

**KOMATSU**

# SHOP MANUAL

**FD100/115-7**

**FD135/150E/160E-7**

MACHINE MODEL

**FD100/115-7**

**FD135/150E/160E-7**

SERIAL No.

**6001 and up**

**6001 and up**

ENGINE

**6BG1T**

**6BG1T**

### PRECAUTIONS WHEN PERFORMING THE SERVICE WORK

Always pay attention to "Safety" before starting any work — this is important.

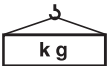
Never attempt any work where danger to yourself or to other persons.

Whenever work requiring safety precautions are described in this manual, a flag mark  inserted, always make double sure that safety measures are taken.

Other unmarked work, should always be performed after studying and using your common sense to prevent accidents.

## DESCRIPTION OF THE SYMBOLS

The symbols described below are used in this manual for convenience and better understanding.

| Symbol                                                                              | Item                     | Description                                                              |
|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------|
|   | <b>Safety</b>            | Special safety precautions are needed to perform the work.               |
|  | <b>Note</b>              | Special technical precautions are needed to perform the work             |
|  | <b>Tightening torque</b> | Fastening parts that require specified tightening force when assembling. |
|  | <b>Weight</b>            | Weight of parts or systems                                               |
|  | <b>Coat</b>              | Places to be coated with adhesives, etc. when assembling                 |

# SECTION INDEX

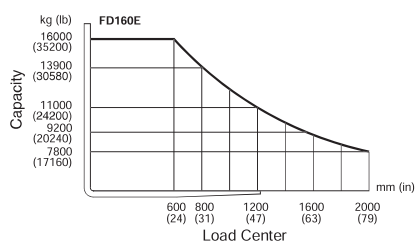
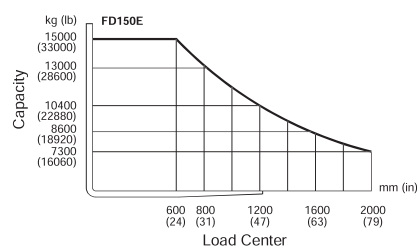
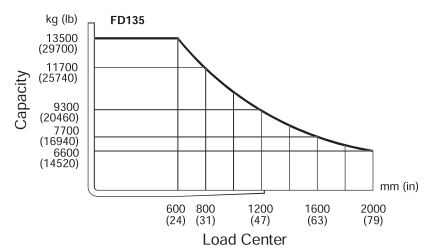
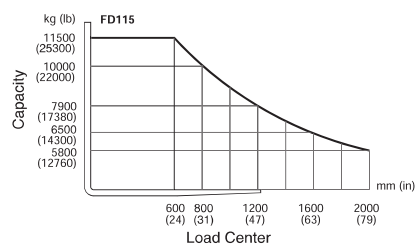
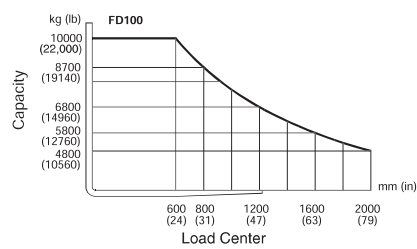
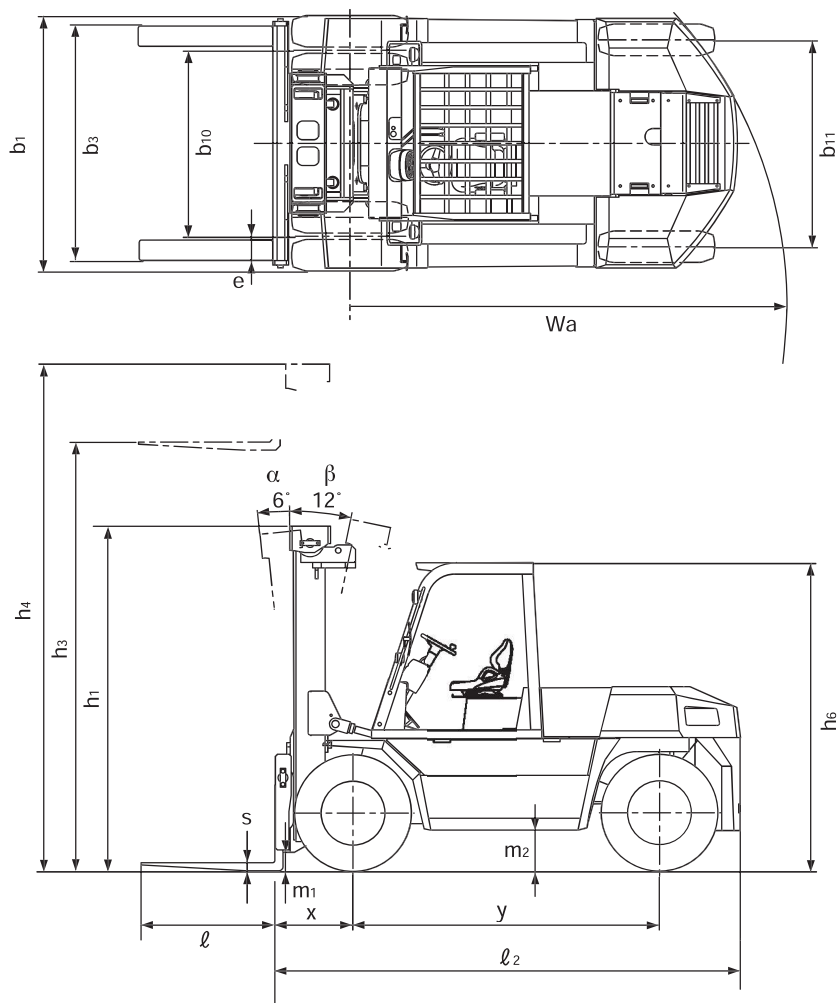
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|--------------------------------|--|
| 00. FOREWORD                   |  |
| 10. GENERAL AND SPECIFICATIONS |  |
| 20. TESTING AND ADJUSTING      |  |
| 30. REMOVAL AND INSTALLATION   |  |
| 40. DISASSEMBLY AND ASSEMBLY   |  |
| 50. MAINTENANCE STANDARD       |  |
| 60. STRUCTURE AND FUNCTION     |  |
| 70. TROUBLESHOOTING            |  |
| 80. CONVERSION TABLE           |  |



## 10. GENERAL AND SPECIFICATIONS

|                                                 |       |
|-------------------------------------------------|-------|
| Specifications .....                            | 10- 2 |
| Periodic replacement of consumable parts .....  | 10- 5 |
| Safety items for maintenance .....              | 10- 6 |
| Standard tightening torque for bolts .....      | 10-14 |
| Standard tightening torque for pipe joints..... | 10-15 |

SPECIFICATIONS



|                 |                            |                                |                                   |                                                    |                                |                             |                           |                           |                            |
|-----------------|----------------------------|--------------------------------|-----------------------------------|----------------------------------------------------|--------------------------------|-----------------------------|---------------------------|---------------------------|----------------------------|
| Characteristics | 1.2                        | Model                          |                                   | Manufacturer's Designations                        |                                | FD100-7                     | FD115-7                   | FD135-7                   |                            |
|                 | 1.3                        | Power Type                     |                                   | Electric, Diesel, Gasoline, LPG, Cable             |                                | Diesel                      | Diesel                    | Diesel                    |                            |
|                 | 1.4                        | Operation Type                 |                                   | Pedestrian, Drive Standing, Sitting, Order Picking |                                | Sitting                     | Sitting                   | Sitting                   |                            |
|                 | 1.5                        | Rated Capacity                 |                                   | Q                                                  | Rated Capacity                 | kg(lb)                      | 10000(22,000)             | 11500(25,000)             | 13500(30,000)              |
|                 | 1.6                        | Load Center                    |                                   | c                                                  | Rated Load Center              | mm(in)                      | 600(24)                   | 600(24)                   | 600(24)                    |
|                 | 1.8                        | Load Distance                  |                                   | x                                                  | Front Axle Center to Fork Face | mm(in)                      | 695(27.4)                 | 715(28.1)                 | 740(29.1)                  |
|                 | 1.9                        | Wheelbase                      |                                   | y                                                  |                                | mm(in)                      | 2800(110.2)               | 2800(110.2)               | 3100(122.0)                |
| Weight          | 2.1                        | Service Weight                 |                                   |                                                    |                                | kg(lb)                      | 12800(28,220)             | 14200(31,310)             | 15400(33,950)              |
|                 | 2.2                        | Axle Loading                   | Loaded                            | Front                                              | kg(lb)                         | 20720(45,680)               | 23430(51,655)             | 26450(58,312)             |                            |
|                 | Rear                       |                                |                                   | kg(lb)                                             | 2080(4,586)                    | 2270(5,004)                 | 2450(5,401)               |                           |                            |
|                 | 2.3                        |                                | Unloaded                          | Front                                              | kg(lb)                         | 6095(13,440)                | 6530(14,400)              | 7115(15,686)              |                            |
|                 | 2.3.2                      |                                |                                   | Rear                                               | kg(lb)                         | 6705(14,780)                | 7670(16,910)              | 8285(18,265)              |                            |
| Tyres           | 3.1                        | Tyre Type                      |                                   |                                                    |                                | Pneumatic                   | Pneumatic                 | Pneumatic                 |                            |
|                 | 3.2                        | Tyre Size                      |                                   | Front                                              |                                | 9.00-20-14PR(I)             | 10.00-20-14PR(I)          | 11.00-20-14PR(I)          |                            |
|                 | Rear                       |                                |                                   | 9.00-20-14PR(I)                                    | 10.00-20-14PR(I)               | 11.00-20-14PR(I)            |                           |                           |                            |
|                 | 3.3                        | Number of Wheel                |                                   | Front/Rear(x=driven)                               |                                | 4x/2                        | 4x/2                      | 4x/2                      |                            |
|                 | 3.6                        | Tread, Front                   |                                   | b10                                                |                                | mm(in)                      | 1700(66.9)                | 1700(66.9)                | 1770(69.7)                 |
|                 | 3.7                        | Tread, Rear                    |                                   | b11                                                |                                | mm(in)                      | 1900(74.8)                | 1890(74.4)                | 1890(74.4)                 |
| Dimensions      | 4.1                        | Tilting Angle                  |                                   |                                                    | Forward/Backward               | degree                      | 6/12                      | 6/12                      | 6/12                       |
|                 | 4.2                        | Mast Height, Lowered           |                                   | h1                                                 | with Std. Mast                 | mm(in)                      | 2890(113.8)               | 3160(124.4)               | 3170(124.8)                |
|                 | 4.3                        | Std. Free Lift                 |                                   | h2                                                 | with Std. Mast from Ground     | mm(in)                      | 0(0.0)                    | 0(0.0)                    | 0(0.0)                     |
|                 | 4.4                        | Std. Lift Height               |                                   | h3                                                 | with Std. Mast from Ground     | mm(in)                      | 3000(118)                 | 3000(118)                 | 3000(118)                  |
|                 | 4.5                        | Mast Height, Extended          |                                   | h4                                                 | with Std. Mast                 | mm(in)                      | 4400(173.2)               | 4670(183.9)               | 4680(184.3)                |
|                 | 4.7                        | Height, Overhead Guard         |                                   | h6                                                 |                                | mm(in)                      | 2780(109.4)               | 2800(110.2)               | 2810(110.6)                |
|                 | 4.19                       | Length, with Std. Forks        |                                   | l1                                                 |                                | mm(in)                      | 5465(215.2)               | 5485(215.9)               | 5860(230.7)                |
|                 | 4.20                       | Length, to fork face           |                                   | l2                                                 |                                | mm(in)                      | 4245(167.1)               | 4265(167.9)               | 4640(182.7)                |
|                 | 4.21                       | Width, at tyre                 |                                   | b1                                                 |                                | mm(in)                      | 2280(89.8)                | 2310(90.9)                | 2410(94.9)                 |
|                 | 4.22                       | Forks                          |                                   | s/e/l                                              | Thickness/Width/Lengh          | mm(in)                      | 75x170x1220(3.0x6.7x48.0) | 75x185x1220(3.0x7.3x48.0) | 80x185x1220(3.1x7.3x48.0)  |
|                 | 4.23                       | Fork Carriage Class            |                                   | ISO 2328, Type A/B/no                              |                                | Pin Mount                   | Pin Mount                 | Pin Mount                 |                            |
|                 | 4.24                       | Width, Fork Carriage           |                                   | b3                                                 |                                | mm(in)                      | 2140(84.3)                | 2140(84.3)                | 2200(86.6)                 |
|                 | 4.31                       | Ground Clearance               |                                   | m1                                                 | Under the Mast                 | mm(in)                      | 250(9.8)                  | 250(9.8)                  | 260(10.2)                  |
|                 | m2                         |                                |                                   | at the center of wheelbase                         | mm(in)                         | 325(12.8)                   | 345(13.6)                 | 350(13.8)                 |                            |
| 4.33            | Right Angle Stacking Aisle |                                | Ast                               |                                                    | mm(in)                         | 6115(240.7)                 | 6135(241.5)               | 6460(254.3)               |                            |
| 4.35            | Turning Radius             |                                | Wa                                |                                                    | mm(in)                         | 4000(157.5)                 | 4000(157.5)               | 4300(169.3)               |                            |
| Performance     | 5.1                        | Travel Speed(FWD)              |                                   | Loaded, 1st/2nd/3rd                                |                                | km/h(mph)                   | 8.5/18/28(5.3/11.2/17.4)  | 8.5/19/28(5.3/11.8/17.4)  | 9/19.5/27.5(5.6/12.1/17.1) |
|                 | 5.1.1                      |                                |                                   | Unloaded, 1st/2nd/3rd                              |                                | km/h(mph)                   | 9/20/32(5.6/12.4/19.9)    | 9/21/32(5.6/13.0/19.9)    | 9.5/21/32.5(5.9/13.0/20.2) |
|                 | 5.2                        | Lifting Speed                  |                                   | Loaded/Unloaded                                    |                                | mm/s(fpm)                   | 470/500(93/98)            | 430/450(85/89)            | 350/375(69/74)             |
|                 | 5.3                        | Lowering Speed                 |                                   | Loaded/Unloaded                                    |                                | mm/s(fpm)                   | 400/500(78.7/98.4)        | 400/500(78.7/98.4)        | 400/500(78.7/98.4)         |
|                 | 5.6                        | Max. Drawbar Pull              |                                   | Loaded                                             |                                | kN(lb)                      | 112(25,132)               | 108(24,339)               | 105(23,677)                |
|                 | 5.8                        | Max. Gradeability              |                                   | Loaded 1.6km/h, 3min rating                        |                                | %                           | 38                        | 32                        | 28                         |
|                 | 5.10                       | Service Brake                  |                                   | Operation/Control                                  |                                |                             | Foot/Hydraulic, Powered   | Foot/Hydraulic, Powered   | Foot/Hydraulic, Powered    |
|                 | 5.11                       | Parking Brake                  |                                   | Operation/Control                                  |                                |                             | Hand/Mechanical           | Hand/Mechanical           | Hand/Mechanical            |
| 5.12            | Steering                   |                                | Type                              |                                                    |                                | Hydraulic Power Steering    | Hydraulic Power Steering  | Hydraulic Power Steering  |                            |
| 6.4             | Battery                    |                                | Voltage/Capacity at 5-hour rating |                                                    | V/Ah                           | 24/100                      | 24/100                    | 24/100                    |                            |
| Drive           | 7.1                        | Maker/Model                    |                                   |                                                    |                                | ISUZU 6BG1T                 | ISUZU 6BG1T               | ISUZU 6BG1T               |                            |
|                 | 7.2                        | Rated Output, SAE gross        |                                   |                                                    |                                | kW(HP)                      | 119(160)                  | 119(160)                  | 119(160)                   |
|                 | 7.3                        | Rated Speed                    |                                   |                                                    |                                | min <sup>-1</sup>           | 2200                      | 2200                      | 2200                       |
|                 | 7.3.1                      | Max Torque, SAE gross          |                                   |                                                    |                                | N-m(lbft)@min <sup>-1</sup> | 540(398)@1600             | 540(398)@1600             | 540(398)@1600              |
|                 | 7.4                        | No. of Cylinder/Displacement   |                                   |                                                    |                                | cm³(cu.in)                  | 6/6494(396)               | 6/6494(396)               | 6/6494(396)                |
| Others          | 7.6                        | Fuel Tank Capacity             |                                   |                                                    |                                | Ltr(US gal)                 | 260(68.7)                 | 260(68.7)                 | 280(74.0)                  |
|                 | 8.2                        | Relief Pressure for Attachment |                                   |                                                    |                                | bar(psi)                    | 215(3,118)                | 215(3,118)                | 215(3,118)                 |
|                 | 8.2.1                      | Hydraulic Tank Capacity        |                                   |                                                    |                                | Ltr(US gal)                 | 150(39.6)                 | 150(39.6)                 | 180(47.6)                  |
|                 | 8.6                        | Clutch                         |                                   |                                                    |                                |                             | Torque Converter          | Torque Converter          | Torque Converter           |
|                 | 8.7                        | Transmission                   |                                   |                                                    |                                |                             | TORQFLOW                  | TORQFLOW                  | TORQFLOW                   |

Specifications are subject to change without notice.

The performance values indicated herein represent nominal values obtained under typical operating conditions.

|                 |             |                                |          |                                                    |                                       |                            |                            |                           |                           |
|-----------------|-------------|--------------------------------|----------|----------------------------------------------------|---------------------------------------|----------------------------|----------------------------|---------------------------|---------------------------|
| Characteristics | 1.2         | Model                          |          | Manufacturer's Designations                        |                                       | FD150E-7                   | FD160E-7                   |                           |                           |
|                 | 1.3         | Power Type                     |          | Electric, Diesel, Gasoline, LPG, Cable             |                                       | Diesel                     | Diesel                     |                           |                           |
|                 | 1.4         | Operation Type                 |          | Pedestrian, Drive Standing, Sitting, Order Picking |                                       | Sitting                    | Sitting                    |                           |                           |
|                 | 1.5         | Rated Capacity                 |          | Q                                                  | Rated Capacity kg(lb)                 | 15000(33,000)              | 16000(35,000)              |                           |                           |
|                 | 1.6         | Load Center                    |          | c                                                  | Rated Load Center mm(in)              | 600(24)                    | 600(24)                    |                           |                           |
|                 | 1.8         | Load Distance                  |          | x                                                  | Front Axle Center to Fork Face mm(in) | 750(29.5)                  | 750(29.5)                  |                           |                           |
|                 | 1.9         | Wheelbase                      |          | y                                                  | mm(in)                                | 3100(122.0)                | 3100(122.0)                |                           |                           |
| Weight          | 2.1         | Service Weight                 |          |                                                    | kg(lb)                                | 16500(36,380)              | 17050(37,590)              |                           |                           |
|                 | 2.2         | Axle Loading                   | Loaded   | Front                                              | kg(lb)                                | 28755(63,390)              | 30120(66,400)              |                           |                           |
|                 | 2.2.1       |                                |          | Rear                                               | kg(lb)                                | 2745(6,052)                | 2930(6,460)                |                           |                           |
|                 | 2.3         |                                | Unloaded | Front                                              | kg(lb)                                | 7225(15,930)               | 7155(15,770)               |                           |                           |
|                 | 2.3.2       |                                |          | Rear                                               | kg(lb)                                | 9275(20,450)               | 9895(21,810)               |                           |                           |
| Tyres           | 3.1         | Tyre Type                      |          |                                                    |                                       | Pneumatic                  | Pneumatic                  |                           |                           |
|                 | 3.2         | Tyre Size                      |          |                                                    |                                       | 11.00-20-16PR(I)           | 12.00-20-16PR(I)           |                           |                           |
|                 | 3.3         |                                |          |                                                    |                                       | 11.00-20-16PR(I)           | 12.00-20-16PR(I)           |                           |                           |
|                 | 3.5         | Number of Wheel                |          |                                                    | Front/Rear(x=driven)                  | 4x/2                       | 4x/2                       |                           |                           |
|                 | 3.6         | Tread, Front                   |          |                                                    | b10                                   | mm(in)                     | 1770(69.7)                 | 1770(69.7)                |                           |
| 3.7             | Tread, Rear |                                |          | b11                                                | mm(in)                                | 1890(74.4)                 | 1870(73.6)                 |                           |                           |
| Dimensions      | 4.1         | Tilting Angle                  |          |                                                    |                                       | Forward/Backward           | degree                     | 6/12                      | 6/12                      |
|                 | 4.2         | Mast Height, Lowered           |          |                                                    | h1                                    | with Std. Mast             | mm(in)                     | 3270(128.7)               | 3290(129.5)               |
|                 | 4.3         | Std. Free Lift                 |          |                                                    | h2                                    | with Std. Mast from Ground | mm(in)                     | 0(0.0)                    | 0(0.0)                    |
|                 | 4.4         | Std. Lift Height               |          |                                                    | h3                                    | with Std. Mast from Ground | mm(in)                     | 3000(118)                 | 3000(118)                 |
|                 | 4.5         | Mast Height, Extended          |          |                                                    | h4                                    | with Std. Mast             | mm(in)                     | 4780(188.2)               | 4800(189.0)               |
|                 | 4.7         | Height, Overhead Guard         |          |                                                    | h6                                    |                            | mm(in)                     | 2810(110.6)               | 2830(111.4)               |
|                 | 4.19        | Length, with Std. Forks        |          |                                                    | l1                                    |                            | mm(in)                     | 5920(233)                 | 6020(237)                 |
|                 | 4.20        | Length, to fork face           |          |                                                    | l2                                    |                            | mm(in)                     | 4700(185)                 | 4800(189)                 |
|                 | 4.21        | Width, at tyre                 |          |                                                    | b1                                    |                            | mm(in)                     | 2410(94.9)                | 2480(97.6)                |
|                 | 4.22        | Forks                          |          |                                                    | s/e/l                                 | Thickness/Width/Lengh      | mm(in)                     | 85x190x1220(3.3x7.5x48.0) | 85x210x1220(3.3x8.3x48.0) |
|                 | 4.23        | Fork Carriage Class            |          |                                                    | ISO 2328, Type A/B/no                 |                            |                            | Pin Mount                 | Pin Mount                 |
|                 | 4.24        | Width, Fork Carriage           |          |                                                    | b3                                    |                            | mm(in)                     | 2200(86.6)                | 2200(86.6)                |
|                 | 4.31        | Ground Clearance               |          |                                                    | m1                                    | Under the Mast             | mm(in)                     | 250(9.8)                  | 270(10.6)                 |
|                 | 4.32        |                                |          |                                                    | m2                                    | at the center of wheelbase | mm(in)                     | 350(13.8)                 | 370(14.6)                 |
|                 | 4.33        | Right Angle Stacking Aisle     |          |                                                    | Ast                                   |                            | mm(in)                     | 6520(256.7)               | 6670(262.6)               |
|                 | 4.35        | Turning Radius                 |          |                                                    | Wa                                    |                            | mm(in)                     | 4350(171.3)               | 4500(177.2)               |
| Performance     | 5.1         | Travel Speed(FWD)              |          |                                                    | Loaded, 1st/2nd/3rd                   | km/h(mph)                  | 9/19.5/27.5(5.6/12.1/17.1) | 9.5/20/28(5.9/12.4/17.4)  |                           |
|                 | 5.1.1       |                                |          |                                                    | Unloaded, 1st/2nd/3rd                 | km/h(mph)                  | 9.5/21/32.5(5.9/13.0/20.2) | 10/21.5/33(6.2/13.4/20.5) |                           |
|                 | 5.2         | Lifting Speed                  |          |                                                    | Loaded/Unloaded                       | mm/s(fpm)                  | 330/350(65/69)             | 320/345(63/68)            |                           |
|                 | 5.3         | Lowering Speed                 |          |                                                    | Loaded/Unloaded                       | mm/s(fpm)                  | 450/450(88.6/88.6)         | 450/450(88.6/88.6)        |                           |
|                 | 5.6         | Max. Drawbar Pull              |          |                                                    | Loaded                                | kN(lb)                     | 105(23,677)                | 100(22,487)               |                           |
|                 | 5.8         | Max. Gradeability              |          |                                                    | Loaded 1.6km/h, 3min rating           | %                          | 25                         | 23                        |                           |
|                 | 5.10        | Service Brake                  |          |                                                    | Operation/Control                     |                            | Foot/Hydraulic, Powered    | Foot/Hydraulic, Powered   |                           |
|                 | 5.11        | Parking Brake                  |          |                                                    | Operation/Control                     |                            | Hand/Mechanical            | Hand/Mechanical           |                           |
| 5.12            | Steering    |                                |          | Type                                               |                                       | Hydraulic Power Steering   | Hydraulic Power Steering   |                           |                           |
| 6.4             | Battery     |                                |          | Voltage/Capacity at 5-hour rating                  |                                       | V/Ah                       | 24/100                     | 24/100                    |                           |
| Drive           | 7.1         | Maker/Model                    |          |                                                    |                                       |                            | ISUZU 6BG1T                | ISUZU 6BG1T               |                           |
|                 | 7.2         | Rated Output, SAE gross        |          |                                                    | kW(HP)                                |                            | 119(160)                   | 119(160)                  |                           |
|                 | 7.3         | Rated Speed                    |          |                                                    | min <sup>-1</sup>                     |                            | 2200                       | 2200                      |                           |
|                 | 7.3.1       | Max Torque, SAE gross          |          |                                                    | N-m(lbft)@min <sup>-1</sup>           |                            | 540(398)@1600              | 540(398)@1600             |                           |
|                 | 7.4         | No. of Cylinder/Displacement   |          |                                                    | cm³(cu.in)                            |                            | 6/6494(396)                | 6/6494(396)               |                           |
| Others          | 7.6         | Fuel Tank Capacity             |          |                                                    | Ltr(US gal)                           |                            | 280(74.0)                  | 280(74.0)                 |                           |
|                 | 8.2         | Relief Pressure for Attachment |          |                                                    | bar(psi)                              |                            | 215(3,118)                 | 215(3,118)                |                           |
|                 | 8.2.1       | Hydraulic Tank Capacity        |          |                                                    | Ltr(US gal)                           |                            | 180(47.6)                  | 180(47.6)                 |                           |
|                 | 8.6         | Clutch                         |          |                                                    |                                       |                            | Torque Converter           | Torque Converter          |                           |
|                 | 8.7         | Transmission                   |          |                                                    |                                       |                            | TORQFLOW                   | TORQFLOW                  |                           |

## PERIODIC REPLACEMENT OF CONSUMABLE PARTS

For operation safety, never fail to perform periodic maintenance or make periodic replacement of the consumable parts listed in the following.

These parts may deteriorate in time and are susceptible to wear. It is difficult to estimate the degree of wear at time of periodic maintenance; therefore, even if no apparent wear is found, always replace with new parts within the prescribed period of replacement (or earlier if trouble is found).

Note that periodic replacement has nothing to do with guarantee service.

| No. | Part name                                           | Period of replacement |
|-----|-----------------------------------------------------|-----------------------|
| 1   | Master cylinder and wheel cylinder cups, dust seals | Every 1 year          |
| 2   | Brake hose or tube                                  | Every 2 years         |
| 3   | Brake reservoir tank and tube                       | Every 2 to 4 years    |
| 4   | Power steering hose                                 | Every 2 years         |
| 5   | Stop lamp switch (Oil pressure type)                | Every 2 years         |
| 6   | Fuel hose                                           | Every 2 years         |
| 7   | Rubber parts of power steering                      | Every 2 years         |
| 8   | Lift chain                                          | Every 3 years         |
| 9   | Hose of load handling                               | Every 2 years         |

## SAFETY ITEMS FOR MAINTENANCE

### FOR SAFETY OPERATION



#### USE QUALIFIED PERSONNEL FOR INSPECTION AND MAINTENANCE

- Only persons authorized by the owner or operator of the equipment and having proper certification (local or national) may carry out inspection, maintenance and repairs of the lift truck.  
If inspection, maintenance, or repair work is carried out incorrectly, it is very dangerous.



#### MAINTENANCE LOCATION

- When carrying out inspection and maintenance, use a level, dry, dust-free area.
- If the work is carried out inside a building, make sure that there is ample ventilation.



#### PRECAUTIONS FOR INSPECTION AND MAINTENANCE

- To be prepared in the event of a fire, have a fire extinguisher nearby and make sure that you know how to use it.
- Before carrying out inspection, lower the forks to the ground and stop the machine.
- Do not run the engine unless it is necessary.
- Place the directional lever, speed lever, and work equipment control levers in neutral.



#### PRECAUTIONS WHEN CARRYING OUT INSPECTION AND MAINTENANCE

- Wipe off any oil or grease. Immediately wipe up any oil that has leaked.  
If the lift truck is dirty, it becomes difficult or impossible to find cracks or other problems. Always clean the lift truck before starting inspection.
- Do not smoke or allow any flame to exist under any circumstances.  
Do not use any cloth which is soaked in fuel, oil, or grease. There is danger that it may catch fire.
- Wear suitable clothes for the job.
- Use suitable safety and protective equipment (hard hat, safety boots, safety glasses, gloves) for the job.
- When working on top of the lift truck, be careful not to fall.
- Do not put your feet under the forks.
- When opening or closing the floor plate or engine hood, be careful not to get your hands or body caught.
- When carrying out inspection with the forks raised, insert a stand under the inner mast to prevent the forks and mast from dropping.
- When carrying out job with another worker, decide who is the leader and carry out the job in accordance with instructions from that person.
- After repairing, make sure that the trouble has been corrected by performing a trial run.
- During the trial run, start/operate the lift truck carefully because it is possible that the trouble has not been fully corrected or that defective parts have not been removed.