

INSTALLATION MANUAL

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| REF NO. | B945000 |
| DATE | Jan. 5, 1994 |

SUBJECT: FIELD INSTALLATION OF HI-LIFT BOOM

PURPOSE: Field installation of hi-lift boom

APPLICATION: WA380-1 Wheel Loaders, Serial Nos. 20001 and up and A45001 and up
WA420-1 Wheel Loaders, Serial Nos. 20001 and up and A25001 and up
WA450-2 Wheel Loaders, Serial Nos. A25001 and up
WA470-1 Wheel Loaders, Serial Nos. 10001 and up

DESCRIPTION:

1. Introduction

When installing the hi-lift boom in the field follow the procedure described herein.

INSTALLATION MANUAL contents

- The main specification data of a machine equipped with a hi-lift boom.
 - The installation procedure of hi-lift boom and bucket cylinder.
 - *• The installation procedure of logging counterweight.
- * Machines equipped with the hi-lift boom should be provided with the logging counterweight to ensure stability.

HI-LIFT BOOM OPTIONAL ATTACHMENT SPECIFICATIONS

| DIMENSIONS | | WA380 | WA420 | WA450-2 | WA470-1 |
|------------|---------------------------------|------------------------|------------------------|------------------------|--------------------|
| | Flywheel Horsepower | 180 hp | 204 hp | 260 hp | |
| | Operating Weight | 17,910 kg | 20,120 kg | 24,030 kg | 23,200 kg |
| | Counterweight | 1620 kg | 1750 kg | 2150 kg | |
| | Bucket Capacity | 3.1 m ³ | 3.7 m ³ | 4.2 m ³ | 3.5 m ³ |
| | Bucket Type | General Purpose | General Purpose | General Purpose | General Purpose |
| A | Bucket Width | 2905 mm | 3048 mm | 3170 mm | 3170 mm |
| | Overall Length | 8530 mm | 8748 mm | 9167 mm | |
| | Wheelbase | 3200 mm | 3200 mm | 3400 mm | |
| | Overall Height | 3485 mm | 3596 mm | 3638 mm | |
| | Width over Tires | 2785 mm | 2901 mm | 3001 mm | |
| | Tread Width | 2160 mm | 2200 mm | 2300 mm | |
| B | Hinge Pin Height | 4590 mm | 4773 mm | 4868 mm | 4870 |
| C | Dump Clearance | 3608 mm | 3721 mm | 3800 mm | 3805 |
| D | Dump Reach | 1172 mm | 1085 mm | 1303 mm | 1270 |
| | Turning Radius | 6630 mm | 6860 mm | 7090 mm | |
| | Static Tipping Load Straight | 12,020 kg | 13,830 kg | 15,537 kg | |
| | Full 40° Turn | 9,870 kg | 11,973 kg | 13,346 kg | |
| | Breakout Force | 16,600 kg | 19,700 kg | 21,600 kg | |
| | Travel Speed F/R - 1st | 7.7 km/h | 7.6 km/h | 6.6 km/h | |
| | F/R - 2nd | 12.3 km/h | 13.6 km/h | 12.3 km/h | |
| | F/R - 3rd | 21.9 km/h | 23.0 km/h | 22.0 km/h | |
| | F/R - 4th | 36.6 km/h | 38.7 km/h | 40.3 km/h | |
| | Hydraulic Flow (Loader Circuit) | 344 ℓ/min | 399 ℓ/min | 570 ℓ/min | |
| | Relief Valve Setting | 210 kg/cm ² | 210 kg/cm ² | 210 kg/cm ² | |
| | Cycle Times: Raise: (w/load) | 6.4 sec | 6.4 sec | 6.6 sec | |
| | Lower: (no load) | 3.0 sec | 3.9 sec | 3.5 sec | |
| | Dump: (with load) | 1.7 sec | 1.6 sec | 1.6 sec | |
| | Tilt Back: (no load)* | 1.8 sec | 2.1 sec | 2.0 sec | |
| | Tilt Back: (w/load)** | 1.5 sec | 1.7 sec | 1.4 sec | |
| | Tire Size | 23.5-25 20PR(L3) | 26.5-25 20PR(L3) | 26.5-25 20PR(L3) | 26.5-25 20PR(L2) |

3. Installation procedure of the hi-lift boom and bucket cylinder.

- I. Referring to Chart one, replace parts according to the "Replacements parts." For shims, etc., those on the standard machine may be reused.
- II. Install the related components. For the installation procedure of the logging counterweight, refer to Par. 4.
- III. Important: if parts for the standard link are erroneously installed in place of those for the hi-lift boom, interferences or malfunction will be encountered during operation. To prevent such problems, positively confirm hi-lift parts are being installed; referring to "Component Identification", Page 5.
- IV Chart One items 11 through 16 are those for restricting the return circuit on the bucket cylinder bottom side. If these parts are not used, dumping will occur at a speed higher than the oil quantity can be supplied from the pump, causing a vacuum to form in the bucket cylinder rod end. Consequently attachment fluttering will occur causing subsequent damage to the link parts and frame. Be sure to install the correct restrictor parts to prevent these problems.

★ The oil flow restricting direction

The parts should be installed so that flow restriction is made in the return direction toward the reservoir on the boom side.

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CHART ONE

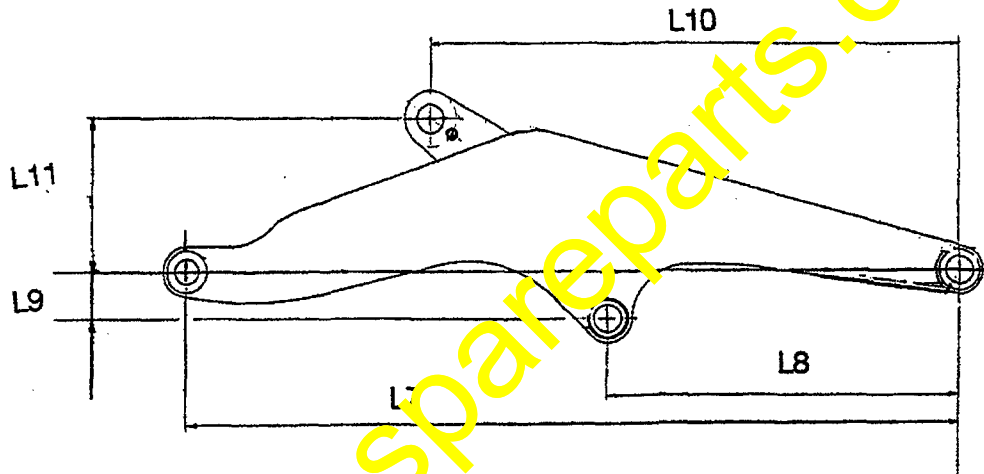
| | No. | Parts Name | Qty. | WA380 | | WA420 | | WA450-2 | | WA470 | | Remarks |
|-----------------------|------------|--------------------|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------|
| | | | | Std. link | Hi-lift | Std. link | Hi-lift | Std. link | Hi-lift | Std. link | Hi-lift | |
| I REPLACEMENT PARTS | 1 | Boom ass'y | 1 | 423-70-00070 | 423-850-0011 | 424-70-00140 | 424-850-0010 | 421-70-00070 | 421-850-0010 | 421-70-00070 | 421-850-0010 | Fig. 1 |
| | | Weight | kg | | 1365 | | 1455 | | 1810 | | 1810 | |
| | 2 | .Bushing | 2 | 424-70-11810 | 424-70-11810 | 424-70-11810 | 424-70-11810 | 421-70-11241 | 421-70-11241 | 421-70-11241 | 421-70-11241 | |
| | 3 | .Bushing | 2 | 424-70-11770 | 424-70-11770 | 424-70-11770 | 424-70-11770 | 421-70-11381 | 421-70-11381 | 421-70-11381 | 421-70-11381 | |
| | 4 | .Bushing | 2 | 424-70-11890 | 424-70-11890 | 424-70-11890 | 424-70-11890 | 421-70-11261 | 421-70-11261 | 421-70-11261 | 421-70-11261 | |
| | 5 | .Dust seal | 4 | 424-09-12320 | 424-09-12320 | 424-09-12320 | 424-09-12320 | 421-09-11310 | 421-09-11310 | 421-09-11310 | 421-09-11310 | |
| | 6 | .Dust seal | 8 | 421-09-11310 | 421-09-11310 | 421-09-11310 | 421-09-11310 | 421-09-11320 | 421-09-11320 | 421-09-11320 | 421-09-11320 | |
| | 7 | Link ass'y | 1 | 424-70-00080 | 423-850-0030 | 424-70-00080 | 423-850-0030 | 421-70-00081 | 421-850-0020 | 421-70-00082 | 421-850-0020 | |
| | 8 | .Bushing | 2 | 424-70-11820 | 424-70-11820 | 424-70-11820 | 424-70-11820 | 421-70-11251 | 421-70-11251 | 421-70-11251 | 421-70-11251 | |
| | 9 | .Dust seal | 4 | 424-09-12320 | 424-09-12320 | 424-09-12320 | 424-09-12320 | 421-09-11310 | 421-09-11310 | 421-09-11310 | 421-09-11310 | |
| | 10 | .Fitting | 2 | 07020-00000 | 07020-00000 | 07020-00000 | 07020-00000 | | | 0720-00000 | 07020-00000 | |
| | 11 | Flange | 1 | | 423-837-1610 | | 424-837-1610 | | | | | Fig. 2 |
| | 12 | Plate | 1 | | 423-837-1620 | | 424-837-1620 | | | | | |
| | 13 | Vent | 1 | | 423-837-1630 | | 424-837-1630 | | | | | |
| | 14 | O-ring | 2 | | 07000-23032 | | 07000-23038 | | | | | |
| | 15 | Bolt | 4 | | 07372-21055 | | 07372-01060 | | | | | |
| 16 | Retainer | 1 | | | | 709-12-11211 | | | 425-V65-1390 | 709-12-11211 | 425-V65-1390 | Fig. 3 |
| II RELATED COMPONENTS | 17 | Bucket Cylinder | | | | | | | | | | |
| | | Part No. | | 707-01-03700 | 707-01-02050 | 707-01-03250 | 707-01-02150 | 707-01-03250 | 707-01-02130 | 707-01-03250 | 707-01-02130 | |
| | | Max. length | mm | | 2069 | | 2120 | | 2226 | | 2226 | |
| | | Min. length | mm | | 1581 | | 1635 | | 1676 | | 1676 | |
| | | Counterweight: C/W | | 423-46-13313 | 423-974-1210 | 423-46-13313 | 424-974-1111 | 421-46-13137 | 421-974-1113 | 421-46-13137 | 421-974-1113 | |
| | C/W weight | kg | | 1620 | | 1750 | | 2150 | | 2150 | | |

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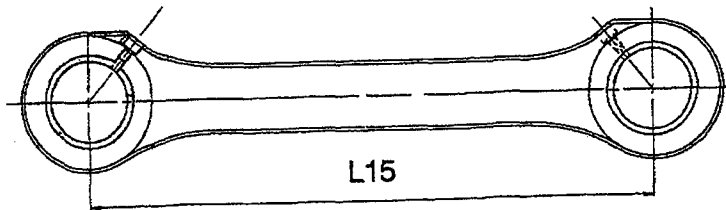
COMPONENT IDENTIFICATION

| | Parts Name | Type Measurement | WA380 | | WA420 | | WA450-2 AND WA470 | | Remarks |
|-----|---------------------------|------------------|-----------|---------|----------|---------|-------------------|---------|---------|
| | | | Std. link | Hi-lift | Std.link | Hi-lift | Std.link | Hi-lift | |
| L7 | Boom Length | mm | 2760 | 3334 | 2785 | 3370 | 2960 | 3550 | |
| L8 | | mm | 1540 | 1519 | 1573 | 1560.5 | 1610 | 1597 | |
| L9 | | mm | 35 | 257 | 27 | 171 | 65 | 214.5 | |
| L10 | | mm | 1790.5 | 2294 | 1815.5 | 2334 | 1905 | 2424 | |
| L11 | | mm | 506 | 595 | 506 | 602 | 552 | 663 | |
| L15 | Length of the bucket link | mm | 671.5 | 780 | 671.5 | 780 | 730 | 840 | |

BOOM



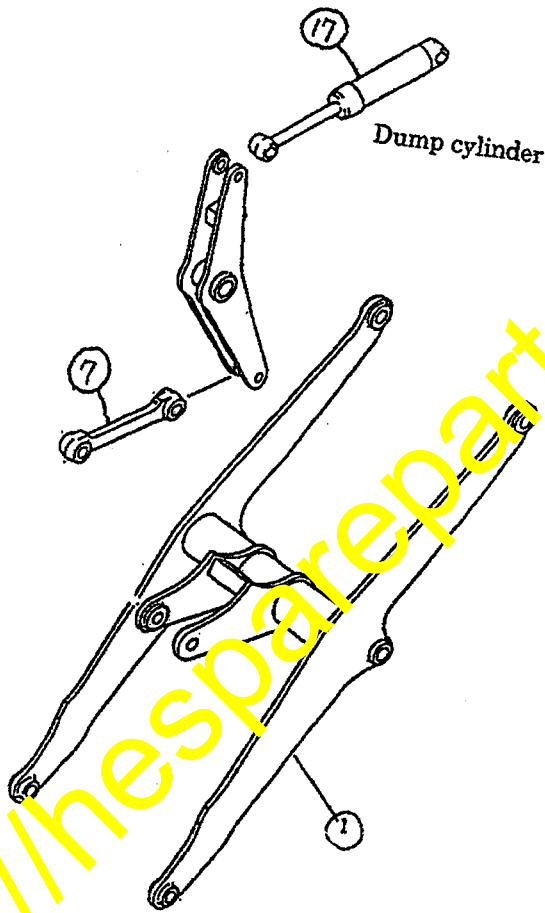
BUCKET LINK



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Link Parts

- ⌒ Boom: Standard Boom → to be replaced with Hi-lift boom
- ⑦ Bucket link: Standard Link → to be replaced with link for Hi-lift boom
- ⑰ Bucket Cylinder: Standard Cylinder → to be replaced with cylinder for Hi-lift boom



CAUTION: DO NOT INSTALL THE INCORRECT PARTS!

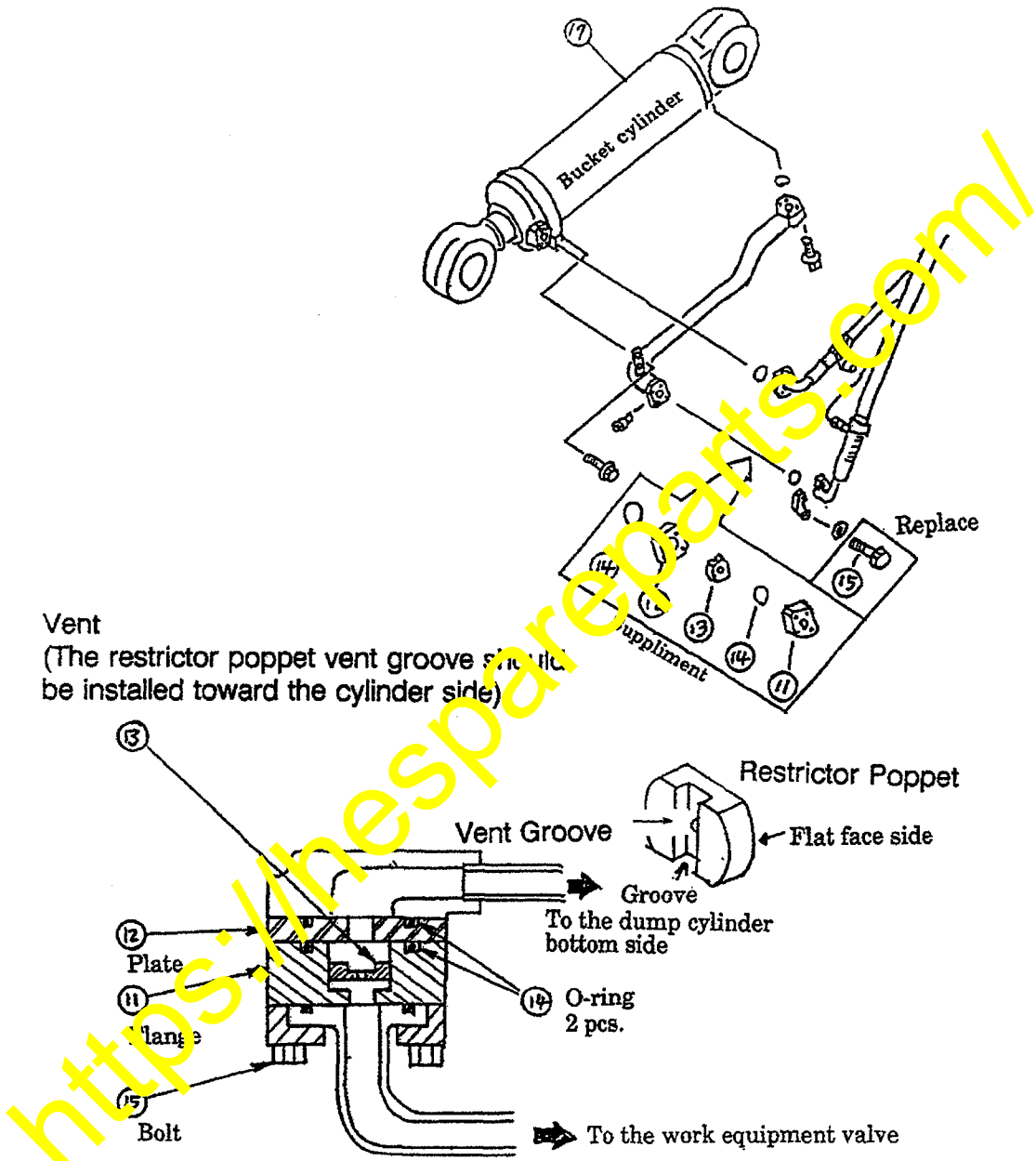
Most importantly, incorrect bucket links must not be installed. Be sure to confirm the link length by measuring.

Since bushings, dust seals, pins, etc. remain the same between the Hi-lift boom and the standard boom, refer to the Parts Catalogs for the standard machines to obtain these items. Refer to the applicable Shop Manual for disassembly and assembly procedures, because the Hi-lift boom is installed in the same manner as the standard boom.

Figure 1

Installing return flow restrictors on WA380 and WA420

Piping, etc. for the standard machine may also be applied as the piping, etc. for the Hi-Lift boom bucket loader. The flow restricting parts ⑪ through ⑭ should be added into the circuit



!! Be careful about the vent direction

Install restrictor poppet with the vent groove on the dump cylinder side and also set the flat face side on the work equipment valve side. If they are mounted in the reverse manner, the effect of the vent will not function.

Fig. 2

Installing the flow restricting parts on WA450-2 and WA470

Remove the valve cover and replace the standard retainer with 425-V65-1390. The standard bucket cylinder piping, etc. can also be utilized onto the Hi-lift boom machine WA450-2 and WA470-1

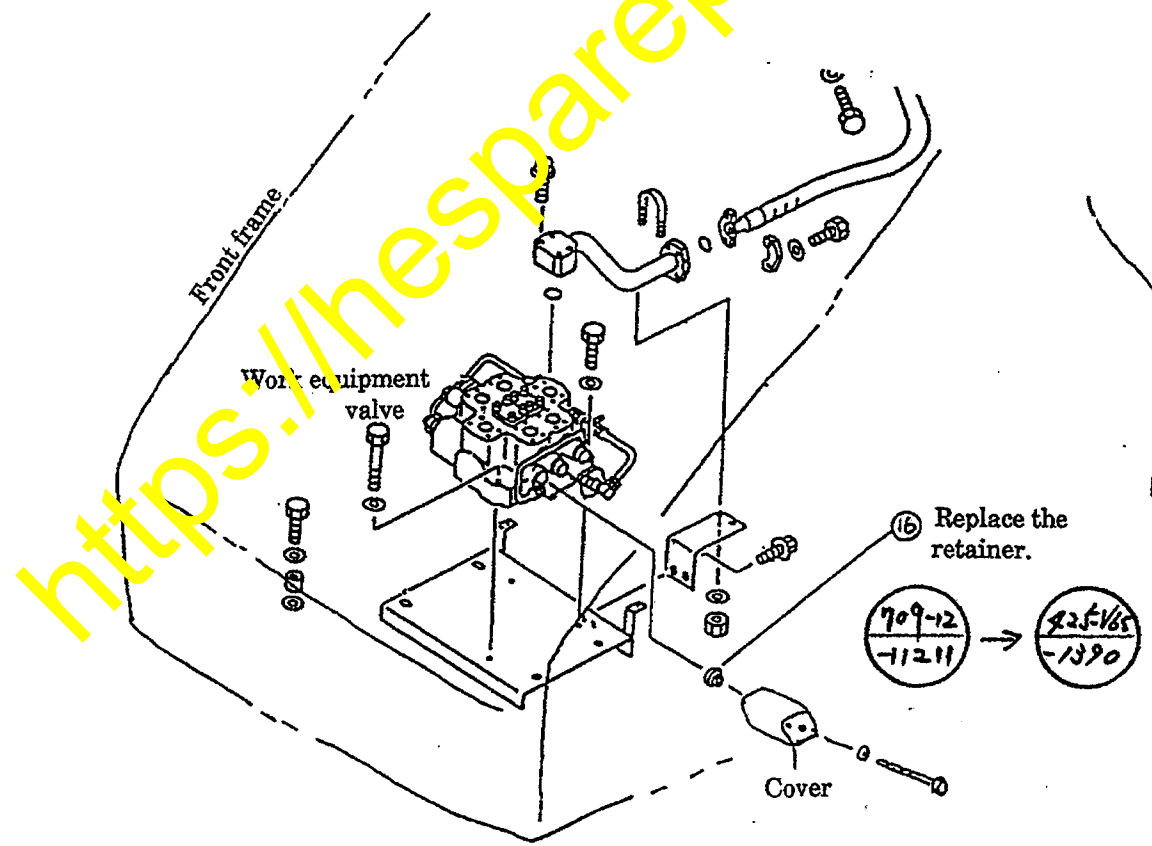
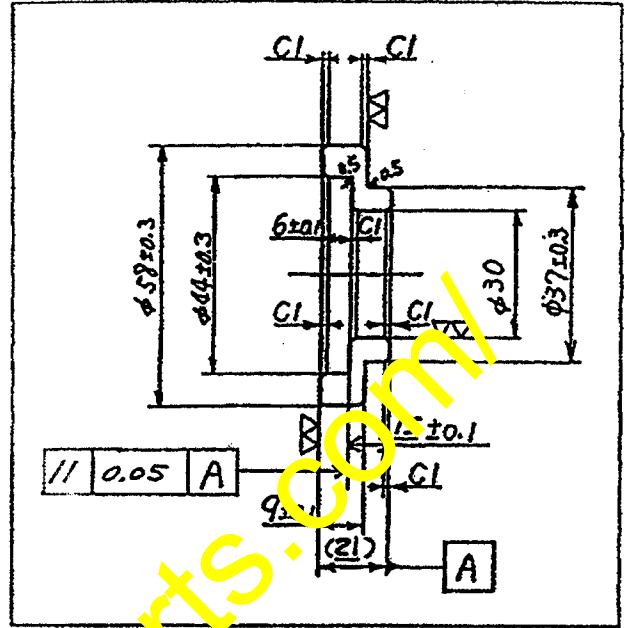
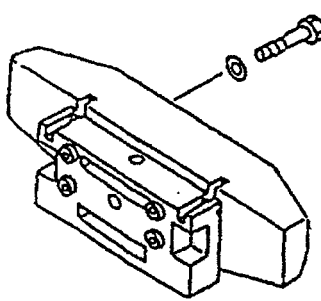
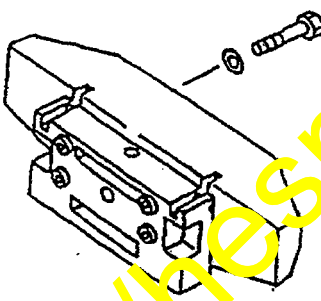
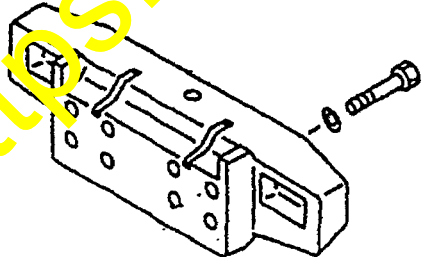


Fig. 3

4. Logging counterweight installation procedure for use with hi-lift boom machines

Remove the standard counterweight and install the replacement parts as indicated below.

| Machine model | Contour | Part No. (Q'ty) | Remarks |
|------------------------|---|---|---|
| WA380 |  | Weight 423-974-1210 (1) Mounting bolt 423-974-1120 (4) | Weight 1600 kg Standard parts may also be used for other parts. |
| WA420 |  | Weight 424-974-1111 (1) Mounting bolt 423-974-1120 (4) | Weight 1750 kg Standard parts may also be used for other parts. |
| WA450-2 AND WA470-1 |  | Weight 421-974-1113 (1) Mounting bolt 418-975-1140 (4) | Weight 2150 kg Standard parts may also be used for other parts. |