CAT® Lift Trucks

Service Manual

Chassis & Mast

GC15K
AT81C-00011-up
AT81D-00011-up
AT81E-00011-up

GC18K
AT81C-00011-up
AT81D-00011-up
AT81E-00011-up

GC20K
AT82C-00011-up
AT82D-00011-up
AT82E-00011-up

GC20K HP
AT82C-90011-up
AT82D-90011-up
AT82E-90011-up

GC25K
AT82C-00011-up
AT82D-00011-up
AT82E-00011-up

GC25K HP
AT82C-90011-up
AT82D-90011-up
AT82E-90011-up

GC30K
AT83C-00011-up
AT83D-00011-up
AT83E-00011-up

For use with 4G63/4G64 Engine Service Manual and Liquefied Petroleum Gas Supplements.

99719-80150

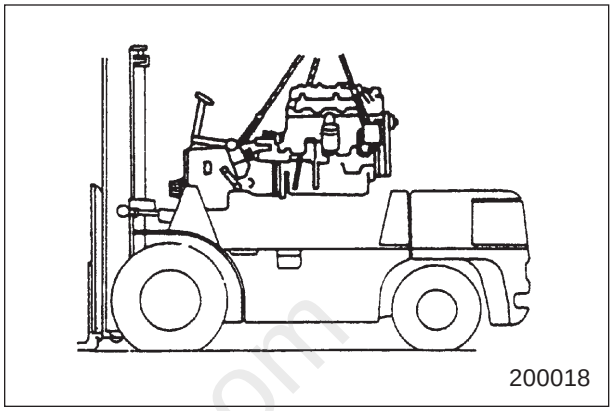
Start by:

(a) Drain coolant from the engine cooling system.

(b) Drain oil from the transmission, reduction gear and differential.

Suggestions for Removal

Fasten a hoist to the engine-power line combination. Carefully lift the combination from the frame and move it backward into position for removal.



Weight of components

Unit: kg (lb)

Component	GC15K GC18K	GC20K GC20K HP GC25K GC25K HP	GC30K
Mast [3.3 m (130 in.) simplex]	520 (1147)	725 (1599)	830 (1830)
Overhead guard	60 (132)	65 (143)	65 (143)
Power line	320 (706)	360 (794)	360 (794)

Installation

To install, follow the reverse of removal sequence.

Hints for reduction gear and differential installation

(1) Fill the cooling system with soft water and add antifreeze.

NOTE

For the concentration of antifreeze, see “GROUP 13 SERVICE DATA”.

(2) Fill the transmission, reduction gear and differential, front axle and torque converter after making adjustments.

(3) Bleed air out of the brake fluid lines.

(4) Check the oil level in the hydraulic tank and add oil, if necessary.

(5) Start the engine and check it for operating condition. If the engine vibrates, retighten the mounting bolts to see if this tightening has any effect.

3. Brake drums

Inspect the inside (friction) surfaces of the drum for abnormal wear, grooving and other defects. Minor grooving can be removed by grinding, provided that the service limit on the inside diameter is not exceeded.

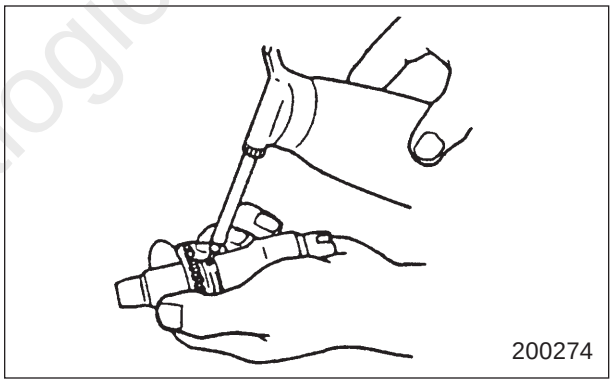
A: Standard value B: Repair or service limit

Unit: mm (in.)

Item \ Truck Model		GC15K GC18K	GC20K/20K HP GC25K/25K HP GC30K
Brake drum inner diameter	A	$254^{+0.13}_{0}$ ($10.0^{+0.006}_{0}$)	$310^{+0.15}_{0}$ ($12.20^{+0.006}_{0}$)
	B	256 (10.08)	312 (12.28)

4. Adjusting screws

Check the wheel teeth for wear. Turn the screw by hand to see if its rotating parts turn smoothly.



5. Parking brake cable

Replace a cable found permanently stretched, rusted or damaged.

6. Others

(1) Check the return springs for cracks or fatigue.

(2) Check the adjusting springs for cracks or fatigue.

(3) Check the fitting cables for stretching.

Fuel and Lubricant Specifications

Fuel or lubricant		Recommendation	Recommendation for ambient temperature, °C (°F)	
			-30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86)	
Fuel		—	Consult your dealer.	
Engine oils		API service classification SH	SAE 10W-30	
Differential oil		API service classification GL-4 or GL-5 (multi-purpose)	SAE 80W	SAE 90
Powershift transmission oil		Dexron	See “Recommended Brands of Lubricants”.	
Hydraulic oil		ISO VG32		
Brake fluid		FMVSS No.116 – DOT 3 or DOT 4 (SAE J1703)		
Grease	Wheel bearings	NLGI No. 2 grade multi-purpose type (lithium base) Consistency: 265 to 295	See “Recommended Brands of Lubricants”.	
	Chassis	NLGI No. 1 grade multi-purpose type (lithium base) Consistency: 310 to 340		

Antifreeze solution (Long Life Coolant)	Ambient temperature °C (°F)	-45 (-49)	-39 (-38.2)	-30 (-22)	-25 (-13)	-20 (-4)	-15 (5)	-10 (14)
	Concentration %	60	55	50	45	40	35	30

Remarks: Avoid mixing lubricants. In some cases, different brands of lubricants are not compatible with each other and deteriorate when mixed. It is best to stick with one and the same brand at successive service intervals.

3. Others

(1) Check the outer surface of the oil seal retainer for wear or damage.

(2) Check the outer and inner oil seals for wear and damage.

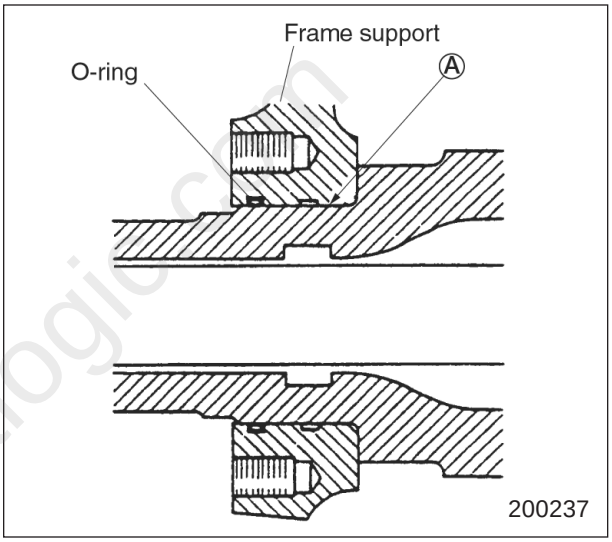
Reassembly

To reassemble, follow the reverse of disassembly sequence, and do the following steps:

1. Axle housing

(1) Install the O-ring in the outer groove (of the two grooves in the bore of each frame support).

(2) Apply grease to the surfaces Ⓐ of the support and axle housing.

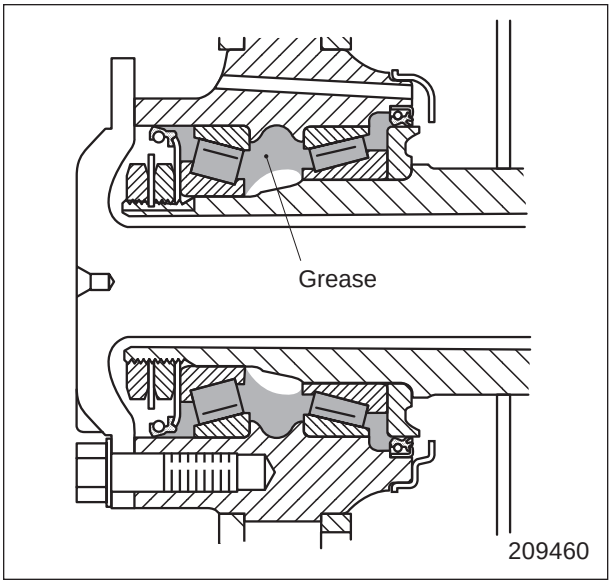


2. Front wheel hub

(1) Fill the front wheel hub, especially the roller holder and oil seal lip groove, with grease.

NOTE

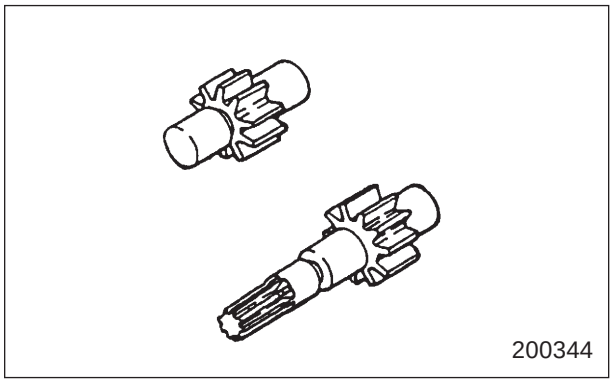
Take care not to apply grease to the brake drum.



Inspection after Disassembly

1. Drive and driven gears

Inspect the gear teeth for wear and damage. Similarly inspect the journals and splines.



2. Pump covers, body and bushings

Inspect these parts for wear and damage.

Reassembly

Suggestions for Reassembly

(1) Before staritng reassembly, visually inspect all parts to be sure they are perfectly clean, and apply hydraulic oil to the sliding surfaces of the gear plate.

(2) Replace oil seals, backup rings and plate seal once disturbed.

(3) Apply a thin coat of grease to the lip of each oil seal and to the seals just before fitting them.

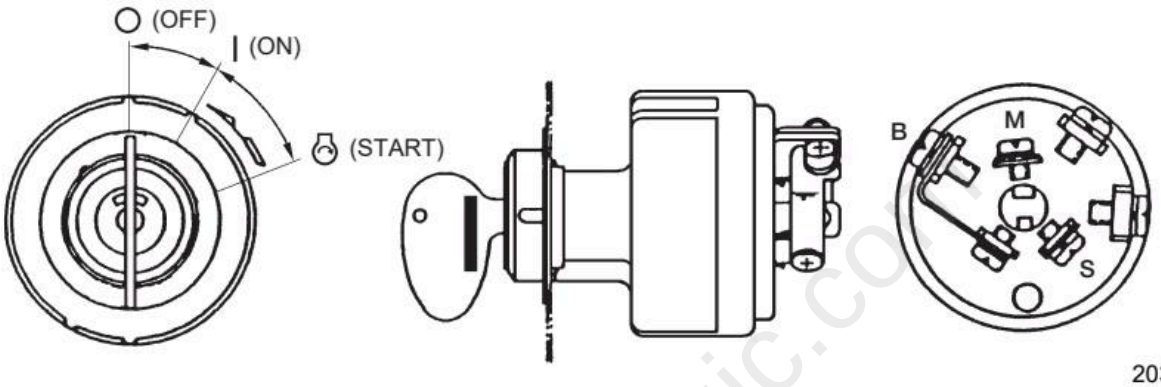
(4) Tighten the cover bolts.

(5) The fit of the pump gears in the reassembled pump may be satisfactory if the pump shaft rotates smoothly and lightly when turned by hand with an adjustable wrench.

Major Electrical Components

Starter Switch (with Anti-Restart Lock)

This switch has a built-in anti-restart lock, so the key cannot be turned from I (ON) to (START) position while the engine is running.



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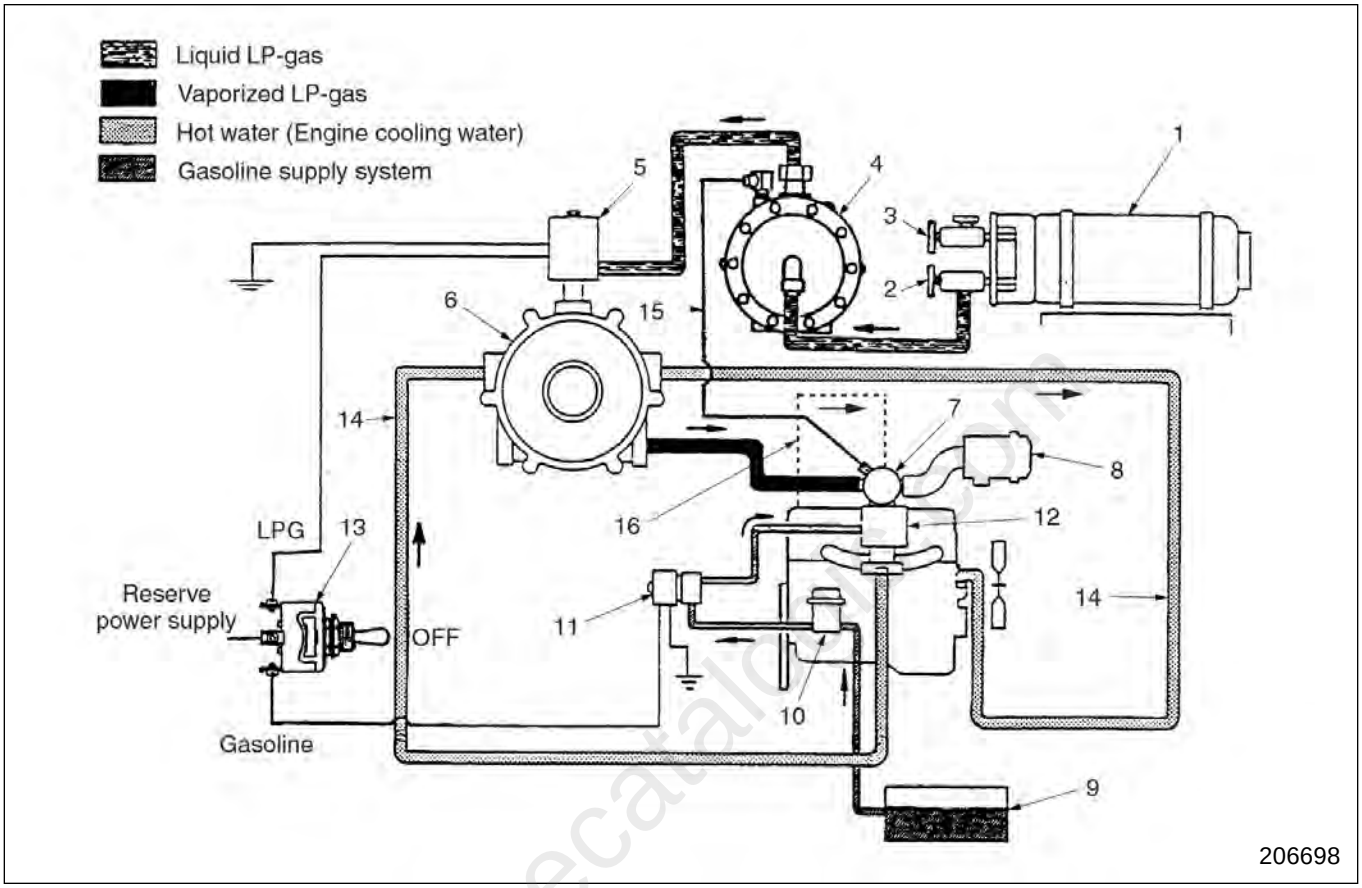
Connection Chart

Terminal / Component / Key position	B	M	S
(OFF)	○		
(ON)	○	○	
(START)	○	○	○

Structure and Function

Outline of Dual Fuel Type



1	LP-gas tank	7	LP-gas carburetor	13	Gasoline/LPG selector switch
2	LP-gas charge valve	8	Air cleaner	14	Hot-water hose
3	LP-gas outlet valve	9	Gasoline tank	15	Vacuum hose
4	Vacuum fuel lock filter	10	Fuel pump	16	Blow-by hose
5	LP-gas solenoid valve	11	Gasoline solenoid valve		
6	Converter (vaporizer)	12	Gasoline carburetor		

The LP-gas device of the units with a “C” in the chassis serial number is comprised of components shown above.

Liquid LP-gas in the LP-gas tank located at the back side of the truck flows through the LP-gas outlet valve into the LP-gas hose. It then passes through the filter and LP-gas solenoid valve and reaches the converter.

The converter vaporizes liquid LP-gas and reduces its pressure. The vaporized LP-gas mixes with air at the LP-gas carburetor and enters the engine.

A gasoline solenoid valve is provided between the fuel pump and gasoline carburetor. This valve is operated by the gasolin/LPG selector switch, and allows the use of either LP-gas or gasoline as fuel.

The converter is connected with hot-water hoses that circulate the engine cooling water (hot water). The converter uses the heat from this water to vaporixe LP-gas.

For further details, refer to the separate supplement to this manual entitled “LP-gas Supplement”

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Full Version Available

Caterpillar GC20K Forklift LPG Service Manual (99719-80150)

Caterpillar GC20K Forklift service manual, LPG fuel system, converter, regulator and mixer procedures. Searchable PDF download.