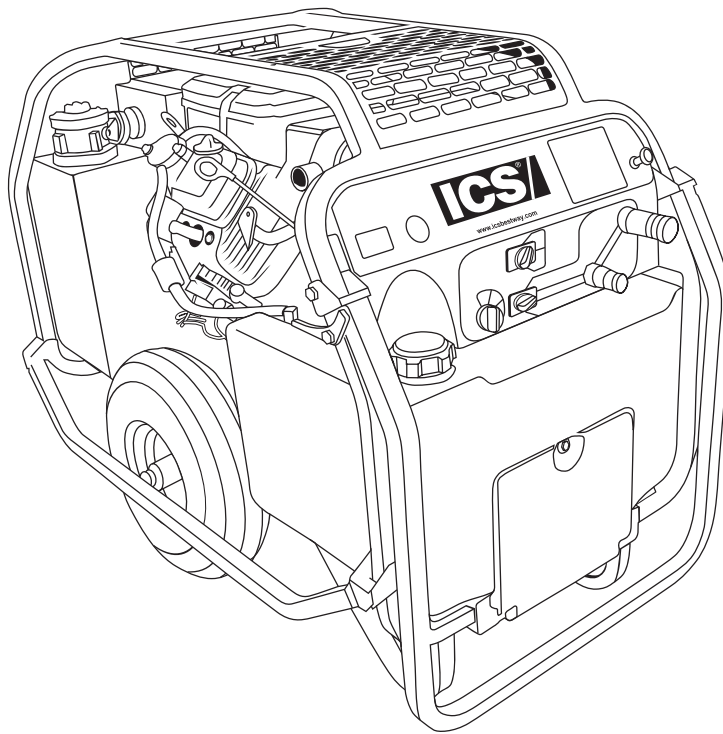




P95

MultiFlow Hydraulic Powerpack



OPERATOR'S MANUAL

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THE FOLLOWING SYMBOLS & DEFINITIONS ARE FOUND THROUGHOUT THIS MANUAL AND ARE DESIGNED TO MAKE YOU AWARE OF POTENTIAL HAZARDS OR UNSAFE PRACTICES.

⚠ WARNING

A potentially hazardous situation exists which, if not avoided, could result in death or serious injury.

⚠ CAUTION

A potentially hazardous situation exists which, if not avoided, may result in minor or moderate injury or property damage.

IMPORTANT

A potential situation exists which, if not avoided, may result in product or property damage.

THE FOLLOWING SYMBOLS & LABELS MAY BE FOUND IN THIS MANUAL OR ON THE SAW



Read the operator's manual carefully and understand the contents before you use this equipment.



Always use:

- Protective helmet
- Ear protection
- Protective glasses or full face protection



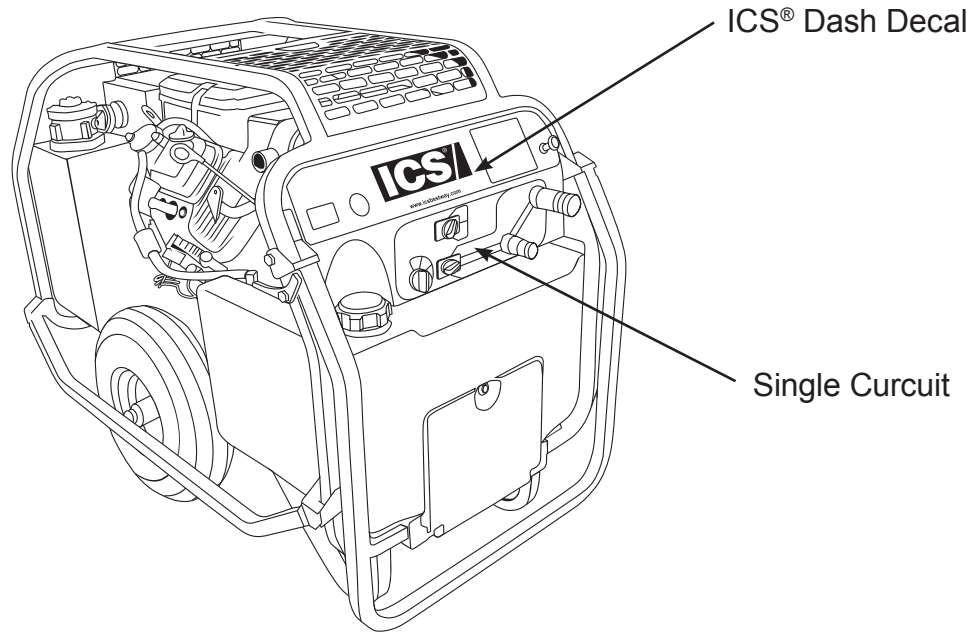
Wear hand protection

GENERAL SAFETY PRECAUTIONS

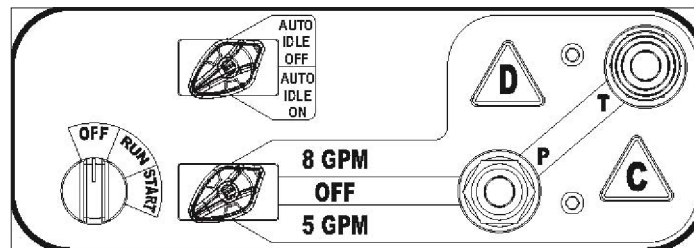
- Operator must start in a work area without bystanders. The operator must be familiar with all prohibited work areas such as excessive slopes and dangerous terrain conditions.
- Establish a training program for all operators to ensure safe operation.
- Do not operate the power unit unless thoroughly trained or under the supervision of an instructor.
- Always wear safety equipment such as goggles, ear, head protection, and safety shoes at all times when operating the power unit and a hydraulic tool.
- Do not inspect or clean the power unit while it is running. Accidental engagement of the unit can cause serious injury.
- Always use hoses and fittings rated at 2500 psi (172 bar) with a 4 to 1 safety factor. Be sure all hose connections are tight.
- Be sure all hoses are connected for correct flow direction to and from the tool being used.
- Do not inspect hoses and fittings for leaks by using bare hands. "Pin-hole" leaks can penetrate the skin.
- NEVER OPERATE THE POWER UNIT IN A CLOSED SPACE. Inhalation of engine exhaust can be fatal.
- Do not operate a damaged, improperly adjusted power unit.
- Never wear loose clothing that can get entangled in the working parts of the power unit.
- Keep all parts of your body away from the working parts of the power unit.
- Keep clear of hot engine exhaust.
- Do not add fuel to the power unit while the power unit is running or is still hot.
- Do not operate the power unit if gasoline odor is present.
- Do not use flammable solvents around the power unit engine.
- Do not operate the power unit within 3.3 ft (1 m) of buildings, obstructions or flammable objects.
- Do not reverse tool rotation direction by changing fluid flow direction.
- Allow power unit engine to cool before storing in an enclosed space.
- Always keep critical tool markings, such as labels and warning stickers legible.
- To avoid personal injury or equipment damage, all tool repair, maintenance and service must only be performed by authorized and properly trained personnel.

Engine	18 hp Briggs
Capacity	One 5 gpm (19 l/min) Circuit One 8 gpm (30 l/min) Circuit
Length	36 inches (91.4 cm)
Width	23 inches (58.4 cm)
Height	29.5 inches (74.9 cm)
Weight (wet)	330 lbs (149.6 kg)
Fuel Tank Capacity	7 gal (26.5 ltr)
Estimated Gas Consumption per Hour	1.3 gal (4 ltr)
Hydraulic Reservoir Capacity	3 gal (11 ltr)
Relief Valve "crack" Setting	2,100 psi (145 bar)
Full Relief Setting	2,500 psi (172 bar)
HTMA Category	"C" (20 l/min @ 138 bar) "D" (30 l/min @ 138 bar)
Sound Power Level	104 dBA

TOOLS STICKERS AND TAGS



Single Circuit



HYDRAULIC HOSE REQUIREMENTS

Hydraulic hose types authorized for use with the P95 are as follows:

- Certified non-conductive ❶
- Wire-braided (conductive) ❷
- Fabric-braided (not certified or labeled non-conductive) ❸

Hose ❶ listed above is the only hose authorized for use near electrical conductors.

Hose ❷ and ❸ listed above are conductive and must never be used near electrical conductors.

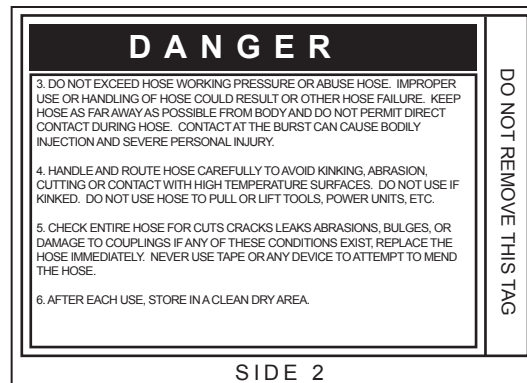
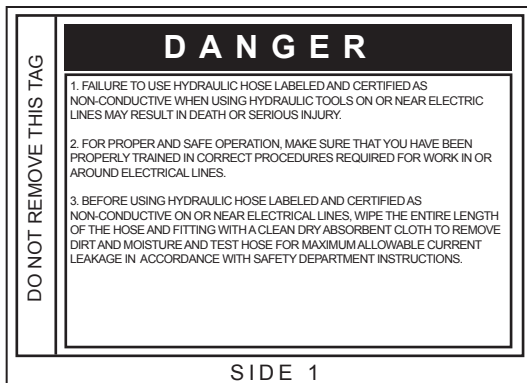
HOSE SAFETY TAGS

To help ensure your safety, the following DANGER tags are attached to all hoses purchased from ICS.

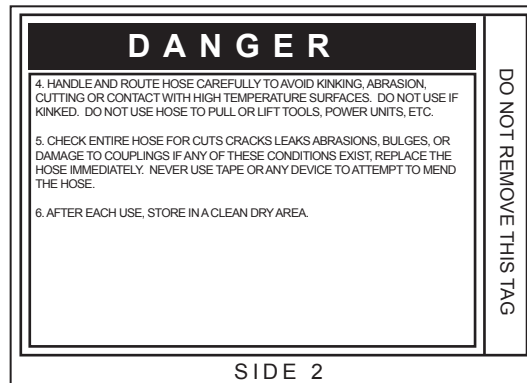
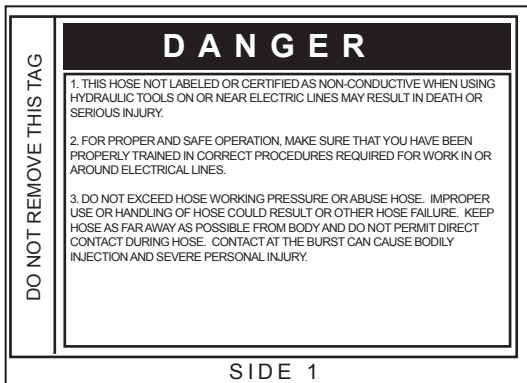
DO NOT REMOVE THESE TAGS

If the information on the tag is illegible because of wear or damage, replace the tag immediately. A new tag maybe obtained from your ICS Distributor.



THE TAG SHOWN BELOW IS ATTACHED TO "CERTIFIED NON-CONDUCTIVE" HOSE



THE TAG SHOWN BELOW IS ATTACHED TO "CONDUCTIVE" HOSE



HTMA REQUIREMENTS

	TOOL CATEGORY			
Hydraulic System Requirements	 TYPE I	 TYPE II	TYPE III	TYPE RR
Flow Rate	4-6 gpm (15-23 l/min)	7-9 gpm (26-34 l/min)	11-13 gpm (42-49 l/min)	9-10.5 gpm (34-40 l/min)
Tool Operating Pressure (at the power supply outlet)	2000 psi (138 bar)	2000 psi (138 bar)	2000 psi (138 bar)	2000 psi (138 bar)
System Relief Valve Setting (at the power supply outlet)	2100-2250 psi (145-155 bar)	2100-2250 ps (145-155 bar)i	2100-2250 psi (145-155 bar)	2200-2300 psi (152-159 bar)
Maximum Back Pressure (at the tool end of the return hose)	250 psi (17 bar)	250 psi (17 bar)	250 psi (17 bar)	250 psi (17 bar)
Measured at max. fluid viscosity of: (at min. operating temperature)	400 SSU* (82 CST)**	400 SSU* (82 CST)**	400 SSU* (82 CST)**	400 SSU* (82 CST)**
Temperature Sufficient heat rejection capacity to limit max. fluid temperature to: (at max. expected ambient temp.)	140° F (60° C)	140° F (60° C)	140° F (60° C)	140° F (60° C)
Minimum Cooling Capacity (at a temperature difference of between ambient and fluid temps)	3 hp (2.24 kW) 40° F (22° C)	5 hp (3.73 kW) 40° F (22° C)	7 hp (4.47 kW) 40° F (22° C)	6 hp (5.22 kW) 40° F (22° C)
NOTE: DO NOT operate the tool at oil temperature above 140° F (60° C). Operation at higher temperatures can cuase operator discomfort at the tool.				
Filter	25 microns	25 microns	25 microns	25 microns
Minimum Full-Flow Filtration Sized for Flow at Least: (for cold temp. start-up and max. dirt holding capacity)	30 gpm (114 l/min)	30 gpm (114 l/min)	30 gpm (114 l/min)	30 gpm (114 l/min)
Hydraulic Fluid (Petroleum based; premium grade, anti-wear, non conductive)	100-400 SSU* (20-82 CST)**	100-400 SSU* (20-82 CST)**	100-400 SSU* (20-82 CST)**	100-400 SSU* (20-82 CST)**
NOTE: When choosing hydraulic fluid, the expected oil temperature extremes that will be experienced win service determine the most suitable temperature viscosity characteristics. Hydraulic fluids with a viscosity index over 140 will meet the requirements over a wide range of operating temperatures.				
*SSU = Saybolt Seconds Universal **CST = Centistokesl				
NOTE: These are general hydraulic sysem requirements. See tool Specification page (page 6) for tool specific requirements.				

OPERATION

Do not operate the power until you have read the operating manual.

1. Crankcase Oil Level: Always check the oil level before starting the engine. Make sure the oil level is at the FULL MARK on the dipstick. Do not overfill. Use detergent oil classified "For Service SE, SF, SG" as specified in the engine operating and maintenance manual. See engine manual for oil viscosity grade.
2. Engine Fuel Level: Check the fuel level. If low, fill with un-leaded gasoline with a minimum of 85 octane.
3. Hydraulic Fluid: Check the dip stick in the hydraulic fluid reservoir for the proper fluid level. Use fluids meeting the following specifications.

U.S.A.	Metric
50°F - 450 SSU Maximum	10°C - 95 CST Maximum
100°F - 130-200 SSU	38°C - 27-42 CST
140°F - 85 SSU Minimum)	60°C - 16.5 CST Minimum

Pour Point	-10°F (-23°C) Min. (cold start up)
Viscosity Index	(ASTM D-2220) 140 Min.
Demulsibility	(ASTM D-1401) 30 Minutes Max.
Flash Point	(ASTM D-92) 340°F (171°C) Min.
Rust Inhibition	(ASTM D-665 A&B) Pass
Oxidation	(ASTM D-943) 1,000 Hrs. Min.
Pump Wear Test	(ASTM D-2882) 60 mg Max.

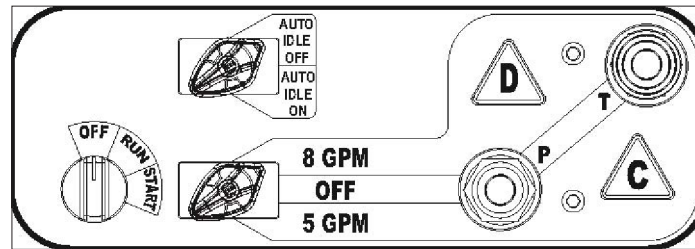
The following fluids work well over a wide temperature range, allow moisture to settle out and resist biological growth that may occur in cool operating hydraulic circuits. These fluids are recommended by ICS. Other fluids that meet or exceed the specifications of these fluids may also be used.

Chevron	AW-MV-32
Exxon	"Univis" J-26
Mobile	D.T.E. 13
Gulf	"Harmony" AW-HVI-150-32
Shell	"Tellus" T-32
Texaco	"Rando" HD-HZ
Union	"Unax" AW-WR-32
Terresolve	EnviroLogic 132

3. The recommended hose length is 25 ft (8 m) with a 1/2 inch (12.7 mm) inside diameter. The hoses must have a working pressure rating of at least 2500 psi/175 bar. Each hose end must have male thread ends compatible with H.T.M.A. (HYDRAULIC TOOL MANUFACTURERS ASSOCIATION) quick disconnect fittings (NPT type threads).

OPERATION

Facing the panel control valve, the bottom male quick disconnect fitting is the PRESSURE FLUID OUT fitting. The top female quick disconnect fitting is the RETURN FLUID IN fitting.



QUICK DISCONNECT COUPLERS

H.T.M.A. approved quick disconnect couplings are installed to hydraulic hoses so that the direction of oil flow is always from the male to the female quick disconnect as shown in figure 2. Quick disconnect couplings and hose fittings are selected so that additional fittings such as reducer or adapter fittings are not required.

If adapter fittings are used, they must be approved steel hydraulic fittings meeting a minimum operating pressure rating of 2500 psi (172 bar). Do not use galvanized pipe fittings or black pipe fittings.

Use thread tape or pipe joint compound when installing quick disconnect couplings to hose or tool fittings. Follow the instructions furnished with the selected thread sealant.

DO NOT OVERTIGHTEN THE FITTINGS.

The supplied 12 Volt DC battery is a non-spillable, maintenance-free battery and is fully charged.

Make sure the battery cables are tight and charging circuit functions are operating properly.

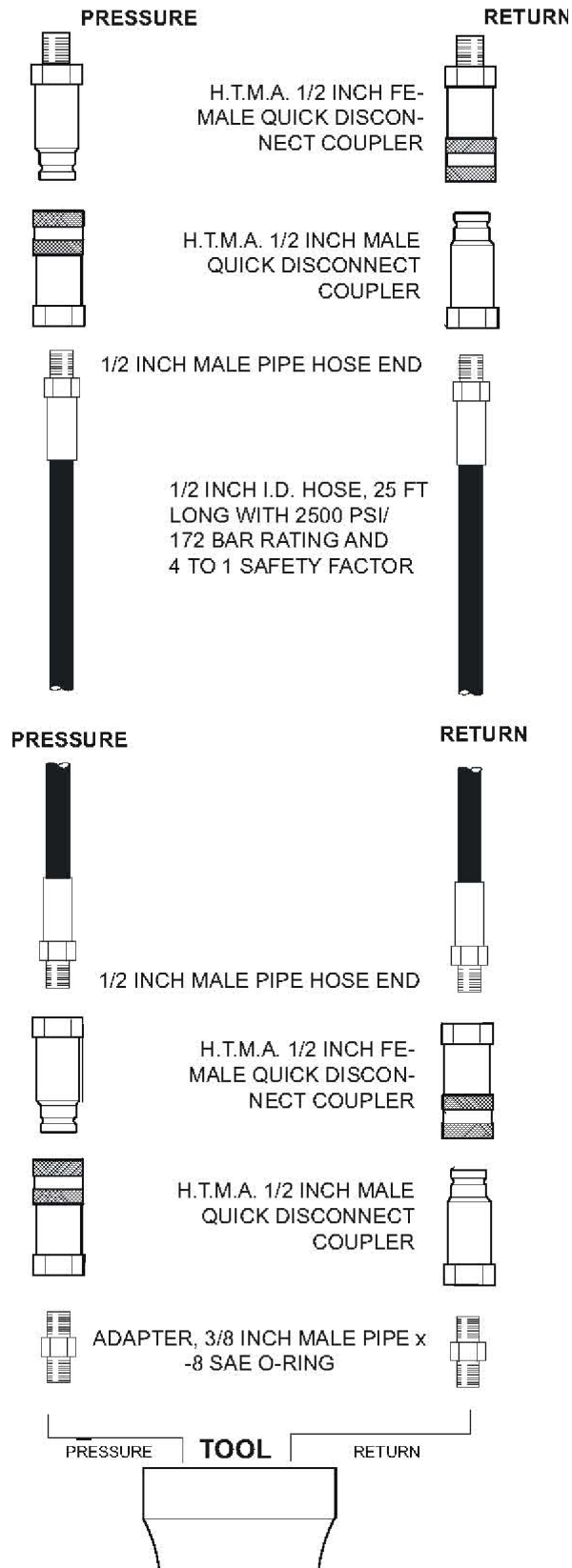
NOTICE

Do not charge the battery with a standard automotive battery charger. This type of charger produces a charging amperage higher than 2 amps. Charging the battery at higher than 2 amps will damage the battery.

NOTICE

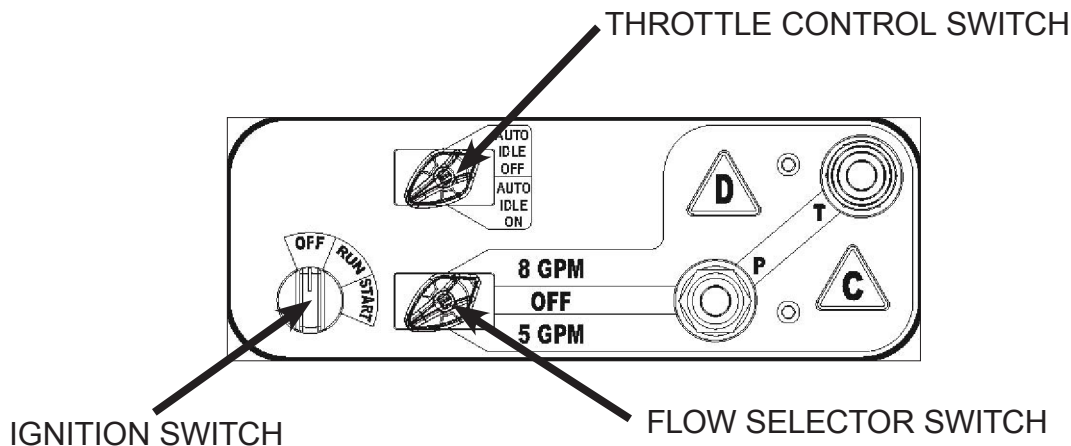
If the engine runs out of gas or dies during operation and the ignition switch is left in the ON or RUN position, this could drain the battery. Make sure the ignition switch is returned to the OFF position.

CONTROL PANEL



CONTROLS

This unit is equipped with an advanced proportional engine control system. It provides a means of controlling engine speed by adjusting the fuel control lever with an actuator. The Power Unit provides one circuit, with an oil flow of 5 gpm (19 l/min) up to 2000 psi (140 bar) or 8 gpm (30 l/min) up to 2000 psi (140 bar) with a factory-programmed electronic governed engine throttle.



One hydraulic tool can be connected to the tool circuit. The circuit is activated by turning the flow control switch to either the 5 gpm (19 l/min) or 8 gpm (30 l/min) setting.

THROTTLE CONTROL

The throttle control permits the operator to select one of 2 operating modes after the engine has warmed up. When starting the engine, make sure the flow selector switch is in the OFF position. The throttle control switch can be set in either the AUTO-IDLE-ON or AUTO-IDLE-OFF positions.

AUTO-ON

When the throttle control switch is in the "AUTO-ON" position, the oil flow is regulated automatically when the trigger on the tool is activated. When the tool is not being used the engine will return to idle automatically, after a 10 second delay. This setting will produce 5 gpm (19 l/min) or 8 gpm (30 l/min) depending on which position the operator has selected with the flow selector switch.

AUTO-OFF

When the throttle control switch is in the "AUTO-OFF" position, the engine speed is held to maintain 5 gpm/19 l/min or 8 gpm/30 l/min depending on which position the operator has selected with the flow selector switch. When a tool is not being used the engine will not return to idle until either the flow selector switch is turned to the OFF position or the throttle control switch is turned to AUTO-ON. Note: It may be necessary to reset the Controller.

At times it may be necessary to reset the controller. This could happen if a fault occurs in the controller. For example, excessive engine speed. If a fault does occur the power unit will return to an idle and the operator will have no control of the unit. To reset the controller, simply turn off the power unit and restart it.

START UP

Before starting the engine make sure the flow selector switch is in the OFF position.

NOTE: The power unit will not start if the flow control switch is not in the "OFF" position.

- Pull choke knob out and move the Throttle Control Switch to the auto-idle-off or the auto-idle-on position, whichever mode of operation the operator prefers. Ensure the flow selector switch is in the OFF position.
- Turn the Ignition Switch to the START position. After the engine starts, release the switch.
- Gradually push in the choke knob as the engine begins to idle smoothly.
- Allow the engine to warm up.
- Connect hoses and the tool

FOR 5 gpm (19 l/min) OPERATION

- For 5 gpm (19 l/min) operation, select mode of operation with the Throttle Control switch, either auto-idle-on or the auto-idle-off position. Move the flow selector switch to the 5 gpm position.
- When finished operating the tool, move the flow selector switch to the OFF position.

FOR 8 gpm (30 l/min) OPERATION

- For 8 gpm (30 l/min) operation, select mode of operation with the Throttle Control Switch, either auto-idle-on or the auto-idle-off position. Move the flow selector switch to the 8 gpm (30 l/min) position.
- When finished operating the tool, move the flow selector switch to the OFF position.

COLD WEATHER START UP

1. Use the procedures described under "STARTUP" and then follow the procedure below.
2. Hydraulic fluids are thicker in cold weather. Therefore, it is recommended that the engine be run at low idle long enough to bring the fluid temperature up to a minimum of 50°F (10°C).
3. If the tools and tool hoses are cold, it is recommended to allow hydraulic fluid to circulate through the tool hoses until warm before using the tool.

SHUTDOWN

1. Ensure the flow selector switch in the OFF position (center position).
2. Unless already at idle the power unit should return to idle. This may take a few seconds for the unit to react due to a built-in program delay.
3. Allow the engine to idle for approximately one minute and move the Ignition Switch to the OFF position.

ROUTINE MAINTENANCE

ENGINE MAINTENANCE

Follow the maintenance schedule and general maintenance instructions in the engine maintenance and operation manual furnished with the power unit

HYDRAULIC SYSTEM MAINTENANCE

- Check hydraulic fluid level daily. Add fluid per specifications in this manual.
- Remove condensed moisture from the hydraulic fluid by pumping the hydraulic fluid into a 5 gal/20 l container through the pressure hose. Make sure the engine is at idle when performing this procedure. When the hydraulic reservoir is empty turn the engine off immediately.
- Allow the fluid to sit long enough for the water to settle to the bottom of the container. Slowly pour the fluid back into the hydraulic tank, avoiding the water at the bottom of the container.
- Each day, check hydraulic lines and fittings for leaks, kinks, etc. Do not use your hand to perform this check.
- Change the hydraulic filter element every 200 hours of operation. Change more often if cold, moist or dusty conditions exist.
- Check oil cooler for debris. Remove debris with air pressure.

STORAGE

- Clean the unit thoroughly before storage. Do not use water pressure.
- Always store the unit in a clean and dry facility.
- If the unit will be stored for a prolonged period (over 30 days), add a fuel additive to the fuel tank to prevent the fuel from gumming. Run engine for a short period to circulate the additive.
- Replace crankcase oil with new oil.
- Remove spark plugs and pour approximately 1 ounce (30 ml) of engine oil into each cylinder. Replace spark plugs and crank the engine slowly to distribute the oil.
- Check hydraulic reservoir for water. If water is found, change the oil and circulate it through the tool hose and tool.
- Disconnect tool hoses.

PROGRAMMABLE CONTROLLER

The ICS programmable controller is an electronic engine governor that provides a means of controlling and limiting engine speed by adjusting the fuel control lever with a proportional actuator.

The controller is factory programmable and has no manual adjustments.

CALIBRATION

Calibration and programming can only be done by the factory.

TROUBLESHOOTING GUIDELINES

Please follow the checklist below to troubleshoot your ICS controller.

1. Check battery voltage for stability and correct value. The LED will turn on for one second when the controller is first powered up.
2. Check the actuator linkage for binding and backlash.

CHECKING PERFORMANCE CONTROL (ELECTRICAL GOVERNOR-STATIC CHECK)

To determine whether a governor problem is being caused by the actuator or the control module, perform the following static check exactly in order shown.

A pair of jumper wires and a known good 12-volt battery is required.

1. Disconnect red and green wires from the control module to actuator.
2. Attach jumper wires from battery to RED and GREEN wires to actuator.
 - A. Attach 12 volt + (positive) to RED wire.
 - B. Attach 12 volt – (negative) to GREEN wire.
3. Actuator should move throttle lever to wide open position.
 - A. If actuator does not move it is defective. (Replace).
 - B. If actuator moves throttle to wide-open position, the module is defective. (Replace).

FAULT CODES

The ICS controller is capable of identifying certain fault conditions and alerting the user to them. A flashing LED indicates the fault conditions. The current fault code list is shown on the following page. Please note the following:

1. When power is first applied to the controller, the LED will flash just once for one second to indicate that the LED is working.
2. If there are multiple faults, the LED will flash them all in sequence. Count the flash codes to determine the fault conditions or connect the Calibration Tool to observe the fault conditions. (Use the "Display Faults" option under the Monitor Menu).
3. If there are no faults, the LED will flash once at reset and from then on indicate the detection of engine speed. A continuous ON LED indicates that a valid engine speed is being sensed.
4. The controller will attempt to shut down for some faults and will not permit starting after reset with faults 1, 5 and 8.

FLASH CODE	FAULT	ENGINE SHUTDOWN	CORRECTIVE ACTION
1	Unit not calibrated	YES	Have engine serviced by an Authorized ICS Dealer.
2	Engine speed excessive	YES	Have engine serviced by an Authorized ICS Dealer.
3	Engine speed unusually low	YES	Have engine serviced by an Authorized ICS Dealer.
4	Engine shutdown due to engine protection input	YES	Have engine serviced by an Authorized ICS Dealer.
5	Factory settings lost	YES	Have engine serviced by an Authorized ICS Dealer.
6	External pot out-of-range	NO	Have engine serviced by an Authorized ICS Dealer.
7	Accelerator position/ idle switch conflict	NO	Have engine serviced by an Authorized ICS Dealer.
8	Controller unit failed	YES	Have engine serviced by an Authorized ICS Dealer.
9	Limiting excessive actuator current	NO	Have engine serviced by an Authorized ICS Dealer.
10	Engine speed input signal missing	NO	Check speed sensor wiring. Check starter motor.
11	Auto crank unable to start engine	NO	Check fuel.
12	Auxillary output is shorted	NO	Check the lamp or relay hooked to the output. If fault is still present, have engine serviced by and ICS Authorized Dealer.
13	Auxillary output #2 is shorted	NO	Check the lamp or relay hooked to the output. If fault is still present, have engine serviced by and ICS Authorized Dealer.
14	Actuator disconnected or open circuit	NO	Check actuator wiring and actuator resistance. Resistance should be less than 10 ohms.

TESTING

GENERAL

Tests and adjustments should be performed periodically to ensure the power unit is operating at maximum efficiency. ICS Circuit Tester is recommended. This tester can be used to isolate problems in both the engine and hydraulic system prior to any power unit disassembly.

TESTING THE HYDRAULIC CIRCUIT

The following tests can be performed to ensure that the hydraulic pump is supplying the correct flow and pressure and that the system relief valve is operating properly.

During these tests, make sure the engine is warm and operating smoothly. If test results are not as specified, refer to the troubleshooting table in this section for possible causes.

TESTING THE 5 GPM HTMA TYPE 1 CIRCUIT OR THE 8 GPM TYPE 11 CIRCUIT

To test the circuit, proceed as follows:

1. Set the flow selector switch to the OFF (center) position.
2. Set the throttle control switch to AUTO-OFF position.
3. Connect the ICS Circuit Tester across two hose ends (where the tool would normally be connected).
4. Fully open the tester restrictor valve (counterclockwise).
5. Start the engine and allow it to run until warm.
6. Switch the flow selector switch to 5 or 8 gpm depending on which flow you are testing.
7. With the engine at the programmed speed, the test flow gauge should read 4-6 gpm (15-23 l/min) or 7-9 gpm (26.5-34 l/min).
8. Slowly turn the restrictor valve clockwise while watching the pressure gauge. The flow rate should stay at 4-6 gpm (15-23 l/min) or 7-9 gpm (26.5-34 l/min) as the pressure gauge reaches 2100-2200 psi (148-155 bar).
9. At 2100-2200 psi (148-155 bar), the relief valve should begin to open. The pressure at which the relief valve just begins to open is commonly referred to as the "cracking pressure". At the "cracking pressure," the flow rate should start to drop because the relief valve is allowing fluid to by-pass to the hydraulic reservoir. The "cracking pressure" is preset at the factory and if it is not within the above range, the relief valve must be re-set as follows:
 - A. The relief valve is located on the right side of the unit just behind the dash panel. It protrudes out from the manifold assembly. Use an open end or box end wrench to loosen the nut on the relief valve.
 - B. Use an Allen wrench to adjust the relief valve. Turn clockwise to raise the pressure and counterclockwise to reduce the pressure. Use an Allen wrench to adjust the relief valve. Turn clockwise to raise the pressure and counterclockwise to reduce the pressure.
 - C. Tighten the nut and retest.

TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
Engine will not start	Flow selector switch not in the OFF position	Make sure the flow selector switch in the OFF position when starting
	Battery not connected	Attch battery cables, check wires
	Weak battery	Test battery, charge or replace
	No fuel	Add fuel
	Fuel filter plugged	Replace fuel filter
	Defective spark plugs	Remove plugs, check gap, clean or replace
Fluid blowing out of fluid reservoir vent	Hydraulic tank overfilled	Correct the fluid level
	Pump suction leak	Check suction connections, Tighten
Hydraulic tool won't operate	Flow selector switch not switched ON	Check that the flow selector switch is set to 5 or 8 gpm
	Incorrect hose connection tool	Make sure the tool hose circuit goes from left (pressure) fitting to tool and back to the right fitting (return), fluid always flows form the male to the female fittings
	Quick disconnect fittings defective	Detach from hose, connect set together and check for free flow
	Hydraulic fluid level low	Check for correct fluid level, fill using the recommended fluid
	Pump coupling defective	With the engine not running, check the coupling between the pump and engine that is engaged and is not damaged CAUTION: keep hands clear of rotating objects
	Relief valve stuck open	Adjust or replace valve
	Suction hose kinked	Make sure suction hose from fluid reservoir to pump inlet has a smooth curve
	Solenoid not working	Check solenoid operation and electrical connections
	Tool is defective	Refer to tool manul

P95 OPERATOR'S MANUAL

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