



# M157103B.1

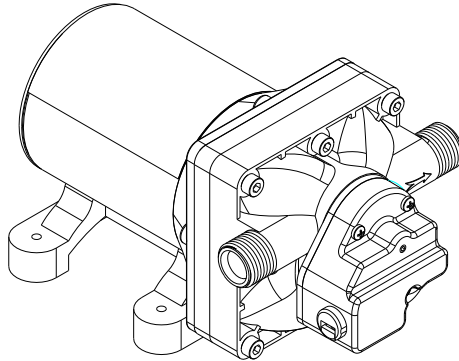
ITEM NUMBER: 157103 & 157104

SERIAL NUMBER: \_\_\_\_\_

## Owner's Manual

Instructions for Installation, Testing, Operation, Servicing, and Storage

**12V RV Pump:** For use in RVs to transfer potable water, indoor use only.



### **⚠ WARNING**

**READ and UNDERSTAND the Owner's Manual completely before using this potable water pump.** Install, test, and use only in accordance with the Owner's Manual instructions.

**WEAR personal protective gear when filling, using, cleaning, and servicing the water pump.**

**DO NOT START water pump until ready to use to avoid unintentional distribution.**

**FOR INDOOR USE ONLY.**

**ALWAYS** keep a fire extinguisher rated "ABC" nearby.

**Improper use of the water pump could result in serious injury to the operator or nearby persons/animals, or could cause damage.**

**Any Questions, Comments or Problems**  
**Call NorthStar Product Support 1-800-270-0810.**



## Hazard Signal Word Definitions






	<p>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.</p>
	<p>DANGER (red) indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</p>
	<p>WARNING (orange) indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p>CAUTION (yellow) indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p>CAUTION (yellow) used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.</p>

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## Intended Use

The pump is intended for use in RVs to transfer potable/drinking water, for indoor use only.

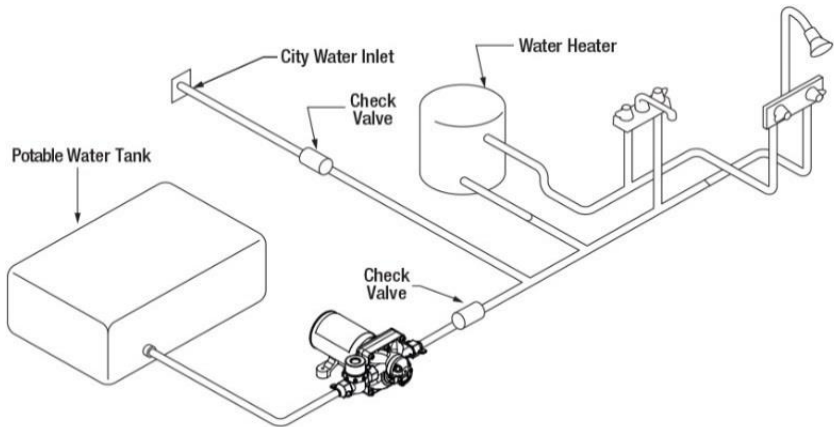
The pump is intended for intermittent or continuous duty when the proper operating criteria is met.

The technical specifications for your pump are provided in the Specifications section of this manual.

Follow all safety precautions presented throughout the manual. A summary of important information can be found at the beginning of this manual.

**Contact NorthStar Product Support at 1-800-270-0810 for any questions about the appropriate use of the pump and/or optional accessories.**

## Example Plumbing Schematic



## Summary of Important Information

### **⚠ WARNING**

Read and understand **this owner's manual** completely before using the pump, particularly the plumbing section.

*Improper use of the pump could result in serious injury or illness for the operator or nearby persons/animals, or cause damage to the environment.*

**LISTED BELOW** is a summary of safety information of particular importance. See individual sections of this owner's manual for more details.

#### ----- **BEFORE INSTALLATION** -----

- **READ and FOLLOW** the plumbing instructions and warnings in the RV manual.
- **CHECK** for properly sized wiring and correct electrical protection.
- **CONFIRM** the mounting location will allow adequate ventilation to prevent overheating.
- **TURN** power OFF to the existing pump(s).
- **RELIEVE** system pressure.
- **DISCONNECT** the main power to the pump.

#### ----- **DURING INSTALLATION** -----

- **EXERCISE CAUTION** when attaching pump to 12 Vdc power supply. Follow the steps listed in the Installation section of this manual when connecting the pump to the power supply.
- **CHECK and TEST** installed pump as directed in this manual.
- **DO NOT MODIFY** pump design.

#### ----- **GENERAL SAFETY** -----

- **READ and FOLLOW** instructions and warnings in this manual.
- **READ and FOLLOW** instructions and warnings in the RV manual.
- **DO NOT USE** flammable or corrosive chemicals in this pump.

#### ----- **OPERATION** -----

##### Before Use

- **INSPECT and PREPARE** pump before each use as directed in this manual.
- **SANITIZE** the pump before each use and prior to storage.
- **DO NOT TURN ON POWER** to pump until ready to USE to avoid unintentional flow.

##### During Use

- **TURN OFF** power to pump and **RELIEVE** system pressure before leaving pump unattended.
- **SEE** Troubleshooting section of this manual before attempting any repairs. Wear personal protective equipment and follow safety instructions.

##### After Use

- **SANITIZE** pump according to the directions provided in this manual.

### **Accident Procedures**

Immediate response is necessary in the event of a pump leak. See instructions below:

<b>Pump leak</b>	<b>If the pump develops a leak, immediately stop using.</b> Turn off power to the pump and refer to the troubleshooting section of this manual, as applicable.
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## Warning Label Location

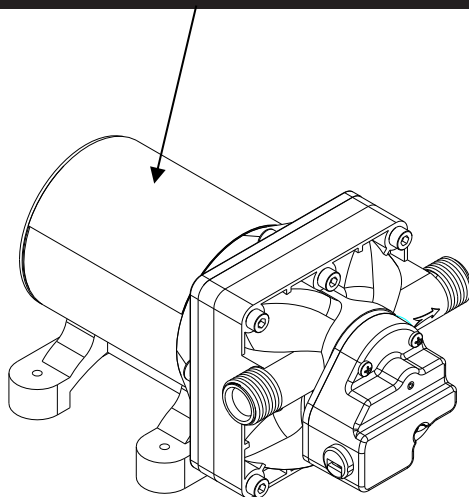
### ⚠ WARNING

- Do not pump flammable liquids
- Acceptable for indoor use only
- Relieve system pressure before performing maintenance

### ⚠ AVERTISSEMENT

- Ne pas pomper de liquides inflammables
- Acceptable uniquement pour une utilisation en intérieur
- Relâchez la pression du système avant d'effectuer l'entretien

799657



Item #	Part #	Description	Model
157103	799667	Decal, 3.0 GPM RV Pump	3055R
157104	799672	Decal, 5.0 GPM RV Pump	5055R

**Always make sure warning labels are in place and in good condition.** If a warning label is missing or not legible, order new labels or unsafe operation could result. To order replacement warning labels, call NorthStar Product Support at 1-800-270-0810.

# Installation

## **Step One: Prepare for Installation**

- This NorthStar pump is self-priming.
- The pump is for indoor use only and should be mounted on a solid surface in a location that is dry and provides adequate ventilation.

### **⚠ CAUTION**

**DO NOT** locate the motor near plastics that could melt or combustible material. The surface temperature of the motor may exceed 200°F [93°C].

- Prior to installation ensure properly sized wiring, proper electrical protection and adequately sized plumbing lines and connections.

## **Step Two: Mounting**

- The pump may be mounted in any horizontal position. If mounting the pump vertically, the pump head should be in the down position so that in the unlikely event of a leak, fluid will not enter the motor.
- Secure the rubber feet with #8 fasteners. **DO NOT** compress the feet, doing so will reduce their ability to isolate vibration/noise. (Note: fasteners are not included.)
- Mount pump within 6 feet of the tank for best pump performance and longer pump life.

## **Step Three: Plumbing**

- See table below for port size and recommended hose sizes.
  - Remove shipping plugs from pump ports.
  - Use included NorthStar swivel fittings to connect flexible high-pressure tubing to the NPS ported pumps.

Model	Ports	Minimum inlet hose size	Minimum outlet hose size
3055R	1/2" NPS – M	1/2" (13mm) Inside diameter	1/2" (13mm) Inside diameter
5055R	1/2" NPS – M	1/2" (13mm) Inside diameter	1/2" (13mm) Inside diameter

**NOTE:** NorthStar does not recommend the use of rigid pipe to plumb the inlet/outlet ports.

- Tubing/hose should be flexible, compatible with potable water and rated for the pump's maximum pressure. At least 18" [450mm] length is suggested to minimize stress on the fitting/ports and reduce noise. Allow for the shortest possible tubing/hose route and avoid sharp bends that may kink over time.
- The tubing/hose should be anchored where it meets rigid pipe/hard plumbing to reduce vibration.
- Installation of the include potable water approved 50-mesh strainer is required to prevent foreign debris from entering the system. Failures due to foreign debris are not covered under the warranty.

**NOTE:** Restrictions on the inlet may cause a loss in performance. Additionally, inlet pressure must not exceed 30 psi [2.1 bar]

- If a check valve is installed in the plumbing, it must have a cracking pressure of no more than 2 psi [.14 bar].

## Installation (continued)

### Step Four: Connect pump to 12 Vdc power supply

#### ⚠ WARNING

*Caution must be exercised when making connections to a 12 Vdc power supply to avoid shock.*

ALWAYS follow the safety instructions and steps listed below *in exact sequence* when connecting the pump to a 12 Vdc power supply.

#### 1. Preparatory safety

##### Preparatory safety steps:

- ALWAYS use eye protection.
- NEVER smoke or work near sparks or other sources of ignition.

#### 2. Electrical requirements

- The pump should be on a dedicated (individual) circuit, controlled with a double pole switch (UL/CSA certified) rated at or above the fuse ampere indicated by the pump motor label. Depending on distance of the power source from the pump and ampere load on the circuit, wire may need to be heavier than indicated by the chart.
- Use an approved wire of the size specified below or heavier.

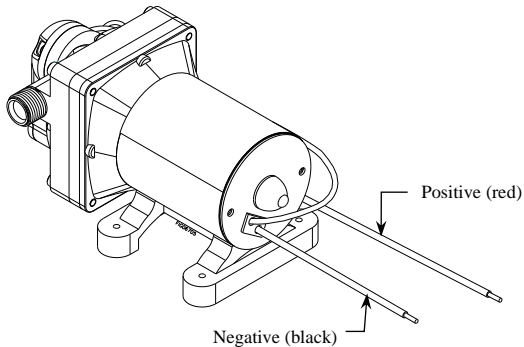
Item #	Voltage	Model	Fuse (amp)	Wire Leads	Wire Size (Stranded MTW)
157103	12 Vdc	3055R	10A	RED (positive +) BLACK (negative -)	#14 AWG (2.5mm <sup>2</sup> ) (or heavier)
157104	12 Vdc	5055R	20A	RED (positive +) BLACK (negative -)	#14 AWG (2.5mm <sup>2</sup> ) (or heavier)

#### 3. Connect pump to 12 Vdc power supply

##### Connect the pump to a 12 Vdc power supply using the following procedure:

- a) Strip off about 1/2" of insulation from the end of each power supply wire.
- b) Position the **pump's red** wire parallel with the positive (+) wire from power supply. Secure using a twist-on wire nut.
- c) Position the **pump's black** wire parallel to the **negative (-)** wire from the power supply. Secure using a twist-on wire nut.

**WARNING:** Always connect in this sequence to avoid possible shock.





## Installation (continued)

### Step Five: Check and test the installation of the pump

#### **WARNING**

- Serious injury could result from leaks if pump is improperly assembled, installed or the design of the pump is modified.
- Follow the steps below to ensure the pump is properly installed. Never modify the pump design.

<b>1. Check installation</b>	Check installation to ensure the pump is properly mounted, wired, plumbed and in safe working condition.
<b>2. Test with potable water</b>	Test the system for leaks with potable water: <ol style="list-style-type: none"><li>a) Fill the tank with potable water.</li><li>b) The pump is an “on demand” pump. When turned on, the pump will prime itself, then turn off once reaching pressure. When the demand for flow continues, the pump will automatically re-start.</li><li>c) If the pump does not shut off automatically, see the pressure switch operation and bypass operation sections in the Operation section</li><li>d) Check for leaks throughout the system. If a leak is detected, fix the leak and re-test the system with potable water.</li></ol>

## Operation – Preparing the Pump for Use

Inspect and prepare pump before each use.

### **WARNING**

Read instructions below carefully for inspecting and preparing the pump.

Damaged or clogged equipment could result in leaks or uncontrolled distribution.

Leaks could result in injury to the operator or bystanders.

#### **Important safety rules:**

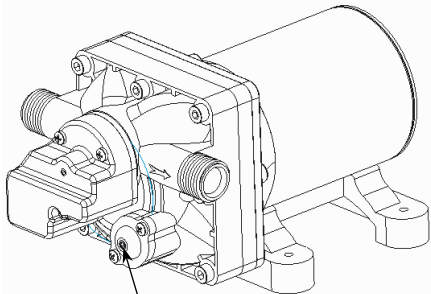
- **Power off.** Make sure all power is OFF before cleaning, inspecting, or servicing the pump.
- **Guards / shields.** Make sure all guards and shields are replaced after servicing the pump.
- **Replacement parts.** If a part needs replacement, only use parts that meet the manufacturer's specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the pump.

<b>1. Ensure clean system</b>	<b>Ensure the pump has been thoroughly flushed, drained, and sanitized.</b>
<b>2. Inspect &amp; repair</b>	<b>Inspect and test the system thoroughly with potable water:</b>  a) Inspect hoses/ lines for exposed mesh and holes. Replace all worn or damaged hoses/ lines. b) Inspect fittings for cracks and leaks. Replace NorthStar pump if needed. c) Partially fill system with potable water and turn on to test for leaks. Repair as needed.  <b><i>IMPORTANT: After any repair work has been done, ALWAYS test for leaks with potable water one final time before using.</i></b>

## Operation – Using the Pump

### ⚠ WARNING

ALWAYS wear personal protective equipment when operating or servicing the pump.

<b>1. Review safety information</b>	<b>Review the Summary of Important Information section</b> provided in this manual.
<b>2. Wear personal protective equipment</b>	<b>Wear personal protective equipment as needed.</b>
<b>3. Turn on power</b>	<p><b>Turn on the power to the pump.</b></p> <p><i>Note: The pump will start automatically when power is turned on. The pump will cycle on and off as needed to retain pressure in the hose.</i></p>
<b>4. Pressure switch operation</b>	<p>The pressure switch reacts to outlet pressure, and interrupts power at the preset shut-off pressure indicated on the pump label. When outlet pressure drops below a predetermined limit the switch will close and the pump operates until the shut-off pressure is achieved. The shut-off pressure is set to factory calibrated standards.</p> <p>Note: If the plumbing is restrictive or the flow rate is very low, the pump may re-pressurize the outlet faster than the fluid is being released, causing rapid cycling (*ON/OFF within 2 seconds). If the pump is subjected to rapid cycling during normal operation, or for infrequent periods, damage may occur. Applications which exhibit rapid cycling should have restrictions in the outlet minimized.</p>
<b>5. Internal bypass operation</b>	<p>The 157103 (3.0gpm) and 157104 (5.0gpm) pumps are equipped with an internal bypass feature. By allowing some fluid to circulate inside the pump, the pumps can operate at low output flow without on/off cycling caused by pressure switch activation. The bypass pressure is calibrated and set at the factory during assembly. However, voltage and plumbing differences in individual installations may require an adjustment. If the pump will not turn off when all plumbing fixtures are closed, locate the internal bypass adjustment screw on the front of the pump and rotate clockwise until the pump shuts off. (A 2mm hex key is required.)</p> <div style="text-align: center; margin-top: 20px;">  <p style="margin-left: 100px;">Internal bypass adjustment screw</p> </div>

## Operation – Using the Pump (continued)

<b>6. Leaving unattended</b>	<b>If the pump must be left unattended at any time:</b> <ul style="list-style-type: none"><li>a) Disconnect power to the pump.</li><li>b) Relieve system pressure.</li></ul>
<b>7. Discontinue use if clogged or inoperative</b>	<b>If the pump becomes clogged or inoperative during use, discontinue use immediately.</b> <ul style="list-style-type: none"><li>- Do not attempt to service while water is in the pump and power is connected.</li><li>- Return to the troubleshooting section of this manual before attempting to service.</li></ul>

### CAUTION

**DO NOT** operate the pump at pressures which cause the motor to exceed the amperes rating indicated on the name plate.

Improper adjustment of the pressure switch setting may cause severe overload or premature failure. Failures due to improper adjustment of the pressure switch setting will not be covered under the warranty.

## Storage

The pump should always be stored indoors.

For long term or winter storage, prepare the pump by running RV antifreeze through the system. This will keep internal parts lubricated, protect against corrosion, and keep the unit from freezing.

### CAUTION

- The pump will be damaged if it freezes.
- Protect the pump from freezing during storage by following the instructions below.

### Preparing for storage:

<b>1. Add antifreeze</b>	Pour RV antifreeze into the pump system.  <i>Note: RV antifreeze is non-toxic and biodegradable and generally safer for the environment than automotive antifreeze.</i>
<b>2. Operate briefly</b>	Turn on the pump and run the pump system briefly until fluid is distributed through plumbing system.

### Removing from storage:

<b>1. Drain</b>	Drain the antifreeze left in the plumbing system into a suitable container.
<b>2. Flush with water</b>	Fill the potable water tank with potable water and run through the system. Operate the pump system until the system is completely flushed. Be sure to set up containers to capture the antifreeze flush water.
<b>3. Disposal</b>	Dispose of the antifreeze and flush properly with potable water.
<b>4. Sanitize</b>	<p>To ensure clean, safe drinking water, it is important for your health to sanitize the potable water system if the pump has been sitting in storage or has not been used for a while. The potable water holding tank, hot water tank, and the water lines are potential places for bacteria to grow.</p> <p>Before you start, read all of the instructions in this manual on how to properly sanitize the plumbing system.</p> <p>Before you get started, there are some things to consider.</p> <ul style="list-style-type: none"><li>• You will need at least 5 to 10 hours of time to complete this task.</li><li>• Remove the water filters while sanitizing the water system and consider replacing the water filter when you have completed the sanitation.</li><li>• If you have a hot water tank, this is an ideal time to flush out the hot water tank.</li></ul>

## Storage (continued)

Sanitize your potable water system.

1. Determine the size of your water system, the potable water holding tank, plus the hot water tank and two to three gallons for your water lines, depending on your set up. Refer to your owner's manual.
2. Prepare a 5% sodium-hypochlorite solution using chlorine bleach (non-scented and non-gel) and water. Use the chart below for mix concentrations.

<b>Fresh Water Tank Size</b>	<b>Amount of Bleach</b>	<b>Mix Including Water</b>
40 gallons (152 liters)	1 cup (240 ml)	4 gallons (16 liters)
50 gallons (190 liters)	1 1/4 cup (300 ml)	5 gallons (20 liters)
60 gallons (227 liters)	1 1/2 cup (360 ml)	6 gallons (24 liters)
80 gallons (302 liters)	1 3/4 cup (420 ml)	7 gallons (28 liters)
100 gallons (380 liters)	2 cups (480 ml)	8 gallons (32 liters)

3. Add bleach mixture to the water tank – NEVER POUR STRAIGHT BLEACH INTO THE FRESH WATER TANK!
4. If you have a bypass for your hot water tank, make sure that is set for normal use so that the bleach mixture will be pumped through the hot water tank.
5. Top off the potable water tank with potable water.
6. Run the chlorinated water through all lines (hot and cold, one at a time) for one to two minutes. You should be able to smell the chlorine.
7. Top off the potable water tank again.
8. Let it sit for 4 hours minimum; overnight is best. The most important thing is to wait the appropriate amount of time for the tank to be properly sanitized.

NOTE: Doubling the bleach will not cut the time in half! Drain and rinse the potable water tank and water lines several times with fresh, potable water. The water should now be safe to drink, but if the chlorine odor is too strong, add a mixture of 1/2 cup baking soda and a gallon of fresh water to the potable water tank and repeat the potable water flush.

## Troubleshooting

### WARNING

Before troubleshooting or attempting to service, read the following safety rules to avoid risk of electric shock.

#### **Before attempting to service the pump:**

<b>1. Personal protective equipment</b>	Wear personal protective equipment while servicing your pump.
<b>2. Review troubleshooting table</b>	Review the troubleshooting table below for the type of problem you are experiencing. However, DO NOT attempt to repair until the steps listed below are followed.
<b>3. Empty and flush</b>	Empty the pump system and flush the pump system with potable water as directed in the Storage section, removing from storage.
<b>4. Disconnect power/relieve pressure</b>	Disconnect power to the pump and be sure all system pressure is relieved.
<b>5. Perform repairs</b>	Follow the directions provided in the troubleshooting table to repair the pump.
<b>6. Test after servicing</b>	After servicing, ALWAYS test the pump for leaks with potable water before using.

## Troubleshooting (continued)

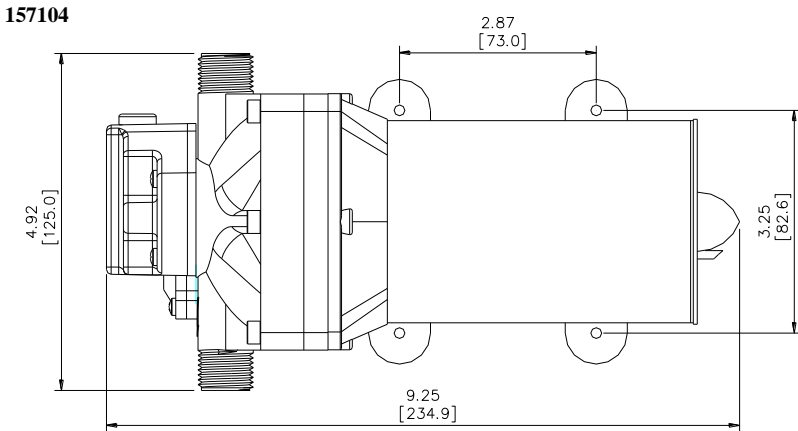
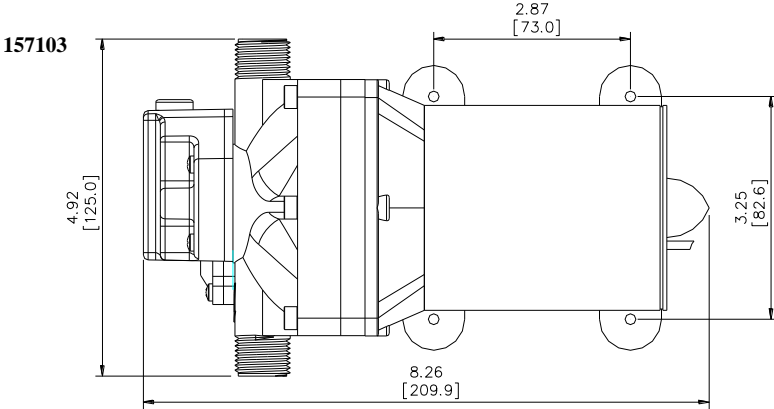
PROBLEM	CAUSE	SOLUTION
Pump will not turn on	Bad electrical connection	Check battery connections
	Short in wires	Check condition of wires
	Fuse blown (if applicable)	Replace fuse
	Locked drive	Replace pump
	Faulty pressure switch	Replace pump
	Incorrect voltage	Check voltage ( $\pm 10\%$ )
Pump will not turn off	Internal bypass setting too low	See Internal bypass operation section
Pump will not prime	Out of potable water	Refill potable water tank
	Inlet air leak	Tighten hose clamps/Replace pump
	Inlet/Outlet tube restriction	Remove restriction
	Clogged intake valves	Remove obstruction
	Clogged intake tube	Remove obstruction
Low pressure/flow	Inlet air leak	Tighten hose clamps/Replace pump
	Worn diaphragm	Replace pump
	Worn valves	Replace pump
	Inlet/Outlet tube restriction	Remove restriction
	Incorrect voltage	Check voltage ( $\pm 10\%$ )
	Clogged intake valves	Remove obstruction
	Clogged intake tube	Remove obstruction
Pump leaks	Loose fasteners	Tighten fasteners
	Pump seals degraded	Replace pump
	Leak in diaphragm	Replace pump
Pump starts with faucets closed	Leak in the system	Tighten leaking hose clamps/fittings
	Faulty pressure switch	Replace pump
	Air trapped in system	Purge the air from the system
Rough operation	Flexible mounting surface	Mount pump on rigid surface
	Loose pump head	Tighten fasteners
	Compressed base feet	Decompress base feet
	Rigid plumbing	Plumb pump with flexible plumbing



# Specifications

Item number	Electrical connection	Maximum amp draw	Maximum flow	Maximum pressure	Ports	Overall dimensions	Weight
157103	12 Vdc	9.5 Amps	3.0 GPM [11.3 LPM]	55 PSI [3.8 bar]	1/2" NPS-M	8.26" x 4.92" x 4.4" [209.9mm x 125mm x 110.5mm]	4.4 lbs. [2.0 kg]
157104	12 Vdc	16 Amps	5.0 GPM [18.9 LPM]	55 PSI [3.8 bar]	1/2" NPS-M	9.25" x 4.92" x 4.4" [234.9mm x 125mm x 110.5mm]	5.1 lbs. [2.3 kg]

The noise emissions from this product do not exceed 70 dB(A).



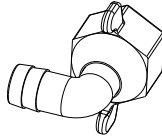
The manufacturer reserves the right to make improvements in design and/or changes in specifications at any time without incurring any obligation to install them on units previously sold.

**Any Questions, Comments, Problems, or Parts Orders**  
*Call NorthStar Product Support 1-800-270-0810*

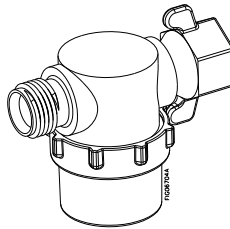
## Accessories



#157110



#157112



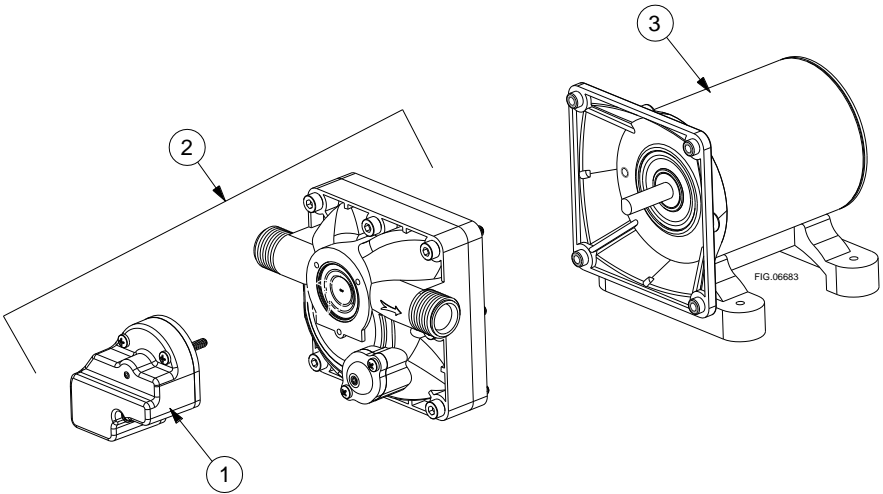
#157106

Part#	Description	Included with Model	Qty
157110	RV Swivel x 1/2" Hose Barb, Straight	157103 & 157104	2
157106	Inlet Strainer w/ 1/2" Threaded Ports, 50 mesh	157103 & 157104	1

\*Additional RV fittings are listed below along with compatible models.  
Call NorthStar Product Support at 1-800-270-0810 to order.

Part#	Description	Compatible with Model
157112	RV Swivel x 1/2" Hose Barb, Elbow	157103 & 157104

## Exploded View – 157103 and 157104 – Rev B



Ref #	Part #	Description	Model	Qty
1	801452	Pressure switch assembly	All	1
2	A157103	Complete pump head assembly	157103	1
	A157104		157104	
3	789888	Motor assembly	157103	1
	789964		157104	

## Limited Warranty

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability. Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high-quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product.

### Limited Warranty

NorthStar shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of 2 years for noncommercial/nonrental use and a period of 90 days for commercial/rental use from the date of purchase by user.

NorthStar shall warranty any wear item, including, but not limited to, valves, seals, pump diaphragms, hoses, and filter elements to be free from defects in material or workmanship for a period of 90 days from the date of purchase by user. This warranty applies to the original purchaser of the equipment and is non-transferable. Verification of purchase is the responsibility of the buyer. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar.

**NOTE:** Some services performed by parties other than NorthStar may void warranty.

**This warranty covers parts only. It will not provide for replacement of complete products due to defective parts.**

**Components not manufactured by NorthStar are guaranteed by their manufacturer and can be serviced at factory-authorized locations near you. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. NorthStar can supply you with the service center location in your area.**

This warranty specifically excludes the following: failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use.

Warranty does not cover items subject to normal wear such as tires, receptacles or any part subject to direct physical contact by the public. This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part.

This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

Please fill in the following information and have it on hand when you call in on a warranty claim.

Customer Number: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

NorthStar Serial Number: \_\_\_\_\_

Item Number: \_\_\_\_\_

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Northern Tool + Equipment Co., Inc.  
Burnsville, MN 55306  
[www.northerntool.com](http://www.northerntool.com)  
Made in China