

PARTS & SERVICE NEWS

REF NO.	AT03052A
DATE	Apr. 25, 2003

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This PARTS & SERVICE NEWS supersedes the previous issue No. AT03052 dated Mar. 20, 2003 which should be discarded.

SUBJECT: MODIFICATION PROCEDURE TO PREVENT CRACK IN REAR FRAME ON HM400-1

PURPOSE: To introduce modification procedure to prevent occurrence of cracks in the rear frame on HM400-1 articulated dump trucks

APPLICATION: HM400-1 Articulated Dump Trucks, Serial Nos. 1001 thru 1076

FAILURE CODE: 4700HA


DESCRIPTION:

1-1. Introduction

On the HM400-1 articulated dump trucks, there is a possibility of occurrence of cracks in the rear frame and the equalizer bar.


Therefore, make the modification being introduced in this Service News to prevent occurrence of the aforementioned cracks.

1-2. Revised places:

16 places 	Apr. 25, 2003	Detail drawing for the welding bead shape has been added.
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2. List of parts

Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-99-11970	Plate	} Addition	1	
56B-99-11980	Plate		1	
56B-99-11980	Plate		2	
56B-99-11991	Plate		2	
56B-99-119810	Plate		2	
56B-99-119821	Plate		2	
56B-99-119831	Plate		2	
56B-99-11910	Plate		2	
56B-99-11920	Plate		2	
56B-99-11930	Plate		2	
56B-99-11940	Plate		2	
56B-99-11950	Plate		2	

Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-99-11960	Plate	}	2	
56B-99-19910	Plate		2	
56B-99-19921	Plate		2	
56B-99-19931	Plate		1	
56B-99-19941	Plate		1	
56B-99-12140	Plate		2	
56B-99-12150	Plate		1	
56B-99-12160	Plate		1	
56B-99-12170	Plate		1	
56B-99-12180	Plate		1	
56B-99-12190	Plate		2	
56B-99-12210	Plate		1	
56B-99-12220	Plate		1	
56B-99-12230	Plate		2	
56B-99-12240	Plate		8	
01571-01016	Seat		3	
56B-99-19950 (56B-61-12291)	Bracket (Bracket)	}	1 (1)	
56B-99-19960 (56B-61-12531)	Bracket (Bracket)		1 (1)	
 09162-C0881	Plate	Addition	1	Without caption

3. Details of the modification

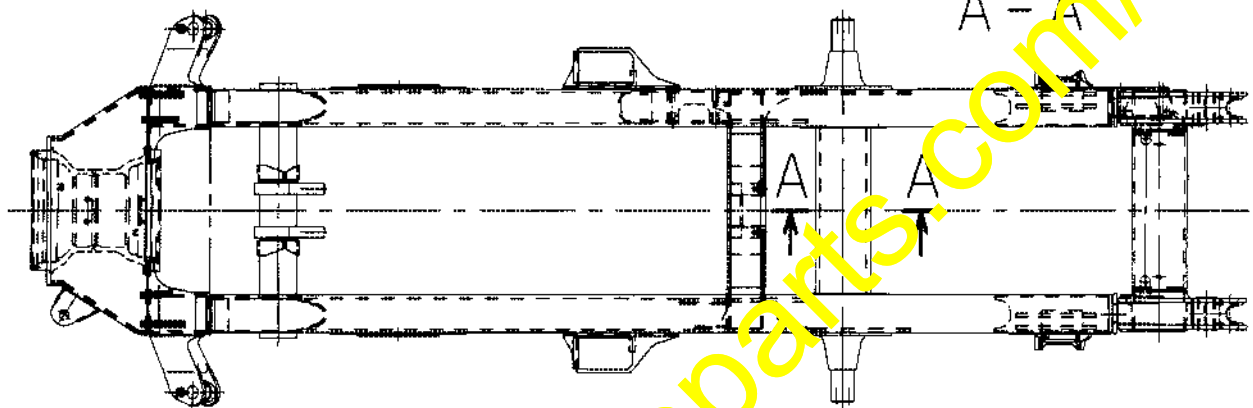
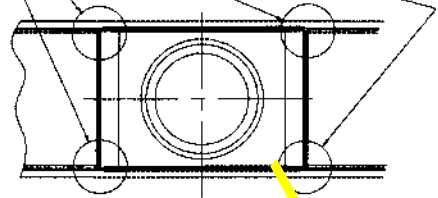
3-1) The following modification is made by welding for reinforcement of the frame and the equalizer bar.

5. Reinforcement of the welded joint section of the cross member by adding weld beads (Refer to Section 5-5.)



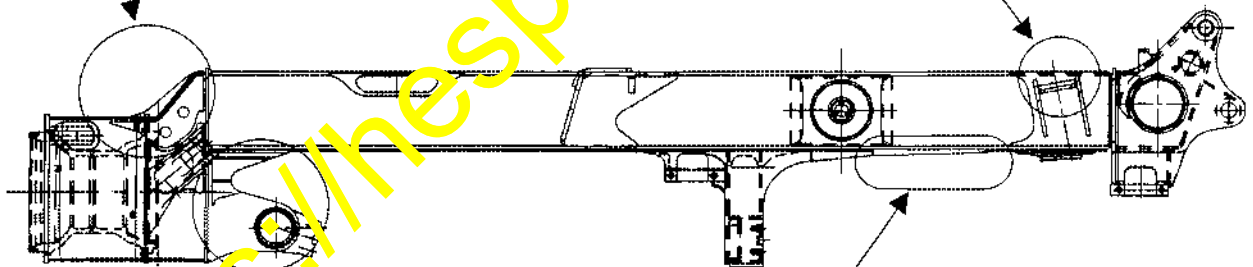
Precautions when carrying out the welding work

1. The welding rod to be used: Low oxygen type welding rod for high tensile steel applications of the 490 KN/mm² grade
2. Regarding the welding bead
 - Undercut and overlap should not occur with the welding bead.
 - Sections where overlap is occurring should be removed by use of a grinder.



1. Reinforcement of the hitch bracket (Refer to section 5-1.)

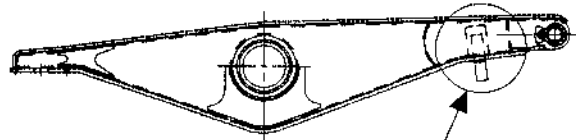
4. Reinforcement of the equalizer stopper bracket (Refer to Section 5-4.)



3. Addition of plate to the welding end section of the bracket for the rear shaft A arm (Refer to Section 5-3.)

2. Reinforcement of the bracket for the center shaft A arm (Refer to Section 5-2.)

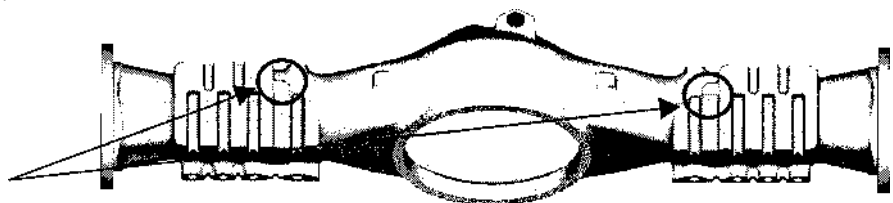
4. Reinforcement of the equalizer bar (Refer to Section 5-6.)



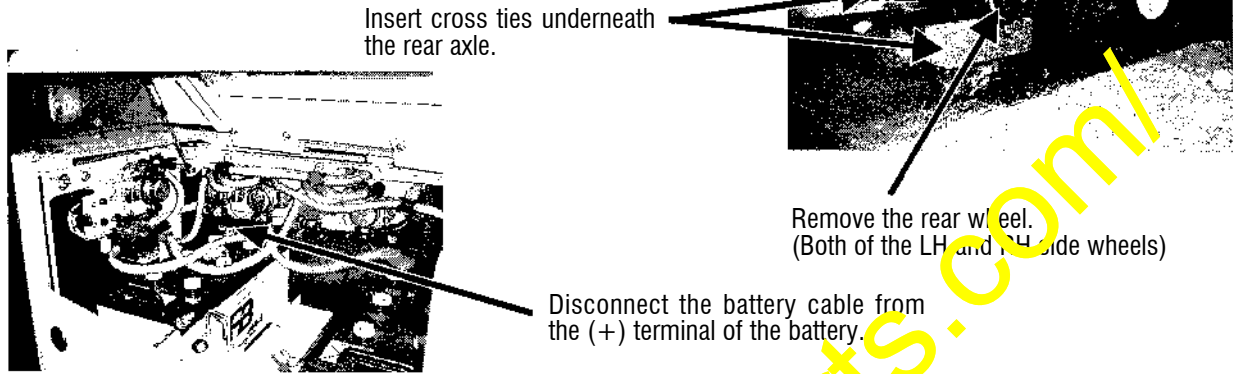
3-2) Grinding off the rear shaft axle housing

The cast seat is removed by grinding to secure space between the axle housing and the rear frame side stopper.

The above processing is made at 1 place each on the LH and RH sides. (Refer to Section 5-8.)



4. Preparations before starting the modification work
 - 1) Wash the modifying sections to remove mud and sand sufficiently.
 - 2) Raise the dump body and insert the safety pins.
 - 3) Park the vehicle on a flat place and stop the engine. Apply chocks to the front wheels and remove the rear wheels.
 - 4) For protection of the electronic equipment and devices, disconnect the battery cable from the (+) terminal of the battery.



- 5) Install protection materials over the hoist cylinder, hoses and harnesses.

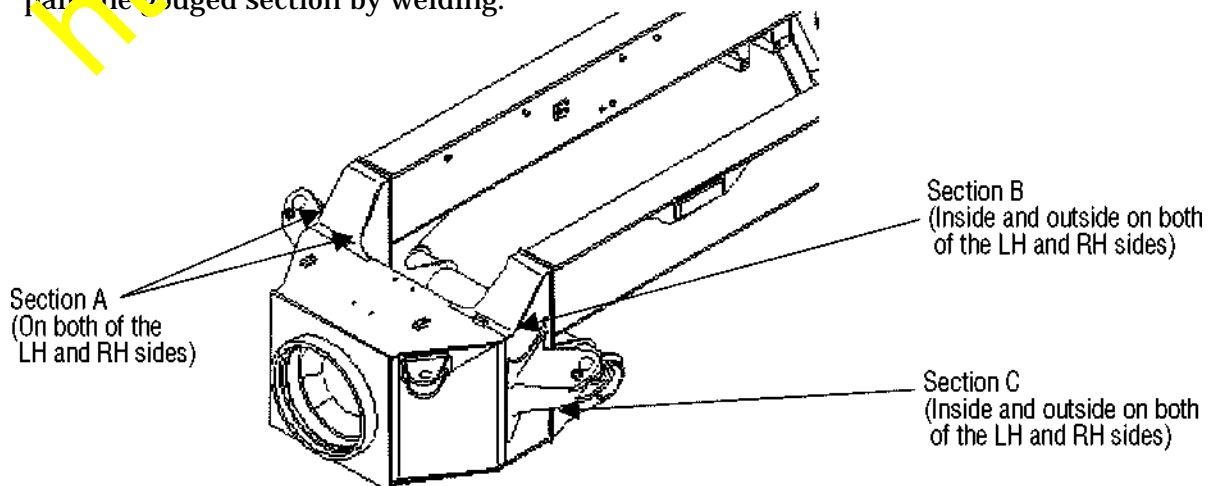


Example 1) Protection material for the hoist cylinder



Example 2) Protection materials for the hoses and harnesses

- 6) Check if cracks are not occurring
After sufficiently washing the sections A, B, and C of the rear frame, make color checks to check if cracks are occurring or not.
When cracks are occurring, remove the cracked section by gouging and, after that, repair the gouged section by welding.

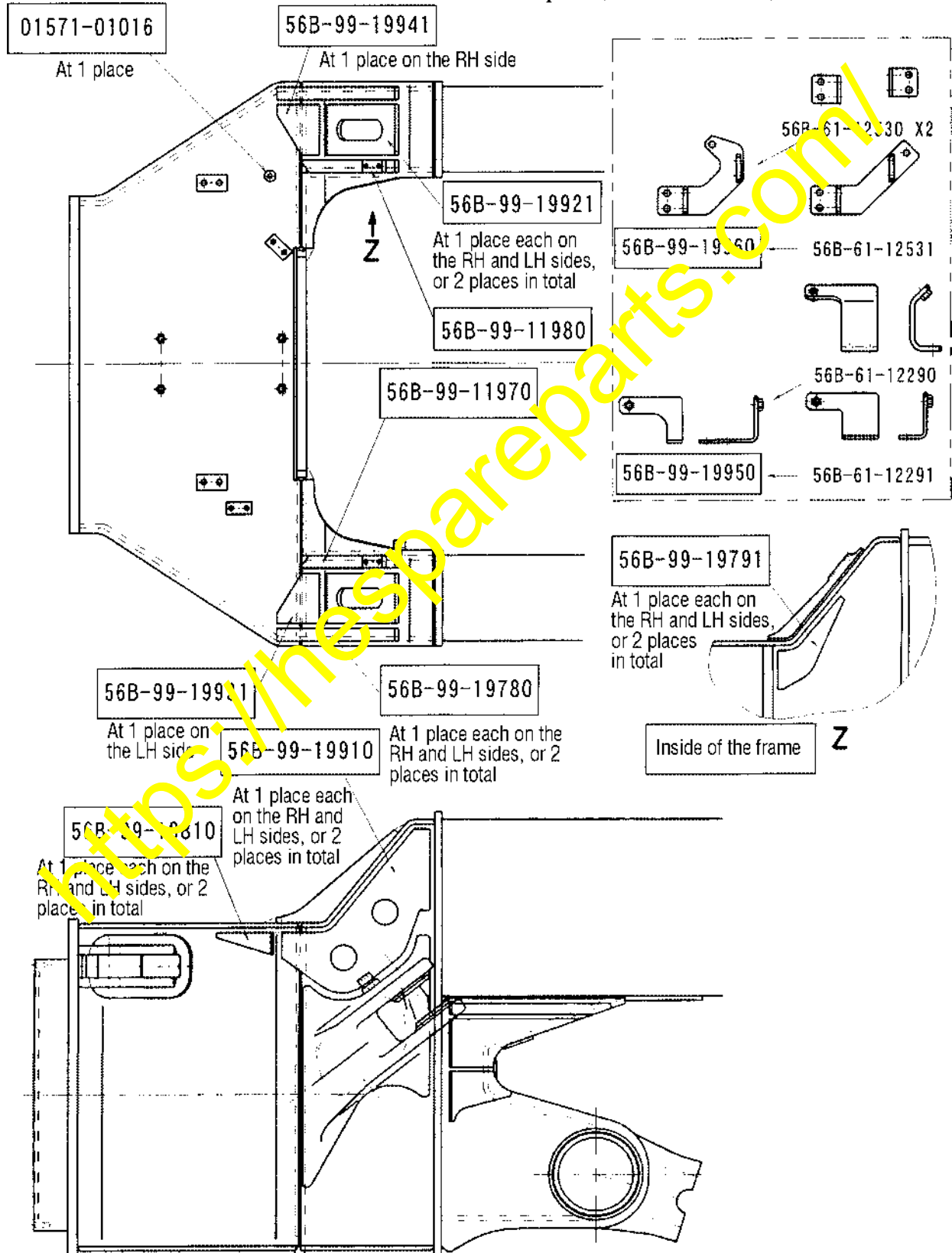


5. Modification procedure

5-1) Reinforcement of the hitch bracket

1. Weld the reinforcement plate (14 sheets in total).
2. Weld the seat (01571-01016).
3. Replace the bracket for the hydraulic piping clamp.

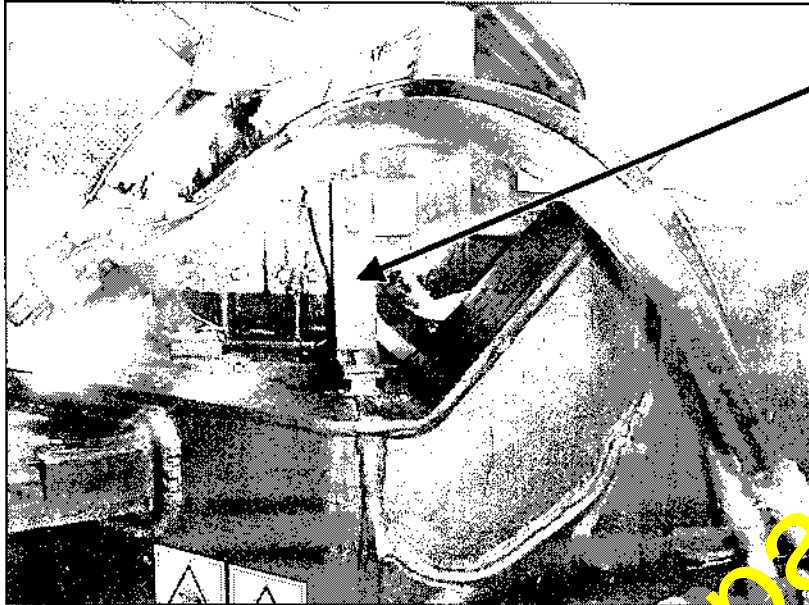
56B-99-19960	1 pc. ←	56B-61-12530	2 pcs. (#1001 thru #1019)
		56B-61-12531	1 pc. (#1020 and after)
56B-99-19950	1 pc. ←	56B-61-12290	1 pc. (#1001 thru #1019)
		56B-61-12291	1 pc. (#1020 and after)



5-1-1. Removal of the bracket for the hydraulic piping clamp

Remove the bracket for the hydraulic piping clamp and move the positions of the pipings and hoses to places where they may not hinder the welding work.

LH side (#1001 thru 1019)



Remove the bracket.

56B-61-12191 (BRACKET)
01010-81025 (2) (BOLT)
01643-31035 (2) (WASHER)



After finishing the welding work, restore the bracket back to its original position. (Reuse the current parts.)

56B-61-12191 (BRACKET)
01010-81025 (2) (BOLT)
01643-31035 (2) (WASHER)

LH side (#1020 and after)



Remove the bracket.

56B-88-12511 (BRACKET)
01435-01020 (2) (BOLT)

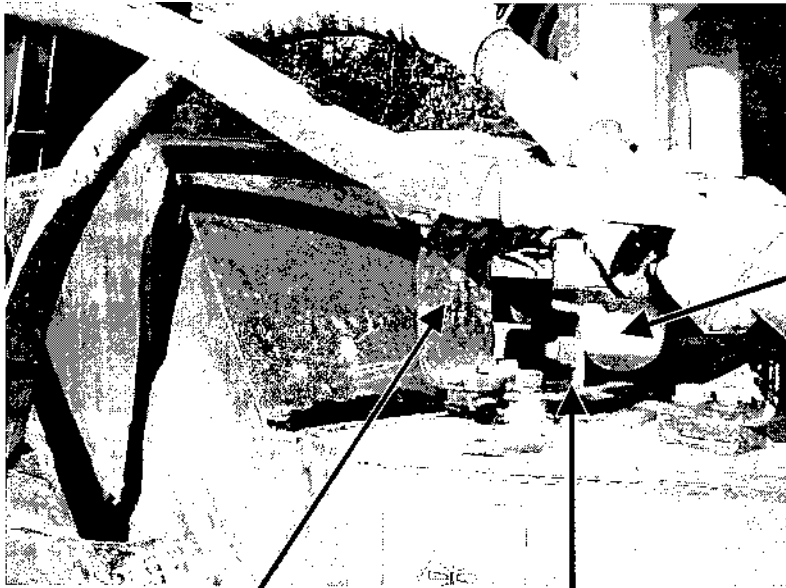


After finishing the welding work, restore the bracket back to its original position. (Reuse the current parts.)

56B-88-12511 (BRACKET)
01435-01020 (2) (BOLT)

Remove the hoist cylinder circuit clamp and move the position of the piping to a place where it may not hinder the welding work.

RH side (#1001 thru 1019)



Remove the brake cooling piping clamp and move the position of the tube to a place where it may not hinder the welding work.

Remove the bracket.

56B-88-12290 (BRACKET)
01435-01020 (2) (BOLT)



After finishing the welding work, restore the bracket back to its original position. (Replace the bracket.)

56B-99-19950 (BRACKET)
01435-01020 (2) (BOLT)

Remove the bracket.



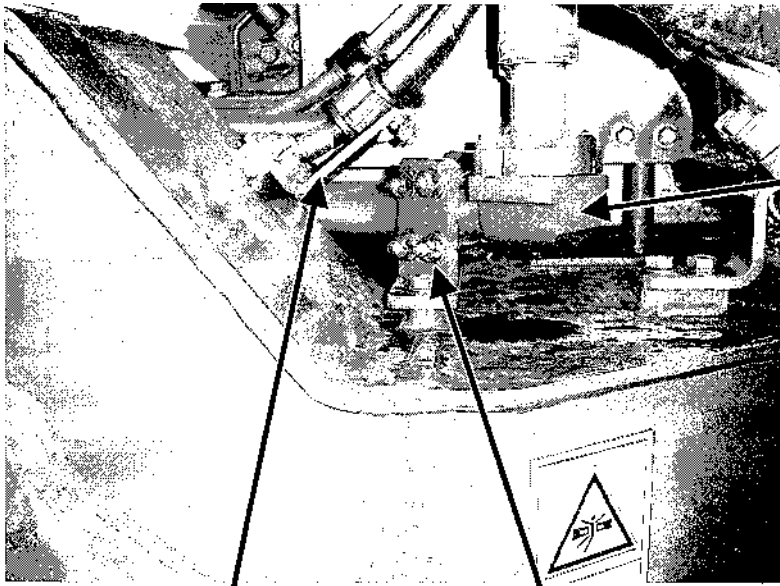
After finishing the welding work, restore the bracket back to its original position. (Replace the bracket.)

56B-61-12530 (2) (BRACKET)
01010-81025 (4) (BOLT)
01643-31032 (8) (WASHER)
07283-33442 (2) (CLIP)
01597-01009 (4) (NUT)

56B-61-12531 (BRACKET)
01010-81025 (3) (BOLT)
01643-31032 (7) (WASHER)
07283-33442 (2) (CLIP)
01597-01009 (4) (NUT)

<https://hespartsparts.com/>

RH side (#1020 and after)



Remove the brake cooling piping clamp and move the position of the tube to a place where it may not hinder the welding work.

Remove the bracket.

56B-88-12290 (BRACKET)
01435-01020 (2) (BOLT)



After finishing the welding work, restore the bracket back to its original position. (Replace the bracket.)

56B-99-19950 (BRACKET)
01435-01020 (2) (BOLT)

Remove the bracket.



After finishing the welding work, restore the bracket back to its original position. (Replace the bracket.)

56B-6-12531 (BRACKET)
01010-81025 (3) (BOLT)
01643-31032 (7) (WASHER)
07283-33442 (2) (CLIP)
01597-01009 (4) (NUT)

56B-99-19960 (BRACKET)
01010-81025 (3) (BOLT)
01643-31032 (7) (WASHER)
07283-33442 (2) (CLIP)
01597-01009 (4) (NUT)

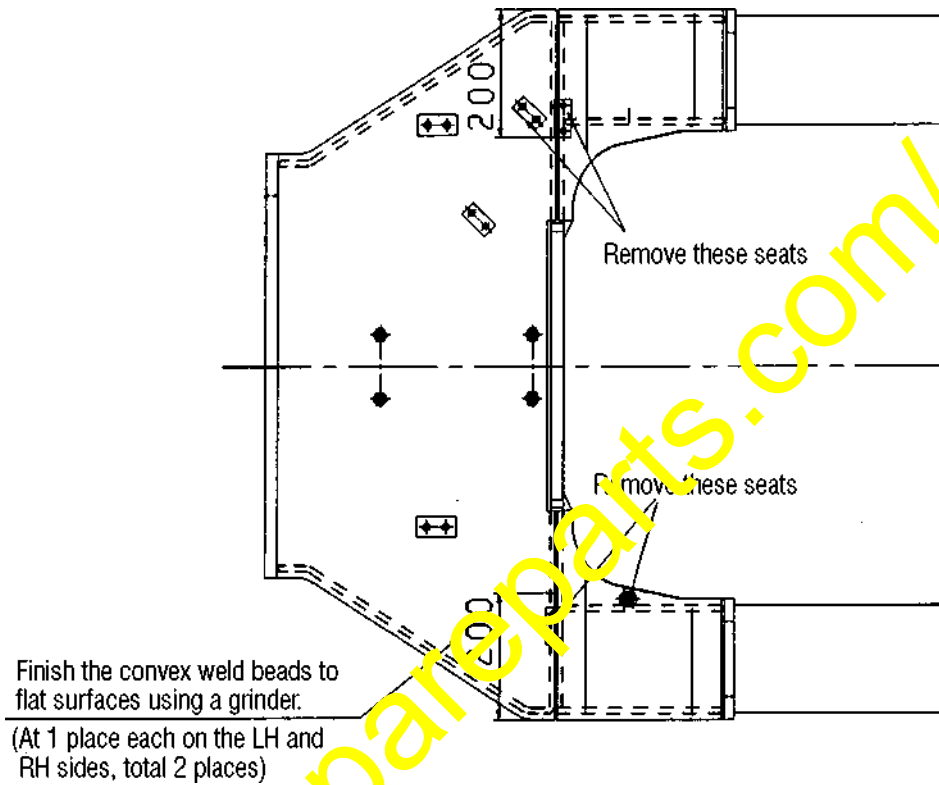
<https://thespareparts.com/>

5-1-2. Removing the seats

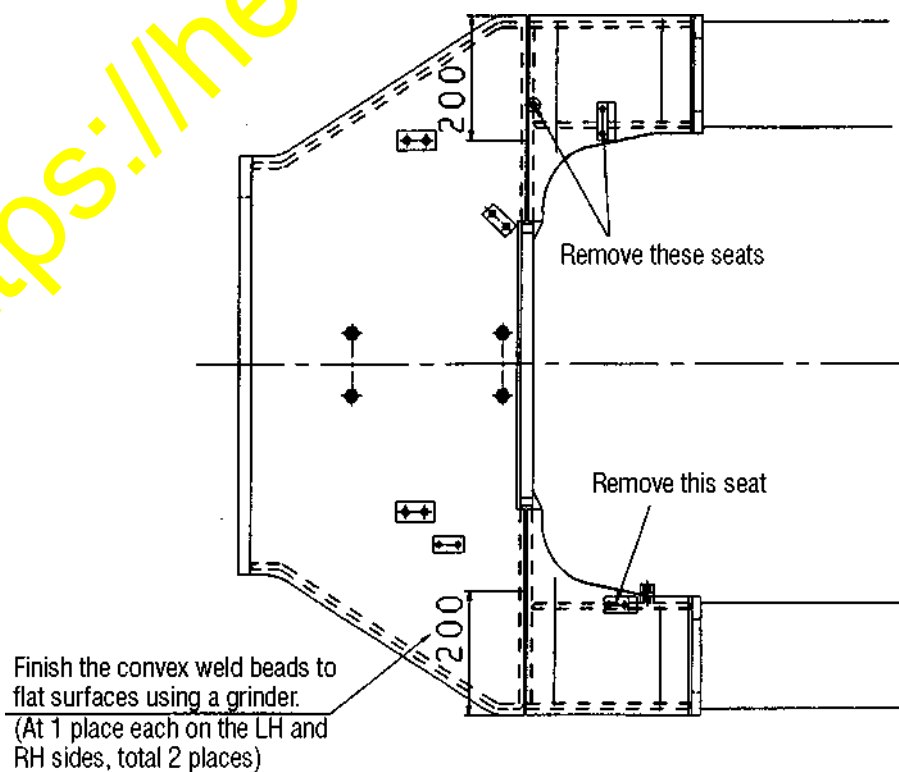
Remove those seats which exist at the positions where the reinforcement plates are to be installed.

Also, finish the existing weld beads to flat surfaces using a grinder.

On the upper surface of the rear frame (#1001 thru #1019)

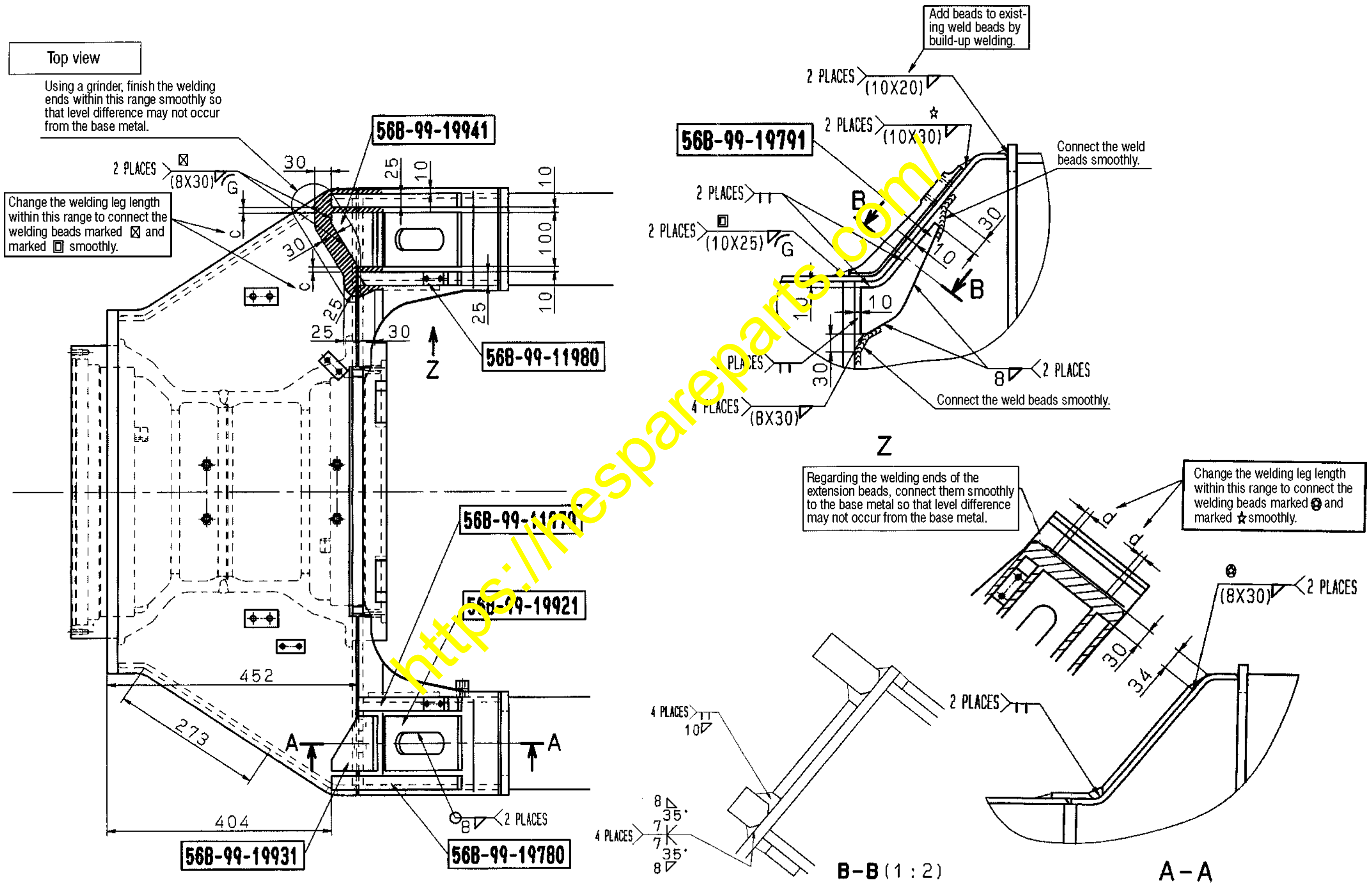


On the upper surface of the rear frame (#1020 and after)



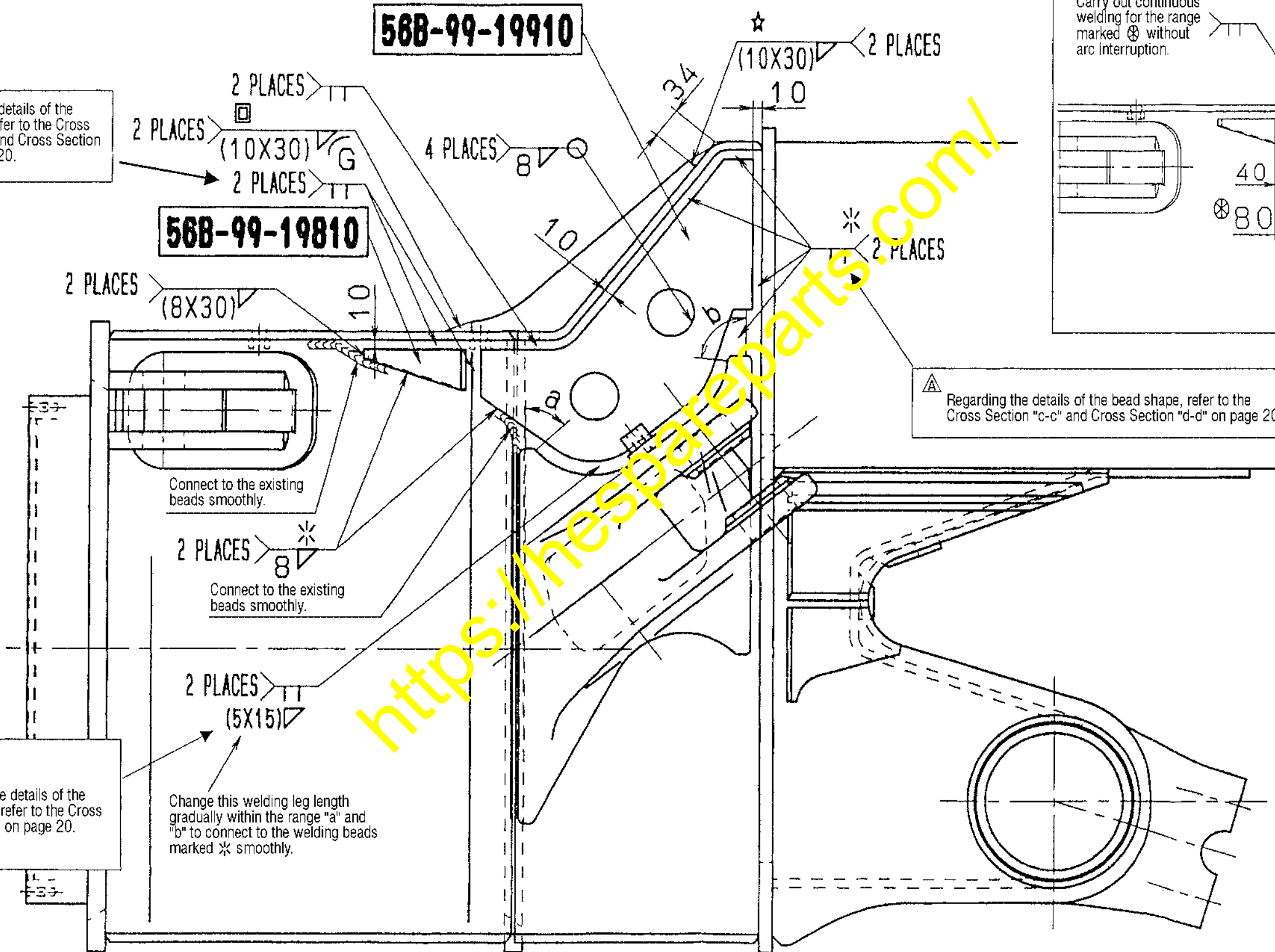
5-1-3. Welding the reinforcement plates

Weld the reinforcement plates (14 sheets) as per the instructions given in the drawing below.



LH side view

Regarding the details of the bead shape, refer to the Cross Section "a-a" and Cross Section "b-b" on page 20.



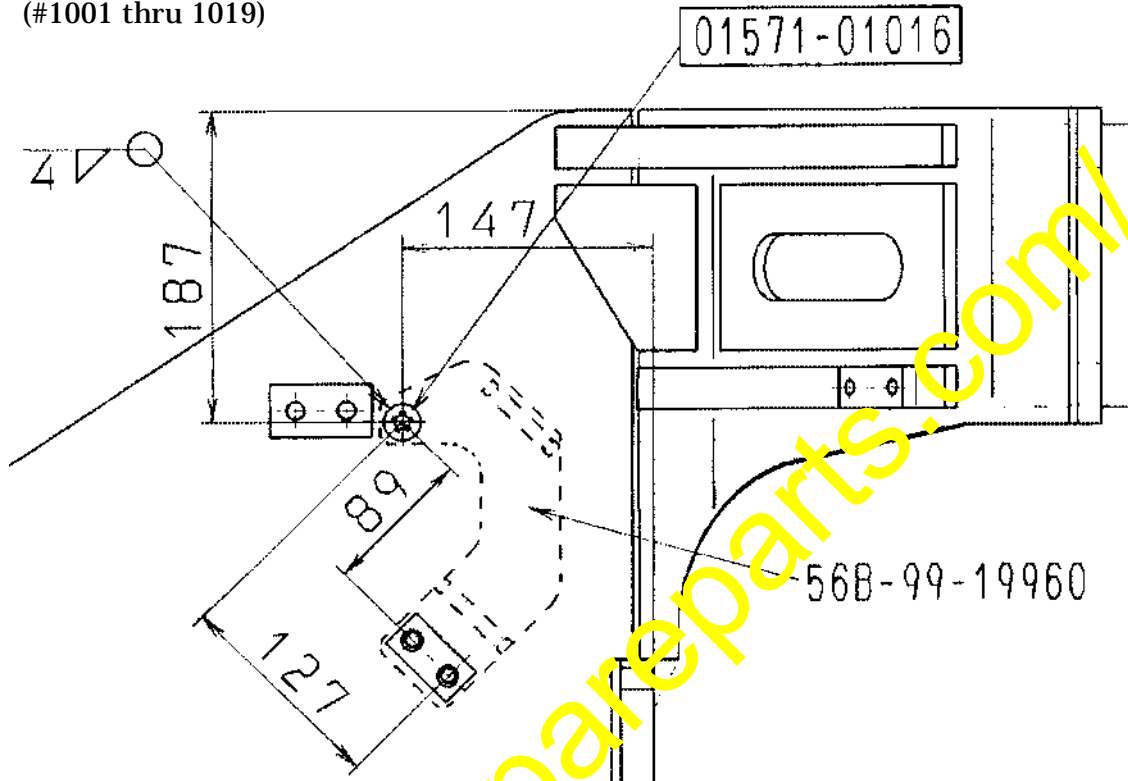
Regarding the details of the bead shape, refer to the Cross Section "e-e" on page 20.

5-1-4. Welding the seats

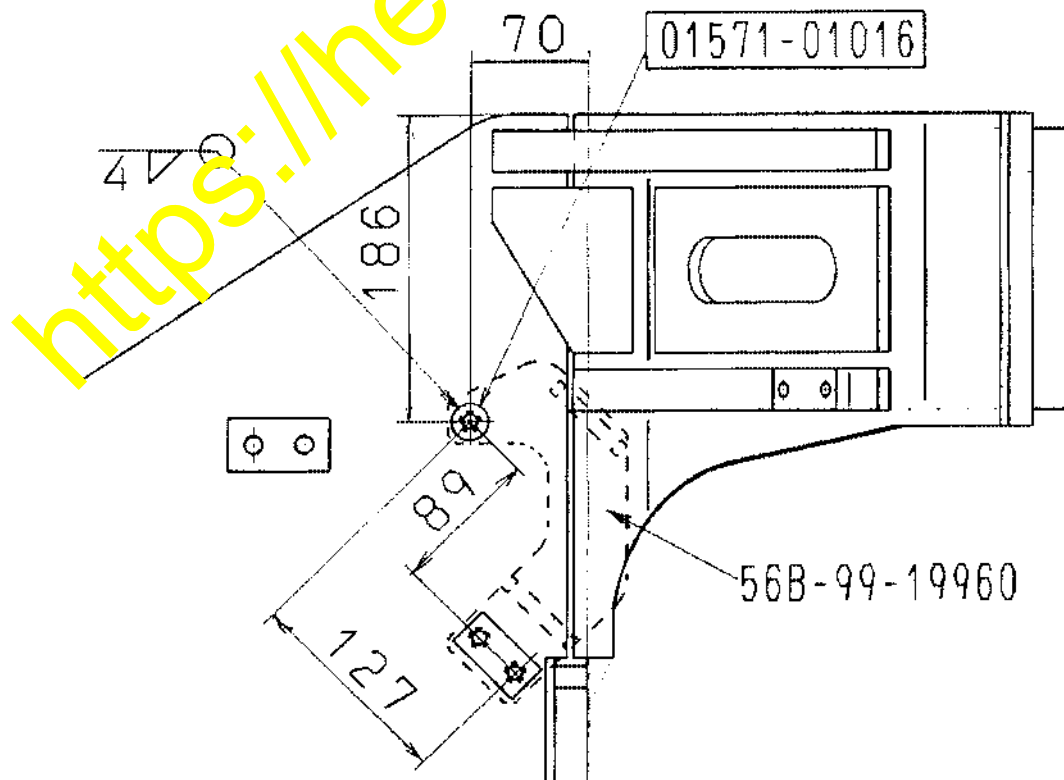
- 1) Weld 1 piece of seat (01571-01016) for installation of the bracket (56B-99-19960) for the brake cooling piping clamp.

Regarding the welding position, try to match the welding position to the position of the hole in the bracket (56B-99-19960).

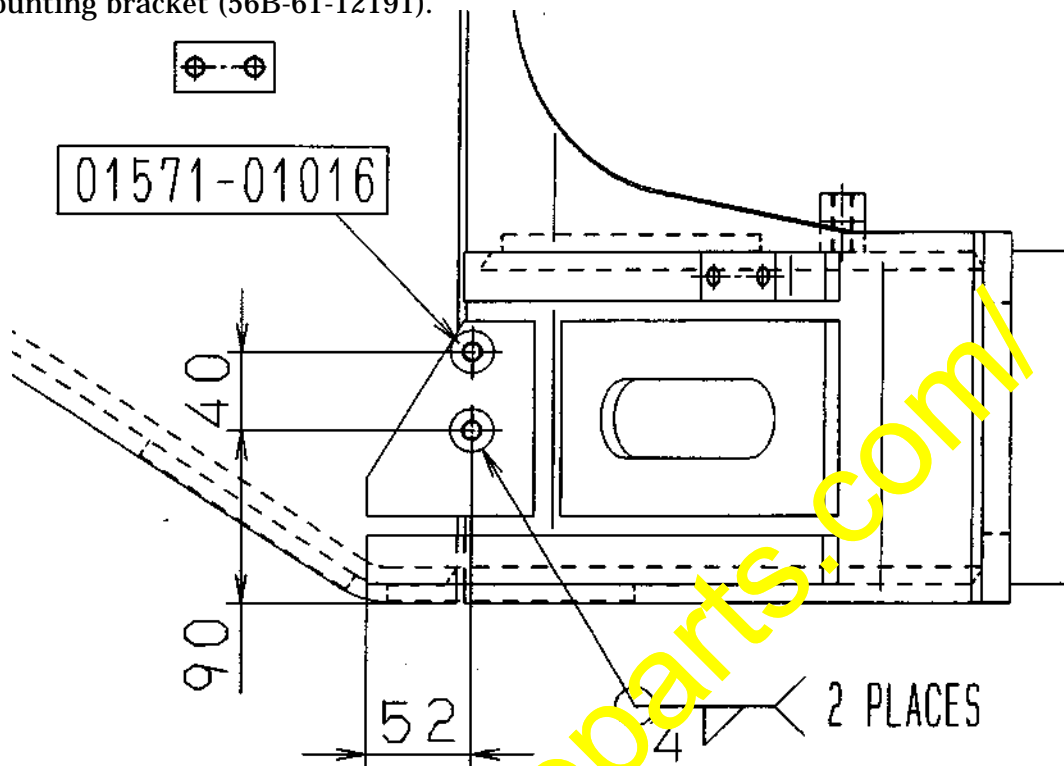
(#1001 thru 1019)



(#1020 and after)



- 2) In case of vehicles with the serial numbers of #1001 thru #1019 only
 Weld 2 pieces of the seats (01571-01016) to install the differential lock hose clamp mounting bracket (56B-61-12191).



5-1-5. Restoration of the hydraulic piping clamp mounting brackets

After finishing the welding work, restore the hydraulic pipings which have been moved away in preparation for the welding work back to their original positions and reinstall the removed hydraulic piping clamp mounting brackets back to their original places. However, as indicated in Section 5-1, replace the hydraulic piping clamp mounting brackets on the LHS side of the vehicle body as follows.

Hardwares (such as bolts) must be reused.

- | | | | | |
|--------------|-------|---|--------------|---------------------------|
| 56B-99-19960 | 1 pc. | ← | 56B-61-12530 | 2 pcs. (#1001 thru #1019) |
| | | | 56B-61-12531 | 1 pc. (#1020 and after) |
| 56B-99-19950 | 1 pc. | ← | 56B-61-12290 | 1 pc. (#1001 thru #1019) |
| | | | 56B-61-12291 | 1 pc. (#1020 and after) |

On vehicles of all the serial numbers

- | |
|--------------------------|
| 56B-99-19960 (BRACKET) |
| 01010-81025 (3) (BOLT) |
| 01643-31032 (3) (WASHER) |

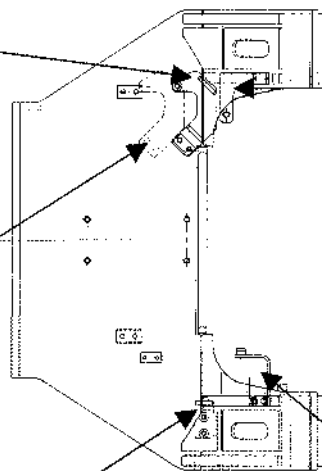
On vehicles of all the serial numbers

- | |
|------------------------|
| 56B-99-19950 (BRACKET) |
| 01435-01020 (2) (BOLT) |

Position to install the bracket 56B-99-19960 in case of vehicles with the serial numbers of #1001 thru #1019

(# 1001 thru 1019)

- | |
|--------------------------|
| 56B-61-12191 (BRACKET) |
| 01010-81025 (2) (BOLT) |
| 01643-31035 (2) (WASHER) |

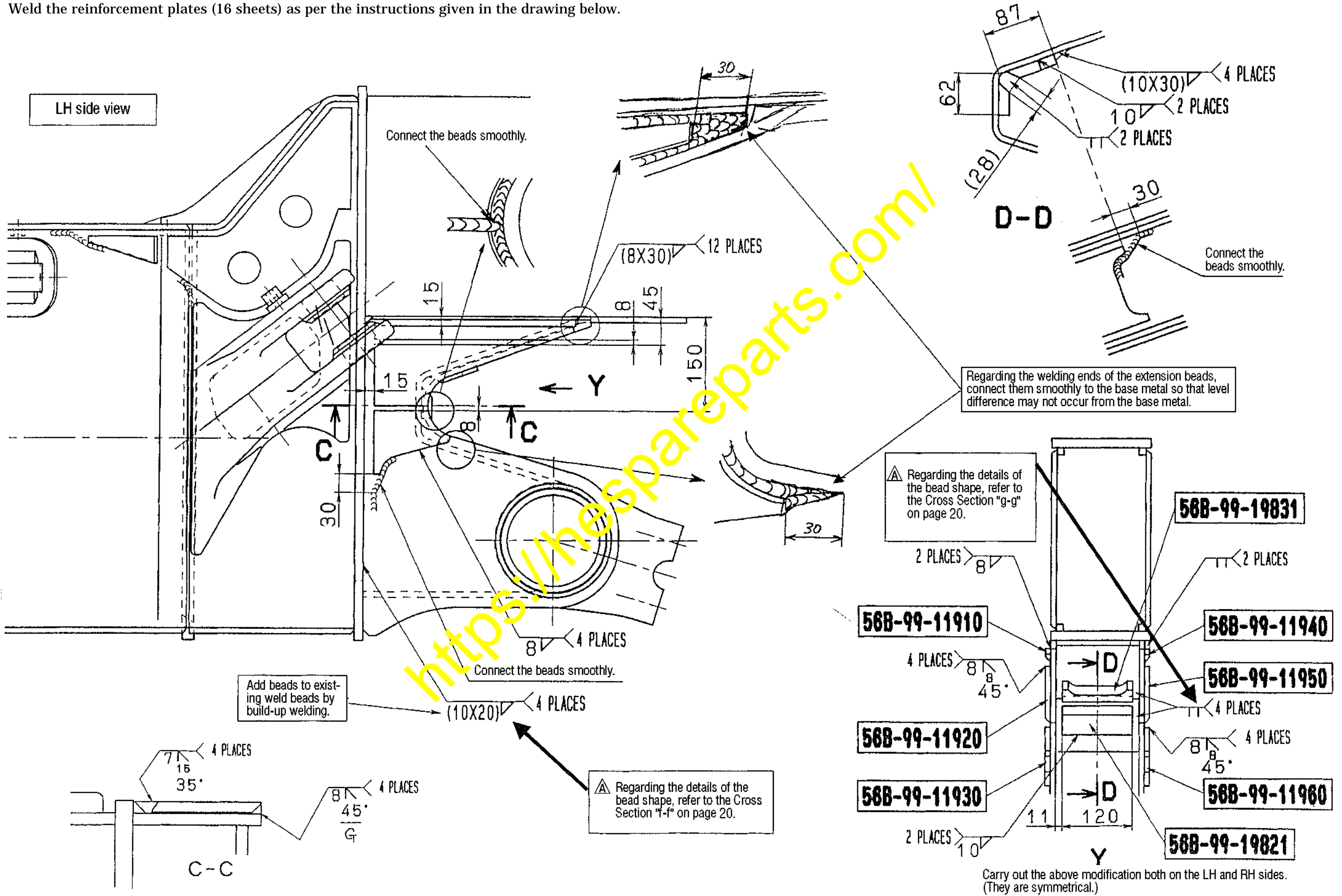


(#1020~)

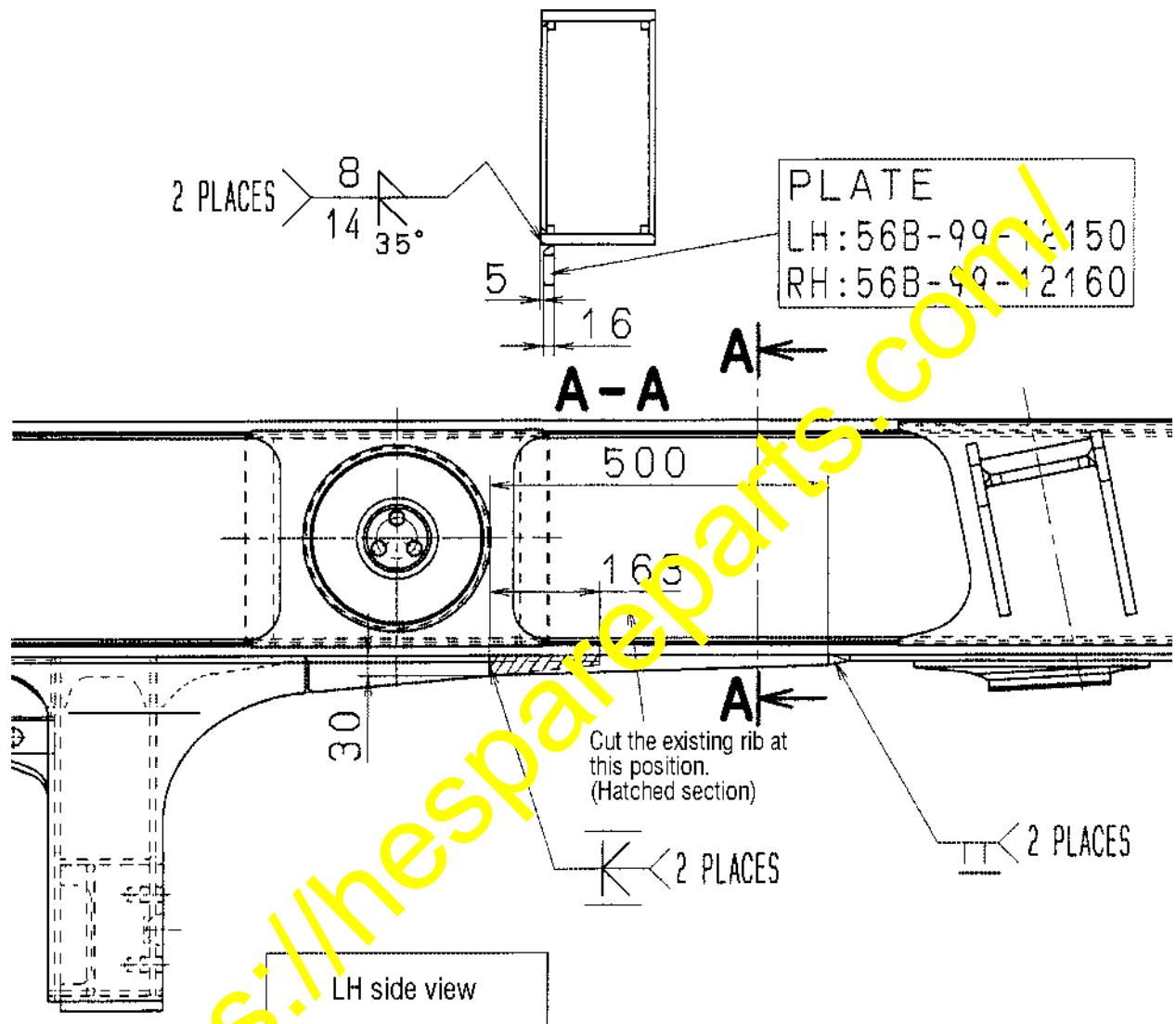
- | |
|------------------------|
| 56B-88-12511 (BRACKET) |
| 01435-01020 (2) (BOLT) |

5-2) Reinforcement of the bracket for the center shaft A arm

Weld the reinforcement plates (16 sheets) as per the instructions given in the drawing below.



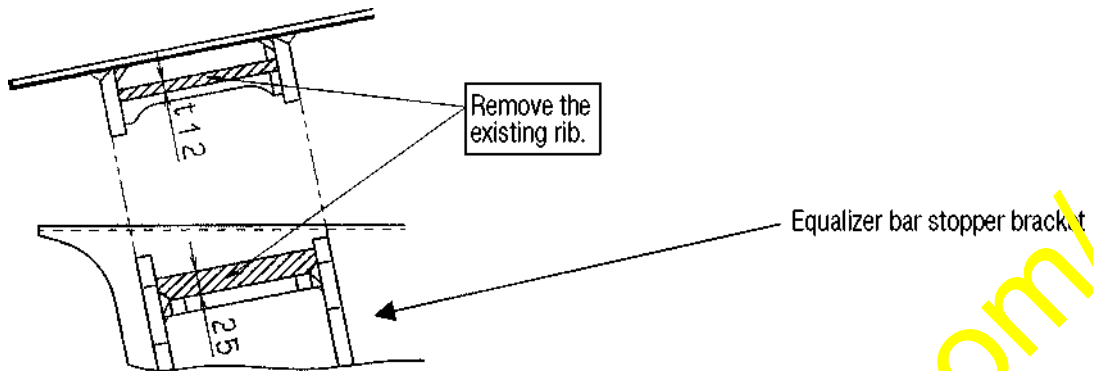
- 5-3) Addition of the plate to the welding end section of the bracket for the rear shaft A arm
Weld the plate to ease stress concentration at the welding end section (1 sheet each on the LH and RH sides).



5-4) Reinforcement of the equalizer bar stopper bracket

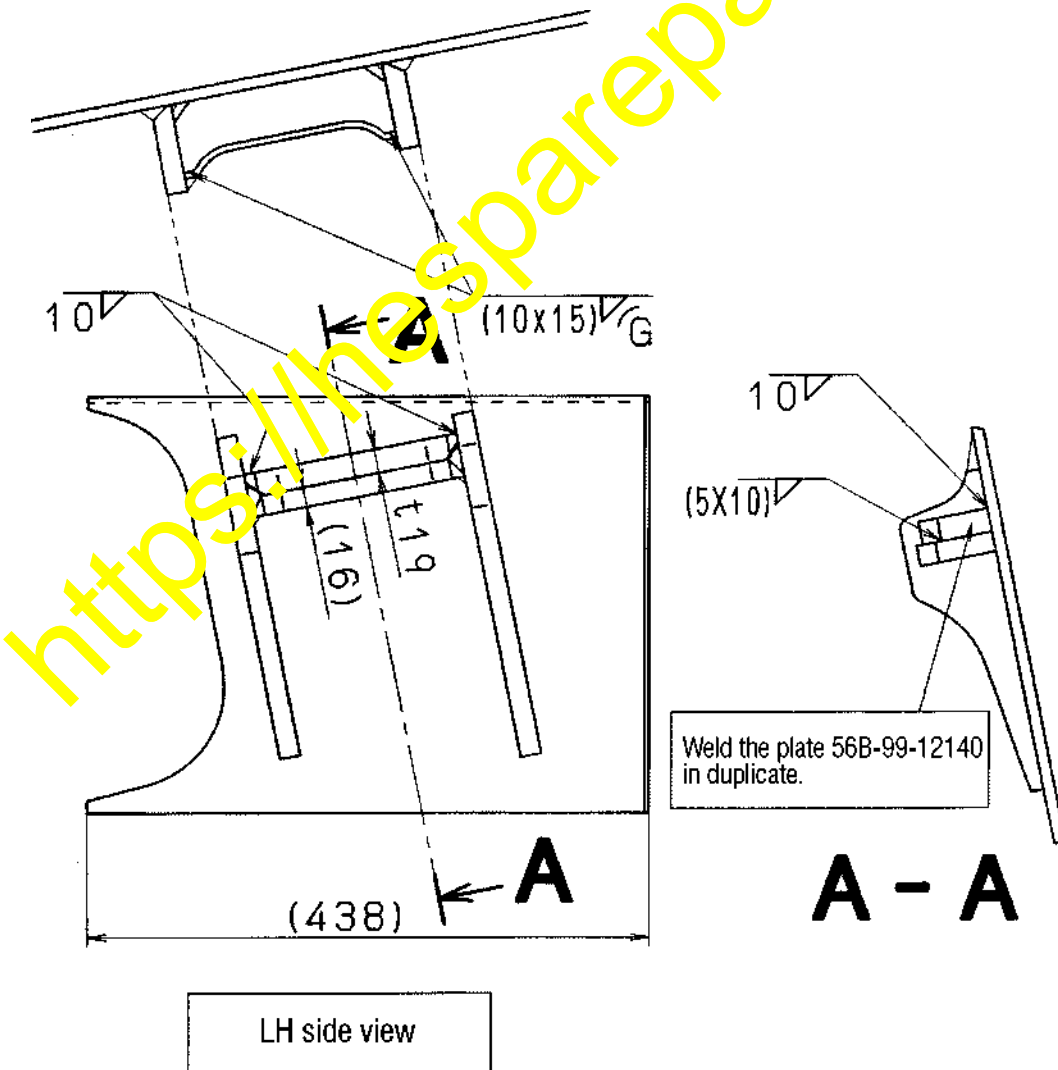
Reinforce the bracket by welding a t 19 plate (1 sheet each on the LH and RH sides).

5-4-1. Removal of the existing rib



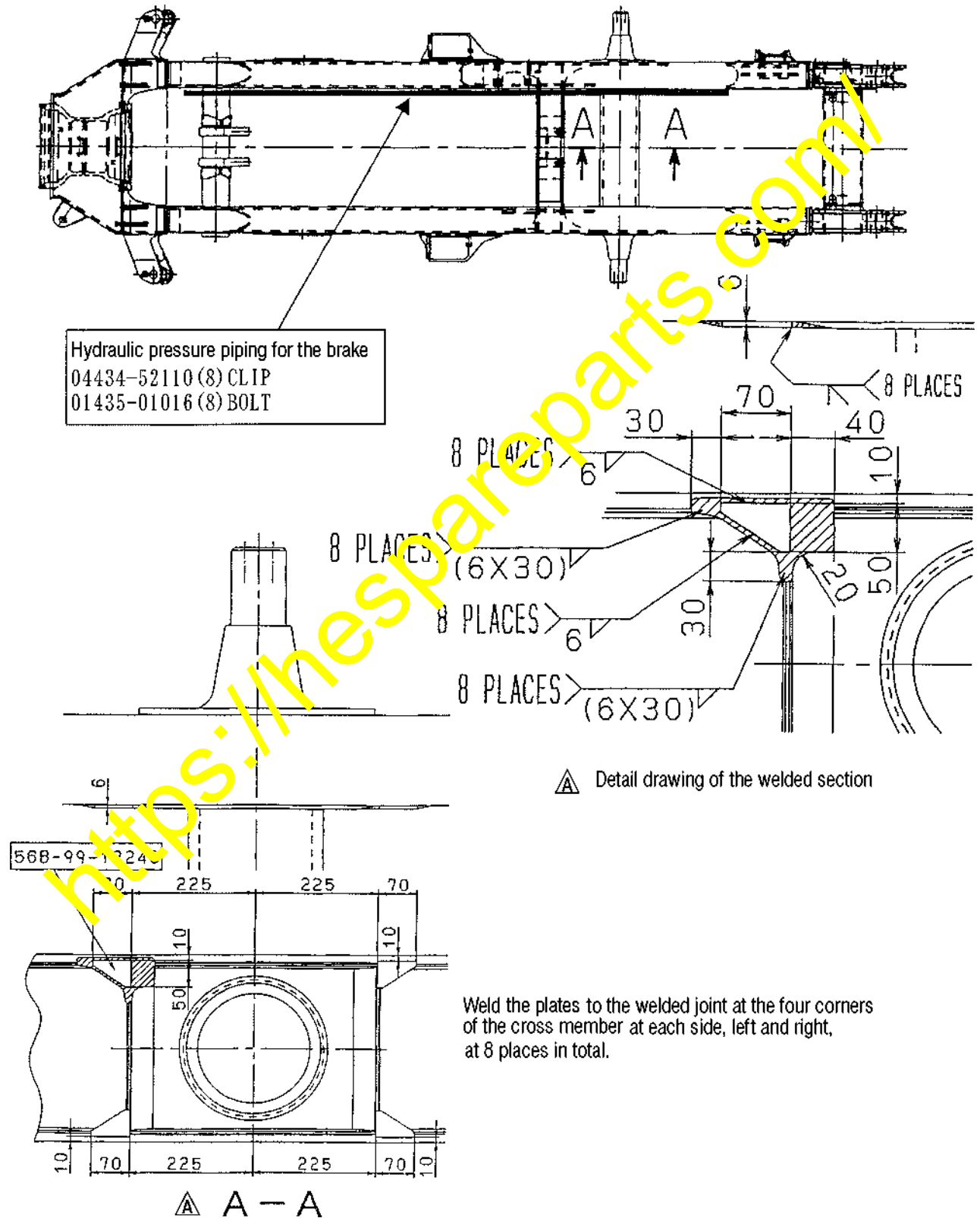
5-4-2. Welding the reinforcement plate

Weld the reinforcement plate (56B-99-12140).
(A t 19 plate, both on the LH and RH sides)



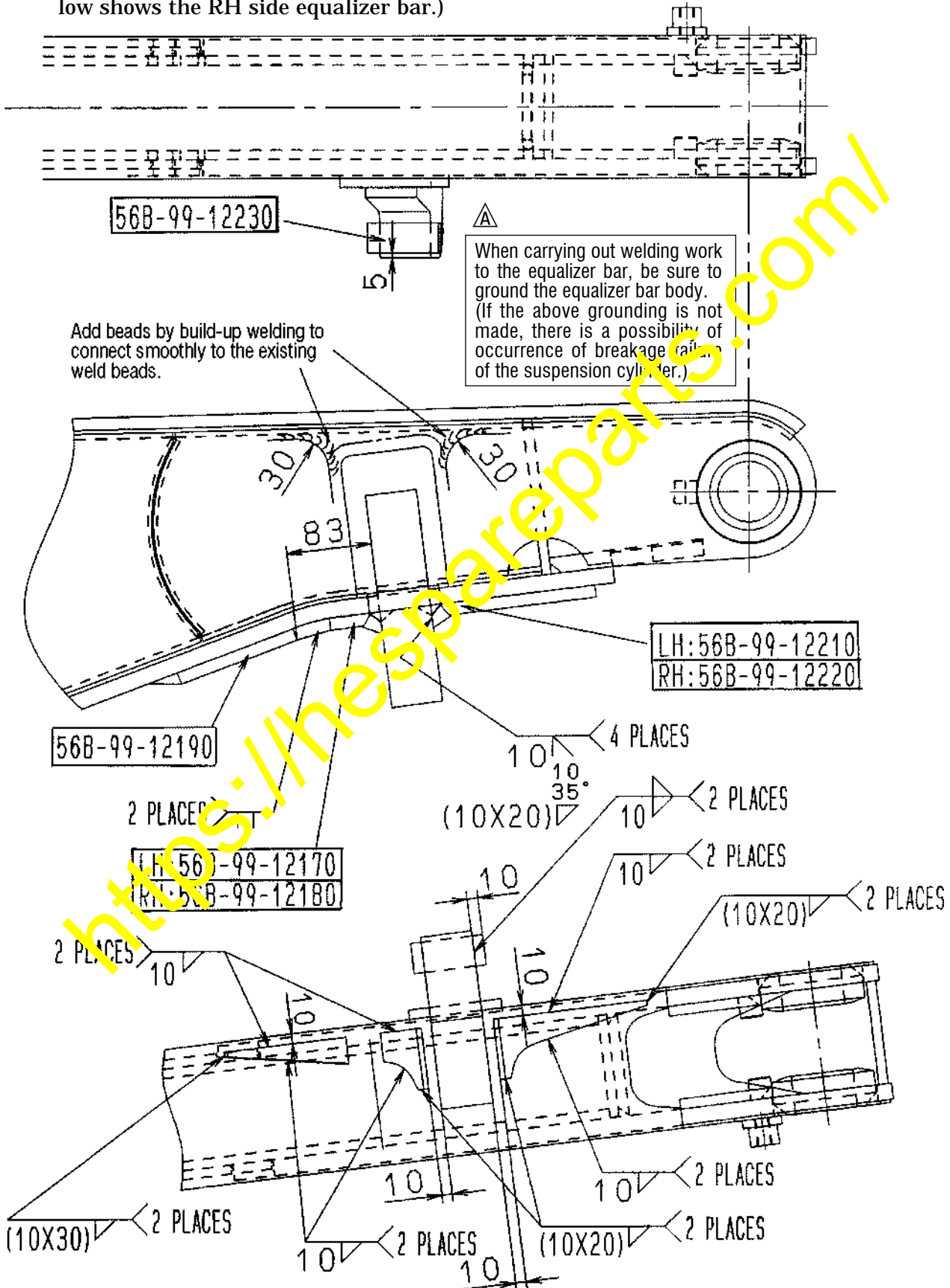
5-5) Reinforcement of the weld beads at the welding joint section of the cross member
 Weld the plate (56B-99-12240) to the welding joint section between the side member and the cross member for reinforcement. (At 4 places on each side, total 8 places on the LH and RH sides)

In the meantime, when carrying out the welding work for the RH side, remove the brake piping clamp once to move the position of the brake piping to a place where it may not hinder the welding work. Restore the brake piping back to its original position after finishing the welding work.




5-6) Reinforcement of the equalizer bar

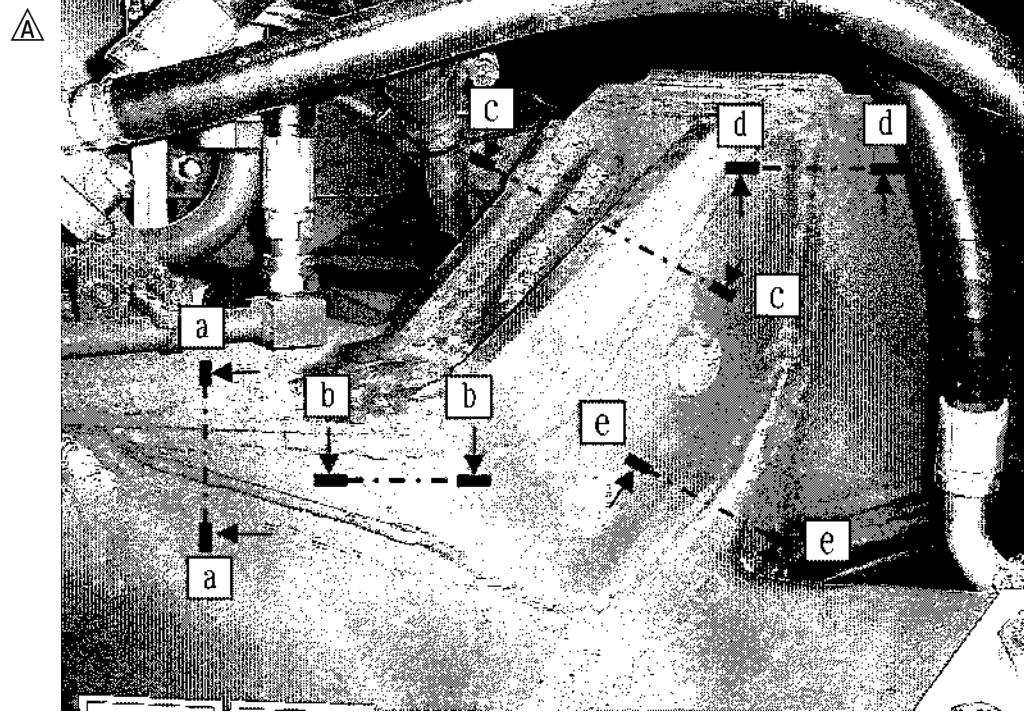
- ① Weld the equalizer bar stroke adjusting plate (56B-99-12230). (common for the LH and RH sides.)
- ② Weld 3 sheets each of the reinforcement plates to the lower surface of the equalizer bar. (The LH side and RH side equalizer bars are symmetrical. The drawing indicated below shows the RH side equalizer bar.)



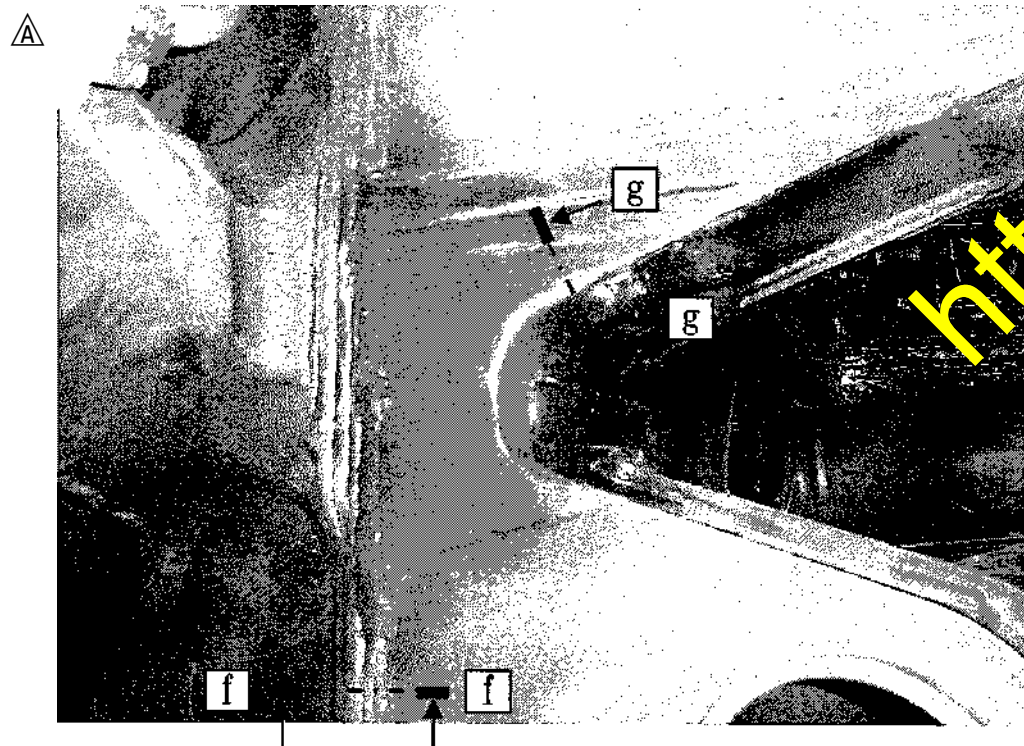
5-7) Photographs showing the modified statuses by welding

 When carrying out the modification work, refer to the following photographs and the drawings of the cross-sections of the beads (on page 20) at the same time.

① Reinforcement of the hitch bracket (Section 5-1)



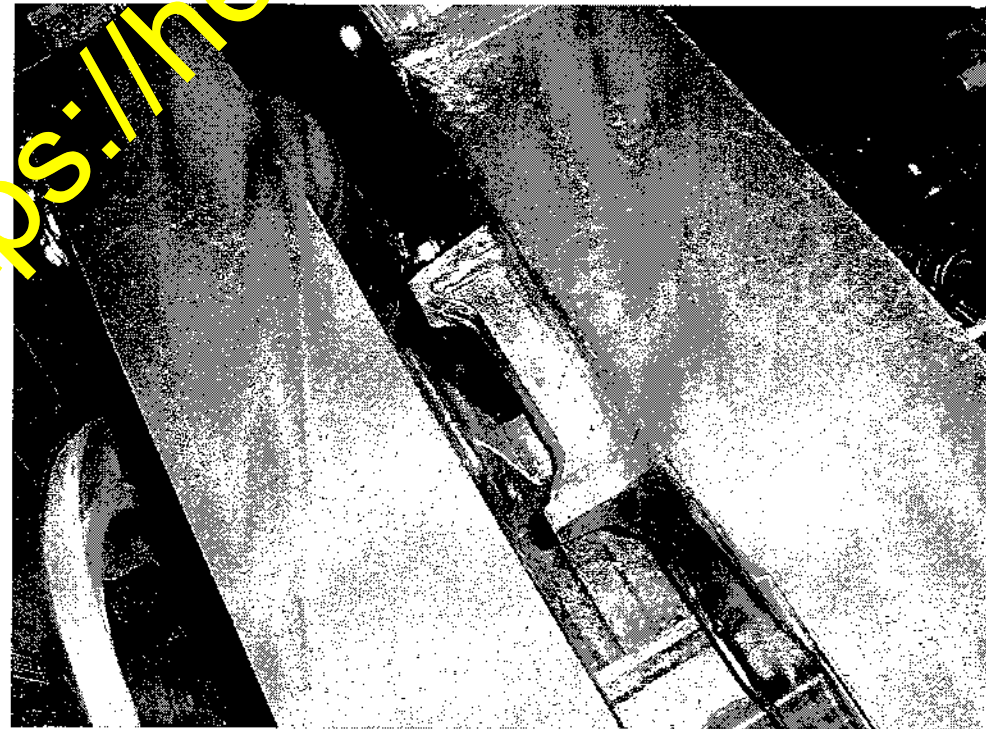
② Reinforcement of the bracket for the center shaft A arm (Section 5-2)



③ Addition of the plate to the welding end section of the bracket for the rear shaft A arm (Section 5-3)



④ Reinforcement of the equalizer bar stopper bracket (Section 5-4)



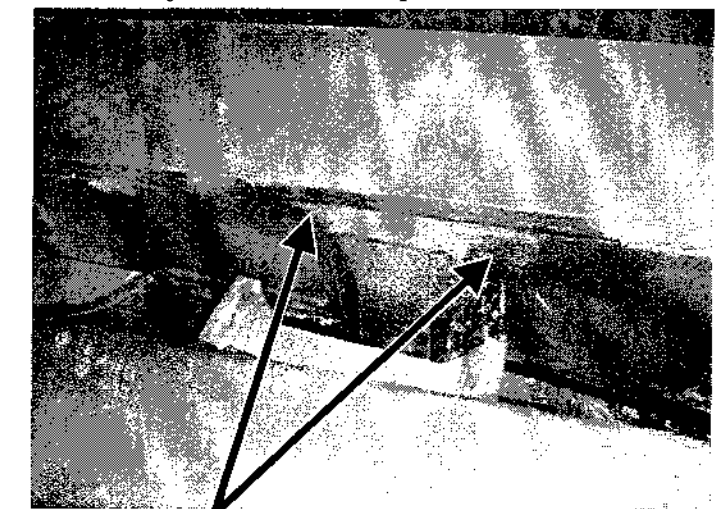
⑤ Reinforcement of the welding joint section of the cross member (Section 5-5)



⑥ Reinforcement of the equalizer bar (Section 5-6)



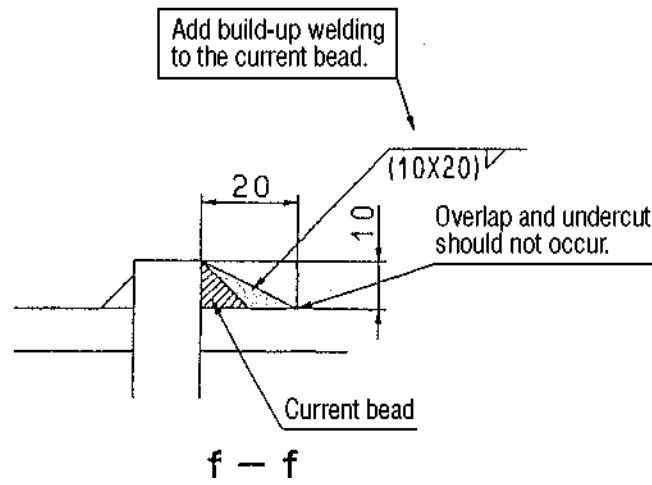
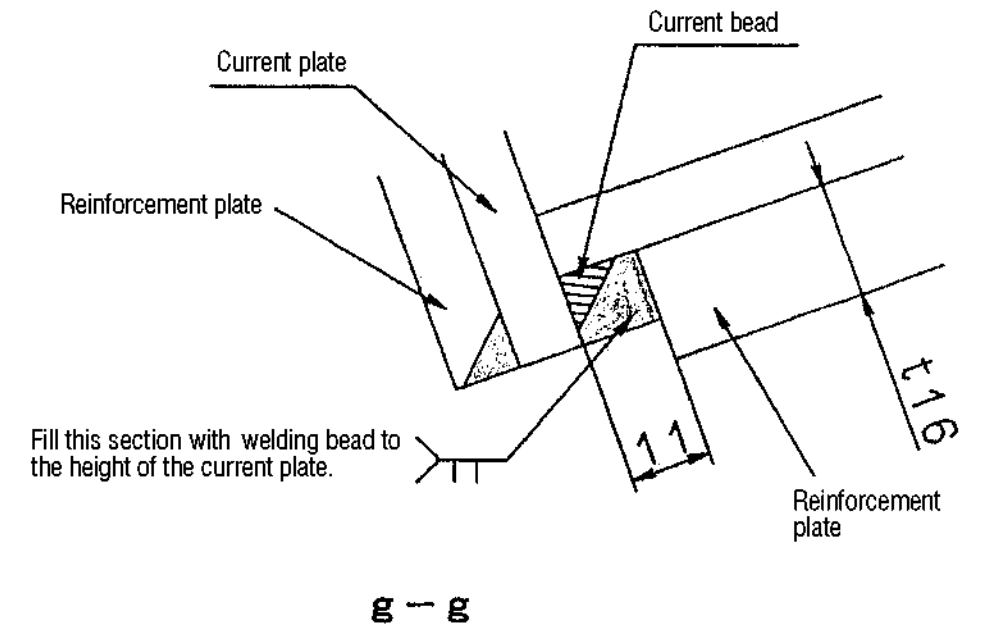
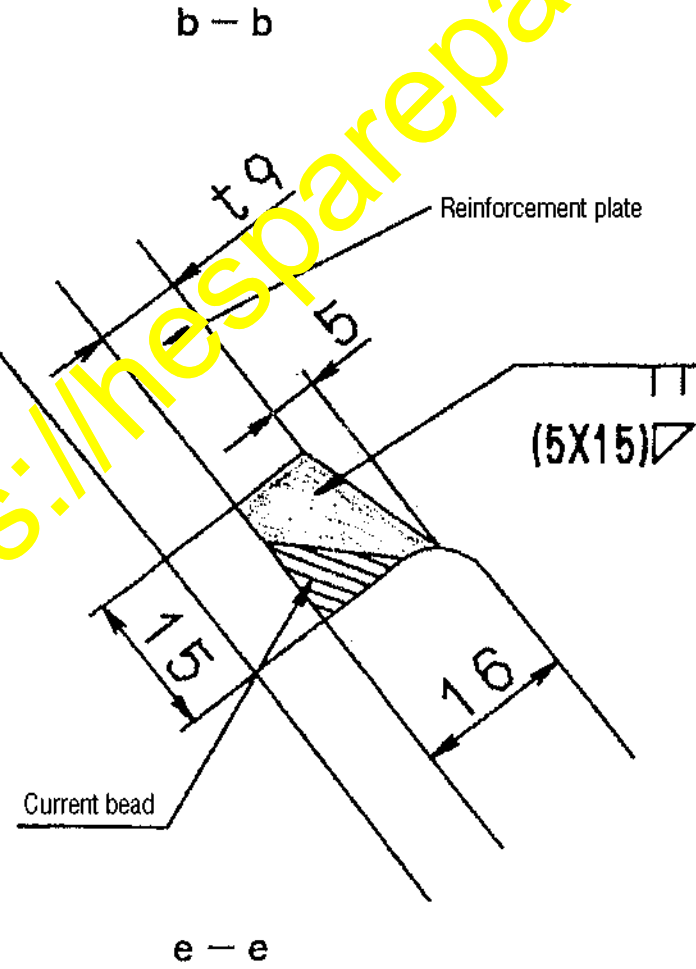
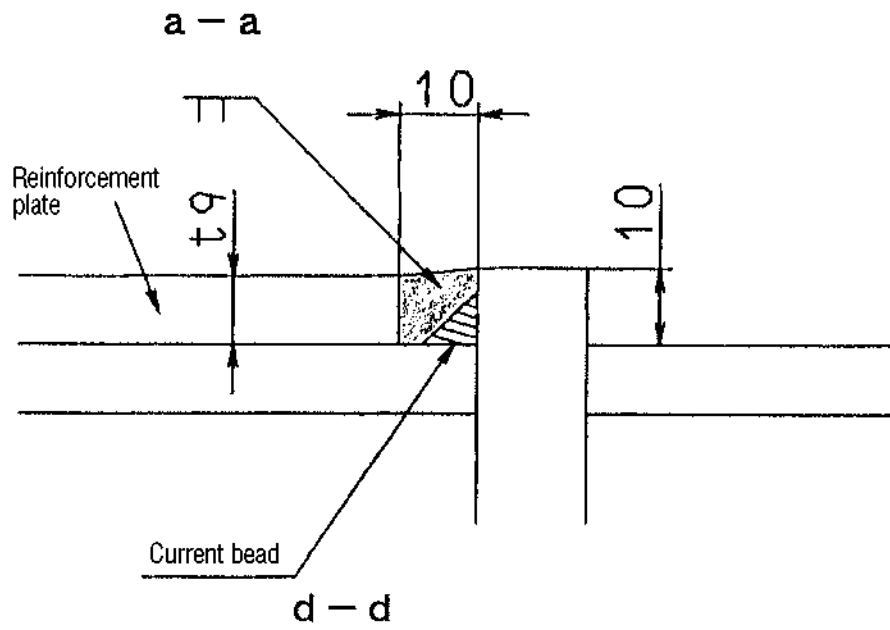
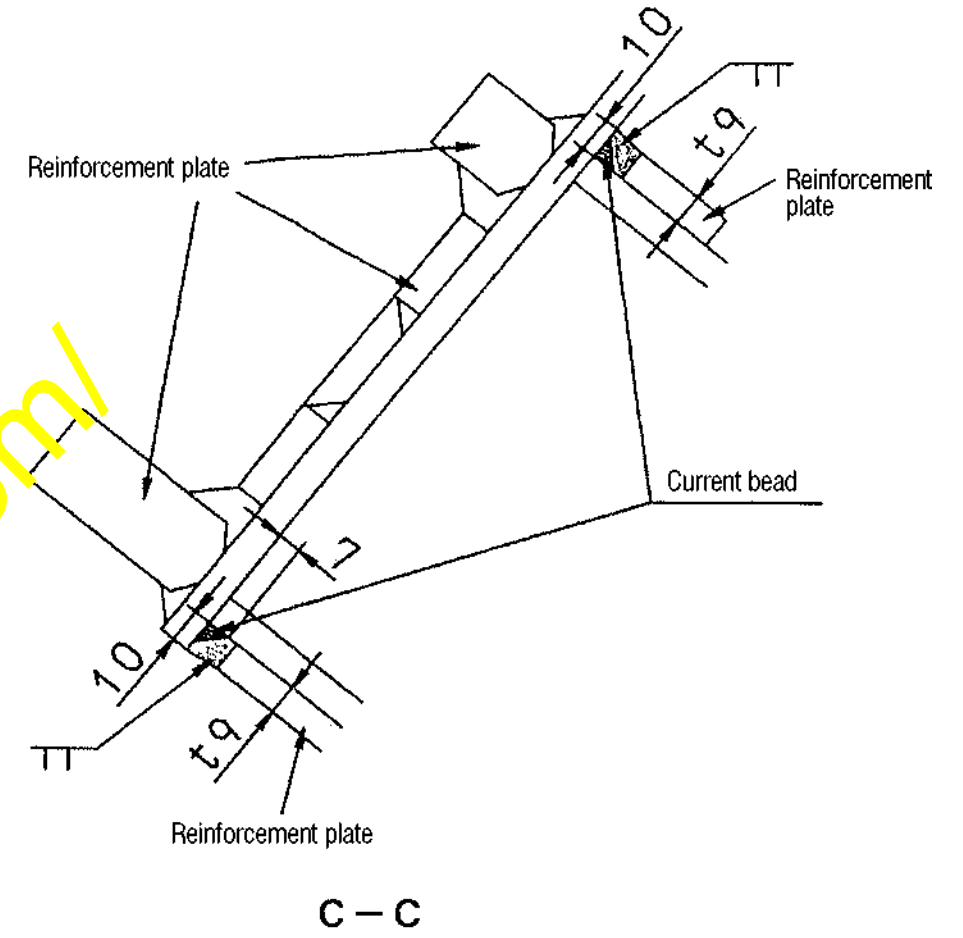
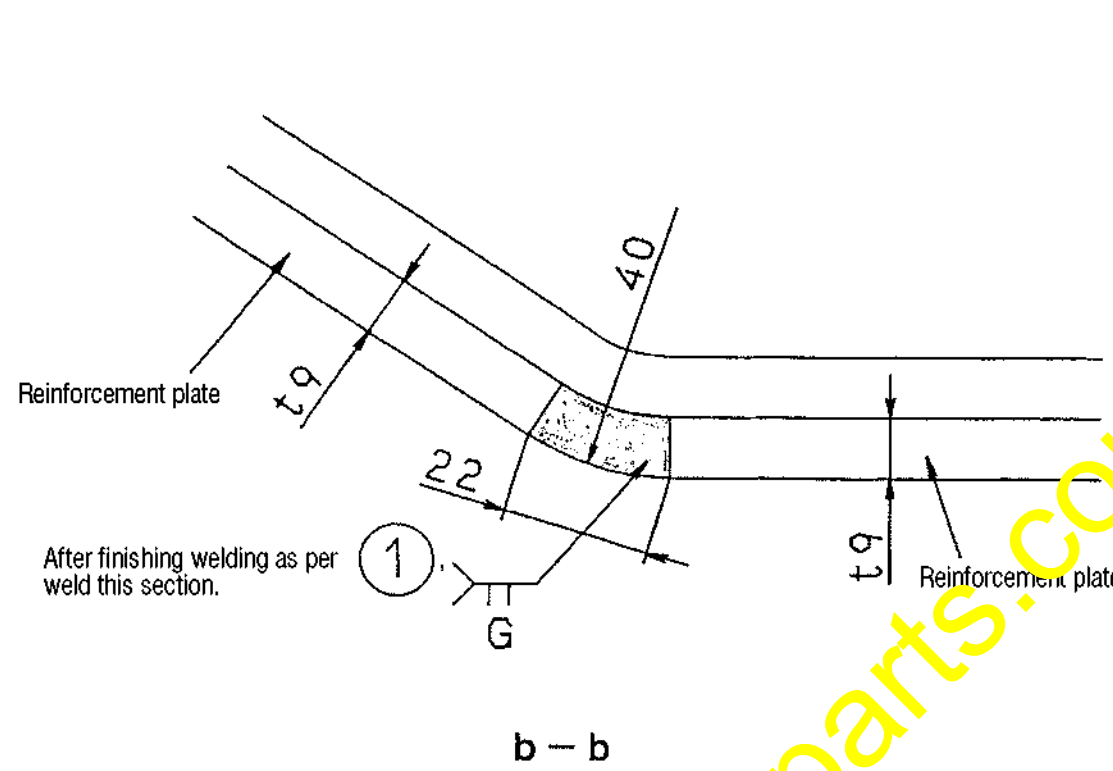
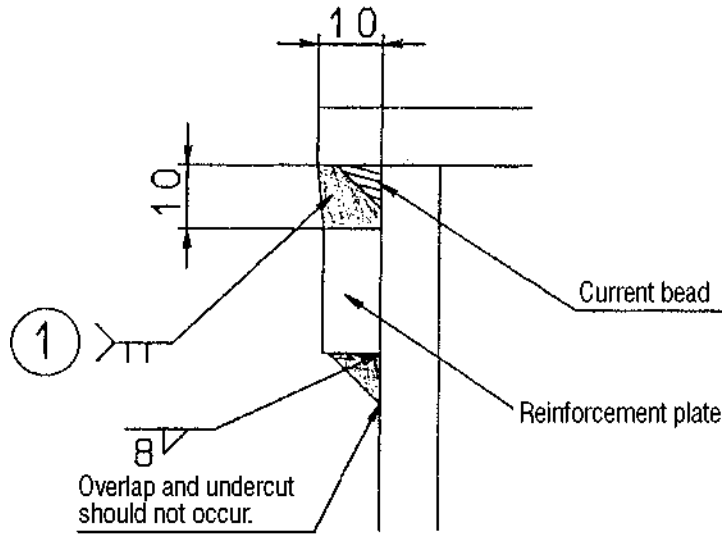
1) By addition of the plate



2) By extending the weld beads

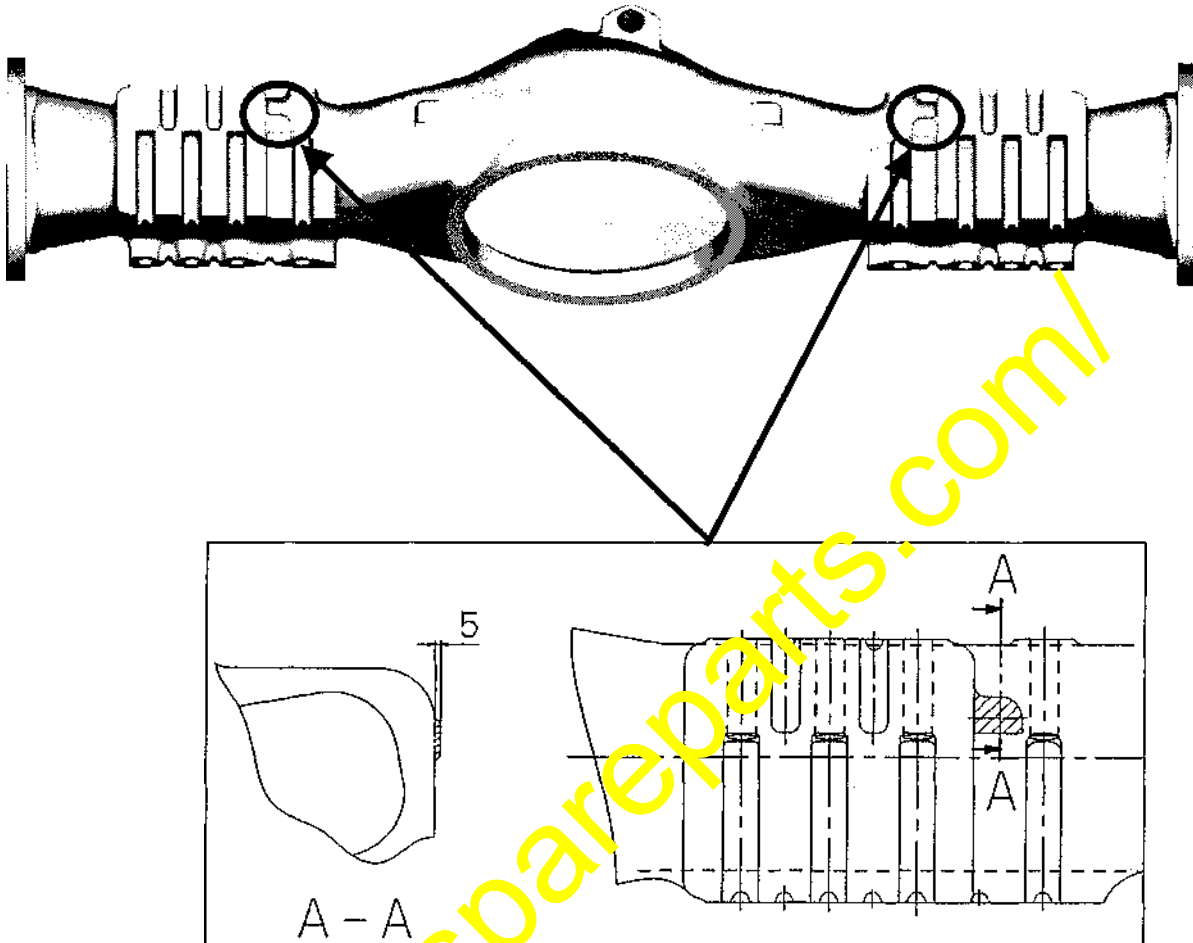
\triangle Page added

Detail drawings of the welding bead shapes



5-8) Grinding off the rear shaft axle housing casting

Remove the unnecessary cast seats by grinding to secure increased space between the axle housing and the rear frame side stopper.




Remove the hatched cast seat (at 1 place each on the LH and RH side) using a grinder. Finish the surface smoothly so that level difference may not remain from the surrounding casting surface.

6. Restoration of the vehicle body

After finishing the modification work for reinforcement, restore the vehicle body to the original state.

- 1) Paint the welded and ground sections with touch-up paint after taking off scale, spatters, etc. off and cleaning the sections.
- 2) Restore the hydraulic pipings and wiring harnesses which have been moved to places where they may not hinder the welding work back to their original positions and clamp them securely back to their original statuses.
- 3) Install the rear wheels.
- 4) After completing all the restoration work, start the engine and check if any unusual conditions, like oil leakage, exists or not.

-  5) When carrying out this modification work, it becomes necessary to move the position of the caution plate (Do Not Enter) being applied on the RH side of the machine body in order to weld the reinforcement plate.

Therefore, remove the current caution plate and apply it to the hatched section in the drawing being indicated on the RH side.

"Do Not Enter" Caution Plate: 09162-C0881

The position to apply the caution plate

