PARTS & SERVICE NEWS

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DATE	Jun. 7, 2004
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SUBJECT: IMPROVED INJECTOR FOR ϕ170E-3 SERIES ENGINE

PURPOSE: To introduce modification procedure to increase the durability of the injector spring for the ϕ170E-3 Series engines when it breaks

APPLICATION:
HD465-7 Dump Trucks
HD605-7 Dump Trucks
WA600-3 Wheel Loaders
WD600-3 Wheel Dozers
WA700-3 Wheel Loaders
D375A-5 Bulldozers
PC1250-7 Hydraulic Excavators
A6D170E-KC-3 Engines
170CUM-IND Engines
170CUM-PG-3 Engines
A6D170E-G1-3 Engines
} Refer to page 6

FAILURE CODE: A1LOFF

DESCRIPTION:

1. Introduction
When the injector spring for the ϕ170E-3 Series engines breaks, repair the failure following the modification procedure described in this Service News.

2. List of parts

Part No.	Part Name	Purpose of part	Q'ty	Remarks
6560-11-1114 (6560-11-1113)	Injector (Injector)	Replacement	6 (6)	D375-5, HD465-7, HD605-7, PC1250-7, A6D170E-CC-3, A6D170E-KC-3
6560-11-1812 (6560-11-1811)	Injector (Injector)	Replacement	6 (6)	A6D170E-CG-3 A6D170E-G2-3 170CUM-PG-3
6560-11-1213 (6560-11-1212) (6560-11-1211)	Injector (Injector) (Injector)	Replacement	6 (6) (6)	A6D170E-G1-3
6560-11-1414 (6560-11-1413) (6560-11-1412)	Injector (Injector) (Injector)		6 (6) (6)	WA600-3E, WD600-3 WA700-3E
6240-11-8810	Gasket		6	Common for all the machine models

3. Details of the modification
   1) Details of the improvements
      The injector has been improved to increase its durability.

   2) Outline of the modification
      Replace the injector with the improved one.
      Refer to the descriptions given below regarding the identification method for the improved injector.

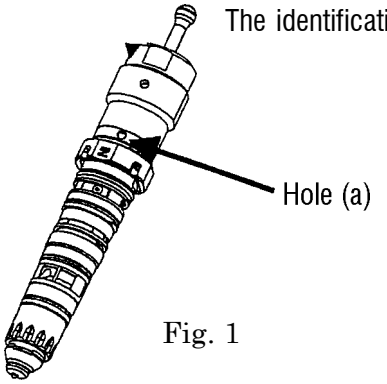


Fig. 1

The identification color of the injector spring can be seen through the hole (a).

Improved injector:	Sky blue
Current injector:	White

Confirm that the sky blue identification color can be seen.

   3) Modification procedure
      Regarding the details of the disassembly and assembly procedures, refer to the Shop Manual.
      Replace all the gaskets, seals and O-rings which have been removed with new parts.

      1. Remove the head cover (2) of the engine.

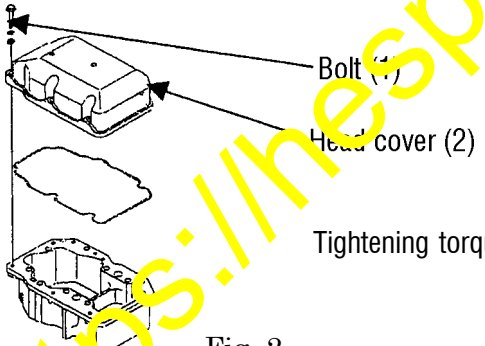


Fig. 2

Tightening torque for the bolt (1): 9.8 ± 1.0 Nm (1.0 ± 0.1 kgm)

      2. Loosen the adjust screws (3), (4) and (5). After that, loosen the bolt (6) to remove the rocker arm ass'y (7).

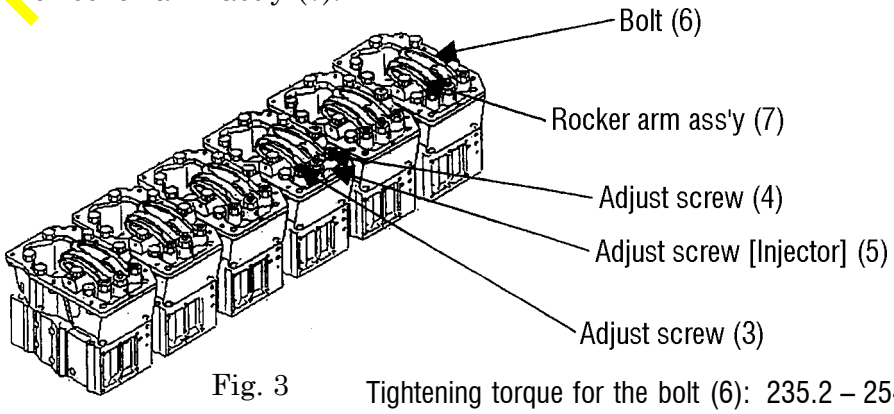
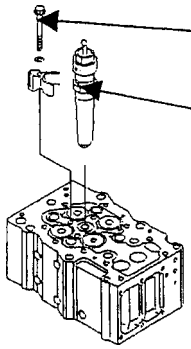


Fig. 3

Tightening torque for the bolt (6): 235.2 – 254.8 Nm (24 – 26 kgm)

3. Loosen the bolt (8) and replace the injector (9).



Tightening procedure for the bolt (8)
① Apply engine oil #30 to the threads and the bearing surface of the bolt.
② Tighten the bolt at the tightening torque of 24.5 – 34.3 (2.5 – 3.5 kgm).
③ Tighten the bolt further by 90° – 120° toward the tightening direction.

Fig. 4

4. Install the rocker arm ass'y as per the Shop Manual.

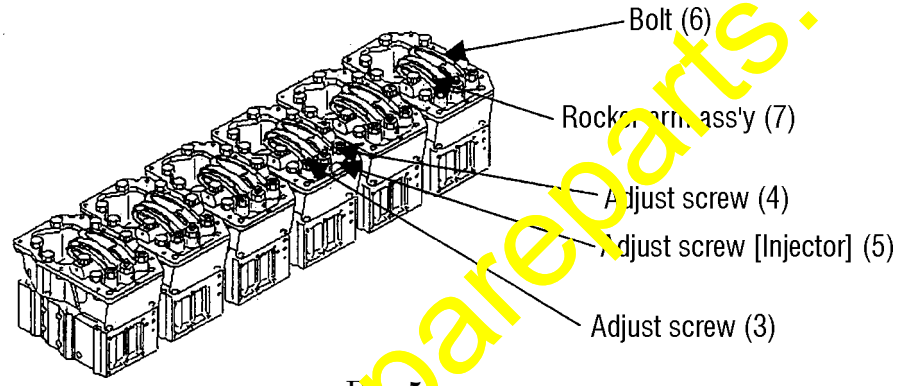
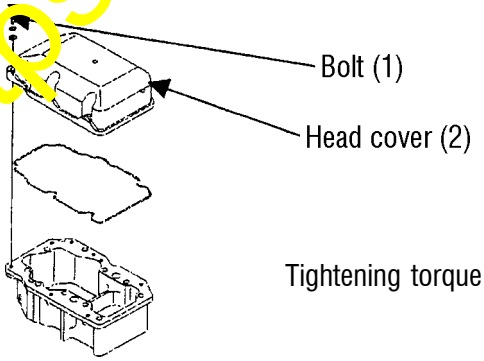


Fig. 5

Adjusting method for the injector setting load: Refer to page 4.
Adjusting method for the valve clearance: Refer to page 5.
Tightening torque for the bolt (6): 235.2 – 254.8 Nm (24 – 26 kgm)

5. Install the head cover (2) of the engine.

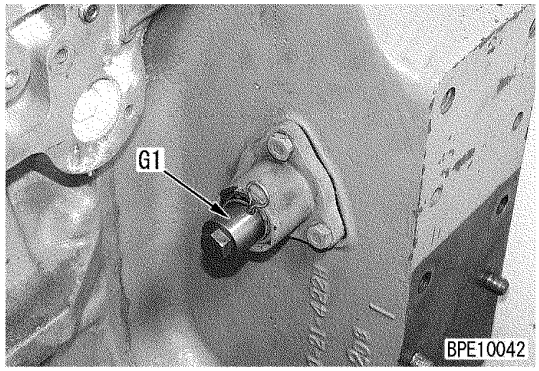


Tightening torque for the bolt (1): 9.8 ±1.0 Nm
(1.0 ± 0.1 kgm)

Fig. 6

ADJUSTING INJECTOR SET LOAD

1. Remove the cover of the flywheel housing, then install barring device **G1**.



2. Remove the cylinder head cover.

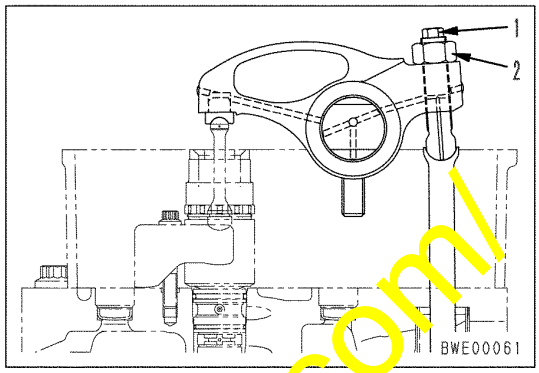
3. Using barring device **G1**, rotate the crankshaft in the normal direction to set No. 1 cylinder at compression top dead center, and align pointer **b** with the [1.6TOP] line **a** on the crankshaft pulley.
   - ★ Watch the movement of the rocker arm and check that the No. 1 cylinder is at the compression stroke. (If the rocker arms for both the intake and exhaust sides move only the amount of the valve clearance, the cylinder is at the compression stroke.)
   - ★ The cylinder where at compression top is different from the cylinder where the injector is being adjusted, so check the table below when carrying out the operation.
   - ★ Cylinder at compression top and cylinder for adjustment of injector

Compression top	1	5	3	6	2	4
Injector to adjust	2	4	1	5	3	6

4. Loosen lock nut (2), then fully loosen adjustment screw (1) of the injector to be adjusted, then tighten it by hand.
   - ★ Check that the socket at the tip of the rocker arm and the ball of the push rod are both fitted securely into the injector and push rod, respectively.

5. Tighten adjustment screw (1), repeat the loosening operation, then tighten finally.
   Adjustment screw:
   1st time : 29.4 – 34.3 Nm {3.0 – 3.5 kgm}
   2nd time : Loosen fully
   3rd time : 29.4 – 34.3 Nm {3.0 – 3.5 kgm}
   4th time : Loosen fully
   5th time : 29.4 – 34.3 Nm {3.0 – 3.5 kgm}

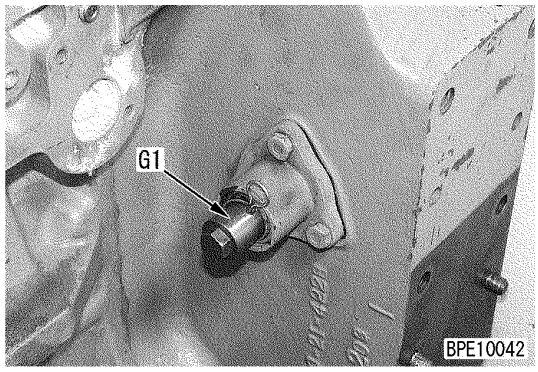
6. Hold adjustment screw (1) in position, then tighten locknut (2).
   Locknut: **205.8 – 245 Nm {21 – 25 kgm}**



7. After completing the adjustment, set to the original position.
   Cylinder head mounting bolt :
   9.8 ± 1.0 Nm {1 ± 0.1 kgm}

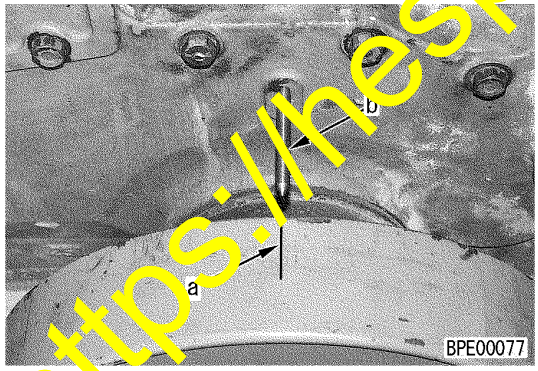
ADJUSTING VALVE CLEARANCE

1. Remove the cover of the flywheel housing, then install barring device **G1**.



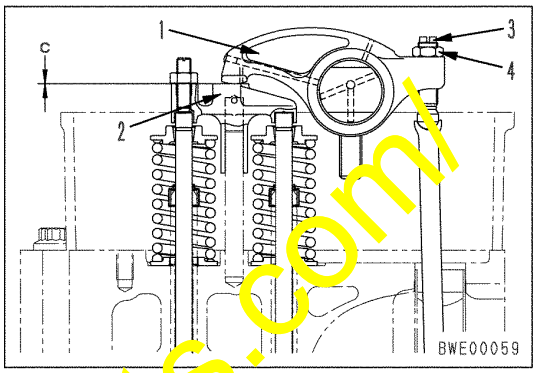
2. Remove the cylinder head cover.

3. Using barring device **G1**, rotate the crankshaft in the normal direction to set No. 1 cylinder at compression top dead center, and align pointer **b** with the [1.6TOP] line **a** on the crankshaft pulley.
   ★ At compression top dead center, the valve rocker arm can be moved by hand by the amount of the valve clearance. If the rocker arm does not move, the crankshaft is not at compression dead center, so rotate it one more turn.



4. To adjust the valve clearance, insert feeler gauge **G2** into clearance c between rocker arm (1) and crosshead (2), and adjust the valve clearance with adjustment screw (3).
   ★ Insert the feeler gauge and turn the adjustment screw until the clearance is a sliding fit.
   ★ Valve clearance
   Intake valve: 0.32 mm
   Exhaust valve: 0.62 mm

5. Tighten locknut (4) to hold adjustment screw (3) in position.
   Locknut :
   57.8 – 77.4 Nm {5.9 – 7.9 kgm}
   ★ After tightening the locknut, check the clearance again.



6. Turn the crankshaft 120° each time in the normal direction and repeat the procedure in Steps 3 to 5 to adjust the valves of each cylinder according to the firing order.
   Firing order : 1 – 5 – 3 – 6 – 2 – 4

7. After completing the measurement, set to the original condition.
   Cylinder head cover mounting bolt:
   9.8 ± 1.0 Nm {1 ± 0.1 kgm}

Check table for the serial numbers of main machine models applicable to this modification

No.	Applicable machine model	Serial No. of the engine		Serial No. of the machine	
		Engines in the field	Engines shipped with the modification completed	Machines in the field	Machines shipped with the modification completed
1	WA600-3A		#311590 ~	#52001 ~ #52131	#52132 ~
2	WA600-3D		#311590 ~	#53001 ~ #53054	#53055 ~
3	WA600-AC-3	~ #310648	From the next shipment	–	–
4	WA600-3		#311590 ~	#54001 ~ #54013	#54014 ~
5	WD600-3		#311590 ~	#50001 ~ #50012	#50013 ~
6	WA700-3		#311590 ~	#51001 ~ #51024	#51025 ~
7	HD465-7		#311590 ~	#7001 ~ #7269	#7270 ~
8	HD605-7		#311590 ~	#7001 ~ #7129	#7130 ~
9	D375A-5		#311590 ~	#18001 ~ #18254	#18255 ~
10	PC1250-7		#311590 ~	#20001 ~ #20169	#20170 ~
11	A6D170E-G1-3		#311327 ~		
12	A6D170E-KC		#311590 ~		
13	170CUM-PG3		#311590 ~		
14	170CUM-IND		#311590 ~		
15					
16					
17					
18					
19					
20					