

Trouble Shooting the MaxFlight Hydraulic VR2000/VR2002/VR2500/MT3000

Quick Checks

Electrical Power Problem:

- Circuit breakers ---ON
- Extension Cords—GOOD and Plugged IN
- Leviton Surge Suppressor—Green Light ON
- UPS---Turned ON
- Computer Monitor-- ON
- Computer Power Supply

Cockpit Power Problem:

- Power Distribution Box Main and Cockpit Power switches ON
- 110/220 VAC from Box to Pitch Rings
- Pitch Ring brushes #1 Hot, #2 Gnd, #3 Neut.
- Roll Ring brushes #1 Hot, #2 Gnd., #3 Neut.
- Power Receptacles under seats of cockpit ON
- Projector, check fuses TELEX, power switch INFOCUS.
- 12VDC power supply-check fuses.

Hydraulic Problems:

- Circuit breaker
- ON/OFF E-Stop switch
- Re-set motor contactor

Hydraulic Pressure Problems:

- Check pressure gauge, 1500 PSI VR2000, 2000 PSI others
- Cockpit Power Switch ON you get above pressures
- Manual let down lever—If OPEN close it.
- Platform Lowered Sensor

Unit Drops OFF Stairway/Tail Boom Stand

- Fail Safe Sensor problem
- Counterweight movement/ fails to position correctly
- Old Ham coupling

Sensors:

Any/all sensors can be checked using the settings pages of the program or, the program front window or, Mitsubishi Client Test program on later versions.

Detailed Checks and Procedures

Power Problems

Electrical Single Phase 110VAC/220VAC

Ensure you have electrical power by checking your circuit breakers and then the extension cord. The computer power flows through a UPS, check it to ensure it is providing 110VAC/220VAC on the output side.

Turn on the Main Power Switch, check for the GREEN light on the surge/noise suppressor, if the light is RED, the surge suppressor has taken a spike and requires replacement. (MF Part # 11123/Leviton 51020(110VAC)/Leviton 51240(220VAC)).

Computer Power

Is the monitor ON?

If the computer is not powering up, check the computers' power supply, first check to see if the cooling fan is running, check the drive lights. If no power, disconnect the computer and test it on a bench, the power supply is available at any computer store, (300 watt ATX Power Supply), do not remove the old one until you have the new one so you can easily make the proper connections.

Cockpit Power/Video/Sound Problems

Turn the cockpit power switch ON. The power flows through the Pitch and Roll Rings. On both rings, brush number 1 is the 110/220VAC HOT, number 2 is the GROUND and number 3 is the NEUTRAL. Ensure the brushes are in the correct rings and are making good contact, and the wires are connected to the brushes, not frayed or burned.

Check each 110/220VAC receptacle from the power distribution box through each ring, then the receptacle mounted on the cockpit frame for proper voltage.

For units with electrical harnesses and 12VDC amplifiers, ensure the 12VDC power supply is providing 12 volts. The power supply has a fuse located behind the kick plate under the right seat (VR2002) or behind the lower cockpit cover panel (VR2000), it is a screw-in-type fuse holder.

For SOUND problems check the 12VDC amplifier, it has a Protection Light on it that illuminates when the 12VDC or speaker connectors are loose, or the volume controls are mismatched. Check the volume output from the computer programs settings page and normally lower the amplifiers' volume and raise the computers' output volume in the sound settings' page. If the sound is scratchy, could be time to clean the roll and pitch rings. For units with external pre and power amps, check volume settings and overload protect lights. Check audio wiring.

The Telex projector is 110/220VAC powered and has a double fuse holder located just under the 110/220VAC input receptacle, the fuses are replaceable and can be purchased at any electrical store, they are 6.3 amps, and should be checked first if there seems to be a power problem.

The Infocus projector is 115/220 VAC powered has no external fuses. Check to see if power switch is ON, selector buttons on front hi-lighted. If so, power is to the projector and another problem is likely.

For VIDEO problems, check all connections between the projector, roll ring, pitch ring and computer. Normally you will find a loose connection between the computer and pitch ring and/or in the center cross block between the pitch and roll rings. Remember to ensure the bulb is functioning. If the video image is fuzzy only in the cockpit, could be time to clean the roll and pitch rings. Also check the projectors' lens for security (putty in place), adjustment and cleanliness. Make sure the fan is working and clean.

Hydraulic Power Problems

The hydraulic pump is driven by three phase electricity, 208/220/360/440/480. If you do not have power, check your circuit breakers first, then check the reset inside the A-Frame, then the on/off switch. If the three phase electricity has been changed and one of the phases has been reversed, this will cause the pump to run reverse, depleting the prime and possibly causing the pump to fail completely.

IF UNIT DOES NOT RAISE

Hydraulic Pressure Problems

If the hydraulic pump is running and you are not reading any pressure on the pressure gage, check the cockpit power switch, if it is on you will read 0 PSI, when you turn cockpit power off, you should read 2000 PSI (VR2002) and 1500 PSI (VR2000). If the pressure is low or the unit does not raise, check the manual lowering handle, make sure it is in the up position. If the unit was manually lowered, and you are ready to re-start the unit, ensure prior to switching cockpit power on, the program is ready and the unit is reading lowered on the operator panel. If not, manually lower the unit so it closes the lower platform sensor.

Platform Lower Sensor

This sensor is located on the right side A-Frame center weldment area. It cycles when the unit is lowered, and basically resets the units' encoders. As stated above, if it is not engaged a few things will occur, one the unit will not counterweight, it may not raise, it will not reset to zero or home position.

You can check this sensors' operation on the operator panel or in the Lift settings page. This sensor is adjustable and is factory set during installation.

IF UNIT DROPS OFF THE STAIRWAY and/or THE TAILBOOM STAND AFTER RAISE IS ATTEMPTED

Failsafe Sensor

This sensor is located on the pitch shaft arm, just in front of the pitch ring/swivel in the right A-Frame. The sensor is a basic back-up to the pitch encoder, it senses the units' home position during the raise and counterweight cycles. If the unit has not counterweighted properly, and the weight is too far forward or back, this sensor will shut-down the hydraulic system and send a warning to the alert box on the operator panel stating, "The motion system was unable to maintain control of the motion

platform, hydraulics have been disabled”. This sensor is adjustable and factory set, it can be checked for function on the Lift settings page.

Pitch Control Valve

A faulty/leaking pitch control valve will allow the platform to move in the pitch axis. Normally during the raise cycle both the pitch and roll valves are held closed or center position thereby acting as the axis brake. Test by swapping valves from one axes to the other.

IF UNIT STOPS IN-FLIGHT and GOES TO THE HOME POSITION

Platform Raise Sensors

There are two sensors a left and right platform raise sensor located on the center weldment of both A-Frames at the top. These sense the unit is ready for operation and both have to be engaged for a ride to begin. If one side opens during a ride, the unit will immediately go to the home position, (vertical) and stop, an alert in the alert box on the operator panel will illuminate stating, “The motion system was unable to maintain control of the motion platform”, it does not Disable hydraulics, the unit will go to the Home Position. This is caused by either the up-sensors are incorrectly adjusted or loose, or the unit has settled and requires to be re-leveled and squared. These sensors are adjustable and factory set. You can check these sensors on the operator panel or the Lift settings page.

Occupant Safety Switch

Located in the cockpit between the seats (VR2002) or the lower left button on the joystick (VR2000). This switch allows for the occupant to stop the ride, when activated, it immediately sends the ride to the home position and an Alert will appear in the Alert Box on the operator panel stating the occupant has depressed the switch. This switch is not adjustable, it is a basic on/off switch and can be function checked on the Video settings page (VR2002) or joystick settings page (VR2000) or on later Motion Com units on the program page bottom center.

IF UNIT STOPS IN-FLIGHT

Canopy Open Sensor

This sensor is located in the cockpit on the center frame tube (VR2002) and left side seat frame tube (VR2000) and is adjusted to close within one inch to canopy lock and closed position. It is wired to the normally closed (NC) position. If the canopy opens in flight or the sensor senses incorrectly the canopy is open, the unit will stop and no further motion will occur and an Alert will appear in the alert box on the operator panel. If the sensor is intermittent, the unit will stop, and the Alert box on the operator panel will be clear, you have control over the unit with the mouse and can actually hit the terminate icon and lower the unit. Check the sensor for proper adjustment, normally you will find the lever on the sensor is so bent up that when the canopy is closed, slight movement can cause the sensor to activate. If the sensor is

functioning properly and adjusted correctly, it may be time to clean the roll and pitch rings. This sensor is adjustable and factory set, it can be checked on the Lift settings page or on later programs in bottom of program window.

COUNTERWEIGHT NOT WORKING

Power Distribution Box Rev-M and Later and Up-Graded Units after August 1998

The counterweight is moved by a 24VDC motor that is relayed through the Power Distribution Box, Cockpit Power must be ON for it to function. The most common problem is the connection of the motor and the pitch ring located in the center cross-block assembly, it is a two prong type trailer connection and can come loose, depending on the movement of the counterweight, either side of the connector can be positive, so if the connector is loose, it may have shorted out the 24VDC power supply in the Power Distribution Box. Check the 24VDC power supply (PS2) in the box, it should provide 23.95VDC, if not, disconnect the + wires and check it, if it provides 23.95VDC now, then there is a short between the relays. In the power distribution box, the PS2 and relays numbers K1, K2, K5 and K6 are the controls for the counterweight. K1 and K2 are OPTO 22 Relays which are basically switches opening and closing depending on the signals received from the motion control board in the computer through the motion control interface board in the box. When the counterweight is stopped and the unit is raising, both K1 and K2 are energized sending a positive signal to both sides of the motor causing it to be an electric brake. K1 and K2 send their power through K5 and K6 which are coiled Double Throw Double Pole relays. A normal problem that occurs is the coil in either K5 or K6 can weld itself closed, causing a short problem, or causing the counterweight to move in one direction only, this can be corrected by removing the K5/K6 and tapping on them, then reinstall and check the counterweight movement by using the mouse and arrows on the operator panel. We have found that a new relay part # K10P-11D55-24 should be used to replace the K5 and K6 relays, it can handle higher amperage and also has silver cadmium contacts, which are more difficult to weld closed. Another area to look at is the Pitch Shaft flange welds', if a shaft is slightly cracked, and the pitch shaft plugs are installed, you may have to strip the paint off the weld and check it thoroughly to insure there is no crack, if it is cracked or starting to weaken, the unit will not counterbalance properly. Also check there needs to be at least ¼ to ½ inch play when the unit is fully down, in other words, move the weight fully forward and measure the distance between the tail boom cover and tail boom stand, if you do not have this gap or it is too much of a gap, the unit will not counterbalance properly. To quickly fix this problem, the pillars on the stairway platform can be adjusted. Do not operate the unit without verifying the counterweight moves in both the decrease and increase directions prior to initiating the raise cycle.

Units' Previous to Up-Grade August 1998 and Power Distribution Boxes Rev A-L the Following is Applicable

The counterweight system is the same as above except the OPTO 22 and coiled DPDT relays are driven by 110VAC. Apply the same troubleshooting procedure as above.

UNCONTROLLABLE ROLL PROBLEMS

The cockpit rotates on the roll axis. The roll system encompasses an encoder, mounted on the Heco/Ross roll motor/transmission, and a hydraulic shuttle valve (Vickers Proportional Valve) located on the hydraulic pump. It is driven by signals received from the motion control board in the computer and will receive up to a (+ -)10VDC signal depending on where the cockpit needs to be during the ride. Usually, if the cockpit rolls out of control, it is due to the shuttle valve being clogged, the motion control board in the computer became loose, or one of the ribbon cables (J1 or J2) can be shorted. Not normal, but can be a problem is the roll encoder if the glass disc has been wiped or broken. The first step to troubleshoot this problem is to check the roll encoder, open the status box on the program, read the roll axis numbers in the "error" column, with hydraulic power Off, the unit in the down position, roll the cockpit side to side, if the encoder is reading actual and error, and error does not build, but zeros out the actual, the encoder is usually presumed to be good. The next step is to re-seat the motion control board in the computer and check the J1 and J2 cables for crimping, a short or bare wires. Finally, you can remove the roll valve, make sure cockpit power is Off, disconnect the valve cable, then remove. The valve can be cleaned by blowing (not more than 10PSI of dry air) through the valve ports, this may dislodge any foreign materials. Then re-install the valve. One of the easiest troubleshooting practices for this valve is to swap it with the pitch valve, if the problem goes to the pitch axis side, then you are sure a new valve is required.

UNCONTROLLABLE PITCH PROBLEMS

The unit rotates on the pitch axis. The pitch system encompasses an encoder, mounted on the KYB motor, a hydraulic shuttle valve (Vickers Proportional Valve), and an OPTO 22 relay (K7 in the Power Distribution Box). It is driven by the motion control board in the computer, through J1 and J2 ribbon cables to the motion control interface board to the shuttle valve, up to (+ -) 10VDC. The K7 relay acts as an interrupt to the valve for counterweight purposes only, when the unit initially raises, the power to the pitch valve is disabled during the counterweight process, 2.5 seconds after the unit is counterweighed and has stabilized, the K7 relay is then activated which enables the pitch valve. Normally, if the unit is pitching uncontrollably, it is due to the valve having foreign matter in it causing it to stick in one position.

You can remove the valve and blow the ports (using 10PSI of dry air) this will usually dislodge any foreign materials. An easy procedure to ensure it is not the

valve, is to swap it with the roll valve, if the problem moves to the roll side, you definitely need a new valve. You need to check the pitch encoder readings in the status box under pitch axis, if the error does not build, the encoder is usually presumed to be good. Check it by pushing the unit up and down and watch the readings to ensure they follow the movement. The motion control board inside the computer can become loose, check and re-seat it, and the ribbon cables could have a short in them, so check them for any crimping or bare wires.