50ml POWERMASTER™
BY NJ PHILLIPS

The 50ml Powermaster Applicator, operated by LP gas or compressed air, is designed for the administration of selected products for the forestry industry.

The applicator is product specific, and is **NOT** suitable for use with EVERY type of product available. For further information about the product you wish to use with this applicator, please contact your stockist, local distributor or NJ Phillips customer service.

All information contained in this handbook relating to the use of LP gas and compressed air fittings is applicable, and must be strictly adhered to.

No liability will be accepted by the manufacturer if the applicator is used for any purpose other than which it has been designed for.

Prior to setting up the applicator and for the protection of the applicator operator, please carefully read this handbook, along with the leaflet enclosed with the regulator supplied, the product/chemical manufacturer's product instructions for use, material safety data sheets, or safety instructions on the label of the chemical container.

To ensure continued high performance from the applicator, attention to cleanliness is essential. Cleaning and care instructions must be adhered to.

The **WARNING STATEMENTS** covering the use of the applicator and this leaflet supplied with the gas regulator, **MUST** be read and applied prior to use of the applicator by the operator.

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MADE IN AUSTRALIA

phillipsgreen.com
Our expertise is in your hands.

P50P-F | QL444-FORESTRY

IMPORTANT SAFETY WARNING

The applicator, associated equipment, and horticultural chemicals each pose inherent risks to human health and safety if used incorrectly and without appropriate safety precautions.
All owners of the applicator, including employers and self-employed persons, are reminded of their strict obligations to ensure the health and safety of employees and all other persons in the place (ie workplace) in which the applicator, associated equipment, and chemicals are used and stored.
In particular, employers and self-employed persons MUST make appropriate arrangements to ensure safety and the absence of risks to health in connection with the use, handling, storage, maintenance and transport of the applicator, associated equipment, and all chemicals. Such arrangements include but are not limited to the provision of appropriate protective gloves, clothing, eye wear and respirators, ensuring the applicator, associated equipment and all chemicals are stored at all times safely out of the reach of unauthorised persons, and ensuring that the applicator and associated equipment is assembled, used, cleaned and maintained strictly in accordance with the directions in this Handbook.
In addition, employers and self-employed persons MUST provide such information, instruction, training and supervision in connection with the use, handling, storage and transport of the applicator, associated equipment and chemicals as is necessary to ensure the health and safety in the workplace of employees and all other persons.
Employers and self-employed persons MUST take particular care to ensure the appropriate instruction, training and supervision of employees and others who are under-age, inexperienced, unskilled and/or have difficulties reading or speaking the English language.
Employers and self-employed persons MUST ensure that this Handbook is kept with the applicator at all times, and that its warnings and instructions are referred to each time the applicator is used.

WARNING STATEMENT

1 As this applicator may be dangerous in the hands of children, it MUST be kept in a safe place, out of the reach of children and to stop use by unauthorised persons.
2 Do not place the applicator near any heat source.
3 Oil lubricants other than those indicated may damage rubber components in this applicator.
4 You MUST read the "WARNING STATEMENT" and "IMPORTANT SAFETY ISSUE" covered by the leaflet in the regulator package, this leaflet contains important instructions for connection of the gas regulator and LP gas cylinder.
5 The manufacturer will accept no responsibility or liability if a gas regulator and valve assembly, and or, gas cylinder other than the units supplied in this package are used to operate the applicator. If other equipment is used, this may result in creating an unsafe hazardous situation in the use of LP gas. These situations may be explosive through the build up of LP gas or poisonous by the inhaling of toxic LP gas. Both these situations can cause death or injury to the operator.
6 The manufacturer will accept no responsibility or liability if the applicator gas tube (diag. 2-5) or other components relating to the use of LP gas to operate the applicator are interfered with or modified in any way, as this may create an unsafe hazardous situation in the use of LP gas. These situations may be explosive through the build up of LP gas or poisonous by the inhaling of toxic LP gas. Both these situations can cause death or injury to the operator.
7 The regulator valve must be kept fully closed at all times when the applicator is not in use, to avoid possible unsafe or hazardous situations. These situations may be explosive through the build up of LP gas or poisonous by the inhaling of toxic LP gas. Both these situations can cause death or injury to the operator.
8 Setting of the applicator dose levels, and use of the products should be carried out in strict accordance with the chemical manufacturer's administration instructions, otherwise the health of the applicator operator may be at risk.
9 Components in this applicator may be affected by some commonly used farm chemicals. No responsibility or liability will be accepted by the manufacturer, should the applicator be used with any product other than forestry chemicals recommended by your stockist/ local distributor or NJ Phillips.
10 When the applicator is used for the application of forestry chemicals:
- **a** Gloves must be worn at all times by the applicator operator.
- **b** The operator MUST avoid body contact or inhalation of chemicals, otherwise injury to the health of the applicator operator may occur.
- **c** Care must be taken to ensure the draw off cap, feed tube and spring are firmly secured to the backpack to prevent leakage of its contents. Otherwise injury to the health of the operator may occur.

11 When the applicator is operated by compressed air:
- **a** Care must be taken to ensure the air pressure supplied from the compressor does not exceed 690 Kpa (100 psi) otherwise damage to the regulator and or applicator may occur.
- **b** Unless an approved in line compressed air filter/lubricator is installed, moisture and or foreign matter will enter the trigger valve system of the applicator, which will cease to operate in a satisfactory manner.

12 Care must be taken to ensure the chemical manufacturer's instructions and material safety data sheets (MSDS) or any other product or health or safety information are followed in regard to safe use and storage of forestry chemicals, otherwise injury to the health of personnel may occur.

WARRANTY & SERVICE

Scope of this warranty

This warranty entitles you to repairs or replacement (at no charge) of any parts of the NJ Phillips Powermaster Applicator ("Product") found to be defective in materials or workmanship within 12 months from date of purchase (date validated by proof of purchase receipt). Repair or replacement is at the option of NJ Phillips Pty Limited ("Company") or its authorised agent. This warranty is in addition to any rights and remedies extended to the owner under applicable laws, and is not intended to negate or restrict such rights and remedies except where it is competent to do so.

What is not covered by this warranty

Repair or replacement under this warranty is not available for faults or failure due to:
- ordinary wear and tear;
- accident, contamination, misuse, neglect, abuse or tampering;
- incorrect installation or maintenance;
- failure to follow the Company's warnings, instructions, and recommendations for safe and effective use;
- the fitting or use of faulty, poor quality or incompatible associated parts or components, and in particular the use of a gas regulator and valve assembly and/or gas cylinder other than those component parts supplied with the Product;
- use of the applicator other than for its designed purpose;
- use of the applicator with any product other than products specifically recommended by your stockist/local distributor or NJ Phillips Pty Limited.
- repairs, alterations or modifications carried out other than by the Company or its authorised agent, and in particular interference with or modification in any way to the applicator gas tube (diag. 2-5) or other components relating to the use of LP gas to operate the Product; or
- any other cause occurring after the Product left the Company's, stockist's or local distributor's control.

Subject to the operation of any laws to the contrary, this warranty does not cover:
- the costs of travelling or transportation of the Product or parts to and/or from the Company or its authorised agent;
- loss of the applicator or parts while in transit to or from the Company or its authorised agent; or
- personal injury, property damage, or economic and consequential loss or damage, howsoever caused.

The Company and its authorised agents reserve the right to charge their reasonable costs in investigating and correcting faults and failure caused other than by defects in materials or workmanship.

How to claim under this warranty

If service is necessary, contact the Company or an authorised agent, and provide details of the alphanumeric batch code number located on the handle of the Product, and the date of purchase.

Thank you for purchasing this NJ Phillips Pty Limited precision instrument. Norman Phillips founded the Phillips reputation on reliability, accuracy and innovation in 1931. It is by not deviating from these original ethics that NJ Phillips Pty Limited is able to guarantee this instrument is not only the best you can buy today, but that tomorrow's NJ Phillips instrument will be even better.

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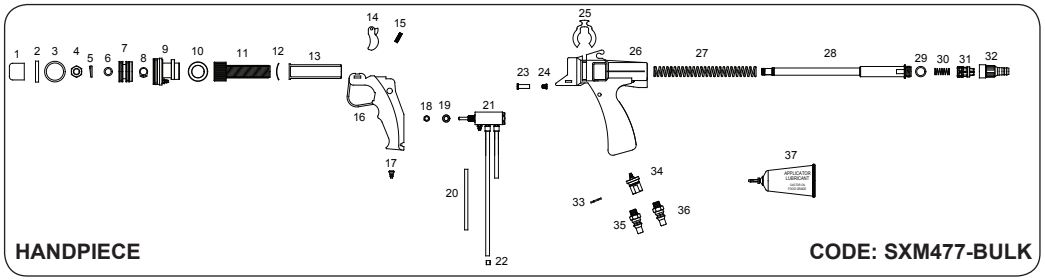
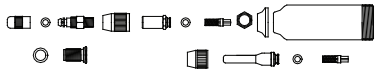
Schematic Diagram No 1: Powermaster Forestry Applicator Range

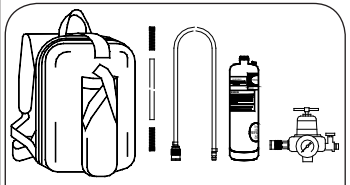


HANDPIECE **CODE: SXM477-BULK**

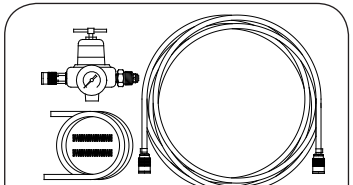


CYLINDER ASSEMBLY **CODE: SXM474**

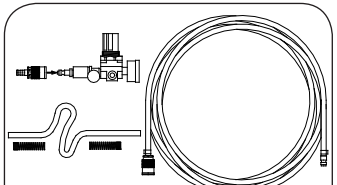
POWER SOURCE



PORTABLE CODE: SXM470

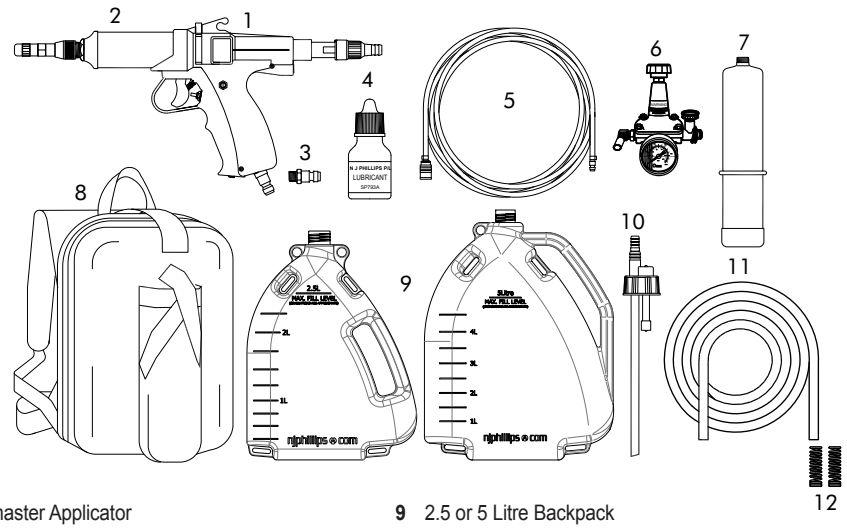


GAS PROCESSOR CODE: SXM471



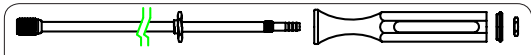
AIR PROCESSOR CODE: SXM488

Schematic Diagram No 2: Powermaster Forestry Applicator

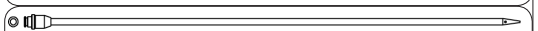


1 Powermaster Applicator
2 Cylinder – cone spray nozzle
3 Nipple for air fitting adaptor *(when supplied)*
4 15ml Lubricant (2 per)
5 Gas Tube
6 LP Gas or Compressed Air Regulator Assembly
7 LP Gas Cylinder
8 Backpack Bag
9 2.5 or 5 Litre Backpack
(NOTE: not supplied – available as an NJ Phillips accessory.)
10 Air Bleed Draw Off Cap and Feed Tube
(NOTE: supplied with 2.5 or 5 Litre Backpack – also available as an NJ Phillips accessory.)
11 9mm (3/8") clear feed tube
12 feed tube springs

SECTION 2: ACCESSORIES

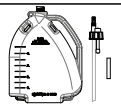


Extension Wand **CODE:** WX1375



Spear Nozzle **CODE:** WX1371

10 Metre Harsh Chemical Tube 3/8 Bore **CODE:** SP1142

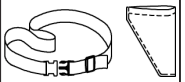


5 Litre Back Pack, Draw-Off Cap & Tube **CODE:** WX185

Universal Back Pack **CODE:** SP1009

Gas Regulator with Pressure Gauge **CODE:** SXM476

Lubrication Oil 2 per **CODE:** WX1510



Holster & Belt **CODE:** WX1478

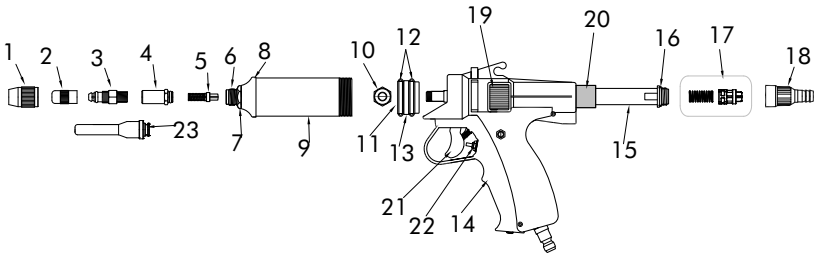
10 Metre Gas Line **CODE:** SP1139

Carry Case **CODE:** SP985

SECTION 3: SETTING UP THE APPLICATOR FOR USE

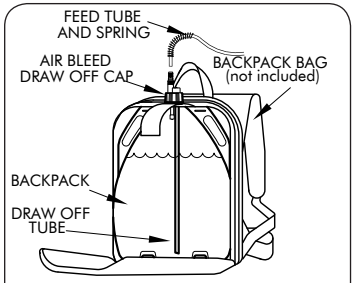
Schematic Diagram No 3: Handpiece Setup

1 nozzle nut
2 cone spray nozzle tip
3 cone spray nozzle and seal ring
4 nozzle fitting and seal ring
5 delivery valve assembly
6 delivery cage and seal ring
7 delivery cage lock nut
8 cylinder shield cap
9 forestry cylinder
10 lock nut
11 piston
12 piston seal rings
13 piston lubricating washer
14 handpiece
15 push rod
16 inlet adaptor seal ring
17 inlet valve assembly
18 9mm (3/8") inlet adaptor
19 dose adjustor
20 dose adjustor sleeve
21 trigger
22 trigger valve
23 stream nozzle

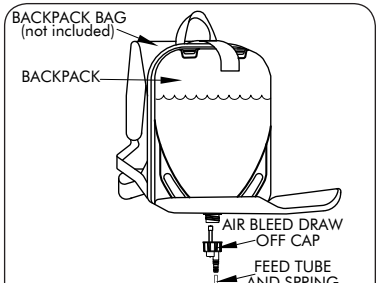


PART 1: Backpack, Bag and Holster

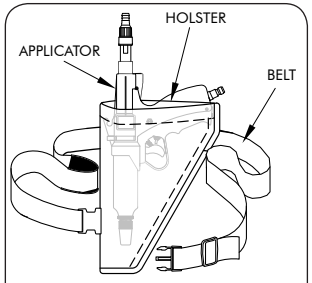
Schematic Diagram No 4: ***NOTE:*** *This diagram only covers the NJ Phillips back-pack and air bleed draw off system.*



1 Backpack used in the **UPRIGHT** position, with draw off tube pushed into air bleed draw off cap.



2 Backpack **INVERTED** with draw off tube removed from air bleed draw off cap.



3 Holster and Belt
Holster suitable for use by either right or left hand operators.

BACKPACK, BAG AND HOLSTER

a Backpack Used in Upright Position:

i When using the NJ Phillips backpack and air bleed draw off system remove the air bleed draw off cap (diag. 4-1) from the backpack by screwing in an anticlockwise direction, check to ensure the draw off tube is securely pushed into the draw off cap, replace the draw off cap onto the backpack by screwing in a clockwise direction and hand tighten.

b Backpack used in Inverted Position:

i When using the NJ Phillips Backpack and air bleed draw off system, remove the air bleed draw off cap (diag. 4-2) from the backpack by screwing in an anticlockwise direction, remove the draw off tube from the draw off cap and place aside in the toolbox. Replace the draw off cap onto the backpack by screwing in a clockwise direction and hand tighten.

WARNING: When the NJ Phillips or product manufacturer's back pack is used in the upright or inverted position, the draw off cap, feed tube and spring, must be firmly secured to the backpack, to prevent leakage of it's contents, which can be injurious to the health of the applicator operator.

c Holster and Belt (diag. 4-3)

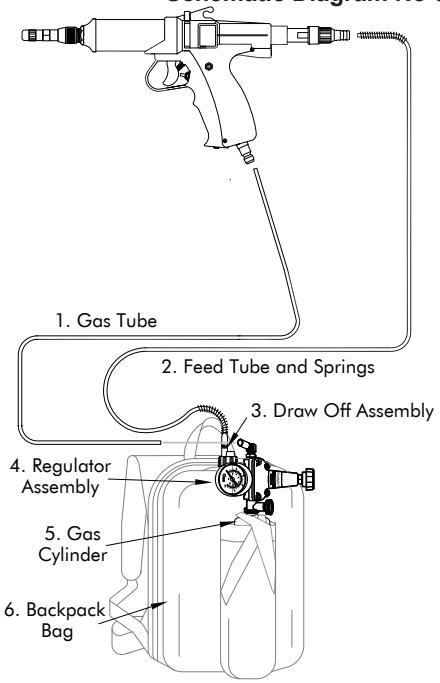
When the applicator is connected to the gas cylinder or compressed air hose and backpack, a holster and belt may be purchased as an accessory, so that when required by the operator, the applicator can be placed in the holster to enable the operator to attend to other duties.

The holster is suitable for use by either right hand or left hand operations.

d The backpack, bag and holster are now set up ready for connection to the applicator and LP gas or compressed air systems for the treatment of livestock.

PART 2: Applicator Set-Up for Operation by LP Gas

Schematic Diagram No 5: *NOTE: Gas cylinder not supplied in all countries.*



APPLICATOR OPERATED BY LP-GAS

Refer Schematic Diagram No 5: Applicator setup for operation by LP gas.

WARNING: You must not fit or use faulty, poor quality or incompatible associated parts or components, and in particular the use of a gas regulator and valve assembly other than those components supplied with the product. You must not repair, alter or modify the product, other than those carried out by NJ Phillips Pty Limited or it's authorised agent, and in particular interference with or modification in any way to the applicator gas tube (diag. 5-1) or other components relating to the use of LP gas to operate the product. Any occurrence of these issues will VOID the warranty. See warranty statement page 1.

a Remove the gas cylinder from the backpack bag and fill the gas cylinder with liquid petroleum gas (LPG).

WARNING: Gas cylinders must only be filled by authorised filling agents.

NOTE: DO NOT OVERFILL GAS CYLINDER: It is important not to overfill the gas cylinder as liquid gas may enter the applicator and freeze the trigger valve (diag. 3-22). When filling, shut off the filling exhaust valve as soon as the first cloudy vapour is observed coming from the valve. Do not fill until liquid gas is pouring out and freezing up. If liquid gas enters the gas tube (diag. 5-1), release the regulator fitting on the gas tube, and the liquid will vaporise.

b Connect the gas regulator and valve assembly to the gas cylinder as covered by the instruction leaflet supplied with the regulator and valve assembly, and detailed in sections 1 to 5 of that procedure.

Place the gas cylinder into the pocket of the backpack bag, and secure the cylinder by placing velcro straps around the neck of the cylinder.

c Connect the gas tube (diag. 5-1) to both the applicator and the outlet port on the regulator, and hand tighten.

Set the gas operating pressure at 414 to 550 Kpa (60-80 psi) on the pressure gauge as covered by sections 6 and 7 in the instruction leaflet supplied with the regulator and valve assembly.

NOTE: The gas pressure may require adjustment by the regulator within the specified limits to achieve satisfactory delivery of products, and may vary depending on climatic conditions, use of the backpack in the upright or inverted position, or the type of nozzle used.

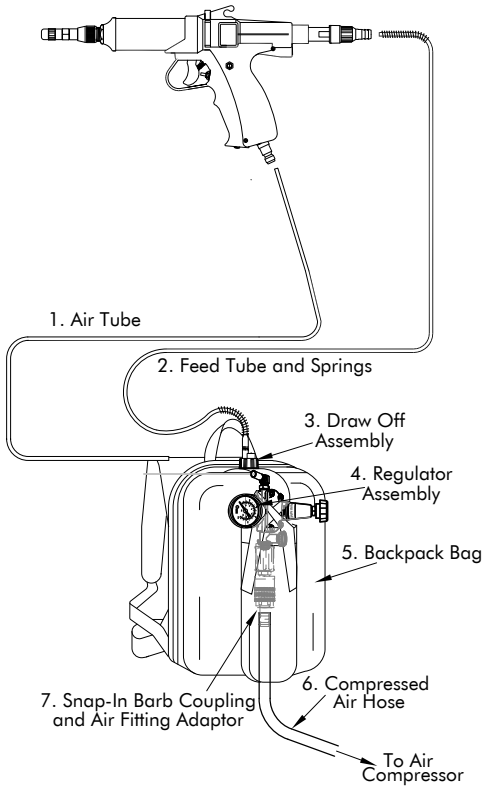
d The applicator is now set up ready for the backpack to be filled with product and connection of the feed tube to the applicator and backpack.

i **NOTE:** The applicator must only be used with the gas cylinder placed in the upright or vertical position, so that gas and NOT liquid passes through the valve on the gas tube (diag. 5-1). Otherwise the liquid will freeze up the valve and the applicator will cease to operate. In this case, release the regulator fitting on the gas tube (diag. 5-1) for the liquid to vaporise, then re-tighten.

ii It is essential, to prevent injury to the user, that you refer to the WARNING STATEMENTS relating to the use of the applicator when operated by LP gas, page 1, and the instruction leaflet supplied with the regulator and valve assembly, instructions for connection of gas regulator to LP gas cylinder.

PART 3: Applicator Setup for Operation by Compressed Air

Schematic Diagram No 6



APPLICATOR OPERATED BY COMPRESSED AIR

Refer Schematic Diagram No 6.

Applicator setup for operation by compressed air.

To prevent moisture and or other foreign matter entering the applicator and affecting the operation of the trigger valve system, the manufacturer strongly recommends that an approved filter/lubricator suitable for compressed air systems be installed in the compressed air line connected to the regulator and applicator. Otherwise, moisture and or foreign matter will enter the trigger valve system (diag. 3-22) of the applicator, which will cease to operate in a satisfactory manner. Warranty claims will not be accepted for damage caused by moisture or foreign matter entering the trigger valve system due to the installation of an unapproved filter/lubricator.

The manufacturer recommends 10mm inside diameter compressed air hose and suitable 10mm fittings should be used for connection of the applicator pressure regulator to the compressed air supply hose, and the compressor unit supplying the compressed air to the applicator be set to operate at a maximum of 690 Kpa (100 psi).

a Ensure the air nipple (diag. 2-3) is fitted at the base of the handpiece (diag. 3-14).

b Remove the gas cylinder where applicable, and the regulator from the backpack bag, fully close the brass control valve on the regulator assembly by turning in a clockwise direction, and unscrew the gas cylinder from the regulator by turning in an anticlockwise direction. Locate and replace the plastic cap into the neck of the gas cylinder and place aside.

c Pass the compressed air hose through the bottom of the gas cylinder pocket on the backpack bag, and connect it to the nipple on the handpiece.

Position the brass valve of the regulator at the top of the gas cylinder pocket on the backpack bag and secure in place by the velcro straps.

d Connect the air tube (diag. 6-1) to both the applicator and the outlet port on the regulator.

e Set the air operating pressure of the applicator at 414 to 550 Kpa (60 - 80 psi) on the pressure gauge by turning the control knob on the regulator in a clockwise direction to increase pressure. If the pressure is too high, reduce by turning the control knob in an anticlockwise direction, operate the applicator a few times, and adjust for optimal pressure setting.

When the optimal air pressure is achieved, fasten the lock nut on the control knob screw against the regulator body.

NOTE: The air pressure may require adjustment by the regulator within the specified limits to achieve satisfactory delivery of chemicals, and may vary depending on climatic conditions, use of the backpack in the upright or inverted position, or the type of nozzle used.

i The applicator is now set up ready for the backpack to be filled with product and connection of the appropriate feed tube to the applicator and backpack.

SECTION 4: INSTRUCTION FOR USE

As components in the applicator and draw off system may be affected by solvents in some forestry formulations, please consult your stockist/local distributor or NJ Phillips for advice as to suitable forestry products to be used in the applicator and draw off system.

WARNING: Careful attention MUST be given to the forestry horticultural manufacturer's instructions and material safety data sheets (MSDS) or any other product or health or safety information in regard to the safe use and storage of foresty products. Otherwise injury to the health of the operator and/ or plant life may occur.

For the administration of selected products, and to protect the operator, the backpack **MUST** be used in the vertical or upright position. However, due to the heavy viscosity of some products, to achieve satisfactory cylinder fill rates and delivery pressures, it may become necessary to use the backpack in the inverted position.

WARNING: Care must be taken to ensure there is NO leakage of forestry product from the backpack, feed tube or the applicator, and gloves must be worn at all times when handling forestry products.

1. APPLICATOR OPERATED BY LP GAS

a Equipment Required:
- **i** Applicator handpiece with nozzle and cylinder.
- **ii** Selected backpack and draw off cap.
- **iii** Backpack bag, if used, with gas regulator assembled to gas cylinder.
- **iv** Selected feed tube and springs.
- **v** Gas tube.
- **vi** Holster and belt, if used.

b Check connection of the gas tube (diag. 5-1) to the applicator and gas regulator and hand tighten. Set the gas pressure to 414 – 550 Kpa (60 – 80 psi).

Check that the applicator operates freely by depressing the trigger (diag. 3-21) a number of times. If the applicator does not operate freely, please refer to Section 6, trouble shooting guide.

c Fill the selected backpack with the forestry product to be applied, and securely replace the draw off cap onto the backpack by screwing in a clockwise direction and hand tighten. (diag 4)

WARNING: Ensure the backpack and bag are kept in the upright or vertical position whilst carrying out this process. Otherwise chemicals will spill and may cause injury to the health of the operator.

d Connect the feed tube and springs to the applicator and backpack draw off cap. Ensure the feed tube springs are securely screwed over the feed tube in an anticlockwise direction. This will prevent the feed tube kinking. (diag. 5)

e Place the backpack bag, containing the backpack with draw off system, LP gas cylinder and regulator onto the back of the applicator operator and fix the straps in place.

f To prime the applicator, set the dose at the maximum dose graduation on the push rod (diag. 3-15) by screwing the dose adjustor (diag. 3-19) in a clockwise direction, and with the instrument held **vertically**, **nozzle pointed upwards**, depress the trigger (diag. 3-21) a number of times until the product is expelled from the nozzle in an unbroken stream and all air bubbles have been eliminated from the cylinder.

g Clip the belt and holster (if used) in place around the waist and insert the applicator into the holster. (diag. 4-3)

h To Set Required Dose:
- **i** Dose levels and application of the forestry product must be set in accordance with the product manufacturer's administration instructions.
- **ii** Turn the dose adjustor (diag. 3-19) in an anticlockwise direction to decrease dose, and a clockwise direction to increase the dose, as indicated by graduations on the push rod (diag. 3-15).
- **iii** To be sure of complete accuracy, the dose should be checked with a calibrated measuring cylinder.
- **iv** Cylinder fill rate and delivery pressure can be varied with adjustment to the gas pressure on the regulator between 414 to 550 Kpa (60 - 80 psi). (diag. 5-4).

  The minimum gas pressure should be used to achieve acceptable filling rate and delivery speed.

i The applicator is now set up ready for the forestry product.

WARNING: As forestry products can be harmful to the health of the applicator operator when inhaled or contact made with the body, gloves must be worn at all times when handling forestry products. Wherever possible the backpack must be used in the upright position.

If it is necessary to use the backpack in the inverted position, care must be taken to ensure there is no leakage of forestry product from the backpack draw off and feed tube system. Otherwise injury to the health of the applicator operator may occur, from chemical contacting the operators body.

j ***WARNING: At the close of each days work, or on completion of the forestry treatment, to avoid possible unsafe or hazardous situations, the regulator valve must be fully closed by turning in a clockwise direction, as indicated by arrow on the valve. Failure to do this may result in LP gas leaking and creating an explosive situation, which may cause injury or death to the operator(s).***

k NEW ZEALAND – Due to the dryness of NZ gas, fine oil should be added to the gas cylinder when empty by removing the brass venting valve on the top of the cylinder, adding oil (5-10mls), replacing the brass valve and shaking the cylinder. This should be done as required to prevent valve sticking.

l IMPORTANT NOTES
1. **Delivery valve must be in position for the unit to work correctly.**
2. **Always make sure that the gas cylinder is upright when operating the gun so that gas and NOT liquid goes through the valve.**
3. **Do not tamper with the trigger valve, if you believe it is giving problems (after all trouble shooting points have been checked) contact NJ Phillips Pty Limited or your local agent.**
4. **If using an extension, delivery valve must be placed behind the nozzle tip on the end of the extension.**

m CAUTION

DO NOT USE NEAR NAKED FLAME OR IN CONFINED SPACES. YOU MUST NOT SMOKE WHILE USING THE POWERMASTER OR CHANGING CYLINDERS, ETC.

n Excessive crystal build-up may cause fluid to leak past the inlet check valve (whilst under pressure) which may alter the actual dose injected into the tree.

2. APPLICATOR OPERATED BY COMPRESSED AIR

a Equipment Required:
- **i** Applicator handpiece with nozzle and cylinder.
- **ii** Selected backpack and draw off cap.
- **iii** Backpack bag, if used, with air regulator assembled to compressed air hose.
- **iv** Selected feed tube and springs.
- **v** Air tube.
- **vi** Holster and belt, if used.
- **vii** Air compressor, in line filter/lubricator, 10mm inside diameter air hose and fittings. This equipment is **NOT** supplied by the applicator manufacturer.

b Check connection of the air tube (diag. 6-1) to the applicator and air regulator and hand tighten. Turn on the air compressor, and when the air pressure has reached its operating level (max 690 Kpa - 100 psi), set the air pressure on the regulator to 414 - 550 Kpa (60 - 80 psi).

Check that the handpiece operates freely by depressing the trigger (diag. 3-21) a number of times. If the handpiece does not operate freely, please refer to Section 6, trouble shooting guide.

c Fill the selected backpack with the forestry product, and securely replace the draw off cap onto the backpack by screwing in a clockwise direction and hand tighten. (diag 4)

WARNING: Ensure the backpack and bag are kept in the upright or vertical position whilst carrying out this process. Otherwise chemicals will spill and may cause injury to the health of the operator.

d Connect the selected inlet adaptor, feed tube and springs to the applicator and backpack draw off cap. Ensure the feed tube springs are securely screwed over the feed tube in an anticlockwise direction. This will prevent the feed tube kinking.

e Place the backpack bag, containing the backpack with draw off system, regulator with compressed air hose attached onto the back of the applicator operator and fix the straps in place.

f To prime the applicator, set the dose at 50ml graduation on the push rod (diag. 3-15) by screwing the dose adjustor (diag. 3-19) in a clockwise direction, and with the instrument held **vertically**, **nozzle pointed upwards**, depress the trigger (diag. 3-21) a number of times until the forestry product is expelled from the nozzle in an unbroken stream into a clean container, and all air bubbles have been eliminated from the cylinder. The forestry product in the clean container can be returned to the backpack or supplier's container.

g Clip the belt and holster in place around the waist and insert the applicator into the holster. (diag 4-3)

h To Set Required Dose:
- **i** Dose levels and application of the forestry product must be set in accordance with the chemical/product manufacturer's administration instructions.
- **ii** Turn the dose adjustor (diag. 3-19) in an anticlockwise direction to decrease dose, and a clockwise direction to increase the dose, as indicated by graduations on the push rod (diag. 3-15).
- **iii** To be sure of complete accuracy, the dose should be checked with a calibrated measuring cylinder.
- **iv** Cylinder fill rate and delivery pressure can be varied with adjustment to the compressed air pressure on the regulator between 414 to 550 Kpa (60 - 80 psi). (diag 6-4)

  The minimum compressed air pressure should be used to achieve acceptable filling rate and delivery speed.

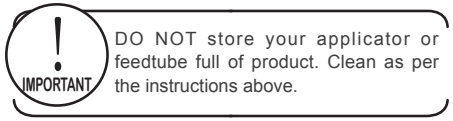
i The applicator is now set up ready for the forestry treatment.

WARNING: As forestry products can be harmful to the health of the applicator operator when inhaled or contact made with the body, gloves must be worn at all times when handling forestry products. Wherever possible the backpack must be used in the upright position.

If it is necessary to use the backpack in the inverted position, care must be taken to ensure there is no leakage of forestry product from the backpack draw off and feed tube system. Otherwise injury to the health of the applicator operator may occur, from chemical contacting the operator's body.

j ***WARNING: At the close of each days work, or on completion of the forestry treatment, to avoid possible unsafe or hazardous situations, the regulator valve must be fully closed by turning in a clockwise direction, as indicated by arrow on the valve, and turn off the air compressor. Failure to do this may result in excess pressure build up in the regulator causing it to fail which may injure the operator.***

SECTION 5: APPLICATOR CARE AND MAINTENANCE



To ensure continued high performance from the applicator, attention to cleanliness is essential. On completion of each use of the applicator and feed tube **MUST** be thoroughly cleaned in accordance with the following procedure, which is applicable for the applicator operated by either LP gas or compressed air.

WARNING: For the protection of the operator, gloves must be worn at all times whilst carrying out this procedure. Also avoid skin, body contact or inhalation of chemicals, which may cause injury to the health of the operator.

1. Place the backpack bag containing backpack, gas cylinder or compressed air hose, with regulator and applicator onto a flat work bench.
2. **Fully close the regulator valve by turning in a clockwise direction.**

   For the applicator operated by LP gas, release the velcro straps around neck of gas cylinder, remove gas cylinder and regulator from pocket in backpack bag and place aside onto work bench.

OR

For the applicator operated by compressed air, release the velcro straps around regulator, disconnect the snap-in barb coupling on the compressed air hose from the air fitting adaptor, remove both the compressed air hose and regulator from pocket in the backpack bag, and reconnect the snap-in barb coupling and air fitting adaptor, and place aside onto work bench.

3 Place backpack bag containing backpack onto the work bench with the backpack placed in the upright or vertical position, and disconnect both the feed tube spring from the feed tube by turning in a clockwise direction and the feed tube from the draw off cap and place aside.

4 Seal backpack to prevent spillage of any remaining contents. Unzip the backpack bag and remove backpack.

WARNING: Storage of any remaining contents MUST be carried out as stated in the product manufacturer's instructions or material safety data sheets or any other product or health or safety information.

5 Remove the air bleed draw off system from the backpack and thoroughly clean both parts by washing with a mixture of warm water and detergent. Rinse both parts with clean water, wipe dry, replace the air bleed draw off cap onto the backpack, and place backpack and backpack bag aside into storage.

WARNING: Particular care MUST be taken to ensure all residue of the product has been removed, otherwise injury to the health of the applicator operator and/or livestock may occur from residue contacting the body of the operator or being incorrectly administered to livestock.

6 Fully open the regulator valve by turning in an anticlockwise direction, or if applicator operated by compressed air, turn on compressor and on reaching the operating pressure, fully open regulator valve.

7 Place the applicator feed tube into a clean container with approximately 1 litre of warm water and 0.5ml of non-corrosive detergent.

8 Set dose of applicator to 50ml and draw the solution through the applicator and feed tube by depressing trigger a number of times until the applicator cylinder and feed tube are clean.

9 Hand wash exterior of applicator, feed tube and springs with a soft brush.

10 Flush the applicator and feed tube with clean water and pump dry by depressing trigger a number of times.

11 Wipe applicator, feed tube and springs dry, disconnect the feed tube from applicator and place aside.

12 Immerse the applicator inlet fitting into a small clean container of castor oil and draw a small quantity of castor oil into the cylinder by depressing the trigger several times.

Fully close regulator valve by turning in a clockwise direction, disconnect the gas tube from both the regulator and applicator, and place aside.

13 For the applicator operated by LP gas, disconnect the regulator and valve assembly from the gas cylinder, replace the red plastic cap into top of gas cylinder to prevent the entry of dirt and foreign matter, place the regulator and valve assembly and gas cylinder into toolbox.

OR

For the applicator operated by compressed air, switch off the air compressor and release air pressure in air hose. Disconnect the air fitting adaptor from the snap-in barb coupling on the compressed air hose. Disconnect the air fitting adaptor from the regulator and valve assembly and place both parts into toolbox.

a Remove the cylinder assembly from the applicator handpiece by unscrewing in an anticlockwise direction, taking care not to damage the seal rings on piston and place cylinder assembly aside.

b Check seal rings for any sign of wear or damage and replace if necessary.

c Check the inside of the cylinder assembly is thoroughly clean, otherwise wash with warm water and detergent then rinse with clean water and wipe dry. Lubricate inside of the cylinder, piston rings, lubrication washer and push rod shaft behind the piston, with a small quantity of castor oil supplied. Carefully place the cylinder over the piston and screw clockwise into handle and hand tighten. Place the applicator with cylinder attached, into toolbox.

SECTION 6: TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
1 Applicator lacks power or not functioning.	Empty gas cylinder.	Refill gas cylinder, refer instructions Section 3 Part 2(a).
	No compressed air supply.	**Check:** i air compressor switched on and operates to 690 Kpa (100 psi). ii No leaks in compressed air hose.
	Gas transfer tube kinked or not attached to gas regulator or applicator.	Check gas transfer tube for kinks and ensure it is firmly attached to the applicator and gas regulator outlet port.
	Inadequate gas or compressed air pressure.	Reset pressure on regulator. Wind black knob fully out and then wind in until pressure on gauge reaches 414 to 550 kpa (60-80 psi). (Refer instructions Section 3 Part 2(c) and Part 3(e).
	Regulator outlet port and fittings not firmly attached to the regulator.	Ensure outlet port and brass fittings are firmly screwed into regulator. (Refer diagram enclosed with the regulator assembly).
	Gas cylinder over filled or not kept upright and trigger valve frozen up by liquid gas.	Release regulator fitting on gas transfer tube and liquid will vaporize.
2 Applicator leaking (gas or compressed air).	Fault in tube connections from pressure regulator to trigger on applicator.	Fully close regulator valve, disconnect applicator from regulator outlet port by unscrewing regulator fitting on gas transfer tube and return applicator to stockist or local distributor for service.
3 Applicator will not deliver full dose.	Applicator not primed or dose not set correctly.	Prime the applicator and set dose as covered by instructions in Section 4, part 1h. These instructions cover applicator operated by either LP gas or compressed air.
	Inlet valve and seal ring not sealing, caused by foreign matter lodged under inlet valve.	Remove the inlet adaptor and inlet valve from applicator, clean with water and replace in applicator.
	Foreign matter lodged in the delivery valve and spring assembly or a blockage in the nozzle.	Remove nozzle and delivery valve assembly from the applicator, clean the delivery valve assembly, nozzle fluid hole and re-assemble.
4 Slow applicator (fill and/or delivery rate of product).	Incorrect pressure setting on regulator (diag 2-6).	Check and adjust regulator pressure to operate applicator between 414 to 550 kpa (60 – 80 psi).
	Chemical backpack is not collapsing as the applicator draws fluid.	Vent the backpack by removing it from your back, ensure the backpack is in the upright position. Gloves MUST be worn. Unscrew the draw off cap to allow air into the container. Re-tighten draw off cap and return it to your back to continue use. **WARNING: Ensure you do NOT inhale any fumes of the product or allow the product to contact the body in any way or injury to the health of the operator may occur.** Or use N J Phillips collapsible backpack and air bleed draw off system.
	Kinking or restriction of feed tube.	Remove the restriction or re-position the feed tube to avoid kinking.
	Piston seal rings (diag 3-12) and piston lubricating washer (diag 3-13) are dry or have not been lubricated.	Remove cylinder from handpiece. Lubricate the piston seal rings and lubricating washer with castor oil. Lubricate the push rod shaft behind the piston.
5 Spitting of product from nozzle or air being drawn into the cylinder from the nozzle end of applicator.	Foreign matter lodged in the delivery valve and spring assembly.	Remove nozzle and delivery valve assembly, clean valve seat of delivery cage by rinsing and wiping with a soft cloth. Clean valve and spring and re-assemble.
	Incorrect assembly and location of the delivery valve in the delivery cage.	Check that delivery valve and spring are clean and reassembled correctly.
6 Spray pattern dropping at end of stroke or incorrect dose.		Point gun up and operate to expel air.
7 Slow on return stroke.		Check and clean inlet valve and check delivery strainer, clean and refit.
8 Jerky return stroke.	Caused by not cleaning properly.	Put plenty of clean water (preferably with soluble oil in it) through the gun.
9 Very slow on return and delivery stroke.	Trigger valve may be sticking.	Put a small amount of fine clean oil in gas fitting.
10 Slow and incomplete delivery stroke.		Check and clean delivery valve and nozzle tip.
11 Cleaning gun.		Firstly, empty backpack and ensure it is clean, fill with clean soapy water and fire the gun off a number of times (set on full dose) to flush out product and clean. Secondly, fill container with clean water and repeat operation. When storing the applicator, undo nozzle nut and pour some oil into the cylinder and move round to get a good coverage of the cylinder. Clean the tip, delivery valve and inlet valve regularly and re-oil to ensure lubrication and movement. We recommend castor oil or vegetable oil.