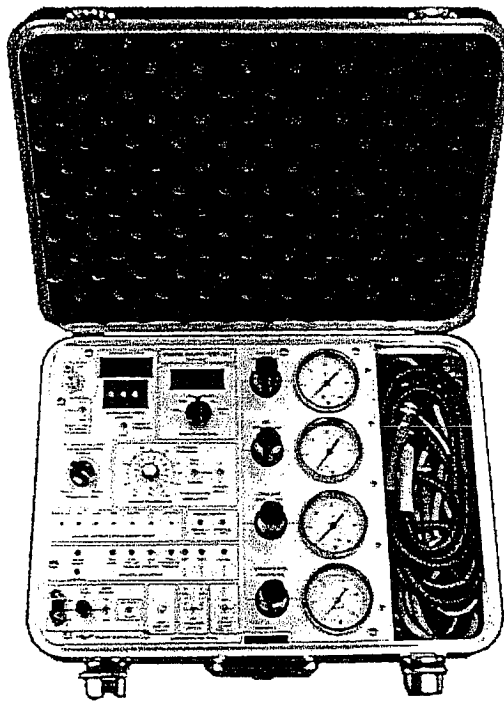


**ENGINE SAVER®
TEST SET
MODEL 9550
MANUAL**



FLIGHT SYSTEMS

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Flight Systems

9550 ENGINE SAVER TEST SET

February 1, 2001 revision

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1.0 INTRODUCTION

The Model 9550 Engine Saver Test Set was designed to provide the equipment OEM and fleet user with a convenient means of testing, calibrating and troubleshooting the Engine Saver and other related engine protection products, components and accessories. The Model 9550 Test Set is compact and self-contained in an attractive and serviceable aluminum or fiberglass attaché case that weighs less than 20 lbs. All of the electronic and pneumatic components, as well as the hoses and electrical cable necessary for testing the 550 Engine Saver, are included. The only additional requirements are an air supply of 60 to 150 PSI, a source of 24 volts DC power at 1 amp, and a portable volt-ohmmeter.

The present revision of this manual incorporates updated information reflecting the advances in the 550 Engine Saver through the many years it has been in reliable service to the industry. Thus, in order to stay as up-to-date as possible and at the same time to keep this manual down to a reasonable size, the emphasis here is on the current Level 7 in its original design, and in its newer RETROFITTED version.

The previous switch-type sensors for the Turbo and Crankcase pressure channels have been upgraded to analog, continuous-type sensors along with the Level 7's ability to provide DC ANALOG OUTPUT of 0 to 5 Vdc for each channel. This is one of the many features of the Level 7 Engine Saver, which were not available on earlier levels.

However, Flight Systems continues to provide Model 550 upgrade and test capability for earlier models of the Model 550 Level 7 Engine Saver by means of dual testing capability to test the 65 Coolant Temp. Sensor (Pn 57-5500-65) used only with the PC board part numbers 57-5500-49B & C and the 76 Coolant Temp Sensor (Pn 57-CU66-76) used only with the 57-5500-49C Engine Saver PC board.

2.0 DESCRIPTION AND THEORY OF OPERATION

2.1 GENERAL

The 9550 contains all of the electronic and pneumatic components necessary to simulate the electrical and pressure inputs to the Engine Saver under test. Electrical parameters, such as pulse frequency and RPM, analog DC outputs corresponding to oil & coolant pressures, etc., are displayed on front-panel digital readouts. Internal circuitry also converts each analog DC output from the Level 7 Engine Saver directly into the corresponding units for that output; e.g., 5 volts DC from the OIL PRESSURE channel is automatically converted into "60" PSI and may be read as such from the digital voltmeter (DVM) on the front panel of the 9550 Test Set.

The pressure inputs are simulated by individually regulating the incoming compressed air source for each input. The amount of pressure being applied to each input (turbo, oil, coolant and crankcase) is adjusted by means of a front-panel control and measured by a large, easy-to-read gauge.

Other front-panel features include power switch, line fuse, Master Reset pushbutton, engine relay position indicators and binding posts for easy electrical connections. In addition, the Test Set now provides a variable TEMPERATURE sensor simulation, with a fixed 100 deg. C "cal" position also selectable. Also included is an AUDIBLE ALARM with loudness control. A compartment to the right of the panel stores hoses, electrical cables and accessory fittings.

2.2 PULSE FREQUENCY GENERATION/MEASUREMENT

In actual Engine Saver operation, pulses are generated by a reluctance pickup mounted on the engine or by a tachometer generator. These pulses are simulated by the electronics of the 9550 Test Set. An internal oscillator produces pulses at a rate set by the FREQ/RPM control on the front panel. When the DISPLAY FUNCTION switch is in the FREQ position, the simulated pulses are applied to the Engine Saver unit under test and displayed on the digital readout. The amplitude (strength) of the internally generated pulses is set near the lowest level of signal to be expected in actual practice (approx. 0.4 volts) so as to properly test the sensitivity of the Engine Saver.

2.3 ENGINE RPM MEASUREMENT

A convenient means has been provided to measure the simulated RPM of the internally generated pulses directly, without the usual need for calculating the conversion from frequency to RPM. This function is performed by an analog computing circuit within the 9550 Test Set. It is only necessary to know the number of teeth on the flywheel ring gear. For U.S.-made engines using SAE gear standards, this would be 103, 118, 142, or 168 teeth. The 9550 Test Set can accommodate any number of teeth from 100 to 200. To make direct RPM simulation and measurement, the number of teeth is first programmed into the front-panel thumb-wheel switch marked EQUIVALENT TEETH. With the DISPLAY FUNCTION switch in the RPM position, the simulated RPM will be displayed directly on the digital readout, and may be varied with the FREQ/RPM knob.

The TYPE of RPM source being fed into the Engine Saver under test is selectable via an RPM SENSOR switch, whose 3 positions simulate a MAGNETIC pickup signal, an ALTERNATOR signal, or an OPEN-circuit RPM line to simulate the loss of an RPM signal.

2.4 DC ANALOG OUTPUTS MEASUREMENT

The 9550 Test Set has been upgraded to permit measurement of the analog outputs provided by the Engine Saver levels 7 and up. Front-panel banana jacks allow an external voltmeter to read the DC analog outputs generated by the Engine Saver. For example, at 60 PSI into the OIL PRESSURE sensor, the Engine Saver's internal electronics outputs an analog signal of 0 to +5 volts DC. At 30 PSI into the Engine Saver would cause it to output +2.5 volts DC, and so on. This feature of the Engine Saver conversion of pressures into varying DC voltages—allows the Engine Saver to be monitored by our Model 575 SERVICE ADVANTAGE DATA COLLECTION SYSTEM. The Model 575 creates readouts and graphs of engine data supplied by the Engine Saver and accessory sensors, providing critical engine TREND ANALYSIS need to diagnose an engine or equipment problems before they become catastrophic failures. The capability vastly expands the Engine Saver's capability to protect expensive engines.

2.4 continued

Not only is the Engine Saver able to warn the operator and shut down a malfunctioning engine before irreversible damage is done, but with the trend analysis capabilities made possible with the analog DC outputs of engine parameters, engine owners can spot a potential problem well before it actually occurs.

On the 9550 Test Set, it is easy to verify the analog outputs from the Engine Saver (per the example given above) simply by plugging the HI lead of a portable voltmeter into the banana jack marked OIL PRESSURE on the far left of the front panel. Then connect the LOW lead of the meter in the black ANALOG RETURN banana jack. Dialing in 30 PSI via the OIL PRESSURE regulator and gauge, you should then see 2.5 volts on the portable voltmeter.

In addition, the 9550 AUTOMATICALLY CONVERTS THE SAME 2.5 Vdc into PSI units which may be read directly off the front-panel DVM. Turning the DVM SELECT rotary switch to ANALOG OIL gives reading of "30" PSI on the DVM readout, in this case. The automatic DC volts-to-selected units are automatically accomplished internally for each of the other 4 parameters. (Note: TACH position gives RPM x 10; i.e., 1800 RPM would appear as "180" RPM on DVM. Also note that there are no available Turbo or Crankcase analog DC outputs from the original, non-retrofitted Level 7 Engine Saver).

2.5 TEMPERATURE MEASUREMENT

The 9550 Test Set provides for the testing of the Engine Saver's TEMP channel via a front-panel pot whose resistance is variable, simulating a temperature sensor, over a range of 50 to 180 degrees C. In addition, the user may flip a switch to select a fixed 100-degrees C "reference" in order to check the calibration of the variable temp knob. A third switch position open-circuits the temperature channel completely to simulate an open temp sensor wire or bad temp sensor in an actual field situation.

2.5 continued

On our new test set Model 9550 C, you will find a selector switch that gives you the option to test either the 65 Coolant Temp. Sensor (Pn 57-5500-65) or the 76 Coolant Temp Sensor (Pn 57-CU66-76). The 65 Coolant Temp Sensor is used with the Pn 57-5500-49A &B Engine Saver PC boards and the 76 Coolant Temp Sensor is only used with the Pn 57-5500-49C Engine Saver PC boards. If you install a PC board in a unit that has the wrong Temp Sensor, you will get an immediate trip on Coolant Temperature. For easy part number identification on our new 49C PC boards, you will find the part number stamped on the PC board faceplate.

2.6 SIMULATION OF PRESSURE INPUTS

A source of regulated compressed air between 60 to 80 PSI is connected to the test set at the inlet marked AIR Supply. The incoming air is reduced in pressure by four separate regulators. Each regulator can be set by means of a control knob on the front panel of the test set. A gauge on the panel measures the air pressure applied to each input of the unit being tested. For the oil and coolant pressures, a range of 0 to 60 PSI is available.

Turbo pressure is variable from 0 to 30 PSI. The crankcase pressure input is limited to a maximum of 15 inches of water column, in order to protect the test set gauge and transducer on retrofitted Engine Savers. A 10 inches of water column switch is install in all stock Engine Savers. If you find that the stock switch is not suited for your application we do stock 8 and 15 inches of water column switches. A flexible hose with a quick-disconnect type coupler connects the Test Set to each of the 4 pressure inputs of the Engine Saver unit under test.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES

MODEL 9550-C TEST SET REQUIRED

3.0 TEST PROCEDURES

The Model 9550 Test Set will test the following Level-7 Engine Saver Model:
Model 550 Lv-7 – Engine Saver with PN 57-5500-49A, B & C, PC boards.

Model 565 Lv-7 Engine Saver:

You must order special harness adapters to test the following PC boards, PN 57-5500-49A, B & C, PC boards.

Equipment required that is not supplied:

- Regulated 60-PSI Air supply.
- 24 volts DC power supply
- Volt-ohmmeter
- Potentiometer adjustment tool or slotted screwdriver

Factory preset trip settings:

All unit trip settings are preset at the Factory on all new or repaired Models 550 and 565. Please note, you will find factory trip setting taped on the face of each Engine Saver.

Warning:

The markings around the adjustment pots on the PC board are not to be used to calibrate your unit. They are only to be used as reference points.

Our test sets are calibrated every three months. We suggest you recalibrate your test set every three months with a new Model 550 or new PC board that we have recently ship to you.

Prepare Test Set for testing

- ✓ Set Pressure gauges to zero, turn counter clockwise.
- ✓ Set Temperature sensor simulator to desired position on test set – for testing a 49A & B PCB, set to 65 Temp Sensor; for testing a 49C PCB, set test set to 76 temp sensor.
- ✓ Connect Regulated Air Supply to Test Set.
- ✓ Set RPM sensor to MAG.
- ✓ Set Analog display function to RPM.
- ✓ Set Equivalent Teeth dials to desired application (See service manual, page 13, table 4)
- ✓ Set Freq./RPM rotary knob to zero.
- ✓ Set 100C sensor switch to variable
- ✓ Set temperature degrees knob to 80C.
- ✓ Set display function to RPM.
- ✓ Set Aux. Input toggle switch to off. (center position).
- ✓ Set Alarm switch to low.

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Model 550 test procedures

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES MODEL 9550-C TEST SET REQUIRED

To Begin Testing

1. Connect main and accessory test set cables to the Engine Saver.
2. Connect only the Turbo and Crankcase pressure lines to ES.
3. Set oil pressure gauge to 50 PSI on test set.
4. Set Coolant pressure gauge to 30 PSI on test set
5. Turn on test set main power switch, Test set red LED relay output normally closed, is on.
6. Turn on Engine Saver switch (also doubles as reset switch).
On the relay output, the red LED on the Test Set turns off and the Green LED's turn on and the Accessory power green LED turns on.
Engine Saver LED display on back of Engine Saver board green power LED turns on.
Red LED's for Oil and Coolant on top of the board comes on for about 120 seconds. Relay should not trip out during this period. If the unit trips out, that indicates there is a problem with the PC board.
7. Slowly increase turbo pressure, the green turbo LED (on the board top) should turn on near 8 PSI. After a 15-20 second delay, the green enable LED is on the test set and the Engine Saver (back of the board) will turn on.
8. After another 10 seconds delay, the red LED for low oil on the test set and the back of the board turns on steady. The red LED's for alarm on the test set and the alarm output on back of the board, blink. The audible alarm beeps. This condition continues for 20-30 seconds, then the relay will trip. The red LED's will be on steady and the audible alarm will sound steady.
9. Connect oil and coolant pressure lines to the Engine Saver. The red LED's on the top of the PC board turns off.
10. Restore turbo pressure to Zero.
11. Press test set master reset button.
Red LED's on the test set and the back of the board turn off. The audible alarm turns off.
12. Connect a voltmeter (red wire) to test point #1 on the top of the board.
Connect the voltmeter (black wire) to the black wire on either transducer of the Engine Saver.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES

MODEL 9550-C TEST SET REQUIRED

13. On the test set, turn display function switch to RPM.
14. On the test set, turn the frequency/RPM knob clockwise to 2500 on the test set frequency/RPM meter. The voltmeter should read 8 volts at test point 1 located on the PC board. If needed, adjust the RPM fine pot on the PC board to Maintain 8 volts at 2500 RPM's while adjusting over-speed pot.
15. Make pot adjustments with care.

TESTING THE ANALOG OUTPUT VOLTAGE FROM THE ENGINE SAVER

Making sure the Analog Output Voltage is correct is very important for two reasons. Number one, if the voltage required is not correct, that is a good indicator there could be a problem in that circuit. Number two, the Analog output voltage must be correct when you are using our data collection system. The data collection systems will only work with the 49C PC board. The output voltage does change depending on what version PC board you are testing. The three different PC boards are PN57-5500-49A, B and C. On the stock Model 550 there are 4 analog outputs, RPM, Coolant temp, Oil pressure and Coolant pressure. When the auxiliary PC board is added to the Model 550, there is also turbo pressure and Crankcase pressure analog outputs.

16. TEST FOR RPM ANALOG OUTPUTS VOLTAGE FROM ENGINE SAVER - Plug the voltmeter negative into Analog return on test set, then plug the positive into RPM plug on the test set. Turn test set to 2500 RPM, voltmeter should read 4 to 4.3 volts.

17. Adjust the over-speed pot to turn on the red over-speed LED's on the test set and the backside of the board. Also turned on is the test set red LED NC and the red LED alarm output on the back of the board. The audible alarm sounds, is on steady. Over-speed trip may now be reset to your desired specification.

18. Switch off the audible alarm for the next part of the test.

19. Leave the RPM switch at 2500

20. On the test set flip RPM sensor switch to ALT.

21. On the test set, turn equivalent teeth to 015.

22. On top of the board, set the RPM coarse pot to #4.

23. On top of the board, set the dip-switch (small rocker switches under the clear cover on the top of the board) #1 off, #2 and #3, on, #4 and #5 off.

24. The voltmeter should read between 5.2 and 6.2 volts. (5.7 is optimum).

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Model 550 test procedures

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES

MODEL 9550-C TEST SET REQUIRED

25. Restore dip-switch to #1 on, #2-#3-#4-#5 off, and replace the switch cover.
26. Restore RPM coarse pot to #0.
27. Restore test set RPM sensor switch to MAG.
28. Restore Equivalent teeth to 142.
Voltmeter should read between 7.98 and 8.02 volts. Turn the Freq./RPM knob counter clockwise to lower the RPM reading on the test set meter to 2200 RPM's.
29. Press master reset button on the test set.
30. Repeat steps #12 thru #29 to verify the settings.
31. Disconnect the voltmeter.
32. Leave the Freq./RPM set at 2200 on the test set.
33. Press the master reset button.
34. Restore audible alarm switch to low.
35. Place RPM sensor switch to open. The tests set over-speed red LED and alarm red LED will blink. The audible alarm will beep. On the back of the board, the over-speed red LED and the alarm output red LED's will blink on 49C PC board only. After a delay of 30-60 seconds the red LED's and the audible alarm will be on steady.
36. Restore RPM sensor switch to MAG.
The red LED's and audible alarm turn off automatically.
37. Turn the Freq./RPM knob counter clockwise to zero on the test set meter.
38. Set temperature to 80C. (A lower temp setting will result in longer delay delayed timing – two to three minuets.)
39. Turn Freq./RPM knob clockwise slowly to 500 RPM on the test set meter.
The enable green LED on top of the board turns on. Adjust the enable pot if needed. After a 10-second delay, the enable green LED's on the test set and on the back of the board turns on.
40. TEST FOR RPM IDLE, ANALOG OUTPUT VOLTAGES FROM ENGINE SAVER. - Plug the voltmeter negative into Analog return on test set, then plug the positive into RPM plug on the test set. Turn test set to 500 RPM, voltmeter should read for the 49A B, & C PC boards - .804 to .826 volts.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES MODEL 9550-C TEST SET REQUIRED

41. On the test set, turn the digital display function switch to analog oil.
42. On the test set, turn the Freq./RPM knob clockwise to 2200 RPM on the test set meter.
43. Turn the oil pressure knob counter clockwise to lower the oil pressure to 42 PSI while tapping on the oil transducer in the Engine Saver (tap firmly). Carefully adjust the oil run pot if needed. The oil red LED on top of the board should turn on. After a 10-second delay the red LED low oil on the test set and the back of the board turn on steady. The test set red LED alarm and the red LED alarm output on the back of the board will blink. Also the audible alarm will beep. This condition will continue 20-30 seconds and then the relay will trip. All low oil red LED's and the test set relay NC turn on steady as well as the audible alarm. During the first 10 second delay, if the oil pressure returns to normal, it will cancel out the indicated fault and the unit will not trip.

TEST FOR RUN OIL PRESSURE, ANALOG OUTPUTS VOLTAGE FROM ENGINE SAVER – for the PN57-5500-49A, B, and C PC boards - Plug the voltmeter negative into Analog return on test set, then plug the positive into Oil pressure plug on the test set. Turn RPM to 2200 RPM on test set, then turn oil pressure gauge to 42 PSI on test set. Voltmeter should read 3.52 to 3.77 volts.

44. Restore oil pressure to 50 PSI on the test set.
45. Press the master reset button on the test set.
46. Wait approximately 10 seconds for the green LED enable to turn on (test set and board back.)
47. Idle trip range, on the test set, turn the RPM knob to 900 RPM on the test set meter.
Lower the oil pressure to 12 PSI while tapping the oil transducer in the Engine Saver.
The red oil LED on top of the board turns on.
Adjust low oil idle pot if needed.
After a 10-second delay, the red LED low oil on the test set and the back of the board turn on steady. The test set red LED alarm and the red LED alarm output on the back of the board will blink – also the audible alarm beeps. This condition will continue 20-30 seconds and then the relay will trip. All low oil red LED's and the test set relay NC turn on steady as well as the audible alarm.
48. TEST FOR IDLE OIL PRESSURE, ANALOG OUTPUT VOLTAGES FROM ENGINE SAVER – for the PN57-5500-49A, B, and C PC boards - Plug the voltmeter negative into Analog return on test set, then plug the positive into Oil pressure plug on the test set. Turn RPM to 900 RPM on test set, then turn oil

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES

MODEL 9550-C TEST SET REQUIRED

48. continued

pressure gauge to 12 PSI on test set. Voltmeter should read 1.37 to 1.43 volts for the 49B & C and about 1.25 volts for the 49A PC board.

49. Restore oil pressure to 50 PSI on the test set.

50. On the test set, press the master reset button.

51. Wait 10 seconds for the green LED's enable to turn on.

52. On the test set, turn the digital display Function switch to analog coolant.

53. On the test set turn the RPM knob to 2200 RPM.

54. Turn the coolant pressure knob counter clockwise to 15 PSI while tapping on the coolant transducer in the Engine Saver. Carefully adjust the coolant pot if needed. The red LED coolant on top of the board turns on. After 20-30 second delay, the red LED low coolant on the test set and the back of the board turns on steady. The test set alarm red LED and the alarm output red LED will blink. Also the audible alarm will beep. This condition will continue 20-30 seconds and the relay will trip. All low coolant red LED and the red LED relay NC turn on steady as will as the audible alarm.

55. TEST FOR RUN COOLANT PRESSURE, ANALOG OUTPUTS VOLTAGE FROM ENGINE SAVER – for the PN57-5500-49B, and C, PC boards - Plug the voltmeter negative into Analog return on test set, then plug the positive into Coolant pressure plug on the test set. Turn RPM to 2200 RPM on test set, then turn Coolant pressure gauge to 15 PSI on test set. Voltmeter should read 2.95 to 3.09 volts.

56. Restore coolant pressure to 30 PSI on the test set

57. Press the master reset button on the test set.

58. Wait 10 seconds for the green LED enable to turn on, test set and board back).

59. On the test set, turn RPM knob to 900 RPM on the test set meter. Lower the coolant pressure to 3 PSI while tapping the coolant transducer in the Engine Saver. The coolant red LED on top of the board turns on. Adjust low coolant pot if needed. After a delay of 20-30 seconds, the red LED low coolant on the test set and the back of the board turn on steady. The test set red LED alarm and the red LED alarm output on the back of the board will blink – also the audible alarm will beep. This condition will continue 20-30 seconds and the relay will trip. All low coolant and relay NC red LED is on steady as well as the audible alarm.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES

MODEL 9550-C TEST SET REQUIRED

59. continued

TEST FOR IDLE COOLANT PRESSURE, ANALOG OUTPUTS VOLTAGE FROM ENGINE SAVER – for the PN57-5500-49B, and C, PC boards - Plug the voltmeter negative into Analog return on test set, then plug the positive into Coolant pressure plug on the test set. Turn RPM to 900 RPM on test set, then turn Coolant pressure gauge to 3 PSI on test set. Voltmeter should read .588 to .663 for the 49B & C and .920 to .931 volts for the 49A PC boards.

60. Restore coolant pressure to 30 PSI.

61. Press master reset button on the test set, and wait for the green LED enable to turn on.

62. Turn temp degrees knob slowly to 100C. The temp red LED on top of board should turn on. Adjust temp pot if needed. After a delay of 15 seconds, the test set red LED Hi-temp, and the red LED HI-temp on the back of the board should turn on steady. The test set red LED alarm and the red LED alarm output on the back of the board should blink and the audible alarm will beep. This condition will continue 20-30 seconds and the relay will trip. The test set relay NC and all temp red LED turn on steady as well as the audible alarm.

62a. Test for temperature open circuit, turn temp toggle switch, 100C/variable to open. The test set red LED high temp and alarm will blink and the audible alarm will beep. The red LED high temp and alarm on the back of the board will blink. These conditions will continue for 20 to 30 seconds and the relay will trip. At this time, the relay output and alarm red LED's are on steady as well as the audible alarm. The high temp LED continues to blink, restore the temp toggle switch to variable. The test set will reset automatically.

- A voltmeter may be used to verify the voltage at 100C by connecting the black wire to a black wire on the oil or coolant transducers in the Engine Saver. The red wire of the voltmeter connects to the 7th pin (violet wire) on the long red 24-pin connector on top of the board. The voltage for the 49C should read between 2.54 and 2.62 volts (2.59 volts is optimum). The analog output voltage should read the same. The 49B should read 1.32 volts. The analog output voltage should read the same.

63. TEST FOR COOLANT TEMP. - ANALOG OUTPUT VOLTAGES FROM ENGINE SAVER – for the PN57-5500-49B, and C, PC boards that use the GE temp sensor. The PC boards are fixed at the factory to trip at 112C. Plug the voltmeter negative into Analog return on test set, then plug the positive into Coolant Temp plug on the test set. The voltmeter should read for the 49C PC board only, 2.54 to 2.67 volts. A 49B PC board that uses a 65 coolant temp sensor should read about 1.32 volts.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES MODEL 9550-C TEST SET REQUIRED

64. Restore temp knob to 80C.
65. On the test set, press the master reset button.
66. Repeat steps 62 to 65 to verify the settings.
67. To test for open circuit on 49C PC board only, remove the red wire from the oil transducer. The test set red LED low oil and alarm will blink. Also the red LED low oil and output alarm blink on the back of the board and the audible alarm beeps. Replace the wire.
68. Remove the orange wire from the coolant transducer and note the same results as in step 66.
69. The crankcase pressure gauge and switch are very sensitive. Turn very slowly to verify that the crankcase switch is tripping at desired pressure, 10" H₂O. We also have 15" H₂O switches available, see part book. The adjustable crankcase pressure pot is not used in the stock Model 550 Engine Saver. An Auxiliary PC board must be purchased to receive crankcase and turbo analog outputs.
70. On the test set, slowly turn the crankcase pressure knob to raise the pressure, between 9" and 13 Inches of H₂O. The red LED crankcase pressure on top of the board should turn on. After a 10 second delay, the hi-crankcase red LED on the test set and the back of the board will turn on steady. The test set red LED alarm and red LED alarm output on the back of the board will blink and the audible alarm beeps. This condition will continue 20-30 seconds and the relay will trip. The test set red LED relay NC will turn on and all high crankcase red LED, are on steady as well as the audible alarm.
71. Restore crankcase pressure to zero.
72. Press test set master reset button.
73. Wait for green LED enable to turn on.
74. Repeat steps 69 to 73 to verify the settings.
(Note that the interval of blinking LED and audible alarm beeps of 20-30 seconds may be shorter or longer by adjusting the shutdown pot on the top of the PC board.)
75. On the test set, turn on the aux. Trip switch #1 position. After an 18 second delay, the test set red LED Aux. Fault #1 and the Aux. fault #1 on the back of the PC board blink and the audible alarm beeps. This condition will continue 20-30 seconds and the relay will trip. The test set red LED relay NC turns on and all Aux. fault red LED are on steady as is the audible alarm.

MODEL 550 & 565 ENGINE SAVER TEST PROCEDURES MODEL 9550-C TEST SET REQUIRED

76. Restore Aux. Fault switch too off, center position. Press test set master reset button.

77. To check Aux. Fault #2, connect a wire from the pin 1 (2 pin green connector on top of PC board) to a black wire on the transducer. After a delay of 20-30 seconds, the test set red LED alarm will blink and the audible alarm beeps. On the back of the board, the red LED alarm output is on steady and the Aux. fault #2 blinks. This condition will continue for 20-30 seconds and the relay will trip. See the red LED and the audible alarm are on steady.

END OF TEST

4.0 SERVICING AND CALIBRATION OF THE MODEL 9550 TEST SET

Flight Systems offers a complete repair service for all of the products that we manufacture, along with free technical assistance at any of the locations shown below. If for any reason you have problems contacting our distributors, please contact Flight Systems Headquarters, 505 Fishing Creek Road, Lewisberry, PA 17339 - phone # 717-932-9900, Fax # 717-932-9925. You can find out about all of Flight Systems' products and services on our website www.flightsystems.com.

SALES AND SERVICE LOCATIONS

NORTH AMERICA / CORPORATE HEADQUARTERS

Flight Systems Inc. Sales – Barry Ickes / Michelle Dougherty
505 Fishing Creek Road Engineering / Tech Support – Ron Twietmeyer
Lewisberry, PA 17339

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V3T 4W2, Canada Key Contact: Bill Lapp

5.0 WARRANTY INFORMATION

The Model 9550 ENGINE SAVER TEST SET is warranted to be free from defects in materials and workmanship for a period of twenty-four (24) months from the date of shipment, or the date it is first put into service, if the latter is documented by completing and returning the Warranty Registration below. FLIGHT SYSTEMS' liability is limited to the Repair or Replacement of defective product during the warranty period, and does not cover installation or removal costs incurred or possible damage to other equipment (including engines or parts thereof) as a result of a malfunction of the 9550 TEST SET. If, in the opinion of FLIGHT SYSTEMS (or its authorized agents) the malfunction of the 9550 TEST SET was caused by abuse, misuse or improper installation, the warranty claim shall be disallowed and established repair rates shall apply. Units should be shipped, Freight Charges Prepaid, directly to FLIGHT SYSTEMS, 505 Fishing Creek Road, Lewisberry, PA 17339, USA or any of our authorized agents.

MODEL 9550 WARRANTY REGISTRATION -- PLEASE FILL OUT AND RETURN

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

PHONE: _____

DATE PURCHASED _____ UNIT SERIAL NO. _____

PLEASE PRINT YOUR NAME & TITLE _____

6.0 FLIGHT SYSTEMS TECHNICAL SUPPORT HOTLINE

Flight Systems Diesel Controls Technical Support Hotline

Office hours Monday – Friday 8:00 AM to 5:00 PM, EST

Phone: 717-932-9900 Fax: 717-932-9925

Flight Systems Website – www.flightsystems.com

6.1 CONTACT PERSONNEL AT FLIGHT SYSTEMS USA

Phone: 717-932-9900 Fax: 717-932-9925

- A. Product Application/Sales Manager –
Barry Ickes, email - bickes@flightsystems.com**
- B. Purchasing/Sales Manager –
Michelle Dougherty, email - mdougherty@flightsystems.com**
- C. Product Engineer –
Ron Twietmeyer, email - rtwietmeyer@flightsystems.com**
- D. Repair Technician – Gary Givler**
- E. Test Technician – Ken Smith**