



**POWER EQUIPMENT**

# HOT WATER PRESSURE WASHER



**HW3024HG12V**

**HW3524HG12V**

## OPERATOR'S MANUAL

**INDUSTRIAL**

**SERIES**



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## INTRODUCTION & PRODUCT INFO



**ATTENTION:** Read through the complete manual prior to the initial use of your pressure washer.

### Using the Operator's manual

The operator's manual is an important part of your pressure washer. It should be read thoroughly before initial use, and referred to often to make sure adequate safety and service concerns are being addressed.

Reading the operator's manual thoroughly will help avoid any personal injury or damage to your machine. By knowing how best to operate this machine, you will be better positioned to show others who may also operate the unit.

This manual was written to take you from the safety requirements to the operating functions of your machine. You can refer back to the manual at any time to help troubleshoot any specific operating functions, so store it with the machine at all times.

### Record Identification Numbers

If you need to contact an Authorized Dealer or Customer Service line (**1-800-663-8331**) for information on servicing, always provide the product model and identification numbers.

You will need to locate the model and serial number for the pump and record the information in the spaces provided below.

<b>Date of Purchase:</b>
<b>Dealer Name:</b>
<b>Dealer Phone:</b>

PRODUCT IDENTIFICATION NUMBERS	
<b>Model Number:</b>	
<b>Serial Number:</b>	









	<b>WARNING</b> ADVERTENCIA • AVERTISSEMENT
	Cancer and Reproductive Harm Cáncer y Daño Reproductivo Cancer et dommages à la reproduction <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>



**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.**

<b>DANGER</b>	This indicates a hazard which, if not avoided, will result serious injury or death
<b>WARNING</b>	This indicates a hazard which, if not avoided, will result in serious injury or property damage.
<b>CAUTION</b>	This indicates a hazard which, if not avoided, might result in minor or moderate injury.
<b>NOTICE</b>	This indicates a situation that could damage equipment or other property. Make sure all security messages are observed and followed.

### HAZARD SYMBOLS AND MEANINGS

			
EXPLOSION	FIRE	HOT SURFACE	MOVING PARTS
			
FLYING OBJECTS	ELECTRIC SHOCK	TOXIC FUMES	INJECTION

### **DANGER**

- Always operate the pressure washer in a well-ventilated area free of flammable vapors, combustible dust, gases, or other combustible materials.
- Do not store the pressure washer near an open flame or any equipment such as a stove, furnace, water heater, etc., which utilizes a pilot light or sparking device.
- Do not use this pressure washer to spray flammable material.
- Do not smoke while filling burner fuel tank.
- Never fill the fuel tanks while the pressure washer is running or hot. Allow unit to cool for two minutes.
- Always refuel slowly to avoid the possibility of spilled fuel which may cause a risk of fire.
- Always leave room for fuel to expand in the gas tank. Do not overfill.
- Engine Fuel Tank: If using a Gasoline Engine, refuel with gasoline only. Do not use diesel or kerosene.
- Burner Fuel Tank (Black): When refueling the Burner Fuel Tank, use No. 1 or No. 2 fuel oil/diesel or kerosene. Do not use gasoline.
- Do not operate the unit if gasoline or diesel fuel is spilled. Wipe the pressure washer clean and move it away from the spill. Avoid creating any ignition until the gasoline or diesel fuel has evaporated.
- When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging.
- Be certain to disconnect the battery ground terminal before servicing. When disconnecting the cable from the battery, start with the negative terminal. When connecting them, start with the positive cable.
- When charging the battery, remove the battery vent plugs.
- Use only a voltmeter or hydrometer to check a battery charge.
- DO NOT jump start the battery unless both batteries are of equal voltage and amperage.

## IMPORTANT SAFETY WARNINGS

### WARNING



Serious injury or death may occur from a fire caused by a muffler spark.  
Serious injury or death may occur if system safety's are not properly maintained.

- A spark arrester must be added to the muffler of this engine when using on land covered with any flammable agricultural crop (hay and grain), and if they are used in or near brush or forested areas. The arrester must be maintained in effective working order by the operator of the equipment. In the state of California, the above is required by law. (Section 4442 and 4443 of the California Public Resources Code.) Other states/provinces may have similar laws. Federal laws apply on Federal lands.
- This pressure washer has a Safety Relief Valve . This should never be altered, modified, removed or made inoperative. If the device fails, replace immediately with genuine manufacturer replacement part.

### WARNING



Serious injury or death may occur from inhaling engine/burner exhaust or dangerous vapors. The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

- Never operate this pressure washer in an enclosed area. Always ensure there is adequate ventilation (fresh outside air) for breathing and combustion. This will prevent the buildup of dangerous carbon monoxide gases. Beware of poorly ventilated areas, or areas with exhaust fans which can cause poor air exchange. This unit should only be used outdoors to ensure ventilation is never an issue.
- Follow all safety instructions provided with the materials you are spraying. Use of a respirator may be required when working with some materials. Do not use this pressure washer to dispense hazardous detergents.

### WARNING



Serious injury or death could occur from high pressure spray penetrating the skin.

- Keep clear of nozzle and spray! Never put your hand, fingers or body directly over the spray nozzle.
- Do not direct discharge stream at self, other persons, or pets.
- This product is to be used only by trained operators.
- Always keep operating area clear of other people.
- Do not allow children to operate this unit or be in the vicinity while you operate it.
- Seek emergency medical care if spray seems to have penetrated the skin. Do not treat as a simple cut!
- High pressure hoses and fuel lines should be inspected daily for signs of wear. If evidence of failure exists, promptly replace all suspect hoses and fuel lines to prevent the possibility of injury from the high pressure spray. If a hose or fitting is leaking, do not place your hand on the leak.
- Never operate the gun with the trigger held in the open position. To prevent accidental discharge, the trigger gun should be securely locked when not in use.
- Before removing the spray nozzle or servicing the unit, always shut the unit off and pull the trigger of the gun to release trapped pressure (even after you shut off the unit, there is high pressure water left in the pump, hose and gun until you release it by pulling the trigger the gun).

### WARNING



Serious injury or death may occur from contact with electricity.

- Do not direct spray on or into electrical installations of any kind! This includes electrical outlets, light bulbs, fuse boxes, transformers, and the unit itself.
- Do not allow metal components of the pressure washer to come in contact with live electrical components.

### WARNING



Serious injury may occur from touching the gasoline engine, muffler, or heat exchanger. These areas can remain hot for some time after the pressure washer is shutdown.

- Never allow any part of your body to contact the gasoline engine, muffler, or heat exchanger.

### WARNING



Serious injury may occur from a pressure washer malfunction or exploding accessories if incorrect system components, attachments, or accessories are used. Serious injury or death may occur if attempting to start the pressure washer when the pumping system is frozen.

- Never make adjustments to the factory set pressures.
- Never exceed manufacturers maximum allowable pressure rating of attachments.
- Do not allow any hoses to make contact with heat exchanger to prevent the possibility of bursting. Avoid dragging the hoses over abrasive surfaces such as cement.
- Use only manufacturer recommended repair parts for your pressure washer.
- In freezing temperatures, the unit must always be warm enough to ensure there is no ice formation in the pump. Do not start the pressure washer if it has been transported in an open or under heated vehicle without first allowing the pump to thaw.

### WARNING



Serious injury may occur to the operator from moving parts on the pressure washer.

- Before making any adjustments, be certain the engine is turned off and the ignition cable(s) is removed from the spark plug(s). Turning the machinery over by hand during adjustment or cleaning might start the engine and machinery with it.
- Do not operate the unit without all protective covers in place.

### WARNING

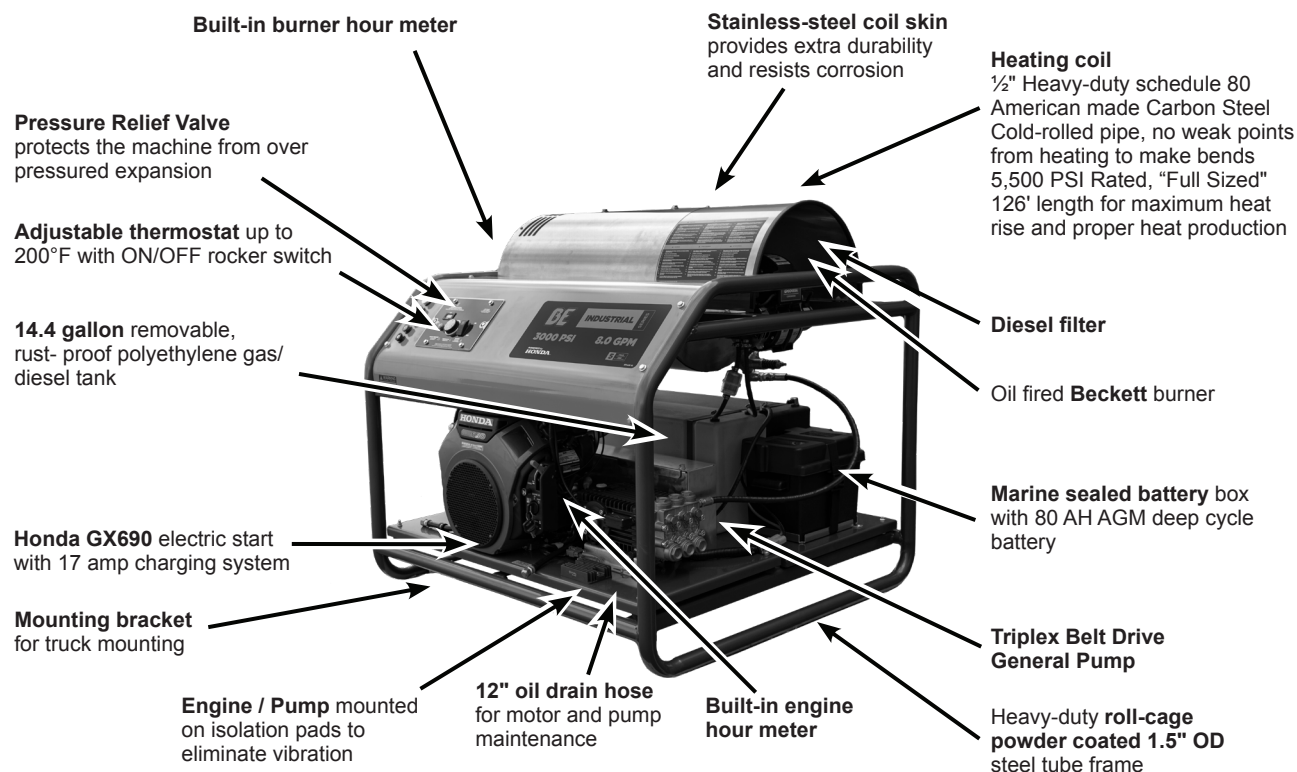


Serious injury or death may occur from detergents contacting the skin. Serious injury can occur from loose debris being propelled at a high speed from the spray gun. Injury may occur if the operator loses their balance caused by the thrust of water traveling through the spray nozzle.

- Never use any solvents or highly corrosive detergents or acid type cleaners with this pressure washer.
- Protective equipment such as rubber gloves and respirators are advisable, especially when using cleaning detergents.
- Keep all detergents out of the reach of children!
- Always wear protective goggles when operating the unit to shield the eyes from flying debris and detergents.
- Do not direct spray toward fragile materials such as glass.
- Stay alert: watch what you are doing. Do not operate the unit when fatigued or under the influence of alcohol or drugs.
- Never squeeze the trigger unless securely braced.
- Do not overreach or stand on unstable support.
- Wet surfaces can be slippery. Wear protective foot gear and keep good footing/balance at all times.
- Never pull the trigger of the gun while on a ladder, roof, or other unstable surface.
- Always hold on firmly to the gun/lance assembly when starting and operating the unit. Failure to do so can cause the lance to fall and whip dangerously.
- Do not leave pressurized unit unattended. Shut off the pressure washer and release trapped pressure before leaving.
- Do not operate the unit if you see any fuel, oil, or water leaking from the machine. DO NOT resume operation until the unit has been inspected and repaired by a qualified technician.
- Do not transport the unit by pulling on hoses or cords.

# GENERAL INFORMATION

## PRODUCT FEATURES & COMPONENTS



Description	HW3024HG12V	HW3524HG12V
Pressure Rating	3000	3500
GPM	8	5.6
Engine Model	HONDA GX690	HONDA GX690
Displacement	688 CC	688 CC
Voltage	12VDC	12VDC
Amps	17	
Burner Type	ADC Beckett	
Unloader	VRT100	VRT3
Pump Type	GP TSF2021	GP TS2021
Nozzles Included	0°, 15°, 25°, 40°, Soaper	
Hose length	50'	
Start Type	Electric Start	
Gasoline Capacity	54.5 litres (14.4 U.S. gal)	
Diesel Capacity	54.5 litres (14.4 U.S. gal)	
Engine Oil Capacity	2.0 litres (2.1 U.S. qts)	
Weight	444 kg (979 lbs)	
Hose diameter	3/8"	
Hose Material	Rubber / Double Wire Braid	



## WATER SUPPLY

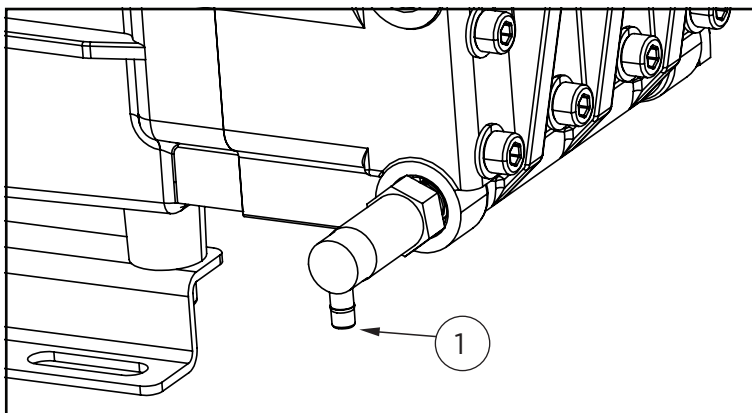
1. Select a water supply hose which is a quality grade of the hose measuring at least 3/4" ID and no longer than 50 feet to the water tank.
2. Attach a hose measuring 1/2" ID and rated for 100PSI minimum to the bypass from the unloader valve to the water supply tank
3. Connect the hose to the inlet of your high pressure pump. Ensure the connection is tight at both ends (at the pump inlet and at the water supply source).
4. Install water inlet filter between pump and tank.
5. **Never allow the unit to operate without the water hose attached and the water supply opened all the way.**

### NOTICE

- If there is a high mineral content in your water, it is highly recommended that a water softener and an additional water strainer be added to the water inlet. This will help prevent the possibility of excessive scale buildup inside the heat exchanger coil.

**Pumps are water cooled.** When the machine is running, ensure the trigger of the gun is pressed to allow a constant flow of fresh water into and out of the pump. **Do not let the machine run for more than 30 seconds without pulling the trigger.**

Most pumps are protected by a **thermal valve (1)**. The thermal valve releases water if a pump starts to run too hot. It will prevent catastrophic heat failure. However, the pump may have suffered damage and need maintenance, repair, or replacement. If it does not reset and continues to leak water, the thermal valve may need to be replaced.





## SET-UP

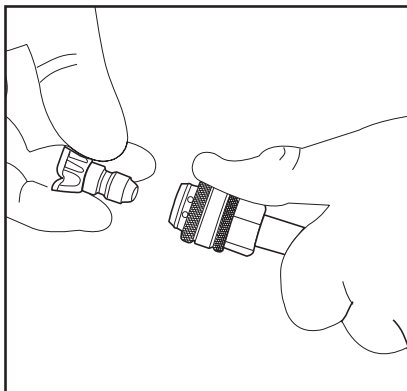


## HOW TO USE SPRAY TIPS

The quick-connect on the nozzle extension allows you to switch between five different quick-connect spray tips. Spray tips can be changed while the pressure washer is running once the spray gun trigger safety lock is engaged. The spray tips vary the spray pattern as shown above.

## FOLLOW THESE INSTRUCTIONS TO CHANGE SPRAY TIPS:

1. Pull back collar on quick-connect coupler and pull the current spray tip off. Store the spray tips in the holder provided on the handle. Storing tips in the designated holder will help prevent any debris from clogging the tip.



2. Select the desired spray tip:
  - For a gentle rinse, select the white 40° spray tip.
  - For light cleaning, select the green 25° spray tip.
  - For high pressure cleaning, select the yellow 15° spray tip.
  - To scour the surface, select the red 0° spray tip.
  - To apply detergent, select the black spray tip. **No other spray tip will draw soap**
3. Pull back on collar, insert spray tip and release collar. Tug on spray tip to ensure it is securely in place.

## USAGE TIPS

- For most effective cleaning, keep spray tip 8 to 24 inches away from cleaning surface.
- If the spray tip gets too close to the surface being cleaned, especially using a high pressure spray tip (red or yellow), it may be damaged. **Do not use the red spray tip on glass.** Doing so could result in broken or cracked glass.

## **PRE-OPERATION SAFETY**

1. This unit should only be placed on a level surface to ensure proper lubrication for the water pump while operating. Placing the unit on a level surface will also ensure that fuel, oil, and other fluids don't spill during operation. NEVER spray water directly on the unit.
2. Do not use unit in an area:
  - A. with insufficient ventilation.
  - B. where there is evidence of oil or fuel leaks.
  - C. where flammable gas vapors may be present.

This unit has multiple ignition sources that could cause a fire or explosion.

3. Do not allow the unit to be exposed to rain, snow, or freezing temperatures. If any part of the unit becomes frozen, excessive pressure may build up in the unit which could cause it to burst. This would result in possible serious injury to the operator or bystanders.
4. Pump oil level should be checked before each use. Make certain the oil is on the "Full" mark on the dipstick or in the center of the oil sight glass. If the level appears to be low, fill with SAE30W non-detergent pump oil.
5. Your pressure washer is equipped with an electric starter. On initial start-up, wear proper eye and skin protection when filling the battery with acid. Fully charge the battery to allow electric starter to function.

## **MANUAL & SAFETY REVIEW**

1. Review "Risk of Explosion or Fire" warnings, before fueling.
2. Locate the Safety Decals on your unit and heed their warnings.
3. Engines: See the included engine Owner's Manual for fuel requirements.
4. Burner Fuel: When filling tank, use No. 1 or No 2 fuel oil/diesel or kerosene.
5. Check the engine oil level before starting the engine.
6. Review the engine manual accompanying this pressure washer for correct engine start-up and maintenance procedures.

## **START-UP PROCEDURE PREPARATION**

Before starting the unit, perform the following procedures:

1. Check the oil level and condition for the pump and engine. We recommend **SAE 10W30** oil for engines and **SAE 30** mineral oil for pumps.
2. Inspect the water inlet strainer. Clean or replace if necessary.
3. Check all hose connections to ensure they are securely tightened.
4. Inspect for system water leaks, oil leaks and fuel leaks. **If a fuel leak is found, do not start the unit.** Be sure that all damaged parts are replaced and mechanical problems are corrected prior to operation of the unit.
5. Inspect high pressure hoses for kinking, cuts, and leaks. **If a cut or leak is found, do not use the hose.** Replace hose before starting unit. Be sure that all damaged parts are replaced and that the mechanical problems are corrected prior to operation of the unit.

## OPERATION

### START-UP (COLD WATER)

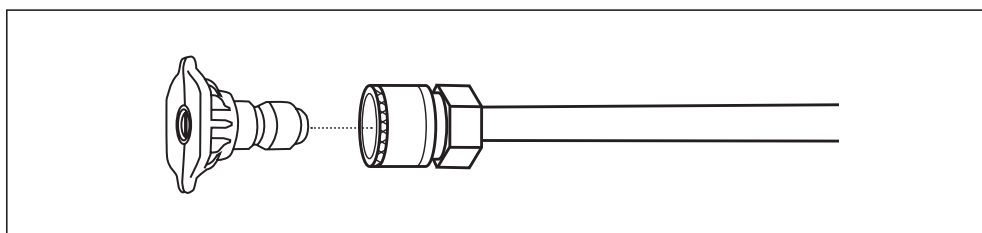
To start your pressure washer for the first time, follow these instructions step-by-step. This starting information also applies if you have let the pressure washer sit idle for at least a day.

1. Make sure the unit is level and placed on solid surface.
2. Connect garden hose to water inlet on pressure washer pump. To do this, thread the end of the hose into the inlet by hand until tight and secure.
3. Attach wand extension to spray gun. Tighten by hand.

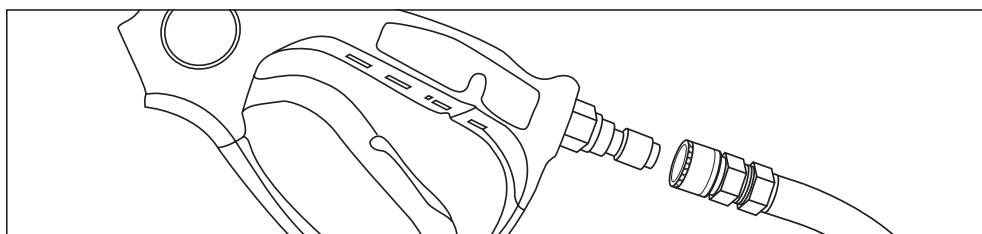
#### NOTICE

DO NOT run the pump without the water supply connected and turned on. Failure to follow this rule will result in damage to the pump. **Damage caused by running the pump without water is not covered by warranty.**

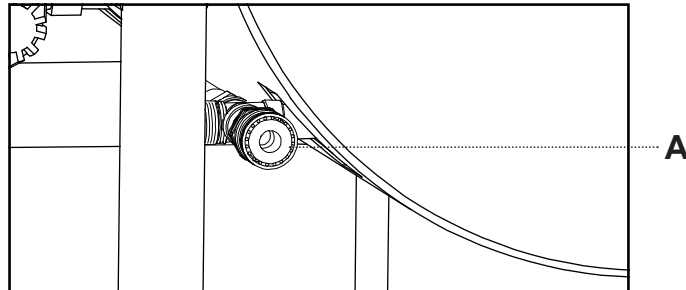
4. Choose desired spray tip, pull back nozzle extension collar, insert spray tip and release collar. Tug on spray tip to make sure it is securely in place. See **Spray Tips** on page 9 for more information.



5. Pull down on the collar of the quick-connect coupler, slide onto the gun connector and let go of collar. Pull on hose to ensure the connection is tight.



6. Attach the other end of the high pressure hose to high pressure outlet ("A" on diagram below) on pump. Pull down on collar of quick-connect, slide onto pump and let go of collar. Note that some pumps require the hose to be threaded on. Tug on the hose to ensure connection is secure.



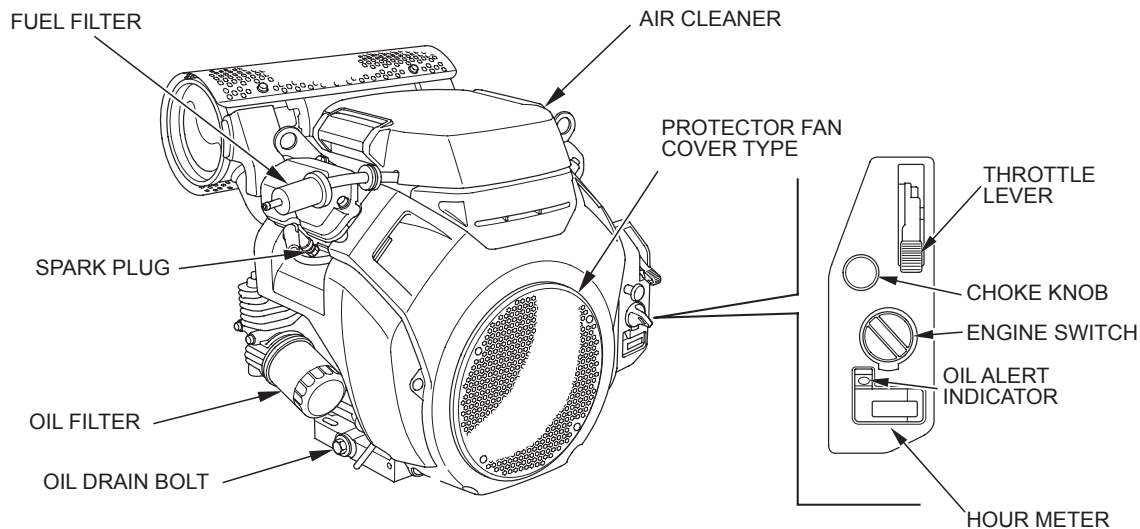
**\*Pump Uses SAE30 Non-Detergent Mineral Oil**

7. Turn water supply on if you have not already done so. Point the gun in a safe direction and squeeze the trigger to purge the pump of air and debris. Do this until water flow is flowing at a steady rate. Continue to hold trigger of gun down while starting the machine to ensure there is no pressure build-up.
8. Take a final look at all connections to make sure there are no leaks or loose connections. If there are any leaks in hoses, they must be replaced.

**IMPORTANT:** DO NOT siphon standing water for the water supply.  
Make sure burner switch is OFF

9. To start the machine, locate the electric ignition switch on the right side of the engine. Insert the key and turn it to the "ON" position until the unit starts. Do not hold the switch to the "ON" position for more than 5 seconds as this can cause damage to the engine. Check to ensure fuel valve is in the ON position and if starting cold, move the choke lever to the "CLOSED" position. Reference the component diagram below for the location of these parts.

**Remember to gradually move the choke lever back to the "open" position once the engine is running.**



**\*Engine Uses SAE 10W30 Oil**

## OPERATION

### HOT WATER OPERATION

Now that the unit is running, it is operating as a cold water pressure washer.

**When you wish to switch to hot water, turn the burner switch to the "ON" position.**

#### NOTICE

Upon initial start-up, water will begin heating up in approximately 20 seconds. It will reach maximum temperature within 2-1/2 minutes providing that the trigger is continuously pressed down. The burner will not fire when the trigger is released.

#### ⚠ WARNING

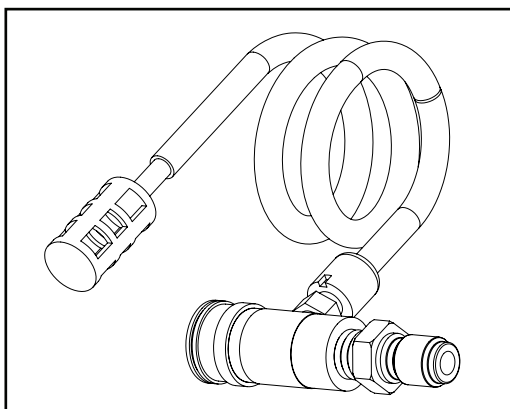
The temperature of the water can become extremely hot during operation.  
Use caution when operating the spray gun.

### APPLYING DETERGENT

#### NOTICE

This feature is designed for use with mild detergents only. Since the cleaning solution travels through the heat exchanger coil, DO NOT use corrosives as they will cause extensive damage as well as pose a considerable safety hazard.

1. Prepare detergent solution according to label directions. Never pump acids, alkaline, abrasive fluids or solvents through the unit. Due to the unknown and often corrosive characteristics of many detergents commonly used in the pressure washer cleaning industry, it is recommended to use only mild detergents with this unit.
2. Fully immerse the detergent strainer into the detergent solution.
3. To apply solution, install the black soap nozzle to the tip of the spray gun, unlock the gun, and squeeze the trigger. After a few moments, a detergent/water mixture will exit the nozzle. Start spraying the lower portion of the surface being cleaned and move up, using long overlapping strokes. Applying from the bottom up helps avoid streaking. Allow everything to soak briefly.
4. Avoid working on hot surfaces or in direct sunlight to minimize the chances of the detergent drying, which may result in damaged surfaces. Be certain to rinse a small section at a time.
5. To rinse, lock the trigger gun in the "OFF" position. From here, securely place the white or green spray tip in the end of the spray gun. Unlock the trigger and spray. It will take about 30 seconds to purge all detergent from the line. For best rinsing results, start at the top and work down.
6. Siphon a gallon of water through the low pressure detergent injection system after each use. This prevents the possibility of corrosion or detergent residue causing mechanical problems during the next use.



## SHUTTING THE UNIT DOWN


1. Move the burner switch to the "OFF" position.
2. Squeeze the trigger and discharge the water for three minutes to cool the heat exchanger and high pressure hose. Insufficient cool-down periods for the high pressure hose will cause excessive wear and eventual rupture of the hose.
3. Do not close the choke to stop the engine. Backfire or engine damage may occur.
4. Move the engine key switch to the OFF position.
5. Turn off the water supply and pull the trigger of the gun to relieve trapped pressure.

Disconnect and drain the high pressure hose, gun, and lance. Wipe the unit clean and store in a non-freezing environment.

## STORAGE AND WINTERIZING

If you do not plan to use the pressure washer for more than 30 days, you must prepare the engine and pump for long term storage. See the engine user manual for specific instructions regarding this.

When storing the unit for winter, it is important to ensure it is stored in the right environment. Ensure the storage area stays above freezing during cold weather, and try to limit the amount of dust gathered on the unit via a cover.

⚠ WARNING	
	Storage covers can be flammable.
<ul style="list-style-type: none"> <li>• DO NOT place a storage cover over a hot pressure washer.</li> <li>• Let equipment cool for at least 30 minutes before placing the cover on the equipment.</li> </ul>	

You will need to ensure that the fuel is drained from the engine prior to storage. For the steps required to do this, see the engine user manual.

Once the unit has been stored and the gasoline has been drained, the last thing to do is to winterize your pump. This can be done in one of two ways:

- BE **"Pump Saver"** Solution (P/N: 85.490.046). This is an anti-freeze solution that is used before storing the unit. It coats to inside of the pump to ensure that any residual water doesn't freeze. To use BE Pump Saver, follow the instructions written on the bottle. Water freezing in the pump will damage seals and other internal parts. **Freezing damage is not covered by warranty.**

⚠ CAUTION
Be certain the hoses and spray gun are not attached to the pump during application of pump saver or use of the blowout tool. Having a hose attached greatly reduces the amount of water/debris removed from the pump and coil.

NOTICE
You must protect your unit from freezing temperatures.
<ol style="list-style-type: none"> <li>1. Failure to do so will permanently damage your pump and render your unit inoperable.</li> <li>2. Freezing damage is not covered under warranty.</li> </ol>

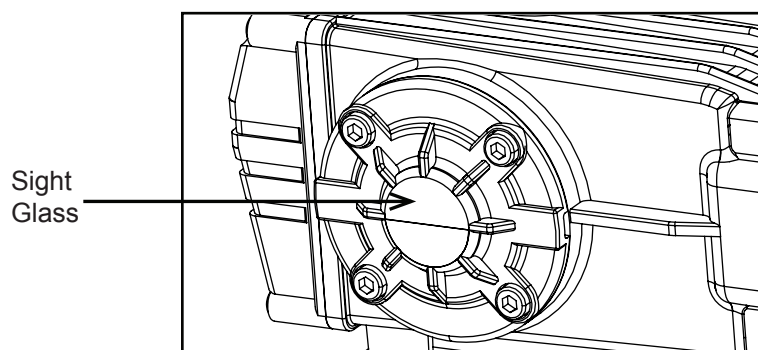
## MAINTENANCE

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### SPECIFIC MAINTENANCE

**ENGINE:** The engine instructions that accompany your unit detail specific procedures for maintenance of the engine. Following the engine manufacturer's recommendations will extend the engine's life and ensure the best possible performance.

**PUMP:** Change the pump oil after the first 50 hours of operation. After the initial change, every 3 months or 250 hour intervals are recommended. If oil appears dirty or milky, changes may be required in greater frequency. **Use SAE 30 non-detergent pump oil** and fill only to the center of the oil sight glass. **DO NOT** overfill.



**NOZZLE:** Water flow through the spray nozzle will erode the orifice over time, making it larger. This will result in a reduction of pressure. Nozzles should be replaced whenever pressure is less than 85% of the maximum. The frequency of replacement will depend upon such variables as mineral content in the water and number of hours the nozzle is used. Every 3-6 months tends to be a standard interval for replacement.



## MAINTENANCE SCHEDULE

PROCEDURE		DAILY	3 MONTHS	6 MONTHS	9 MONTHS	12 MONTHS
Check engine oil level		X				
Change engine oil	*****		X	X	X	X
Check water pump oil level		X				
Change water pump oil	**		X	X	X	X
Oil leak inspection		X				
Fuel leak inspection		X				
Water leak inspection		X				
Hose inspection		X				
Water inlet screen inspection		X				
Check fuel filter			X	X	X	X
Replace fuel filter				X		
Inspect belts			X	X	X	X
Replace high pressure nozzle	***		X	X	X	X
Inspect fuel pump filter	*					X
Replace fuel nozzle	*					X
Check burner air adjustment			X	X	X	X
Check burner electrodes	*					X
Test water pressure	*		X	X	X	X
Test fuel pressure	*		X	X	X	X
Test water temperature	*		X	X	X	X
Descale coil	****					X

\* Must be performed by an authorized service technician.

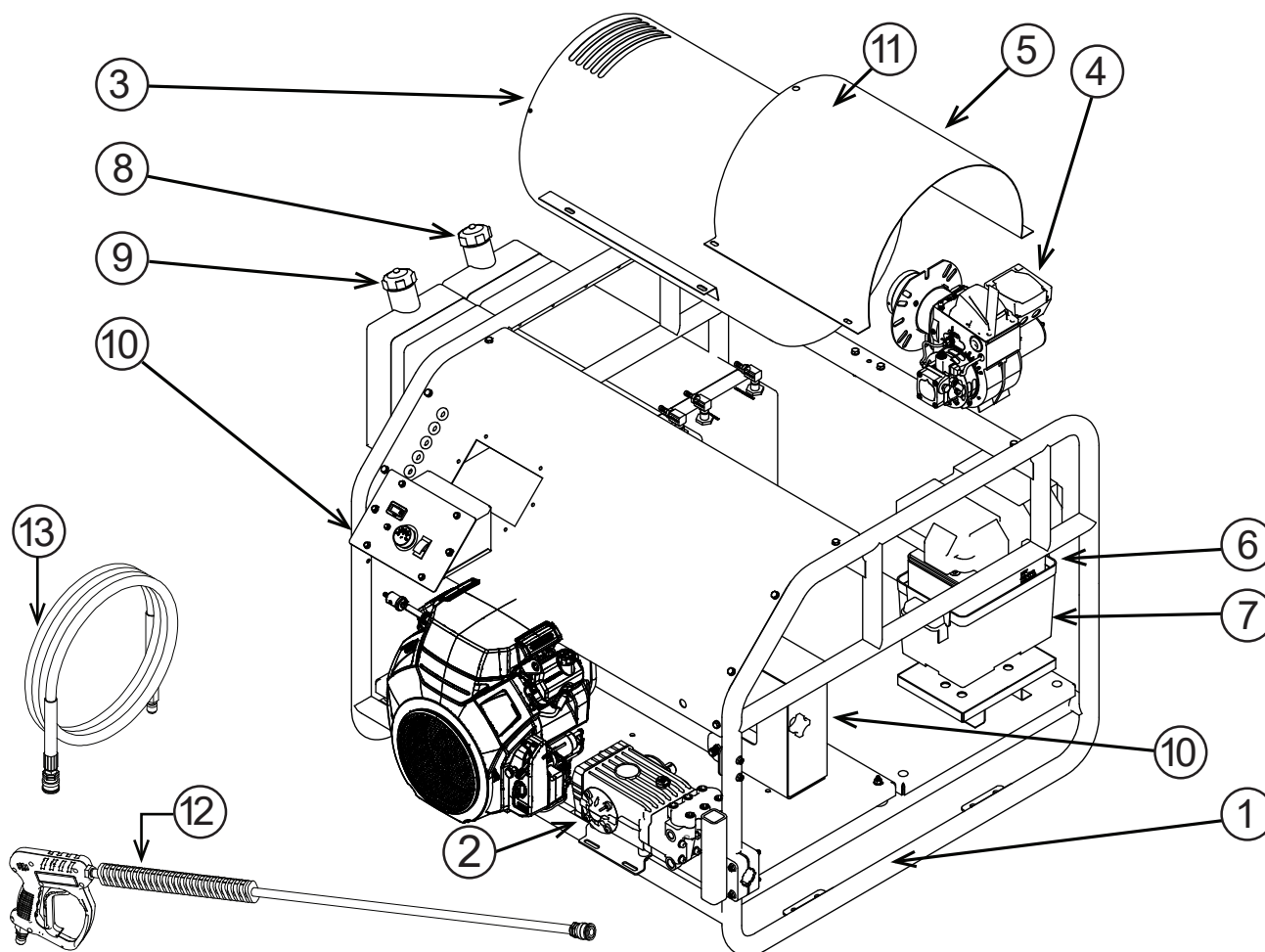
\*\* The pump oil must be changed after the first 50 hours of operation and then every 250 hours or 3 months, whichever comes first.

\*\*\* High pressure nozzle should be replaced whenever pressure drops to less than 85%.

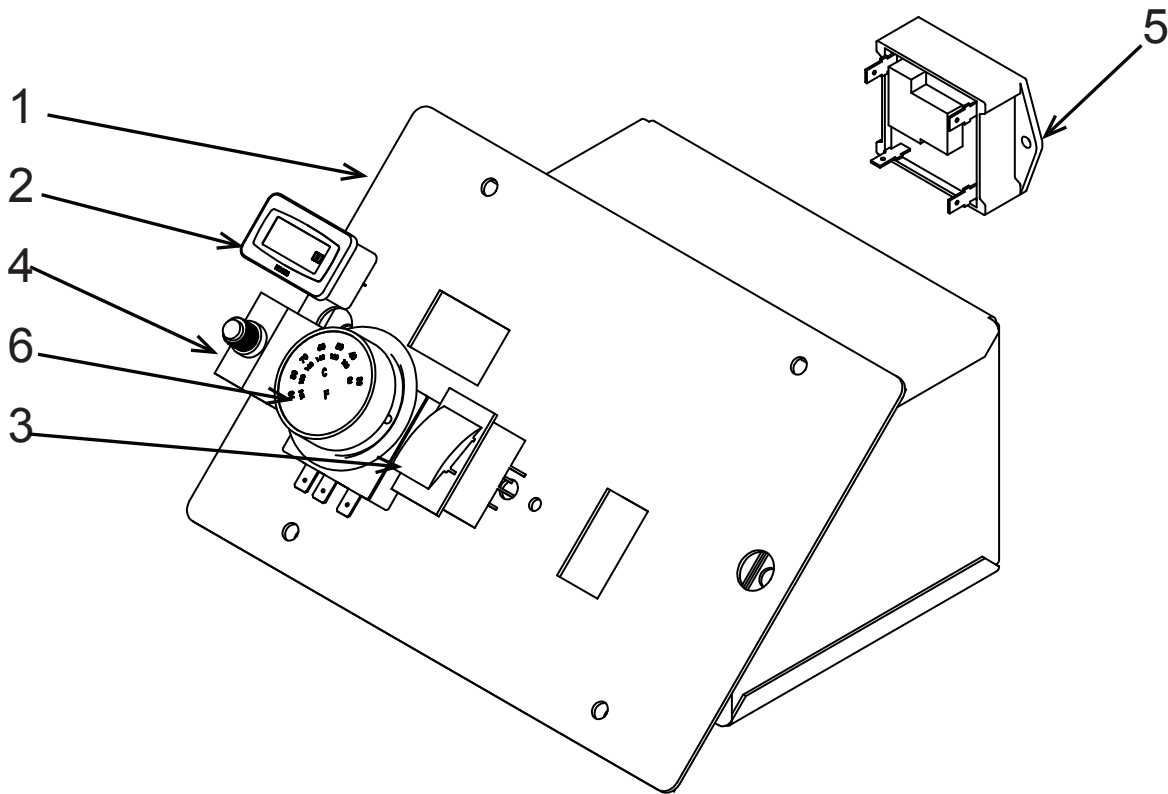
\*\*\*\* Scale build-up will vary with mineral content in the water and amount of usage. Descaling can range from weekly to yearly maintenance.

\*\*\*\*\* The engine oil must be changed after the first 8 hours of operation and then every 50 hours or 3 months, whichever comes first.

# UNIT BREAKDOWN



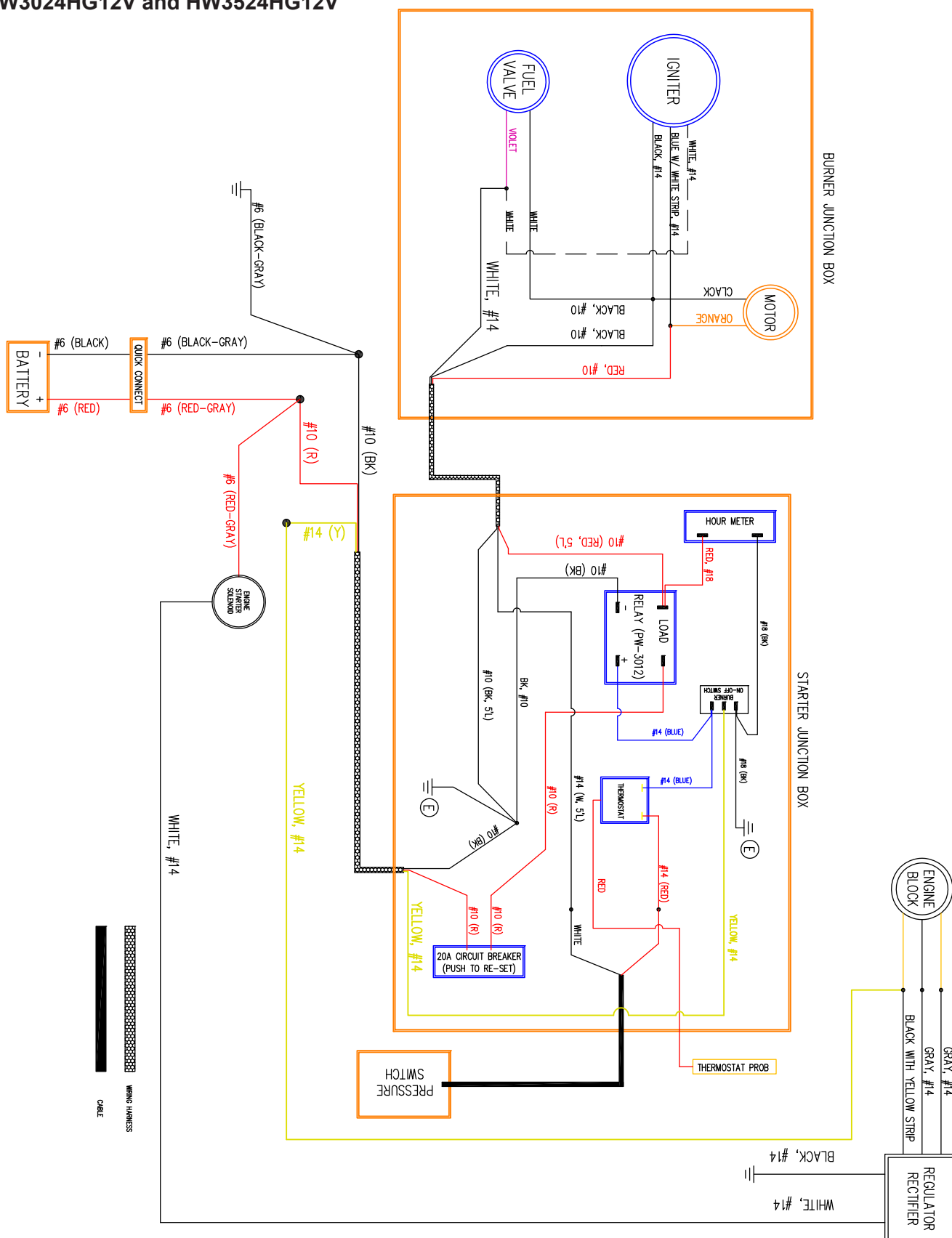
ITEM #.	PART #	DESCRIPTION	QTY.	PART #	DESCRIPTION	QTY.
1	85.600.220	FRAME ASSEMBLY	1	AL607	UNLOADER, VRT3, 5.6GPM (3524HG12V)	1
2	85.130.071B	GENERAL PUMP TSF2021 8GPM (3024HG12V)	1	85.300.033	UNLOADER, VRT100, 8.0GPM (3024HG12V)	1
	85.130.026B	GENERAL PUMP TS2021 5.6GPM (3524HG12V)	1	85.300.082	PRESSURE SWITCH	1
3	59.000.200	COIL, HOT WASH 5.6GPM (3524HG12V)	1	85.300.088	EXPANSION VALVE	1
	59.000.208	COIL, HOT WASH 8GPM (3024HG12V)	1	47.002.045	BELTS 3VX450	4
4	59.110.016	BURNER / (12V ADC SERIES)	1	59.000.104	FUEL FILTER	2
5	59.000.201	BURNER HOOD; HOT WASH	1	85.550.063	ENGINE AIR FILTER	1
6	85.603.101	BATTERY BOX FOR SKID HW	1	85.550.064	ENGINE OIL FILTER	1
7	85.603.100	BATTERY, AGM, 12V, 80AH	1	85.550.065	ENGINE DIP STICK	1
8	85.601.040	14.4 GALLONS DIESEL FUEL TANK	1	85.550.066	ENGINE SPARK PLUG	2
9	85.601.041	14.4 GASOLINE FUEL TANK	1	85.550.008L	MUFFLER	1
10	85.602.222	BELT GUARD	1			
11	59.000.008	INSULATION	1			
12	85.205.066H	GUN	1			
13	85.238.251	HOSE	1			



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	85.600.231	BURNER CONTROL BOX	1
2	59.000.206	HOUR METER	1
3	59.000.103	TOGGLE ON/OFF SWITCH FOR 12V BURNER (ADC SERIES)	1
3	59.000.205	TOGGLE ON/OFF SWITCH FOR 120V BURNER (AFG SERIES)	1
4	85.504.026	PUSH TO RESET 25A CIRCUIT BREAKER (12V)	1
5	59.000.102	LOW VOLTAGE RELAY (12V)	1
6	85.400.071	THERMOSTAT	1

## CONTROL PANEL WIRE DIAGRAM

## HW3024HG12V and HW3524HG12V



## ADC Beckett Burner

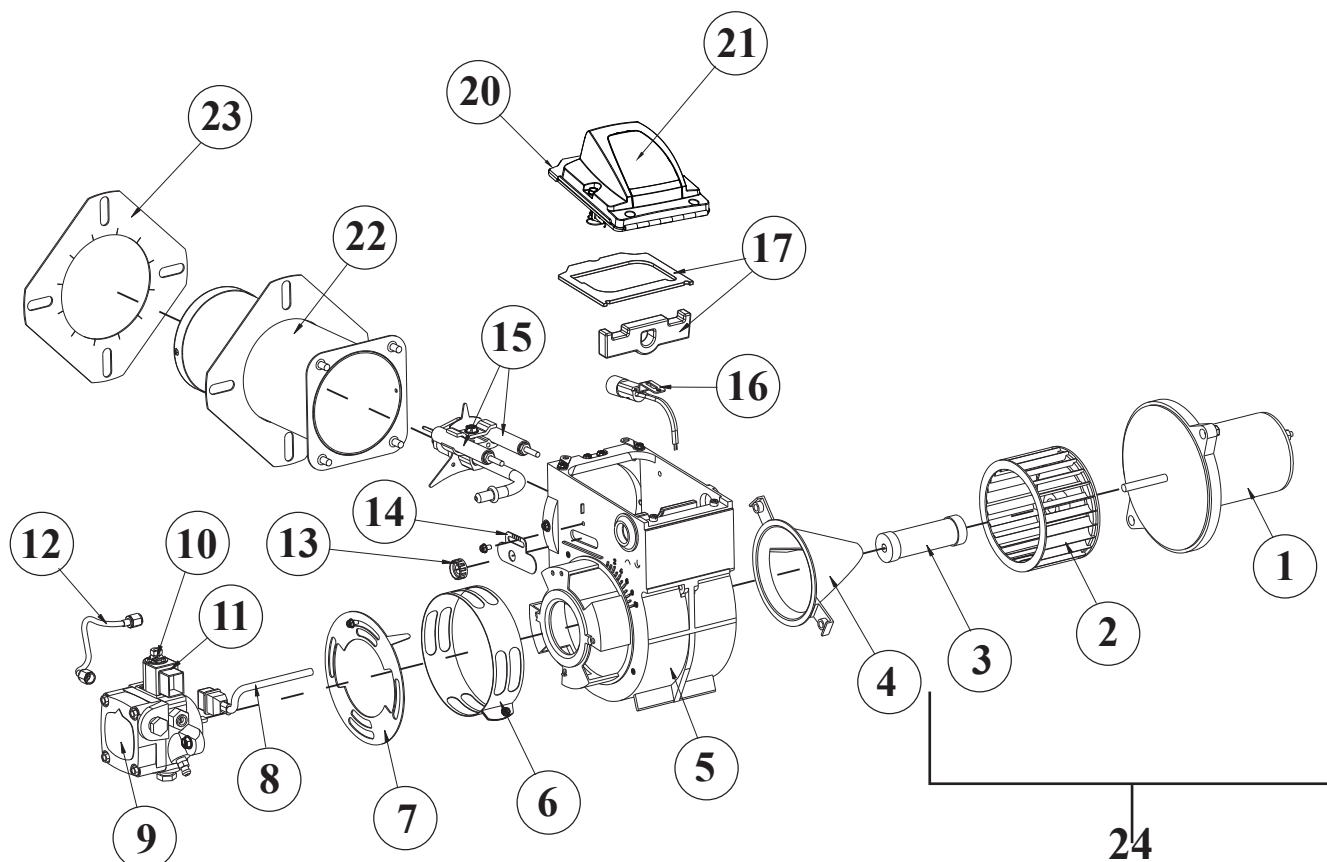


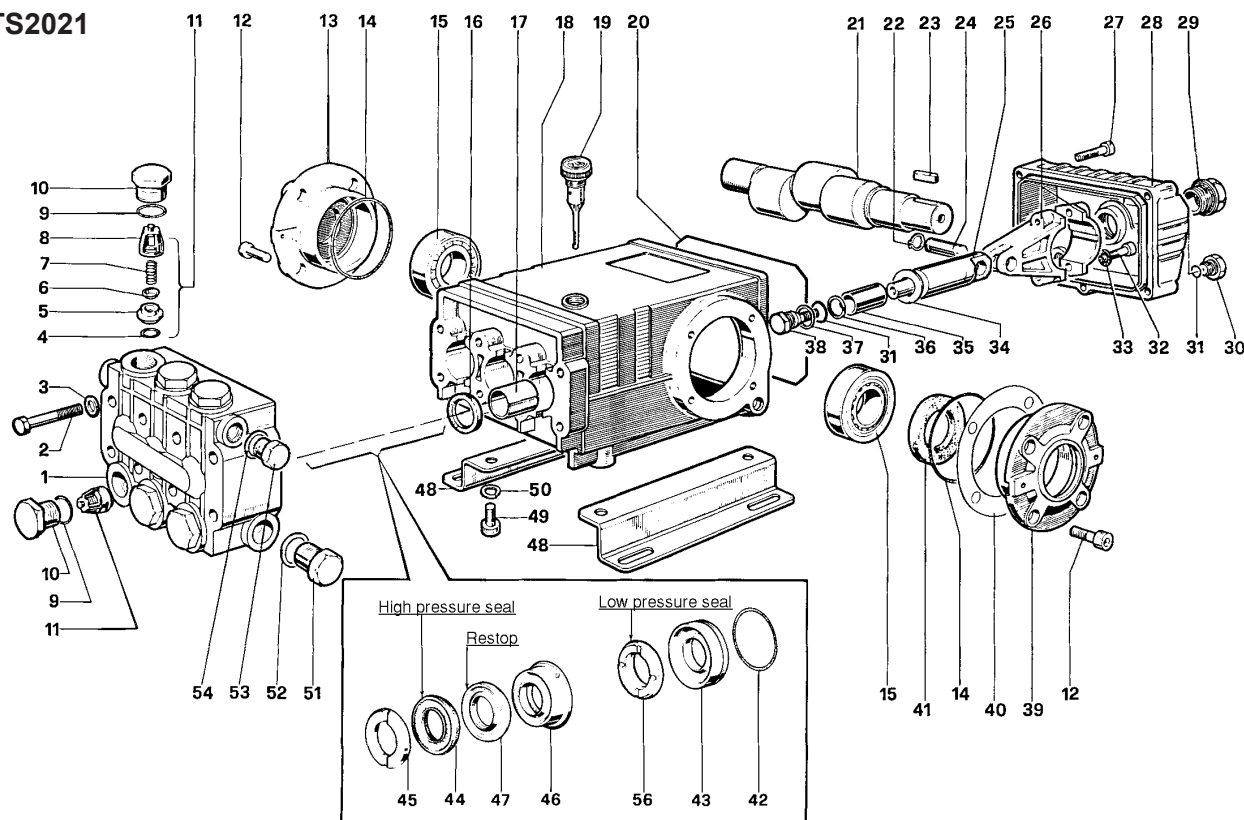
Illustration #	Description
1	DC Motor
2	Blower Wheel
3	Coupling
4	Air Guide
5	Burner Housing - Black
6	Air Band
7	Air Shutter - 4 Slot Air Shutter - 8 Slot
8	Cord set
9	Pump (CleanCut)
10	Valve Stem
11	12 Volt Coil
12	8" Copper Tubing
13	Escutcheon Plate Spline Nut
14	Escutcheon Plate
15	Electrode Kit over 3-5/8"
16	Cad Cell Detector
17	Igniter Gasket Kit

Illustration #	Description
20	Igniter Assy with baseplate
21	Igniter only
22	Air Tube Ass'y
23	Flange Mounting Gasket
24	Motor Kit with Blower Wheel and Coupling
Not Shown	Tune-up Kit for 30 & 35 Air Tube Lengths

Illustration #	PART #	Description
9	59.110.000	Fuel Pump
8,10,11	59.110.001	Fuel Solenoid
15	59.110.002	Electrode Assy
21	59.110.003	Igniter
1	59.110.004	Blower Motor
3	59.110.005	Shaft Coupling

# PUMP BREAKDOWN AND PARTS LIST

## GP TS2021



## PARTS LIST

ITEM	PART NO.	DESCRIPTION	KIT NO.	QTY.	ITEM	PART NO.	DESCRIPTION	KIT NO.	QTY.	ITEM	PART NO.	DESCRIPTION	KIT NO.	QTY.
1	47120841	Manifold		1	19	98210600	Oil Dip Stick		1	37	96728000	Washer	6	3
	47120941	Manifold, Nickel-Plated (TS2021-N)			20	90392200	O-Ring, Cover		1	38	47219566	Screw, Plunger	6	3
2	99320600	Screw, M8 x 70		8	21	47021735	Crankshaft		1	39	47150022	Cover, Crankcase		1
3	96702000	Washer, M8.4		8	22	90055700	Ring, Snap		6	40	97567800	Shim		2
4	90384100	O-Ring, .674 x .103	1	6	23	91489000	Key		1	41	90164800	Seal, Oil	3	1
5	36200366	Seat, Valve	1	6	24	97738000	Pin, Wrist		3	42	90361600	O-Ring, 1.364 x .070	10, 28	3
6	36200176	Plate, Valve	1	6	25	47050554	Guide, Plunger		3	43	47080570	Retainer, Packing	10, 28	3
7	94737600	Spring	1	6	26	47030001	Rod, Connecting		3	44	90270500	Packing	28, 69	3
8	36200251	Guide, Valve	1	6	27	99191200	Screw, M6 x 30		5	45	47100051	Ring, Head, M20	7, 28	3
9	90384700	O-Ring, .797 x .103	4, 5	6		99183700	Screw, M6 x 14 (T1011)		5	46	47216970	Intermed. Ring	28, 71	3
10	98222000	Cap	4	6	28	47160122	Cover, Crankcase		1	47	90270400	Restop Ring	28, 69, 71	3
	98222200	Cap, Ni-Plated (TS2021-N)	5			47160022	Cover, Crankcase (T1011)			48	47200074	Pump Feet		2
11	36703201	Valve Assembly	1	6	29	97596800	Oil Indicator		1	49	99364400	Screw, M10 x 18		4
12	99303900	Screw, M8 x 16		8	30	98204100	Cap		1	50	96710600	Washer, M10.2		4
13	47150122	Cover, Crankcase	1		31	90358500	O-Ring, .426 x .070	6	4	51	98217600	Cap		1
14	90391300	O-Ring, 2.675 x .103		2	32	99309900	Screw, M8 x 35		6	52	96751400	Washer, M21.5		1
15	640047	Bearing, Roller		2	33	96701400	Washer, M8.4		6	53	98210000	Cap		1
16	90162500	Seal, Oil	2	3	34	96728600	Washer, M14		6	54	96738000	Washer, M17.5		1
17	90912600	Bushing		3	35	47040409	Plunger, (20 mm)		3	56	90271000	Seal, Low Press., 20mm	28,69	3
18	47010522	Crankcase		1	36	90506700	Ring, Back-up		6					

## REPAIR KITS

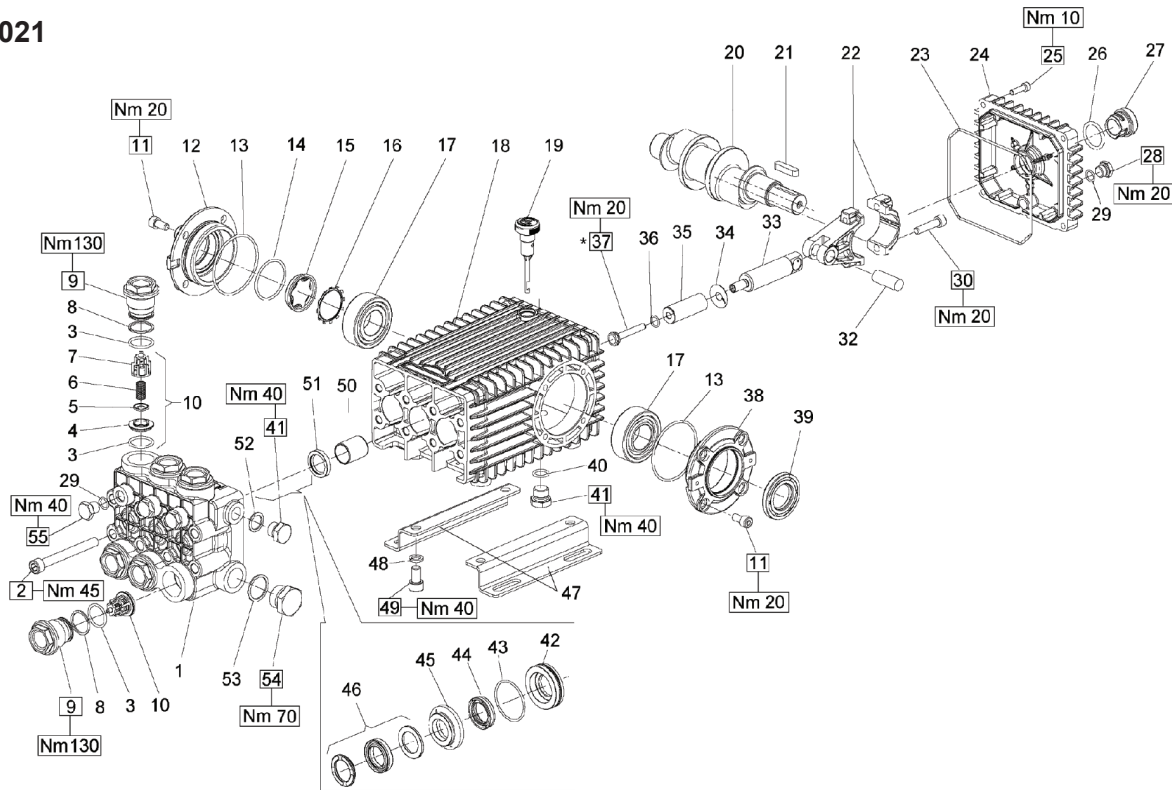
KIT NO.	1	2	3	4	5	6	7	10	28	69	71
ITEM NO.s INCLUDED IN KIT	4, 5 6, 7, 8 (11)	16	41	9, 10	9, 10	31, 34, 36, 37, 38	45	42, 43	42, 43, 44, 45, 46, 47, 56	44, 47, 56	46, 47
NUMBER OF ASSEMBLIES IN KIT	6	3	2	6	6	3	6	3	1	3	3
NUMBER OF CYLINDERS KIT WILL SERVICE	3	3	-	3	3	3	3	3	1	3	3

## TORQUE SPECS\*

Position	Ft.-lbs.
2	22.1
10	73.7
12	14.7
27	7.3
29	13.2
30	14.7
32	14.7
38	14.7
49	29.4
51	29.4
53	29.4

\*Decrease torque by 20% if threads are lubricated.

GP TSF2021



## PARTS LIST

POS.	PART NO.	DESCRIPTION	QTY.	POS.	PART NO.	DESCRIPTION	QTY.	POS.	PART NO.	DESCRIPTION	QTY.
1	66124541	Manifold, Ø 18mm	1	22	66030001	Connecting Rod, Complete	3	43	90361600	O-ring, Ø 34.65x1.78	3
	66120041	Manifold, Ø 20mm	1	23	90392200	O-ring, Ø133.02x2.62	1	44	90265200	LP Seal, Ø 18mm	3
	66120141	Manifold, Ø 22 mm	1	24	66160022	Rear Cover	1		90269000	LP Seal, Ø 20mm	3
	66120241	Manifold, Ø 24mm	1	25	99188400	Screw, M6x20	4		90271500	LP Seal, Ø 22mm	3
	66124641	Manifold, Ø 28mm	1	26	90405100	O-ring, 26.58x3.53	1		90273800	LP Seal, Ø 24mm	3
2	99380100	Headbolt M10 x 90	8	27	63210051	Oil Level Indicator	1		90275300	LP Seal, Ø 28mm	3
3	90385700	O-ring, Ø 23.81x2.62	12	28	98204100	Plug, G1/4"x9	1	45	66216370	Intermediate Ring, Ø 18mm	3
4	36203366	Valve Seat	6	29	701013	O-ring, Ø .426x.070	4		66216070	Intermediate Ring, Ø 20mm	3
5	36203476	Valve Poppet	6	30	99309900	Screw, M8x35	6		66216170	Intermediate Ring, Ø 22mm	3
6	94738800	Valve Spring Ø10x18x18.5	6	32	97740500	Wrist Pin, 14x39	3		66216470	Intermediate Ring, Ø 24mm	3
7	36203551	Valve Guide	6	33	66050064	Piston Guide	3		66220070	Intermediate Ring, Ø 28mm	3
8	90516500	Anti-ext ring Ø24.7x29x1.5	6	34	96710100	Flinger Washer	3	46	90265500	HP Seal, Ø 18mm	3
9	66130041	Plug, M32x1.5x29.5	6	35	66040309	Plunger, Ø 18mm	3		90269200	HP Seal, Ø 20mm	3
10	36712701	Valve Assy., Complete	6		66040009	Plunger, Ø 20mm	3		90271700	HP Seal, Ø 22mm	3
11	99303900	Screw M8 x 16	8		66040109	Plunger, Ø 22 mm	3		90274100	HP Seal, Ø 24mm	3
12	47151222	Cover	1		66040409	Plunger, Ø 24mm	3		90275400	HP Seal, Ø 28mm	3
13	90391300	O-ring, Ø67.95x2.62	2		66041009	Plunger, Ø 28mm	3	47	47200074	Pump Rail	2
14	90387700	O-ring, Ø 39.34x2.62	1	36	90358400	O-ring, Ø 10.82x1.78	3	48	96710600	Washer M10	4
15	70211801	Oil Sight Glass	1	37	66219566	Plunger Bolt	3	49	99364400	Screw M10 x 18	4
16	90075600	Retainer Clip	1	38	47151022	Side Cover, PTO	1	50	90912600	Guide Bushing	3
17	91838000	Bearing	2	39	90164800	Seal, Shaft	1	51	90162500	Seal, Plunger Rod	3
18	66010022	Crankcase	1	40	90383300	O-ring, Ø 13.95x2.62	1	52	96738000	Gasket, Aluminum 3/8"	1
19	98210600	Dipstick, vented	1	41	98210000	Plug 3/8 x 13	2	53	96770000	Washer	1
20	66021035	Crankshaft, 19mm Stroke, Dual Shaft	1	42	66080370	Seal Retainer, Ø 18mm	3	54	98226800	Plug, G3/4"x16	1
	66020035	Crankshaft, 19mm Stroke	1		66080070	Seal Retainer, Ø 20mm	3	55	98204300	Plug 1/4" x 13	3
	66020435	Crankshaft, 21mm Stroke	1		66080170	Seal Retainer, Ø 22mm	3				
21	91489200	Key, 9x7x35	1		66080470	Seal Retainer, Ø 24mm	3				
					66082570	Seal Retainer, Ø 28mm	3				

## REPAIR KITS

KIT NO.	K02	K03	K169	K180 (18mm)	K176 (18mm)	K170 (20mm)	K171 (20mm)	K172 (22mm)	K173 (22mm)	K181 (24 mm)	K182 (24mm)	K248 (28mm)	K247 (28mm)
POS. NO's INCLUDED IN KIT	51	39	3, 4, 5, 6, (10)	44, 46	42, 43, 44, 45, 46	44, 46	42, 43, 44, 45, 46	44, 46	42, 43, 44, 45, 46	44, 46	42, 43, 44, 45, 46	44, 46	42, 43, 44, 45, 46
NUMBER OF ASSEMBLIES IN KIT	3	1	6	3	1	3	1	3	1	3	1	3	1
NUMBER OF CYLINDERS KIT WILL SERVICE	3	N/A	3	3	1	3	1	3	1	3	1	3	1



# TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	FIX
Engine will not start	Various engine problems	Refer to the Engine Manual accompanying your unit.
	Unit components are frozen.	Allow to thaw. If any part of the unit becomes frozen; excessive pressure may build up in the unit. This can cause the unit to burst, resulting in possible serious injury to the operator or bystanders.
No discharge at nozzle when trigger mechanism is squeezed.	Inadequate water supply.	Ensure hose is 3/4" diameter and incoming water supply is turned on. Ensure the water is turned all the way on.
Low or fluctuating pressure.	Kink in water inlet hose.	Remove kink.
	Water inlet screen obstructed.	Remove screen, clean, or replace.
	Pump sucking air. (Prime eliminated)	Tighten all water intake connections Eliminate leaks in intake line.
	Incorrect nozzle installed on gun.	Insert high pressure nozzle.
	Obstructed or worn spray nozzle.	Remove, clean or replace.
	Damaged or obstructed valve assy. on pump.	Remove, clean or replace.
	Pump packings worn.	Replace packings.
Water is leaking at safety relief valve.	Unloader/bypass valve not operating correctly.	Repair or replace.
	Unloader malfunction.	Detect and correct unloader problem.
	Pressure switch malfunction.	Detect and correct pressure switch problem.
Oil appears milky or foamy.	Water in oil.	Change pump oil. Fill to proper level.
Oil leaking from unit.	Worn seals or o-rings.	Consult customer service.

Detergent will not siphon	Detergent strainer is not completely submerged in detergent solution.	Check, submerge if necessary.
	Detergent strainer obstructed.	Inspect, clean, or replace.
	Detergent hose cut, obstructed or kinked.	Inspect, clean, or replace.
	Detergent adjusting knob turned to closed position.	Open adjusting knob. Refer to "Cleaning with Detergents".
	Nozzle assembly is plugged.	Clean or replace.
Water flows back into detergent container.	Ball & spring in Venturi reversed, missing, or corroded.	Remove, clean, or replace.
Water flows from the nozzle when the trigger gun is locked in the "OFF" position	Trigger gun is malfunctioning.	Repair or replace.
Blower motor will not run. (Burner will not ignite without blower running)	Burner/Blower motor malfunction.	Repair or replace.
	Belt broken or slipping on generator.	Adjust or replace as necessary.

Blower runs, but burner will not ignite.	Switch is not in "Burner" position.	Check switch position.
	Thermostat knob is OFF.	Check thermostat knob position.
	Out of fuel.	Refuel.
	Gun trigger is closed/not pressed.	Press down on gun trigger.
	Detergent valve is open, but detergent hose is not completely submerged in solution. (This causes safety devices to shut down burner.)	Close valve, or completely submerge clear vinyl hose into detergent solution.
	Pressure switch override.	Pressure should be over 375 PSI
	No voltage.	Consult Service Department.
	Fuel pump sucking air.	Tighten all fuel intake connections. Eliminate leaks in intake line.
	Poor or improper fuel supply.	Check fuel to ensure it is correct. Drain tank and filter if necessary and refill with proper fuel.
Blower runs, but burner will not ignite.	Dirty or clogged fuel filter or fuel water separator.	Drain or replace as necessary.
	Low fuel pump pressure.	Check fuel pump pressure, adjust or replace as necessary.
	Fuel pump inoperative.	Check pressure, replace if necessary.
	Flexible coupler broken.	Replace.
	Fuel solenoid valve failure.	Replace.
	Dirty or clogged fuel nozzle.	Replace fuel nozzle.
	Improper burner air adjustment.	Adjust.
	Faulty ignition module.	Repair or replace. Consult Customer Service.
	Ignition electrodes damaged or worn.	Adjust or replace electrodes. Consult Customer Service.
Burner runs erratically.	Water in the fuel.	Drain fuel filter/water separator. Drain fuel tank, and replace with clean fuel.
	Dirty fuel filter	Replace filter
	Dirty fuel nozzle.	Replace.
	Improper air adjustment setting.	Adjust.
	Fuel pump malfunctioning.	Replace.
Blower runs, burner ignites but will not heat.	Thermostat knob is OFF.	Check thermostat knob position.
	Detergent valve is open, but detergent hose is not completely submerged in solution. (This causes safety devices to shut down burner.)	Close valve, or completely submerge vinyl hose into detergent solution.
	Poor or improper fuel supply.	Check fuel to ensure it is correct. Drain tank and replace filter if necessary and refill with proper fuel.
	Dirty or clogged fuel filter or fuel water separator.	Drain or replace as necessary.
	Low fuel pump pressure.	Check fuel pump pressure, adjust or replace if needed.
	Dirty or clogged fuel nozzle.	Replace fuel nozzle.
Blower runs, burner ignites but will not heat.	Improper burner air adjustment setting.	Adjust the setting.
	Scale build up in heat exchanger coil.	Consult Customer Service.
Burner discharges white smoke.	Low on fuel.	Refuel. If white smoke persists, consult Customer Service.
	Excessive air supply.	Adjust air flow.
Burner discharges black smoke.	Insufficient air supply.	Adjust to ensure air flow is sufficient.