to produce spray droplets of a precisely controlled size. Control of the droplet size minimises wastage of pesticide and ensures optimum penetration and coverage of the target. This ensures flexibility over a wide range of application parameters and products. The sprayer can be used for flow rates from 0.2 - 3.5litres per minute.

The sprayhead is driven by a high velocity air stream produced by a blower powered by a reliable 4 stroke engine with electric start. The air stream from the sprayhead carries the spray droplets for a distance of up to 10 metres in still air and typically enables a swath of 50 - 100 metres to be achieved when using a drift spraying technique with a wind speed of 2 metres/second or more. The air stream also ensures optimum penetration of dense foliage and carries all spray safely away from the vehicle and its driver. The sprayhead is fitted in an adjustable mounting which enables it to be directed towards the target to ensure optimum coverage.

The AU8115MS sprayer is operated from a control box in the vehicle cab. This incorporates switches for the electric engine starter, engine throttle and pesticide pump.

It is the responsibility of the user to determine the optimum application rate and droplet size for the product mix being used. This information should then be used in conjunction with the section on Calibration to determine the required atomiser flow rate. It is important to read this manual carefully before using the sprayer.

## 2. SPECIFICATION

Dimensions:	140 cm long x 76 cm wide x 85 cm high (excluding spray head and support)
Height of spray head:	180 cm above bed of vehicle
Weight (empty):	130 kg
Pesticide tank:	100 litres capacity; UV stabilised polyethylene
Flushing tank:	10 litres capacity; UV stabilised polyethylene
Pesticide flow rate:	0.2 – 3.5 litres/minute
Flow rate adjustment:	By manually adjustable restrictor valve or by interchangeable restrictor orifice discs
Pump:	12 V magnetically coupled centrifugal pump
Spray droplet size:	40 – 100 microns VMD (depending upon formulation used)
Spray band width	10 – 100 metres (when using a drift spraying technique)
Engine :	4 stroke petrol (gasoline) 13 HP engine with electric start and electrically operated throttle
Fuel capacity:	5.0 litres
Running time (with full fuel tank):	3 hours approx.
Electrical requirements:	12 volts DC (vehicle battery) 50 A (during electric start) 10 A maximum (spraying)



Fig. 1 – Components of AU8115MS Sprayer

## 3. INSTALLATION

#### 3.1. Installation on Vehicle

The AU8115MS Sprayer can be installed on any vehicle with an open bed and an enclosed cab to protect the driver from the spray. The sprayer should be positioned as far to the rear of the vehicle as possible so that when the support frame is raised the atomiser projects behind the rear of the vehicle. When positioning the sprayer in the vehicle, ensure that there is easy access to engine controls, starter cord, control valves, filter etc.

The frame of the sprayer should be rigidly secured to the vehicle using the nuts, bolts, washers and foot plates provided. The bolts should be fitted in four holes drilled in the bed of the vehicle in appropriate positions, taking care to avoid the vehicle fuel tank or other vulnerable items. Alternatively, for a temporary installation the sprayer can be tied down with ropes secured around the frame



Fig. 2 – Attachment to Vehicle

#### 3.2. Assembly of Sprayer

The AU8115MS sprayer is shipped partially dismantled and must be assembled prior to use. The procedure for setting up a new sprayer is as follows:

- 1. Position the lower ends of the sprayhead support frame between the lugs at the rear of the sprayer frame and secure in position with the pins and R-clips provided.
- 2. Position the lower ends of the A-frame between the lugs at the rear of the sprayer frame and secure in position with the pins and R-clips provided.
- 3. Raise the support frame so that it protrudes over the rear of the sprayer.
- 4. Secure the support frame by lifting the A-frame and locking in place through the securing lug with the pin and R-clip provided.
- 5. Position the spray head in the support ring. Place a red fibre friction disc between each mounting boss and the inside of the support ring. Fix the spray head in position with securing bolts and washers as supplied.
- 6. Secure the air duct hose to the fan outlet using the hose clip provided.
- 7. Connect the lower end of the feed hose to the atomiser to the outlet of the needle valve mounted on the top of the blower casing.
- 8. Fill the engine crankcase with oil as described in section 8.1.1.

- 1. Route the flexible conduit from the sprayer over or under the bed of the vehicle and into the vehicle cab. Ensure that the conduit is clear of sharp edges or hot parts (eg the engine exhaust under the bed of the vehicle) and is not vulnerable to damage from objects placed in the rear of the vehicle.
- 9. Route the cable for the control box (with the 7-pin connector) to a suitable position in the vehicle cab.
- 10. Connect the control box to the cable and tighten the retaining ring on the connector.
- 11. Route the battery cable to the battery in the engine compartment of the vehicle.
- 12. Connect the battery leads to the vehicle battery with the red wire to the positive (+) terminal and the black wire to the negative (-) terminal.
- 13. Ensure that the THROTTLE switch on the control box is set to IDLE and the PUMP switch is set to OFF.
- 14. Plug the connector on the battery cable into the receptacle on the battery leads.
- 15. Secure the cable in the engine compartment with the cable ties provided. Ensure that the cable is well clear of sharp edges and all moving or hot parts.
- 16. Put a small quantity (about 5 litres) of diesel or kerosene in the sprayer tank, operate the valves to select the main tank, fully open the flow control valve and place a bucket under the atomiser.
- 17. Set the PUMP switch on the control box to ON. Check that the pump operates and that liquid flows from the atomiser. Set the PUMP switch to OFF.
- 18. Move the THROTTLE switch on the control box between the IDLE and ON positions and check that the throttle linkage at the top of the engine above the air filter moves between its extreme minimum and maximum positions.
- 19. Test the starting and stopping of the engine as described in section 4.2 below.

IMPORTANT: the engine is shipped without oil. OIL MUST BE ADDED before starting the engine

## 4. CONTROLS

This section describes the main features and controls of the sprayer and gives a brief explanation of their functions. Further details will be found elsewhere in this manual.

#### 4.1. Pump and Valves

The AU8115MS sprayer is fitted with an electrically driven magnetically coupled pump that is powered from the vehicle battery. The on/off switch for the pump is located on the control box located in the vehicle cab.

Three valves control the flow of pesticide:

- A master isolation valve that shuts off all liquid flow.
- A three way tank selector valve that determines whether the main (100 litre) tank or the flushing (10 litre) tank is used.
- A drain valve allows the system to be drained after use.



Angle the spray head downwards and place a container underneath the atomiser. Switch on the pump at the control box without the engine of the sprayer running. After a short time, liquid





Fig. 4 – Flow Check

should start flowing from the atomiser. Flow rate to the head is controlled either the adjustable valve or in-line orifice restrictor – refer to the Calibration section. Check that there are no leaks from any hoses or connections.

#### 4.2. Engine

The sprayer is fitted with a Briggs and Stratton 13 HP four stroke engine with electric start. The engine drives a blower that provides air both to rotate the atomiser and to carry the spray droplets away from the sprayer and towards the target.

There are three options for starting the engine:

- By a remote switch on the sprayer control box in the vehicle cab.
- By a key switch on the engine.
- By the manual (rope) starter on the engine.

Power for the electric starter is provided by the battery of the vehicle on which the sprayer is installed. The engine throttle is controlled by an electric actuator mounted on the sprayer. This is operated by a switch on the sprayer control box in the vehicle cab (see Fig. 6).

#### 4.2.1. Engine Controls

- 1. Fuel On/Off valve lever (black): mounted on the side of the engine. Must be opened by moving fully to the right before starting the engine and closed by moving fully to the left when the sprayer is not in use.
- 2. Engine choke lever (grey): mounted on the side of the engine above the fuel valve. The choke lever should be in the OPEN (I+I).position (fully to the right when the engine is running. The choke must be set to the CLOSED position (INI).by moving the lever to the left when starting engine with the manual (rope) starter and returned to the OPEN position during normal running. It should not be necessary to close the choke when starting the engine with the electric starter at temperatures above about 15° C.
- 3. Throttle control: remotely operated from the control box. DO NOT attempt to directly operate the throttle control lever on the engine.
- 4. Ignition and engine electric starter switch: key switch mounted on the side of the engine.



5. Manual rope starter pull handle. Mounted on the side face of the engine.

Fig. 5 – Engine Controls



Fig. 6 – Control Box in Cab

#### 4.2.2. Engine Start/Stop Procedure

Before starting the engine check the fuel and oil levels. If necessary, add fuel or oil as described in section 8.1.1. Open the fuel valve by moving the black lever fully to the right.

#### 4.2.3. Using Remote Starter

- 1. Set the CHOKE lever on the engine to the OPEN (Run) position (I+I).
- 2. Set the key switch on the engine to the ON (1) position with the key vertical.

**IMPORTANT:** The engine will not start if the key switch is set to the anticlockwise (O) STOP position

- 3. Set the THROTTLE switch on the control box to the ON position.
- 4. Hold the ENGINE switch on the control box in the START position until the engine starts. Release the ENGINE switch when the engine starts. The switch is spring loaded and will return to the RUN position. In case the engine fails to start set the CHOKE control on the engine to the CLOSED position (INI). Return the CHOKE control to the OPEN position (III). after the engine starts.

5. If the machine is not required to spray immediately set the THROTTLE switch on the control box to IDLE.

#### 4.2.4. Using Engine Key Switch

- 1. If the engine is cold set the CHOKE lever on the engine to the CLOSED position (INI).
- 2. Set the ENGINE switch on the control box to the central RUN position.

**IMPORTANT:** The engine will not start if the ENGINE switch on the control box is set to the STOP position.

- 3. Set the THROTTLE switch on the control box to the ON position.
- 4. Turn the key switch on the engine fully clockwise to the START ( $\bigcirc$ ) position until the engine starts. Release the key switch and allow it to return to the ON position as soon as the engine is running.
- 5. If necessary, return the CHOKE lever on the engine to the RUN position (1+1).
- 6. If the machine is not required to spray immediately set the THROTTLE switch on the control box to IDLE.

#### 4.2.5. Using Manual Engine Starter

- 1. Set the ENGINE switch on the control box to the central RUN position.
- 2. Set the key switch on the engine to the ON (1) position (key vertical).

**IMPORTANT:** The engine will not start if the ENGINE switch on the control box or the key switch on the engine is set to the STOP position

- 3. Set the THROTTLE switch on the control box to the ON position.
- 4. If the engine is cold set the CHOKE lever on the engine to the CLOSED position (INI).
- 5. Pull the engine starter cord gently until the compression of the engine is felt. Release the cord so that it retracts fully and then pull again firmly to start the engine. The cord should never be pulled fully out to the end stop as this will strain the cord and the starter mechanism and could lead to premature failure. If the engine does not start easily, move the choke to MID position. If the engine still fails to start and the carburettor becomes flooded, set the choke to the OPEN position and pull the starter cord at least 10 times before repeating the normal starting procedure.
- 6. If the machine is not required to spray immediately set the THROTTLE switch on the control box to IDLE.

## 4.2.6. Engine Stop

- 1. Set the THROTTLE switch on the control box in the vehicle cab to the IDLE position.
- 2. Set the ENGINE switch on the control box in the vehicle cab to STOP.
- 3. Move the fuel valve lever on the engine to the CLOSED position (fully to the left).

**IMPORTANT:** Ensure that neither the ENGINE switch on the control box nor the ignition switch on the engine is left in the STOP position before starting the engine.

## 5. SAFETY

#### 5.1. Using Pesticides

- 1. ALWAYS follow the safety instructions on the pesticide label when handling and using pesticides.
- 2. ALWAYS wear appropriate protective clothing during filling and calibration.
- DO NOT spray near people or domestic animals. There should be no people or domestic animals within 200 metres downwind from where spraying is to take place.
- 4. Ensure spraying does not take place near waterways, rivers or lakes.
- 5. DO NOT carry people, bedding, clothing or animals in the back of the spray vehicle when spraying or when it is contaminated with pesticide.
- 6. NEVER carry foodstuffs in the spray vehicle.
- 7. ONLY use a spray vehicle fitted with an enclosed cab.
- 8. ALWAYS wash hands, face and body after filling the spray tank, after spraying and before eating or smoking.
- 9. ALWAYS carry soap and towels for washing in the cab of the spray vehicle and a supply of petrol, water and rags for cleaning the vehicle and sprayer.















#### 5.2. Engine Safety

For full details of the safe operation and maintenance of the engine refer to the Briggs & Stratton Vanguard Engine Operator's Manual supplied with the sprayer.

**IMPORTANT:** fire, explosion or injury to the operator can occur if the following instructions are not followed:

- 1. Do not run the engine in an enclosed area. Exhaust gases contain carbon monoxide, an odourless and deadly poison.
- 2. Do not fill the petrol (gasoline) tank while the engine is running. Allow the engine to cool for two minutes before refuelling. Only fill in a well ventilated area.
- 3. If petrol (gasoline) is spilled, move the sprayer away from the area of the spill and avoid creating any source of ignition until the petrol (gasoline) has evaporated.
- 4. Do not operate the engine without a muffler fitted. Inspect the muffler periodically and replace if necessary.
- 5. Do not use the engine on any forest covered, brush covered or grass covered unimproved land unless a spark arrester is attached to the muffler.
- 6. Do not operate the engine if the air cleaner or the cover directly over the carburettor air intake is removed.
- 7. When transporting the sprayer, the fuel shut-off valve must be closed to prevent fuel leaking from carburettor.
- 8. Do not choke the carburettor to stop the engine.
- 9. Do not run the engine at excessive speeds.
- 10. Do not change the engine speed selected by the original equipment manufacturer.
- 11. Avoid contact with the exhaust, cylinder or fins when they are hot as contact may cause burns.
- 12. To prevent accidental starting when servicing the engine or sprayer, always remove the spark plug or disconnect the wire from the spark plug.

#### CAUTION TO UNITED STATES CUSTOMERS:

If this engine is not equipped with a spark arrester and is to be used on any forest covered, bush covered, or grass covered unimproved land, before using on such land a spark arrester must be added to the muffler. The arrester must be maintained in effective working order by the operator. In the State of California the above is required by law (section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. See your Authorised Briggs & Stratton Service Centre for spark arrester muffler options.

## 6. CALIBRATION

To apply the correct volume of spray liquid to an area it is necessary to calibrate the sprayer accurately. This is critically important to prevent under or over dosing of pesticide. The calibration procedure is as follows:

#### 6.1. Measure the Forward Speed of the Vehicle

- 1. Select a gear that will give an appropriate speed in the terrain of the spray area and carry out a trial run over a measured distance of 100 metres. Measure how long it takes, in seconds, to cover this distance (time = t seconds).
- 2. Calculate the forward speed using the formula: Speed (km/hr) = 360/t

Example: time to cover 100 metres, t = 36 seconds, so speed = 360/36 = 10 km/hr

Note that the vehicle's speedometer is unlikely to be accurate at the low speeds typically used for spraying.

#### 6.2. Select a Suitable Track Spacing

The track spacing is the distance between successive spray passes of the vehicle. Spray passes should always be made with the wind at right angles to the direction of travel of the vehicle. Although the peak spray deposit is likely to occur at a point downwind of the vehicle some spray will be carried more than twice this distance. Spray coverage of the target area is evened out by accumulating spray deposits from overlapping swaths. This is known as an incremental spraying technique.

When using droplets of  $50 - 75 \ \mu m$  (VMD) in diameter in a steady wind (in excess of 7 km/hr or 2 m/s) a track spacing of 50 - 100 metres will be possible in open areas with sparse vegetation. A narrower track spacing will be necessary if larger droplet sizes are used or if the sprayer is used in lighter winds. If necessary, the track spacing can be determined by measuring the width of the swath deposited under the prevailing operating conditions. As a guide, the track spacing should be less than about 50% of the measured swath to ensure sufficient overlap of successive swaths.



Fig. 7 – Incremental Spraying Technique

#### 6.3. Calculate Required Flow Rate from the Sprayer

The required flow rate (in litres per minute) can be calculated using the following formula:

Flow Rate (l/min) = <u>Volume Application Rate (l/ha) x Speed (km/hr) xTrack Spacing (m)</u> 600

Volume application rate is chosen so as to apply the recommended dose of active ingredient (see FAO guidelines or manufacturer's label).

Example: if required volume application rate	= 0.5 litres per ha (l/ha)
Vehicle speed	= 10 kilometres per hour (km/hr)
Track spacing	= 50 metres (m)
Then required flow rate from sprayer	$= \frac{0.5 \times 10 \times 50}{600} = 0.42$ litres/ min
	= 420 ml/min

The tables below give examples of combinations of flow rates and vehicle speeds needed to apply volume application rates of 0.5 and 1.0 litre per hectare.

Volume Application	Atomiser Flow Rate (ml/min)				
Rate 0.5 l/ha	Vehicle Forward Speed (km/hr)				
Track Spacing (m)	5.0	7.5	10.0	15.0	20.0
25	104	156	208	312	417
30	125	188	250	375	500
35	146	219	291	438	583
50	208	313	417	616	833
100	417	616	833	1250	1667

Volume Application	Atomiser Flow Rate (ml/min)				
Rate 1.0 l/ha	Vehicle Forward Speed (km/hr)				
Track Spacing (m)	5.0	7.5	10.0	15.0	20.0
25	208	312	417	614	834
30	250	375	500	750	1000
35	291	438	583	876	1076
50	417	616	833	1232	1667
100	833	1250	1667	2500	3334

#### 6.4. Set the Flow Rate

The flow rate from the AU8115MS can be controlled either by the use of an adjustable restrictor valve or by interchangeable in-line orifice restrictor plates. The orifice restrictor plates should only be used when the sprayer will remain set to a constant flow rate for a long period. The adjustable restrictor valve should used when frequent changes of flow rate are required as it eliminates the need to disconnect pipe fittings and the consequent risk of exposure to pesticide.

To set the flow rate:

- 1. Park the vehicle facing into the wind with the spray head downwind so as to minimise operator contamination.
- 2. Ensure the drain valve is closed and the main tank valve open.
- 3. Put at least 10 litres of the actual pesticide to be used into the main tank.
- 4. Place a clean bucket directly underneath the atomiser to collect spray liquid.
- 5. Referring to the table below, either select the orifice restrictor plate that gives the flow rate closest to that required and fit it in the outlet of the flow regulator valve or adjust the setting of the restrictor valve to a position that gives the flow rate closest to that required. If using orifice restrictor plates, the restrictor valve MUST be set to the fully open position for both calibration and spraying. Note that the values given in the tables are for light oil. Actual flow rates will vary according to the pesticide used and its viscosity. The flow rate must always be measured with the actual product to be sprayed.

Restrictor Number	Flow Rate (ml/min) Oil
24	108
30	149
39	294
49	461
59	581
68	709
80	957
98	1210



Fig. 8 – Installation of Orifice Plate

- 6. Ensure that the vehicle engine is running to charge the battery and to provide the correct voltage to the pump. Switch on the pump at the control box. Note that the blower engine MUST NOT be running. Liquid should begin to flow from the atomiser into the bucket. Wait until the flow has stabilised and all air bubbles have been purged from the pump and hoses.
- 7. Once liquid is flowing at a steady rate, hold the measuring jug (supplied with the sprayer) underneath the atomiser and collect the output over a measured period of time (typically one minute), using a stopwatch.



Fig. 9 – Flow Rate Calibration

- If the flow rate is too low or too high, fit a larger or smaller orifice plate or select a larger or smaller restrictor valve setting as appropriate and repeat steps 5 – 9. Actual flow rate will vary according to the pesticide used and its temperature, therefore calibration MUST be carried out using the actual product.
- 9. Return all the spray liquid collected in the bucket to the spray tank through the lid filter. DO NOT stand under the atomiser, even after the pump has been switched off as some residual dripping may occur.
- 10. Clean the bucket and measuring cylinder. Wash down any spillage on the tank and vehicle.
- 11. ALWAYS wash hands and face after handling pesticides.

**IMPORTANT:** if using the flow control valve, it is essential to ensure that there are no orifice plates fitted. The position of the flow control valve knob can be fixed after adjustment by tightening the locking screw using the 2 mm hexagonal key provided in the tool kit.

#### 6.5. Select the Correct Droplet Size

The correct spray droplet size must be selected for the application. The factory settings for the AU8115MS are designed to produce the smallest possible droplet size. For some spray applications, however, it may be more appropriate to select a larger size of droplet. The size of the spray droplets produced by the spray head is mainly determined by the rotational speed of the atomiser and decreasing the rotational speed will produce larger droplets. The droplet size is also influenced the properties of the spray mix.

Due to the loading effect of liquid flowing through the atomiser, the speed of rotation (and therefore droplet size) will be affected by the liquid flow rate. The relationship between atomiser blade angle setting, flow rate and atomiser rotational speed is given in the table and graph below.

Flow	Atomiser Speed (RPM)			
(I/min)	Blade Setting Number			ber
(#11111)	1.75	2	4	6
0.00	11500	8700	4750	2700
0.25	10800	8600	4600	2650
0.50	10500	8300	4550	2600
1.00	9800	7850	4400	2540
1.50	9600	7600	3900	2400



#### 6.6. Changing the Droplet Size

The rotational speed of the atomiser is determined by the angle of the fan blades. A fine blade angle (corresponding to a smaller setting number in the figure below) gives a high rotational speed and small spray droplets. A coarser angle (larger number) gives larger droplets.

The procedure to change the blade angle is as follows:

- 1. Remove the two screws securing the rear casing of the spray head. Slide off the rear casing.
- 2. Rotate the atomiser so the setting marks on a fan blade can be seen through the inspection hole in the support ring.



Fig. 10 – Fan Blade Adjustment

- 3. Use Micronair blade adjustment tool EX4420 or a pair of pliers with cloth wrapped around the jaws to adjust the fan blade so that the correct setting mark aligns with the split line of the hub.
- 4. Repeat steps 2 & 3 for each of the four fan blades.

**IMPORTANT:** all four fan blades must be set to the same angle.

If necessary the atomiser speed can be checked with a hand-held optical or contact type tachometer.

## 7. SPRAYING PROCEDURE

- 1. Before starting to spray, the vehicle must be correctly positioned relative to the target. If the vehicle is to be stationary, it must be parked upwind of the target area with the spray head facing in the downwind direction. The spray head should be raised, lowered or moved sideways in its adjustable mounting as required.
- 2. If the vehicle will be moving whilst spraying, it must be driven upwind of the target and in a direction at 90° to the wind. The spray head should be angled upwards to achieve maximum effective release height and a wide swath or it should be angled downwards for a narrow swath closer to the vehicle (see section 6 Calibration).
- 3. When in the spray area, start the engine of the sprayer and then set the throttle to the IDLE position.
- 4. When ready to start spraying, first set the engine throttle control to MAX and then switch on the pump.
- 5. To stop spraying, first switch off the pump and then set the engine throttle control to IDLE.
- 6. At the end of the spraying operation allow the engine to idle for 1 minute before switching the engine switch to OFF. The engine switch should be left in the OFF position when the sprayer is not in use.

#### 7.1. After Use

After use, drain any remaining pesticide from the tank by placing the drain hose into a suitable container and opening the drain valve. Any unused pesticide must be kept in a closed container for future use or safe disposal.

#### 7.2. Cleaning

It is vital that the entire sprayer is flushed out and cleaned after use. The 10 litre flushing tank is provided for flushing the sprayer with kerosene or a similar solvent compatible with the pesticide used.

The system should be flushed through by selecting the 10 litre flushing tank position on the tank selector valve and operating the sprayer (with its engine running) for about 1 minute. This should be done at the spray site so as to avoid the risk of contamination of an off-target area by dilute pesticide. Any solvent remaining in the sprayer should be drained from the tank and disposed of safely.

After flushing, all external surfaces should be washed down with water and detergent.

**IMPORTANT:** under no circumstances should any pesticide be left in the sprayer when it is not in use.

#### 7.3. Additional Applications

The spray head may be de-mounted from the gimbal mounting ring and held by an operator to direct spray towards a specific target (eg into a ditch etc). Care should be taken to avoid contact with the rotating gauze.

The sprayer may also be used from a stationary vehicle, using the wind to carry the droplets to a specific target (eg pests resting in trees etc).

#### 8. MAINTENANCE

#### 8.1. Engine

**IMPORTANT:** To prevent accidental starting when servicing the engine or sprayer, always remove the spark plug or disconnect the cap from the spark plug and insert it in the holding tab adjacent to the spark plug.

For full details of engine maintenance refer to engine manufacturer's manual and safety instructions supplied. With the sprayer.

#### 8.1.1. Oil

The engine is shipped with no oil in the crankcase. Oil must be added before the engine is run. The grade of oil must be chosen according to the normal ambient temperature as shown in the table below.

Below -5°C	SAE 5W-20 or 5W-30
-10° C to +35°C	SAE 10W-30 (suitable for most applications)
+10°C to +35°C	SAE 30

Check the oil level regularly and after each 5 hours of operation. Ensure that the oil level is maintained.

**IMPORTANT:** the engine is fitted with an automatic low oil level cut-out. The engine will stop and cannot be re-started of the oil level is low.

#### 8.2. Fan

The AU8115MS sprayer is fitted with a robust blower fan which is designed to withstand ingestion of dirt and debris without damage. The fan and fan casing must be cleaned after every six months of operation or more frequently if the sprayer is used in dusty or dirty conditions. This will ensure efficient operation with a minimum of vibration. To clean the fan, proceed as follows

- 1. Remove the four bolts securing the fan cover and guard. Remove the cover and guard.
- 2. Thoroughly clean the fan vanes and back plate of the fan and inside of the casing, using a stiff brush and compressed air (if available).
- 3. If the area behind the fan is contaminated it may be necessary to remove the fan. This should only be done if absolutely necessary, as this requires demounting the fan housing.

#### 8.3. Pump

The pump used in the AU8115MS sprayer incorporates a magnetic coupling between the motor and the pump rotor. The pump is a centrifugal type with a brass housing.

If debris should block the pump impeller the pump will stall but the motor will continue to operate.

If necessary, the pump must be cleaned by disassembling the pump head as shown in section 10.5.

**IMPORTANT:** the sprayer must be thoroughly cleaned and flushed out before working any part of the pump, pipework or atomiser. Suitable gloves and protective clothing must always be worn if any part is contaminated with pesticides. Clean all pesticide deposits with kerosene and soapy water.

#### 8.4. Atomiser

The atomiser is constructed from chemical resistant materials and its simple design and robust construction will ensure many years of trouble-free performance provided that it is not mistreated and is properly cleaned after use.

Every atomiser is dynamically balanced to ensure that it will run smoothly without vibration. Some products, particularly certain solids in suspension, can dry or crystallise on the gauze, blocking the mesh and causing the atomiser to run out of balance and vibrate. This can easily be avoided by selecting the flushing tank and spraying 1 - 2 litres of kerosene or other suitable solvent through the atomiser at the end of each spray job. Water will normally only dissolve water-based formulations, whereas kerosene or diesel fuel is suitable for most ULV products.

The bearings of the atomiser are sealed and lubricated for life and should, therefore, only be replaced if they become worn.

If it should be necessary to replace the bearings or any other part, the procedure to dismantle an atomiser is as follows (numbers in brackets refer to items in the figure below):



Fig. 11 – Atomiser Components

- 1. If necessary, remove the sprayhead from the sprayer and remove the two screws holding the front and rear casings together. Slide the atomiser securing ring out of the casing.
- 2. Remove the hose connector and atomiser securing nut and slide the atomiser spindle from the support ring.

- 3. Remove the four screws (18) and washers (19) from the blade clamp ring (3), lift off the ring and remove the blades (9).
- 4. Remove the three screws (22) securing the cap and deflector assembly (5). Pull the cap from the end of the gauze and push the spindle (2) through the atomiser.
- 5. If it is necessary to remove the gauze, insert a screwdriver through the holes in the rear of the gauze and take out the three screws (20) securing the gauze to the hub.
- 6. If it is necessary to remove the bearings, use a pair of circlip pliers to remove the circlip (17) from the front of the hub. Next, push an aluminium or brass drift against the inner part of the rear bearing and tap both bearings out through the front of the hub. Ensure that the hub (1), spacers (6 and 7) and ring (10) are not damaged or lost.

After dismantling the atomiser, the following must be checked:

Gauze (4)	Free from dents or chemical contamination
Bearings (13)	Both in good condition. If one bearing is faulty, both must be replaced together
Tolerance rings (16)	Not cracked or deformed
Bearing spacers (6 and 7)	Not corroded or worn
V-Ring seal (14)	In good condition and not damaged or worn
Nilos ring (15)	Not worn or distorted

Any worn and damaged parts must be replaced with genuine Micronair spares. Any attempted repair of parts or the use of substitute parts could seriously damage the sprayer and impair its performance.

The procedure to re-assemble an atomiser is the reverse of the dismantling procedure. It is important that the following points are observed:

- 1. A new Nilos ring should always be fitted when the bearings are replaced.
- 2. Fill the recess of the Nilos ring and brass sealing ring with grease. The bearings, spacers and lip of the V-Ring should also be coated with a thin film of grease before assembly.
- 3. The bearings must be pressed squarely into the hub and must not be allowed to become mis-aligned. They must NOT be driven in with a hammer.
- 4. The clamp ring (3) must be assembled in the correct position with the dimples in the ring and hub body aligned.

## 9. FAULT FINDING

Problem	Cause	Remedy
Engine will not start	Fuel valve closed Engine key switch in OFF	Open valve Set to ON ( I )
	Engine switch on control box in OFF position	Set to RUN
	Engine choke incorrectly adjusted	Adjust choke control
	Contaminated spark plug	Clean and adjust
	Blocked fuel filter	Clean or replace filter
Unsteady engine	Contaminated fuel	Drain tank and re-fill
speed	Partially blocked fuel filter	Clean or replace filter
	Dirty or sticking governor	Clean (see engine maintenance handbook)
	Carburettor contaminated or requires adjustment	Refer to qualified mechanic or local Briggs & Stratton service centre
No flow	Orifice restrictor plate blocked	Remove plate and clean
	Blocked variable restrictor valve	Remove valve sleeve from body, clean and reassemble
	Blocked hoses	Dismantle if necessary and flush out with suitable solvent followed with clean water
	Pump not working	Check pump electrical connections and repair if necessary. Check pump motor. Replace if necessary
Erratic chemical flow	Blocked bowl filter	Remove and clean filter element
	Blocked variable restrictor valve	Remove valve sleeve from body, clean and reassemble
PUMP indicator illuminates but pump does not run	PUMP circuit breaker tripped	Locate fault and reset PUMP circuit breaker on box under flushing tank

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Engine starter, throttle actuator and indicator lights on control box do not function	Battery cable disconnected Battery fuse blown CONTROLS circuit breaker	Check connector and battery cables Locate fault and replace fuse (100 A) Locate fault and reset CONTROLS circuit breaker
	lipped	
Engine throttle does not move between maximum and minimum settings when THROTTLE switch is actuated	Throttle cable loose at linkage to engine Electric throttle actuator defective	Check and adjust clamp on outer part of cable and/or screw securing inner part of cable Service or replace throttle actuator

## 10. PARTS

When ordering spare parts, please specify the following information:

- 1. Serial number of sprayer or engine
- 2. Approximate date of purchase
- 3. Description of part
- 4. Part number as shown in this section
- 5. Number of parts required

## 10.1. AU8115MS Main Components



Fig. 12 – AU8115MS Main Components

ITEM	PART NO.	DESCRIPTION	QTY.
1	EX6723	Main frame	1
2	EX6724	Mast	1
3	EX6725	Mast support	1
4	5823	Tank, 100 litre	1
5	AJ6201A	Tank lid with air vent	1
6	AJ6200	Filter basket	1
7	5955	Tank, flushing, 10 litre	1
8	5208A	Cap assembly	1
9	5449	Filter bowl	1
10	EX6550	Atomiser assembly	1
12	EX6531	Fan housing	1
13	EX6529	Air intake guard	1
14	5922	Pump cover	1
15	EX6730	Pivot pin, 10 mm dia.	4
16	5671	'R' clip	6
17	EX6729	Locking pin, 12mm dia.	1
18	CBP3855	Engine	1
19	6026	Screw, M6 x 45	2
20	CBP2226	Washer, M6, flat	22
21	5984	Nut, M6 nyloc	10
50	5967	Screw, M10 x 20	4
51	5972	Washer, M10, spring	4
52	EX6205	Plate, air inlet	1
53	EX6203	Impellor	1
54	EX7277	Control box assembly	1
55	5914	Tube end inserts	12
58	EX4617	Gimbal assembly	1
59	EX4759	Washer, fibre	4
60	EX4713	Bolt, Tommy	4

#### AU8115MS Main Components – Parts List





Fig. 12 – AU8115MS Main Components (Continued)

ITEM	PART NO.	DESCRIPTION	QTY.
61	EX4682	Spacer, engine	1
62	EX6528	Locking plate	1
63	EX6443	Кеу	1
64	CBP1959	Clip, jubilee, No.5	2
65	EX7258	Hose, 4" x 1.6 m	1
66	CBP1451	Washer, M8	15
67	CBP1909	Nut, M8 nyloc	13
68	CBP679	Warning label	1
69	CBP1413	Bolt, M10 x 50	4
70	CBP2807	Bolt, 7/16" UNF x1 1/2" hex head	1
71	EX6835	Washer, tab	1
72	CBP447	Grommet	1
73	AJ6418	Cable tie	2
74	CBP2865	Cable gland, 20 mm	2
75	EX6860	Bracket, needle valve	1
76	AJ6187	Conduit, nylon	4m
77	4693	Screw, 4BA x 7/8"	2
78	3667	Nut, 4 BA nyloc	2
79	4756	Washer, 4BA, flat	2
80	5942	Terminal block, 16A	3
81	5895	Enclosure	1
82	CBP1898	Bolt, M8 x 20	1
83	CBP2866	T-piece, conduit, nylon	1
92	CBP1416	Washer M10	8
93	CBP1908	Nut, M10, Nyloc	4
94	EX6834	Engine Spacer	2
95	CBP2809	Washer, 7/16" UNC	2
96	CBP2808	Bolt, 7/16" UNC x 1 3/4"	2
97	CBP2715	Resistor, 0R22	1
98	CBP2716	Screw, M3	2
99	CBP2717	Nut, Stiff, M3	2
100	CBP1956	Screw, M5 x 16mm	1

## AU8115MS Main components – Parts List (Continued)



#### 10.2. AU8115MS Pipework Components

Fig. 13 – AU8115MS Pipework Components

ITEM	PART NO.	DESCRIPTION	QTY.
20	CBP2226	Washer, M6, flat	22
21	5984	Nut, M6 nyloc	11
22	5983	Screw, M6 x 20	4
23	5969	Screw, M6 x 55	2
24	5968	Screw, M6 x 80	2
25	5882	Manifold	1
26	5900	Valve, 2 port	2
27	5901	Valve, 3 port	1
28	CBP2874	T-piece, 1/2" BSP (F/F), 1/2"BSPT (M)	1
29	EX7090	Adaptor, 1/2"BSP M/M, P/T	5
30	CBP2895	Swivel adaptor, 1/2" BSPT (M) – 1/2" BSPP (F)	3
31	CBP2873	Adaptor, 1/2" BSP M/M, P/P	1
32	CBP2892	Connector, Bulkhead, 1/2" BSP	1
33	CBP1262	Washer, 1/4"	4
34	CBP2894	Plug, 1/2" BSP	1
35	EX7008	Pump, centrifugal, DC 40/10, 12 V	1
36	5881A	Filter c/w Viton 'O' rings	1
37	6721	'O' ring, BS116, Viton	1
38	6797	Nut, 1/2" BSP flanged	1
39	CBP2903	Adaptor, 3/4" BSP – 1/2" BSP M/M	1

AU8115MS Pipework Components – Parts List



AU8115MS Pipework Components (Continued)

Fig. 13 – AU8115MS Pipework Components (Continued)

ITEM	PART NO.	DESCRIPTION	QTY.
41	CBP2896	Adaptor, 3/8"BSP – 1/4"BSP M/M	1
42	6002	Needle valve	1
43	EX6911	Hose, needle valve to sprayhead	1
44	EX6910	Hose, pump to needle valve	1
45	EX6909	Hose, filter to pump	1
46	EX6907	Hose, tank to 3 way valve	1
47	EX6908	Hose, flushing tank to 3 way valve	1
49	EX6900	Hose, drain	1
56	6003	Nut, M17	1
57	AJ6379	Body, LFM 1/4" BSP, brass	1
84	AJ6337	Orifice restrictor plate, No 24	1
85	AJ6338	Orifice restrictor plate, No 30	1
86	AJ6339	Orifice restrictor plate, No 39	1
87	AJ6340	Orifice restrictor plate, No 49	1
88	AJ6341	Orifice restrictor plate, No 59	1
89	AJ6342	Orifice restrictor plate, No 68	1
90	AJ6343	Orifice restrictor plate, No 80	1
91	AJ6344	Orifice restrictor plate, No 98	1

## AU8115MS Pipework Components – Parts List (Continued)



#### 10.3. AU8115MS Sprayhead Components

Fig. 14 – AU8115MS Sprayhead Components

## AU8115MS Sprayhead Components – Parts List

ITEM	PART NO.	DESCRIPTION	QTY.
1	EX4675	AU 8115 atomiser	1
2	EX4676	Front casing assembly	1
3	EX6540	Rear casing assembly	1
4	EX4622	Support ring	1
5	EX2275	Bush	1
6	EX2701	Washer	1
7	CBP1721	Nut	1
8	EX6539	Hosetail	1
9	EX2571	Olive	1
10	CBP1959	Hose clamp	1
11	EX4679	Casing sleeve	1
12	CBP1956	Screw	2
13	CBP1268	Washer	2





Fig. 15 – AU8115MS Atomiser Components

#### AU8115MS Atomiser Components – Parts List

ITEM	PART NO.	DESCRIPTION	QTY.
1	EX3667	Hub and drivet	1
2	EX3677	Spindle assembly	1
3	EX3669	Clamp ring	1
4	EX3676/20	Gauze assembly	1
5	EX4641	Cap and deflector	1
6	EX3685	Inner spacer	1
7	EX3686	Outer spacer	1
8	EX3670	Spacer bush	1
9	EX4681	Blade	4
10	EX5044	Sealing ring	1
11	EX5062	Wave spring	1
12	EX2265	Nut	1
13	CBP776	Bearing	2
14	CBP777	V-Ring seal	1
15	CBP774	Nilos ring	1
16	CBP808	Tolerance ring	2
17	CBP2107	Circlip	1
18	CBP1720	Screw	4
19	SP127C	Washer	4
20	EX2612	Screw	3
22	A206-C10	Screw	3



Fig. 16 – EX7008 Pump Components

## **EX7008 Pump Components - Parts List**

ITEM	PART NO.	DESCRIPTION	QTY.
1	4220	Washer, 2 BA shakeproof	4
2	5766	Drive magnet complete with grub screw screw	1
3	5767	Pump motor bracket, PP, blue	1
4	5768	Screw, M5 x 12mm, ch head	4
5	5770	Pump body, 1/2" BSP in/out	1
6	5771	Impeller, 10 pole, 37 oz ins, PP	1
7	5772	Shaft, ceramic Hilox 961	1
8	5773	Spindle housing	1
9	5774	'O' ring, 200-148, Viton, black	1
10	5775	Screw, No. 6 x 1.5", pozi, S/T	6
11	AJ6420	Motor, 12V DC	1



## 10.6. 5881A Filter Components

Fig. 17 – 5881A Filter Components

## 5118A Filter Components - Parts List

ITEM	PART NO.	DESCRIPTION	QTY.
1	5881	Filter body, 1/2" BSP female, 50 mesh, pressure line	1
2	AJ6146	'O' ring, in-line filter, viton	1
3	5403	'O' ring, filter mesh, viton	2
4	LF5331	Filter screen, in line, 50 mesh	1

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**10.7. EX7463 Electric Throttle Actuator Components** 

Fig. 18 – Electric Throttle Actuator Components

#### **Electric Throttle Actuator Components**

ITEM	PART NO	DESCRIPTION	QTY
1	EX7462	Actuator sub-assembly	1
2	EX7219-2	Box lid	1
3	CBP3362	Screw, M4 x 10	2
4	CBP2608	Nut, M4 nyloc	2
5	CBP2226	Washer, M6 plain	2
6	CBP1645	Washer, M4 shakeproof	2
7	CBP2865	Conduit gland	1
9	CBP3359	Throttle cable assembly	1
10	EX7219-1	Box body	1
11	CBP3361	Gasket	1

#### 10.8. Electrical Schematic



VIEW ON REAR OF ENGINE SWITCH

VIEW ON CONTACT SIDE OF SOCKET

## 11. CONVERSION FACTORS

1 yard 1 metre 1 statute mile 1 nautical mile 1 kilometre 1 statute mile 1 nautical mile 1 kilometre 1 metre/sec	<ul> <li>= 3 feet</li> <li>= 39.37 inches</li> <li>= 0.87 nautical mile</li> <li>= 1.15 statute mile</li> <li>= 0.62 statute mile</li> <li>= 1760 yards</li> <li>= 2027 yards</li> <li>= 1094 yards</li> <li>= 2.237 miles per hr</li> </ul>	<ul> <li>= 0.91 metre</li> <li>= 1.09 yards</li> <li>= 1.61 kilometres</li> <li>= 1.85 kilometres</li> <li>= 0.54 nautical mile</li> <li>= 5280 feet</li> <li>= 6081 feet</li> <li>= 3282 feet</li> <li>= 196.9 ft/min</li> </ul>
1 acre 1 acre 1 hectare 1 hectare 1 sq mile 1 sq kilometre	<ul> <li>= 43560 sq feet</li> <li>= 4047 sq metres</li> <li>= 107600 sq feet</li> <li>= 10000 sq metres</li> <li>= 640 acres</li> <li>= 247 acres</li> </ul>	<ul> <li>= 4840 sq yards</li> <li>= 0.40 hectare</li> <li>= 11955 sq yards</li> <li>= 2.47 acres</li> <li>= 259 hectares</li> <li>= 100 hectares</li> </ul>
1 US gal	= 0.83 Imp gal	= 3.78 litres
1 Imp gal	= 1.20 US gals	= 4.54 litres
1 litre	= 0.26 US gal	= 0.22 Imp gal
1 US pint	= 16 US fl ounces	= 0.47 litres
1 Imp pint	= 20 Imp fl ounces	= 0.57 litre
1 US gal/acre	= 8 US pint/acre	= 9.45 litres/hectare
1 Imp gal/acre	= 8 Imp pints/acre	= 11.35 litres/hectare
1 litre/hectare	= 0.11 US gal/acre	= 0.081 lmp gal/acre
1 pound 1 kilogram 1 ounce	= 16 ounces = 2.20 pounds = 28.35 grams	= 0.45 kilogram = 35.3 ounces
1 pound/sq inch	= 0.068 atmosphere	= 0.067 bar
1 atmosphere	= 14.70 pounds/sq in	= 1.01 bar
1 bar	= 14.50 pounds/sq in	= 0.98 atmosphere

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Every care has been taken in the design of this equipment and the preparation of this manual. However, Micron Sprayers Limited cannot accept responsibility for errors or the consequences thereof.

Users must satisfy themselves that the equipment is suited to the intended use, is functioning correctly and its use is in compliance with local regulations controlling the application of pesticides.

All spray applications illustrated in this manual are provided for guidance only. Users should always refer to the pesticide product label for specific conditions of use.

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