



Service Manual

Chassis, Mast & Options

FG40K	F29C-00011-up	FD40K	F19C-00011-up
FG40KL	F29C-50001-up	FD40KL	F19C-50001-up
FG45K	F29C-80001-up	FD45K	F19C-80001-up
FG50K	F33B-50001-up	FD50K	F28B-50001-up

FOREWORD

This service manual is a guide for servicing Mitsubishi forklift trucks. For your convenience the instructions are grouped by systems as a ready reference.

The long productive life of your forklift truck(s) depends on regular and proper servicing. Servicing consistent with what you will learn by reading this service manual. Read the respective sections of this manual carefully and familiarize yourself with all of the components before attempting to start a test, repair or rebuild job.

The descriptions, illustrations and specifications contained in this manual are for trucks with serial numbers in effect at the time of printing. Mitsubishi Forklift Trucks reserves the right to change specifications or design without notice and without incurring obligation.

The trucks listed in this manual are powered by TB45 gasoline engines or S6S diesel engines. For engine servicing, please refer to the applicable engine service manual.

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.



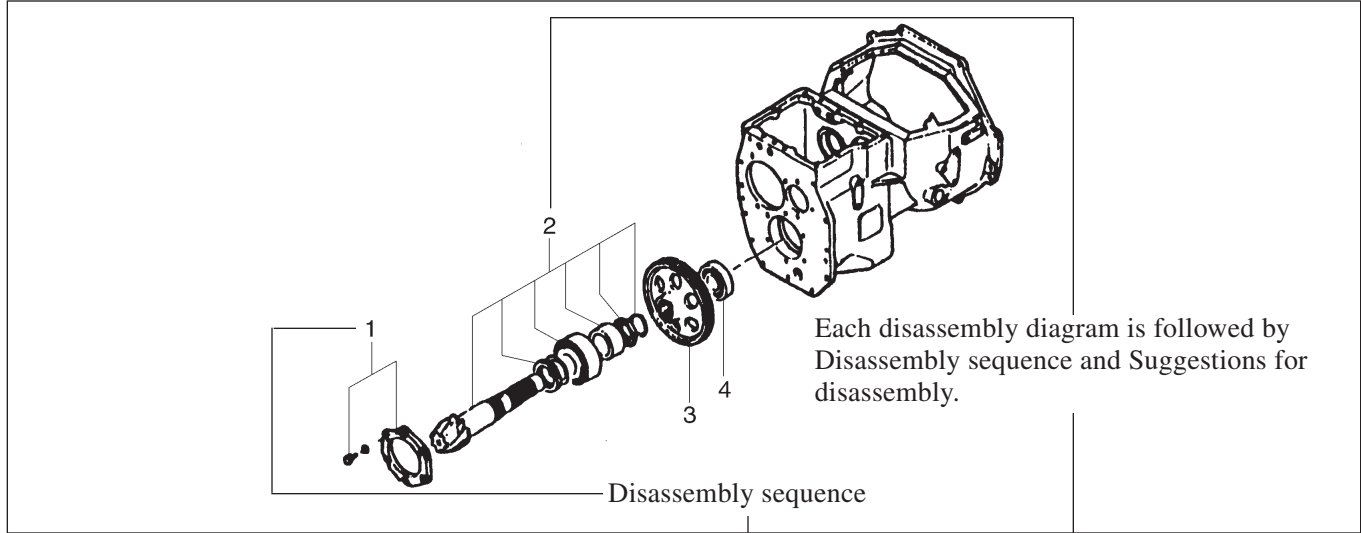
Indicates a specific potential hazard resulting in bodily injury, or damage to, or destruction of, the machine.



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

HOW TO READ THIS MANUAL

Disassembly diagram (example)

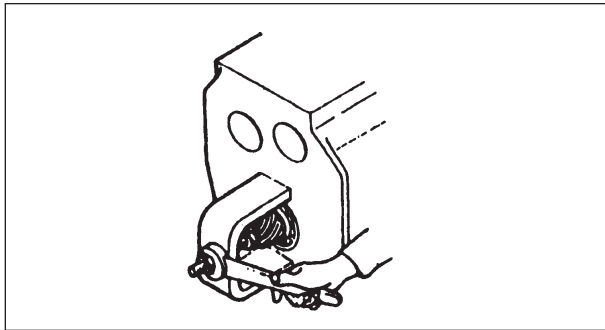


Sequence

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: Standard value B: Repair or service limit

Symbols or abbreviations

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

SAFETY

 **WARNING**

The proper and safe lubrication and maintenance for these forklift trucks, 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 on these trucks.

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 these trucks unless you have read and understood 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.

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 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.
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 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.

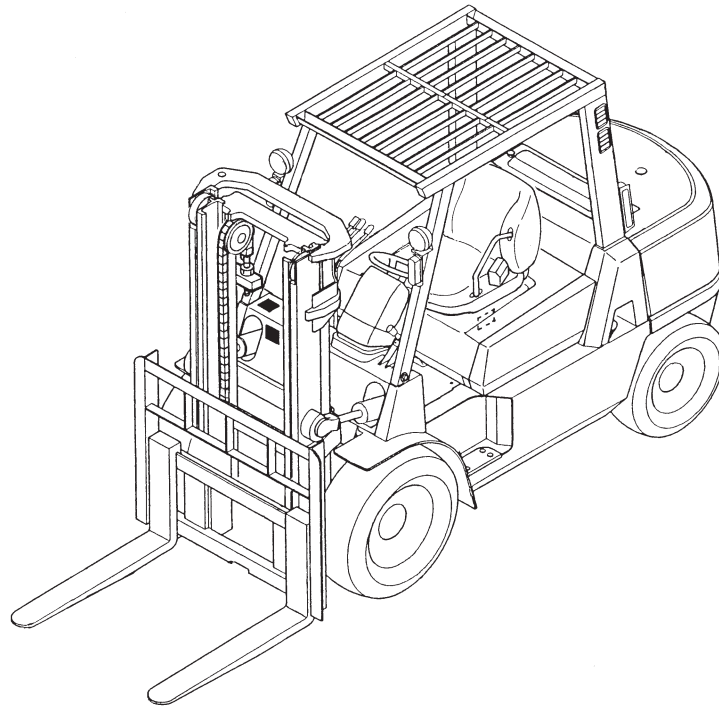
GROUP INDEX

GROUP INDEX	Items	
GENERAL INFORMATION	Model View, Truck Models Covered, Serial Number Locations, Chassis and Mast Model Identification, Dimensions, Technical Data	1
COOLING SYSTEM	Structure, Removal and Installation, Inspection and Adjustment	2
ELECTRICAL SYSTEM	Structure and Functions, Major Electrical Components, Lamp Bulb Specifications, Battery Maintenance, Disassembly and Reassembly, Troubleshooting, Electrical Schematic	3
POWER TRAIN	Removal and Installation	4
CLUTCHES	Dry Type Clutch, Wet Type Clutch, Pressure Plate Assembly, Clutch Booster, Clutch Master Cylinder, Clutch Release Cylinder, Adjustment, Troubleshooting, Service Data	5
MANUAL TRANSMISSION	Structure and Functions, Removal and Installation, Disassembly, Inspection and Repair, Reassembly, Troubleshooting, Service Data	6
POWERSHIFT TRANSMISSION	1-Speed Transmission, Automatic 2-Speed Transmission, Troubleshooting, Service Data	7
FRONT AXLE AND REDUCTION DIFFERENTIAL	Structure and Function, Removal and Installation, Axle shafts and Hubs, Reduction Differential, Troubleshooting, Service Data	8
REAR AXLE	(SIS) Structure, Removal and Installation, Rear Axle Assembly, Adjustment, Troubleshooting, Service Data, (FHS) Structure, Removal and Installation, Rear Axle Assembly, Steering Cylinder, Adjustment, Troubleshooting, Service Data	9
BRAKE SYSTEM	Structures and Functions, Master Cylinder, Wheel Cylinders, Wheel Brakes, Adjustment and Test, Troubleshooting, Service Data	10
STEERING SYSTEM	(SIS) Structure and Function, Removal and Installation, Steering Gear, Power Cylinder, Troubleshooting, Service Data, (FHS) Structure and Functions, Removal and Installation, Steering Valve, Troubleshooting, Service Data	11
HYDRAULIC SYSTEM	Structure and Functions, Removal and Installation, Hydraulic Pumps, Control Valve, Lift Cylinders, Tilt Cylinders, Flow Regulator Valve, Down Safety Valve, Inspection and Adjustment, Testing, Hydraulic Circuit Diagram, Piping of Hydraulic System, Troubleshooting, Service Data	12
MASTS AND FORKS	Specifications, Structure, Removal and Installation, Disassembly and Reassembly, Inspection and Adjustment, Troubleshooting, Service Data	13
SERVICE DATA	Tightening Torque for Standard Bolts and Nuts, Maintenance Schedule, Parts to be Changed Periodically, Lubrication Instructions, Special Tools	14
OPTIONS	Radiator Screen Kit, Plate Fin Type Radiator Kit, Elevated Exhaust Kit, Headlamp Kit, Tail Lamp Upper Relocate Kit, Battery Switch Kit, Extinguisher Kit, Back Mirror Kit, Drawbar Pin, Low Head Guard Kit, Semi Under Side Guard Kit, Torque Converter Oil Filter Kit, Hydraulic Oil Cooler Kit, Gear Pump Seal Kit	15

GENERAL INFORMATION

Model View	1 – 1
Truck Models Covered	1 – 1
Serial Number Locations	1 – 2
Chassis and Mast Model Identification	1 – 3
Dimensions	1 – 4
Technical Data	1 – 6

Model View



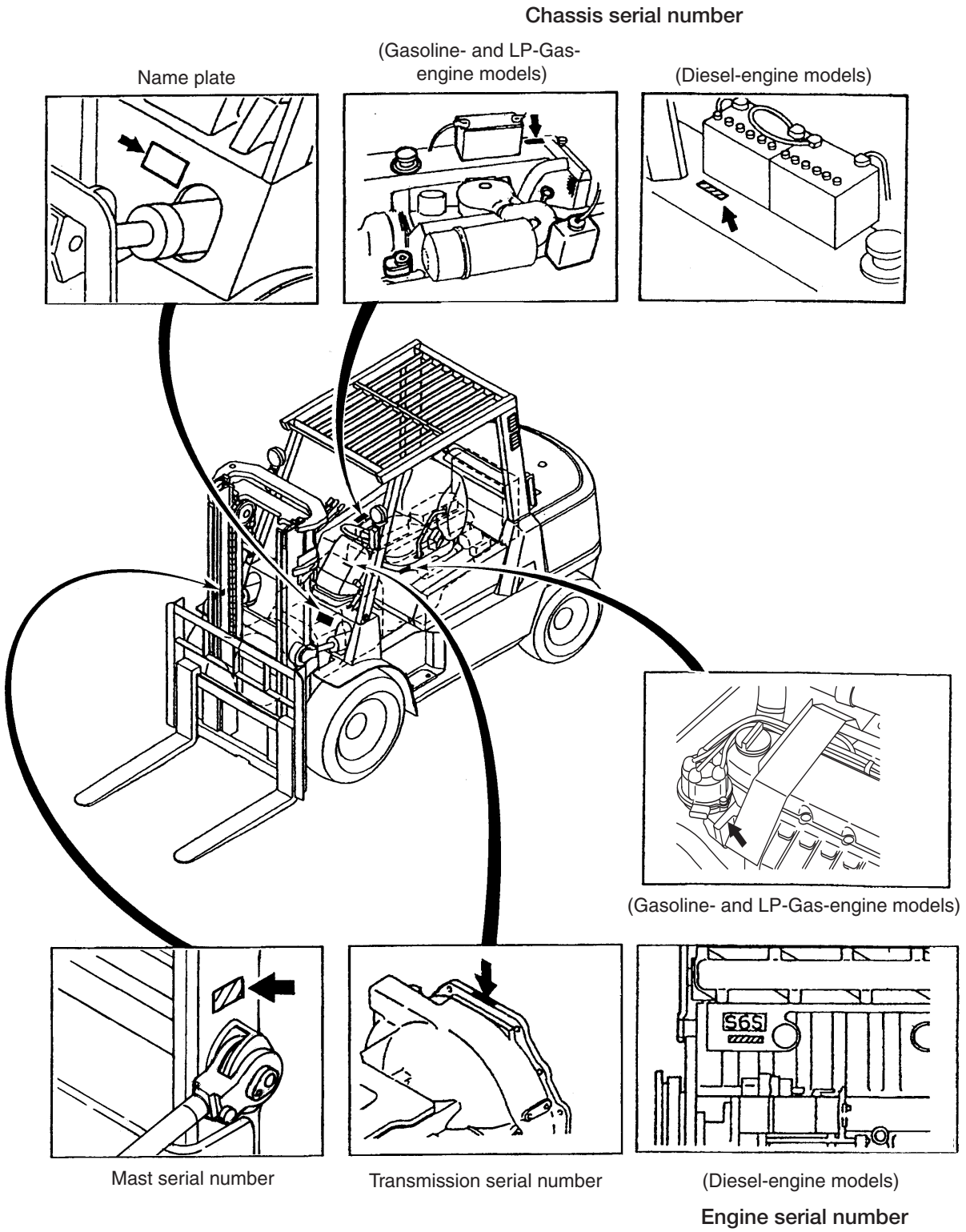
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Truck Models Covered

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

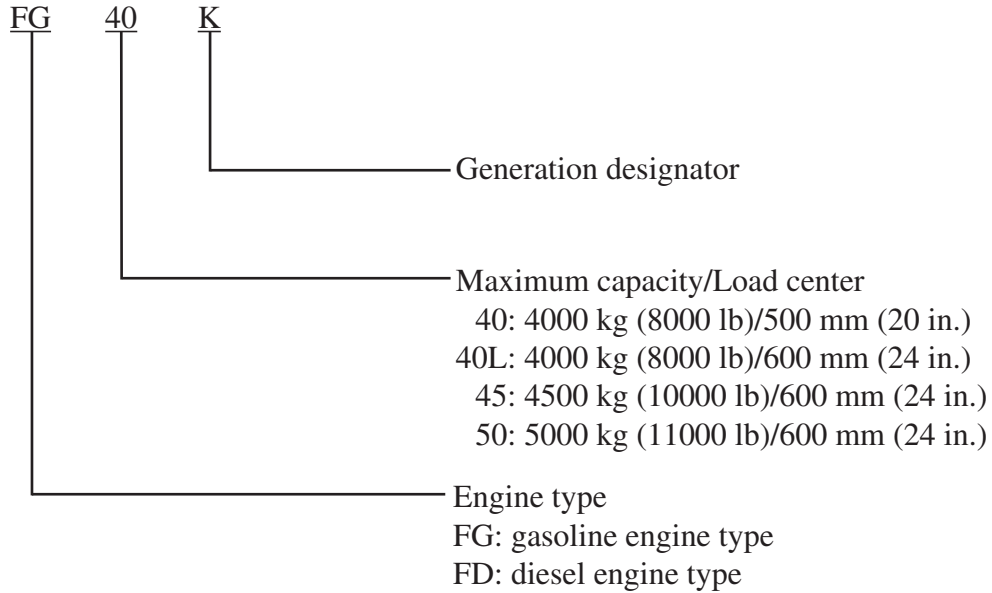
Truck model	Transmission	Model code – Serial number	Engine mounted
FG40K	Powershift	F29C – 00011- up	TB45 gasoline engine
FG40KL	Powershift	F29C – 50001- up	TB45 gasoline engine
FG45K	Powershift	F29C – 80001- up	TB45 gasoline engine
FG50K	Powershift	F33B – 50001- up	TB45 gasoline engine
FD40K	Manual	F19C – 00011- up	S6S diesel engine
	Powershift		
FD40KL	Manual	F19C – 50001- up	S6S diesel engine
	Powershift		
FD45K	Manual	F19C – 80001- up	S6S diesel engine
	Powershift		
FD50K	Powershift	F28B – 50001- up	S6S diesel engine

Serial Number Locations

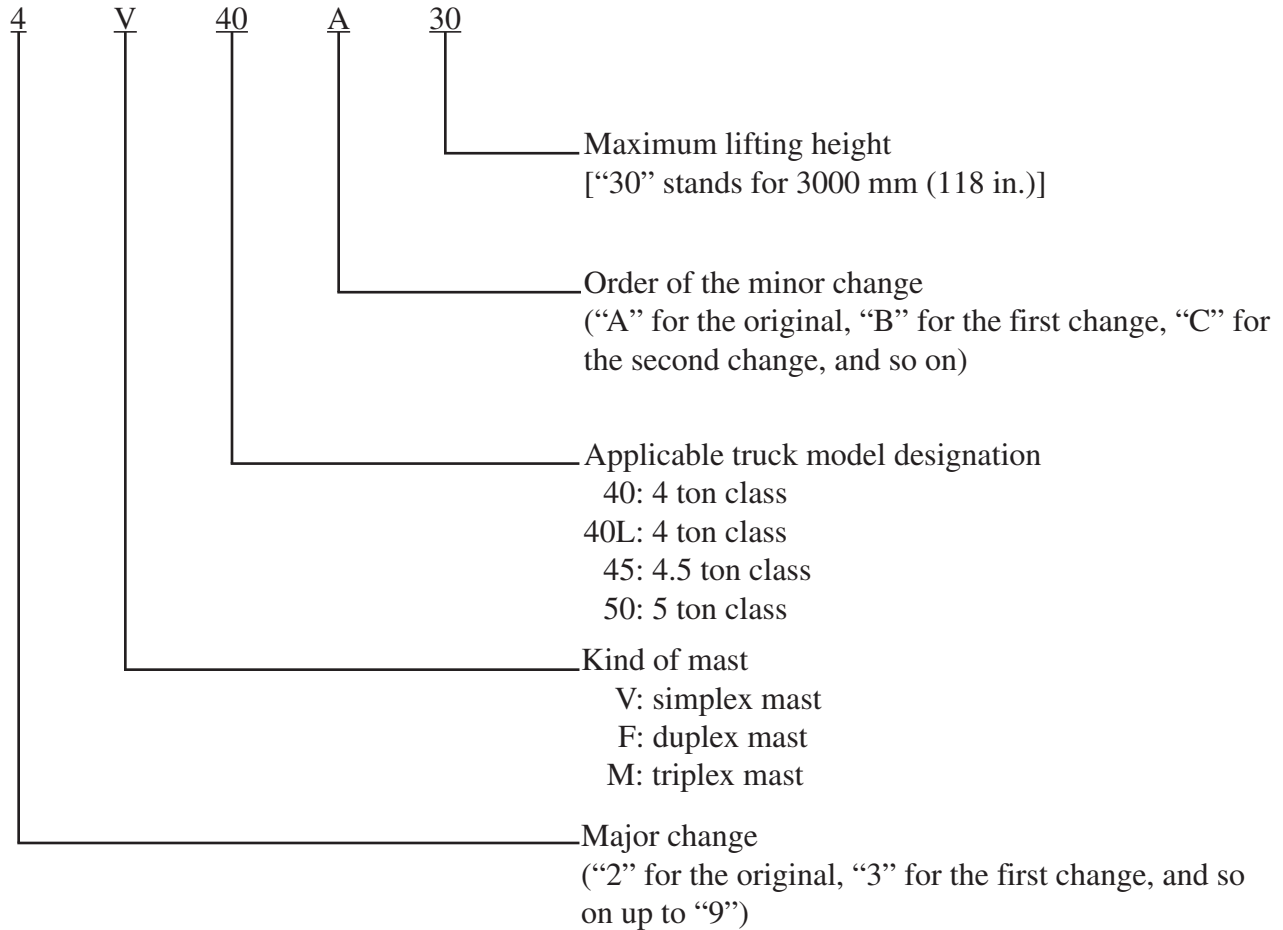


Chassis and Mast Model Identification

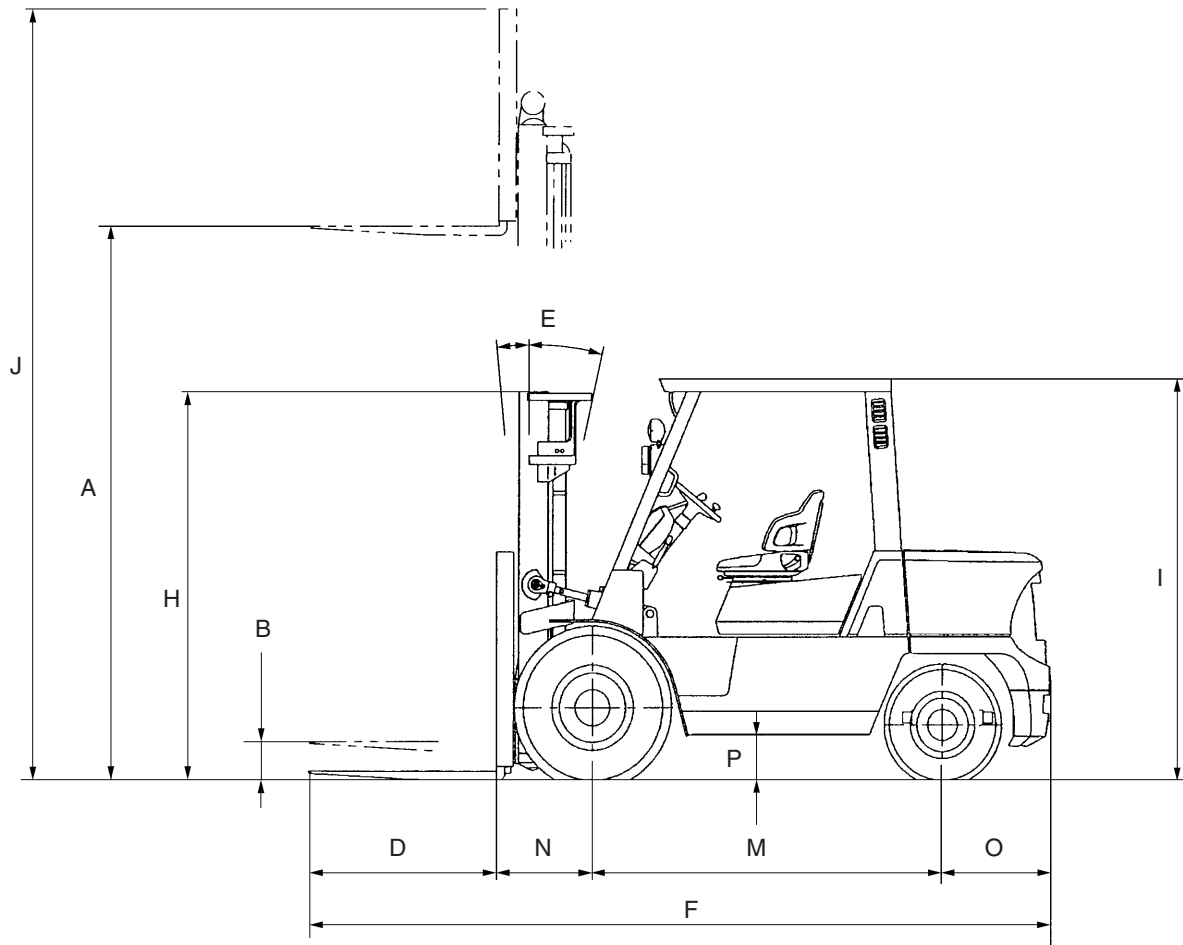
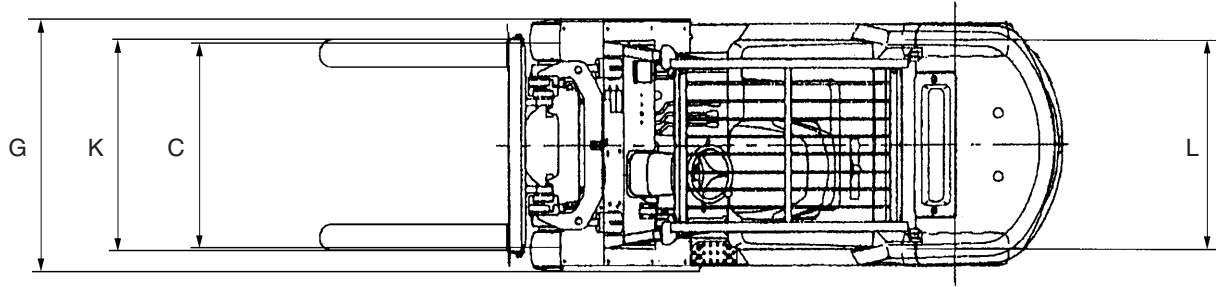
[Chassis]



[Mast]



Dimensions



202762A

GENERAL INFORMATION

Unit: mm (in.)

Ref. No.	Truck Model		FG40K FD40K	FG40KL FD40KL	FG45K FD45K	FG50K FD50K
	Item					
A	Maximum lift		3000 (118)			
B	Free lift		150 (5.9)			160 (6.5)
C	Fork spread (outside)		300 to 1190 (12 to 47)			
D	Fork length		1070 (42)			1220 (48)
E	Tilt angle (forward – backward)		6° – 10°			
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)		
		Dual tire	1780 (70.1)			1965 (77.4)
H	Overall height (to top of mast lowered)		2170 (85.4)		2250 (88.6)	
I	Overall height (to top of overhead guard)		2250 (88.6)			
J	Overall height (mast extended)		4270 (168.1)			4290 (168.9)
K	Tread (front)	Single tire	1175 (46.3)			
		Dual tire	1310 (51.6)			
L	Tread (rear)		1180 (46.5)			
M	Wheelbase		2000 (78.7)			2150 (84.6)
N	Front overhang		557 (21.9)		562 (22.1)	582 (22.9)
O	Rear overhang		513 (20.2)	563 (22.2)	613 (24.1)	573 (22.6)
P	Underclearance (at frame)		252 (9.9)			

Technical Data

Truck Model		FG40K FD40K	FG40KL FD40KL	FG45K FD45K	FG50K FD50K	
Item						
Model code		FG: F29C FD: F19C			FG: F33B FD: F28B	
Type		Standard				
General	Capacity/load center kgf/mm (lbf/in.)	4000/500 (8000/24)	4000/600 (9000/24)	4500/600 (10000/24)	5000/600 (11000/24)	
	Maximum lift mm (in.)	3000 (118)				
	Lift speed (rate load) mm/sec (fpm)	FG: 510 (100) FD: 500 (98)		FG: 440 (87) FD: 430 (85)	FG: 430 (85) FD: 420 (83)	
	Lowering speed (rate load) mm/sec (fpm)	500 (98)				
	Tilt angle (forward – backward)	6° – 10°				
	Free lift mm (in.)	150 (5.9)			160 (6.5)	
Performance	Travel speed of powershift transmission models km/h (mph)	Forward	19.5 (12.1)		23.5 (14.6)	
		Reverse	19.5 (12.1)		23.5 (14.6)	
	Minimum turning radius mm (in.)	2735 (107.7)	2775 (109.3)	2820 (111)	2965 (116.7)	
	Steering angle	Inside	83°			
		Outside	56°33'			
	Minimum intersecting aisle mm (in.)	Single tire	2360 (92.9)	2400 (94.5)	2450 (96.5)	2510 (98.8)
Dual tire		2490 (98)	2520 (99.2)	2570 (101.2)	2740 (107.9)	
Tires	Front tires (size and inflation pressure) kPa (kgf/cm ²) [psi]	Single tire	8.25-15-12PR (I) 800 (8.2) [116]	300-15-18PR (I) 800 (8.2) [116]		
		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/cm ²) [psi]	7.00-12-12PR (I) 800 (8.2) [116]			7.00-12-12PR (I) 800 (8.2) [116]	
Truck weight	Single drive tire (unloaded) kg (lb)	FG: 5530 (12190) FD: 5630 (12400)	FG: 5930 (13070) FD: 6030 (13300)	FG: 6490 (14300) FD: 6590 (14500)	FG: 7010 (15400) FD: 7100 (15650)	
	Dual drive tire (unloaded) kg (lb)	FG: 5660 (12480) FD: 5760 (12700)	FG: 6010 (13250) FD: 6110 (13470)	FG: 6570 (14490) FD: 6670 (14700)	FG: 7090 (15630) FD: 7180 (15830)	

Item		Truck Model		FG40K	FG40KL	FG45K	FG50K
Engine (gasoline and LP-gas)	Engine model	TB45					
	Type	Gasoline					
	Cooling system	Water cooled					
	No. of cylinders – arrangement	6 – in-line					
	No. of strokes	4					
	Type of combustion chamber	Semi -spherical					
	Valve arrangement	Overhead					
	Type of cylinder liners	Integral					
	Cylinder bore × stroke mm (in.)	99.5 × 96.0 (3.92 × 3.78)					
	Displacement cc (cu in.)	4500 (275)					
	Compression ratio	9.2 : 1					
	Rated output kW/rpm	72/2450					
	Rated torque N·m (kgf·m) [lbf·ft]/rpm	280 (28.5) [207]/1200					
	Minimum engine speed rpm	650 to 700					
	Maximum engine speed rpm	2450					
	Dimensions (L × W × H) mm (in.)	907 × 649.5 × 781 (35.7 × 25.5 × 30.7)					
	Weight kg (lb)	290 (639)					
	Installation position	Rear					
	Ignition	Spark					
Firing order	1 – 5 – 3 – 6 – 2 – 4						
Initial ignition timing BTDC deg	10 ± 1						
Fuel tank capacity liter (U.S. gal.)	115 (30)						

GENERAL INFORMATION

Item		Truck Model		FG40K	FG40KL	FG45K	FG50K	
Ignition system	Ignition coil type		Mold					
	Distributor	Type	Pointless					
		Type of spark advance control	Internal solid state circuit					
	Spark plug	Model	BPR4ES					
		Size	mm (in.)	—				
		Gap	mm (in.)	0.8 to 0.9 (0.031 to 0.035)				
Fuel system	Fuel pump type		Electromagnetic					
Air cleaner	Type × Number		Cyclone with paper element × 1					
Engine lubrication system	Type		Pressure feed					
	Oil pump		Gear pump					
	Oil filter		Paper element					
	Oil cooler		Oil to water type					
	Refill capacities	Oil pan	liter (U.S. gal.)	7.3 (1.93)				
		Oil filter & cooler	liter (U.S. gal.)	0.3 (0.08)				
Total		liter (U.S. gal.)	7.6 (2.01)					
Cooling system	Type		Forced circulation					
	Radiator		Corrugated fin with pressure type					
	Refill capacity	liter (U.S. gal.)	15.3 (4.04)					
	Water pump		Centrifugal type driven by V-belt					
	Thermostat		Wax type					

Item		Truck Model	FG40K	FG40KL	FG45K	FG50K
Battery	Type × number		55D26R			
	Voltage	V	12			
	Capacity	AH (5 Hr)	50			
Alternator	Type		3-phase AC			
	Rated output	V – A	12 – 50			
	Regulator		Built-in IC type			
Starter	Type		Electromagnetic			
	Voltage – output	V – kW	12 – 0.75			

GENERAL INFORMATION

Item		Truck Model		FD40K	FD40KL	FD45K	FD50K
Engine (diesel)	Engine model		S6S				
	Type		Water-cooled, 4-stroke cycle				
	No. of cylinders – arrangement		6 – in-line				
	Type of combustion chambers		Swirl				
	Valve arrangement		Overhead				
	Type of cylinder liners		Dry				
	Bore × stroke		mm (in.)	94 × 120 (3.70 × 4.72)			
	Displacement		cc (cu in.)	4996 (305)			
	Compression ratio		22 : 1				
	Rated output		kW/rpm	62.5/2450			
	Maximum torque		N·m (kgf·m) [lbf·ft]/rpm	250 (25.5) [184]/1600			
	Dimensions (L × W × H)		mm (in.)	907.5 × 639 × 801 (35.7 × 25.2 × 31.5)			
	Weight (service)		kg (lb)	350 (771)			
	Installation position		Rear				
	Intake valves	Open	BTDC deg	30°			
		Close	ABDC deg	50°			
	Exhaust valves	Open	BBDC deg	74°			
Close		ATDC deg	30°				
Valve clearance (at cold)	Intake valves		0.25 (0.0098)				
	Exhaust valves						
Ignition		Compression					
Firing order		1 – 5 – 3 – 6 – 2 – 4					
Ignition or injection timing		BTDC deg	19°				

Item		Truck Model		FD40K	FD40KL	FD45K	FD50K
Engine (diesel)	Fuel tank capacity liter (U.S. gal.)		115 (30)				
	No-load minimum speed rpm		650 to 700				
	No-load maximum speed rpm		2600 to 2650				
Fuel system	Fuel injection pump	Type	Bosch				
		Plunger diam. mm (in.)	6.5 (0.256)				
		Cam lift (one side) mm (in.)	6 (0.24)				
	Fuel injection nozzles	Type	Throttle				
		Spray holes diam. mm (in.)	1.0 (0.04)				
		Injection pressure kPa (kg/cm ²) [psi]	1372 (140) [1992]				
	Glow plugs	Type	Sheathed				
		Voltage – current V – A	22 – 4.4				
	Fuel pump type		Plunger				
	Air cleaner	Type × number	Cyclone with paper element × 1				
Lubrication system	Type		Pressure feed				
	Oil pump		Trochoid type				
	Oil filter		Paper element type				
	Refill capacities liter (U.S. gal.)	Oil pan	11 (2.9)				
		Oil filter	1 (0.3)				
Total		12 (3.2)					

GENERAL INFORMATION

Item		Truck Model		FD40K	FD40KL	FD45K	FD50K
Cooling system	Type	Forced circulation					
	Radiator	Corrugated fin with pressure cap					
	Refill capacity liter (U.S. gal.)	12.4 (3.28)					
	Water pump	Centrifugal type driven by V-belt					
	Thermostat	Wax type					
Battery	Type × number	48D26R × 2					
	Voltage	V	24				
	Capacity	Ah	50				
Alternator and regulator	Alternator type	3-phase AC					
	Capacity	V – A	24 – 35				
	Voltage/current regulator	Built-in IC type					
Starter	Type	Electromagnetic					
	Voltage – output	V – kW	24 – 5				
Engine stop device	Control timer	Setting	sec	5 to 7			
	Stop solenoid	Operating voltage	V	16 to 30			
		Rated current (at 24 V)	V	11.3			
	Detector (magnetic pickup)	Output	mA	180 minimum			
Gap		mm (in.)	0.7 ± 0.2 (0.028 ± 0.008)				

Item		Truck Model		FG40K FD40K	FG40KL FD40KL	FG45K FD45K	FG50K FD50K	
Power train	Clutch (FD40K thru FD45K)	Type		Dry, single disc (OP: wet type)				
		Facing (OD × ID), mm (in.)		325 × 210 (12.8 × 8.3) [wet: 325 × 225 (12.8 × 8.9)]				
		Material		DR-8 (wet: cork)				
	Torque converter	Type		3-element, 1-stage, 2-phase				
		Model		M15				
		Stall torque ratio		3.2				
	Powershift transmission	Control and shift		Hydraulic and column shift				
		Ratios	Forward	4.044				F1: 5.735 F2: 3.239
			Reverse	4.057				R1: 5.735 R2: 3.239
	Manual transmission (FD40K thru FD45K)	Type		Synchro-mesh				
		Shift		Floor-shift				
		Forward ratio	1st	8.462				
			2nd	4.145				
		Reverse ratio	1st	8.489				
			2nd	4.159				
	Reduction gear	Type of gear		Spiral bevel				
Gear ratio		4.857						
Differential	Housing		Banjo					
	Type of gear – number		Straight bevel – 2					
	Type of pinion – number		Straight bevel – 4					

GENERAL INFORMATION

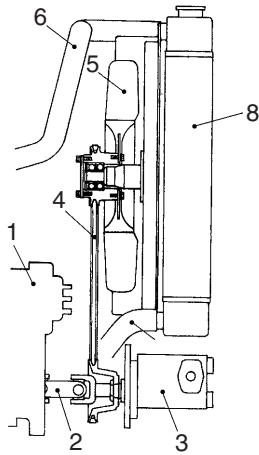
Item		Truck Model	FG40K FD40K	FG40KL FD40KL	FG45K FD45K	FG50K FD50K	
Steering system	Type		Recirculating ball-and-nut				
	Gear ratio		20.0				
	Steering wheel diameter mm (in.)		380 (15)				
	Power steering	Type		Semi-integral system (SIS)			
		Power cylinder ID × rod diam. mm (in.)		55 × 25 (2.17 × 0.98)			
		Effective stroke mm (in.)		275 (10.8)			
		Relief pressure kPa (kgf/cm ²) [psi]		8336 ⁺⁴⁹⁰ ₀ (85 ⁺⁵ ₀) [1209 ⁺⁷¹ ₀]			
		Flow rate liter (U.S. gal.)/min		17.5 ± 0.5 (4.6 ± 0.13)			
	Steering valve	Type		Full-hydraulic system (FHS) Open center, non-load reaction type			
		Displacement cc (cu in.)/rev.		120 (7.32)			
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			5.0°				
Brake system	Type		Self-adjusting, duo-servo				
	Drum diameter mm (in.)		317.5 (12.50)				
	Wheel brakes	Lining (length × width × thickness – number) mm (in.)		351 × 60 × 6 – 2 (13.8 × 2.4 × 0.2 – 2)		332 × 63 × 10 – 2 (13.1 × 2.5 × 0.4 – 2)	
		Master cylinder ID mm (in.)		22.22 (0.8748)		25.4 (1.000)	
		Wheel cylinder ID mm (in.)		28.58 (1.1252)		31.75 (1.2500)	
	Parking brake type		Mechanical, mounted on wheels				

Item		Truck Model		FG40K FD40K	FG40KL FD40KL	FG45K FD45K	FG50K FD50K
Brake booster		Mastervac (vacuum suspended)					
Body		Assembled-frame type					
Hydraulic system	Hydraulic pump	Type	Gear				
		Rated discharge liter (U.S. gal.)/rpm	110 (29.0)/2450				
		Drive line	Universal joint				
	Control valve	Type	KVS-120VPF-2				
		Relief pressure kPa (kgf/cm ²) [psi]	19123 ⁺⁴⁹⁰ ₀ (195 ⁺⁵ ₀) [2773 ⁺⁷¹ ₀]				
	Flow regulator valve	Type	Variable (Adjustable)				
		Regulated flow rate liter (U.S. gal.)/min	100 (26.4)		115 (30.4)		
	Lift cylinders	ID mm (in.)	65 ^{+0.1} ₀ (2.56 ^{+0.004} ₀)		70 ^{+0.1} ₀ (2.76 ^{+0.004} ₀)		
		Stroke mm (in.)	1500 (59.06)				
	Tilt cylinders	ID mm (in.)	80 ^{+0.1} ₀ (3.15 ^{+0.004} ₀)		90 ^{+0.1} ₀ (3.54 ^{+0.004} ₀)		
		Stroke mm (in.)	185 (7.28)				
	Hydraulic tank capacity liter (U.S. gal.)		L: 56.5 (14.9) N: 58.7 (15.5) H: 64.4 (17.0)				

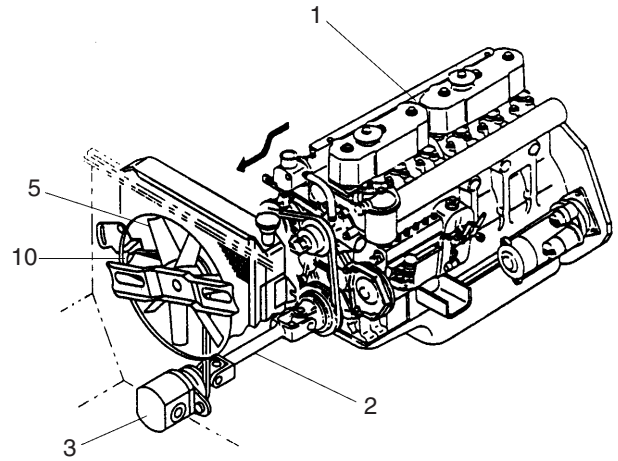
COOLING SYSTEM

Structure	2 – 1
Removal and Installation	2 – 2
Inspection and Adjustment	2 – 5
Fan Belt Condition	2 – 5
Fan Belt Tension	2 – 5
Connecting Radiator Hoses	2 – 5
Coolant	2 – 6
Radiator Cap	2 – 6

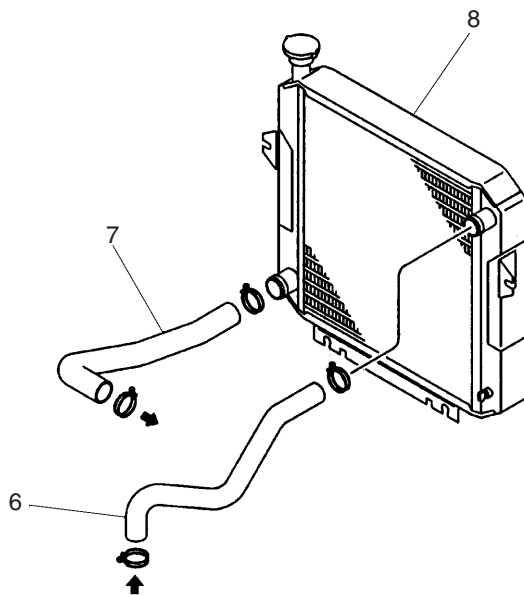
Structure



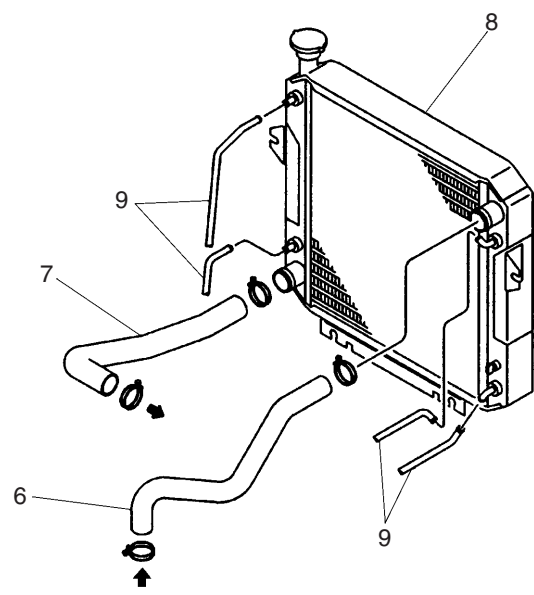
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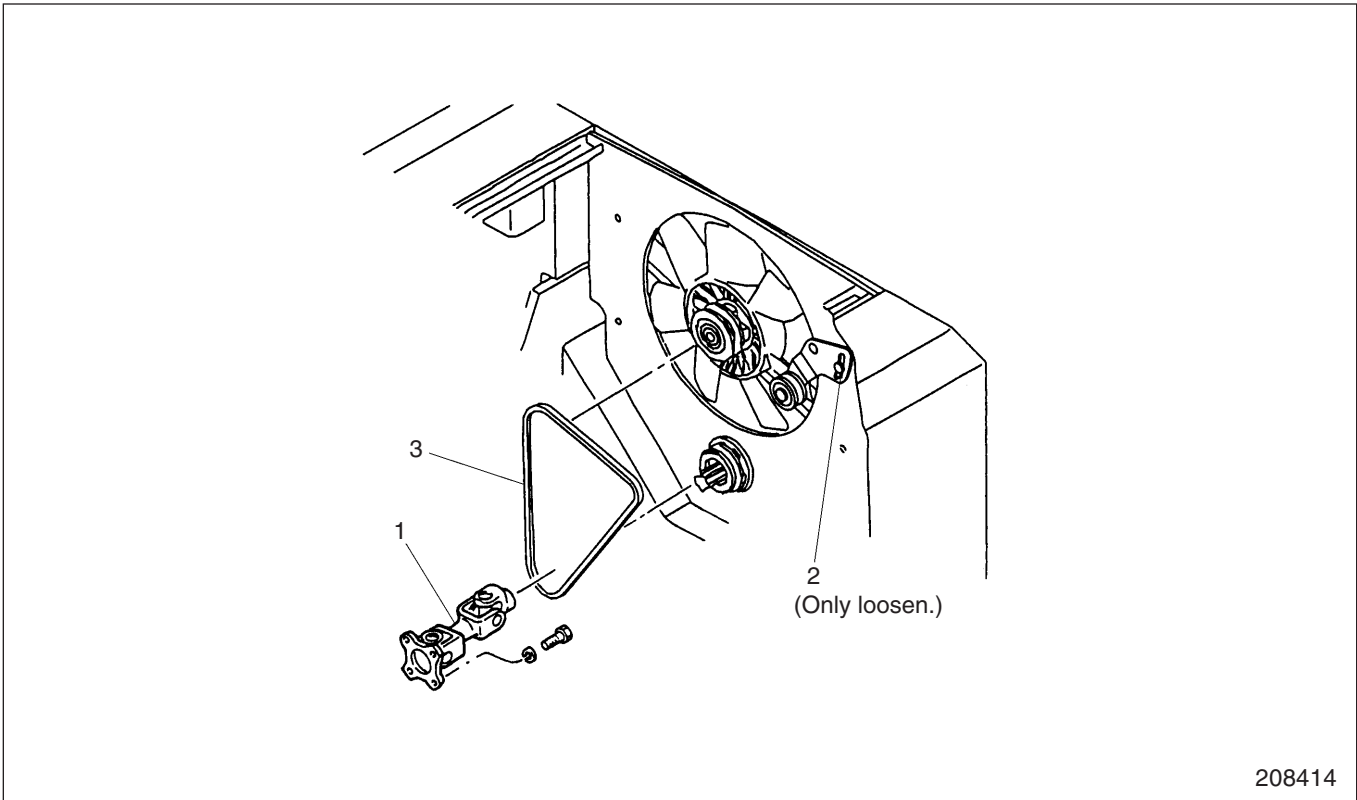
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- 1 Engine
- 2 Universal joint
- 3 Gear pump
- 4 Fan belt
- 5 Cooling fan

- 6 Upper hose
- 7 Lower hose
- 8 Radiator
- 9 Oil cooler hoses
- 10 Tension pulley

Removal and Installation

Fan Belt Removal



208414

Sequence

- 1 Universal joint
- 2 Tension pulley assembly, Bolt
- 3 Fan belt

Start by:

Remove the radiator cover.

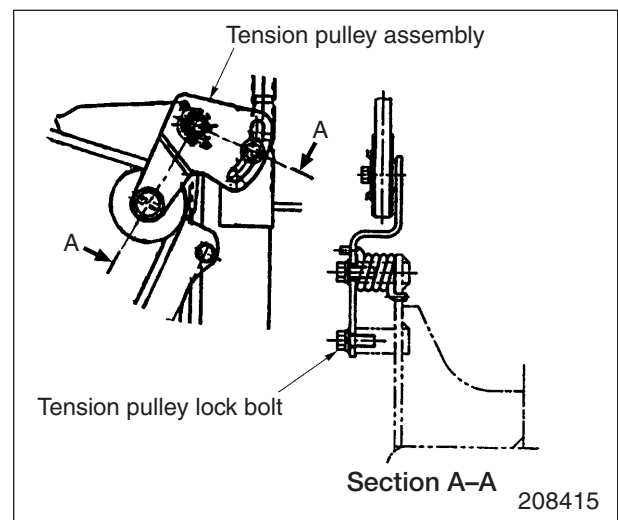
Suggestion for removal

- (1) Using a ratcheting wrench inserted in the gap between the weight and frame, loosen the tension pulley lock bolt by three or four turns. If the bolt is loosened insufficiently, the tension pulley will not move.

NOTE

Do not loosen the lock bolt to such an extent that the tension pulley would be removed.

- (2) Move the tension pulley fully toward the fan, then remove the belt.

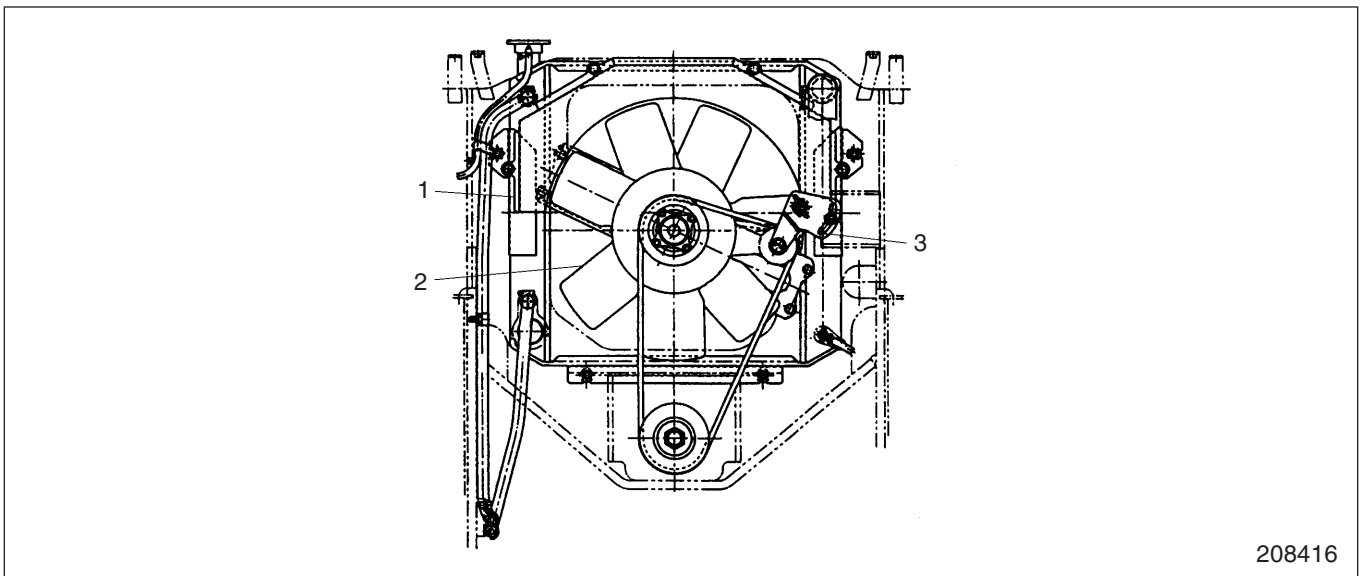


Installation

Perform installation by following the removal sequence in reverse. Also follow the instructions given below.

- (1) Before installing the belt, turn the fan to check for smooth rotation. Replace the bearing if it generates abnormal sound.
- (2) After installing the belt, push it at a point midway between the driven and drive pulleys to make sure that the tension pulley moves, then tighten the pulley lock bolt firmly.

Fan Assembly Removal



Sequence

- 1 Fan cover
- 2 Fan assembly
- 3 Tension pulley assembly

Start by:

Remove the radiator cover.

Suggestion for removal

Remove the fan support bolts, detach the belt from the driven pulley, and then remove the fan assembly. Place the fan assembly with the fan support facing down and turn the fan to check for smooth rotation. Replace the bearing if it generates abnormal sound.

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