


LMS2, Installation, Pressure Sensor

This section covers the installation of the Green, Yellow and Blue LMS2 Pressure Sensors.

Further Information


Please visit <http://www.sil3.com.au/lms2/> for more information regarding this product.



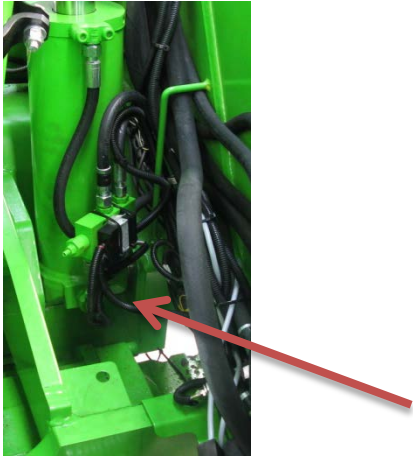

Each machine contains at least two pressure sensors. Machines with dual lift cylinders contain three pressure sensors, and machines with boom suspension contain four pressure sensors. Pressure sensors are denoted by their colours. Colours are used to identify the location of each sensor, and aide with diagnostics should a failure occur.

	CAUTION
	<p>Do not secure the pressure sensor cable to any part of the lock valve using cable ties. The cable tie will damage the delicate sensor cable over time.</p> <p>If required encase the pressure sensor cable in loom tube.</p>

Sensor Colours and Locations





The table below details the pressure sensors and their locations:




Colour	Location	Image
Yellow	<p>Main lift cylinder, rod end line.</p> <p>This sensor is typically located at the valve bank.</p>	


Green	Main lift cylinder, lock valve.	
Blue	Main lift cylinder, lock valve. Dual lift cylinder machines only.	
Red	Tilt compensation cylinder, bottom end.	
White	Tilt compensation cylinder, top end.	


Cautions and Warnings

All cautions and warnings must be observed.


	CAUTION
	<p>The outer body of the pressure sensor is a thin wall stainless steel tube. It will break if subjected to excessive force</p>
	<p>The latest revision of pressure sensor uses a 24MM fitting. The correct spanner should be used. It is recommended that an open ended spanner is not used.</p>
	<p>Pressure sensors are very delicate and highly precise instruments. They must be treated with care during handling and installation.</p>
	CAUTION
	<p>If a pressure sensor is dropped or subjected to high G-shock forces, it must not be installed and must be replaced.</p>
	WARNING
	<p>The boom of the machine must be supported during the installation of a pressure sensor. After the sensor is installed, the system must be load tested by a qualified person.</p>
	WARNING
	<p>Failure of any load holding device could result in uncontrolled boom movements. Never work under an unsupported boom.</p>

	<p>WARNING</p> <p>The minimum bend radius of a pressure sensor cable is 25mm. Any cables bent at near right-angles will damage the sensor and will void the warranty.</p> <p>The wire connecting the pressure sensor to the electronics module is delicate. Do not excessively twist or bend this wire during installation.</p>
	<p>WARNING</p> <p>Always ensure that the O-ring in the end of the pressure sensor is in place and in good condition prior to installation</p> <p>The pressure sensor is sealed by use of a DIN O-ring, a gas specification thread and the additional use of hydraulic thread sealant.</p>
	<p>WARNING</p> <p>Always use hydraulic thread sealant when installing a pressure sensor.</p> <p>Never use Teflon based sealants; they are not rated to the pressures inside the hydraulic systems.</p>

	WARNING
	<p>With the exception of dual lift cylinders, no single lift cylinder machine must ever use an elbow fitting to connect a pressure sensor to a lock valve. Elbow fittings reduce the safety integrity of the lock valve.</p> <p>The elbow fittings supplied with the LMS contain a burst protection feature. This feature protects the hydraulic system against a sudden loss of oil in the event the elbow fitting is severed or fractured.</p> <p>All LMS2 pressure sensor components are tested to burst at pressures greater than 1700bar.</p>

	WARNING
	<p>If installing a hydraulic spacer for the main inlet line (V1) into the lock valve, ensure that the spacer clears the sides of the boom cavity before booming up to maximum boom angle.</p> <p>Modification to the metal work in the boom cavity will need to be made on several models</p> <p>Always check clearances after installation.</p>


Lock Valve Sensor Installation




	WARNING
	<p>Always have a second person check the clearance between the gussets on the side of the cylinder. On some P38.13 models it is necessary to slight modify the gusset. On P40.17 machines it is necessary to remove a large amount of material using a 5-inch angle grinder.</p>




A green pressure sensor, or a green and a blue pressure sensor must be installed in the lock valves of the lift cylinder(s)



Procedure



Note: On dual lift cylinder machines one Green and one Blue sensor is required.

Step	Details
1	<p>Where possible, remove the lock valve from the machine. This helps reduce the damage to the sensor during installation. Always ensure that the boom is supported during and after these procedures.</p>
2	<p>On P38.13 and P40.17 models, a hydraulic spacer component is to be installed. This component requires removal of the lock valve. The hydraulic spacer is sealed against the lock valve with a copper washer (supplied).</p> <p>P38.13 – Hydraulic Spacer</p>  <p>P40.17 Spacer & Cut-out</p>

	
3	<p>Remove the gauge port plug from the side of the lock valve, and ensure the area around the plug is clear of any paint or dirt.</p> 
4	<p>Place some hydraulic thread sealant on the pressure sensor.</p>  <p>WARNING: Do not use Teflon based sealant products.</p>
5	<p>If the lock valve is not removed from the machine, hold the cable with one hand whilst screwing the sensor into the lock valve with the other hand. The cable and electronics module must be rotated together.</p>

	 <p>Warning:</p> <p>Always ensure that the cable connecting the pressure sensor to the electronics module is NEVER twisted or damaged during installation.</p>
6	<p>On BSS models, the pressure sensor must be installed with the lock valve in a vice.</p> 
7	<p>On models with boom suspension, it is necessary to rotate the BSS solenoid out of the way.</p> 

8	<p>Where possible, tighten the sensor using a 24mm pipe spanner (if available). This type of spanner ensures the sensor is tightened correctly.</p> 
9	<p>The electronics module must be attached with silicone adhesive to the side of the lock valve. This is to ensure that the electronics module does not detach and also to assist with thermal issues. The electronics module must then be cable-tied to the lock valve.</p> 

	
10	<p>The wire between the pressure sensor and the electronics module must be cable-tied so as it will not foul on the rear of the boom tunnel.</p> <p>Warning:</p> <p>There must be sufficient clearance between the pressure sensor wire and the side of the machine. If necessary use additional cable ties to keep the wiring clear.</p> 
11	<p>Route the network data cable along the same path as the inlet pressure line to the lock valve. Only cable tie the data cable at the hydraulic connector. This is to ensure that the differences in the bend radii of the data cable and hydraulic hose do not</p>

	cause damage to the data cable.
--	---------------------------------

Yellow Hydraulic Sensor


The yellow hydraulic sensor is to be installed in the lift cylinder rod end.

Bend Radii

The minimum bend radius on the wiring for any sensor is 25mm.

Procedure

The yellow hydraulic sensor is to be installed in the lift cylinder rod end oil line.

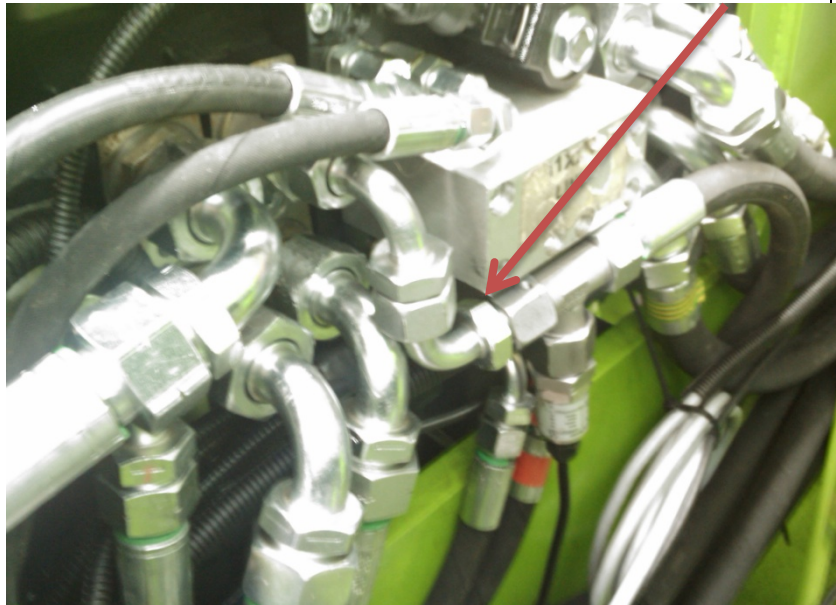
Step	Details
1	<p>Locate the location of the rod end line.</p> <p>On most panoramic models, the most convenient location is at the valve bank.</p> <p>On turbo farmer models, the easiest location is just rear of the cab, in the forward facing port of the accumulator. On the HM chassis models, the most convenient location is read of the valve bank.</p> <p>Compact Models</p>  <p>Panoramic Models</p>

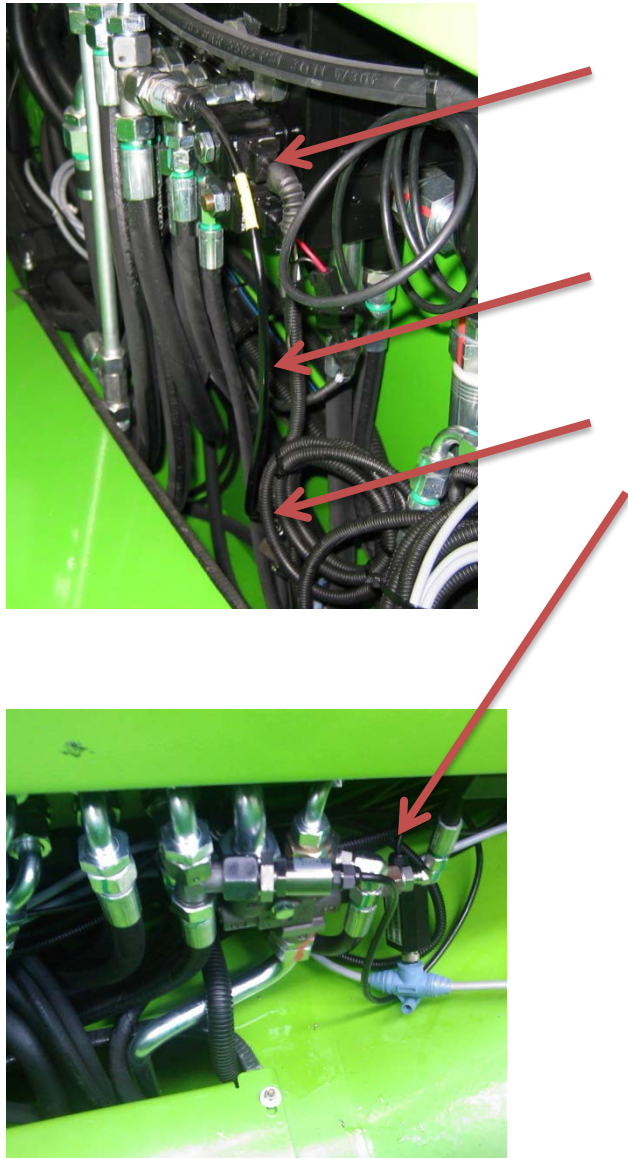


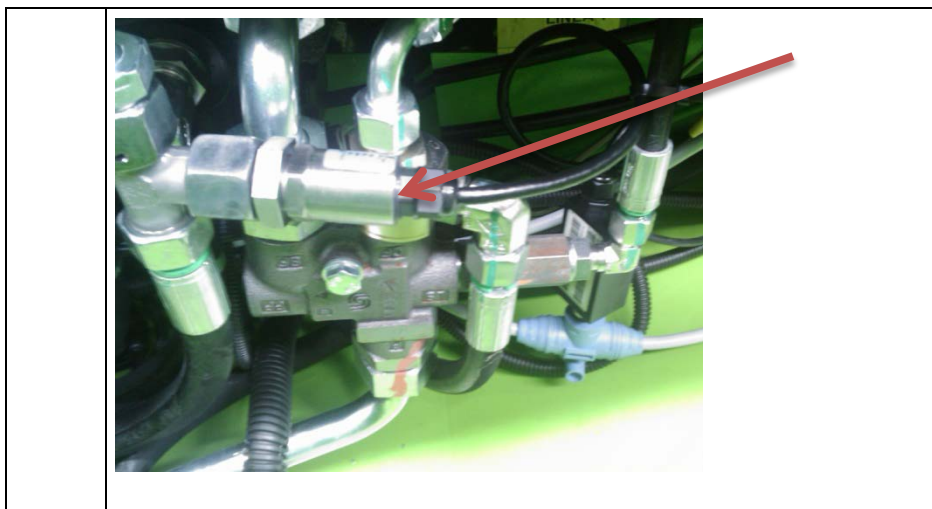
HM Chassis



On P75.9CS an additional fitting is required:



2	<p>Install the sensor using the tee fitting provided.</p> <p>Install hydraulic thread sealant to the threads of the sensor.</p>
3	<p>Connect the sensor into the network data cable</p>
4	<p>The sensor's wiring must be secured. The sensor is not to be left unsupported for any reason. The images below shows a yellow sensor install where the wiring is not supported.</p> 



Testing

After any operation on the hydraulic system, exhaustively test the pressure sensor and lock valve sealing.

Ensure the hydraulic systems are leak free using visual inspection methods while the hydraulic system is pressurised.

NEVER use your hand or finger to check for the presence of leaks on hydraulic systems.

Have a second operator check the clearances of modified components.