CAT® Lift Trucks

Service Manual

TB45 Gasoline Engine
111219-up

For use with GP40N/NF-GP55N/NF Chassis Service Manual. 99739-31100

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ENGINE GENERAL

SECTION EG

CONTENTS

PRECAUTIONS FOR SAFETY AND QUALITY EG-2
- Description EG-2
- Safe Operation EG-2
- Correct Operation EG-3
- Precautions for Radio Equipment Installation EG-3

HOW TO USE THIS MANUAL EG-4
- Description EG-4
- Definition of Terms EG-4
- Definition of Units EG-4
- Description EG-5
- Component Parts Location EG-5

TROUBLE DIAGNOSIS EG-7
- ECM Trouble Diagnosis EG-7
- ECM Abbreviations List EG-10

ECM GENERAL SERVICE INFORMATION EG-11
- Connector Terminal Inspection EG-11
- Inspection for Electrical System EG-12
- Control Unit and Electronic Component EG-13

PRECAUTIONS EG-14
- Precautions in Draining Engine Coolant EG-14
- Precautions for Disconnecting Fuel Piping ... EG-14
- Precautions for Removing and Disassembling EG-14
- Precautions for Inspection, Correction, and Replacement EG-14
- Precautions for Assembly and Installation ... EG-14
- Caution for Use of Power Tools EG-15
- Precautions for Liquid Gasket Application EG-15
- Parts Requiring Angle Tightening EG-16

PREPARATION EG-17
- Service Parts EG-17

SERVICE DATA EG-18
- Periodical Inspection EG-18
- Standard, Repair Limit EG-20
- Tightening Torque EG-21

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ENGINE TUNE-UP

SECTION ET

CONTENTS

VALVE CLEARANCE **ET-2**
- Description ET-2
- Inspection ET-2
- Adjustment ET-3

ENGINE DRIVE BELT **ET-4**
- Inspection ET-4
- Belt Tension Adjustment ET-5

ENGINE OIL **ET-6**
- Inspection ET-6
- Replacement ET-7
- Oil Filter Replacement ET-8

COMPRESSION PRESSURE **ET-10**
- Inspection ET-10

SPARK PLUG **ET-11**
- Removal and Installation ET-11
- Inspection After Removal ET-11

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ENGINE MECHANICAL

SECTION EM

CONTENTS

INTAKE MANIFOLD EM-2
- Component Parts Location EM-2
- Removal and Installation EM-3
- Inspection EM-3

EXHAUST MANIFOLD EM-4
- Component Parts Location EM-4
- Removal and Installation EM-4
- Inspection EM-5

OIL PAN AND OIL STRAINER EM-6
- Component Parts Location EM-6
- Removal and Installation EM-6

ROCKER COVER EM-8
- Component Parts Location EM-8
- Removal and Installation EM-8

ROCKER ARM AND ROCKER SHAFT ASSEMBLY EM-9
- Component Parts Location EM-9
- Removal and Installation EM-9
- Disassembly and Assembly EM-10
- Inspection EM-10

CYLINDER HEAD EM-12
- Component Parts Location EM-12
- Removal and Installation EM-12
- Disassembly EM-15
- Inspection EM-16
- Assembly EM-18

TIMING CHAIN EM-20
- Component Parts Location EM-20
- Removal EM-20
- Installation EM-23

CYLINDER BLOCK EM-27
- Component Parts Location EM-27
- Disassembly EM-27
- Selective-Fit Service Parts EM-31
- Inspection After Disassembly EM-31
- Assembly EM-44

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Diagnosis Chart by Symptom (Cont'd)

Main unit symptom
◎ : Highly possible
● : Possible
▽ : Not very possible

	Symptoms	Im-possible to start		Im-possible to start		Poor idle					Poor driving control							Engine stall				Other					Description/notable characteristics of the symptom
		No initial combustion	Initial combustion	When engine is cold	When engine is warming up	Fast idle is not effective	High idle rpm	Low idle rpm	Inconsistent idle when engine is cold	Inconsistent idle when warming up	Poor power output	Poor acceleration	Engine rpm does not increase smoothly	During surge and acceleration	During surge and constant speed drive	Knocking	Blackfire	After-burn	At idle	Driving	During deceleration	During a heavy load	Overheat	Overcool	Poor fuel	High oil consume	Oil pressure warning lamp ON	Mechanical noise	
Spark-ing	Leakage from high-tension cord	▽	●	●	●				●	●	●	●	●	●	●			●	●	●		●		●				・ Symptom varies depending on the level of leakage.
	Leakage from distributor cap.	▽	●	●	●				●	●	●	●	●	●	●			●	●	●		●		●				–
	Loose or span of primary wire connection																											–
Com-pres-sion pres-sure	Improper bulb contact	▽	●	◎	◎				◎	◎	◎	◎	◎	◎	◎			●	●	●	●	●							・ The symptom occurs depending on malfunctioning grade and the number of malfunctioning cylinders.
	Worn, stuck, broken piston ring	▽	●	◎	◎				◎	◎	◎	◎	◎	◎	◎			●	●	●		●				●			
	Blow out from head gasket	▽	●	●	●				●	●	●	●	●	●	●			●	●	●		●	●						・ The symptom occurs depending on malfunctioning grade and the number of malfunctioning cylinders. Precautions for head bolt tightening torque.
	Broken or deterioration valve spring	▽	●	●	●				●	●	●	●	●	●	●			●	●	●		●						・ The symptom occurs depending on malfunctioning grade and the number of malfunctioning cylinders.
	Stuck and upthrust valve stem	▽	●	◎	◎				◎	◎	◎	◎	◎	◎	◎			●	●	●		●						・ The symptom occurs depending on malfunctioning grade and the number of malfunctioning cylinders.
	Pressure leakage from spark plug										◎																	・ Check gasket and tightening condition.
Others	Low idle base speed			▽	▽				▽	▽									●	●	●	●						・ Engine stall may occur by power steering load and cargo load during deceleration or at idling.
	Crack and water leakage on cylinder block																						●					
Main motor system	Excessive crankshaft end play																										●	
	Crankshaft and connecting rod bearing clearance bad																									●	●	・ Oil leakage around front or rear crankshaft.
	Broken crankshaft front/rear oil seal																								●			・ Oil leakage around front or rear crankshaft.
	Excessive clearance between piston and cylinder																								●		●	・ Whitish exhaust gas. Worn piston or cylinder.
Main motor system	Excessive piston pin clearance																										●	
	Improper piston ring installation																								●			・ Whitish exhaust gas. Improper location of connecting and and assemble it upside down.
	Excessive piston ring clearance																								●			・ Whitish exhaust gas. Worn piston ring glove or piston ring.
	Worn torque converter pilot bushing																										●	
Heads	Crack and water leakage on cylinder block																						●					
	Carbon deposit in combustion chamber															●												
	Worn valve stem or guide																								●			・ Whitish exhaust gas
	Deterioration of valve oil seal lip																								●			
Valves	Excessive or clogged valve clearance								●	●	●	●	●														●	・ Excessive clearance: Chattering noise at idling ・ Clogged clearance: Engine leakage at idling
	Rocker cover gasket oil leakage																								●			・ Loose or broken gasket

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SST Data Monitor Display

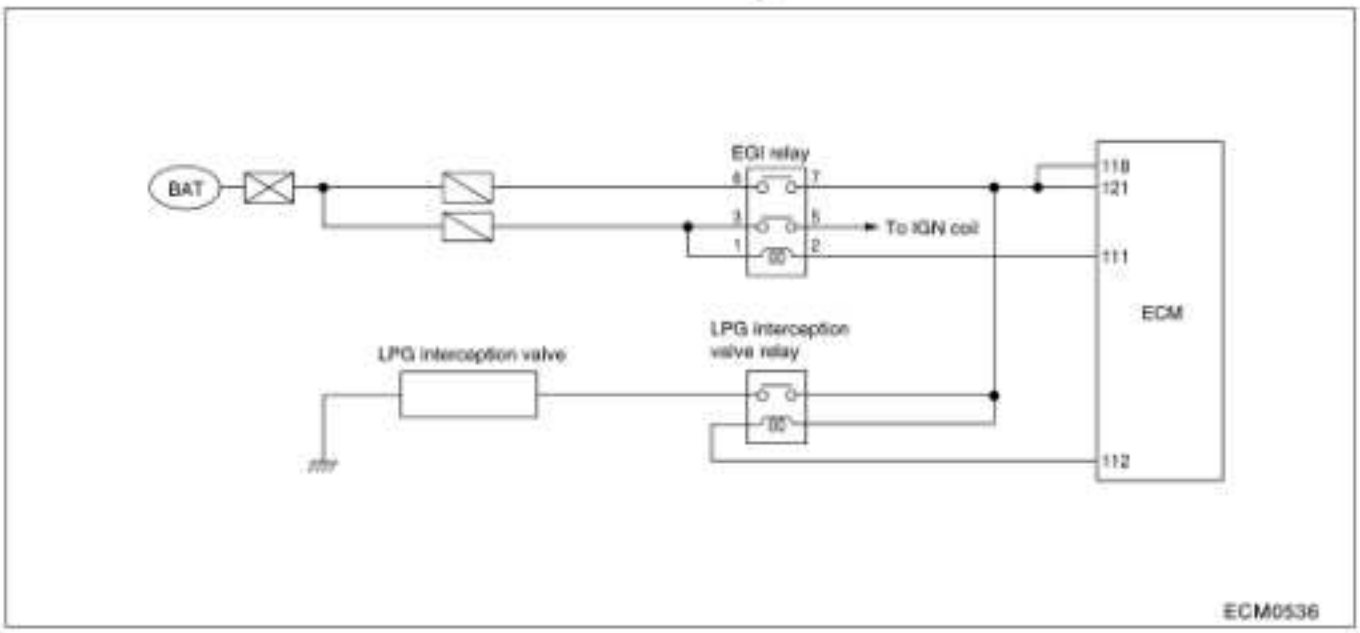
Monitor item	At engine stop	At engine running
MAIN CUT RELAY	OFF	ON

ECM Input/Output Signal Specifications

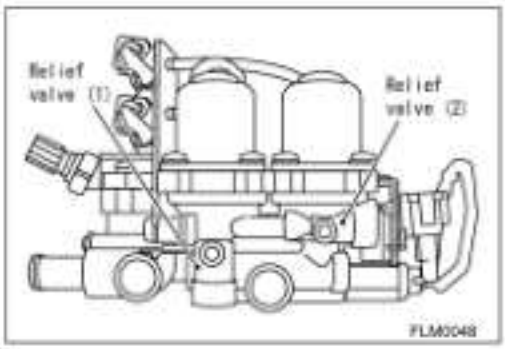
Check voltage between terminals shown below and ground using a circuit tester.

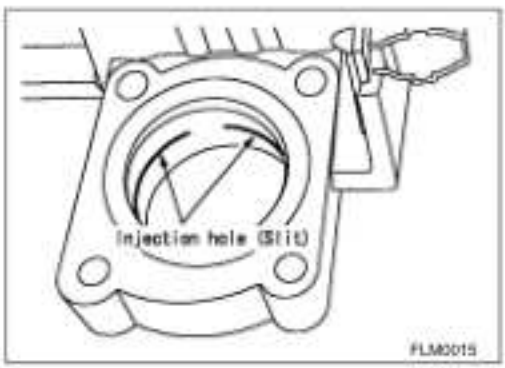
Terminal	Signal name	At engine stop	At engine running
112	Main cut relay	Approx. 0V	Battery voltage

Circuit Diagram



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Injector Holder (Cont'd)

RELIEF VALVE (BUILT-IN HOLDER, 2)

Installation and setting

- Two relief valves are built into holder.
- Relief valve (1) setting pressure is 78 kPa (0.78 bar, 0.8 kg/cm^2, 11 psi).
  Relief valve (2) setting pressure is 118 kPa (1.18 bar, 1.2 kg/cm^2, 17 psi).

Check and cleaning

Seal necessary part of each holder.
Apply compressed air from fuel connector.
Raise air pressure from 0 kPa (0 bar, 0 kg/cm^2, 0 psi) (gauge pressure) gradually. Check continuity of the passage at nearly above setting pressure.

Clean with compressed air up to 490 kPa (4.9 bar, 5 kg/cm^2, 71 psi) if continuity should not exist.
Replace holder with a new one if continuity should not exist after applying compressed air of 490 kPa (4.9 bar, 5 kg/cm^2, 71 psi).

⚠ CAUTION:
Do not replace relief valve only.

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