



# HL970

## WHEELED LOADER



# SERVICE MANUAL

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## SECTION 1 GENERAL

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## 1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This service manual mainly contains the necessary technical information for operations performed in a service workshop.

For ease of understanding, the manual is divided into the following sections.

### **Structure and function**

This group explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

### **Operational checks and troubleshooting**

This group explains the system operational checks and troubleshooting charts correlating problem to remedy.

### **Tests and adjustments**

This group explains checks to be made before and after performing repairs, as well as adjustments to be made at completion of the checks and repairs.

### **Disassembly and assembly**

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your Hyundai distributor for the latest information.

## 2. HOW TO READ THE SERVICE MANUAL

### Distribution and updating

Any additions, amendments or other changes will be sent to HYUNDAI distributors.

Get the most up-to-date information before you start any work.

### Filing method

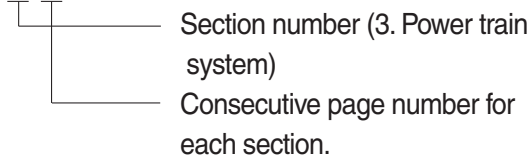
1. See the page number on the bottom of the page.

File the pages in correct order.

2. Following examples shows how to read the page number.

Example 1

3 - 3



3. Additional pages : Additional pages are indicated by a hyphen(-) and number after the page number. File as in the example.

10 - 4

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### Revised edition mark (①②③…)



When a manual is revised, an edition mark is recorded on the bottom outside corner of the pages.

### Revisions

Revised pages are shown at the list of revised pages on the between the contents page and section 1 page.

### Symbols

So that the shop manual can be of ample practical use, important places for safety and quality are marked with the following symbols.

| Symbol                                                                              | Item    | Remarks                                                                                                             |
|-------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------|
|   | Safety  | Special safety precautions are necessary when performing the work.                                                  |
|                                                                                     |         | Extra special safety precautions are necessary when performing the work because it is under internal pressure.      |
|  | Caution | Special technical precautions or other precautions for preserving standards are necessary when performing the work. |

### 3. CONVERSION TABLE

Method of using the Conversion Table

The Conversion Table in this section is provided to enable simple conversion of figures. For details of the method of using the Conversion Table, see the example given below.

#### Example

1. Method of using the Conversion Table to convert from millimeters to inches

Convert 55 mm into inches.

- (1) Locate the number 50 in the vertical column at the left side, take this as **Ⓐ**, then draw a horizontal line from **Ⓐ**.
- (2) Locate the number 5 in the row across the top, take this as **Ⓑ**, then draw a perpendicular line down from **Ⓑ**.
- (3) Take the point where the two lines cross as **Ⓒ**. This point **Ⓒ** gives the value when converting from millimeters to inches. Therefore, 55 mm = 2.165 inches.

2. Convert 550 mm into inches.

- (1) The number 550 does not appear in the table, so divide by 10 (move the decimal point one place to the left) to convert it to 55 mm.
- (2) Carry out the same procedure as above to convert 55 mm to 2.165 inches.
- (3) The original value (550 mm) was divided by 10, so multiply 2.165 inches by 10 (move the decimal point one place to the right) to return to the original value.  
This gives 550 mm = 21.65 inches.

Millimeters to inches

**Ⓑ**

1mm = 0.03937 in

|             | 0     | 1     | 2     | 3     | 4     | 5                 | 6     | 7     | 8     | 9     |
|-------------|-------|-------|-------|-------|-------|-------------------|-------|-------|-------|-------|
| 0           |       | 0.039 | 0.079 | 0.118 | 0.157 | 0.197             | 0.236 | 0.276 | 0.315 | 0.354 |
| 10          | 0.394 | 0.433 | 0.472 | 0.512 | 0.551 | 0.591             | 0.630 | 0.669 | 0.709 | 0.748 |
| 20          | 0.787 | 0.827 | 0.866 | 0.906 | 0.945 | 0.984             | 1.024 | 1.063 | 1.102 | 1.142 |
| 30          | 1.181 | 1.220 | 1.260 | 1.299 | 1.339 | 1.378             | 1.417 | 1.457 | 1.496 | 1.536 |
| 40          | 1.575 | 1.614 | 1.654 | 1.693 | 1.732 | 1.772             | 1.811 | 1.850 | 1.890 | 1.929 |
| <b>Ⓐ</b> 50 | 1.969 | 2.008 | 2.047 | 2.087 | 2.126 | <b>Ⓒ</b><br>2.165 | 2.205 | 2.244 | 2.283 | 2.323 |
| 60          | 2.362 | 2.402 | 2.441 | 2.480 | 2.520 | 2.559             | 2.598 | 2.638 | 2.677 | 2.717 |
| 70          | 2.756 | 2.795 | 2.835 | 2.874 | 2.913 | 2.953             | 2.992 | 3.032 | 3.071 | 3.110 |
| 80          | 3.150 | 3.189 | 3.228 | 3.268 | 3.307 | 3.346             | 3.386 | 3.425 | 3.465 | 3.504 |
| 90          | 3.543 | 3.583 | 3.622 | 3.661 | 3.701 | 3.740             | 3.780 | 3.819 | 3.858 | 3.898 |

**Millimeters to inches**

1mm = 0.03937in

|    | 0     | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0  |       | 0.039 | 0.079 | 0.118 | 0.157 | 0.197 | 0.236 | 0.276 | 0.315 | 0.354 |
| 10 | 0.394 | 0.433 | 0.472 | 0.512 | 0.551 | 0.591 | 0.630 | 0.669 | 0.709 | 0.748 |
| 20 | 0.787 | 0.827 | 0.866 | 0.906 | 0.945 | 0.984 | 1.024 | 1.063 | 1.102 | 1.142 |
| 30 | 1.181 | 1.220 | 1.260 | 1.299 | 1.339 | 1.378 | 1.417 | 1.457 | 1.496 | 1.536 |
| 40 | 1.575 | 1.614 | 1.654 | 1.693 | 1.732 | 1.772 | 1.811 | 1.850 | 1.890 | 1.929 |
| 50 | 1.969 | 2.008 | 2.047 | 2.087 | 2.126 | 2.165 | 2.205 | 2.244 | 2.283 | 2.323 |
| 60 | 2.362 | 2.402 | 2.441 | 2.480 | 2.520 | 2.559 | 2.598 | 2.638 | 2.677 | 2.717 |
| 70 | 2.756 | 2.795 | 2.835 | 2.874 | 2.913 | 2.953 | 2.992 | 3.032 | 3.071 | 3.110 |
| 80 | 3.150 | 3.189 | 3.228 | 3.268 | 3.307 | 3.346 | 3.386 | 3.425 | 3.465 | 3.504 |
| 90 | 3.543 | 3.583 | 3.622 | 3.661 | 3.701 | 3.740 | 3.780 | 3.819 | 3.858 | 3.898 |

**Kilogram to Pound**

1kg = 2.2046lb

|    | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0  |        | 2.20   | 4.41   | 6.61   | 8.82   | 11.02  | 13.23  | 15.43  | 17.64  | 19.84  |
| 10 | 22.05  | 24.25  | 26.46  | 28.66  | 30.86  | 33.07  | 35.27  | 37.48  | 39.68  | 41.89  |
| 20 | 44.09  | 46.30  | 48.50  | 50.71  | 51.91  | 55.12  | 57.32  | 59.5   | 61.73  | 63.93  |
| 30 | 66.14  | 68.34  | 70.55  | 72.75  | 74.96  | 77.16  | 79.37  | 81.57  | 83.78  | 85.98  |
| 40 | 88.18  | 90.39  | 92.59  | 94.80  | 97.00  | 99.21  | 101.41 | 103.62 | 105.82 | 108.03 |
| 50 | 110.23 | 112.44 | 114.64 | 116.85 | 119.05 | 121.25 | 123.46 | 125.66 | 127.87 | 130.07 |
| 60 | 132.28 | 134.48 | 136.69 | 138.89 | 141.10 | 143.30 | 145.51 | 147.71 | 149.91 | 152.12 |
| 70 | 154.32 | 156.53 | 158.73 | 160.94 | 163.14 | 165.35 | 167.55 | 169.76 | 171.96 | 174.17 |
| 80 | 176.37 | 178.57 | 180.78 | 182.98 | 185.19 | 187.39 | 189.60 | 191.80 | 194.01 | 196.21 |
| 90 | 198.42 | 200.62 | 202.83 | 205.03 | 207.24 | 209.44 | 211.64 | 213.85 | 216.05 | 218.26 |



**Liter to U.S. Gallon**

1 l = 0.2642 U.S.Gal

|    | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0  |        | 0.264  | 0.528  | 0.793  | 1.057  | 1.321  | 1.585  | 1.849  | 2.113  | 2.378  |
| 10 | 2.642  | 2.906  | 3.170  | 3.434  | 3.698  | 3.963  | 4.227  | 4.491  | 4.755  | 5.019  |
| 20 | 5.283  | 5.548  | 5.812  | 6.076  | 6.340  | 6.604  | 6.869  | 7.133  | 7.397  | 7.661  |
| 30 | 7.925  | 8.189  | 8.454  | 8.718  | 8.982  | 9.246  | 9.510  | 9.774  | 10.039 | 10.303 |
| 40 | 10.567 | 10.831 | 11.095 | 11.359 | 11.624 | 11.888 | 12.152 | 12.416 | 12.680 | 12.944 |
| 50 | 13.209 | 13.473 | 13.737 | 14.001 | 14.265 | 14.529 | 14.795 | 15.058 | 15.322 | 15.586 |
| 60 | 15.850 | 16.115 | 16.379 | 16.643 | 16.907 | 17.171 | 17.435 | 17.700 | 17.964 | 18.228 |
| 70 | 18.492 | 18.756 | 19.020 | 19.285 | 19.549 | 19.813 | 20.077 | 20.341 | 20.605 | 20.870 |
| 80 | 21.134 | 21.398 | 21.662 | 21.926 | 22.190 | 22.455 | 22.719 | 22.983 | 23.247 | 23.511 |
| 90 | 23.775 | 24.040 | 24.304 | 24.568 | 24.832 | 25.096 | 25.361 | 25.625 | 25.889 | 26.153 |

**Liter to U.K. Gallon**

1 l = 0.21997 U.K.Gal

|    | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0  |        | 0.220  | 0.440  | 0.660  | 0.880  | 1.100  | 1.320  | 1.540  | 1.760  | 1.980  |
| 10 | 2.200  | 2.420  | 2.640  | 2.860  | 3.080  | 3.300  | 3.520  | 3.740  | 3.950  | 4.179  |
| 20 | 4.399  | 4.619  | 4.839  | 5.059  | 5.279  | 5.499  | 5.719  | 5.939  | 6.159  | 6.379  |
| 30 | 6.599  | 6.819  | 7.039  | 7.259  | 7.479  | 7.699  | 7.919  | 8.139  | 8.359  | 8.579  |
| 40 | 8.799  | 9.019  | 9.239  | 9.459  | 9.679  | 9.899  | 10.119 | 10.339 | 10.559 | 10.778 |
| 50 | 10.998 | 11.281 | 11.438 | 11.658 | 11.878 | 12.098 | 12.318 | 12.528 | 12.758 | 12.978 |
| 60 | 13.198 | 13.418 | 13.638 | 13.858 | 14.078 | 14.298 | 14.518 | 14.738 | 14.958 | 15.178 |
| 70 | 15.398 | 15.618 | 15.838 | 16.058 | 16.278 | 16.498 | 16.718 | 16.938 | 17.158 | 17.378 |
| 80 | 17.598 | 17.818 | 18.037 | 18.257 | 18.477 | 18.697 | 18.917 | 19.137 | 19.357 | 19.577 |
| 90 | 19.797 | 20.017 | 20.237 | 20.457 | 20.677 | 20.897 | 21.117 | 21.337 | 21.557 | 21.777 |

kgf · m to lbf · ft

1 kgf · m = 7.233lbf · ft

|     | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9       |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|     |        | 7.2    | 14.5   | 21.7   | 28.9   | 36.2   | 43.4   | 50.6   | 57.9   | 65.1    |
| 10  | 72.3   | 79.6   | 86.8   | 94.0   | 101.3  | 108.5  | 115.7  | 123.0  | 130.2  | 137.4   |
| 20  | 144.7  | 151.9  | 159.1  | 166.4  | 173.6  | 180.8  | 188.1  | 195.3  | 202.5  | 209.8   |
| 30  | 217.0  | 224.2  | 231.5  | 238.7  | 245.9  | 253.2  | 260.4  | 267.6  | 274.9  | 282.1   |
| 40  | 289.3  | 296.6  | 303.8  | 311.0  | 318.3  | 325.5  | 332.7  | 340.0  | 347.2  | 354.4   |
| 50  | 361.7  | 368.9  | 376.1  | 383.4  | 390.6  | 397.8  | 405.1  | 412.3  | 419.5  | 426.8   |
| 60  | 434.0  | 441.2  | 448.5  | 455.7  | 462.9  | 470.2  | 477.4  | 484.6  | 491.8  | 499.1   |
| 70  | 506.3  | 513.5  | 520.8  | 528.0  | 535.2  | 542.5  | 549.7  | 556.9  | 564.2  | 571.4   |
| 80  | 578.6  | 585.9  | 593.1  | 600.3  | 607.6  | 614.8  | 622.0  | 629.3  | 636.5  | 643.7   |
| 90  | 651.0  | 658.2  | 665.4  | 672.7  | 679.9  | 687.1  | 694.4  | 701.6  | 708.8  | 716.1   |
| 100 | 723.3  | 730.5  | 737.8  | 745.0  | 752.2  | 759.5  | 766.7  | 773.9  | 781.2  | 788.4   |
| 110 | 795.6  | 802.9  | 810.1  | 817.3  | 824.6  | 831.8  | 839.0  | 846.3  | 853.5  | 860.7   |
| 120 | 868.0  | 875.2  | 882.4  | 889.7  | 896.9  | 904.1  | 911.4  | 918.6  | 925.8  | 933.1   |
| 130 | 940.3  | 947.5  | 954.8  | 962.0  | 969.2  | 976.5  | 983.7  | 990.9  | 998.2  | 10005.4 |
| 140 | 1012.6 | 1019.9 | 1027.1 | 1034.3 | 1041.5 | 1048.8 | 1056.0 | 1063.2 | 1070.5 | 1077.7  |
| 150 | 1084.9 | 1092.2 | 1099.4 | 1106.6 | 1113.9 | 1121.1 | 1128.3 | 1135.6 | 1142.8 | 1150.0  |
| 160 | 1157.3 | 1164.5 | 1171.7 | 1179.0 | 1186.2 | 1193.4 | 1200.7 | 1207.9 | 1215.1 | 1222.4  |
| 170 | 1129.6 | 1236.8 | 1244.1 | 1251.3 | 1258.5 | 1265.8 | 1273.0 | 1280.1 | 1287.5 | 1294.7  |
| 180 | 1301.9 | 1309.2 | 1316.4 | 1323.6 | 1330.9 | 1338.1 | 1345.3 | 1352.6 | 1359.8 | 1367.0  |
| 190 | 1374.3 | 1381.5 | 1388.7 | 1396.0 | 1403.2 | 1410.4 | 1417.7 | 1424.9 | 1432.1 | 1439.4  |

kgf/cm<sup>2</sup> to lbf/in<sup>2</sup>

1kgf / cm<sup>2</sup> = 14.2233lbf / in<sup>2</sup>

|     | 0     | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|     |       | 14.2  | 28.4  | 42.7  | 56.9  | 71.1  | 85.3  | 99.6  | 113.8 | 128.0 |
| 10  | 142.2 | 156.5 | 170.7 | 184.9 | 199.1 | 213.4 | 227.6 | 241.8 | 256.0 | 270.2 |
| 20  | 284.5 | 298.7 | 312.9 | 327.1 | 341.4 | 355.6 | 369.8 | 384.0 | 398.3 | 412.5 |
| 30  | 426.7 | 440.9 | 455.1 | 469.4 | 483.6 | 497.8 | 512.0 | 526.3 | 540.5 | 554.7 |
| 40  | 568.9 | 583.2 | 597.4 | 611.6 | 625.8 | 640.1 | 654.3 | 668.5 | 682.7 | 696.9 |
| 50  | 711.2 | 725.4 | 739.6 | 753.8 | 768.1 | 782.3 | 796.5 | 810.7 | 825.0 | 839.2 |
| 60  | 853.4 | 867.6 | 881.8 | 896.1 | 910.3 | 924.5 | 938.7 | 953.0 | 967.2 | 981.4 |
| 70  | 995.6 | 1010  | 1024  | 1038  | 1053  | 1067  | 1081  | 1095  | 1109  | 1124  |
| 80  | 1138  | 1152  | 1166  | 1181  | 1195  | 1209  | 1223  | 1237  | 1252  | 1266  |
| 90  | 1280  | 1294  | 1309  | 1323  | 1337  | 1351  | 1365  | 1380  | 1394  | 1408  |
| 100 | 1422  | 1437  | 1451  | 1465  | 1479  | 1493  | 1508  | 1522  | 1536  | 1550  |
| 110 | 1565  | 1579  | 1593  | 1607  | 1621  | 1636  | 1650  | 1664  | 1678  | 1693  |
| 120 | 1707  | 1721  | 1735  | 1749  | 1764  | 1778  | 1792  | 1806  | 1821  | 1835  |
| 130 | 1849  | 2863  | 1877  | 1892  | 1906  | 1920  | 1934  | 1949  | 1963  | 1977  |
| 140 | 1991  | 2005  | 2020  | 2034  | 2048  | 2062  | 2077  | 2091  | 2105  | 2119  |
| 150 | 2134  | 2148  | 2162  | 2176  | 2190  | 2205  | 2219  | 2233  | 2247  | 2262  |
| 160 | 2276  | 2290  | 2304  | 2318  | 2333  | 2347  | 2361  | 2375  | 2389  | 2404  |
| 170 | 2418  | 2432  | 2446  | 2460  | 2475  | 2489  | 2503  | 2518  | 2532  | 2546  |
| 180 | 2560  | 2574  | 2589  | 5603  | 2617  | 2631  | 2646  | 2660  | 2674  | 2688  |
| 200 | 2845  | 2859  | 2873  | 2887  | 2901  | 2916  | 2930  | 2944  | 2958  | 2973  |
| 210 | 2987  | 3001  | 3015  | 3030  | 3044  | 3058  | 3072  | 3086  | 3101  | 3115  |
| 220 | 3129  | 3143  | 3158  | 3172  | 3186  | 3200  | 3214  | 3229  | 3243  | 3257  |
| 230 | 3271  | 3286  | 3300  | 3314  | 3328  | 3343  | 3357  | 3371  | 3385  | 3399  |
| 240 | 3414  | 3428  | 3442  | 3456  | 3470  | 3485  | 3499  | 3513  | 3527  | 3542  |

## TEMPERATURE

Fahrenheit-Centigrade Conversion.

A simple way to convert a fahrenheit temperature reading into a centigrade temperature reading or vice versa is to enter the accompanying table in the center or boldface column of figures.

These figures refer to the temperature in either Fahrenheit or Centigrade degrees.

If it is desired to convert from Fahrenheit to Centigrade degrees, consider the center column as a table of Fahrenheit temperatures and read the corresponding Centigrade temperature in the column at the left.

If it is desired to convert from Centigrade to Fahrenheit degrees, consider the center column as a table of Centigrade values, and read the corresponding Fahrenheit temperature on the right.

| °C    | °F  | °C    | °F    | °C | °F    | °C   | °F | °C    | °F   | °C  | °F    |
|-------|-----|-------|-------|----|-------|------|----|-------|------|-----|-------|
| -40.4 | -40 | -40.0 | -11.7 | 11 | 51.8  | 7.8  | 46 | 114.8 | 27.2 | 81  | 117.8 |
| -37.2 | -35 | -31.0 | -11.1 | 12 | 53.6  | 8.3  | 47 | 116.6 | 27.8 | 82  | 179.6 |
| -34.4 | -30 | -22.0 | -10.6 | 13 | 55.4  | 8.9  | 48 | 118.4 | 28.3 | 83  | 181.4 |
| -31.7 | -25 | -13.0 | -10.0 | 14 | 57.2  | 9.4  | 49 | 120.2 | 28.9 | 84  | 183.2 |
| -28.9 | -20 | -4.0  | -9.4  | 15 | 59.0  | 10.0 | 50 | 122.0 | 29.4 | 85  | 185.0 |
| -28.3 | -19 | -2.2  | -8.9  | 16 | 60.8  | 10.6 | 51 | 123.8 | 30.0 | 86  | 186.8 |
| -27.8 | -18 | -0.4  | -8.3  | 17 | 62.6  | 11.1 | 52 | 125.6 | 30.6 | 87  | 188.6 |
| -27.2 | -17 | 1.4   | -7.8  | 18 | 64.4  | 11.7 | 53 | 127.4 | 31.1 | 88  | 190.4 |
| -26.7 | -16 | 3.2   | -6.7  | 20 | 68.0  | 12.8 | 55 | 131.0 | 32.2 | 90  | 194.0 |
| -26.1 | -15 | 5.0   | -6.7  | 20 | 68.0  | 12.8 | 55 | 131.0 | 32.2 | 90  | 194.0 |
| -25.6 | -14 | 6.8   | -6.1  | 21 | 69.8  | 13.3 | 56 | 132.8 | 32.8 | 91  | 195.8 |
| -25.0 | -13 | 8.6   | -5.6  | 22 | 71.6  | 13.9 | 57 | 134.6 | 33.3 | 92  | 197.6 |
| -24.4 | -12 | 10.4  | -5.0  | 23 | 73.4  | 14.4 | 58 | 136.4 | 33.9 | 93  | 199.4 |
| -23.9 | -11 | 12.2  | -4.4  | 24 | 75.2  | 15.0 | 59 | 138.2 | 34.4 | 94  | 201.2 |
| -23.3 | -10 | 14.0  | -3.9  | 25 | 77.0  | 15.6 | 60 | 140.0 | 35.0 | 95  | 203.0 |
| -22.8 | -9  | 15.8  | -3.3  | 26 | 78.8  | 16.1 | 61 | 141.8 | 35.6 | 96  | 204.8 |
| -22.2 | -8  | 17.6  | -2.8  | 27 | 80.6  | 16.7 | 62 | 143.6 | 36.1 | 97  | 206.6 |
| -21.7 | -7  | 19.4  | -2.2  | 28 | 82.4  | 17.2 | 63 | 145.4 | 36.7 | 98  | 208.4 |
| -21.1 | -6  | 21.2  | -1.7  | 29 | 84.2  | 17.8 | 64 | 147.2 | 37.2 | 99  | 210.2 |
| -20.6 | -5  | 23.0  | -1.1  | 35 | 95.0  | 21.1 | 70 | 158.0 | 51.7 | 125 | 257.0 |
| -20.0 | -4  | 24.8  | -0.6  | 31 | 87.8  | 18.9 | 66 | 150.8 | 40.6 | 105 | 221.0 |
| -19.4 | -3  | 26.6  | 0     | 32 | 89.6  | 19.4 | 67 | 152.6 | 43.3 | 110 | 230.0 |
| -18.9 | -2  | 28.4  | 0.6   | 33 | 91.4  | 20.0 | 68 | 154.4 | 46.1 | 115 | 239.0 |
| -18.3 | -1  | 30.2  | 1.1   | 34 | 93.2  | 20.6 | 69 | 156.2 | 48.9 | 120 | 248.0 |
| -17.8 | 0   | 32.0  | 1.7   | 35 | 95.0  | 21.1 | 70 | 158.0 | 51.7 | 125 | 257.0 |
| -17.2 | 1   | 33.8  | 2.2   | 36 | 96.8  | 21.7 | 71 | 159.8 | 54.4 | 130 | 266.0 |
| -16.7 | 2   | 35.6  | 2.8   | 37 | 98.6  | 22.2 | 72 | 161.6 | 57.2 | 135 | 275.0 |
| -16.1 | 3   | 37.4  | 3.3   | 38 | 100.4 | 22.8 | 73 | 163.4 | 60.0 | 140 | 284.0 |
| -15.6 | 4   | 39.2  | 3.9   | 39 | 102.2 | 23.3 | 74 | 165.2 | 62.7 | 145 | 293.0 |
| -15.0 | 5   | 41.0  | 4.4   | 40 | 104.0 | 23.9 | 75 | 167.0 | 65.6 | 150 | 302.0 |
| -14.4 | 6   | 42.8  | 5.0   | 41 | 105.8 | 24.4 | 76 | 168.8 | 68.3 | 155 | 311.0 |
| -13.9 | 7   | 44.6  | 5.6   | 42 | 107.6 | 25.0 | 77 | 170.6 | 71.1 | 160 | 320.0 |
| -13.3 | 8   | 46.4  | 6.1   | 43 | 109.4 | 25.6 | 78 | 172.4 | 73.9 | 165 | 329.0 |
| -12.8 | 9   | 48.2  | 6.7   | 44 | 111.2 | 26.1 | 79 | 174.2 | 76.7 | 170 | 338.0 |
| -12.2 | 10  | 50.0  | 7.2   | 45 | 113.0 | 26.7 | 80 | 176.0 | 79.4 | 172 | 347.0 |

# SECTION 1 GENERAL

|                                                 |      |
|-------------------------------------------------|------|
| Group 1 Safety Hints .....                      | 1-1  |
| Group 2 Specifications .....                    | 1-10 |
| Group 3 Operational Checkout Record Sheet ..... | 1-23 |

# SECTION 1 GENERAL

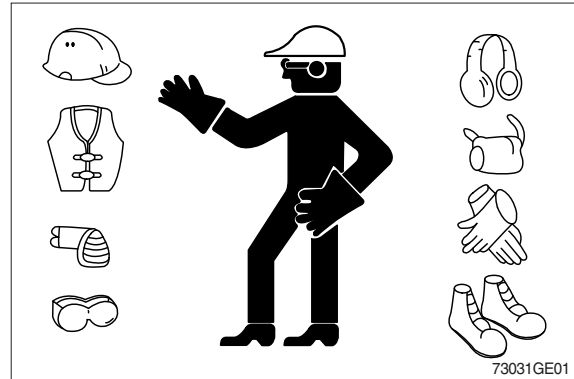
## GROUP 1 SAFETY HINTS

### FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; Do not attempt shortcuts.

### WEAR PROTECTIVE CLOTHING

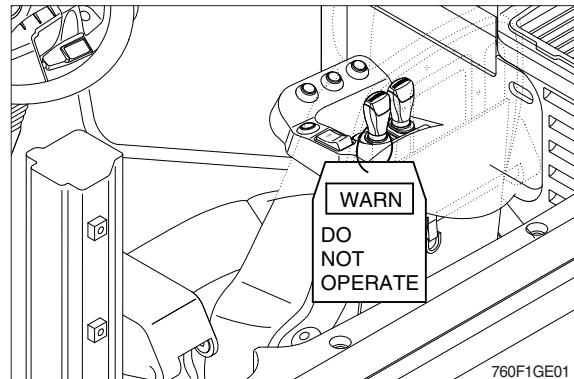
Wear close fitting clothing and safety equipment appropriate to the job.



### WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.

Before performing any work on the wheel loader, attach a 「Do Not Operate」 tag on the right side controller lever.



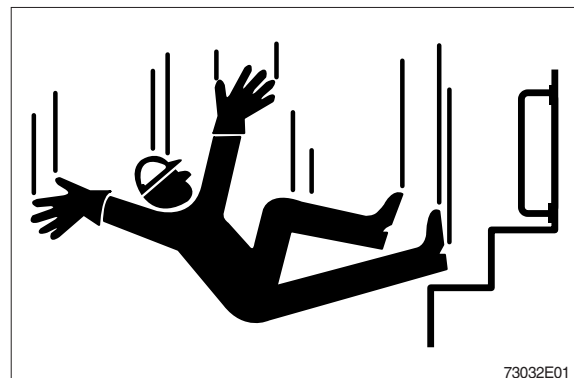
### USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.

When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.

Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.

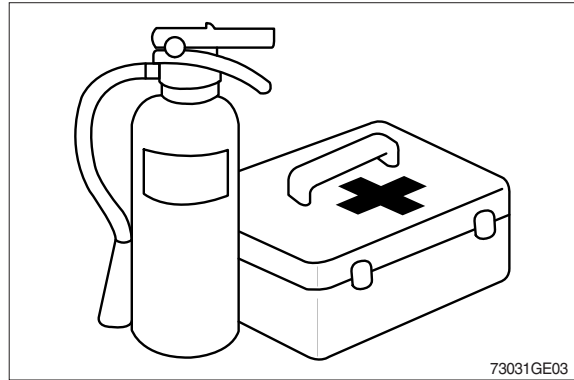


## PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

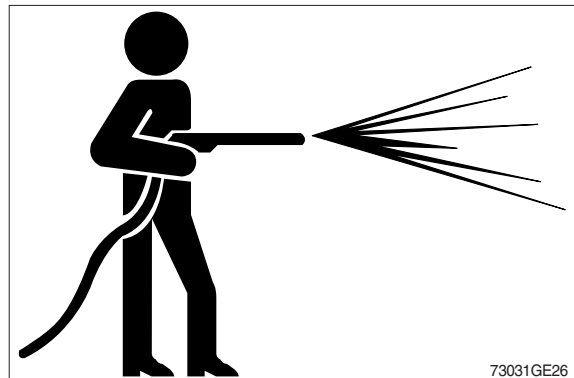
Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



## WORK IN CLEAN AREA

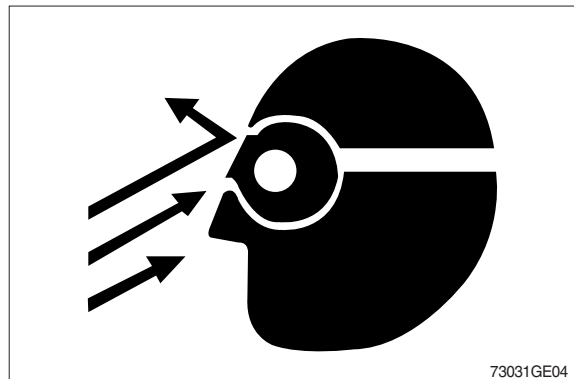
Before starting a job :

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; Do not attempt shortcuts.



## PROTECT AGAINST FLYING DEBRIS

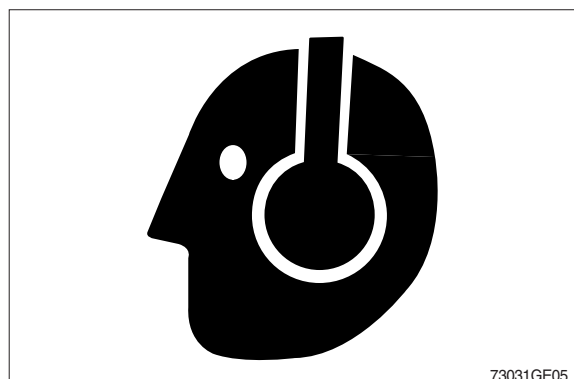
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



## PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

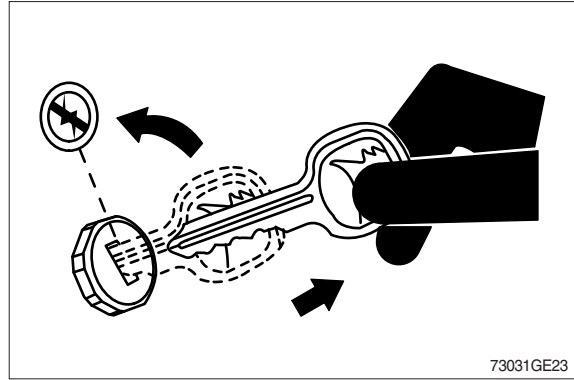
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



## PARK MACHINE SAFELY

Before working on the machine:

- Park machine on a level surface.
- Lower bucket to the ground.
- Turn key switch to OFF to stop engine. Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.



## SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.

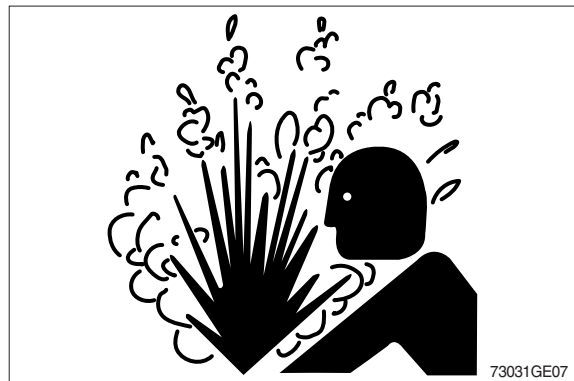
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



## SERVICE COOLING SYSTEM SAFELY

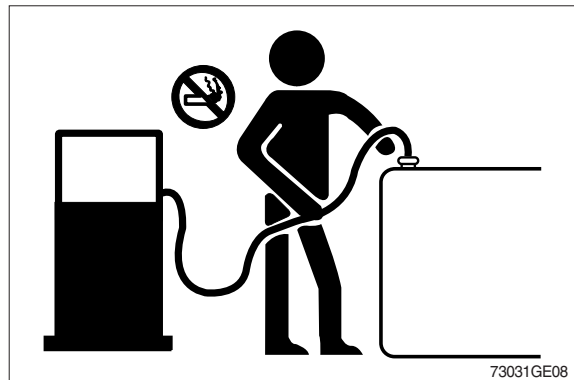
Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands.



## HANDLE FLUIDS SAFELY-AVOID FIRES

Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.

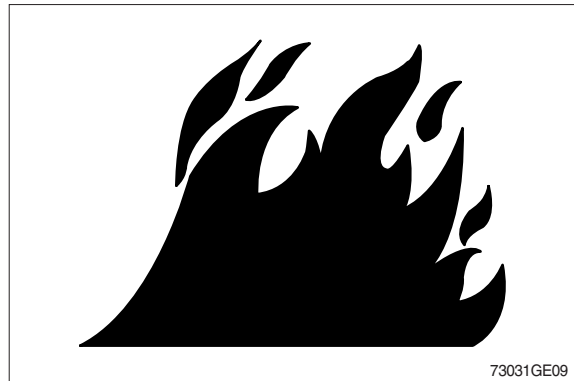




Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags ; They can ignite and burn spontaneously.



### **BEWARE OF EXHAUST FUMES**

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in a building, be positive there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.

### **REMOVE PAINT BEFORE WELDING OR HEATING**

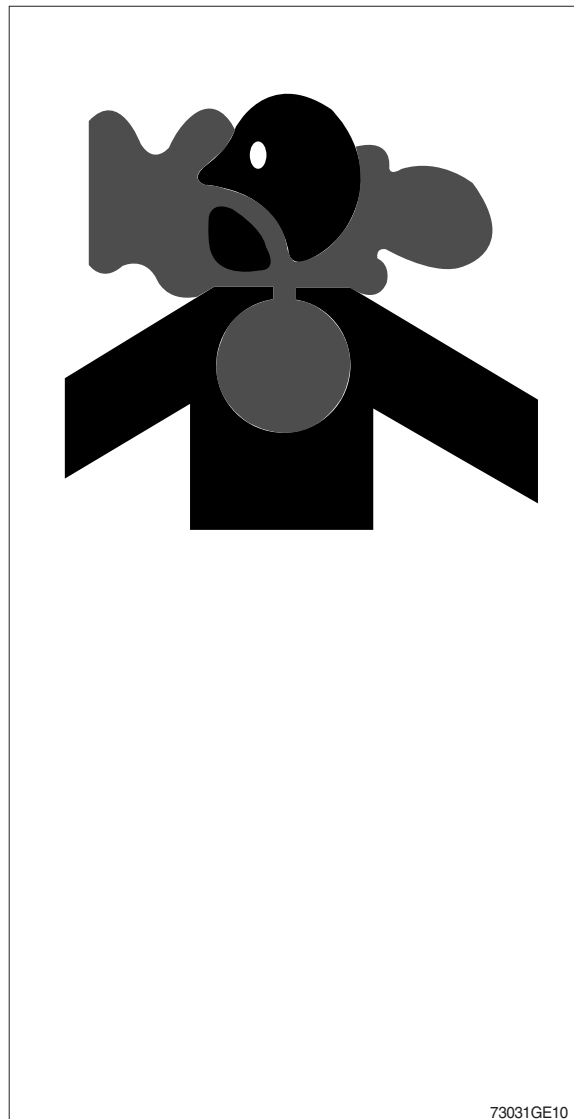
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

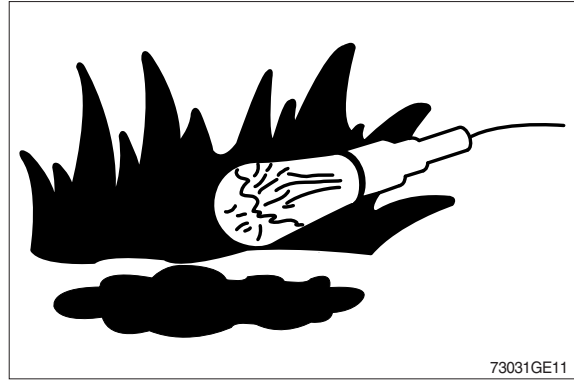
Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



### ILLUMINATE WORK AREA SAFELY

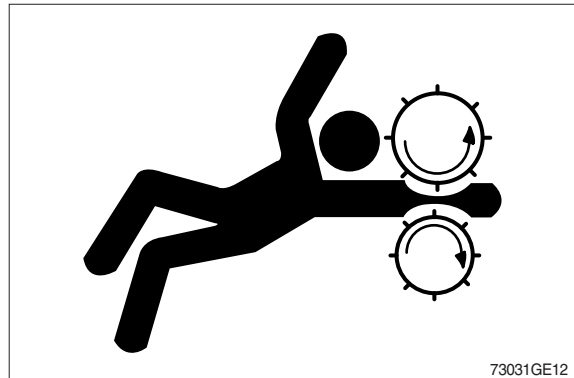
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



### SERVICE MACHINE SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

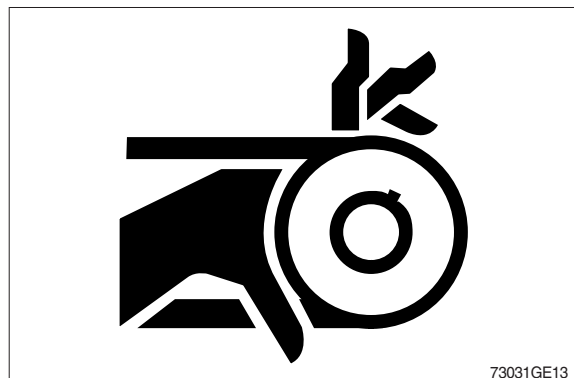
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



### STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

To prevent accidents, use care when working around rotating parts.



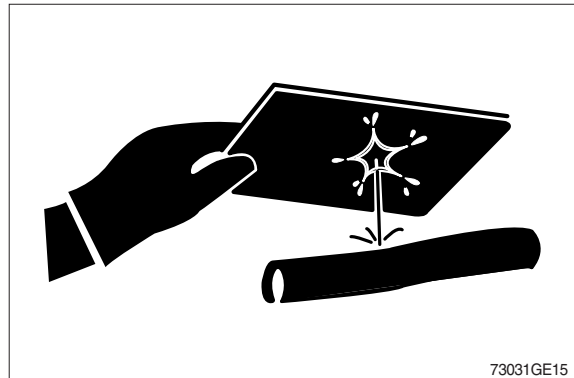
## AVOID HIGH PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

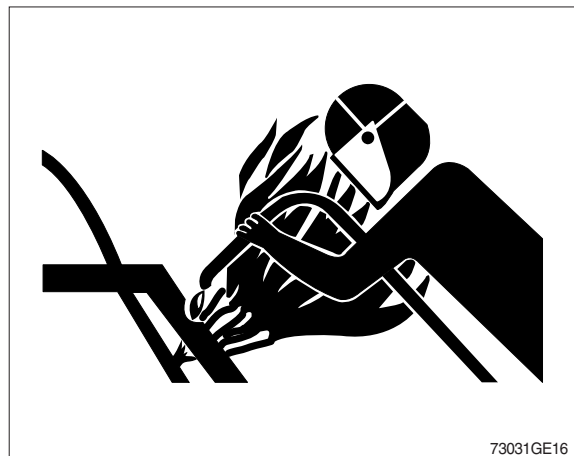
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.



## AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials.

Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area. Install fire resisting guards to protect hoses or other materials.



## PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

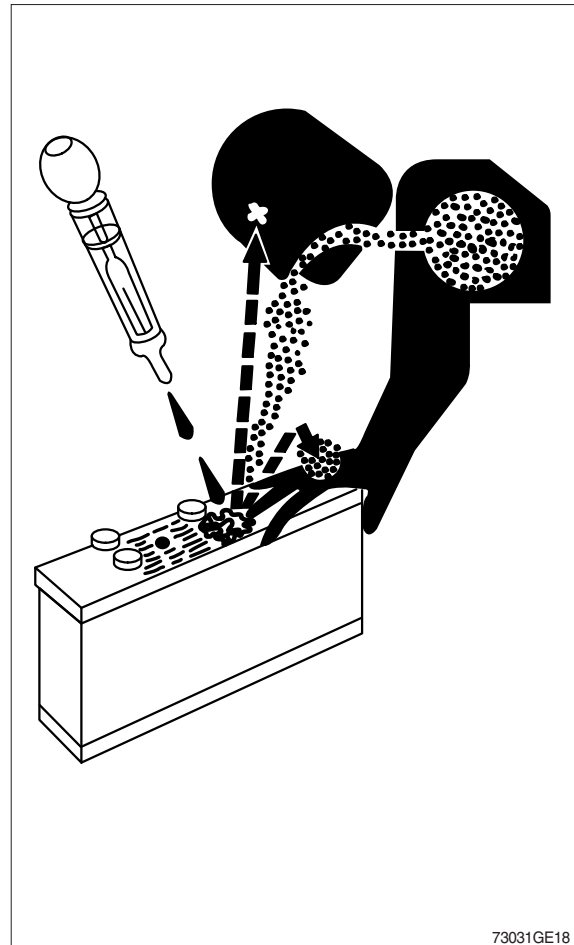
Do not charge a frozen battery; It may explode. Warm battery to 16°C (60°F).



## PREVENT ACID BURNS

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

1. Avoid the hazard by:
  2. Filling batteries in a well-ventilated area.
  3. Wearing eye protection and rubber gloves.  
Avoiding breathing fumes when electrolyte is added.
  4. Avoiding spilling or dripping electrolyte.
  5. Use proper jump start procedure.
1. If you spill acid on yourself:
  2. Flush your skin with water.  
Apply baking soda or lime to help neutralize the acid.
  3. Flush your eyes with water for 10-15 minutes.  
Get medical attention immediately.
1. If acid is swallowed:
  2. Drink large amounts of water or milk.  
Then drink milk of magnesia, beaten eggs, or vegetable oil.
  3. Get medical attention immediately.



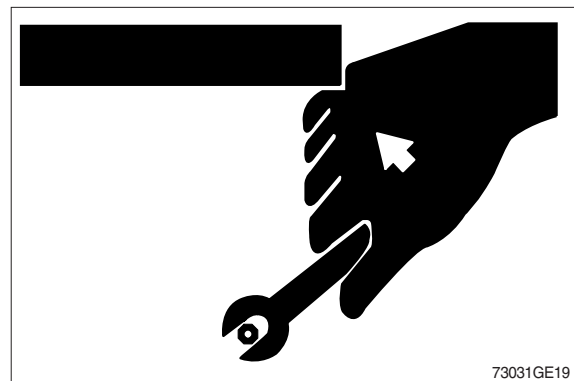
## USE TOOLS PROPERLY

Use tools appropriate to the work. Makeshift tools, parts, and procedures can create safety hazards.

Use power tools only to loosen threaded tools and fasteners.

For loosening and tightening hardware, use the correct size tools. Avoid bodily injury caused by slipping wrenches.

Use only recommended replacement parts. (See Parts catalogue.)



## SERVICE TIRES SAFELY

Explosive separation of a tire and rim parts can cause serious injury or death.

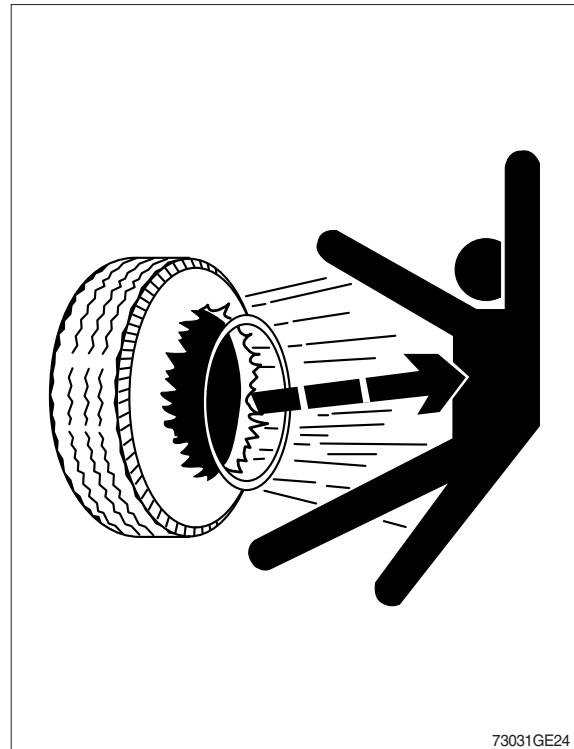
Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion.

Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and not in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

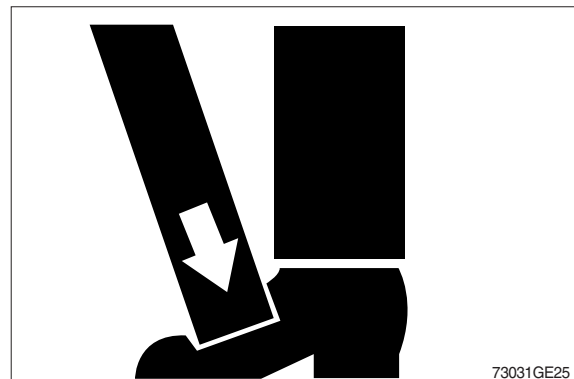


73031GE24

## USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



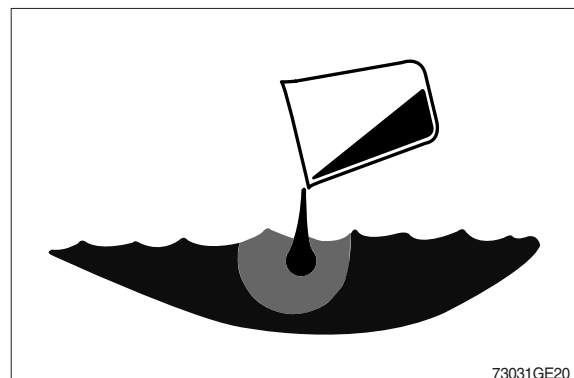
73031GE25

## DISPOSE OF FLUIDS PROPERLY

Improperly disposing of fluids can harm the environment and ecology. Before draining any fluids, find out the proper way to dispose of waste from your local environmental agency.

Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

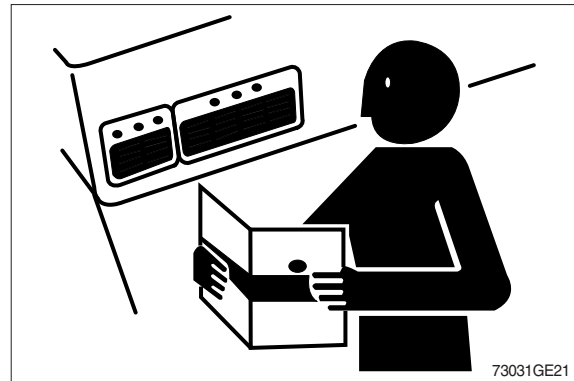
DO NOT pour oil into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, batteries, and other harmful waste.



73031GE20

## REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



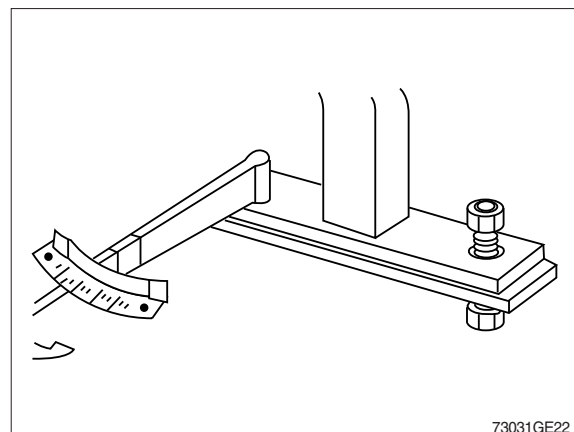
## LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

## KEEP ROPS INSTALLED PROPERLY

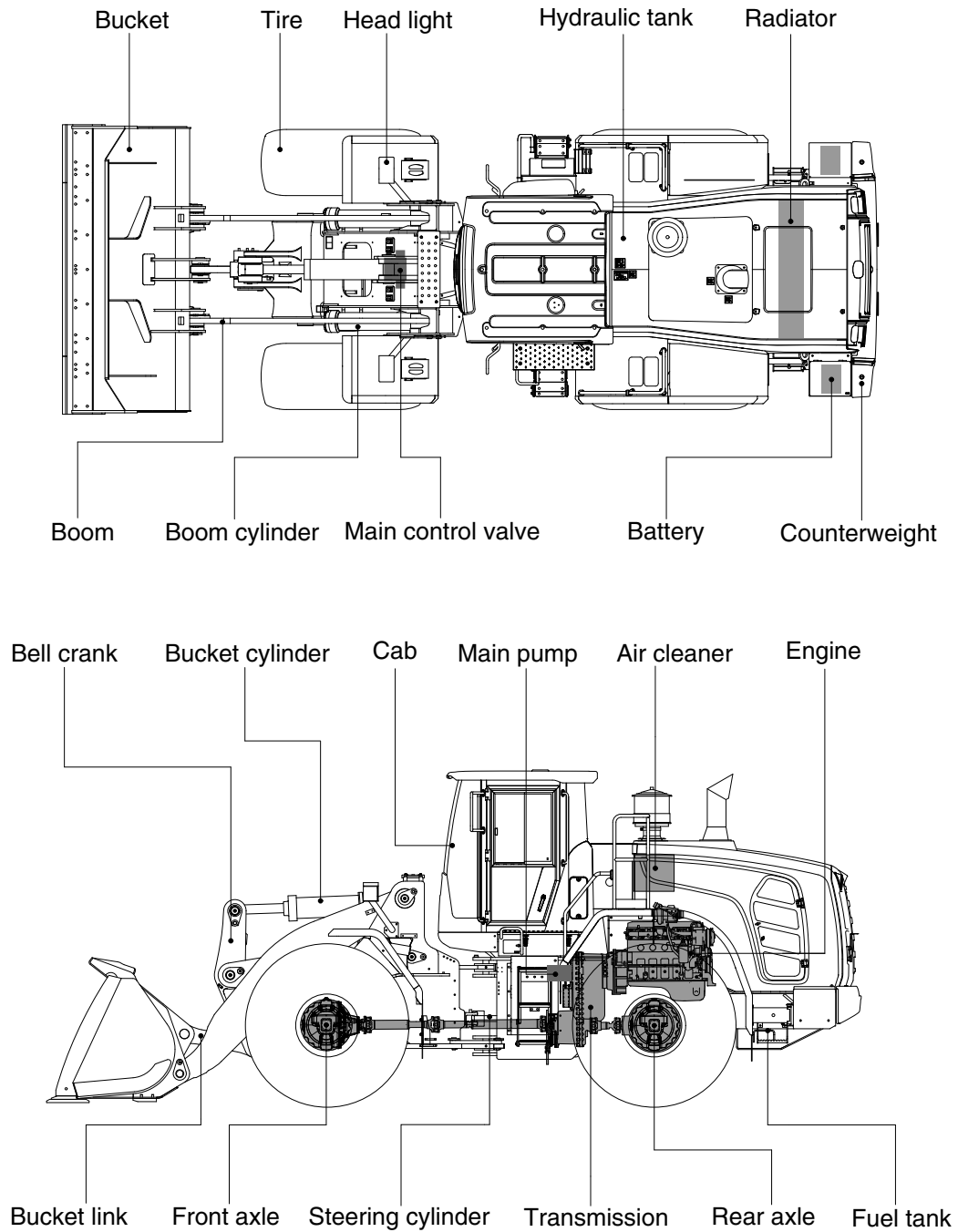
Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting. A damaged ROPS should be replaced, not reused.



## GROUP 2 SPECIFICATIONS

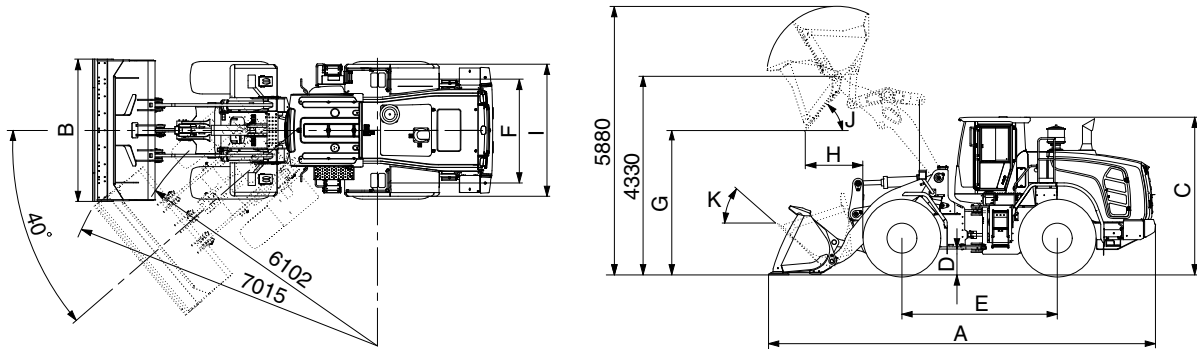
### 1. MAJOR COMPONENT



770F2SE01

## 2. SPECIFICATIONS

### 1) WITH BOLT-ON CUTTING EDGE TYPE BUCKET (HL970)

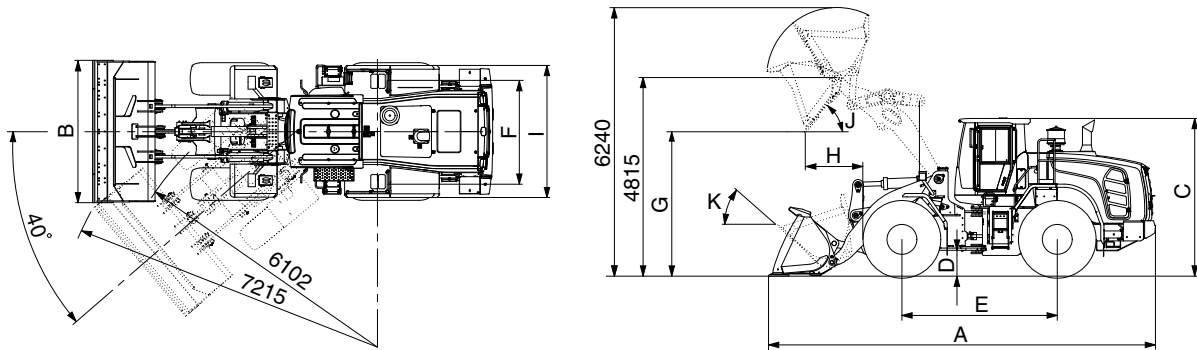


770F2SE03

| Description                                     |                  | Unit                              | Specification |    |
|-------------------------------------------------|------------------|-----------------------------------|---------------|----|
| Operating weight                                |                  | kg (lb)                           | 23500 (51810) |    |
| Bucket capacity                                 | Struck           | m <sup>3</sup> (yd <sup>3</sup> ) | 3.6 (4.7)     |    |
|                                                 | Heaped           |                                   | 4.2 (5.5)     |    |
| Overall length                                  | A                | mm (ft-in)                        | 8740 (28' 8") |    |
| Overall width                                   | B                |                                   | 3100 (10' 2") |    |
| Overall height                                  | C                |                                   | 3590 (11' 9") |    |
| Ground clearance                                | D                |                                   | 480 (1' 7")   |    |
| Wheelbase                                       | E                |                                   | 3500 (11' 6") |    |
| Tread                                           | F                |                                   | 2300 (7' 7")  |    |
| Dump clearance at 45°                           | G                |                                   | 3080 (10' 1") |    |
| Dump reach (full lift)                          | H                |                                   | 1270 (4' 2")  |    |
| Width over tires                                | I                |                                   | 2975 (9' 9")  |    |
| Dump angle                                      | J                |                                   | degree (°)    | 50 |
| Roll back angle (carry position)                | K                |                                   |               | 47 |
| Cycle time                                      | Lift (with load) | sec                               | 5.7           |    |
|                                                 | Dump (with load) |                                   | 1.4           |    |
|                                                 | Lower (empty)    |                                   | 3.1           |    |
| Maximum travel speed                            |                  | km/hr (mph)                       | 40.0 (24.9))  |    |
| Braking distance                                |                  | m (ft-in)                         | 13 (42' 8")   |    |
| Minimum turning radius (center of outside tire) |                  |                                   | 6.10 (20' 0") |    |
| Gradeability                                    |                  | degree (°)                        | 30            |    |
| Breakout force                                  |                  | kg (lb)                           | 21720 (47880) |    |
| Travel speed                                    | Forward          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
|                                                 |                  | Third gear                        | 27.2 (16.9)   |    |
|                                                 |                  | Fourth gear                       | 40.0 (24.9)   |    |
|                                                 | Reverse          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
| Third gear                                      |                  | 27.2 (16.9)                       |               |    |



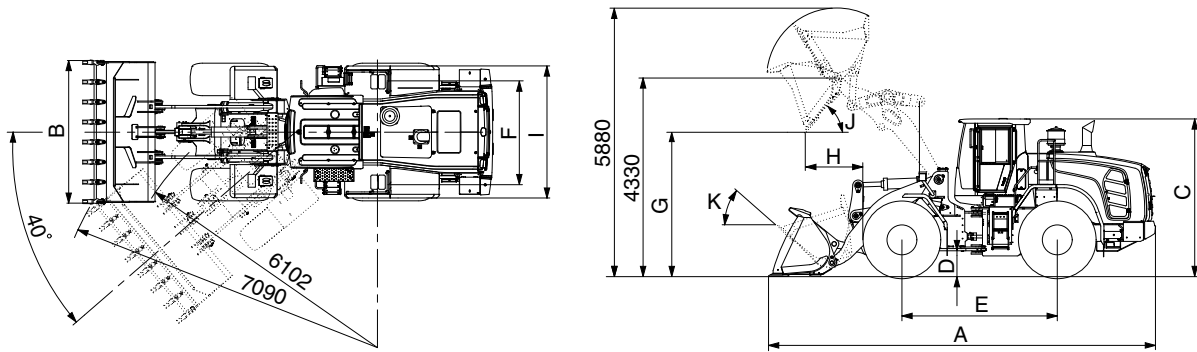
WITH BOLT-ON CUTTING EDGE TYPE BUCKET (HL970 XT)



770F2SE03-1

| Description                                     |                  | Unit                              | Specification |    |
|-------------------------------------------------|------------------|-----------------------------------|---------------|----|
| Operating weight                                |                  | kg (lb)                           | 24200 (53350) |    |
| Bucket capacity                                 | Struck           | m <sup>3</sup> (yd <sup>3</sup> ) | 3.6 (4.7)     |    |
|                                                 | Heaped           |                                   | 4.2 (5.5)     |    |
| Overall length                                  | A                | mm (ft-in)                        | 9270 (30' 5") |    |
| Overall width                                   | B                |                                   | 3100 (10' 2") |    |
| Overall height                                  | C                |                                   | 3560 (11' 8") |    |
| Ground clearance                                | D                |                                   | 480 (1' 7")   |    |
| Wheelbase                                       | E                |                                   | 3500 (11' 6") |    |
| Tread                                           | F                |                                   | 2300 (7' 7")  |    |
| Dump clearance at 45°                           | G                |                                   | 3570 (11' 9") |    |
| Dump reach (full lift)                          | H                |                                   | 1265 (4' 2")  |    |
| Width over tires                                | I                |                                   | 2975 (9' 9")  |    |
| Dump angle                                      | J                |                                   | degree (°)    | 50 |
| Roll back angle (carry position)                | K                |                                   |               | 48 |
| Cycle time                                      | Lift (with load) | sec                               | 5.8           |    |
|                                                 | Dump (with load) |                                   | 1.2           |    |
|                                                 | Lower (empty)    |                                   | 3.8           |    |
| Maximum travel speed                            |                  | km/hr (mph)                       | 40.0 (24.9)   |    |
| Braking distance                                |                  | m (ft-in)                         | 13 (42' 8")   |    |
| Minimum turning radius (center of outside tire) |                  |                                   | 6.10 (20' 0") |    |
| Gradeability                                    |                  | degree (°)                        | 30            |    |
| Breakout force                                  |                  | kg (lb)                           | 21700 (47840) |    |
| Travel speed                                    | Forward          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
|                                                 |                  | Third gear                        | 27.2 (16.9)   |    |
|                                                 |                  | Fourth gear                       | 40.0 (24.9)   |    |
|                                                 | Reverse          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
| Third gear                                      |                  | 27.2 (16.9)                       |               |    |

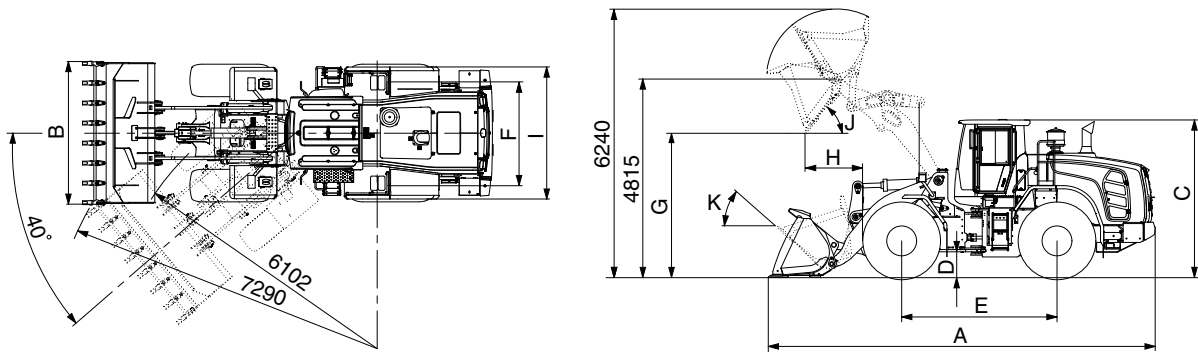
2) WITH TOOTH TYPE BUCKET (HL970)



770F2SE04

| Description                                     |                  | Unit                              | Specification |     |
|-------------------------------------------------|------------------|-----------------------------------|---------------|-----|
| Operating weight                                |                  | kg (lb)                           | 23400 (51590) |     |
| Bucket capacity                                 | Struck           | m <sup>3</sup> (yd <sup>3</sup> ) | 3.4 (4.4)     |     |
|                                                 | Heaped           |                                   | 4.0 (5.2)     |     |
| Overall length                                  | A                | mm (ft-in)                        | 8895 (29' 2") |     |
| Overall width                                   | B                |                                   | 3150 (10' 4") |     |
| Overall height                                  | C                |                                   | 3560 (11' 8") |     |
| Ground clearance                                | D                |                                   | 480 (1' 7")   |     |
| Wheelbase                                       | E                |                                   | 3500 (11' 6") |     |
| Tread                                           | F                |                                   | 2300 (7' 7")  |     |
| Dump clearance at 45°                           | G                |                                   | 2955 (9' 8")  |     |
| Dump reach (full lift)                          | H                |                                   | 1375 (4' 6")  |     |
| Width over tires                                | I                |                                   | 2975 (9' 9")  |     |
| Dump angle                                      | J                |                                   | degree (°)    | 50  |
| Roll back angle (carry position)                | K                |                                   |               | 48  |
| Cycle time                                      | Lift (with load) |                                   | sec           | 5.8 |
|                                                 | Dump (with load) | 1.2                               |               |     |
|                                                 | Lower (empty)    | 3.8                               |               |     |
| Maximum travel speed                            |                  | km/hr (mph)                       | 40.0 (24.9)   |     |
| Braking distance                                |                  | m (ft-in)                         | 13 (42' 8")   |     |
| Minimum turning radius (center of outside tire) |                  |                                   | 6.10 (20' 0") |     |
| Gradeability                                    |                  | degree (°)                        | 30            |     |
| Breakout force                                  |                  | kg (lb)                           | 22980 (50660) |     |
| Travel speed                                    | Forward          | First gear                        | 7.3 (4.5)     |     |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |     |
|                                                 |                  | Third gear                        | 27.2 (16.9)   |     |
|                                                 |                  | Fourth gear                       | 40.0 (24.9)   |     |
|                                                 | Reverse          | First gear                        | 7.3 (4.5)     |     |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |     |
| Third gear                                      |                  | 27.2 (16.9)                       |               |     |

**WITH TOOTH TYPE BUCKET (HL970 XT)**



770F2SE04-1

| Description                                     |                  | Unit                              | Specification |    |
|-------------------------------------------------|------------------|-----------------------------------|---------------|----|
| Operating weight                                |                  | kg (lb)                           | 24100 (53130) |    |
| Bucket capacity                                 | Struck           | m <sup>3</sup> (yd <sup>3</sup> ) | 3.4 (4.4)     |    |
|                                                 | Heaped           |                                   | 4.0 (5.2)     |    |
| Overall length                                  | A                | mm (ft-in)                        | 9440 (31' 0") |    |
| Overall width                                   | B                |                                   | 3150 (10' 4") |    |
| Overall height                                  | C                |                                   | 3560 (11' 8") |    |
| Ground clearance                                | D                |                                   | 480 (1' 7")   |    |
| Wheelbase                                       | E                |                                   | 3500 (11' 6") |    |
| Tread                                           | F                |                                   | 2300 (7' 7")  |    |
| Dump clearance at 45°                           | G                |                                   | 3695 (12' 1") |    |
| Dump reach (full lift)                          | H                |                                   | 1350 (4' 5")  |    |
| Width over tires                                | I                |                                   | 2975 (9' 9")  |    |
| Dump angle                                      | J                |                                   | degree (°)    | 50 |
| Roll back angle (carry position)                | K                |                                   |               | 48 |
| Cycle time                                      | Lift (with load) | sec                               | 5.8           |    |
|                                                 | Dump (with load) |                                   | 1.2           |    |
|                                                 | Lower (empty)    |                                   | 3.8           |    |
| Maximum travel speed                            |                  | km/hr (mph)                       | 40.0 (24.9)   |    |
| Braking distance                                |                  | m (ft-in)                         | 13 (42' 8")   |    |
| Minimum turning radius (center of outside tire) |                  |                                   | 6.10 (20' 0") |    |
| Gradeability                                    |                  | degree (°)                        | 30            |    |
| Breakout force                                  |                  | kg (lb)                           | 22980 (50660) |    |
| Travel speed                                    | Forward          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
|                                                 |                  | Third gear                        | 27.2 (16.9)   |    |
|                                                 | Reverse          | First gear                        | 7.3 (4.5)     |    |
|                                                 |                  | Second gear                       | 12.2 (7.6)    |    |
|                                                 |                  | Third gear                        | 27.2 (16.9)   |    |

### 3. WEIGHT

| Item                                                 | kg       | lb        |      |
|------------------------------------------------------|----------|-----------|------|
| Front frame assembly                                 | 2110     | 4650      |      |
| Rear frame assembly                                  | 2370     | 5220      |      |
| Front fender (LH & RH)                               | 76       | 168       |      |
| Counterweight (HL970)                                | 1100     | 2430      |      |
| Counterweight (HL970 XT)                             | 1600     | 3730      |      |
| Cab assembly                                         | 1070     | 2360      |      |
| Engine assembly                                      | 975      | 2150      |      |
| Transmission assembly (4-speed/5-speed)              | 760/810  | 1680/1790 |      |
| Drive shaft (front)                                  | 42       | 93        |      |
| Drive shaft (center)                                 | 37       | 82        |      |
| Drive shaft (rear)                                   | 21       | 46        |      |
| Front axle (include differential)                    | 1200     | 2650      |      |
| Rear axle (include differential)                     | 1090     | 2400      |      |
| Tire (26.5 R25, ★ L3)                                | 420      | 926       |      |
| Hydraulic tank assembly                              | 168      | 370       |      |
| Fuel tank assembly                                   | 384      | 847       |      |
| Main pump assembly                                   | 55       | 121       |      |
| Fan & brake pump assembly                            | 12       | 26        |      |
| Main control valve (2 spool/3 spool)                 | 34/41    | 75/90     |      |
| Flow amplifier                                       | 29       | 64        |      |
| Boom assembly                                        | HL970    | 1205      | 2660 |
|                                                      | HL970 XT | 1425      | 3140 |
| Bell crank assembly                                  | 360      | 794       |      |
| Bucket link                                          | 55       | 121       |      |
| 4.2 m <sup>3</sup> bucket, with bolt on cutting edge | 1830     | 4030      |      |
| 4.0 m <sup>3</sup> bucket, with tooth                | 1750     | 3860      |      |
| Boom cylinder assembly                               | 222      | 489       |      |
| Bucket cylinder assembly                             | 233      | 514       |      |
| Steering cylinder assembly                           | 29       | 64        |      |
| Seat                                                 | 80       | 176       |      |
| Battery                                              | 55       | 121       |      |

## 4. SPECIFICATION FOR MAJOR COMPONENTS

### 1) ENGINE

| Item                                | Specification                                         |
|-------------------------------------|-------------------------------------------------------|
| Model                               | Scania DC09                                           |
| Type                                | 4-cycle turbocharged, charge air cooled diesel engine |
| Control type                        | Electronic control                                    |
| Cooling method                      | Water cooling                                         |
| Number of cylinders and arrangement | 5 cylinders, in-line                                  |
| Firing order                        | 1-2-4-5-3                                             |
| Combustion chamber type             | Direct injection type                                 |
| Cylinder bore × stroke              | 130 × 140 mm (5.1" × 5.7")                            |
| Piston displacement                 | 9300 cc (568 cu in)                                   |
| Compression ratio                   | 17 : 1                                                |
| Rated gross horse power             | 311 hp at 2100 rpm                                    |
| Maximum gross torque (1200 rpm)     | 174 kgf · m (1259 lbf · ft)                           |
| Engine oil quantity                 | 36 ℓ (9.5 U.S. gal)                                   |
| Wet weight                          | 975 kg (2150 lb)                                      |
| High idling speed                   | 2100 ± 50 rpm                                         |
| Low idling speed                    | 800 ± 25 rpm                                          |
| Rated fuel consumption              | 210 g/kW · hr                                         |
| Starting motor                      | Nippondenso (24 V - 6.0 kW)                           |
| Alternator                          | Bosch (24 V - 100 Amp)                                |
| Battery                             | 2 × 12 V × 200 Ah                                     |

### 2) MAIN PUMP

| Item                       | Specification                      |                                    |
|----------------------------|------------------------------------|------------------------------------|
|                            | Steering                           | Loader                             |
| Type                       | Variable tandem piston pump        |                                    |
| Capacity                   | 110 cc/rev                         | 61 cc/rev                          |
| Maximum operating pressure | 210 kgf/cm <sup>2</sup> (2990 psi) | 280 kgf/cm <sup>2</sup> (3980 psi) |
| Rated oil quantity         | 208 ℓ /min (54.9 U.S.gpm)          | 115 ℓ /min (30.4 U.S.gpm)          |
| Maximum speed              | 2100 rpm                           |                                    |

### 3) FAN + BRAKE PUMP

| Item                       | Specification                      |
|----------------------------|------------------------------------|
| Type                       | Variable piston pump               |
| Capacity                   | 28 cc/rev                          |
| Maximum operating pressure | 250 kgf/cm <sup>2</sup> (3560 psi) |
| Rated oil quantity         | 63 l /min (16.6 U.S.gpm)           |
| Maximum speed              | 2100 rpm                           |

### 4) MAIN CONTROL VALVE

| Item                                  | Specification                      |
|---------------------------------------|------------------------------------|
| Type                                  | 2 spool                            |
| Operating method                      | Hydraulic pilot assist             |
| Main relief valve pressure            | 280 kgf/cm <sup>2</sup> (3980 psi) |
| Overload relief valve pressure        | 340 kgf/cm <sup>2</sup> (4840 psi) |
| Overload relief valve pressure (dump) | 310 kgf/cm <sup>2</sup> (4410 psi) |

### 5) ELECTRO-HYDRAULIC BLOCK

| Item            | Specification                        |
|-----------------|--------------------------------------|
| Type            | Proportional pressure reducing valve |
| Control current | 0~950 mA                             |
| Resistance      | 10.5 Ω                               |
| Normal flow     | 12 l /min (3.17 U.S.gpm)             |

### 6) REMOTE CONTROL VALVE (EH TYPE)

| Item              | Specification                           |
|-------------------|-----------------------------------------|
| Type              | Fingertip                               |
| Axle              | Single axle for boom, bucket, auxiliary |
| Operating voltage | 4.5~5.5 V                               |
| Output signal     | 0.5~4.5 V (neutral 2.5 V)               |

### 7) REMOTE CONTROL VALVE (FNR TYPE)

| Item           | Specification                                   |
|----------------|-------------------------------------------------|
| Type           | Joystick                                        |
| Axle           | Two axle for boom, bucket, roller for auxiliary |
| Operating type | CAN J1939                                       |
| Baud rate      | 500 kbps                                        |

## 8) CYLINDER

| Item                       |                             | Specification         |
|----------------------------|-----------------------------|-----------------------|
| Boom cylinder              | Bore dia × Rod dia × Stroke | ∅ 160 × ∅ 95 × 780 mm |
| Bucket cylinder (HL970)    | Bore dia × Rod dia × Stroke | ∅ 180 × ∅ 95 × 565 mm |
| Bucket cylinder (HL970 XT) | Bore dia × Rod dia × Stroke | ∅ 180 × ∅ 95 × 570 mm |
| Steering cylinder          | Bore dia × Rod dia × Stroke | ∅ 95 × ∅ 50 × 480 mm  |

## 9) DYNAMIC POWER TRANSMISSION DEVICES

| Item                       |                 | Specification                                                                                                                       |                                                  |
|----------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 4-speed transmission (std) | Model           | ZF 4WG 260                                                                                                                          |                                                  |
|                            | Type            | Converter                                                                                                                           | Single-stage, single-phase                       |
|                            |                 | Transmission                                                                                                                        | Full-automatic power shift                       |
|                            | Gear shift      | Forward fourth gear, reverse third gear                                                                                             |                                                  |
|                            | Control         | Electrical single lever type, kick-down system<br>Automatic kick down from 2nd to 1st gear<br>FNR switch on joystick lever (option) |                                                  |
|                            | Pump rated flow | 135 ℓ /min (35.7 U.S.gpm) at 2000 rpm                                                                                               |                                                  |
|                            | Travel speed    | See the page 2-2.                                                                                                                   |                                                  |
| 5-speed transmission (opt) | Model           | ZF 5WG 260                                                                                                                          |                                                  |
|                            | Type            | Converter                                                                                                                           | Single-stage, double-phase (with lock up clutch) |
|                            |                 | Transmission                                                                                                                        | Full-automatic power shift                       |
|                            | Gear shift      | Forward fifth gear, reverse third gear                                                                                              |                                                  |
|                            | Control         | Electrical single lever type, kick-down system<br>Automatic kick down from 2nd to 1st gear<br>FNR switch on joystick lever (option) |                                                  |
|                            | Pump rated flow | 135 ℓ /min (35.7 U.S.gpm) at 2000 rpm                                                                                               |                                                  |
|                            | Travel speed    | Forward 1/2/3/4/5                                                                                                                   | 7.2/12.4/19.7/28.1/40.0 km/hr                    |
| Reverse 1/2/3              |                 | 7.2/12.4/28.1 km/hr                                                                                                                 |                                                  |
| Axle                       | Drive devices   | 4-wheel drive                                                                                                                       |                                                  |
|                            | Front           | Front fixed location                                                                                                                |                                                  |
|                            | Rear            | Oscillation ± 11° of center pin-loaded                                                                                              |                                                  |
| Wheels                     | Tires           | 26.5 R25, ★(L3)                                                                                                                     |                                                  |
| Brakes                     | Travel          | Four-wheel, wet-disc type, full hydraulic                                                                                           |                                                  |
|                            | Parking         | Spring applied, hydraulic released brake on T/M                                                                                     |                                                  |
| Steering                   | Type            | Full hydraulic, articulated                                                                                                         |                                                  |
|                            | Steering angle  | 40° to both right and left angle, respectively                                                                                      |                                                  |

## 5. TIGHTENING TORQUE

Use following table for unspecified torque.

### 1) BOLT AND NUT

#### (1) Coarse thread

| Bolt size | 8.8T        |             | 10.9T       |             | 12.9T       |             |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
|           | kgf · m     | lbf · ft    | kgf · m     | lbf · ft    | kgf · m     | lbf · ft    |
| M 6×1.0   | 0.8 ~ 1.2   | 5.8 ~ 8.6   | 1.2 ~ 1.8   | 8.7 ~ 13.0  | 1.5 ~ 2.1   | 10.9 ~ 15.1 |
| M 8×1.25  | 2.0 ~ 3.0   | 14.5 ~ 21.6 | 2.8 ~ 4.2   | 20.3 ~ 30.4 | 3.4 ~ 5.0   | 24.6 ~ 36.1 |
| M10×1.5   | 4.0 ~ 6.0   | 29.0 ~ 43.3 | 5.6 ~ 8.4   | 40.5 ~ 60.8 | 6.8 ~ 10.0  | 49.2 ~ 72.3 |
| M12×1.75  | 6.8 ~ 10.2  | 50.0 ~ 73.7 | 9.6 ~ 14.4  | 69.5 ~ 104  | 12.3 ~ 16.5 | 89.0 ~ 119  |
| M14×2.0   | 10.9 ~ 16.3 | 78.9 ~ 117  | 16.3 ~ 21.9 | 118 ~ 158   | 19.5 ~ 26.3 | 141 ~ 190   |
| M16×2.0   | 17.9 ~ 24.1 | 130 ~ 174   | 25.1 ~ 33.9 | 182 ~ 245   | 30.2 ~ 40.8 | 141 ~ 295   |
| M18×2.5   | 24.8 ~ 33.4 | 180 ~ 241   | 34.8 ~ 47.0 | 252 ~ 340   | 41.8 ~ 56.4 | 302 ~ 407   |
| M20×2.5   | 34.9 ~ 47.1 | 253 ~ 340   | 49.1 ~ 66.3 | 355 ~ 479   | 58.9 ~ 79.5 | 426 ~ 575   |
| M22×2.5   | 46.8 ~ 63.2 | 339 ~ 457   | 65.8 ~ 88.8 | 476 ~ 642   | 78.9 ~ 106  | 570 ~ 766   |
| M24×3.0   | 60.2 ~ 81.4 | 436 ~ 588   | 84.6 ~ 114  | 612 ~ 824   | 102 ~ 137   | 738 ~ 991   |
| M30×3.5   | 120 ~ 161   | 868 ~ 1164  | 168 ~ 227   | 1216 ~ 1641 | 202 ~ 272   | 1461 ~ 1967 |

#### (2) Fine thread

| Bolt size | 8.8T        |             | 10.9T       |             | 12.9T       |             |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
|           | kgf · m     | lbf · ft    | kgf · m     | lbf · ft    | kgf · m     | lbf · ft    |
| M 8×1.0   | 2.1 ~ 3.1   | 15.2 ~ 22.4 | 3.0 ~ 4.4   | 21.7 ~ 31.8 | 3.6 ~ 5.4   | 26.1 ~ 39.0 |
| M10×1.25  | 4.2 ~ 6.2   | 30.4 ~ 44.9 | 5.9 ~ 8.7   | 42.7 ~ 62.9 | 7.0 ~ 10.4  | 50.1 ~ 75.2 |
| M12×1.25  | 7.3 ~ 10.9  | 52.8 ~ 78.8 | 10.3 ~ 15.3 | 74.5 ~ 110  | 13.1 ~ 17.7 | 94.8 ~ 128  |
| M14×1.5   | 12.4 ~ 16.6 | 89.7 ~ 120  | 17.4 ~ 23.4 | 126 ~ 169   | 20.8 ~ 28.0 | 151 ~ 202   |
| M16×1.5   | 18.7 ~ 25.3 | 136 ~ 182   | 26.3 ~ 35.5 | 191 ~ 256   | 31.6 ~ 42.6 | 229 ~ 308   |
| M18×1.5   | 27.1 ~ 36.5 | 196 ~ 264   | 38.0 ~ 51.4 | 275 ~ 371   | 45.7 ~ 61.7 | 331 ~ 446   |
| M20×1.5   | 37.7 ~ 50.9 | 273 ~ 368   | 53.1 ~ 71.7 | 384 ~ 518   | 63.6 ~ 86.0 | 460 ~ 622   |
| M22×1.5   | 51.2 ~ 69.2 | 370 ~ 500   | 72.0 ~ 97.2 | 521 ~ 703   | 86.4 ~ 116  | 625 ~ 839   |
| M24×2.0   | 64.1 ~ 86.5 | 464 ~ 625   | 90.1 ~ 121  | 652 ~ 875   | 108 ~ 146   | 782 ~ 1056  |
| M30×2.0   | 129 ~ 174   | 933 ~ 1258  | 181 ~ 245   | 1310 ~ 1772 | 217 ~ 294   | 1570 ~ 2126 |



**2) PIPE AND HOSE (FLARE type)**

| 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      |

**3) PIPE AND HOSE (ORFS type)**

| Thread size | 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                                     | Torque    |            |             |
|-----|--------------------|-----------------------------------------------|-----------|------------|-------------|
|     |                    |                                               | kgf · m   | lbf · ft   |             |
| 1   | Engine             | Engine mounting bolt, nut (rubber, 2EA)       | M24×3.0   | 76.5 ± 7.7 | 553 ± 55.7  |
| 2   |                    | Engine mounting bolt (bracket, 8EA)           | M16×1.5   | 28.6 ± 4.3 | 207 ± 31.1  |
| 3   |                    | Engine mounting bolt (T/C housing, 11EA)      | M10×1.5   | 6.63 ± 1.0 | 48 ± 7.2    |
| 4   |                    | Engine mounting socket bolt (flywheel, 8EA)   | M10×1.5   | 4.6 ± 0.7  | 33.3 ± 5.1  |
| 5   |                    | Fan motor mounting bolt                       | M12×1.75  | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 6   |                    | Radiator mounting bolt                        | M16×2.0   | 29.7 ± 5.9 | 215 ± 42.7  |
| 7   |                    | Fuel tank mounting bolt, nut                  | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 8   | Hydraulic system   | Main pump housing mounting bolt               | M14×2.0   | 19.6 ± 2.9 | 142 ± 21.0  |
| 9   |                    | Fan & Brake pump housing mounting bolt        | M12×1.75  | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 10  |                    | Main control valve mounting bolt              | M12×1.75  | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 11  |                    | Steering unit mounting bolt                   | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 12  |                    | Flow amplifier mounting bolt                  | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 13  |                    | Brake valve mounting bolt                     | M8×1.25   | 2.5 ± 0.5  | 18.1 ± 3.6  |
| 14  |                    | Cut-off valve mounting bolt                   | M8×1.25   | 2.5 ± 0.5  | 18.1 ± 3.6  |
| 15  |                    | EH control block mounting bolt                | M8×1.25   | 2.5 ± 0.5  | 18.1 ± 3.6  |
| 16  |                    | Safety valve                                  | M10×1.5   | 6.9 ± 1.4  | 50 ± 10.1   |
| 17  |                    | Hydraulic oil tank mounting bolt              | M16×2.0   | 29.7 ± 4.5 | 215 ± 32.5  |
| 18  | Power train system | Transmission mounting bolt, nut (rubber, 4EA) | M24×3.0   | 76.5 ± 7.7 | 553 ± 55.7  |
| 19  |                    | Transmission mounting bolt (bracket, 8EA)     | M20×2.5   | 46.3 ± 7.0 | 335 ± 50.6  |
| 20  |                    | Front axle mounting bolt, nut                 | M33×2.0   | 225 ± 20   | 1627 ± 145  |
| 21  |                    | Rear axle support mounting bolt, nut          | M36×3.0   | 280 ± 30   | 2025 ± 217  |
| 22  |                    | Tire mounting nut                             | M22×1.5   | 79 ± 2.5   | 571 ± 18.1  |
| 23  |                    | Drive shaft joint mounting bolt               | 1/2-20UNF | 15 ± 2.0   | 108 ± 14.5  |
| 24  | Others             | Counterweight mounting bolt                   | M30×3.5   | 199 ± 30   | 1439 ± 216  |
| 25  |                    | Operator's seat mounting bolt                 | M8×1.25   | 3.4 ± 0.8  | 24.6 ± 5.0  |
| 26  |                    | ROPS Cab mounting bolt (4EA)                  | M30×3.5   | 199 ± 29.9 | 1440 ± 216  |
|     |                    | ROPS Cab mounting nut (4EA)                   | M16×2.0   | 20.5 ± 4.7 | 148 ± 34    |

## 6. RECOMMENDED LUBRICANTS

Use only oils listed below.

Do not mix different brand oil.

| Service point             | Kind of fluid                                      | Capacity<br>ℓ (U.S. gal)                     | Ambient temperature °C (°F)                                  |              |             |             |           |            |            |
|---------------------------|----------------------------------------------------|----------------------------------------------|--------------------------------------------------------------|--------------|-------------|-------------|-----------|------------|------------|
|                           |                                                    |                                              | -50<br>(-58)                                                 | -30<br>(-22) | -20<br>(-4) | -10<br>(14) | 0<br>(32) | 10<br>(50) | 20<br>(68) |
| Engine oil pan            | Engine oil                                         | 36 (9.5)                                     | SAE 0W-20, 0W-30                                             |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 0W-40, 5W-40                                             |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 5W-20, 5W-30                                             |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 15W-30                                                   |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 10W-40                                                   |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 15W-40                                                   |              |             |             |           |            |            |
| DEF/<br>AdBlue®<br>tank   | Mixture of urea and deionized water                | 45 (11.9)                                    | ISO 22241, High-purity urea + deionized water (32.5 : 67.5)  |              |             |             |           |            |            |
| Transmission              | Engine oil                                         | 43 (11.4)                                    | SAE 10W-30                                                   |              |             |             |           |            |            |
|                           |                                                    |                                              | SAE 15W-40                                                   |              |             |             |           |            |            |
| Axle* <sup>4</sup>        | UTTO                                               | Front : 51 (13.5)<br>Rear : 40 (10.6)        | *Refer to below list                                         |              |             |             |           |            |            |
| Hydraulic tank            | Hydraulic oil                                      | Tank:<br>152 (40.2)<br>System:<br>276 (72.9) | * <sup>2</sup> ISO VG 15                                     |              |             |             |           |            |            |
|                           |                                                    |                                              | ISO VG 46, HBHO VG 46* <sup>4</sup>                          |              |             |             |           |            |            |
|                           |                                                    |                                              | ISO VG 68                                                    |              |             |             |           |            |            |
| Fuel tank                 | Diesel fuel* <sup>1</sup>                          | 365 (96.4)                                   | * <sup>2</sup> ASTM D975 NO.1                                |              |             |             |           |            |            |
|                           |                                                    |                                              | ASTM D975 NO.2                                               |              |             |             |           |            |            |
| Fitting (grease nipple)   | Grease                                             | As required                                  | * <sup>2</sup> NLGI NO.1                                     |              |             |             |           |            |            |
|                           |                                                    |                                              | NLGI NO.2                                                    |              |             |             |           |            |            |
| Radiator (reservoir tank) | Mixture of antifreeze and soft water* <sup>3</sup> | 48 (12.7)                                    | Ethylene glycol base permanent type (50 : 50)                |              |             |             |           |            |            |
|                           |                                                    |                                              | * <sup>2</sup> Ethylene glycol base permanent type (60 : 40) |              |             |             |           |            |            |

**SAE** : Society of Automotive Engineers

**API** : American Petroleum Institute

**ISO** : International Organization for Standardization

**NLGI** : National Lubricating Grease Institute

**ASTM** : American Society of Testing and Material

**UTTO** : Universal Tractor Transmission Oil

**DEF** : Diesel Exhaust Fluid

DEF compatible with AdBlue®

\*<sup>1</sup> Ultra low sulfur diesel

- sulfur content ≤ 15 ppm

\* : Recommended oil list

- BP TERRAC SUPER TRANSMISSION 10W-30

- CASTROL AGRI TRANS PLUS 10W-30

- MOBILFLUID 426

- SHELL DONAX TD 10W-30

- TOTAL DYNATRANS MPV

\*<sup>2</sup> : Cold region

Russia, CIS, Mongolia

\*<sup>3</sup> : Soft water

City water or distilled water

\*<sup>4</sup> : Hyundai Bio Hydraulic Oil

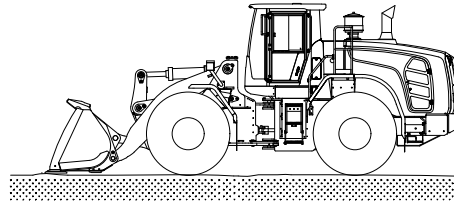
- For more information, contact HYUNDAI dealers.

## GROUP 3 OPERATIONAL CHECKOUT RECORD SHEET

- Owner : \_\_\_\_\_
- Date : \_\_\_\_\_
- Hours : \_\_\_\_\_
- Serial No. : \_\_\_\_\_
- Technician : \_\_\_\_\_

※ Use this sheet to record operational checkout results.

Perform the operational check before installing any test equipment.



770F1GE02

| Item | OK | NOT<br>OK | Comments |
|------|----|-----------|----------|
|------|----|-----------|----------|

### 1. Monitor indicator and gauge checks (engine OFF)

- Hourmeter and gauge check  OK  NOT OK \_\_\_\_\_
- Battery check  OK  NOT OK \_\_\_\_\_
- Monitor indicator circuit check  OK  NOT OK \_\_\_\_\_
- Cluster turn signals and warning indicator check  OK  NOT OK \_\_\_\_\_

### 2. Transmission, axle and engine, neutral start switch and reverse warning alarm switch checks

- Transmission control lever and neutral  OK  NOT OK \_\_\_\_\_
- Neutral start and reverse warning  OK  NOT OK \_\_\_\_\_
- Alarm circuit checks  OK  NOT OK \_\_\_\_\_

### 3. Monitor indicator and gauge checks (engine running)

- Monitor display and alternator output checks  OK  NOT OK \_\_\_\_\_
- Monitor bypass circuit and seat belt indicator check  OK  NOT OK \_\_\_\_\_
- Monitor primary and secondary level check  OK  NOT OK \_\_\_\_\_
- Transmission oil warm up procedure  OK  NOT OK \_\_\_\_\_
- Transmission temperature gauge check  OK  NOT OK \_\_\_\_\_

#### 4. Brake system and clutch cut off checks

- Park brake capacity check   \_\_\_\_\_
- Park brake transmission lockout check   \_\_\_\_\_
- Service brake pump flow check   \_\_\_\_\_
- Service brake capacity check   \_\_\_\_\_
- Brake accumulator precharge check   \_\_\_\_\_
- Brake system leakage check   \_\_\_\_\_
- Service brake pedal check   \_\_\_\_\_
- Service and park brake system drag check   \_\_\_\_\_
- Clutch cut off check   \_\_\_\_\_

#### 5. Driving checks

- Transmission oil warm up procedure   \_\_\_\_\_
- Transmission noise check   \_\_\_\_\_
- Speedometer check   \_\_\_\_\_
- Transmission kick down system check   \_\_\_\_\_
- 1st, 2nd, 3rd and 4th speed clutch pack drag check   \_\_\_\_\_
- Transmission pressure, pump flow and leakage check   \_\_\_\_\_
- Transmission shift modulation check   \_\_\_\_\_
- Torque converter check   \_\_\_\_\_
- Engine power check   \_\_\_\_\_

#### 6. Hydraulic system checks

- Hydraulic system warm up procedure   \_\_\_\_\_
- Hydraulic pump performance check   \_\_\_\_\_
- Pilot control valve boom float check   \_\_\_\_\_
- Boom down solenoid valve check   \_\_\_\_\_
- Control valve lift check   \_\_\_\_\_
- Bucket rollback circuit relief valve check   \_\_\_\_\_
- Bucket dump circuit relief
  - Low pressure check   \_\_\_\_\_
  - High pressure check   \_\_\_\_\_
- Boom and bucket cylinder drift check   \_\_\_\_\_
- Boom down solenoid valve leakage check   \_\_\_\_\_
- Pilot controller check   \_\_\_\_\_
- Return to dig check   \_\_\_\_\_
- Boom height kickout check-if equipped   \_\_\_\_\_

## 7. Steering system checks

- Steering unit check   \_\_\_\_\_
- Steering system leakage check   \_\_\_\_\_
- Steering valve (EHPS)  
  Low check pressure   \_\_\_\_\_
- High check pressure   \_\_\_\_\_

## 8. Accessory checks

- Operating lights check   \_\_\_\_\_
- Work light check   \_\_\_\_\_
- Brake light check   \_\_\_\_\_
- Cab light check   \_\_\_\_\_
- Horn circuit check   \_\_\_\_\_
- Windshield washer and wiper check   \_\_\_\_\_
- Defroster blower check   \_\_\_\_\_
- Heater/Air conditioner blower check   \_\_\_\_\_
- Heater functional check   \_\_\_\_\_
- Air conditioner functional check   \_\_\_\_\_
- Start aid system check   \_\_\_\_\_

## 9. Cab components and vandal protection checks

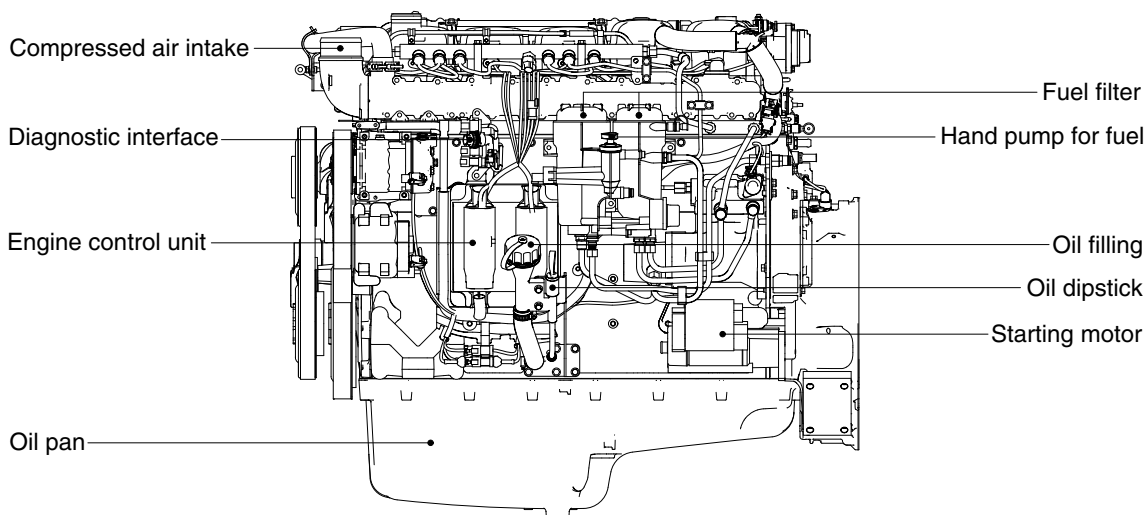
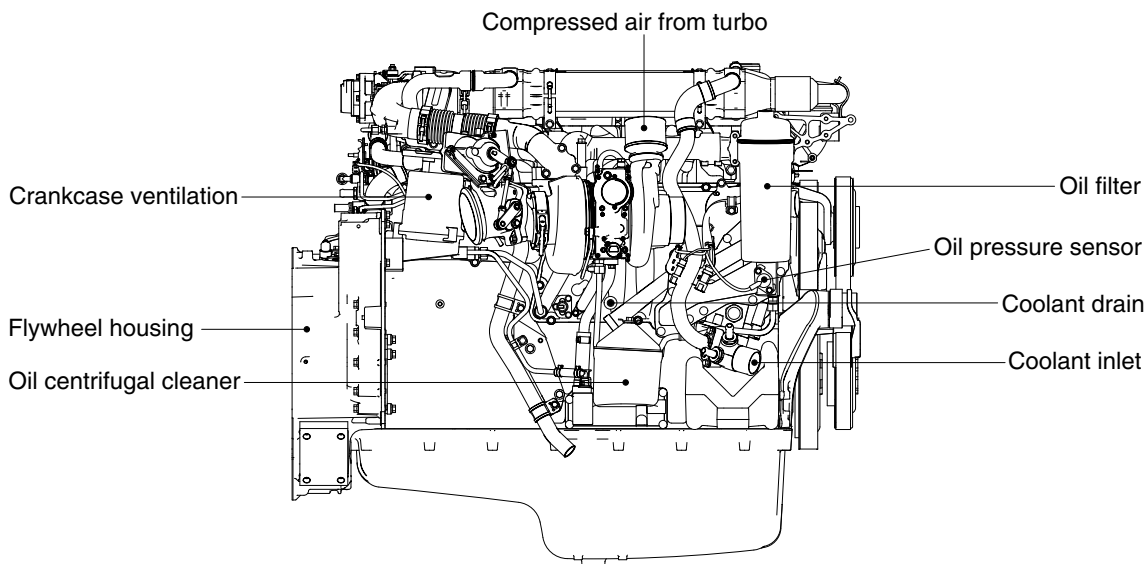
- Cab door latch check   \_\_\_\_\_
- Cab door hold open latch check   \_\_\_\_\_
- Cab door release button check   \_\_\_\_\_
- Cab door lock check   \_\_\_\_\_
- Cab door window check   \_\_\_\_\_
- Cab window latch check   \_\_\_\_\_
- Steering column adjustment check   \_\_\_\_\_
- Seat and seat belt check   \_\_\_\_\_
- Air intake filter door check   \_\_\_\_\_
- Engine side panels check   \_\_\_\_\_
- Radiator cap access door check   \_\_\_\_\_
- Frame locking bar check   \_\_\_\_\_
- Boom lock check   \_\_\_\_\_
- Service decal check   \_\_\_\_\_

## SECTION 2 ENGINE

|                                          |     |
|------------------------------------------|-----|
| Group 1 Structure and Function .....     | 2-1 |
| Group 2 Engine speed and Stall rpm ..... | 2-3 |

## GROUP 1 STRUCTURE AND FUNCTION

### 1. STRUCTURE



770F2EG01

- Direct 4-stroke, 5-cylinders, water-cooling and charge air cooled diesel engine in installed, cylinder block and cylinder head are made of case iron and turbocharger is attached.



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