Refer to page 5 thru

# PARTS & SERVICE

REF NO.	AK01018	
DATE	Nov 8, 2001	
(C)	Page 1 of 8	

SUBJECT: **IMPROVED CAM BUSHING ON 140-ENGINE** 

**PURPOSE:** To introduce improved cam bushings for the 140-type engines for easier

installation

**APPLICATION:** S(D)(A)A12V140-1 Engines, Serial Nos.

S(A)6D140-1 Engines, Serial Nos.

Engines, Serial Nos. S(A)(A)6D140E-2

S(A)(A)6D140E-3 Engines, Serial Nos.

All Serial Nos. of machine models (Refer to page 5 thru 8)

**FAILURE CODE:** A402Z9

## **DESCRIPTION:**

#### 1. Introduction

To prevent installation errors of the cam bushings being used for the 140-type engines, the shape of the oil holes has been changed into a stotled hole shape in the axial direc-

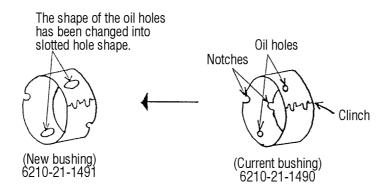
Since this modification cancels the directive character of the bushings in their press fitting direction, the possibility of installing the bushing in the reversed direction to cover the oil holes has been eliminated.

When replacing the cam bushings at time of overhauling of those engines, use those improved bushings following the instalkation procedures outlined in this Service News.

## 2. List of parts

Part No	Part Name	Q'ty	Remarks
6210-21-1 '91 (6217-21-1,90)	Bushing (Bushing)	14 (14)	For S(D)(A)A12V140
(6210-21-1491 (6210-21-1490)	Bushing (Bushing)	7 (7)	For S(A)(A)6D140

## 3. Contents of the modification



The shape of the oil holes has been changed into slotted hole shape in the axial direction. Since the oil holes of the current bushings are located at closer position to the ends of the bushing, if the bushings are installed in reversed direction, the oil holes in the cylinder block and the oil holes of the bushing do not match.

By this modification to change the shape of the oil holes into slowed hole shape, the directive character of the bushings in their press fitting directic has been eliminated, thus the installation errors of the cam bushings can be prevented.

## 4. Replacement procedures for the cam bushings

Refer to the Section "Replacement of cam bushing" in the Shop Manual.

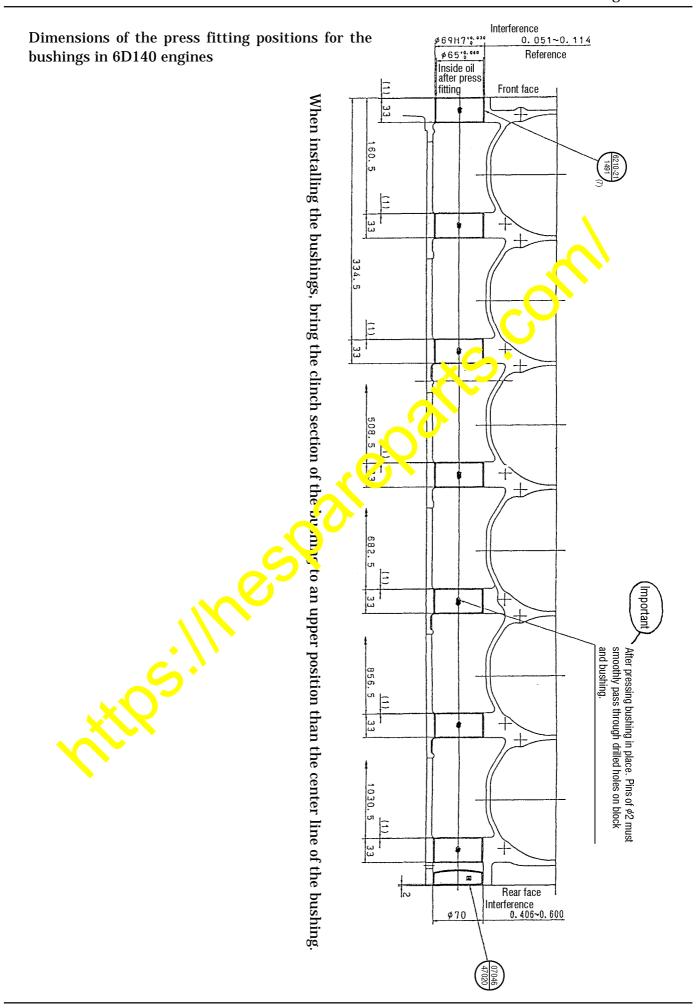
The replacement procedures and using special tools remain the same for those new bushings and the current bushings.

#### (Precautions)

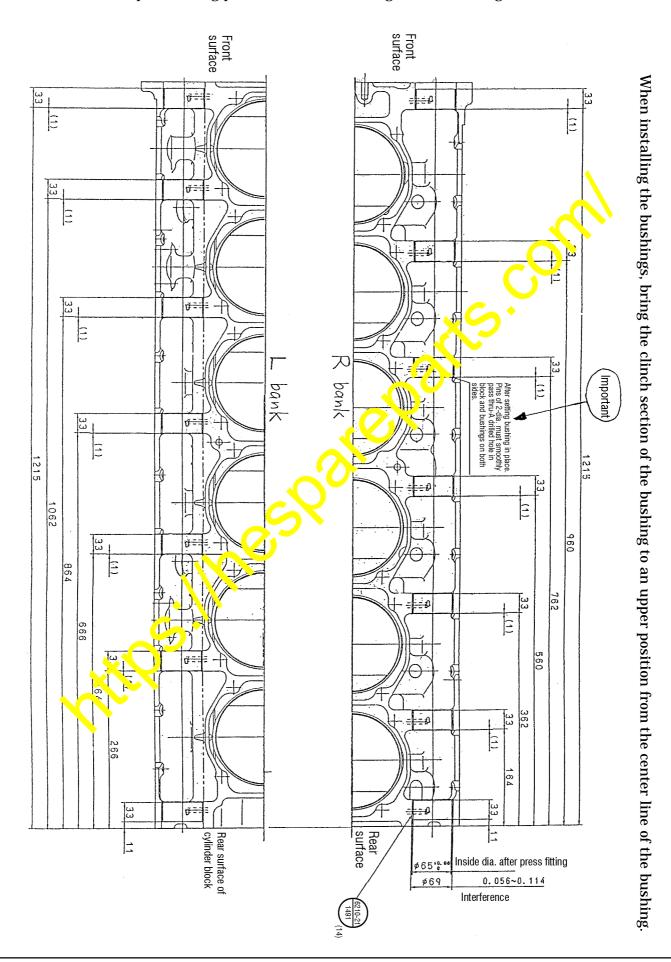
Before press-fitting each bushing, check the positions of the oil holes of the bushing if the drilled holes in the cylinder hock and the oil holes in the bushing are in alignment. Also, when installing the bushings, bring the clinch (joint) of the bushing to an upper position than the center line of the bushing.

After finishing installation of the bushings, make sure that a  $\phi 2$  mm diameter pin can pass through the upper and lower oil holes in the busing and the mating drilled holes in the cylinder block smoothly.

As a reference, the press fitting position in the axial direction of the bushings is being shown her catter. Next page and after.)



# Dimensions of the press fitting positions for the bushings in 12V140 engines



5. Table of the serial numbers of machines and engines this modification to apply.

# 1) 6D140 engines

No.	Applicable machine and	Serial numbers of the applicable engines		Serial numbers of the applicable machines	
INU.	engine models	Already shipped out of the factory	Modification already made at the factory	Already shipped out of the factory	Modification already made at the factory
1	HD325-6	- #28710	From the next	- #5960	From the next
2	HD405-6	- #28799	production	- #1186	∫ production
3	GS360-2	- #28934	#28966 -	- #12079	#12 <mark>0</mark> 80 –
4	GC380F-2	<b>- #28769</b>	#29204 -	- #12061	# <mark>7276</mark> ? –
5	GD825A-2	- #28721	#29069 -	- #12098	#13099 -
6	D155A-2A	- #28963	#28988 -	- #57064 <b>(</b>	#37065 -
7	D155AX-5	- #28914	#28953 -	- #7029 <mark>7</mark>	#70300 –
8	WA500-3	- #28939	#28967 -	- #50952	#50953 -
9	LW500-1	- #28722	#29010 -	15037	#10038 -
10	PC750 (SE, LC)-6	- #28956	#28957 –	- 110345	#10346 -
11	PC750SE-6-KUK	- #28956	#28957 –	)\36\355~K30125	K30126 -
12	PC800 (SE, LC)-6	- #28956	#28957 –	- #30251	#30252 -
13	PC1600 (SP)-1	- #28727	#28994 -	- #10127	#10128 -
14	PC1800-6	- #28964	#29143	- #10010	#10011 -
15	EG300BS-5	<b>- #77383</b>	From the next pr	oduction	
16	J6D140E-G1-2	- #70022	<del>"</del> 7(0%3 –		
17	J6D140E-GD-2	- #28870	V		
18	S6D140-G1-1	- #27230	From the next		
19	S6D140-G2-1	- #285 94	production		
20	S6D140-G3-1	- 14533	J		
21	S6D140-GD-1	- #28216	#29189 -		
22	S6D140-GH-1	· #26744	]		
23	S6D140-GN-1	- #22496	From the next		
24	S6D149-F 1	- #22031	production		
25	S6D1_0-r CA 1	- #27965	j		
26	5.16D14u-A2-1	- #28926	#29173 -		
27	SA6.7140A-G1-1	- #28112	#29236 -		
28	SA6D140A-G2-1	- #28927	#28996 -		
29	SA6D140A-G3-1	- #28685	#29207 -		
30	SA6D140A-GH-1	- #21611	From the next pr	oduction /	
31	SA6D140A-GN-1	- #27934	#29276 -	/	
32	SA6D140B-G1-1	- #28614	#29308 -		
33	SA6D140B-G2-1	- #28405	#29319 -		
34	SA6D140B-G3-1	- #22039	From the next		
35	SA6D140B-GN-1	- #26449	production		
36	SA6D140-C2-1	- #28929	#29004 -		

No.	Applicable machine and engine models	Serial numbers of the applicable engines		Serial numbers of the applicable machines	
INO.		Already shipped out of the factory	Modification already made at the factory	Already shipped out of the factory	Modification already made at the factory
37	SA6D140H-GJ-1	- #27904			
38	SA6D140H-R-1	- #28816	From the next production -		
39	SA6D140-W1-1	- #25688	production		
40	SAA6D140-G1-1	- #28874	#29005 -		
41	SAA6D140-G3-1	- #28933	#29061 -		
42	T6D140E-W2-2	- #24724			
43	6M-132A-1	- #21659	_		
44	6M-132A-2	- #22250	From the next production		
45	6M-132A-3	- #10063	production		
46	6M140A-1	- #23374	J		)
47	6M140A-2	- #22281	#22282 -		
48	6M140A-3	- #10187	]	X	
49	6M140B-2	- #22276	From the next		
50	6M137A-1	- #10096	production		
51	6M137B-1	- #10019			
52	SA6D140A-M-1	- #28906	#29002 -		

# 2) 12V140 engines

Modification Almost Modification Modification	No.		Serial numbers of the applicable engines		Serial numbers of the applicable machines	
HD785-3	110.			already made at		Modification already made at the factory
3   HD785-5	1	HD785-2	- #12773		- #1942	#1943 –
4 HD985-3       -#12454       #12867 - #1020       #1021 - #1031 - #1031 - #1074 - #1073         5 HD985-5       -#12794       #12799 - #1053       #10 4 - #1053         6 HV700-2       -#10815       From the next production       -#10719       #10720 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10738 - #10734 - #10738 - #10734 - #10738 - #10734 - #10738 - #10734 - #10738 - #10734 - #10738 - #10734 - #10738 - #10704 - #10734 - #10738 - #10704 - #10734 - #10738 - #10704 - #10734 - #10738 - #10704 - #10734 - #10734 - #10738 - #10704 -	2	HD785-3	- #12454	#12867 -	- #2574	#2575 –
The first of the content of the co	3	HD785-5	- #12794	#12797 –	- #4194	#4195 –
6 HV700-2       -#10815         7 WA800-1       -#12732         8 WA800-2       -#12732         9 WA800-3       -#12760       #12890 -       -#50022       #50023 -         10 WA900-1       -#12721       From the next production       #10703       #10704 -         11 WA900-3       -#12795       #12924 -       #50017       #50018 -         12 WD900-3       -#12795       #12924 -       -#50005       #50006 -         14 D475A-2       -#12546       -#10466       #10467 -       -#10466       #10467 -         15 EG750A-L-1       -#11041       -#1041       -#10680       #10681 -       -#10680       #10681 -         16 EG750B-L-1       -#11041       -#1041       -#10680       #10681 -       -#10680       #10681 -         19 SA12V140-G3-1       -#12823       #12884 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680       #10681 -       -#10680	4	HD985-3	- #12454	#12867 -	- #1020	#10 <mark>21</mark> –
To   WA800-1	5	HD985-5	- #12794	#12799 –	- #1053	#1054 -
7   WAS00-1	6	HV700-2	- #10815	]		
8 WA800-2       -#12732       -#10733       #10738 -         9 WA800-3       -#12760       #12890 -       -#50022       #50023 -         10 WA900-1       -#12721       From the next production       #10704 -         11 WA900-3       -#12795       #12924 -       #50017       #50018 -         12 WD900-3       -#12795       #12924 -       -#50005       #50006 -         13 D475A-2       -#12546       -#10466       #10467 -         14 D475A-3       -#12746       From the path of the path	7	WA800-1	- #12732	\$	<b>- #10719</b>	#10720 -
10   WA900-1	8	WA800-2	- #12732	production	- #1073 <mark>/</mark>	#10738 –
10   WA900-1	9	WA800-3	- #12760	#12890 -	- #50022	#50023 -
12   WD900-3	10	WA900-1	- #12721		#10703	#10704 -
13 D475A-2	11	WA900-3	- #12795	#12924 -	#50017	#50018 -
14   D475A-3	12	WD900-3	- #12795	#12924 -	<b>-</b> #50005	#50006 -
15   EG750A-L-1	13	D475A-2	- #12546		- #10466	#10467 -
15   EG750A-L-1	14	D475A-3	- #12746	From the pext	- #10680	#10681 -
17   A12V140-G3-1	15	EG750A-L-1	- #11041			/
18 EPSA12V140-1 -#10594  19 SA12V140-1 -#12;45  20 SA12V140-A2-1 -/11,32   production  21 SA12V140-G2-1 -#12823    22 SA12V140-G1-1 -#12789   #12821 -  23 SA12V140-G2-1 -#11256   From the next    25 SA12V140-G3-1 -#11256   From the next    25 SA12V140-G-1 -#11041   production  26 SA12V1-0-G0-1 -#12786   #12879 -  27 SA12V140-GH-1 -#12789   #12821 -  28 SA12V140-GT-1 -#12635   #12853 -  29 SA12V140-F1 -#12790   #12855 -  30 SA12V140-W1-1 -#12773   From the next production  31 J12V140E-G1-1 -#60015   #60016 -  32 J12V140E-GD-1 -#12770    33 J12V140E-GE-1    34 J12V140-WJK-1 -#12646   From the next    34 J12V140-WJK-1 -#12646   From the next    36 From the next    37 From the next    38 From the next    39 From the next    30 From the next    30 From the next    31 From the next    32 From the next    33 J12V140E-GE-1    34 J12V140-WJK-1 -#12646   From the next    34 J12V140-WJK-1 -#12646   From the next    35 From the next    36 From the next    37 From the next    38 From the next    39 From the next    30 From the next    30 From the next    31 From the next    32 From the next    33 From the next    34 From the next    35 From the next    36 From the next    37 From the next    38 From the next    39 From the next    40 From the next    40 From the next    41 From the next    41 From the next    42 From the next    43 From the next    44 From the next    45 From the next    46 From the next    47 From the next    47 From the next    48 From the next    49 From the next    49 From the next    40 From the next    41 From the next    41 From the next    42 From the next    43 From the next    44 From the next    45 From the next    46 From the next    47 From the next    47 From the next    48 From the next    49 From the next    40 From	16	EG750B-L-1	- #11041			
19   SA12V140-1	17	A12V140-G3-1	- #12823	#12884 -		
20   SA12V140-A2-1   - #11.32	18	EPSA12V140-1	- #10594			
20   SA12V140-A2-1	19	SA12V140-1	- #12!45	From the next		
22   SA12V140-G1-1	20	SA12V140-A2-1	- 11132			
23 SA12V140-G2.1 - #12789 #12821 -  24 SA12V14C-G3.1 - #11256 From the next  25 SA12V14O-C.A-1 - #11041 production  26 CA12V1:O-GD-1 - #12786 #12879 -  27 SA12V140-GH-1 - #12789 #12821 -  28 SA12V140-GT-1 - #12635 #12853 -  29 SA12V140-P-1 - #12790 #12855 -  30 SA12V140-W1-1 - #12773 From the next production  31 J12V140E-G1-1 - #60015 #60016 -  32 J12V140E-GD-1 - #12770  33 J12V140E-GE-1 From the next production  34 J12V140-WJK-1 - #12646 production	21	SA12V140-C2-1	- #11823	j		
24 SA12V14C-G3 1       -#11256       From the next production         25 SA12V14O-GA-1       -#11041       production         26 SA12V1-O-GD-1       -#12786       #12879 -         27 SA12V14O-GH-1       -#12789       #12821 -         28 SA12V14O-GT-1       -#12635       #12853 -         29 SA12V14O-P-1       -#12790       #12855 -         30 SA12V14O-W1-1       -#12773       From the next production         31 J12V14OE-G1-1       -#60015       #60016 -         32 J12V14OE-GD-1       -#12770       -#12770         33 J12V14OE-GE-1	22	SA12V140-G1-1	- #12790	#12855 -		
25 SA12V14Q-GA-1 - #11041   production   26 SA12V1-D-GD-1 - #12786   #12879 -   27 SA12V140-GH-1 - #12789   #12821 -   28 SA12V140-GT-1 - #12635   #12853 -   29 SA12V140-P-1 - #12770   #12855 -   30 SA12V140-W1-1 - #12773   From the next production   31 J12V140E-G1-1 - #60015   #60016 -   32 J12V140E-GD-1 - #12770   33 J12V140E-GE-1   From the next   34 J12V140-WJK-1 - #12646   production	23	SA12V140-G2	- #12789	#12821 -		
26 CA12V1-30-GD-1 - #12786 #12879 -  27 SA12V140-GH-1 - #12789 #12821 -  28 SA12V140-GT-1 - #12635 #12853 -  29 SA12V140-P-1 - #12770 #12875    30 SA12V140E-G1-1 - #60015 #60016 -  32 J12V140E-GD-1 - #12770    33 J12V140E-GE-1    34 J12V140-WJK-1 - #12646    From the next production    From the next production    From the next production	24	SA12V14(-G3-1	- #11256	From the next		
27 SA12V140-GH-1       -#12789       #12821 -         28 SA12V140-GT-1       -#12635       #12853 -         29 SA12V140-P-1       -#12790       #12855 -         30 SA12V140-W1-1       -#12773       From the next production         31 J12V140E-G1-1       -#60015       #60016 -         32 J12V140E-GD-1       -#12770                 33 J12V140E-GE-1       -                 34 J12V140-WJK-1       -#12646	25	SA12V149-64-1	- #11041	production		
28 SA12V140-GT-1 - #12635 #12853 -  29 SA12V140-P-1 - #12790 #12855 -  30 SA12V140-W1-1 - #12773 From the next production  31 J12V140E-G1-1 - #60015 #60016 -  32 J12V140E-GD-1 - #12770  33 J12V140E-GE-1 -  34 J12V140-WJK-1 - #12646 From the next production	26	SA12V1-10-GD-1	- #12786	#12879 -		
29 SA12V140-P-1       -#12790       #12855 -         30 SA12V140-W1-1       -#12773       From the next production         31 J12V140E-G1-1       -#60015       #60016 -         32 J12V140E-GD-1       -#12770       -         33 J12V140E-GE-1	27	SA12V140-GH-1	- #12789	#12821 -		
30       SA12V140-W1-1       -#12773       From the next production         31       J12V140E-G1-1       -#60015       #60016 -         32       J12V140E-GD-1       -#12770         33       J12V140E-GE-1       -         34       J12V140-WJK-1       -#12646    From the next production	28	SA12V140-GT-1	- #12635	#12853 -		
31 J12V140E-G1-1 - #60015 #60016 -  32 J12V140E-GD-1 - #12770  33 J12V140E-GE-1 - From the next production	29	SA12V140-P-1	- #12790	#12855 -		
32 J12V140E-GD-1 - #12770 33 J12V140E-GE-1 - From the next production	30	SA12V140-W1-1	- #12773	From the next pr	oduction	
33 J12V140E-GE-1 — From the next production From the next production	31	J12V140E-G1-1	- #60015	#60016 -		
34 J12V140-WJK-1 – #12646 production	32	J12V140E-GD-1	- #12770	]		
34 J12V140-WJK-1 - #12646 production	33	J12V140E-GE-1	_	From the next		
35 SA12V140-M-1 - #10765	34	J12V140-WJK-1	- #12646			
	35	SA12V140-M-1	- #10765	j		
36 12M140A-1 -#11070 #11071 -	36	12M140A-1	- #11070	#11071 -		

# 3) 6D140E-3

Applicable No. machine and		Serial numbers of the applicable engines		Serial numbers of the applicable machines	
INU.	engine models	Already shipped out of the factory	Modification already made at the factory	Already shipped out of the factory	Modification already made at the factory
1	HD325-6-EE	- #110063	#110110 -	- #2007	#2008 -
2	HD405-6-EE	- #110071	#110089 -	- #6009	#6010 -
3	PC600-6	- #110073	#110082 -	- #11016	#11017 -
4	PC650-6	- #110072	#110076 -	- #31005	#31006 -
5	D155AX-5A	- #110069	#110085 -	- #75011	#75012
6	HM400	- #110029	#110238 -	- #1003	#1005 -