

FOREWORD

This manual covers the service procedures of the TOYOTA FORKLIFT 50-4FD100~135, 50-4FDK150,160. Please use this manual for providing quick, correct servicing of the corresponding forklift models.

This manual deals with the above models as of August 2008. Please understand that disagreement can take place between the descriptions in the manual and actual vehicles due to change in design and specifications. Any change or modifications thereafter will be informed by Toyota Industrial Equipment Parts & Service News.

For the service procedures of the mounted engine, read the repair manuals listed below as reference together with this manual.

(Reference)

Repair manuals related to this manual are as follows:

TOYOTA INDUSTRIAL EQUIPMENT J08E-UM ENGINE
REPAIR MANUAL (No.)

TOYOTA Material Handling Company
A Division of TOYOTA INDUSTRIES CORPORATION

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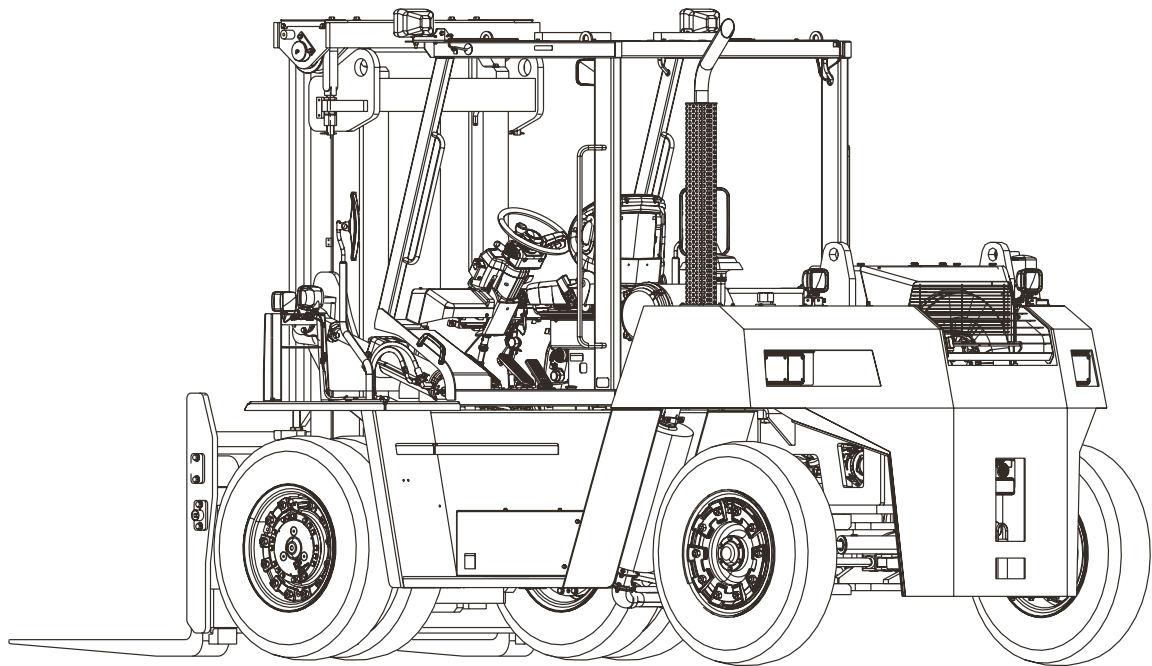
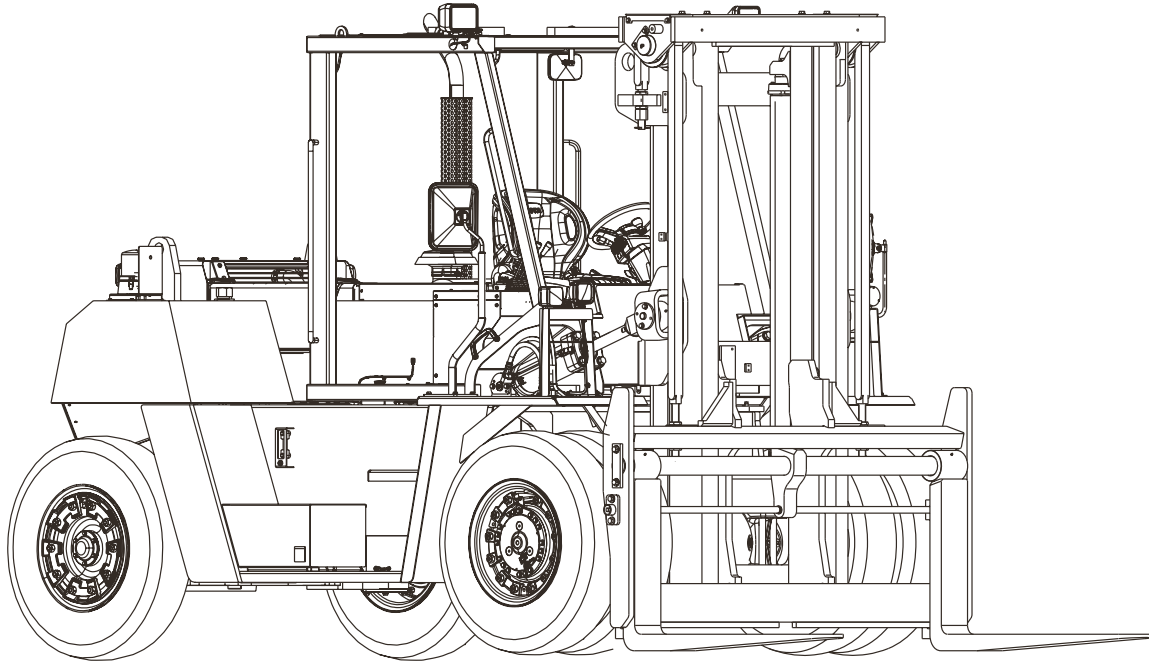
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GENERAL

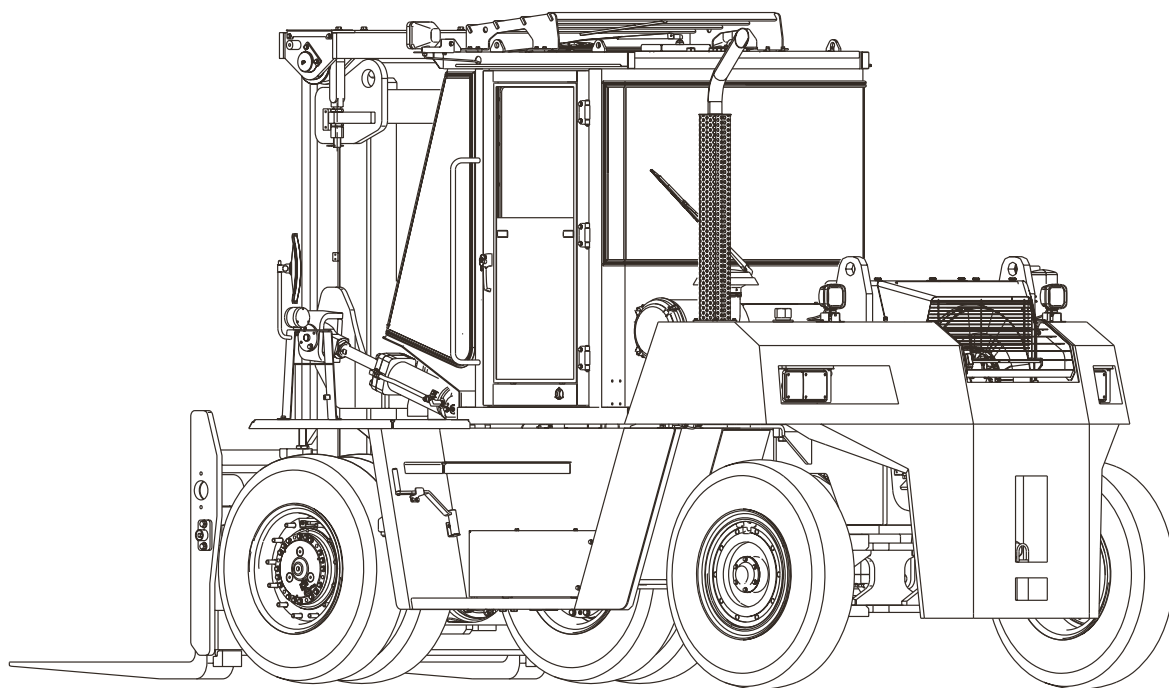
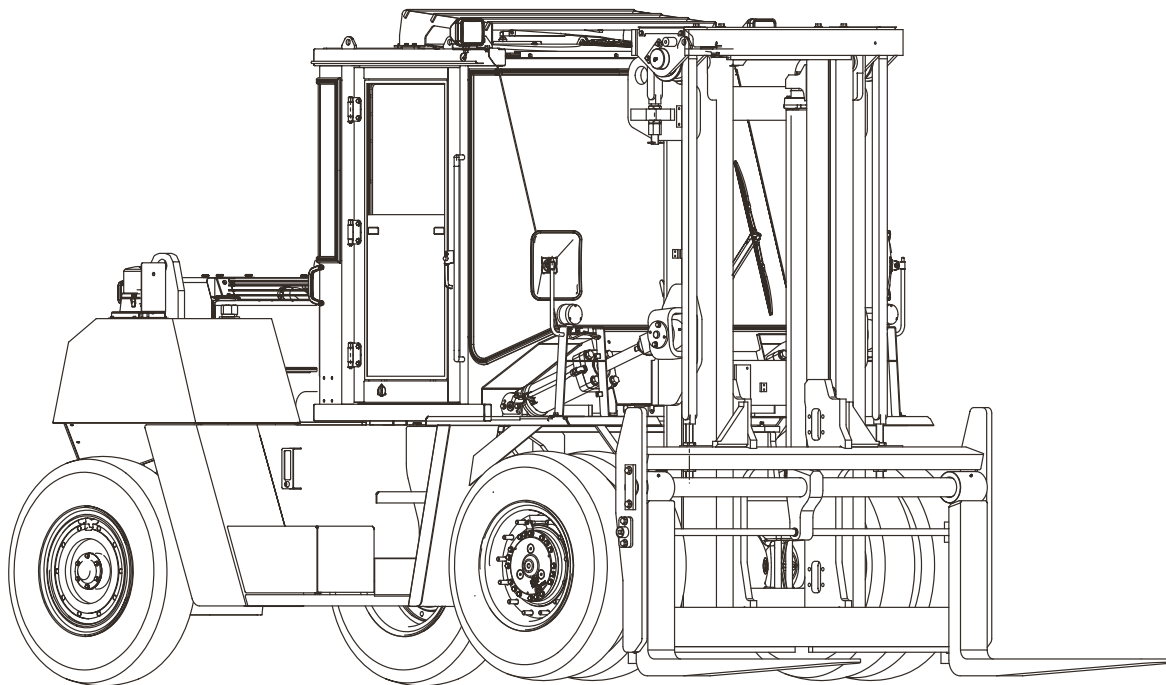
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VEHICLE EXTERIOR VIEWS

HEADGUARD MODEL



CABIN MODEL

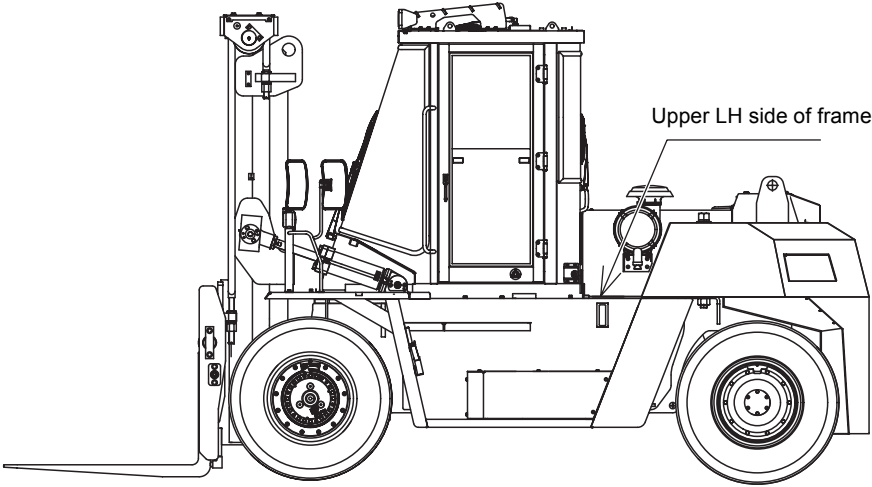


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VEHICLE MODEL

Payload	Vehicle model	Standard load center	Engine model
10 ton	50-4FD100	600 mm (23.6 in)	J08E-UM
11.5 ton	50-4FD115		
12 ton	50-4FD120		
13.5 ton	50-4FD135		
15 ton	50-4FDK150		
16 ton	50-4FDK160		

FRAME NUMBER

Vehicle model	Punching format
50-4FD100	4FD120-50011
50-4FD115	
50-4FD120	
50-4FD135	4FDK160-50011
50-4FDK150	
50-4FDK160	
Punching position	

HOW TO USE THIS MANUAL

EXPLANATION METHOD

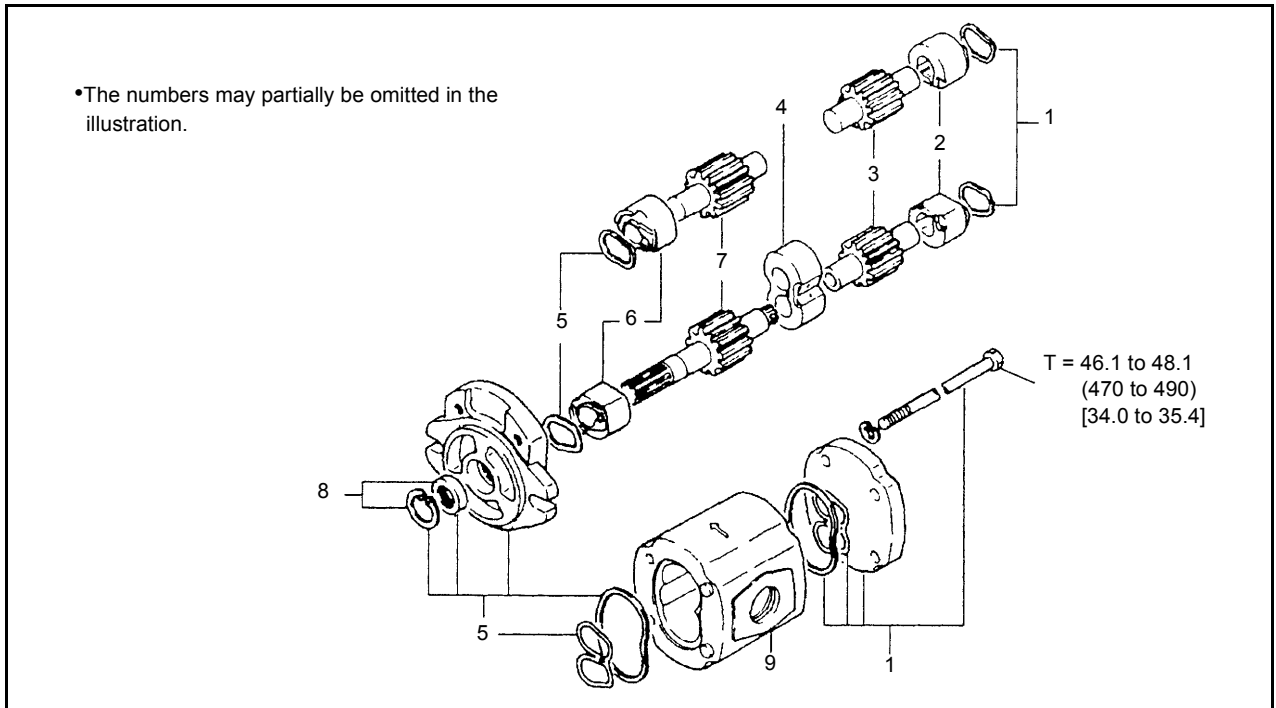
1. Operating procedure

Description example

DISASSEMBLY•INSPECTION•REASSEMBLY

Tightening torque unit → N·m (kgf·cm) [ft·lbf]

0



Disassembly Procedure

- 1 Remove the cover. **[Point 1]**
- 2 Remove the bushing. **[Point 2]**
- 3 Remove the gear.

← Operation to be explained

Point Operations

↙ Explanation of operation point with illustration

[POINT 1]

Disassembly:
Make match marks before removing the pump cover.

[POINT 2]

Inspection:
Measure the bushing inside diameter.
Limit: 19.12 mm

Explanation of abbreviations used for point operations	
Removal	Reassembly
Installation	Adjustment
Disassembly	Inspection

2. Matters omitted from this manual

This manual omits descriptions of the following jobs, but perform them in actual operation:

- (1) Cleaning and washing of removed parts as required
- (2) Visual inspection (partially described)

TERMINOLOGY

Caution:

Important matters, negligence of which may cause accidents. Be sure to observe them.

Note:

Important matters, negligence of which may cause failures, or matters in operation procedure requiring special attention.

Standard: Value showing the allowable range in inspection or adjustment.

Limit: The maximum or minimum value allowed in inspection or adjustment.

ABBREVIATIONS

Abbreviation	Meaning	Abbreviation	Meaning
ASSY	Assembly	SAE	Society of Automotive Engineers (USA)
LH	Lefthand	SAS	System of Active Stability
LLC	Long Life Coolant	SST	Special Service Tool
L/	Less	STD	Standard
M/T	Manual Transmission	T/C	Torque Converter & Transmission
OPT	Option	T=	Tightening Torque
O/S	Oversize	〇〇T	Number of teeth (〇〇T)
PS	Power Steering	U/S	Undersize
RH	Righthand	W/	With

OPERATING TIPS

GENERAL

1. Safe operation

- (1) After jacking up, always support the vehicle with wooden blocks and rigid stands.
- (2) When hoisting the vehicle, use wire ropes with sufficient reserve in load capacity.
- (3) Always disconnect the battery plug before the inspection or servicing of electrical parts.
- (4) The operator must always extract and carry the engine key when entering the area under the vehicle.
- (5) When 2 or more persons work as a group, always assign an instructor and operate according to his instructions.

2. Tactful operation

- (1) Prepare the tools, necessary measuring instruments (circuit tester, megohmmeter, oil pressure gauge, etc.) and SSTs before starting operation.
- (2) Check the cable color and wiring state before disconnecting any wiring.
- (3) When overhauling functional parts, complicated sections or related mechanisms, arrange the parts neatly to avoid confusion.
- (4) When disassembling and inspecting a precision part such as the control valve, use clean tools and operate in a clean location.
- (5) Always follow the specified operation steps for disassembly, inspection, reassembly and adjustment.
- (6) Always replace gaskets, packing, O-rings, self-locking nuts and cotterpins with new ones whenever they are disassembled.
- (7) Use genuine Toyota parts for replacement.
- (8) Use specified bolts and nuts and observe the specified tightening torque when reassembling. (Tighten to the medium value of the specified tightening torque range.) If no tightening torque is specified, use the value given in the "standard tightening torque table".

3. Defect status check

Do not start disassembly and/or replacement immediately, but first check that disassembly and/or replacement is necessary for the defect.

4. Waste fluid disposal

Always use a proper container to collect draining waste fluid from the vehicle.

Careless discharge of oil, fuel, coolant, oil filter, battery or other harmful substance may adversely affect human health and the environment. Always collect and sort them well, and ask specialized companies for appropriate disposal.

JACKING UP

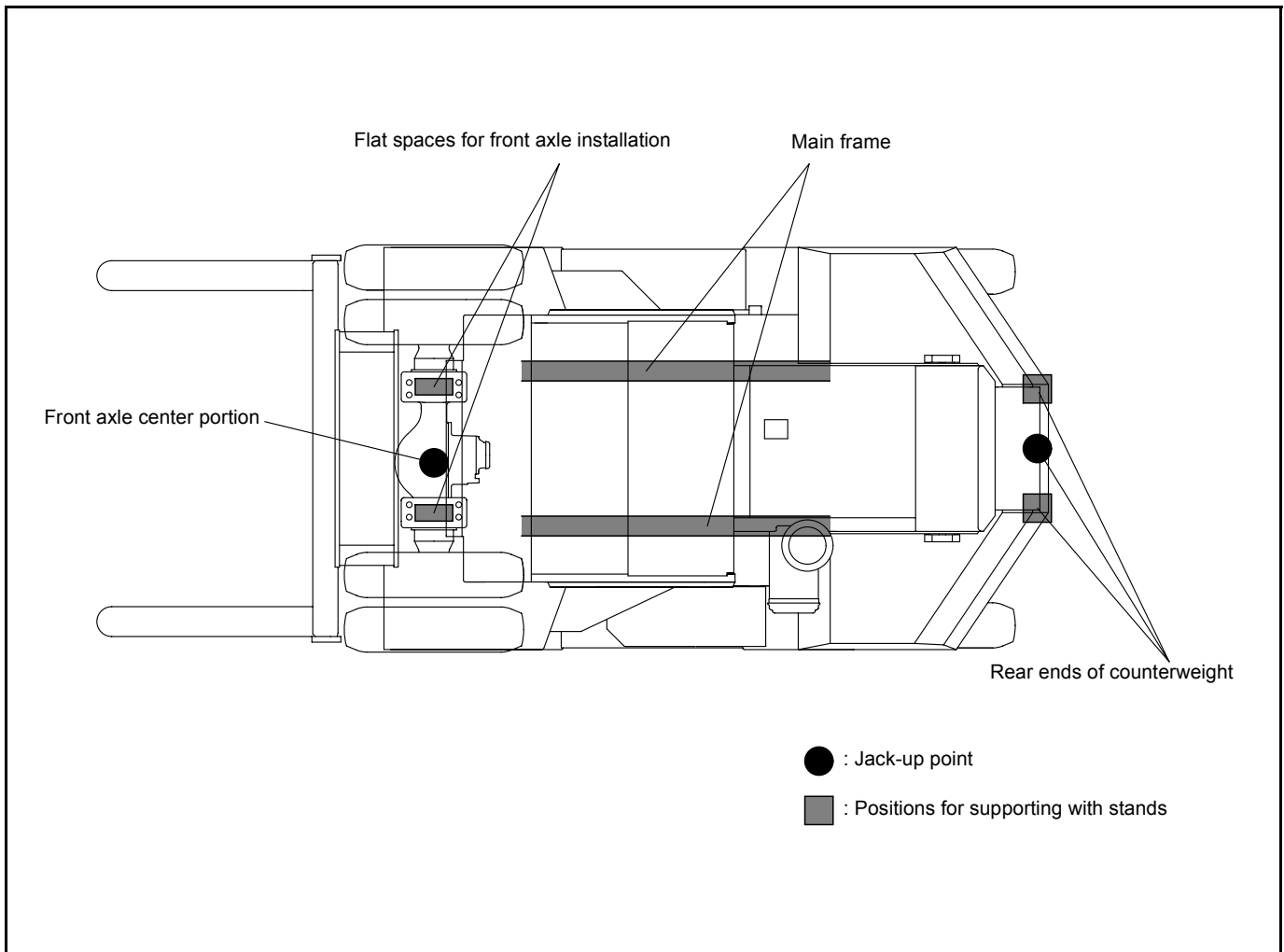
When jacking up the vehicle, always observe the following instructions.

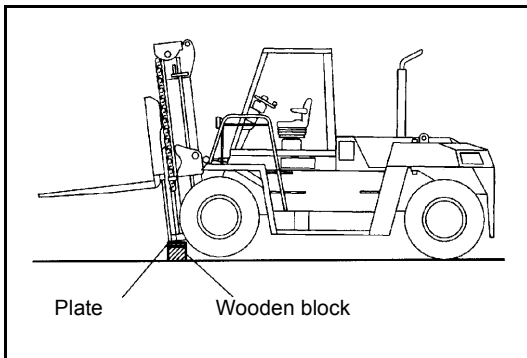
- When the fork is loaded, unload it and park the vehicle on a flat surface. Do not park on an inclined or rough ground.
- Use a jack with ample capacity and jack up the vehicle at the specified jack-up point. Jacking up at any other point is dangerous.
- Always support the load of jacked-up vehicle with wooden blocks at specified points. Supporting the vehicle only with the jack is very dangerous.
- Never, under any circumstances, put any part of the body (including hands and feet) under the jacked-up vehicle.

Reference weight

kg (lb)

Vehicle model		50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
Vehicle overall weight		13570 (29916)	14650 (32297)	15120 (33334)	16040 (35362)	18070 (39837)	18630 (41072)
Front axle load	W/mast ASSY	6860 (15124)	6970 (15366)	6950 (15322)	7750 (17086)	8630 (19026)	8580 (18915)
Rear wheel load	W/mast ASSY	6710 (14793)	7680 (16931)	8170 (18012)	8290 (18276)	9440 (20811)	10050 (22156)



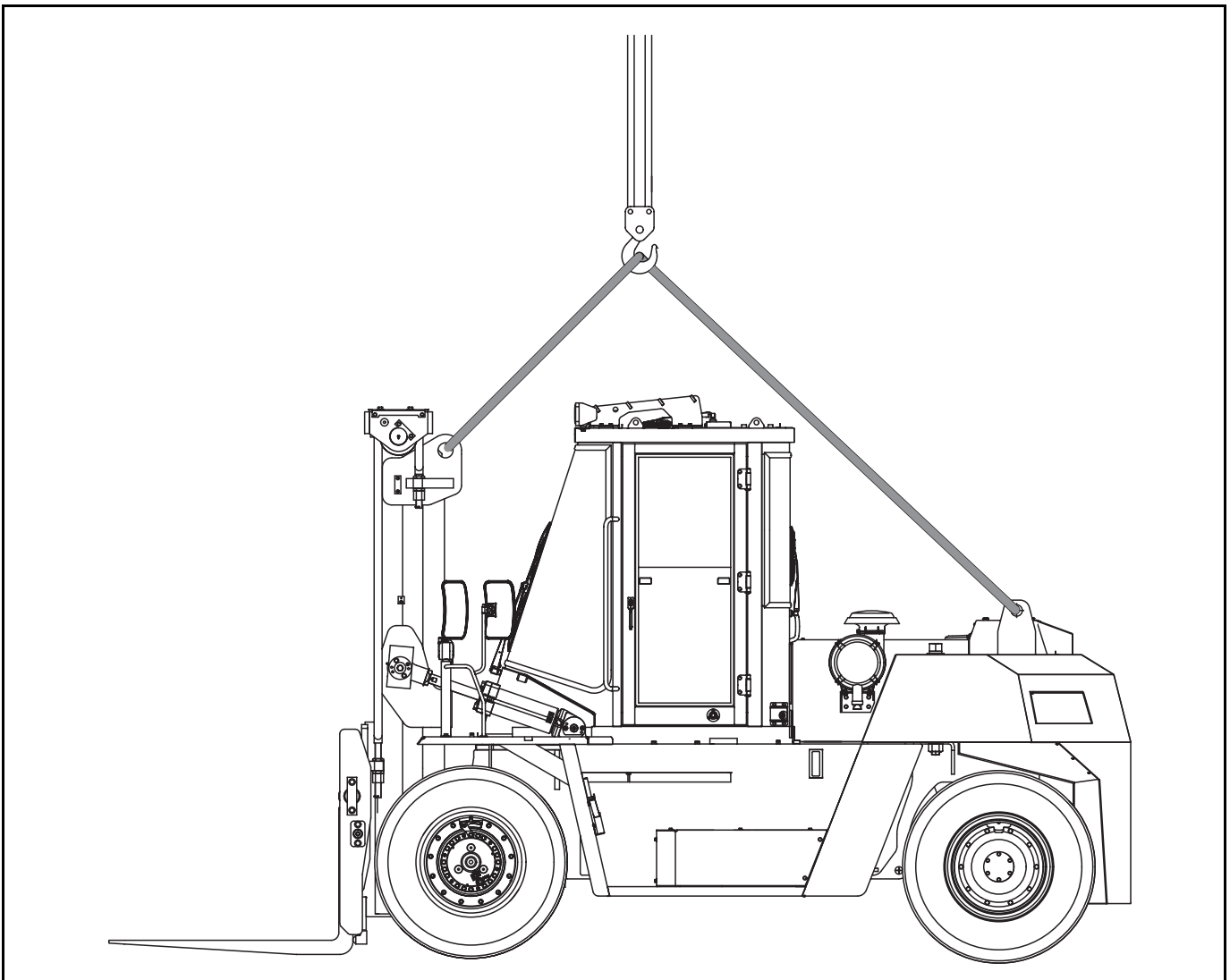


When the mast ASSY is installed on the vehicle, it is also possible to jack up the front side of the vehicle as follows:

1. Lift the lift bracket to a height not obstructing operation.
2. Place wooden blocks and a plate under the outer mast.
3. Tilt the mast forward to raise the front of the vehicle.
4. Support the flat spaces of the front axle mounting portion with stands.

HOISTING THE VEHICLE

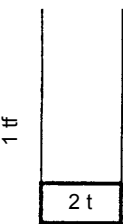
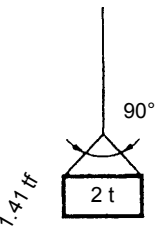
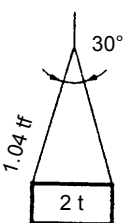
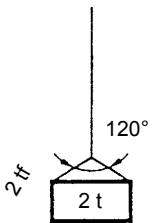
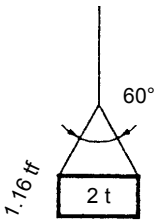
Always hoist the vehicle as specified in the specified position. Never hoist by any other attachment section as it is very dangerous.



Caution:

Hoist the vehicle only for loading/unloading at the time of vehicle shipment. Do not hoist the vehicle while ordinary servicing jobs.

WIRE ROPE SUSPENSION ANGLE LIST

Lifting angle	Tension	Com-pression	Suspension method	Lifting angle	Tension	Com-pression	Suspension method
0°	1.00 time	0 time		90°	1.41 time	1.00 time	
30°	1.04 time	0.27 time		120°	2.00 time	1.73 time	
60°	1.16 time	0.58 time					

SAFE LOAD FOR EACH WIRE ROPE SUSPENSION ANGLE

Unit: N (tf) [lbf]

Rope diameter	Cutting load	Single-rope suspension	Two-rope suspension					Four-rope suspension			
		0°	0°	30°	60°	90°	0°	30°	60°	90°	
6 mm (0.24 in)	21380 (2.18) [4807]	3040 (0.31) [683.6]	6080 (0.62) [1367]	5880 (0.6) [1323]	5200 (0.53) [1169]	4310 (0.44) [970]	12160 (1.24) [2734]	11770 (1.2) [2646]	10400 (1.06) [2337]	8630 (0.88) [1940]	
8 mm (0.32 in)	31480 (3.21) [7078]	4410 (0.45) [992.3]	8830 (0.9) [1985]	8530 (0.87) [1918]	7650 (0.78) [1720]	6280 (0.64) [1411]	17650 (1.8) [3969]	17060 (1.74) [3937]	15300 (1.56) [3440]	12550 (1.28) [2822]	
10 mm (0.4 in)	49230 (5.02) [11.69]	6960 (0.71) [1565.6]	14020 (1.43) [3153]	13440 (1.37) [3021]	11770 (1.2) [2646]	9810 (1.0) [2205]	27460 (2.8) [6174]	26480 (2.7) [5954]	23540 (2.4) [5292]	19610 (2.0) [4410]	
12.5 mm (0.5 in)	76880 (7.84) [17387]	10980 (1.12) [2469.5]	21570 (2.2) [4851]	21280 (2.1) [4631]	18630 (1.9) [4190]	14710 (1.5) [3308]	43150 (4.4) [9702]	41190 (4.2) [9261]	37270 (3.8) [8379]	29420 (3.0) [6615]	
14 mm (0.56 in)	96400 (9.83) [21675]	13730 (1.4) [3087]	27460 (2.8) [6174]	26480 (2.7) [5954]	23540 (2.4) [5292]	18630 (1.9) [4190]	54920 (5.6) [12348]	52960 (5.4) [11907]	47070 (4.8) [10584]	37270 (3.8) [8379]	

MEMBER WEIGHTS

Vehicle weight

kg (lb)

Specifications	Weight					
	50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
Headguard Mast V mast, lifting height: 3000 Fork length: 1220 mm Attachment A31	13420 (29585)	14500 (32000)	14970 (33000)	15890 (35030)	17920 (39510)	18480 (40740)

Weight increase when the attachment is installed

kg (lb)

Attachment type	Weight					
	50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
A35	110 (243)	150 (331)	150 (331)	160 (353)	100 (220)	100 (220)
E3	490 (1080)	530 (1168)	530 (1168)	590 (1300)	450 (992)	450 (992)
E3A35	530 (1168)	560 (1235)	560 (1235)	620 (1367)	480 (1058)	480 (1058)

Weight increase when the cabin air conditioner is installed: 230 kg

Mast weight (including lift bracket and excluding the fork)

kg (lb)

Mast type	Lifting height mm (in)	Mast ASSY weight					
		50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
V	3000 (118)	2560 (5644)	2650 (5842)	2650 (5842)	2920 (6437)	3730 (8223)	3730 (8223)
	3300 (130)	2620 (5776)	2720 (5997)	2720 (5997)	3000 (6614)	3830 (8444)	3830 (8444)
	3500 (138)	2660 (5864)	2770 (6107)	2770 (6107)	3060 (6746)	3900 (8598)	3900 (8598)
	3700 (146)	2700 (5952)	2820 (6217)	2820 (6217)	3100 (6834)	3940 (8686)	3940 (8686)
	4000 (157)	2760 (6085)	2890 (6371)	2890 (6371)	3200 (7055)	4130 (9105)	4130 (9105)
	4500 (177)	2930 (6459)	3070 (6768)	3070 (6768)	3360 (7407)	4280 (9436)	4280 (9436)
	5000 (197)	3050 (6724)	3240 (7143)	3240 (7143)	3570 (7870)	4540 (10009)	4540 (10009)
	5500 (217)	3160 (6967)	3380 (7452)	3380 (7452)	3720 (8201)	4690 (10340)	4690 (10340)
	6000 (236)	3230 (7121)	3500 (7716)	3500 (7716)	3850 (8488)	4830 (10648)	4830 (10648)
FV	3000 (118)	2610 (5754)	-	-	-	-	-
	3500 (138)	2730 (6019)	-	-	-	-	-
	4000 (157)	2850 (6283)	-	-	-	-	-
	4500 (177)	2990 (6592)	-	-	-	-	-
	5000 (197)	3180 (7011)	-	-	-	-	-
FSV	4000 (157)	3080 (6790)	3550 (7826)	3550 (7826)	3810 (8400)	-	-
	5000 (197)	3310 (7297)	3800 (8377)	3800 (8377)	4080 (8995)	-	-
	6000 (236)	3710 (8179)	4220 (9303)	4220 (9303)	4520 (9965)	-	-

Fork weight

kg (lb)

Fork length mm (in)	Weight (for 2 forks)					
	50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
1220 (48.0)	370 (816)	410 (904)	410 (904)	470 (1036)	470 (1036)	520 (1146)
1370 (53.9)	390 (860)	430 (948)	430 (948)	500 (1102)	500 (1102)	550 (1213)
1520 (59.8)	410 (904)	450 (992)	450 (992)	520 (1146)	520 (1146)	580 (1279)
1670 (65.7)	430 (948)	470 (1036)	470 (1036)	550 (1213)	550 (1213)	610 (1345)
1820 (71.7)	450 (992)	500 (1102)	500 (1102)	570 (1257)	570 (1257)	630 (1389)
2440 (96.1)	600 (1323)	670 (1477)	670 (1477)	730 (1609)	730 (1609)	810 (1786)

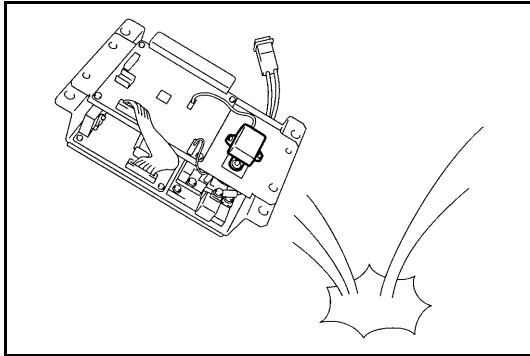
Member weights

kg (lb)

Member name	Weight					
	50-4FD100	50-4FD115	50-4FD120	50-4FD135	50-4FDK150	50-4FDK160
Engine ASSY	520 (1146)	←	←	←	←	←
Torque converter & transmission ASSY	455 (1000)	←	←	←	←	←
Front axle	1075 (2370)	←	←	←	←	←
Counterweight	3860 (8510)	4720 (10405)	5180 (11420)	5420 (11950)	6640 (14640)	7080 (15610)
Cabin ASSY	550 (1212)	←	←	←	←	←
Rear axle ASSY	710 (1565)	←	←	←	←	←
Tilt Cylinder	40 (88)	←	←	←	←	←
Lift Cylinder	90 (198)	←	←	←	←	←
Oil pump	35 (77)	←	←	←	←	←
Oil control valve	75 (165)	←	←	←	←	←

ELECTRICAL PARTS INSPECTION

1. Always disconnect the battery plug before inspecting or servicing electrical parts.
2. Pay sufficient attention when handling electronic parts.



- (1) Never subject electronic parts, such as computers and relays, to impact.
- (2) Never expose electronic parts to high temperature or moisture.
- (3) Do not touch connector terminals, as they may be deformed or damaged due to static electricity.

3. Use a circuit tester that matches the object and purpose of measurement.

Analog type: This type is convenient for observing movement during operation and the operating condition. The measured value is only for reference or guideline.

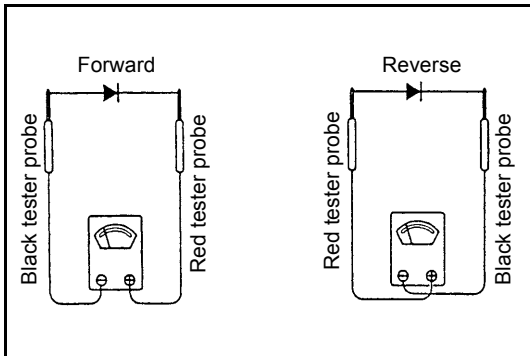
Digital type: A fairly accurate reading is possible. However, it is difficult to observe operation or movement.

- 1 Difference between results of measurement with analog and digital types

* The results of measurements using the analog type and the digital type may be different. Use the circuit tester according to its instruction manual.

Differences between the polarities of the analog type and the digital type are described below.

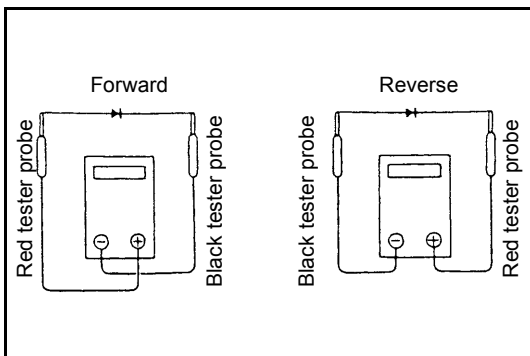
- (1) Analog circuit tester



Example of measurement result
Tester range: $k\Omega$ range

Forward direction: Continuity 11 $k\Omega$
Reverse direction: No continuity ∞

- (2) Digital circuit tester



Example of measurement result
Tester range: 2 $M\Omega$

Forward direction: Continuity 2 $M\Omega$
Reverse direction: No continuity

BOLT & NUT TIGHTENING TORQUE






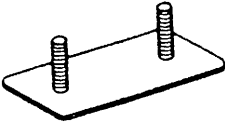
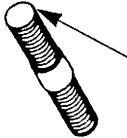
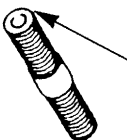
Standard bolt & nut tightening torque

Tightening torques of standard bolts and nuts are not indicated throughout the manual. Use the charts and table below to judge the standard tightening torque.

1. Judge the tightening torque for the hexagon head bolt, welded bolt or stud bolt having the standard bearing surface according to the tightening torque table by identifying the bolt strength class from the table below.
2. Judge the tightening torque for the hexagon flange bolt based on the threading diameter.
3. The nut tightening torque can be judged from its corresponding bolt type.

BOLT STRENGTH CLASS IDENTIFICATION METHOD AND TIGHTENING TORQUE

Identification by actual part

Type	Shape and class	Class
Hexagon head bolt (standard)	 Number in relief or hallmark on the head	4 = 4T 5 = 5T 6 = 6T 7 = 7T 8 = 8T
	 No mark	4T
	 Bolt with two raised lines on head	5T
	 Bolt with three raised lines on head	7T
	 Bolt with four raised lines on head	8T
Welded bolt		4T
Stud bolt	 No mark	4T
	 2 mm groove(s) on one/both edge(s)	6T

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download the complete
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No waiting.

Identification by part No.

Type	Part No.	Shape
Hexagon bolt	91611-40625 	
Stud bolt	92132-40614 	

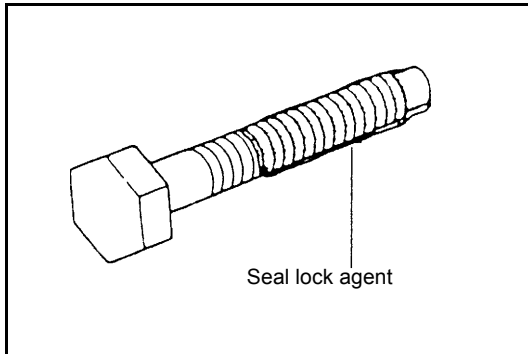
Tightening torque table

Class	Nominal diameter mm	Pitch mm	Standard tightening torque		
			N•m	kgf•cm	ft•lbf
4T	6	1.0	5.4	55	48 in•lbf
	8	1.25	13	130	9
	10	1.25	25	260	19
	12	1.25	47	480	35
	14	1.5	75	760	55
	16	1.5	113	1150	83
5T	6	1.0	6.5	65	56 in•lbf
	8	1.25	16	160	12
	10	1.25	32	330	24
	12	1.25	59	600	43
	14	1.5	91	930	67
	16	1.5	137	1400	101
6T	6	1.0	7.8	80	69 in•lbf
	8	1.25	19	195	14
	10	1.25	39	400	29
	12	1.25	72	730	53
	14	1.5	108	1100	80
	16	1.5	172	1750	127
7T	6	1.0	11	110	8
	8	1.25	25	260	19
	10	1.25	52	530	38
	12	1.25	95	970	70
	14	1.5	147	1500	108
	16	1.5	226	2300	166
8T	6	1.0	12	125	9
	8	1.25	29	300	22
	10	1.25	61	620	45
	12	1.25	108	1100	80
	14	1.5	172	1750	127
	16	1.5	265	2700	195

HEXAGON FLANGE BOLT TIGHTENING TORQUE

Nominal diameter mm	Pitch mm	Standard tightening torque N•m (kgf•cm) [ft•lbf]	Remarks
5	0.8	7.5 (76.5) [5.5]	
			Built-in washer
6	1.0	12.5 (128) [9.2]	
		13 (133) [9.6]	Built-in washer
8	1.25	31 (316) [22.9]	
		30 (306) [22.1]	Built-in washer
10	1.25	64 (653) [47.2]	
		63 (643) [46.5]	Built-in washer
12	1.25	115 (1173) [84.9]	
		115 (1173) [84.9]	Built-in washer
14	1.5	180 (1837) [133]	
		180 (1837) [133]	Built-in washer
16	1.5	280 (2857) [207]	
		275 (2806) [203]	Built-in washer

PRECOATED BOLTS (BOLTS WITH SEAL LOCK AGENT COATING ON THREADS)



1. Do not use the precoat bolt as it is in either of the following cases:
 - (1) After it has been removed.
 - (2) When it has been moved by tightness check, etc. (Loosened or tightened.)

Note:

For torque check, tighten the bolt at the lower limit of the allowable tightening torque range; if the bolt moves, retighten it according to the steps below.

2. How to reuse precoated bolts
 - (1) Wash the bolt and threaded hole.
(The threaded hole must be washed even when replacing the bolt with a new one.)
 - (2) Completely dry the washed parts by blowing with air.
 - (3) Apply the specified seal lock agent on the bolt threaded portion.