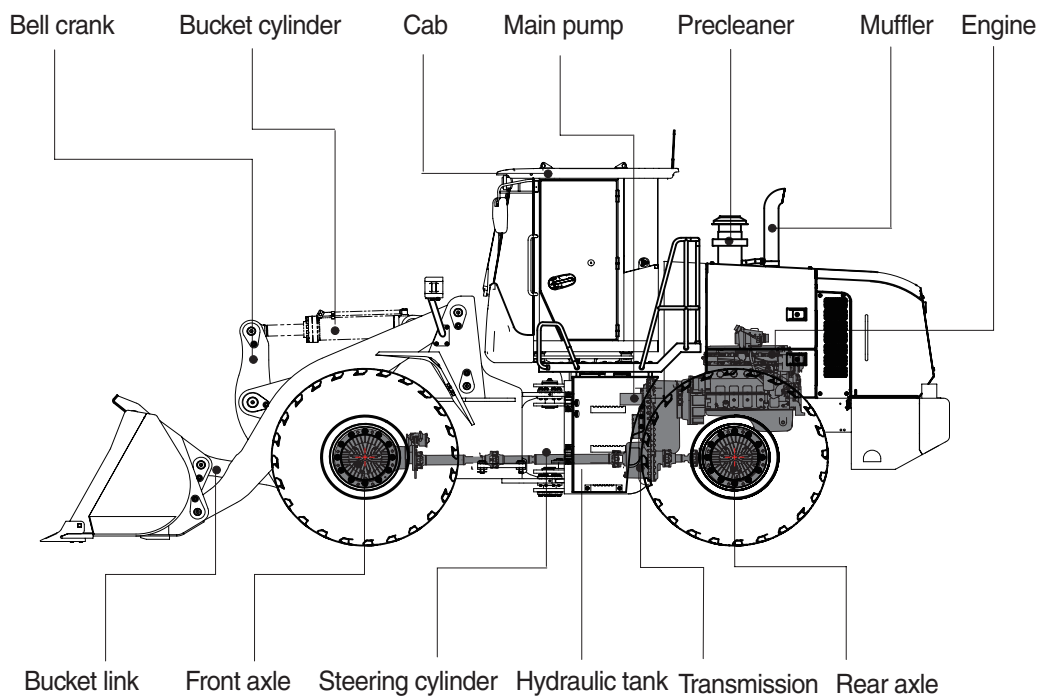
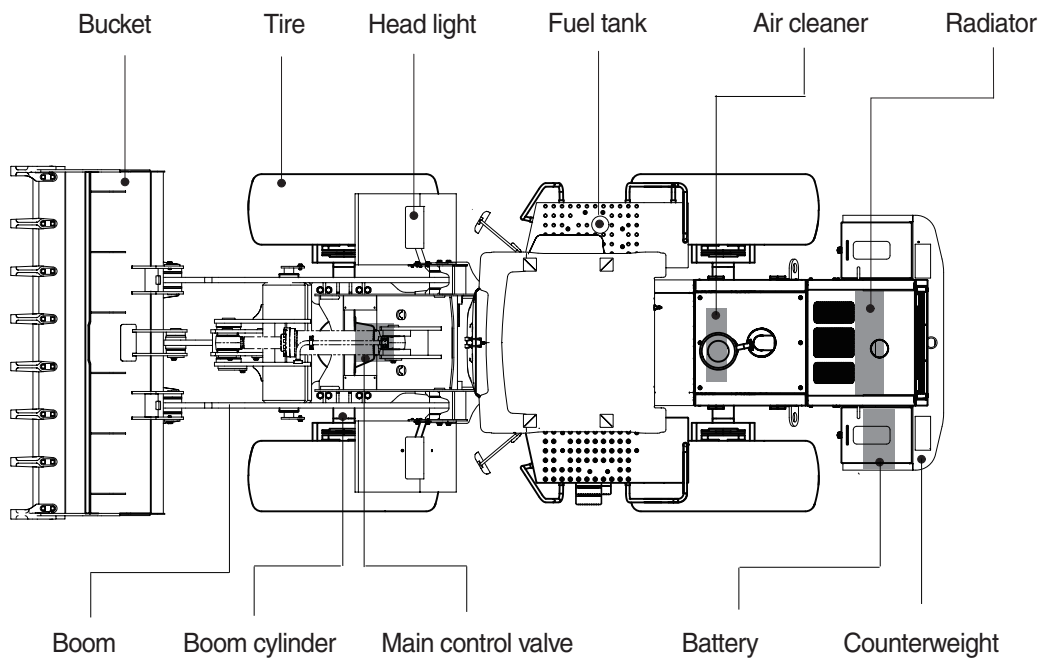


## 2. SPECIFICATIONS

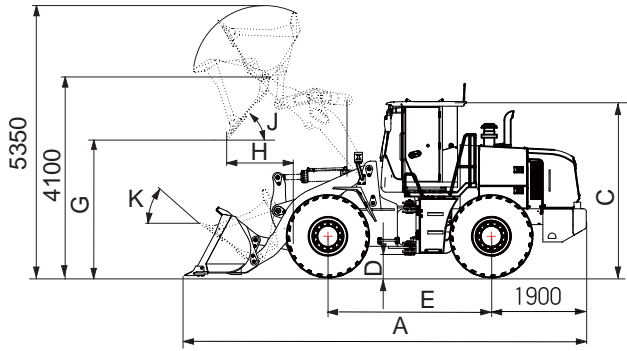
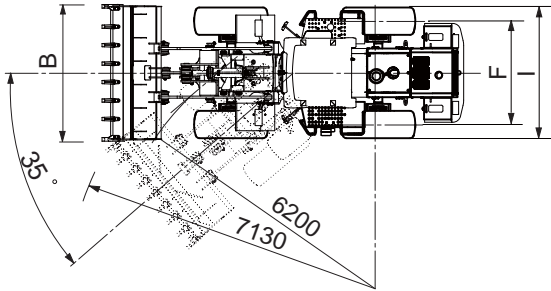
### 1. MAJOR COMPONENTS



850S2SE01

## 2. SPECIFICATIONS

### WITH TOOTH TYPE BUCKET



850S2SE02

| Description                                     |                  | Unit                              | Specification  |    |
|---|------------------|-----------------------------------|----------------|----|
| Operating weight                                |                  | kg (lb)                           | 16500 (36380)  |    |
| Bucket capacity                                 | Struck           | m <sup>3</sup> (yd <sup>3</sup> ) | 2.6 (3.4)      |    |
|   | Heaped(Filled)   |                                   | 3.0 (3.9)      |    |
| Overall length                                  | A                | mm (ft-in)                        | 7900 (25' 11") |    |
| Overall width                                   | B                |                                   | 2980 (9' 9")   |    |
| Overall height                                  | C                |                                   | 3420 (11' 3")  |    |
| Ground clearance                                | D                |                                   | 410 (1' 4")    |    |
| Wheelbase                                       | E                |                                   | 3200 (10' 6")  |    |
| Tread   | F                |                                   | 2250 (7' 5")   |    |
| Dump clearance at 45°                           | G                |                                   | 3100 (10' 2")  |    |
| Dump reach (full lift)                          | H                |                                   | 1240 (4' 1")   |    |
| Width over tires                                | I                |                                   | 2845 (9' 4")   |    |
| Dump angle                                      | J                |                                   | degree (°)     | 45 |
| Roll back angle (carry position)                | K                |                                   |                | 49 |
| Cycle time                                      | Lift (with load) | sec                               | 5.6            |    |
|   | Dump (with load) |                                   | 1.1            |    |
|   | Lower (empty)    |                                   | 3.5            |    |
| Maximum travel speed                            |                  | km/hr(mph)                        | 39.0 (24.2)    |    |
| Braking distance                                |                  | m(ft-in)                          | 12.5 (41' 0")  |    |
| Minimum turning radius (center of outside tire) |                  |                                   | 6.2 (20' 4")   |    |
| Gradeability                                    |                  | degree (°)                        | 30             |    |
| Travel speed                                    | Forward          | First gear                        | 10.6 (6.6)     |    |
|   |                  | Second gear                       | 39.0 (24.2)    |    |
|   | Reverse          | First gear                        | 14.5 (9.0)     |    |

### 3. SPECIFICATION FOR MAJOR COMPONENTS

#### 1) ENGINE

| Item                                  | Specification                       |
|---------------------------------------|-------------------------------------|
| Model                                 | Weichai Power WD10G220E23           |
| Type                                  | 4-cycle turbocharged diesel engine. |
| Control type                          | Mechanical control                  |
| Cooling method                        | Water cooling                       |
| Number of cylinders and arrangement   | 6 cylinders, in-line                |
| Firing order                          | 1-5-3-6-2-4                         |
| Combustion chamber type               | Direct injection type               |
| Cylinder bore × stroke                | 126 × 130 mm (5.0" × 5.1")          |
| Piston displacement                   | 9726 cc (594 cu in)                 |
| Compression ratio                     | 17 : 1                              |
| Rated gross horse power               | 162 kW / 2000 rpm                   |
| Maximum gross torque at 1300~1500 rpm | 900 N · m                           |
| Engine oil quantity                   | 20 ℓ (5.3 U.S. gal)                 |
| Dry weight                            | 1000 kg (2200 lb)                   |
| High idling speed                     | 2200 ± 20 rpm                       |
| Low idling speed                      | 750 ± 20 rpm                        |
| Rated fuel consumption (at rated)     | 208 g/kW · hr                       |
| Starting motor                        | 24 V-8.1 kW                         |
| Alternator                            | 24 V-55 Amp                         |
| Battery                               | 2 × 12 V × 120 Ah                   |

## 2) MAIN PUMP

| Item                       | Specification                      |
|----------------------------|------------------------------------|
| Type                       | Gear pump                          |
| Capacity                   | 100 cc/rev                         |
| Maximum operating pressure | 255 kgf/cm <sup>2</sup> (3630 psi) |
| Rated oil quantity         | 200 ℓ /min (52.8 U.S.gpm)          |
| Rated speed                | 2000 rpm                           |

## 3) STEERING PUMP

| Item                       | Specification                      |
|----------------------------|------------------------------------|
| Type                       | Gear pump                          |
| Capacity                   | 80 cc/rev                          |
| Maximum operating pressure | 255 kgf/cm <sup>2</sup> (3630 psi) |
| Rated oil quantity         | 160 ℓ /min (42.3 U.S.gpm)          |
| Rated speed                | 2000 rpm                           |

## 4) MAIN CONTROL VALVE

| Item   | Specification                      |
|--|------------------------------------|
| Type   | 2 spool                            |
| Operating method                               | Mechanical control                 |
| Main relief valve set pressure                 | 183 kgf/cm <sup>2</sup> (2600 psi) |
| Overload relief valve set pressure (bucket in) | 204 kgf/cm <sup>2</sup> (2900 psi) |

## 5) CYLINDER

| Item              | Specification   |
|-------------------|---|
| Boom cylinder     | Bore dia × Rod dia × Stroke<br>Ø 160 × Ø 80 × 835 mm  |
| Bucket cylinder   | Bore dia × Rod dia × Stroke<br>Ø 180 × Ø 100 × 565 mm |
| Steering cylinder | Bore dia × Rod dia × Stroke<br>Ø 90 × Ø 50 × 340 mm   |

## 6) DYNAMIC POWER TRANSMISSION DEVICES

| Item         |                | Specification   |                            |
|--------------|----------------|---|----------------------------|
| Transmission | Model          | ZL50  |                            |
|              | Type           | Converter   | Double-stage, Double-phase |
|              |                | Transmission  | Mechanical, hydraulic      |
|              | Gear shift     | Forward second gear, reverse first gear               |                            |
|              | Control        | Mechanical single lever type                          |                            |
| Axle         | Drive devices  | 4-wheel drive   |                            |
|              | Front          | Front fixed location                                  |                            |
|              | Rear           | Oscillation $\pm 11^\circ$ of center pin-loaded       |                            |
| Wheels       | Tires          | 23.5-25, 16PR (L3)                                    |                            |
| Brakes       | Travel         | Single line gas oil caliper disc brake                |                            |
|              | Parking        | Drum type brake on transmission, mechanical control   |                            |
| Steering     | Type           | Hydraulic, articulated                                |                            |
|              | Steering angle | $35^\circ$ to both right and left angle, respectively |                            |

## 4. TIGHTENING TORQUE

Use following table for unspecified torque.

### 1) BOLT AND NUT

#### (1) Coarse thread

| Bolt size  | 8T          |             | 10T         |             |
|------------|-------------|-------------|-------------|-------------|
|            | kg · m      | lb · ft     | kg · m      | lb · ft     |
| M 6 × 1.0  | 0.85 ~ 1.25 | 6.15 ~ 9.04 | 1.14 ~ 1.74 | 8.2 ~ 12.6  |
| M 8 × 1.25 | 2.0 ~ 3.0   | 14.5 ~ 21.7 | 2.73 ~ 4.12 | 19.7 ~ 29.8 |
| M10 × 1.5  | 4.0 ~ 6.0   | 28.9 ~ 43.4 | 5.5 ~ 8.3   | 39.8 ~ 60   |
| M12 × 1.75 | 7.4 ~ 11.2  | 53.5 ~ 79.5 | 9.8 ~ 15.8  | 71 ~ 114    |
| M14 × 2.0  | 12.2 ~ 16.6 | 88.2 ~ 120  | 16.7 ~ 22.5 | 121 ~ 167   |
| M16 × 2.0  | 18.6 ~ 25.2 | 135 ~ 182   | 25.2 ~ 34.2 | 182 ~ 247   |
| M18 × 2.5  | 25.8 ~ 35.0 | 187 ~ 253   | 35.1 ~ 47.5 | 254 ~ 343   |
| M20 × 2.5  | 36.2 ~ 49.0 | 262 ~ 354   | 49.2 ~ 66.6 | 356 ~ 482   |
| M22 × 2.5  | 48.3 ~ 63.3 | 350 ~ 457   | 65.8 ~ 98.0 | 476 ~ 709   |
| M24 × 3.0  | 62.5 ~ 84.5 | 452 ~ 611   | 85.0 ~ 115  | 615 ~ 832   |
| M30 × 3.0  | 124 ~ 168   | 898 ~ 1214  | 169 ~ 229   | 1223 ~ 1655 |
| M36 × 4.0  | 174 ~ 236   | 1261 ~ 1703 | 250 ~ 310   | 1808 ~ 2242 |

#### (2) Fine thread

| Bolt size  | 8T           |             | 10T         |             |
|------------|--------------|-------------|-------------|-------------|
|            | kg · m       | lb · ft     | kg · m      | lb · ft     |
| M 8 × 1.0  | 2.17 ~ 3.37  | 15.7 ~ 24.3 | 3.04 ~ 4.44 | 22.0 ~ 32.0 |
| M10 × 1.25 | 4.46 ~ 6.66  | 32.3 ~ 48.2 | 5.93 ~ 8.93 | 42.9 ~ 64.6 |
| M12 × 1.25 | 7.78 ~ 11.58 | 76.3 ~ 83.7 | 10.6 ~ 16.0 | 76.6 ~ 115  |
| M14 × 1.5  | 13.3 ~ 18.1  | 96.2 ~ 130  | 17.9 ~ 24.1 | 130 ~ 174   |
| M16 × 1.5  | 19.9 ~ 26.9  | 144 ~ 194   | 26.6 ~ 36.0 | 193 ~ 260   |
| M18 × 1.5  | 28.6 ~ 43.6  | 207 ~ 315   | 38.4 ~ 52.0 | 278 ~ 376   |
| M20 × 1.5  | 40.0 ~ 54.0  | 289 ~ 390   | 53.4 ~ 72.2 | 386 ~ 522   |
| M22 × 1.5  | 52.7 ~ 71.3  | 381 ~ 515   | 70.7 ~ 95.7 | 512 ~ 692   |
| M24 × 2.0  | 67.9 ~ 91.9  | 491 ~ 664   | 90.9 ~ 123  | 658 ~ 890   |
| M30 × 2.0  | 137 ~ 185    | 990 ~ 1338  | 182 ~ 248   | 1314 ~ 1795 |
| M36 × 3.0  | 192 ~ 260    | 1389 ~ 1879 | 262 ~ 354   | 1893 ~ 2561 |

## 2) PIPE AND HOSE (FLARE type)

| Thread size (PF) | Width across flat (mm) | kgf·m | lbf·ft |
|------------------|------------------------|-------|--------|
| 1/4"             | 19                     | 4     | 28.9   |
| 3/8"             | 22                     | 5     | 36.2   |
| 1/2"             | 27                     | 9.5   | 68.7   |
| 3/4"             | 36                     | 18    | 130    |
| 1"               | 41                     | 21    | 152    |
| 1-1/4"           | 50                     | 35    | 253    |

## 3) PIPE AND HOSE (ORFS type)

| Thread size (UNF) | Width across flat (mm) | kgf·m | lbf·ft |
|-------------------|------------------------|-------|--------|
| 9/16-18           | 19                     | 4     | 28.9   |
| 11/16-16          | 22                     | 5     | 36.2   |
| 13/16-16          | 27                     | 9.5   | 68.7   |
| 1-3/16-12         | 36                     | 18    | 130    |
| 1-7/16-12         | 41                     | 21    | 152    |
| 1-11/16-12        | 50                     | 35    | 253    |

## 4) FITTING

| Thread size | Width across flat (mm) | kgf·m | lbf·ft |
|-------------|------------------------|-------|--------|
| 1/4"        | 19                     | 4     | 28.9   |
| 3/8"        | 22                     | 5     | 36.2   |
| 1/2"        | 27                     | 9.5   | 68.7   |
| 3/4"        | 36                     | 18    | 130    |
| 1"          | 41                     | 21    | 152    |
| 1-1/4"      | 50                     | 35    | 253    |

### 5) TIGHTENING TORQUE OF MAJOR COMPONENT

| No. |                  | Descriptions                           | Bolt size | kgf · m    |
|-----|------------------|--|-----------|------------|
| 1   | Engine           | Engine mounting bolt (2EA)             | M18×2.5   | 30.4 ± 4.6 |
| 2   |                  | Engine mounting bolt (bracket)         | M12×1.5   | 9.03 ± 1.8 |
| 3   |                  | Radiator mounting bolt                 | M16×2.0   | 21.9 ± 3.3 |
| 4   |                  | Fuel tank mounting bolt                | M16×2.0   | 21.9 ± 3.3 |
| 5   | Hydraulic system | Main pump housing mounting bolt        | M12×1.5   | 9.03 ± 1.8 |
| 6   |                  | Main control valve mounting bolt       | M12×1.75  | 12.3 ± 2.5 |
| 7   |                  | Steering unit mounting bolt            | M10×1.5   | 5.0 ± 1.0  |
| 8   |                  | Steering valve mounting bolt           | M10×1.5   | 5.0 ± 1.0  |
| 9   |                  | Brake valve mounting bolt              | M8×1.25   | 2.5 ± 0.5  |
| 10  |                  | Control lever mounting bolt            | M10×1.5   | 5.0 ± 1.0  |
| 11  |                  | Hydraulic oil tank mounting bolt       | M16×2.0   | 21.9 ± 3.3 |
| 12  | Power train      | Transmission mounting bolt             | M18×2.5   | 30.4 ± 4.6 |
| 13  |                  | Transmission mounting bolt (bracket)   | M18×2.5   | 32.7 ± 4.9 |
| 14  |                  | Torque converter mounting bolt         | M12×1.5   | 9.03 ± 1.8 |
| 15  |                  | Front and rear axle mounting bolt, nut | M30×2.0   | 161 ± 24.2 |
| 16  |                  | Tire mounting nut                      | M22×1.5   | 79 ± 2.5   |
| 17  |                  | Drive shaft joint mounting bolt, nut   | M12×1.25  | 13.3 ± 2.7 |
| 18  | Others           | Counterweight mounting bolt            | M30×3.5   | 199 ± 29.9 |
| 19  |                  | Cab mounting bolt                      | M27×3.0   | 70 ± 10    |



## 6. RECOMMENDED LUBRICANTS

Use only oils listed below or equivalent.

Do not mix different brand oil.

| Service point              | Kind of fluid                                    | Capacity<br>ℓ (U.S. gal)                       | Ambient temperature °C (°F)         |             |           |                |            |            |             |
|----------------------------|--|--|-------------------------------------|-------------|-----------|----------------|------------|------------|-------------|
|                            |  |  | -20<br>(-4)                         | -10<br>(14) | 0<br>(32) | 10<br>(50)     | 20<br>(68) | 30<br>(86) | 40<br>(104) |
| Engine oil pan             | Engine oil                                       | 20 (5.3)                                       | SAE 30                              |             |           |                |            |            |             |
|                            |  |  | SAE 10W                             |             |           |                |            |            |             |
|                            |  |  | SAE 10W-30                          |             |           |                |            |            |             |
|                            |  |  |                                     |             |           | SAE 15W-40     |            |            |             |
| Transmission               | Gear oil   | 60 (15.9)                                      | ATF DEXRON III                      |             |           |                |            |            |             |
| Axle                       | Gear oil   | Front : 29 (7.7)<br>Rear : 29 (7.7)            | SAE 80W-90                          |             |           |                |            |            |             |
|                            |  |  |                                     |             |           | SAE 85W-90     |            |            |             |
| Hydraulic tank             | Hydraulic oil                                    | Tank :<br>170 (44.9)<br>System :<br>230 (60.8) | ISO VG 32                           |             |           |                |            |            |             |
|                            |  |  |                                     |             |           | ISO VG 46      |            |            |             |
|                            |  |  |                                     |             |           | ISO VG 68      |            |            |             |
| Fuel tank                  | Diesel fuel                                      | 260 (68.7)                                     | ASTM D975 NO.1                      |             |           |                |            |            |             |
|                            |  |  |                                     |             |           | ASTM D975 NO.2 |            |            |             |
| Fitting<br>(grease nipple) | Grease   | As required                                    | NLGI NO.1                           |             |           |                |            |            |             |
|                            |  |  |                                     |             |           | NLGI NO.2      |            |            |             |
| Radiator                   | Mixture of<br>antifreeze<br>and water<br>50 : 50 | 44 (11.6)                                      | Ethylene glycol base permanent type |             |           |                |            |            |             |
| Brake<br>(air booster)     | Brake oil  | Front : 1.0 (0.3)<br>Rear : 1.0 (0.3)          | DOT-3 Synthetic brake fluid         |             |           |                |            |            |             |