PARTS & SERVICE NEWS

REF NO.	AA02039
DATE	January 29, 2002

(C)

SUBJECT: REPLACING TORQUE CONVERTER REGULATOR VALVE FOR TRACTION IMPROVEMENT

PURPOSE: To inform the field of proper repair procedure for replacing torque converter regulator valve.

APPLICATION: Komatsu Wheel Loaders:
WA800-2L A20001 - A20019;
WA800-2LC A20020 - A20028;
WA800-3LC A50001 - A50023;
WA900-1L A20001 - A20007;
WA900-1LC A20008 - A20021, A20023;
WA900-3LC A50002 - A50013

FAILURE CODE: 1300NQ

DESCRIPTION:

1. Introduction

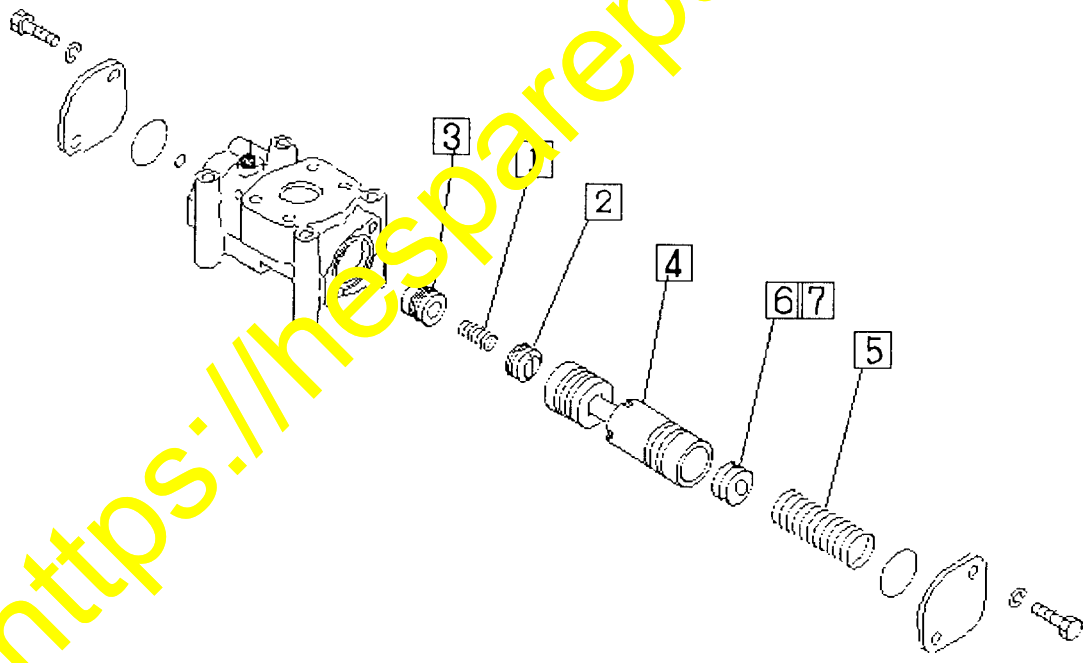
Depending on the dispersion in the pressure loss in the torque flow oil cooler piping under the higher oil temperature condition, the torque converter outlet pressure may be lowered, and traction force may be decreased.
The improved regulator valve has been developed and it keeps the torque converter outlet pressure constant in any oil temperature.
Make the modification introduced in this Service News to prevent the above problem.
Check the machine condition according to the procedure in this Service News page 3, while doing the modification.

2. List of parts

Part No.	Part Name	Purpose of part	Q'ty	Remarks
711-56-31004 (711-56-31003)	Converter ass'y (Converter ass'y)	Reworked	1 (1)	Replace valve ass'y
711-56-36601 (711-56-36600)	Valve ass'y (Valve ass'y)	Replacement	1 (1)	Regulator valve ass'y
07000-73048 (07000-73048)	O-ring (O-ring)		2 (2)	Consumable parts
07000-72014 (07000-72014)	O-ring (O-ring)		2 (2)	
07000-F2055 (07000-F2055)	O-ring (O-ring)		1 (1)	
01643-31445	Washer		2	Use as shim to adjust
23S-15-45860	Shim		9	Shim to adjust
07000-73045 (07000-73045)	O-ring (O-ring)		2 (2)	Consumable parts
07000-72014 (07000-72014)	O-ring (O-ring)		1 (1)	

[Reference] Changed parts in valve ass'y

No.	Part No.	Part Name	Q'ty	Remarks
1 1	711-56-36610 (562-15-16110)	Spring (Spring)	1 (1)	Not interchangeable alone
2 1	427-15-15490 (562-13-16460)	Valve (Valve)	1 (1)	
3 1	711-56-36620 (562-13-16470)	Valve (Valve)	1 (1)	
4 1	711-56-36640 (562-13-16910)	Spool (Spool)	1 (1)	
5 1	711-56-36650 (711-56-36630)	Spring (Spring)	1 (1)	
6 1	01643-31445	Washer	2	
7 1	23S-15-45860	Shim	0	



3. Machine inspection procedures:
   Use the flow chart below to check the machine conditions. Refer to the appropriate shop manual for measurement procedures.

START

Engine Speed	Unit	Specification	Measurement	Judgement
High-Idling	rpm	2200 ~ 2300		
Torque Converter Stall	rpm	2000 ~ 2100		
Hydraulic Stall	rpm	2025 ~ 2125		
Full Stall	rpm	1570 ~ 1770		

OK? NO → Adjust the engine speed:
(Check / adjust the engine, the fuel control cable and linkage, and the servo-cylinder)
→ GO TO START

YES

T/C outlet pressure (before modification)	Unit	Specification	Measurement	Judgement
* Oil Temp. 50° C ~ 60° C	- - - -	- - - -	- - - -	- - - -
High-Idling	kg/cm²	5.0 ~ 7.0		
Torque Converter Stall	kg/cm²	5.0 ~ 7.0		
* Oil Temp. 110° C ~ 120° C	- - - -	- - - -	- - - -	- - - -
High-Idling	kg/cm²	5.0 ~ 7.0		
Torque Converter Stall	kg/cm²	5.0 ~ 7.0		

OK? YES → Even if measured values of T/C outlet pressure satisfy the specifications, the modification to the regulator valve is still recommended. See the note at the bottom of the page.

NO → Make the modification following pages 4 ~ 5

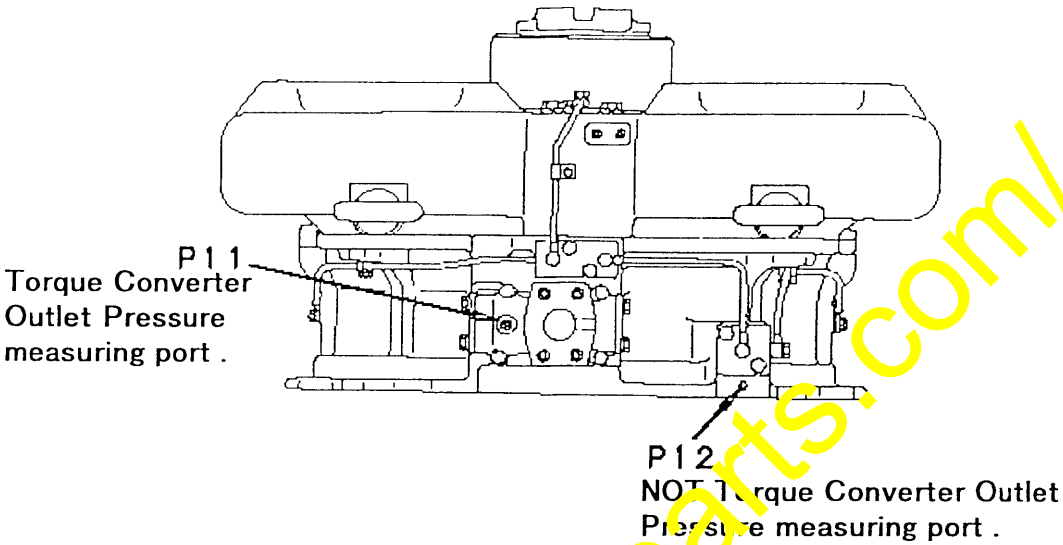
T/C outlet pressure (after modification)	Unit	Specification	Measurement	Judgement
* Oil Temp. 50° C ~ 60° C	- - - -	- - - -	- - - -	- - - -
High-Idling	kg/cm²	5.0 ~ 7.0		
Torque Converter Stall	kg/cm²	5.0 ~ 7.0		
* Oil Temp. 110° C ~ 120° C	- - - -	- - - -	- - - -	- - - -
High-Idling	kg/cm²	5.0 ~ 7.0		
Torque Converter Stall	kg/cm²	5.0 ~ 7.0		

OK? NO → Adjust shim thickness in the regulator valve according to page 6.
- Increased shim thickness, but the T/C outlet pressure is still lower.
  -> Check T/C internal parts. There is a possibility that T/C internal leakage has increased.
- Decreased shim thickness, but the T/C outlet pressure is still higher.
  -> Check the oil cooler and piping for clogging.

YES → END

{NOTE} For the machine on which the Torque Converter outlet pressure satisfies the above specifications, the modification introduced in this Service News is not effective to increase the traction force. However, the improved Regulator Valve makes the Torque Converter outlet pressure constant even under temperature variances, making traction force more stable. Therefore, the modification in this bulletin is recommended for machines on which Torque Converter outlet pressure satisfies the above requirements.

[NOTICE] Port For Measuring Torque Converter Outlet Pressure.
Measure the Torque Converter Outlet Pressure at P11 in following fig.
(P12 is not the Torque Converter Outlet Pressure measuring port.)



There is a MISPRINTED in SHOP MANUAL as shown below.

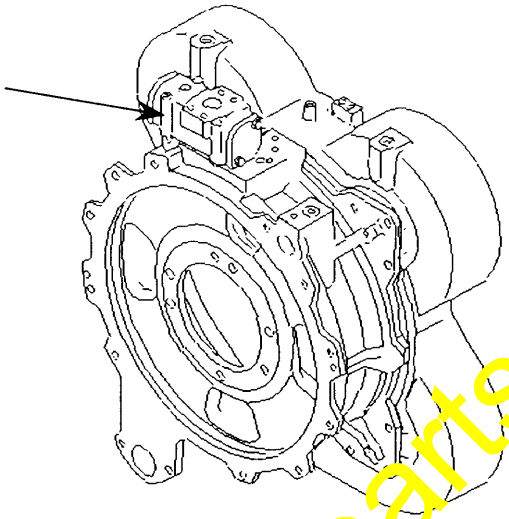
5. Measuring torque converter outlet pressure
1) Remove plug (P11) ~~or (P12)~~ (PT 1/8), and ···

MISPRINTED

4. Contents of the improvement.

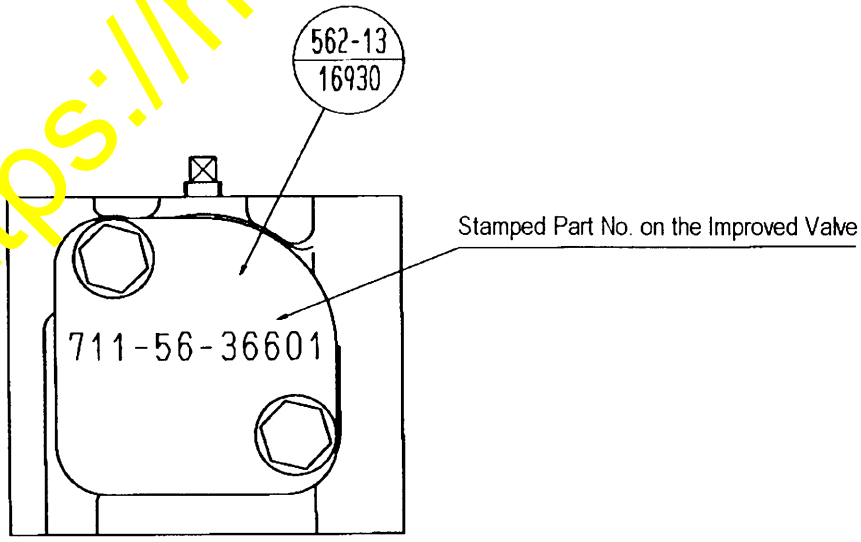
The performance of Regulator Valve has been improved.
The improved Regulator Valve makes the Torque Converter outlet pressure constant irrespective of oil temperature, and it prevents traction force from lowering, that is caused by the lower Torque Converter outlet pressure in higher oil temperature condition.

(Current) 711-56-36600
↓
(Improved) 711-56-36601



5. Identification method for the improved valve.

For the identification between the improved valve and the current valve, on the side plate (562-13-16930) of the improved valve, Part No. "711-56-36601" has been stamped.

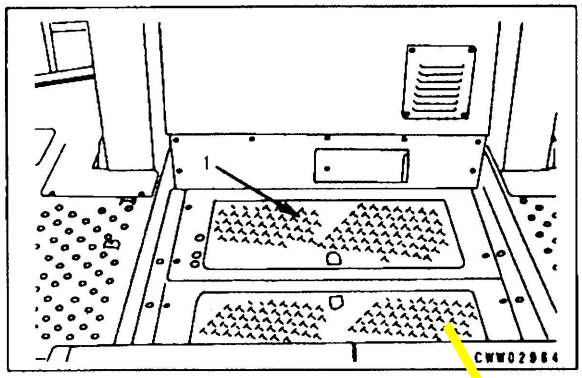


6. Modification procedures [Replacement of Regulator Valve Ass'y].

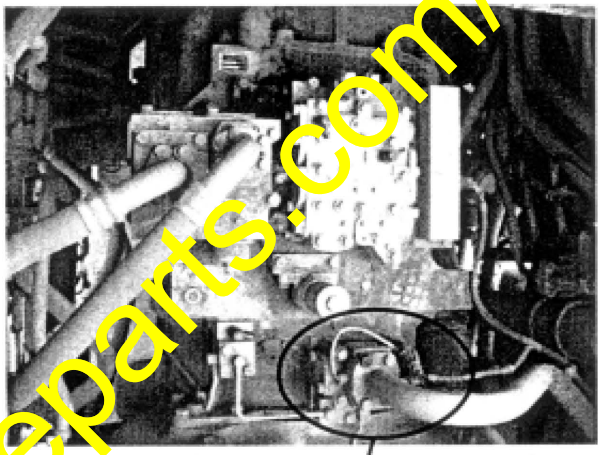
① Open the Platform Cover (1).

★ Before the Valve Ass'y is removed, clean up the Valve Ass'y and the area around the Valve Ass'y.

★ The entry of dust into the Valve Ass'y or Torque Flow Ass'y causes the internal troubles.



② Disconnect the Connector (2) of the Oil Temperature Sensor.



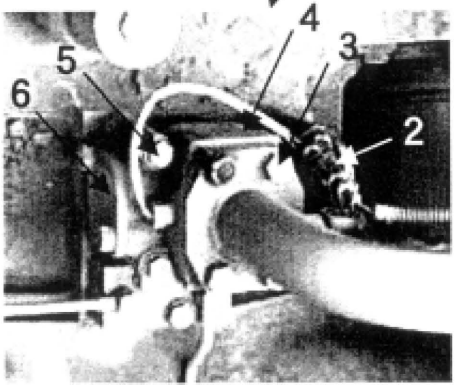
③ Remove 4 Bolts (3) on the tube flange.

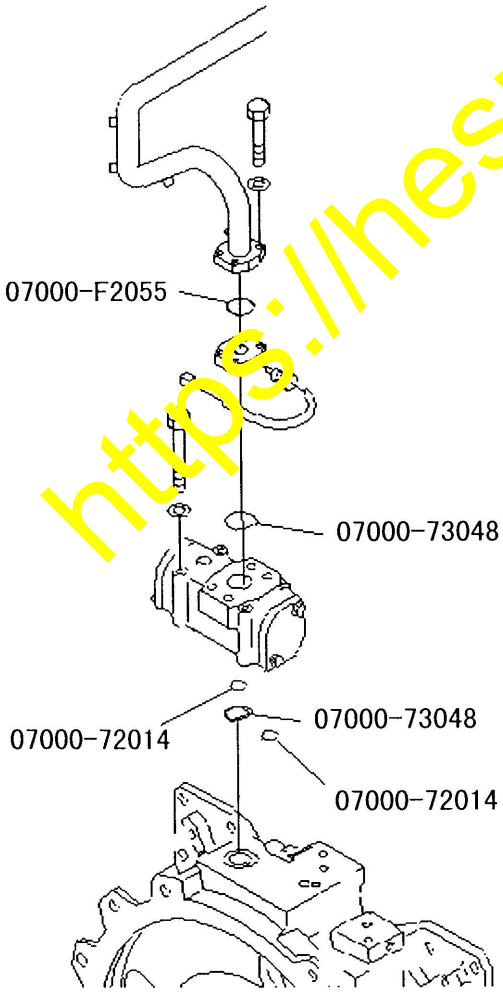
④ Remove the Flange (4).

⑤ Remove 4 Bolts (5) on the valve body.

⑥ Remove the Valve Ass'y (6).

★ Following O-rings to be replaced with new ones.





⑦ Install the improved Valve Ass'y.

⑧ Tighten 4 Bolts (5) on the valve body.

★ Tighten the bolts diagonally.

kgm Tightening torque : 5.0±0.5 kgm

⑨ Install the Flange (4).

⑩ Tighten 4 Bolts (3) on the tube flange.

⑪ Connect the Connector (2) of the Oil Temperature Sensor.

⑫ Close the Platform Cover (1).

7. Adjustment procedures of shim thickness for the improved Regulator Valve.

The improved Regulator Valve has been set to 6 kg/cm^2 at shipping test.
However, installed on machine, depending on the dispersion in conditions, some of valve may be getting out of the setting.
In this case, the valve setting can be adjusted by changing the shim thickness.

★ Remove off the Regulator Valve Ass'y from the Torque Converter Ass'y, and make the adjustment of the shim thickness.

★ Do not make the adjustment of shim thickness as the Regulator Valve Ass'y stays on the Torque Converter Ass'y.
There is a large risk that some parts of valve are fallen into the Torque Converter Ass'y.
to prevent entry of

★ Be careful so that dust does not enter into the Valve Ass'y.
The entry of dust into the Valve Ass'y causes performance troubles.

[1] Remove the Regulator Valve Ass'y according to "6. Modification procedures [Replacement of Regulator Valve Ass'y]" on page 5.

[2] Adjust the thickness of shims (8) in the Spool (7).

- 0 1 6 4 3-3 1 4 4 5 (t=4.5) Amount of pressure adjustment by 1 piece : 0. 3 4 8 kg/cm^2
- 2 3 S-1 5-4 5 8 6 0 (t=0.5) Amount of pressure adjustment by 1 piece : 0. 0 3 9 kg/cm^2

★ Clean up the orifice hole (φ1.6) of Spool (7) and the orifice hole (φ0.8) of Valve (9).
And check that no dust is in the orifice holes φ1.6 and φ0.8.

★ Valve (9), Spring (10) and Valve (11) shall be moved smoothly in Spool (7).
★ Sticking of Valve (9) or Valve (11) causes troubles on valve performance.

★ Following O-rings to be replaced with new ones.