

# **KOBELCO**

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## **UR Series**

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# **SERVICEMAN HANDBOOK**

**SK30UR-2**

PR 03-02501~

**SK50UR-2**

YJ 02-04001~

**SK 75UR-2**

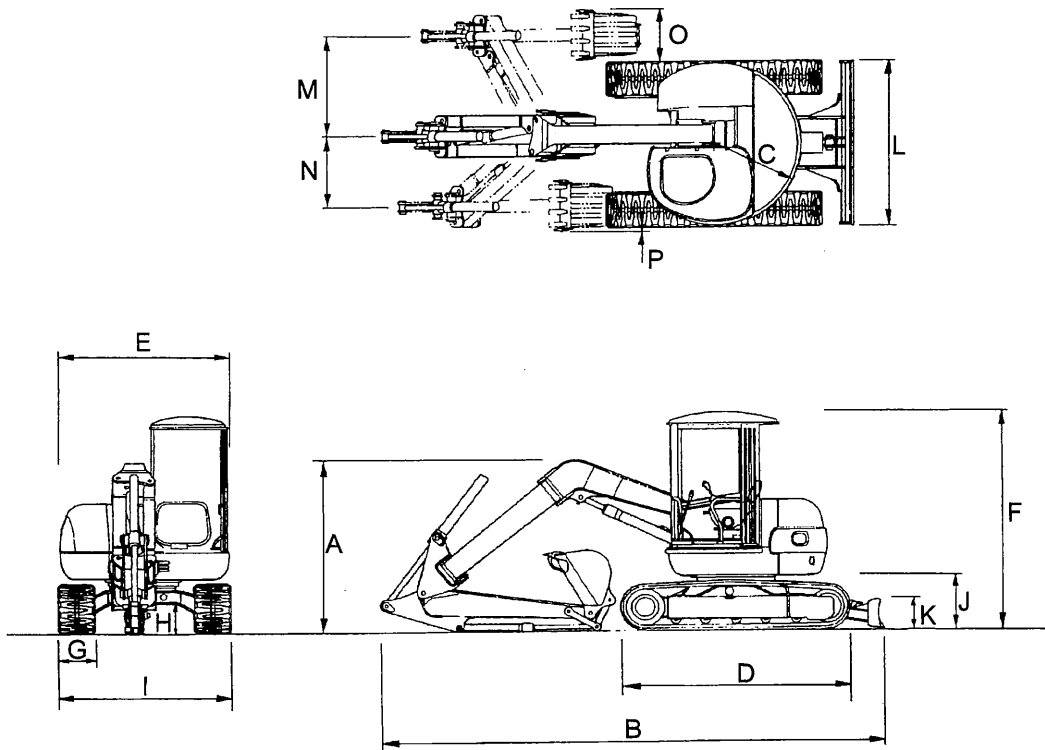
YR 03-02801~



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## 1. DIMENSIONS IN TRANSPORTATION



Unit : mm

|          | Arm   | A     | B     | C      | D     | E     | F     | G   | H   | I     | J   | K   | L     | M     | N     | O   | P   |
|----------|-------|-------|-------|--------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|-------|-----|-----|
| SK30UR-2 | 1,220 | 1,575 | 4,380 | R775   | 2,010 | 1,525 | 2,400 | 300 | 310 | 1,550 | 570 | 350 | 1,550 | 860   | 745   | 475 | 40  |
|          | 1,580 | 1,590 | 4,370 |        |       |       |       |     |     |       |     |     |       |       |       |     |     |
| SK50UR-2 | 1,910 | 2,000 | 5,570 | R990   | 2,500 | 1,960 | 2,550 | 400 | 330 | 1,980 | 635 | 355 | 1,980 | 1,205 | 850   | 630 | 45  |
|          | 1,530 | 1,980 | 5,560 |        |       |       |       |     |     |       |     |     |       |       |       |     |     |
| SK75UR-2 | 1,760 | 2,200 | 6,070 | R1,075 | 2,800 | 2,170 | 2,760 | 450 | 380 | 2,320 | 750 | 500 | 2,320 | 1,370 | 1,005 | 690 | 115 |
|          | 2,060 | 2,210 | 6,085 |        |       |       |       |     |     |       |     |     |       |       |       |     |     |

## 2. MACHINE SPECIFICATIONS

| Model           |                                          |                     | SK30UR-2                                          | SK50UR-2                                 | SK75UR-2                           |         |
|-----------------|------------------------------------------|---------------------|---------------------------------------------------|------------------------------------------|------------------------------------|---------|
| Item            |                                          |                     |                                                   |                                          |                                    |         |
| Performance     | Heaped capacity of bucket                |                     | m <sup>3</sup>                                    | 0.07                                     | 0.16                               | 0.28    |
|                 | Travel speed                             | Rubber crawler      | km/h(low/high)                                    | 3.0/5.1                                  | 3.0/5.0                            | 3.5/5.6 |
|                 |                                          | Iron crawler        | km/h(low/high)                                    | 2.8/4.8                                  | 2.7/4.6                            | 3.3/5.4 |
|                 | Slewing speed                            |                     | min <sup>-1</sup> {rpm}                           | 9.2                                      | 10                                 | 13      |
|                 | Gradeability                             |                     | degree                                            | 30                                       | 30                                 | 35      |
|                 | Travel force                             | Rubber crawler      | kgf                                               | 2,510                                    | 4,700                              | 6,330   |
|                 |                                          | Iron crawler        | kgf                                               | 2,690                                    | 5,080                              | 6,670   |
|                 | Digging force                            | Bucket              | kgf                                               | 2,310                                    | 3,500                              | 4,800   |
|                 |                                          | Arm                 | kgf                                               | 1,600                                    | 2,400                              | 3,670   |
|                 |                                          | Arm length          | mm                                                | 1,220                                    | 1,910                              | 1,760   |
| Ground pressure | Rubber crawler                           | kgf/cm <sup>2</sup> | 0.28                                              | 0.30                                     | 0.36                               |         |
|                 | Iron crawler                             | kgf/cm <sup>2</sup> | 0.29                                              | 0.31                                     | 0.36                               |         |
| Weight          | Cab                                      | Upper structure     | kg                                                | —                                        | 2,490                              | 3,360   |
|                 |                                          | Undercarriage       | kg                                                | —                                        | 1,810                              | 2,900   |
|                 |                                          | Machine weight      | kg                                                | —                                        | 5,340                              | 7,820   |
|                 | Canopy                                   | Upper structure     | kg                                                | 1,220                                    | 2,400                              | 3,270   |
|                 |                                          | Undercarriage       | kg                                                | 1,010                                    | 1,810                              | 2,900   |
|                 |                                          | Machine weight      | kg                                                | 2,920                                    | 5,250                              | 7,730   |
| Engine          | Model                                    |                     | YANMER 3TNE84-YB<br>4-cycle water cooled          | YANMER 4TNE88-YB<br>4-cycle water cooled | ISUZU 4JB1<br>4-cycle water cooled |         |
|                 | Output rating                            | PS/rpm              | 24/2,150                                          | 39.7/2,350                               | 57/2,200                           |         |
|                 | Maximum torque                           | kgf·m/rpm           | 9.18/1,400                                        | 14.5/1,400                               | 19.2/1,600                         |         |
|                 | Total displacement                       | L                   | 1.496                                             | 2.189                                    | 2.771                              |         |
|                 | Number of cylinders-BoreXStroke          | mm                  | 3-84X90                                           | 4-88X90                                  | 4-93X102                           |         |
|                 | Fuel consumption rate                    | g/PS·h              | 180                                               | 185                                      | 164±5%                             |         |
|                 | Fuel tank capacity                       | L                   | 32                                                | 53                                       | 105                                |         |
| Hyd. component  | Hydraulic pump                           |                     | Variable displacement double piston gear pump X 2 |                                          |                                    |         |
|                 | Setting pressure                         | kgf/cm <sup>2</sup> | 210                                               | 210 (230 travel)                         | 260 (320 travel)                   |         |
|                 | Slewing motor                            |                     | Axial piston motor                                |                                          |                                    |         |
|                 | Travel motor                             |                     | 2-speed axial piston motor X 2                    |                                          |                                    |         |
|                 | Control valve                            |                     | 7-spool+2-spool                                   | 8-spool                                  | 8-spool                            |         |
|                 | Hydraulic tank capacity(system capacity) |                     | L                                                 | 41(55)                                   | 50(70)                             | 50(85)  |

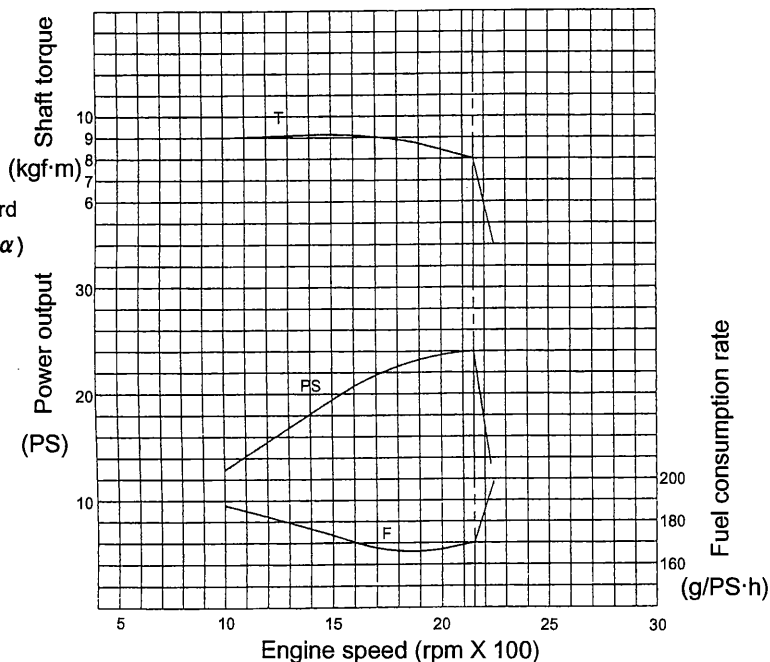
### 3. COMPONENT SPECIFICATIONS

#### 3-1 ENGINE SPECIFICATIONS

| Item                                        | Engine Model        | YANMAR 3TNE84-YB                                 |
|---------------------------------------------|---------------------|--------------------------------------------------|
| Type                                        |                     | Vertical 4-cycle water-cooled diesel engine      |
| No. of cylinders-Bore x Stroke              | mm                  | 3-84 x 90                                        |
| Displacement                                | cc                  | 1,496                                            |
| Compression ratio                           |                     | 18.0 (Effective 16.2)                            |
| Fuel injection timing (FID, b.T.D.C)        | degree              | 12°                                              |
| Dry weight                                  |                     | 155 <sup>±5</sup>                                |
| Firing order                                |                     | 1-3-2                                            |
| Compression pressure                        | kgf/cm <sup>2</sup> | 33 at 250rpm                                     |
| Recommended diesel gas oil                  |                     | Diesel oil                                       |
| Valve clearance at cool, intake and exhaust | mm                  | 0.2                                              |
| Intake valve timing (Open) (b.T.D.C)        | degree              | 15°±5                                            |
| Intake valve timing (Close) (a.B.D.C)       | degree              | 45°±5                                            |
| Exhaust valve timing (Open) (b.T.D.C)       | degree              | 56°±5                                            |
| Exhaust valve timing (Close) (a.B.D.C)      | degree              | 18°±5                                            |
| Injection pump                              |                     | Bosch type                                       |
| Governor                                    |                     | Mechanical centrifugal governor (All speed type) |
| Fuel injection pressure                     | kgf/cm <sup>2</sup> | 200±5                                            |
| Cooling system                              |                     | Liquid cooling / Radiator                        |
| Cooling fan                                 |                     | Pusher type, 6 blades 335dia.                    |
| Thermostat                                  | degrees C           | Starting 71, Full open 85                        |
| Cooling water capacity                      | L                   | 2.0                                              |
| Lubrication system                          |                     | Forced lubrication with trochoid pump            |
| Lubricating oil capacity                    | L                   | 4.7                                              |
| Recommended lubricating oil                 |                     | API grade CD class                               |
| Fuel filtration                             |                     | With water separator, paper cartridge type       |
| Oil filtration                              |                     | Paper cartridge type                             |
| Alternator                                  |                     | 12V-40A                                          |
| Starter                                     |                     | 12V-1.4kW                                        |

Engine performance curve

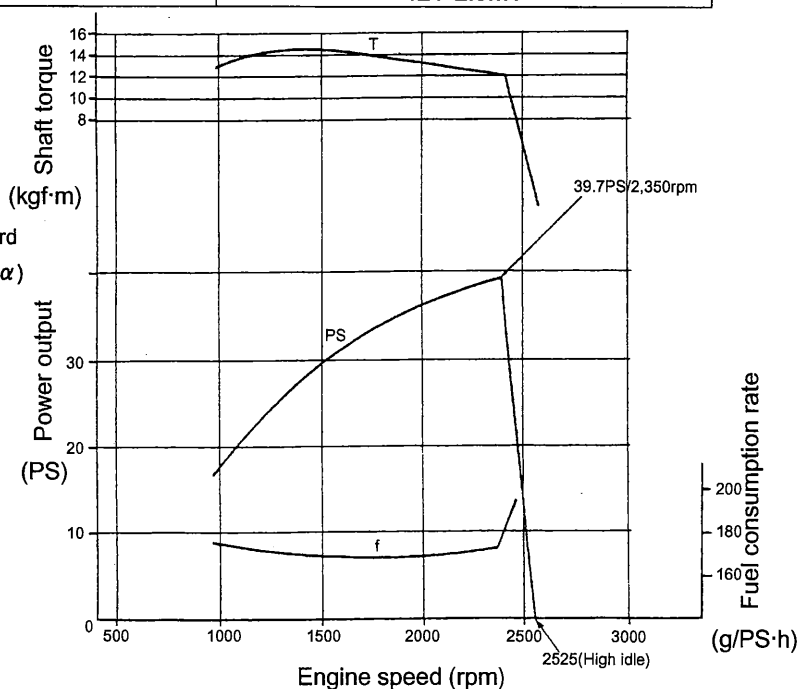
$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times \text{PS} \times \text{Standard load factor } (\alpha)$$



| Item                                        | Engine Model        | YANMAR 4TNE88-YB                                 |
|---------------------------------------------|---------------------|--------------------------------------------------|
| Type                                        |                     | Vertical 4-cycle water-cooled diesel engine      |
| No. of cylinders-Bore x Stroke              | mm                  | 4-88 x 90                                        |
| Displacement                                | cc                  | 2,189                                            |
| Compression ratio                           |                     | 18.0 (Effective 16.2)                            |
| Fuel injection timing (FID, b.T.D.C)        | degree              | 14°                                              |
| Dry weight                                  |                     | 180                                              |
| Firing order                                |                     | 1-3-4-2                                          |
| Compression pressure                        | kgf/cm <sup>2</sup> | 30                                               |
| Recommended diesel gas oil                  |                     | Diesel oil                                       |
| Valve clearance at cool, intake and exhaust | mm                  | 0.2                                              |
| Intake valve timing (Open) (b.T.D.C)        | degree              | 15°±5                                            |
| Intake valve timing (Close) (a.B.D.C)       | degree              | 45°±5                                            |
| Exhaust valve timing (Open) (b.T.D.C)       | degree              | 56°±5                                            |
| Exhaust valve timing (Close) (a.B.D.C)      | degree              | 18°±5                                            |
| Injection pump                              |                     | Bosch type                                       |
| Governor                                    |                     | Mechanical centrifugal governor (All speed type) |
| Fuel injection pressure                     | kgf/cm <sup>2</sup> | 200~18                                           |
| Cooling system                              |                     | Liquid cooling / Radiator                        |
| Cooling fan                                 |                     | Pusher type, 8 blades 410 dia. (Suction type)    |
| Thermostat                                  | degrees C           | Starting 71, Full open 85                        |
| Cooling water capacity                      | L                   | 2.7                                              |
| Lubrication system                          |                     | Forced lubrication with trochoid pump            |
| Lubricating oil capacity                    | L                   | 5.8                                              |
| Recommended lubricating oil                 |                     | API grade CD class                               |
| Fuel filtration                             |                     | With water separator, paper cartridge type       |
| Oil filtration                              |                     | Paper cartridge type                             |
| Alternator                                  |                     | 12V-40A                                          |
| Starter                                     |                     | 12V-2.0kW                                        |

Engine performance curve

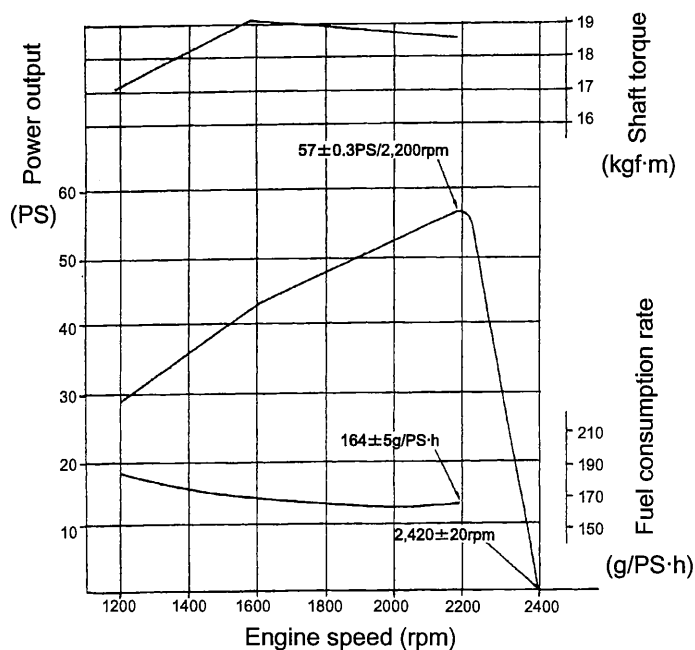
$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times \text{PS} \times \text{Standard load factor } (\alpha)$$



| Item                                        | Engine Model        | ISUZU 4JB1                                                   |
|---------------------------------------------|---------------------|--------------------------------------------------------------|
| Type                                        |                     | Vertical 4-cycle water-cooled direct injection diesel engine |
| No. of cylinders-Bore x Stroke              | mm                  | 4-93 x 102                                                   |
| Displacement                                | cc                  | 2,771                                                        |
| Compression ratio                           |                     | 18.2                                                         |
| Fuel injection timing (FID, b.T.D.C)        | degree              | 17°                                                          |
| Dry weight                                  |                     | 253                                                          |
| Firing order                                |                     | 1-3-4-2                                                      |
| Compression pressure                        | kgf/cm <sup>2</sup> | 30 at 200rpm                                                 |
| Recommended diesel gas oil                  |                     | Diesel oil                                                   |
| Valve clearance at cool, intake and exhaust | mm                  | 0.4                                                          |
| Intake valve timing (Open) (b.T.D.C)        | degree              | 24.5°                                                        |
| Intake valve timing (Close) (a.B.D.C)       | degree              | 55.5°                                                        |
| Exhaust valve timing (Open) (b.T.D.C)       | degree              | 54°                                                          |
| Exhaust valve timing (Close) (a.B.D.C)      | degree              | 26°                                                          |
| Injection pump                              |                     | Bosch type                                                   |
| Governor                                    |                     | Mechanical centrifugal governor (All speed type)             |
| Fuel injection pressure                     | kgf/cm <sup>2</sup> | 185                                                          |
| Cooling system                              |                     | Liquid cooling / Radiator                                    |
| Cooling fan                                 |                     | 7 blades 450 dia. (Suction type), plastic                    |
| Thermostat                                  | degrees C           | Starting 82                                                  |
| Cooling water capacity                      | L                   | 5                                                            |
| Lubrication system                          |                     | Forced lubrication                                           |
| Lubricating oil capacity                    | L                   | About 8.0                                                    |
| Recommended lubricating oil                 |                     | API grade CD class                                           |
| Fuel filtration                             |                     | With water separator, paper cartridge type                   |
| Oil filtration                              |                     | Paper cartridge type                                         |
| Alternator                                  |                     | 12V-40A                                                      |
| Starter                                     |                     | 12V-3.5kW                                                    |

### Engine performance curve

$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times \text{PS} \times \text{Standard load factor } (\alpha)$$

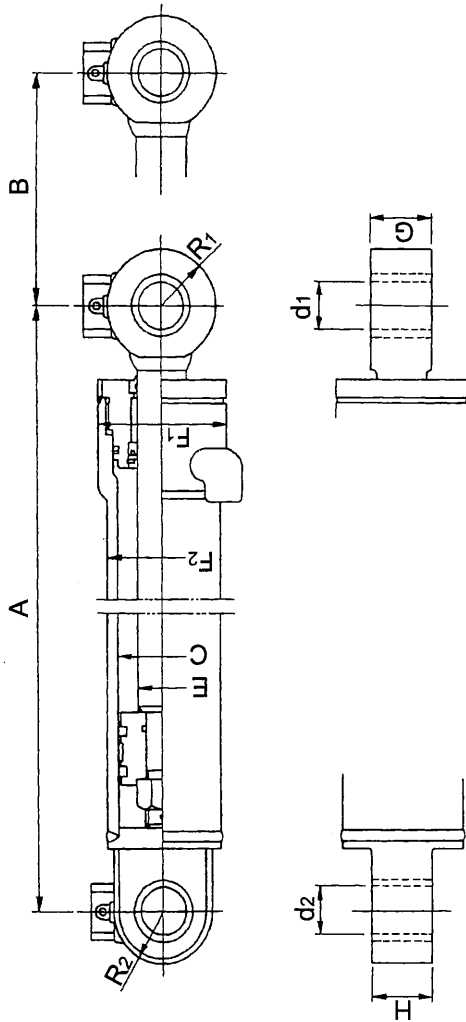


### 3-2 HYDRAULIC COMPONENTS

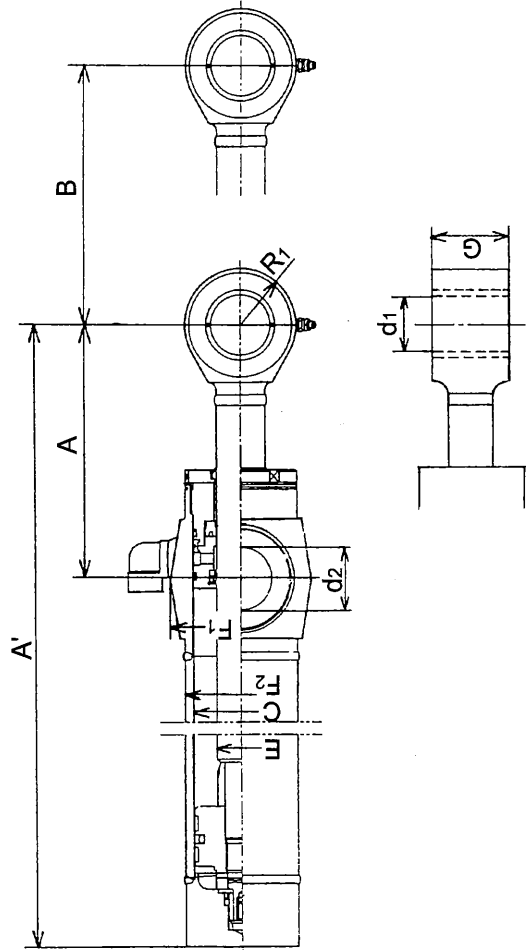
| Item           |                              |                            | Model                        | SK30UR-2                            | SK50UR-2                              | SK75UR-2                              |
|----------------|------------------------------|----------------------------|------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|
| Hydraulic pump | First & Second               | Type                       |                              | Variable displacement double piston | Variable displacement double piston   | Variable displacement double piston   |
|                |                              | Displacement               | cc/rev                       | 15.6X2                              | 23.5X2                                | 30X2                                  |
|                |                              | Delivery flow rate         | L/min                        | 33.5X2                              | 55.2X2(at 2,350rpm)                   | 71.4X2                                |
|                |                              | Working pressure           | kgf/cm <sup>2</sup>          | 210                                 | 210/230                               | 260/320                               |
|                | Third Type                   | Type                       |                              | Gear pump                           | Gear pump                             | Gear pump                             |
|                |                              | Displacement               | cc/rev                       | 9                                   | 13.9                                  | 19.4                                  |
|                |                              | Delivery flow rate         | L/min                        | 19.4X2                              | 29.5                                  | 55.4                                  |
|                |                              | Working pressure           | kgf/cm <sup>2</sup>          | 200                                 | 200                                   | 160                                   |
|                | Weight                       |                            | kg                           | 22                                  | 41                                    | 43                                    |
|                | Pilot                        | Type                       |                              | Gear pump                           | Gear pump                             | Gear pump                             |
|                |                              | Displacement               | cc/rev                       | 5                                   | 5.45                                  | 9                                     |
|                |                              | Delivery flow rate         | L/min                        | 10.7                                | 12.8                                  | 21.4                                  |
|                |                              | Working pressure           | kgf/cm <sup>2</sup>          | 35                                  | 35                                    | 35                                    |
| Control valve  | Main                         | Model                      |                              | AC3AS                               | BCV-70C2                              | BCV-70B                               |
|                |                              | No. of element             |                              | 7                                   | 8                                     | 8                                     |
|                |                              | Main relief valve pressure | kgf/cm <sup>2</sup> at L/min | 210 at 33.6                         | 230 at 25 (Travel)<br>210 at 55 (ATT) | 320 at 24 (Travel)<br>260 at 55 (ATT) |
|                |                              | Weight                     | kg                           | 31                                  | 98                                    | 98                                    |
|                | Sub                          | Model                      |                              | AC3A                                | —                                     | —                                     |
|                |                              | No. of element             |                              | 2                                   | —                                     | —                                     |
|                |                              | Main relief valve pressure | kgf/cm <sup>2</sup> at L/min | 200 at 20                           | —                                     | —                                     |
|                |                              | Weight                     | kg                           | 12                                  | —                                     | —                                     |
| Slewing motor  | Model                        |                            |                              | SGO1DE-054                          | SGO15E-053C                           | SGO25DE-050                           |
|                | Type                         |                            |                              | Axial piston motor                  | Axial piston motor                    | Axial piston motor                    |
|                | Displacement                 |                            | cc/rev                       | 22.02                               | 39.1                                  | 45.5                                  |
|                | Relief valve pressure        |                            | kgf/cm <sup>2</sup> at L/min | 170 at 20                           | 150 at 55                             | 225                                   |
|                | Reduction ratio              |                            |                              | 14.72                               | 18.6                                  | 15.537                                |
|                | Reduction lubricant capacity |                            | L                            | Lubricated with hydraulic oil       | Lubricated with hydraulic oil         | 1.5                                   |
|                | Weight                       |                            | kg                           | 32                                  | 48                                    | 67                                    |
| Travel motor   | Model                        |                            |                              | PHW-250-41B-1S1-8057B               | GMO5VL-C-16/27-1                      | GMO9L-A-23/37-1                       |
|                | Type                         |                            |                              | Axial piston motor                  | Axial piston motor                    | Axial piston motor                    |
|                | Displacement                 |                            | cc/rev                       | 12.24/22.16                         | 15.5/27                               | 23.2/37.2                             |
|                | Relief valve pressure        |                            | kgf/cm <sup>2</sup> at L/min | 240 at 20                           | —                                     | —                                     |
|                | Reduction ratio              |                            |                              | 40.6                                | 60                                    | 52.8                                  |
|                | Reduction lubricant capacity |                            | L                            | 0.8X2                               | 1.1X2                                 | 1.7X2                                 |
|                | Weight                       |                            | kg                           | 45                                  | 62                                    | 90                                    |
| Pilot valve    | Work                         | Torque for operation       | kgf·m                        | 6                                   | ←                                     | ←                                     |
|                |                              | Operating angle            | degree                       | 25(for port 2&4), 19(for port 1&3)  | ←                                     | ←                                     |
|                |                              | Weight                     | kg                           | 4.8                                 | ←                                     | ←                                     |
|                | Travel                       | Torque for operation       | kgf·m                        | 1.32                                | ←                                     | ←                                     |
|                |                              | Operating angle            | degree                       | 12.4                                | ←                                     | ←                                     |
|                |                              | Weight                     | kg                           | 10                                  | ←                                     | ←                                     |

### 3-3 HYDRAULIC CYLINDER

Boom, Bucket, Off-set, Dozer Cylinder



Arm Cylinder



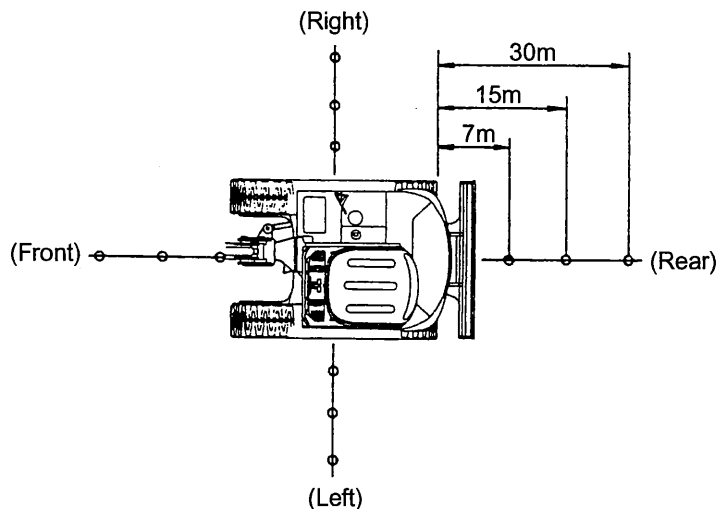
| Machine  | Applicable cylinder | Parts No.                    | A            |  | B   | C   | E  | F1  | F2  | G  | H  | R1 | R2 | d1 | d2 | Weight (kg) | Cushion mechanism |           | Remarks |
|----------|---------------------|------------------------------|--------------|--|-----|-----|----|-----|-----|----|----|----|----|----|----|-------------|-------------------|-----------|---------|
|          |                     |                              | A'           |  |     |     |    |     |     |    |    |    |    |    |    |             | Rod side          | Head side |         |
| SK30UR-2 | Boom                | PR01V00001F1                 | 990          |  | 650 | 85  | 45 | 106 | 101 | 60 | 60 | 45 | 45 | 45 | 45 | 41          | O                 |           |         |
|          | Arm                 | PR01V00002F1                 | 235<br>869   |  | 509 | 80  | 40 | 115 | 95  | 50 | -  | 45 | -  | 45 | -  | 32          | O                 | O         |         |
|          | Bucket              | PR01V00003F1                 | 700          |  | 420 | 70  | 35 | 85  | 85  | 45 | 45 | 37 | 42 | 40 | 40 | 21          |                   |           |         |
|          | Off-set             | PR01V00004F1                 | 675          |  | 407 | 70  | 35 | 85  | 85  | 45 | 45 | 37 | 42 | 40 | 40 | 20          |                   |           |         |
|          | Dozer               | PR01V00005F1                 | 560          |  | 140 | 95  | 55 | 114 | 114 | 60 | 60 | 50 | 50 | 55 | 55 | 32          |                   |           |         |
| SK50UR-2 | Boom                | YJ01V00001F1                 | 1,250        |  | 840 | 100 | 60 | 124 | 114 | 85 | 90 | 50 | 50 | 55 | 55 | 65          | O                 |           |         |
|          | Arm                 | YJ01V00002F1                 | 240<br>1,142 |  | 758 | 95  | 55 | -   | 109 | 85 | -  | 50 | -  | 50 | 55 | 62          | O                 | O         |         |
|          | Bucket              | YJ01V00003F1                 | 945          |  | 610 | 80  | 50 | 93  | 89  | 60 | 60 | 50 | 50 | 45 | 45 | 34          |                   |           |         |
|          | Off-set             | YJ01V00004F1                 | 932          |  | 542 | 100 | 55 | 120 | 112 | 85 | 85 | 50 | 50 | 55 | 55 | 50          | O                 | O         |         |
|          | Dozer               | YJ01V00005F1                 | 540          |  | 175 | 110 | 60 | 136 | 136 | 70 | 70 | 55 | 65 | 55 | 55 | 46          |                   |           |         |
| SK75UR-2 | Boom                | YR01V00001F1                 | 1,405        |  | 975 | 115 | 70 | 142 | 131 | 95 | 95 | 60 | 70 | 65 | 65 | 100         | O                 |           |         |
|          | Arm                 | YR01V00006F1                 | 270<br>1,182 |  | 725 | 110 | 70 | 147 | 129 | 95 | -  | 60 | -  | 60 | 65 | 90          | O                 | O         |         |
|          | Bucket              | YR01V00003F1                 | 1,120        |  | 735 | 85  | 55 | 105 | 97  | 85 | 85 | 50 | 50 | 50 | 50 | 50          |                   |           |         |
|          | Off-set             | YR01V00007F1                 | 1,023        |  | 664 | 110 | 55 | 136 | 126 | 95 | 95 | 55 | 67 | 67 | 55 | 61          |                   |           |         |
|          | Dozer               | YR01V00008F1<br>YR01V00008F2 | 540          |  | 150 | 90  | 55 | 111 | 111 | 60 | 60 | 50 | 50 | 50 | 45 | 31          |                   |           |         |

## 4. PERFORMANCE

Earth : Soft soil  
Dump truck loading by 90° slewing  
(Start to dig from ground level)

| Item<br>Machine | Slewing speed rpm |     | Travel speed km/h      | Traction kg          | Grade-ability deg | Attachment digging force  |            | Fuel consumption L/h | Workload m³/h | Cycle time 90° slewing sec | Remarks |
|-----------------|-------------------|-----|------------------------|----------------------|-------------------|---------------------------|------------|----------------------|---------------|----------------------------|---------|
|                 | High              | Low |                        |                      |                   | Arm (Arm length) kgf (mm) | Bucket kgf |                      |               |                            |         |
| SK30UR-2        | 9.2/5.4           |     | Rubber crawler 3.0/5.1 | Rubber crawler 2,510 | 30                | 1,600 (1,220)             | 2,310      | 3.50                 | 16.8          | 15                         |         |
|                 |                   |     | Iron crawler 3.3/5.4   | Iron crawler 6,670   |                   |                           |            |                      |               |                            |         |
| SK50UR-2        | 10/5.5            |     | Rubber crawler 3.0/5.0 | Rubber crawler 4,700 | 30                | S type 2,800 (1,530)      | 3,500      | 5.60                 | 33.6          | 15                         |         |
|                 |                   |     | Iron crawler 2.7/4.6   | Iron crawler 5,080   |                   | L type 2,400 (1,910)      |            |                      |               |                            |         |
| SK75UR-2        | 12.5/6.5          |     | Rubber crawler 3.5/5.6 | Rubber crawler 6,330 | 35                | 3,670 (1,760)             | 4,800      | 8.45                 | 60.0          | 15                         |         |
|                 |                   |     | Iron crawler 3.3/5.4   | Iron crawler 6,670   |                   |                           |            |                      |               |                            |         |

### Noise level



Unit : dB

| Machine  | 7m         |      |      |       |             | 15m        |      |      |       |             | 30m        |      |      |       |             | Cab  |       |                         |        |
|----------|------------|------|------|-------|-------------|------------|------|------|-------|-------------|------------|------|------|-------|-------------|------|-------|-------------------------|--------|
|          | Directions |      |      |       | Noise level | Directions |      |      |       | Noise level | Directions |      |      |       | Noise level | Door |       | Close to operator's ear |        |
|          | Front      | Rear | Left | Right |             | Front      | Rear | Left | Right |             | Front      | Rear | Left | Right |             | Open | Close | Right                   | Left   |
| SK30UR-2 | 63         | 64   | 65   | 65    | 64          | 58         | 56   | 60   | 59    | 58          | 52         | 51   | 52   | 54    | 52          | —    | —     | 78 (canopy)             | 78 (←) |
| SK50UR-2 | 65         | 70   | 68   | 69    | 68          | 61         | 64   | 63   | 64    | 63          | 56         | 58   | 57   | 58    | 57          | —    | —     | 80 (canopy)             | 78 (←) |
| SK75UR-2 | 68         | 68   | 68   | 71    | 69          | 61         | 62   | 62   | 64    | 62          | 56         | 56   | 56   | 58    | 57          | —    | —     | —                       | —      |

## 5. WEIGHT OF COMPONENTS

|                                                                     |       | Unit : kg      |               |
|---------------------------------------------------------------------|-------|----------------|---------------|
| Item                                                                | Model | Canopy         | Cab           |
| Machine complete                                                    |       | 2,9200 (3,000) | 3,030 (3,110) |
| ● Upper structure (Assembly of followings)                          |       | 1,220          | 1,330         |
| ● ● Counterweight                                                   |       | 216            | ←             |
| ● ● Canopy (Cab)                                                    |       | 46             | 160           |
| ● ● Engine, Radiator                                                |       | * 30           | ←             |
| ● ● Hydraulic pump                                                  |       | 22             | ←             |
| ● ● Hydraulic oil & Fuel tank                                       |       | * 50           | ←             |
| ● ● Slewing motor                                                   |       | 32             | ←             |
| ● ● Control valve (8-spool)                                         |       | 31             | ←             |
| ● ● Control valve (2-spool)                                         |       | 12             | ←             |
| ● ● Boom cylinder                                                   |       | * 41           | ←             |
| ● ● Upper frame                                                     |       | 290            | ←             |
| ● Undercarriage (Assembly of followings)                            |       | 1,010 (1,090)  | ←             |
| ● ● Lower frame                                                     |       | 310            | ←             |
| ● ● Slewing bearing                                                 |       | 40             | ←             |
| ● ● Travel motor, Reduction gear                                    |       | 80             | ←             |
| ● ● Upper roller                                                    |       | 6              | ←             |
| ● ● Lower roller                                                    |       | 60             | ←             |
| ● ● Idler adjuster                                                  |       | 20             | ←             |
| ● ● Idler assembly, Crawler                                         |       | 42             | ←             |
| ● ● Sprocket                                                        |       | 26             | ←             |
| ● ● Swivel joint                                                    |       | 22             | ←             |
| ● ● Dozer                                                           |       | 125            | ←             |
| ● ● 300mm rubber shoe (300mm iron shoe)                             |       | 240 (320)      | ←             |
| ● ● Dozer cylinder                                                  |       | * 30           | ←             |
| ● Attachment (Assembly of followings)                               |       | 545            | ←             |
| ● ● Bucket assembly (0.07m <sup>3</sup> )                           |       | 70             | ←             |
| ● ● Arm assembly (Assembly of followings)                           |       | 106            | ←             |
| ● ● ● Bucket link                                                   |       | 63             | ←             |
| ● ● ● Idler link                                                    |       | * 21           | ←             |
| ● ● ● Bucket cylinder                                               |       | 5              | ←             |
| ● ● ● Arm                                                           |       | 7              | ←             |
| ● ● ● Pin (Arm cylinder attaching, Bucket attaching x 2)            |       | 10             | ←             |
| ● ● Boom assembly (Off-set cylinder attaching, including following) |       | 355            | ←             |
| ● ● ● Arm cylinder                                                  |       | * 32           | ←             |
| ● Fluid, Water (Assembly of followings)                             |       | 69             | ←             |
| ● ● Hydraulic oil, Engine oil                                       |       | 39             | ←             |
| ● ● Fuel                                                            |       | 26             | ←             |
| ● ● Water (Coolant)                                                 |       | 4              | ←             |

Note: 1 Marks \* show a dry weight.

2 The figures in ( ) show the case of iron shoe.

Unit : kg

| Item                                                            | Model | Canopy |       | Cab (Option) |       |
|-----------------------------------------------------------------|-------|--------|-------|--------------|-------|
|                                                                 |       | Rubber | Iron  | Rubber       | Iron  |
| Machine complete                                                |       | 5,250  | 5,250 | 5,340        | 5,340 |
| ● Upper structure (Assembly of followings)                      |       | 2,400  | ←     | 2,490        | ←     |
| ● ● Counterweight                                               |       | 580    | ←     | ←            | ←     |
| ● ● Canopy (Cab)                                                |       | 96     | ←     | 188          | ←     |
| ● ● Engine                                                      |       | 185    | ←     | ←            | ←     |
| ● ● Hydraulic pump                                              |       | 41     | ←     | ←            | ←     |
| ● ● Hydraulic oil tank                                          |       | * 49   | ←     | ←            | ←     |
| ● ● Fuel tank                                                   |       | * 29   | ←     | ←            | ←     |
| ● ● Slewing motor                                               |       | 48     | ←     | ←            | ←     |
| ● ● Control valve                                               |       | 98     | ←     | ←            | ←     |
| ● ● Boom cylinder                                               |       | * 65   | ←     | ←            | ←     |
| ● ● Upper frame                                                 |       | 650    | ←     | ←            | ←     |
| ● ● Radiator                                                    |       | * 28   | ←     | ←            | ←     |
| ● Undercarriage (Assembly of followings)                        |       | 1,810  | ←     | ←            | ←     |
| ● ● Lower frame                                                 |       | 540    | ←     | ←            | ←     |
| ● ● Slewing bearing                                             |       | 76     | ←     | ←            | ←     |
| ● ● Travel motor                                                |       | 62X2   | ←     | ←            | ←     |
| ● ● Upper roller                                                |       | 4X2    | ←     | ←            | ←     |
| ● ● Lower roller                                                |       | 8X10   | ←     | ←            | ←     |
| ● ● Front idler                                                 |       | 44X2   | ←     | ←            | ←     |
| ● ● Idler adjuster                                              |       | 24X2   | ←     | ←            | ←     |
| ● ● Sprocket                                                    |       | 14X2   | ←     | ←            | ←     |
| ● ● Swivel joint                                                |       | 22     | ←     | ←            | ←     |
| ● ● Dozer                                                       |       | 190    | ←     | ←            | ←     |
| ● ● Dozer cylinder                                              |       | * 46   | ←     | ←            | ←     |
| ● ● Rubber shoe                                                 |       | 260X2  | —     | 260X2        | —     |
| ● ● Track link with 400mm iron shoe                             |       | —      | 260X2 | —            | 260X2 |
| ● Attachment                                                    |       | 1,040  | ←     | ←            | ←     |
| (Boom, 1.91m arm, 0.16m <sup>3</sup> bucket and followings)     |       |        |       |              |       |
| ● ● Bucket assembly (0.16m <sup>3</sup> ) with 2 attaching pins |       | 140    | ←     | ←            | ←     |
| ● ● Arm assembly (Assembly of followings)                       |       | 210    | ←     | ←            | ←     |
| ● ● ● Bucket link                                               |       | 11     | ←     | ←            | ←     |
| ● ● ● Idler link                                                |       | 7      | ←     | ←            | ←     |
| ● ● ● Bucket cylinder                                           |       | * 34   | ←     | ←            | ←     |
| ● ● ● Arm                                                       |       | 140    | ←     | ←            | ←     |
| (With idler link attaching pin, arm cylinder and rod pin)       |       |        |       |              |       |
| ● ● ● Pin (Bucket cylinder attaching pin)                       |       | 6      | ←     | ←            | ←     |
| ● ● Boom assembly (Assembly of followings)                      |       | 710    | ←     | ←            | ←     |
| ● ● ● Rear boom, front boom, upper frame                        |       | 590    | ←     | ←            | ←     |
| ● ● ● Arm cylinder                                              |       | * 64   | ←     | ←            | ←     |
| ● ● ● Pin (Arm cylinder attaching pin and arm attaching pin)    |       | 10     | ←     | ←            | ←     |
| ● ● ● Off-set cylinder                                          |       | * 50   | ←     | ←            | ←     |
| ● Fluid, Water (Assembly of followings)                         |       | 117    | ←     | ←            | ←     |
| ● ● Hydraulic oil, Engine oil                                   |       | 66     | ←     | ←            | ←     |
| ● ● Fuel                                                        |       | 44     | ←     | ←            | ←     |
| ● ● Water (Coolant)                                             |       | 7      | ←     | ←            | ←     |

Note: Marks \* show a dry weight.

Unit : kg

| Item                                                            | Model | Canopy |       | Cab (Option) |       |
|-----------------------------------------------------------------|-------|--------|-------|--------------|-------|
|                                                                 |       | Rubber | Iron  | Rubber       | Iron  |
| Machine complete                                                |       | 7,820  | 7,780 | 7,730        | 7,690 |
| ● Upper structure (Assembly of followings)                      |       | 3,360  | ←     | 3,270        | ←     |
| ● ● Counterweight                                               |       | 1,190  | ←     | ←            | ←     |
| ● ● Canopy (Cab)                                                |       | 96     | ←     | 122          | ←     |
| ● ● Engine                                                      |       | 250    | ←     | ←            | ←     |
| ● ● Hydraulic pump                                              |       | 42     | ←     | ←            | ←     |
| ● ● Hydraulic oil tank                                          |       | * 71   | ←     | ←            | ←     |
| ● ● Fuel tank                                                   |       | * 57   | ←     | ←            | ←     |
| ● ● Slewing motor                                               |       | 67     | ←     | ←            | ←     |
| ● ● Control valve                                               |       | 99     | ←     | ←            | ←     |
| ● ● Boom cylinder                                               |       | * 100  | ←     | ←            | ←     |
| ● ● Upper frame                                                 |       | 700    | ←     | ←            | ←     |
| ● ● Radiator                                                    |       | * 35   | ←     | ←            | ←     |
| ● Undercarriage (Assembly of followings)                        |       | 2,900  | 2,900 | 2,900        | 2,860 |
| ● ● Lower frame                                                 |       | 1,000  | ←     | ←            | ←     |
| ● ● Slewing bearing                                             |       | 115    | ←     | ←            | ←     |
| ● ● Travel motor                                                |       | 90X2   | ←     | ←            | ←     |
| ● ● Upper roller                                                |       | 5X2    | ←     | ←            | ←     |
| ● ● Lower roller                                                |       | 15X10  | ←     | ←            | ←     |
| ● ● Front idler                                                 |       | 45X2   | ←     | ←            | ←     |
| ● ● Idler adjuster                                              |       | 28X2   | ←     | ←            | ←     |
| ● ● Sprocket                                                    |       | 28X2   | ←     | ←            | ←     |
| ● ● Swivel joint                                                |       | 21     | ←     | ←            | ←     |
| ● ● Dozer                                                       |       | 260    | ←     | ←            | ←     |
| ● ● Dozer cylinder                                              |       | * 31X2 | ←     | ←            | ←     |
| ● ● Rubber shoe                                                 |       | 420X2  | ←     | ←            | ←     |
| ● ● Track link with 450mm iron shoe                             |       | —      | 413X2 | —            | 413X2 |
| ● Attachment                                                    |       | 1,560  | ←     | ←            | ←     |
| (Boom, 1.76m arm, 0.28m <sup>3</sup> bucket and followings)     |       |        |       |              |       |
| ● ● Bucket assembly (0.28m <sup>3</sup> ) with 2 attaching pins |       | 210    | ←     | ←            | ←     |
| ● ● Arm assembly (Assembly of followings)                       |       | 260    | ←     | ←            | ←     |
| ● ● ● Bucket link                                               |       | 17     | ←     | ←            | ←     |
| ● ● ● Idler link                                                |       | 15     | ←     | ←            | ←     |
| ● ● ● Bucket cylinder                                           |       | * 50   | ←     | ←            | ←     |
| ● ● ● Arm                                                       |       | 148    | ←     | ←            | ←     |
| (With idler link attaching pin, arm cylinder and rod pin)       |       |        |       |              |       |
| ● ● ● Pin (Bucket cylinder attaching pin)                       |       | 7      | ←     | ←            | ←     |
| ● ● Boom assembly (Assembly of followings)                      |       | 1,250  | ←     | ←            | ←     |
| ● ● ● Rear boom, front boom, upper frame                        |       | 870    | ←     | ←            | ←     |
| ● ● ● Arm cylinder                                              |       | * 90   | ←     | ←            | ←     |
| ● ● ● Pin (Arm cylinder attaching pin and arm attaching pin)    |       | 16     | ←     | ←            | ←     |
| ● ● ● Off-set cylinder                                          |       | * 61   | ←     | ←            | ←     |
| ● Fluid, Water (Assembly of followings)                         |       | 135    | ←     | ←            | ←     |
| ● ● Hydraulic oil, Engine oil                                   |       | 44     | ←     | ←            | ←     |
| ● ● Fuel                                                        |       | 86     | ←     | ←            | ←     |
| ● ● Water (Coolant)                                             |       | 5      | ←     | ←            | ←     |

Note: Marks \* show a dry weight.

## 6. SPECIFIED OIL, GREASE AND FILTER ELEMENT

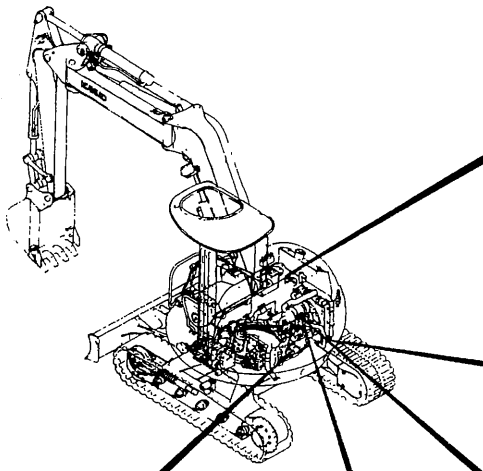
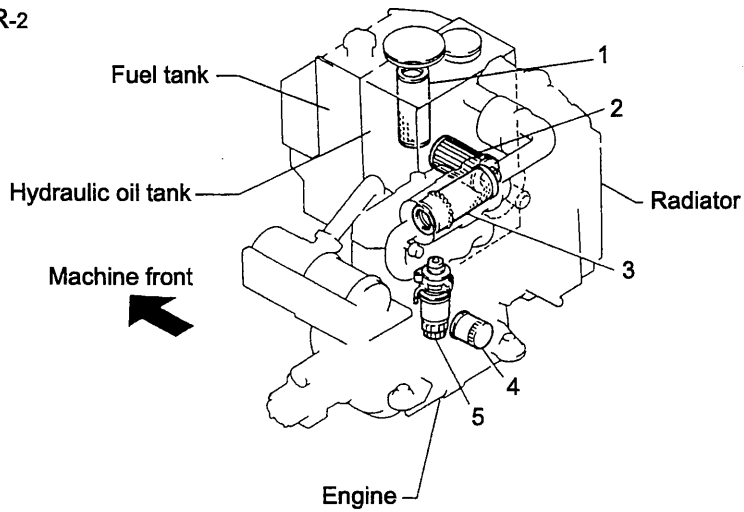
### Lubricant list

| Machine       |                       |              | SK30UR-2                                                        |              | SK50UR-2                                                        |            | SK75UR-2                                                        |            |
|---------------|-----------------------|--------------|-----------------------------------------------------------------|--------------|-----------------------------------------------------------------|------------|-----------------------------------------------------------------|------------|
| Serial number |                       |              | PR02501~                                                        |              | YJ04001~                                                        |            | YR02801~                                                        |            |
| No.           | Component             |              | Type of lubricant                                               | Capacities   | Type of lubricant                                               | Capacities | Type of lubricant                                               | Capacities |
|               | Hydraulic tank        | Tank         | Hydraulic oil                                                   | 27L          | Hydraulic oil                                                   | 50L        | Hydraulic oil                                                   | 50L        |
|               |                       | Total system |                                                                 | 41L          |                                                                 | 70L        |                                                                 | 85L        |
|               | Engine oil            | H            | Engine oil<br>(API classification for service CD)               | 4.7L         |                                                                 | 5.8L       |                                                                 | 8L         |
|               |                       | L            |                                                                 | 2.9L         |                                                                 | 3.5L       |                                                                 | 6L         |
|               | Upper roller          |              | Gear oil<br>(API classification for service GL-4)               | 0.04LX2      | Engine oil<br>(API classification for service CD)               | 0.02LX2    | Engine oil<br>(API classification for service CD)               | 0.02LX2    |
|               | Lower roller          | S            |                                                                 | 0.07LX8      |                                                                 | 0.07LX10   |                                                                 | 0.09LX6    |
|               |                       | W            |                                                                 | ——           |                                                                 | ——         |                                                                 | 0.16LX4    |
|               | Front idler           |              |                                                                 |              |                                                                 | 0.05LX2    |                                                                 |            |
|               | Slewing reduction     |              | Hydraulic oil                                                   | Auto filling |                                                                 | ——         |                                                                 | 1.5L       |
|               | Travel reduction      |              |                                                                 | 0.08LX2      |                                                                 | 1.1LX2     |                                                                 | 1.7LX2     |
|               | Attachment, Dozer pin |              | KOBELCO Genuine parts<br>(Extreme pressure multipurpose grease) | 28 places    | KOBELCO Genuine parts<br>(Extreme pressure multipurpose grease) | 28 places  | KOBELCO Genuine parts<br>(Extreme pressure multipurpose grease) | 33 places  |
|               | Slewing bearing       |              |                                                                 | 1 place      |                                                                 | 1 place    |                                                                 | 1 place    |
|               | Track adjuster        |              |                                                                 | 2 places     |                                                                 | 2 places   |                                                                 | 2 places   |
|               | Slewing gear          |              | N.L.G.I. No.2 Lithium base with MoS2 grease                     | 2.5kg        | N.L.G.I. No.2 Lithium base with MoS2 grease                     | 4.8kg      | N.L.G.I. No.2 Lithium base with MoS2 grease                     | 5kg        |
|               | Fuel tank             |              | Diesel oil                                                      | 32L          | Diesel oil                                                      | 53L        | Diesel oil                                                      | 100L       |
|               | Radiator              | Radiator     | Coolant (LLC)                                                   | 1.8L         | Coolant (LLC)                                                   | 3.7L       | Coolant (LLC)                                                   | 3.8L       |
|               |                       | Total system |                                                                 | 4.9L         |                                                                 | 7.5L       |                                                                 | 11L        |

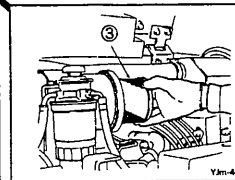
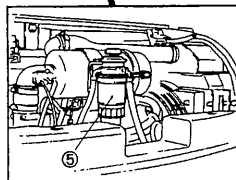
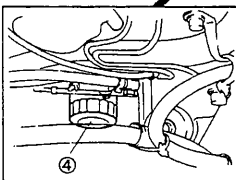
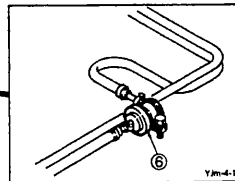
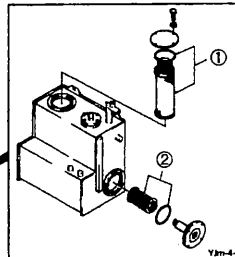
### Filter element list

| Machine |                                  |         | SK30UR-2                     |      | SK50UR-2                   |      | SK75UR-2                     |      |
|---------|----------------------------------|---------|------------------------------|------|----------------------------|------|------------------------------|------|
| No.     | Name                             | Section | Parts No.                    | Q'ty | Parts No.                  | Q'ty | Parts No.                    | Q'ty |
| 1       | Return filter<br>(O ring)        |         | PR50V00002P1<br>(ZD11G12500) | 1    | 2446R336F1<br>(ZD11G12500) | 1    | YR50V00004P1<br>(ZD11P14000) | 1    |
| 2       | Suction strainer<br>(O ring)     |         | 2446R344F1<br>(ZD11G12500)   | 1    | ←                          | 1    | YR50V00003P1<br>(ZD11P14000) | 1    |
| 3       | Air cleaner                      |         | 121120-18901                 | 1    | ←                          | 1    | YR11P00003S002               | 1    |
| 4       | Engine oil filter                |         | 129150-35151                 | 1    | ←                          | 1    | 897049-7081                  | 1    |
| 5       | Fuel filter<br>(Water separator) |         | 129574-55710                 | 1    | ←                          | 1    | 894369-2993                  | 1    |
| 6       | Fuel prefilter                   |         | —                            | —    | YJ21P1008P1                | 1    | 894369-2963                  | 1    |
| 7       | Water separator                  |         | —                            | —    | —                          | —    | 121850-55710                 | 1    |

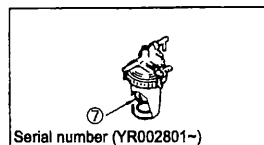
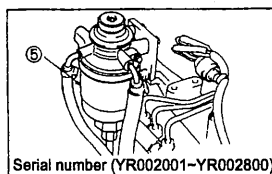
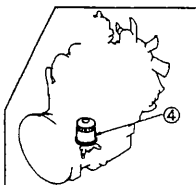
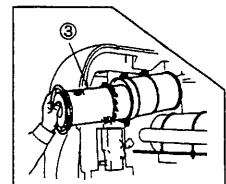
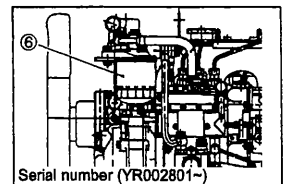
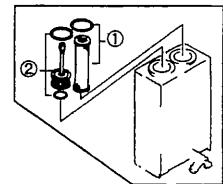
# SK30UR-2



## SK50UR-2



## SK75UR-2



# SK30UR-2 SK75UR-2 SK50UR-2

## 7. CAB, CANOPY INTERFERENCE PREVENTION SYSTEM

### Outline

The canopy (cab) interference prevention equipment performs the following 4 large functions.

#### 1. Height and depth indication

##### 2. Height limit

When this machine stops automatically, all attachment doesn't function except the dozer operation.

In case of **SK30UR-2**, dozer and travel are excluded.

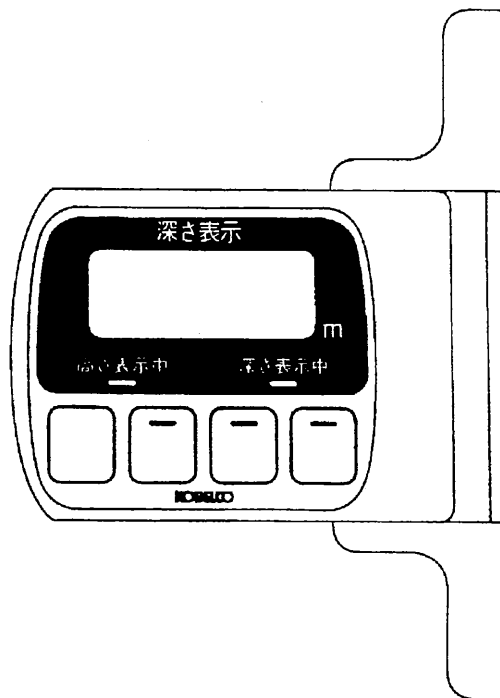
##### 3. Depth limit

When this machine stops automatically, all attachment doesn't function except the dozer operation.

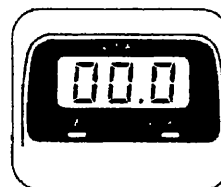
In case of **SK30UR-2**, dozer and travel are excluded.

##### 4. Canopy (cab) interference prevention

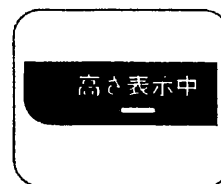
When this machine stops automatically, boom up, arm in and off-set left don't function.



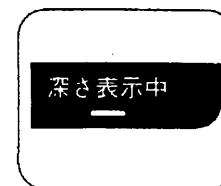
#### 1) Depth display



#### 2) Indicating the height



#### 3) Depth indication



CONTROLLER

### 7-1 SWITCH DESIGNATION

#### (1) Controller (See Fig.)

The controller is installed on the right front of operator seat, and it is foldable. When this controller is folded, the display disappears but the functions are in live condition.

##### 1) Depth display (See Fig.)

The difference between the present arm top pin position and boom foot pin position (0 level) is numerically indicated. (See 7-3 on page 22)

##### 2) Red LED (Light Emitting Diode) during indicating the height

ON: Shows that the attachment is on the highest position when the auto stop with height limit is functioning.

##### 3) Red LED (Light Emitting Diode) during depth indication

ON: Shows the depth indication except the case of above 2).

## (2) Control switches (See Fig.)

### 1) Standard position setting switch

The position, where the arm top pin height (A) and the boom foot pin height (B) are in same level, is set as standard (0) level. (See Fig. on page 22)

Even if the engine key is turned off or the display panel is folded, this initial standard wouldn't change.

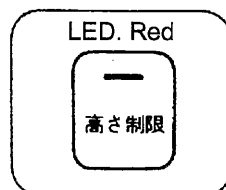
When you need to change this initial standard, move the arm top pin to the desired position and press this switch, you can get the new standard (0) level.

For example, if you need to change the standard (0) position to ground level, place the arm to the ground and press this switch.

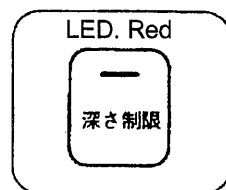
### 1) Standard position



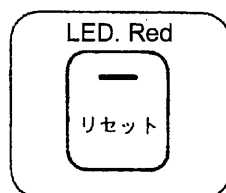
### 2) Height limit



### 3) Depth limit



### 4) Reset



## CONTROL SWITCHES

### 2) Height limit switch

This switch is used to set the limit height.

The attachment is stopped automatically, when it reaches to the limit height.

If this switch is pressed, LED is illuminated, and the height limitation functions. Press it again, and the height limitation is released.

### 3) Depth limit switch

This switch is used to set the limit depth.

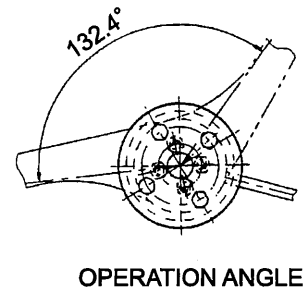
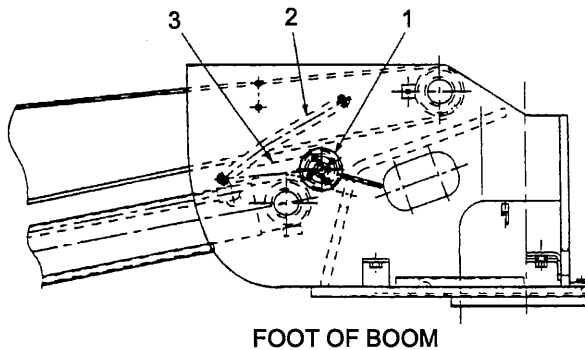
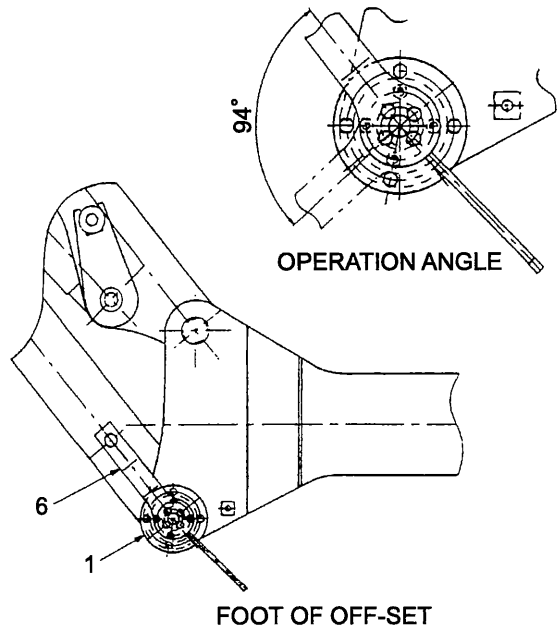
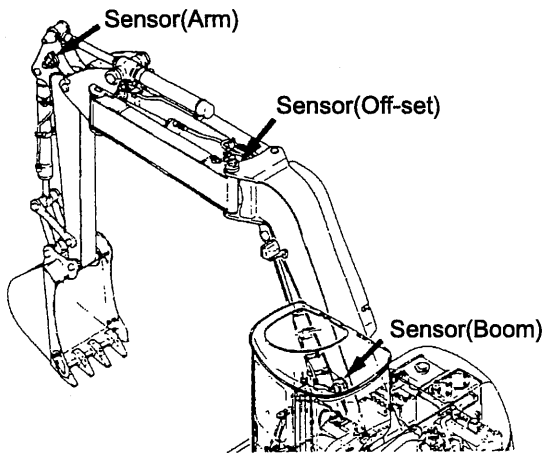
The attachment is stopped automatically, when it reaches to the limit depth.

If this switch is pressed, LED is illuminated, and the depth limitation functions. Press it again, and the depth limitation is released.

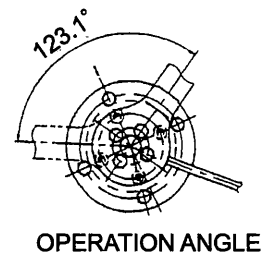
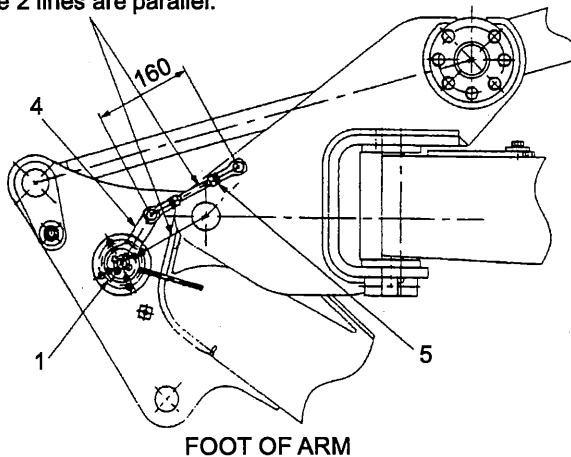
### 4) Reset switch

This reset switch is used to reset the setting of standard level, height limitation and depth limitation.

If this switch is pressed, LED is illuminated, and the display shows the setting is becoming initial standard.

**7-2 CONSTRUCTION****Sensor (Potentiometer) location**

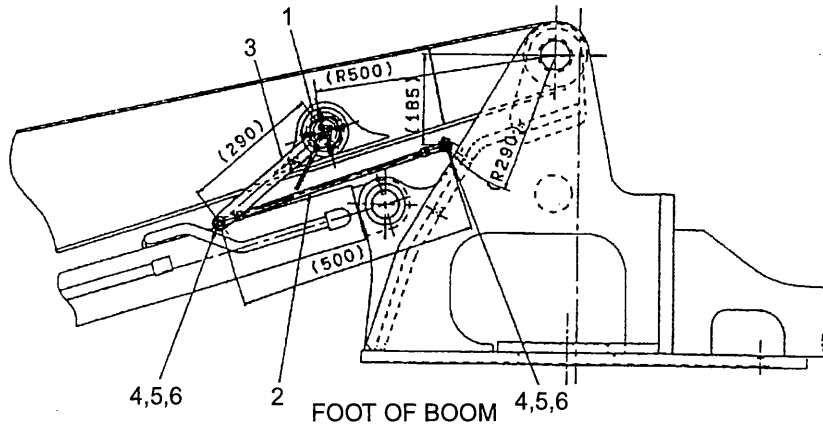
Install a rod assembly so that these 2 lines are parallel.



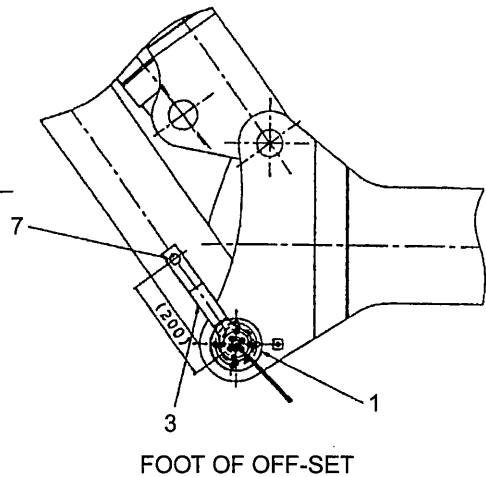
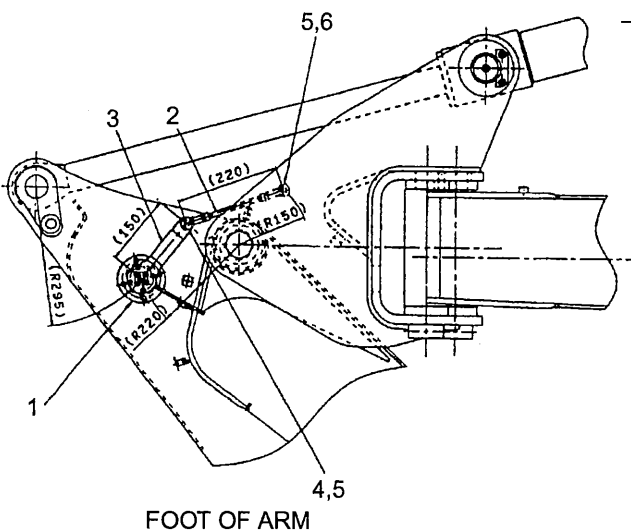
- 1 Sensor
- 2 Lever assembly
- 3 Lever
- 4 Lever
- 5 Rod assembly

The distance between centers of ball joints with rod on the arm foot section is 160mm.

# Sensor (Potentiometer) location



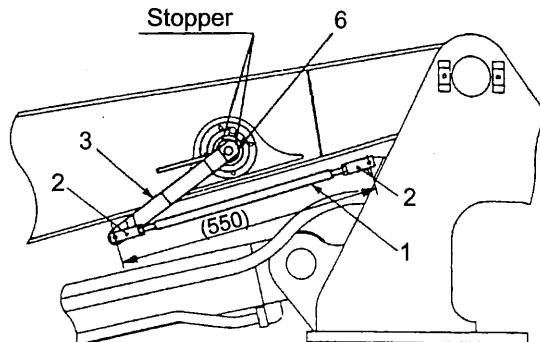
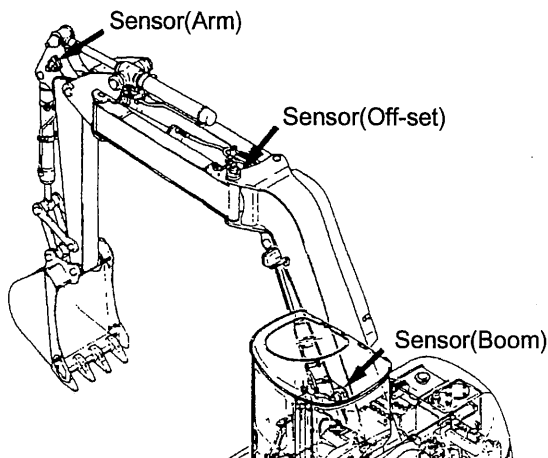
| No. | Parts           | Boom | Arm | Off-set |
|-----|-----------------|------|-----|---------|
| 1   | SENSOR          | 1    | 1   | 1       |
| 2   | ROD ASSEMBLY    | 1    | 1   | —       |
| 3   | LEVER           | 1    | 1   | 1       |
| 4   | NUT M10         | 2    | 1   | —       |
| 5   | LOCK WASHER M10 | 2    | 2   | —       |
| 6   | WASHER M10      | 2    | 2   | —       |
| 7   | NUT M10         | —    | —   | 1       |



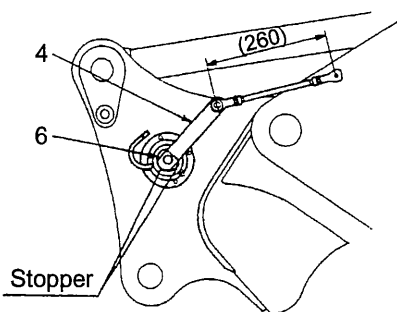
The distance between centers of ball joints with rod on the arm foot section is 500mm.

The distance between centers of ball joints with rod on the arm foot section is 220mm.

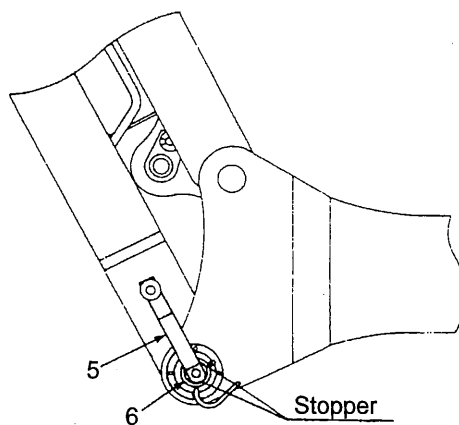
## Sensor (Potentiometer) location



FOOT OF BOOM



FOOT OF ARM

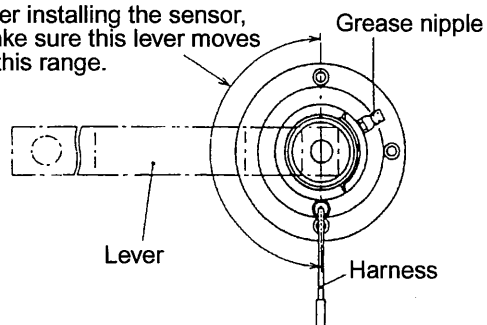


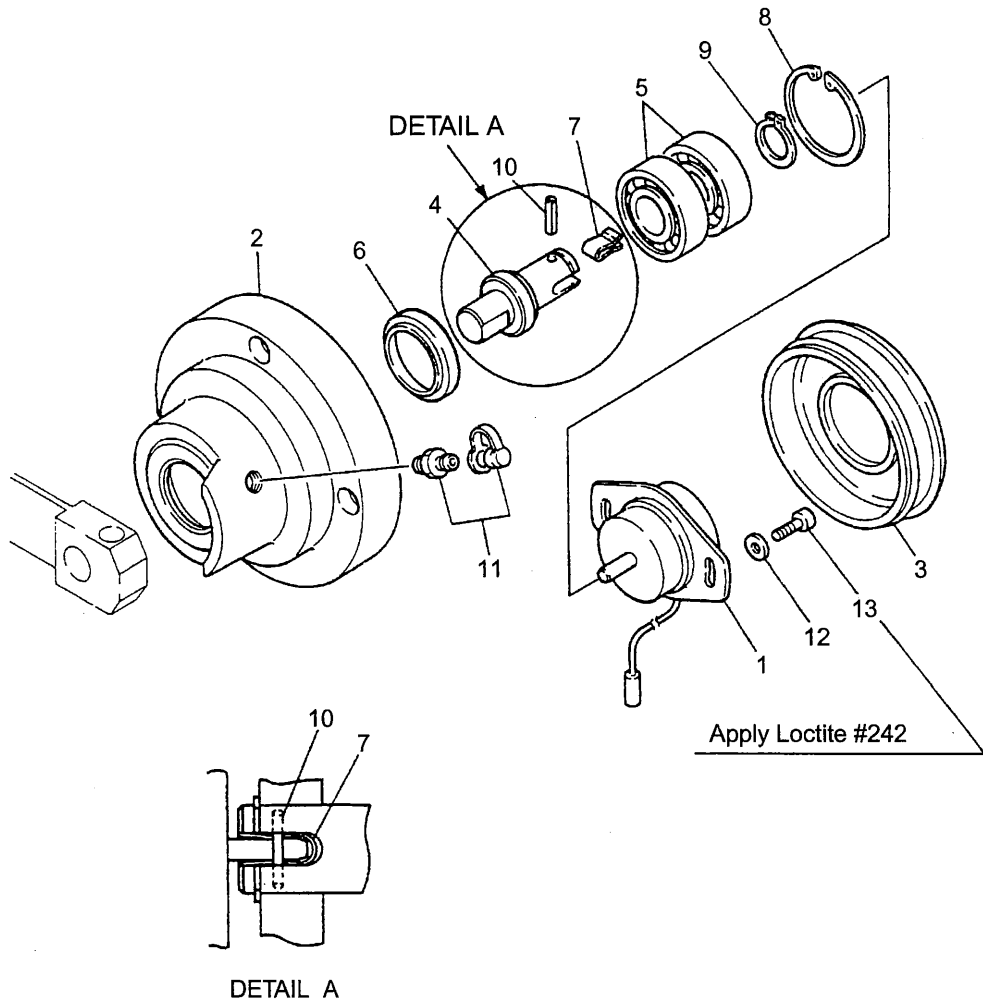
FOOT OF OFF-SET

- 1) When installing the lever on the sensor (potentiometer), make sure that the lever manually rotates 180 degrees. And then install the sensor on attachment. (See Fig.)
- 2) Install the sensor paying attention to the position of stopper as shown in the above figure.
- 3) The distance between centers of ball joints with rod on the boom foot section is 550mm.
- 4) The distance between centers of ball joints with rod on the arm foot section is 260mm.

| No. | Parts      | Q'ty |
|-----|------------|------|
| 1   | ROD        | 1    |
| 2   | BALL JOINT | 2    |
| 3   | LEVER      | 1    |
| 4   | LEVER      | 1    |
| 5   | LEVER      | 1    |
| 6   | SENSOR     | 3    |

After installing the sensor, make sure this lever moves in this range.



**Construction of sensor (Potentiometer) installation**

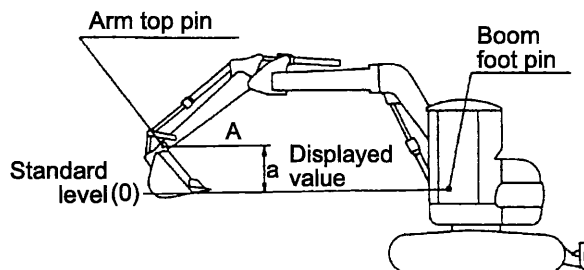
Apply small amount of grease to a grease-nipple (11) once a year.

| No. | Parts           | Q'ty | No. | Parts          | Q'ty |
|-----|-----------------|------|-----|----------------|------|
|     | SENSOR ASSEMBLY | 3    | 9   | SNAP RING      | 1    |
| 1   | POTENTIOMETER   | 1    | 10  | SPRING PIN     | 1    |
| 2   | BODY            | 1    | 11  | GREASE- NIPPLE | 1    |
| 3   | COVER           | 1    | 12  | WASHER         | 1    |
| 4   | SHAFT           | 1    | 13  | SOCKET BOLT    | 2    |
| 5   | BEARING         | 2    |     |                |      |
| 6   | DUST SEAL       | 1    |     |                |      |
| 7   | SPRING          | 1    |     |                |      |
| 8   | SNAP RING       | 1    |     |                |      |

# SK30UR-2 SK75UR-2 SK50UR-2

## 7-3 INDICATOR ADJUSTMENT PROCEDURE AND CAB INTERFERENCE PREVENTION FUNCTION

- (1) Height and depth display device
  - 1) Move the arm top pin to the standard level position.
  - 2) Press the **“Standard Setting”** switch.  
— 0.0(m) is displayed.
  - 3) Move the attachment, and the height or depth from the arm point pin position at the time when the switch was pressed in Paragraph 2) is displayed. (See right Fig.)
  - 4) When being necessary to change the standard position, position the arm top pin to the required point, and press the **“Standard Setting”** switch again.
  - 5) In shipping machines or pressing the **“Reset”** switch, the boom top pin position is set to the standard position.
  - 6) The set standard position does not change even if the engine key switch turns off or the indicator is folded.



STANDARD LEVEL FOR HEIGHT AND  
DEPTH

### [Example]

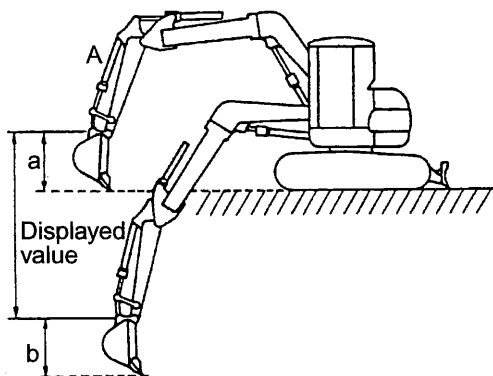
When desired to display the digging depth, put the attachment to level ground and press **“Standard Setting”** switch.

(Position A)

Taking the arm top pin position as “0”, read the indicated value for a certain depth (Position B), which corresponds to the required digging depth.

But, attention must be paid to the bucket condition, which is equivalent to the standard setting to read correct depth.

(To be  $a=b$ )



DEPTH

(2) Height limiting function

When the highest position of the attachment is detected and it reaches to the set height, the attachment stops moving.

The highest position is detected at three points, boom top, offset top and arm top points.

- 1) Move the attachment highest position to the required setting position.

- 2) Press the **"Height Limit"** switch.

LED on the switch turns ON to tell that the setting was completed.

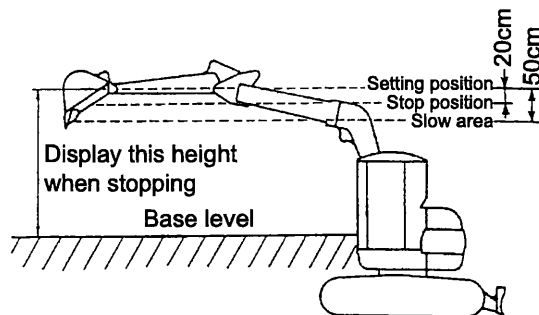
- 3) Then, since the attachment changes in stop condition, lower the attachment to the slow speed range keeping the release switch (R mark) on the right control lever pressed. That's all for setting.

- 4) When the attachment highest position comes closer to the set position than distance of 50cm during operation, the buzzer sounds intermittently and the operating speed slows down.

- 5) And when the attachment highest position comes closer to the set position than distance of 20cm further, the buzzer sounds continuously for 1.5 seconds and the attachment stops moving.

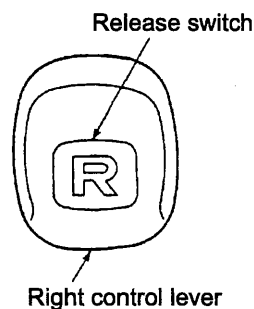
- 6) Press the **"Height Limit"** switch again and the setting is released.

LED on the switch turns OFF to tell that the setting is released. If you press the **"Reset"** switch, the setting is released too, but in this same time the depth limit setting is released simultaneously and the standard setting is initialized.



HEIGHT LIMITATION SETTING

In the case of **SK30UR-2**, this slow-down isn't available, but only the buzzer sounds intermittently.



- \* The setting is not released even if the engine key is turned OFF or the indicator is folded.
- \* The depth display shows the height from the standard position to the highest positions of boom top, offset top and arm top.
- \* The stop function due to the height limit acts on the boom, offset, bucket, slewing and traveling operations.

In the case of **SK30UR-2**, the height limit acts on the boom, offset, arm, bucket and slewing.

## SK30UR-2 SK75UR-2 SK50UR-2

### (3) Depth limiting function

When the arm top pin position (or bucket tooth tip) is detected and reaches to the set depth, the attachment stops moving.

- 1) Move the arm top pin position (bucket tooth tip) to the required setting position.

- 2) Press the **"Depth Limit"** switch.

LED on the switch turns ON to tell that the setting was completed.

- 3) Then since the attachment changes in stop condition, raise the attachment to the slow speed range keeping the release switch (R mark) on the right control lever pressed. That's all for setting.

- 4) When the arm top pin or bucket tooth tip positions come closer to the set position than distance of 50cm during operation, the buzzer sounds intermittently and the operating speed slows down.

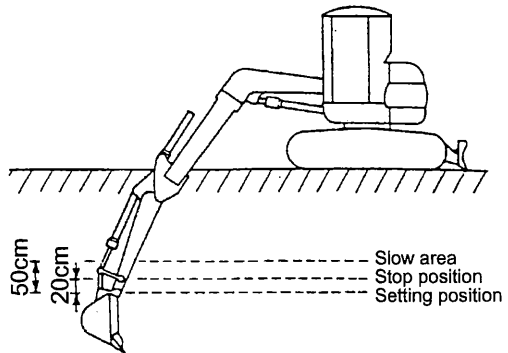
In the case of **SK30UR-2**, this slow-down isn't available, but only the buzzer sounds intermittently.

- 5) And when the arm top pin or bucket tooth tip positions come closer to the set position than distance of 20cm further, the buzzer sounds continuously for 1.5 seconds, and the attachment stops moving.

- 6) Press the **"Depth Limit"** switch again, and the setting is released.

LED on the switch turns OFF to tell that the setting is released.

If you press the **"Reset"** switch, the setting is released too, but in this same time the height limit setting is released simultaneously and the standard setting is initialized.



**DEPTH LIMITATION SETTING**  
(Arm top pin or bucket tooth tip position)



- \* The setting is not released even if the engine key is turned OFF or the indicator is folded.
- \* Since the attachment position is set or stopped moving, taking the arm the top pin position as standard position, the bucket tooth tip depth in stop condition varies with bucket posture.
- \* The stop function due to the depth limit acts on boom, offset, bucket, swing and traveling operations.

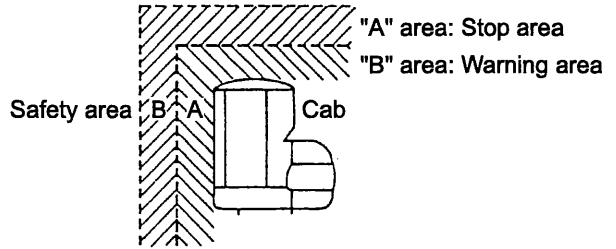
In the case of **SK30UR-2**, the limit acts on the boom, offset, arm, bucket and slewing operations to stop moving.

(4) Cab interference prevention function

1) Operation in the range of "B" area (See Fig.)

When the arm top pin position (or bucket tooth tip) comes into the range of "B" area set from the cab position, the warning buzzer sounds intermittently to warn operator of danger.

And FC solenoid valve is excited to decrease the pump flow rate, resulting in slow operating speed. (Except for **SK30UR-2**.)



INTERFERENCE PREVENTION AREA

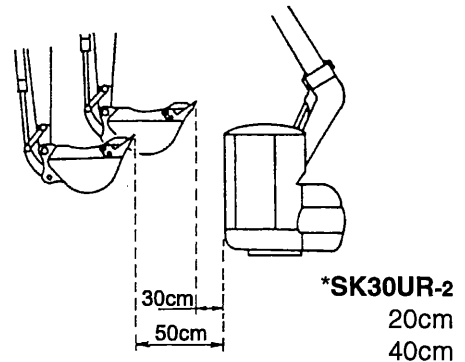
2) Operation in the range of "A" area (See Fig.)

1. By moving the attachment closer to the cab further (the bucket tooth tip comes into "A" area.) the excitation of solenoid valve for emergency stop is cut resulting in auto stop, and simultaneously the warning buzzer sounds continuously.

But the warning continues for 1.5 seconds and then stops sounding.

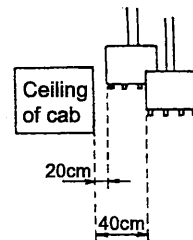
2. And the solenoid valves for emergency stop cut the pilot commands for boom up, arm in and offset left, consequently these movements stop.

3. Subsequently the interference with the cab is avoided. But the traveling, slewing, dozer, boom down, arm out, and offset right operations do not stop.



INTERFERENCE PREVENTION AREA  
IN FRONT

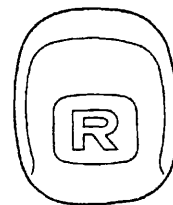
- 3) And the distance from the cab to the "A" area or "B" area varies depending on the bucket posture because the position is detected with arm top pin.



SIDE INTERFERENCE PREVENTION AREA

4) Releasing of auto stop

1. When required to move the attachment closer to the cab further, press the release switch (R mark) on the right control lever and the solenoid valve for emergency stop is forced to excite making the operation possible.
2. But the attachment can be returned into the safety side with normal lever, and then the above switch operation is not required.



RELEASE SWITCH

# SK30UR-2 SK75UR-2 SK50UR-2

## 7-4 IN THE FOLLOWING CASES

- (1) The boom, off-set, arm, bucket, slewing and traveling other than dozer do not function. (**SK50UR-2, SK75UR-2**)

For **SK30UR-2**, the operations other than dozer and traveling do not function.

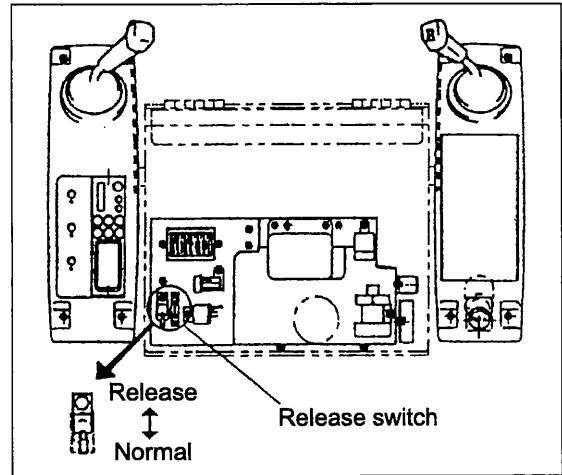
\* The attachment may come in the range of height limit or depth limit. If it is in the limit range, those operations cannot be performed.

- (2) The buzzer keeps sounding and the dozer does not move. (**SK50UR-2, SK75UR-2**)  
For **SK30UR-2**, the operations other than dozer and traveling do not function.

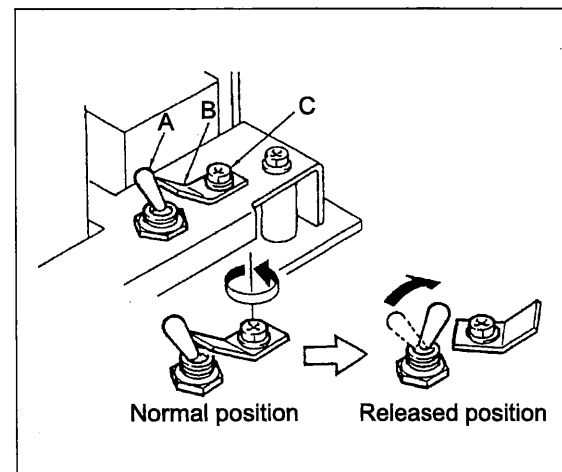
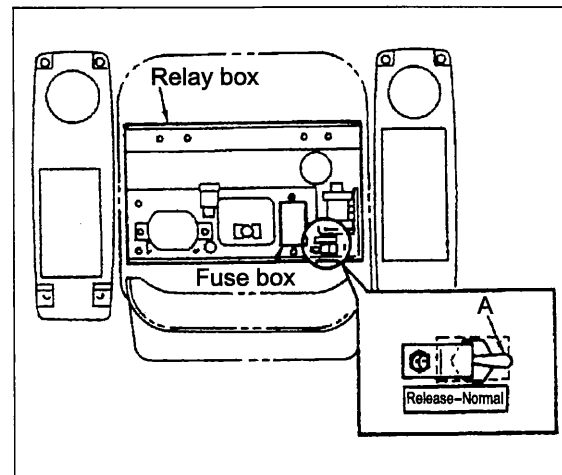
\* When it is obliged to operate the machine, set the stop release switch (toggle switch) in the relay box installed under the operator's seat to the release side and the stop condition is released.

But the buzzer continues sounding.

### SK50UR-2, SK75UR-2



### SK30UR-2



## 7-5 ADJUSTING PROCEDURE

Store the values of angle sensor at stroke end of boom up, arm in and out, and off-set right and left in the controller.

- (1) Start engine.
- (2) Keep the **"Standard Setting"** switch and **"Reset"** switch pressed simultaneously until the following condition is appeared. (For about 5 seconds)(See Fig.)

- 1) Indication "111"
- 2) Buzzer sounds continuously.
- 3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn ON.

- (3) Move the boom up, off-set right and arm in positions to the stroke ends respectively. (See Fig.)
- (4) Press the **"Height Limit"** and **"Depth Limit"** switches the LED lamps are ON once simultaneously. The display changes in the following. (See Fig.)

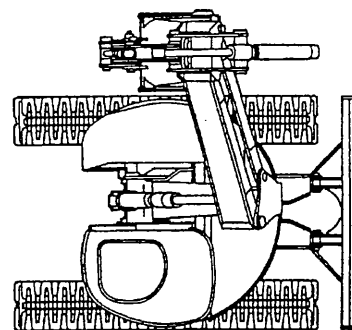
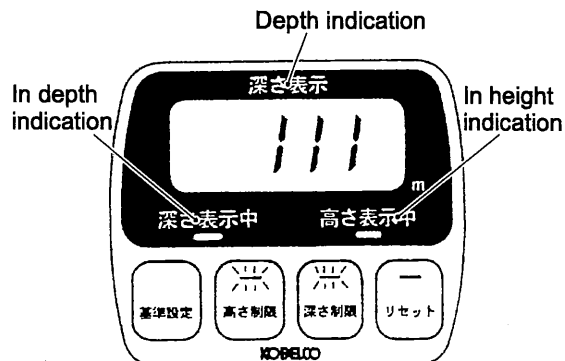
- 1) Indication "222"
- 2) LED lamp on the **"Reset"** switch turns ON.
- 3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn OFF.

- (5) Move the off-set left (Cab side) and arm out positions to the stroke ends respectively. (The boom posture is not related.)
- (6) Press the **"Reset"** switch the LED lamp is ON once.

- 1) The arm top pin height is indicated on the depth display.
- 2) Buzzer stops sounding.
- 3) All LED lamps on the switch panel turn OFF.

This is end for adjusting procedure.

(\* The bucket posture is not related to the above adjustment.)



\* The bucket angle has no relation regarding adjustment.

### IN ADJUSTING POSITION



## SK50UR-2 SK75UR-2

Store the values of angle sensor at stroke end of boom up, arm in and out, and off-set right and left in the controller.

- (1) Start engine.
- (2) Keep the **"Standard Setting"** switch and **"Reset"** switch pressed simultaneously until the following condition is appeared. (For about 5 seconds)(See Fig. )

- 1) Indication "111"
- 2) Buzzer sounds continuously.
- 3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn ON.
- (3) Move the boom up, off-set right and arm in positions to the stroke ends respectively. (See Fig. )
- (4) Press the **"Height Limit"** and **"Depth Limit"** switches the LED lamps are ON once simultaneously. The display changes in the following. (See Fig.)

- 1) Indication "222"
- 2) LED lamp on the **"Reset"** switch turns ON.
- 3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn OFF.
- (5) Move the off-set left (Cab side) and arm out positions to the stroke ends respectively. (The boom posture is not related.)
- (6) Press the **"Reset"** switch the LED lamp is ON once. The display changes in the following.

- 1) Indication "777" or "666"
- 2) LED lamp on the **"Height Limit"** switch turns ON.
- (7) Press the **"Height Limit"** switch LED lamp is ON and the display alternates form/to "666" to/from "777". Then press the switch until the indication accords with the value corresponding to the arm length.

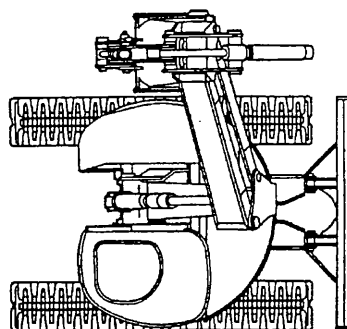
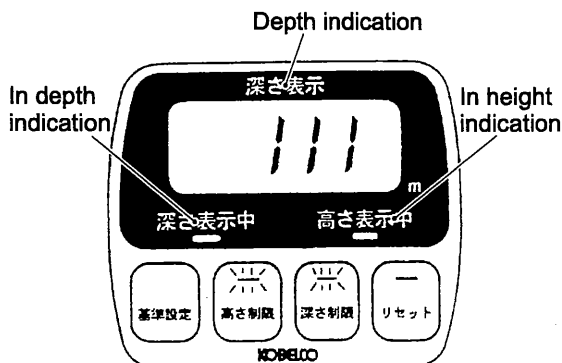
### [SK50UR-2]

"666" ..... 1.53m arm (Short arm)  
"777" ..... 1.91m arm (Standard arm)

### [SK75UR-2]

"666" ..... 2.06m arm (Long arm)  
"777" ..... 1.76m arm (Standard arm)

- (8) Then, press the **"Standard Setting"** switch and the buzzer stops sounding. This is end for adjusting procedure.
- (9) And finally press the **"Reset"** switch. (To initialize standard setting position.)



\* The bucket angle has no relation regarding adjustment.

IN ADJUSTING POSITION



**7-6 ERROR CODE DISPLAY ON LIQUID CRYSTAL DISPLAY**

- (1) Angle sensor input error (Potentiometer)  
Where the input signal from angle sensor is in disconnection or short circuit, the following code is displayed on liquid crystal display.  
In this case, excepting dozer operation, since solenoid proportional valve's excitation is cut, the boom, arm, offset, bucket, slewing and travel operation stop and the buzzer is sounding continuously.

| Code | Failure                                 |
|------|-----------------------------------------|
| 300  | Arm angle sensor input signal error     |
| 030  | Off-set angle sensor input signal error |
| 003  | Boom angle sensor input signal error    |

**Note:**

The hundreds digit indicates the error of arm angle sensor, the tens digit indicates the error of offset and the units digit indicates the error of boom angle sensor, respectively.

For example, when the display shows 303, this indicates the errors of arm and boom angle sensors.

**Corrective action:**

Check the harness and angle sensor for possible failure.

- (2) Adjusted data error "**Code 555**"  
The input data of angle sensor at each stroke end of boom-up, arm-in and out, off-set right and left operation is stored into controller at the time of adjustment (See Item 7.5 "Adjustment procedure"), but if the angle value of each input data differs more than 25 degrees from the theoretical value, the controller infers that it may be caused by faulty adjustment position or angle sensor input value error, and the data is not therefore written in controller.  
In this case, error code "555" is displayed.

**Corrective actions:**

1. Check that it is on adjustment position.
2. Check on angle sensor and harness

**[SK30UR-2]**

- (3) Set data error "**Code 444**"

When the angle sensor input data stored in controller at the time of adjustment is not in the specified range, the controller infers that the data is rewritten by a factor of same kind, and code "444" is displayed on the liquid crystal display to inform of error occurred.  
In this case, excepting dozer operation, since solenoid proportional valve's excitation is cut, the boom, arm, off-set, bucket, slewing and travel operation stop and the buzzer is sounding continuously.

**Corrective actions:**

1. Adjust it again.
2. After readjustment, if error still occurs, replace the controller.

**[SK50UR-2, SK75UR-2]**

- (4) Set data error "**Code 999**"

When the angle sensor input data of arm length stored in controller at the time of adjustment differs from standard length and long length, the controller infers that the data is rewritten by a factor of same kind, and code "999" is displayed on the liquid crystal display to inform of error occurred.  
In this case, the controller infers that this machine equips standard length arm. And the controller controls cab interference prevention, height limitation and depth limitation.

**Corrective actions:**

1. Adjust it again.
2. After readjustment, if error still occurs, replace the controller.

# SK30UR-2 SK75UR-2 SK50UR-2

## 7-7 ELECTRICAL EQUIPMENT CHECKING METHOD

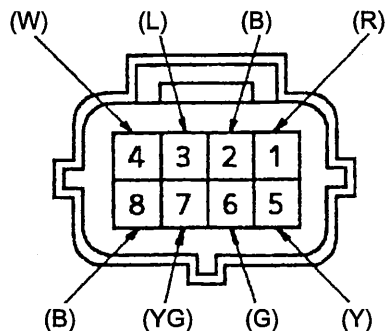
- (1) Checking angle sensor resistance  
Checking is performed when angle sensor input error is displayed on the controller, or the stop position of attachment is too far or too close from specified position.
  - 1) Disconnect the CN2 connector from the harness.
  - 2) Measure the resistance at terminal section of connector (8 pins, female) on the harness side connected to the harness by the following procedure.
  - 3) Checking on arm angle sensor
    1. Remove the connector for boom and offset angle sensors. (Under the condition where the arm angle sensor is connected.)
    2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) in the pin arrangement shown in figure is about 5KΩ.
    3. Check that the resistance between No.5 pin and No.2 pin (wire color Y-B) changes from about 0.9 KΩ to 4.1KΩ while arm operation changes from the arm out to the arm in.
  - 4) Checking boom angle sensor
    1. For arm and offset angle sensors, remove connectors. (Under the condition where the boom angle sensor is connected.)
    2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) is about 5KΩ.
    3. Check that the resistance between No.3 pin and No.2 pin (wire color L-B) changes from about 0.7 KΩ to 4.3KΩ while boom operation changes from the boom up to the boom down.
  - 5) Checking offset angle sensor
    1. For boom and arm angle sensors, remove connector. (Under the condition where the offset angle sensor is connected.)
    2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) is about 5KΩ.
    3. Check that the resistance between No.4 pin and No.2 pin (wire color W-B) changes from about 3.7 KΩ to 1.3KΩ while offset operation changes from the off-set right to the off-set left.



The tolerance of above resistance is within 20%.

Check the sensor for possible abnormality

Trouble occurred → Angle sensor error  
→ Disconnection of harness



CN2 8 PINS FEMALE CONNECTOR  
(Harness side connector)

- (2) Inspection for signal of angle sensor on depth display

When you operate independently each attachment, if you check the change of depth display, you can confirm the error of potentiometer easily.

- 1) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the boom-up and the boom-down are operated.

Or display is changed over 0.2m even though actual movement is about 0.1m.

- Boom angle sensor failure
- Boom angle sensor installation mistake

- 2) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the arm-in and the arm-out are operated.

Or display is changed over 0.2m even though actual movement is about 0.1m.

- Arm angle sensor failure
- Arm angle sensor installation mistake

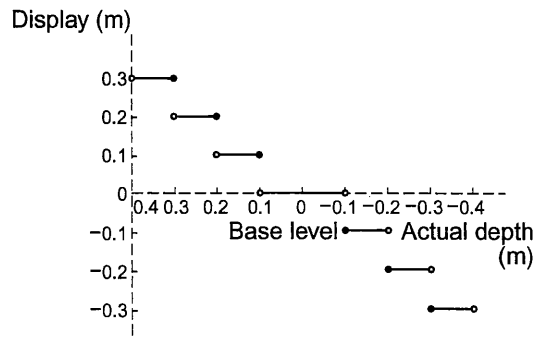
- 3) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the off-set right and the off-set left are operated.

Or display is changed over 0.2m even though actual movement is about 0.1m.

- Offset angle sensor failure
- Offset angle sensor installation mistake

**Note:**

Because the digit of  $1/100 \text{ m} = 1 \text{ cm}$  in the display is omitted as shown in the graph, in the vicinity of the standard 0 level, the indicated value between 0.1 and 0m is displayed 00, and the value between 0 and -0.1m is displayed -00.



- (3) Checking method of emergency stop (for interference prevention) and control cut solenoid valve (for height and depth limits)  
Check them when the auto stop does not function.

- 1) Disconnect connector CN1 on the controller.
- 2) Short circuit the No.2 and No.4 pins of pin arrangement in the figure of connectors (with 8P male terminal with O ring) on the harness side connected to CN1 with alligator clips, and the emergency stop relay in the relay box (wire color B-LW) is excited and the 3-sections solenoid valve is cut. Consequently the operation of boom up, arm in and off-set left (Cab side) become impossible.

\* Short-circuiting between No.2 and No.3 causes buzzer sounding.  
Short-circuiting No.2 and No.5 causes cutting of control.

- 3) When the operation is possible in the condition of short circuit between No.2 and No.4, disconnect one connector connected to 3-sections solenoid valve, and check the voltage of connector on the harness side.

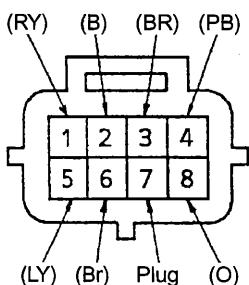
\* In no voltage

→ Failure of 3-sections solenoid valve or hydraulic pressure

\* Voltage of 20V or higher

→ Fuse blown  
→ Failure of relay for emergency stop  
→ Disconnection of harness  
→ The emergency stop switch is set to the release side.

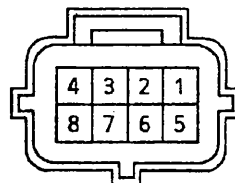
\* The hydraulic circuit is designed to stop when the 3-sections solenoid valve, control cut valve and solenoid valve are not live.



CN18 Pins Male (Harness side connector)

<Control side connector>

CN18 Pins Female

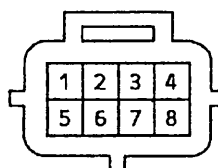


| No. | Description                 | Male                       | Female                   |
|-----|-----------------------------|----------------------------|--------------------------|
|     |                             | Controller side wire color | Outer harness wire color |
| 1   | 24V input                   | Red                        | RY Red-Yellow            |
| 2   | Grounding input             | Black                      | B Black                  |
| 3   | Buzzer output               | White-Black                | BR Black-Red             |
| 4   | Emergency stop relay output | Light green                | LW Blue-White            |
| 5   | Control cut relay output    | Blue                       | LY Blue-Yellow           |
| 6   | * FC relay output           | Orange                     | PB Pink-Black            |
| 7   | Standby output              | Green                      |                          |
| 8   | Power for back light        | Yellow                     | O Orange                 |

\* In case of **SK30UR-2**, this circuit isn't connected.

<Control side connector>

CN18 Pins Male



\* Pin arrangement viewed from the connector inserting section

| No. | Description                       | Male                       | Female                   |
|-----|-----------------------------------|----------------------------|--------------------------|
|     |                                   | Controller side wire color | Outer harness wire color |
| 1   | Angle sensor 5V output            | Red-Black                  | R Red                    |
| 2   | Angle sensor grounding            | White                      | B Black                  |
| 3   | Boom angle sensor signal input    | Light Violet               | L Blue                   |
| 4   | Off-set angle sensor signal input | Gray                       | W White                  |
| 5   | Arm angle sensor signal input     | Purple                     | Y Yellow                 |
| 6   | Standby input                     | Brown                      |                          |
| 7   | Release switch input              | Pink                       | YG Yellow-Green          |
| 8   | Release switch grounding          | Sky Blue                   | B Black                  |

## 8. PRESSURE AND PERFORMANCE STANDARD

### Test procedure

Measure the value 3 times for each test, and calculate the average.

#### 1. Main circuit pressure

##### (1) Measuring condition

Engine speed: High idling

Hydraulic oil temperature:

50 to 60C (122 to 140F)

Connect the pressure gauge to detecting port, operate the attachment, which is required the measuring of pressure.

| Circuit        | Detecting port |       | Relief valve |
|----------------|----------------|-------|--------------|
|                | Position       | Size  |              |
| Boom<br>Bucket | P1             | PF1/4 | R1           |
| Arm<br>Off-set | P2             | PF1/4 | R2           |
| Dozer          | P3             | PF1/4 | R3           |
| Slewing        | LH             | PF1/4 | R4           |
|                | RH             |       | R5           |

##### (2) Pressure adjustment

- 1) Loosen locknut, and adjust the setting pressure turning the setscrew.

CW turning: Increasing setting pressure

CCW turning: Decreasing setting pressure

- 2) After the adjustment, tighten up the locknut holding the setscrew not to allow its turning.
- 3) Again actuate the relief valve, and verify that the set pressure is being stable.

#### 2. Pilot circuit pressure

##### (1) Measuring conditions

Engine: High idling

Hydraulic oil temperature:

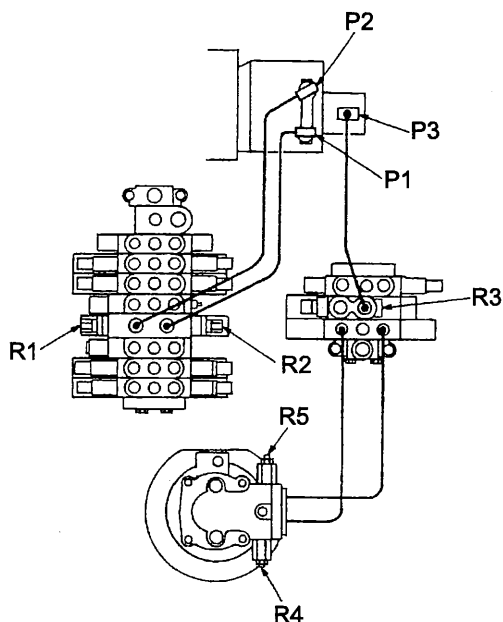
50 to 60C (122 to 140F)

Connect the pressure gauge to detecting port and measure the pressure.

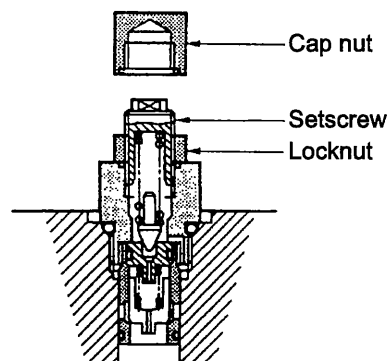
| Detecting port |       | Relief valve |
|----------------|-------|--------------|
| Position       | Size  |              |
| P4             | PF1/4 | R6           |

##### (2) Pressure adjustment

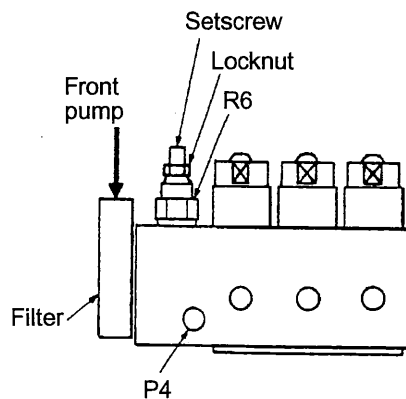
- 1) Loosen locknut, and adjust the setting pressure turning the setscrew.
- 2) After the adjustment, tighten up the locknut holding the setscrew not to allow its turning.
- 3) Again actuate the relief valve, and verify that the set pressure is being stable.



PRESSURE MEASURING



MAIN RELIEF VALVE



SOLENOID VALVE WITH RELIEF VALVE

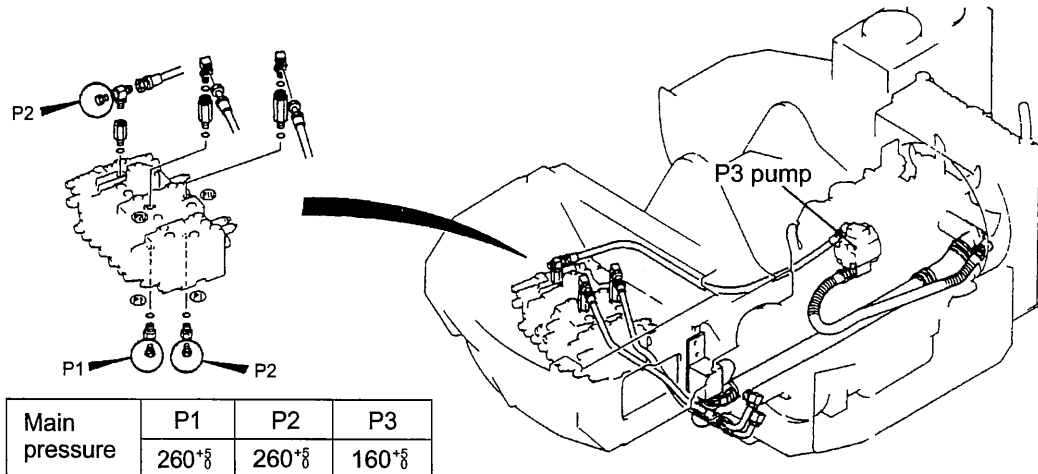
## SK50UR-2 SK75UR-2

### 3. Main relief pressure

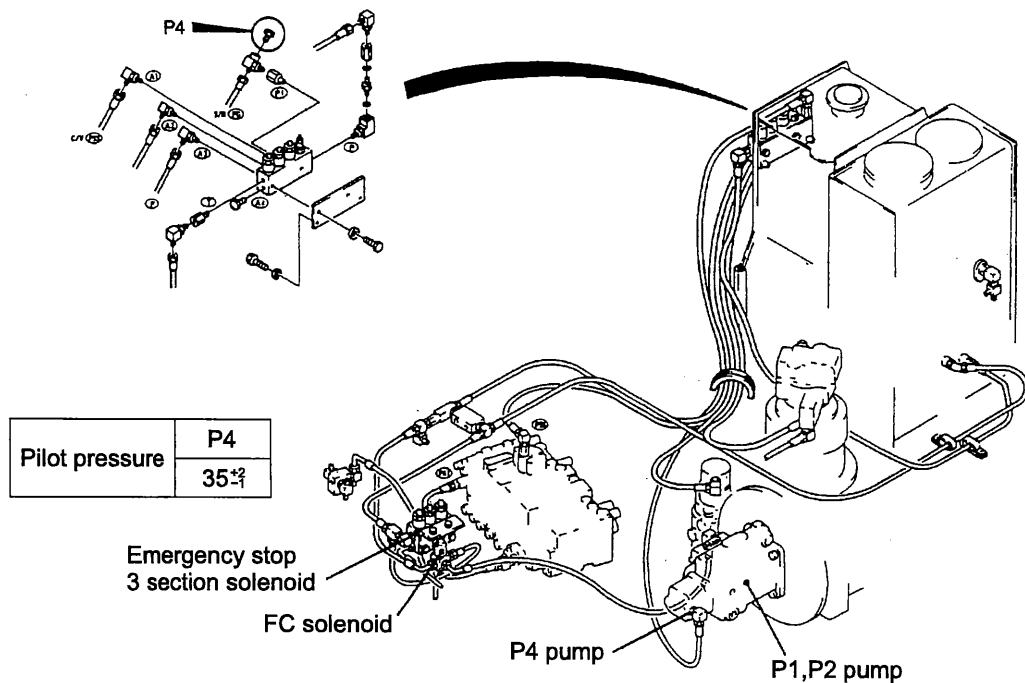
- (1) Warm the hydraulic oil to about 50 degrees C.
- (2) Before connecting pressure gauge, bleed the hydraulic oil tank of air.
- (3) Measure the pressure when the engine is high idling and at H mode.

### 4. Pressure gauge location (All threads are PF1/4.)

- (1) Measurement of P1, P2 and P3

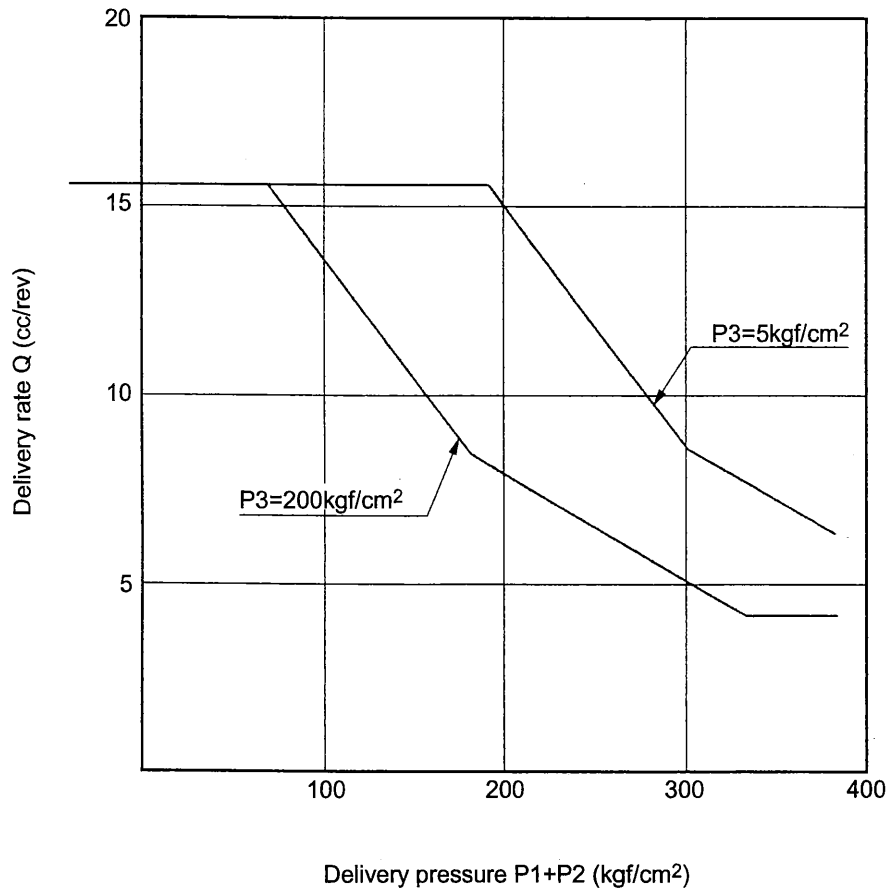


- (2) Measurement of P4

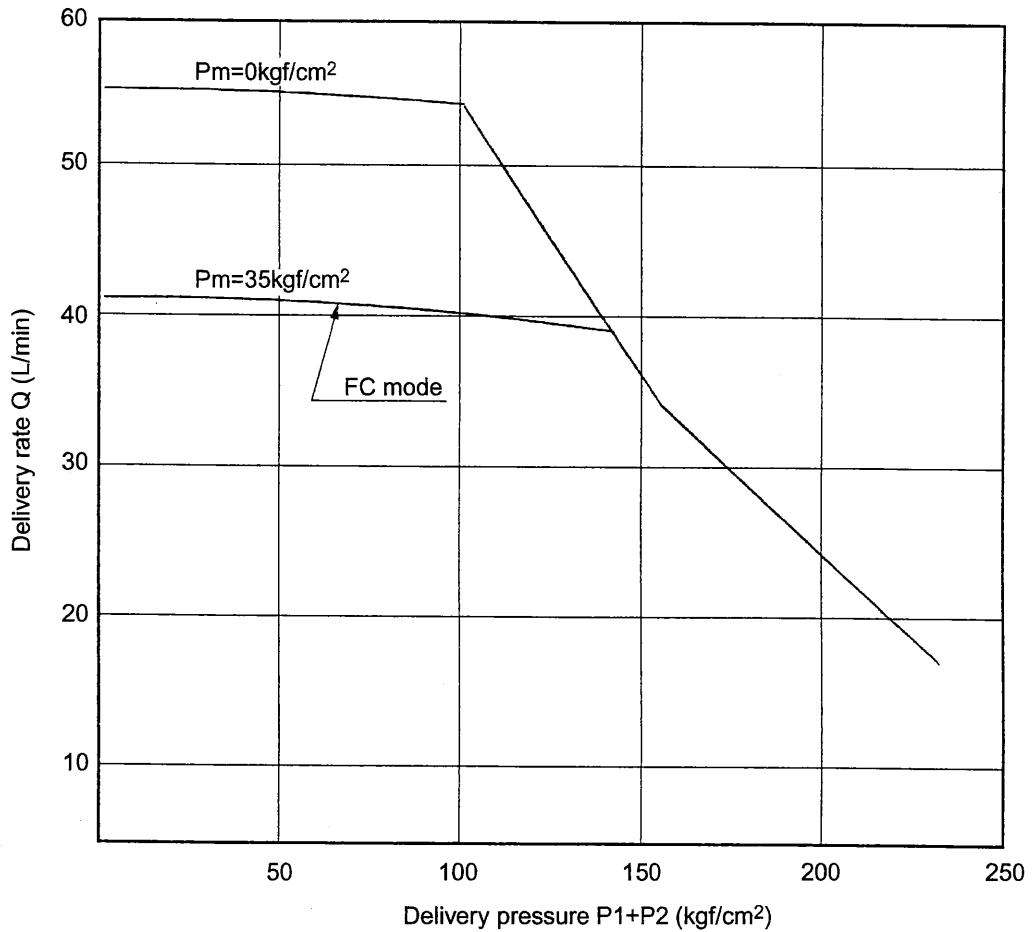


## 9. PERFORMANCE STANDARD TABLE

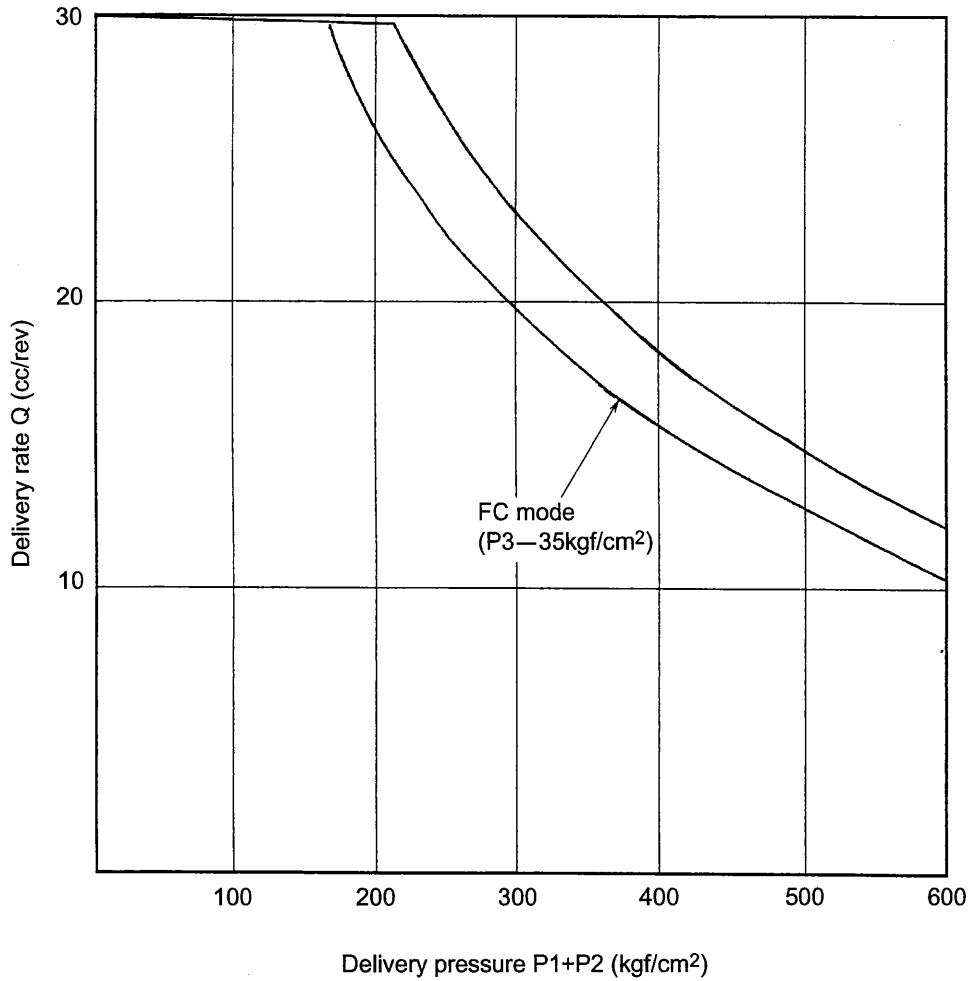
| Item                | Measuring position               |                                               |                                  | Unit                | SK30UR-2                        | SK50UR-2                       | SK75UR-2                          |            |  |
|---------------------|----------------------------------|-----------------------------------------------|----------------------------------|---------------------|---------------------------------|--------------------------------|-----------------------------------|------------|--|
|                     |                                  |                                               |                                  |                     | Standard value                  | Standard value                 | Standard value                    |            |  |
| Measuring condition | Hydraulic oil temperature        |                                               |                                  | ℃                   | 50±5                            | 50±5                           | 50±5                              |            |  |
|                     | Coolant temperature              |                                               |                                  |                     | 75±15                           | 75±15                          | 75±15                             |            |  |
|                     | Engine speed                     | Low idling                                    |                                  | rpm                 | 1,000±50                        | 1,050±50                       | 950±50                            |            |  |
|                     |                                  | H mode, High idling                           |                                  |                     | 2,300±50                        | 2,490±50                       | 2,380±50                          |            |  |
|                     |                                  | FC mode                                       |                                  |                     | —                               | 2,490±50                       | 1,600 <sup>+50</sup> <sub>0</sub> |            |  |
|                     |                                  | Deceleration                                  |                                  |                     | 1,000±50                        | 1,050±50                       | 1,600 <sup>+50</sup> <sub>0</sub> |            |  |
| Hydraulic pressure  | Pilot relief                     | Primary delivery                              |                                  | kgf/cm <sup>2</sup> | 35 <sup>+3</sup> <sub>0</sub>   | 35 <sup>+2</sup> <sub>1</sub>  | 35 <sup>+2</sup> <sub>1</sub>     |            |  |
|                     | Main relief set                  | P1                                            | Attachment, Travel               |                     | 210 <sup>+10</sup> <sub>0</sub> | 210 <sup>+5</sup> <sub>0</sub> | 260 <sup>+5</sup> <sub>0</sub>    |            |  |
|                     |                                  | P2                                            |                                  |                     |                                 | 230 <sup>+5</sup> <sub>0</sub> |                                   |            |  |
|                     |                                  | P3                                            | Dozer                            |                     | 200 <sup>+10</sup> <sub>0</sub> | 200 <sup>+5</sup> <sub>0</sub> | 320 <sup>+5</sup> <sub>0</sub>    |            |  |
|                     | Overload relief set              | Boom                                          | H                                |                     | 250 <sup>+10</sup> <sub>0</sub> | 240 <sup>+5</sup> <sub>0</sub> | 280 <sup>+5</sup> <sub>0</sub>    |            |  |
|                     |                                  |                                               | R                                |                     |                                 |                                |                                   |            |  |
|                     |                                  | Arm                                           | H,R                              |                     |                                 |                                |                                   |            |  |
|                     |                                  | Bucket                                        |                                  |                     |                                 |                                |                                   |            |  |
|                     |                                  | Offset                                        |                                  |                     |                                 |                                |                                   |            |  |
|                     |                                  | Dozer                                         |                                  |                     |                                 |                                |                                   |            |  |
|                     |                                  | Travel                                        |                                  |                     |                                 |                                |                                   |            |  |
|                     | Slewing                          | 170 <sup>+30</sup> <sub>0</sub>               | 150 <sup>+40</sup> <sub>10</sub> |                     | 260 <sup>+5</sup> <sub>0</sub>  |                                |                                   |            |  |
| Travel              | Travel speed (5 revolutions)     | Rubber crawler                                | Low speed                        | Sec / 5 rev         | 26.3~27.3                       | —                              | —                                 |            |  |
|                     |                                  | High speed                                    | 15.2~16.2                        |                     | —                               | —                              |                                   |            |  |
|                     | Sprocket revolutions             | Rubber crawler                                | Low speed                        | rpm                 | —                               | 33.1~36.6                      | 35.6±2                            |            |  |
|                     |                                  |                                               | High speed                       |                     | —                               | 23.1~62.7                      | 55.9±3                            |            |  |
|                     | Travel deviation                 |                                               |                                  | mm / 10m            | 125 or less                     | 125                            | 80                                |            |  |
|                     | Parking brake performance        |                                               |                                  | mm / 5min           | 0                               | 0                              | 0                                 |            |  |
| Slewing             | Slewing speed                    |                                               | Standard                         | Sec / 2 rev         | 12.8~14.0                       | 11.4~21.2                      | 9.6±0.5                           |            |  |
|                     |                                  |                                               | Low speed                        |                     | 21.8~24.0                       | 18.0~22.3                      | 17.2±0.5                          |            |  |
|                     | Drift at slewing stop            |                                               |                                  | mm                  | 100~150                         |                                | 420~560                           |            |  |
|                     | Slewing natural drift by gravity |                                               |                                  | mm / 5min           | 0                               | 0                              | 0                                 |            |  |
| Cylinder            | Cylinder speed                   | Boom                                          | Up                               | Sec                 | 3.4~4.0                         | 2.6~3.2                        | 2.7±0.3                           |            |  |
|                     |                                  |                                               | Down                             |                     | 3.7~4.3                         | 2.6~3.2                        | 3.4±0.3                           |            |  |
|                     |                                  | Arm                                           | In                               |                     | 3.6~4.2                         | 3.7~4.3                        | 3.5±0.3                           |            |  |
|                     |                                  |                                               | Out                              |                     | 3.3~3.9                         | 2.9~3.7                        | 2.3±0.3                           |            |  |
|                     |                                  | Bucket                                        | Digging                          |                     | 2.7~3.3                         | 3.2~3.8                        | 3.8±0.3                           |            |  |
|                     |                                  |                                               | Dump                             |                     | 2.0~2.6                         | 1.9~2.5                        | 2.2±0.3                           |            |  |
|                     |                                  | Offset                                        | Left                             |                     | 2.7~3.3                         | 7.7~9.3                        | 7.4±0.5                           |            |  |
|                     |                                  |                                               | Right                            |                     | 2.5~3.2                         | 6.0~7.0                        | 5.5±0.4                           |            |  |
|                     |                                  | Dozer                                         | Down                             |                     | 2.9~3.5                         | 3.2~3.8                        | 1.3±0.2                           |            |  |
|                     |                                  |                                               | Up                               |                     | 1.9~2.5                         | 2.3~2.9                        | 0.8±0.2                           |            |  |
|                     |                                  | Cylinder drift by gravity                     | Boom                             |                     | mm / 10min                      | 12 or less                     |                                   | 10 or less |  |
|                     |                                  |                                               | Arm                              |                     |                                 | 10 or less                     |                                   | 8 or less  |  |
|                     | Bucket                           |                                               | 5 or less                        |                     |                                 | 4 or less                      |                                   |            |  |
|                     | Offset                           |                                               | 5 or less                        |                     |                                 |                                |                                   |            |  |
|                     | Dozer                            |                                               | 5 or less                        |                     |                                 |                                |                                   |            |  |
|                     | Bucket tooth tip                 |                                               | 200 or less                      | 200 or less         |                                 | 85 or less                     |                                   |            |  |
|                     | Slewing bearing                  | Amount of horizontal play at bucket tooth tip |                                  |                     | mm                              | 20~65                          | 25~50                             | 40         |  |
|                     |                                  | Play of slewing bearing's meshing             |                                  |                     |                                 | 0.7±0.4                        |                                   | 1.2~2.8    |  |

**10. P-Q CURVE OF MAIN PUMP****CHARACTERISTIC CURVE OF PUMP**

## CHARACTERISTIC CURVE OF PUMP

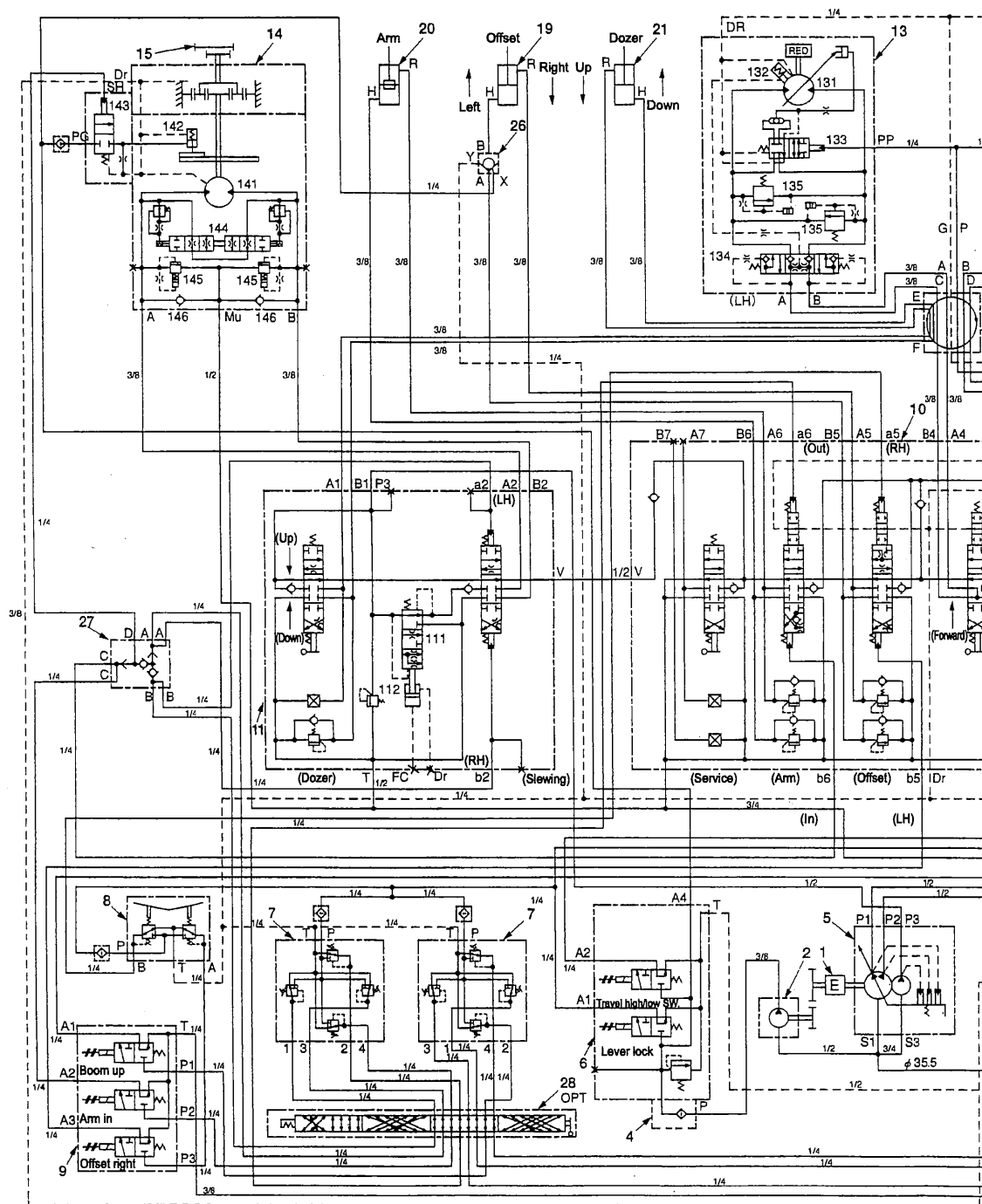


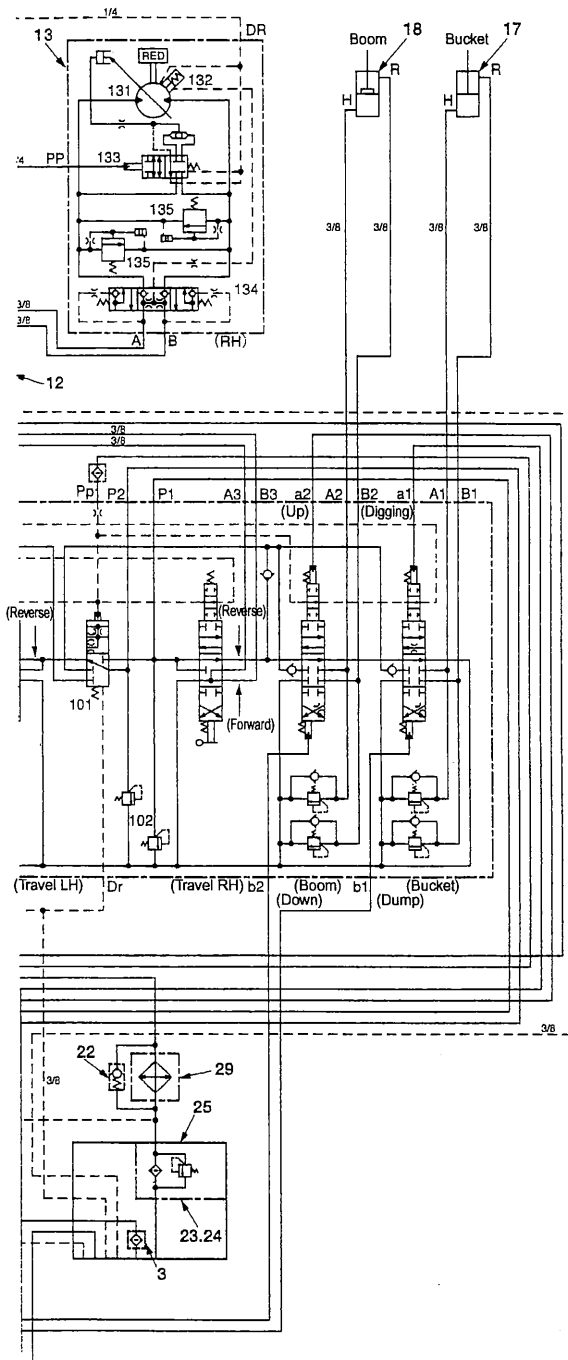
**CHARACTERISTIC CURVE OF PUMP**



**MEMO**

## 11. HYDRAULIC CIRCUIT DIAGRAM

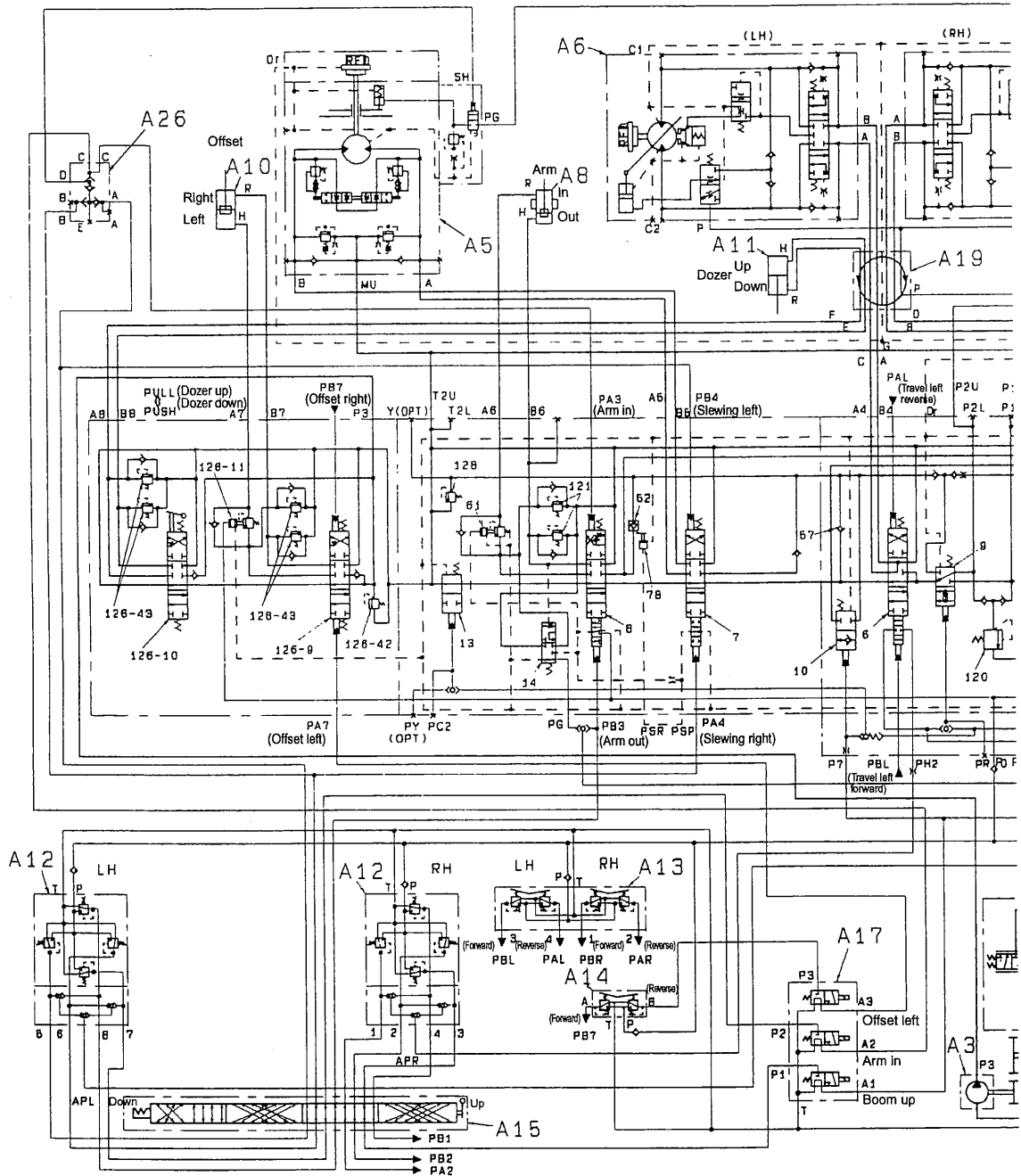


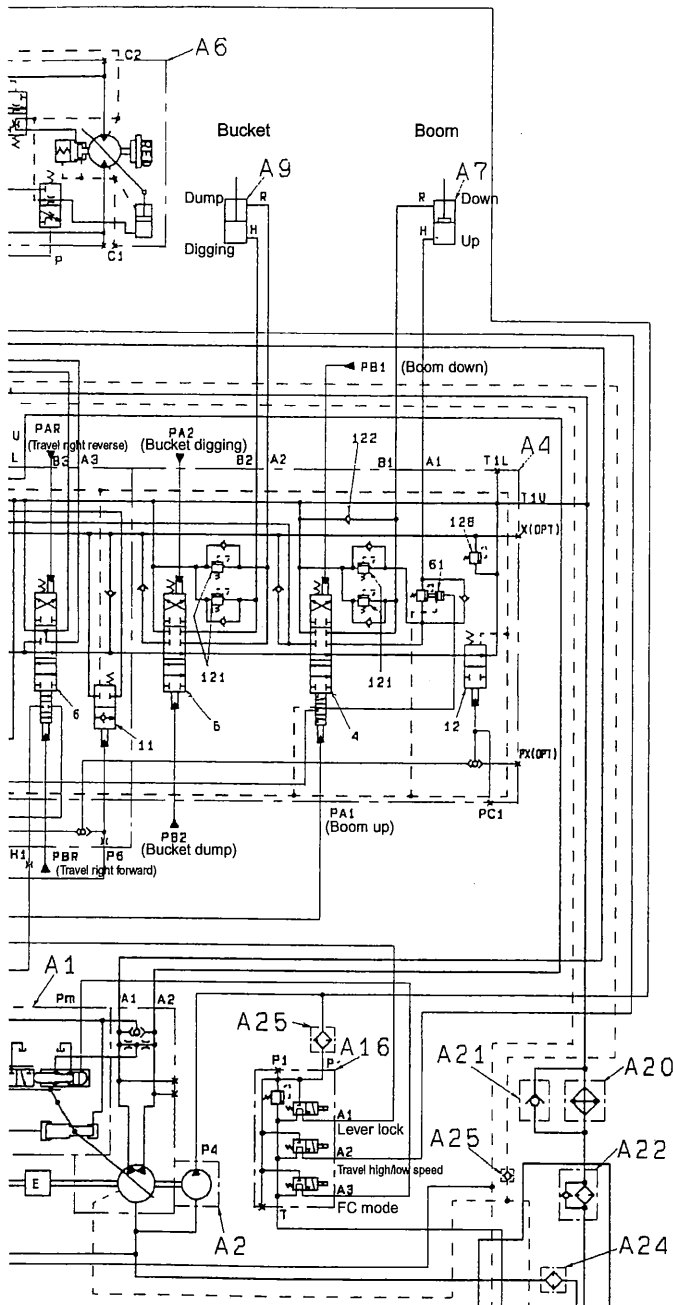


| No.  | Component                                  |
|------|--------------------------------------------|
| 1    | Engine                                     |
| 2    | Gear pump (for Pilot)                      |
| 3    | Suction strainer                           |
| 4    | Line filter                                |
| 5    | Main pump                                  |
| 6    | Solenoid valve (Travel speed & Lever lock) |
| 7    | Pilot valve (for Attachment)               |
| 8    | Pilot valve (for Off-set)                  |
| 9    | Solenoid valve (Interference prevention)   |
| 10   | Main control valve                         |
| 11   | Control valve (Dozer & Slewing)            |
| 12   | Swivel joint                               |
| 13   | Travel motor                               |
| 14   | Slewing motor                              |
| 15   | Slewing ring                               |
| —    | —                                          |
| 17   | Bucket cylinder                            |
| 18   | Boom cylinder                              |
| 19   | Offset cylinder                            |
| 20   | Arm cylinder                               |
| 21   | Dozer cylinder                             |
| 22   | Check valve                                |
| 23   | Return filter                              |
| 24   | Bypass valve                               |
| 25   | Hydraulic oil tank                         |
| 26   | Pilot check valve                          |
| 27   | Shuttle valve                              |
| * 28 | Multi control valve (Option)               |
| 29   | Oil cooler                                 |
| 30   | Block (Piping)                             |

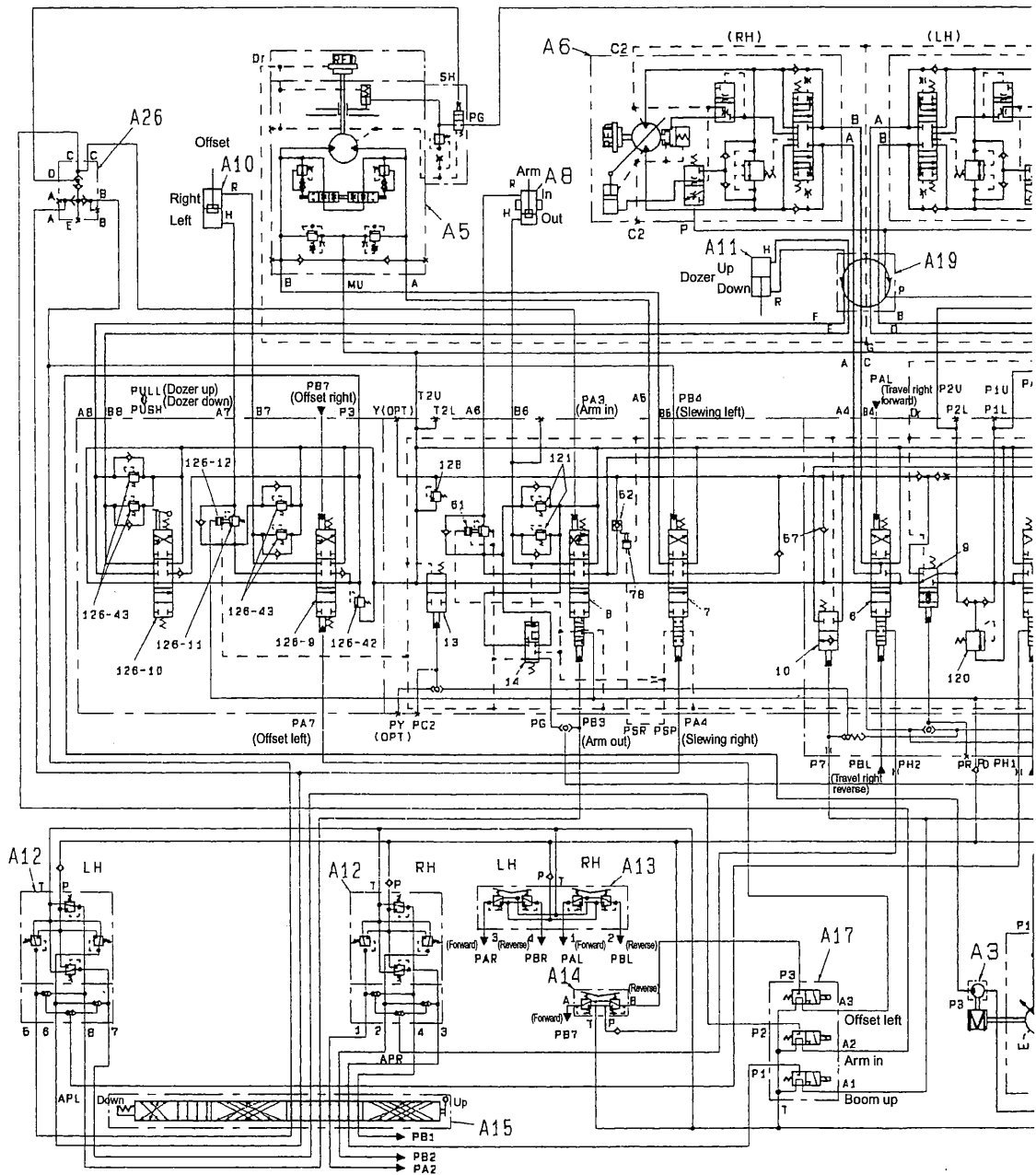
\* Mark: Option

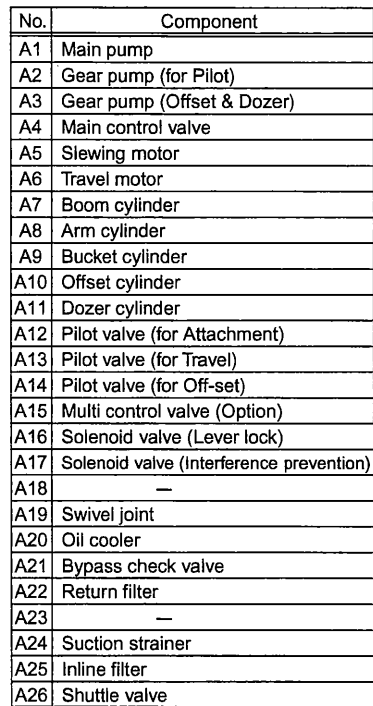
| No. | Component (Inner parts)     |
|-----|-----------------------------|
| 101 | Travel straight valve       |
| 102 | Main relief valve (Travel)  |
| 111 | —                           |
| 112 | Main relief valve (Slewing) |
| 131 | Travel motor                |
| 132 | Parking brake (Travel)      |
| 133 | Travel speed switch valve   |
| 134 | Counter balance valve       |
| 135 | Relief valve                |
| 141 | Slewing motor               |
| 142 | Parking brake (Slewing)     |
| 143 | Slewing brake timer         |
| 144 | Slewing anti-shock valve    |
| 145 | Relief valve                |
| 146 | Make-up valve               |





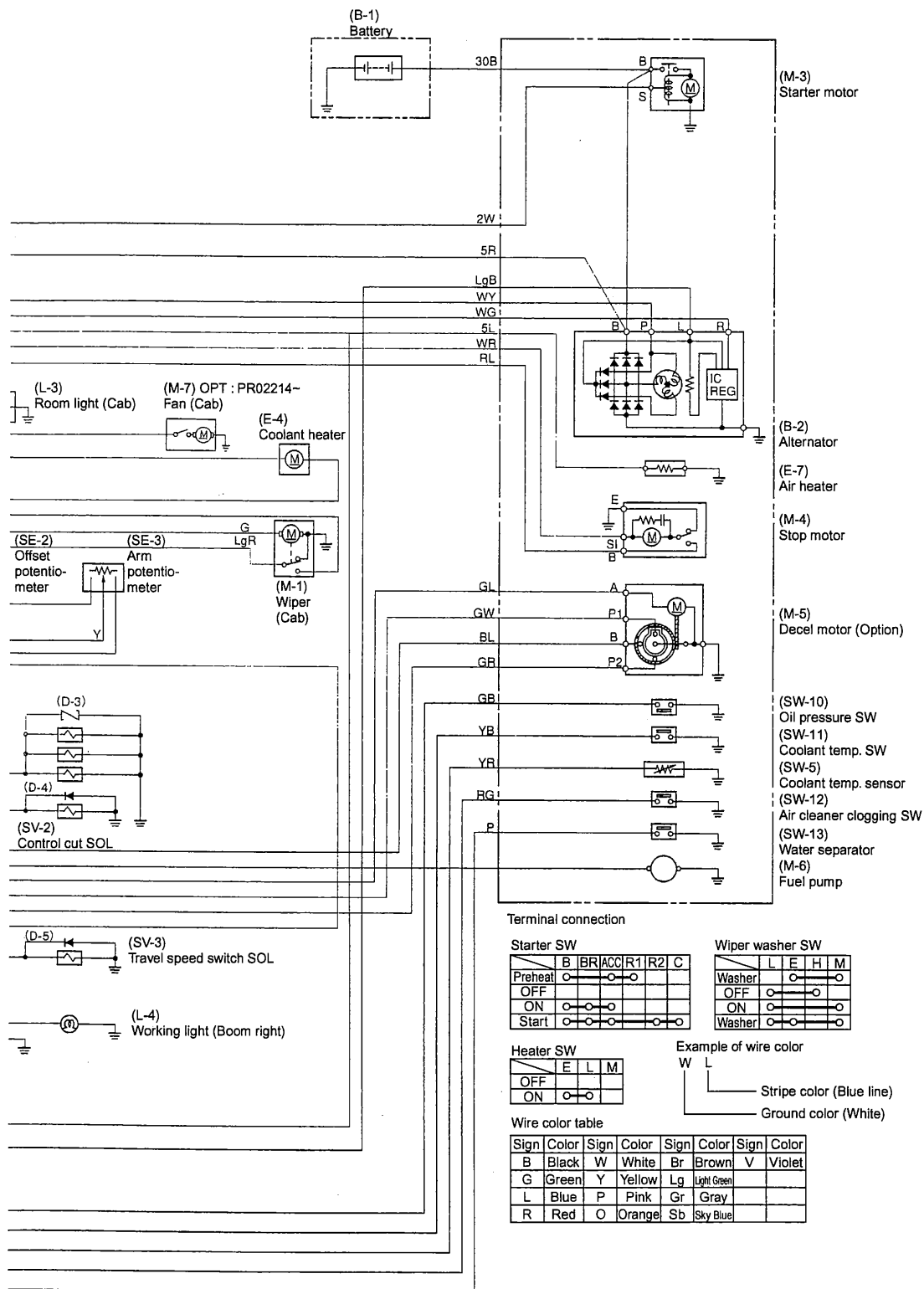
| No. | Component                                |
|-----|------------------------------------------|
| A1  | Main pump                                |
| A2  | Gear pump (for Pilot)                    |
| A3  | Gear pump (Offset & Dozer)               |
| A4  | Main control valve                       |
| A5  | Slewing motor                            |
| A6  | Travel motor                             |
| A7  | Boom cylinder (R & L)                    |
| A8  | Arm cylinder                             |
| A9  | Bucket cylinder                          |
| A10 | Offset cylinder                          |
| A11 | Dozer cylinder                           |
| A12 | Pilot valve (for Attachment)             |
| A13 | Pilot valve (for Travel)                 |
| A14 | Pilot valve (for Off-set)                |
| A15 | Multi control valve (Option)             |
| A16 | Solenoid valve (Lever lock)              |
| A17 | Solenoid valve (Interference prevention) |
| A18 | —                                        |
| A19 | Swivel joint                             |
| A20 | Oil cooler                               |
| A21 | Bypass check valve                       |
| A22 | Return filter                            |
| A23 | —                                        |
| A24 | Suction strainer                         |
| A25 | Inline filter                            |
| A26 | Shuttle valve                            |

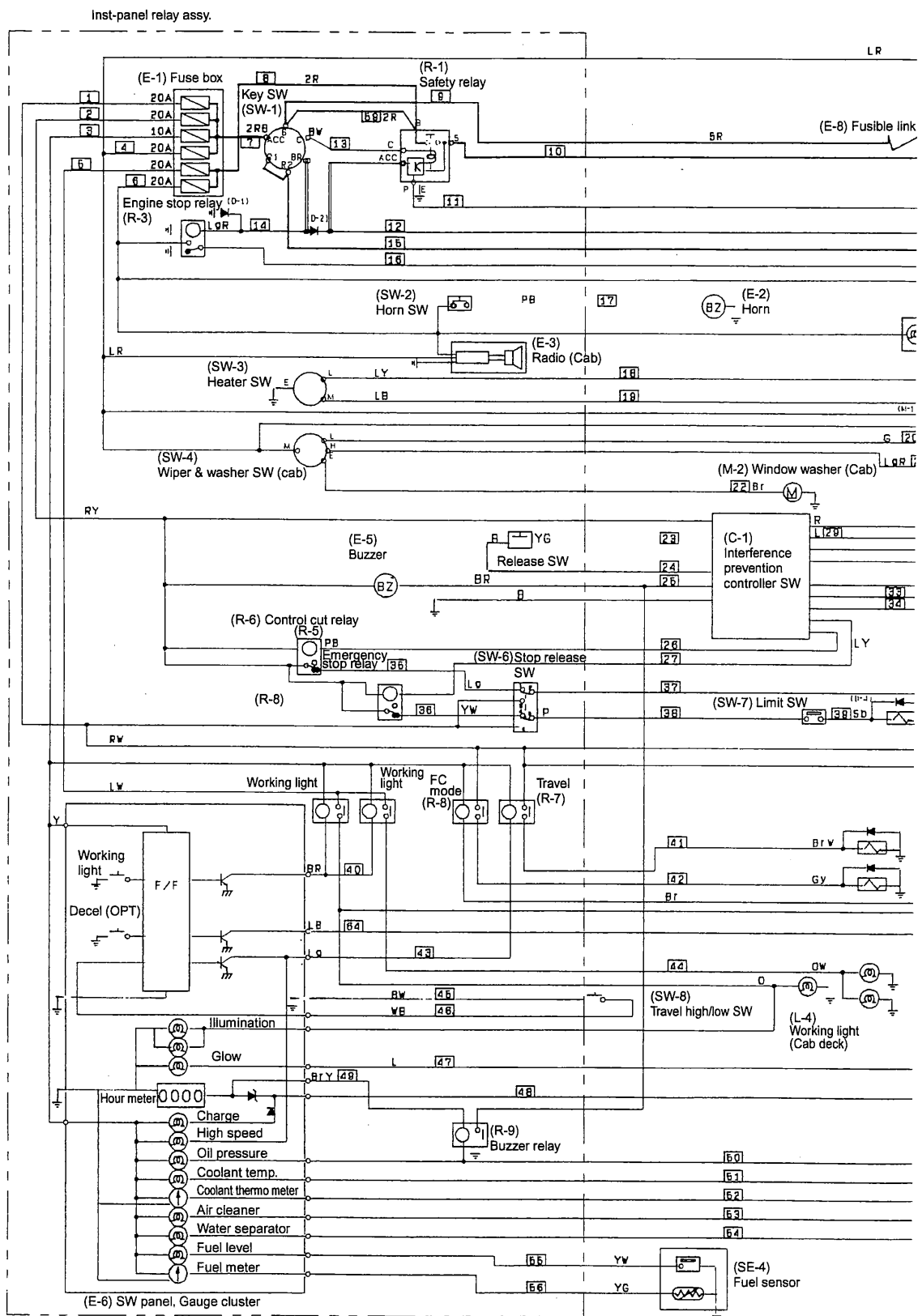


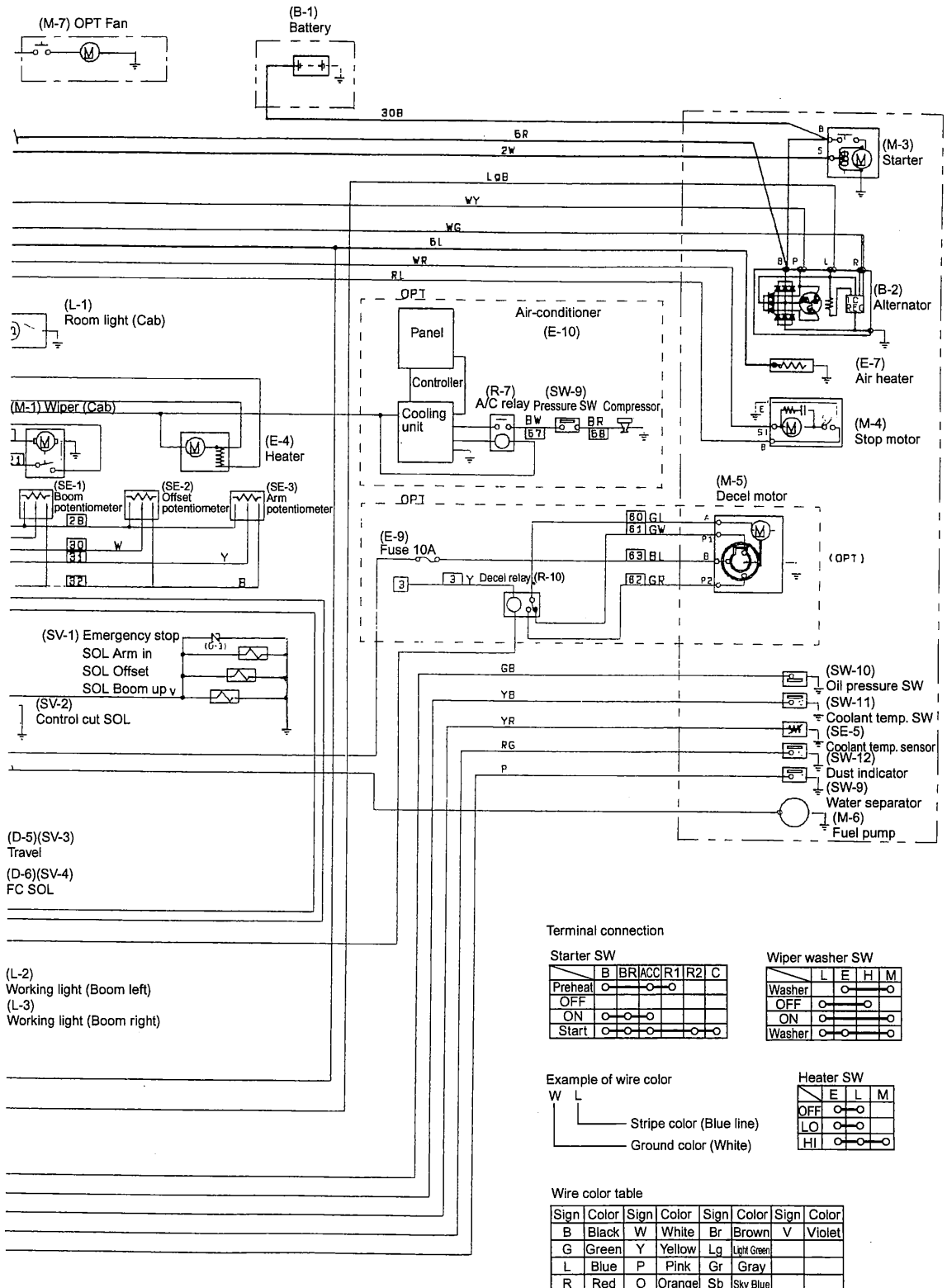


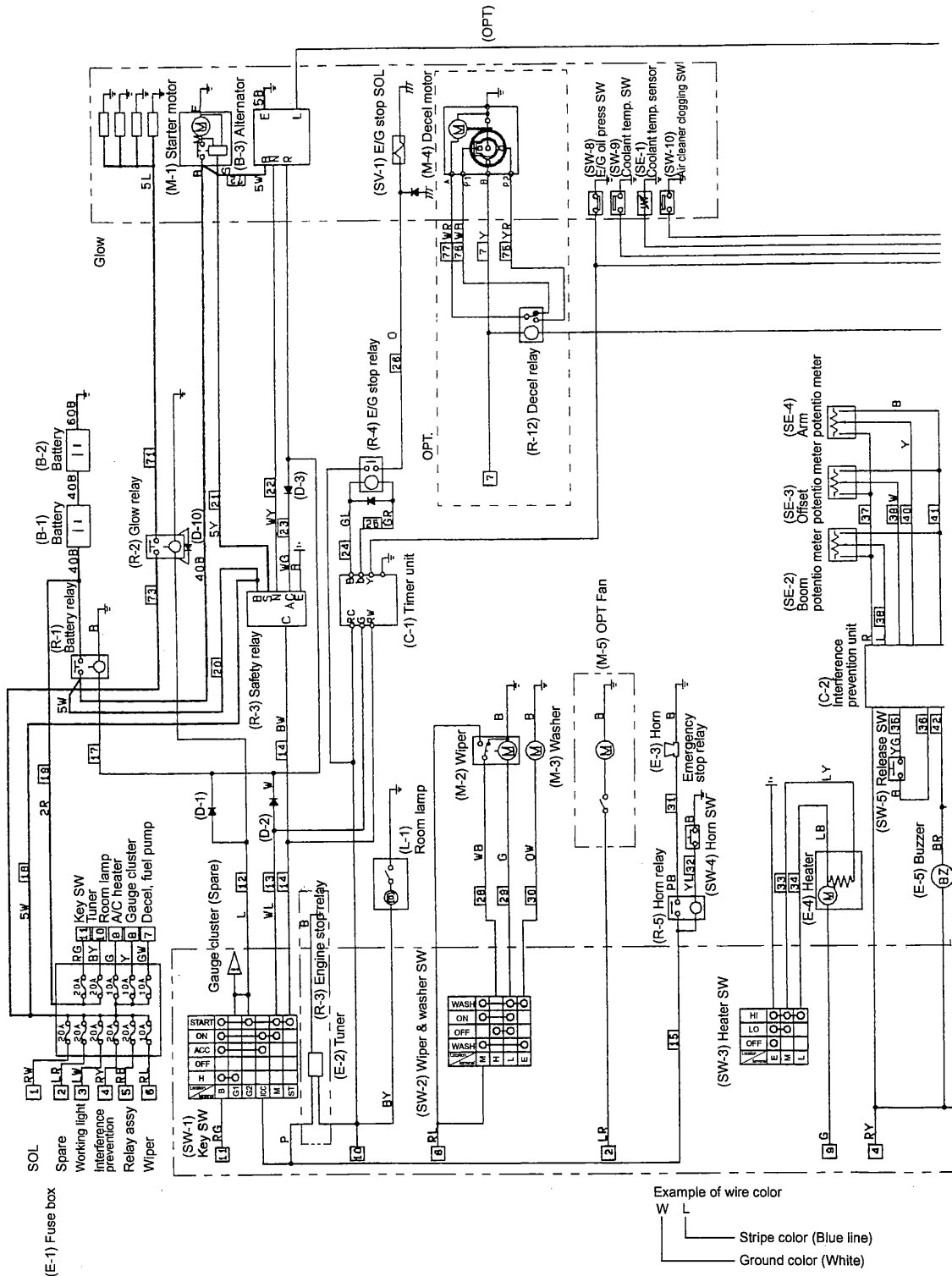
Inst-panel relay assy.

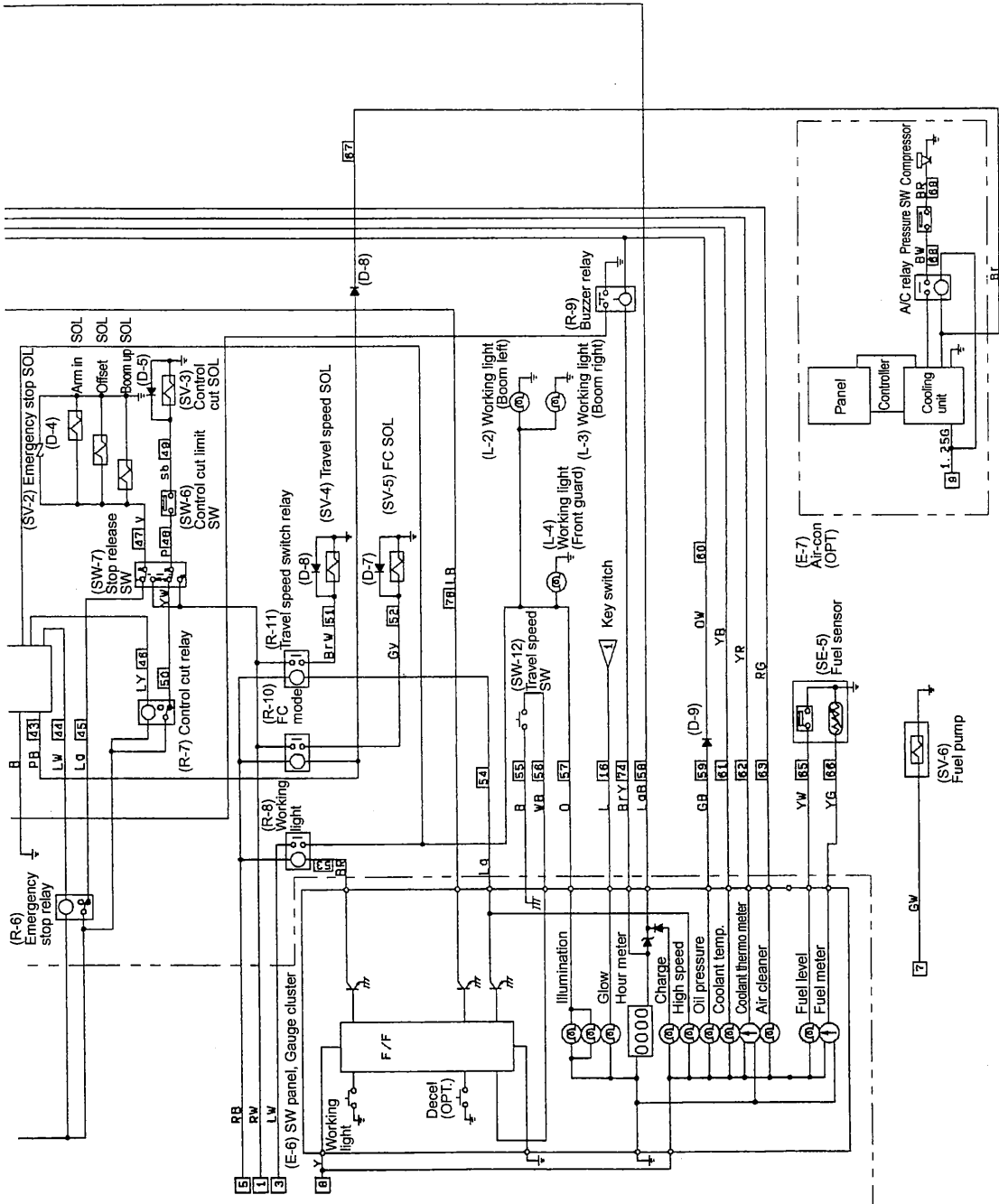






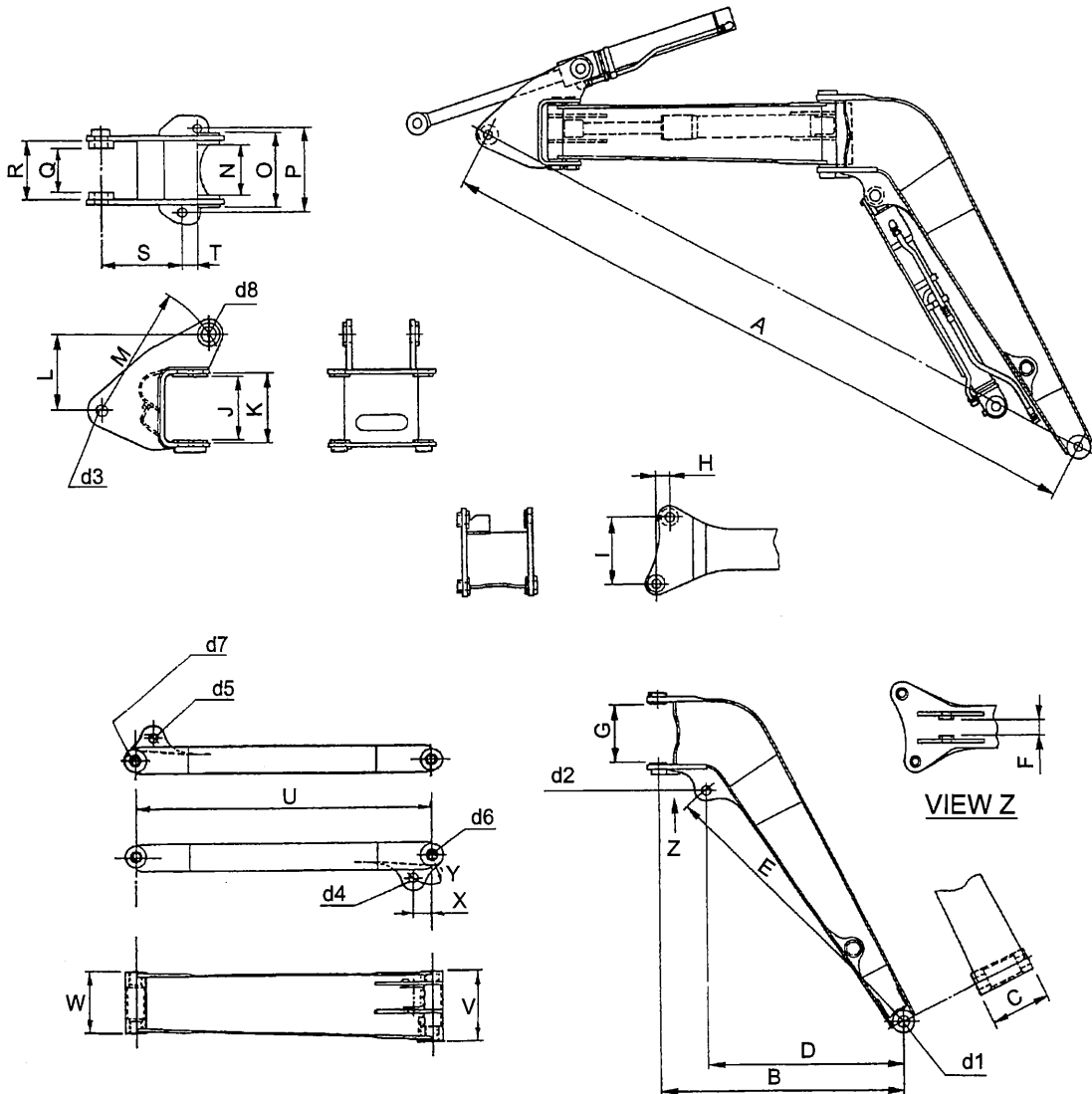






### 13. DIMENSIONS OF ATTACHMENT

#### BOOM



A : Boom length

B : Distance between boom foot pin and rear boom bracket pin

C : Width of boom foot

D : Distance between boom foot pin and boom cylinder rod pin bracket

E : Radius from boom foot pin to pin of boom cylinder rod pin

F : Inner width (SK75UR-3E), Outer width (SK130UR-1E)

G : Inner width of boss

H : Distance between pins

I : Distance between pins

J : Inner width of boss

K : Inner width of bracket

L : Distance between pins

M : Distance between pins

N : Inner width of boss

O : Outer width of boss

P : Distance between pins

Q : Inner width of boss

R : Inner width of bracket

S : Distance between pins

T : Distance between pins

U : Distance between pins

V : Outer width of boss

W : Outer width of boss

X : Distance between pins

Y : Distance between pins

Z : Inner width of boss

d1 : Pin dia.

d2 : Pin dia.

d3 : Pin dia.

d4 : Pin dia.

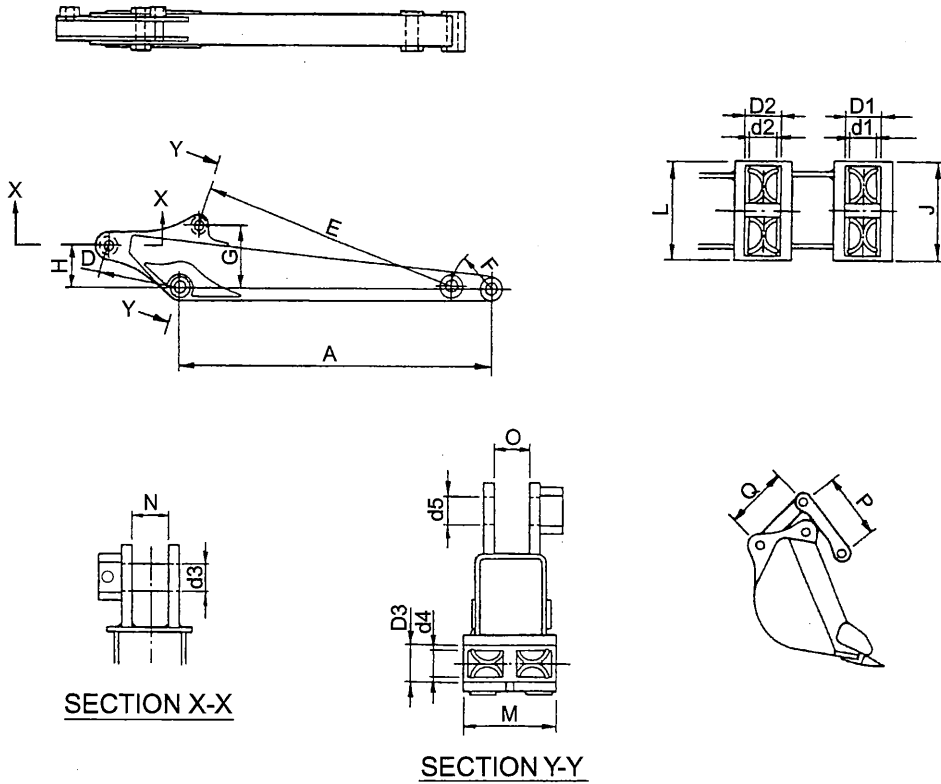
d5 : Pin dia.

d6 : Pin dia.

d7 : Pin dia.

d8 : Pin dia.

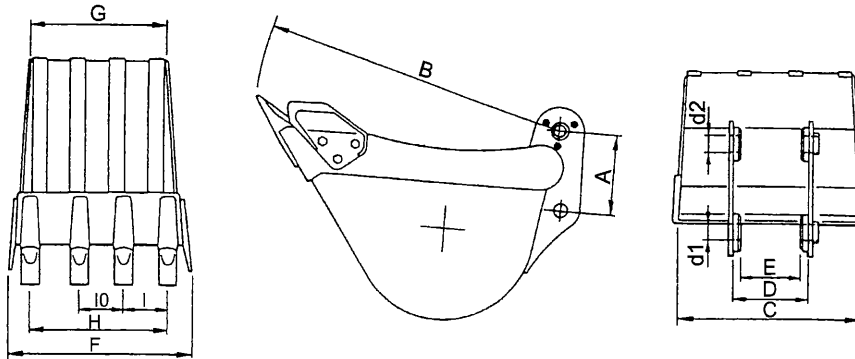
## ARM



A : Arm length  
 D : Distance between pins of boss and bracket  
 D1 : I.D of boss  
 D2 : I.D of boss  
 D3 : I.D of boss  
 E : Distance between pins of boss and bracket  
 F : Distance between pins of boss and boss  
 G : Height between pins of boss and bracket  
 H : Height between pins of boss and bracket  
 J : Arm top end width (with bushing)

L : Arm top end width  
 M : Boss width  
 N : Bracket inner width  
 O : Bracket inner width  
 P : Link dimension  
 Q : Link dimension  
 d1 : Pin dia.  
 d2 : Pin dia.  
 d3 : Pin dia.  
 d4 : Pin dia.  
 d5 : Pin dia.

## BUCKET



- A : Distance between pin and bracket
- B : Distance between bracket pin and tooth end
- C : Inner width of bracket top end
- D : Inner width of lug
- E : Outer width of side cutter
- F : Inner width of bucket bottom
- G : Tooth outer width
- H : Tooth outer width
- I : Pitch between tooth
- I0 : Pitch between tooth
- d1 : Pin dia.
- d2 : Pin dia.

Unit : mm

|    | Boom     |          |          |
|----|----------|----------|----------|
|    | SK30UR-2 | SK50UR-2 | SK75UR-2 |
| A  | 2,648.5  | 3,527    | 3,870    |
| B  | 898      | 1,256    | 1,478    |
| C  | 173      | 250      | 360      |
| D  | 712      | 1,056    | 1,198    |
| E  | R1,320   | R1,680   | R1,879   |
| F  | 65       | 90       | 100      |
| G  | 226      | 298      | 354      |
| H  | 32       | 63       | 90       |
| I  | 278      | 380      | 415      |
| J  | 176      | 248      | 304      |
| K  | 199      | 285      | 332      |
| L  | 261      | 382      | 367      |
| M  | R501.5   | R652     | R651.5   |
| N  | 126      | 245      | 285      |
| O  | 200      | 335      | 373      |
| P  | 278      | 380      | 415      |
| Q  | 135      | 175      | 215      |
| R  | 150      | 251      | 291      |
| S  | 280      | 403      | 400      |
| T  | 32       | 63       | 80       |
| U  | 1,100    | 1,480    | 1,540    |
| V  | 224      | 296      | 353      |
| W  | 174      | 246      | 303      |
| X  | 115      | 138.5    | 92       |
| Y  | R135     | R174     | R150     |
| d1 | Ø 45     | Ø 60     | Ø 60     |
| d2 | Ø 45     | Ø 55     | Ø 65     |
| d3 | Ø 45     | Ø 55     | Ø 60     |
| d4 | Ø 40     | Ø 55     | Ø 55     |
| d5 | Ø 40     | Ø 55     | Ø 55     |
| d6 | Ø 35     | Ø 50     | Ø 55     |
| d7 | Ø 35     | Ø 50     | Ø 55     |
| d8 | Ø 50     | Ø 55     | Ø 65     |

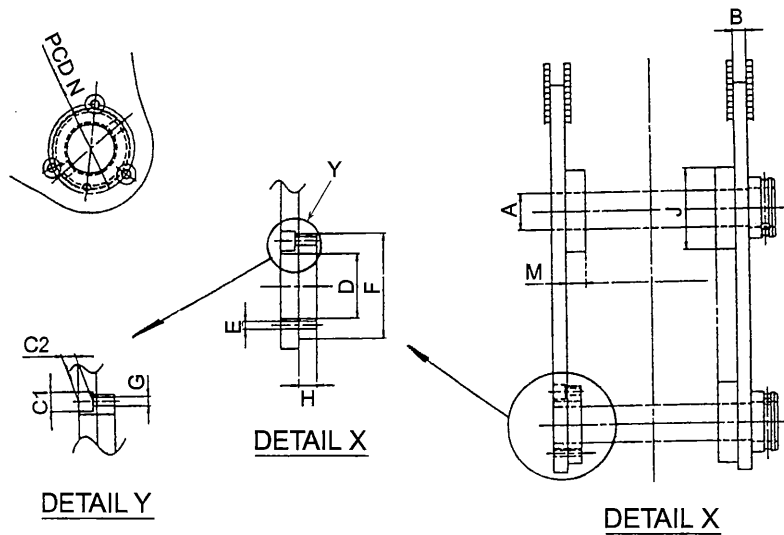
Unit : mm

|    | Arm      |  |          |         |          |         |
|----|----------|--|----------|---------|----------|---------|
|    | SK30UR-2 |  | SK50UR-2 |         | SK75UR-2 |         |
|    | 1.22M    |  | 1.91M    | 1.53M   | 1.76M    | 2.06M   |
| A  | 1,220    |  | 1,910    | 1,530   | 1,760    | 2,060   |
| B  | —        |  | —        | —       | —        | —       |
| C  | —        |  | —        | —       | —        | —       |
| D  | R290     |  | R448     | R448    | R416     | R416    |
| D1 | Ø 45     |  | Ø 55     | Ø 55    | Ø 65     | Ø 65    |
| D2 | Ø 45     |  | Ø 55     | Ø 55    | Ø 60     | Ø 60    |
| D3 | Ø 55     |  | Ø 65     | Ø 65    | Ø 70     | Ø 70    |
| E  | R918     |  | R1255.5  | R1255.5 | R1497.5  | R1497.5 |
| F  | R180     |  | R246     | R246    | R230     | R230    |
| G  | 257      |  | 356      | 356     | 417      | 417     |
| H  | 153      |  | 210      | 230     | 248      | 248     |
| I  | —        |  | —        | —       | —        | —       |
| J  | 122      |  | 150      | 150     | 180      | 180     |
| K  | —        |  | —        | —       | —        | —       |
| L  | 122      |  | 150      | 150     | 180      | 180     |
| M  | 130      |  | 170      | 170     | 210      | 210     |
| N  | 58       |  | 90       | 90      | 100      | 100     |
| O  | 52       |  | 66       | 66      | 90       | 90      |
| P  | 243      |  | 358      | 358     | 420      | 420     |
| Q  | 243      |  | 340      | 340     | 380      | 380     |
| d1 | Ø 35     |  | Ø 45     | Ø 45    | Ø 50     | Ø 50    |
| d2 | Ø 35     |  | Ø 45     | Ø 45    | Ø 50     | Ø 50    |
| d3 | Ø 45     |  | Ø 50     | Ø 50    | Ø 60     | Ø 60    |
| d4 | Ø 45     |  | Ø 55     | Ø 55    | Ø 60     | Ø 60    |
| d5 | Ø 40     |  | Ø 45     | Ø 45    | Ø 50     | Ø 50    |

Unit : mm

|    | Bucket             |                    |  |                    |                    |                   |                    |                    |                    |                    |
|----|--------------------|--------------------|--|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
|    | SK30UR-2           |                    |  | SK50UR-2           |                    |                   | SK75UR-2           |                    |                    |                    |
|    | 0.05M <sup>3</sup> | 0.07M <sup>3</sup> |  | 0.08M <sup>3</sup> | 0.14M <sup>3</sup> | 0.2M <sup>3</sup> | 0.13M <sup>3</sup> | 0.16M <sup>3</sup> | 0.20M <sup>3</sup> | 0.25M <sup>3</sup> |
| A  | 182                | ←                  |  | 264                | ←                  | ←                 | 290                | ←                  | ←                  | ←                  |
| B  | R685               | ←                  |  | R875               | ←                  | ←                 | R1,040             | ←                  | ←                  | ←                  |
| C  | 305                | 385                |  | 310                | 510                | 600               | 381                | 450                | 550                | 650                |
| D  | 180                | ←                  |  | 208                | ←                  | ←                 | 238                | ←                  | ←                  | ←                  |
| D1 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| D2 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| D3 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| E  | 124                | ←                  |  | 152                | ←                  | ←                 | 182                | ←                  | ←                  | ←                  |
| F  | 380                | 460                |  | 400                | 600                | 690               | 450                | 550                | 650                | 750                |
| G  | 261                | 341                |  | 254                | 454                | 544               | 281                | 350                | 450                | 550                |
| H  | 244                | 324                |  | 250                | 450                | 540               | 297                | 366                | 466                | 566                |
| I0 | 122                | 162                |  | 125                | 150                | 180               | 148.5              | 183                | 166                | 190                |
| I  | 122                | 162                |  | 125                | 150                | 180               | 148.5              | 183                | 150                | 188                |
| K  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| L  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| M  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| N  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| O  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| P  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| Q  | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| d1 | Ø 35               | ←                  |  | Ø 45               | ←                  | ←                 | Ø 50               | ←                  | ←                  | ←                  |
| d2 | Ø 35               | ←                  |  | Ø 45               | ←                  | ←                 | Ø 50               | ←                  | ←                  | ←                  |
| d3 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| d4 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |
| d5 | —                  | —                  |  | —                  | —                  | —                 | —                  | —                  | —                  | —                  |

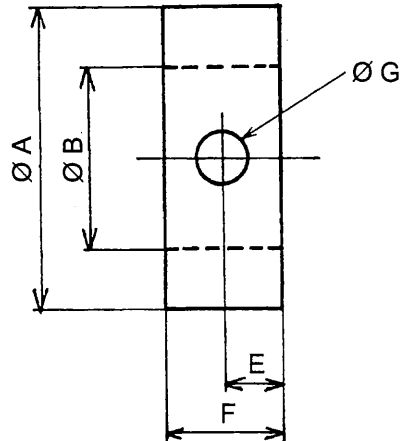
## DIMENSION OF LUG SECTION



Unit : mm

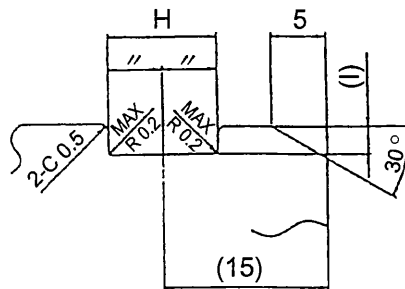
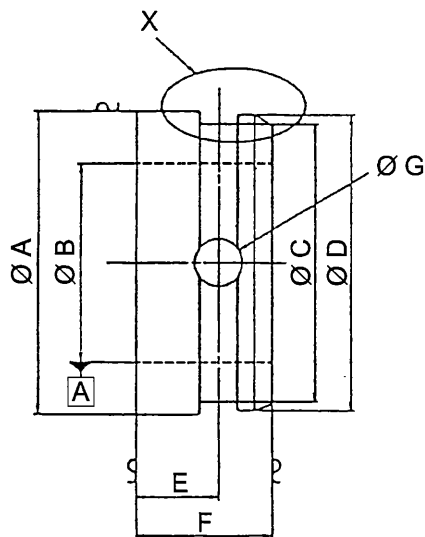
| Item<br>Model | Pin hole dia | Lug plate thickness | Bolt bore depth | Hole dia. | Spring pin dia. | Boss outer dia. | Screw dia. | Boss width | Boss outer dia. | Boss width | Screw hole P.C.D |
|---------------|--------------|---------------------|-----------------|-----------|-----------------|-----------------|------------|------------|-----------------|------------|------------------|
|               | Ø A          | B                   | Ø C1<br>C2      | Ø D       | Ø E             | Ø F             | Ø G        | H          | Ø J             | M          | Ø N              |
| SK30UR-2      | 35           | 12                  | 21              | 45        | 8               | 90              | 10         | 12         | 70              | 28         | 72               |
|               |              |                     | 5               |           |                 |                 |            |            |                 |            |                  |
| SK50UR-2      | 45           | 14                  | 21              | 60        | 8               | 108             | 10         | 12         | 85              | 28         | 85               |
|               |              |                     | 3.5             |           |                 |                 |            |            |                 |            |                  |
| SK75UR-2      | 50           | 19                  | 20              | 65        | 8               | 110             | 10         | 9          | 110             | 28         | 91               |
|               |              |                     | 15              |           |                 |                 |            |            |                 |            |                  |

## DIMENSION OF BOSS



Unit : mm

| Model    | Boss P. No   | Ø A  | Ø B  | E  | F  | Ø G |
|----------|--------------|------|------|----|----|-----|
| SK30UR-2 | PV61B01022P1 | 60.5 | 36.5 | 12 | 24 | 11  |
| SK50UR-2 | 2418T21055D1 | 82.6 | 48.6 | 15 | 30 | 13  |



DETAIL X

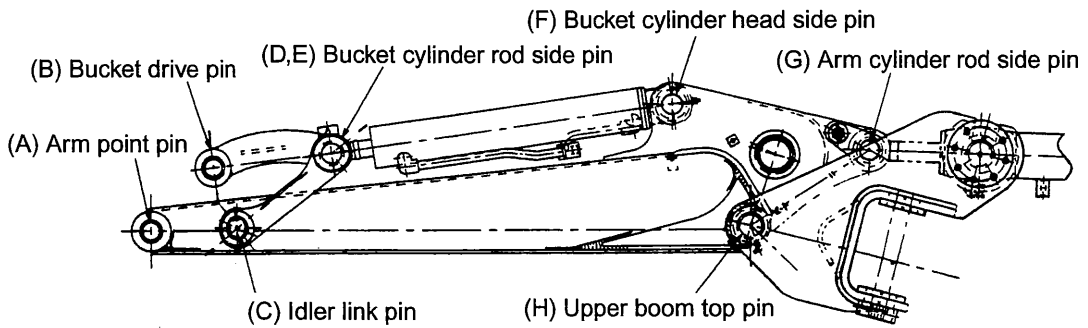
Unit : mm

| Model    | Boss P. No | Ø A  | Ø B | Ø C        | Ø D  | E  | F  | Ø G | H  | I   |
|----------|------------|------|-----|------------|------|----|----|-----|----|-----|
| SK75UR-2 | 2418P26830 | 82.6 | 54  | 75.5 ± 0.2 | 80.5 | 23 | 38 | 13  | 10 | 2.5 |

## 14. MAINTENANCE STANDARD

### 14-1 CLEARANCE BETWEEN PIN AND BUSHING (Arm, Boom)

(1) Clearance between pin and bushing around arm.



## CLEARANCE OF PIN AND BUSHING AROUND ARM

**SK30UR-2**

Unit : mm

| Symbol | Item                                | Standard value |                    |                        |            | Clearance        |               | Remedy                 |  |
|--------|-------------------------------------|----------------|--------------------|------------------------|------------|------------------|---------------|------------------------|--|
|        |                                     | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance  | Repairable level | Service limit |                        |  |
| A      | Arm point pin                       | Ø 35           | -0.06<br>-0.09     | +0.05<br>0             | 0.06~0.14  | More than 0.8    | 12            | Replace bushing or pin |  |
| B      | Bucket drive pin                    |                |                    |                        |            |                  |               |                        |  |
| C      | Idler link pin                      |                |                    |                        |            |                  |               |                        |  |
| D      | Bucket link (Idler link connection) | Ø 40           |                    | +0.03<br>0             | 0.06~0.12  |                  |               |                        |  |
| E      | Bucket cylinder rod side pin        |                |                    | +0.10<br>-0.03         | 0.03~0.19  |                  |               |                        |  |
| F      | Bucket cylinder head side pin       |                |                    |                        |            |                  |               |                        |  |
| G      | Arm cylinder rod side pin           | Ø 45           |                    | +0.025<br>0            | 0.06~0.115 |                  |               |                        |  |
| H      | Upper boom top pin                  |                |                    |                        |            |                  |               |                        |  |

**SK50UR-2**

Unit : mm

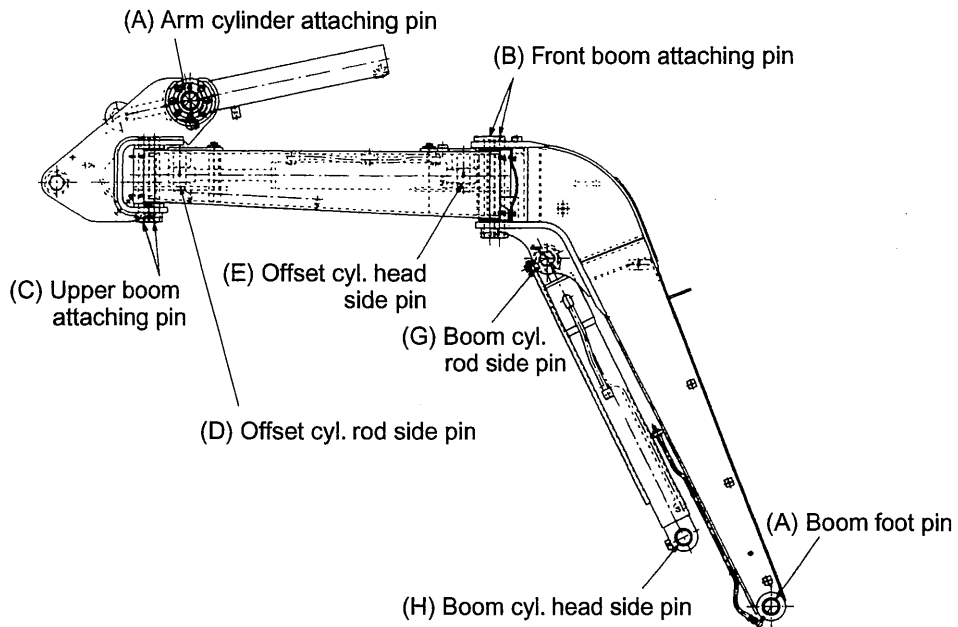
| Symbol | Item                                | Standard value |                    |                        |             | Clearance        |               | Remedy                 |
|--------|-------------------------------------|----------------|--------------------|------------------------|-------------|------------------|---------------|------------------------|
|        |                                     | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance   | Repairable level | Service limit |                        |
| A      | Arm point pin                       | Ø 45           | -0.06<br>-0.09     | +0.033<br>+0.097       | 0.093~0.187 | 1.5              | 12            | Replace bushing or pin |
| B      | Bucket drive pin                    |                |                    |                        |             |                  |               |                        |
| C      | Idler link pin                      |                |                    | +0.040<br>+0.102       | 0.100~0.192 |                  |               |                        |
| D      | Bucket link (Idler link connection) |                |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| E      | Bucket cylinder rod side pin        |                |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| F      | Bucket cylinder head side pin       |                |                    |                        |             |                  |               |                        |
| G      | Arm cylinder rod side pin           | Ø 50           |                    | +0.043<br>+0.112       | 0.103~0.202 |                  |               |                        |
| H      | Upper boom top pin                  | Ø 55           |                    |                        |             |                  |               |                        |

**SK75UR-2**

Unit : mm

| Symbol | Item                                | Standard value |                    |                        |           | Clearance        |               | Remedy                 |
|--------|-------------------------------------|----------------|--------------------|------------------------|-----------|------------------|---------------|------------------------|
|        |                                     | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance | Repairable level | Service limit |                        |
| A      | Arm point pin                       | Ø 50           | -0.06<br>-0.09     | +0.21<br>+0.07         | 0.13~0.30 | More than 1.2    | 2.0           | Replace bushing or pin |
| B      | Bucket drive pin                    |                |                    | +0.16<br>+0.06         | 0.12~0.25 |                  |               |                        |
| C      | Idler link pin                      |                |                    | +0.09<br>+0.01         | 0.07~0.18 |                  |               |                        |
| D      | Bucket link (Idler link connection) |                |                    |                        |           |                  |               |                        |
| E      | Bucket cylinder rod side pin        |                |                    |                        |           |                  |               |                        |
| F      | Bucket cylinder head side pin       |                |                    |                        |           |                  |               |                        |
| G      | Arm cylinder rod side pin           | Ø 60           |                    | +0.11<br>+0.01         | 0.07~0.20 |                  |               |                        |
| H      | Upper boom top pin                  |                |                    | +0.07<br>+0.01         | 0.07~0.16 |                  |               |                        |

(2) Clearance between pin and bushing around boom.



## CLEARANCE OF PIN AND BUSHING AROUND BOOM

### SK30UR-2

Unit : mm

| Symbol | Item                          | Standard value |                    |                        |            | Clearance        |               | Remedy                 |
|--------|-------------------------------|----------------|--------------------|------------------------|------------|------------------|---------------|------------------------|
|        |                               | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance  | Repairable level | Service limit |                        |
| A      | Boom foot pin                 | Ø 45           | -0.06<br>-0.09     | +0.25<br>0             | 0.06~0.115 | More than 0.8    | 1.2           | Replace bushing or pin |
| B      | Front boom attaching pin      | Ø 35           |                    | +0.05<br>0             | 0.06~0.14  |                  |               |                        |
| C      | Upper boom attaching pin      | Ø 40           |                    | +0.10<br>-0.03         | 0.03~0.19  |                  |               |                        |
| D      | Offset cylinder rod side pin  | Ø 40           |                    | +0.10<br>-0.03         | 0.03~0.19  |                  |               |                        |
| E      | Offset cylinder head side pin | Ø 40           | -0.06<br>-0.15     | 0<br>-0.025            | 0.035~0.15 |                  |               |                        |
| F      | Arm cylinder attaching pin    | Ø 50           |                    | 0<br>-0.025            | 0.035~0.15 |                  |               |                        |
| G      | Boom cylinder rod side pin    | Ø 45           |                    | +0.10<br>-0.01         | 0.05~0.19  |                  |               |                        |
| H      | Boom cylinder head side pin   | Ø 45           |                    | +0.10<br>-0.01         | 0.05~0.19  |                  |               |                        |

### SK50UR-2

Unit : mm

| Symbol | Item                          | Standard value |                    |                        |             | Clearance        |               | Remedy                 |
|--------|-------------------------------|----------------|--------------------|------------------------|-------------|------------------|---------------|------------------------|
|        |                               | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance   | Repairable level | Service limit |                        |
| A      | Boom foot pin                 | Ø 60           | -0.06<br>-0.09     | +0.022<br>+0.094       | 0.082~0.184 | 1.5              | 2.0           | Replace bushing or pin |
| B      | Front boom attaching pin      | Ø 50           |                    | +0.036<br>+0.099       | 0.096~0.189 |                  |               |                        |
| C      | Upper boom attaching pin      | Ø 50           |                    | +0.036<br>+0.099       | 0.096~0.189 |                  |               |                        |
| D      | Offset cylinder rod side pin  | Ø 55           |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| E      | Offset cylinder head side pin | Ø 55           |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| F      | Arm cylinder attaching pin    | Ø 55           |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| G      | Boom cylinder rod side pin    | Ø 55           |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |
| H      | Boom cylinder head side pin   | Ø 55           |                    | +0.050<br>+0.180       | 0.110~0.270 |                  |               |                        |

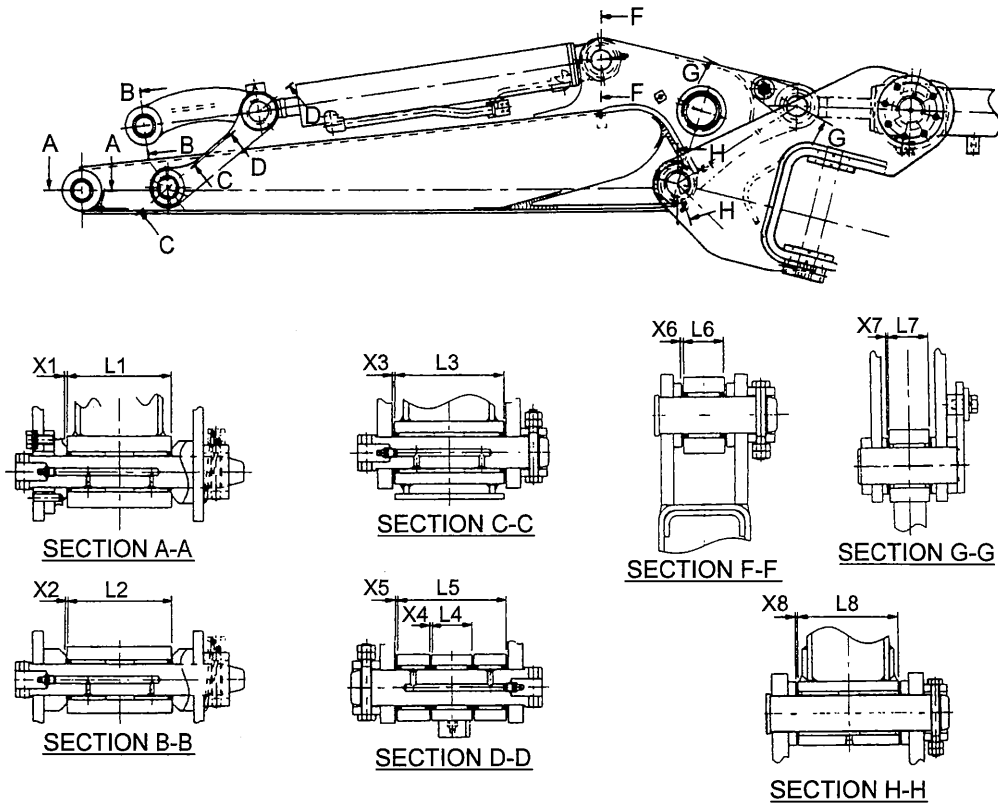
### SK75UR-2

Unit : mm

| Symbol | Item                          | Standard value |                    |                        |           | Clearance        |               | Remedy                 |
|--------|-------------------------------|----------------|--------------------|------------------------|-----------|------------------|---------------|------------------------|
|        |                               | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance | Repairable level | Service limit |                        |
| A      | Boom foot pin                 | Ø 60           | -0.06<br>-0.09     | +0.07<br>+0.01         | 0.07~0.16 | More than 1.2    | 2.0           | Replace bushing or pin |
| B      | Front boom attaching pin      | Ø 55           |                    | +0.10<br>+0.01         | 0.07~0.19 |                  |               |                        |
| C      | Upper boom attaching pin      | Ø 55           |                    | +0.10<br>+0.01         | 0.07~0.19 |                  |               |                        |
| D      | Offset cylinder rod side pin  | Ø 55           |                    | +0.11<br>+0.01         | 0.07~0.20 |                  |               |                        |
| E      | Offset cylinder head side pin | Ø 55           |                    | +0.11<br>+0.01         | 0.07~0.20 |                  |               |                        |
| F      | Arm cylinder attaching pin    | Ø 65           |                    | +0.25<br>+0.01         | 0.11~0.34 |                  |               |                        |
| G      | Boom cylinder rod side pin    | Ø 65           |                    | +0.14<br>0             | 0.06~0.23 |                  |               |                        |
| H      | Boom cylinder head side pin   | Ø 65           |                    | +0.25<br>+0.05         | 0.11~0.34 |                  |               |                        |

## 14-2 CLEARANCE IN THRUST DIRECTION (Arm, Boom)

(1) Clearance in thrust direction around arm and cylinder.



### CLEARANCE IN THRUST DIRECTION AROUND ARM AND CYLINDER

SK30UR-2

Unit : mm

| Symbol | Item                                |             | Basic size |                                     | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy          |
|--------|-------------------------------------|-------------|------------|-------------------------------------|--------------------------------------------------|------------------|---------------|-----------------|
|        |                                     |             | Code       | Dimension                           | Standard value                                   | Repairable level | Service limit |                 |
| A      | Arm point pin                       | Arm         | L1         | 122 <sup>0</sup> <sub>-0.2</sub>    | 0.3~1.0                                          | More than 1.0    |               | Shim adjustment |
|        |                                     | Bucket      |            | 124 <sup>+1.0</sup> <sub>-0.5</sub> |                                                  |                  |               |                 |
| B      | Bucket drive pin                    | Link side   | L2         | 122 <sup>0</sup> <sub>-0.2</sub>    | —                                                | —                | —             |                 |
|        |                                     | Bucket      |            | 124 <sup>-0.2</sup> <sub>-1.2</sub> |                                                  |                  |               |                 |
| C      | Idler link pin                      | Arm         | L3         | 122 <sup>0</sup> <sub>-0.2</sub>    | 0.1~0.5                                          | More than 1.0    | 1.5           |                 |
|        |                                     | Link side   |            | —                                   |                                                  |                  |               |                 |
| D      | Bucket link (Rod side)              | Rod side    | L4         | 45 <sup>0</sup> <sub>-0.5</sub>     | 0.6~1.0                                          | More than 1.0    | 1.5           |                 |
|        |                                     | Link side   |            | 50 <sup>±0.2</sup>                  |                                                  |                  |               |                 |
|        | Bucket link (Idler link connection) | Bucket link | L5         | 122 <sup>0</sup> <sub>-0.2</sub>    |                                                  |                  |               |                 |
|        |                                     | Idler link  |            | —                                   |                                                  |                  |               |                 |
| F      | Bucket cylinder head side pin       | Bottom side | L6         | 45 <sup>0</sup> <sub>-0.5</sub>     | 0.6~2.0                                          | More than 2.0    | 3.0           |                 |
|        |                                     | Arm         |            | 52 <sup>+2.0</sup> <sub>0</sub>     |                                                  |                  |               |                 |
| G      | Arm cylinder rod side pin           | Rod side    | L7         | 50 <sup>0</sup> <sub>-0.5</sub>     | 0.6~1.0                                          | More than 1.0    | 1.5           |                 |
|        |                                     | Arm         |            | 56 <sup>±1.0</sup>                  |                                                  |                  |               |                 |
| H      | Upper boom top pin                  | Arm         | L8         | 130 <sup>0</sup> <sub>-0.2</sub>    | 0.1~0.5                                          |                  |               |                 |
|        |                                     | Upper frame |            | 135 <sup>+0.2</sup>                 |                                                  |                  |               |                 |

SK50UR-2

Unit : mm

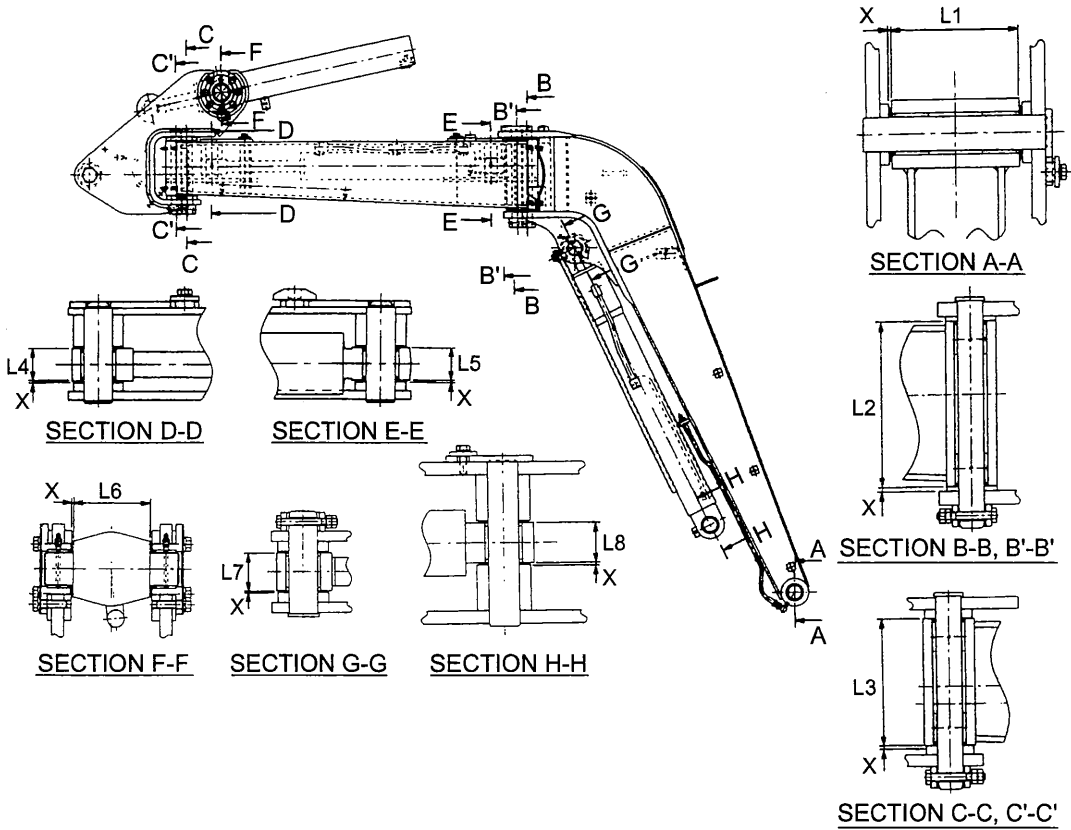
| Symbol | Item                          |             | Basic size |                     | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy          |
|--------|-------------------------------|-------------|------------|---------------------|--------------------------------------------------|------------------|---------------|-----------------|
|        |                               |             | Code       | Dimension           | Standard value                                   | Repairable level | Service limit |                 |
| A      | Arm point pin                 | Arm         | L1         | $150^{+0}_{-0.2}$   | Less than 1.0                                    | 1.5              | 2.0           | Shim adjustment |
|        |                               | Bucket      |            | $152^{+0.2}_{-1.2}$ |                                                  |                  |               |                 |
| B      | Bucket drive pin              | Link side   | L2         | $150^{+0.6}_{-0.2}$ | Less than 0.6                                    |                  |               |                 |
|        |                               | Bucket      |            | $152^{+0.2}_{-1.2}$ |                                                  |                  |               |                 |
| C      | Idler link pin                | Arm         | L3         | $150^{+0}_{-0.2}$   | 0.6~1.0                                          |                  |               |                 |
|        |                               | Link side   |            | —                   |                                                  |                  |               |                 |
| D      | Bucket link                   | Rod side    | L4         | $60^{+0}_{-0.5}$    | 0.6~2.0                                          |                  |               |                 |
|        |                               | Link side   |            | $65^{+1.0}_{-1.2}$  |                                                  |                  |               |                 |
| F      | Bucket cylinder head side pin | Bottom side | L5         | $60^{+0}_{-0.5}$    | 2.5                                              | 3.0              |               |                 |
|        |                               | Arm         |            | $66^{+1}_{-0.5}$    |                                                  |                  |               |                 |
| G      | Arm cylinder rod side pin     | Rod side    | L6         | $85^{+0}_{-0.5}$    | 1.5                                              | 2.0              |               |                 |
|        |                               | Arm         |            | $90^{+1.0}_{-0}$    |                                                  |                  |               |                 |
| H      | Upper boom top pin            | Arm         | L7         | $170^{+0}_{-0.2}$   | Less than 0.6                                    |                  |               |                 |
|        |                               | Upper frame |            | $175^{+0}_{-0.2}$   |                                                  |                  |               |                 |

SK75UR-2

Unit : mm

| Symbol | Item                          |             | Basic size |                     | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy          |
|--------|-------------------------------|-------------|------------|---------------------|--------------------------------------------------|------------------|---------------|-----------------|
|        |                               |             | Code       | Dimension           | Standard value                                   | Repairable level | Service limit |                 |
| A      | Arm point pin                 | Arm         | L1         | $180^{+0.6}_{-0.6}$ | Less than 1.0                                    | More than 1.2    | 2.0           | Shim adjustment |
|        |                               | Bucket      |            | $182^{+0.2}_{-1.2}$ |                                                  |                  |               |                 |
| B      | Bucket drive pin              | Link side   | L2         | $180^{+0.6}_{-0.2}$ | —                                                | —                | —             |                 |
|        |                               | Bucket      |            | $182^{+0.2}_{-0.2}$ |                                                  |                  |               |                 |
| C      | Idler link pin                | Arm         | L3         | $180^{+0}_{-0.2}$   | Less than 0.5                                    | More than 1.0    | 2.0           |                 |
|        |                               | Link side   |            | —                   |                                                  |                  |               |                 |
| D      | Bucket link                   | Rod side    | L4         | $175^{+0}_{-1.5}$   | 0.6~1.0                                          | More than 1.2    |               |                 |
|        |                               | Link side   |            | —                   |                                                  |                  |               |                 |
| F      | Bucket cylinder head side pin | Bottom side | L5         | $85^{+0}_{-0.5}$    | 0.6~2.0                                          | More than 2.0    | 2.5           |                 |
|        |                               | Arm         |            | $90^{+2}_{-0}$      |                                                  |                  |               |                 |
| G      | Arm cylinder rod side pin     | Rod side    | L6         | $95^{+0}_{-0.5}$    | 0.6~2.0                                          | More than 2.0    |               |                 |
|        |                               | Arm         |            | $100^{+0.5}_{-0}$   |                                                  |                  |               |                 |
| H      | Upper boom top pin            | Arm         | L7         | $210^{+0}_{-0.2}$   | Less than 0.6                                    | More than 1.0    | 2.0           |                 |
|        |                               | Upper frame |            | $215^{+0.5}_{-0}$   |                                                  |                  |               |                 |

(2) Clearance in thrust direction around boom and cylinder.



CLEARANCE IN THRUST DIRECTION AROUND BOOM AND CYLINDER

SK30UR-2

Unit : mm

| Symbol | Item                          |                 | Basic size |                     | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy          |
|--------|-------------------------------|-----------------|------------|---------------------|--------------------------------------------------|------------------|---------------|-----------------|
|        |                               |                 | Code       | Dimension           | Standard value                                   | Repairable level | Service limit |                 |
| A      | Boom foot pin                 | Rear boom       | L1         | $170_{-0.2}^{+0}$   | 8.0~10.2                                         | More than 1.0    | 1.5           | Shim adjustment |
|        |                               | Upper frame     |            | $178_{-0}^{+2}$     |                                                  |                  |               |                 |
| B,B'   | Front boom attaching pin      | Front boom (LH) | L2         | $224_{-0.2}^{+0}$   | 2.3~2.7                                          |                  |               |                 |
|        |                               | Rear boom       |            | $226_{-0.3}^{+0.5}$ |                                                  |                  |               |                 |
| C,C'   | Upper boom attaching pin      | Front boom (LH) | L3         | $174_{-0.2}^{+0}$   | 2.3~2.7                                          |                  |               |                 |
|        |                               | Upper boom      |            | $176_{-0.3}^{+0.5}$ |                                                  |                  |               |                 |
| D      | Offset cylinder rod side pin  | Rod side        | L4         | $45_{-0.5}^{+0}$    | 5.0~7.5                                          | More than 2.0    | 3.0           |                 |
|        |                               | Front boom (LH) |            | $50_{-0}^{+2}$      |                                                  |                  |               |                 |
| E      | Offset cylinder head side pin | Head side       | L5         | $45_{-0.5}^{+0}$    | 5.0~7.5                                          |                  |               |                 |
|        |                               | Front boom (RH) |            | $50_{-0}^{+2}$      |                                                  |                  |               |                 |
| F      | Arm cylinder attaching pin    | Head side       | L6         | $120_{-0.5}^{+0}$   | 5.5~8.0                                          |                  |               |                 |
|        |                               | Upper boom      |            | $126.5_{-1}^{+1}$   |                                                  |                  |               |                 |
| G      | Boom cylinder rod side pin    | Rod side        | L7         | $60_{-0.5}^{+0}$    | 5.0~7.5                                          | More than 1.0    | 1.5           |                 |
|        |                               | Rear boom       |            | $65_{-0}^{+2}$      |                                                  |                  |               |                 |
| H      | Boom cylinder head side pin   | Head side       | L8         | $60_{-0.5}^{+0}$    | 5.0~7.5                                          |                  |               |                 |
|        |                               | Upper frame     |            | $65_{-0}^{+2}$      |                                                  |                  |               |                 |

SK50UR-2

Unit : mm

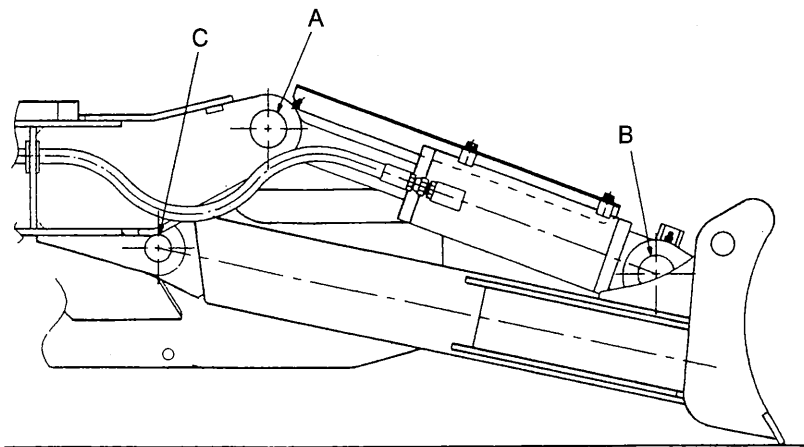
| Symbol | Item                          |                 | Basic size |                                     | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy             |         |     |     |
|--------|-------------------------------|-----------------|------------|-------------------------------------|--------------------------------------------------|------------------|---------------|--------------------|---------|-----|-----|
|        |                               |                 | Code       | Dimension                           | Standard value                                   | Repairable level | Service limit |                    |         |     |     |
| A      | Boom foot pin                 | Rear boom       | L1         | 250 <sup>+0.8</sup>                 | Less than<br>0.6                                 | 1.5              | 2.0           | Shim<br>adjustment |         |     |     |
|        |                               | Upper frame     |            | 255 <sup>+2</sup> <sub>0</sub>      |                                                  |                  |               |                    |         |     |     |
| B,B'   | Front boom attaching pin      | Front boom (LH) | L2         | 296 <sup>0</sup> <sub>-0.2</sub>    |                                                  |                  |               |                    |         |     |     |
|        |                               | Rear boom       |            | 298 <sup>+0.5</sup> <sub>+0.2</sub> |                                                  |                  |               |                    |         |     |     |
| C,C'   | Upper boom attaching pin      | Front boom (LH) | L3         | 246 <sup>0</sup> <sub>-0.2</sub>    |                                                  |                  |               |                    |         |     |     |
|        |                               | Upper boom      |            | 248 <sup>+0.5</sup> <sub>+0.2</sub> |                                                  |                  |               |                    |         |     |     |
| D      | Offset cylinder rod side pin  | Rod side        | L4         | 90 <sup>+2</sup> <sub>0</sub>       |                                                  |                  |               |                    | 0.6~2.0 | 2.5 | 3.0 |
|        |                               | Front boom (LH) |            | 85 <sup>0</sup> <sub>-0.5</sub>     |                                                  |                  |               |                    |         |     |     |
| E      | Offset cylinder head side pin | Head side       | L5         | 85 <sup>0</sup> <sub>-0.5</sub>     |                                                  |                  |               |                    |         |     |     |
|        |                               | Front boom (RH) |            | 90 <sup>+2</sup> <sub>0</sub>       |                                                  |                  |               |                    |         |     |     |
| F      | Arm cylinder attaching pin    | Head side       | L6         | 240 <sup>0</sup> <sub>-0.5</sub>    |                                                  |                  |               |                    |         |     |     |
|        |                               | Upper boom      |            | 245 <sup>+0.5</sup> <sub>0</sub>    |                                                  |                  |               |                    |         |     |     |
| G      | Boom cylinder rod side pin    | Rod side        | L7         | 85 <sup>0</sup> <sub>-0.5</sub>     |                                                  |                  |               |                    |         |     |     |
|        |                               | Rear boom       |            | 90 <sup>+2</sup> <sub>0</sub>       |                                                  |                  |               |                    |         |     |     |
| H      | Boom cylinder head side pin   | Head side       | L8         | 90 <sup>0</sup> <sub>-0.5</sub>     |                                                  |                  |               |                    |         |     |     |
|        |                               | Upper frame     |            | 95 <sup>+2</sup> <sub>0</sub>       |                                                  |                  |               |                    |         |     |     |

SK75UR-2

Unit : mm

| Symbol | Item                             |                 | Basic size |                                  | Shim adjusting clearance X (Total of both sides) |                  |               | Remedy             |
|--------|----------------------------------|-----------------|------------|----------------------------------|--------------------------------------------------|------------------|---------------|--------------------|
|        |                                  |                 | Code       | Dimension                        | Standard value                                   | Repairable level | Service limit |                    |
| A      | Boom foot pin                    | Rear boom       | L1         | 360 <sup>0</sup> <sub>-0.2</sub> | Less than<br>0.5                                 | More than<br>1.2 | 2.0           | Shim<br>adjustment |
|        |                                  | Upper frame     |            | 365 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| B,B'   | Front boom<br>attaching pin      | Front boom (LH) | L2         | 353 <sup>0</sup> <sub>-0.2</sub> |                                                  |                  |               |                    |
|        |                                  | Rear boom       |            | 354 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| C,C'   | Upper boom<br>attaching pin      | Front boom (LH) | L3         | 303 <sup>0</sup> <sub>-0.2</sub> |                                                  |                  |               |                    |
|        |                                  | Upper boom      |            | 304 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| D      | Offset cylinder<br>rod side pin  | Rod side        | L4         | 95 <sup>0</sup> <sub>-1.5</sub>  | 0.6~2.0                                          | More than<br>2.0 | 2.5           |                    |
|        |                                  | Front boom (LH) |            | 100 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| E      | Offset cylinder<br>head side pin | Head side       | L5         | 95 <sup>0</sup> <sub>-1.5</sub>  | 0.6~1.0                                          | More than<br>1.2 | 2.0           |                    |
|        |                                  | Front boom (RH) |            | 100 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| F      | Arm cylinder<br>attaching pin    | Head side       | L6         | 280 <sup>0</sup> <sub>-0.5</sub> |                                                  |                  |               |                    |
|        |                                  | Upper boom      |            | 285 <sup>+0.5</sup> <sub>0</sub> |                                                  |                  |               |                    |
| G      | Boom cylinder rod<br>side pin    | Rod side        | L7         | 95 <sup>0</sup> <sub>-0.5</sub>  | 0.6~2.0                                          | More than<br>2.0 | 2.5           |                    |
|        |                                  | Rear boom       |            | 100 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |
| H      | Boom cylinder<br>head side pin   | Head side       | L8         | 95 <sup>0</sup> <sub>-0.5</sub>  | 0.6~1.0                                          | More than<br>1.2 | 2.0           |                    |
|        |                                  | Upper frame     |            | 100 <sup>+2</sup> <sub>0</sub>   |                                                  |                  |               |                    |

### 14-3 CLEARANCE BETWEEN PIN AND BUSHING (Dozer)



CLEARANCE BETWEEN PIN AND BUSHING (Dozer)

#### SK30UR-2

Unit : mm

| Symbol | Item                       | Standard value |                    |                        |           | Clearance        |               | Remedy                 |
|--------|----------------------------|----------------|--------------------|------------------------|-----------|------------------|---------------|------------------------|
|        |                            | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance | Repairable level | Service limit |                        |
| A      | Dozer cylinder (Rod side)  | Ø 55           | -0.06<br>-0.09     | +0.10<br>-0.03         | 0.03~0.19 | More than 0.8    | 1.2           | Replace bushing or pin |
| B      | Dozer cylinder (Head side) |                |                    |                        |           |                  |               |                        |
| C      | Dozer foot                 | Ø 40           |                    | ±0.05                  | 0.01~0.14 |                  |               |                        |

#### SK50UR-2

Unit : mm

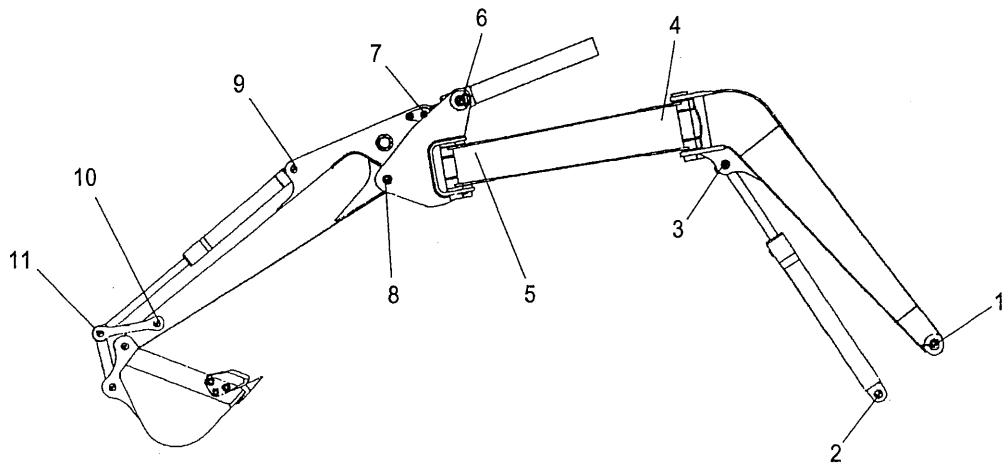
| Symbol | Item                       | Standard value |                    |                        |             | Clearance        |               | Remedy                 |
|--------|----------------------------|----------------|--------------------|------------------------|-------------|------------------|---------------|------------------------|
|        |                            | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance   | Repairable level | Service limit |                        |
| A      | Dozer cylinder (Rod side)  | Ø 55           | -0.150<br>-0.210   | +0.050<br>+0.180       | 0.200~0.390 | 1.5              | 2.0           | Replace bushing or pin |
| B      | Dozer cylinder (Head side) |                |                    |                        |             |                  |               |                        |
| C      | Dozer foot                 | Ø 40           |                    | +0.058<br>+0.117       | 0.208~0.327 |                  |               |                        |

#### SK75UR-2

Unit : mm

| Symbol | Item                       | Standard value |                    |                        |           | Clearance        |               | Remedy                 |
|--------|----------------------------|----------------|--------------------|------------------------|-----------|------------------|---------------|------------------------|
|        |                            | Pin dia.       | Pin dia. tolerance | Bushing I.d. tolerance | Clearance | Repairable level | Service limit |                        |
| A      | Dozer cylinder (Rod side)  | Ø 45           | -0.15<br>-0.21     | +0.09<br>0             | 0.15~0.30 | More than 1.2    | 2.0           | Replace bushing or pin |
| B      | Dozer cylinder (Head side) |                |                    |                        |           |                  |               |                        |
| C      | Dozer foot                 | Ø 40           |                    | +0.18<br>+0.05         | 0.20~0.39 |                  |               |                        |

## 14-4 PLASTIC SHIM LIST



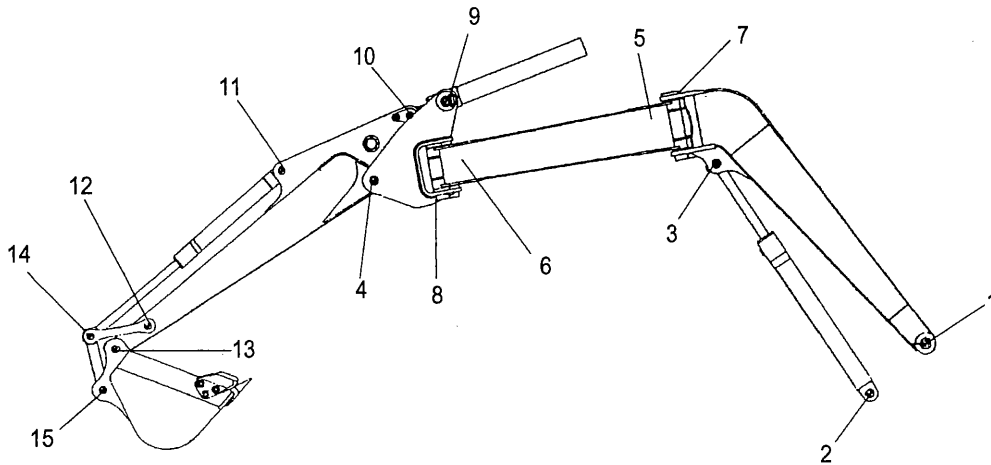
Note : The numbers of shim for item 11 are 4 pieces but the others are 2 pieces.

Unit : mm

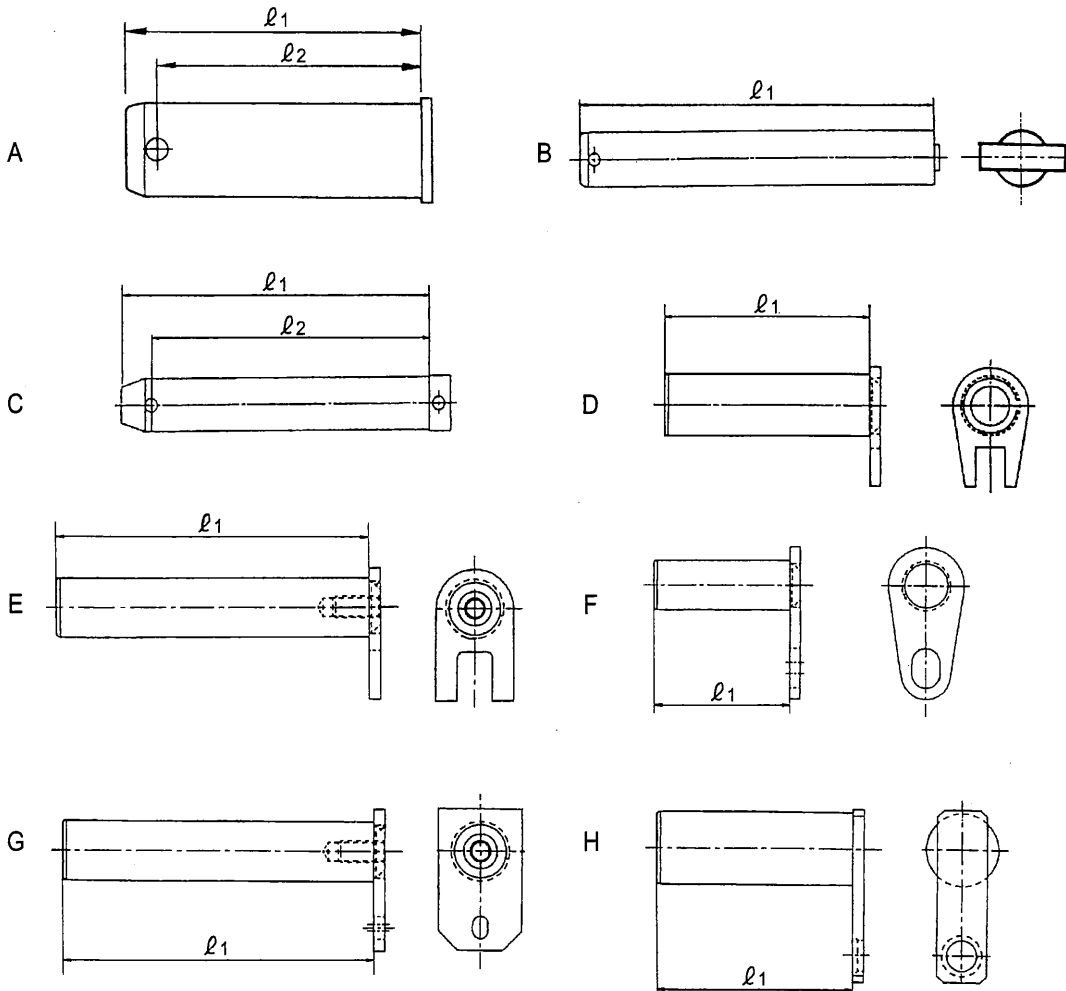
|    | SK30UR-2     |                       | SK50UR-2     |                       | SK75UR-2     |                       |
|----|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|
|    | P. NO        | I.D X O.D X Thickness | P. NO        | I.D X O.D X Thickness | P. NO        | I.D X O.D X Thickness |
| 1  | PY12B01011P1 | 47 X 70 X 2           | YR02B01265P1 | 62 X 130 X 2          | YR02B01265P1 | 62 X 130 X 2          |
| 2  | PY12B01011P1 | 47 X 70 X 2           | YJ02B01112P1 | 57 X 100 X 2          | YR02B01046P1 | 67 X 110 X 2          |
| 3  | ↑            | ↑                     | ↑            | ↑                     | ↑            | ↑                     |
| 4  | PR12B01018P1 | 42 X 65 X 2           | YR12B01029P1 | 57 X 90 X 2           | YR12B01029P1 | 57 X 90 X 2           |
| 5  | ↑            | ↑                     | ↑            | ↑                     | ↑            | ↑                     |
| 6  | PR02B01110P1 | 52 X 90 X 2           | YJ02B01112P1 | 57 X 100 X 2          | YR02B01262P1 | 72 X 120 X 2          |
| 7  | PY12B01011P1 | 47 X 70 X 2           | PY02B01001P1 | 52 X 80 X 2           | PY02B01028P1 | 62 X 110 X 2          |
| 8  | ↑            | ↑                     | YJ12B01045P1 | 57 X 110 X 2          | ↑            | ↑                     |
| 9  | PR12B01018P1 | 42 X 65 X 2           | PY12B01011P1 | 47 X 70 X 2           | YR12B01028P1 | 52 X 90 X 2           |
| 10 | PR12B01017P1 | 37 X 60 X 2           | ↑            | ↑                     | ↑            | ↑                     |
| 11 | PR12B01018P1 | 42 X 65 X 2           | ↑            | ↑                     | ↑            | ↑                     |

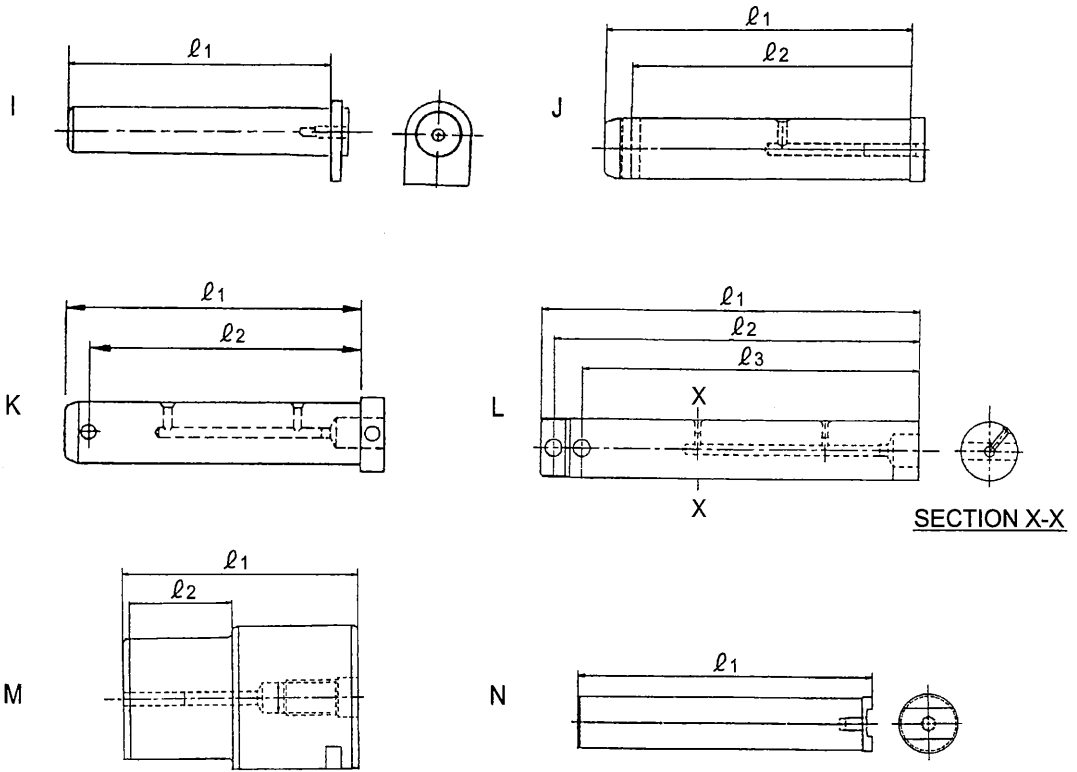
## 14-5 PINS AND BUSHINGS

### (1) Pins and bushings

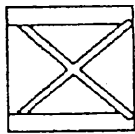


#### Pin

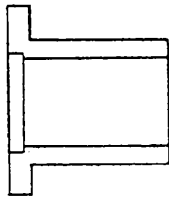




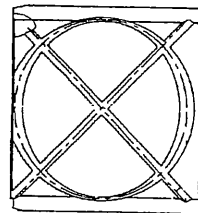
### Bushing



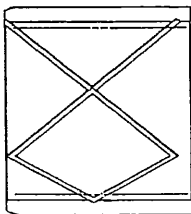
TYPE A



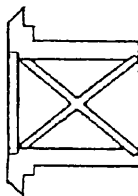
TYPE B



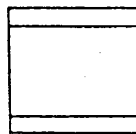
TYPE C



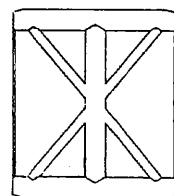
TYPE D



TYPE E



TYPE F



TYPE G

(2) Dimensions of pins and bushings.

SK30UR-2

Unit : mm

| Item<br>No. | Pin  |          |          |      | Bushings           |      | Remarks   |
|-------------|------|----------|----------|------|--------------------|------|-----------|
|             | Dia. | $\ell_1$ | $\ell_2$ | Type | I.D X O.D X Length | Type |           |
| 1           | 45   | 244      | —        | E    | 45 x 55 x 45       | A    | Dust seal |
| 2           | 45   | 244      | —        | G    |                    |      |           |
| 3           | 45   | 163      | 146      | A    |                    |      |           |
| 4           | 45   | 222      | 205      | A    | 45 x 55 x 45       | A    | Dust seal |
| 5           | 40   | 131      | —        | D    |                    |      |           |
| 6           | 40   | 131      | —        | D    |                    |      |           |
| 7           | 35   | 309      | 292      | A    | 35 x 45 x 55       | A    | Dust seal |
| 8           | 35   | 265      | 248      | A    | 35 x 45 x 55       | A    | Dust seal |
| 9           | —    | —        | —        | —    | 50 x 60 x 32       | F    | Dust seal |
| 10          | 45   | 124      | —        | F    |                    |      |           |
| 11          | 40   | 132      | 115      | A    |                    |      |           |
| 12          | 35   | 192      | 175      | K    | 35 x 45 x 40       | A    | Dust seal |
| 13          | 35   | 253      | 221      | K    | 35 x 45 x 40       | G    | Dust seal |
| 14          | 40   | 192      | 175      | K    | 40 x 50 x 27       | G    | Dust seal |
| 15          | 35   | 253      | 221      | K    | 35 x 45 x 40       | G    | Dust seal |
| Bucket      |      |          |          |      | 35 x 45 x 43       | B    |           |

SK50UR-2

Unit : mm

| Item<br>No. | Pin  |          |          |          |      | Bushings           |      | Remarks   |
|-------------|------|----------|----------|----------|------|--------------------|------|-----------|
|             | Dia. | $\ell_1$ | $\ell_2$ | $\ell_3$ | Type | I.D X O.D X Length | Type |           |
| 1           | 60   | 351      | —        | —        | I    | 60 X 70 X 65       | C    | Dust seal |
| 2           | 55   | 185      | 168      | —        | C    |                    |      |           |
| 3           | 55   | 200      | 183      | —        | A    |                    |      |           |
| 4           | 55   | 323      | 306      | —        | A    | 55 X 65 X 55       | A    | Dust seal |
| 5           | 55   | 151      | —        | —        | H    |                    |      |           |
| 6           | 55   | 151      | —        | —        | H    |                    |      |           |
| 7           | 50   | 399      | 382      | —        | A    | 50 X 60 X 50       | A    | Dust seal |
| 8           | 50   | 357      | 340      | —        | A    | 50 X 60 X 50       | A    | Dust seal |
| 9           | 55   | 110      | 49       | —        | M    |                    |      |           |
| 10          | 50   | 147      | —        | —        | F    |                    |      |           |
| 11          | 45   | 151      | 135      | —        | A    |                    |      |           |
| 12          | 45   | 221      | 204      | —        | C    | 45 X 55 X 45       | G    | Dust seal |
| 13          | 45   | 290      | 280      | 258      | L    | 45 X 55 X 45       | G    | Dust seal |
| 14          | 45   | 221      | 204      | —        | C    | 45 X 55 X 33.5     | G    | Dust seal |
| 15          | 45   | 290      | 280      | 258      | L    | 45 X 55 X 45       | G    | Dust seal |
| Bucket      |      |          |          |          |      | 45 X 60 X 46       | B    |           |

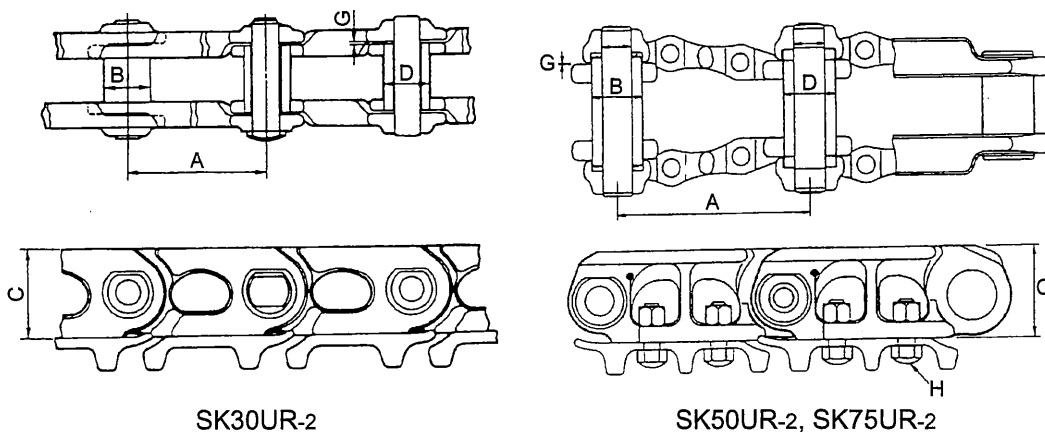
SK75UR-2

Unit : mm

| Item<br>No. | Pin  |          |          |      | Bushing            |      | Remarks   |
|-------------|------|----------|----------|------|--------------------|------|-----------|
|             | Dia. | $\ell_1$ | $\ell_2$ | Type | I.D X O.D X Length | Type |           |
| 1           | 60   | 486      | —        | N    | 80 X 70 X 65       | D    | Dust seal |
| 2           | 65   | 175      | —        | D    |                    |      |           |
| 3           | 65   | 222      | 205      | A    |                    |      |           |
| 4           | 60   | 379      | 362      | A    | 60 X 70 X 55       | A    | Dust seal |
| 5           | 55   | 163      | —        | D    |                    |      |           |
| 6           | 55   | 163      | —        | D    |                    |      |           |
| 7           | 55   | 472      | 455      | A    | 55 X 65 X 55       | F    | Dust seal |
| 8           | 55   | 404      | 387      | B    | 55 X 65 X 55       | F    | Dust seal |
| 9           | 65   | 128      | 69       | M    |                    |      |           |
| 10          | 60   | 176      | —        | F    |                    |      |           |
| 11          | 50   | 180      | 163      | A    |                    |      |           |
| 12          | 50   | 274      | 257      | K    | 50 X 60 X 50       | F    | Dust seal |
| 13          | 50   | 333      | 301      | C    | 50 X 65 X 57       | E    | Dust seal |
| 14          | 50   | 274      | 257      | K    | 50 X 60 X 36       | F    | Dust seal |
| 15          | 50   | 333      | 301      | C    | 50 X 65 X 47       | A    | Dust seal |
| Bucket      |      |          |          |      | 50 X 65 X 48       | B    |           |

## 14-6 UNDERCARRIAGE

### MAINTENANCE STANDARD OF TRACK LINK



SK30UR-2

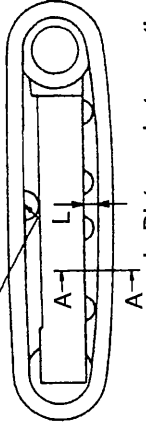
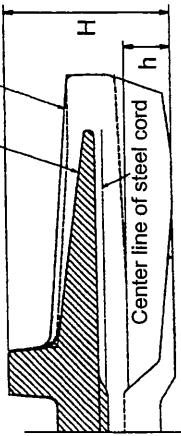
SK50UR-2, SK75UR-2

Unit : mm

| Model |                                           |                                 | SK30UR-2                                                             | SK50UR-2                                                             | SK75UR-2                                                                | Remedy    |
|-------|-------------------------------------------|---------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------|-----------|
| A     | Link pitch                                | Standard values                 | 101.6                                                                | 135                                                                  | 155.6                                                                   | Replace   |
|       |                                           | Repairable level                | 103.6                                                                | 139                                                                  | 160                                                                     |           |
|       |                                           | Service limit                   | 104.5                                                                | 140                                                                  | 164                                                                     |           |
| B     | O.D of bushing                            | Standard values                 | $\varnothing 32.20 \begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix}$ | $\varnothing 35.02 \begin{smallmatrix} +0.03 \\ 0 \end{smallmatrix}$ | $\varnothing 41 \begin{smallmatrix} +0.214 \\ +0.174 \end{smallmatrix}$ | Replace   |
|       |                                           | Repairable level                | $\varnothing 30.5$                                                   | $\varnothing 32$                                                     | $\varnothing 37$                                                        |           |
|       |                                           | Service limit                   | $\varnothing 29.5$                                                   | $\varnothing 31$                                                     | $\varnothing 36$                                                        |           |
| C     | Height of link                            | Standard values                 | $61 \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$                 | 65                                                                   | 75                                                                      | Replace   |
|       |                                           | Repairable level                | 57                                                                   | 61                                                                   | 69                                                                      |           |
|       |                                           | Service limit                   | 55.5                                                                 | 60                                                                   | 67                                                                      |           |
| D     | Interference between bushing and link     | Basic dimension                 | $\varnothing 32$                                                     | $\varnothing 35.02$                                                  | $\varnothing 41$                                                        | Replace   |
|       |                                           | Tolerance                       | Shaft                                                                | $\begin{smallmatrix} +0.2 \\ +0.16 \end{smallmatrix}$                | $\begin{smallmatrix} +0.03 \\ 0 \end{smallmatrix}$                      |           |
|       |                                           |                                 | Hole                                                                 | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$                   | $\begin{smallmatrix} +0.214 \\ +0.174 \end{smallmatrix}$                |           |
|       |                                           | Repairable level (Interference) | 0.1                                                                  | 0.05                                                                 | 0.05                                                                    |           |
|       |                                           | Service limit (Interference)    | 0                                                                    | 0                                                                    | 0                                                                       |           |
| E     | Interference between track and link       | Basic dimension                 | $\varnothing 19$                                                     | $\varnothing 22.03$                                                  | $\varnothing 44$                                                        | Replace   |
|       |                                           | Tolerance                       | Shaft                                                                | $\begin{smallmatrix} +0.21 \\ +0.17 \end{smallmatrix}$               | $\begin{smallmatrix} +0.03 \\ 0 \end{smallmatrix}$                      |           |
|       |                                           |                                 | Hole                                                                 | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$                   | $\begin{smallmatrix} +0.04 \\ 0 \end{smallmatrix}$                      |           |
|       |                                           | Repairable level (Interference) | 0.1                                                                  | 0.05                                                                 | 0.05                                                                    |           |
|       |                                           | Service limit (Interference)    | 0                                                                    | 0                                                                    | 0                                                                       |           |
| F     | Interference between master pin and links | Basic dimension                 | $\varnothing 19$                                                     | $\varnothing 21.88$                                                  | $\varnothing 24$                                                        | Replace   |
|       |                                           | Tolerance                       | Shaft                                                                | $\begin{smallmatrix} +0.2 \\ +0.1 \end{smallmatrix}$                 | $\begin{smallmatrix} -0.05 \\ -0.08 \end{smallmatrix}$                  |           |
|       |                                           |                                 | Hole                                                                 | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$                   | $\begin{smallmatrix} -0.05 \\ -0.08 \end{smallmatrix}$                  |           |
|       |                                           | Repairable level (Interference) | 0.05                                                                 | 0.05                                                                 | 0.05                                                                    |           |
|       |                                           | Service limit (Interference)    | 0                                                                    | 0                                                                    | 0                                                                       |           |
| G     | Clearance between links (both sides)      | Standard values (Both sides)    | 1.2                                                                  | 1.0                                                                  | —                                                                       | Replace   |
|       |                                           | Repairable level (Both sides)   | 6                                                                    | 8                                                                    | 8                                                                       |           |
|       |                                           | Service limit (Both sides)      | 7                                                                    | 10                                                                   | 10                                                                      |           |
| H     | Tightening torque of shoe bolt (kgf-m)    |                                 | —                                                                    | 22±3                                                                 | 30±3                                                                    | Retighten |

# MAINTENANCE STANDARDS OF RUBBER CRAWLER

Place "M"/KOBELCO mark at machine center.  
"M" is a seam joint mark.



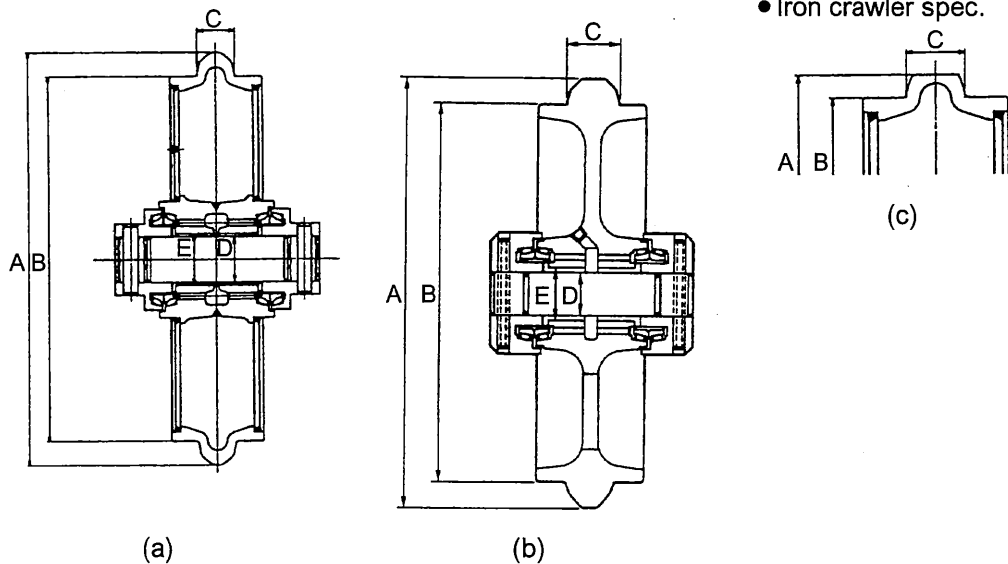
L=Distance between the bottom of frame  
and top of rubber crawler

Unit : mm

## SECTION A-A

| Item                                               | Model            | SK30UR-2                                                 | SK50UR-2 | SK75UR-2 | Remedy     |
|----------------------------------------------------|------------------|----------------------------------------------------------|----------|----------|------------|
| Sag of rubber crawler L                            | Standard values  | 68~78                                                    | 70~85    | 130~145  | Adjustment |
|                                                    | Repairable level | —                                                        | —        | 160      |            |
|                                                    | Service limit    | —                                                        | —        | 170      |            |
| Cracks and cuts on rubber crawler                  | Standard values  | None                                                     | ←        | ←        | Replace    |
|                                                    | Repairable level | Where the depth of them does not reach to the steel cord | ←        | ←        |            |
|                                                    | Service limit    | Where the depth of them reaches to the steel cord        | ←        | ←        |            |
| Breakage of steel cords                            | Standard values  | None                                                     | ←        | ←        | Replace    |
|                                                    | Repairable level | None                                                     | ←        | ←        |            |
|                                                    | Service limit    | Exist                                                    | ←        | ←        |            |
| Contact surface of rubber crawler and lower roller | Standard values  | None                                                     | ←        | ←        | Replace    |
|                                                    | Repairable level | Where 10 percent of core(2) is visible from outside      | ←        | ←        |            |
|                                                    | Service limit    | Where a half of core is visible from outside             | ←        | ←        |            |
| Height H (Lug projection h)                        | Standard values  | 85 (25)                                                  | 98 (24)  | 107 (31) | Replace    |
|                                                    | Repairable level | 65 (5)                                                   | 84 (10)  | 82 (6)   |            |
|                                                    | Service limit    | 60 (0)                                                   | 78 (5)   | 76 (0)   |            |

## MAINTENANCE STANDARDS OF FRONT IDLER

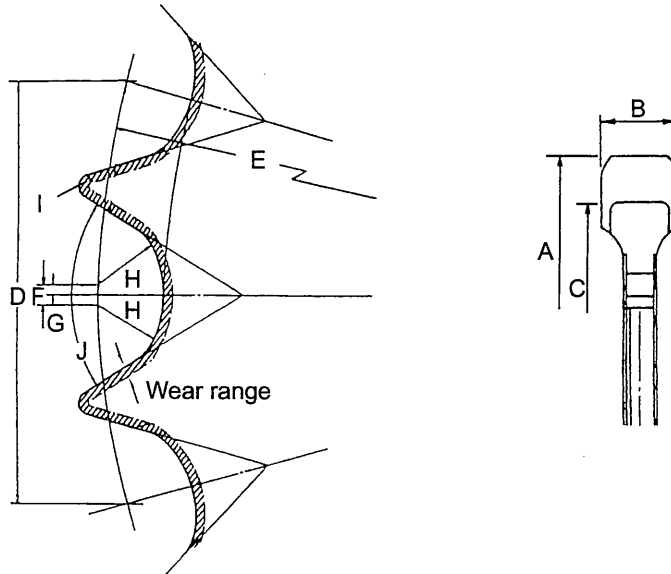


Unit : mm

| Symbol | Model                           | SK30UR-2                            | SK50UR-2                                 | SK75UR-2                                 | Remedy                                |
|--------|---------------------------------|-------------------------------------|------------------------------------------|------------------------------------------|---------------------------------------|
| A      | Standard values                 | Ø 347                               | Ø 364                                    | Ø 453(Ø 432)                             | Repair by build-up welding or replace |
|        | Repairable level                | —                                   | —                                        | —(—)                                     |                                       |
|        | Service limit                   | —                                   | —                                        | —(—)                                     |                                       |
| B      | Standard values                 | Ø 305                               | Ø 320                                    | Ø 400                                    |                                       |
|        | Repairable level                | Ø 301                               | Ø 312                                    | Ø 394                                    |                                       |
|        | Service limit                   | Ø 299                               | Ø 310                                    | Ø 392                                    |                                       |
| C      | Standard values                 | 40                                  | 40                                       | 104                                      | Replace of bushing                    |
|        | Repairable level                | 36                                  | 36                                       | 98                                       |                                       |
|        | Service limit                   | 34                                  | 34                                       | 96                                       |                                       |
| D      | Basic dimensions                | Ø 35 <sup>0</sup> <sub>-0.03</sub>  | Ø 45 <sup>-0.050</sup> <sub>-0.089</sub> | Ø 50 <sup>-0.050</sup> <sub>-0.075</sub> |                                       |
|        | Repairable level (Clearance)    | 0.5                                 | 1.5                                      | 1.5                                      |                                       |
|        | Service limit (Clearance)       | 0.8                                 | 2.0                                      | 2.0                                      |                                       |
| E      | Basic dimensions                | Ø 42 <sup>+0.025</sup> <sub>0</sub> | Ø 49 <sup>+0.020</sup> <sub>+0.030</sub> | Ø 57 <sup>+0.03</sup> <sub>-0.02</sub>   | Replace of bushing                    |
|        | Repairable level (Interference) | 0.01                                | 0                                        | 0                                        |                                       |
|        | Service limit (Clearance)       | 0                                   | 0.01                                     | 0.01                                     |                                       |
|        | Reference drawing               | (b)                                 | (a)                                      | (a) (c)                                  |                                       |

Note: The values in ( ) show the value for iron crawler.

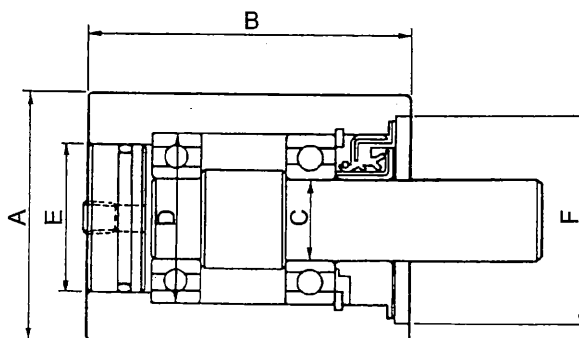
## MAINTENANCE STANDARDS OF SPROCKET



Unit : mm

| Symbol |                         |                    | SK30UR-2 | SK50UR-2                      | SK75UR-2                           | Remedy                                |
|--------|-------------------------|--------------------|----------|-------------------------------|------------------------------------|---------------------------------------|
| A      | O.D of sprocket         | Standard values    | Ø 385.6  | Ø 435.8                       | Ø 540 <sup>+2</sup> <sub>0</sub>   | Repair by build-up welding or replace |
|        |                         | Repairable level   | Ø 380    | Ø 430                         | Ø 534                              |                                       |
|        |                         | Service limit      | Ø 378    | Ø 428                         | Ø 532                              |                                       |
| B      | Width of sprocket teeth | Standard values    | 36       | 32 <sup>0</sup> <sub>-1</sub> | 38 <sup>+0.5</sup> <sub>-2.5</sub> | Replace                               |
|        |                         | Repairable level   | 30       | 28                            | 32                                 |                                       |
|        |                         | Service limit      | 28       | 26                            | 30                                 |                                       |
| C      | I.D of sprocket bottom  | Standard values    | —        | Ø 380.4                       | Ø 487                              | Repair by build-up welding or replace |
|        |                         | Repairable level   | —        | Ø 374                         | Ø 481                              |                                       |
|        |                         | Service limit      | —        | Ø 372                         | Ø 479                              |                                       |
|        | Sprocket teeth wear     | Service limit      | 4        | —                             | —                                  | Replace                               |
| D      | Standard values         | Link pitch         | 101.6    | 135                           | 156                                |                                       |
|        |                         | Number of teeth    | 23       | 19                            | 21                                 |                                       |
| E      |                         | P.C.D.             | 376.6    | 415.8                         | 527.9                              |                                       |
|        |                         | Diameter of roller | —        | Ø 35.4                        | Ø 41                               |                                       |
| F      |                         | Tooth profile      | —        | 7                             | 8                                  |                                       |
| G      |                         |                    | —        | 3.5                           | 4                                  |                                       |
| H      |                         |                    | R41.7    | R17.7                         | R20.6                              |                                       |
| I      |                         |                    | R4.5     | R6                            | R10                                |                                       |
| J      |                         |                    | —        | —                             | 62°                                |                                       |

## MAINTENANCE STANDARDS OF UPPER ROLLER



Unit : mm

| Symbol | Item                            | Model | SK30UR-2                 | Remedy                    |
|--------|---------------------------------|-------|--------------------------|---------------------------|
| A      | Standard values                 |       | $\varnothing 75 \pm 0.5$ | Replace                   |
|        | Repairable level                |       | $\varnothing 71$         |                           |
|        | Service limit                   |       | $\varnothing 69$         |                           |
| B      | Standard values                 |       | 98                       | Replace                   |
|        | Repairable level                |       | —                        |                           |
|        | Service limit                   |       | —                        |                           |
| C      | Basic dimension                 |       | $\varnothing 25$         | Replace shaft or bearing  |
|        | Interference                    |       | 0.008~0.031              |                           |
|        | Repairable level (Interference) |       | 0.008                    |                           |
|        | Service limit (Interference)    |       | —                        |                           |
| D      | Basic dimension                 |       | $\varnothing 52$         | Replace roller or bearing |
|        | Interference                    |       | 0.004~0.039              |                           |
|        | Repairable level (Interference) |       | 0.004                    |                           |
|        | Service limit (Interference)    |       | —                        |                           |
| E      | Basic dimension                 |       | $\varnothing 45$         | Replace cover             |
|        | Interference                    |       | 0.010~0.050              |                           |
|        | Repairable level (Interference) |       | 0.010                    |                           |
|        | Service limit (Interference)    |       | —                        |                           |
| F      | Basic dimension                 |       | $\varnothing 63$         | Replace cover             |
|        | Interference                    |       | 0.074~0.140              |                           |
|        | Repairable level (Interference) |       | 0.074                    |                           |
|        | Service limit (Interference)    |       | —                        |                           |

A: Tread dia.

B: Tread width

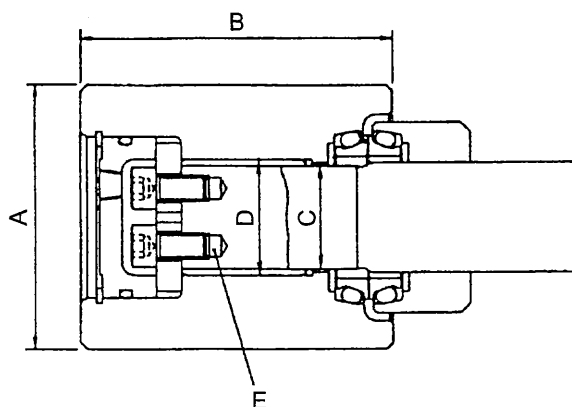
C: Interference between shaft and bearing

D: Interference between roller and bearing

E: Interference between roller and cover

F: Interference between roller and cover

## MAINTENANCE STANDARDS OF UPPER ROLLER



Unit : mm

| Symbol | Item                            | Model | SK50UR-2                                                      | SK75UR-2 | Remedy             |
|--------|---------------------------------|-------|---------------------------------------------------------------|----------|--------------------|
| A      | Standard values                 |       | Ø 82                                                          | ←        | Replace            |
|        | Repairable level                |       | Ø 73                                                          | ←        |                    |
|        | Service limit                   |       | Ø 70                                                          | ←        |                    |
| B      | Standard values                 |       | 102                                                           | ←        |                    |
|        | Repairable level                |       | 95                                                            | ←        |                    |
|        | Service limit                   |       | 92                                                            | ←        |                    |
| C      | Basic dimension                 |       | Ø 32 $\begin{smallmatrix} -0.060 \\ -0.090 \end{smallmatrix}$ | ←        | Replace bushing    |
|        | Repairable level (Clearance)    |       | 0.7                                                           | ←        |                    |
|        | Service limit (Clearance)       |       | 1.0                                                           | ←        |                    |
| D      | Basic dimension                 |       | Ø 36 $\begin{smallmatrix} 0 \\ -0.03 \end{smallmatrix}$       | ←        |                    |
|        | Repairable level (Interference) |       | 0                                                             | ←        |                    |
|        | Service limit (Clearance)       |       | 0.01                                                          | ←        |                    |
| E      | Tightening torque (kgf-m)       |       | 3.4±0.35                                                      | ←        | Apply Loctite #242 |

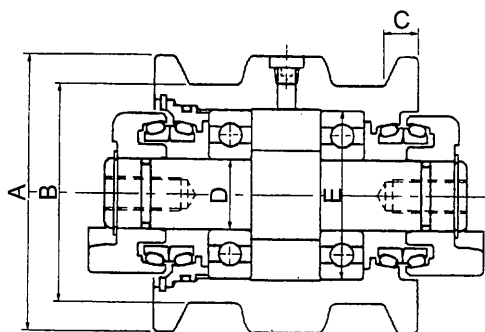
A: Tread dia.

B: Tread width

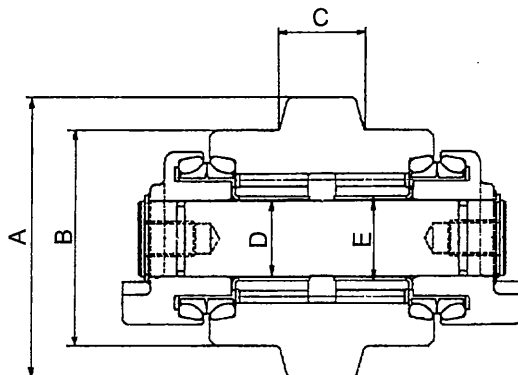
C: Clearance between shaft and bushing

D: Interference between roller and bushing

## MAINTENANCE STANDARDS OF LOWER ROLLER



SK30UR-2



SK50UR-2

Unit : mm

| Symbol                      | Model                           | SK50UR-2                                   | SK75UR-2                              | Remedy                                      |
|-----------------------------|---------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|
| A                           | Standard values                 | Ø 118                                      | Ø 130                                 | Repair by<br>build-up welding<br>or replace |
|                             | Repairable level                | —                                          | —                                     |                                             |
|                             | Service limit                   | —                                          | —                                     |                                             |
| B                           | Standard values                 | Ø 93                                       | Ø 100                                 |                                             |
|                             | Repairable level                | Ø 87                                       | Ø 94                                  |                                             |
|                             | Service limit                   | Ø 83                                       | Ø 92                                  |                                             |
| C                           | Basic dimension                 | 14.5                                       | 40                                    | Replace bushing<br>(SK50UR-2)               |
|                             | Repairable level                | —                                          | 36                                    |                                             |
|                             | Service limit                   | —                                          | 34                                    |                                             |
| D                           | Basic dimension                 | Ø 30 <sup>+0.021</sup> / <sub>+0.008</sub> | Ø 35 <sup>0</sup> / <sub>-0.025</sub> |                                             |
|                             | Repairable level                | (Interference) 0.008                       | 0.7                                   |                                             |
|                             | Service limit                   | —                                          | 1.0                                   |                                             |
| E                           | Basic dimension                 | Ø 72 <sup>-0.009</sup> / <sub>-0.033</sub> | Ø 39 <sup>+0.025</sup> / <sub>0</sub> | Replace roller<br>or bearing<br>(SK30UR-2)  |
|                             | Repairable level (Interference) | 0.004                                      | 0                                     |                                             |
|                             | Service limit (Clearance)       | —                                          | 0.01                                  |                                             |
| Engine oil API grade CD #30 |                                 | Gear oil SAE #90<br>API class CL-4 70cc    | 70cc                                  | Replenish                                   |

A: O.D. of flange

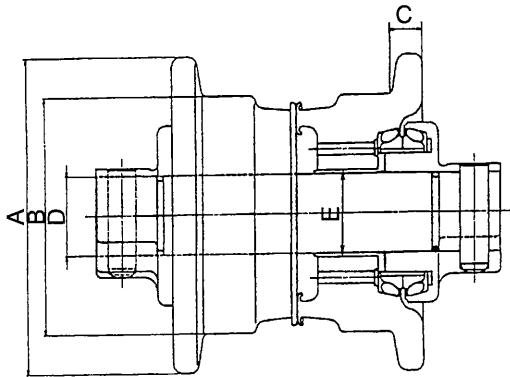
B: Tread dia.

C: Flange width

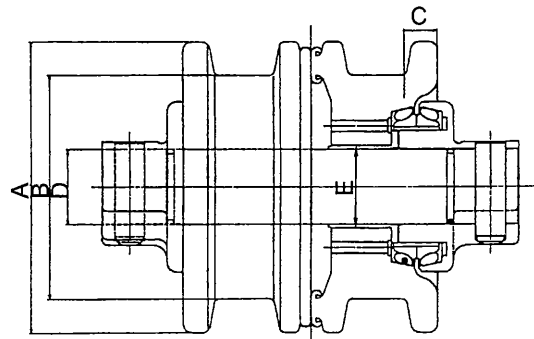
D: Clearance between shaft and bushing (Roll bushing) [SK50UR-2]

E: Interference between roller and bearing [SK30UR-2, SK50UR-2]

## MAINTENANCE STANDARDS OF LOWER ROLLER



TYPE S



TYPE W

Unit : mm

| Symbol                      | Item \ Model                 | TYPE S                                                        | TYPE W | Remedy                                |
|-----------------------------|------------------------------|---------------------------------------------------------------|--------|---------------------------------------|
| A                           | Standard values              | Ø 160 (Ø 147)                                                 | Ø 130  | Repair by build-up welding or replace |
|                             | Repairable level             | Ø 144 (Ø 130)                                                 | Ø 140  |                                       |
|                             | Service limit                | Ø 138 (Ø 125)                                                 | Ø 134  |                                       |
| B                           | Standard values              | Ø 120 (Ø 120)                                                 | ←      |                                       |
|                             | Repairable level             | Ø 110 (Ø 110)                                                 | ←      |                                       |
|                             | Service limit                | Ø 106 (Ø 106)                                                 | ←      |                                       |
| C                           | Basic dimension              | 18                                                            | ←      | Replace bushing                       |
|                             | Repairable level             | 12                                                            | ←      |                                       |
|                             | Service limit                | 10                                                            | ←      |                                       |
| D                           | Basic dimension              | Ø 40 $\begin{smallmatrix} -0.060 \\ -0.090 \end{smallmatrix}$ | ←      |                                       |
|                             | Repairable level             | 0.7                                                           | ←      |                                       |
|                             | Service limit                | 1.0                                                           | ←      |                                       |
| E                           | Basic dimension              | Ø 44 $\begin{smallmatrix} +0.025 \\ -0.020 \end{smallmatrix}$ | ←      | Replenish                             |
|                             | Repairable level (Clearance) | 0                                                             | ←      |                                       |
|                             | Service limit (Clearance)    | 0.01                                                          | ←      |                                       |
| Engine oil API grade CD #30 |                              | 90cc                                                          | 160cc  | Replenish                             |

Note: The values in ( ) show the value for iron crawler.

A: O.D. of flange

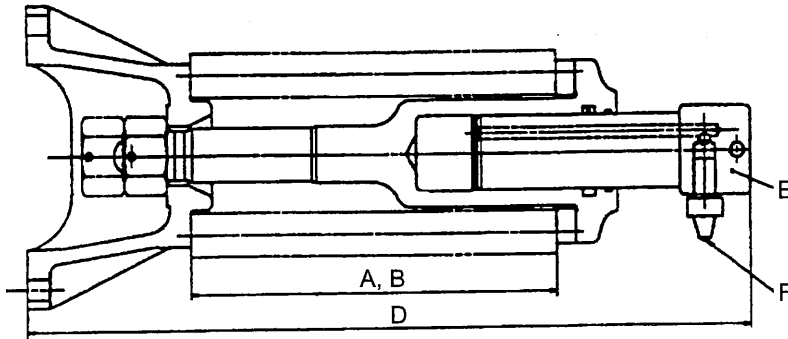
B: Tread dia.

C: Flange width

D: Clearance between shaft and bushing (Roll bushing)

E: Interference between roller and bearing

## MAINTENANCE STANDARDS OF TRACK SPRING



Unit : mm

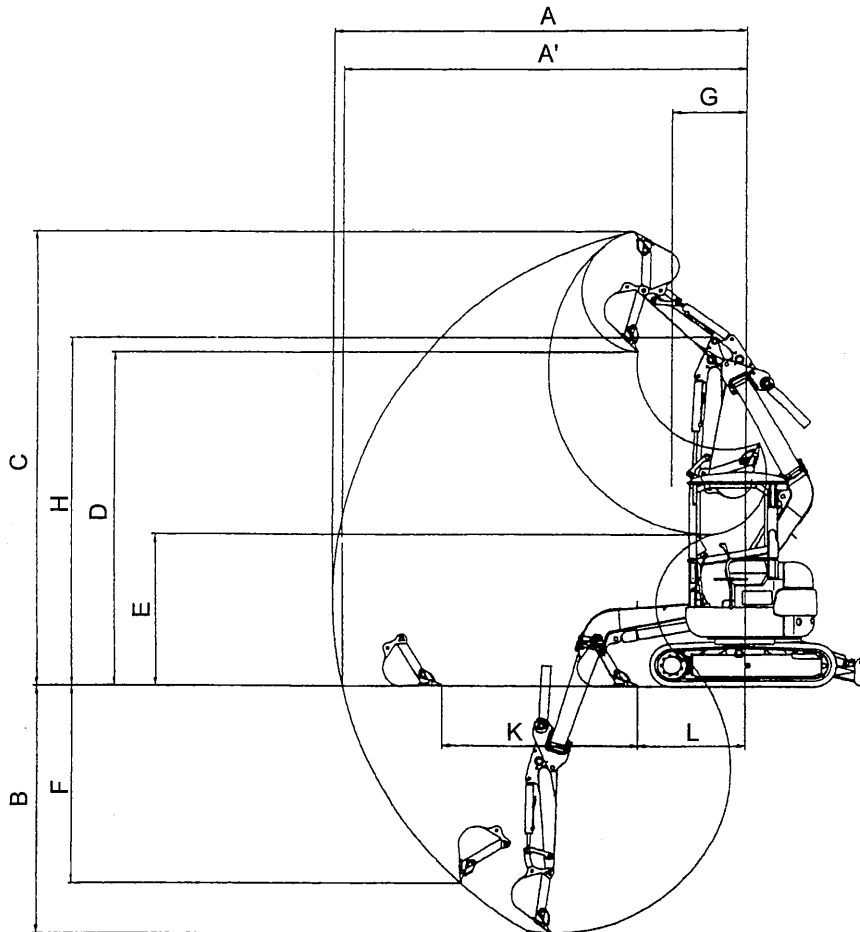
| Symbol |                                            | SK30UR-2                |      | SK50UR-2 |      | SK75UR-2 |      |
|--------|--------------------------------------------|-------------------------|------|----------|------|----------|------|
|        |                                            | Rubber                  | Iron | Rubber   | Iron | Rubber   | Iron |
| A      | Installed length of spring                 | 212                     |      | 266      | 282  | 257      | 270  |
| B      | Free length of spring                      | 256                     |      | 336      |      | 320      |      |
| C      | Stroke                                     | 23                      |      | 14       | 30   | 22       | 35   |
| D      | Set length                                 | —                       |      | —        | —    | 505.5    | 495  |
| E      | Outer circumferences of piston             | Nor scoring and rusting |      | ←        |      | ←        |      |
| F      | Tightening torque of grease nipple (kgf·m) | 6kgf·m                  |      | ←        |      | ←        |      |

Note: Stroke C = Installed length — Spring compressed length

## 15. WORKING RANGE

### ■ BACKHOE ATTACHMENT

1.22M Arm



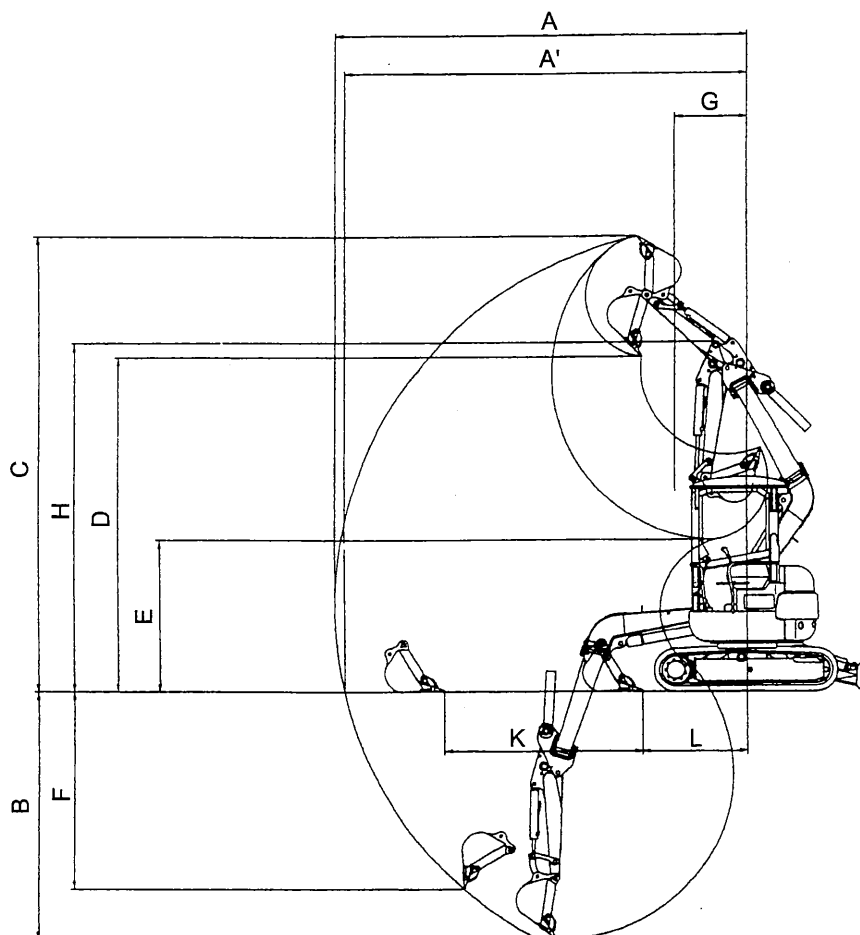
Unit : mm

| Attachment Type<br><br>Item |                                | At neutral                               | At off-set right<br>(Max. 860mm)         | At off-set left<br>(Max. 745mm)          |
|-----------------------------|--------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
|                             |                                | 1.22m Arm<br>+0.068m <sup>3</sup> Bucket | 1.22m Arm<br>+0.068m <sup>3</sup> Bucket | 1.22m Arm<br>+0.068m <sup>3</sup> Bucket |
| A                           | Maximum digging reach          | 4.47                                     | 4.08                                     | 4.20                                     |
| A'                          | Maximum reach at ground level  | 4.37                                     | 3.97                                     | 4.09                                     |
| *B                          | Maximum digging depth          | 2.84                                     | 2.45                                     | 2.56                                     |
| *C                          | Maximum digging height         | 5.09                                     | 4.74                                     | 4.84                                     |
| *D                          | Maximum dumping clearance      | 3.72                                     | 3.38                                     | 3.48                                     |
| *E                          | Minimum dumping clearance      | 1.67                                     | 1.33                                     | 1.43                                     |
| *F                          | Vertical digging depth         | 2.28                                     | 1.90                                     | 2.01                                     |
| G                           | Minimum swing radius           | 0.775                                    | 1.40                                     | 1.05                                     |
| *H                          | Height at minimum swing radius | 3.87                                     | 3.53                                     | 3.62                                     |
| K                           | Horizontal digging stroke      | Stroke                                   | 2.11                                     | 2.13                                     |
| L                           | at ground level                | Minimum                                  | 0.81                                     | 0.91                                     |

NOTE : \* marked dimensions don't include height of shoe lug.

# ■ BACKHOE ATTACHMENT

1.58M Arm



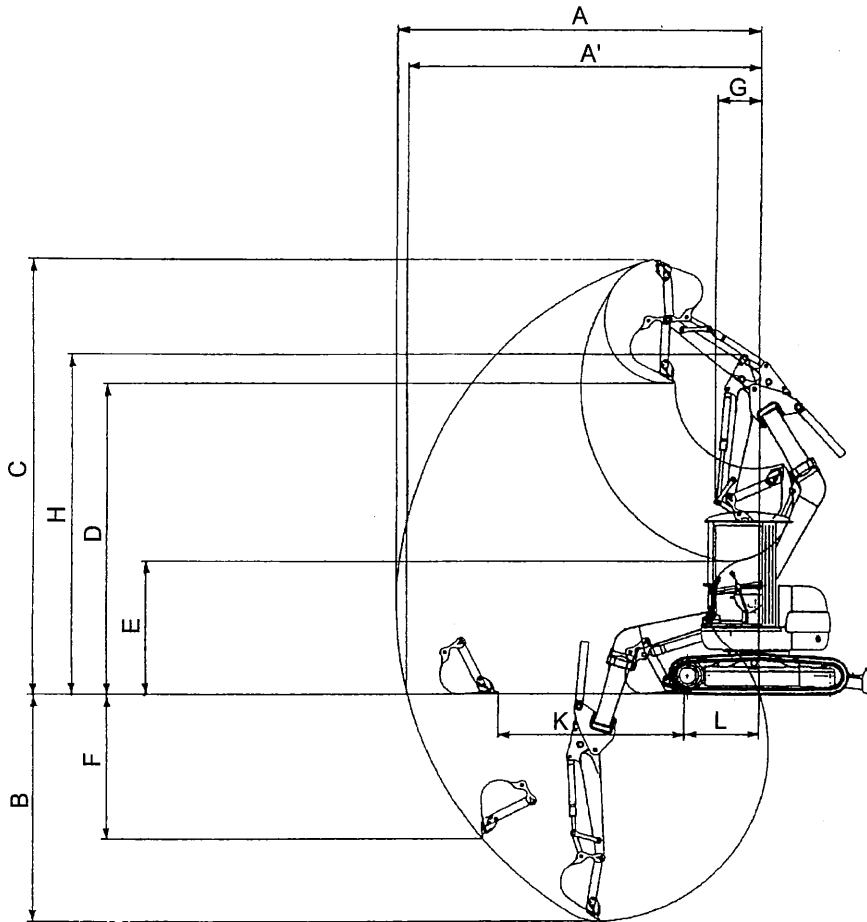
Unit : mm

| Attachment Type |                                | At neutral                               | At off-set right<br>(Max. 860mm)         | At off-set left<br>(Max. 745mm)          |
|-----------------|--------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
|                 |                                | 1.58m Arm<br>+0.055m <sup>3</sup> Bucket | 1.58m Arm<br>+0.055m <sup>3</sup> Bucket | 1.58m Arm<br>+0.055m <sup>3</sup> Bucket |
| Item            |                                |                                          |                                          |                                          |
| A               | Maximum digging reach          | 4.86                                     | 4.47                                     | 4.58                                     |
| A'              | Maximum reach at ground level  | 4.77                                     | 4.38                                     | 4.48                                     |
| *B              | Maximum digging depth          | 4.20                                     | 2.81                                     | 2.92                                     |
| *C              | Maximum digging height         | 5.46                                     | 5.12                                     | 5.21                                     |
| *D              | Maximum dumping clearance      | 4.10                                     | 3.76                                     | 3.85                                     |
| *E              | Minimum dumping clearance      | 1.37                                     | 1.02                                     | 1.12                                     |
| *F              | Vertical digging depth         | 2.87                                     | 2.47                                     | 2.58                                     |
| G               | Minimum swing radius           | 0.92                                     | 1.40                                     | 1.05                                     |
| *H              | Height at minimum swing radius | 3.87                                     | 3.53                                     | 3.62                                     |
| K               | Horizontal digging stroke      | Stroke                                   | 2.79                                     | 2.83                                     |
| L               | at ground level                | Minimum                                  | 0.91                                     | 0.48                                     |
|                 |                                |                                          |                                          | 0.60                                     |

NOTE : \* marked dimensions don't include height of shoe lug.

# BACKHOE ATTACHMENT

## 1.53M Arm



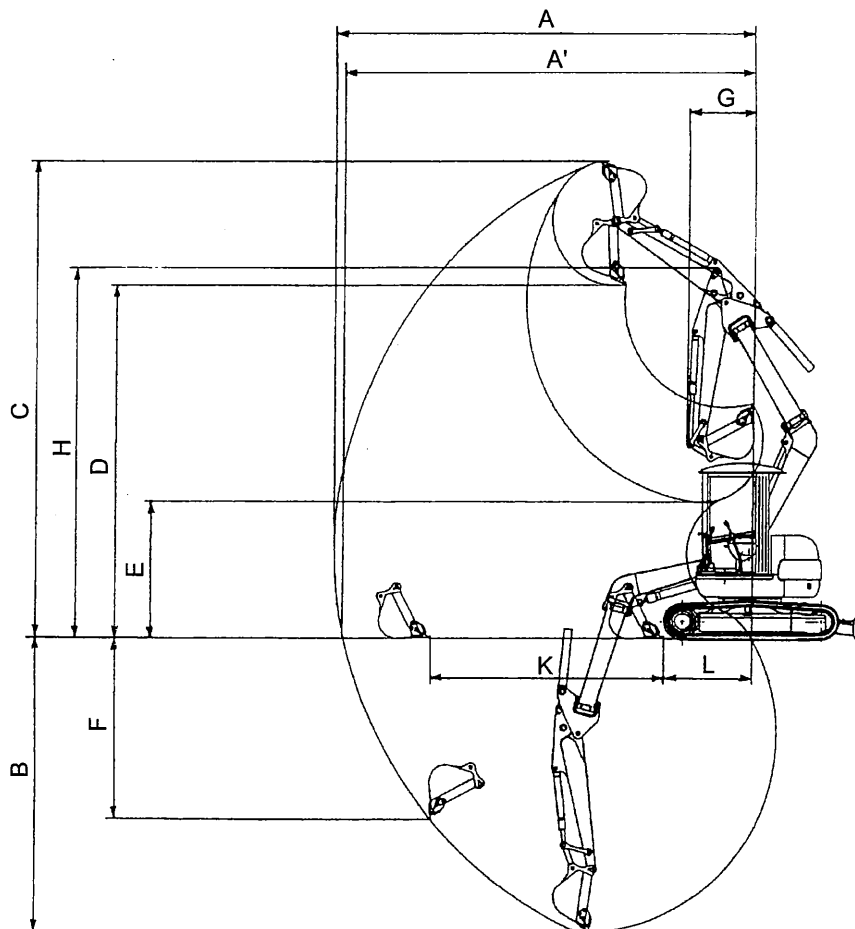
Unit : mm

| Attachment Type |                                | At neutral                              | At off-set right<br>(Max. 1,205mm)      | At off-set left<br>(Max. 850mm)         |
|-----------------|--------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
|                 |                                | 1.53m Arm<br>+0.22m <sup>3</sup> Bucket | 1.53m Arm<br>+0.22m <sup>3</sup> Bucket | 1.53m Arm<br>+0.22m <sup>3</sup> Bucket |
| A               | Maximum digging reach          | 5.65                                    | 5.06                                    | 5.39                                    |
| A'              | Maximum reach at ground level  | 5.52                                    | 4.91                                    | 5.25                                    |
| *B              | Maximum digging depth          | 3.80                                    | 3.20                                    | 3.53                                    |
| *C              | Maximum digging height         | 6.53                                    | 6.01                                    | 6.30                                    |
| *D              | Maximum dumping clearance      | 4.80                                    | 4.28                                    | 4.57                                    |
| *E              | Minimum dumping clearance      | 2.35                                    | 1.84                                    | 2.12                                    |
| *F              | Vertical digging depth         | 2.56                                    | 2.04                                    | 2.33                                    |
| G               | Minimum swing radius           | 0.98                                    | 1.80                                    | 1.27                                    |
| *H              | Height at minimum swing radius | 5.20                                    | 4.69                                    | 4.98                                    |
| K               | Horizontal digging stroke      | Stroke                                  | 2.63                                    | 2.59                                    |
| L               | at ground level                | Minimum                                 | 1.60                                    | 1.03                                    |

NOTE : \* marked dimensions don't include height of shoe lug.

# ■ BACKHOE ATTACHMENT

1.91M Arm



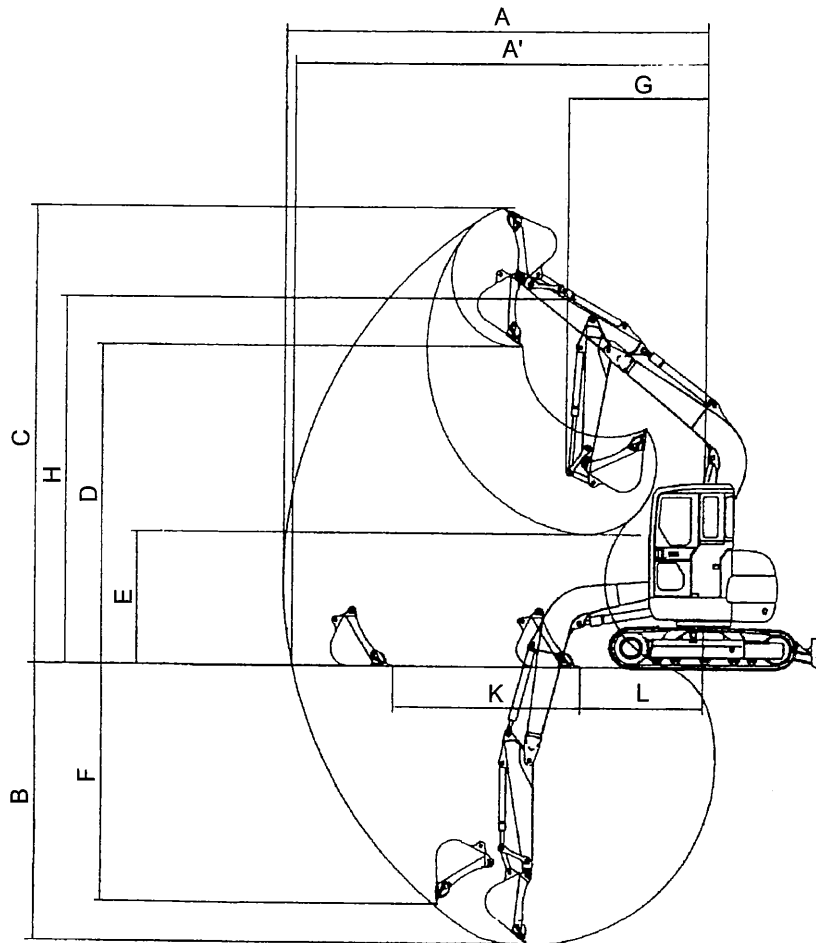
Unit : mm

| Attachment Type |                                | At neutral                              | At off-set right<br>(Max. 1,205mm)      | At off-set left<br>(Max. 850mm)         |
|-----------------|--------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
|                 |                                | 1.91m Arm<br>+0.16m <sup>3</sup> Bucket | 1.91m Arm<br>+0.16m <sup>3</sup> Bucket | 1.91m Arm<br>+0.16m <sup>3</sup> Bucket |
| Item            |                                |                                         |                                         |                                         |
| A               | Maximum digging reach          | 5.93                                    | 5.32                                    | 5.67                                    |
| A'              | Maximum reach at ground level  | 5.80                                    | 5.18                                    | 5.53                                    |
| *B              | Maximum digging depth          | 4.18                                    | 3.58                                    | 3.91                                    |
| *C              | Maximum digging height         | 6.67                                    | 6.16                                    | 6.45                                    |
| *D              | Maximum dumping clearance      | 4.96                                    | 4.44                                    | 4.73                                    |
| *E              | Minimum dumping clearance      | 1.96                                    | 1.45                                    | 1.74                                    |
| *F              | Vertical digging depth         | 2.60                                    | 2.11                                    | 2.38                                    |
| G               | Minimum swing radius           | 0.98                                    | 1.84                                    | 1.31                                    |
| *H              | Height at minimum swing radius | 5.21                                    | 4.69                                    | 4.98                                    |
| K               | Horizontal digging stroke      | Stroke                                  | 3.28                                    | 3.31                                    |
| L               | at ground level                | Minimum                                 | 1.25                                    | 0.71                                    |
|                 |                                |                                         |                                         | 1.01                                    |

NOTE : \* marked dimensions don't include height of shoe lug.

# BACKHOE ATTACHMENT

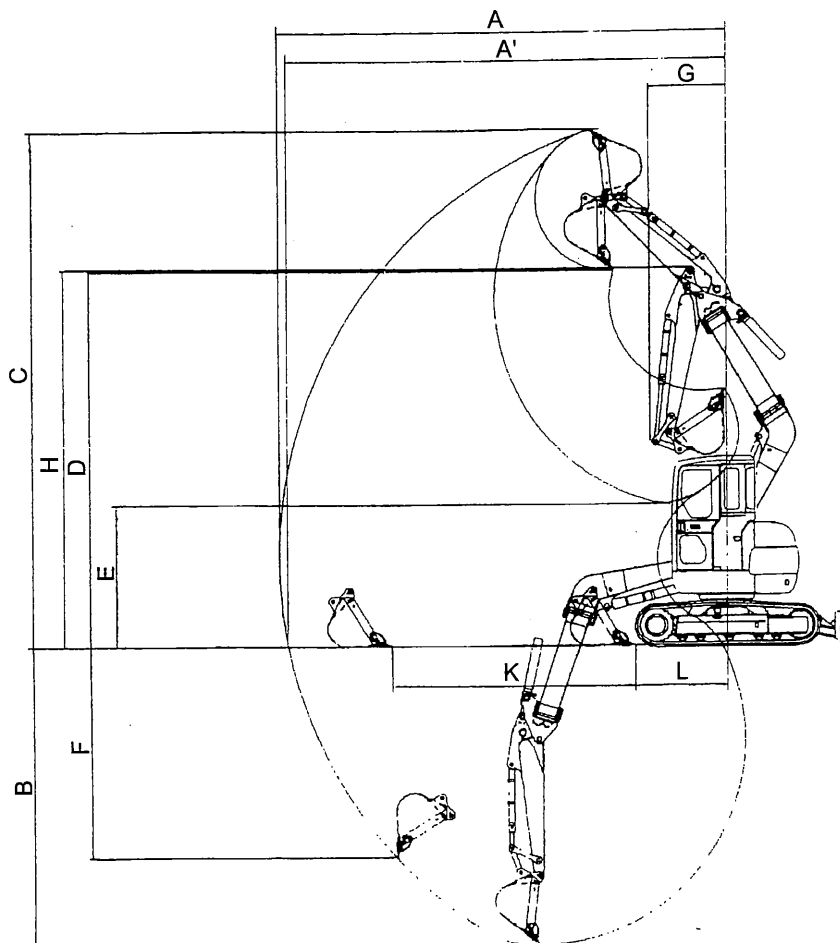
1.76M Arm



Unit : mm

| Attachment Type |                                | At neutral                  | At off-set right<br>(Max. 1,370mm) | At off-set left<br>(Max. 1,005mm) |
|-----------------|--------------------------------|-----------------------------|------------------------------------|-----------------------------------|
|                 |                                | 1.76m Arm<br>+0.28m³ Bucket | 1.76m Arm<br>+0.28m³ Bucket        | 1.76m Arm<br>+0.28m³ Bucket       |
| A               | Maximum digging reach          | 6.46                        | 5.66                               | 6.10                              |
| A'              | Maximum reach at ground level  | 6.32                        | 5.50                               | 5.96                              |
| *B              | Maximum digging depth          | 4.20                        | 3.41                               | 3.85                              |
| *C              | Maximum digging height         | 7.43                        | 6.72                               | 7.12                              |
| *D              | Maximum dumping clearance      | 5.38                        | 4.67                               | 5.06                              |
| *E              | Minimum dumping clearance      | 2.41                        | 1.71                               | 2.10                              |
| *F              | Vertical digging depth         | 3.01                        | 2.22                               | 2.61                              |
| G               | Minimum swing radius           | 1.08                        | 2.07                               | 1.49                              |
| *H              | Height at minimum swing radius | 5.61                        | 4.90                               | 5.30                              |
| K               | Horizontal digging stroke      | Stroke                      | 3.10                               | 3.13                              |
| L               | at ground level                | Minimum                     | 1.64                               | 0.91                              |
|                 |                                |                             |                                    | 1.27                              |

NOTE : \* marked dimensions don't include height of shoe lug.

**■ BACKHOE ATTACHMENT**
**2.06M Arm**


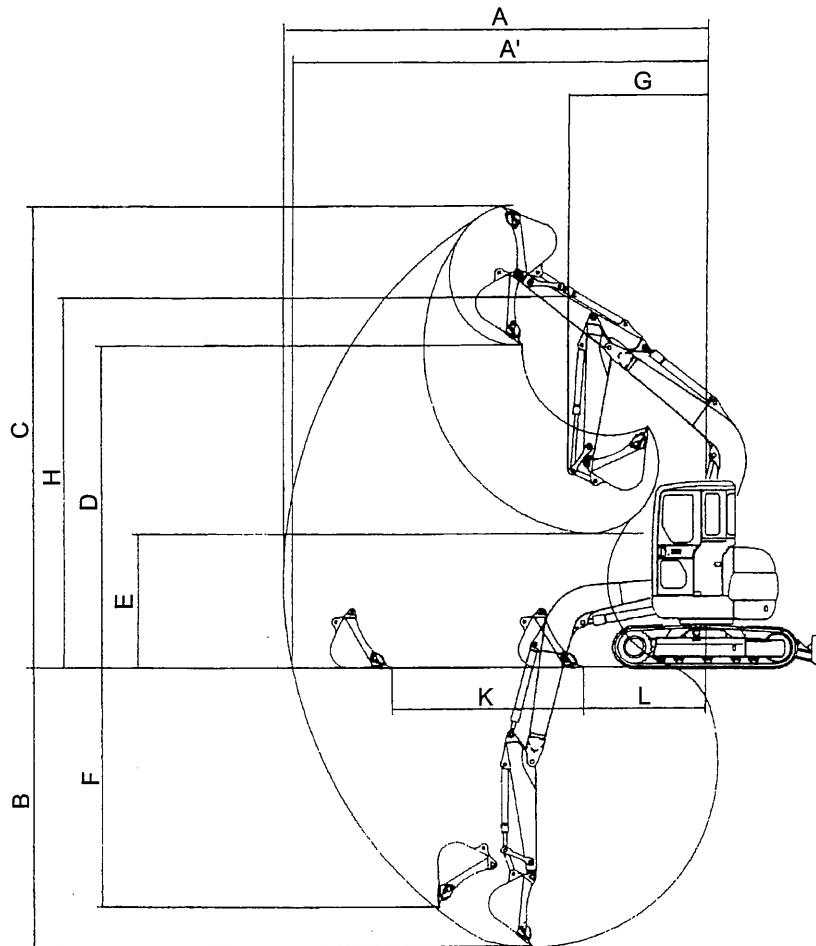
Unit : mm

| Attachment Type<br>Item |                                | At neutral                              | At off-set right<br>(Max. 1,370mm)      | At off-set left<br>(Max. 1,005mm)       |
|-------------------------|--------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
|                         |                                | 2.06m Arm<br>+0.23m <sup>3</sup> Bucket | 2.06m Arm<br>+0.23m <sup>3</sup> Bucket | 2.06m Arm<br>+0.23m <sup>3</sup> Bucket |
| A                       | Maximum digging reach          | 6.72                                    | 5.92                                    | 6.36                                    |
| A'                      | Maximum reach at ground level  | 6.59                                    | 5.77                                    | 6.23                                    |
| *B                      | Maximum digging depth          | 4.50                                    | 3.71                                    | 4.15                                    |
| *C                      | Maximum digging height         | 7.64                                    | 6.94                                    | 7.33                                    |
| *D                      | Maximum dumping clearance      | 5.59                                    | 4.88                                    | 5.28                                    |
| *E                      | Minimum dumping clearance      | 2.12                                    | 1.41                                    | 1.81                                    |
| *F                      | Vertical digging depth         | 3.20                                    | 2.49                                    | 2.88                                    |
| G                       | Minimum swing radius           | 1.15                                    | 2.07                                    | 1.49                                    |
| *H                      | Height at minimum swing radius | 5.61                                    | 4.90                                    | 5.30                                    |
| K                       | Horizontal digging stroke      | Stroke                                  | 3.63                                    | 3.56                                    |
| L                       | at ground level                | Minimum                                 | 1.39                                    | 0.64                                    |
|                         |                                |                                         |                                         | 1.03                                    |

NOTE : \* marked dimensions don't include height of shoe lug.

# ■ BACKHOE ATTACHMENT

## 1.73M Arm



Unit : mm

| Attachment Type |                                | 1.73m Arm<br>+0.28m³ Bucket |      |
|-----------------|--------------------------------|-----------------------------|------|
| Item            |                                |                             |      |
| A               | Maximum digging reach          |                             | 6.39 |
| A'              | Maximum reach at ground level  |                             | 6.26 |
| *B              | Maximum digging depth          |                             | 4.19 |
| *C              | Maximum digging height         |                             | 6.83 |
| *D              | Maximum dumping clearance      |                             | 4.79 |
| *E              | Minimum dumping clearance      |                             | 2.01 |
| *F              | Vertical digging depth         |                             | 3.59 |
| G               | Minimum swing radius           |                             | 2.06 |
| *H              | Height at minimum swing radius |                             | 5.49 |
| K               | Horizontal digging stroke      | Stroke                      | 2.88 |
| L               | at ground level                | Minimum                     | 1.82 |

NOTE : \* marked dimensions don't include height of shoe lug.

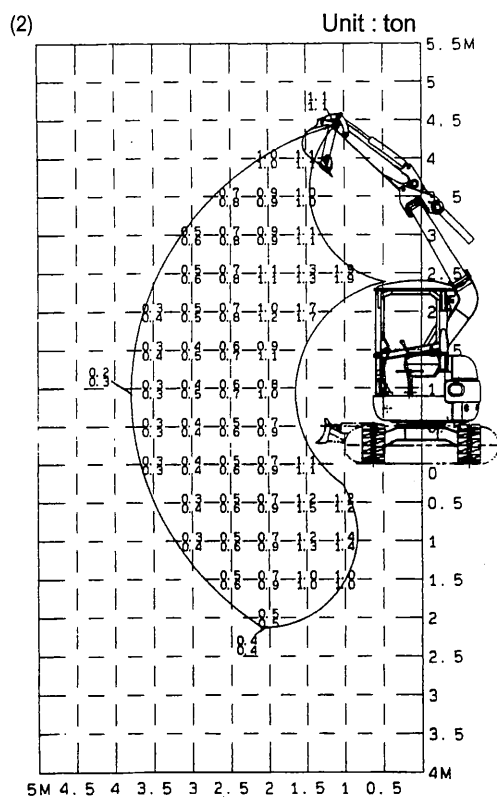
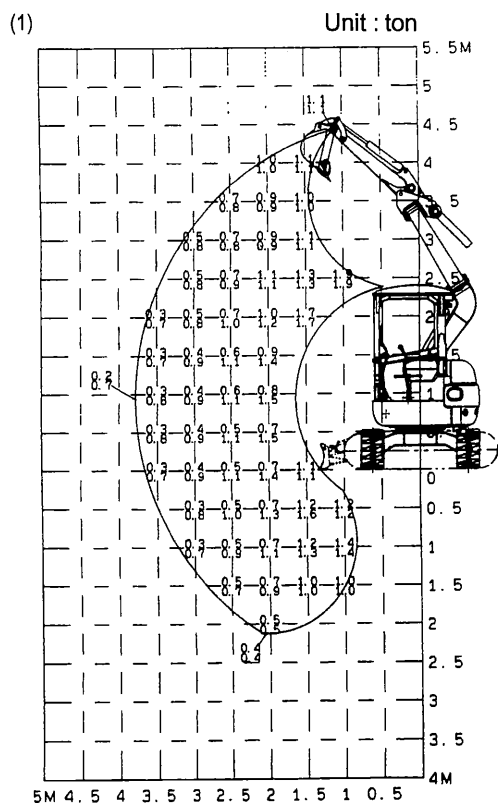
## 16. LIFTING CAPACITIES

### (1) Condition of Calculation

- 1) The lifting load shows the lower value either 87% or hydraulic lifting capacity or 75% of tipping load.
- 2) The load point is on the bucket supporting point, and the bucket position is a closed position.
- 3) The values in the upper rows show the lifting capacity of a machine facing sideways, and values in the lower rows show a machine facing longitudinally.
- 4) Unit : ton Crawler : Rubber shoe

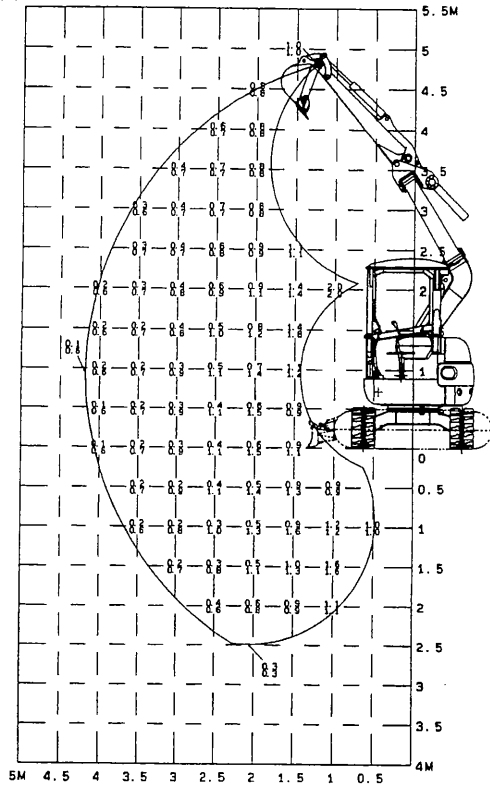
### (2) Reference No. List of lifting diagram

| Model    | 1.22m Arm + 0.08m <sup>3</sup> Bucket |                     | 1.58m Arm + 0.055m <sup>3</sup> Bucket |                     |
|----------|---------------------------------------|---------------------|----------------------------------------|---------------------|
|          | With dozer blade down                 | With dozer blade up | With dozer blade down                  | With dozer blade up |
| SK30UR-2 | (1)                                   | (2)                 | (3)                                    | (4)                 |



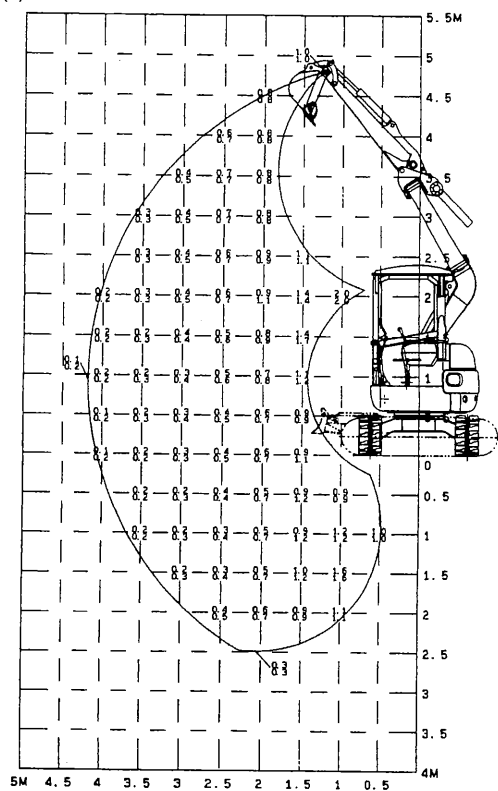
(3)

Unit : ton



(4)

Unit : ton



## 17. SOME CONVERSION UNITS

### Units of weight :

| From | Into | Multiply by |
|------|------|-------------|
| kg   | lb   | 2.2         |
| Lb   | kg   | 0.454       |

### Units of length :

| From   | Into   | Multiply by | Divide by |
|--------|--------|-------------|-----------|
| meters | feet   | 3.28        |           |
| mm     | inches |             | 25.4      |
| inches | mm     | 25.4        |           |

### Units of power :

| From | Into | Multiply by |
|------|------|-------------|
| PS   | kW   | 0.7355      |
| kW   | PS   | 1.360       |

### Units of flow :

| From                  | Into                    | Multiply by |
|-----------------------|-------------------------|-------------|
| Gal / min<br>(US liq) | Lit / min               | 3.79        |
|                       | Lit / sec               | 0.0631      |
|                       | cm <sup>3</sup> / min   | 3785.4      |
|                       | ft <sup>3</sup> / min   | 0.1337      |
| Lit / min             | ft <sup>3</sup> / min   | 0.0353      |
|                       | Gal / min               | 0.264       |
|                       | Gal / sec               | 0.004403    |
|                       | yard <sup>3</sup> / min | 0.001308    |

### Units of torque :

| From   | Into   | Multiply by |
|--------|--------|-------------|
| N-m    | Lbf-ft | 0.738       |
|        | kgf-m  | 0.1019716   |
|        | Lbf-ft | 0.737561    |
|        | Lbf-in | 8.85075     |
| Lbf-ft | Kgf-m  | 0.1382552   |
|        | N-m    | 1.35582     |
|        | Lbf-in | 12          |

### Units of pressure :

| From                  | Into                  | Multiply by |
|-----------------------|-----------------------|-------------|
| Kgf / cm <sup>2</sup> | psi                   | 14.223      |
|                       | Pa<br>(Pascal)        | 9.807       |
| psi                   | Atm                   | 0.06805     |
|                       | Bars                  | 0.06895     |
|                       | Kgf / cm <sup>2</sup> | 0.0703      |
|                       | Pa<br>(Pascal)        | 6894.76     |
| MPa<br>(Mega Pascal)  | psi                   | 145.04      |

### Units of volume :

| From              | Into              | Multiply by |
|-------------------|-------------------|-------------|
| Liters            | Gal<br>(US liq)   | 0.264       |
|                   | in <sup>3</sup>   | 61.02       |
|                   | yard <sup>3</sup> | 0.00131     |
|                   | quarts            | 1.0567      |
|                   | ounces<br>(US)    | 33.81       |
| Yard <sup>3</sup> | m <sup>3</sup>    | 0.765       |
|                   | in <sup>3</sup>   | 46656       |
|                   | ft <sup>3</sup>   | 27          |
|                   | cm <sup>3</sup>   | 764554.9    |
|                   | liters            | 764.555     |



