PARTS & SERVICE NEWS

REF NO.	AT02027
DATE	Mar. 13, 2002

SUBJECT: INTRODUCTION OF IMPROVED TORQUE CONVERTER REGULATOR VALVE ON WA800-1, -3

PURPOSE: To introduce improved torque converter regulator valve for use on WA800-1 and WA800-3 wheel loaders

APPLICATION: WA800-1 Wheel Loaders, Serial Nos. 10001 thru 10730
WA800-3 Wheel Loaders, Serial Nos. 50001 thru 50025
[• Power train (Transmission + Torque converter) Serial Nos. up to 1101, 1103
• Torque converter Serial Nos. up to 1504, 1506]

FAILURE CODE: 1300NQ

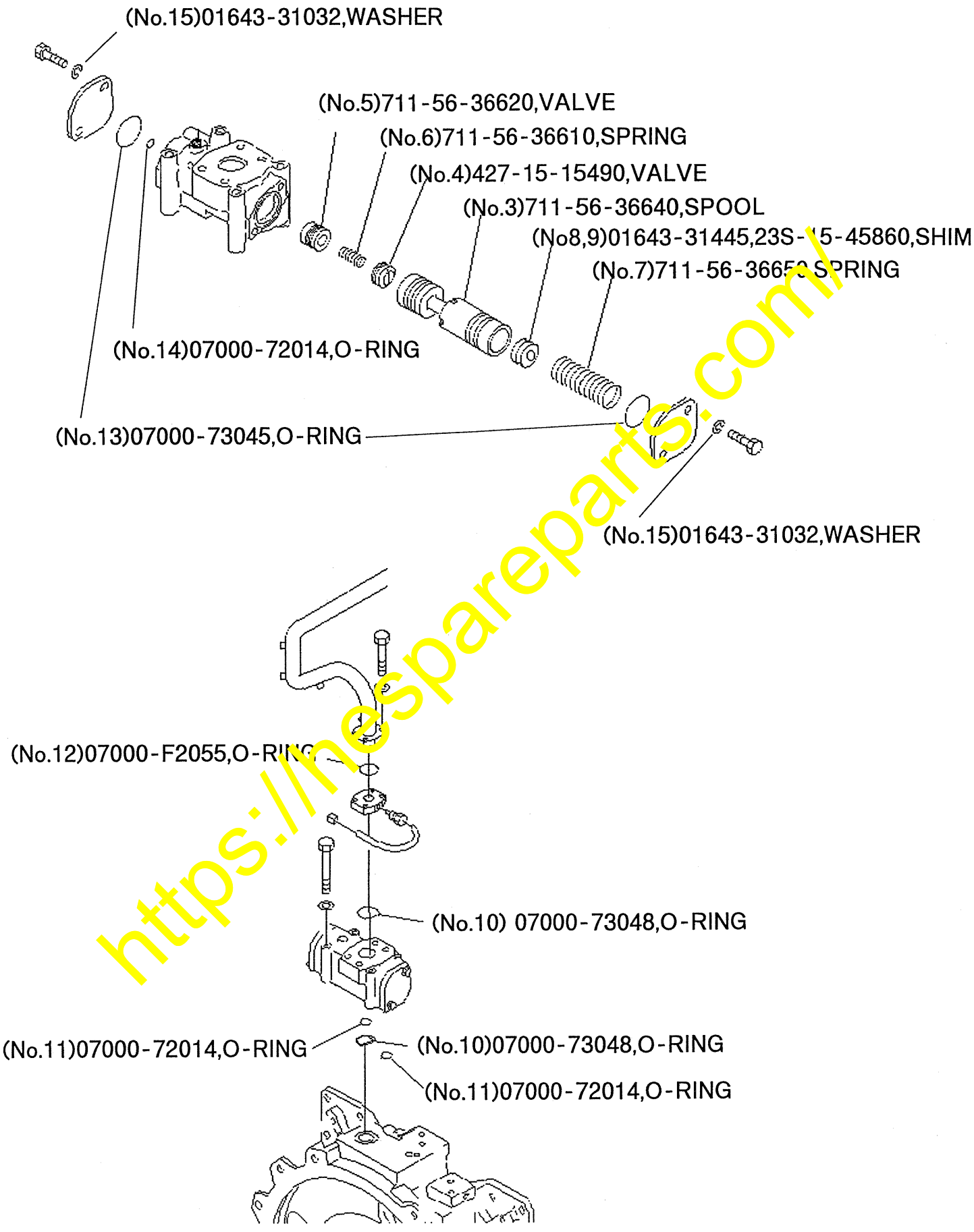
DESCRIPTION:

1. Introduction
   - Market reports are saying that the tractive force becomes insufficient with the WA800-1 and WA800-3 wheel loaders having been used for a long period of time or after overhauling has been made.
     Causes for insufficient tractive force:
     (1) Decrease of the inlet port pressure and the outlet port pressure of the torque converter while the oil temperature is high
     ..... It is possible to check them by measuring the pressure.
     (2) Decrease of the engine output
     ..... It is possible to check it by conducting torque converter stall test.
     (3) Inadequate accelerator linkage adjustment
     ... It is possible to check it by measuring the maximum revolution of the engine.
     (4) Occurrence of brake dragging
     ..... It is possible to check it by measuring the maximum traveling speed.

   - This Service News will introduce the modification procedure to improve the above Item (1).
     Implement this modification when the inlet port pressure and the outlet port pressure of the torque converter are lower than the specifications in the Shop Manual.
     [This modification is not necessary when the aforementioned pressure levels are remaining within the specifications.]
     Extracts from the Shop Manual are being attached to this Service News. (Refer to pages 4 and 5.)
   - Contents of the modification: The pressure setting for the regulator valve has been changed to maintain the outlet port pressure of the torque converter at a constant level regardless of the oil temperature level.

2. List of parts

No.	Part No.	Part Name	Q'ty	Remarks
1	711-56-31004 (711-56-31003)	Converter ass'y (Converter ass'y)	1 (1)	New T/C ass'y with new valve ass'y
2	711-56-36601 (711-56-36600)	Valve ass'y (Valve ass'y)	1 (1)	New regulator valve ass'y
Possible to reconstruct to new VALVE ASS'Y (711-56-36601) by exchanging (Package change) internal parts of the following No. 3 – 9.				
3	711-56-36640 (562-13-16910)	Spool (Spool)	1 (1)	
4	427-15-15490 (562-13-16460)	Valve (Valve)	1 (1)	
5	711-56-36620 (562-13-16470)	Valve (Valve)	1 (1)	
6	711-56-36610 (562-13-16110)	Spring (Spring)	1 (1)	
7	711-56-36650 (711-56-36630)	Spring (Spring)	1 (1)	
8	01643-31445	Washer	2	To be used for shim of oil presure adjustment
9	23S-15-45860	Shim	0	For oil pressure adjustment (a standard is 0 sheet)
In the case of reconstruction, exchange consumables parts of the following No. 10 – 15.				
10	07000-73048	O-ring	2	To be used at valve ass'y exchange
11	07000-72014	O-ring	2	
12	07000-F2055	O-ring	1	
13	07000-73045	O-ring	2	To be used at internal part exchange
14	07000-72014	O-ring	1	
15	01643-31032 (01602-21030)	Washer (Washer)	4 (4)	
The following No. 16 – 17 are spare parts for oil pressure adjustment.				
16	01643-31445	Washer	2	To be used for shim of oil pressure adjustment
17	23S-15-45860	Shim	9	



Machine model					WA800-3	
Category	Item		Measurement conditions	Unit	Standard value for new machine	Service limit value
Engine speed	Torque converter stall		• Engine water temperature: Within operating range • Torque converter oil temperature: 60 – 80°C • Hydraulic oil temperature: 45 – 55°C • Speed control lever: F3	rpm	2,040 ± 50	2,040 ± 50
	Hydraulic stall				2,080 ± 100	2,080 ± 200
	Torque converter stall + hydraulic stall (full stall)				1,660 ± 100	1,660 ± 200
Transmission, torque converter	Transmission main relief valve pressure		• Torque converter oil temperature: 60 – 80°C		$2.75^{+0.29}_{0}$ {28^{+3}_{0}}	$2.75^{+0.29}_{0}$ {28^{+3}_{0}}
	Pilot reducing pressure		• Engine: High idling • Torque converter oil temperature: 60 – 80°C	MPa {kg/cm²}	1.03 ± 0.10 {10.5 ± 1.0}	1.03 ± 0.10 {10.5 ± 1.0}
	Modulate pressure (excluding F3, R3)				$2.45^{+0.29}_{0}$ {25^{+3}_{0}}	$2.45^{+0.29}_{0}$ {25^{+3}_{0}}
	Torque converter inlet port pressure				0.69 ± 0.10 {7 ± 1}	0.59 ± 0.20 {6 ± 2}
	Torque converter outlet port pressure				~~0.49 ± 0.10 {5 ± 1}~~ 0.59 ± 0.10 {6 ± 1}	0.49 ± 0.10 {5 ± 1}
	Lubrication valve pressure				0.14 ± 0.06 {1.4 ± 0.6}	0.14 ± 0.06 {1.4 ± 0.6}
	Reducing valve pressure (for F3, R3)				1.96 ± 0.10 {20 ± 1}	1.96 ± 0.10 {20 ± 1}
Steering	Steering relief pressure		• Hydraulic oil temperature: 45 – 55°C • Engine [illegible] • Steering is relieved.	MPa {kg/cm²}	$31.36^{+0.49}_{-0.39}$ {320^{+5}_{-4}}	$31.36^{+0.98}_{-0.78}$ {320^{+10}_{-8}}
	Emergency steering relief pressure		• Engine started Hydraulic oil temperature: 45 – 55°C Machine speed: 24 km/h	MPa {kg/cm²}	20.58 ± 0.49 {210 ± 5}	20.58 ± 0.98 {210 ± 10}
Accumulator	Charge cut-in pressure		• Engine speed: Low idling • Brake oil temperature: 45 – 55°C	• Brake oil pressure warning lamp: When goes out	MPa {kg/cm²}	$5.88^{+0.49}_{0}$ {60^{+5}_{0}}	$5.88^{+0.98}_{-0.49}$ {60^{+10}_{-5}}
	Charge cut-out pressure			• When oil pressure turns from increasing to decreasing		$9.8^{+0.98}_{0}$ {100^{+10}_{0}}	$9.8^{+1.47}_{-0.49}$ {100^{+15}_{-5}}
PPC	PPC valve source pressure (Orbit-roll source pressure)		• Hydraulic oil temperature: 45 – 55°C • Engine speed: High idling	MPa {kg/cm²}	$3.72^{+0.2}_{0}$ {38^{+2}_{0}}	$3.72^{+0.2}_{-0.2}$ {38^{+2}_{-2}}
	PPC valve output pressure	Boom RAISE, FLOAT, bucket DUMP, TILT	• Hydraulic oil temperature: 45 – 55°C • Engine speed: High idling • Work equipment control lever: Full operating		$3.72^{+0.2}_{0}$ {38^{+2}_{0}}	$3.72^{+0.2}_{-0.2}$ {38^{+2}_{-2}}
		Boom LOWER			2.54 ± 0.05 {26 ± 0.5}	2.54 ± 0.05 {26 ± 0.5}

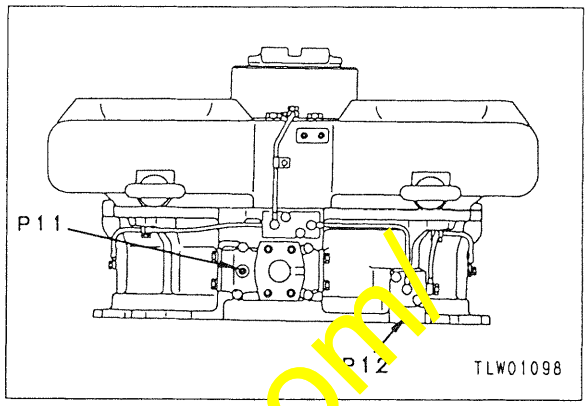
3. **Measuring modulating pressure**
   1) Remove plug (P2) (PT 1/8), and install nipple **C2** and hydraulic tester **C1** (5.9 MPa {60 kg/cm²}).
   2) Run the engine at engine full and put the directional lever in neutral, and measure the pressure when the speed control lever is operated.
      ★ Measure pressure except F3 and R3.

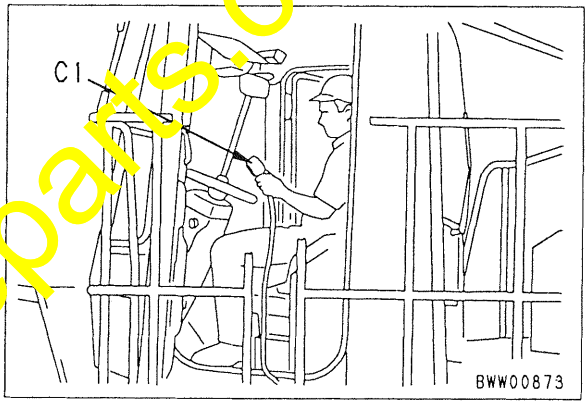
4. **Measuring torque converter inlet pressure**
   1) Remove plug (P10) (PT 1/8), and install nipple **C2** and hydraulic tester **C1** (2.5 MPa {25 kg/cm²}).
   2) Start the engine and measure the pressure at engine full.

5. **Measuring torque converter outlet pressure**
   1) Remove plug (P11) ~~or (P12)~~ (PT 1/8), and install nipple **C2** and hydraulic tester **C1** (2.5 MPa {25 kg/cm²}).
   2) Start the engine and measure the pressure at engine full.

6. **Measuring lubrication valve pressure**
   1) Remove plug (P9) (PT 1/8), and install nipple **C2** and hydraulic tester **C1** (2.5 MPa {25 kg/cm²}).
   2) Start the engine and measure the pressure at engine full.

7. **Measuring reducing valve pressure**
   1) Remove plug (P3) (PT 1/8), and install nipple **C2** and hydraulic tester **C1** (2.5 MPa {25 kg/cm²}).
   2) Start the engine and measure the pressure at engine full.

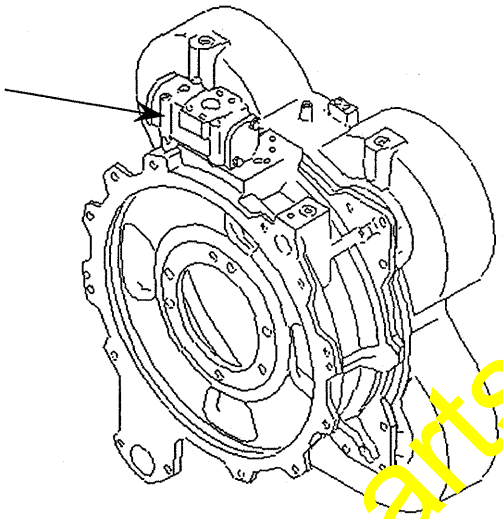




4. Contents of the improvement.

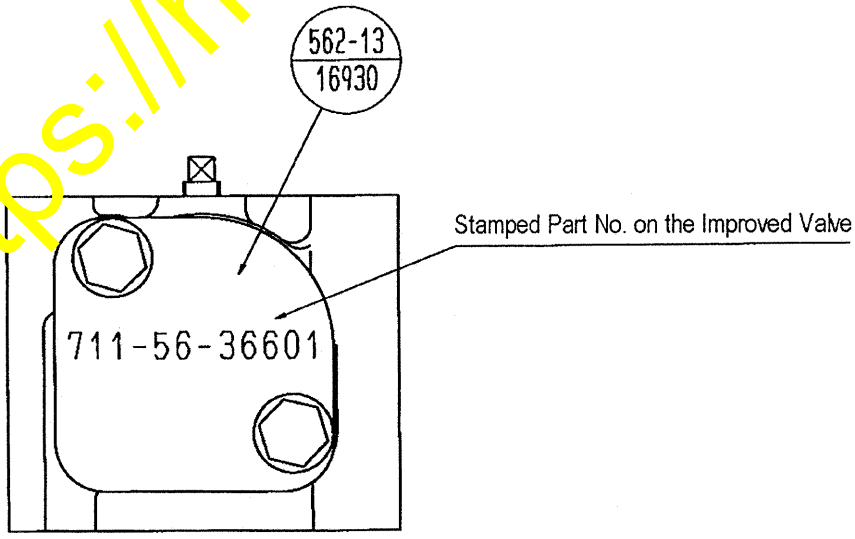
The performance of Regulator Valve has been improved.
The improved Regulator Valve makes the Torque Converter outlet pressure constant irrespective of oil temperature, and it prevents the lower tractive effort by the lower Torque Converter outlet pressure in higher oil temperature condition.

(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.

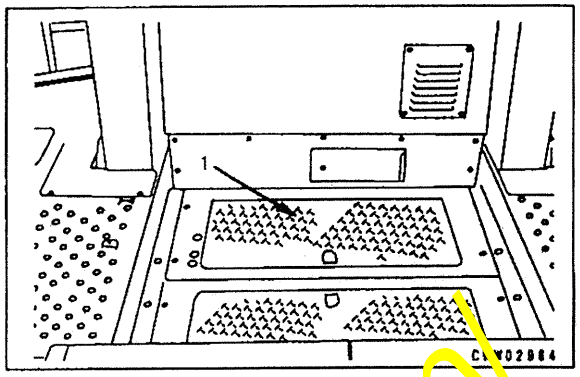


6. Modification procedure [Replacement of Regulator Valve Ass'y].

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.

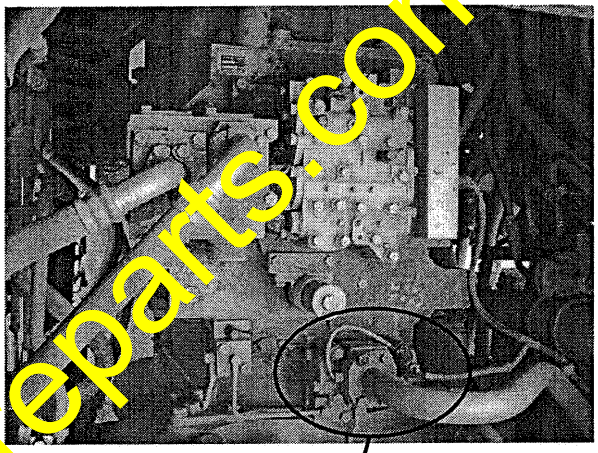
③ Remove 4 Bolts (3) on the tube flange.

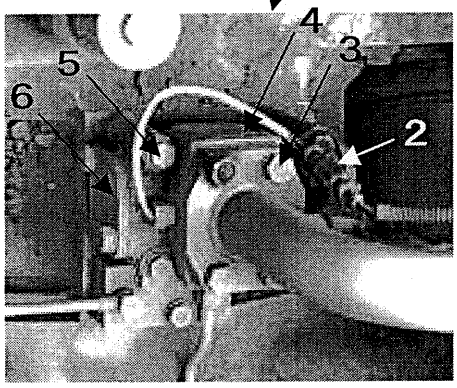
④ Remove the Flange (4).

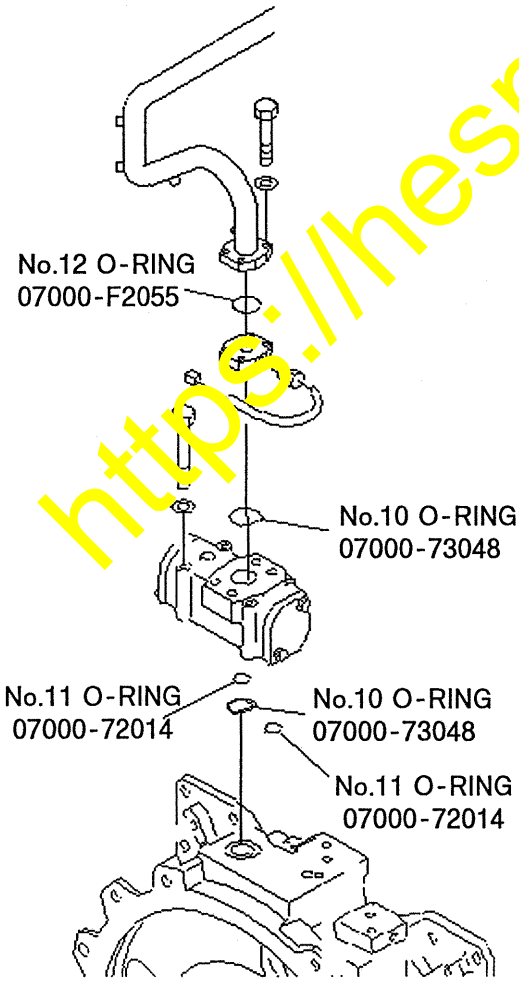
⑤ Remove 4 Bolts (5) on the valve body.

⑥ Remove the Valve Ass'y (6).

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







⑦ Install the improved Valve Ass'y.

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

★ Tighten the bolts diagonally.

K gfm 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 procedure of shim thickness for the improved Regulator Valve.

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

★ Make the adjustment of the shim thickness with the Regulator Valve Ass'y off the Torque Converter Ass'y.

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

★ Be careful to prevent entry of dust 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 7.

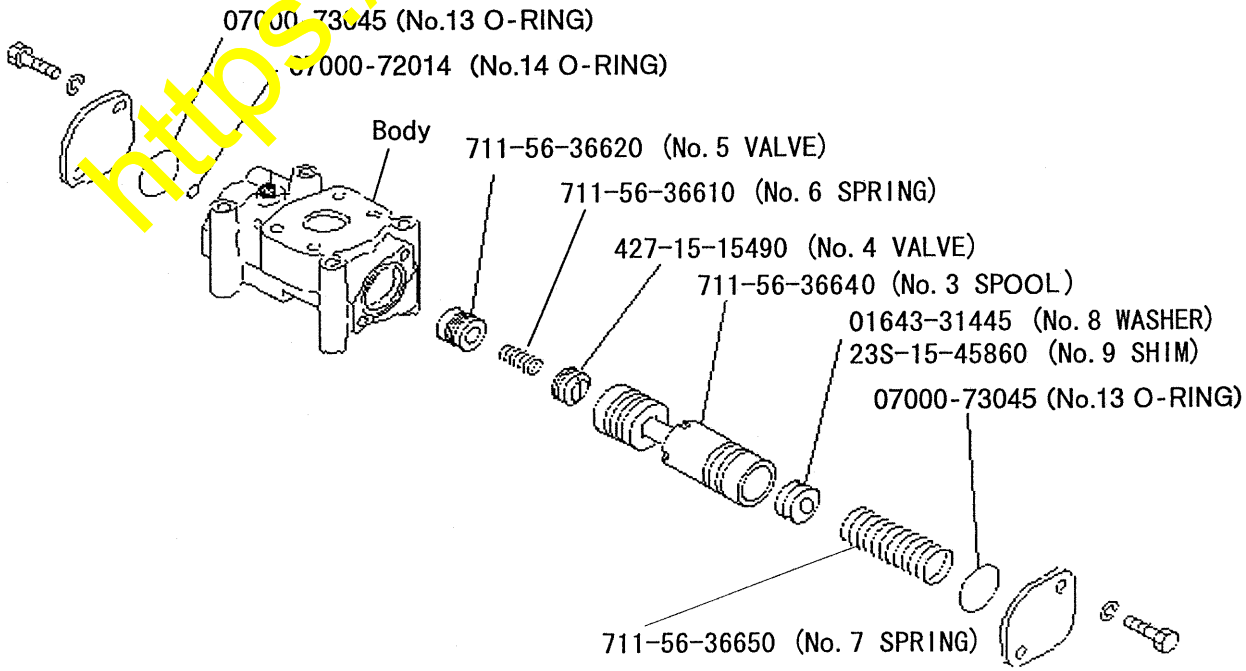
[2] Adjust the thickness of shims (8,9) in the Spool (3).

- 01643-31445 (t=4.5) Amount of pressure adjustment by 1 piece : 0.348 kg/cm^2
- 23S-15-45860 (t=0.5) Amount of pressure adjustment by 1 piece : 0.039 kg/cm^2

★ Clean up the orifice hole (ϕ1.6) of Spool (3) and the orifice hole (ϕ0.8) of Valve (4).
And make sure that no dust is in the orifice holes ϕ1.6 and ϕ0.8.

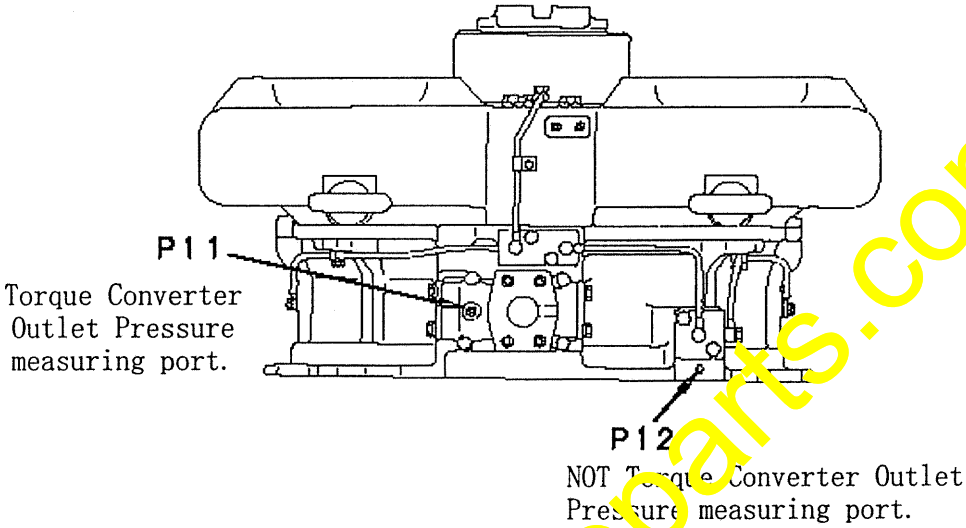
★ Valve (4), Spring (6) and Valve (5) shall be moved smoothly in Spool (3).
★ Sticking of Valve (4) or Valve (5) causes troubles on valve performance.

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



[NOTE]Port For Measuring Torque Converter Outlet Pressure.

Measure the Torque Converter Outlet Pressure at P11 in the following fig.
(P12 is not the Torque Converter Outlet Pressure measuring port.)



There is a MISPRINT in the SHOP MANUAL as shown below.

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

MISPRINTED