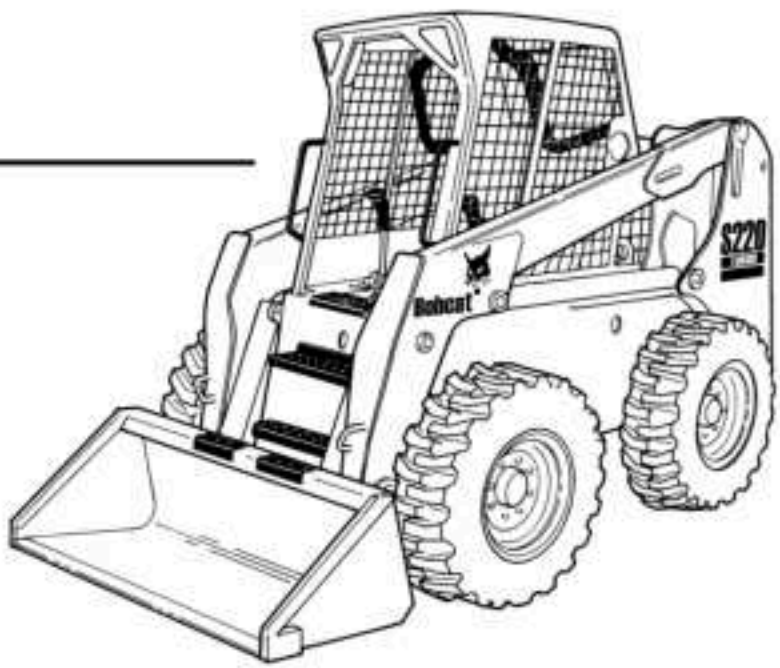
S220 TURBO

S220 TURBO HIGH FLOW

Bobcat®

Service Manual

S/N 523211001 & Above
S/N 523311001 & Above



EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)

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Ingersoll Rand
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Troubleshooting Guide

The following list shows the effects which can happen to the loader, and the probable causes when the BICS System lights are off or flashing and associated service code. (See DIAGNOSTICS SERVICE CODES on Page 60-90-1.)

Indicator Light	Light ON	Light OFF	Effect on Operation of Loader When Light is OFF	SERVICE CODES Means System Error (See Your Bobcat Dealer for Service)		
				No. of Flashes	Service Code	Causes
	PRESS TO OPERATE LOADER Button is pressed.	PRESS TO OPERATE LOADER Button is not pressed.	Lift, tilt and traction functions will not operate.	----	----	----
	Seat Bar is down.	Seat Bar is up.	Lift and tilt functions will not operate.	2	11-05	Seat Bar sensor circuit shorted to battery voltage*.
				3	11-06	Seat Bar sensor circuit shorted to ground.
	Control valve can be used.	Control valve cannot be used.	Lift, tilt and traction functions will not operate.	1	17-07	Valve output circuit is open.
				2	17-05	Valve output circuit shorted to battery voltage*.
				3	17-06	Valve output circuit shorted to ground.
				3	17-06	Controller not grounded or intermittent ground.
	Loader can be moved forward & backward	Loader cannot be moved forward and backward.	Loader cannot be moved forward and backward.	1	16-07	Traction lock hold solenoid circuit is open.
				2	16-05	Traction lock hold solenoid circuit shorted to battery voltage*.
				3	16-06	Traction lock hold solenoid circuit shorted to ground.
				5	15-02	Traction lock pull solenoid circuit is shorted to battery voltage* - ERROR ON (Should be OFF).
				6	15-03	Traction lock pull solenoid circuit ERROR OFF (Should be ON).
SEAT BAR (2) LIFT & TILT VALVE (3) TRACTION (4)				Continuous Flashing	03-09 03-10	System voltage low System voltage high

NOTES:

Multiple SERVICE CODES and/or Abnormal Symptoms can be caused by corroded or loose ground. Check grounds and both battery connections.

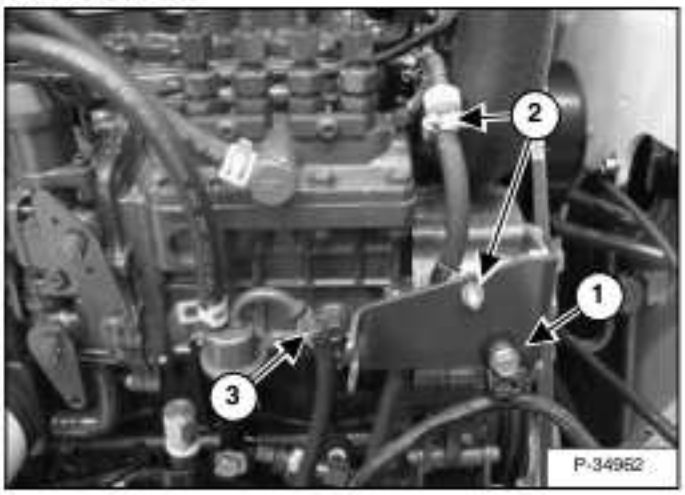
ERROR OFF = shorted to ground or bad fuse, faulty wiring, faulty open relay, no voltage from relay to controller.
ERROR ON = shorted to battery voltage, faulty wiring, faulty closed relay.

*Normal BICS operating voltage is less than the electrical system voltage.

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Removal And Installation (Cont'd)

Figure 70-70-13

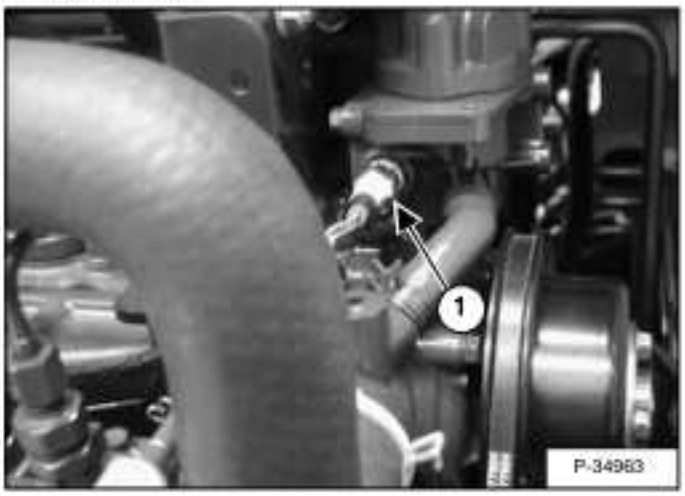


Remove the wiring harness clamp (Item 1) **[Figure 70-70-13]**.

Remove the fuel return line and mount clamp (Item 2) **[Figure 70-70-13]**. Plug and cap the fuel line and fitting.

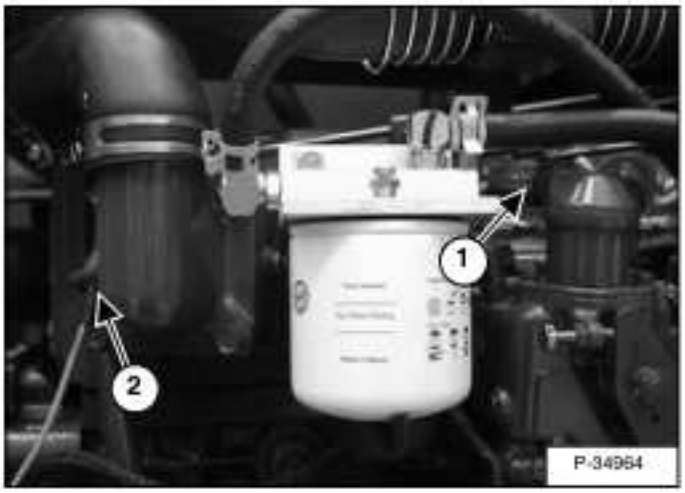
Disconnect the fuel inlet hose (Item 3) **[Figure 70-70-13]**. Plug and cap the fuel line and fitting.

Figure 70-70-14



Disconnect the wiring harness connector (Item 1) **[Figure 70-70-14]** from the water temperature sender.

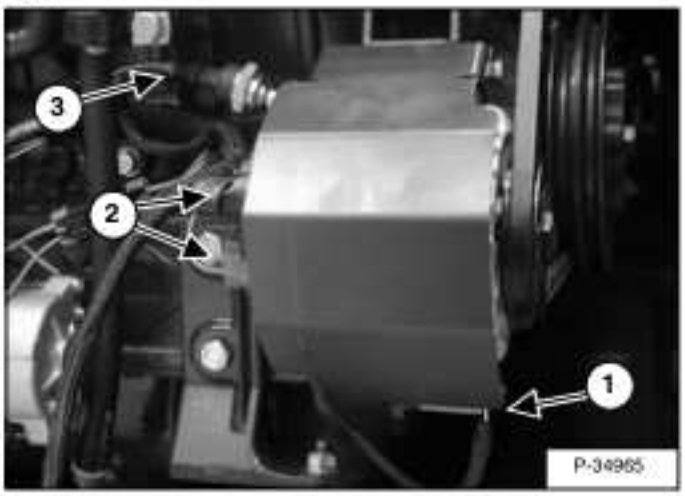
Figure 70-70-15



Disconnect the wiring harness connector (Item 1) **[Figure 70-70-15]** from the fuel shut-off solenoid.

Disconnect the wiring harness (Item 2) **[Figure 70-70-15]** from the air intake heater.

Figure 70-70-16



Remove the ground wire (Item 1) **[Figure 70-70-16]** from the alternator.

Disconnect the two wires (Item 2) **[Figure 70-70-16]** from the alternator.

Disconnect the wire connector (Item 3) **[Figure 70-70-16]** from the oil pressure sender.

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LOADER SPECIFICATIONS (S220) (CONT'D)

Performance

Rated Operating Capacity (SAE)	2200 lb. (998 kg)
Rated Operating Capacity (SAE) With Counterweight	2300 lb. (1043 kg)
Tipping Load (SAE Rating)	4400 lb. (1996 kg)
Operating Weight	6902 lb. (3130 kg)
SAE Breakout Force - Lift	5500 lbf. (24465 N)
SAE Breakout Force - Tilt	6550 lbf. (29136 N)
Axle Torque	5957 ft.-lb. (26498 N)
Travel Speed - Single Speed Loader - Two-Speed Loader (Opt.) Low/High	 6.9 MPH (11,1 km/hr) 6.9 MPH (11,1 km/hr) / 12.0 (19,3 km/hr)

Controls

Vehicle Steering	Direction and speed controlled by two hand levers
Loader Hydraulics - Lift and Tilt - Front Auxiliary (Std.) - Rear Auxiliary (Option)	 Controlled by separate foot pedals or optional Advanced Control System (ACS) Controlled by electrical switch on Right Hand steering lever Controlled by electrical switch on Left Hand steering lever
Auxiliary Pressure Release	Pressure relieved through quick couplers. Push couplers in, hold for 5 seconds.
Engine	Hand lever throttle; key-type starter switch and shutdown
Starting Aid	Intake Air Heater automatically activated as needed by Instrument Panel
Service Brake	Two independent hydrostatic systems controlled by two hand operated steering levers
Secondary Brake	One of the hydrostatic transmissions
Parking Brake (Std.)	Mechanical disc, hand operated rocker switch on instrument panel
Parking Brake (Two-Speed Option)	Spring applied pressure release multi-disk brake activated by rocker switch in instrument panel

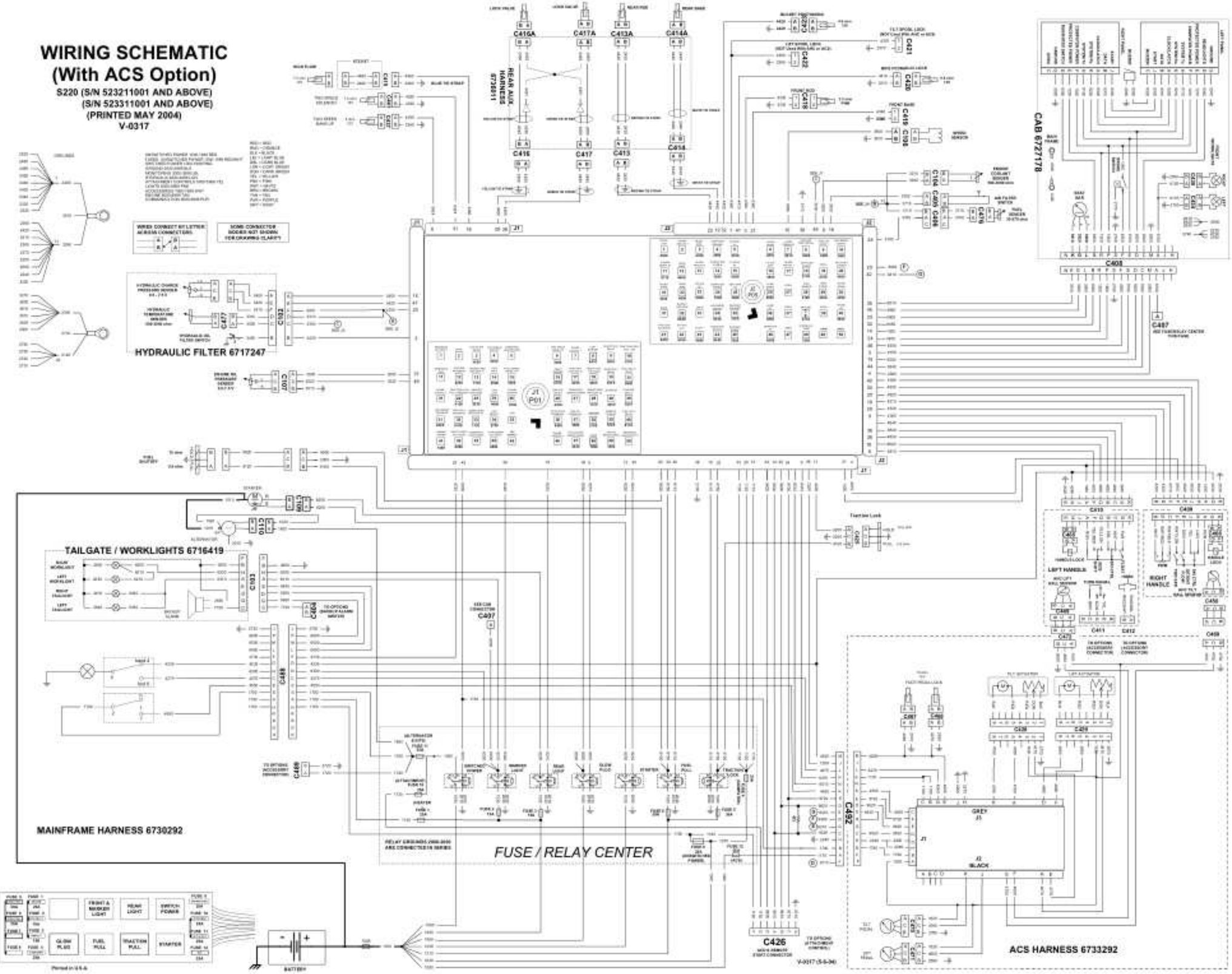
Engine

Make/Model	Kubota V3300-DI-T Turbo-Charged
Fuel/Cooling	Diesel/Liquid
Horsepower, Maximum	75.0 HP (54,0 kW) @ 2400 RPM
Maximum Governed RPM	2600 RPM
Low Idle	1125-1175 RPM
High Idle	2525-2575 RPM
Torque, Maximum	197.6 lbf.-ft. (268 N•m) @ 1400 RPM
Number of Cylinders	4
Displacement	202.5 cu. in. (3,138 L)
Bore/Stroke	3.86/4.33 (98/110 mm)
Lubrication	Pressure System with Filter
Crankcase Ventilation	Open Breathing
Air Cleaner	Dry replaceable paper cartridge with safety element
Ignition	Diesel-Compression
Engine Coolant	Propylene Glycol / Water Mixture
Starting Aid	Intake Air Heater

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WIRING SCHEMATIC
(With ACS Option)

S220 (S/N 523211001 AND ABOVE)
(S/N 523311001 AND ABOVE)
(PRINTED MAY 2004)
V-0317



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