

\$15.00

OPERATION & MAINTENANCE MANUAL



**IMPORTANT: CAUTION! TO REDUCE RISK OR
INJURY, READ OPERATING INSTRUCTIONS
CAREFULLY BEFORE USING**

ULTIMATE LINE POWER WASHERS

**CN SERIES
CP SERIES
CW SERIES
HP SERIES
HX SERIES
SC SERIES
SS SERIES**

HYDRO  TEK.US
CLEANING EQUIPMENT MFG.
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Certified
To UL-1776
eStandards



HYDRO TWISTER® SURFACE CLEANERS



The ANT3C Contractor Series HYDRO TWISTERS are the proven choice for professional surface cleaning with three options for your cleaning needs. The ANT3C is a 3-in-1 rotary surface cleaner and includes a spot / gum remover and a hydro broom creating an all-in-one portable system. The dual trigger gun control allows you to activate either device simply by pulling the appropriate trigger. By combining three processes into one unit, you will save time and fatigue when cleaning large expanses of concrete, parking lots or other flat surfaces. The secret that makes the Contractor Hydro Twister so effective is the water spray angles and nozzle heights optimizing the unit for maximum cleaning power. Use the water broom function to power away debris and dirt in a 28" wide swath and the job is done.

Advantages...

- Multipurpose: One unit includes a gum & spot remover, water broom and a rotary cleaner to get jobs done faster.
- Stainless Steel Construction: Heavy Duty, lifetime corrosion resistance.
- High Productivity: Cleans up to 15 times faster than an operator with a handheld wand.

Specifications...

Up to 4000 PSI
28" Cleaning Path
Up to 10 GPM (5 GPM Standard)
Temperatures up to 250° F



Integrated water broom and spot remover

The ANT38 HYDRO TWISTER is a unique surface cleaner with a 38" cleaning path. The impressive size and construction allows the operator to maneuver and clean wide areas in one pass. Suitable for use on greasy factory floors, concrete parking lots and drive thru areas, gas stations and garages.

Advantages...

- Stainless steel construction for lifetime corrosion resistance. Saves time, money and fatigue.

Specifications...

Up to 4000 PSI
Up to 5 - 7 GPM
38" Cleaning Path
Temperatures up to 200° F



The Hydro Twister ANT20 and ANT28 are surface cleaners that connect to a pressure washer and uses two nozzles rotating at a high RPM within 1" of the ground. It will clean concrete at up to 15 times the speed of an operator using a wand and with more consistency and less operator fatigue. Simply move the twister over the surface and watch a clean path appear behind the unit.

Advantages...

- Three Stainless Steel Sealed Bearings: Requires no maintenance
- Carbide Seal Design: Offers long life at high temperatures
- All Stainless Steel Construction: Provides lifetime corrosion resistance.

Specifications...

Up to 4000 PSI
Up to 10 GPM (5 GPM Standard)
20" or 28" Cleaning Path
Temperatures up to 250° F



ANT20 has lightweight composite deck

WASH WATER RECYCLE / RECOVERY / FILTRATION

HYDRO LOOP
WASH - CONTAIN - RECYCLE



TRAILERS
200 - 500 Gallon



TANK SKIDS



OTHER ACCESSORIES



HOSE EXTENSIONS



ADJUSTABLE PRESSURE WAND



HOSE REELS



TURBO NOZZLE



SAND BLASTER



CHEMICAL INJECTORS

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INTRODUCTION:

THANK YOU: The employees and management of HYDRO TEK SYSTEMS, INC. thank you for selecting our products. The production and quality assurance personnel have taken the greatest care in the assembly process to ensure that your new Industrial Cleaning Equipment exceeds the standards set by you, the customer, by Hydro Tek engineering and management, and by our safety certification to U.L. 1776.

YOUR RESPONSIBILITY: This operator's manual was compiled for your benefit. By studying and following the safety, installation, operation, maintenance, and troubleshooting information contained within, you can look forward to many years of trouble free service from your equipment. Every person who will operate the equipment must read and follow the safety warning and operating instruction sections of this owner's manual prior to use. You are responsible for operating the product properly and safely. You are also responsible to follow the maintenance schedule on the back page of this manual to keep your warranty active.

FREIGHT DAMAGE: If delivered by trucking company, please inspect for any concealed freight damage and note this on the paperwork from the trucking company before signing. Should you find damage has occurred during shipping, do not return the damaged merchandise to Hydro Tek, but file a claim immediately with the freight carrier involved.

QUESTIONS: Help us provide you with the fastest service. Please locate the enclosed warranty registration card and return it to Hydro Tek to register your machine. Contact your local AUTHORIZED HYDRO TEK SERVICE DEALER that you purchased from or call HYDRO TEK factory and ask for technical services if problems occur. **THERE ARE NO USER SERVICEABLE COMPONENTS ON THIS EQUIPMENT.**

GETTING STARTED: If your dealer has not prepared the machine for startup, you may need to connect the hose to the pressure outlet on the washer and connect the other end of the hose that swivels to the trigger gun inlet and tighten. The water will be removed or anti-freeze solution will be added to the pump and coil. Mobile Wash Skids are engine powered and shipped from the factory with the fuel tanks empty, the battery cables disconnected, the battery dry (if included on engine powered units). Fill the battery to the fill line with electrolyte (available at a local auto parts store), connect the battery cables, and follow the operation instructions for starting. Pressure Steamers are electric powered and will require an appropriate electric outlet or disconnect box and an electric plug that is rated for your machine's voltage and amperage and matches to your electrical socket. Smaller machines are equipped with a ground fault interrupter on the electrical cord and you will need to press the reset button after it is plugged in. (See Operating Instructions section and enclosed page on Installation Guidelines).

NO- NONSENSE GUARANTEE:

Hydro Tek Systems, Inc. (Hydro Tek) promises to repair Ultimate and Proline washers if defective in materials or workmanship for one year from the date of original retail purchase including the costs of PARTS and LABOR, but you must pay transportation costs and travel time.

Items and Conditions Not Covered:

1. Normal wear items such as discharge hose, guns, wands, spray arms, nozzles, quick couplers, o-ring, pump packing, brushes, filters, belts, and tires.
2. Cost of regular maintenance or adjustments or damage from lack of maintenance.
3. Damage due to freezing, abrasive fluids, chemical deterioration, and scale build up.
4. Damage from fluctuation in electrical or water supply.
5. Any product or part which has been altered, modified, over pressurized, misused, or been in an accident.
6. Dealer installation or damage from improper installation of the machine or alteration by a dealer or promise of additional warranty from dealer. The factory warranty is not transferable from the dealer to the retail purchaser on used or rented equipment.
7. Labor is not paid if the dealer that serviced your machine is not an authorized service center.
8. Labor is not paid on added accessories such as surface cleaners, hose reels, wastewater recycler, and vacuums.

WARRANTY PROVIDED BY OTHERS: Gasoline, diesel engines and some electric motors are warranted by the manufacturer of the motor and their warranty is provided through the manufacturer's service centers.

BIG 6 COIL REPLACEMENT: Should the heater coil leak under normal conditions within the first 6 years of service, Hydro Tek will provide a replacement coil free of charge. Failure from freezing or freight and installation labor excluded.

GENERAL CONDITIONS:

Hydro Tek's responsibility with respect to claims is limited to making the required repairs or replacements to the original retail user, and no claim of breach of warranty shall be cause for any cancellation or rescission of the contract of sale of any Hydro Tek product. Hydro Tek reserves the right to change or improve the design of any of its products or illustrations without assuming any obligation to modify any product previously manufactured.

This supersedes any and all previous warranty statements for products purchased after January 1, 2007. Hydro Tek is not liable for indirect, incidental or consequential damages including any cost of substitute equipment, loss of revenue, pecuniary expense or loss, or any damages whatsoever arising out of the use or inability to use a Hydro Tek product. Hydro Tek disclaims all implied warranties, including those of

IMPORTANT SAFETY WARNINGS: SAVE THESE INSTRUCTIONS 5

merchantability and fitness for use for a particular purpose. Some states do not allow exclusions or limitations on how long an implied warranty lasts, so the above exclusions may not apply to you. It is the buyer's responsibility to ensure installation and use of Hydro Tek products conforms to local codes. Products exported outside the US and Canada are covered solely by the warranty of the local export dealer and this warranty does not apply.

HOW TO OBTAIN WARRANTY SERVICE:

1. Write down your model # _____ and serial # _____ (on base plate of machine near the motor).
2. Contact your local service dealer and return the Hydro Tek washer or part within the warranty period along with your sales receipt. To locate service, call the factory and ask for technical services or go to www.hydrotek.us
3. You may also ship the defective part freight prepaid directly to the factory if you contact technical services first and we will issue you a return goods authorization and then repair or replace under the conditions of warranty. We will pay the cost of returning it back to you by a method of our choice.
4. If the defective component is an engine or motor made by another manufacturer, your authorized Hydro Tek dealer or we can help you obtain warranty service through the specific manufacturer's local authorized service center.
5. If you are unable to resolve the warranty claim, write to Hydro Tek Systems, Inc., 2353 Almond Ave, Redlands, CA 92374. Attn: Technical Services. Please enclose a copy of the dated purchase receipt and explain the nature of the defect.

WARNING

THIS EQUIPMENT CAN BE HAZARDOUS TO THE OPERATORS SAFETY AND ONLY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTOOD THE OPERATION MANUAL SHOULD BE PERMITTED TO OPERATE THIS UNIT. NEVER ALLOW CHILDREN TO PLAY ON OR AROUND THIS EQUIPMENT.

ELECTRICAL PRECAUTIONS:

1. **Observe all State, Local, and National codes for the installation of your electrically powered washer.**
2. For a grounded product rated 250 volts, single phase, or less: This Product Is Provided With A Ground Fault Circuit Interrupter Built Into The Power Cord Plug. If Replacement Of The Plug Or Cord Is Needed, Use Only Identical Replacement Parts.
3. **GROUNDING INSTRUCTIONS:**
Cord Connected, Grounded Products:
This product must be grounded. If it should malfunction

or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Danger - Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the product, do not cut off the ground pin - if it will not fit the outlet, have a proper outlet installed by a qualified electrician. Do not use any type of adaptor with this product.

4. To comply with the national electric code, this pressure washer should only be connected to a receptacle that is protected by a ground fault circuit interrupter (GFCI).
5. **EXTENSION CORDS:**
Use of extension cords is not recommended.
6. **NEVER** operate an electrically powered washer after it has tripped a breaker or a ground fault device without having the reason for the trip determined by an authorized service engineer or competent electrician.
7. Use only in a dry area. Do not handle electrical cords and plugs when they are wet, when your hands are wet, or when standing in water. **Do not spray high pressure water on to the machine.**
8. Disconnect power supply before making any repairs or adjustments.
9. Transformer on burner is 20,000 volts. Disconnect battery cable before servicing burner or engine on 12 volt systems.

Warning: FIRE OR EXPLOSION HAZARD CAN CAUSE SEVERE INJURY OR DEATH AND PROPERTY DAMAGE

FIRE PRECAUTIONS:

1. **DO NOT** use improper fuels or solvents in this equipment, and only fill with the correct fluids when the unit is in an OFF condition, main power is disconnected, and engine and burner are cool.

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2. Fill the diesel burner fuel tank with #2 diesel fuel or kerosene. NEVER use gasoline. Do not confuse gasoline and fuel oil tanks. Keep proper fuel in proper tank.
3. NEVER operate this equipment in the presence of flammable vapors, dust, gases, or other potentially combustible materials.
4. AVOID contact with the exterior of the coil/heat exchanger assembly, mufflers, and exhaust stack to prevent burns.
5. DO NOT store fuel or other flammable materials near the burner or any other open flame.
6. To avoid burns NEVER stand over burner exhaust outlet or in front of engine exhaust. Burner may start at any time once power is turned on.
7. Do not touch burner exhaust port, mufflers, or hoses as contact may cause burns.
- 8 Diesel fired or gasoline power units are designed for outdoor use and installation only.
9. Burner on/off switch must be placed in the OFF position when the pressure washer is not being used. Do not depend on engine run switch to turn the burner off - This may cause a safety hazard.

⚠️ VENTILATION PRECAUTIONS:

1. DO NOT run engine or burner in an enclosed area. Exhaust gases contain carbon monoxide, an odorless deadly poison.
2. Observe all State, Local, and National codes providing for indoor use or installation of this unit.
3. Provide adequate ventilation to prevent engine overheating and inefficient burner combustion (minimum 2' of air space).

⚠️ SPRAY INJECTION PRECAUTION:

1. Fluid from high pressure spray or leaks can penetrate the skin and cause serious injury. If any fluid appears to penetrate the skin get emergency medical help at once. DO NOT treat as a simple cut. Tell the physician exactly what fluid was injected. For treatment instructions have the physician call your local poison center. Without proper treatment, complications can develop.
2. WARNING - Risk of injection or severe injury to persons - Keep clear of nozzle. DO NOT direct discharge stream at persons. This machine is to be used by trained operators. Keep operating area clear of all

persons. Use only 48" long wands on machines producing over 3000 psi. Also, only use straight wands or wands with a bend of 10° or less.

CAUTION: Hot discharge fluid - DO NOT touch or direct discharge stream at persons. Gun kicks back - Hold with both hands. Stay alert - Watch what you are doing.

3. Always wear protective eye goggles when operating the equipment. Additional protective items such as a rubber suit, gloves, and respirators are advisable, particularly when using cleaning detergents with a corrosive content.
4. Know the detergents you are using. Read and follow the directions on the detergent labels.

⚠️ PERSONAL HAZARD:

1. DO NOT remove belt guards or electrical covers while engine is operating or when the power is connected.
2. DO NOT move engine powered machinery while the engine is operating.
3. DO NOT lock the trigger on the gun valve in the on position.
4. DO NOT exceed recommended operating pressure or temperature.
5. Observe all regulations when towing trailer mounted units.
6. KEEP Hands Clear Of Belts: Some units equipped with auto on may start at any time when power is connected.
7. Do not operate the product when fatigued or under the influence of alcohol or drugs.

BEFORE START UP:

1. Read all instructions before using this product.
2. CHECK OIL AND FLUID LEVELS:

Check pump oil by locating the oil view window and fill to the red dot. On the SC and SS series fill to the top of the sight glass window. Check fuel levels. Check engine oil and coolant levels if unit is so equipped. (See the maintenance schedule on page 9).



3. CONNECT HOSE AND GUN ASSEMBLY.
4. CONNECT THE WATER SUPPLY & TURN WATER ON:

Maintain an adequate supply of water using a 3/4" I.D. hose with a pressure between 25 and 60 PSI. Burner power switches should be off before starting. If tank fed, be sure there is water in the tank and the valve is switched for supply tank feed. Do not run dry for longer than one minute.



5. BATTERY INFORMATION:

The battery is included on all Ultimate Line machines and will have to be filled with electrolyte (available at local auto parts store).



!WEAR EYE PROTECTION!

If the opening on your battery box measures 9" by 6" we recommend Exides' U1L/GTH 235CCA battery. If the opening measures 8" by 12" we recommend Exides' group 46-60 550 CCA battery. Deep cycle batteries are recommended to extend battery life. Always connect the positive battery cable before the negative and coat the battery terminals with corrosion inhibitor to prevent corrosion.

6. If wheel kit, accessories, or discharge hose are not installed, see your local dealer for instructions & installation.

OPERATION:



1. STARTING:

A. Electric Powered Units:

Connect power supply and ensure that all wiring connections and voltages are of sufficient rating to comply with the equipment's requirements. Turn pump

power switch on. If unit is equipped with auto-start, keep all power switches off when left unattended. (Unit will only turn on when trigger gun is pulled.) Unit will shut off 60 seconds after trigger is released.

B. Gasoline Engine Units:

Turn engine power switch to the on position, choke if necessary and turn key to start position only until engine starts. On units with a rewind starter, pull cord rapidly.

C. Diesel Engine Units:

Turn power switch to heat the glow plugs for a maximum of 30 seconds and release. Turn the power switch to the start position only until engine starts. (Do not use starter fluids)

2. PURGE AIR FROM SYSTEM:

Squeeze the trigger on the spray gun until a constant stream of water comes out. (Purging works best with nozzle removed from wand and/or dual wand in the low pressure mode.

3. SELECT DESIRED NOZZLE &



Connect nozzle securely to spray wand. If equipped, close pressure adjusting knob on dual wand. Hold gun firmly, squeeze trigger for high pressure spray.

CAUTION - Gun kicks back - hold with both hands.

WARNING - Risk of explosion - DO NOT spray flammable liquids.

4. START BURNER:

To create hot water on high pressure washers equipped with heat exchangers, release the trigger on the gun, turn the burner to the "on" position, and turn the thermostat to the desired temperature.

Squeeze the trigger on the spray gun and the burner will begin heating the water. It will stop firing whenever the water spray is off or if the temperature setting is exceeded.



5. STEAM:

Insert green steam nozzle and turn thermostat to 250° steam setting. The steam nozzle is sized for approximately 25% less water volume than the hot water mode.

6. BYPASS MODE:

System will go into bypass mode when machine is left running and trigger gun is closed. Bypass mode is when the inlet water coming into the pump recirculates through the unloader across the pump head. If left in bypass too

long - More Than Five Minutes - friction created by the movement of the water will begin to heat the water at a rapid rate.

If equipped with a bulk water tank, water can be bypassed back through the tank allowing for a larger volume of water to be recirculated through the pump head thus reducing heat on the pump seals.

!Warning: Do not leave in bypass for longer than five minutes to prevent pump from overheating. Shut off unit when not spraying water

7. SET CHEMICAL INJECTION:

If unit is equipped with inlet chemical injection, place chemical pickup tube in pre-mixed chemical solution and open chemical valve for desired chemical concentration. Rinse and close valve after use, do not use harsh chemicals through the inlet injector system. Drawing air into the chemical tube by leaving the chemical valve open will cause the pump to lose pressure and may cause pump damage. If unit is equipped with a downstream chemical injector, connect the chemical injection assembly into the high pressure discharge hose quick connects. Place the chemical pickup into chemical solution and turn brass collar to adjust concentration. The chemical will inject only when you drop the outlet pressure by opening the valve on the dual wand or changing to a low pressure nozzle. Soap the surface from the bottom up. Close chemical valve when not in use.

WASHING TECHNIQUES

When washing always start from the bottom up, and do the final rinse from the top down. This will keep the water from streaking the surfaces that are being cleaned. When applying chemicals, it is also best to start from the bottom and work up.

In areas where there is no grease or oil present, and the dirt is loose, cold water will be sufficient. When it comes to grease, oil, and hard to clean dirt, hot water and/or chemicals can make the job easier, and speed up the cleaning process. For applications that require even more heat and where water use/runoff must be minimized, switch to the steam mode (if equipped) and adjust the thermostat for up to 250° steam.

For general washing use a broad pattern spray nozzle such as the 40 degree nozzle. Rinsing and delicate surface washing is best performed by backing away from the surface and using the broad spray nozzle. In areas where the cleaning is more difficult and in smaller areas such as cracks and holes use the narrow spray nozzles, 0 or 15 degree.

Chemicals can be applied in a couple of different ways. One way is with a hand spray pump. The other is

with the chemical system on the equipment; either down stream or high pressure depending on the system you have. When using the high pressure chemical system do not use any caustic chemical as this may cause damage to the pump. For very harsh chemicals it is best to use the hand sprayer. First wet the surface and wash off heavy debris. Test the surface to be sure the chemical won't harm it. Then apply the chemical & let work for a couple of minutes for them to take affect before rinsing. Do not allow chemicals to dry on the surface.

When rinsing off the chemicals always start from the top down. When finished using the chemical be sure to rinse out the chemical line and valve with fresh water to prevent clogging.

SHUT DOWN:

1. TURN BURNER SWITCH TO THE OFF POSITION.
2. RINSE & CLOSE CHEMICAL VALVE.
3. SQUEEZE THE TRIGGER ON THE SPRAY GUN UNTIL THE WATER BECOMES COOL.
4. TURN MOTOR/ENGINE SWITCH OFF with the appropriate controls. Turn off diesel engine units by pulling the throttle kill lever.
5. TURN OFF WATER SUPPLY.
6. SQUEEZE TRIGGER TO RELEASE ANY TRAPPED PRESSURE IN DISCHARGE HOSE.
7. DISCONNECT & STORE HOSES.
8. ANTIFREEZE EQUIPMENT:

In the event that the equipment is not to be used for an extended period, store in heated space or anti-freeze the unit. Run the machine until the float tank is near empty, fill with a 50% mix of water and antifreeze and run until antifreeze appears at the high pressure outlet. If unit is equipped with a blowout valve, it may be blown out with compressed air in addition to using antifreeze solution.

On direct feed units (no float tank), use a 5' garden hose to draw the antifreeze mix from a bucket or blow out the unit with compressed air until only air and no water comes out of the discharge.

CHASSIS & TRAILER ASSEMBLY:

To maintain the appearance of the machine use stainless steel cleaner on the stainless steel panels.

Check tire air pressure. Check all bolts including the lug nuts for tightness and condition periodically. Grease wheel bearings as required and adjust after first month.

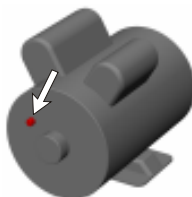
TIRE PRESSURE			
T200	T300	T400	T500
35 psi	35 psi	40 psi	40 psi

Be sure that the trailer you order conforms to your particular State Department of Transportation regulations in effect at this time, including braking and lighting requirements. If water is being transported on the highway, trailer brakes are recommended.

To insure safe trailering, be certain that the hitch on your tow vehicle is rated for the full trailer weight and of the proper height so that the trailer remains level when hitched, or wheel damage could result. **DOUBLE CHECK** safety chain, hitch coupler and wire harness before departing. Check latch on coupler and adjust if required to fit your trailer ball properly.

POWER SYSTEMS:

ELECTRIC MOTORS: All single phase electric motors contain a manual or automatic thermal overload which will shut down the motor if it overheats. If the overload or starter shuts down the motor, have an electrician or an authorized Hydro Tek distributor check for electrical problems. Voltage reading under load should be +/- 10% of name plate voltage on motor. The motor can be reset by depressing the red overload button located on either the motor or the starter, (as shown above). Use thumb pressure only - **DO NOT** force. Wait for motor to cool before re-setting. The automatic overload will reset itself after the motor has cooled.



Never spray water on the unit, or damage to the electric motor(s) may occur.

Consult the factory if running an electric machine from a
A = TOTAL SYSTEM AMPERES

HORSE POWER	115V 1PH	WIRE SIZE	208V 1PH	WIRE SIZE	208V 3PH	WIRE SIZE	230V 1PH	WIRE SIZE	230V 3PH	WIRE SIZE	460V 3PH	WIRE SIZE
1.5	15A	12/3	N/A	N/A	N/A	N/A	10A	14	N/A	N/A	N/A	N/A
2	20A	12/3	N/A	N/A	N/A	N/A	12A	14	N/A	N/A	N/A	N/A
5	N/A	N/A	26A	10/3	N/A	N/A	24A	10/3	N/A	N/A	N/A	N/A
6.5 / 6	N/A	N/A	N/A	N/A	N/A	N/A	27A	10/3	22A	12/4	13A	14/4
7.5	N/A	N/A	N/A	N/A	N/A	N/A	35A	#8	N/A	N/A	N/A	N/A
10	N/A	N/A	50A	#8	32A	#8	48A	#8	30A	#10	16A	#12
15	N/A	N/A	N/A	N/A	40A	#8	N/A	N/A	38A	#8	20A	#12

generator.

A dedicated breaker of sufficient ampere rating should be installed by an electrician. Refer to the chart above for electrical requirements: (208 Volt is acceptable, but unit motor must be under nameplate amps; turn psi down). If your unit is equipped with a ground fault interrupter, it will have to be reset whenever it is plugged in or if a ground fault interruption occurs. Test regularly for proper operation.

GASOLINE ENGINE: With the proper care and maintenance, your gasoline engine will give years of trouble free service. Please follow the Service and Maintenance Guide and the enclosed engine sheet or contact your local authorized engine dealer for maintenance and repairs.

Use unleaded gasoline with an octane rating of 87 or higher in the engine fuel tank. Consult engine manual for proper oil type and capacity. Change oil every 50 hours and the filter every 100 hours (see engine manual). Do not rely on the low oil shutdown (if equipped) as a reminder to add oil. Engine damage from lack of oil will typically not be warranted by the engine manufacturer even if the low oil system failed.

On machines with a 115V generator or a 12V burner, the throttle is preset at the factory (See generator on page 11 for adjustment).

DIESEL ENGINE: The diesel engine, although it has a higher initial cost can save money with lower fuel consumption and longer life. Use clean diesel fuel #2 and do not allow engine to run out of fuel or the system will have to be bled to restart the engine.

Clean the fuel filter periodically with kerosene (See Engine Manual). Use 10w-30 oil with API classification CC/CD grade rated for diesel engines in the engine crankcase and change every 50 hours. If the engine is water cooled use a 50/50 mix of antifreeze/deionized water solution and check daily. Never use more antifreeze than water or damage to the engine could occur from overheating.

POWER TRANSMISSION:

BELTDRIVE: Check belt condition, alignment and tension periodically. Replace belts when they show signs of wear or cracking. Tighten belts by loosening the mounting bolts on the pump and generator to permit them to slide. Turn the horizontal rail adjusting bolts to tighten belts until they deflect 1/4" to 1/2" inch with finger pressure.



GENERATOR:

Some self-contained Hot Water Units are equipped with a 115 volt generator to power the diesel burner. The generator output voltage must be between 110 to 130 Volts, (or between 59 to 63hz), when the unit is under full load. If the generator voltage falls out of this range the RPM of the engine will need to be adjusted to proper speed. If the engine cannot maintain the proper RPM do not use the burner or any power from the generator until the engine is repaired.

An AUXILIARY VOLTAGE OUTLET is available on some machines for running accessories off of the generator. A maximum of 1500 watts of 115v power is available when the burner is on or 2000 watts when it is off. A switch/circuit breaker located on the control panel will need to be reset if the circuit is overloaded. Use of a ground fault interrupter is recommended when plugging in accessories or lights to the auxiliary voltage outlet.

To extend generator life make sure the burner and all auxiliary power is off when the engine is started or stopped. Keep generator dry. Do not spray off with trigger gun.

PUMPING SYSTEM:

PUMP: The pump is a positive displacement, oil bath crankcase, triplex plunger type. It contains 3 plungers which move forward and backward in a cylinder to propel water past 3 inlet valves and 3 discharge valves into a high pressure manifold.



The crankcase oil window should be checked for oil level and clarity and the pump for oil or water leaks before each use. The sight window is located at the rear (opposite the head) of the pump and should be filled to the red dot with Cat Pump Oil, available at your Hydro Tek dealer. On the SC and SS series the oil should be filled to the top of the sight glass window. If the oil becomes milky in color, moisture is entering the crankcase. Change the oil and contact your authorized Hydro Tek dealer if the problem persists.

To increase pump life, prevent cavitation (air bubbles), overheating, and dirty water. Cavitation can be prevented by keeping filters clean and checking for air in pump feed lines. Do not run the pump in the bypass mode (pump running with the trigger gun off), for a period of more than 5 minutes or the pump will begin to overheat (maximum water temperature is 145°F). Do not run pump dry. Protect from freezing. Do not run a frozen pump until it is

completely thawed

UNLOADER AND PRESSURE RELIEF VALVE: The unloader valve is preset at the factory to govern the proper output pressure of your machine. It will release the pressure of the pump output back into the inlet if the trigger on the spray gun is released. NEVER increase the set pressure on the unloader to exceed the specifications for your machine. The unloader should be adjusted only by qualified personnel.



All hot water machines are equipped with a SAFETY PRESSURE RELIEF VALVE. In the unlikely event that your unloader fails, or if the burner overheats and builds excessive pressure, the pressure relief valve will vent the pressure into the atmosphere. If this occurs, turn off the machine and have it checked by an authorized dealer. The pressure relief valve will automatically reset itself.



BURST DISK TECHNOLOGY: This additional safety feature functions to protect the coil and other components from overpressurizing from the heating system and high system spikes of pressure. If this component ruptures, you should take the machine in to an authorized Hydro Tek dealer. Do not plug off and continue to run.



CHEMICAL INJECTION SYSTEM: With an inlet chemical injection system the chemicals are introduced at the inlet of the pump and controlled with a chemical metering valve. The pump is fed by a float tank to create a slight vacuum which draws up the chemical into the inlet manifold of the pump, mixes it with the water, and sprays it out of the nozzle under high pressure.

Open the chemical valve only when the pickup tube is submerged in a solution or air will enter the pump and you will lose pressure and the pump will run rough.

Do not use highly corrosive detergents or acid type cleaners, and be sure to rinse and close the chemical valve after each use or the chemical line and check valve may become obstructed. Chemicals should be between 5-9PH. Consult Hydro Tek for chemical compatibility. Chemical abuse is not covered under warranty.

An optional DOWNSTREAM INJECTOR is available if harsh chemicals need to be applied. The downstream injector will apply chemicals only at low pressure. If equipped standard with downstream injection, adjust concentration level by turning brass collar on the injector, or the knob on pump or control panel. Read



SYSTEM INFORMATION

and follow all safety instructions on the detergent label.

WATER SUPPLY: An adequate water supply must be maintained to the pump at all times. If the inlet flow is too low or if there is air in the water supply, the pump will run rough, pulsate and lose pressure. Maximum inlet water temperature is 145°F. If the pump is run dry, it can quickly overheat.

The water is filtered by a garden hose adapter screen. Clean and replace as required or install a large capacity strainer to insure a clean supply of water.

DIRECT WATER FEED: Maintain an inlet water pressure between 25 PSI and 60 PSI using a 3/4" I.D. hose. Install a back flow preventer on your supply hose if State or Local ordinances require it. Install a water regulator if your water pressure exceeds 60 PSI.

FLOAT TANK WATER FEED: A float tank is usually used to regulate the incoming water supply to the pump and introduce chemicals into the inlet of the pump. The float tank and filter (located inside the tank) should be flushed out if debris accumulates in the bottom. If the float tank overflows or runs out of water, adjust or replace the float valve inside the tank and check the inlet water feed pressure.

BULK TANK WATER SUPPLY: Large capacity water supply tanks can be used with most units if water is not readily available at the washing site. Belt driven, low speed pumps (less than 1750 RPM) can draw from a tank if you ensure

that the vacuum does not exceed negative 4 psi. A 200 mesh strainer and a 3/4" I.D. or larger suction hose must be used to maintain a clean and adequate water supply. 8-10 gpm machines require 1" feed & filtration. Be sure that there is no air in the water supply or damage to the pump could result. Clean out the water supply tank if debris accumulates on the bottom and rinse out the strainer periodically.

If a water supply tank and a float tank are both utilized, a special three way valve can be used to switch the tanks. Water supply tanks can be filled from a garden hose or large line filled from a hydrant with the proper permits. Filter the water from the hydrant with a 200 mesh filter on the fill line.

WATER TREATMENT: The inlet water can be deionized for spot free rinse or softened to make detergents

clean more effectively. Do not use deionized water through the coil on a hot water machine or coil corrosion will result. Water softeners, however, will reduce coil scale deposits and should be installed if your water is especially hard.

HEATING SYSTEM:

COIL/HEAT EXCHANGER SYSTEM: The heat exchanger contains a continuous coil of pipe which forms a cold water jacket around the outside of the heating area. It is double wrapped with ceramic blanket insulation and a stainless steel cover.



The inside of the coil assembly can become covered with soot if it is fired with diesel fuel and the burner is out of adjustment. This can be cleaned by removing both end caps of the heat exchanger enclosure and brushing or spraying off debris, or by adding a soot removal agent (Part # CB200) to the diesel fuel. When the water is heated, scale (calcium) will begin to form on the inside of the coil pipe depending upon the hardness of the water in

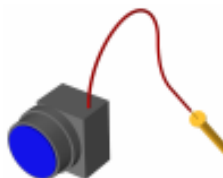
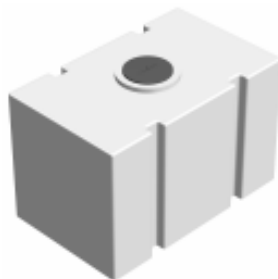
your area. The coil can be DESCALED by using a scale remover (Part # CB105) available at your authorized Hydro Tek dealer. It is necessary to perform this service only when a noticeable pressure drop is detected across the coil. Follow directions to avoid damage. Wear safety glasses.

TEMPERATURE SWITCH: The burner is equipped with a high temperature limit switch which will shut off the burner when the water temperature becomes too hot. Hot water machines are equipped with an adjustable thermostat so that the operator can control the outlet water temperature. The burner will automatically cycle on and off to maintain the desired temperature.

STEAM INSTRUCTIONS: If your unit is steam - capable, install the green steam nozzle, turn thermostat to 250° F.

PRESSURE/FLOW/VACUUM SWITCH: The burner is equipped with either a pressure switch, flow and/or a vacuum switch to control the burner. When the trigger on the spray gun is squeezed, water begins to move through the coil and pressurize. The flow/pressure/vacuum switch turns the burner on and begins to heat the water. Whenever the water spray stops or if the water is shut off, the burner will shut off.

⚠️ WARNING: Burner should fire only when the trigger is squeezed and spraying water, if it comes on at any other time, shut off machine and have it serviced.



DIAGNOSTIC LIGHT: The burner diagnostic light on the rocker switch, (if equipped), can help in determining problems with the burner. The red light indicates that power is going to the fuel solenoid valve. The burner should be firing and heating the water whenever the red light is on. When the trigger on the spray gun is released or if the temperature set point is exceeded, the red light will go off and the burner will stop firing.

DIESEL FIRED BURNER: The diesel fired burner is a forced draft pressure atomizing burner. Diesel fuel is sprayed out of an atomizing nozzle, mixed with air, and ignited by a high voltage spark. The flame is directed towards the coils of pipe which, in turn, heats the water flowing through it. Use clean #2 DIESEL FUEL for the burner or substitute #1 diesel, light fuel oil, or Kerosene if diesel is not available.



AIR BAND adjustments may need to be made to compensate for higher elevations, or if more than a trace of smoke is observed in the burner exhaust. The **ELECTRODES** may need to be cleaned and adjusted periodically. These adjustments have to be made precisely and should be performed only by qualified personnel. Set between #1 & #2 on smoke gauge.

The **FUEL PUMP** is a self priming, low volume pump which is propelled by the burner motor. The fuel pump pressure is typically set at 100 PSI but can be turned as high as 140 PSI during the winter when the incoming water temperature is lower. Before adjusting the fuel pressure, connect a fuel pressure gauge and an outlet water temperature gauge, turn the pump and burner on, and turn the fuel pressure screw clockwise until the desired water temperature is obtained. Be sure not to exceed the recommended specifications of the machine.

The **FUEL FILTER** will need to be replaced often if the



BF020



BF025



BF015

diesel fuel quality is poor. A fuel filter with a water separator is recommended if the fuel quality is consistently poor.

The **FUEL SOLENOID** is an electric fuel valve which shuts off the fuel whenever the trigger on the spray gun is released or if the set temperature on the heat switch is exceeded.

The **IGNITION TRANSFORMER** provides a high voltage spark which travels down the electrodes to ignite the diesel fuel. Disconnect all power before servicing.



The **12 VOLT BURNER** operates from

the battery on the SS/SM Series. The engine has a 15 to 16 amp charging system which keeps the battery charged which runs the burner. The burner motor and transformer stops when the trigger gun is released. Its best to release the trigger gun periodically, and also cool down the burner before shutting off the engine to keep the battery fully charged. Shut off burner & engine switch when unattended.

PRESSURE DELIVERY SYSTEM:

DISCHARGE HOSE: Use only a wire braid hose rated for the output pressure and temperature of the machine. Single wire braid hoses are generally rated from 2500 to 3000 PSI and double wire braid from 4000 to 5000 PSI. Additional hose lengths can be added with quick couplers with a minimal loss in pressure of about .5 PSI per foot. Inspect hoses for wear and replace if necessary. Avoid kinking or running over the hose to extend the hose life.



⚠ WARNING: Hydro Tek hot water machines require special 250° Rated hose to operate in the steam mode. If the hose is not replaced when worn or if it is not replaced by a Hydro Tek original equipment hose, it may burst and serious injury and burns could result.

QUICK COUPLERS: The swivel connectors on the high pressure hose and quick couplers on the spray nozzle make it easy to change nozzles or hoses. When connecting hoses or nozzles, be certain that the collar on the quick coupler snaps back to the locked position or the nozzle or hose may come loose when pressure is applied to it. If the quick connect begins to leak, replace the O-ring (specify Viton or EDPM material) located in the female socket coupler. Grease the coupler periodically to make it work smoothly. Replace if it becomes worn. Twist couplers are used on the wands so they can be interchanged.



TRIGGER GUNS: The trigger gun is merely a valve that turns water spray on and off. If it begins to leak or fails to shut off, replace or repair the valve assembly. **Never lock the gun in the on position or point it at any person or any part of the body.**



Machines that spray steam only are equipped with an open gun that does not shut off the water spray.

NOZZLES: The spray nozzle is a precisely machined orifice made of hardened stainless steel. The orifice size is matched to the output of your machine to attain the proper flow and pressure that



your machine was designed for. The orifice, or hole, of the nozzle will begin to get larger as the nozzle becomes worn. For optimum performance, replace the spray nozzle to maintain the full output pressure of your machine. The nozzle installed in your machine from the factory is designed to allow only about 90% of the water being pumped to discharge out of the nozzle. The remaining 10% is bypassed back into the inlet water supply by the unloader/regulator valve. If an incorrect nozzle size is used the maximum flow and pressure of the machine cannot be achieved and the pressure unloader valve can wear prematurely. When replacing the nozzle match to one size under the flow and pressure output of the pump.

The nozzle is usually connected to the wand with a quick coupler. Be sure the collar on the quick coupler snaps back to the locked position, or the nozzle could be lost when the trigger on the spray gun is squeezed. Never connect the spray nozzle directly to the trigger gun without a wand or injury could result. Never place hands or fingers over the nozzle tip.

The nozzles generally come in four different spray angles, 0°, 15°, 25° and 40°. The different spray angles of a given size of nozzle do not change the output pressure of the machine, just the impact force and surface coverage of the water spray.

The 0° nozzle sprays a straight stream which impacts the surface very hard but does not cover a very wide area. Use the 0° nozzle with care because it can damage the surface you are spraying with its high impact and long reaching spray.

The 15° nozzle sprays out a flat stream at a 15° width. It gives you less impact power but covers a wider area with one pass of the spray wand. As you back away the spraying nozzle from the surface, the spray impact will decrease.

The 25° is wider than the 15° and is most commonly used to indicate the steam nozzle

The steam nozzles are sized to spray less water than the other high pressure nozzles, so the water is discharged at a higher temperature. (Up to 250° F).

The 40° nozzle spreads the water stream over an even wider area to give you less impact for delicate surfaces.

ACCESSORIES:

WET SANDBLASTER: The wet sandblaster is a system that introduces sand into the water stream for abrasive blasting. It is especially effective for graffiti or paint removal. Performance of the sand unit is directly related to the output of your high pres-



sure washer. The sand is mixed with the water at the sand head in a tungsten carbide nozzle.

A vacuum is created in the sand nozzle which draws a sand and air mixture up the sand hose. If the sand becomes wet or the sand nozzle becomes plugged the vacuum will be lost and the sand will quit flowing. The sand probe can be poked directly into a bag or bucket of sand to draw it up the sand hose. Do not cover the air intake port on the top of the sand probe or the sand flow will be disrupted. Uncoil the sand hose completely before use to improve the sand flow and replace the sand hose when it becomes worn. The carbide sand mixing nozzle can be unscrewed and replaced when worn.

Use bagged silica sand for best results through the sandblaster. Use 16 to 20 grit (course) sand for rust or concrete. Use 30 grit (fine) sand for fine metal surfaces or wood. Do not use wet sand or mix different grits of sand. A sand hopper is available for convenient sand storage. An air valve is available for adjusting feed rate on the hopper and should be fully open when using fine media such as baking soda.



Always use safety goggles and protective clothing when operating the wet sandblaster.

TURBONOZZLE: The turbo nozzle multiplies the power of your machine by rotating the spray jet and making the water impact the surface harder to give better cleaning results. Simply replace the spray nozzle with the turbo nozzle and squeeze the trigger on the spray gun with the burner off for high pressure spray. Do not point the turbo nozzle upward when starting. "Turbo Laser" type nozzles cannot be used with water over 190° F or life of the turbo nozzle will be greatly decreased and the warranty voided. The "Rotomax" type nozzle can be used up to 170° F.



EXTENSION HOSES AND HOSE REELS(OPTIONAL)

The high pressure discharge hose can be extended by connecting additional hose lengths by means of twist couplers. Hose extensions generally come in 50 and 100 foot lengths. Specify maximum pressure and temperature of your machine when ordering.

Low pressure inlet garden hose is available in 50 and 100 foot lengths. Premium quality, 200 PSI rated hose is recommended to be used and is available at your local dealer.

Hose reels are available for convenient and quick stor-

age of both discharge and inlet hoses. To keep the hose from unreeling, lock the drum in place and secure the gun or the end of the hose or it may drag on the road. If the reel begins to leak, replace the seal kit in the swivel, or connect the hose directly to the machine until the leak is repaired.

The high pressure hose should be completely unreeled before use or it can contract on the drum and cause damage to the hose reel. The low pressure hose should be of sufficient quality that it will not flatten out when reeled up, or the supply of water to the machine will be cut off.

⚠ WARNING: Replace discharge hose with original equipment hose rated for 250°F available at Hydro Tek dealer.

SPRAY WANDS:

Spray wands are available in different lengths and with variable pressure adjustment. The dual wand has a low pressure and high pressure nozzle. When the dual

wand is installed on the machine, the output pressure can be lowered simply by turning the valve on the dual wand to divert water into the low pressure nozzle. This lowers the pressure (PSI) but has little or no effect on the discharge flow (GPM) or outlet water temperature on hot water machines.

The short wands are ideal for washing in confined areas such as a car lot. The longer wands help to clean areas that could not normally be reached.

A downstream chemical injector is available if harsh chemicals need to be applied and water supply tanks are available for remote cleaning sites (see pages 11 & 12).

⚠ WARNING: Wands under 48" in length should not be used with machines producing over 3000 psi.

HYDRO CAPTURE SYSTEM: Hydro Tek trailers and tank skids can be ordered with a recovery tank system that captures wastewater so it can be transported for proper disposal. Fill the flexible berm with water and place in the low area where the waste water will drain. Plug the sump pump into the generator auxiliary outlet on the SC Series washer and connect the waste pump hose to the garden hose adapter on the black waste tank. Place the sump pump in the water puddle that forms behind the berm and turn on only when the water depth exceeds 3 inches.

⚠ WARNING: Do not run the wastewater back to the pressure washer feed or your high-pressure pump will be

damaged. Not recommended for solids or gravel over .25" diameter. Do not run dry or run flammable fluid into the waste tank.

Empty tank thru 2" drain valve located near the bottom of the waste tank by attaching a 2" hose (not provided).

Dispose of properly: Permits can be obtained to dump wastewater into a sanitary sewer system if properly treated and tested. It is illegal to allow wash water to run into storm drains or into the soil.

The capture system is equipped with a 800 mesh filter bag located under the 8" black fill cap and will need to be cleaned periodically. Oil absorption pillows and fine mesh bags up to 25 micron are available if required.



HYDRO TWISTER: The Hydro Twister is a surface cleaner that connects to a pressure washer and uses two nozzles rotating at a high RPM within 1" of the ground. It can clean concrete up to 10 times the speed of an operator using a wand, and with more consistency and less operator fatigue. Simply move the twister over the surface and watch a clean path appear behind the unit. The Hydro Twister can be used with up to 4000PSI, 10 gallons per minute, and up to 250°F. The 17" diameter Hydro Twister is designed for use in confined areas and the 27" for large expanses of concrete or decks. An adjustable pressure knob is included for use in sensitive areas.

PROBLEM	PROBABLE CAUSE*	REMEDY
Power System: Gasoline or Diesel Engine Driven		
Engine will not start or crank over.	Battery dead. Dirty battery connection. Battery cables disconnected. Engine, pump, or gearbox is seized. Keyswitch, solenoid and starter on engine defective.	Charge or replace battery, add electrolyte if battery is new. Clean connections. Connect or replace damaged cables. Replace or repair seized part. Repair or replace.
Engine will not start but will crank over.	Engine power switch is off or defective. Low oil shut down is activated. Low on fuel. Fuel filter is clogged. Engine flooded or starved.	Check engine power switch. Add oil to engine, check more frequently. Fill with the appropriate fuel, bleed injector pump on diesel engines. Replace or clean fuel filter, bleed injector pump on diesel engines. Choke only as required (not diesel).
Engine bogs down under load, whenever spray gun is triggered.	Engine needs to be repaired or replaced. Operating in high elevation. Carbon deposits on cylinder head.	See engine manual or engine dealer. Lower the pressure on the unit and check for correct engine speed (RPM). Remove head and wire brush deposits.
Power System: Electric Motor Driven		
Electric motor does not start.	No electric power. Thermal overload in the motor/or starter has been tripped. Power switch inoperative. Electric motor or wiring failure. No water to inlet.	Check cord, plug, socket, and breaker. Reset manual overload by depressing the thermal switch on the outside of the motor or starter after the motor has cooled. CAUTION! Automatic overload will restart the motor automatically when it has cooled. Check power switch. Replace or repair motor and/or wiring. Connect water supply.
Machine will not auto-start (If equipped with ETS or ITS).	Must have adequate water supply. Coil scale build up. Check filter screen & inlet pressure. Inlet flow switch defective or jammed with debris.	25 psi minimum. Descale coil for better water flow. Remove spray nozzle and pull trigger to check auto-start function Check mechanical function & electrical signal to relay by testing for continuity on #2 & #4 of time delay. If no continuity with trigger pulled, replace inlet flow switch. If continuity is present, remove wires from #1 & #5 of the time delay relay and make a connection between the two wires and test the machine. If machine works replace time delay relay. If machine does not work replace contactor or motor starter.
Pumping System		
Trigger gun leaks or will not shut off.	Debris in gun valve assembly.	Clean valve assembly or replace gun.
Pump runs but there is no spray pressure.	Water turned off. Nozzle is plugged. Inlet chemical injection valve is open, without the end of the pickup tube inserted into detergent. Coil on hot water machines is obstructed. Priming of pump after run dry.	Turn water on. Clean or replace with proper size. Close soap valve or submerge detergent pickup tube into solution. Clean obstruction or scale deposits from coil with coil cleaner. Crack open fitting on high pressure outlet of pump.
Pump runs but has low spray pressure.	Nozzle not installed. Dual wand valve is open. Leaky discharge hose or quick coupler. Inlet strainer clogged. Worn or wrong size nozzle. Belt slippage. Unloader valve worn or improperly adjusted. Air leak in inlet plumbing. EZ start valve is leaking.	Install Nozzle. Dual wand valve must be closed and high pressure nozzle installed. Replace hose, quick coupler, or o-ring in the quick coupler. Clean and check more frequently. Replace nozzle of proper size. Tighten or replace with correct belt. Install pressure gauge on pump head to adjust pressure. Check valve seat on unloader. Reseal fittings and inspect inlet hoses for air leaks. Remove hose to check for internal leaks.
Pump runs but there is erratic, fluctuating pressure.	Inadequate incoming water supply. Stuck inlet or discharge valves. Restricted inlet or air entering the inlet plumbing on the pump. Leaking H.P. seals. Leaking L.P. seals.	Increase water supply flow. Clean out or replace worn valves. Check fittings and hose for air tight seal, clean inlet strainer screen. Replace seals. Pressure feed the pump and replace L.P. seals if water leaks from the pump head.
Excessive crankshaft play or loud, knocking noise in pump.	Broken or worn bearing or connecting rod in crankcase.	Replace pump or bearing.
Oil leaking from pump.	Loose drain plug or damaged seal.	Locate point of oil leakage and replace damaged O-ring or seal.

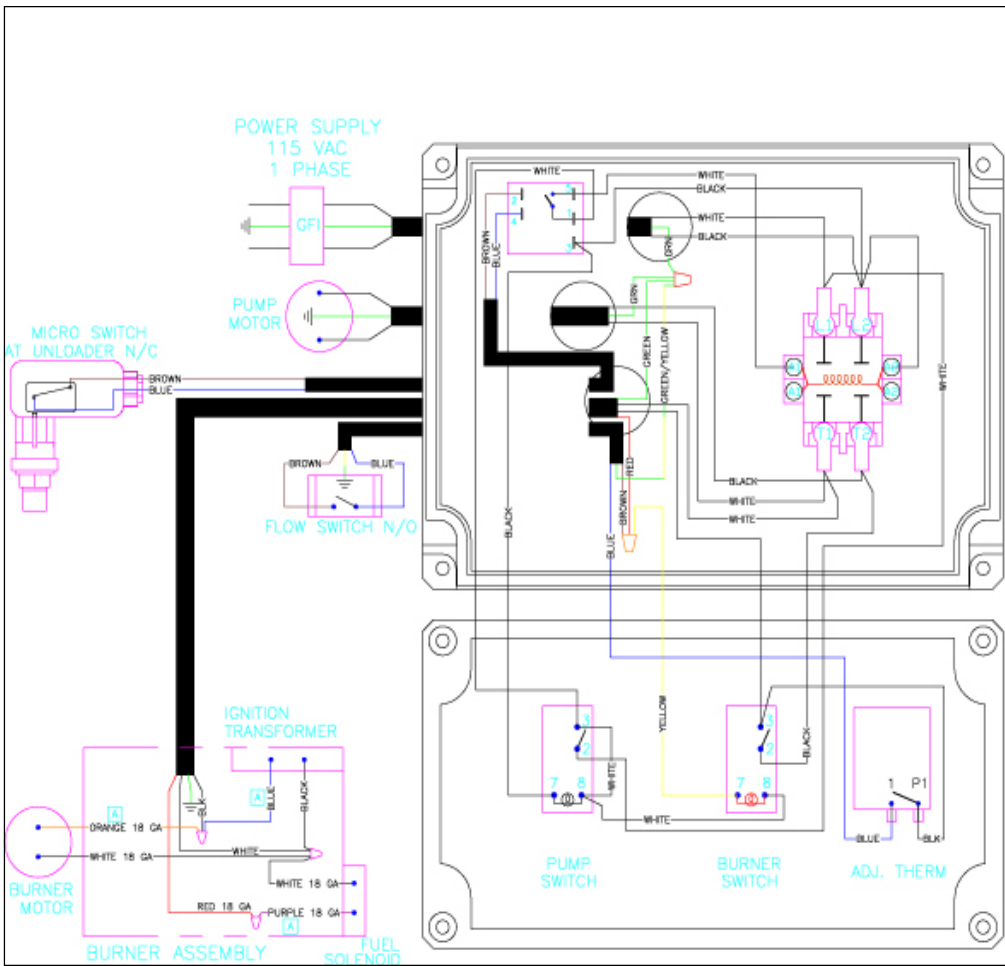
* The most recurring probable cause is listed first. Repairs should be made only by a qualified technician.

PROBLEM	PROBABLE CAUSE*	REMEDY
Inlet injection will not siphon chemical.	Check valve in strainer clogged. Chemical valve not open or clogged. Strainer not submerged in solution. Detergent hose cut or kinked.	Clean or replace. Rinse after each use. Open chemical valve or clean. Submerge strainer and replenish chemical. Inspect hose, replace as necessary.
Water is emitted from the chemical pickup tube.	Check valve malfunctioning.	Repair or replace check valve.
Downstream injector will not siphon chemical.	Brass knob on injector is closed. Unit not in low pressure mode. Detergent hose cut or kinked. Strainer plugged or not submerged. Internal injector parts corroded or stuck. Outlet water temperature too high.	Open by turning counter clockwise. Open dual wand or install low pressure tip. Inspect hose, replace as required. Check screen on strainer pickup tube. Disassemble, clean or replace. Use with cold water (150° Maximum)
Pressure relief relieving water.	Unloader failure/Coil overheating/Excessive pressure	Turn machine off, wait a few minutes and restart. If problem continues, take in for repair.
Burst disk relieving water.	Excessive overpressurizing and system spikes.	Take in for system check.

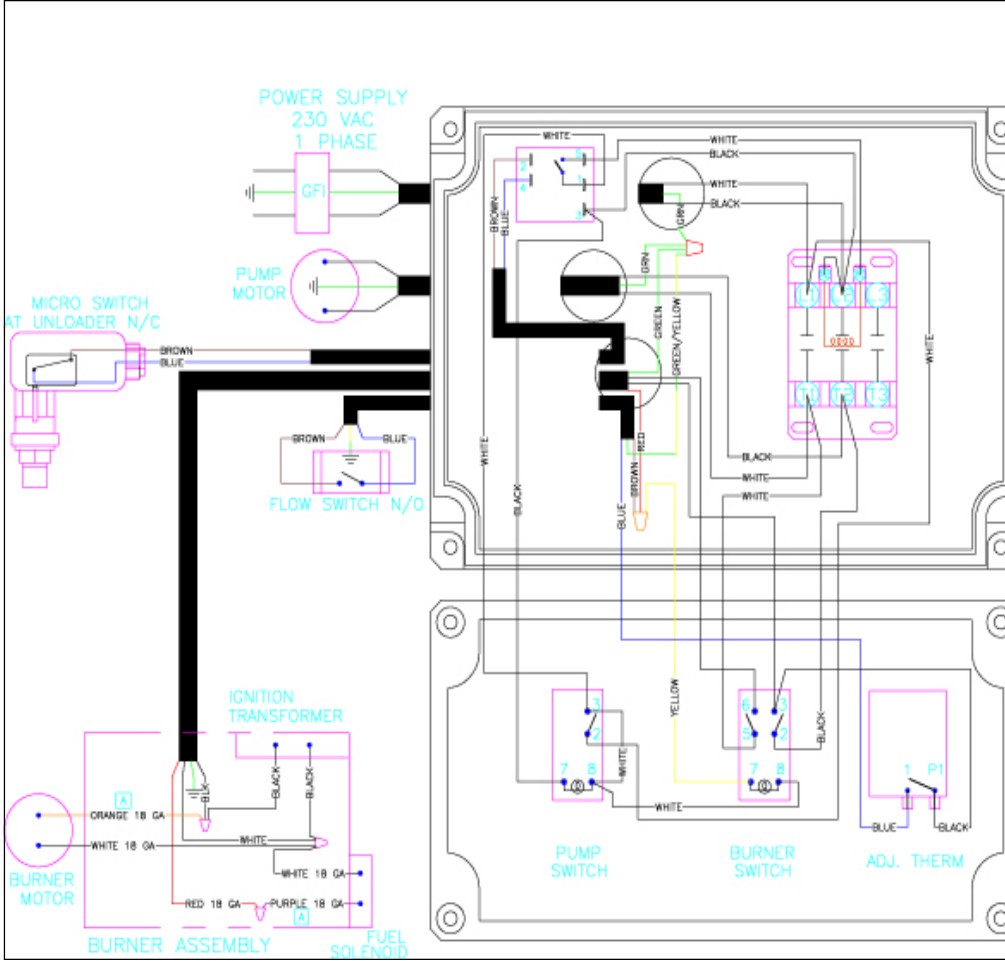
Heating/Burner System-Diesel Fired

<p>Burner will not fire.</p> <p>⚠ WARNING: High voltage on ignitor can cause electrical shock. Disconnect power before servicing.</p>	<p>Burner switch not on.</p> <p>Diesel fuel level low.</p> <p>Trigger on spray gun not pulled.</p> <p>Fuel filter plugged or loose.</p> <p>Spray nozzle plugged.</p> <p>Overload on burner motor tripped.</p> <p>Nozzle not in wand.</p> <p>Low water pump pressure.</p> <p>Fuel pump or nozzle stopped.</p> <p>Vacuum/Flow/Pressure or temperature switch faulty.</p> <p>Fuel solenoid valve faulty.</p> <p>Low generator voltage output.</p> <p>Burner relay faulty (12-V Burner only)</p>	<p>Turn switch on; Thermostat on if equipped.</p> <p>Fill burner tank with #2 diesel.</p> <p>Squeeze trigger to fire burner.</p> <p>Clean or tighten fuel filter. (Check fuel pressure)</p> <p>Clean spray nozzle.</p> <p>Reset overload, locate source of overload.</p> <p>Install nozzle in wand.</p> <p>See pumping systems trouble shooting.</p> <p>Check fuel pressure, filter, fuel lines. Replace fuel pump and/or nozzle.</p> <p>Check electrical continuity with pump spraying and burner on.</p> <p>Replace fuel valve if it does not open when power is applied.</p> <p>Adjust generator RPM for proper voltage under full load conditions.</p> <p>Replace burner relay.</p>
<p>Burner will not fire, plus diesel fumes are emitted from the exhaust port.</p> <p>⚠ WARNING: Replace insulation. Unburned fuel can saturate it and cause a fire.</p>	<p>Fuel to air ratio out of adjustment.</p> <p>Fuel nozzle partially clogged.</p> <p>Ignition transformer not providing spark to fuel.</p>	<p>Set air band and fuel pressure to specs.</p> <p>Replace nozzle of proper size.</p> <p>Replace ignition transformer, clean and adjust electrodes.</p>
<p>Burner fires and smokes.</p> <p>Discharge water temperature exceeds recommended operating temperature.</p>	<p>Fuel to air ratio out of adjustment.</p> <p>Excessive soot on coils.</p> <p>Improper voltage at burner.</p> <p>Burner input too high for conditions.</p> <p>Water flow restricted.</p> <p>High temperature limit switch faulty or set too high.</p>	<p>Set air band and fuel pressure to specs.</p> <p>Clean soot off to improve air flow.</p> <p>Adjust RPM of generator (if equipped)</p> <p>Decrease fuel pump pressure and/or fuel nozzle size.</p> <p>Clean or replace nozzle of proper size. Descale coil and clear obstructions.</p> <p>Replace or reset temperature limit switch.</p>
<p>Burner continues to fire even when trigger on spray gun is released</p>	<p>Faulty Flow/Pressure/Vacuum switch.</p> <p>Faulty fuel solenoid.</p>	<p>Replace switch.</p> <p>Replace solenoid.</p>
<p>Discharge water temperature not reaching maximum operating temperature.</p>	<p>Burner input too low for conditions.</p>	<p>Increase fuel pump pressure and/or fuel nozzle size.</p>
<p>Battery keeps losing voltage. (For 12 volt burner systems)</p>	<p>Battery voltage Low.</p> <p>RPM too low.</p> <p>Engine charging system faulty.</p> <p>Electrodes misadjusted.</p> <p>Fuel pump pressure too high.</p> <p>Air band too far open.</p> <p>Burner amp draw too high.</p>	<p>Have battery checked and load test, charge if low and replace if necessary. Allow water to cool 2 min. before shutting off engine.</p> <p>Engine RPM should be 3600 RPM w/no load.</p> <p>Check engine charging system-Must have 16 Amp output.</p> <p>Adjust electrodes to maximum 1/8" gap.</p> <p>Fuel pump pressure should be approximately 100 to 110 PSI. Adjust for proper burn.</p> <p>Check amp draw of burner motor - should be 13 amp or less. Check amp draw of transformer should be 4.2 or less.</p>

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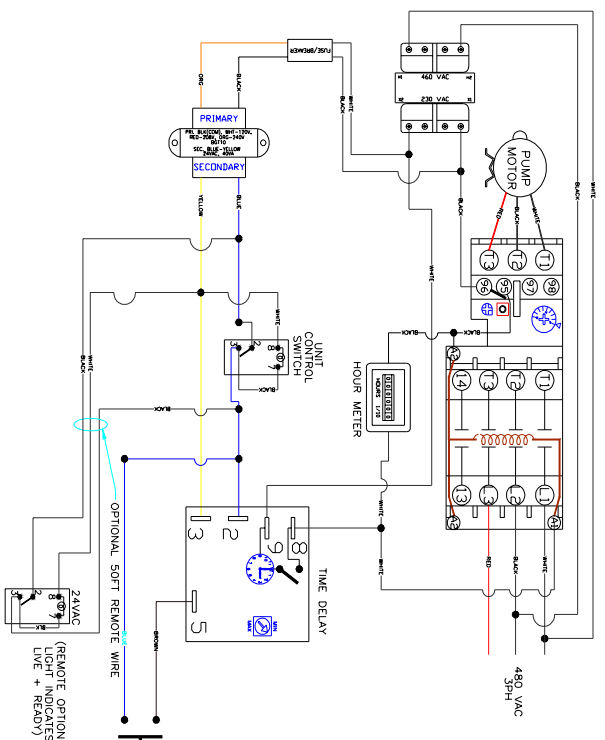


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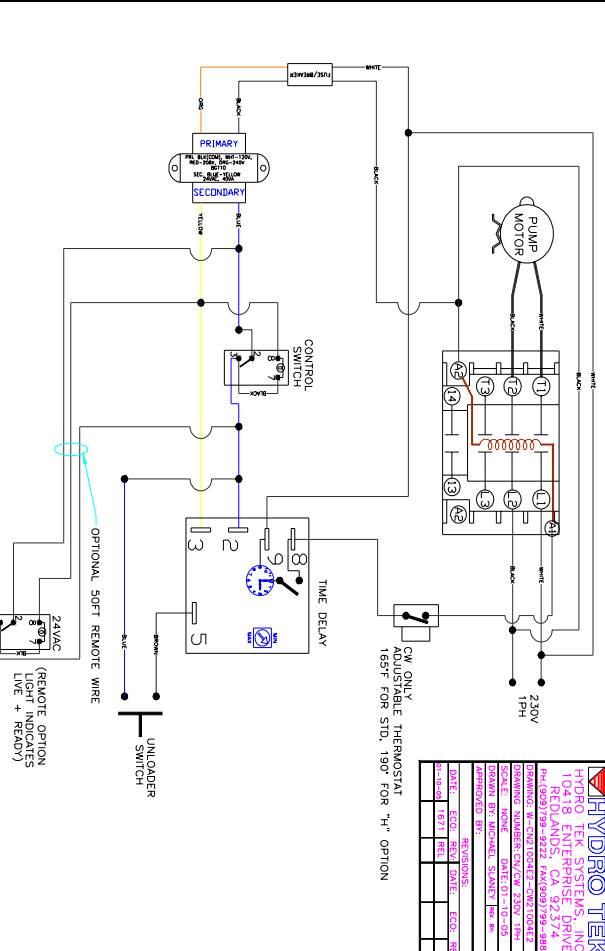
8 CN/CW 230 3PH & 460 3PH WIRING DIAGRAMS CW/CN 230V 1PH

HYDRO TEK
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 DIVISION NUMBER: CN/CW 460V 3PH
 DIVISION NUMBER: CW/CN 230V 1PH
 DIVISION: 802 MICHAEL STANLEY INC. W. VA.
 DIVISION: 803 MICHAEL STANLEY INC. W. VA.
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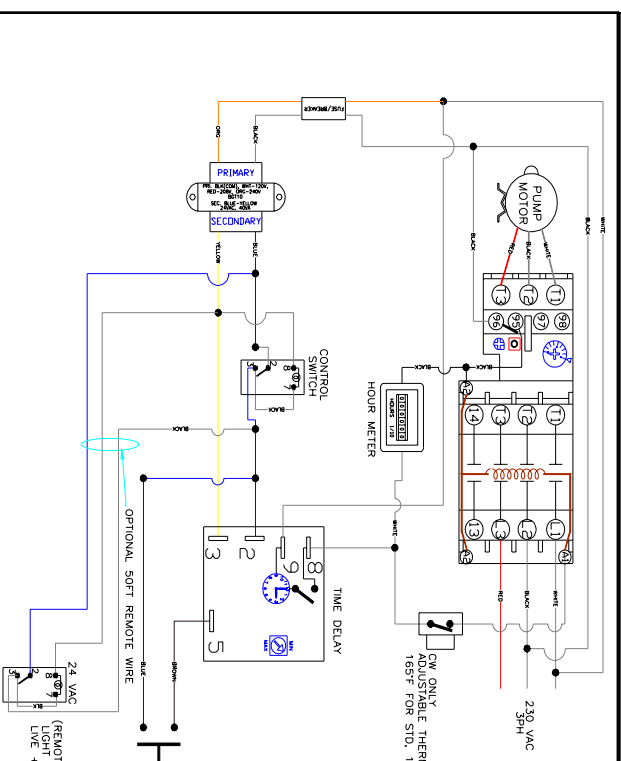


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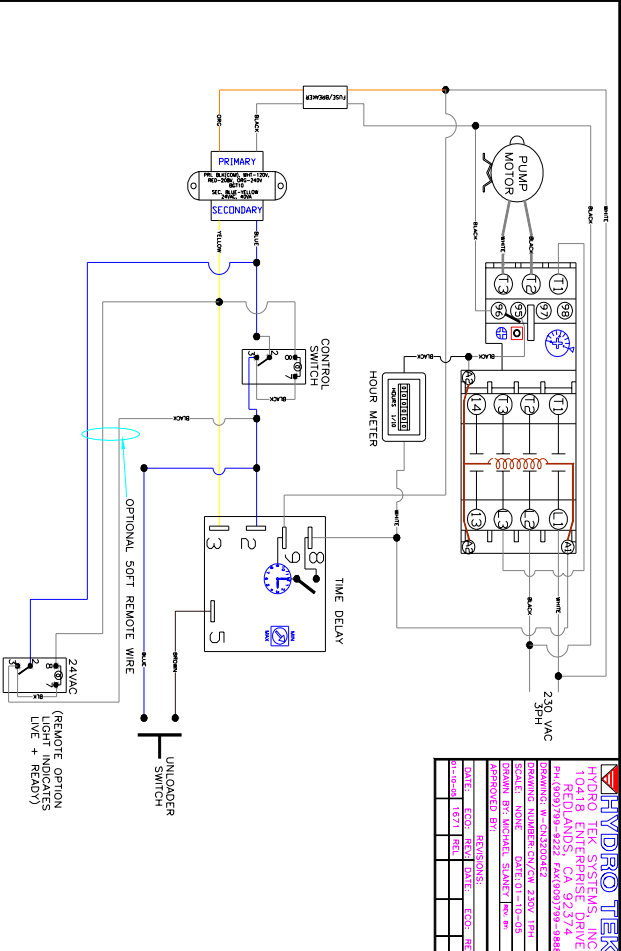


HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 FELD AND CA 95726
 PH: (909)799-9222 FAX: (909)799-8888
 WWW: WWW.HYDROTEK.COM
 DIVISION NUMBER: CN/CW 230V 1PH
 DIVISION NUMBER: CW/CN 230V 1PH
 DIVISION: 802 MICHAEL STANLEY INC. W. VA.
 DIVISION: 803 MICHAEL STANLEY INC. W. VA.
 APPROVED BY: RESIDENCES:
 DATE: 10/17/13 DATE: 10/03/13



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 APPROVED BY: RESIDENCES:
 DATE: 10/17/13 DATE: 10/03/13

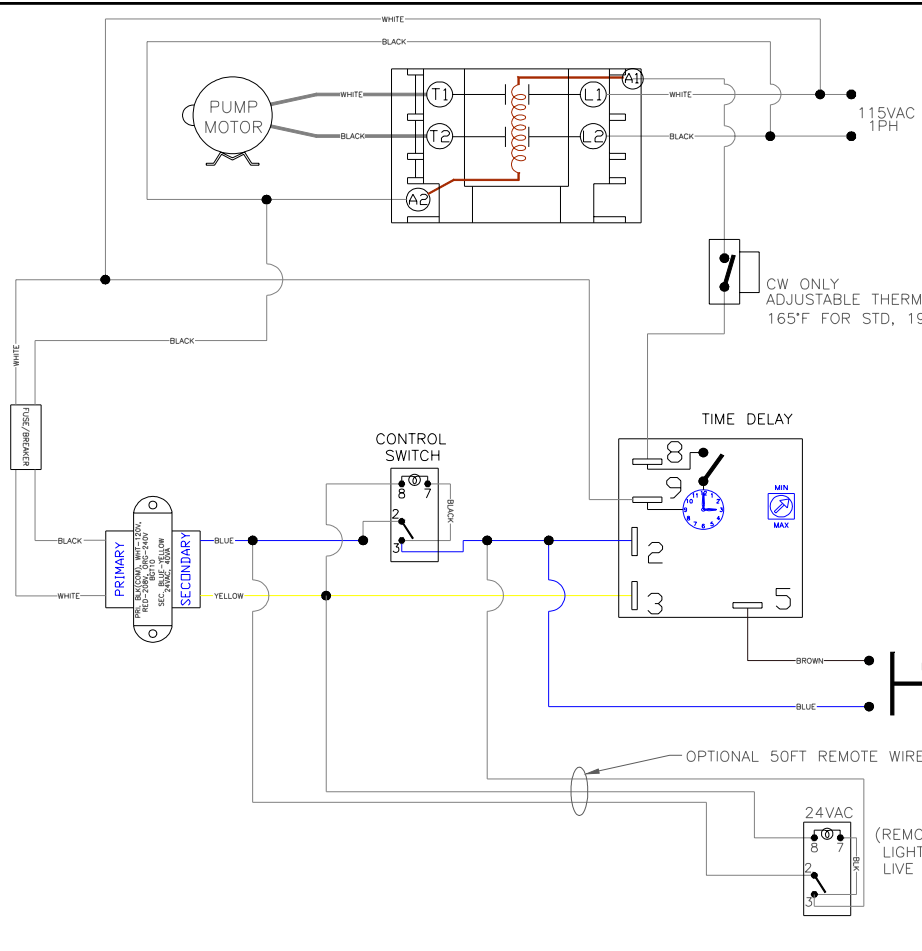
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HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 REDLANDS, CA 92374
 PH.(909)799-9222 FAX(909)799-9888

DRAWING: W-CW12003E1-CN12003E1
 DRAWING NUMBER: CN/CW 115V 1PH
 SCALE: NONE DATE: 01-10-05
 DRAWN BY: MICHAEL SLANEY Rev. #:
 APPROVED BY:

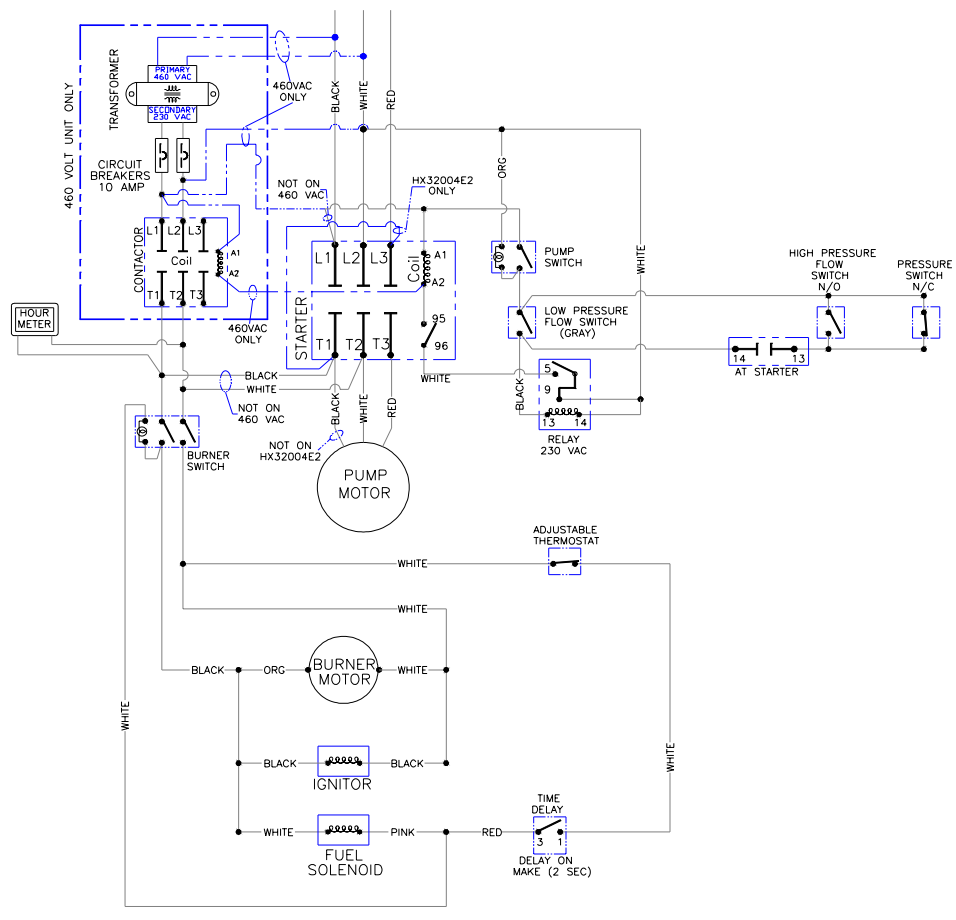
REVISIONS:		
DATE:	ECO:	REV:
01-10-05	1671	REL



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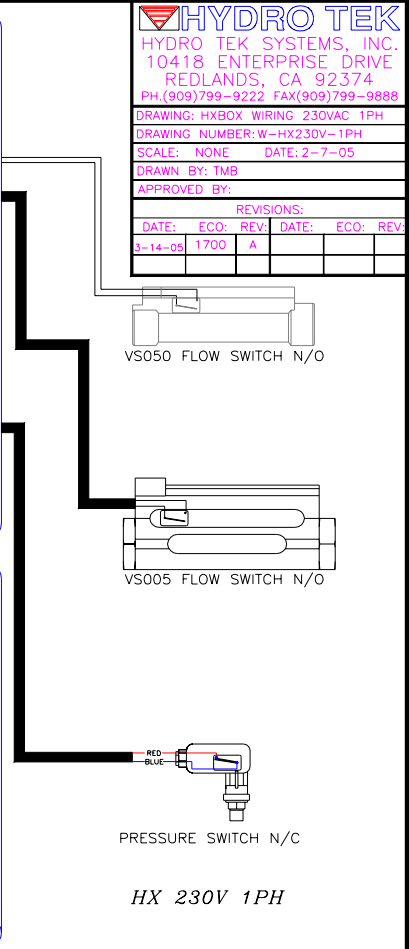
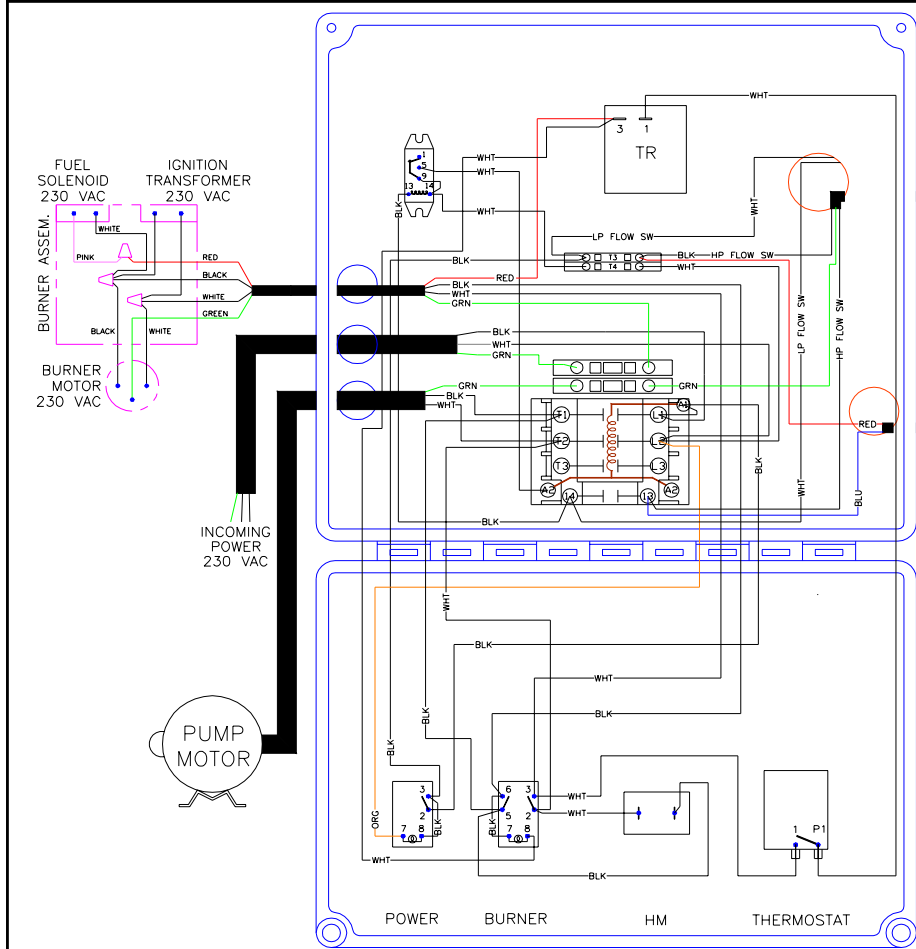
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 DRAWING NUMBER: WC-HX
 SCALE: NONE DATE: 2-5-05
 DRAWN BY: TOM BEIGHEY Rev. #: TMR
 APPROVED BY:

REVISIONS:		
DATE:	ECO:	REV:
3-14-05	1700	A



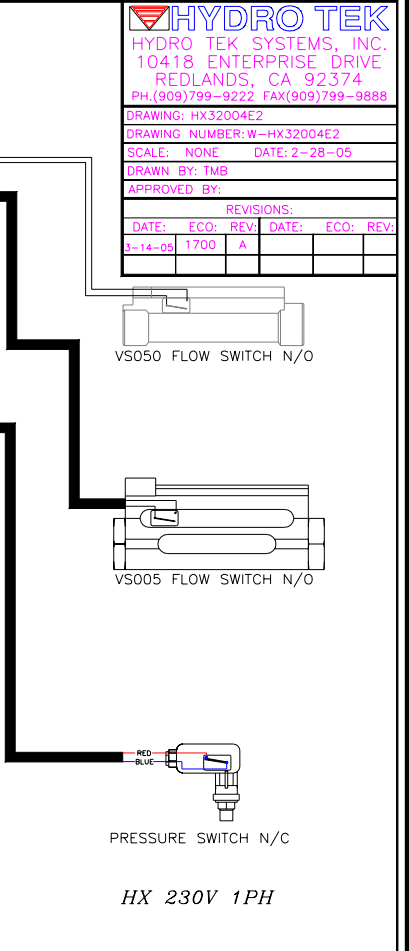
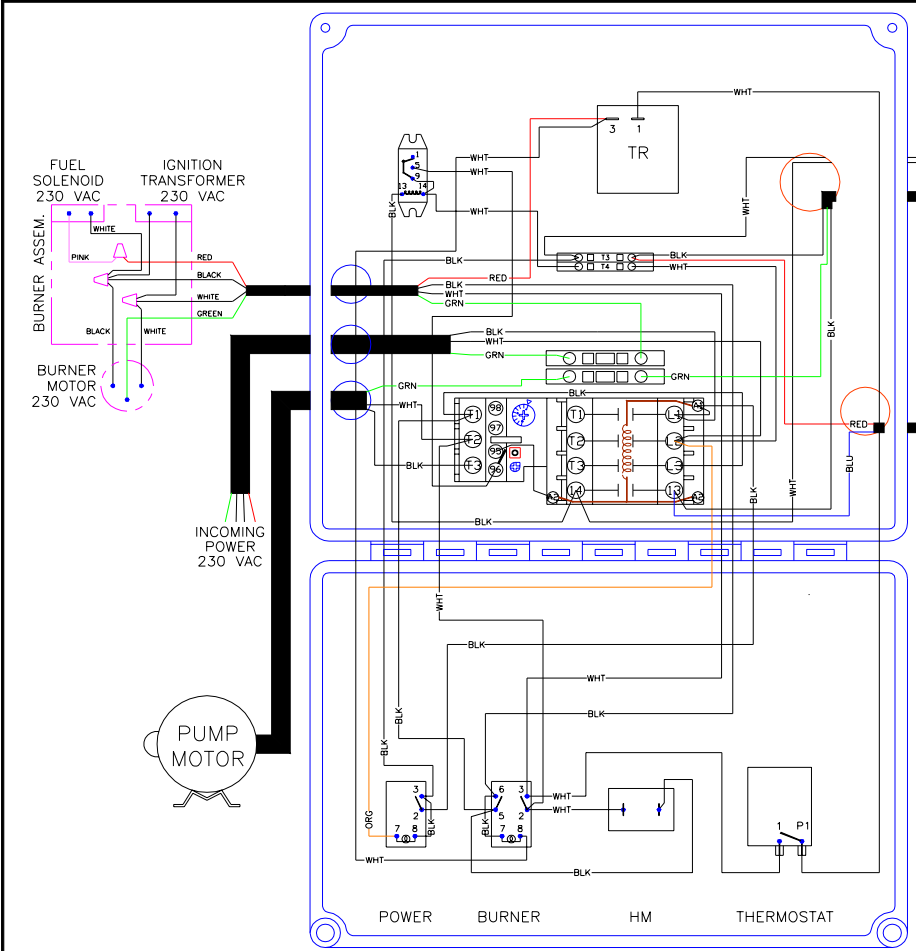
HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 REDLANDS, CA 92374
 PH (909)799-9222 FAX(909)799-9888

DRAWING: HXBOX WIRING 230VAC 1PH	
DRAWING NUMBER: W-HX230V-1PH	
SCALE: NONE	DATE: 2-7-05
DRAWN BY: TMB	
APPROVED BY:	
REVISIONS:	
DATE:	ECO: REV: DATE: ECO: REV:
3-14-05	1700 A



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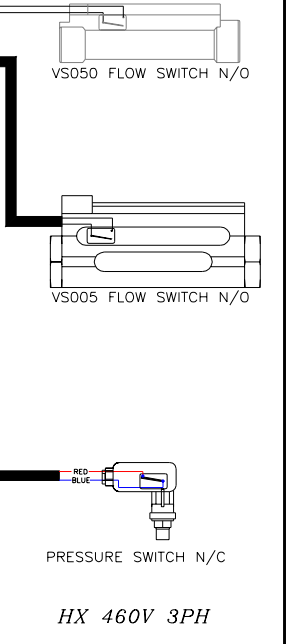
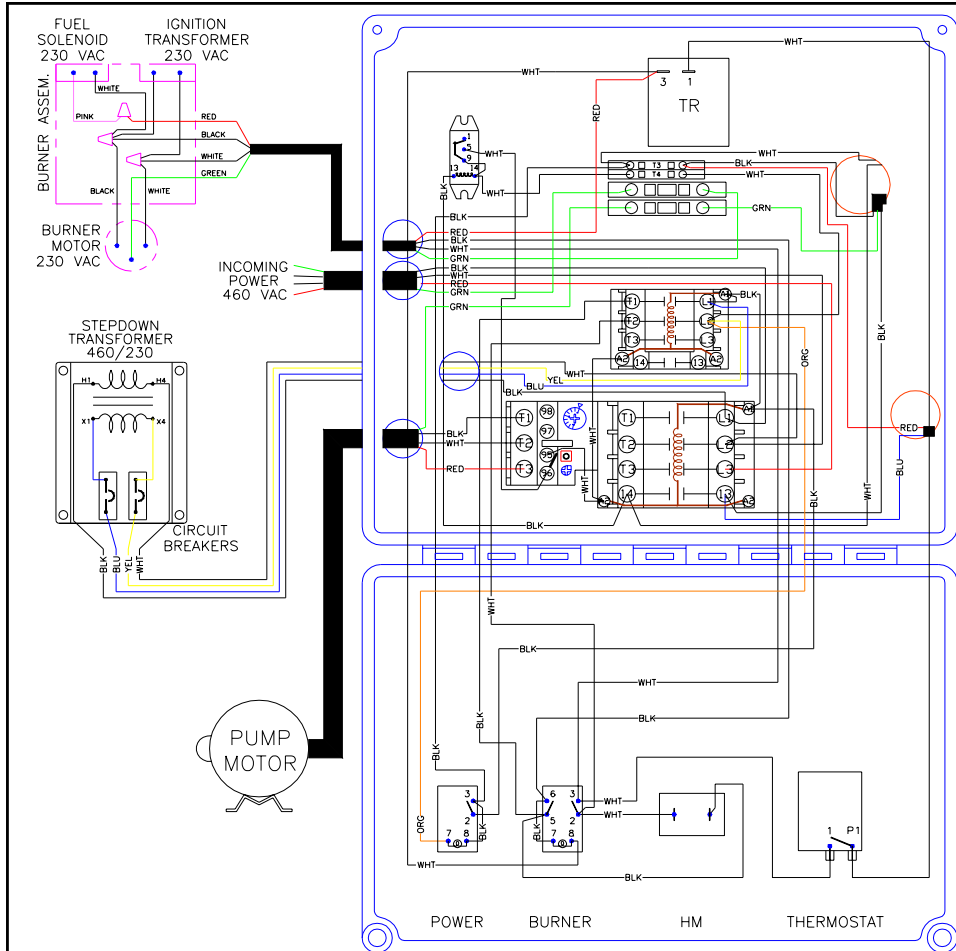
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APPROVED BY:	
REVISIONS:	
DATE:	ECO: REV: DATE: ECO: REV:
3-14-05	1700 A



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 REDLANDS, CA 92374
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DRAWING: HX 460V 3PH BLOCK DIAGRAM
 DRAWING NUMBER: W-HX460V-3PH
 SCALE: NONE DATE: 2-14-05
 DRAWN BY: TMB
 APPROVED BY:

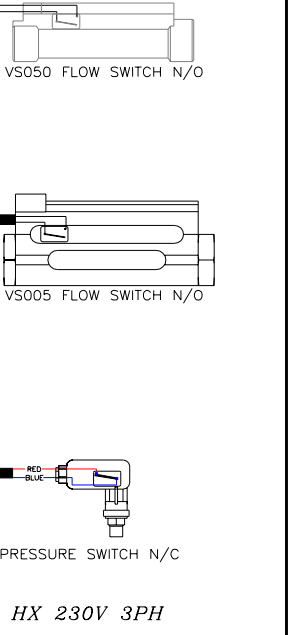
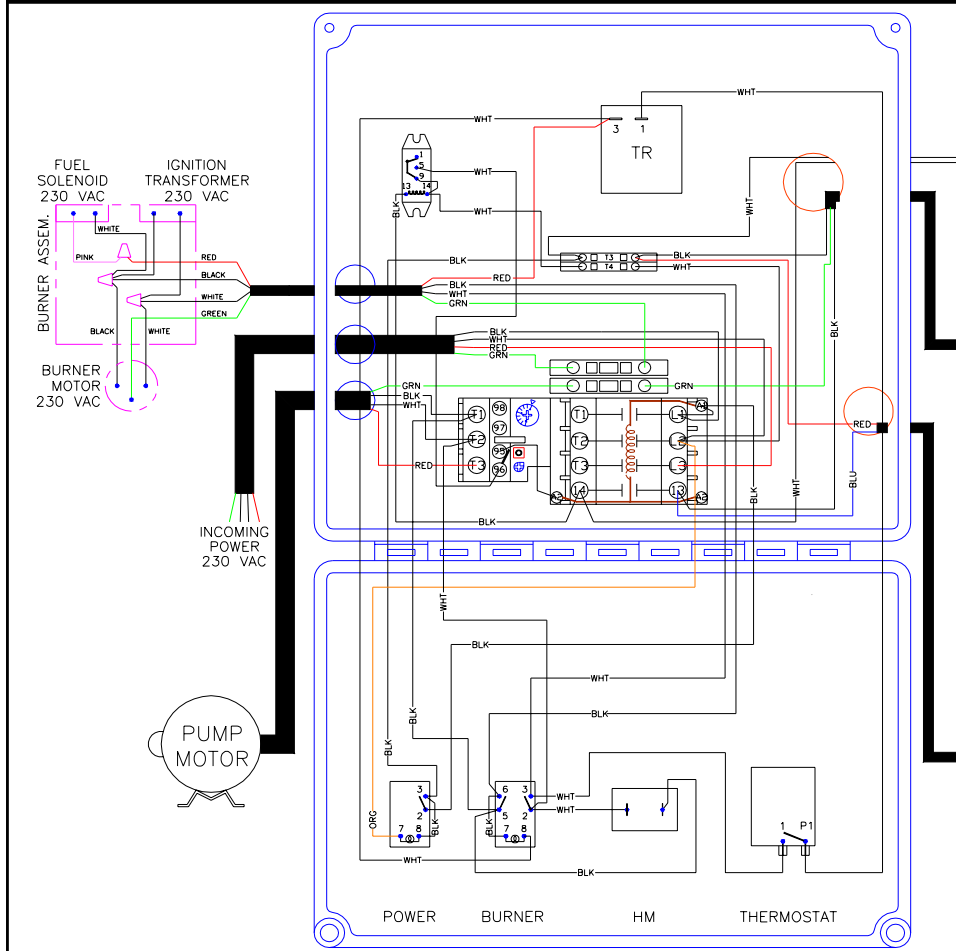
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DATE:	ECO:	REV:
3-14-05	1700	A

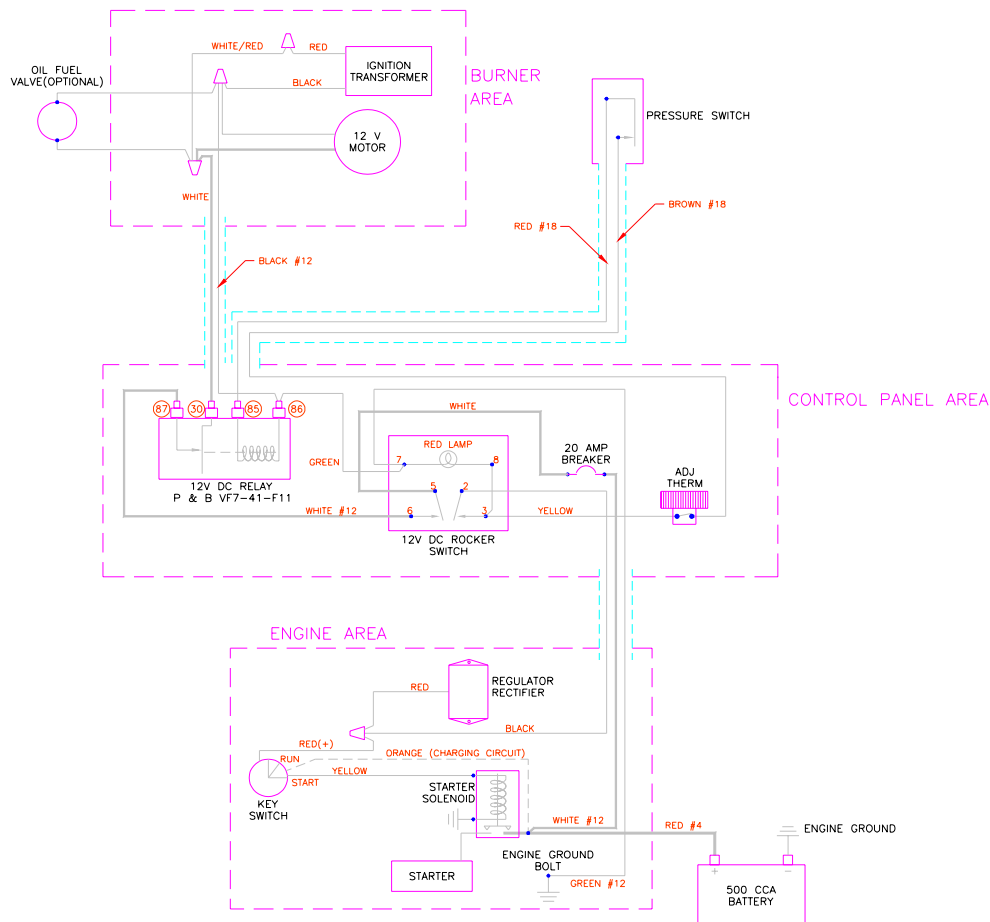
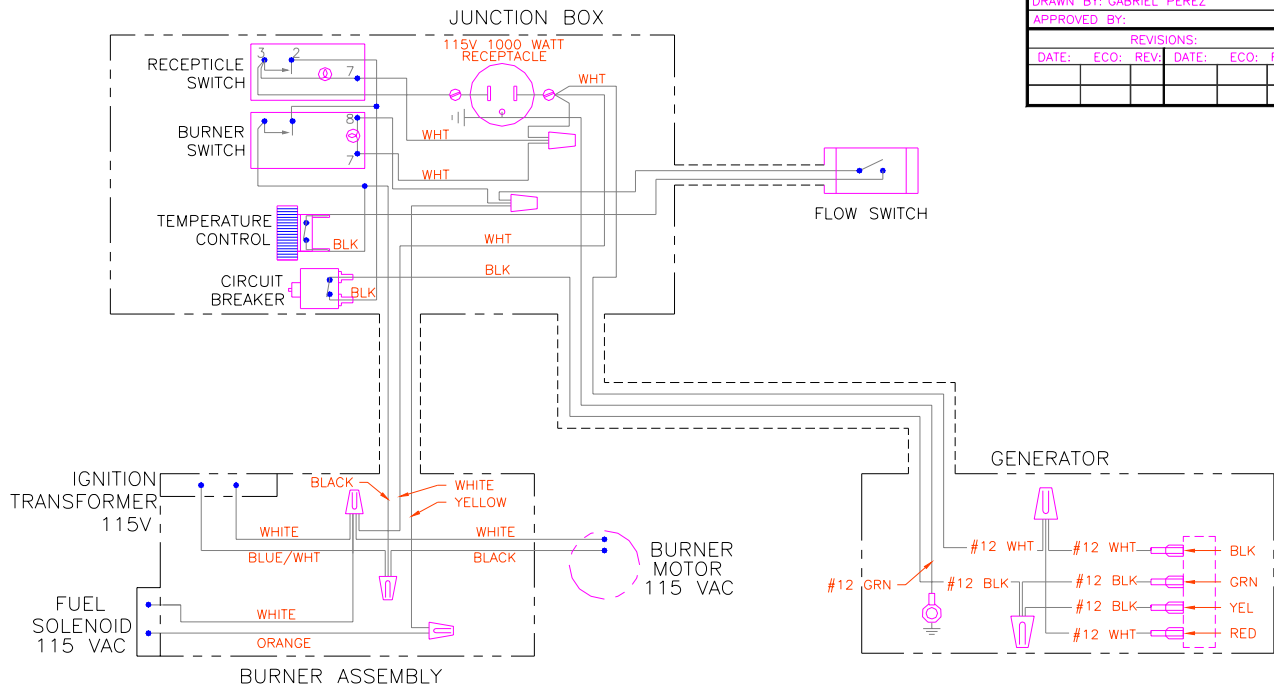


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 REDLANDS, CA 92374
 PH.(909)799-9222 FAX(909)799-9888

DRAWING: HXBOX WIRING 230VAC 3PH
 DRAWING NUMBER: W-HX230V-3PH
 SCALE: NONE DATE: 3-27-00
 DRAWN BY: TMB
 APPROVED BY:

REVISIONS:		
DATE:	ECO:	REV:
3-14-05	1700	A

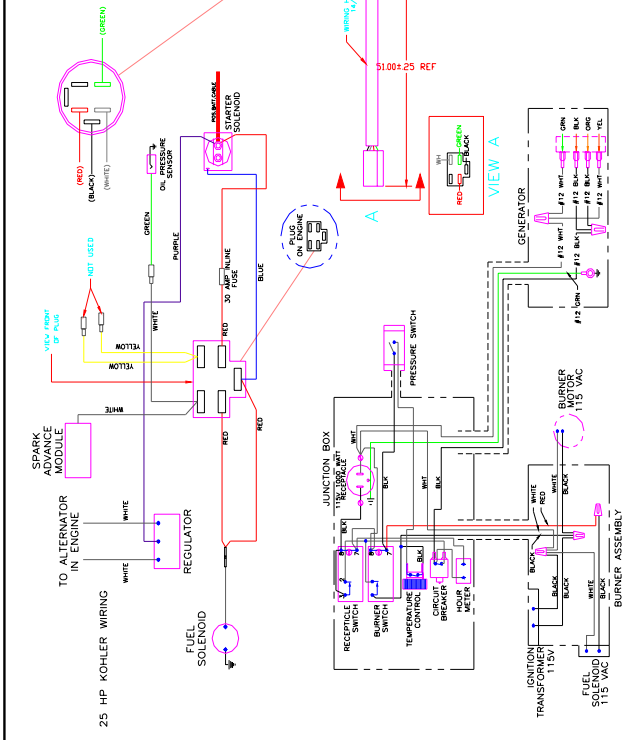




HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 SAN JOSE, CA 95131
 PH: (408) 799-1222 FAX: (408) 799-1888

DRAWING NUMBER: W-2525HP
 SCALE: NONE DATE: 1-27-00
 APPROVED BY: BOB KOCH 1-27-00

REVISIONS:
 DATE: EOD: REV: DATE: EOD: REV:
 1-27-00 1030 A



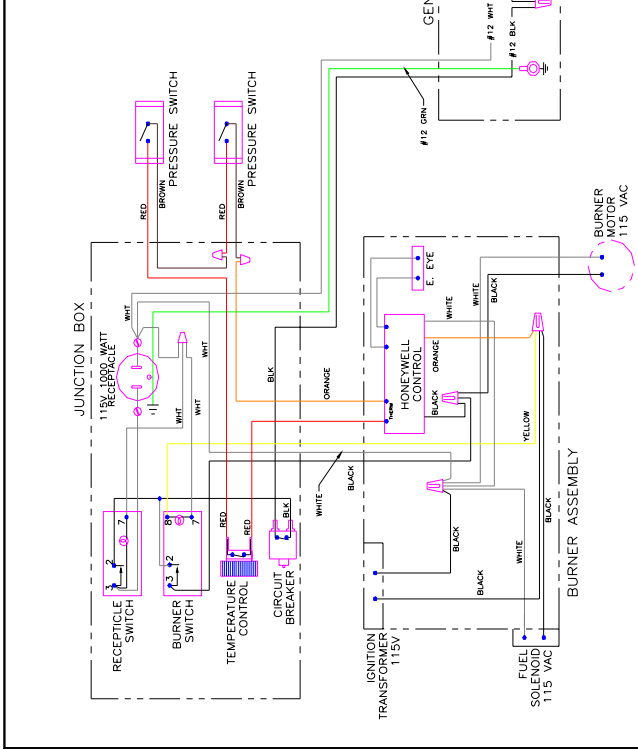
HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 SAN JOSE, CA 95131
 PH: (408) 799-1222 FAX: (408) 799-1888

DRAWING NUMBER: W-1805S-BURNER

SCALE: NONE DATE: 8-19-97

APPROVED BY: MICHAEL WENZEL

REVISIONS:
 DATE: EOD: REV: DATE: EOD: REV:
 8-19-97 727 1 A



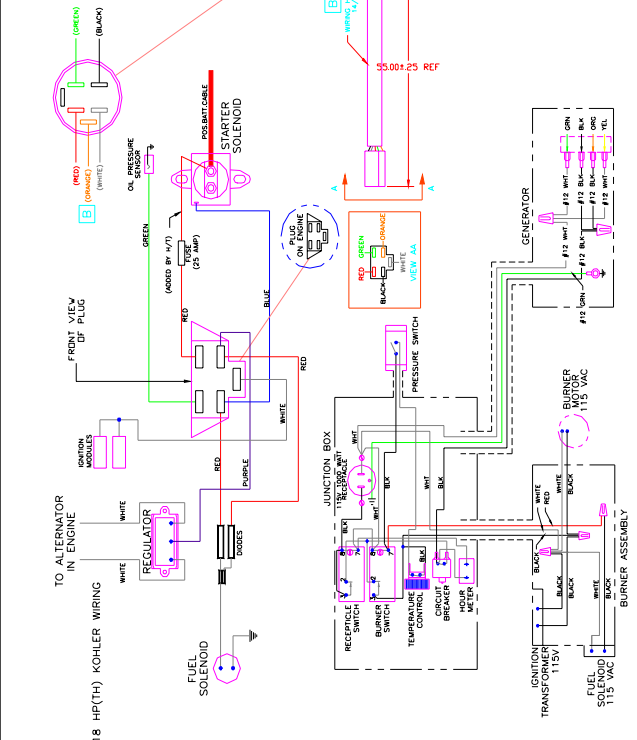
HYDRO TEK
 HYDRO TEK SYSTEMS, INC.
 10418 ENTERPRISE DRIVE
 REDLANDS, CA 92374
 PH: (909) 799-1222 FAX: (909) 799-1888

DRAWING NUMBER: W-2525HP

SCALE: NONE DATE: 8-11-94

APPROVED BY: CARROLL PEREZ

REVISIONS:
 DATE: EOD: REV: DATE: EOD: REV:
 8-11-94 1024 A



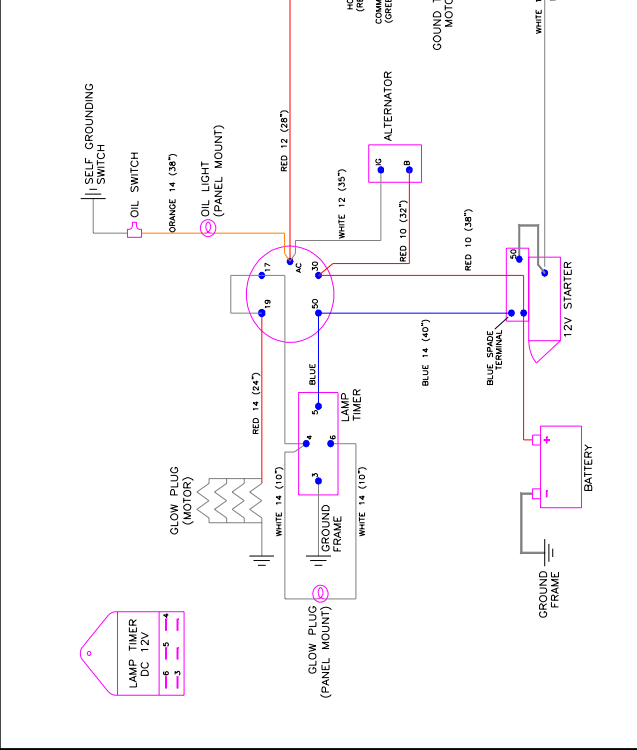
HYDRO TEK
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 10418 ENTERPRISE DRIVE
 REDLANDS, CA 92374
 PH: (909) 799-1222 FAX: (909) 799-1888

DRAWING NUMBER: W-1805S-BURNER

SCALE: NONE DATE: 8-18-97

APPROVED BY: CARROLL PEREZ

REVISIONS:
 DATE: EOD: REV: DATE: EOD: REV:
 8-18-97 727 1 A



PREVENTATIVE MAINTENANCE:

While your pressure washer has been produced with quality materials and craftsmanship, you as the owner have certain responsibilities for the correct care of the equipment. Attention to regular preventative maintenance procedures will assist in preserving the performance of your

equipment. Contact your Hydro Tek dealer for maintenance. A small investment in preventative maintenance will add many hours to the life of your pressure washer. Perform maintenance more often under severe conditions. Do not spray high pressure water onto the machine. **Not all maintenance items apply to all machines.**

MAINTENANCE SCHEDULE**

Engine Oil*	Inspect	Daily
	Change	After first 8 hours then every 50 hours. Every 25 hours in high ambient temperature
	Filter	Every 100 hours
Air Cleaner	Inspect	Every 50 hours
	Clean	Every 3 months
Diesel Engine Coolant Ck.	Check daily	(maximum 50% antifreeze)
Battery Level	Check monthly. 12VDC Burner Systems: replace battery every 2 years	
Engine Fuel Filter	500 hrs or 6 months	
Spark Plug Maint.	500 hrs or 6 months	
Clean Fuel Tank(s)	Annually	
Replace Fuel Lines	Annually	
Pump Oil*	Inspect	Daily
	Change	After first 25 hours, then every 6 months or 500 hours
Clean Burner Filter	Monthly	(More often if fuel quality is poor)
Remove Burner Soot	Annually	
Burner Adjustment/Cleaning	Annually	
Descale Coil	Annually-(More often if required)	
Replace Spray Nozzle	6 months	
Rplc Quick Connects	Annually	
Clean Water Screen/Filter	Weekly	
Clean Float/Supply Tank	Every 6 months	
Replace HP Hose	Annually	
Belts	Tighten	6 months
	Inspect/Replace	Annually
Trailer Tires/Bearings	Monthly (Check tires for condition, tighten lug nuts, grease & check bearings)	

MAINTENANCE INFORMATION

DESCRIPTION	OIL TYPE	CAPACITY	FUEL	CAPACITY
Gas Engine	10W-30	.63 to 3qt	Gasoline	8qt to 7 gal
Diesel Engine Kubota	10w-30wAPI cc/cd	3.25qt	Diesel #2	7gal
Pump, Cat	Cat Hydraulic, non-detergent 10w-40	11-42oz		
Pump, AR	Non detergent sae 30w	10-41oz		

**Check the engine manufacturer's service guide for additional maintenance items.