CATERPILLAR®

Service Manual

GP40K, GP40KL, GP45K, GP50K; DP40K, DP40KL, DP45K, DP50K Chassis & Mast

GP40K	T29B-00011-up	DP40K	T19C-00011-up
GP40KL	T29B-50001-up	DP40KL	T19C-50001-up
GP45K	T29B-80001-up	DP45K	T19C-80001-up
GP50K	T33A-50001-up	DP50K	T28B-50001-up

For use with G6 (GM4.3L), S6S Engine Service Manual

FOREWORD

This service manual is a guide to servicing of Caterpillar[®] Lift Trucks. The instructions are grouped by systems to serve the convenience of your ready reference.

Long productive life of your lift trucks depends to a great extent on correct servicing – the servicing consistent with what you will learn from this service manual. We hope you read the respective sections of this manual carefully and know all the components you will work on before attempting to start a test, repair or rebuild job.

The descriptions, illustrations and specifications contained in this manual were of the trucks of serial numbers in effect at the time it was approved for printing. Caterpillar reserves the right to change specifications or design without notice and without incurring obligation.

GP40K, GP40KL, GP45K, and GP50K are powered by G6 (GM4.3L) gasoline engine. DP40K, DP40KL, DP45K, and DP50K are powered by Mitsubishi S6S diesel engine.

Safety Related Signs

The following safety related signs are used in this service manual to emphasize important and critical instructions:



Indicates a specific potential hazard resulting in serious bodily injury or death.



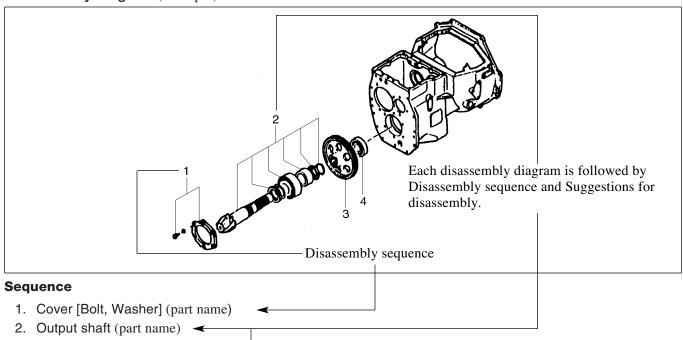
Indicates a specific potential hazard resulting in bodily injury, or damage to, or destruction of, the machine.



Indicates a condition that can cause damage to, or shorten service life of, the machine.

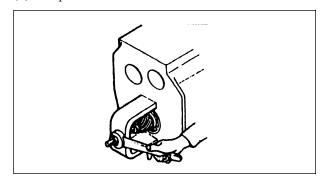
HOW TO READ THIS MANUAL

Disassembly diagram (example)



Suggestion for disassembly

(1) Output shaft removal



		Unit: mm (in.
Clearance between	A	0.020 to 0.105 (0.00079 to 0.00413)
cylinder and piston	В	0.15 (0.0059)

Symbols or abbreviations

OPOption
R1/4Taper pipe thread (external) 1/4 inch (formerly PT1/4)
Rc1/8Taper pipe thread (internal) 1/8 inch (formerly PT1/8)
G1/4AStraight pipe thread (external) 1/4 inch (formerly PF1/4-A)
Rp1/8Straight pipe thread (internal) 1/8 inch (formerly PS1/8)

SAFETY

WARNING

The proper and safe lubrication and maintenance for this lift truck, recommended by Caterpillar, are outlined in the OPERATION & MAINTENANCE MANUAL for these trucks.

Improper performance of lubrication or maintenance procedures is dangerous and could result in injury or death. Read and understand the OPERATION & MAINTENANCE MANUAL before performing any lubrication or maintenance.

The serviceman or mechanic may be unfamiliar with many of the systems on this truck. This makes it important to use caution when performing service work. A knowledge of the system and/or components is important before the removal or disassembly of any component.

Because of the size of some of the truck components, the serviceman or mechanic should check the weights noted in this Manual. Use proper lifting procedures when removing any components.

Following is a list of basic precautions that should always be observed.

- 1. Read and understand all warning plates and decals on the truck before operating, lubricating or repairing the product.
- 2. Always wear protective glasses and protective shoes when working around trucks. In particular, wear protective glasses when pounding on any part of the truck or its attachments with a hammer or sledge. Use welders gloves, hood/goggles, apron and other protective clothing appropriate to the welding job being performed. Do not wear loose-fitting or torn clothing. Remove all rings from fingers when working on machinery.
- Do not work on any truck that is supported only by lift jacks or a hoist. Always use blocks or jack stands to support the truck before performing any disassembly.

WARNING

Do not operate this truck unless you have read and understand the instructions in the OPERATION & MAINTENANCE MANUAL. Improper truck operation is dangerous and could result in injury or death.

- 4. Lower the forks or other implements to the ground before performing any work on the truck. If this cannot be done, make sure the forks or other implements are blocked correctly to prevent them from dropping unexpectedly.
- 5. Use steps and grab handles (if applicable) when mounting or dismounting a truck. Clean any mud or debris from steps, walkways or work platforms before using. Always face truck when using steps, ladders and walkways. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.
- 6. To avoid back injury, use a hoist when lifting components which weigh 23 kg (50 lb.) or more. Make sure all chains, hooks, slings, etc., are in good condition and are of the correct capacity. Be sure hooks are positioned correctly. Lifting eyes are not to be side loaded during a lifting operation.
- 7. To avoid burns, be alert for hot parts on trucks which have just been stopped and hot fluids in lines, tubes and compartments.
- 8. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located at opposite ends of the cover or device and pry cover loose to relieve any spring or other pressure, before removing the last two bolts or nuts completely.
- 9. Be careful when removing filler caps, breathers and plugs on the truck. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the truck has just been stopped because fluids can be hot.

- Always use tools that are in good condition and be sure you understand how to use them before performing any service work.
- 11. Reinstall all fasteners with same part number. Do not use a lesser quality fastener if replacements are necessary. Do not mix metric fasteners with standard nuts and bolts.
- 12. If possible, make all repairs with the truck parked on a level, hard surface. Block truck so it does not roll while working on or under truck.
- Disconnect battery and discharge any capacitors (electric trucks) before starting to work on truck.
 Hang "Do not Operate" tag in the Operator's Compartment.
- 14. Repairs, which require welding, should be performed only with the benefit of the appropriate reference information and by personnel adequately trained and knowledgeable in welding procedures. Determine type of metal being welded and select correct welding procedure and electrodes, rods or wire to provide a weld metal strength equivalent at least to that of parent metal.
- 15. Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged nor will it be damaged in operation by contacting sharp corners, or by rubbing against some object or hot surface. Do not connect wiring to a line containing fluid.
- 16. Be sure all protective devices including guards and shields are properly installed and functioning correctly before starting a repair. If a guard or shield must be removed to perform the repair work, use extra caution.
- 17. Always support the mast and carriage to keep carriage or attachments raised when maintenance or repair work is performed, which requires the mast in the raised position.

- 18. Loose or damaged fuel, lubricant and hydraulic lines, tubes and hoses can cause fires. Do not bend or strike high pressure lines or install ones which have been bent or damaged. Inspect lines, tubes and hoses carefully. Do not check for leaks with your hands. Pin hole (very small) leaks can result in a high velocity oil stream that will be invisible close to the hose. This oil can penetrate the skin and cause personal injury. Use cardboard or paper to locate pin hole leaks.
- 19. Tighten connections to the correct torque. Make sure that all heat shields, clamps and guards are installed correctly to avoid excessive heat, vibration or rubbing against other parts during operation. Shields that protect against oil spray onto hot exhaust components in event of a line, tube or seal failure, must be installed correctly.
- 20. Relieve all pressure in air, oil or water systems before any lines, fittings or related items are disconnected or removed. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.
- 21. Do not operate a truck if any rotating part is damaged or contacts any other part during operation. Any high speed rotating component that has been damaged or altered should be checked for balance before reusing.

GROUP INDEX

GROUP INDEX	Items
GENERAL INFORMATION	Model view, Truck models covered, Serial number locations, Dimensions, Technical data
COOLING SYSTEM	Fan removal and installation, Fan belt inspection and adjustment
ELECTRICAL SYSTEM	Console box, Chassis electrical devices, Lamp bulb specifications, Battery maintenance, Electrical system schematic
POWER TRAIN	Removal and installation
CLUTCHES	Dry type clutch, Wet type clutch, Pressure plate assembly, Clutch booster, Clutch master cylinder, Clutch release cylinder, Adjustment
MANUAL TRANSMISSION	Description, Suggestions for removal and installation, Disassembly, Inspection and repair, Reassembly
POWERSHIFT TRANSMISSION	Torque converter, 1-speed transmission, Control valve, Automatic 2-speed transmission, Solenoid valve, Hydraulic control
FRONT AXLE AND REDUCTION DIFFERENTIAL	Front tires, Front axle, Reduction and differential
REAR AXLE	Rear tires, Rear axle, Toe-in, Minimum turning radius
BRAKE SYSTEM	Master cylinder, Wheel cylinders, Wheel brakes, Brake booster
STEERING SYSTEM	Steering gear, Power cylinder, Flow divider
HYDRAULIC SYSTEM	Hydraulic tank, Gear pump, Control valve, Lift and tilt cylinders, Flow regulator valve, Down safety valve
MASTS AND FORKS	Simplex mast, Duplex mast, Triplex mast
SERVICE DATA	Maintenance standards, Periodic service chart, Periodic replacement parts, Lubrication instructions, Special tools
OPTIONS	Radiator screen kit, Radiator plate-fin type kit, Elevated exhaust kit. Head lamp kit (installed on mast), Tail lamp upper relocate kit, etc.

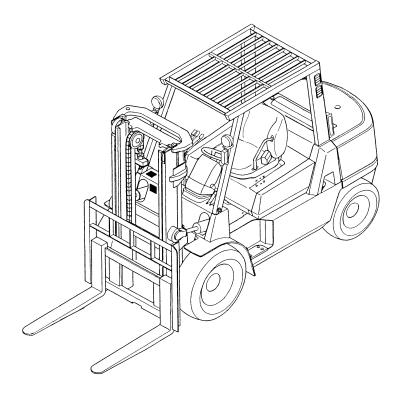
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GENERAL INFORMATION

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Model View



103190

Truck Models Covered

This Service Manual furnishes servicing and maintenance information for the following trucks:

Truck model	Transmission	Model code – Serial number	Engine mounted	
GP40K	Powershift	T29B – 00011- up	G6 (GM4.3L) gasoline engine	
GP40KL	Powershift	T29B – 50001- up	G6 (GM4.3L) gasoline engine	
GP45K	Powershift	T29B – 80001- up	G6 (GM4.3L) gasoline engine	
GP50K	Powershift	T33A – 50001- up	G6 (GM4.3L) gasoline engine	
DP40K	Manual	T19C – 00011- up	Mitsubishi S6S diesel engine	
DP40K	Powershift	119C – 00011- up		
DP40KL	Manual	T19C – 50001- up	Mitsubishi S6S diesel engine	
DF40KL	Powershift	119C – 30001- up		
DP45K	Manual	T19C – 80001- up	Mitsubishi S6S diesel engine	
Dr43K	Powershift	119C – 60001- up	witsubisiii 303 diesei eligilie	
DP50K Powershift		T28B – 50001- up	Mitsubishi S6S diesel engine	

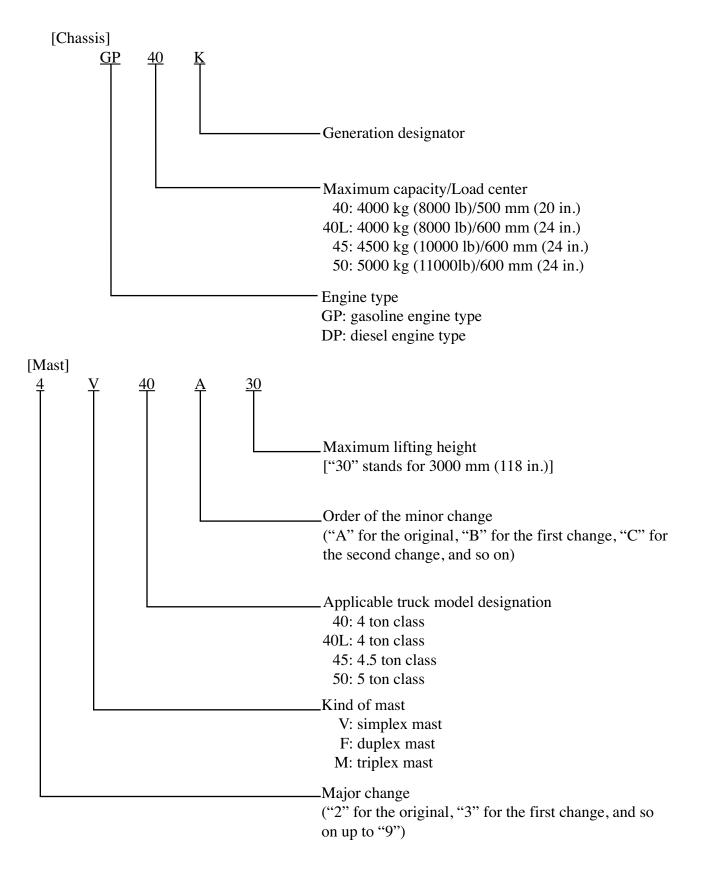
Serial Number Locations

(Gasoline- and LP-Gasengine models) (Diesel-engine models) Name plate (Gasoline- and LP-Gas-engine models) Mast serial number Transmission serial number (Diesel-engine models)

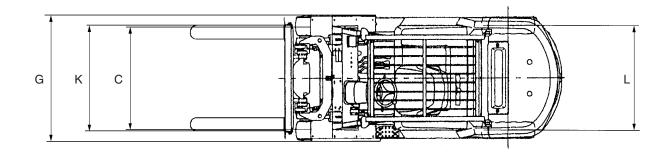
Chassis serial number

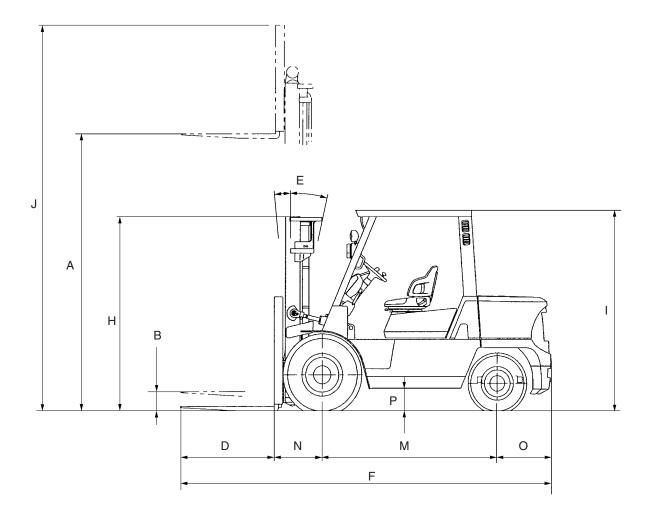
Engine serial number

Chassis and Mast Model Identification



Dimensions





202762A

Unit: mm (in.)

Ref. No.	Truck Model Item		GP40K DP40K	GP40KL DP40KL	GP45K DP45K	GP50K DP50K	
Α	Maximum lift		3000 (118)				
В	Free lift		150 (5.9)			160 (6.5)	
С	Fork spread (outside)			300 to 1190	(12 to 47)		
D	Fork length			1070 (42)		1220 (48)	
Е	Tilt angle (forward – backward)			6° –	· 12°		
F	Overall length		4140 (163.0)	4190 (165.0)	4245 (167.1)	4525 (178.2)	
G	Overall width (outside of tires)	Single tire	1415 (55.7)	1460 (57.5)			
G	Overall width (outside of thes)	Dual tire		1780 (70.1)		1965 (77.4)	
Н	Overall height (to top of mast lowered)		2170 (85.4) 2250		(88.6)		
I	Overall height (to top of overhea	d guard)	2250 (88.6)				
J	Overall height (mast extended)		4270 (168.1) 4290 (168			4290 (168.9)	
K	Tread (front)	Single tire	1175 (46.3)				
	Dual t		1310 (51.6)				
L	Tread (rear)		1180 (46.5)				
М	Wheelbase		2000 (78.7) 2150 (8			2150 (84.6)	
N	Front overhang		557 ((21.9)	562 (22.1)	582 (22.9)	
0	Rear overhang		513 (20.2)	563 (22.2)	613 (24.1)	573 (22.6)	
Р	Underclearance (at frame)			252	(9.9)		

Technical Data

Truck Model Item			GP40K DP40K	GP40KL DP40KL	GP45K DP45K	GP50K DP50K	
Model code			GP: T29B DP: T19C			GP: T33A DP: T28B	
Туре				Stan	dard		
	Capacity/load center kgf/mm (lbf/in.)		4000/500 (8000/20)	4000/600 (8000/24)	4500/600 (10000/24)	5000/600 (11000/24)	
	Maximum lift	mm (in.)		3000	(118)		
General	Lift speed (rate load)	m/sec (fpm)	GP: 51 DP: 50	0 (100) 00 (98)	GP: 440 (87) DP: 430 (85)	GP: 430 (85) DP: 420 (83)	
Ge	Lowering speed (rate	load) n/sec (fpm)		500	(98)		
	Tilt angle (forward – backward)			6° –	· 12°		
	Free lift	mm (in.)		150 (5.9)		160 (6.5)	
	Travel speed of powershift transmission models km/h (mph)	Forward	19.5 (12.1)	19.5 (12.1)	19.5 (12.1)	23.5 (14.6)	
		Reverse		23.5 (14.6)			
Performance	Minimum turning radius mm (in.)		2735 (107.7)	2775 (109.3)	2820 (111)	2965 (116.7)	
erfori	Inside		83°				
Ъ	Steering angle	Outside		56°33'			
	Minimum intersecting aisle	Single tire	2360 (92.9)	2400 (94.5)	2450 (96.5)	2510 (98.8)	
	mm (in.)	Dual tire	2490 (98)	2520 (99.2)	2570 (101.2)	2740 (107.9)	
	Front tires (size and inflation	Single tire	8.25-15-12PR (I) 800 (8.2) [116]				
Tires	pressure) kPa (kgf/cm²) [psi] Dual tire		7.50-16-12PR (I) 800 (8.2) [116]			8.25-15-12PR (I) 800 (8.2) [116]	
	Rear tires (size and inflation pressure) kPa (kgf/cm²) [psi]			7.00-12-12PR (I) 800 (8.2) [116]		7.00-12-12PR (I) 800 (8.2) [116]	
veight	Single drive tire (unloaded) kg (lb)		GP: 5540 (12200) DP: 5630 (12400)	GP: 5950 (13100) DP: 6030 (13300)	GP: 6510 (14300) DP: 6590 (14500)	GP: 7010 (15400) DP: 7080 (15600)	
Truck w	Single drive tire (unloaded) Single drive tire (unloaded) Single drive tire (unloaded) Kg (lb)		GP: 5730 (12600) DP: 5810 (12800)	GP: 6080 (13400) DP: 6160 (13600)	GP: 6640 (14600) DP: 6730 (14800)	GP: 7170 (15800) DP: 7250 (15900)	

Iteı	Truck Model	GP40K	GP40KL	GP45K	GP50K		
1101	Engine model	G6 (GM4.3L)					
	Manufacturer	General Motors					
Ī	Туре	Gasoline					
	Cooling system	Water cooled					
	No. of cylinders – arrangement		6 – 9				
	No. of strokes						
	Type of combustion chamber		Semi -s				
	Valve arrangement		Over				
	Type of cylinder liners		Inte				
	Cylinder bore × stroke						
s)	mm (in.)	$101.6 \times 88.39 \\ (4.00 \times 3.48)$					
P-ga	Displacement cc (cu in.)	4293 (262)					
and I	Compression ratio	9.2 : 1					
soline	Rated output kW/rpm	68/2450					
Engine (gasoline and LP-gas)	Rated torque N·m (kgf·m) [lbf·ft]/rpm	310 (31.0) [224]/1200					
Ē	Minimum engine speed rpm		750 to	o 800			
	Maximum engine speed rpm	2600 to 2650					
	Dimensions (L × W × H) mm (in.)	$710 \times 620 \times 740$ (28.0 × 24.4 × 29.1)					
	Weight kg (lb)	260 (573)					
	Installation position	Rear					
	Ignition	Spark					
	Firing order	1 - 6 - 5 - 4 - 3 - 2					
	Initial ignition timing BTDC deg	0° Gasoline 8° L.P.G.					
	Fuel tank capacity liter (U.S. gal)	115 (30)					

Truck Model		GP40K GP40KL GP45K GP50K					
Item							
	Ignition	Туре	Mold				
	coil	Manufacturer	AC Delco				
		Туре	Pointless				
em	Distributor	Manufacturer		AC I	Delco		
Ignition system		Type of spark advance control		Internal solic	l state circuit		
Igni		Model		#41	-932		
	Carada alua	Manufacturer		AC I	Delco		
	Spark plug	Size mm (in.)		14 (0	0.55)		
		Gap mm (in.)		1.24 (0.0488)			
	Carburatar	Туре	1FZ				
Fuel system	Carburetor	Manufacturer	ASIAN Kogyo Co.				
gnel s	Eugl numn	Туре	Electromagnetic				
[Fuel pump Manufacturer		Jidosha Kiki				
Air cleaner	Type × Number		Cyclone with paper element × 1				
Air cl	Manufacturer		Nippon Rokaki				
	Туре		Pressure feed				
	Oil pump		Gear pump				
ystem	Oil filter		Paper element				
tion sy	Oil cooler		Oil to water type				
Engine lubrication system		Oil pan liter (U.S. gal)		4.2 ((1.1)		
Engin	Refill capacities	Oil filter & cooler liter (U.S. gal)		0.8	(0.2)		
		Total liter (U.S. gal)		5.0 ((1.3)		

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