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FREQUENCY OF OIL CHANGES

If your oil gets dark in color, or begins to get a different odor, feel the oil between your fingers. New oil will be slick, while worn-out oil loses lubricity, and may even feel tacky to the touch. Oil changes should be scheduled at least annually, even with low usage, to replace deteriorated additives. Some prominent groups in the industry suggest that oil and filters should be changed every four to six weeks, or 250 operating hours.

Any time oil turns milky, it is a sign that it contains water and/or air. If it homogenizes, or reaches an emulsion stage, it is very difficult to purify.

If oil analysis is carried out then consider it as an important check on your entire system, not just a check on the condition of the oil.

Hydraulic oil is almost always under pressure up to 25 times as high as engine oil. The resulting fact is that 1000 hours of operating time on a hydraulic system can be equal to about 70,000 miles of driving on an automobile engine.

Oil has a tough job to do even under ideal conditions. Keep it clean and cool, and oil does its job better and longer. Change oils as frequently as you find necessary, and your system will reward you with improved performance and longevity.

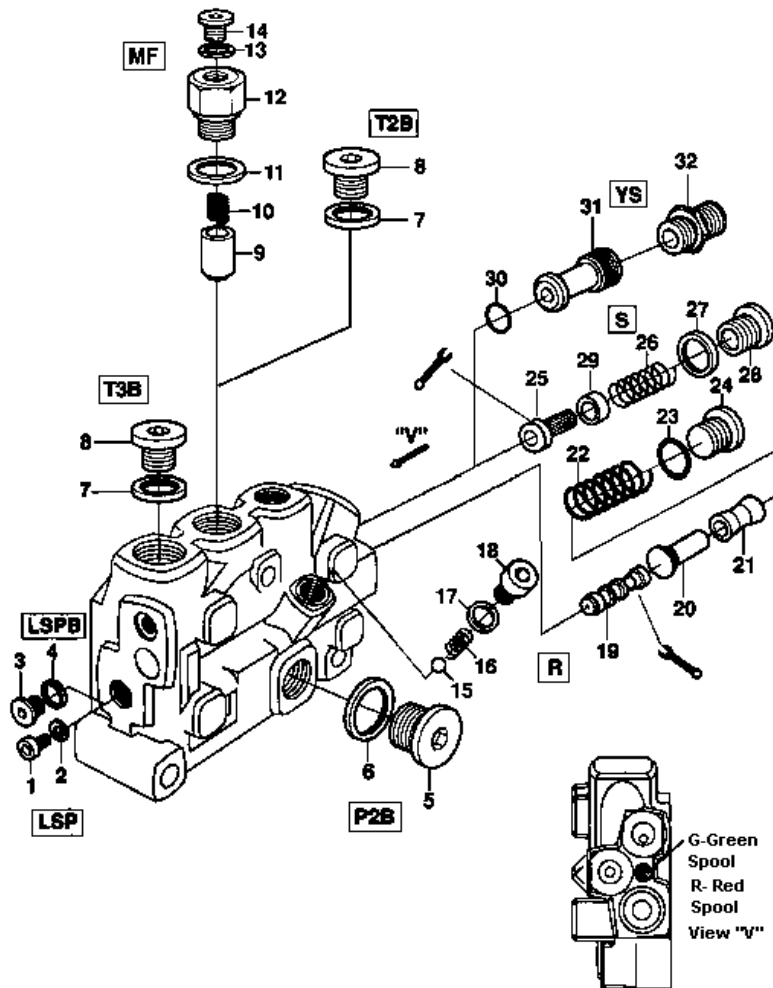
To get the most out of a hydraulic system, follow these points: -

- Design it to allow free and unobstructed flow and include frequently cleaned air breathers.
- Use only oils suited for the conditions of operation.
- Filter the oil from the beginning using 10-micron or better filters.
- Keep the system filled. It reduces sloshing, inhibits air entry, and takes longer to overheat. Using new oil also replaces additives that have been used up.
- Change oil seasonally, especially before winter, and at least annually.
- Design and keep heat out. Add cooler if necessary.

- Give serious consideration to oil sampling, especially if you are managing a large fleet.
- Replace components when they begin to contaminate the system.
- When ordering a system, spec it around your needs.
- Show respect for equipment with regular maintenance, and always operate within desired temperature, RPM, and flow parameters.

NOTE

L90LS, End section
LSP, LSPB, P2B, MF, T2B, T3B



NOTE:-

ITEM # 20 IS A PILOT FILTER. IT IS IMPERITIVE THAT IT BE REMOVED, CLEANED AND REPLACED EACH TIME THE TRUCK ENGINE IS SERVICED.

MAINTENANCE

Today's hydraulic equipment (especially pumps and motors) is made to closer fitting tolerances than those of yesterday. Subsequently, regular maintenance will, in the long run, provide you with trouble free, longer lasting equipment.

The key to this longevity is CLEANLINESS, and this is achieved through filtration of the hydraulic oil. Since the filter can only trap so much contamination, its periodic replacement is inevitable as is the oil itself. There are more than just the filters in the tank units themselves. There is often a filter for the valve pilot, which, if contaminated, will cause sluggish spool response and most systems are equipped with a pressure filter between the pump and the valve.

Along with cleanliness of the system and its oil, there are other checks, which should be made on a regular basis for general upkeep. These are listed in the table at the end of this section along with a recommended time reference. Please follow this procedure as closely as possible.

The *Accu-Cast*® system is a very reliable system, however it can only be as good as the maintenance it receives. If you keep it clean, change filters regularly, and keep the electrical system in good working order it will give you many years of trouble free performance.

WHEN ALL ELSE FAILS CALL US AT:

1-800-363-0091

OR

(403) 279-2070

FAX. (403) 236-2658



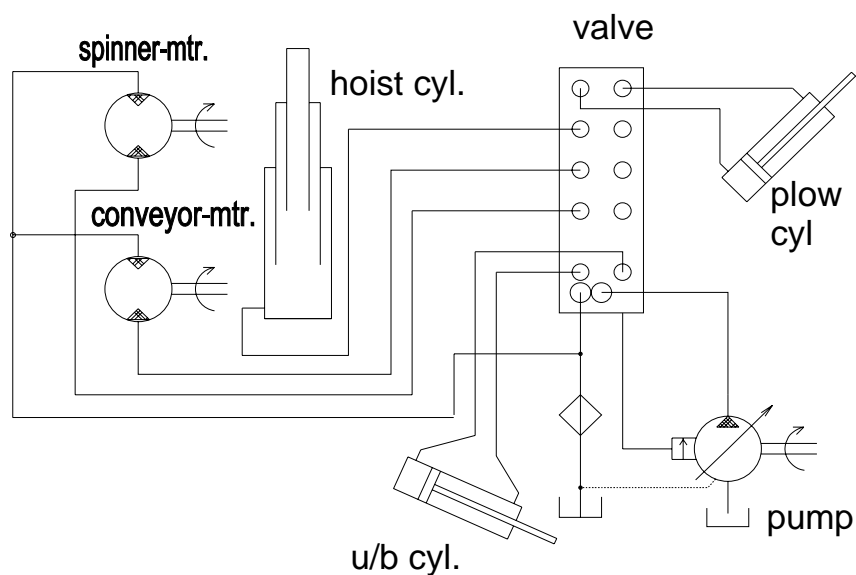
7525-51 ST. SE
CALGARY, AB T2C 4A6

Email- info@accucastsystems.com

NOTE - For systems sending load sensing signals back to the pump, it is possible for such communication to result in instability, e.g., excessive vibration, surging or irregular actuation. Changing the length, diameter, or type of hydraulic line (hose or tube) may alleviate such interaction between the pump and the valve. Also, in load sensing applications where other valves operate from a common pump it is best to systematically isolate sensing signals during diagnosis. To accomplish this disconnect and cap ALL BUT ONE of the load sensing lines

from returning to the pump. Further, remove any participating logic check valves. Operate the offending function(s). Continue in this manner, checking one input at a time, to identify which signal(s) contributes to the instability and requires further attention.

CAUTION - Obstructions that contaminate filter elements in many cases are not easily visible. Therefore, filters should be cleaned or replaced particularly if the system has (1) been recently put into service, (2) operated in a



dirty environment, (3) operated for some time without maintenance.

SYSTEM DIAGNOSIS

The following diagnostic information is provided for the AC 2000 V Board. The same information for the AC 3000V board is covered on page 12 of this section.

The *ACCU-CAST* 2000V computer board as depicted in the electrical section (3) of this manual is equipped with several led's for the purpose of troubleshooting. They are listed as follows.

Conv. PWM
Spin. PWM
Speedo pulse
Plow event
Conv. Pulse
+ 12 V
+ 5 V

Checking the condition of these lights can be a valuable troubleshooting tool i.e.

If the spinner or conveyor does not work when they should, check the "PWM lights", if they are "on" the board is doing its job and you will have to look elsewhere for the problem.

If the conveyor and/or spinner work in manual mode, but not in auto mode, check the "speedo pulse" light. This light should pulse when the truck is moving slowly, if it is steady on or not on at all this would indicate that the computer is not receiving a speed signal.

If the system continually defaults to manual mode check the conv. Pulse light, it should pulse when the conveyor is moving slowly. If it does not pulse this would indicate a problem with the conveyor sensor or associated wiring.

If the + 12 V light is not on it means that the board is not getting power. You may have a blown fuse or a bad master switch.

The +5 V light is an indication of the proper operation of the 5 volt circuit which is necessary for the operation of much of the electronics.

It has been found in the past that most electrical problems are not the result of failed PC boards or computers. **95 % of electrical failures in our systems are caused by poor electrical connections or grounds.** I can not stress enough the importance of this statement. **Computer operations depend on good clean interference free connections.**

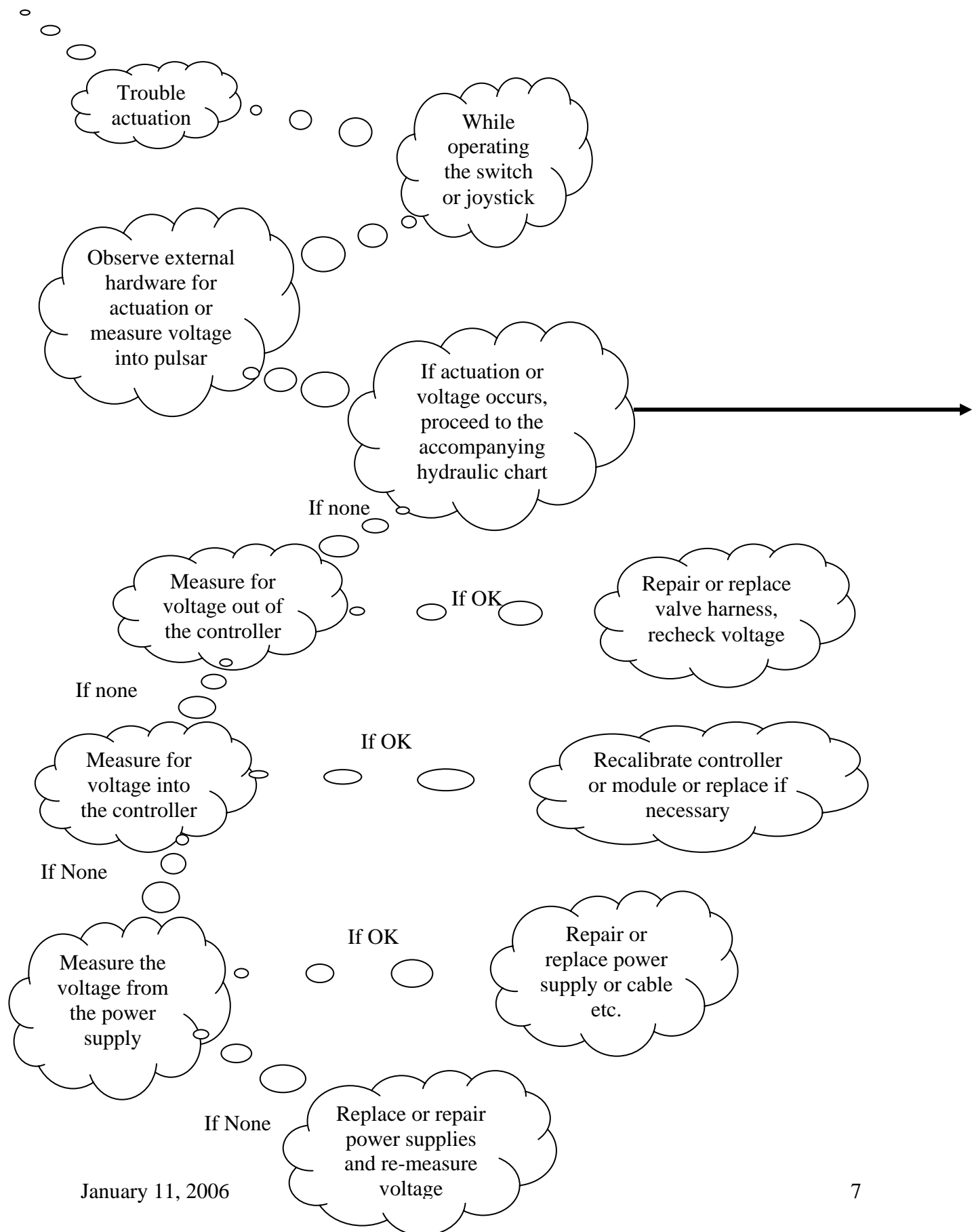
The troubleshooting scheme on the following pages is provided to determine if the valve requires off-vehicle service. To accomplish this the remainder of the Electro-hydraulic system is sequentially examined to eliminate other possible actuation interruptions. Since an assortment of symptoms is possible, this troubleshooting guide should be supplemented with reasonable on-site observation and judgement.

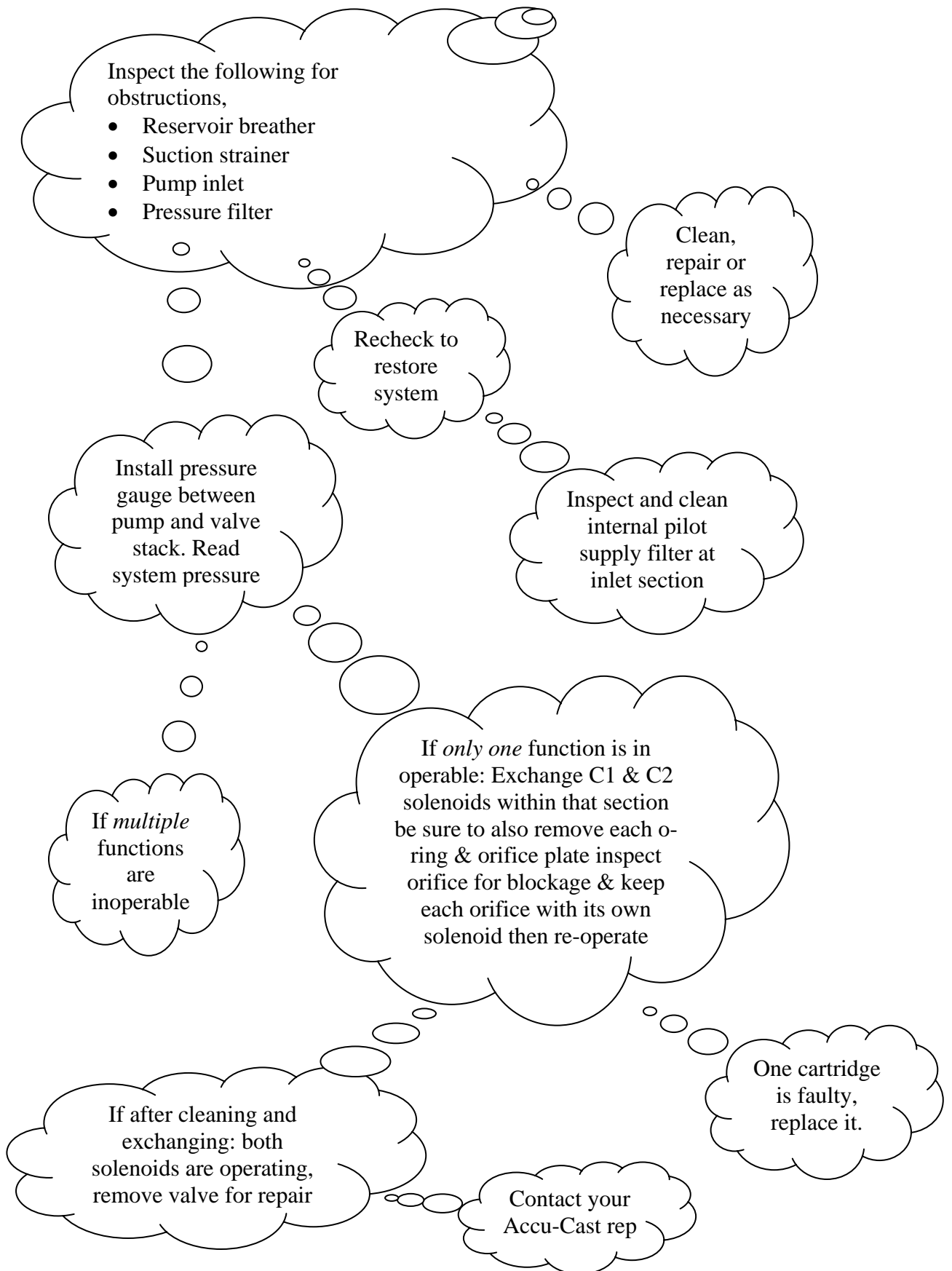
In order to perform this diagnosis two instruments are required, an analog DC voltmeter and a pressure gauge capable of reading maximum system pressure.

To make a voltage reading, connect the meter across the leads of the component being tested. **Do not measure voltage from a component to ground.** Make the reading and proceed.

NOTE - A considerable number of electrically related problems are due to contaminated connectors. To avoid an early reoccurrence, each time a connector is separated and checked, clean both leads with an appropriate contact cleaner, containing a de-greasing agent if possible if its condition is suspect, replace it. This precaution can avoid wrongly identifying electrical component(s) as faulty.

NOTE - For systems sending load sensing signals back to the pump, it is possible for such communication to result in instability, e.g., excessive vibration or irregular actuation. Changing the length, diameter, or type of hydraulic line (hose or tube) may alleviate such interaction between the pump and the valve. Also, in load sensing applications where other valves operate from a common pump it is best to systematically isolate sensing signals during diagnosis. To accomplish this disconnect and cap ALL BUT ONE of the load sensing lines from returning to the pump. Further, remove any participating logic check valves. Operate the offending function(s). Continue in this manner, checking one input at a time to identify which signal(s) contributes to the instability and requires further attention.





PARKER

PAVC 65 Piston Pump Application Notes

<u>Speed</u>	Minimum 600 RPM Maximum 3000 RPM
<u>Pressure</u>	Limited by the pressure compensator control in the pump. Maximum allowable setting 3000 psi continuous 3300 psi intermittent (20% duty)
<u>Flow</u>	@1800 RPM – 31 GPM
<u>Inlet Conditions</u>	Not to exceed 5” Hg vacuum at 1800 RPM Inlet pressure not to exceed 25 psi
<u>Filtration</u>	For maximum pump and system component life, fluid contamination should be limited to a level not to exceed 125 particles greater than 10 micron per milliliter of fluid.
<u>Temperature Range</u>	-40° F to 160°
<u>Control Drain</u>	In full compensation @ 1500 psi control drain flow should be less than 1.0 GPM. Maximum back pressure is 100 psi

Compensator setting:

- Compensator settings are factory set and should be specified on all orders.
- If adjustments are necessary CW rotation will increase setting, CCW rotation will decrease pressure setting.

Caution!

Please read section 2 page 10 of this manual before attempting to adjust the compensator setting.

Load Sense Lines:

- Use of 3/8” O.D. steel or 3/8” steel braid load-sense lines may be required for stability if distance from pump to control valve is excessive.
- On load sense controls, sense line must be connected to pressure for high-pressure cut-off to occur. For low pressure stand-by the sense line must be vented to tank.

Pump Start-Up

- Install required gauges prior to filling pump with fluid so that system pressure and inlet pressure can be observed during and after start up.

- Check all fittings to be sure they are tight.
- Fill reservoir with *filtered* approved oil.

- Fill pump case with filtered system oil. Make sure the case is at least half full before start-up. Internal leakage will not provide enough lubrication if case is dry. If the pump is below the oil level in the tank this can be done simply by loosening the case plug at the top of the pump and allowing the air to escape. If the pump is above the oil level the case must be manually filled. **The Pump must not be run Dry.**
- Open any shut-off valves between reservoir and pump.
- Start the truck engine and operate at minimum speed and minimum pressure until all air is purged from pump.
- Increase speed and load pump by operating each control valve to purge air from remote parts of system.
- Check fluid lines for leaks. **Inlet line must be “air tight”.**
- Re-check reservoir fluid level, add if necessary.
- Cycle pump – observing system pressure and inlet pressure to ensure that ratings are not exceeded.

Application Assistance:

- Professional application and controls engineering assistance is available by contacting **ACCU-CAST**® at (403) 270-2070 or 1 (800) 363-0091

INSPECT WEEKLY	SEMI ANNUAL	ANNUAL	OFF SEASON
<u>TANK LID:</u> Keep clean free of salt, sand and debris.	<u>HYDRAULIC FILTER</u> Change	<u>HYDRAULIC OIL:</u> Clean or replace as necessary.	Cycle all unused functions once a month during the off season.
<u>OIL LEVEL:</u> Middle of site glass.	<u>PILOT FILTER:</u> Remove and clean.	<u>HYDRAULIC TANK:</u> Remove inspection cover and clean suction screen and tank bottom.	Loop lines to complete circuit if equipment is removed for a prolonged period to prevent pressure build-up and possible damage.
<u>OIL CONDITION:</u> Check for discoloration. i.e. Milky-Water Contamination.	<u>OIL SAMPLE:</u> Take oil sample from tank and send to lab for analysis.	<u>MAIN RELIEF:</u> Check pressure 1800 psi (OR 2100 if equipped with a pressure compensated pump) unless otherwise stated by the body manufacturer. unless otherwise stated by body manufacturer.	Lubricate conveyor chain with used engine oil and install conveyor cover.
<u>OIL LEAKS:</u> All hoses & fittings etc.	<u>PTO SPLINE</u> Remove pump, inspect and lubricate male spline on shaft and female spline in PTO.	<u>COMPENSATOR:</u> Check pressure (if equipped) 1800 psi. unless otherwise stated by the body manufacturer.	Clean and flush Pre-Wet tanks, pump and nozzles.
<u>CABLES/HOSES:</u> Check electrical cables and hydraulic hoses for damage and leaks.			
<u>OPERATION:</u> Check operation of all hydraulic controls and lighting functions.			
<u>PUMP DRIVESHAFT</u> Lubricate U-Joints			

AC 3000V SANDING SYSTEM DIAGNOSTIC LIGHTING

Following is a summary of the diagnostic led's on the ac 3000v main board.

Green power status lights:-

D5 = 20 volt Balluff transducer power.

D6 = Valve and peripheral power.

D7 = 5volt DC.

D8 = 12 volt DC input.

Amber input status lights:-

D27 = Hot oil.

D26 = Low oil.

D25 = No material.

D24 = Spare.

D23 = Spare.

D22 = Conveyor pulse.

D21 = Spare.

D20 = Speedometer pulse.

Red output status lights:-

D11 = Conveyor.

D12 = Spinner.

D13 = Gate up.

D14 = Gate down.

D15 = Spare.

D16 = Spare.

D17 = Peripheral and Balluff power enable.

With the above information and a little common sense, troubleshooting of the electronics is simplified to the point that the technician can easily determine if a problem exists in the main board or if in fact it is caused by the absence of an input signal or an open circuit downstream of the board.

PROBLEM	CONDITION	ACTION	RESULT	CORRECTION
SPINNER NOT WORKING (ALL POSITIONS)	OUTPUT LED (OFF)	SWITCH PLUGS FROM ROTARY SWITCHES ON BOARD	SPINNER WORKS	REPLACE ROTARY SWITCH OR HARNESS
			SPINNER DOES NOT WORK	PROBLEM IN BOARD (CONTACT ACCU-CAST)
	OUTPUT LED (ON)	CHECK FOR VOLTAGE AT VALVE SOLENOID	VOLTAGE VARIES WITH SWITCH POSITION	REPLACE SOLENOID
			NO VOLTAGE	CHECK VALVE CABLE
SPINNER NOT WORKING (SOME POSITIONS)		SWITCH PLUGS FROM ROTARY SWITCHES ON BOARD	SPINNER WORKS IN ALL POSITIONS	REPLACE ROTARY SWITCH OR WIRE HARNESS
			SPINNER DOES NOT WORK IN ALL POSITIONS	PROBLEM IN BOARD (CONTACT ACCU-CAST)
CONVEYOR NOT WORKING (ALL POSITIONS) NOTE IN COMPUTER MODE TRUCK MUST BE MOVING FASTER THAN 3 KM.	CONV. OUTPUT LED OFF	CHECK SPEEDO INPUT LED	SPEEDO INPUT LED BLINKING	PROBLEM IN BOARD (CONTACT ACCU-CAST)
			SPEEDO INPUT OFF OR STEADY ON	CHECK SPEEDO SENDING UNIT AND WIRING
		CHECK TRUCK SPEEDO	SPEEDO WORKING	CHECK WIRING BETWEEN SENDING UNIT AND 3000V BOARD
			SPEEDO NOT WORKING	REPLACE SENDING UNIT
	SPEEDO INPUT LED BLINKING BUT ZERO SPEED REGISTERED ON REMOTE DISPLAY	CONTACT ACCU-CAST		
	CONV.OUTPUT LED OFF	CHECK GATE UP LED	GATE UP LED ON	CHECK GATE VALVE SECTION AND WIRING
			GATE UP LED OFF	CHECK FOR SIGNAL FROM BALLUFF SENSOR

PROBLEM	CONDITION	ACTION	RESULT	CORRECTION
CONVEYOR NOT WORKING (SOME POSITIONS)		SWITCH PLUGS FROM ROTARY SWITCHES ON BOARD	CONVEYOR WORKS IN ALL POSITIONS	REPLACE ROTARY SWITCH OR WIRE HARNESS
			CONVEYOR DOES NOT WORK IN ALL POSITIONS	PROBLEM IN BOARD (CONTACT ACCU-CAST
SYSTEM REVERTS TO MANUAL OPERATION WHEN TRUCK IS PUT IN MOTION FOR MORE THAN 30 SECONDS	YELLOW CONVEYOR INPUT LED (BLINKING)	CHECK LED'S ON CONVEYOR MOTOR PIGTAIL	GREEN LED (ON) YELLOW LED (BLINKING)	CONTACT ACCU-CAST
	YELLOW CONVEYOR INPUT LED (OFF OR STEADY ON)	CHECK LED'S ON CONVEYOR MOTOR PIGTAIL	GREEN LED (ON) YELLOW LED (OFF)	REPLACE MOTOR SENSOR
			GREEN LED (OFF)	CHECK VOLTAGE BETWEEN PINS 1&3 AT MOTOR OR 1&2 ON EXTENSION
		CHECK VOLTAGE BETWEEN PINS 1&3 AT MOTOR OR 1&2 ON EXTENSION	12 VOLTS PRESENT	REPLACE SENSOR
			0 VOLTS PRESENT	CHECK WIRING BACK TO BOARD
NO FUNCTIONS IN CONSOLE WORKING	FUSE IN BACK OF CONSOLE BURNED	REPLACE FUSE	ALL FUNCTIONS OK	
			FUSE BLOWS	LOCATE SHORT IN CONSOLE
SANDER FUNCTIONS NOT WORKING	FUSE ON 3000V BLOWN	REPLACE FUSE	FUNCTIONS WORK	
			FUSE BLOWS	LOCATE SHORT IN VALVE CABLE, SOLENOID OR WIRING
	FUSE ON 3000V OK	CHECK 12 V INPUT LED	INPUT LED (ON)	CONTACT ACCU-CAST
			INPUT LED (OFF)	CHECK POWER SUPPLY TO BOARD
JOYSTICK NO FUNCTIONS	LED'S COME ON WHEN STICK IS MOVED FROM CENTER	CHECK FOR VOLTAGE AT SOLENOIDS	NO VOLTAGE	CHECK WIRING IN VALVE CABLE AND BACK TO JOYSTICK

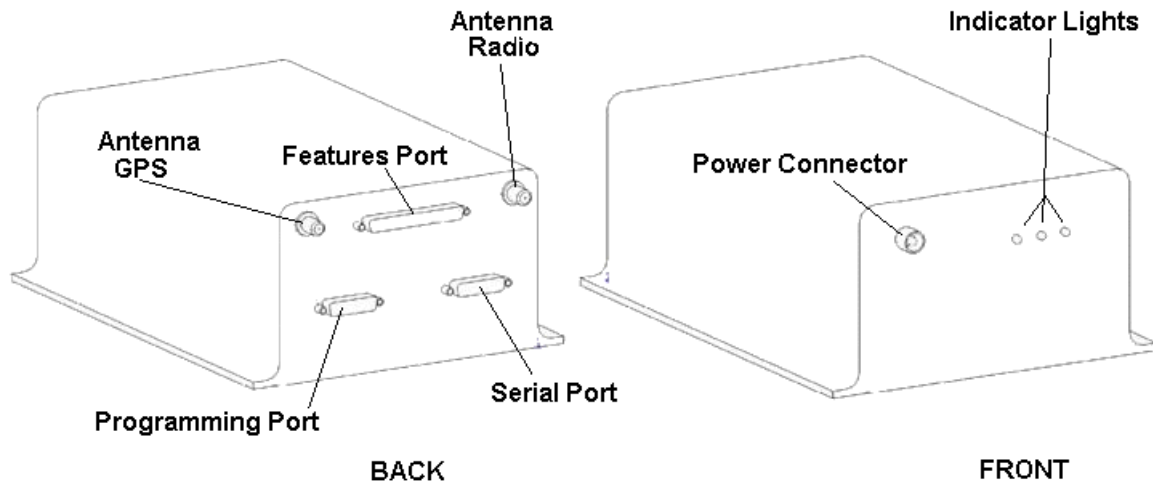
PROBLEM	CONDITION	ACTION	RESULT	CORRECTION
			VOLTAGE PRESENT	CHECK STANDBY PRESSURE AND PUMP PERFORMANCE
	LED'S DO NOT COME ON	CHECK FUSE ON JOYSTICK BOARD	FUSE OK	CHECK POWER SUPPLY TO JOYSTICK
			FUSE BLOWN	REPLACE FUSE AND RE TEST JOYSTICK
			FUSE BLOWS AGAIN	CHECK OUTPUTS AND SOLENOIDS FOR SHORT
POWER FLOAT WILL NOT TURN ON	FUSE BURNED	REPLACE FUSE	FUSE BLOWS AGAIN	CHECK WIRING AND SOLENOIDS FOR SHORT
	FUSE OK	INCREASE SETTING ON PRESSURE SWITCH	FLOAT WORKS	
		DISCONNECT PRESSURE SWITCH	FLOAT WORKS	REPLACE PRESSURE SWITCH
	PRESSURE SWITCH CHECKED OK	CHECK FOR POWER AT SOLENOIDS B & C	NO POWER	POSSIBLE BOARD FAILURE (CALL ACCU-CAST)
			POWER AT SOLENOIDS	CHECK COILS
PLOW WILL NOT STAY IN RAISED POSITION	PILOT LAMP IN SWITCH STAYS LIT	DECREASE SETTING ON PRESSURE SWITCH	PLOW WORKS PROPERLY	
PLOW WILL NOT LOWER	CHECK FOR POWER AT SOLENOID A WITH PLOW CONTROL IN DOWN POSITION	SOLENOID A HAS POWER	CHECK COIL	REPLACE COIL OR VALVE CARTRIDGE
	NO POWER AT SOL. A	CHECK FOR POWER AT TERMINAL 7 ON PLOW JOYSTICK WHEN IN DOWN POSITION	POWER AT TERMINAL 7	CHECK CIRCUIT BETWEEN TERMINAL 7 AND FLOAT BOARD (JP1 PIN 4) AND ALSO BETWEEN JP2 PIN 3 ON FLOAT BOARD AND SOL. A
			NO POWER AT TERMINAL 7	POSSIBLE JOYSTICK BOARD FAILURE (CONTACT ACCU-CAST)

GREY ISLAND AVL

The power connector for the AVL Box requires the following:

- 1) White Wire = Connected to Ignition, 12 volts when the vehicle is started.
- 2) Black Wire = Connected to Vehicle Ground.

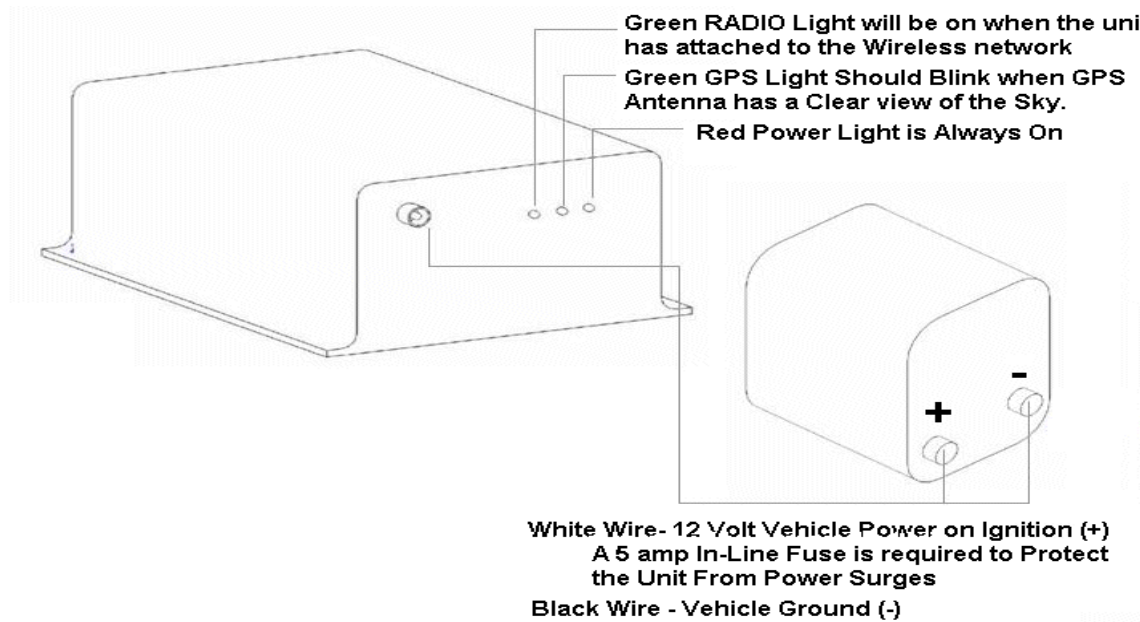
Grey Island AVL



AVL OPERATIONAL INDICATING LIGHTS

The AVL Tracking Device is equipped with 3 Indicating lights:

- RED POWER LIGHT- The light is ON Solid when 12 Volt Power is supplied to the device.
- GREEN GPS LIGHT - The GPS Light will Blink when the device has attached (through the antenna) to the GPS Satellites
- GREEN RADIO LIGHT –The RADIO light will be on Solid when the device is attached to the Cellular Network.



GPS Trouble Shooting Guide -CHECK LIST

Power Supply to the AVL Unit:

The power connector for the AVL Box requires the following:

- 1) White Wire and Inline Fuse = Connected to Ignition, 12 volts when the vehicle is started.
- 2) Black Wire = Connected to Vehicle Ground.

NOTE: If there is no power to the AVL Unit, Always check the Inline Fuse to confirm it is not blown. Also check the Power wire and the Ground wire to confirm a good connection.

GPS BOX and Light Indicators :

- 1) - Confirm the red power light is on when ignition is on.
- 2) - Confirm the middle green light is blinking when the Antenna has a clear view of the sky.
 - If the Middle Green Light is not on, ensure the antenna GPS connector is connected to the GPS Connector on the AVL Unit.
 - Ensure the Antenna cable is not cut or pinched.

- Ensure the Antenna is properly grounded; The Magnetic Mount Antenna must be mounted to a metal surface.
- 3) Confirm the second green light is on solid when the unit is powered up. If the Second Green Light is not on check the antenna Radio connector is connected to the Radio connector on the AVL Unit.
- If the Radio Light is still not on, check with the provider to confirm the service is activated and have the unit reset if necessary.

FREQUENTLY ASKED QUESTIONS

Q: The AVL Unit does not display any lights.

A1: Check the power source for the AVL unit and confirm there is at least 12 volts supplied when the unit is started.

A2: Check the ground and ensure it is reliable and constant (if there are signs of corrosion, locate another ground source).

A3: Check the inline fuse to confirm it is not blown.

A4: Check the Power Cable to ensure it has not been cut.

Q: The Middle Green GPS Light is not Blinking.

A1: Ensure the Antenna GPS connector is connected properly to the AVL Unit.

A2: Ensure the Vehicle is Outdoors and the Antenna has a clear view of the sky.

A3: Ensure there is at least 12volts supplied power.

Q: The Radio Light is not on.

A1: Ensure the Antenna Radio connector is connected properly to the AVL Unit.

A2: Ensure there is Radio Coverage (GPRS or CDMA) in the area where the AVL Unit is located.

A3: Ensure the Unit is activated with the Cellular Provider.

Q: There is no Salt Controller Data being retrieved from the AVL Unit.

A1: Ensure the controller data cable is connected to the Serial Port of the AVL Unit

A2: Ensure the correct cable is being used to communicate with the controller.

A3: Ensure the AVL Unit has the correct software to communicate with the Controller.

(If unsure, call Grey Island Systems Intl to confirm software type.)

A4: The salt controller is a non-compatible controller..

Q: The lights on the ALV Unit are operating correctly but the unit is not reporting.

A1: Ensure the correct software is built on the unit with the correct telephone id number.

A2: Ensure the AVL Unit has been powered-up for at least 5 minutes.

A3: Ensure the AVL Unit has a reliable 12 volts supplied power and a reliable ground source.

Q: The AVL Unit is reporting intermittently.

A1: Confirm the antenna AVL connections are tight.

A2: Confirm the Antenna is not blocked.

A3: Confirm the power and ground connections are reliable.

A4: Confirm the power and antenna cables are not pinched or cut.

A5: Confirm the power supply is from an ignition source and not a fan or heater source.

Q: Why does the AVL Unit not report when an input is activated?

A1: Confirm the correct input is being used.

A2: Confirm the AVL Unit Software has activated the Input for Send Data on Change.

(If unsure, call Grey Island Systems Intl to confirm software type.)