

Operator's Product HandBook

# **AquaDelivery**<sup>TM</sup>

Water Delivery Unit





"HELPING TO DEVELOP AND PROTECT THE LAND"



## **Contents**

Safety	4
General Safety Instructions	5
General Information	6
Specifications	6
Description	7
Machine Limitations	8
Driving Stability	9
Operating Instructions	9
Before First Use	9
Pump Operation – Petrol Engine	10
Pump Operation – Diesel Engine Option	11
Filling the Tank	11
AquaDelivery™ Operation	12
AquaDelivery™ Loading Procedure	13
Risk Assessment	14
Maintenance	15
Periodic Checks	15
Maintenance	15
Maintenance Schedule	16
Trouble Shooting	18
Warranty	19
Warranty Policy	19
What this Warranty Does Not Cover?	19
How to Obtain Service Under this Warranty?	19
Warranty Limitations	19



## **Disclaimer**

All information, illustrations, and specifications contained in this manual are based on the latest product information available at the time of this publication's printing. TransTank International (TTi) reserves the right to alter and substitute specifications and methods at any time, in line with our commitment to continuous improvement.

No patent liability is assumed with respect to the use of information contained within this manual. While every precaution has been taken in the preparation of this manual, TTi assumes no responsibility for errors or omissions.

Thank you for purchasing an AquaDelivery™ Bulk Water Delivery Unit, which will provide many years of reliable service when operated and maintained in accordance with this manual.

TTi manufacture a range of AquaDelivery™ units, from 5,000 through to 17,000 litre tanks, supplied with a Honda electric start petrol or optional Yanmar diesel engine coupled to an Aussie QP303 pump. This manual describes the operation, driving stability and maintenance procedures applicable to all units, noting additional requirements to options where necessary.

All TTi AquaDelivery<sup>™</sup> tanks are rotationally moulded from quality polyethylene, purpose designed and manufactured to high standards. The AquaDelivery<sup>™</sup> is a steel frame-mounted water transport system designed for potable water delivery. With a heavy-duty galvanised steel frame with forklift pockets, the AquaDelivery<sup>™</sup> is easy to load onto any tipper, flat tray or trailer.

The AquaDelivery<sup>™</sup> unit is supplied complete, tested and ready to go. TTi recommends that only water be used in the AquaDelivery<sup>™</sup> unit. TTi warrants that the AquaDelivery<sup>™</sup> has been designed and built for its intended purpose for transporting and dispensing potable water.

The owner is responsible to ensure that the equipment is operated in accordance with this manual, with Australian WorkSafe requirements, applicable road rules and local council regulations. TTi is not liable for any loss, injury or death resulting from the failure to observe all safe working regulations as required by law.

Included with your AquaDelivery™ unit is the following documents:

- Operator's Handbook (this manual, which includes the Warranty Registration Card)
- Integral Honda petrol engine (or optional Yanmar diesel engine) and pump manufacturer's handbook
- Tank Quality Check Form. This is your verification that the unit has been quality checked, and verifies the serial number affixed to the unit.



## Safety

This manual is intended for use by personnel experienced in the use of this and similar equipment. Read and understand this manual before attempting to operate or perform routine maintenance on this equipment. Your safety is of prime priority.



A WARNING highlights an essential operating or maintenance procedure, practice, condition or statement, which, if not strictly observed, could result in injury or death of personnel, or long-term health hazards.



A CAUTION highlights an essential operating or maintenance procedure, practice, condition or statement, which, if not observed, could result in damage or destruction of equipment.



A NOTE highlights or clarifies an essential systems description, operating or maintenance procedure, condition or statement.



## **General Safety Instructions**

- 1. This unit is designed and manufactured solely for the purpose of carrying and pumping potable water. Under no circumstances should it be used for any other purpose. It must never be used for transporting fuel or chemicals.
- 2. Only authorised and trained personnel are to operate this equipment. Operators must have read and fully understood this manual before operating the AquaDelivery<sup>™</sup> unit.
- 3. Do not operate this equipment while under the influence of alcohol or any drugs that could impair your capabilities in any way.
- Personal Protection Equipment (PPE) must be worn when refuelling or operating the pump on the AquaDelivery™. Exposure to excessive noise over an extended period can cause impairment or loss of hearing.
- 5. Avoid unleaded petrol or diesel contact with skin and eyes; and avoid breathing vapours or mists. Refer to the relevant Safety Data Sheet (SDS).
- 6. Any spillage of fuel while refilling the pump engine's tank should be immediately cleaned up and the materials used in the clean-up disposed of safely and in accordance with relevant regulations applying to the safe use, storage and disposal of fuel.
- 7. Disconnect the battery, if fitted, before conducting any electrical maintenance work.
- 8. Ensure the capacity of the vehicle is suitable for the loaded mass of the AquaDelivery™. Refer to the vehicle's operator manual for safe working loads and relevant safety instructions. Do not exceed the carrying and braking capacity as specified by the vehicle manufacturer. As a guide, one litre of water weights one kilogram (kg), therefore a full 5,000 litre AquaDelivery™ will weigh in excess of 5,500kg.
- 9. The unit must be securely restrained when being transported on a vehicle. Ensure all bolts and fasteners are tightened and secure before operation.
- 10. Be aware of the height of the unit when mounted on a vehicle. Keep clear of overhead obstructions, such as bridges, low hanging tree limbs and power lines.
- 11. This AquaDelivery<sup>™</sup> unit must not be lifted when partially or completely filled. The tank must be empty prior to lifting.
- 12. The AquaDelivery™ must never be left unattended while being filled with water.
- 13. Do not operate the pump when there is no water in the tank.
- 14. Do not disconnect any hoses, nozzles or filters while the equipment is operating. Disconnecting any components while under pressure may result in uncontrolled water discharge which may be hazardous.
- 15. Ensure the certified Potable Water layflat hoses provided are clean and dry before being returned to their storage box on the AquaDelivery™.
- 16. Care should be taken at all times, particularly when operating on rough or steep terrain. Drivers should be aware of fluid surge affecting the centre of gravity.
- 17. The AquaDelivery<sup>™</sup> has safety labels affixed to various locations on the unit. These labels should be kept clean and legible, and replaced if damaged.
- 18. Any unauthorised modifications to this equipment may affect its function and create a serious safety risk. Any unauthorised modifications will void any warranty on the unit.



## **General Information**

## **Specifications**

Tank	UV resistant food grade polyethylene tank (5,000 to 17,000 litre capacity)
Skid Frame	Fully welded and galvanised heavy duty steel frame with forklift pockets
Standard Equipment	Honda GX200 electric start petrol engine with 1,000L/min 3" Aussie QP303 pump
	Pressure regulator
	Hydrant Fill System with tilt-lid
	2 x 10m 3" layflat hose and Camlock fittings, Potable Water Approved to AS4020
	Tank bottom fill kit via integral pump
 	Lockable aluminium hose stowage box
 	Level sight tube
Options	Yanmar diesel engine upgrade
 	LiquidLocker™ Baffle Safety System
	Loading Leg System
	20m 19mm spring rewind hose reel
 	Rotating beacon



## **Description**

The TTi AquaDelivery™ is designed to carry and distribute water using a self-contained pump as standard. The AquaDelivery™ has the following features, refer to Figure 1 (Honda petrol pump unit shown).



Figure 1 - Component Identification

#### **Tank**

All TTi AquaDelivery<sup>™</sup> tanks are constructed from UV resistant, virgin material, food grade polyethylene. Due to the rotational moulding process, there may be a small variance in the overall dimensions of the tank, therefore, calibration markings should be used as a guide only. The tank has a tilt-lid top opening funnel for hydrant filling. The AquaDelivery<sup>™</sup> is available in the following capacities:

- 5,000 litres
- 6,000 litres
- 7,000 litres
- 8,000 litres
- 10,000 litres
- 12,000 litres
- 13,000 litres (standard and low-profile options)
- 15,000 litres
- 17,000 litres.

## LiquidLocker Safety Baffle System

The optional LiquidLocker baffle system within the tank demonstrates measurable improvements in braking performance and dynamic stability and controllability. The system has been independently tested, with the report available upon request.



#### Tank Level Indicator

A level sight tube is fitted as standard to the rear of the tank and provides an accurate level indication of water within the tank.

### **Pressure Regulator**

A pressure regulator is fitted to the pump discharge flange to control line pressure and prevent pump cavitation. The factory-set regulator feeds excess water back to the tank and is set to relieve at 50 – 60 psi.

#### **Hose Reel**

An optional 20m 19mm diameter washdown hose can be mounted on a manually operated hose reel. The hose is fitted with an adjustable nozzle which locates in a securing bracket on the hose reel support when the hose is stowed. The nozzle adjusts from closed through to jet and mist sprays, depending on requirement.

### **Pump**

The AquaDelivery<sup>™</sup> is fitted with an Aussie QP303 3" pump capable of delivering 1,000 L/min as standard. The pump is coupled to a Honda GX200 electric start engine or optional Yanmar diesel engine. The diesel engine option comes with electric start as standard.

### **Battery**

A 12-volt battery is installed behind the pump, to provide power to start the petrol or optional diesel powered pump.

## **Layflat Hose**

Each AquaDelivery™ is supplied with two 10m lengths of layflat hose with camlock fittings, for direct connection to the pump and hydrant. The certified Potable Water hose is stowed in a lockable aluminium box mounted on the steel frame, adjacent to the pump.

## **Hydrant Fill Kit**

A hydrant fill kit is standard, which feeds into the top of the tank, with a camlock coupling to directly connect to a hydrant hose. The kit includes a tilt-lid which automatically opens under hydrant pipe water pressure, dropping back to prevent debris entering the tank when the water supply is shut off.

## **Frame**

The frame is an all steel, fully welded construction and hot dip galvanised for corrosion resistance. The frame incorporates forklift pockets for lifting when necessary. The tank must be fully drained of water prior to lifting the unit.

#### **Ball Control Valve**

The AquaDelivery<sup>™</sup> has a ball control valve used to open or close water flow on the suction line from the tank to the pump.

### **Machine Limitations**

The AquaDelivery<sup>™</sup> unit is subject to operating limitations. It is the operators' responsibility to ensure that this equipment is being operated safely and within these limitations.



## **Driving Stability**

The AquaDelivery™ unit is heavy when filled with water. To maintain stability while operating this unit:

- Ensure the vehicle's tyres are inflated to their correct pressure at all times. Underinflated tyres can cause excessive lateral motion of the tyre, which may cause a rollover.
- Allow extra room for braking and turning when the tank is full.
- Ensure any side gradient (slope) is accounted for, especially when the AquaDelivery<sup>™</sup> tank is full, as the unit will have a higher centre of gravity.

## **Operating Instructions**

## **Before First Use**

Your AquaDelivery™ Bulk Water Delivery Unit is delivered fully assembled. Before use, it needs to be set up using the following instructions:

- Complete the warranty registration online at www.tti.com.au/warranty-registration, or use the Warranty Registration Card at the back of this handbook.
- Store this handbook, along with the Tank Quality Check Form and pump unit's manual in the provided leather pouch, in a safe and easily accessible place for future reference.



NOTE: The operator must fully understand all aspects of this handbook. Do not operate the AquaDelivery™ if you are unfamiliar with its operation until you have read this handbook.

- Read and thoroughly understand this handbook, paying particular attention to all safety requirements, before using the AquaDelivery™ for the first time.
- Check that all fittings, valves, hoses and electrical leads are secure following transit, and are not damaged in any way.
- Inspect the tank for any damage or abrasions.



CAUTION: The unit must be securely mounted to the vehicle. Failure to do so may result in the unit moving or falling off the moving vehicle. Warranty is conditional on the unit being correctly mounted.

 Position your AquaDelivery<sup>™</sup> onto the vehicle and mount securely, refer to the AquaDelivery<sup>™</sup> Loading Procedure.



CAUTION: The engine must be inspected and prepared in accordance with the manufacturer's instructions. Failure to fulfil this requirement may void the engine's warranty.



- Prepare the pump engine in accordance with the selected engine's manual supplied with your AquaDelivery™ unit.
- Ensure the 12-volt battery is fully charged and correctly connected to the pump unit's engine. The battery box is located behind the pump unit. Refer to the supplied pump unit's manual and prepare the engine for use, such as filling its tank with fuel.

## **Pump Operation – Petrol Engine**

The AquaDelivery's petrol pump engine is started as follows, refer to Figure 2:

- Turn the fuel lever to ON.
- If the engine is cold, turn the choke lever to ON.



CAUTION: Ensure the engine's throttle is set to idle if the engine is cold. Do not adjust the throttle to maximum speed until the engine has warmed up.

• Set the throttle lever to idle for cold starting. If restarting a warm engine, the throttle can be left at normal engine operating speed.



NOTE: Ensure the ignition key is switched ON. The engine will crank in the OFF position but will not start unless switched to ON.

- SInsert the key and switch the engine to the START position. When the engine starts, release the key which will return to the ON position.
- Back off the choke lever to the OFF position.
- Once the engine is warmed up, adjust the throttle to increase the engine speed to normal operating revs.
- When the engine needs to be stopped, turn the key to the OFF position.



NOTE: If the engine's battery is flat, the recoil starter can be used. Ensure the ignition key is switched ON.

• If the AquaDelivery™ is not going to be used within the next few hours, shut the system down by turning the fuel tap to OFF.Check that all fittings, hoses, tank breather and electrical leads are secure following transit, and are not damaged in any way.





Figure 2 – Engine Start-up (Petrol Engine shown)

## **Pump Operation - Diesel Engine Option**

The AquaDelivery's optional diesel pump engine is started as follows:

Turn the fuel tap to ON.



CAUTION: Ensure the engine's throttle is set to the start position. Do not adjust the throttle to maximum speed until the engine has warmed up.

- Set the throttle lever to the START or RUN position (depending on model).
- Insert the key and switch the engine to the START position. When the engine starts, release the key which will return to the ON position.
- Once warmed up, adjust the engine speed to normal operating revs using the throttle lever.
- When the engine needs to be stopped, turn the ignition OFF.

If the AquaDelivery<sup>™</sup> is not going to be used within the next few hours, shut the system down by turning the fuel tap to OFF.

## Filling the Tank

The AquaDelivery™ tank can be filled using the hydrant fill kit as follows, referring to Figure 3:



WARNING: The AquaDelivery™ unit is designed for water use only. It must not be used for transporting or storing chemicals or fuel.



- Attach one end of a supplied 3" layflat hydrant hose to the AquaDelivery's hydrant port, the other end to the hydrant.
- Open the supply hydrant's valve slowly; water will flow under pressure through the AquaDelivery's pipe system into the top of the tank, automatically tipping the tilt-lid.



CAUTION: To prevent overflow, do not leave the filling operation unattended.

- A level sight tube is fitted to the rear of the tank, providing a visual indicator of the level of water in the
  tank. When the tank is filled, close the supply hydrant's valve. The tilt-lid will fall flat to close off the tank's
  opening to prevent debris entering.
- Disconnect the hydrant supply hose. Clean and dry the hose before stowing it in the aluminium storage box mounted adjacent to the pump unit.



Figure 3 – Hydrant Filling Operation

## **AquaDelivery™ Operation**

The AquaDelivery™ Bulk Water Delivery Unit is operated as follows:

- Install the unit onto the vehicle and check security of all connections (refer to Before First Use procedure above).
- Fill the tank from an appropriate water source, refer to the Filling the Tank procedure above.
- Remove the camlock cap from the pump's discharge port.
- Connect one end of the supplied layflat hose to the discharge port, then connect the other end to the water receiving storage vessel.



- Open the ball valve on the suction line at the bottom of the AquaDelivery™ tank.
- Start the pump (referring to the procedure above) and allow to warm up. The regulator (bypass valve)
  fitted to the top of the pump will divert the water back into the tank if the layflat hose is connected to a
  ball valve at the receiving storage vessel.



CAUTION: Do not allow the pump to run when the tank is empty.

- Fill the receiving vessel, observing the level sight tube on the AquaDelivery<sup>™</sup> tank. When the receiving vessel is full or the AquaDelivery<sup>™</sup> tank is empty, shut down the pump (refer to the procedure above).
- Close the ball valve on the suction at the bottom of the AquaDelivery™ tank.
- Disconnect the layflat hose, clean and dry it before returning it to its stowage box.
- Fit the camlock cap to the pump's discharge port.

## **AquaDelivery™ Loading Procedure**

The AquaDelivery<sup>™</sup> is designed to slip into a tipper tray or mount on a flat tray or trailer, and when not required, can be easily removed. The AquaDelivery<sup>™</sup> unit is loaded as follows:



WARNING: The AquaDelivery™ is heavy and must be loaded or unloaded correctly. Ensure this procedure is followed exactly to avoid injury or death to personnel or damage to the unit.



CAUTION: The AquaDelivery™ unit must never be unloaded with water in the tank. Ensure the tank has been completely emptied prior to installation or removal from the vehicle.

- For a small to medium capacity tipper, release and fold down the side of the body to enable access for the AquaDelivery™ and forklift. For a tipper that doesn't have drop-down sides, TTi recommend using a crane to lift the unit into the tipper body.
- The AquaDelivery™ unit has lifting points at each corner of the steel frame, and two forklift slots across the width of the frame. Lift the unit up from the ground using a suitable capacity forklift, crane or excavator boom to a sufficient height above the donor vehicle's tray.



CAUTION: Ensure that there is an observer to direct the driver when manoeuvring the donor vehicle to load the AquaDelivery™ unit.



- Using an observer, carefully manoeuvre the vehicle underneath the AquaDelivery<sup>™</sup> unit, ensuring it aligns accurately with the centre of the tipper or flat tray. Alternatively, carefully manoeuvre the forklift or crane suspended AquaDelivery<sup>™</sup> over the top of the donor vehicle's tray.
- Carefully lower the AquaDelivery<sup>™</sup> until it rests on the tray floor, ensuring it is centred evenly across the tray.
- Secure the AquaDelivery<sup>™</sup> to the floor of the tray, using a suitable system to ensure the unit, when filled with water, cannot move.

## **Risk Assessment**

Task	Hazard	Risk	Control Measure/Mitigation
Partially fill the tank with water, start the motor & test	Manual handling; slips, trips or falls; petrol; diesel; fumes; fingers jammed	Medium	<ul> <li>Concentrate on task; follow safe manual handling techniques:</li> <li>Don't lift on your own if &gt; 20kg, bend knees &amp; keep back straight; Keep fingers clear;</li> <li>Keep unit at least 8m away from overhead powerlines;</li> <li>Fire extinguisher nearby;</li> <li>Follow warning stickers on tanks; Wear PPE for petrol &amp; diesel fumesmask &amp; gloves.</li> </ul>
Check weather conditions	Manual handling; slips, trips or falls	Low	<ul> <li>Follow safe manual handling techniques: don't lift on your own if &gt;20kg, bend knees &amp; keep back straight.</li> </ul>
Use pump unit.	As above; loss of load; heat & cold; noise; exceed load limit of vehicle; hose entanglement; exhaust fumes; terrain & slopes; run over by unit	High	As above;  • Wear clothes to suit heat & cold;  • Wear hearing protection if noise >85 dBa;  • Follow the manufacturer 's safe operation instruction for the vehicle and the spray unit  • Don't overload - water weighs 1kg for every 1 litre  • Secure unit to tow vehicle;  • Keep hose tidy.
Clean up, maintenance & storage	As above	Low	As above; • Wear PPE for clean up; • Store unit in a dry, well ventilated area.
Burn risk	Hot exhaust/muffler	Med	<ul> <li>Do not reach over hot exhaust</li> <li>Do not service engine while hot</li> <li>Wear appropriate PPE</li> </ul>



## **Maintenance**

Your AquaDelivery<sup>™</sup> Bulk Water Delivery Unit requires minimal maintenance but regular cleaning and checks will ensure safe and reliable service over its lifetime. Periodic checks and inspections will identify any potential issues, enabling timely rectification and minimising downtime.

## **Periodic Checks**

The following checks and cleaning operations should be undertaken on a regular basis. The frequency of these activities will depend on the nature of the operating environment and the operational hours of the AquaDelivery™ unit. Refer to the maintenance schedule tables below for details of maintenance intervals.

- Clean the unit and inspect it for any signs of damage or wear. Replace any safety labels if they are damaged or illegible.
- Check all hoses, fasteners and fittings are firmly secured, tighten if necessary.
- Inspect the certified Potable Water layflat hoses for any signs of damage, wear or contamination. Clean or replace as necessary.
- Unwind the hose from the reel (if fitted) fully to check that hose is in good order. Pressurise the line and check operation of spray nozzle. Rewind the hose onto the reel, ensuring it retracts all the way.
- For the petrol or optional diesel engine driven pump, check the engine's oil level weekly. Top up as required.
- Check for any signs of fuel or oil leaks. If detected, investigate and rectify immediately.
- Check the condition of the optional diesel or petrol pump engine's 12-volt battery, replace it or charge it as necessary.
- If the AquaDelivery<sup>™</sup> is to be stored for an extended period, ensure the tank and all pipelines are empty and are not pressurised. Store the unit is a clean, dry and well-ventilated area.

#### **Maintenance**

The AquaDelivery<sup>™</sup> has been designed and built for minimal maintenance requirements, however, to ensure a long and reliable unit life, the following tasks must be undertaken on a periodic basis.



NOTE: In dusty, dirty or smoky environments, cleaning, inspection and servicing of the unit on a regular basis is essential. The cleaning, inspection and servicing must be undertaken more frequently in harsh conditions to avoid damage or destruction of equipment.

The frequency of these activities will depend on the nature of the operating environment and the operational hours of the AquaDelivery $^{\text{m}}$  unit.

For the petrol or optional diesel engine driven pump, refer to the supplied pump manual, drain and replace the engine oil in accordance with the manufacturer's recommendations.



## **Maintenance Schedule**

The following tasks are be conducted in accordance with each of the schedules. All scheduled tasks are to be undertaken concurrently. For example, at the three month maintenance interval, all task listed are to be undertaken, in addition to the daily, weekly and monthly tasks.



NOTE: Maintenance is important. Keep a record of all maintenance tasks conducted on the AquaDelivery™ unit.

TTi recommends photocopying these schedules in order to keep a detailed log of all maintenance tasks. A copy of these schedules will be required to support any warranty claim.

## **Daily Tasks**

The following tasks are to be undertaken daily, or prior to each use, of the AquaDelivery™ unit.

No.	Task	Notes
1	Inspect the AquaDelivery™ for any signs of damage or wear	Clean, repair or replace
2	Check fuel	Top up as required
3	Inspect engine's air filter and housing for dust	Clean, replace as necessary

## **Weekly Tasks**

The following tasks are to be undertaken each week or 10 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily tasks		
2	Remove and clean the engine's air filter	1 1 1	
3	Check engine oil level, top up as required	1 1 1	 

#### **Monthly Tasks**

The following tasks are to be undertaken each month or 20 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily and Weekly tasks		
2	Check layflat hose by unrolling fully	 	
3	Check securing system used to fastener unit to vehicle	 	
4	Check optional hose and hose reel by unwinding fully	 	
5	* Change pump engine oil (and filter, if fitted) (first change, thereafter every six months or 100 operating hours)	 	



## **Three Monthly Tasks**

The following tasks are to be undertaken every three months or 50 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily, Weekly and Monthly tasks		
2	Inspect the air filter, replace if clogged or damaged	 	
3	Check all hoses, fasteners, nozzles and fittings	 	

## **Six Monthly Tasks**

The following tasks are to be undertaken every six months or 100 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily, Weekly, Monthly and 3-Monthly tasks		
2	Change engine oil (and filter, if fitted)	 	
3	Inspect spark plug (petrol engine only)	 	

## **Twelve Monthly tasks**

The following tasks are to be undertaken every twelve months or 200 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily, Weekly, Monthly, 3-Monthly & 6-Monthly tasks		
2	Check the battery condition	†	
3	Replace the engine's air filter	1	
4	Drain and flush the fuel tank	1	 
5	Replace the engine's fuel filter	1	
6	Replace the spark plug (petrol engine only)	†	

## **Two Yearly Tasks**

The following tasks are to be undertaken every 24 months or 500 operating hours, whichever occurs first.

No.	Task	Date	Signed
1	All Daily, Weekly, Monthly, 3-Monthly, 6-Monthly and 12-Monthly tasks		



## **TroubleShooting**

If a fault develops with the AquaDelivery $^{\text{\tiny{TM}}}$ , the following trouble shooting table provides guidance to identify and rectify the problem.

Problem	Possible Cause	Remedy
Pump will not feed water	Ball valve closed on outlet	Open ball valve
Engine will not crank	Flat battery	Check battery state-of-charge
(petrol or optional diesel engine)	Melted fusible link/circuit breaker	Replace fusible link/breaker
 	Loose Connections	Clean and tighten connections
	Faulty Ignition Switch	Check switch operation, replace as needed
	Faulty magnetic, relay, neutral start or clutch switches	Check and replace as needed
	Mechanical problem in engine	Check Engine
	Problem in theft deterrent system	Check service manual for system tests
Engine cranks too	Weak Battery	Check battery and charge as needed
slowly to start	Loose or corroded connections	Clean and tighten connections
	Faulty starter motor	Test Starter
	Mechanical problems with engine or starter	Check engine and starter, replace worn out parts
Starter keeps running	Damaged pinion or ring gear	Check gears for wear or damage
	Faulty plunger in magnetic switch	Test starter pull-in and hold-in coils
 	Faulty ignition switch or control circuit	Check switch and circuit components
	Binding ignition key	Check key for damage
Starter spins, but engine	Faulty over-running clutch	Check over-running clutch for proper operation
will not crank	Damaged or worn pinion gear or ring gear	Check gears for damage and wear; replace as needed
Starter does not	Faulty magnetic switch	Bench test starter
engage/disengage properly	Damaged or worn pinion gear or ring gear	Check gears for damage and wear; replace as needed



## Warranty

## **Warranty Policy**

TTI will, at its option, repair or replace without charge any part covered by this warranty which is found to be defective in material and/or workmanship within one (1) year after date of sale to the original retail purchaser. If the product is used for rental purposes, this warranty is limited to ninety (90) days.

Upon request, the customer will make the defective part available for inspection and/or return the defective part to TTi, transportation charges prepaid. All parts and components are covered by this warranty except the following, which are warranted separately by their respective manufacturers:

- engines
- gearboxes
- pumps
- regulators.

TTi does not assume any warranty obligation, liability or modification for these items, which are covered exclusively by the stated warranty of the respective manufacturers.

## What this Warranty Does Not Cover?

#### This warranty does not cover:

- defects caused by depreciation or damage caused by incorrect mounting, normal wear, accidents, improper maintenance, improper use or abuse of the product, alterations or failure to follow the instructions and warnings provided.
- 2. Any charges for making service calls, clean up time and transport charges.
- 3. The use of non-genuine parts on equipment supplied by TTi. This will automatically negate any warranty.

## **How to Obtain Service Under this Warranty?**

Warranty service can be arranged by contacting your dealer, or by contacting TTi directly on 1800 816 277.

Proof of warranty registration and date of purchase may be required to verify warranty coverage. Any defective parts returned to TTI must be accompanied by a Return Goods Note. This form can be obtained by contacting Product Support on 1800 816 277 or emailing ProductSupport@tti.com.au.

## **Warranty Limitations**

Warranty limitations are as follows:

- There is no other express warranty. Any warranty that may be implied from this purchase including merchantability and fitness for purpose is hereby limited to the duration of this warranty and to the extent permitted by law. Any and all implied warranties are excluded.
- 2. TTI will not be liable for any incidental, consequential or special damages and/or expenses in connection with the purchase or use of this equipment, to the extent permitted by law.
- 3. Only the warranty expressed in this limited warranty shall apply and no dealer, distributor or individual is authorised to amend, modify, or extend this warranty in any way. Accordingly, additional statements, whether oral or written, do not constitute warranties by TTi, and should not be relied upon.





## 1800 816 277

sales@tti.com.au

PO Box 137, Nathalia, VIC, 3638 Murray Valley Hwy, Nathalia, VIC 3638

Proudly Built By:	Quality Chec	ked By:
Signature Date	e Signature	 Date

www.tti.com.au