



Service Manual

Chassis & Mast

GC35K	AT87-00001-up AT87A-00001-up	GC55K	AT88-00001-up AT88A-00001-up
GC40K	AT87-00001-up AT87A-00001-up	GC55K STR	AT88-00001-up AT88A-00001-up
GC40K STR	AT87-00001-up AT87A-00001-up	GC60K	AT89-00001-up AT89A-00001-up
GC45K SWB	AT87-00001-up AT87A-00001-up	GC70K	AT89-00001-up AT89A-00001-up
GC45K	AT88-00001-up AT88A-00001-up	GC70K STR	AT89-00001-up AT89A-00001-up

FOREWORD

This service manual is a guide to servicing of Cat Lift Trucks for 3.5 thru 7.0 ton models. 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. Cat Lift Trucks reserves the right to change specifications or design without notice and without incurring obligation.

The GM4.3L engine's fuel system was changed to comply with the EPA guidelines. This manual has minimal information on the fuel systems. Please see the Fuel System Supplement for information regarding the Multi Port Fuel Injection System (MPFI). For the items pertaining to the engines, refer to the following service manuals:

- GM4.3L (G6) Engine Service Manual
- GM4.3L Fuel System Supplement

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.

⚠ WARNING

SAFETY

⚠ WARNING

The proper and safe lubrication and maintenance for this lift truck, recommended by Mitsubishi, 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.
3. 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

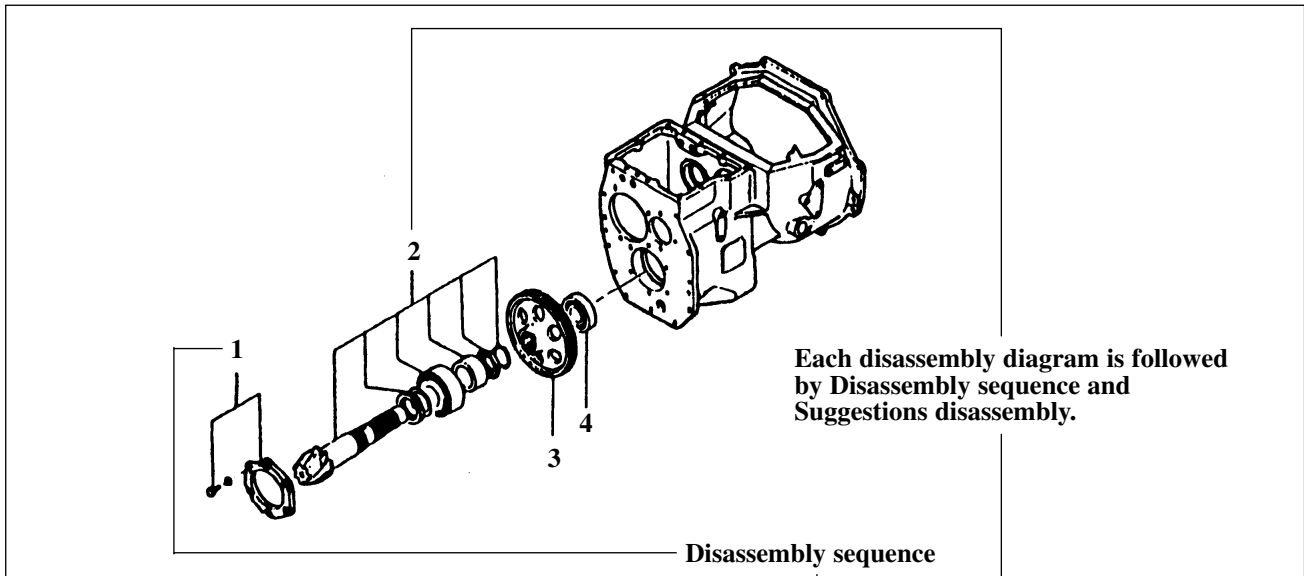
Do not operate this truck unless you have read and understand the instructions in the OPERATION & MAINTENANCE MANUAL. Improper truck operation is dangerous and could result in injury or death.

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 weighs 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 liquid under pressure. The danger is even greater if the truck has just been stopped because fluids can be hot.

10. 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 lesser quality fastener if replacements are necessary. Do not mix metric fastener 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.
13. 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 operation. Reinstall the wiring so it is not damaged nor it will 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, vibrations 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.

HOW TO READ THIS MANUAL

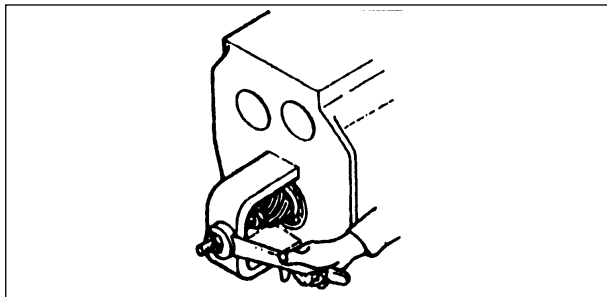
Disassembly diagram (example)



- 1 Cover, Bolt, Washer (part name)
- 2 Output shaft (part name)

Suggestion for disassembly

(1) Output shaft removal



Unit: mm (in.)

Clearance between cylinder and piston	A	0.020 to 0.105 (0.00079 to 0.00413)
	B	0.15 (0.0059)

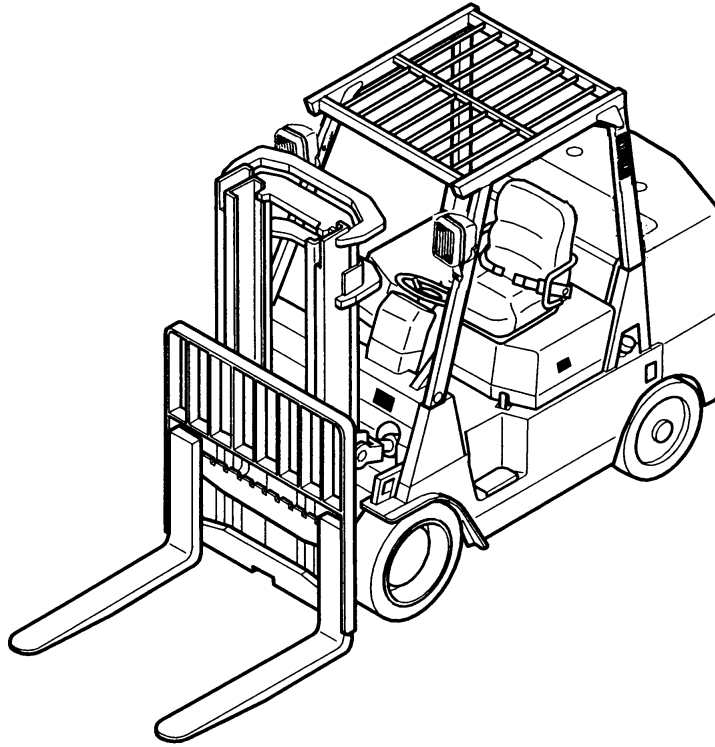
A: Assembly standard
B: Repair or service limit

Symbols or abbreviations

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

Vehicle Exterior

- This Service Manual deals with all components or systems of the Cat Lift Trucks; except for the engine and attachment, which are covered in the respective manuals.



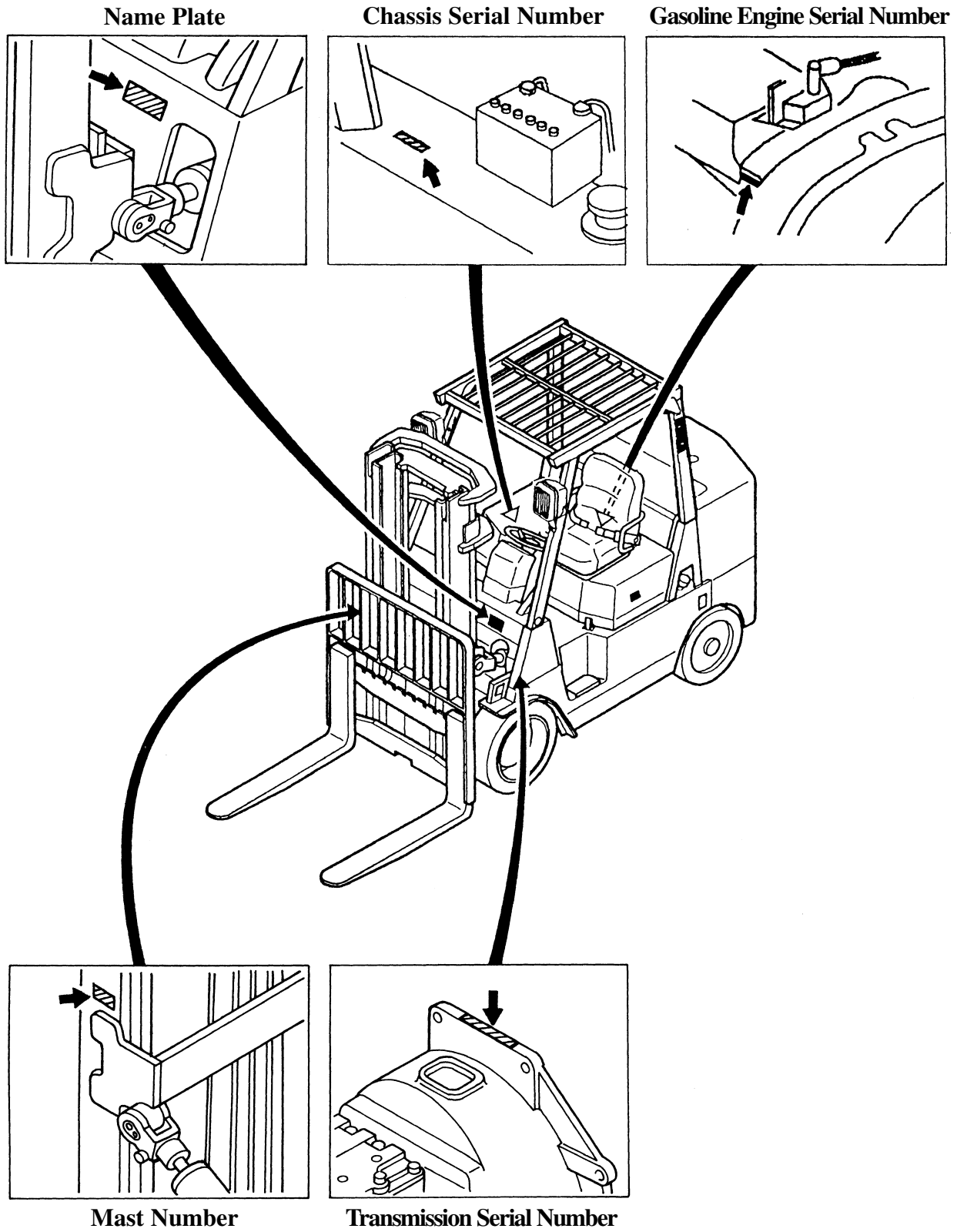
102530A

Models

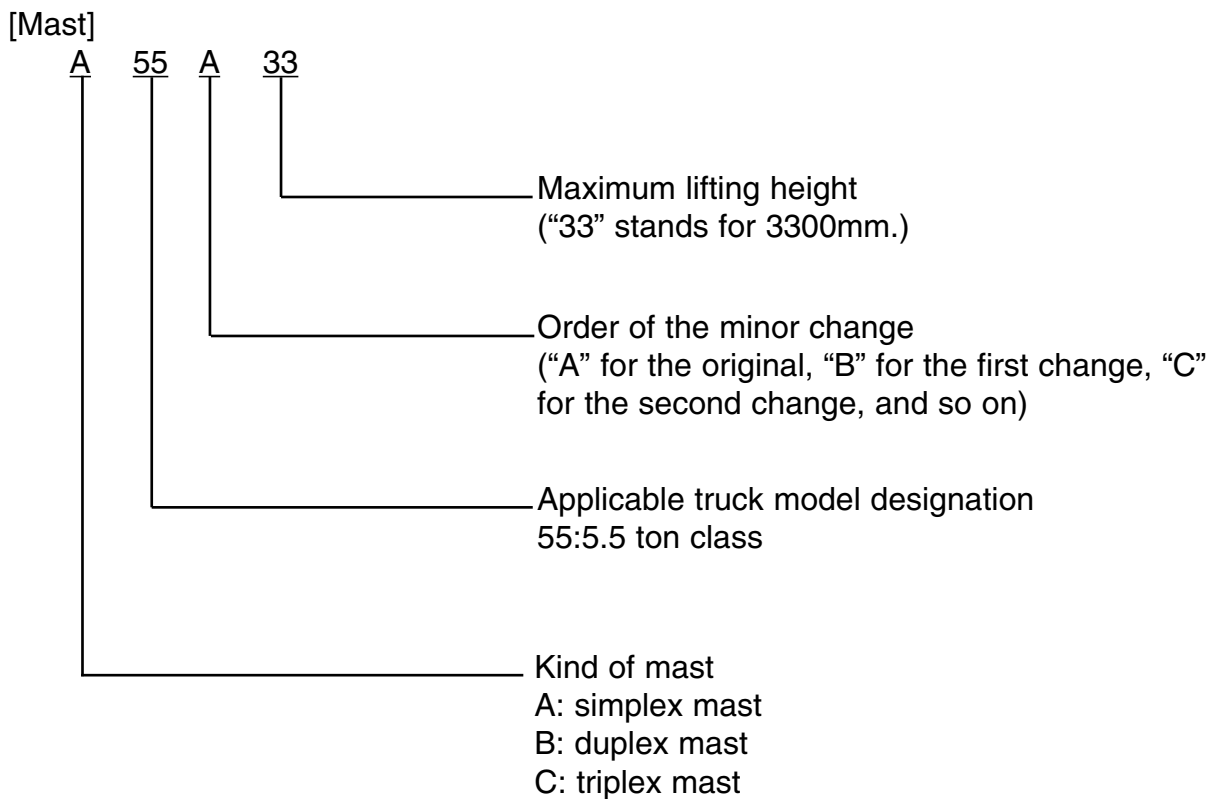
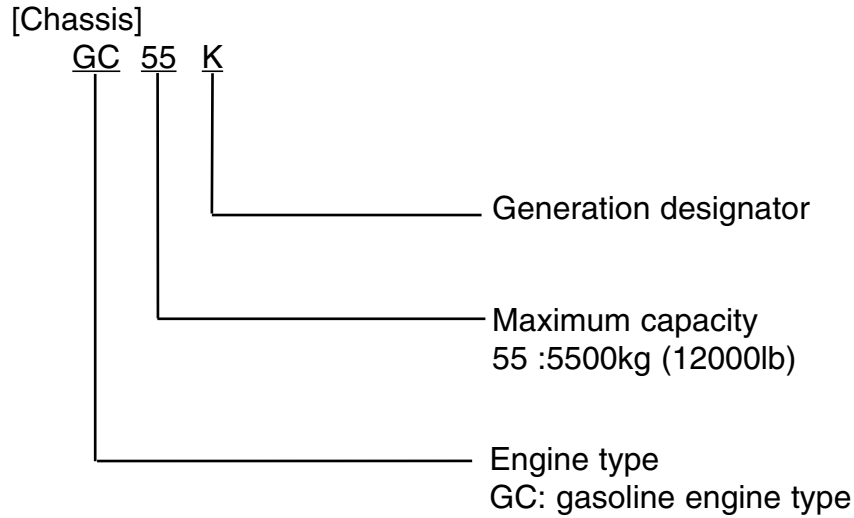
This manual applies to the following vehicle models (names).

Truck Models	Transmission	Serial number	Engine mounted
GC35K	1-Speed	AT87-00001-up AT87A-00001-up	GM4.3L Gasoline Engine
GC40K			
GC40K STR			
GC45K SWB		AT88-00001-up AT88A-00001-up	
GC45K			
GC55K			
GC55K STR	Automatic 2-Speed	AT89-00001-up AT89A-00001-up	
GC60K			
GC70K			
GC70K STR			

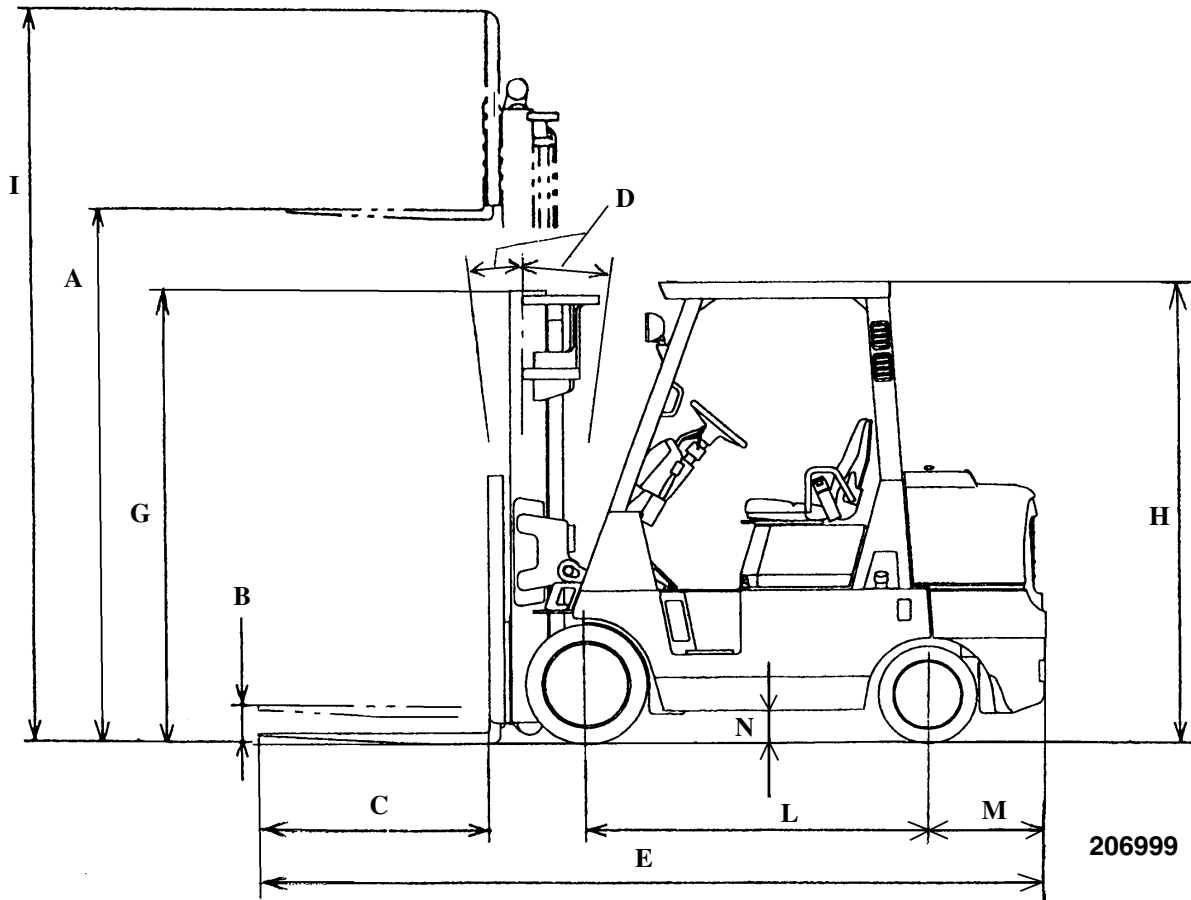
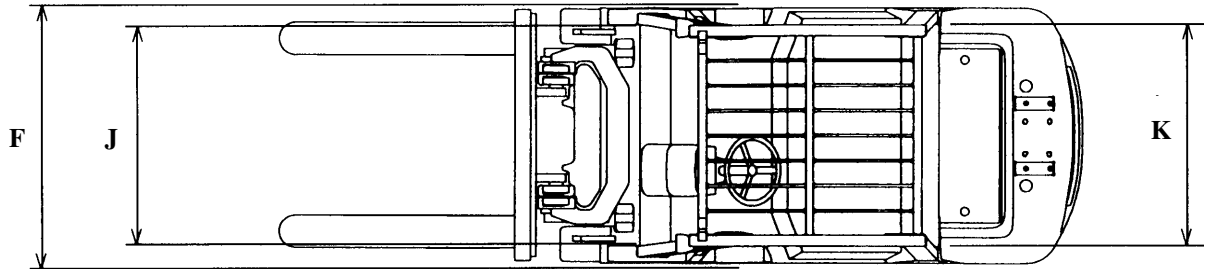
Serial Number Locations



Chassis and Mast Model Identification



Dimensions



GENERAL INFORMATION

Technical Data

Unit: mm (in.)

Ref. No.	Truck Models		GC35K	GC40K	GC40K STR	GC45K SWB
	Items					
A	Maximum lift	Simplex mast	3050 (120)			2900 (114)
B	Free lift (Floor to forktop)	Simplex mast	150 (5.9)			160 (6.3)
		Duplex mast	920 (36.2) 3.0 m (118 in.) mast			895 (35.2) 2.8 m (112 in.) mast
		Triplex mast	800 (31.5) 4.0 m (157 in.) mast			920 (36.2) 4.3 m (169 in.) mast
C	Fork length		1220 (48)			
D	Tilt angle (forward – backward) deg.		5/10 Simplex, Duplex mast 6/5 Triplex mast			
E	Overall length (OLH)		2510 (98.5)	2550 (100)	2360 (93)	2620 (103)
F	Overall width (outside)	Standard	1180 (46.5)			
		Wide tread (option)	1270 (50.0)			
G	Overall height (to top of mast lowered)		2155 (85.0)			
H	Overall height (to top of overhead guard)		2155 (85.0)			
I	Overall height (mast extended)	Simplex mast	4250 (167)			4125 (162)
		Duplex mast	4250 (167) 3.0 m (118 in.) mast			4080 (160.6) 2.8 m (112 in.) mast
		Triplex mast	5250 (206.7) 4.0 m (157 in.) mast			5560 (218.9) 4.3 m (169 in.) mast
J	Tread (front)	Standard	940 (37.0)			
		Wide tread (option)	1040 (41.0)			
K	Tread (rear)		980 (38.5)			
L	Wheelbase		1575 (62.0)			
M	Rear overhang		485 (18.8)	525 (20.3)	335 (13.3)	565 (22.1)
N	Underclearance (at frame)		150 (5.9)			

GENERAL INFORMATION

Unit: mm (in.)

GC45K	GC55K	GC55K STR	GC60K	GC70K	GC70K STR
2900 (114)			2350 (93)		
160 (6.3)			165 (6.5)		
895 (35.2) 2.8 m (112 in.) mast			—————		
895 (35.2) 4.0 m (157 in.) mast			900 (35.4) 3.5 m (138 in.) mast		
1220 (48)					
5/10 Simplex, Duplex mast 6/5 Triplex mast			6/10 Simplex mast 6/5 Triplex mast		
2730 (107)	2910 (115)	2640 (104)	2950 (116)		2730 (107)
1320 (52.0)			1440 (56.5)		
1420 (56.0)			—————		
2155 (85.0)			2205 (87.0)		
2155 (85.0)			2205 (87.0)		
4125 (162)			3585 (141)		
4080 (160.6) 2.8 m (112 in.) mast			—————		
5560 (218.9) 4.0 m (157 in.) mast			4785 (188.3) 3.5 m (138 in.) mast		
1015 (40.0)			1130 (44.5)		
1120 (44)			—————		
965 (38.0)			1160 (45.5)		
1780 (70.0)			1830 (72.0)		
470 (18.1)	650 (26.1)	380 (15.1)	590 (23.1)		340 (13.1)
150 (5.9)			200 (7.9)		

GENERAL INFORMATION

Technical Data

Truck Models				GC35K	GC40K	GC40K STR	GC45K SWB		
Work performance	Capacity/load center		kg/mm (lb/in.)	3500/500 (7000/24)	4000/500 (8000/24)		4500/600 (10000/24)		
	Maximum lift height Simplex		mm (in.)	3050 (120)			2900 (114)		
	Lift speed (loaded)		mm/sec. (fpm)	540 (105)			390 (78.0)		
	Lowering speed (loaded)			550 (108)			440 (86.5)		
	Mast tilt (forward-backward)		degree	5/10					
	Free lift		mm (in.)	150 (6.0)			160 (6.5)		
Traveling performance	Travel speed	Powershift transmission models	Loaded	19 (12.0)			18.5 (11.5)		
			No load	19.5 (12.5)					
	Minimum turning radius		mm (in.)	2235 (88.0)	2285 (90)	2090 (82.5)	2340 (92.0)		
	Minimum intersecting isle	Standard		2245 (88.5)	2295 (90.5)	2100 (82.5)	2350 (92.5)		
	Gradeability at 1 mph (1.6 km/h)		Loaded	37	33	32	27		
			No loaded	23.8	21.1	21.5	17.7		
	Gradeability at stall		Loaded	42	37	36	30		
			No loaded	23.8	21.1	21.5	17.7		
Dimensions	Overall length to fork face		mm (in.)	2510 (98.5)	2550 (100)	2360 (93)	2620 (103)		
	Overall width	Standard		1180 (46.5)					
		Wide tread (optional)		1270 (50.0)					
	Overall height	To top of mast (lowered)		2200 (86.5)		2350 (92.5)			
		To top of mast (extended)		4250 (167.5)		4130 (162.5)			
		To top of overhead guard		2155 (85.0)					
	Wheelbase			1575 (62.0)					
	Tread	Front		Standard	940 (37.0)				
				Wide tread (optional)	1040 (41.0)				
	Rear			980 (38.5)					
	Overhang	Rear		485 (18.8)	525 (20.3)	335 (13.3)	565 (22.1)		
	Underclearance (at frame)			150 (5.9)					
	Tire size	Front		Single wheels	22×9×16				
Rear		18×7×12.12							
Weight	Single wheels (without load)		kg (lb)	Service weight -no load	5200 (11500)	5600 (12300)	5700 (12700)	6500 (14300)	
				Axle loading	Front	2050 (4600)	2025 (4400)	2150 (4900)	1925 (4200)
					Rear	3150 (6900)	3575 (7900)	3550 (7800)	4575 (10100)

GENERAL INFORMATION

GC45K	GC55K	GC55K STR	GC60K	GC70K	GC70K STR
4500/600 (10000/24)	5500/600 (12000/24)		6000/600 (13500/24)	7000/600 (15500/24)	
2900 (114)			2360 (93)		
390 (78.0)			360 (71.0)		
440 (86.5)			540 (106.0)		
5/10			6/10		
160 (6.5)			165 (6.5)		
18.5 (11.5)	18 (11.5)		21 (13.0)	20.5 (12.5)	
19.5 (12.5)			23 (14.5)		22.5 (14.0)
2440 (96.0)	2550 (100)	2350 (92.5)	2570 (101.0)		2400 (94.5)
2345 (92.5)	2455 (96.5)	2255 (89)	2395 (94.5)		2220 (87.5)
26	22.6	22.2	24.5	21.7	21.4
23.8	20.2	20.9	22.2	19.7	20.4
30	26	25	30	27	26
23.8	20.2	20.9	22.2	19.7	20.4
2730 (107)	2910 (115)	2460 (104)	2950 (116)		2700 (106)
1320 (52.0)			1440 (56.5)		
1420 (56.0)			—————		
2350 (92.5)			2530 (99.5)		
4130 (162.5)			2370 (93.0)		
2155 (85.0)			2205 (87.0)		
1780 (70.0)			1830 (72.0)		
1015 (40.0)			1135 (44.5)		
1115 (44.0)			—————		
965 (38.0)			1160 (45.5)		
470 (18.1)	650 (26.1)	380 (15.1)	590 (23.1)		340 (13.1)
150 (5.9)			200 (7.9)		
22×12×16			28×12×12		
18×8×12.12	18×8×12.12		22×8×16		
6600 (14500)	7200 (15800)	7400 (16200)	8800 (19300)	9500 (20900)	9700 (21300)
2625 (5700)	2425 (5300)	2625 (5700)	3300 (7300)	3300 (7200)	3500 (7500)
3975 (8800)	4775 (10500)	4775 (10500)	5500 (12000)	6200 (13700)	6200 (13800)

GENERAL INFORMATION

MPFI specs in **Bold**. If not indicated in bold, specs are for Carbureted and MPFI systems.

Items		Truck Models		GC35K	GC40K	GC40K STR	GC45K SWB
Engine	Engine model	GM4.3L					
	Type	Gasoline					
	Cooling system	Water cooled					
	No. of cylinders-arrangement	6-90°V					
	No. of strokes	4					
	Type of combustion chamber	Semi-spherical					
	Valve arrangement	Overhead					
	Type of cylinder liners	Integral					
	Cylinder bore × stroke, mm (in.)	101.6×88.39 (4.00×3.48)					
	Displacement, cc (cu in.)	4293 (262)					
	Compression ratio	9.2 : 1					
	Rated output, PS/rpm	94/2450					
	Rated torque, kgf-m/rpm	31.0/1200					
	Min. rpm	750-800, 650-700					
	Max. rpm	2650-2700, 2600-2650					
	Dimensions (L×W×H), mm (in.)	710×620×740 (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., ECU Controlled						
Fuel tank capacity, liter (U.S.gal)	66 (17.4)						
Ignition system	Ignition coil	Type	Mold				
	Distributor	Type	Pointless				
		Type of spark advance control	Internal solid state circuit, ECU Controlled				
	Spark plug	Model	AC #41-932, R42LTS				
		Size, mm (in.)	14 (0.55)				
Gap, mm (in.)		1.24 (0.0488), .89 (.035)					
Fuel system	Carburetor	Type	Single Barrel, MPFI				
	Governor	Type	Electronic				
	Fuel pump	Type	Electromagnetic				
	Air cleaner	Type × Number	Cyclone with paper element × 1				

GENERAL INFORMATION

MPFI specs in **Bold**. If not indicated in bold, specs are for Carbureted and MPFI systems.

GC45K	GC55K	GC55K STR	GC60K	GC70K	GC70K STR
GM4.3L					
Gasoline					
Water cooled					
6-90°V					
4					
Semi-spherical					
Overhead					
Integral					
101.6×88.39 (4.00×3.48)					
4293 (262)					
9.2 : 1					
92.6/2450					
31.0/1200					
750-800, 650-700					
2650-2700, 2600-2650					
710×620×740 (28.0×24.4×29.1)					
260 (573)					
Rear					
Spark					
1-6-5-4-3-2					
0° Gasoline, 8° L.P.G., ECU Controlled					
80 (21.1)			128 (34.0)		
Mold					
Pointless					
Internal solid state circuit					
AC #41-932, R42LTS					
14 (0.55)					
1.24 (0.0488), .89 (.035)					
Single Barrel, MPFI					
Electronic					
Electromagnetic					
Cyclone with paper element × 1					

GENERAL INFORMATION

MPFI specs in **Bold**. If not indicated in bold, specs are for Carbureted and MPFI systems.

Items		Truck Models		GC35K	GC40K	GC40K STR	GC45K SWB	
Engine lubrication system	Type	Pressure feed						
	Oil pump	Gear pump						
	Oil filter	Paper element						
	Oil cooler	Oil to water type						
	Refill capacities, liter (U.S.gal)	Oil pan	4.2 (1.1)					
		Oil filter & cooler	0.8 (0.2)					
Total		5.0 (1.3)						
Cooling system	Type	Forced circulation						
	Radiator	Plate fins with pressure cap						
	Refill capacity, liter (U.S.gal)	11 (2.9)						
	Water pump	Centrifugal type, V-belt driven, Serpentine belt driven						
	Thermostat/ Opening Temp F°	Wax type/ 180						
Battery	Type × number	Group 24						
	Voltage, V	12						
	Capacity, AH (5Hr)	45						
Alternator	Type	3-Phase AC						
	Manufacturer	MANDO, AC Delco						
	Rated output, V-A	12-50, 12-70						
	Regulator	Built in IC type						
Starter	Type	Electromagnetic						
	Manufacturer	Delco Remy						
	Voltage-output, V-kW	12 - 0.75						

GENERAL INFORMATION

MPFI specs in **Bold**. If not indicated in bold, specs are for Carbureted and MPFI systems.

GC45K	GC55K	GC55K STR	GC60K	GC70K	GC70K STR
Pressure feed					
Gear pump					
Paper element					
Oil to water type					
4.2 (1.1)					
0.8 (0.2)					
5.0 (1.3)					
Forced circulation					
Plate fins with pressure cap					
11 (2.9)					
Centrifugal type, V-belt driven, Serpentine belt driven					
Wax type/ 180					
Group 24					
12					
45					
3-Phase AC					
MANDO, AC Delco					
12-50, 12-70					
Built in IC type					
Electromagnetic					
Delco Remy					
12 - 0.75					

GENERAL INFORMATION

Items		Truck Models		GC35K	GC40K	GC40K STR	GC45K SWB	
Power train	Torque converter	Type		3-element, 1-stage, 2-phase				
		Manufacturer's model		Okamura M15				
		Stall torque ratio		3.2				
	Transmission	Powershift	Control and shift		Hydraulic and column shift			
			Ratios	Forward	2.898			
				Reverse	2.907			
	Reduction gear	Type of gear		Spiral bevel				
		Gear ratio		4.571				
	Differential	Housing		Banjo				
		Type of gear and pinion number	Gear	Straight bevel-2				
			Pinion	Straight bevel-4				
	Transmission/ torque converter oil		liter (U.S. gal)		14 (3.7)			
Differential gear oil		liter (U.S. gal)		9.1 (2.4)				
Steering system	Type		Full Hydrostatic power steering					
	Steering wheel diameter, mm (in.)		330 (13)					
	Power steering	Power cylinder ID × rod diam., mm (in.)		85×60 (3.3×2.4)				
		Effective stroke, mm (in.)		155 (6.1)				
		Relief pressure, kPa (kgf/cm ²) [psi]		11768 (120) [1706]				
		Flow rate, liter (U.S.gal)/min		23 (6.07)				
Traveling system	Front axle		Full-floating tubular type					
	Rear axle		Elliott type					
	Suspension system	Front		Fixed type				
		Rear		Center-pivot type				
	Wheel alignment	Toe-in, mm (in.)		0				
		Camber		1.0°				
		Caster		0°				
Kingpin inclination		0°						

GENERAL INFORMATION

GC45K	GC55K	GC55K STR	GC60K	GC70K	GC70K STR
3-element, 1-stage, 2-phase					
Okamura M15					
3.2					
Hydraulic and column shift					
2.898			(1st/2nd) 5.104/2.882		
2.907			(1st/2nd) 5.104/2.882		
Spiral bevel			Hypoid gear		
4.571			4.857		
Banjo					
Straight bevel-2					
Straight bevel-4					
Transmission/ Torque oil 15 (3.9)					
9.1 (2.4)					
Full Hydrostatic power steering					
328 (12.9)					
85×60 (3.3×2.4)					
155 (6.1)			180 (7.1)		
11768 (120) [1706]			14710 (150) [2133]		
23 (6.07)					
Full-floating tubular type					
Elliott type					
Fixed tpe					
Center-pivot type					
0					
1.0°					
0°					
0°					

BUY NOW

**Then Instant Download
the Complete Manual
Thank you very much!**