PARTS & SERVICE NEWS

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SUBJECT: INTRODUCTION OF HOSE CLAMP ON ALL DUMP-TRUCK MODELS

PURPOSE: To introduce modification procedure to repair oil leakage occurring from the low pressure circuit rubber hoses on all the dump trucks

APPLICATION: All Dump Trucks

FAILURE CODE: 0300AE

DESCRIPTION:

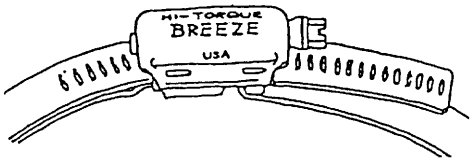
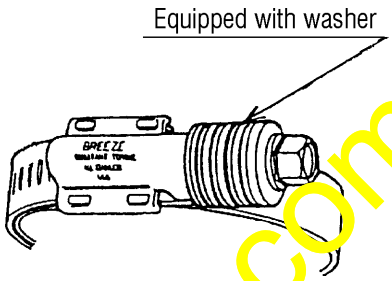
1. Introduction
   The low pressure rubber hoses being used for the cooling circuit and/or the low pressure hydraulic circuit on dump trucks are apt to cause loosening of the clamping force of the hose clamps as the time passes or when the atmospheric temperature drops.
   Oil leakage occurring from the low pressure hydraulic circuit rubber hoses are being caused by lowered clamping force in most cases and, in these cases, it is almost always possible to stop the oil leakage by appropriate re-tightening of these clamps.
   When oil leakage of the aforementioned type occurs while the vehicle is being used in fields, replace the clamps with new ones and re-tighten them following the modification procedure being outlined in this Service News. This Service News will also introduce the measures to take at times of overhauling and take the instructed measures when there is an opportunity of overhauling those vehicles.

2. List of parts

Part No.	Part Name	Q'ty	Remarks
07299-00080 (07289-00080)	Clamp (Clamp)		(205-09-61120)
07299-00095 (07289-00095)	Clamp (Clamp)		(20D-09-11130)
07299-00105 (07289-00105)	Clamp (Clamp)		(205-09-61110)
07299-00120 (07289-00120)	Clamp (Clamp)		(207-09-11120)

3. Regarding the effective measures to cure the oil leakage
   The following measures will be effective to cure the oil leakage and take the following measures.

   (1) Increasing the clamping force by adoption of the high torque clamp

BREEZE HIGH TORQUE (07289-xxxxx)	BREEZE CONSTANT TORQUE (07299-xxxxx)
	
Initial tightening torque: 8.8 N•m {90 kgcm}	Initial tightening torque: 13.7 N•m {140 kgcm}

   ☆ Refer to page 3 regarding the effects of the increased clamping force.

   (2) Removing the liquid gasket when replacing the rubber hoses at the time of overhauling
   Liquid gasket is being applied to compensate the surface roughnesses or deformations of the hoses and the tubes, however once a hose is disconnected, it is not possible to restore the original contact statuses and oil leakage may occur all the more.
   As the agent to apply, apply water soluble neutral detergent to the tube side in case of the cooling circuit and apply a water soluble neutral detergent or oil to the tube side in case of the low pressure hydraulic circuit before inserting the low pressure hoses over the tubes.

4. Effects of increasing the clamping force

With a low pressure hose being fastened by the hose clamp, the clamped section is being compressed and, at first, the elasticity is maintained to hold the clamping force. However, as the time goes by, the rubber will shift toward the arrowed directions to lower the clamping force.

At the same time, the hose clamp and the hose will fit each other and the hose and the tube will fit each other.

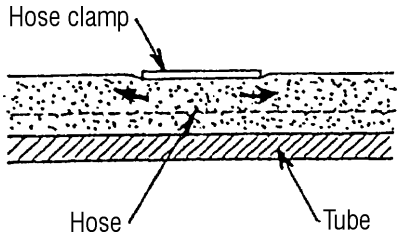


Fig. 1. Permanent set of the hose in fatigue

If re-tightening back to the initial clamping force (A' point) is made at a state where the clamping force has been lowered to a certain extent (the B point in Fig. 2), when the aforementioned re-tightening is made, the low end of the dropped clamping force this time will be at the B' point, which is higher than the first B point as shown in Fig. 2 below.

As the re-tightening number of times increases, lowering of the clamping force will become less. Such maintenance of the clamping force by re-tightening will be very effective to prevent occurrence of oil leakage.

Also, by use of the BREEZE CONSTANT TORQUE CLAMPS, it becomes possible to increase the initial clamping force and also, it becomes possible to prevent occurrence of further drop of the clamping force and it becomes more effective to prevent oil leakage.

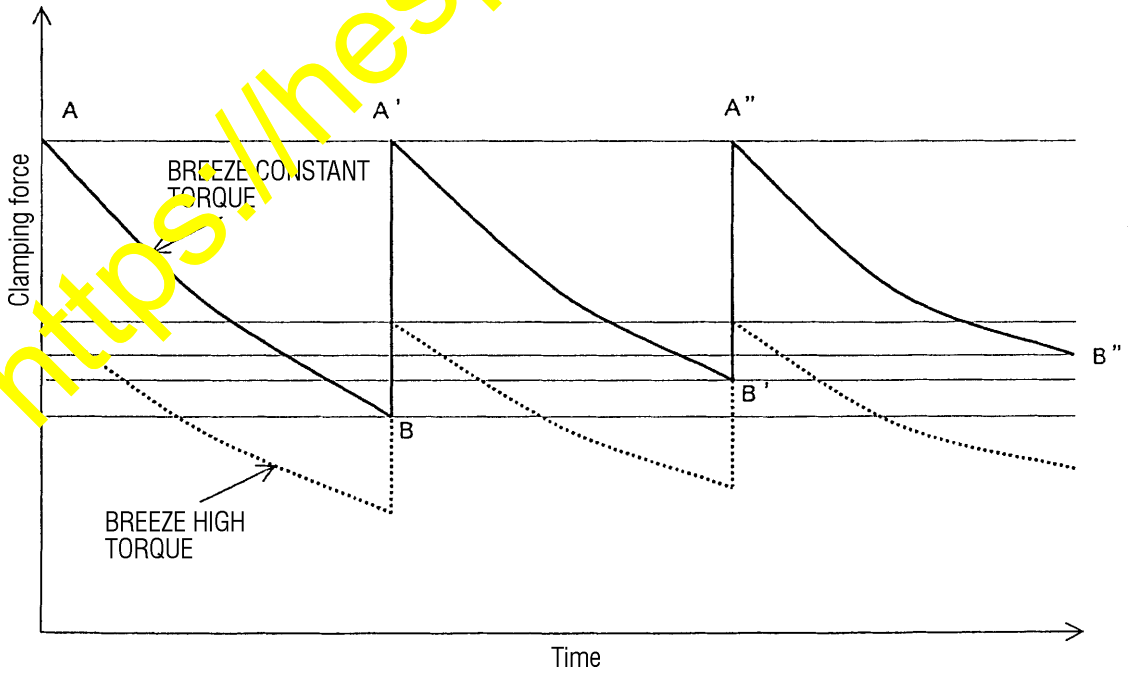


Fig. 2. Changes of the clamping force with passage of time

5. Contents of the measures to take

5-1. Replacement of the clamps

If oil leakage cannot be stopped by re-tightening even when the HIGH TORQUE clamp with the KES Part No. (07289-***) is being used, replace the clamps to the BREEZE CONSTANT TORQUE with the KES Part No (07299-xxxxx).

(With these clamps, larger initial tightening force can be acquired than the initial tightening force of other types.)

5-2. Re-tightening by the tightening torque method

(1) Tightening tool

- Although a torque wrench is being used, it will be more convenient if it is a type of the torque wrench with which the current tightening torque can be read.

(Example) TOHNICHI MFG Co. Ltd.
Type: DB25N or DB25N-S (S.I MODEL)
or Type: 230DB3 or 230DB3-S (METRIC MODEL)

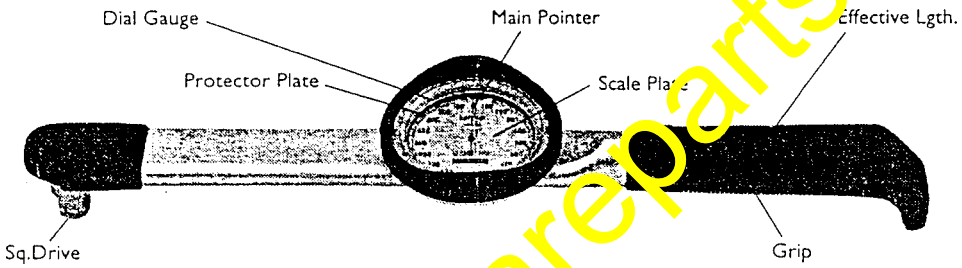


Fig. 4 Dial gauge type torque wrench

Table 1. Other models of the dial gauge type torque wrenches (Made by TOHNICHI MFG)

Type	Torque range (N•m)	1 scale (N•m)	Torque range (kgf•cm)	1 scale (kgf•cm)	Hand efforts at the time of the max. torque		Effective length (mm)	Total length (mm)	Square drive (mm)	Remarks
					(N)	(kg)				
DB25N	3 – 25	0.5			115		200	245	9.5	
DB25N-S	3 – 25	0.5			115		200	245	9.5	With the leaving pointer
230DB3			30 – 230	5		11.5	200	245	9.5	
230DB3-S			30 – 230	5		11.5	200	245	9.5	With the leaving pointer

- Use the socket with the width across flat being indicated below and with the square drive size of 3/8" (9.5 mm).

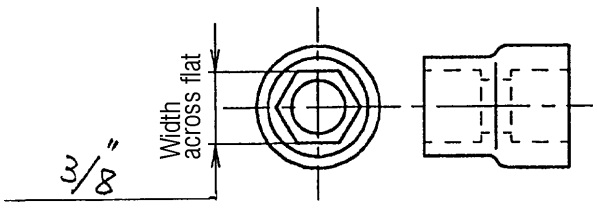


Fig. 5. Socket

(2) Initial tightening torque
When using the CONSTANT TORQUE clamps, tighten them at the tightening torque of 13.7 N•m {140 kgcm} for all the sizes of them.

(Note) Since the CONSTANT TORQUE clamps are not applicable in case of the smaller diameter hoses with the inner diameter of 48 or less, use the HIGH TORQUE clamps or the Jubilee clamps for the case and select the tightening torque corresponding to each clamp.

(3) Re-tightening method
Re-tighten the clamp pulling the wrench slowly toward the tightening direction until the dial scale points to the specified tightening torque level.

(Note) Be careful not to make errors regarding the unit of the tightening torque (N•m or kgcm).
1 N•m ≒ 10 kgcm.

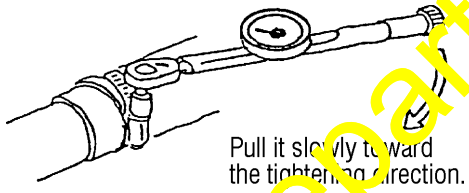


Fig. 7 Re-tightening method

- Except for special cases(∗), **avoid loosening the clamp before re-tightening it**. If the clamp is loosened before re-tightening, even if the clamp is tightened later at the same tightening torque, there may be cases that the tightening force becomes insufficient.
∗: Refer to Section 6.

(4) Timing to carry out re-tightening

- Carry out re-tightening each time oil leakage occurs from the coupler of the low pressure hose.

(Note) During the winter season especially, since the atmospheric temperature drops, leakage may occur more often by the difference of the thermal expansion coefficient between rubber and steel.

- Carry the re-tightening work out before starting the operation in the morning, while the temperatures of the water and oil are low enough.

6. Measures to take when the clamp has loosened completely
   When the clamp has loosened completely, since it is necessary to install the clamps at the proper positions shown in Fig. 8, follow the procedure described below and tighten the clamps at the specified tightening torque.

   ① Tighten the clamp "A" lightly until the tightened state at which the clamp can be moved by hand with much effort.

   ② Move the clamp "A" toward the arrow direction (toward the top end of the tube) until it comes to the position at which the tube has the disconnection preventive processing, where the clamp stops to move.

   (Note) When moving the aforementioned clamp, turning it around slightly toward the directions of the arrow mark ↝ back and forth will help the moving.

   ③ Tighten the clamp "A" at the specified tightening torque. (Refer to the Section (2).)

   ④ Install the clamp "B" separating it by 5 to 10 mm from the hose end and directing it to the direction being shown in the drawing and tighten it at the specified tightening torque.

   ⑤ Tighten the clamp "A" and clamp "B" once again at the specified tightening torque.

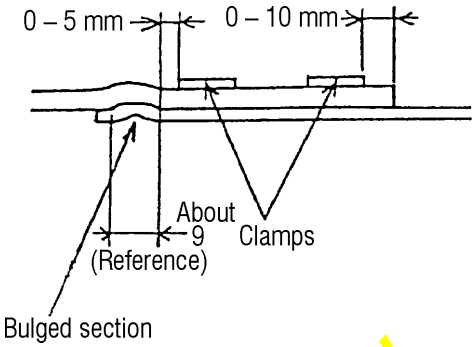


Fig. 8 Position to install the clamps

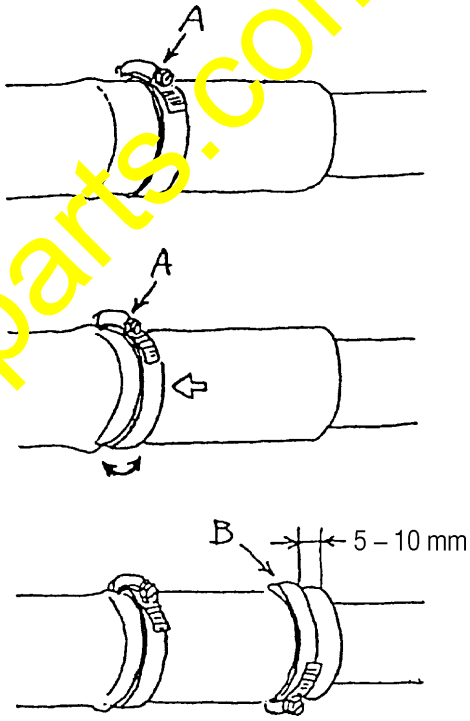


Fig. 9. Tightening sequence

- In the meantime, in the above case, it is recommended to carry out the re-tightening work after about 2 weeks to one month by the method described in the above Section 5-2.

7. Measures to take at the time of overhauling
When it becomes necessary to disconnect the low pressure rubber hoses, at the time overhauling, take the following measures when reconnecting the low pressure rubber hoses regardless oil leakage is occurring or not.
∗: This includes the cases in which water leakage or oil leakage cannot be stopped even if the hose clamps are replaced and re-tightening is repeated.

(1) Use of new hoses
Because of degradation of the hoses and as it is necessary to remove the liquid gasket being applied to the hose inserted sections on the tubes, do not reuse the disconnected hoses but use new hoses instead.

(2) Removal of the liquid gasket
Remove the liquid gasket being applied to the hose inserted sections on the tube completely.

(Note) Since there is no solvent to solve this liquid gasket, use a cloth or a fine grade sand paper to remove the liquid gasket completely.

(3) Assembling method
Apply a water soluble neutral detergent to the tube side in case of the cooling circuit and apply a water soluble neutral detergent also to the tube side in case of the low pressure hydraulic circuit before inserting the low pressure hoses over the tubes.

Refer to the Section 6 regarding the tightening procedure for the clamps.

(4) Measures to take afterward
It is recommended to carry out the re-tightening work after about 2 weeks to one month by the method described in the above Section 5-2.

8. Others
Although similar measures has been introduced previously, since the methods has been reviewed and this Service News was newly issued, discard the Service News No. "A900216". (Issued in '90.)

9. In case of clamps of other sizes than what are being described in this Service News, since it is also possible to prevent leakage by changing to the CONSTANT TORQUE clamps, the comparison table for the part numbers of the CONSTANT TORQUE clamps and the HIGH TORQUE clamps is shown as follows.

KES Part No. of the CONSTANT TORQUE clamps	HIGH TORQUE clamps		Effective tightening dia. (mm)
	KES Part No.	(Part No. in drawings)	
07299-00055	07289-00055	(208-09-11110)	45 – 67
07299-00070	07289-00070	(208-09-11120)	57 – 79
07299-00080	07289-00080	(205-09-61120)	70 – 92
07299-00095	07289-00095	(20D-09-11130)	83 – 105
07299-00105	07289-00105	(205-09-61110)	95 – 118
07299-00120	07289-00120	(207-09-11120)	108 – 130
07299-00130	07289-00130	(209-62-55290)	121 – 143
07299-00145	07289-00145	(————)	133 – 156
07299-00145	————	(562-03-21980)	133 – 156