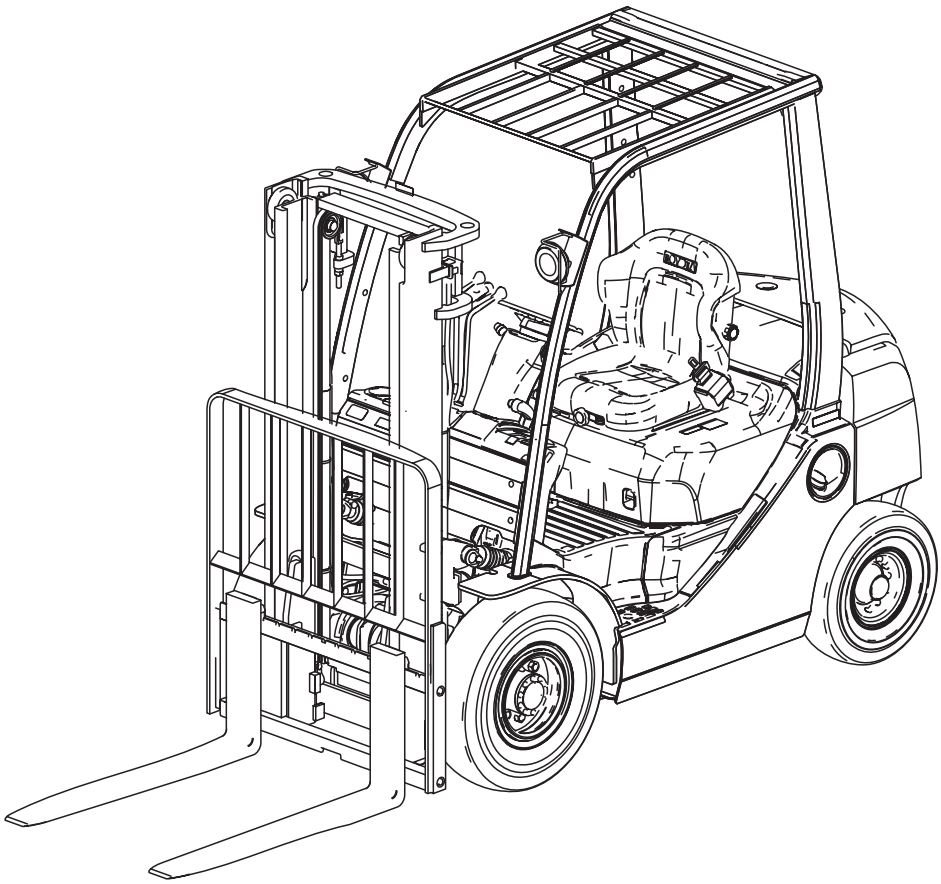
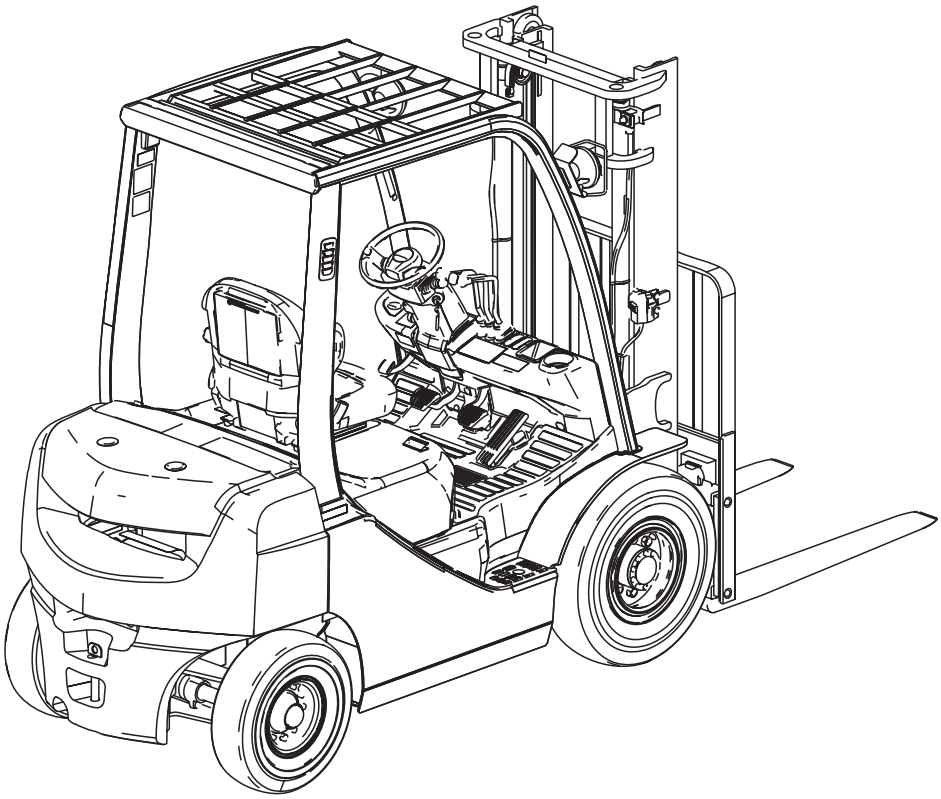
SECTION INDEX

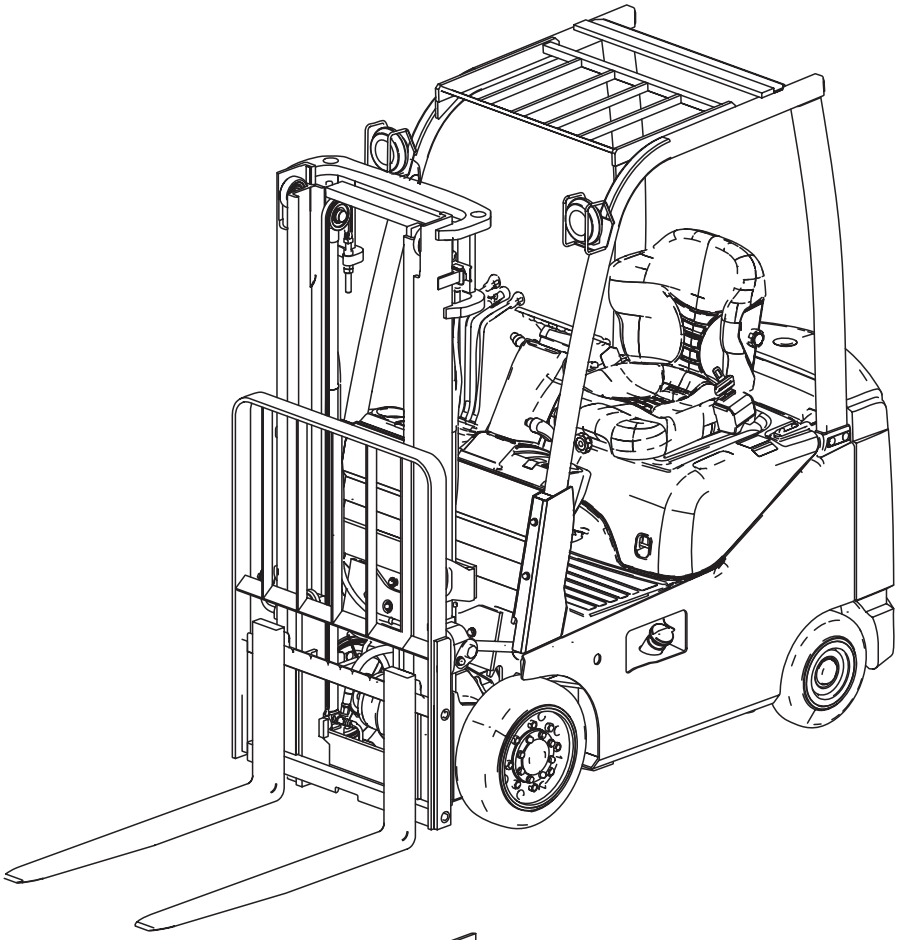
GENERAL

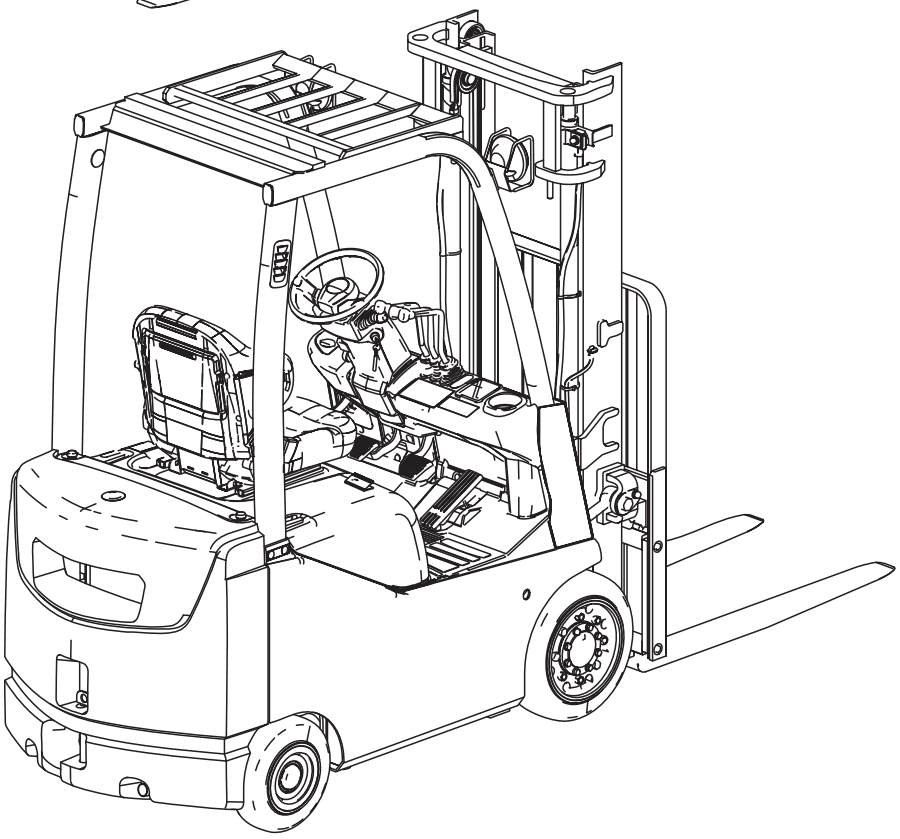
EXTERIOR VIEWS





EXTERIOR VIEWS





VEHICLE MODEL

Pneumatic Tire Models (Pn)

Classification		Load Capacity	Vehicle Model	Transmission Type	Engine	
Series	Model					
1-ton series	Pn15	3000 lbs	8FGU15	T/C	4Y	Gasoline
			8FDU15	T/C	1DZ-III	Diesel
	Pn18	3500 lbs	8FGU18	T/C	4Y	Gasoline
			8FDU18	T/C	1DZ-III	Diesel
2-ton series	Pn20	4000 lbs	8FGU20	T/C	4Y	Gasoline
			8FDU20	T/C	1DZ-III	Diesel
	Pn25	5000 lbs	8FGU25	T/C	4Y	Gasoline
			8FDU25	T/C	1DZ-III	Diesel
3-ton series	Pn30	6000 lbs	8FGU30	T/C	4Y	Gasoline
			8FDU30	T/C	1DZ-III	Diesel
	Pn32	6500 lbs	8FGU32*	T/C	4Y	Gasoline
			8FDU32*	T/C	1DZ-III	Diesel

Cushion Tire Models (Cu)

Classification		Load Capacity	Vehicle Model	Transmission Type	Engine	
Series	Model					
Cu2 ton series	Cu20	4000 lbs	8FGCU20	T/C	4Y	Gasoline
	Cu25	5000 lbs	8FGCU25	T/C	4Y	Gasoline
Cu3 ton series	Cu30	6000 lbs	8FGCU30	T/C	4Y	Gasoline
	Cu32	6500 lbs	8FGCU32*	T/C	4Y	Gasoline

*: USA, CANADA, MEXICO and HAWAII only.

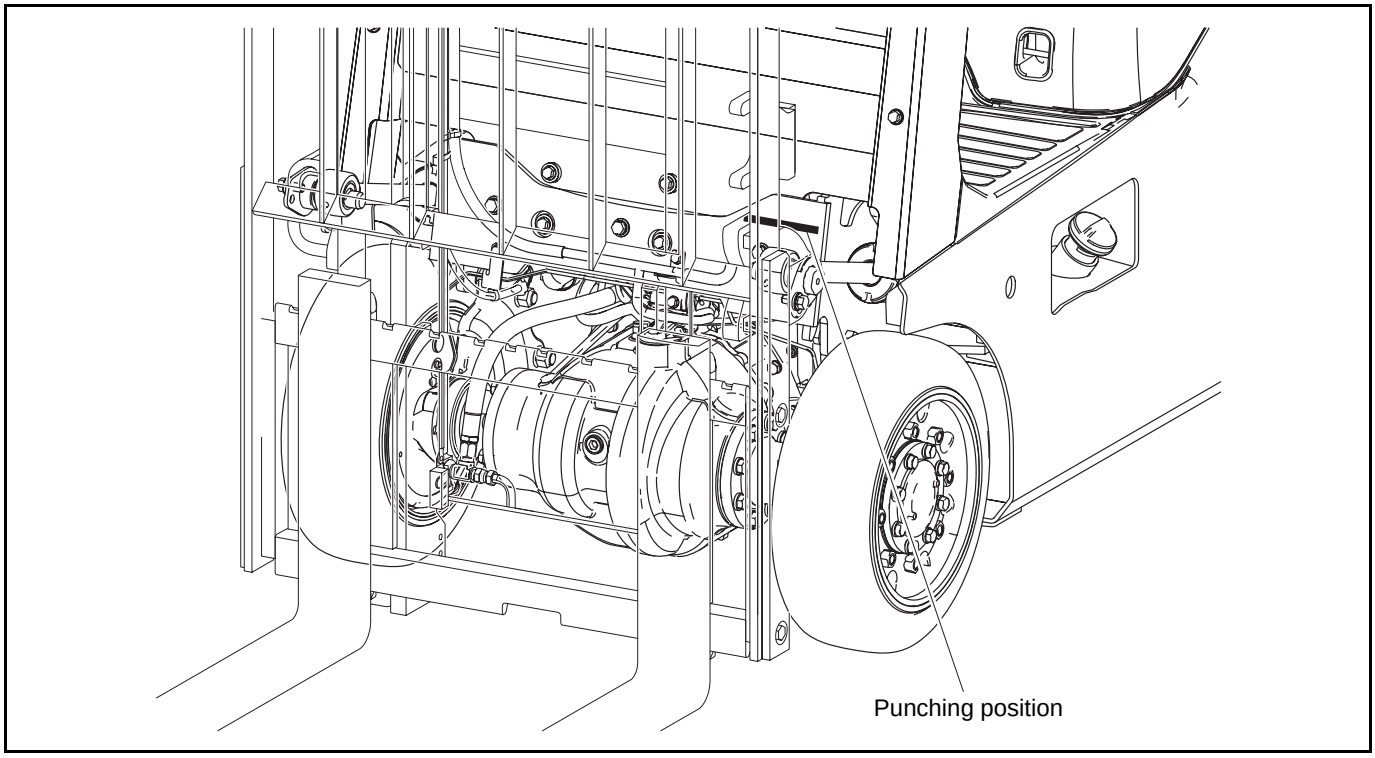
VEHICLE MODEL

Series	Load Capacity	Vehicle Model	Transmission Type	Engine	
1 ton series	3000 lbs	8FGCU15	T/C	4Y	Gasoline
	3500 lbs	8FGCU18	T/C	4Y	Gasoline
	4000 lbs	*8FGCSU20	T/C	4Y	Gasoline

*: USA and CANADA Only

FRAME NUMBER

Frame No. Punching Position

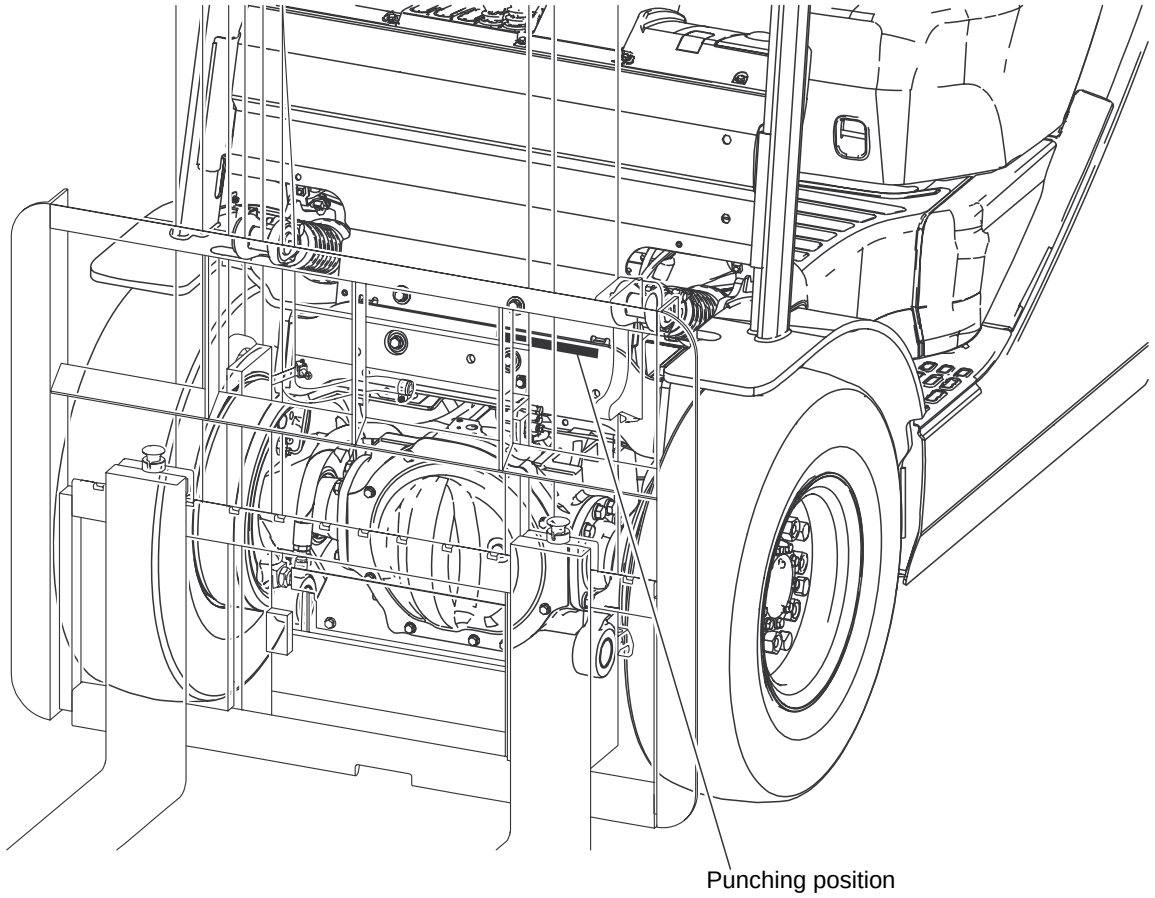


Series	Engine	Vehicle model	Punching format
1 ton series	4Y	8FGCU15	8FGCSU20 - 10011 *8FGCSU20 - 10011
		8FGCU18	
		8FGCSU20	

*: EEC spec.

FRAME NUMBER

Frame No. Punching Position



	Series	Engine	Vehicle model	Punching format
Pneumatic tire	1 ton series	4Y	8FGU15	8FGU18-10011
			8FGU18	
		1DZ-III	8FDU15	8FDU18-10011
			8FDU18	
	2 ton series	4Y	8FGU20	8FGU25-10011
			8FGU25	
		1DZ-III	8FDU20	8FDU25-10011
			8FDU25	
	3 ton series	4Y	8FGU30	8FGU32-10011
			8FGU32	
		1DZ-III	8FDU30	8FDU32-10011
			8FDU32	
Cushion tire	2 ton series	4Y	8FGCU20	8FGCU25-10011 8FGCU25〄10011*
			8FGCU25	
	3 ton series		8FGCU30	8FGCU32-10011 8FGCU32〄10011*
			8FGCU32	

*: EEC spec

HOW TO USE THIS MANUAL

EXPLANATION METHOD

1. Operation procedure

   (1) The operation procedure is described in either pattern A or pattern B below.
   Pattern A: Explanation of each operation step with illustration.
   Pattern B: Explanation of operation procedure by indicating step numbers in one illustration, followed by explanation of cautions and notes summarized as point operations.

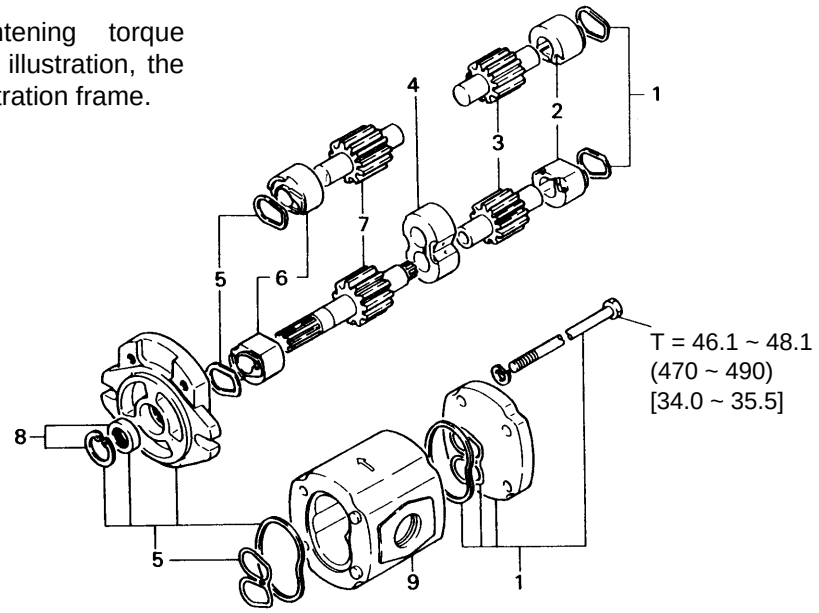
0

Example of description in pattern B

DISASSEMBLY·INSPECTION·REASSEMBLY

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

- Step Nos. are partially sometimes omitted in illustrations.
- When a part requiring tightening torque instruction is not indicated in the illustration, the part name is described in the illustration frame.



Disassembly Procedure

1 Remove the cover. **[Point 1]**

2 Remove the bushing. **[Point 2]** ← Operation explained later

3 Remove the gear.

Point Operations

[Point 1] Explanation of key point for operation with an illustration

Disassembly: ↙

Put a match mark when removing the pump cover.

[Point 2]

Inspection:

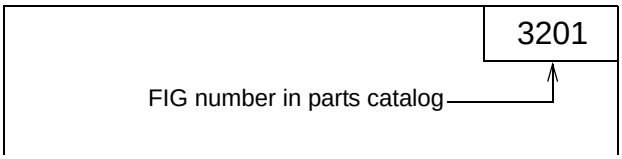
Measure the bush inside diameter.

Limit: 19.12 mm (0.7528 in)

2. How to read components figures

   (1) The components figure uses the illustration in the parts catalog for the vehicle model. Please refer to the catalog for checking the part name.
   The number at the right shoulder of each components figure indicates the Fig. number in the parts catalog.

(Example)



3. Matters omitted in this manual

   (1) This manual omits description of the following jobs, but perform them in actual operation:

      (a) Cleaning and washing of removed parts as required

      (b) Visual inspection (partially described)

TERMINOLOGY

Caution:
Important matters of which negligence may cause hazards on human body. Be sure to observe them.

Note:
Important items of which negligence may cause breakage or breakdown, or matters in operation procedure requiring special attention.

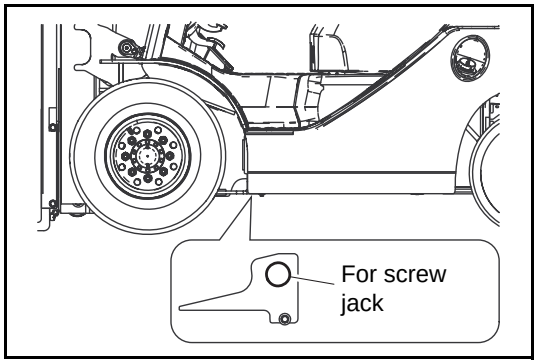
Standard: Values showing allowable range in inspection and adjustment.
Limit: Maximum or minimum allowable value in inspection or adjustment.

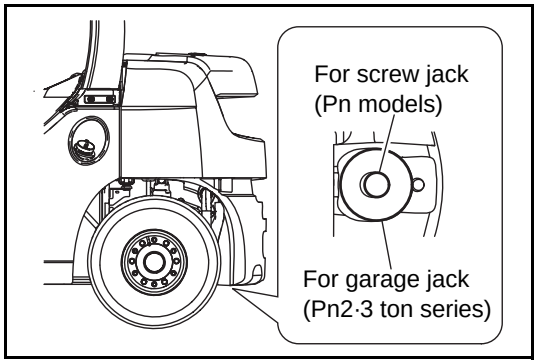
ABBREVIATIONS

Abbreviation (code)	Meaning	Abbreviation (code)	Meaning
ASC	Auto Speed Control	R/B	Relay block
ATT	Attachment	RH	Right hand
Cu	Cushion tire models	RR	Rear
FR	Front	SAE	Society of Automotive Engineers (USA)
J/B	Junction block		
ASSY	Assembly	SAS	System of active stability
LH	Left hand	SOL	Solenoid
LLC	Long life coolant	SST	Special service tool
M/T	Manual transmission	STD	Standard
NMR	No-load maximum speed	T =	Tightening torque
OPS	Operator Presence Sensing	T/C	Torque converter & transmission
OPT	Option		
O/S	Oversize	○ ○ T	Number of teeth (○ ○)
Pn	Pneumatic tire models	U/S	Undersize
PS	Power steering	W/	With
QFV	4-stage mast (Quadruple)	L/	Less

OPERATIONAL TIPS

1. Safe operation
   (1) After jacking up, always support with wooden blocks or rigid stands.
   (2) When hoisting the vehicle or its heavy component, use wire rope(s) with a sufficient reserve in load capacity.
   (3) Always disconnect the battery terminal before the inspection or servicing of electrical parts.
2. Tactful operation
   (1) Prepare the mechanic tools, necessary measuring instruments (circuit tester, megger, oil pressure gauge, etc.) and SSTs before starting operation.
   (2) Before disconnecting wiring, always check the cable color and wiring state.
   (3) When overhauling functional parts, complicated portions or related mechanisms, arrange the parts neatly to prevent confusion.
   (4) When disassembling and inspecting such a precision part as the control valve, use clean tools and operate in a clean location.
   (5) Follow the described procedures for disassembly, inspection and reassembly.
   (6) Replace, gaskets, packings and O-rings with new ones each time they are disassembled.
   (7) Use genuine Toyota parts for replacement.
   (8) Use specified bolts and nuts. Observe the specified tightening torque at the time of reassembly.
   (Tighten to the center of the specified tightening torque range.)
   If no tightening torque is specified, tighten the bolt or nut according to the standard tightening torque table.
3. Grasping the trouble state
   When a trouble occurs, do not attempt immediate disassembly or replacement but first check if the trouble requires disassembly or replacement for remedying.
4. Disposal of waste fluid, etc.
   When draining waste fluid from the vehicle, receive it in a container.
   If any oil, fuel, coolant, oil filter, battery or other harmful substance is directly discharged or scrapped without permission, it will either adversely affect human health or destroy the environment. Always sort waste fluids, etc. and treat them properly by requesting disposal by specialized companies.





5. Jack up points
   Jack up points are provided in the front and rear portions of the vehicle. Always apply jacks at the jack up points.

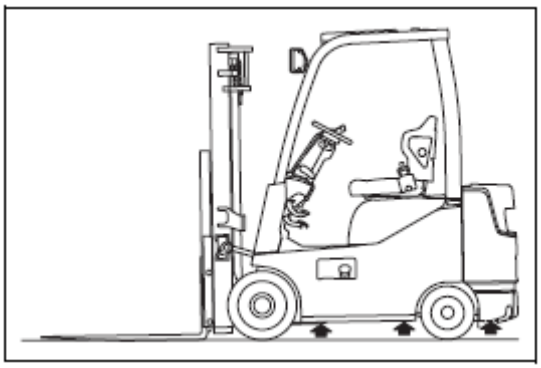
   Front side:
   A circular groove to accept a screw jack is provided under the front side of the frame.
   When a garage jack is used, jack up at the bottom surface of the frame.

   Rear side:
   Pn models
   A circular groove to accept a screw or garage jack is provided at the bottom surface of the counterweight.

   Cu models (except Cu1 ton series)
   Jack up at the under the counterweight or the bottom surface of the frame.

Continued from previous page:

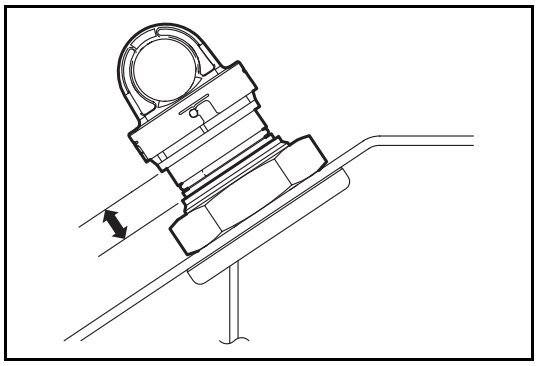
8FGCU15,18,SU20



5. Jack up points

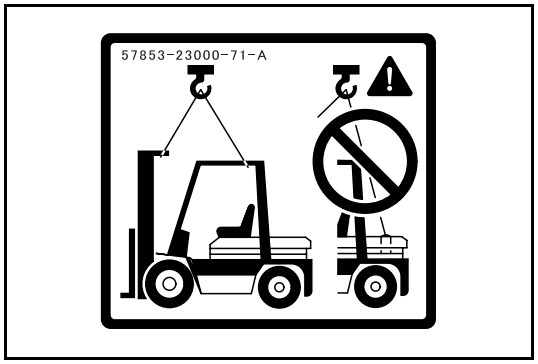
Front side:
Jack up at the bottom surface of the frame.

Rear side:
Jack up at the under the counterweight or the bottom surface of the frame.



6. Hydraulic oil level inspection procedure
   Checking the oil amount inside tank, as shown below, contact top of cap on retainer. (Do not push it into retainer.)

***Note: Excludes 8FGCU15, 18, SU20**

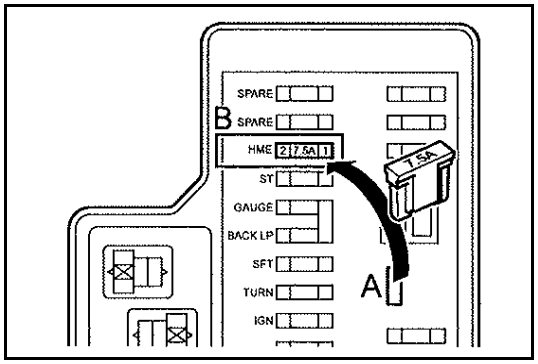


HOISTING THE VEHICLE

When hoisting the vehicle, sling with wire rope(s) at the mast hook holes and the rear side of the head guard.

Caution:

- **Use wire ropes having sufficient strength.**
- **Never hoist the forklift by the weight hook holes.**



HOW TO START THE HOUR METER

Be sure to start the hour meter when delivering a new vehicle to a customer.
Remove the fuse (7.5 A) in position A inside the relay block and install it to position B (HME).
Make sure that the engine is stopped when installing the fuse.

ATTENTIVE POINTS ON SAS

1. Reference should be made to seperate manual “New Model Feature 8FGU/8FDU15-32 Pub. No.PU023” for the explanations of SAS functions and operations.
2. Read Section 16 SAS/OPS “Precautions for Repair” on Page 16-11 in this repair manual in advance.
3. Whenever the repair or replacement is performed to the place where relative to SAS function, matching procedure by which the SAS regain proper function must be performed. (See Page 16-26)
4. The warning on the SAS caution label must be confirmed when the modification or change is such as to change the original specification.
   If improper, change the label. (See Page 16-32)
5. Care should always be exercised for safety operation whenever you operate the truck.
   Make distinction between the SAS featured trucks and those of none, because the control features are different.
6. The SAS oil control valves comprise many precision valves. Since dirty or contaminated hydraulic oil will adversely affect the functions of these valves, always wash the parts clean at the time of installation after disassembly or for replacement of hydraulic parts (valves, piping, etc.). Periodic replacement of the hydraulic oil is very important.
7. Since this vehicle uses high-precision electronic devices, modification of electrical parts may cause faults. Always use genuine Toyota parts when replacing or installing electrical parts (auxiliary equipment, optional parts, etc.).

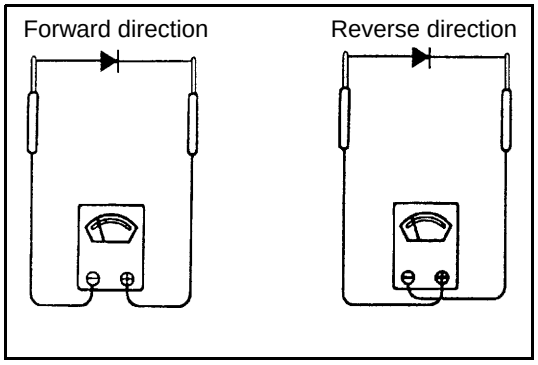
CIRCUIT TESTER

Circuit testers are available in both the analog and digital types. They should be used selectively according to the purpose of measurement.

Analog type: This type is convenient for observing movement during operation, but the measured value should only be used for reference or rough judgement.

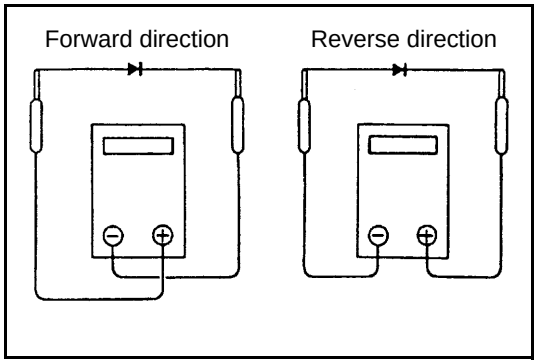
Digital type: Fairly accurate reading is possible, but it is difficult to observe the variation or movement.

1. Difference in measurement results with the digital type and analog type
   * The result may be different between measurements with the analog type and digital type.
     Always use a circuit tester according to its operation manual.
     Cautions when the polarities are different between the analog type and digital type are described below.



(1) Analog circuit tester
Measurement result example
Tester range: kΩ range

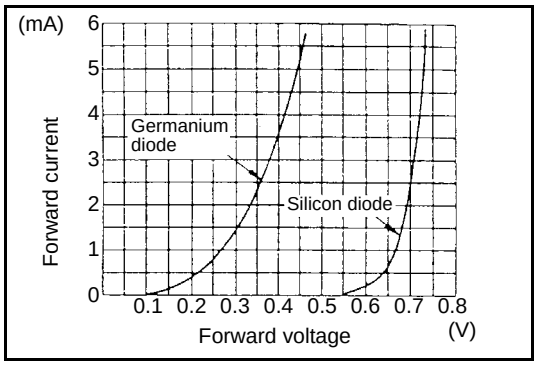
	Analog type
Forward	Continuity exists
	11 kΩ
Reverse	No continuity
	∞



(2) Digital circuit tester
Measurement result example
Tester range: MΩ range

	Digital type
Forward	No continuity
	1
Reverse	Continuity exists
	2 MΩ

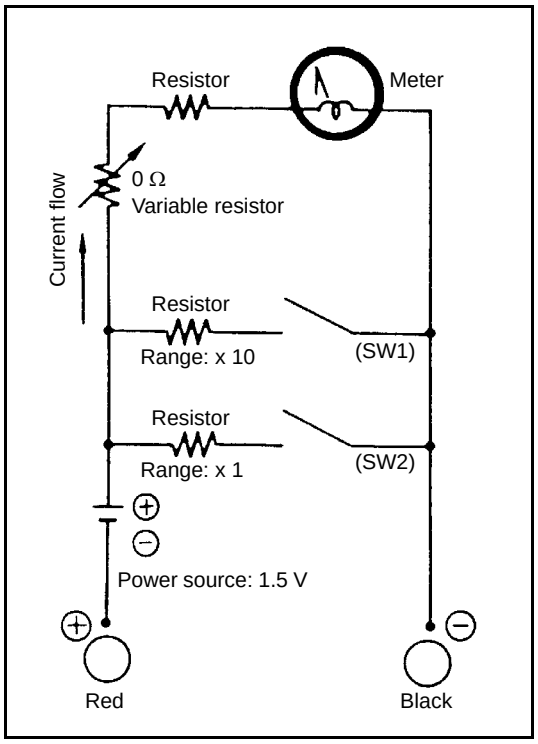
2. Difference in result of measurement with circuit tester
   The circuit tester power supply voltage depends on the tester type. 1.5 V, 3.0 V or 6.0 V is used.
   The resistance of a semiconductor such as a diode varies with the circuit tester power supply voltage. The diode characteristics are shown in the figure below.



The resistance values of the same semiconductor measured with two types of circuit testers having different power supply voltages are different.

This manual describes the results of measurement with a circuit tester whose power supply voltage is 3.0 V.

3. Difference in measurement result by measurement range (analog type)
   In the analog type circuit tester, changing the measurement range switches over the internal circuit to vary the circuit resistance. Even when the same diode is measured, the measurement result varies with the measurement range.



Always use the range described in the repair manual for measurement.

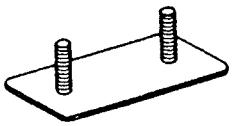
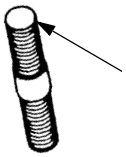
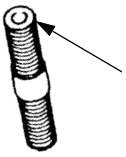
STANDARD BOLT & NUT TIGHTENING TORQUE

Standard bolt and nut tightening torques are not indicated.
Judge the standard tightening torque as shown below.

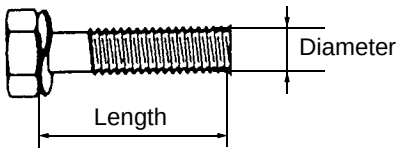
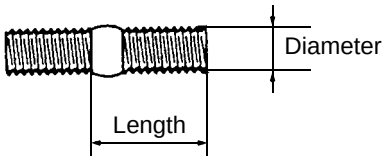
1. For tightening torque of hexagon head bolt, welded bolt and stud bolt with the standard bearing surface, identify bolt class based on the below chart and then determine using the tightening torque table.
2. For tightening torque of hexagon flange bolts, identify bolt class based on the below chart and then determine using the tightening torque table.
3. For tightening torque of nuts, check the mating bolt and use the method 1.

BOLT STRENGTH CLASS IDENTIFICATION METHOD

Identification by Bolt Shape

	Shape and class	Class
Hexagon head bolt	 Bolt head No.	4 = 4T 5 = 5T 6 = 6T 7 = 7T 8 = 8T
	 No mark	4T
	 Two protruding lines	5T
	 Three protruding lines	7T
	 Four protruding lines	8T
Welded bolt		4T
Stud bolt	 No mark	4T
	 Grooved	6T

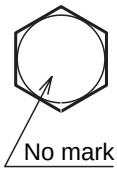
Identification by Part No.

	Part No.	Shape
Hexagon head bolt	91611-40625 Length (mm) Diameter (mm) Class	
Stud bolt	92132-40614 Length (mm) Diameter (mm) Class	

Tightening Torque Table

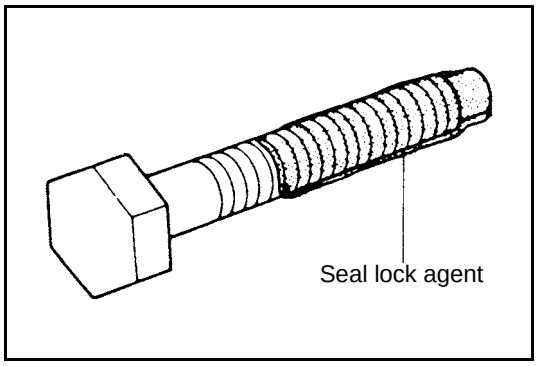
Class	Diameter mm	Pitch mm	Specified torque		
			N·m	kgf·cm	ft·lbf
4T	6	1.0	5.4	55	4
	8	1.25	13	130	9
	10	1.25	25	260	19
	12	1.25	47	480	35
	14	1.5	75	760	55
	16	1.5	113	1150	83
5T	6	1.0	6.5	65	5
	8	1.25	16	160	12
	10	1.25	32	330	24
	12	1.25	59	600	43
	14	1.5	91	930	67
	16	1.5	137	1400	101
6T	6	1.0	7.8	80	6
	8	1.25	19	190	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	120	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

Identification by Bolt Shape (Hexagon flange bolt)

Class	4.8T	6.8T	8.8T	10.9T	11.9T
Hexagon flange bolt					
					
				—	—
					

Tightening Torque Table (Hexagon flange bolt)

Class	Diameter mm	Pitch mm	Specified torque		
			N·m	kgf·cm	ft·lbf
4.8T	6	1.0	5.5	56	4
	8	1.25	13	130	9
	10	1.25	27	280	20
	12	1.25	50	510	37
	14	1.5	78	800	58
	16	1.5	120	1220	88
6.8T	6	1.0	7.5	80	6
	8	1.25	19	190	14
	10	1.25	39	400	29
	12	1.25	71	720	52
	14	1.5	110	1120	81
	16	1.5	170	1730	125
8.8T	6	1.0	12	120	9
	8	1.25	29	300	22
	10	1.25	61	620	45
	12	1.25	110	1120	81
	14	1.5	175	1780	129
	16	1.5	270	2750	199
10.9T	6	1.0	15.5	160	12
	8	1.25	38	390	28
	10	1.25	80	820	59
	12	1.25	145	1480	107
	14	1.5	230	2350	170
	16	1.5	360	3670	266
11.9T	6	1.0	17.5	180	13
	8	1.25	42	430	31
	10	1.25	89	910	66
	12	1.25	160	1630	118
	14	1.5	260	2650	192
	16	1.5	400	4080	295



PRECOAT 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 is removed.
   (2) When the precoat bolt is moved (loosened or tightened) by tightness check, etc.

Note:
For torque check, use the lower limit of the allowable tightening torque range. If the bolt moves, retighten it according to the steps below.

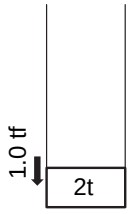
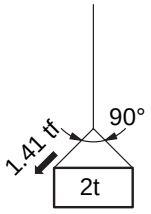
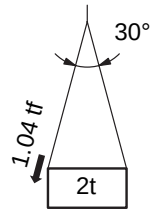
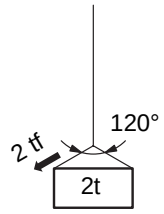
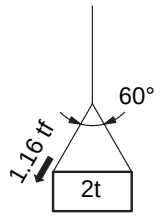
2. Method for reuse of precoat bolts
   (1) Wash the bolt and threaded hole. (The threaded hole must be washed even for replacement of the bolt.)
   (2) Perfectly dry the washed parts by air blowing.
   (3) Coat the specified seal lock agent to the threaded portion of the bolt.

HIGH PRESSURE HOSE FITTING TIGHTENING TORQUE

1. When connecting a high pressure hose, wipe the hose fitting and mating nipple contact surfaces with clean cloth to remove foreign matters and dirt. Also check no dent or other damage on the contact surfaces before installation.
2. When connecting a high pressure hose, hold the hose to align the fitting with the nipple and tighten the fitting.
3. The maximum tightening torque must not exceed twice the standard tightening torque.

Nominal diameter of screw	Standard tightening torque N·m (kgf·cm) [ft·lbf]		Hose inside diameter mm (in)
	Standard	Tightening range	
7/16 — 20UNF	25 (250) [18.1]	24 ~ 26 (240 ~ 270) [17.4 ~ 19.5]	6 (0.24)
9/16 — 18UNF	34 (350) [25.3]	32 ~ 36 (330 ~ 370) [29.3 ~ 26.8]	9 (0.35)
3/4 — 16UNF	59 (600) [43.4]	56 ~ 62 (570 ~ 630) [41.2 ~ 45.6]	12 (0.47)
7/8 — 14UNF	59 (600) [43.4]	56 ~ 62 (570 ~ 630) [41.2 ~ 45.6]	12 (0.47)
7/8 — 14UNF	78 (800) [57.9]	74 ~ 82 (740 ~ 840) [53.5 ~ 60.8]	15 (0.59)
1·1/16 — 12UNF	118 (1200) [86.8]	112 ~ 123 (1140 ~ 1250) [82.5 ~ 90.4]	19 (0.75)
1·5/16 — 12UNF	137 (1400) [101.3]	130 ~ 144 (1330 ~ 1470) [96.2 ~ 106.4]	25 (0.98)
PF1/4	25 (250) [18.1]	24 ~ 26 (240 ~ 270) [17.4 ~ 19.5]	6 (0.24)
PF3/8	34 (350) [25.3]	32 ~ 36 (330 ~ 370) [23.9 ~ 26.8]	9 (0.35)
PF1/2	59 (600) [43.4]	56 ~ 62 (570 ~ 630) [41.2 ~ 45.6]	12 (0.47)
PF3/4	118 (1200) [86.8]	112 ~ 123 (1140 ~ 1250) [82.5 ~ 90.4]	19 (0.75)
PF1	137 (1400) [101.3]	130 ~ 144 (1330 ~ 1470) [96.2 ~ 106.4]	25 (0.98)

WIRE ROPE SUSPENSION ANGLE LIST

Lifting angle	Tension	Compression	Suspension method	Lifting angle	Tension	Compression	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) [2322]
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]