



Service Manual

Chassis & Mast

FBC15K, FBC18K, FBC18KL

A3BC1-10200-up

A3BC1-20200-up

A3BC1-30200-up

A3BC2-40200-up

FBC20K, FBC25K

A3BC2-10200-up

A3BC2-20200-up

A3BC2-30200-up

A3BC2-40200-up

A3BC2-80200-up

FBC25KE, FBC25KL, FBC30K

A3BC3-10200-up

A3BC3-20200-up

A3BC3-30200-up

A3BC3-40200-up

A3BC3-80200-up

FBC30KL

A3BC4-40200-up

Chapter 1: General Information

Scope	1.1
Truck Models Covered	1.1
Nameplate and Serial Number Locations	1.2
Dimensions.....	1.3
Dimensions Chart.....	1.4
General Information (Standard Models)	1.5

Chapter 2: Front Axle & Reduction Differential

Front Axle

Description.....	2.1
General Information.....	2.1
Front Wheels	2.2
Removal	2.2
Method 1	2.3
Method 2	2.3
Method 3.....	2.3
Installation	2.4
Disassembly	2.5
Removing Front Wheel Hub.....	2.6
Inspection after Disassembly	2.7
Reassembly.....	2.8
Axle Housing	2.8
Front Wheel Hub	2.8
Hub Bearing Preload	2.9
Installation and Setting Preload.....	2.9

Reduction Differential

Description.....	2.10
Disassembly	2.11
Inspection after Disassembly	2.12
Reduction Gear	2.12
Differential.....	2.12
Reassembly.....	2.13
Inspection and Adjustment	2.15
Side Bearing Preload	2.15
Reduction Gear Backlash.....	2.15
Reduction Gear Face Runout.....	2.16
Tooth Contact	2.16
Tooth Contact Adjustment	2.17

TABLE OF CONTENTS

Chapter 3: Transfer Assembly

Description.....	3.1
Disassembly	3.2
Disassembly Sequence	3.2
Inspection after Disassembly	3.2
Reassembly.....	3.5

Chapter 4: Rear Axle

Description.....	4.1
Rear Wheels.....	4.2
Removal	4.2
Installation	4.4
Rear Axle	4.7
Removal	4.7
Installation	4.8
Disassembly	4.9
Inspection after Disassembly	4.11
Reassembly.....	4.12
Inspection and Adjustment	4.17
Minimum Turning Radius Adjustment.....	4.17

Chapter 5: Brake System

Description.....	5.1
Automatic Adjusting Device	5.1
General Information.....	5.1
Master Cylinder	
Disassembly	5.2
Inspection after Disassembly	5.3
Reassembly.....	5.3
Service Brakes	
Disassembly	
(FBC15K - 18KL)	5.4
(FBC20K - 30KL)	5.5
Inspection after Disassembly	5.7
Reassembly	
(FBC15K - 18KL)	5.8
(FBC20K - 30KL)	5.9
Wheel Cylinders	
Disassembly	5.12
Inspection after Disassembly	5.13
Reassembly.....	5.13
Inspection and Adjustment	5.14

Chapter 6: Steering System

Steering System

Description	6.1
Steering System	6.1
Oil Flow Sequence	6.1
General Information	6.1

Steering Gear

Steering Wheel	
Removal	6.2
Installation	6.2
Steering Gear	6.3
Inspection after Removal	6.4
Disassembly	6.5
Working Rules and Tips	6.6
Suggestions	6.6
Inspection after Disassembly	6.6
Reassembly	6.7
Suggestions	6.8

Steer Pump

Removal	6.9
Installation	6.10
Disassembly	6.11
Sequence	6.11
Working Rules and Tips	6.12
Suggestions	6.12
Inspection after Disassembly	6.14
Reassembly	6.15
Sequence	6.15
Suggestions	6.16
Inspection after Reassembly	6.18

Chapter 7: Hydraulic System

Hydraulic System

Description	7.1
Schematic	7.1
Hydraulic Tank	7.2
Hydraulic Pump	7.3
Control Valve	7.5
Lift and Tilt Cylinders	7.6
Flow Regulator Valve	7.7
Down Safety Valve	7.8
Removal and Installation Warning	7.9

Chapter 7: Hydraulic System, continued

Hydraulic Pump

Removal	7.10
Installation	7.11
Disassembly	7.12
Working Rules and Tips	7.13
Suggestions	7.14
Inspection after Disassembly	7.16
Body	7.16
Mounting Flange Face.....	7.16
Bushes and Balance Plate	7.16
Gears.....	7.16
Reassembly.....	7.17
Inspection after Reassembly	7.22

Control Valve

Removal	7.23
Installation	7.24
Disassembly	7.25
Suggestions	7.27
Reassembly	7.27

Lift and Tilt Cylinders

Removal	
Lift Cylinders.....	7.28
Tilt Cylinders.....	7.31
Disassembly	
Lift Cylinders.....	7.33
Tilt Cylinders.....	7.34
Flow Regulator Valve.....	7.35
Inspection after Disassembly	7.36
Precautions for Reassembly	7.36

Inspection and Adjustment

Hydraulic Tank	7.37
Control Valve	7.38
Lift and Tilt Cylinders	7.40
Adjusting Method.....	7.41
Testing	7.42

Chapter 8: Mast and Forks

Description	8.1
Removal and Installation	8.2
Disassembly	8.4
Inspection after Disassembly.....	8.6
Reassembly	8.7
Inspection and Adjustment	8.8
Forks.....	8.8
Chain Tension Adjustment	8.9
Clearance Adjustment on Lift Bracket	8.10
Mast Clearance Adjustment.....	8.13
Main Roller Shim Replacement.....	8.15
Mast Strip Adjustment.....	8.15
Tilt Angle Adjustment	8.16
Lift Cylinder Stroke Adjustment	8.17
Bleeding Lift Cylinders.....	8.17
Service Data	8.19
Troubleshooting	8.20

Chapter 9: Troubleshooting Section

Front Axle and Reduction Differential	9.1
Brake System	9.2
Steering System	9.4
Hydraulic System.....	9.6
Rear Axle	9.8
Mast and Forks.....	9.9

TABLE OF CONTENTS

Chapter 10: Maintenance Service Data

Maintenance Service Data	10.1
Front Axle and Reduction Differential.....	10.1
Transfer Case	10.3
Rear Axle	10.4
Brake System	10.6
Steering System,	10.11
Hydraulic System.....	10.13
Mast and Forks (Simplex Mast)	10.16
Tightening Torques for Standard Bolts and Nuts	10.18
Fine Thread—With Spring Washer.....	10.18
Fine Thread—Without Spring Washer.....	10.19
Coarse Thread—With Spring Washer	10.20
Coarse Thread—With Spring Washer	10.21
Maintenance Chart	10.22
Planned Replacement Parts.....	10.28
Lubrication Information	10.29
Chart.....	10.29
Lubricant Specifications.....	10.30
Recommended Brands of Lubrications	10.30
Weight of Major Components (Approximate)	10.31
Special Service Tools	10.32
Special Tool Illustrations	10.33
Inspection Guide.....	10.36

Chapter 1: General Information

Scope..... 1.1

Truck Models Covered..... 1.1

Nameplate and Serial Number Locations..... 1.2

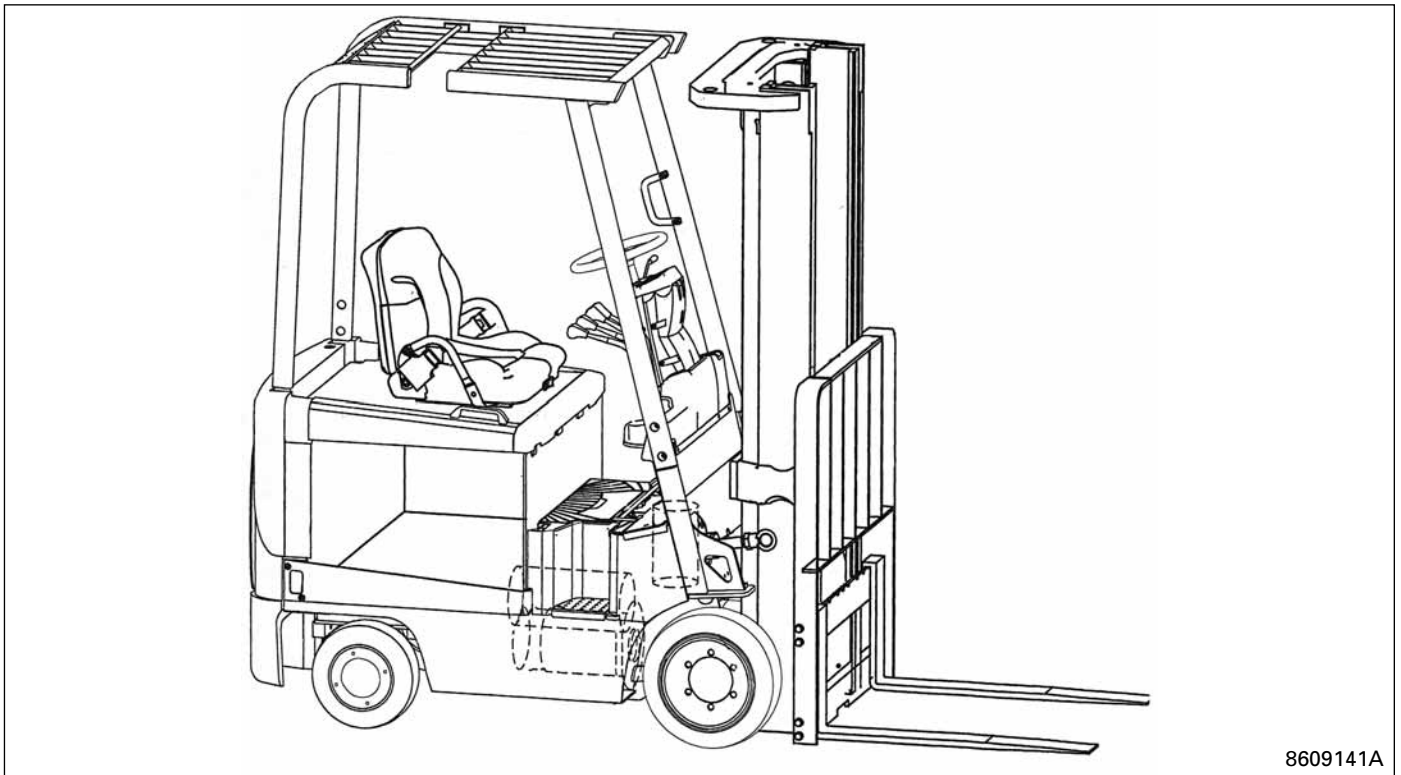
Dimensions 1.3

 Dimensions Chart 1.4

General Information (Standard Models) 1.5

Scope

This service manual deals with all components or systems of the Mitsubishi Forklift Trucks, except for the electrical system, which is covered in a separate manual.



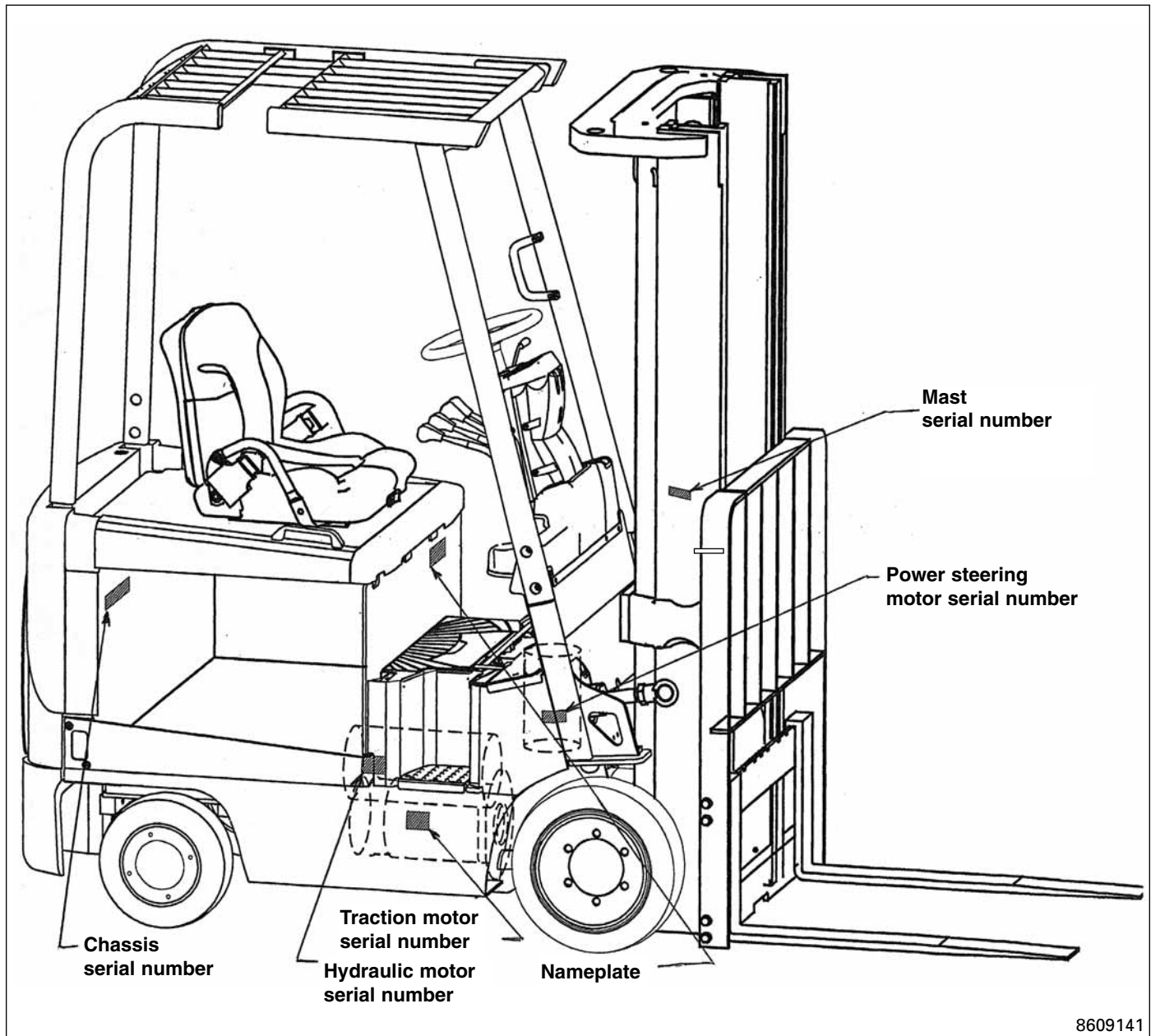
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Truck Models Covered

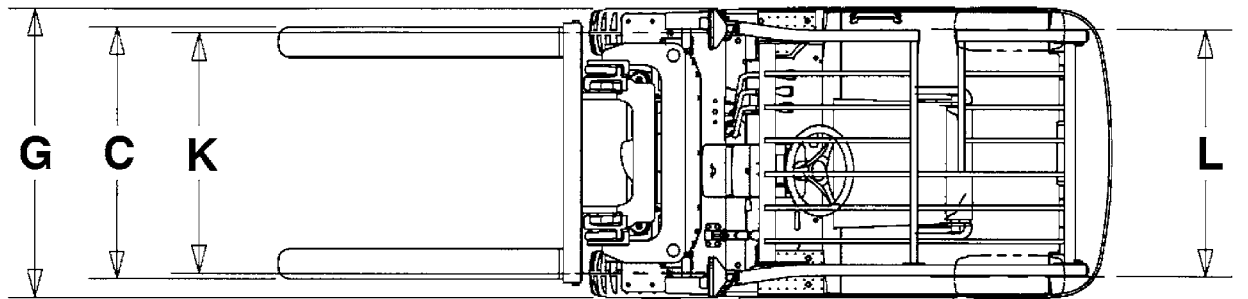
This service manual furnishes service and maintenance information for the following trucks.

Truck Model	Serial Number
FBC15K, FBC18K, FBC18KL	A3BC1-10200-up
	A3BC1-20200-up
	A3BC1-30200-up
	A3BC2-40200-up
FBC20K, FBC25K	A3BC2-10200-up
	A3BC2-20200-up
	A3BC2-30200-up
	A3BC2-40200-up
	A3BC2-80200-up
FBC25KE, FBC25KL, FBC30K	A3BC3-10200-up
	A3BC3-20200-up
	A3BC3-30200-up
	A3BC3-40200-up
	A3BC3-80200-up
FBC30KL	A3BC4-40200-up

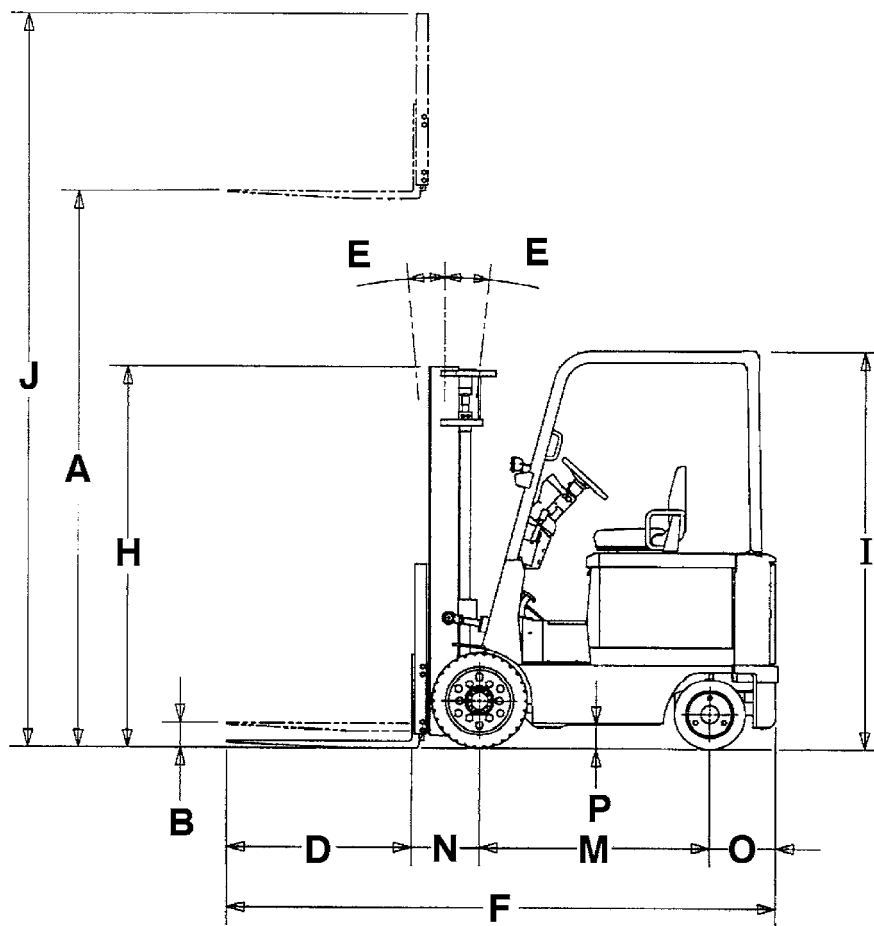
Nameplate and Serial Number Locations



Dimensions



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GENERAL INFORMATION

Dimensions Chart

Ref#	Truck Model	FBC15K, FBC18K	FBC18KL	FBC20K, FBC25K	FBC25KE	FBC25KL	FBC30K	FBC30KL
A	Maximum Lift	3320 (130)	3320 (130)	3340 (131)	3340 (131)	3340 (131)	3310 (130)	3215 (126)
B	Free Lift	115 (4.5)	115 (4.5)	130 (5.1)	130 (5.1)	130 (5.1)	135 (5.3)	135 (5.3)
C	Maximum Fork Spacing (outside to outside)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)
D	Fork Length	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)
E	Tilt Angle (forward/backward)	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°
F	Overall Length	3050 (120)	3123 (122.8)	3152 (124)	3252 (127.9)	3252 (127.9)	3325 (130.8)	3325 (130.8)
G	Overall Width (outside of tires)	945 (37.2)	970 (38.2)	1054 (41.5)	1054 (41.5)	1103 (43.4)	1103 (43.4)	1103 (43.4)
H	Overall Height (to top of mast, lowered)	2105 (83)	2105 (83)	2110 (83.5)	2110 (83.5)	2110 (83.5)	2110 (83.5)	2110 (83.5)
I	Overall Height (to top of overhead guard)	2180 (85.8)	2180 (85.8)	2207 (86.9)	2207 (86.9)	2207 (86.9)	2207 (86.9)	2207 (86.9)
J	Overall Height (to top of mast, extended)	4560 (180)	4560 (180)	4570 (180)	4570 (180)	4570 (180)	4540 (179)	4540 (179)
K	Tread (front)	793 (31.2)	818 (32.2)	875 (34.4)	875 (34.4)	900 (35.4)	900 (35.4)	900 (35.4)
L	Tread (rear)	826 (32.5)	826 (32.5)	897 (35.3)	897 (35.3)	897 (35.3)	897 (35.3)	897 (35.3)
M	Wheelbase	1170 (46.1)	1170 (46.1)	1280 (50.4)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)
N	Front Overhang	376 (14.8)	376 (14.8)	394 (15.5)	394 (15.5)	394 (15.5)	406 (15.9)	406 (15.9)
O	Rear Overhang	434 (17)	507 (19)	408 (16)	408 (16)	408 (16)	469 (18.4)	469 (18.4)
P	Underclearance (at center of wheelbase)	118 (4.6)	118 (4.6)	124 (4.9)	124 (4.9)	124 (4.9)	124 (4.9)	124 (4.9)

Unit: mm (in.)

General Information (Standard Models)

			Truck Model										
			Units	FBC15K	FBC18K	FBC18KL	FBC20K	FBC25K	FBC25KE	FBC25KL	FBC30K	FBC30KL	
Standard Controller			GE SX Controller										
Standard Simplex Mast Size			meters	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
Service Weight (standard axle)	Without Battery	kg (lb)	2095 (4620)	2335 (5140)	2595 (5720)	2685 (5920)	2870 (6330)	2695 (5940)	2865 (6320)	3335 (7353)	3502 (7721)		
	With Max. Battery		3298 (7270)	3534 (7790)	3797 (8370)	4296 (9470)	4482 (9880)	4509 (9940)	4681 (10320)	5150 (11353)	5317 (11722)		
Work Performance	Rated Capacity/ Load Center		kg/mm (lb/in.)	1500/500 (3000/24)	1800/500 (3500/24)	1800/500 (4000/24)	2000/500 (4000/24)	2500/500 (5000/24)	2500/500 (5000/24)	2500/600 (5000/24)	3000/500 (6000/24)	3500/500 (6500/29)	
	Maximum Fork Height		mm (in.)	3320 (130)			3340 (131)			3310 (130)	3215 (126)		
	Lift Speed (Rated Load)	36V	m/sec. (fph)	.24 (48)	.23 (45)	.34 (67)	.31 (61)	.28 (56)		.26 (51)	.23 (45)		
		48V		.34 (67)	.32 (64)	.47 (93)	.40 (78)	.38 (74)		.36 (70)	.31 (62)		
	Lowering Speed (rated load)			.50 (99)			.50 (98)						
	Tilt Angle (forward/backward)		degrees	5° / 6°									
Free Lift		mm (in.)	115 (4.5)			130 (5.1)			135 (5.3)				
Traveling Performance	Travel Speed (Without Load)	36V	km/h (mph)	12.9 (8.0)		14.3 (8.9)	11.6 (7.2)			11.1 (6.9)	10.8 (6.7)	13.2 (8.2)	
		48V		DNA		17.9 (11.1)	14.8 (9.2)			14.5 (9.0)	14.2 (8.8)	16.4 (10.2)	
	Minimum Turning Radius		mm (in.)	1790 (70.5)		1840 (72.5)	1890 (74.5)		1990 (78.5)		2045 (80.5)		
Power Train	Traction Motor Output	36V	60min.	8.2 (6.1)		9.6 (7.1)	8.3 (6.1)						
		48V	HP(kW)	DNA		13.4 (10.0)	11.7 (8.7)						
	Transfer Gear	Type		Spur									
		Ratio		3.538			3.067						
	Reduction Gear	Type		Bevel									
		Ratio		4.571			5.0						
	Differential	Axle Housing		Banjo									
		Gear Type/	Gears	Straight Bevel/2									
		Number	Pinions	Straight Bevel/2									

GENERAL INFORMATION

				Truck Model									
				Units	FBC15K	FBC18K	FBC18KL	FBC20K	FBC25K	FBC25KE	FBC25KL	FBC30K	FBC30KL
Power Steering System	Type			Dynamic Load Sense									
	Turning Angle	Inside	Degrees	83°		83°							
		Outside		54°		56°							
	Steering Wheel Diameter		mm (in.)	328 (13)									
	Cylinder Minimum Test Pressure		kgf/cm ² (psi) [kPa]	107 (1522) [10,500]		163 (2320) [16,000]							
Brake System	Service Brake	Type		Self-Adjusting Duo-Servo									
		Inside Drum Diameter	mm (in.)	254 +0 ^{0.13} (10.00 +0 ^{0.0051})									
		Lining Thickness	mm (in.)	4.87 (0.19)		6 (0.24)							
		Master Cylinder ID	mm (in.)	22.22 (0.8748)									
		Wheel Cylinder ID		22.22 (0.8748)		28.58 (1.1252)							
	Park Brake	Type		Mechanical, Mounted on Front Wheels									
		Lever Operating Effort	kgf (lbf) [N]	25 to 30 (55 to 66) [245 to 294]									
Traveling System	Mounting	Front Wheels		Fixed Type									
		Rear Wheels		Center Pivot Type									
	Wheel Alignment	Oscillation Angle	Degrees	3°									
		Camber		1°									

GENERAL INFORMATION

				Truck Model									
				Units	FBC15K	FBC18K	FBC18KL	FBC20K	FBC25K	FBC25KE	FBC25KL	FBC30K	FBC30KL
Hydraulic System	Hydraulic Pump	Type		Gear									
		Make		Parker Hydraulics, Inc.									
		Model		1PX230		1SX250	1PX290			1SX250			
		Displacement	cc (cu in.)	23.0 (1.403)/rev.		25.(1.526)	29(1.77)			25(1.526)			
		Make		Husco International									
	Control Valve	Model		5000CC Sectional Valve									
		Relief Pressure	kgf /cm ² (psi) [kPa]	263 (3750) [25855]									
		Flow Regulator Valve	Type		Variable								
	Regulated Flow Rate		liter (cu.in.) / min	48(2929)			59 (3600)					71(4332)	
	Lift Cylinders	ID	mm (in.)	45 (1.77)			50 (1.97)			55 (2.17)			
		Stroke		1650 (64.96)					1600 (62.99)				
	Tilt Cylinders	ID		63 (2.48)			70 (2.75)			80 (3.15)			
		Stroke		79 (3.11)			81 (3.19)						
	Hydraulic Tank Capacity liter (Approx)		1 (US gal.)	8 (4.8)			24 (6.3)			30 (7.9)			
Mast and Forks	Mast			Roller type CL									
	Mast Dimensions (Flange Inside Width x THK x WEB THK)	Outer	mm (in.)	100 x 15 x 12 (3.94 x 0.59 x 0.47)			115 x 20 x 13 4.53 x 0.79 x 0.51)			115 x 21 x 13 (4.53 x 0.83 x 0.51)			
		Inner		100 x 17 x 12 (3.94 x 0.67 x 0.47)			115 x 20 x 13 (4.53 x 0.83 x 0.51)						
	Main Rollers	Type		#6308 Ball Bearing			#6309 Ball Bearing						
		Diameter x Width		100 x 30 (3.94 x 1.18)			115 x 35 (4.53 x 1.58)			100 x 30 (3.94 x 1.18)			
	Side Rollers	Type		Lubricating type needle roller bearing									
		Diameter x Width	mm (in.)	42 x 36 (1.65 x 1.42)									
	Lift Chains			BL534			BL634			BL834			
	Forks (Lgth x Wdth x Thk)		mm (in.)	1070x100x35 (36x4x1.3)			1070 x100 x40 (42 x 3.9 x 1.6)			1070 x 125 x 45 (42 x 5 x 1.8)			
	Fork Spacing (out to out) min/max			240 / 818 (9.4/32)			284 / 958 (11.2/37.7)						
Battery	Voltage			36/48		36/48		36/48		36/48		36/48	
	Amp Hours (6 hr. rate)		36V	900			1300			1300			
			48V	700			800			1000			
	Compartment Dimensions	Height-Center	mm (in.)	598 (23.6)									
		Height-Edges		592 (23.3)									
		Length		708 (27.9)			775 (30.5)			875 (34.4)			
		Width		906 (35.6)			1003 (39.5)						
	Weight (Min/Max)		kg (lb)	750/1200 (1650/2650)			1000/1600 (2200/3550)		1315/1600 (2900/3550)		1400/1800 (3100/4000)		

Chapter 2: Front Axle & Reduction Differential

Front Axle

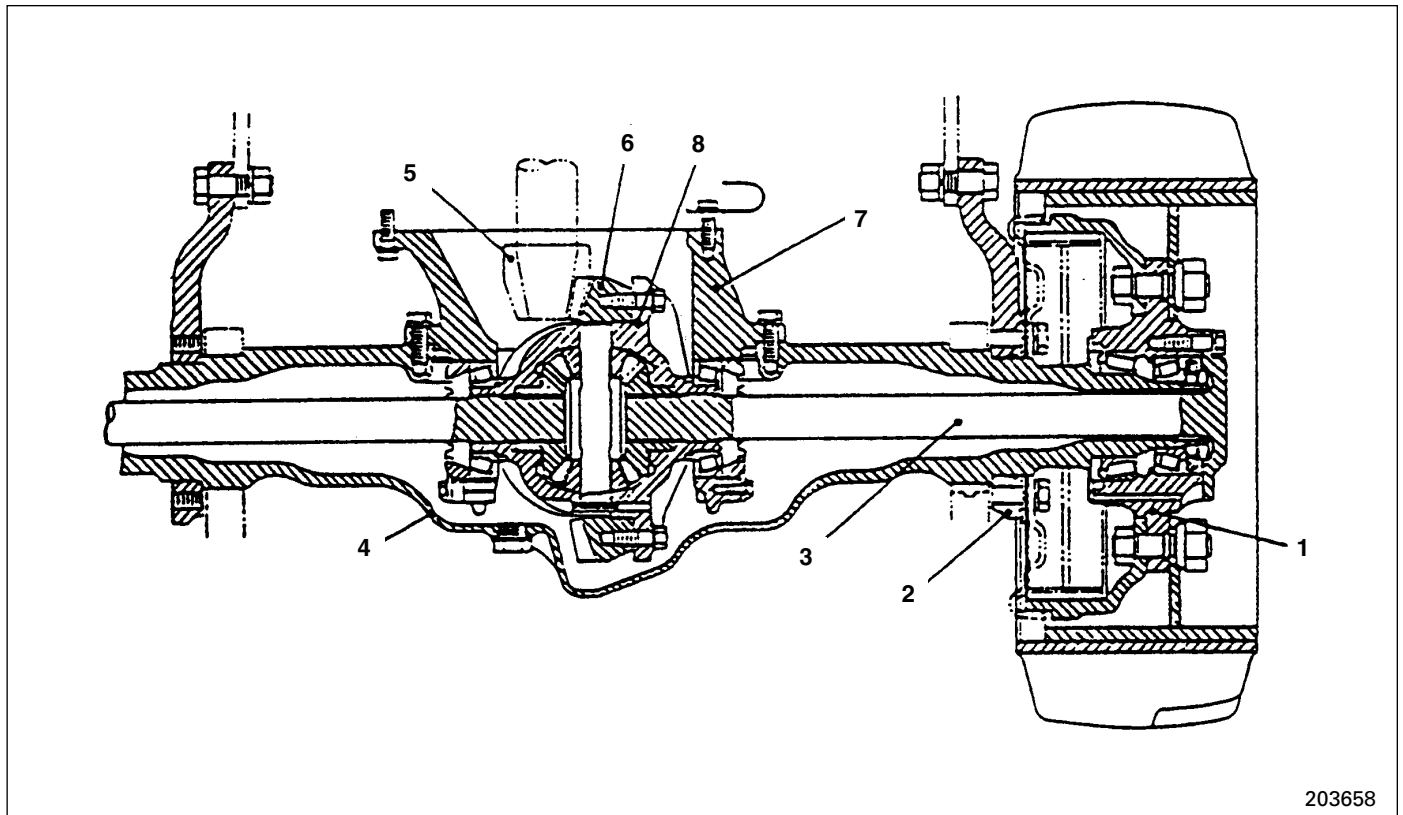
Description.....	2.1
General Information	2.1
Front Wheels	2.2
Removal	2.2
Method 1	2.3
Method 2.....	2.3
Method 3.....	2.3
Installation	2.4
Disassembly	2.5
Removing Front Wheel Hub.....	2.6
Inspection after Disassembly	2.7
Reassembly.....	2.8
Axle Housing	2.8
Front Wheel Hub	2.8
Hub Bearing Preload.....	2.9
Installation and Setting Preload.....	2.9

Reduction Differential

Description	2.10
Disassembly	2.11
Inspection after Disassembly	2.12
Reduction Gear	2.12
Differential	2.12
Reassembly.....	2.13
Inspection and Adjustment.....	2.15
Side Bearing Preload	2.15
Reduction Gear Backlash	2.15
Reduction Gear Face Runout	2.16
Tooth Contact.....	2.16
Tooth Contact Adjustment.....	2.17

Front Axle

Description



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- | | |
|--------------------|-------------------------|
| 1. Front wheel hub | 5. Reduction pinion |
| 2. Frame support | 6. Reduction gear |
| 3. Axle shaft | 7. Differential case |
| 4. Axle housing | 8. Differential carrier |

General Information

The frame supports hold the front axle housing in such a manner as to allow a limited amount of rotary motion of the housing, the rotary sliding surfaces being lubricated with grease.

The cushion tire is press-fitted to the outer ring of the wheel hub.

FRONT AXLE: REMOVAL & INSTALLATION

Removal

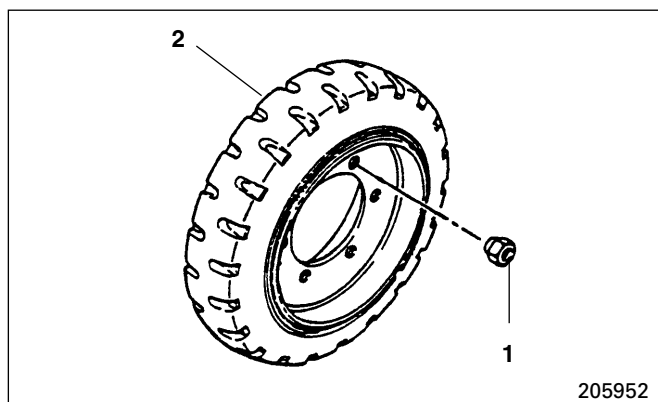
Front Wheels



WARNING

Be sure to use the same size and brand tire for replacement.

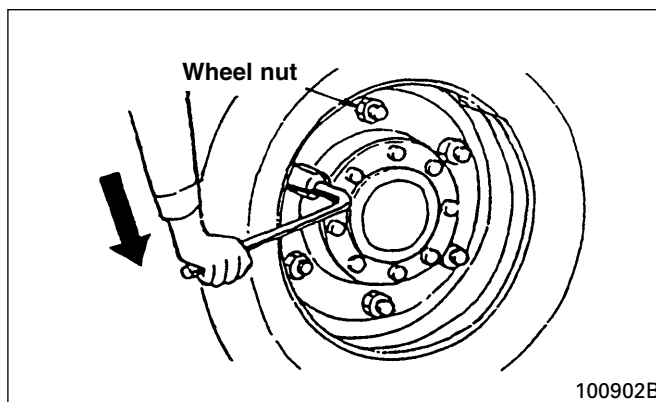
Removal Sequence



1. Wheel Nuts
2. Front Wheel

Suggestions

1. Park the truck on level floor with the parking brake applied, the direction lever in neutral, the forks lowered, and the key switch off.
2. Prepare tools, jacks, and wheel blocks.
3. Block the rear wheels.
4. Loosen the wheel nuts about two turns.



NOTE

Loosen, but do not remove, the wheel nuts.

5. Raise the front end of the truck. Use one of the methods shown.



WARNING

To prevent possible injury, do not replace the tire when the truck is loaded.

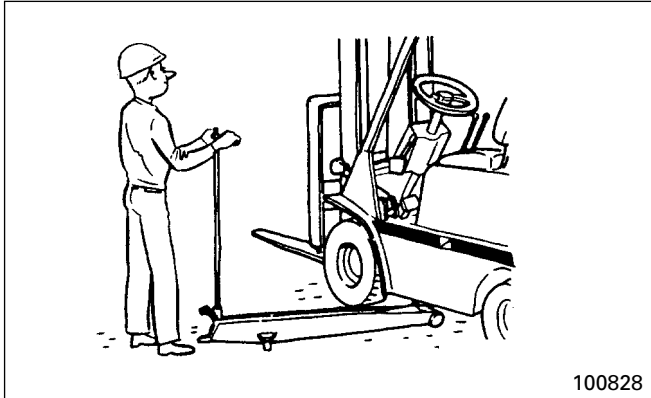
Dismount the truck before raising the front tire.

To prevent possible personal injury, raise the truck only until the tire just clears the ground.

Do not put any portion of your body under the truck. Securely support the truck on blocks after raising it.

Method 1

Position the jack under the frame and raise the truck until the tire clears the floor.



Jack Capacities

FBC15K - 18KL	3000 kgf (6700 lbf)
FBC20K - 30KL	5000 kgf (12,000 lbf)

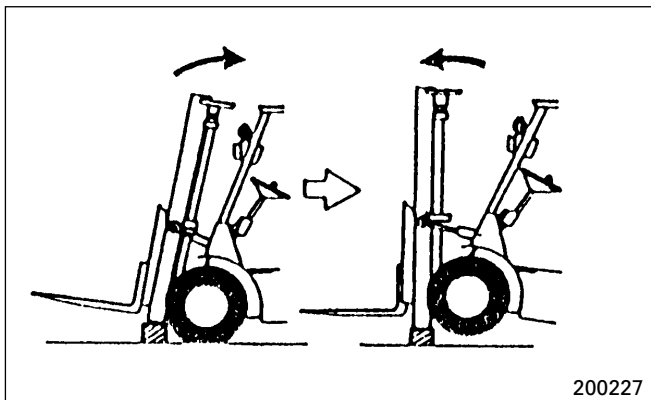
Method 2

Tilt the mast all the way back, place wood blocks under the mast, and tilt the mast forward.



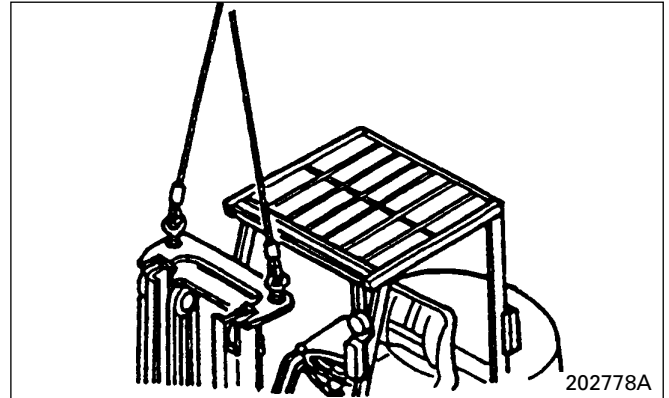
CAUTION

After raising the front end, securely support it by blocks.



Method 3

Fasten a hoist to the mast and lift the front end of the truck as shown.



6. Remove the wheel nuts (loosened in Step 4.)



CAUTION

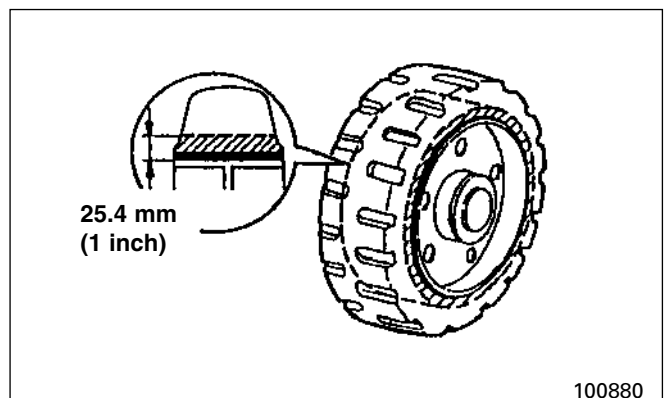
Be careful not to damage the bolt threads when removing the wheel.

7. Remove the wheel.

NOTE

Service Limit For Cushion Tires

Replace the tire if the height of the solid rubber portion is 25.4 mm (1 in. or less). For tire replacement, consult your Forklift Truck Dealer.



FRONT AXLE: REMOVAL & INSTALLATION

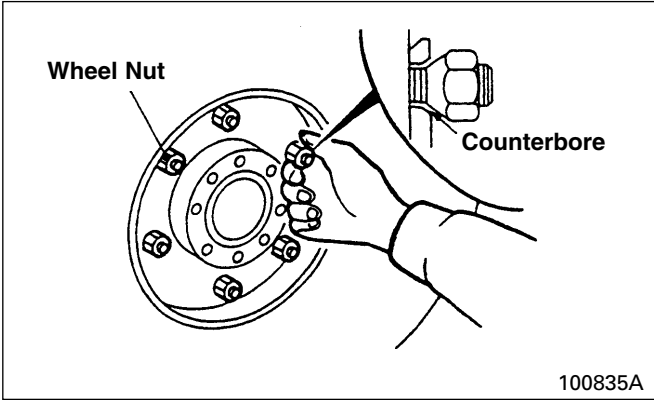
Installation

To install, reverse the removal sequence and do the following steps.

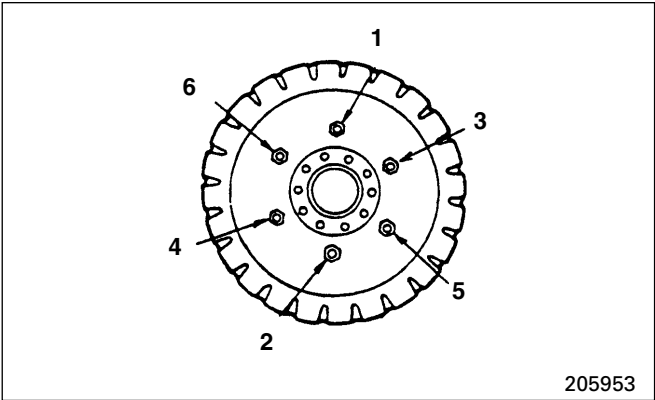


Use the same size and brand of tire.
Make sure the clamping surfaces of the wheel nuts and counterbores in the rim are free of dirt.

- 1. Install the tire and tighten the wheel nuts. Tighten each nut until its tapered portion is in full-face contact with the counterbore in the rim.

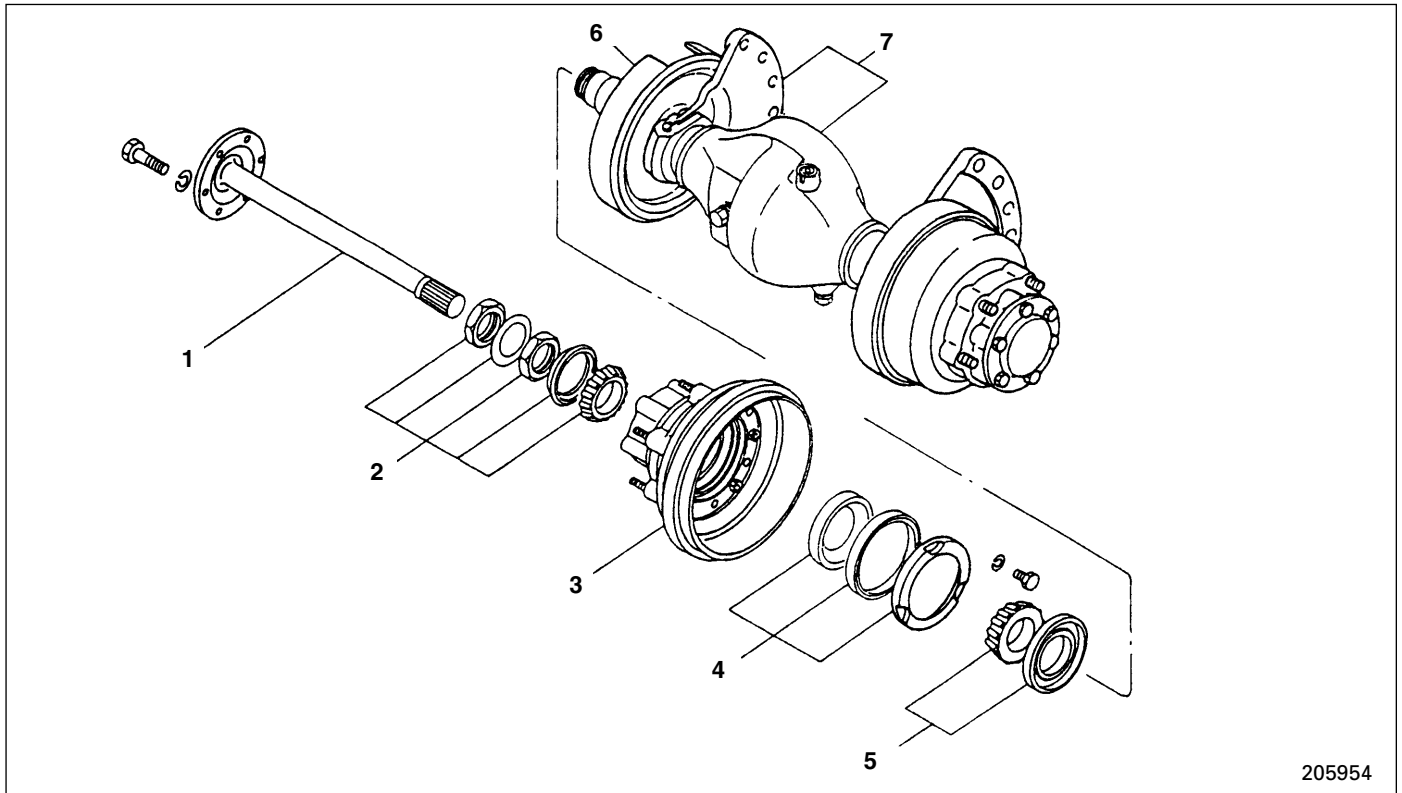


- 2. Lower the truck until the tire touches the floor. Then tighten the wheel nuts in numbered sequence shown below, in two or three steps, to the specified torque.



Tightening Torque For Wheel Nuts	
FBC15K - 18KL	FBC20K - 30KL
16 kgf•m	38.5 kgf•m
(116 lbf•ft)	(278 lbf•ft)
[157 N•m]	[378 N•m]

Disassembly



Sequence

1. Axle shaft
2. Lock nut, lock washer, oil seal, and tapered roller bearing (inner bearing)
3. Hub & drum assembly [Front wheel hub, brake drum, wheel bolts, drum nuts, and tapered roller bearing (outer bearing)]
4. Tapered roller bearing (outer bearing), oil seal, and oil deflector
5. Tapered roller bearing (inner bearing), and seal retainer
6. Brake assembly
7. Frame support and axle housing

Start By:

1. Remove the mast. (For replacement of the front axle housing and disassembly of the differential, refer to section, MAST AND FORKS.)
2. Jack up the truck.
3. Support the front end of the truck at both sides with blocks or stands to keep the truck in a horizontal position.
4. Remove the front wheels.

NOTE

It is not necessary to remove the axle housing or drain the oil for removal of the shaft only.

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