963

Bobcat®

Service Manual

(S/N 562215001 & Above)
(S/N 516515001 & Above)



EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS™)

6900988 (3-06)

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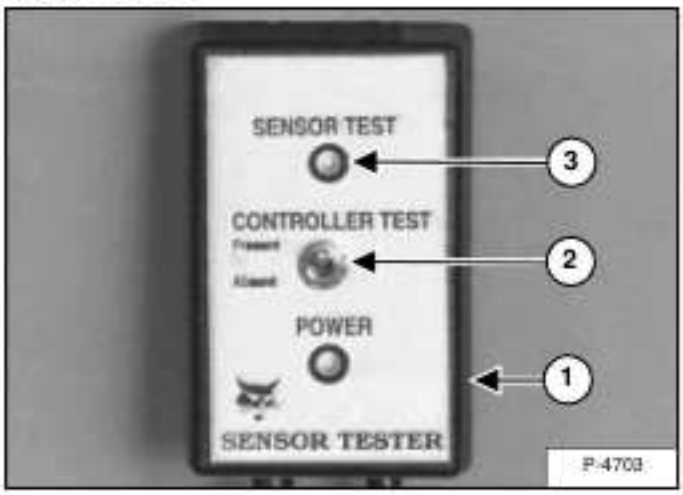
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SPECIFICATIONS SPEC-01

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BICS™ Circuit Test (Cont'd)

Figure 60-100-9



Connect Sensor Tester (Item 1) **[Figure 60-100-9]** inline to the seat bar sensor connectors.

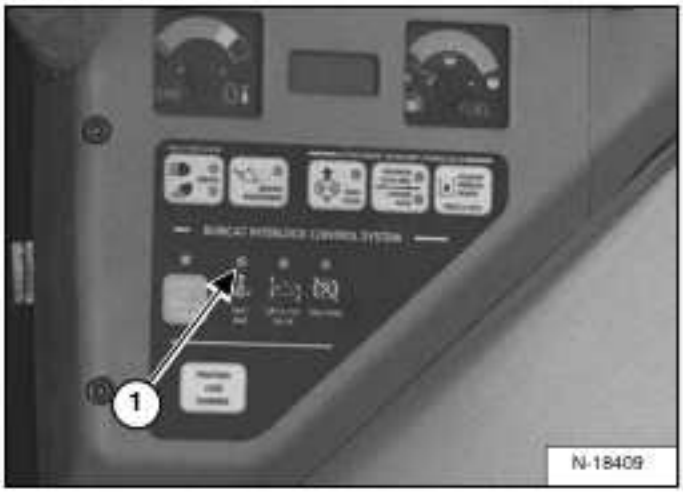
Turn the key to the ON position. **DO NOT START THE ENGINE**.

If there is no power light on the sensor tester, check the tester or wiring harness.

When the power light is illuminated, move the toggle switch (Item 2) **[Figure 60-100-9]** on the sensor tester to the ***Present*** position.

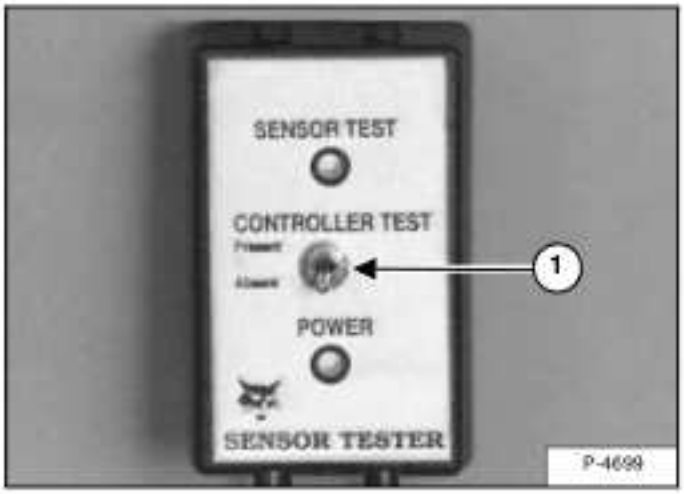
NOTE: The sensor test light (Item 3) [Figure 60-100-9] is only activated by the seat bar. It will be off with the seat bar up or on with the seat bar down.

Figure 60-100-10



The BICS™ seat bar indicator light (Item 1) **[Figure 60-100-10]** should illuminate.

Figure 60-100-11



Move the toggle switch (Item 1) **[Figure 60-100-11]** on the sensor tester to the ***Absent*** position.

The Seat Bar light (Item 1) **[Figure 60-100-10]** should go off.

If the above test fails, there is a problem with the Bobcat controller or the wiring harness.

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SYSTEM TROUBLESHOOTING CHART (CONT'D)

Gauge Pressure Related Troubleshooting (Cont'd)

POSSIBLE CAUSE	INSPECTION	SOLUTION
System pressures Equal.		
1. Clutch not operating.	See magnetic clutch related topics above.	
2. Compressor not pumping.	Equal high and low pressures.	Replace compressor.

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ENGINE SPECIFICATIONS

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.

General

Number Of Cylinders	4
Cylinder Arrangement	In-line
Cycle	4 Stroke
Direction Of Rotation	Clockwise From The Front
Intake System	Turbocharged
Combustion System	Direct Injection
Nominal Bore	3.937 (100)
Stroke	5.000 (127)
Compression Ratio	17.25:1
Displacement	243 C.I. (4 liters)
Firing Order	1-3-4-2

Cylinder Head

Head Thickness	4.047-4.078 (102,8-103,6)
Head Thickness After Machining (Minimum)	4.035 (102,5)
Valve Seat Angle	46°
Leak Test Pressure	29 PSI (200kPa)

Valve Guides

Inside Diameter	0.3744-0.3764 (9,51-9,56)
Outside Diameter	0.6260-0.6264 (15,90-15,91)
Valve Guide Bore	0.6248-0.6256 (15,87-15,89)
Valve Guide Clearance in the Cylinder Head (Interference)	0.0018-0.0027 (0,047-0,007
Overall Length:	
Intake	2.281 (57,94)
Exhaust	2.406 (61,10)
Protrusion From Bottom	0.585-0.596 (14,85-15,15)

Exhaust Valves

Valve Stem Diameter	0.3515-0.3528 (8,93-8-96)
Valve Guide Clearance	0.0016-0.0033 (0,040-0,84)
Maximum	0.0041 (0,104)
Valve Head Diameter	1.609-1.619 (40,88-41,12)
Valve Face Angle	45°
Overall Length	4.829-4.854 (122,66-123,30)
Seal Type	Positive
Valve Seat Angle	46°
Valve Clearance	0.018 (0,45)
Exhaust Depth (Production)	0.055-0.067 (1,40-1,70)
Exhaust Depth (Service)	0.077 (1,95)

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HYDRAULIC/HYDROSTATIC SCHEMATIC
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(Printed February 2000)
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LEGEND

1. RESERVOIR:
   C apacity 30 Qts. (28,4 L)
2. SPRING LOADED FILTER BYPASS VALVE: 45-55 PSI (311-379 kPa)
3. DIFFERENTIAL PRESSURE SWITCH: 36-44 PSI (248-303 kPa) (Normally Closed)
4. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - TWO SPEED
5. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 4640 PSI (31993 kPa)
6. RELIEF VALVE - CHARGE:
   150° F. (65 °C.) Fluid ± Full RPM
   N eutral - 319 PSI (2200 kPa)
7. ANTI DRAIN BACK VALVE
8. HYDROSTATIC CHARGE PUMP: 7.8 GPM (29,5 L/min.) at 3525 RPM
9. HYDRAULIC PUMP: Gear Type 27.9 GPM (105,6 L/min.) at 3525 RPM
10. RELIEF VALVE - MAIN (DUAL PRESSURE) AT QUICK COUPLERS:
    3025 PSI (20857 kPa)
    SECOND STAGE
    3375 PSI (23270 kPa)
11. RELIEF VALVE - PORT:
    4000 PSI (27580 kPa)
12. ANTICAVITATION VALVE
13. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - AUXILIARY
14. RELIEF VALVE - AUXILIARY PORT: (Optiona) 2500 PSI (17237 kPa)
15. LOAD CHECK VALVE
16. ONE WAY RESTRICTOR VALVE
17. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
18. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - BICS LOCK VALVE - TILT CONTROL
19. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - BICS LOCK VALVE - LIFT CONTROL
20. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY PASS
21. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - UNLOADING SPOOL
22. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - FLOW CONTROL SPOOL
23. FLOW DIVIDER ADJUSTMENT VALVE
24. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BLEED OFF REAR AUXILIARY ("SV2")
25. LOAD SHUTTLE VALVE - BLEED OFF
26. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - FOR REAR AUXILIARY - NORMALLY CLOSED
27. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - FOR REAR AUXILIARY - NORMALLY OPEN
28. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - FOR REAR AUXILIARY - NORMALLY OPEN
29. FILTER - DIVERTER VALVE (SCREEN) INTEGRATED IN SOLENOID
30. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - TO ACTIVATE REAR AUXILIARY ("SV1")
31. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE - FOR REAR AUXILIARY - NORMALLY CLOSED
32. FILTER - HYDRAULIC
33. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BRAKE
34. FILTER - BICS VALVE (SCREEN) INTEGRATED IN CHECK VALVE
35. FILTER - BICS VALVE (SCREEN) INTEGRATED IN SOLENOID
36. CHECK VALVE - BUCKET POSITION VALVE
37. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
38. RELIEF VALVE - FLUSHING:
    260 PSI (1793 kPa)
39. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR
40. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BUCKET POSITION VALVE (ON/OFF)
41. CHECK VALVE - BICS VALVE
42. RESTRICTION . . . . . 0.080 inch (2,03 mm)
43. RELIEF VALVE - PORT (TILT ROD END):
    3500 PSI (24133 kPa)
44. RELIEF/ANTICAVITATION VALVE - PORT (TILT BASE END):
    3500 PSI (24133 kPa)
45. RELIEF VALVE - CHARGE:
    150° F. (65 ° C.) Fluid ± Full RPM
    Neutral - 406 PSI (2800 kPa)
46. RESTRICTION 0.04 inch (1,01 mm)
47. DISPLACEMENT CONTROL SPOOL: 72.5 - 290 PSI SPRINGS
48. RESTRICTION . . . . 0.071 inch (1,80 mm)
49. DA CONTROL VALVE
50. RESTRICTION . . . . . 0.217 inch (5,51 mm)
51. LEVER ACTIVATED CONTROLLER
52. PARKING BRAKE
53. DIRECTIONAL CONTROL VALVE - FLUSHING
54. DIRECTIONAL CONTROL VALVE - TWO SPEED
55. CHECK VALVE
56. FAN PUMP
57. SYNCHRONIZING PISTON
58. SPRING LOADED FILTER BYPASS VALVE: 20 PSI (138 kPa)
59. RELIEF VALVE
60. FAN MOTOR
61. SOLENOID ACTIVATED DIRECTIONA CONTROL VALVE
62. PILOT ACTIVATED DIRECTIONAL CONTROL VALVE
63. LOAD SHUTTLE VALVE
64. FILTER
65. SHUTTLE VALVE - LOW PRESSURE
66. HYDRAULIC PRESSURE SENSOR

NOTE: Unless otherwise specified springs have NO significant pressure value.

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