

PARTS & SERVICE NEWS

REF NO.	AT03035D
DATE	Feb. 24, 2004
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This PARTS & SERVICE NEWS supersedes the previous issue No. AT03035B dated Aug. 28, 2003 which should be discarded.

SUBJECT: REPLACEMENT PROCEDURE OF TRANSMISSION ASSEMBLY, ENGINE CONTROLLER AND TRANSMISSION CONTROLLER ON HM350-1 AND HM400-1

PURPOSE: To introduce replacement procedure with improved Transmission assembly, Engine controller and Transmission controller on HM350-1 and HM400-1 Articulate Truck

APPLICATION: HM350-1 Articulated Dump Trucks, Serial Nos. Δ 1041 ~~1042~~
HM400-1 Articulated Dump Trucks, Serial Nos. 1001 thru 1068
1071 thru 1076

FAILURE CODE: 1500FF

DESCRIPTION:

1-1. Introduction


Replace Transmission assembly, Engine controller and Transmission controller with improved components by this Parts and Service News.

1-2. Revised places:

3 places Δ	Jun. 24, 2003	<ul style="list-style-type: none"> The application serial number was changed. Change and addition were carried out to the part numbers of item "2. List of parts".
4 places Δ	Aug. 28, 2003	Added the parts list.
1 place Δ	Feb. 24, 2004	Added the part number.

2. List of parts

Part No.	Part Name	purpose of part	Q'ty	Remarks
(1) Assembly parts				
56B-13-10006 (56B-13-10002)	T/M Ass'y (T/M Ass'y)	} Replacement	1 (1)	For HM350-1 and HM400-1
7818-54-1005 (7818-54-1004)	T/M Controller (T/M Controller)		1 (1)	For HM400-1
7818-54-2003 (7818-54-2002)	T/M Controller (T/M Controller)		1 (1)	For HM350-1
7872-10-2104 (7872-10-2103)	Engine Controller (Engine Controller)		1 (1)	For HM350-1 and HM400-1 Except USA
(2) Individual parts				
7872-10-2124 (7872-10-2123)	Disk Ass'y (Disk Ass'y)	Overwrite	1 (1)	For HM350-1 and HM400-1 For USA only
(3) Consuming parts for Transmission assembly replacement				
02896-21015	O-ring	} Replacement	1	} For Brake valve at rear side under cab
207-62-64740	O-ring		2	
02896-21012	O-ring		9	} For Steering flow AMP valve For Differential lock
02896-21018	O-ring		5	} For Brake valve at rear side under cab For Differential lock
02896-21009	O-ring		8	} For Brake valve at rear side under cab For Steering flow AMP valve L/S For Differential lock
07000-F2060	O-ring		8	} For Hydraulic pump suction piping For Transmission pump suction piping For Transmission return piping
07000-F3035	O-ring		4	} For Hydraulic pump outlet piping For Transmission area miscellaneous
07000-F3052	O-ring		12	} For Hydraulic pump outlet hose For Transmission area miscellaneous
07000-F2055	O-ring		1	} For Transmission oil filler
07000-F3038	O-ring		6	} For Brake cooling hose at transmission right side
07000-F2130	O-ring		3	} For Gear pump mounting
Δ 07000-A5155 (07000-75155)	O-ring (O-ring)		1 (1)	} For connection between front differential and transmission
Δ 04020-01638	Cotter pin Pin		1	


Part No.	Part Name	purpose of part	Q'ty	Remarks
 56B-13-10006 (56B-13-10001)	T/M Ass'y (T/M Ass'y)	Replacement	1 (1)	
(4) Flashing work				
07063-51210	Element		4	Qty 2 for flushing, Qty 2 for final install
07000-F5180	O-ring		2	For filter head
714-07-28712	Cartridge A.		4	Qty 2 for flushing, Qty 2 for final install
23W-60-24140	Element		2	Qty 1 for flushing, Qty 1 for final install
07000-12065	O-ring		1	} For above filter case
07001-02065	Back-up ring		1	

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List of those parts of the new and current transmission ass'ys
(56B-13-10006 ← 56B-13-10002)


Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-13-10006 (56B-13-10002)	T/M Ass'y (T/M Ass'y))	1 (1)	Transmission ass'y used in common for the HM350 and HM400
711-20-31180 (06031-00314)	BRG N314WC3 (BRG N314WC3)		1 (1)	Torque converter support
56B-15-11112 (56B-15-11111)	Case, Comp (Case, Comp)		1 (1)	Front case complete
56B-15-11124 (56B-15-11122)	Case, Comp (Case, Comp)		1 (1)	Rear case complete
01010-81245 (01010-81240)	Bolt, Sems (Bolt)		32 (32)	F. and R. case mounting bolts
01010-81250 (01010-81245)	Bolt, Sems (Bolt)		1 (1)	Tube clamp mounting bolt
714-07-19340 (06043-00315)	Bearing, Roller (Bearing, Roller)		2 (2)	Input shaft support
56B-15-11231 (56B-15-11230)	Cover (Cover)	Replacement	1 (1)	Upper shaft cage
56B-15-11241 (56B-15-11240)	Cover (Cover)		1 (1)	Lower shaft cage
56B-15-18114 (56B-15-18113)	Tube (Tube)		1 (1)	Piping for the 1st clutch
56B-15-18123 (56B-15-18122)	Tube (Tube)		1 (1)	Piping for the FH clutch
56B-15-18132 (56B-15-18131)	Tube (Tube)		1 (1)	Piping for the 2nd clutch
56B-15-18143 (56B-15-18142)	Tube (Tube)		1 (1)	Piping for the 3rd clutch
56B-15-18161 (56B-15-18160)	Tube (Tube)		1 (1)	Piping for lubrication of the lower shaft
56B-15-12573 (56B-15-12571)	Gear, Rev (Gear, Rev))	1 (1)	R. idler gear

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Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-15-12015 (56B-15-12012)	Clutch ass'y, FL & R (Clutch ass'y, FL & R)	Replacement	1 (1)	Input shaft ass'y
56B-15-12023 (56B-15-12021)	Clutch ass'y, FH & 1st (Clutch ass'y, FH & 1st)		1 (1)	Upper shaft ass'y
56B-15-12033 (56B-15-12031)	Clutch ass'y, 2nd & 3rd (Clutch ass'y, 2nd & 3rd)		1 (1)	Lower shaft ass'y
56B-15-12041 (56B-15-12040)	Diff ass'y (Diff ass'y)		1 (1)	Output shaft ass'y
56B-15-12114 (56B-15-12112)	Shaft & Cyl., FL & Rev (Shaft & Cyl., FL & Rev)		1 (1)	Input shaft complete
56B-15-12123 (56B-15-12121)	Shaft & Cyl., FH & 1st (Shaft & Cyl., FH & 1st)		1 (1)	Upper shaft complete
56B-15-12134 (56B-15-12131)	Shaft & Cly., 2 & 3 (Shaft & Cly., 2 & 3)		1 (1)	Lower shaft complete
56B-15-12414 (56B-15-12411)	Gear, FL (Gear, FL)		1 (1)	FL gear
56B-15-12423 (56B-15-12421)	Gear, Rev (Gear, Rev)		1 (1)	Rev gear
56B-15-12443 (56B-15-12441)	Gear, 1st (Gear, 1st)		1 (1)	1st gear
56B-15-12462 (56B-15-12461)	Gear, 3rd (Gear, 3rd)		1 (1)	3rd gear
56B-15-12531 (56B-15-12530)	Gear, Input (Gear, Input)		1 (1)	Input shaft gear
56B-15-12552 (56B-15-12551)	Gear, Lower (Gear, Lower)		1 (1)	Lower shaft gear
56B-15-12561 (56B-15-12563)	Gear, Output (Gear, Output)		1 (1)	Output shaft gear
56B-15-12942 (56B-15-12941)	Spacer (Spacer)		1 (1)	Lower shaft, 3rd side
56B-15-12960 (56B-15-19540)	Spacer (Ring)		1 (1)	Input shaft gear section
56B-15-12960 (711-54-11180)	Spacer (Spacer)		1 (2)	Lower shaft gear section

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Part No.	Part Name	Purpose of part	Q'ty	Remarks
56B-15-17222 (56B-15-17221)	Shaft, Out-front (Shaft, Out-front)	Replacement	1 (1)	Front side shaft of output
56B-15-17251 (56B-15-17250)	Gear, sun (Gear, sun)		1 (1)	Output differential section
56B-15-17312 (56B-15-17311)	Carrier (Carrier)		1 (1)	
56B-15-17411 (56B-15-17410)	Gear (Gear)		4 (4)	
56B-15-17612 (56B-15-17611)	Ring gear (Ring gear)		1 (1)	
56B-15-19311 (56B-15-19310)	Bearing, Taper (Bearing, Taper)		2 (2)	Lower shaft support
56B-15-19430 (56B-15-19410)	BRG, Needle (BRG, Needle)		4 (2)	Under the FL gear and under the 1st gear
56B-15-19411 (56B-15-19410)	BRG, Needle (BRG, Needle)		1 (1)	Under the 2nd gear
56B-15-19440 (56B-15-19420)	BRG, Needle (BRG, Needle)		2 (1)	Under the Rev gear
56B-15-19422 (56B-15-19420)	BRG, Needle (BRG, Needle)		2 (2)	Under the FH gear
714-07-12781 (714-07-12780)	Spring, Wave (Spring, Wave)		62 (62)	For the input shaft, upper shaft and lower shaft
56B-13-11001 (56B-13-11000)	T.HM400-1 (T.HM400-1)	Rework	1 (1)	Torque converter ass'y
569-13-51190 (711-20-31190)	Guide (Guide)	Replacement	1 (1)	Torque converter pump section
711-40-21511 (711-40-21510)	Turbine comp (Turbine comp)		1 (1)	Torque converter turbine section

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Part No.	Part Name	Purpose of part	Q'ty	Remarks
<div style="border: 1px solid black; padding: 5px;"> The parts indicated below are those parts which have been canceled with the new transmission assembly. (56B-13-10006 ← 56B-13-10002) </div>				
(714-07-12930)	(Washer, Thrust)	Not used	(2)	
<div style="border: 1px solid black; padding: 5px;"> The parts indicated below are those parts which have been newly added with the new transmission assembly. (56B-13-10006 ← 56B-13-10002) </div>				
01010-81235	Bolt	} Addition	1	} For the R. idler lubrication piping
01643-31232	Washer		1	
07005-00812	Gasket		4	
07206-30508	Joint		1	
56B-15-12971	Spacer		1	} For the lower gear section
56B-15-12980	Spacer		1	
56B-15-18260	Tube		1	R. idler lubrication piping

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3. Improvement contents

1) Transmission

Reinforced internal parts for severe application like high frequency of rear driving to assure long durability.

2) Transmission controller and Engine controller

(a) Engine controller ----- Changed internal program to meet optimum engine performance in R1

(b) Transmission controller ---- Changed internal program to meet optimum clutch engagement

4. Replacement procedure

1) See SHOP MANUAL for replacement of transmission. If the machine shows error codes related to transmission, perform the flushing after replacement.

See page 8 of 14.

2) See page 10 of 14 for engine controller replacement

3) After completion of transmission replacement and engine controller replacements, replace Transmission controller. See page 13 of 14.

5. Transmission oil circuit flushing procedure

When transmission is replaced, perform oil circuit flushing by following procedure.

<Flushing procedure>

1) Drain oil from brake oil tank.

2) Replace Transmission filter (valve side) 714-07-28711 (2 pieces) with new parts.

3) Drain oil from Transmission filter case at brake cooling side.

4) Clean filter case inside and strainer located at bottom of case

5) Install new filter 07063-51210 (2 pieces)

6) Replace brake oil filter element with new part 23W-60-24140.

7) Clean strainer for differential lock oil drive motor located left hand of rear frame inside.

8) Add transmission oil at oil filler. See Operation & Maintenance manual.

9) Add oil at Transmission filter case at brake cooling side.

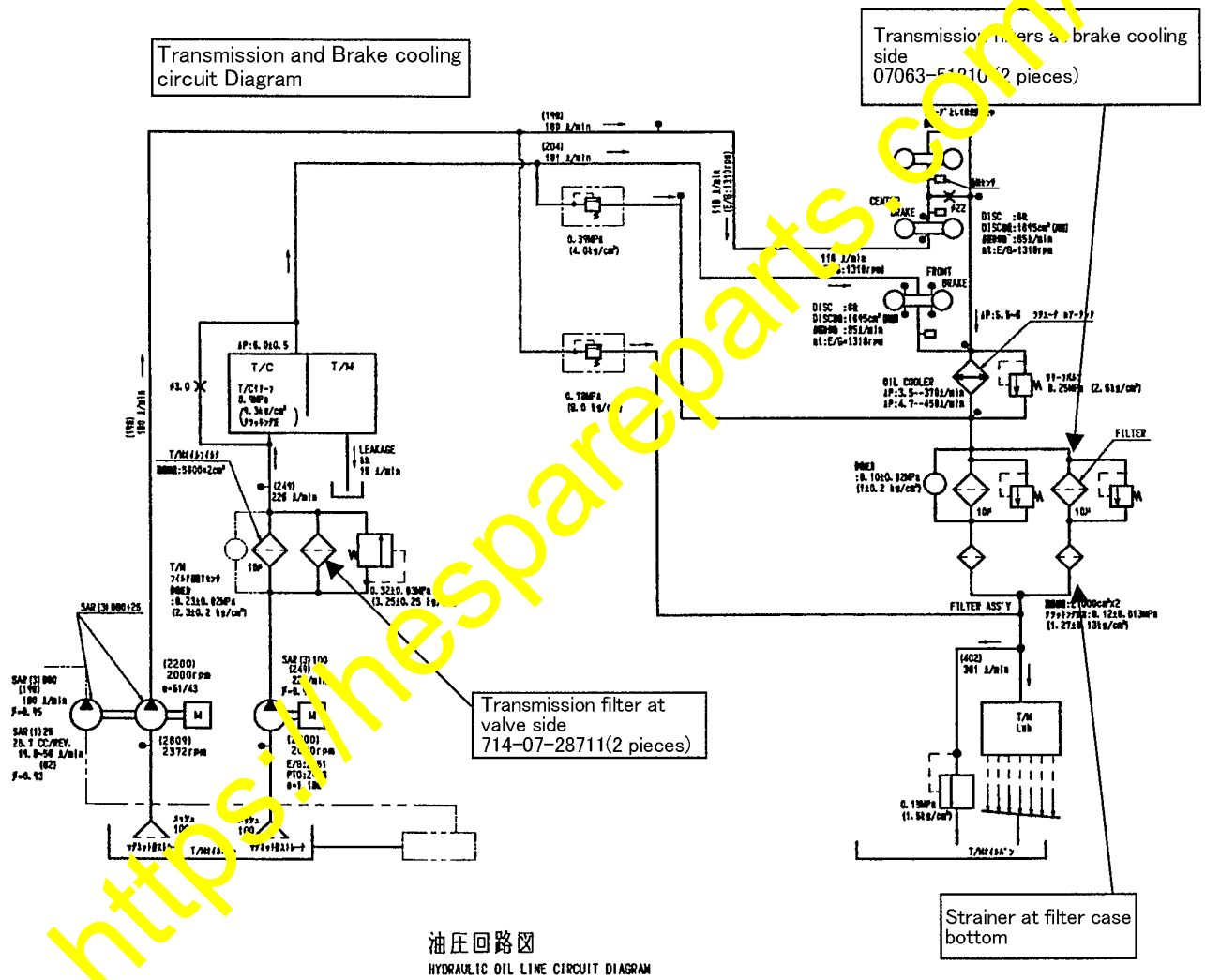
10) Start the engine and keep steady oil level.

11) Keep engine low idling for fifteen (15) minutes.

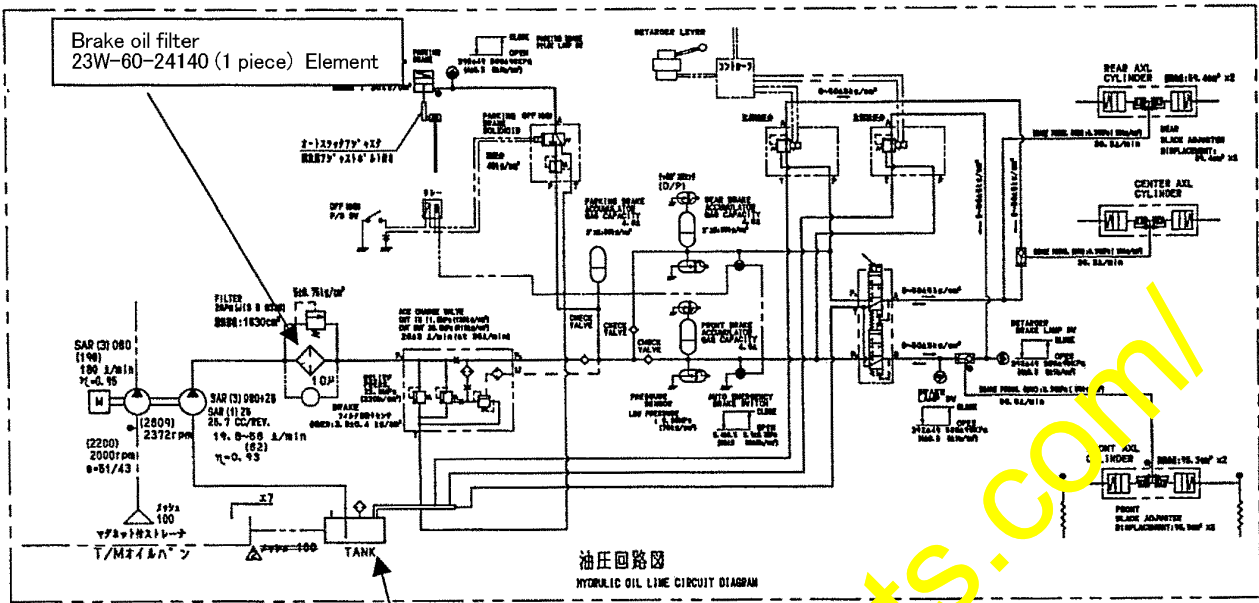
12) Perform air bleeding. See Operation & Maintenance manual.

13) If the oil temperature is lower than 50 degree Celsius, keep warm-up operation to reach this temp.

- 14) Accelerate engine speed to high idle for ten (10) seconds, and then return low idling for one (1) minute.
- 15) Repeat step 14) for ten times.
- 16) Replace Transmission filters at valve side and brake cooling side. Also replace o-rings.
714-07-28711 (2 pieces), 07063-51210 (2 pieces) and 07000-F5180 (2 pieces)
- 17) Replace Brake oil filter element, case o-ring and back-up ring.
23W-60-24140, 07000-12065 and 07001-02065
- 18) Check oil level again, and correct if necessary. Oil circuit flushing is now complete.

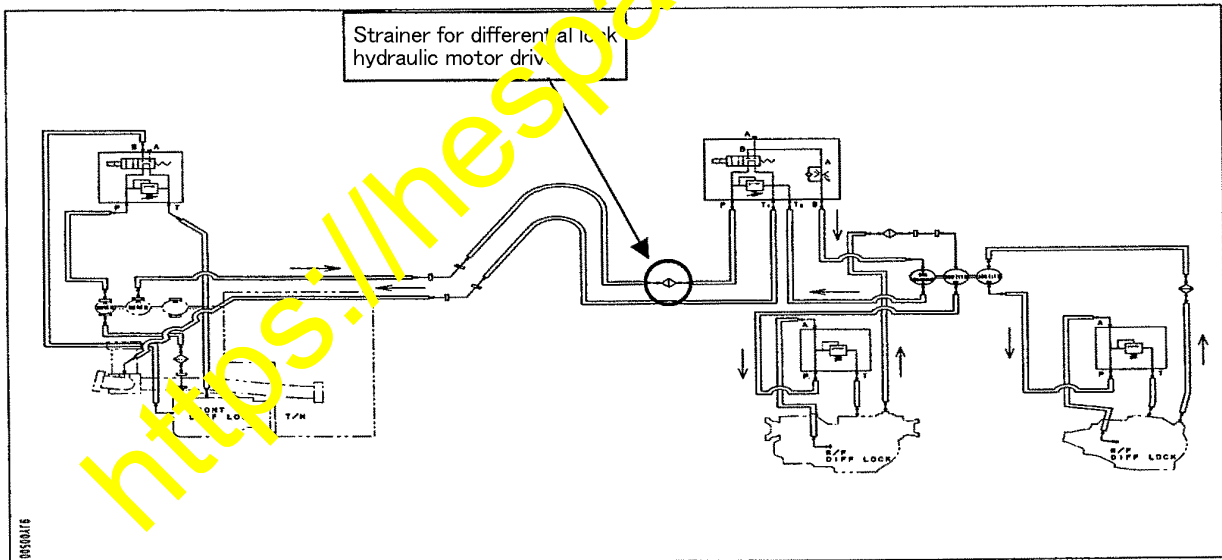


Brake system



Brake oil tank

Differential lock hydraulic circuit

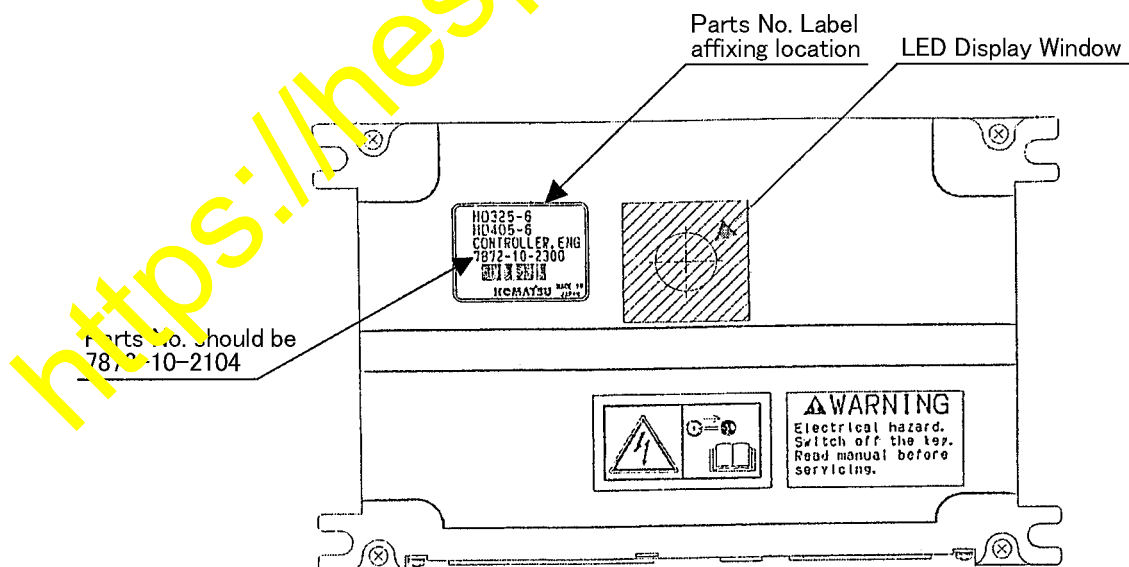


5-1. Parts Preparation and Replacement procedures of engine controller (Except USA)

- 1) Improved controller is sent for each machine with proper Q setting form Japan.
- 2) Replace current controller with this improved one. Make sure if the new controller serial No. label should be met to original machine. If some different, please contact Komatsu Overseas office.
- 3) Ship back dismantled controller to KLTD, Japan by instruction from Komatsu Overseas Office.
- 4) Fill in check sheet (Page 12 of 14) and submit to Komatsu Overseas Office.

5-2. Parts Preparation and Replacement procedures of engine controller (USA only)

- 1) Remove engine controller from chassis.
- 2) Overwrite the engine program per CRI Overwrite instruction.
Since this overwriting is restricted to certified technicians, ensure this task is performed by factory trained CRI Writing ID holder only. This training may be verified by contacting Komatsu Training.
See Service Policy and Procedure Manual SEKA2504.
Prepare necessary tools (See Parts & Service Operation TIPS SEKN5020)
- 3) After overwriting, check if LED display is same as next page check sheet.
Fill in all necessary information in the check sheet.
- 4) Peel off current parts number label form controller and affix new label attached same case from floppy disk.
- 5) Install this controller to the chassis.
- 6) File this modification work record by TIPS system with following information.
- Machine model and Serial No. - Engine Serial No. - Overwritten date, place and ID holder name.
- 7) Fill in check sheet (Page 13 of 14) and submit to Att: Bret Teusink at Service Head Quarters via fax 847-970-4185.



CRI Controller overwriting Check Sheet

Model - Type		Place	
Serial No.		Date	
Engine Serial		ID Holder name	Check sheet X Mark : Fill up data Blank : Check mark

See LED display after turn on the starting key (Do not start the engine)

<Display sample>
 [80]-[78]-[72]-[10]-[A2]-[14]-[88]-[---]-[MM]-[E]-[EE]-[0X]

①

②

③

④

⑤

⑥

②: Make sure version contents (Parts No.) meet above display

Reference

- ①: LED segments check
- ③: Q setting
- ④: (Switch display) / ⑤: Error codes
- ⑥: If there is no error code: HM400=[00], HM350=[10]

Work 1	Check display by controller itself. (Do not mount on the machine)							
	1	Turn ON main power						
	2	LED - Version display	If right after overwriting, this should be same as before overwriting. If same X <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>					
	3	LED - Q setting	X <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;"></td></tr> </table>					
4	If above is OK, affix new label	See page 6.						

Work 2	Check after installation.		Each controller must be mounted on the same machine when removal.
	1	Connector connection	Confirm click
	2	Turn On the switch and clear error from monitor panel.	See SHOP MANUAL
	3	After starting the engine, repeat Low idle to High idle, High idle to Low idle, then confirm error code at monitor panel.	If error code appears, make troubleshooting instruction on the SHOP MANUAL.

6 Replacement procedures of Transmission controller

- 1) Park machine on flat area and apply parking brake. Then turn off the key switch and apply wheel chocks. See Fig.-1

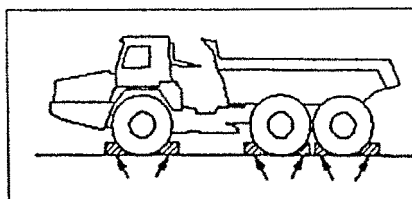


Fig.-1

- 2) Open controllers box cover located rear side of operator seat in the Cab and remove all connectors to transmission controller. See Fig.-2 and -3.

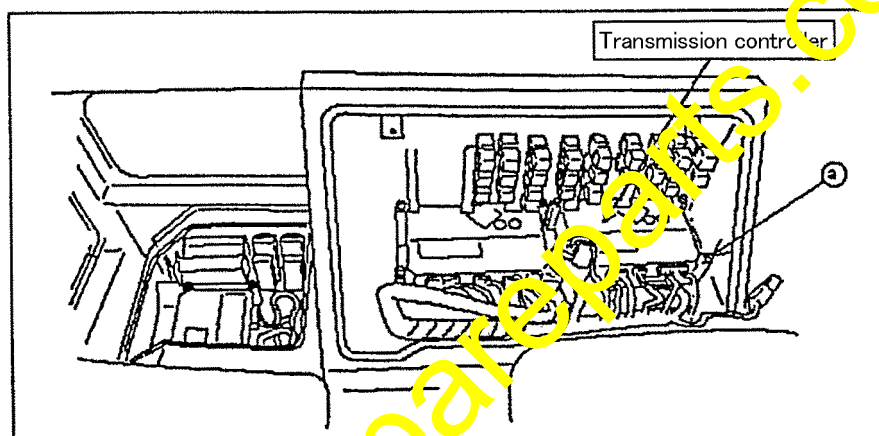
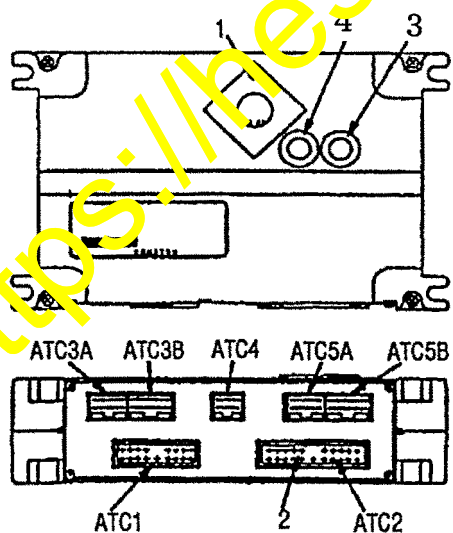


Fig.-2



1. Self diagnostic window (LED)
2. Connector
3. Rotary Switch 1 (SW1)
4. Rotary Switch 2 (SW2)

Fig.-3

- 3) Remove four (4) mounting bolts (a) and controller. See Fig.-2.

- 4) In case of HM350-1
 Remove grommet cover for rotary switch from new controller and adjust to following position.
 Use screwdriver for turning.

Switch	Position	
	HM350-1	HM400-1
SW1	4	0
SW2	0	0

Original 00 setting is applied for HM400-1

Install grommet cover for rotary switch on new controller without any twisting or deformation.

This can be confirmed by rotating grommet. If it does not rotate smoothly, it is deformed.

- 5) Install new controller on the machine and tighten mounting bolts.
 Mounting bolts for HM400-1 : 7818-54-1005
 Mounting bolts for HM350-1 : 7818-54-2003
 Tightening torque of mounting bolt : 27.5 to 34.3 Nm [2.8 to 3.5 Kgm]
- 6) Connect all connectors to the same ID No. of the controller. See Fig-3..
- 7) After turning ON the key switch, confirm the self diagnostic display shows following.
 HM400-1 : 88 → A4 → 0A → d6 → 24 → 9C
 HM350-1 : 88 → A3 → 5A → d6 → 24 → 48
- 8) If caution lamp illuminates or warning buzzer sounds, carry out troubleshooting by SHOP MANUAL
- 9) Remove chocks, then release parking brake. Conduct driving test and confirm shifting performance and check for any error codes at the monitor panel.
- 10) After replacing Transmission, the transmission controller calibration must be performed to adjust each transmission valve characteristics and clutch piston volume. This calibration work should be performed during driving condition. See SHOP MANUAL page 20-196. The oil temperature should be kept 60 to 70 degree Celsius during the calibration procedure (even if the old version SHOP MANUAL shows 50 to 60 degree).