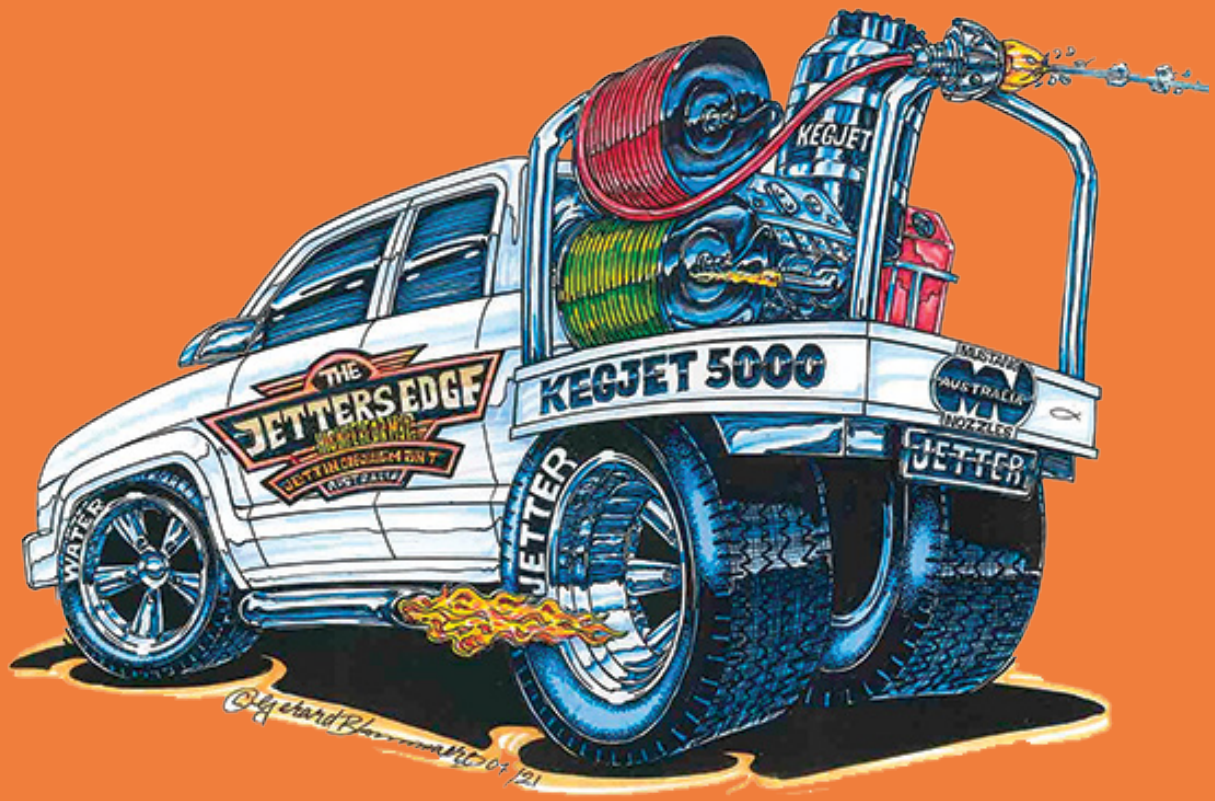
THE JETTERS EDGE
HIGH PERFORMANCE
JETTING EQUIPMENT
AUSTRALIA

SAFE JETTING MANUAL

JULY 2022



SAFETY RULE NO.1

Before using your jetter...
READ THIS MANUAL CAREFULLY!

DRAIN CLEANING JETTER RISK ASSESSMENT

In line with the National Occupational Health & Safety Commission's requirements the data below applies to all Class B The Jetters Edge drain cleaning models.

DESCRIPTION

Engine driven high pressure drain cleaning jetters are designed for both domestic and professional drain cleaning applications.

MATERIAL CONSTRUCTION

The Jetters Edge drain cleaning jetters are mounted on heavy duty steel skids or trolley mounted frames. They consist of a quality internal combustion petrol or diesel engine driving a triplex style three piston high pressure pump. These machines are supplied with hose reels and up to 60 metres of thermoplastic jetting hose to increase operator convenience.

RISK RANKING METHOD

Risk is the combination of the likelihood of a specific unwanted event and the potential consequences if it should occur.

RISK RANKING TABLE

The consequences (loss outcomes) are combined with the likelihood (of those outcomes) in the risk ranking table to identify the risk rank of each loss event (e.g. a consequence of 'Moderate' with a likelihood of 'Likely' yields a risk rank of 17).

The table yields a risk rank from 1 to 25 for each set of probabilities and consequences. A rank of 25 is the highest magnitude of risk that is a highly likely, very serious event.

A rank of 1 represents the lowest magnitude of risk, an almost impossible very low consequence event. ***Controls must be taken to either eliminate or minimise the risk.***

Likelihood	Use the matrix to determine the risk	Consequences				
		Insignificant	Minor	Moderate	Major	Catastrophic
	Almost certain	High 11	High 16	Extreme 20	Extreme 20	Extreme 25
	Likely	Moderate 7	High 12	High 17	Extreme 21	Extreme 24
	Possible	Low 4	Moderate 8	High 13	Extreme 18	Extreme 22
	Unlikely	Low 2	Low 5	Moderate 9	High 14	Extreme 19
	Rare	Low 1	Low 3	Moderate 6	High 10	High 15

SAFE JETTING

Risks associated with operating a drain cleaning jetter. For use on daily SAFE WORK METHOD STATEMENT

POTENTIAL HAZRD	RISK	RISK RATING	CONTROLS
Entanglement with jetting hose (tripping, falling)	Personal injury of the operator or bystanders	13	• Minimise trip hazards by using hose reel • Ensure firm footing before starting jetter
High-pressure water jet	Personal injury of the operator or bystanders	13	• Jetting in progress warning notice on jetter • Wear eye protection & PPE • Use high pressure resistant gloves • Always point jet at area to be cleaned • Use barriers to keep bystanders away from work area • Stop jetting if persons enter working area • Never leave jetter unattended • Never point hose at any person or animal • Never put your hand over jetter nozzle when operating • Stop jetting if a malfunction occurs
Injury from whipping hose: 1. At start-up 2. As drain hose is withdrawn from drain 3. If coupling fails	Personal injury of the operator or bystanders	13	• When starting jetter firmly hold end of hose pointing down to the ground (with no nozzle attached) Markings on hose indicate distance to end of hose • Train the operator • Use of safety plate over drain entrance • Connect hose restraint around junction of hose & gun or hose & Remote Mini Reel
Suffocation	Fatality is the risk	18	• Do not operate engine without suitable ventilation • Confined spaces training
Manual handling	Personal injury	18	• Operator's Manual • Staff training in manual handling • Long handled drain cover keys
High temperature (from engine muffler/ components)	Burns to the operator	11	• Warning sticker on engine • Keep clear of hot engine parts
Fire or explosion	Serious burns, injury	18	• Do not operate jetter in explosive atmosphere • Turn off engine & allow engine to cool before refuelling • Recharge batteries using correct charger • Wear eye & face protection when working near battery
Unsecured machine, moves unattended	Cause of accidents and/or injury	8	• Use of chocks behind wheels or use ute mounting kit
Noise	Hearing damage	11	• Hearing protection
Dislodged particles in atmosphere	Sight damage	20	• Never clean asbestos with high pressure water • Use of eye protection
Electrocution if water contacts electricity	Personal injury	19	• Do not aim water jet at electrical equipment
Slipping	Personal injury	17	• Use of proper footwear on wet surfaces
Contact with foul water or sewage	Infection, illness from water splashes, ingested water	17	• Personal protective equipment, i.e. gloves, overalls, boots, eye and/or face protection etc. • Operator to use good basic hygiene
Contact with chemical cleaners used to clean drains	Skin contact could result in burns, skin irritation etc. Fumes from some chemicals may lead to respiratory problems	22	• Chemical cleaners to only be used as a last resort when other methods have failed • Areas to be kept well ventilated • Staff to follow manufacturers' instructions at all times for use, storage & disposal • Staff to wear the appropriate PPE • Respiratory protection when required

SAFE JETTING

CONTENTS

We want you to get the best results from your new machine and operate it safely. This manual contains information on how to do that, please read it carefully before operating the machine.
Please note that drain and sewer cleaning procedures must be followed carefully. If not it can result in severe injury or even death. Appropriate safety clothing and equipment must be used at all times.

Drain cleaning jetters use water at high pressure to clear blockages such as grease, sediment and tree roots from drains. The pressure is generated by restricting the flow of water with a nozzle at the end of an extremely flexible jetting hose.

The nozzle has reverse facing high pressure jets of water that propel the hose along the drain clearing blockages and flushing away the debris.

FROST PROTECTION

If there is a danger of freezing, the jetter and hose must be completely drained or system flushed with antifreeze as follows;

1. Run the machine until the float tank is nearly empty.

2. Fill with 50% mix of water and antifreeze and run the pump until antifreeze appears at the high pressure outlet.

WARNING: Do not use the jetter if there is a chance that ice has formed inside the hose or pump.

SAFETY PRECAUTIONS

Everyone who uses a high pressure jetter must be competent to do so.

1. Never direct the spray jet at any person or animal.
2. Never direct the spray jet at any surface that may contain asbestos.
3. Do not operate the jetter with a nozzle attached to the hose, with the end of the hose outside the drain. The hose will whip out of control and could cause injury.
4. Never hold a finger over the high pressure nozzle. Skin can be penetrated by high pressure water jets.
5. Never direct the spray jet at the machine itself or any electrical equipment.
6. After use, release the pressure in the high pressure hose by operating the hose reel ball valve (or gun trigger if using gun/lance).
7. When not in use, always switch off the engine, depressurise all hoses and disconnect from water supply.
8. Certain engine components become very hot when in use, e.g. exhaust muffler and cylinder head. Switch off the engine and ALLOW TO COOL before touching or refuelling.
9. Do not attempt any mechanical repair. If you have a problem with your machine contact The Jetters Edge or their nominated service agent.
10. Never supply any liquid other than clean water to the water inlet.
11. Never pull the high pressure hose if it has formed kinks or nooses. Never pull the hose over sharp objects and do not allow the hose to be driven over. A damaged hose must be professionally repaired or replaced. Visually check hoses prior to each use.
12. Do not join jetting hoses together; couplings may fail or get jammed in drains.
13. Use in a well-ventilated area.
14. Ensure unit is level during operation; engine damage could result due to low oil level.
15. Do not attempt to disconnect any hose or coupling when pressurised.
16. Do not operate the machine whilst standing on ladders; use a platform tower or scaffolding.
17. Prevent trolley jetter from moving during operation by using chocks behind the wheels.
18. Use safety goggles when using the machine, particularly with the sand blasting attachment, or any application where loose particles of stone or grit, etc, may be blown around by the high pressure spray.
19. Stay alert and pay attention to what you are doing and the machine you are operating. Do not use jetter while you are tired or under the influence of drugs, alcohol or medication that can impair judgement.

WORK AREA SAFETY - MINIMISE HAZARDS

Keep work area clean and well lit. Set up the jetter and work area in such a way as to reduce the risk of injury from high pressure water, chemical burns, infections, carbon monoxide and other causes.

Mark off the area with barriers if necessary to keep bystanders, passing traffic and non-essential personnel away.

Check for flammable or poisonous liquids, vapours and dust that may ignite. Do not operate jetter until the area has been made safe.

Check the condition of the drains before starting to jet. Drains that are in good condition will not be damaged by the jetting process. Poorly maintained or constructed drains may result in jetting being less effective and could lead to further damage to the drain.

RISK ASSESSMENT

COMPLETE A RISK ASSESSMENT OF THE SITE AND JOB BEFORE YOU START.

See the risk assessment checklist for jetting equipment on page 3.

SAFE JETTING

STAY SAFE

Safety Clothing
All persons operating the unit must wear protective clothing such as safety goggles, face shields, gloves, overalls or raincoat, steel cap boots and ear protection equipment as appropriate. Refer to page 12 for details.

Engine Hazards
Engines emit toxic poisonous carbon monoxide gas which is a colourless, odourless gas. Do not run the jetter in an enclosed area.
Petrol is extremely volatile and explosive under certain conditions. Please note the following:

- Turn off engine and allow to cool before refuelling.
- Refuelling of the unit must be done in a careful manner. Do not overfill the fuel tank. Use suitable equipment for refuelling (suitable containers and funnels). Once the unit is refuelled, please ensure that the fuel tank lid is closed properly and securely.
- Clean off any spills before starting the engine.

Parts of the engine will get hot when it is running. These hot surfaces can cause burns and fire. Keep body parts away from hot areas and please note these parts will take time to cool down. Refer page 3.

Jetter Warning
Before starting up your drain cleaning jetter, ensure that you have read and fully understood this manual.

Note: *Certification of the operator is mandatory for Class B machines … refer to AS/NZS4233.1.*

The jetting hose has been marked at 1m from end of the hose. This ensures that the operator is aware that he is getting near to the end of his jetting hose as it is being removed from the drain or sewer line. Before removing the last metre of jetting hose from the sewer line or drain pipe, water pressure to the nozzle must be shut off. Severe injury or death may occur if this procedure is not followed.

Wash Down Operation
Whilst using your jetter for wash down with the gun/lance, do not spray any persons or animal. Severe injury or death may result if this procedure is not followed.

Bacteria Warning
Sewer lines and drainpipes can carry bacteria and other dangerous micro-organisms which may be infectious. These may cause severe illness or death if exposed to person's mouth, nose, ears, eyes, hands or open cuts and abrasions. To protect the operator against these infectious micro-organisms or bacteria, it is imperative that arms, hands and other areas of the body must be washed after working with sewer lines, with hot soapy water. Refer page 3.

Do not smoke or eat while using the jetter as this may lead to the transfer of dangerous micro-organisms into the body.

UTE OR TRAILER MOUNTING OF JETTER

Trolley mounted jetters must be secured during transit. Special care must be taken to ensure frame is not stressed when using tie-downs to prevent frame distortion.

1. Do not operate jetter while the unit is tied down for transportation as frame damage can result.
2. If the jetter is to be used while secured on the ute it is strongly recommended that it is permanently mounted.

Contact your local distributor for more information.

ACCESSORY IDENTIFICATION

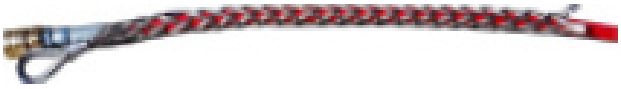
Jetters usually come equipped with the following jetting accessories:

- Steel hose reel rated to 6,000 psi
- 60 metres of 5,000 psi rated ¼" or 3/8" ID R8 jetting hose with quick fit snap on connection on outlet.
- Mustang Nozzle box

- Safety Plate - Prevents nozzle from accidently exiting the drain under pressure

- Hose shroud - Protects operator in case of hose or hose fittings failure, use mandated by safety standard AS/NZS4233.1 (s/code: ATST56600455920)

- Hose restraint - Prevents hose from whipping in the event of hose or coupling failure.



Jetting Accessories Checklist

Accessories that may be required for Class B jetter operation as per safety standard AS/NZS4233.1, subject to your own risk assessment

- Safety plate - Prevents jetting nozzle from accidentally exiting the drain under pressure
- Hose Restraint - At the connection to Remote Mini Reel, if used
- Hose shroud - Protects operator in case of hose or hose fittings failure
- Foot valve (hold to activate device for use with wash-down gun to provide two means of isolation)
- Safety gloves

Optional Accessories - Making Jetting Faster!

- **Remote Mini Reel** - mobile hose reel fitted with either ¼" or 3/16" lightweight jetting hose
- **Whip Hose** - 1/8" super flexible hose, ideal for small drains & tight bends (40mm or smaller). Complete with compressor nozzle and quick fit tail
- **Heavy-Duty Washdown Gun** - with 900mm stainless steel lance & high pressure nozzle

Remote Mini Reel

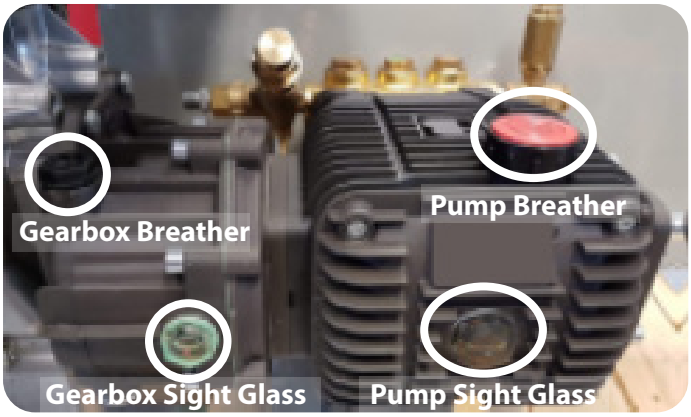
Whip Hose

Heavy-Duty Washdown Gun

PREPARATION FOR USE

PUMP / GEARBOX / ENGINE

1. Check oil in the pump, gearbox & engine daily. **Note: There are separate oil reservoirs for the pump, gearbox and engine.**
2. With the machine on a level surface, pump/gearbox oil level should cover the red dot in the oil level sight glass on the side of the pump or gearbox. If necessary, top up with oil (non-foaming type). Refer to the pump/gearbox manufacturers handbook. Do not mix different grades of oil as this may affect the machine's performance. If alternative oil is used, first empty out oil by unscrewing drain plug in bottom of pump/gearbox.
3. After filling with oil ensure breather plugs are fitted back to pump and gearbox.
4. Check engine oil level daily. Refer to engine manufacturer's separate handbook.



OIL PROPERTIES

Oil loses its lubricity over time. Change pump and gearbox oil every 6 months during regular service. FAILURE TO CARRY OUT REGULAR MAINTENANCE VOIDS WARRANTY!

BATTERY MAINTENANCE

Water jetters are fitted with an Absorbed Glass Mat (AGM) dry cell battery or lead acid battery. It may be necessary to run the jetter for 20 mins to recharge. If the battery is flat it may be recharged using a battery charger. Contact a battery specialist for further assistance.

START UP PROCEEDURE

NOTE: Trolley mounted jetter wheels should be chocked to prevent movement during operation.

1. Pull sufficient amount of water supply hose off the hose reel and connect to the water tap.

2. If your jetter does not have a supply hose reel fitted then use a good quality garden hose. Ensure the supply hose has been flushed to remove any obstructions before attaching it to the water tank. Connect one end of the hose to the inlet hose connector fitted to the break tank or inlet hose connector on the pump head, and the other end to the water tap.

NOTE: The break tank is fitted with a low water cut off switch. The engine will not run if the water level drops below a certain point.

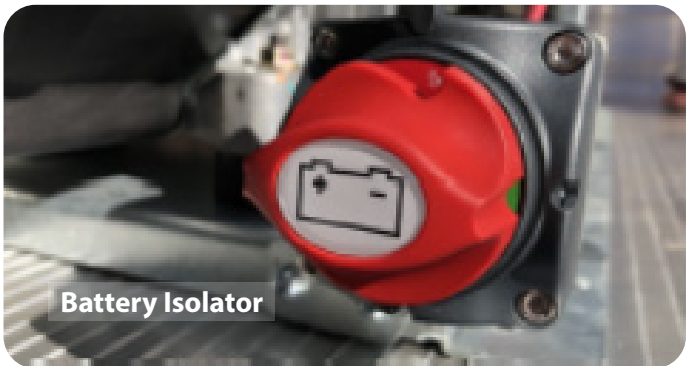
NOTE: If your jetter is not fitted with a break tank an appropriate back flow prevention device should be used to comply with all local water authority regulations.

3. **Turn on water supply.**

4. **Ensure break tank is full** and float valve has shut off.

NOTE: Tap should be fully on and make sure that there are no leaks on the supply hose and connections.

5. **Engage battery isolator** and check that emergency stop button is reset.



START UP PROCEEDURE (CONT'D)

6. **Open fuel tap**.
7. Make sure that your main hose is **connected to the safe starting connector.**

NOTE: If your Jetter does not have a **safe starting connector** you can, hold open ended hose in hand and point downwards. **WARNING:** Ensure **no nozzle** is fitted to the hose, it must be open flow.

8. Ensure that the ball valve is in the **OPEN** position.
9. Ensure engine choke is fully on and turn the key or pull the starter rope to start engine. (Refer to engine manual for more details). Adjust throttle speed as required.

10. Once the engine is started, **close the ball valve** (pump will now go into by-pass mode), **release engine choke.**

OPERATION AS A DRAIN CLEANING JETTER

1. Refer to page 8 for start up procedure.
2. Run out a sufficient length of jetting hose from the hose reel.
3. Push at least 3 metres of jetting hose through the hole in the centre of safety plate.
4. Attach selected drain cleaning nozzle to the end of jetting hose and ensure it is fully snapped into position.

5. Place at least 1 metre of hose down the drain, use hose markings as a guide. Cover the entrance to the drain with the safety plate.
6. Turn on ball valve to activate high pressure jet to nozzle.
7. Ease the hose down the drain. Twist the hose to aid the nozzle in negotiating bends and turns. The nozzle will create a gentle pulling action on the hose. If it becomes stuck a sharp tug will usually free it.
8. For more jetting tips check out page 13.

AVOID FRAME DAMAGE

Do not operate your Jetter while the unit is tied down for transport. Frame damage can result through restricted vibration.

Changing Nozzles?
ALWAYS WEAR PROTECTIVE GLOVES

1. Turn off the ball valve before removing the hose out of the drain.
2. Wait for hose to be depressurised.
3. Change the nozzle as required. Ensure the replacement nozzle is fully snapped into position.

WARNING: When removing hose from drain you must turn off the ball valve before the 1 metre mark on the hose appears. **The hose has been marked for your safety and these marks must be renewed as required.**

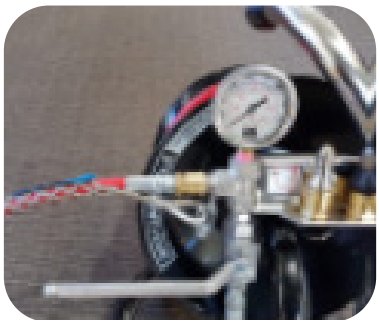
Turning off the Jetter

1. Remove all but the last 1 metre of jetting hose from the drain.
2. Turn off the ball valve.
3. De-throttle the engine and turn off.
4. Release the pressure still in the hose by opening the ball valve. Wait until the hose is depressurised.
5. Pull the remaining hose out of the drain and remove the nozzle.
6. Ensure the engine key is turned to the off position and the fuel tap is off.
7. Isolate the battery.
8. Disconnect the supply hose.
9. Clean & stow jetting hose and nozzle. Connect end of hose to a safe starting connector.

OPERATION OF REMOTE MINI REEL (OPTIONAL EXTRA)

Using a Remote Mini Reel gives the user the option of remotely controlling the jetter.

1. Refer to page 8 for start up procedure.
2. Run out sufficient jetting hose from jetter reel to reach drain access point.
3. Slip the hose restraint over the end of the jetter jetting hose.
4. Connect the extended jetting hose from jetter to the inlet on the Remote Mini Reel and secure the hose restraint to the connection point.



5. Ensure the ball valve on the Remote Mini Reel is closed.
6. Run out a sufficient length of jetting hose from the Remote Mini Reel.
7. Push at least 3 metres of jetting hose through the hole in the centre of safety plate.
8. Attach selected drain cleaning nozzle to the end of jetting hose and ensure it is fully snapped into position.
9. Place at least 1 metre of hose down the drain, use hose markings as a guide.
10. Cover the entrance to the drain with the safety plate.
11. Turn on ball valve on the jetter, and then turn on the ball valve on the Remote Mini Reel to activate the high pressure jet to the nozzle.
12. Ease the hose down the drain. Twist the hose to aid the nozzle in negotiating bends and turns. The nozzle will create a gentle pulling action on the hose. If it becomes stuck a sharp tug will usually free it.
13. NOTE the ball valve on the Remote Mini Reel controls the pressure to the nozzle, the ball valve on the jetter controls the pressure to the Remote Mini Reel.

EMERGENCY STOP BUTTON

All Class B jetters are fitted with a mandatory emergency stop, as per safety standard AS/NZS4233.1.

This should only be used in an emergency. The Jetters Edge recommends de-throttling the engine and running with no load before shutting off the engine by turning the key.

If the emergency stop button has been used, it will need to be reset before the engine will start again. To reset, turn the button clockwise.

WARNING Immediately after activating the E-stop turn the ignition key to the OFF position. **Failure to do so could result in a flat battery and shortened battery life.**

OPERATION AS A PRESSURE CLEANER

1. Refer to page 8 for start up procedure.
2. Slip the hose protector over the end of the jetter hose.
3. Fit the gun/lance assembly to the end of the jetting hose. Use hose restraint and shroud to cover joint between hose and gun and secure strap to gun.
4. Open the ball valve, pressurise hose.
5. Ensure firm footing and brace for pressure.
6. Operate with gun trigger as needed and avoid excessive bypass.
7. Check that there are no leaks in the line connections. All leaks must be fixed before using the jetter.
8. When using gun and lance, pressure begins when the gun trigger is squeezed.

Turning off the Pressure Washer

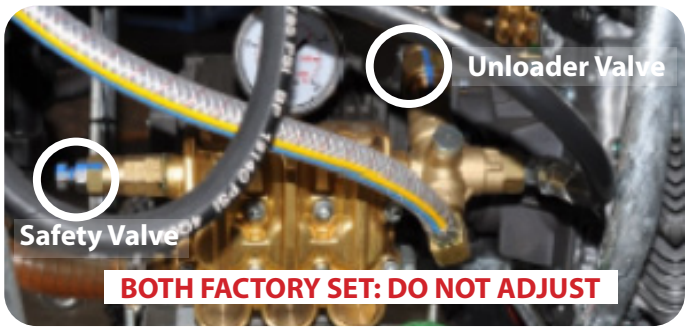
1. De-throttle the engine and turn off.
2. Release the pressure still in the hose using the gun trigger.
3. Ensure the engine key is turned to the off position and the fuel tap is off.
4. Isolate the battery.
5. Disconnect the supply hose.

ASP KIT: AUSSIE SAFETY PROTECTION

DO NOT run machine without break tank on by-pass for more than 2 minutes.

SAFETY VALVE: This device "blows off" excess pres-sure if unloader has been tampered with, thus pro-tecting the pump.

Do not tamper with pre-set unloader and safety valve. ***(This will void your warranty)***



HIGH-PRESSURE PISTON PUMPS

Your high pressure pumping system is the heart of your drain cleaning jetter. The Pump has been specially designed to be used with cold water (max 74°C) for pipe water jetting and high pressure wash down applications. Your high pressure piston pump is designed to move a certain amount of water per revolution by its three solid ceramic pistons.

High pressure is created once the pump outlet is restricted with a nozzle. All high pressure outlet connections, hosing and equipment is rated over and above the maximum operating pressures of the pump.

Do not adjust any pressure regulators on your pump; tampering will void warranty. For any malfunction of the high pressure pumping system, please contact The Jetters Edge or authorised Service Agent.

Because of safety/danger hazards with high pressure systems, only use approved genuine high pressure hoses and components when replacing or repairing your drain cleaning jetter. For guidance on this, please contact The Jetters Edge or the Distributor you purchased the unit from.

ALTERING THE HIGH PRESSURE PUMPING SYSTEM MAY RESULT IN SEVERE INJURY OR DEATH. Warranty will be void if any high pressure equipment has been altered by unauthorised persons. Over-speeding or over-pressurising of pumping system can be very dangerous and severely reduce the life of your Drain Cleaning Jetter and may result in injury or death.

PERSONAL PROTECTION EQUIPMENT

Appropriate personal protective equipment should be worn where:

- hazards cannot be otherwise prevented or suitably controlled, e.g. by engineering or administration controls, total enclosure or substitution; and/or
- complete protection is essential, e.g. in some occupational environments with uncertain levels of hazards.

The provision and use of personal protective equipment does not reduce or replace the need for proper Occupational Health and Safety prevention measures, such as engineering or administrative controls to be undertaken. Recommendations of such preventative measures should always be fully explored before considering issue of personal protective equipment. Where personal protective equipment is issued, instruction and training should be provided regarding its correct use and maintenance.

» **Head Protection**
Where appropriate suitable head protection complying with AS/NZS 1801 should be worn.

» **Eye Protection**
Eye protection complying with AS/NZS 1337 (adequate for the purpose and of adequate fit on the person) should be worn at all times when in the vicinity of water blasting operations. Where liquid is liable to cause eye damage, full visor and goggles are recommended.

» **Body Protection**
All persons should wear suitable waterproof clothing complying with AS/NZS 3765.1 (or AS/NZS 3765.2 if working with hazardous chemicals), having regard to the type of work being undertaken. Liquid or chemical-resistant suits should be worn where there is an assessed risk to health or of injury that can be prevented by such equipment.

» **Hand Protection**
Adequate hand protection complying with the recommendation/s of AS/NZS 2161.2, AS/NZS 2161.3 or AS/NZS 2161.5 should be worn when there is an assessed risk of injury that can be prevented by such equipment.

» **Foot Protection**
All persons should wear appropriate occupational protective footwear complying with AS/NZS 2210.2. A lower leg guard should be used by water blasting operators where it is assessed that the risk of foot injury could be prevented by such equipment. AS/NZS 2210.1 provides guidance for the selection of footwear.

» **Hearing Protection**
Suitable hearing protection complying with AS/NZS 1270 should be worn at all times when the noise levels exceed limits set by regulatory authorities.

Comfort, Function & Safety … at an affordable price
The Jetters Edge supply a full range of personal safety protection gear rated to 500 BAR (7,300 psi).

SAFE JETTING

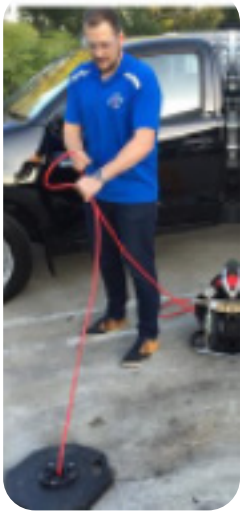
OPERATING TIP

These are some of the tips and techniques that have been tried and tested over the years to make jetting easier.

- Select your hose diameter according to the size of drain you are cleaning.

JETTER HOSE SELECTION	
Pipe Size	**Jetting Hose Size**
1″ - 2″	1/8″
2″ - 4″	3/16″
2″ - 6″	1/4″
5″ - 10″	3/8″

- Always use the safety plate. It will protect your jetting hose against damage from sharp edges and rough surfaces at the entrance to the drain. More damage is done to a hose on the entry and exit point of the drain than anywhere else.



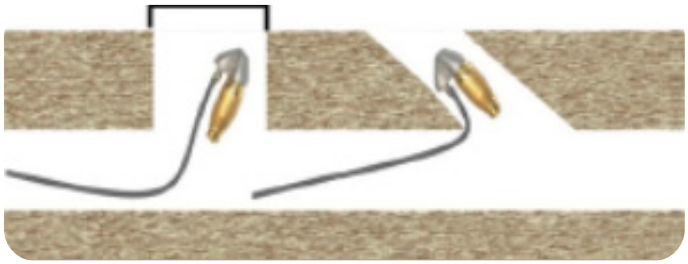
  The safety plate also prevents the jetting nozzle accidentally exiting the drain while under pressure.

- Start your jetting with a long nozzle like the Predator or for smaller drains the Compressor.

- For really tight bends remove the quick coupler from the hose and cowling from the nozzle and connect the head directly to the hose.
- Twist your jet hose to help get it around tight bends and traps.
- Once you have broken through the blockage change to a Root Ranger to clear tree roots from the sides of the drain. When using the Root Ranger Turbine, the hose must be twisted to thoroughly clear the root choke from all sides of the pipe.
- Prevent the Root Ranger turbine from entering side channels by pushing straight through the junction as quickly as possible. Pushing the hose straight without twisting it, will help to keep the turbine on a straight path.
- If your hose becomes jammed, try pulling the hose hard, and then letting it go quickly so it can snap back and loosen itself. Also, try turning the jet off then pull on the hose, then turn jet back on again.
- When accessing a square junction down a shaft, a section of 50mm pipe with an elbow on the end can help direct your nozzle up into the desired location. Alternately you can run your hose through a section of flexible pipe like 50mm ag drain to assist in directing and protecting the jetting hose.

As good as the Root Ranger is it likes to get stuck wherever possible.

- Try running the Root Ranger straight to the blockage without twisting the hose.
- Leave the hose twist for when you are actually cutting the roots or retrieving the hose from the blockage. This will keep it from heading up any branch drains, toilet pans and PVC capped inspection openings!
- For drains larger than 6″ add an extension to the Root Ranger to prevent it from becoming wedged.



HOSE WEAR

Jetting hoses must be checked for wear daily and replaced if damaged.
The Jetters Edge supply only premium quality, super flexible jetting hose on all jetters.

SAFE JETTING

NOZZLE SELECTION

There are three main types of penetrating nozzles; the Predator, the Negotiator, and the Compressor. These three nozzles come in different configuration options – 3-Rear/1-Forward, 6-Rear/1-Forward, and 6-Rear only.

The Predator is a good starting choice for general drain cleaning. It has a long pointed nose for penetrating deep into a choke and blasting out the debris. (P3R1FC)

The Negotiator has been designed shorter to get around tight bends and traps. It is a good multi-purpose nozzle for any drain cleaning application. (N6R1FC)

The Bullet is a small, but powerful nozzle used when all else fails. Although it is very effective, it should only be used on difficult chokes. It is so small it has a habit of leaving the drain. (B6R1FC)

The Beaver has two forward firing jets, with six reverse thrusting jets. The two front jets bore deep into the choke. Ideal for dry chokes. (BV6R2FC)

The Root Rat is extremely popular. It features one front jet with six rear jets, three behind the tip of the nozzle at 45° and three at the rear of the nozzle at 30º, enabling it to quickly penetrate the choke. (RR6R1FC)

The Compressor is smaller again, and assists with smaller blockages. A new extension can also be purchased for the Compressor nozzle. (C6R1FC)

The Root Ranger is used to clear what the Penetrator nozzles leave behind. It has 1 rear thrust port and an optional front jet. This nozzle will clear just about anything from the drain and is the primary root cutter used by plumbers worldwide. (RR8TCF)

NEW NOZZLES MAKE YOUR JOB EASIER! ASK ABOUT OUR LATEST DRAIN CLEANING NOZZLES.

NOZZLE WEAR

Once drain cleaning nozzles or wash down nozzles have worn, pressure loss will occur. Replacement of nozzles is necessary to maintain constant and maximum efficiency of your drain cleaning jetter.

NOZZLE SAFETY... RESPECT THE PRESSURE!

- Do not hold nozzle while pressurised.
- Do not allow nozzle to leave the drain while pressurised.
- Hoses must be conspicuously marked at a nominal distance of 1 metre from the nozzle to indicate the nozzle location.
- Always use a safety plate in case nozzle turns through 180° in the pipe and returns back to the entry.
- The bend radius of the hose, coupling & nozzle combined should be more than the internal diameter of the pipe. If not, a starter bar (a length of rigid pipe) should be fitted to increase the bend radius as necessary.

ROOT RANGE TURBO NOZZLE

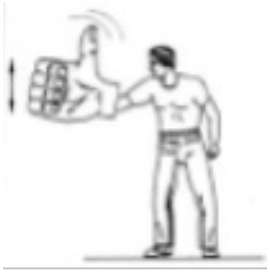
- Never use the Root Ranger nozzle in a drain with a diameter larger than 150mm (6") without a fixed extension equalling the diameter of the pipe.
- Must be used in accordance with your own safe work place method statement.
- Do not allow an inexperienced operator to use this nozzle.
- Clean nozzle after every use and store in a safe place. Remove the turbine barrel to clear debris regularly. Debris left in the barrel may damage the ceramic insert.
- Ensure nozzle is not damaged or jets obstructed. Dropping the Root Ranger may damage the ceramic insert.

If struck by the jet of a Root Ranger nozzle, the water will cause massive injuries to human flesh and organs - never lose respect for this nozzle.
Ensure a fast shut down procedure is ready while using this nozzle.

OPERATOR'S HAND SIGNALS

This section provides a set of hand signals for communication when carrying out water jetting operations.

Pressurise System
Thumb pointing upwards, the rest of the hand closed. From the shoulder height the arm moves up and down.



Depressurise System
Form a fist. Move the arm back and forth at shoulder height.

Raise Pressure
First finger pointing up, the rest of the hand closed. The hand is moved in a circular motion.

Lower Pressure
First finger pointing down, the rest of the hand closed. The hand is moved in a circular motion.

ACCIDENT REPORTING

Reporting
All accidents or injuries, whether resulting in "lost time" or "no lost time" injuries, should be recorded in accordance with the recommendations of AS 1885.1. Incidents that result in "near misses" should also be recorded as a means of providing a record of significant incidents that have the potential to result in serious injury at the workplace, so appropriate measures can be implemented to minimise or eliminate these potential hazards.

Personal Injuries
In the event that a person is injured by the impact of a water jet, the injury caused may appear insignificant and give little indication of the extent of the injury beneath the skin and the damage to deeper tissues. Although only a small hole may be present, quantities of water may have penetrated the skin and entered the flesh and organs causing serious injury.

Medical Recommendation
If an accident occurs where pressurised water penetrates or appears to have penetrated the skin, medical assistance should be sought immediately.

Immediate First Aid
Where medical examination is not immediately possible, appropriate basic first aid measures should be applied and the patient observed closely until medical treatment is available.

ACCIDENT REPORTING (CONT'D)

Medical Alert Card.
All operators engaged in commercial and industrial water blasting operations should carry an immediately accessible, waterproof medical alert card. This card should:

- outline the possible nature of injuries and post-accident infections that can be caused by high pressure water blasting;
- provide details of immediate first-aid treatment until medical treatment can be arranged; and
- provide the name or names of medicos (and contact phone numbers) who should be contacted for expert medical advice for the treatment of high pressure water blasting injuries.

In addition, the card may also identify the worker; and outline medical information about the worker such as blood type, allergies and conditions, such as asthma.

EMERGENCY MEDICAL INFORMATION

Immediate hospital attention should be given to personnel who sustain equipment related injuries while operating the system. In such cases, it is vital that medical personnel be apprised of all facts relevant to such injuries.

Therefore, all operating personnel should be provided with waterproof emergency medical tags or cards describing the nature of their work and the possibility of injury inherent in the use of a water blasting device. The tag or card should also bear the following standard notice:

WARNINGS

◊ OVER-SPEEDING
Do not operate machine at over pre-set engine speed. Over-speeding can cause serious pump damage and will void warranty.

◊ FRAME TIE-DOWNS
Do not operate machine while frame is secured by transit only tie-down points. Frame damage can result.

◊ EXCESSIVE BYPASS
Do not run on excessive bypass. Switch machine off within two minutes of ceasing operation as excessive bypass can cause heat build-up in pump and subsequent damage. Excessive bypass running voids warranty. This does not apply to machines fitted with supply tanks.

◊ HIGH PRESSURE SETTING
The high pressure pump is factory set to operate at its rated pressure. DO NOT ADJUST. Tampering with the pressure regulator will void warranty and can be DANGEROUS.

◊ CHECK NOZZLES & COUPLINGS WEEKLY,
clean after each use. If pressure drops off, check nozzle for wear. Nozzles should be replaced when worn. Using the machine with the incorrect nozzle size will void warranty and can be DANGEROUS to the operator.

JETTER DAILY CHECKLIST

1. Check pump & gearbox oil level.
2. Check engine oil level.
3. Check nozzle for wear.
4. Check all high pressure components for leaks, damage, wear or corrosion:
   a. Gun/Lance
   b. Jetting hose & connections
   c. All fittings
5. Check water filter and clean if necessary.
6. Check unloader & safety valve for leaks.
7. Check the hose marking that marks the last metre of hose and replace if worn.

BEWARE of abrasions on hose and replace if damaged.

SERVICE RECORD

Refer to page 18 for details of service schedule. A service record must be maintained to validate warranty.

Date	Description of work done	Invoice #	Signed

REGULAR SERVICE

All professional machines need to be thoroughly serviced every six months or 100 hours, which ever comes first. Use an approved and qualified The Jetters Edge service agent. The service involved should include the engine manufacturer's recommendations (see separate Engine Manual) and the following:

1. Change pump & gearbox oil.
2. Change engine oil if required (refer to engine manual for schedule).
3. Check filter for foreign debris.
4. Check unloader & safety valve for leaks.
5. Check all high pressure components, including the hose, for leaks, damage, wear or corrosion. Replace if necessary.
6. Replace nozzles if necessary.

EASY CONVERSION CHARTS

PSI	BAR	KPA
2000	138	13,800
3000	207	20,685
4000	276	27,580
4300	297	29,674
5000	345	34,474
6000	414	41,368
7000	483	48,263

IMPERIAL	METRIC
1/8"	3.18mm
3/16"	4.77mm
1/4"	6.35mm
3/8"	9.53mm
1/2"	12.70mm
3/4"	19.05mm
1"	25.40mm

LOOK AFTER YOUR MACHINE AND IT WILL LOOK AFTER YOU!

NOTES

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