PARTS & SERVICE NEWS

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SUBJECT: REINFORCEMENT OF REAR FRAME ON HM350-1

PURPOSE: To introduce modification procedure to prevent occurrence of cracks in the rear frame on HM350-1 articulated dump trucks

APPLICATION: HM350-1 Auticulated Dump Trucks, Serial Nos. Refer to page 2.

FAILURE CODE: 4700HA

DESCRIPTION:

1. Introduction
   On the HM350-1 articulated dump trucks, there is a possibility of occurrence of cracks in the welded joint section of the rear frame.
   Therefore, make the modification being introduced in this Service News to prevent occurrence of the aforementioned cracks.

2. List of parts

Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-99-12140	Plate	Addition	2	
56B-99-12240	Plate		2	

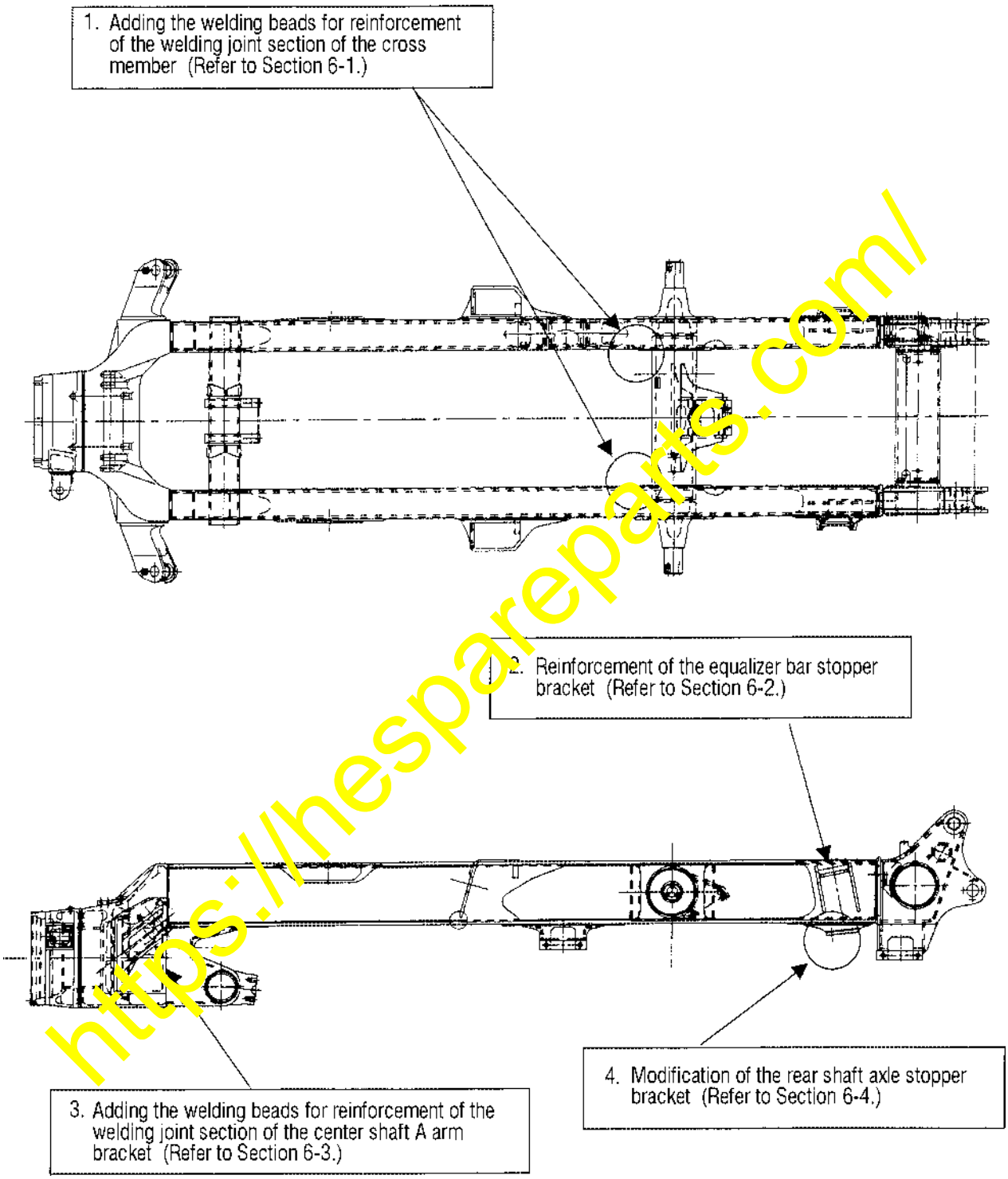
3. Table of the applicable vehicles to this modification

HM350-1: Table of Serial No. of the applicable vehicles (Total 37 vehicles)

No.	Country	Model	Serial No.	Destination	Customer's name
1	U.S.A.	HM350-1	1001	U.S.A., OK	United General
2	(34 vehicles)	HM350-1	1002	U.S.A., FL	URS Corporation
3		HM350-1	1003	U.S.A., OH	Beaver Excavating
4		HM350-1	1005	U.S.A., OH	Beaver Excavating
5		HM350-1	1007	U.S.A., MS	Eutaw Construction
6		HM350-1	1008	U.S.A., MS	Eutaw Construction
7		HM350-1	1010	U.S.A., MS	Eutaw Construction
8		HM350-1	1012	U.S.A., MS	Eutaw Construction
9		HM350-1	1013	U.S.A., MS	Eutaw Construction
10		HM350-1	1014	U.S.A., OK	United General
11		HM350-1	1015	U.S.A.	
12		HM350-1	1016	U.S.A.	
13		HM350-1	1017	U.S.A., OK	United General
14		HM350-1	1018	U.S.A.	
15		HM350-1	1019	U.S.A.	
16		HM350-1	1020	U.S.A.	
17		HM350-1	1021	U.S.A.	
18		HM350-1	1022	U.S.A.	
19		HM350-1	1023	U.S.A.	
20		HM350-1	1024	U.S.A.	
21		HM350-1	1025	U.S.A.	
22		HM350-1	1026	U.S.A.	
23		HM350-1	1027	U.S.A.	
24		HM350-1	1028	U.S.A.	
25		HM350-1	1029	U.S.A.	
26		HM350-1	1030	U.S.A.	
27		HM350-1	1031	U.S.A.	
28		HM350-1	1032	U.S.A.	
29		HM350-1	1033	U.S.A.	
30		HM350-1	1034	U.S.A.	
31		HM350-1	1035	U.S.A.	
32		HM350-1	1036	U.S.A.	
33		HM350-1	1037	U.S.A.	
34		HM350-1	1038	U.S.A.	
35	Belgium	HM350-1	1039	Belgium	
36	(2 vehicles)	HM350-1	1040	Belgium	
37	Russia	HM350-1	1042	C.I.S.	

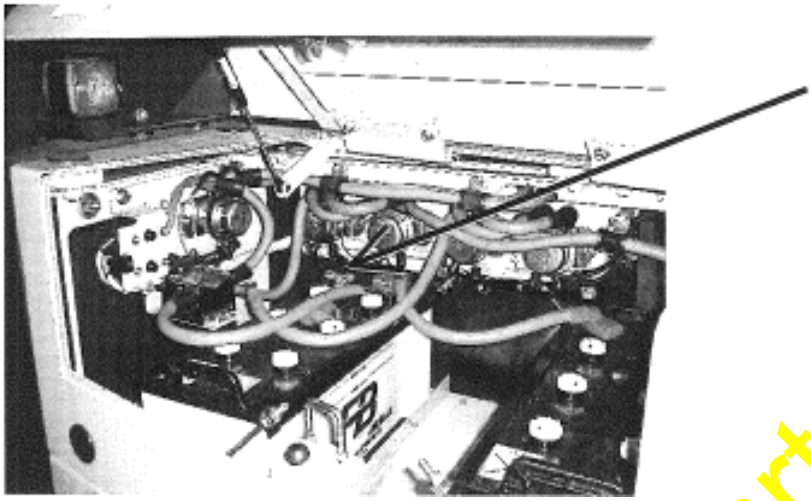
4. Details of the modification

4-1) The following modification by welding is to be carried out for reinforcement of the rear frame.



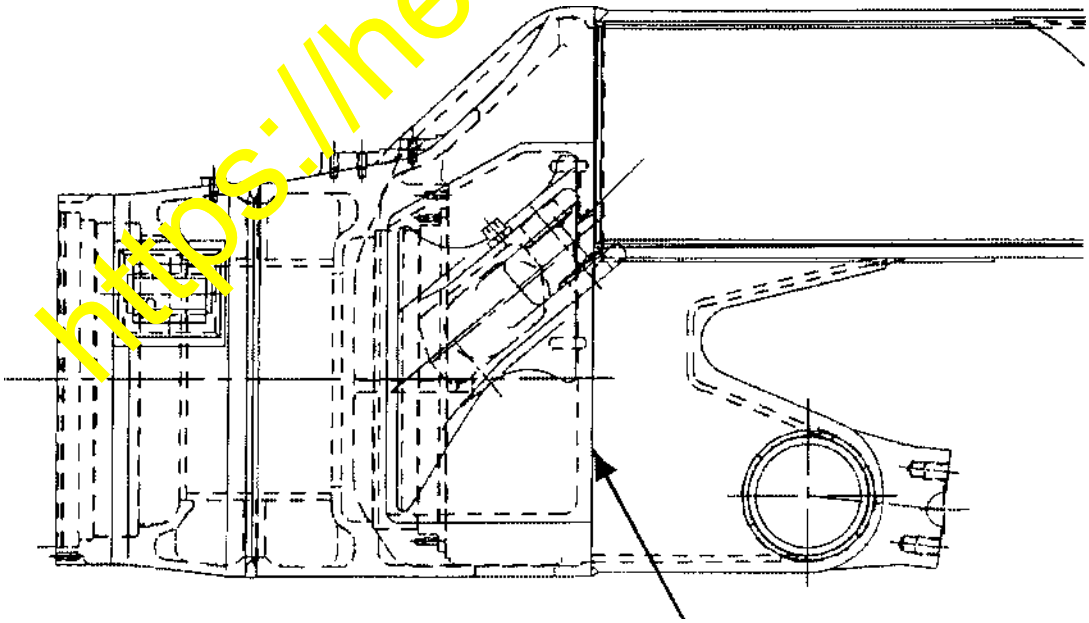
4-2) Prevention of interference of the rear frame with the rear axle
Adjust the oil level of the rear suspension cylinder to optimize the contact of the axle with the frame side stopper.
(So that the axle and the frame side stopper may not contact except when a rear suspension failure has occurred.)
Refer to Section 8. for details.

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



Disconnect the battery cable from the (+) terminal of the battery.

   5) Checking if cracks are not occurring
   After sufficiently washing the welding joint section between the hitch frame bracket and the center shaft axle support fulcrum bracket, conduct color checks to check if cracks are occurring or not.
   When cracks are occurring by any possibility, remove the cracked section by gouging and, after that, repair the gouged section by welding.



Make sure cracks are not occurring.
(On both of the inside and outside of the LH and RH sides, total 4 places)

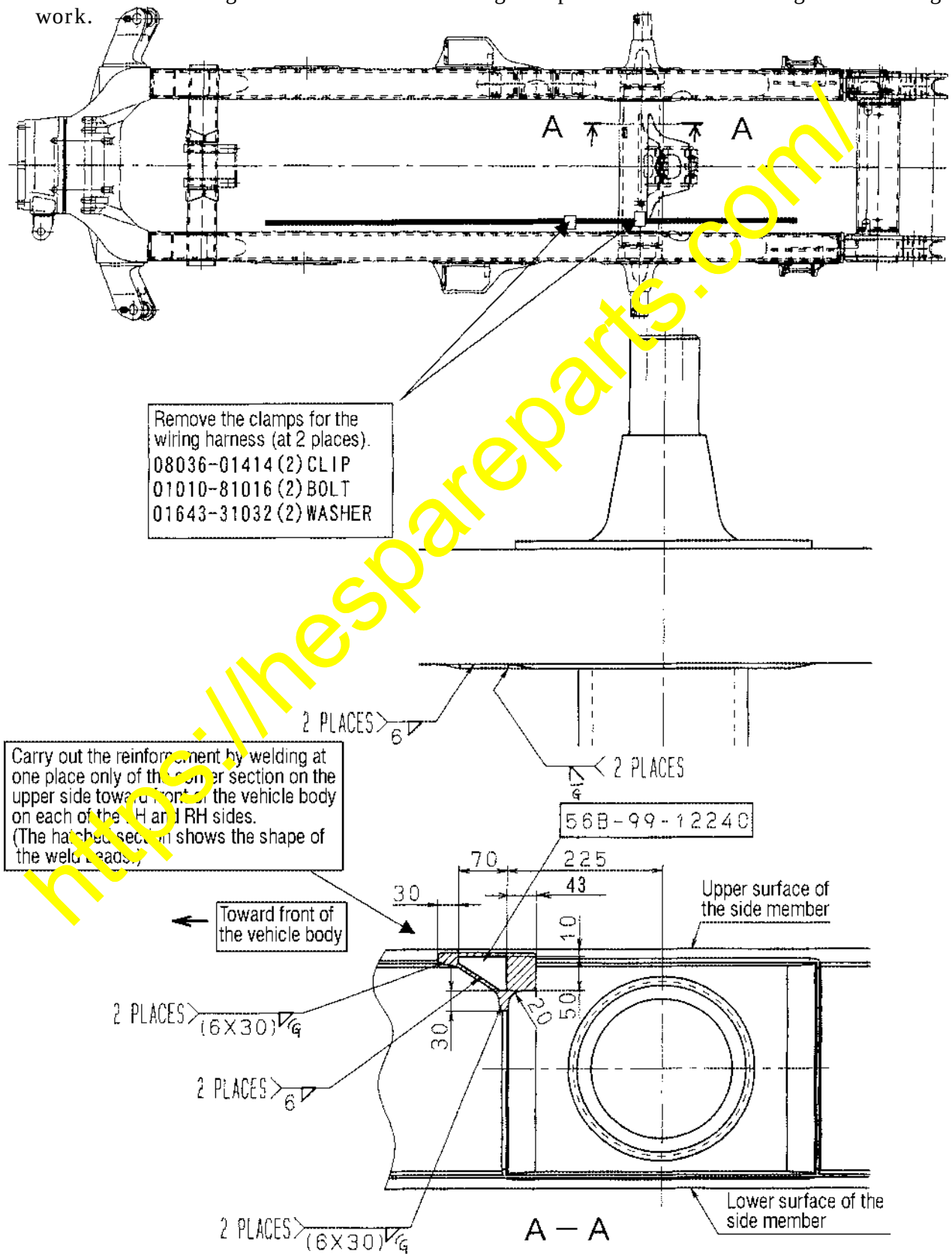
6. Modification procedure

6-1) Reinforcement of the weld joint section of the cross member by addition of weld beads

Weld the reinforcement plate (56B-99-12240) to the welding joint section between the side member and the cross member for reinforcement. (At one place on each side, total 2 places on the LH and RH sides)

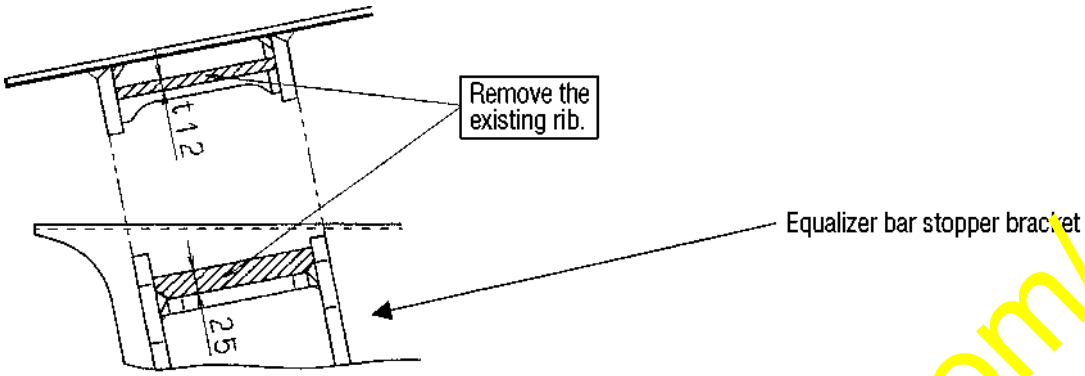
In the meantime, when carrying out the welding work for the LH side, remove the wiring harness clamps once to move the position of the wiring harness to a place where the wiring harness may not hinder the welding work.

Restore the wiring harness back to its original position after finishing the welding work.

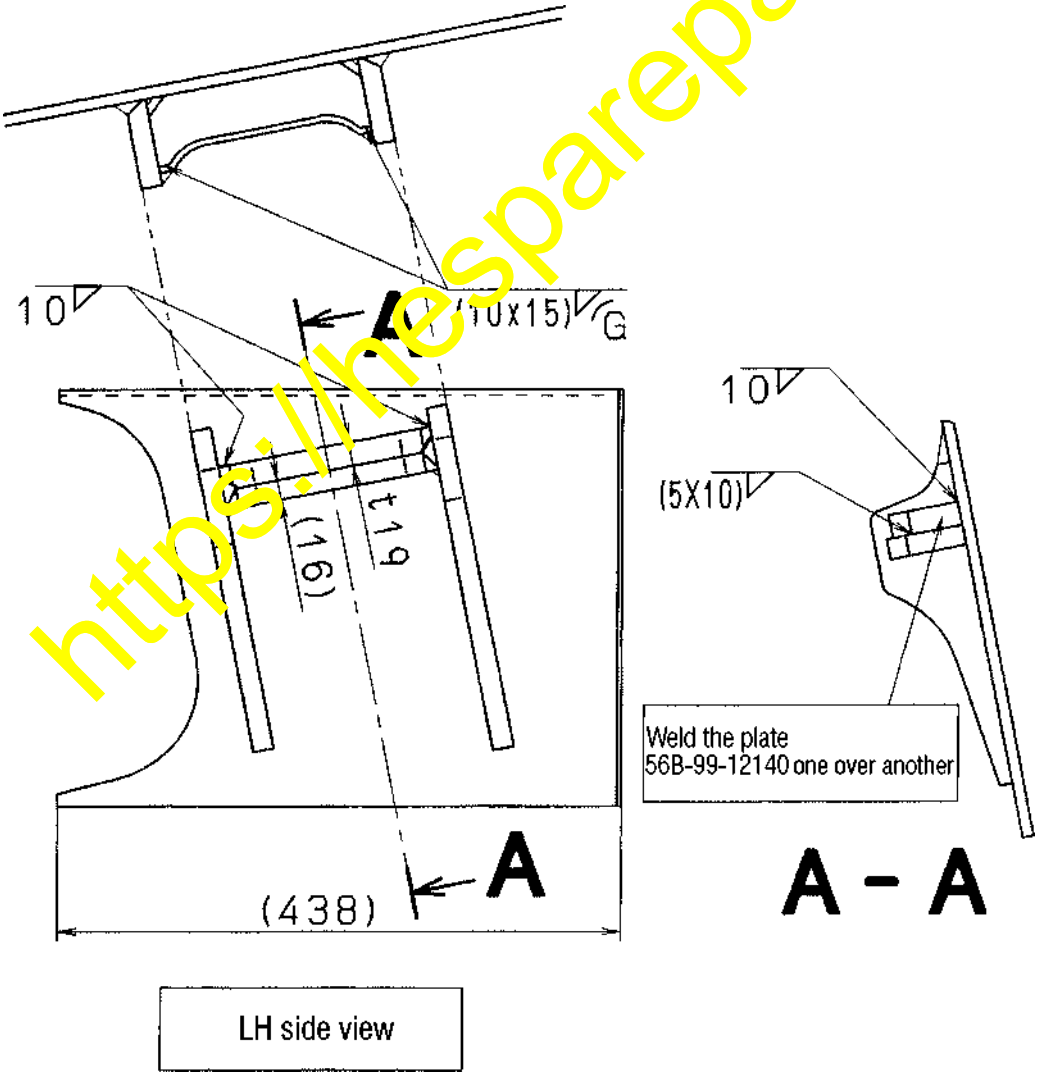


6-2) Reinforcement of the equalizer bar stopper bracket
Reinforce the bracket by welding a t19 plate (1 sheet each on the LH and RH sides).

6-2-1. Removal of the existing rib

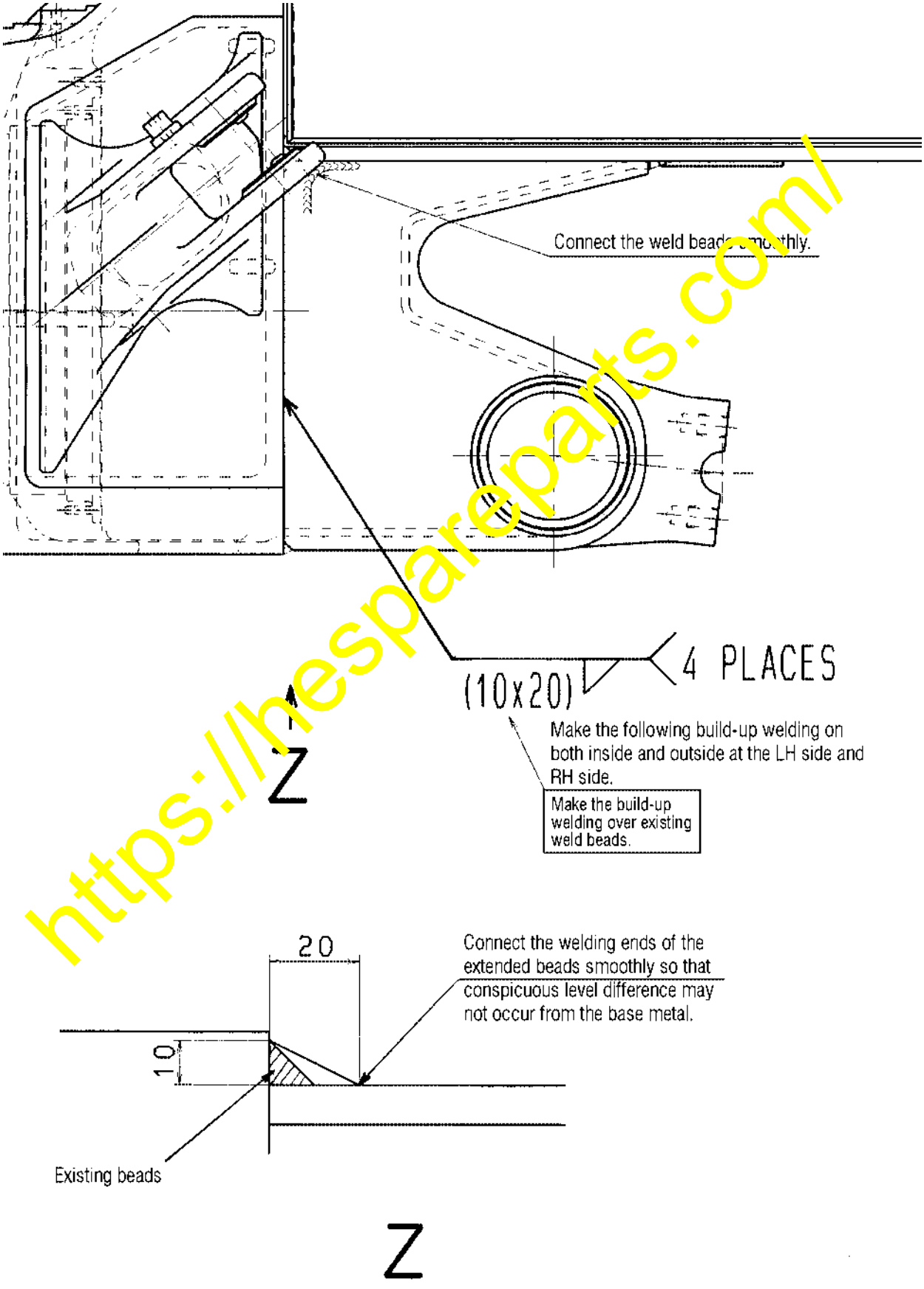


6-2-2. Welding the reinforcement plate
Weld the reinforcement plate (56B-99-12140).
(A t19 plate, both on the LH and RH sides)



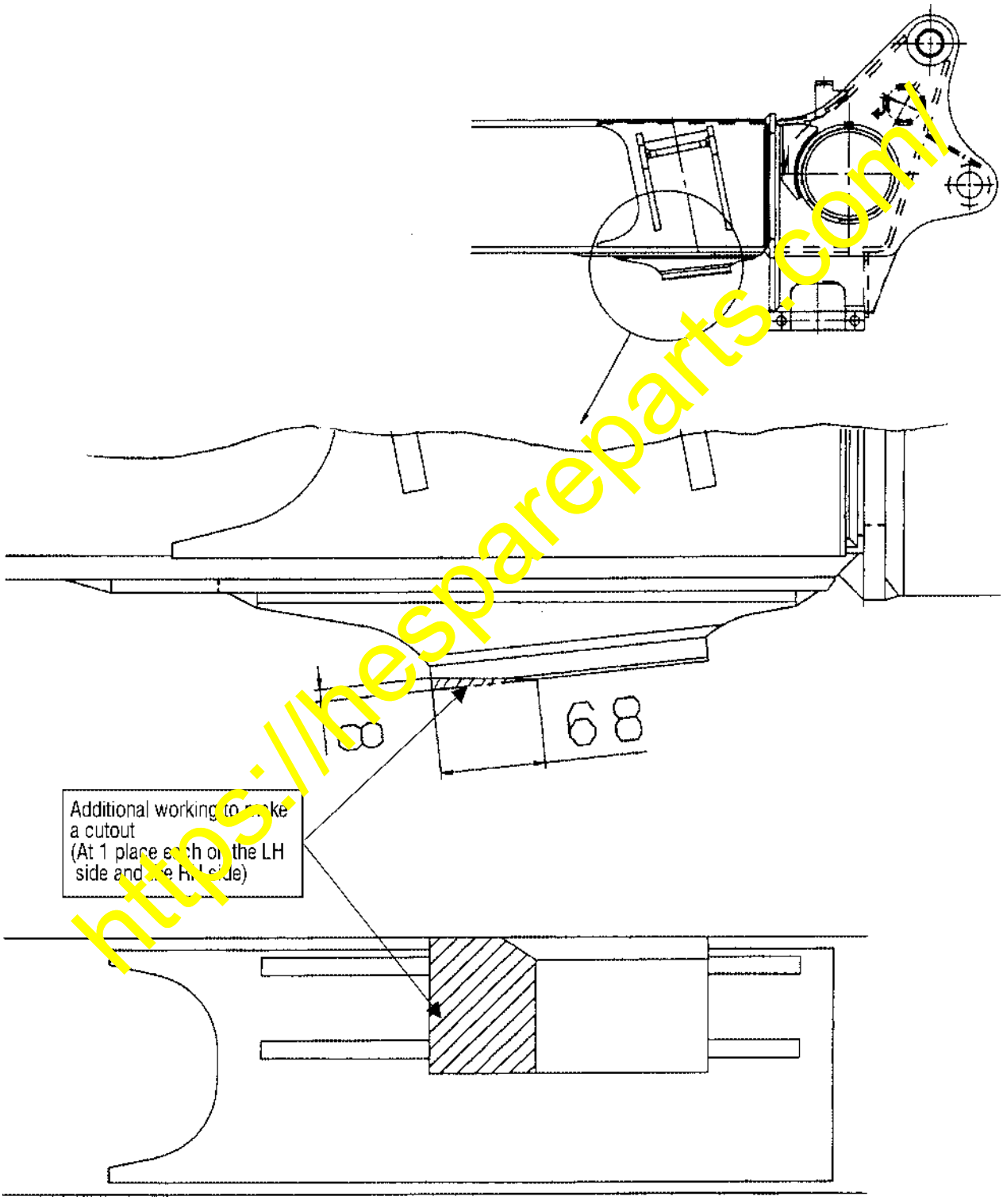
6-3) Reinforcement of the weld beads at the welding joint section of the center shaft A arm bracket

Reinforce the welding joint section as per the instructions given in the drawing shown below.



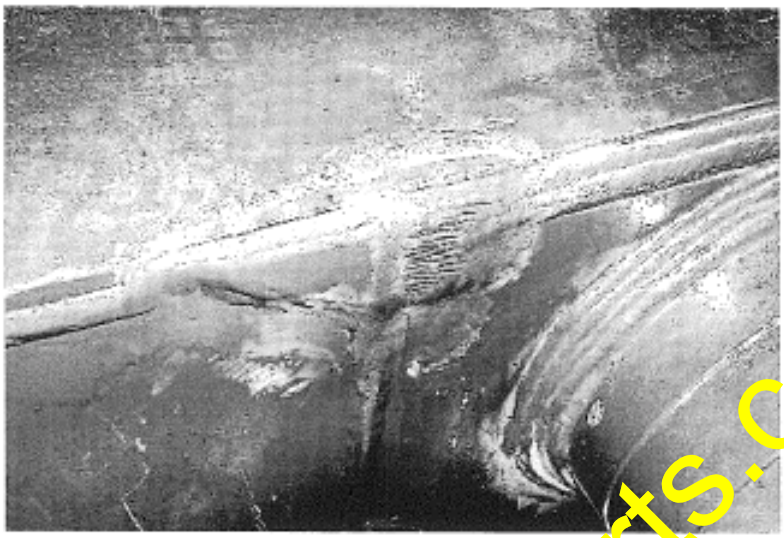
6-4) Modification of the rear shaft axle stopper bracket

Carry out the additional working to make a cutout in the lower plate of the axle stopper bracket by use of a grinder as per the instructions given in the drawing shown below.
Carry out the above additional working at 1 place each on the LH side and RH side. (For the hatched range shown in the drawing)



6-5) Photographs showing the modified statuses by welding
When carrying out this modification work, refer to the photographs shown below at the same time.

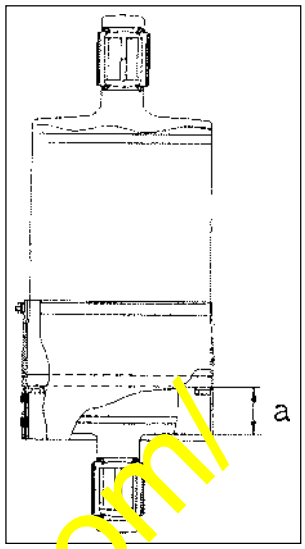
① Reinforcement of the welding joint section of the cross member (Section 6-1)



② Reinforcement of the equalizer bar stopper bracket (Section 6-2)

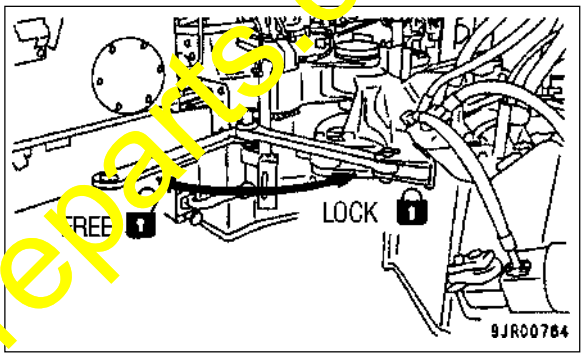
7. Restoration of the vehicle body
After finishing the modification work for reinforcement, restore the vehicle body to the original state.
1) Paint the welded and ground sections with touch-up paint after taking scale, spatters, etc. off and cleaning the sections.
2) Restore the wiring harnesses which 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) After completing all the restoration work, start the engine and make sure that any abnormality, like oil leakage, is not occurring.

8. Adjustment procedure for the rear suspension cylinder
To prevent occurrence of interference between the rear frame and the rear axle, make an additional charge of oil to the suspension cylinder to secure necessary space.

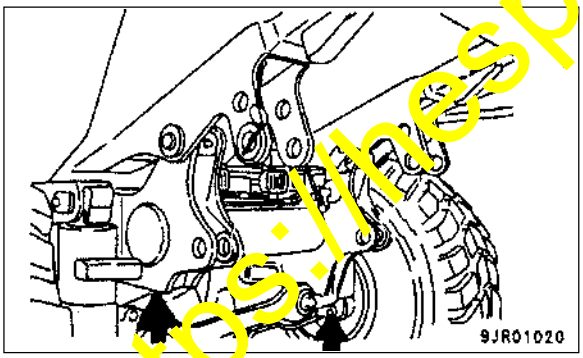


The current dimension "a" after charging the specified oil quantity is as follows.
Dimension "a" : 51 ± 3 mm
Charging oil quantity (reference) : 3.6 ℓ
In this modification, make an additional charge of oil to the suspension cylinder as follows.
Dimension "a" after the additional charge : 91 ± 3 mm
Additional charging oil quantity (reference) : 1.0 ℓ
Total charging oil quantity (reference) : 3.6 + 1.0 = 4.6 ℓ
Charging oil : Engine oil SAE10WCD

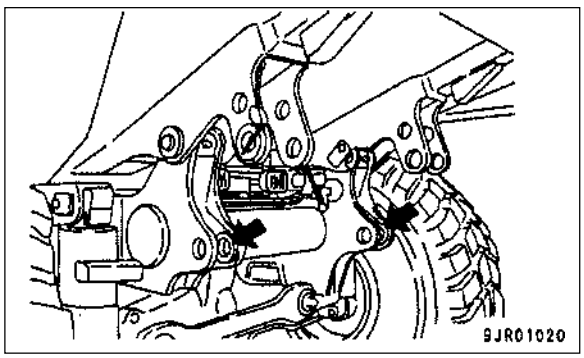
8-1) Preparations before starting the adjustment work
- Park the vehicle on a flat place, turn on the parking brake switch and apply chocks to each tire.
- Apply the articulated lock.



8-2) Discharging the nitrogen gas
1) Set a hydraulic jack underneath the rear frame and jack up the vehicle body or hoist the rear end section of the rear frame to raise the rear wheel tires.

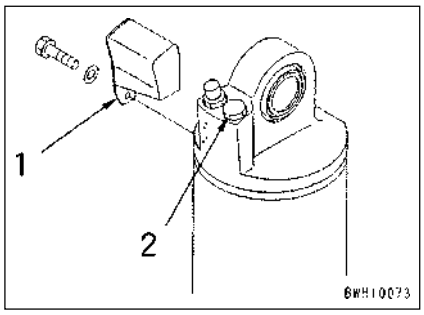


Position to set the hydraulic jack



Position to set the hoisting tool

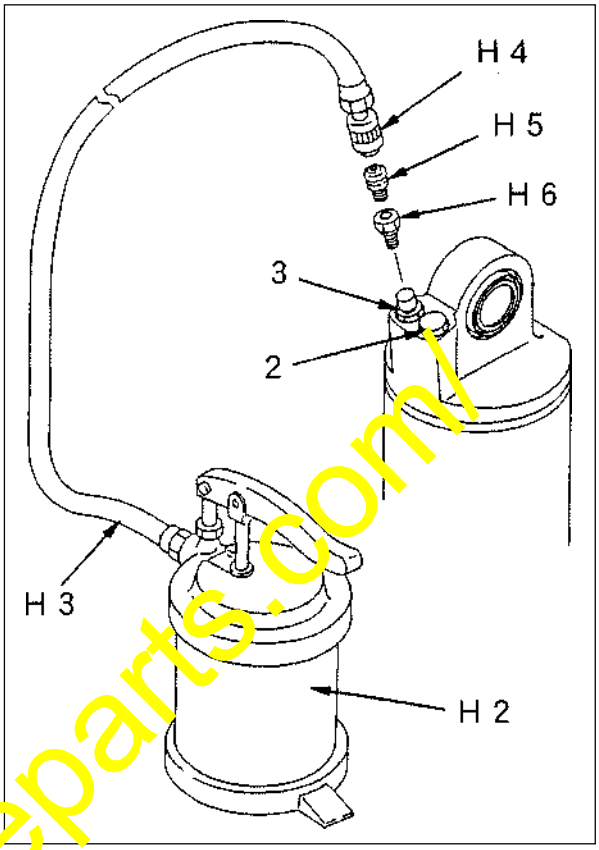
2) Remove the cover (1).
3) Slowly loosen the oil level valve (2), and when the nitrogen gas starts coming out, hold the valve at the position.
If nitrogen gas and oil flow out together from the valve, slightly tighten the valve until the oil flow stops and discharge the nitrogen gas slowly taking enough time.



8-3) Charging the oil

Charge the oil after discharging the nitrogen gas.

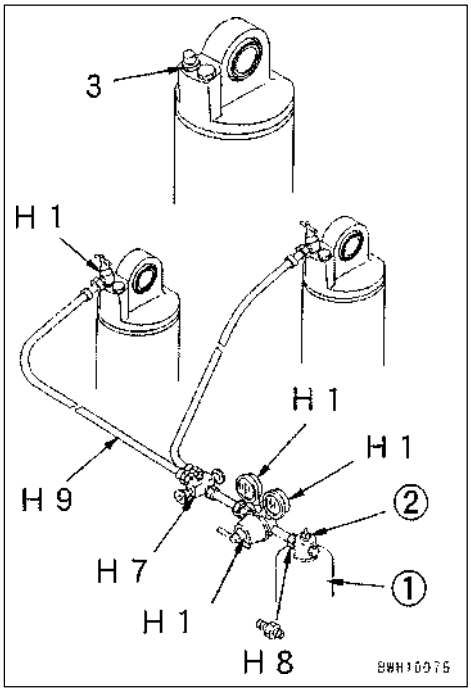
1) Slowly lower the frame so that the dimension "a" of the suspension cylinder may become 91 ± 3 mm.
2) Remove the oil level valve (2).
3) Remove the valve body of the air intake valve (3) and install the joint H6.
4) Install the fitting H5 to the joint H4 and connect the hose H3 and pump H2.
5) Operate the pump H2 and bleed air through the mounting port of the oil level valve (2).
6) Flow the oil out from the mounting port of the oil level valve (2) and charge the oil until air foams stop coming out.
7) After checking that the dimension "a" of the suspension cylinder is at 91 ± 3mm, install the oil level valve (2).
   kgm Oil level valve: 39.2 – 49.0 Nm {4 – 5 kgm}
8) Remove the suspension tools H2 thru H5 and install the air intake valve (3).
   kgm Air intake valve: 39.2 – 49.0 Nm {4 – 5 kgm}



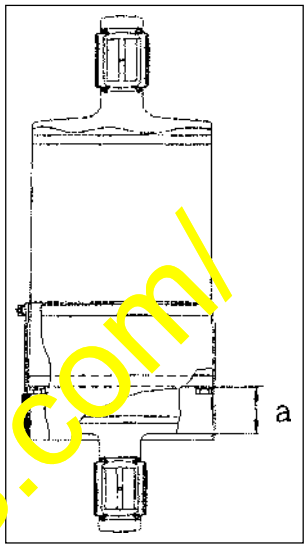
8-4) Charging the nitrogen gas

Charge the nitrogen gas after the completion of the additional charging work for the oil.

1) Remove the upper cap of the air intake valve (3).
2) Connect the suspension tools H7 thru H12 as shown in the drawing.
   - Connect the joint H10 to the air intake valve.
   - Before installing the regulator, blow the fitting section filter sufficiently by nitrogen gas (at 0.98 Mpa {10 kg/cm²} or more) to prevent entry of foreign substance.
3) Open the valve ② of the nitrogen gas cylinder ① and check the indicated pressure (internal pressure of the cylinder) on the gauge H12.
   The indicated pressure should be higher than the internal pressure of the cylinder by 0.98Mpa {10kg/cm²} or more.



4) Gradually turn the handle of the regulator H11 counter clockwise to set the indicated pressure of the gauge H13.
   Do not extend the cylinder to the stroke end by charging the nitrogen gas at a pressure exceeding 3.9 Mpa {40 kg/cm²}.
5) Operating the valve H7 and the handle of the joint H10, charge the nitrogen gas into the suspension cylinder.
   • Charge the nitrogen gas into the LH side and RH side cylinders at the same time.
6) When the LH side and RH side cylinders reach the specified installed length, turn the handle of the regulator H11 counter clockwise to stop the nitrogen gas charge.
   • Installed length "a" of the rear suspension cylinder: 119 ± 5 mm
7) Turn back the handle of the joint H10 to its full stroke and loosen the air bleeder plug of the valve H7 to discharge the gas from inside the hose.
8) Remove the suspension tools H7 thru H12.
   • Be careful not to lose the O-ring of the air intake valve.
9) Install the upper cap of the air intake valve (3).



8-5. Re-adjustment of the cylinder length
   • Re-adjustment of the cylinder length should be made after completion of charging of the nitrogen gas.
   • Re-adjustment of the cylinder length should be made with the body unloaded and on a flat place.
1) Move the vehicle forward by about 15 m and make an abrupt stop, and after that, move the vehicle backward to the original position and make an abrupt stop. Repeat the above operations for 3 to 4 times and, finally, apply the retarder brake little by little to stop the vehicle slowly.
   • Apply the retarder brake little by little to stop the vehicle as slow as possible to eliminate the sliding resistance (being caught by the packing and bushing) of the cylinder.
2) Measure the installed length of the cylinder.
   • Installed length "a" of the rear suspension cylinder: 119 ± 5 mm
3) When the installed length is longer than the specified length, adjust the length by discharging the nitrogen gas through the oil level valve (2).
   • Loosen the oil level valve (2) slightly so that the gas may be discharged in an extent that the cylinder does not move.
   • If the gas is discharged strongly to move cylinder, the installed length may become shorter than the specified length and be careful when discharging the gas.
4) When the re-adjustment work is finished, check the installed length of the cylinder by the above Processes 1) and 2).
5) Inspect if gas leakage is not occurring from the oil level valve (2), air intake valve (3) and the cylinder gland section.
   • Use soapy water when inspecting the gas leakage.
6) After finishing the above adjustment works, install the cover (1) of the suspension cylinder.
7) After 48 hours from the time of changing the oil and changing the gas, inspect the installed length "a" of the cylinder once again and, if the length is out of the specified length, make the above gas adjustment works once again.