

**PARTS & SERVICE  
NEWS**

REF NO.	<b>A950181A</b>
DATE	<b>Mar. 14, 1996</b>

Page 1 of 11

This PARTS & SERVICE NEWS supersedes the previous issue No. A950181 dated Oct. 25, 1995, which should be discarded.

**SUBJECT:** INTAKE VALVE REPAIR ON S(A)6D170

**PURPOSE:** To introduce modification procedures for the intake valve of S(A)6D170 engines.

- \* **APPLICATION:**
- D375A-2 Bulldozers, Engines Serial Nos. up to 17528
  - WA700-1 Wheel Loaders, Engines Serial Nos. up to 17590
  - HD465-5 Dump Trucks, Engines Serial Nos. up to 17307
  - PC1000-1 Hydraulic Excavators, Serial Nos. up to 17496
  - SA6D170A-G3-1 Engines Serial Nos. up to 17582
  - SA6D170A-GD-1 Engines Serial Nos. up to 17522
  - SA6D170A-GH-1 Engines Serial Nos. up to 17527
  - SA6D170A-P-1 Engines Serial Nos. up to 17531
  - SA6D170B-G2-1 Engines Serial Nos. up to 17546
  - SA6D170B-GD-1 Engines Serial Nos. up to 17498
  - SA6D170B-GH-1 Engines Serial Nos. up to 17587
  - SA6D170B-R-1 Engines Serial Nos. up to 17560
  - SA6D170B-TA Engines Serial Nos. up to 17559
  - SAA6D170-G3-1 Engines Serial Nos. up to 17543
  - 6M160A-1 Marine Engines Serial Nos. up to 17118
  - 6M170B-1 Marine Engines Serial Nos. up to 16846

**DESCRIPTION:**

## 1. Introduction

When the intake valve face has been melted through, and when replacing parts for repair, implement the modifications introduced in this SERVICE NEWS following the procedures.

## 2. List of necessary parts

Relevant parts of the cylinder head ass'y (Common with all models)

Per 1 unit of the engine

Part No.	Part Name	Q'ty	Purpose of parts	Applicable models
6162-13-1103 (6162-13-1102)	Cylinder head ass'y (Cylinder head ass'y)	6 (6)	Replacement	S(A)6D170 Replacement IN-TAKE VALVE seat
6162-13-1192 (6162-13-1191)	Cylinder head ass'y (Cylinder head ass'y)	6 (6)		6M160A Replacement IN-TAKE VALVE seat

Per a unit of cylinder head  
Special sintering finish

Part No.	Part Name	Q'ty	Purpose of parts	Applicable models	
6162-15-1370 (6162-13-1330)	Insert (Insert)	2 (2)	Replacement	STD	
6162-19-1370 (6162-19-1330)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.25 mm	For $\phi$ 170
6162-18-1370 (6162-18-1330)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.50 mm	
6162-17-1370 (6162-17-1330)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.75 mm	
6162-13-1351 (6162-13-1350)	Insert (Insert)	2 (2)		STD	6M160A
6162-19-1351 (6162-19-1350)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.25 mm	
6162-18-1351 (6162-18-1350)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.50 mm	
6162-17-1351 (6162-17-1350)	Insert (Insert)	2 (2)		Exclusive spare parts Over-sized parts 0.75 mm	

List of necessary parts (Relevant parts of the mechanical pump)  
(D275A, D375A, PC1000 and HD465-3)

Part No.	Part Name	Q'ty	Purpose of parts	Remarks
6162-23-3960	Plate	1	Addition	Using quantity has been changed
6162-23-3970	Gasket	1		
6110-73-6231	Plug	1		
07043-70108	Plug	2		
07005-00812	Gasket	1		
01010-81016	Bolt	2		
(6162-53-2101)	(Mech. pump ass'y)	(1)	Disused	
(MK-2M-36E-215)	(O-ring)	(1)		
(6162-53-1750)	(Tube)	(1)		
(6162-53-1860)	(Tube)	(1)		
(6162-53-1840)	(Tube)	(1)		
(6130-71-5351)	(Bolt)	(4)	Rework	
07005-00812 (07005-00812)	Gasket (Gasket)	1 (8)		
(6162-53-1820)	(Tube)	(2)	Disused	
(6162-53-1710)	(Elbow)	(2)		
(6127-81-4420)	(Clip)	(3)		
(6162-53-1850)	(Plate)	(1)		
(6162-53-1830)	(Plate)	(2)		
(6127-81-4350)	(Clamp)	(4)		
(6127-81-4360)	(Clamp)	(4)		
(01016-20412)	(Bolt)	(4)		
(01601-00410)	(Washer)	(4)		

List of necessary parts (Relevant parts of the mechanical pump)  
(HD465-5, WA700, WA600 and WD600)

Part No.	Part Name	Q'ty	Purpose of parts	Remarks
6162-23-3960	Plate	1	Addition	Using quantity has been changed.
6162-23-3970	Gasket	1		
6110-73-6231	Plug	1		
07043-70108	Plug	2		
07005-00812	Gasket	1		
01010-81016	Bolt	2		
(6162-53-2101)	(Mech. pump ass'y)	(1)	Disused	
(MK-2M-36E-215)	(O-ring)	(1)		
(6162-53-1750)	(Tube)	(1)		
(6162-53-1860)	(Tube)	(1)		
(6162-53-1840)	(Tube)	(1)		
(6130-71-5351)	(Bolt)	(4)	Rework	
07005-00812 (07005-00812)	Gasket (Gasket)	1 (8)		
(6162-53-1820)	(Tube)	(1)	Disused	
(6162-53-1710)	(Elbow)	(2)		
(6127-81-4420)	(Clip)	(3)		
(6162-53-1850)	(Plate)	(1)		
(175-79-33240)	(Spacer)	(1)		
(01010-31240)	(Bolt)	(1)		
(01602-01236)	(Washer)	(1)		
(6162-53-1830)	(Plate)	(2)		
(6127-81-4350)	(Clamp)	(4)		
(6127-81-4360)	(Clamp)	(4)		
(01016-20412)	(Bolt)	(4)		
(01601-00410)	(Washer)	(4)		

List of necessary parts (Relevant parts of the mechanical pump)  
(EG parts)

Part No.	Part Name	Q'ty	Purpose of parts	Remarks
6162-23-3960	Plate	1	} Addition	Using quantity has been changed
6162-23-3970	Gasket	1		
6110-73-6231	Plug	1		
07043-70108	Plug	2		
07005-00812	Gasket	1		
01010-81016	Bolt	2		
(6162-53-2101)	(Mech. pump ass'y)	(1)	} Disused	
(MK-2M-36E-215)	(O-ring)	(1)		
(6162-53-1750)	(Tube)	(1)		
(6162-53-1860)	(Tube)	(1)		
(6162-53-1840)	(Tube)	(1)	} Rework	
(6130-71-5351)	(Bolt)	(4)		
07005-00812	Gasket	1	} Rework	
(07005-00812)	(Gasket)	(3)		
(6162-53-1820)	(Tube)	(2)	} Disused	
(6162-53-1710)	(Elbow)	(2)		
(6127-81-4420)	(Clip)	(3)		
(6162-53-1850)	(Plate)	(1)		
(175-79-33240)	(Spacer)	(1)		
(01010-31240)	(Bolt)	(1)		
(01602-C-236)	(Washer)	(1)		
(6162-53-1330)	(Plate)	(2)		
(6127-81-4350)	(Clamp)	(4)		
(6127-81-4360)	(Clamp)	(4)		
(01016-20412)	(Bolt)	(4)		
(01601-00410)	(Washer)	(4)		

List of necessary parts (Relevant parts of the mechanical pump)  
(6M170B and 6M160A)

Part No.	Part Name	Q'ty	Purpose of parts	Remarks
6162-23-3960	Plate	1	Addition	Quantity of parts is changed.
6162-23-3970	Gasket	1		
6110-73-6231	Plug	1		
07043-70108	Plug	2		
07005-00812	Gasket	1		
01010-81016	Bolt	2		
(6162-53-2101)	(Mech. pump ass'y)	(1)	Disused	
(MK-2M-36E-215)	(O-ring)	(1)		
(6162-53-1750)	(Tube)	(1)		
(6162-53-1840)	(Tube)	(1)		
(6162-53-1860)	(Tube)	(1)		
(6162-53-1820)	(Tube)	(1)	Fework	
(6130-71-5351)	(Bolt)	(4)		
07005-00812	Gasket	1		
(07005-00812)	(Gasket)	(5)		
(6162-53-1710)	(Elbow)	(2)		
(6127-81-4420)	(Clip)	(3)		
(6162-53-1830)	(Plate)	(2)		
(6127-81-4350)	(Clamp)	(4)		
(6127-81-4360)	(Clamp)	(4)		
(01016-20412)	(Bolt)	(4)		
(01601-00410)	(Washer)	(4)		
(6162-53-1830)	(Plate)	(1)		
(175-79-33240)	(Spacer)	(1)		
(01010-51240)	(Bolt)	(1)		
(01602-21236)	(Washer)	(1)		


### 3. Contents of the modification

- (1) With engines in which the intake valve section is lubricated by a mechanical pump, the intake valve face may be melted through by excessive temperature rise caused by unstable oil feed or by overheating (due to high ambient temperature). To prevent this trouble, the material quality of the intake side inserts has been improved (abrasion resistance has been enhanced) to such a level that the inserts maintain sufficient durability even if use of the mechanical pump is discontinued and the mechanical pump is now being disused.

Table 1 Contents of the modification

	New	Current
Part numbers	6162-15-1370 (6162-13-1351)	6162-13-1330 (6162-13-1350)
Materials	Special sintered alloy	Marter site heat resistant alloy
Identification method ※ (Exclusive spare assembly only)	Part number and size are stamped on the outside surface.	Part number and size are stamped on the outside surface.

※ When using standard inserts (See page 2) as the spare parts, check the part number on their package since they are not provided with identification markings.

- (2) To identify the new cylinder head ass'y  
Those cylinder head assemblies with which a punching reading "BB" is being provided at the location marked  on the upper surface carries the improved inserts. (Punching of the current cylinder head assembly reads "AA".)

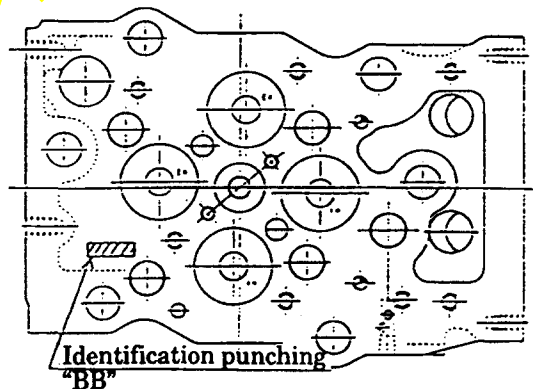


Fig. 1 Location of the identification marking on the cylinder head ass'y

#### 4. Modification procedures

##### 4-(1) Replacing the cylinder head

- 1) Remove the cylinder head assembly referring to the Shop Manual for respective machines or vehicles.
- 2) Install the improved cylinder head assembly referring to the Shop Manual.  
When replacing the inserts only at such occasions as overhauling, refer to the Shop Manual regarding the replacement procedures.  
Meanwhile, when doing this, replace the intake valve with a new one.
- 3) When making this modification, replace consumable parts such as O-rings and gaskets.

4-(2) Discontinuing use of the mechanical pump ass'y  
 [Applicable models: D275A, D375A, PC1000 and HD465-3]

When discontinuing the use of the mechanical pump ass'y, remove the unnecessary parts listed in Table 2-1, since they will become unnecessary.  
 When re-assembling the engine, install the parts listed in Table 2-2.

Note) Parts marked  $\Delta$  in Table 2-1 are unnecessary parts.  
 Quantity of the parts marked  $\star$  in Table 2-1 is changed as indicated.  
 Part code is common in Fig. 2, Table 2-1 and Table 2-2.

Table 2-1

No.	Part No.	Description	Q'ty	No.	Part No.	Description	Q'ty
$\Delta$ 1	6162-53-2101	Mechanical pump ass'y	1	$\Delta$ 18	6162-53-1850	Plate	1
$\Delta$ 2	MK-2M-36E-215	O-ring (K2)	1	19	(01010-31240)	Bolt, (see Fig. 0515)	1
$\Delta$ 3	01010-30616	Bolt	2	20	(01602-01236)	Washer, Spring (see Fig. 0515)	1
$\Delta$ 4	01602-00619	Washer, Spring	2	$\Delta$ 21	6162-53-1830	Plate	2
$\Delta$ 5	6162-53-1750	Tube	1	22	6162-13-4860	Washer	2
$\Delta$ 6	6162-53-1860	Tube	1	23	(01011-31005)	Bolt, (see Fig. 0131)	2
$\Delta$ 7	6162-53-1840	Tube	1	24	(01602-01030)	Washer, Spring (see Fig. 0131)	2
$\Delta$ 8	6130-71-5351	Bolt, Joint	4	25	(01640-21016)	Washer, (see Fig. 0131)	2
$\star$ 9	07005-00812	Gasket (K2)	1 $\leftarrow$ 8	$\Delta$ 26	6127-81-4350	Clamp	1
$\Delta$ 10	6162-53-1820	Tube	1	$\Delta$ 27	6127-81-4360	Clamp	1
$\Delta$ 11	6162-53-1710	Elbow	2	$\Delta$ 28	01016-20412	Bolt	4
$\Delta$ 12	6127-81-4420	Clip	3	$\Delta$ 29	01601-00410	Washer, Spring	4
13	560-43-15220	Washer	1				
14	6134-11-5120	Spacer	2				
15	(01011-31040)	Bolt, (see Fig. 0131)	2				
16	(01602-01030)	Washer, Spring (see Fig. 0131)	2				
17	(01640-21016)	Washer, (see Fig. 0131)	2				

When re-assembling the engine, prepare and install the parts listed in Table 2-2.  
 [Applicable models: D275A, D375A, PC1000 and HD465-3]

Table 2-2 List of parts to be additionally installed when discontinuing use of the mechanical pump ass'y

Codes	Part names	Part numbers	Q'ty	Remarks
A	Plate	6162-23-3960	1	
E	Bolt	01010-81016	2	Tightening torque: 8.8 - 14.7Nm (0.9 - 1.5kgm)
D	Gasket	6162-23-3970	1	
B	Plug	6110-73-6231	1	Tightening torque: 14.7 - 34Nm (1.5 - 3.5kgm)
9	Gasket	07005-00812	1	Apply to the air intake manifold mounting face.
C	Plug	07043-70108	2	Tightening torque: 2.0 - 3.9Nm (0.2 - 0.4kgm)

• Re-use parts coded 13 through 17, 19 through 20 and 22 through 25 as they are.

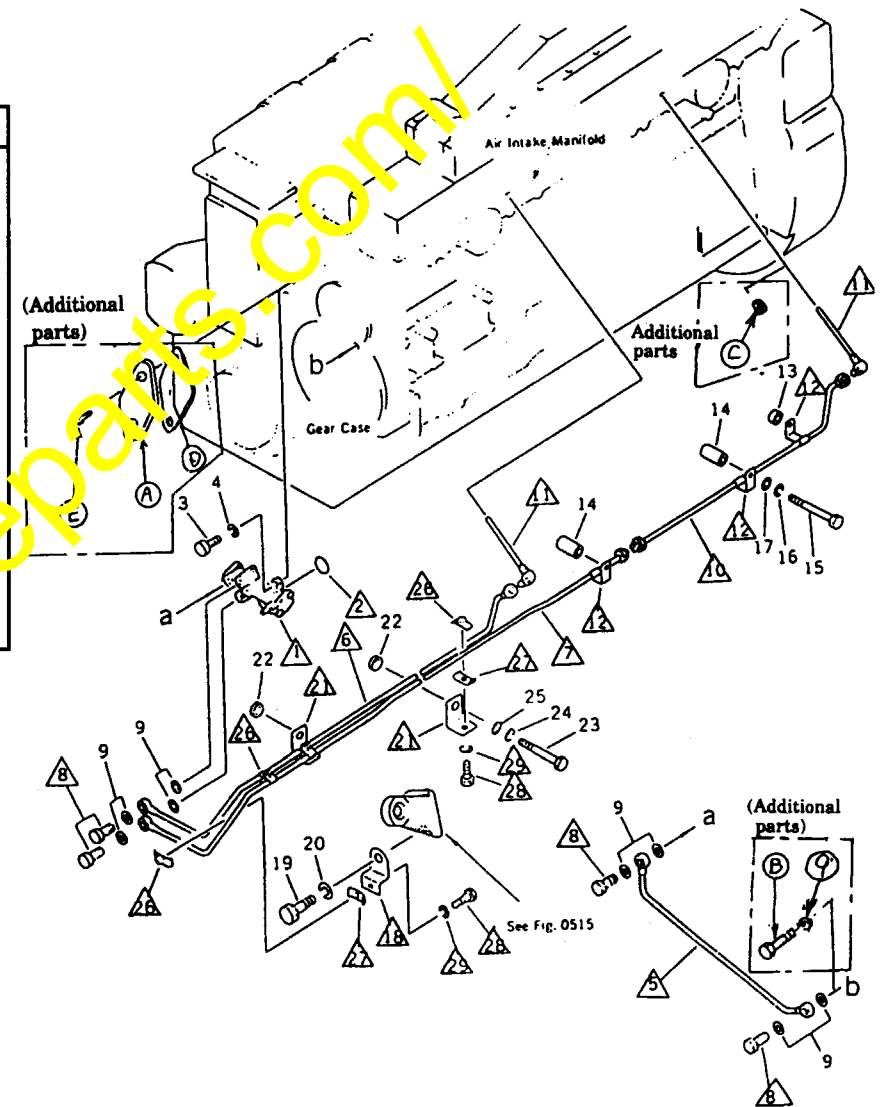


Fig. 2 Mechanical pump and piping



[Applicable models: HD465-5, WA700, WA600, WD600]

When discontinuing the use of the mechanical pump ass'y, remove the unnecessary parts listed in Table 3-1, since they will become unnecessary.

When re-assembling the engine, install the parts listed in Table 3-2.

Note) Parts marked  $\Delta$  in Table 3-1 are unnecessary parts.

Quantity of the parts marked  $\star$  in Table 3-1 is changed as indicated.

Part code is common in Fig. 3, Table 3-1 and Table 3-2.

Table 3-1

No.	Part No.	Description	Q'ty	No.	Part No.	Description	Q'ty
$\Delta$ 1	6162-53-2101	Mechanical pump ass'y	1	$\Delta$ 18	6162-53-1830	Plate	2
$\Delta$ 2	MK-2M-36E-215	O-ring (K2)	1	19	6162-13-4860	Washer	2
$\Delta$ 3	01010-30616	Bolt	2	$\Delta$ 20	6127-81-4350	Clamp	4
$\Delta$ 4	01602-00619	Washer, Spring	2	$\Delta$ 21	6127-81-4360	Clamp	4
$\Delta$ 5	6162-53-1750	Tube	1	$\Delta$ 22	01016-20412	Bolt	4
$\Delta$ 6	6162-53-1860	Tube	1	$\Delta$ 23	01601-00410	Washer, Spring	4
$\Delta$ 7	6162-53-1840	Tube	1				
$\Delta$ 8	6130-71-5351	Bolt, Joint	4				
$\star$ 9	07005-00812	Gasket (K2)	1-8				
$\Delta$ 10	6162-53-1820	Tube	1				
$\Delta$ 11	6162-53-1710	Elbow	2				
$\Delta$ 12	6127-81-4420	Clip	3				
13	560-43-15220	Washer	3				
$\Delta$ 14	6162-53-1850	Plate	1				
$\Delta$ 15	175-79-33240	Spacer	1				
$\Delta$ 16	01010-31240	Bolt	1				
$\Delta$ 17	01602-01236	Washer, Spring	1				

When re-assembling the engine, prepare and install the parts listed in Table 3-2.

[Applicable models: HD465-5, WA700, WA600, WD600]

Table 3-2 List of parts to be additionally installed when discontinuing use of the mechanical pump ass'y

Codes	Part names	Part numbers	Q'ty	Remarks
A	Plate	6162-23-3960	1	
E	Bolt	01010-81016	2	Tightening torque: 8.8 - 14.7Nm (0.9 - 1.5kgm)
D	Gasket	6162-23-3970	1	
B	Plug	6110-73-6231	1	Tightening torque: 14.7 - 34Nm (1.5 - 3.5kgm)
9	Gasket	07005-00812	1	Apply to the air intake manifold mounting face.
C	Plug	07043-70108	2	Tightening torque: 2.0 - 3.9Nm (0.2 - 0.4kgm)

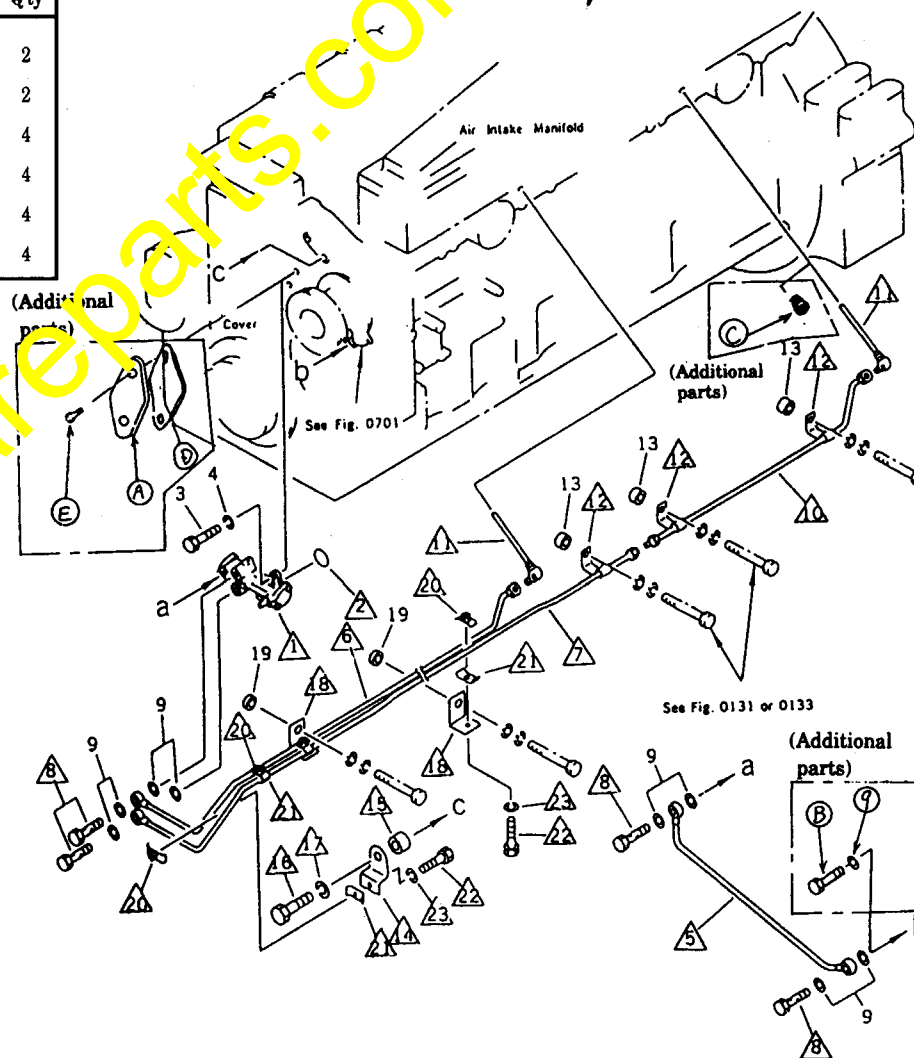


Fig. 3 Mechanical pump and piping

[ Applicable models: EG ]

When discontinuing the use of the mechanical pump ass'y, remove the unnecessary parts listed in Table 4-1, since they will become unnecessary.  
When re-assembling the engine, install the parts listed in Table 4-2.

Note) Parts marked  $\Delta$  in Table 4-1 are unnecessary parts.  
Quantity of the parts marked  $\star$  in Table 4-1 is changed as indicated.  
Part code is common in Fig. 4, Table 4-1 and Table 4-2.

**Table 4-1**

No.	Part No.	Description	Q'ty	No.	Part No.	Description	Q'ty
$\Delta$ 1	6162-53-2101	Mechanical pump ass'y	1	17A	(01640-21016)	Washer	3
	6162-53-2100	Mecahnical pump ass'y	1	$\Delta$ 18	6162-53-1850	Plate	1
$\Delta$ 2	MK-2M-36E-215	O-ring (K2)	1	$\Delta$ 19	615-79-33240	Spacer	1
$\Delta$ 3	01010-30616	Bolt	2	$\Delta$ 20	01010-31240	Bolt	1
$\Delta$ 4	01602-00619	Washer, Spring	2	$\Delta$ 21	01602-01236	Washer, Spring	1
$\Delta$ 5	6162-53-1750	Tube	1	$\Delta$ 22	6162-53-1830	Plate	2
$\Delta$ 6	6162-53-1860	Tube	1	23	6162-13-4860	Washer	2
$\Delta$ 7	6162-53-1840	Tube	1	24	(01011-31005)	Bolt	2
$\Delta$ 8	6130-71-5351	Bolt, Joint	4	25	(01602-01030)	Wwasher, Spring	2
$\star$ 9	07005-00812	Gasket (K2)	1 $\leftarrow$ 8	25A	(01640-21016)	Washer	2
$\Delta$ 10	6162-53-1820	Tube	1	$\Delta$ 26	6127-81-4350	Clamp	4
$\Delta$ 11	6162-53-1710	Elbow	2	$\Delta$ 27	6127-81-4360	Clamp	4
$\Delta$ 12	6127-81-4420	Clip	3	$\Delta$ 28	01016-20412	Bolt	4
13	560-43-15220	Washer	1	$\Delta$ 29	01601-00410	Washer, Spring	4
14	6134-11-5120	Spacer	2				
15	(01011-31090)	Bolt	1				
16	(01011-31040)	Bolt	2				
17	(01640-21016)	Washer, Spring	3				

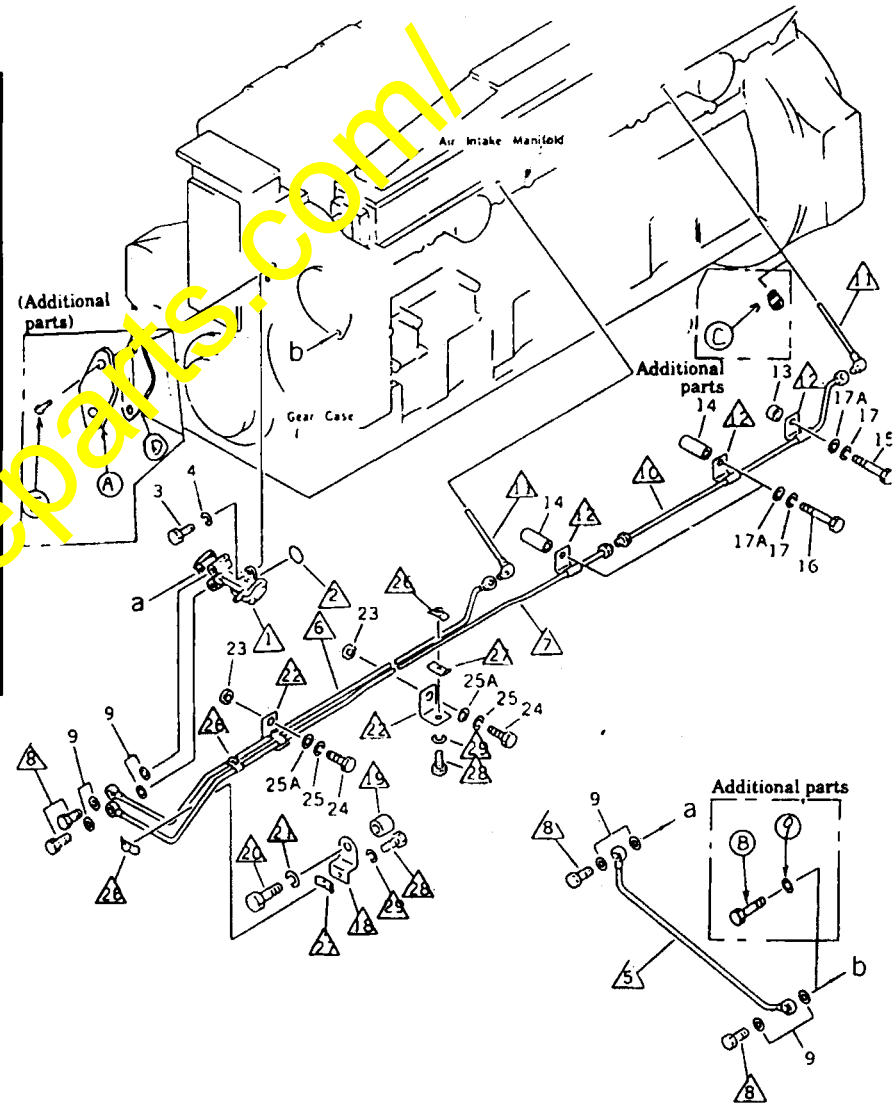
When re-assembling the engine, prepare and install the parts listed in Table 4-2.

[ Applicable models: EG ]

**Table 4-2** List of parts to be additionally installed when discontinuing use of the mechanical pump ass'y

Codes	Part names	Part numbers	Q'ty	Remarks
A	Plate	6162-23-3960	1	
E	Bolt	01010-81016	2	Tightening torque: 8.8 - 14.7Nm (0.9 - 1.5kgm)
D	Gasket	6162-23-3970	1	
B	Plug	6110-73-6231	1	Tightening torque: 14.7 - 34Nm (1.5 - 3.5kgm)
9	Gasket	07005-00812	1	Apply to the air intake manifold mounting face.
C	Plug	07043-70108	2	Tightening torque: 2.0 - 3.9Nm (0.2 - 0.4kgm)

• Re-use parts coded 13 through 17, 23 through 25 as they are.



**Fig. 4** Mechanical pump and piping

[Applicable models: 6M170B, 6M160A]

When discontinuing the use of the mechanical pump ass'y, remove the unnecessary parts listed in Table 5-1, since they will become unnecessary.  
When re-assembling the engine, install the parts listed in Table 5-2.

Note) Parts marked  $\Delta$  in Table 5-1 are unnecessary parts.  
Quantity of the parts marked  $\star$  in Table 3-1 is changed as indicated.  
Part code is common in Fig.5, Table 5-1 and Table 5-2.

Table 5-1

No.	Part No.	Description	Q'ty	No.	Part No.	Description	Q'ty
$\Delta$ 1	6162-53-2101	Mechanical pump ass'y	1	$\Delta$ 18	627-81-4360	Clamp	4
$\Delta$ 2	MK-2M-36E-215	O-ring (K2)	1	$\Delta$ 19	01016-20412	Bolt	4
$\Delta$ 3	01010-30616	Bolt	2	$\Delta$ 20	01601-00410	Washer, Spring	4
$\Delta$ 4	01602-20619	Washer, Spring	2	$\Delta$ 21	6162-53-1850	Plate	1
$\Delta$ 5	6162-53-1750	Tube	1	$\Delta$ 22	175-79-33240	Spacer	1
$\Delta$ 6	6162-53-1840	Tube	1	$\Delta$ 23	01010-51240	Bolt	1
$\Delta$ 7	6162-53-1860	Tube	1	$\Delta$ 24	01602-21236	Washer, Spring	1
$\Delta$ 8	6162-53-1820	Tube	1				
$\Delta$ 9	6130-71-5351	Bolt, Joint	1				
$\star$ 10	07005-00812	Gasket (K2)	1-8				
$\Delta$ 11	6162-53-1710	Elbow	2				
$\Delta$ 12	6127-81-4420	Clip	3				
13	6134-11-5120	Spacer	2				
14	560-43-15220	Washer	1				
$\Delta$ 15	6162-53-1830	Plate	2				
16	6162-13-4860	Washer	2				
$\Delta$ 17	6127-81-4350	Clamp	4				

When re-assembling the engine, prepare and install the parts listed in Table 5-2.

[Applicable models: 6M170B, 6M160]

Table 5-2 List of parts to be additionally installed when discontinuing use of the mechanical pump ass'y

Codes	Part names	Part numbers	Q'ty	Remarks
A	Plate	6162-23-3960	1	
E	Bolt	01010-81016	2	Tightening torque: 8.8 - 14.7Nm (0.9 - 1.5kgm)
D	Gasket	6162-23-3970	1	
B	Plug	6110-73-6231	1	Tightening torque: 14.7 - 34Nm (1.5 - 3.5kgm)
9	Gasket	07005-00812	1	Apply to the air intake manifold mounting face.
C	Plug	07043-70108	2	Tightening torque: 2.0 - 3.9Nm (0.2 - 0.4kgm)

• Re-use parts coded 13, 14 and 16 as they are.

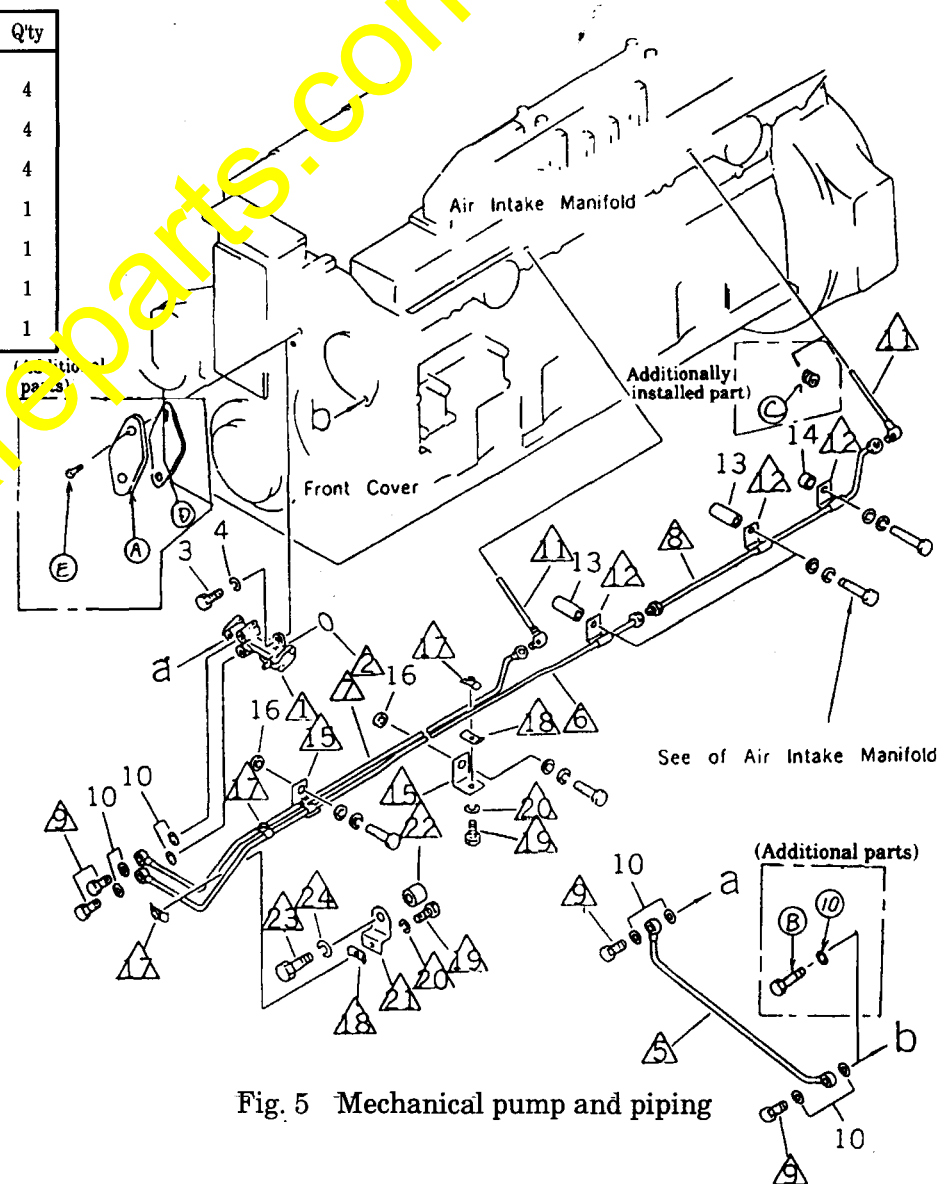


Fig. 5 Mechanical pump and piping