

PARTS & SERVICE NEWS

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SUBJECT: REPAIR PROCEDURE OF HYDRAULIC CIRCUIT PARTS OF TRANSMISSION ON WA380/400/430/450/470/480-5

PURPOSE: To introduce modification procedure to replace the parts of the hydraulic circuit for the transmission on WA380-5, WA400-5, WA430-5, WA450-5, WA470-5 and WA480-5 wheel loaders

APPLICATION: WA380-5 Wheel Loaders,
WA400-5 Wheel Loaders,
WA430-5 Wheel Loaders,
WA450-5 Wheel Loaders,
WA470-5 Wheel Loaders,
WA480-5 Wheel Loaders, } Refer to below

FAILURE CODE: 1556AA

DESCRIPTION:

1. Introduction

On the WA380-5, WA400-5, WA430-5, WA450-5, WA470-5 and WA480-5 wheel loaders, when the engine is started or when the engine revolution is changed abruptly, peak pressure may occur in the inside of the hydraulic circuit for the transmission and the transmission hoses may be damaged.

(Transmission hoses: Between the transmission pump and the flow control valve and between the flow control valve and the transmission filter)

When these hoses are damaged, make the modification being introduced in this Service News to replace the following parts.

- Main relief valve • Flow control valve • Hoses

Table of the applicable machines and already modified machines

Machine model	Serial numbers of the applicable machines and already modified machines	
	Already shipped machines applicable to this modification	Already modified factory shipment machines
WA380-5	#60001 thru #60251	#60252 –
WA400-5	#70001 thru #70022	#70023 –
WA430-5	#60001 thru #60037	#60038 –
WA470-5	#70001 thru #70129	#70130 –
WA480-5	#80001 thru #80031	#80032 –

2. List of parts

2.1 Applicable machine models: WA380-5 and WA400-5
(Ass'y No.)

Part No.	Part Name	Purpose of part	Q'ty	Remarks	
714-12-20000 (714-12-20000)	Transmission ass'y (Transmission ass'y)	}	1 (1)	} WA380-5	
714-12-20001 (714-12-20001)	Transmission ass'y (Transmission ass'y)		1 (1)		
714-12-20010 (714-12-20010)	Transmission ass'y (Transmission ass'y)		1 (1)	} WA380-5-LC	
714-12-20011 (714-12-20011)	Transmission ass'y (Transmission ass'y)		1 (1)		
714-12-20100 (714-12-20100)	Transmission ass'y (Transmission ass'y)		1 (1)	} WA380-5Y Tachograph spec. machines	
714-12-20101 (714-12-20101)	Transmission ass'y (Transmission ass'y)		1 (1)		
714-12-20110 (714-12-20110)	Transmission ass'y (Transmission ass'y)		} Reworked	1 (1)	} WA380-5Y-LC Tachograph spec. machines
714-12-20111 (714-12-20111)	Transmission ass'y (Transmission ass'y)			1 (1)	
714-12-20200 (714-12-20200)	Transmission ass'y (Transmission ass'y)			1 (1)	} WA400-5
714-12-20201 (714-12-20201)	Transmission ass'y (Transmission ass'y)		1 (1)		
714-12-20210 (714-12-20210)	Transmission ass'y (Transmission ass'y)		}	1 (1)	} WA400-5-LC
714-12-20211 (714-12-20211)	Transmission ass'y (Transmission ass'y)			1 (1)	

The assembly part numbers remain the same.

2.1 Applicable machine models: WA380-5 and WA400-5
(Separate Part No.)

Part No.	Part Name	Purpose of part	Q'ty	Remarks
<Main relief valve related parts: Explanation of the modification --- Refer to Section 3. Modification procedure --- Refer to Section 5.>				
714-07-26000 (17A-15-26002)	Main relief V. (Main relief V.)	Replacement	1 (1)	For this modification, the valve ass'y should be replaced.
• 714-07-25230 (• 41E-15-15230)	Valve (Valve)		1 (1)	The replacing part for the above valve ass'y.
• 07002-03034	O-ring		2	Consumable parts to replace when making this modification
• 198-15-15570	Shim		3	Parts to adjust the oil pressure when making this modification
07000-73030	O-ring		5	Consumable parts to replace when making this modification
<Flow control valve related parts: Explanation of the modification --- Refer to Section 6. Modification procedure --- Refer to Section 8.>				
714-07-25401 (714-07-25400)	Valve flow A. (Valve flow A.)	Replacement	1 (1)	} Consumable parts to replace when making this modification
07000-73040	O-ring		1	
07002-12434	O-ring		1	
<Hose related parts: Explanation of the modification --- Refer to Section 9. Modification procedure --- Refer to Sections 11.1 and 11.2.>				
714-07-24760 (714-07-14762)	Hose (Hose)	} Replacement	1 (1)	} Consumable parts to replace when making this modification
714-12-28706 (02762-00619)	Hose (Hose)		1 (1)	
714-07-28310 (02763-00610)	Hose (Hose)		1 (1)	
07000-A3032	O-ring		2	
02896-11018	O-ring		4	

2.2 Applicable machine model: WA430-5

Part No.	Part Name	Purpose of part	Q'ty	Remarks
714-17-20000 (714-17-20000)	Transmission ass'y (Transmission ass'y)	} Reworked	1 (1)	WA430-5
714-17-20010 (714-17-20010)	Transmission ass'y (Transmission ass'y)		1 (1)	WA430-5-LC
714-17-20100 (714-17-20100)	Transmission ass'y (Transmission ass'y)		1 (1)	WA430-5Y Tachograph spec. machines
714-17-20110 (714-17-20110)	Transmission ass'y (Transmission ass'y)		1 (1)	WA430-5Y-LC Tachograph spec. machines
<Main relief valve related parts: Explanation of the modification --- Refer to Section 3. Modification procedure --- Refer to Section 5.>				
714-17-26001 (714-17-26000)	Main relief V. (Main relief V.)	Replacement	1 (1)	For this modification, the valve ass'y should be replaced.
• 714-07-25230 (• 41E-15-15230)	Valve (Valve)		1 (1)	The replacing parts for the above valve ass'y.
• 07002-03034	O-ring		2	Consumable parts to replace when making this modification
• 198-15-15570	Shim		3	Parts to adjust the oil pressure when making this modification
07000-73030	O-ring		5	Consumable parts to replace when making this modification
<Flow control valve related parts: Explanation of the modification --- Refer to Section 6. Modification procedure --- Refer to Section 8.>				
714-17-25401 (714-17-25400)	Valve flow A. (Valve flow A.)	Replacement	1 (1)	} Consumable parts to replace when making this modification
07000-73040	O-ring		1	
07002-03434	O-ring		1	
<Hose related parts: Explanation of the modification --- Refer to Section 9. Modification procedure --- Refer to Sections 11.1 and 11.2.>				
714-07-24760 (714-07-14762)	Hose (Hose)	} Replacement	1 (1)	} Consumable parts to replace when making this modification
714-12-28790 (02762-006A9)	Hose (Hose)		1 (1)	
714-07-28810 (02763-00610)	Hose (Hose)		1 (1)	
07000-A3032	O-ring	2		
02896-11018	O-ring	4		

The assembly part numbers remain the same.

2.3 Applicable machine models: WA450-5, WA470-5 and WA480-5

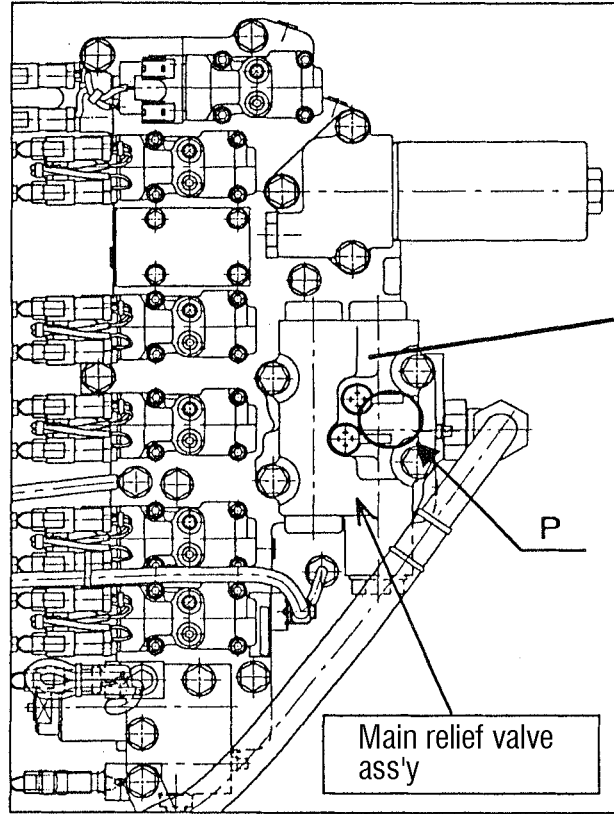
Part No.	Part Name	Purpose of part	Q'ty	Remarks
714-07-20000 (714-07-20000)	Transmission ass'y (Transmission ass'y)	} Reworked	1 (1)	WA450/470/480-5
714-07-20010 (714-07-20010)	Transmission ass'y (Transmission ass'y)		1 (1)	WA450/470/480-5-LC
<Main relief valve related parts: Explanation of the modification --- Refer to Section 3. Modification procedure --- Refer to Section 5.>				
714-07-25230 (41E-15-15230)	Valve (Valve)	Replacement	1 (1)	For this modification, the valve ass'y should be replaced.
• 714-07-25230 (• 41E-15-15230)	Valve (Valve)		1 (1)	The replacing parts for the above valve ass'y.
• 07002-03034	O-ring		2	Consumable parts to replace when making this modification
• 198-15-15570	Shim		3	Parts to adjust the oil pressure when making this modification
07000-73030	O-ring		5	Consumable parts to replace when making this modification
<Flow control valve related parts: Explanation of the modification --- Refer to Section 6. Modification procedure --- Refer to Section 8.>				
714-07-25401 (714-07-25400)	Valve flow A. (Valve flow A.)	Replacement	1 (1)	} Consumable parts to replace when making this modification
07000-73040	O-ring		1	
07002-12434	O-ring		1	
<Hose related parts: Explanation of the modification --- Refer to Section 9. Modification procedure --- Refer to Sections 11.1 and 11.3.>				
714-07-28760 (714-07-28762)	Hose (Hose)	} Replacement	1 (1)	} Consumable parts to replace when making this modification
714-07-28771 (714-07-28770)	Hose (Hose)		1 (1)	
• 714-07-28790 (• 02762-006A8)	Hose (Hose)		1 (1)	
• 714-07-28780	Spiral tube		1	
714-07-28810 (02763-00610)	Hose (Hose)	Replacement	1 (1)	
07000-A3032	O-ring		2	
02896-11018	O-ring		4	

The assembly part numbers remain the same.

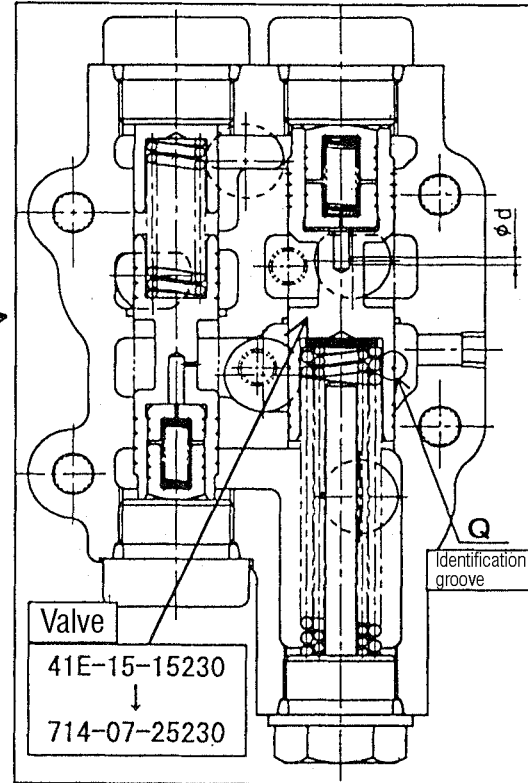
3. Explanation of the modification (Main relief valve)

The peak pressure can be lowered by changing the pressure receiving hole diameter (ϕd) inside the main relief valve ass'y, that improves the response to the hydraulic pressure change.

[Fig. 1] External view of the transmission control valve ass'y



[Fig. 2] Cross sectional view of the main relief valve ass'y



4. Identification methods for the new and current parts

(1) Main relief valve (spool)

Hole diameter (ϕd in Fig. 2) and identification groove (section "Q" in Fig. 2)

New part			Current part		
Part No. of the valve	ϕd	Identification groove	Part No. of the valve	ϕd	Identification groove
714-07-25230	2.0	Exists.	41E-15-15230	1.5	Does not exist.

(2) Main relief valve ass'y

If the stamping mark at the section "P" (in Fig. 1) of the main relief valve ass'y is B or A1 for the new part, the valve ass'y has been already modified and it is not necessary to replace the main relief valve ass'y.

Stamped mark of the valve ass'y (at the section "P" in Fig. 1)

New part		Current part		Applicable machine model
Mark	Part No. of the valve ass'y	Mark	Part No. of the valve ass'y	
B	714-07-26000	17A	17A-15-26002	WA380/400-5 WA450/470/480-5
A1	714-17-26001	A	714-17-26000	WA430-5

5. Modification procedure (Main relief valve)

<Applicable machine model: All the models being described in this Service News>

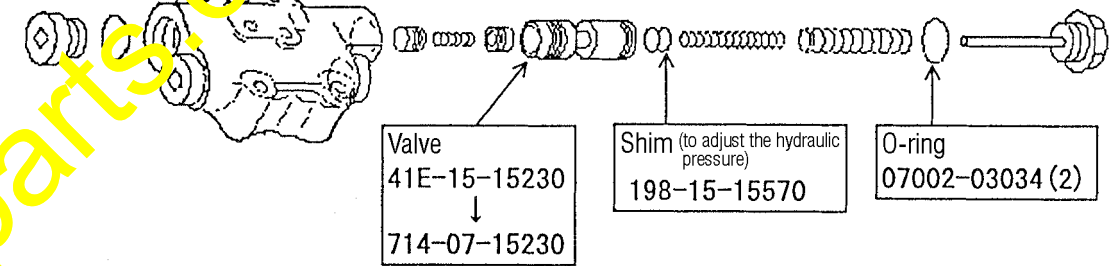
5.1 Replace the valve referring to the Section "Structure and Function, Maintenance Standard" in the Chapter "Disassembly and Assembly of Transmission" in the Shop Manual.

Before starting the replacement work, wash around the valve sufficiently. Also, while conducting the replacement work, be fully careful not to allow entry of sand, dust, etc. into the hydraulic circuits.

Moreover be careful so that the O-ring is not caught while installing the valve assembly.

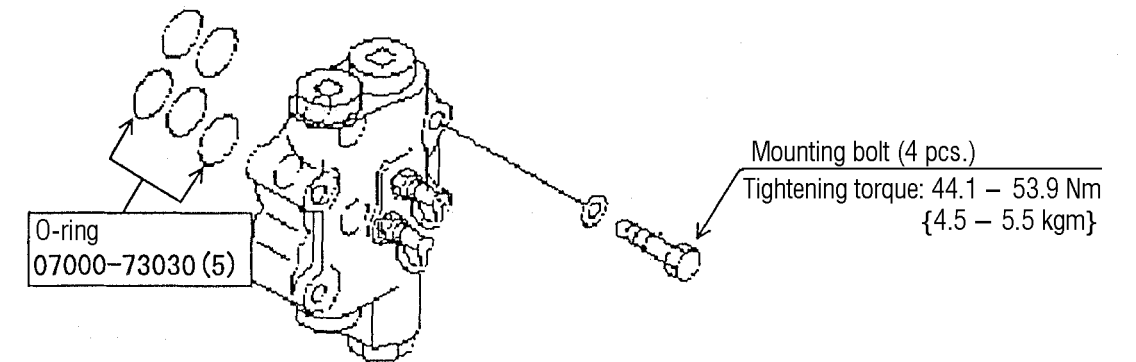
After the replacement work for the valve, carry out touch up painting using a black paint.

(1) Replacing the valve



[Fig. 3]

(2) Installing the valve ass'y



[Fig. 4]

5.2 After the replacement work for the valve, measure the main relief pressure and adjust the main relief valve referring to the Section "Testing and Adjusting, Power Train Oil Pressure" in the Shop Manual.

(Refer to the Section "Standard Value Table for Chassis" in the Shop Manual the standard value for the main relief pressure.)

6. Explanation of the modification (Flow control valve)

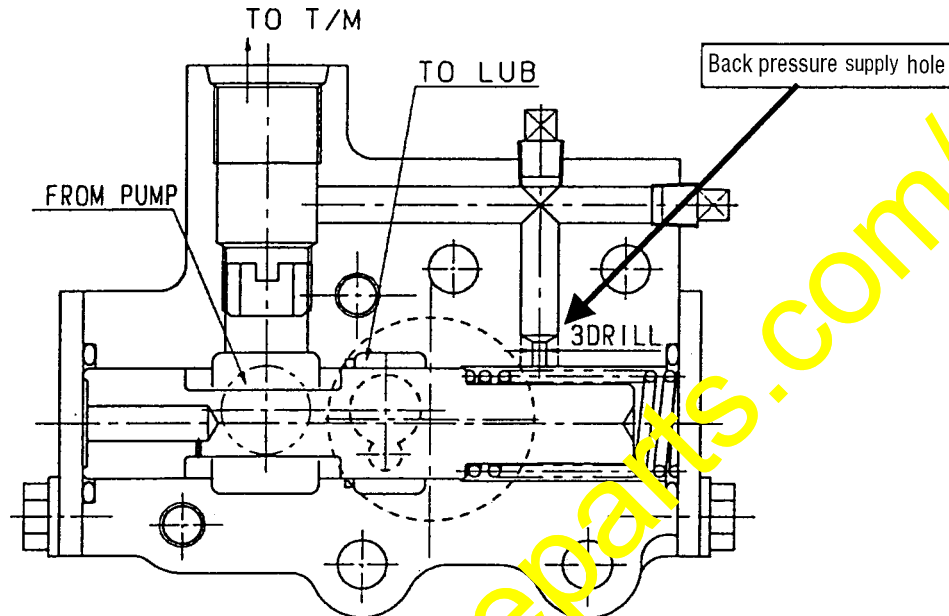
The peak pressure can be lowered by making the hole diameter to supply the back pressure in the flow control valve ass'y smaller, that dulls the response of the valve to the pressure.

New part: Hole diameter $\phi 3$



Current part: Hole diameter $\phi 8.3$ (through hole)

[Fig. 5] Cross sectional view of the flow control valve



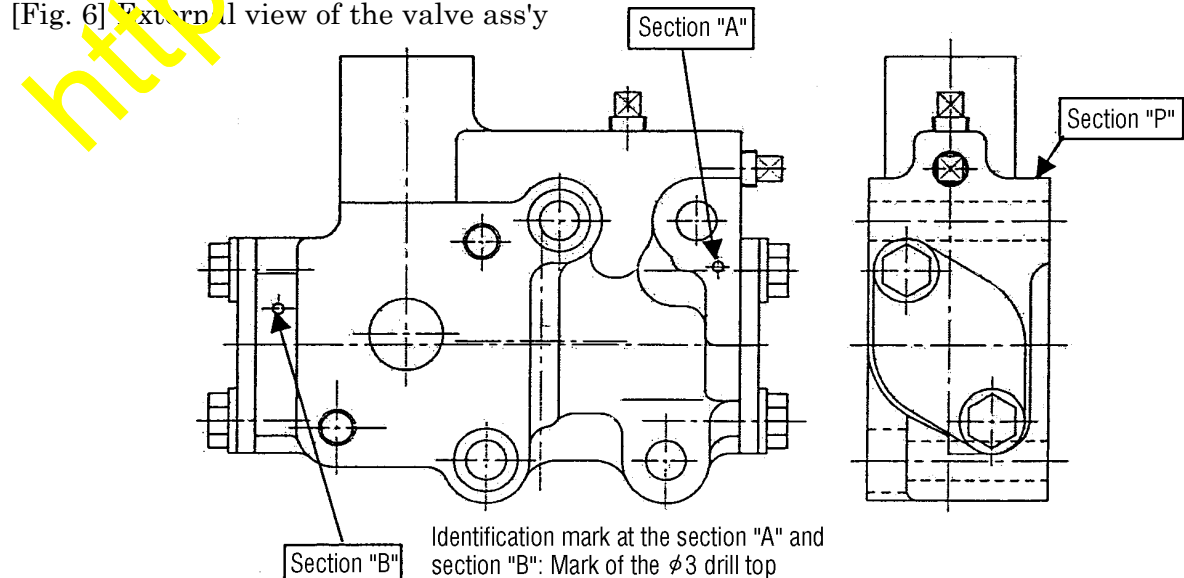
7. Identification methods for the new and current parts (flow control valve)

Identification mark of the valve ass'y (at the section "A" and section "B") and stamping (at the section "P")

Applicable machine model	New part			Current part		
	Part No. of the valve ass'y	Identification mark on the valve body	※Stamping at the section "P"	Part No. of the valve ass'y	Identification mark on the valve body	※Stamping at the section "P"
WA380/400-5 WA450/470/480-5	714-07-2540	Marked at both sections "A" and "B".	G	714-07-25400	Marked at the section "A" only. (Not marked at the section "B".)	C
WA430-5	714-17-2540	↑	H	714-17-25400	↑	D

※ The top mark of the stamped number at the section "P"

[Fig. 6] External view of the valve ass'y



8. Modification procedure (Flow control valve)

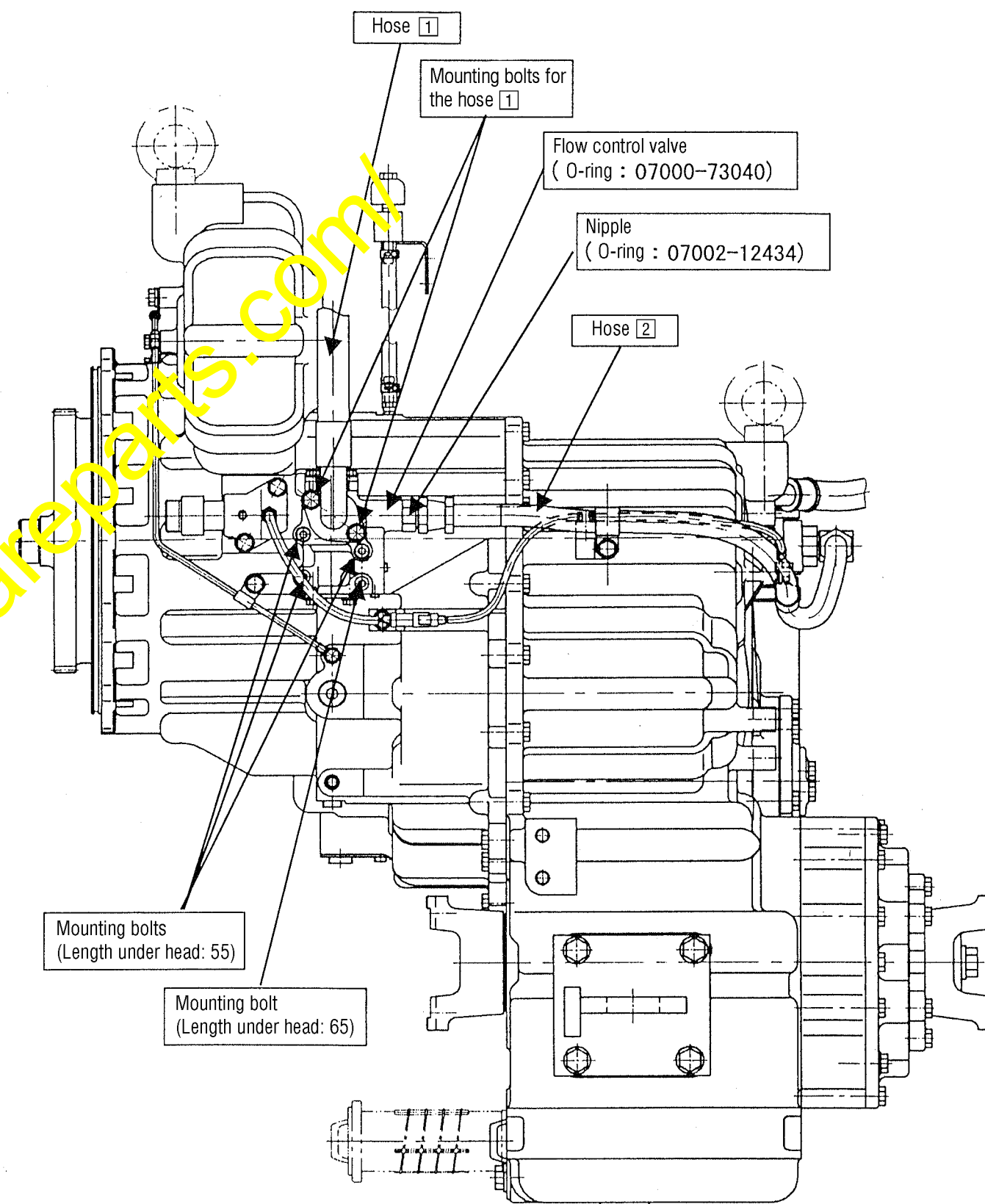
<Applicable machine model: All the models being described in this Service News>

8.1 Modification procedure

[Regarding the modification procedure for the hoses [1] and [2], refer to the modification procedure of the later Section 11.]

- (1) Wash around the valve sufficiently. (While conducting the replacement work for the valve, be fully careful not to allow entry of sand, dust, etc. into the valve ass'y.)
- (2) Remove the mounting bolts (2 pcs.) for the hose [1] and remove the hose [2].
- (3) Remove the mounting bolts (hexagon socket head cap bolts: 4 pcs.) to remove the flow control valve.
- (4) Remove the nipple from the flow control valve.
- (5) Replace the O-ring of the removed nipple with a new part.
- (6) Install the nipple to the newly prepared flow control valve.
- (7) Replace the O-ring being used on the mating surfaces between the flow control valve and the transmission housing with a new one.
- (8) Install the flow control valve to the transmission housing.
(Tightening torque: 29.4 – 39.2 Nm {3 – 4 kgm}, Apply LT-2.)
(Be careful since one of the hexagon socket head cap bolts is longer in the length than the others.)
- (9) After the replacement work for the valve, carry out touch up painting using a black paint.

[Fig. 7]



9. Explanation of the modification (Hose)

The pressure resisting strength of the hoses has been increased to improve the reliability.

New hose: 7 MPa × 10.5 MPa {70 kg/cm² × 105 kg/cm²}

↑

Current hose: 3 MPa × 4.5 MPa {30 kg/cm² × 45 kg/cm²}

10. Identification methods for the new and current parts

See the specification indicated on the hose.

New hose: 7 × 10.5 (or 70 × 105)

↑

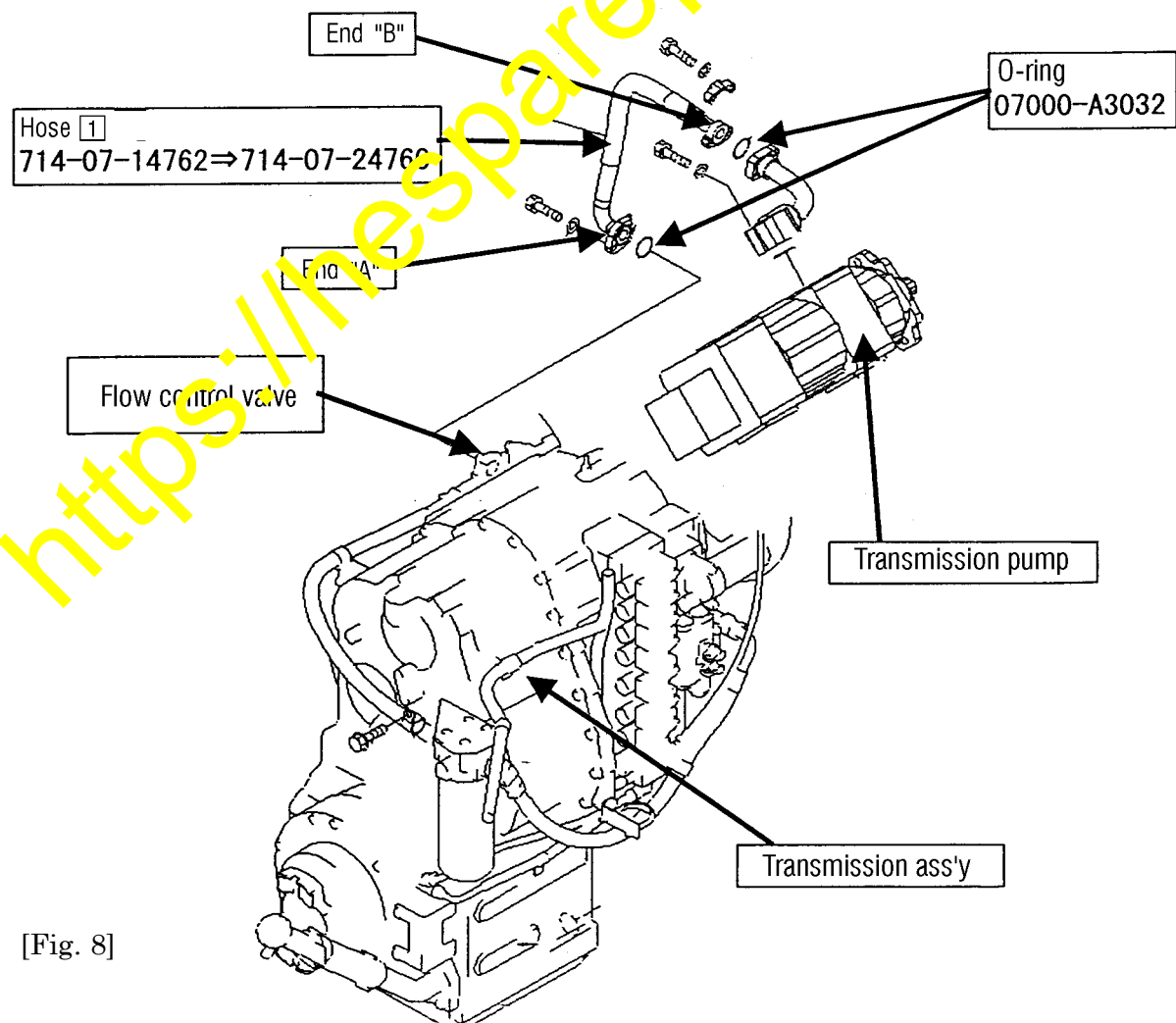
Current hose: 3 × 4.5 (or 30 × 45)

11. Modification procedure (Hose)

11.1 Regarding the hose connecting between the transmission pump and the flow control valve

<Applicable machine model: All the models being described in this Service News.>

- (1) Wash around the flange sections at both ends of the hose. (While conducting the replacement work for the hose, be fully careful not to allow entry of sand, dust, etc. into the ass'y.)
- (2) Disconnect the current hose from the transmission ass'y.
- (3) Install new O-rings to both ends of the newly prepared hose.
- (4) Temporarily tighten the mounting bolts at both ends of the hose and make sure the hose is not being twisted.
- (5) Tighten the mounting bolt on the flow control valve side (at the end "A" in Fig. 8). (Tightening torque: 29.4 – 39.2 Nm {3 – 4 kgm} / Apply LT-2.)
- (6) Tighten the mounting bolt on the pump side (at the end "B" in Fig. 8). (Tightening torque: 58.8 – 73.5 Nm {6 – 7.5 kgm})



[Fig. 8]

11.2 Regarding the "hose connecting between the flow control valve and the transmission filter" and the "hose connecting between the transmission filter and the transmission valve"

<Applicable machine model: WA380-5, WA400-5 and WA430-5>

11.2.1. The hose connecting between the flow control valve and the transmission filter (hose ②)

- (1) Wash around the both ends of the hose. (While conducting the replacement work for the hose, be fully careful not to allow entry of sand, dust, etc. into the ass'y.)
- (2) Disconnect the two hose clips (sections A and B).
- (3) Disconnect the current hose (②) from the transmission ass'y.
- (4) Remove the O-ring (at 2 places) from the face seal section and replace with new O-rings.
- (5) Temporarily tighten the newly prepared hose and make sure the hose is not being twisted.
- (6) Tighten the hose nut section. Be careful not to twist the hose while tightening the hose nut. (Tightening torque: 177 – 245 Nm {18 – 25 kgm})
- (7) Install the hose clip at two places. Refer to "Cross Section A-A" and "Cross Section B-B" in Fig. 9 for the direction of the clips.
- (8) When installing the hoses, check the shape (① in Fig. 9) to make sure interference is not occurring with other parts.

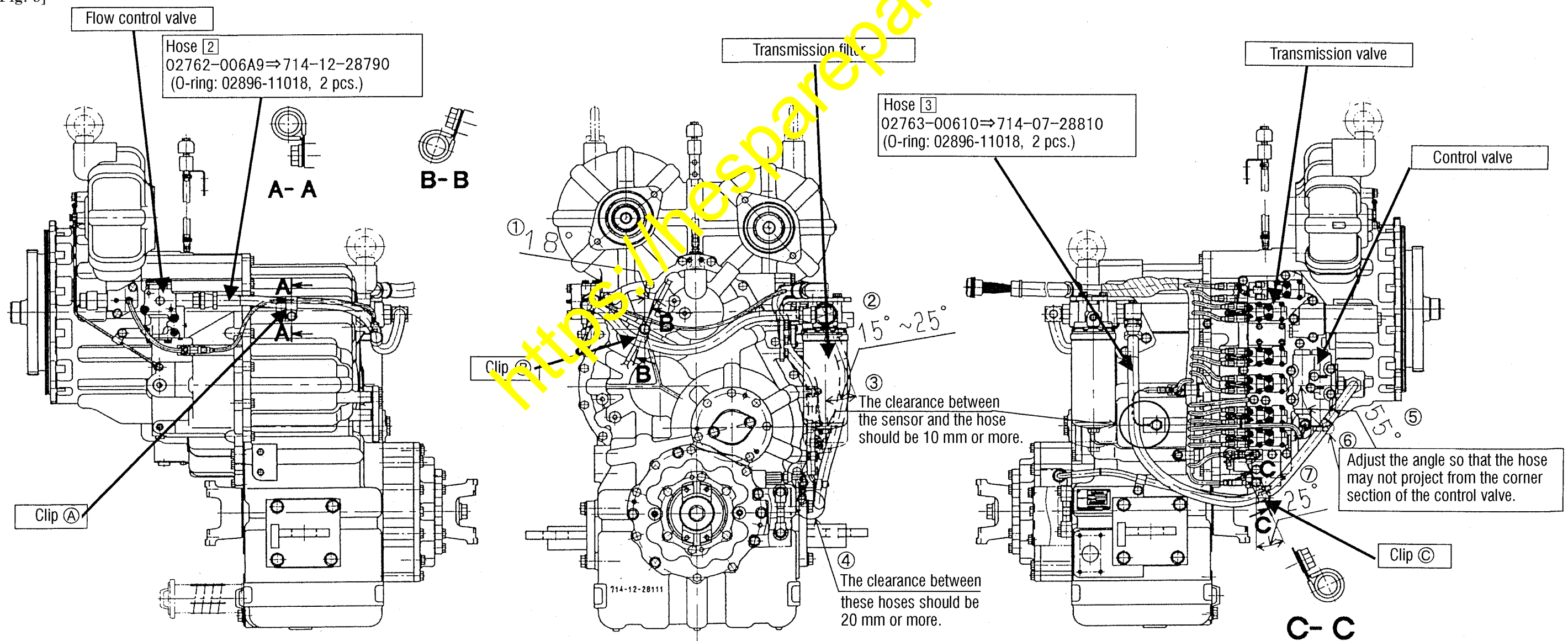
If anything is not satisfactory, arrange the hose shapes adjusting the mounting angles of the hoses and the angles of the clips.

11.2.2. The hose connecting between the transmission filter and the transmission valve (hose ③)

- (1) Wash around the both ends of the hose. (While conducting the replacement work for the hose, be fully careful not to allow entry of sand, dust, etc. into the ass'y.)
- (2) Disconnect the hose clip (at the section C).
- (3) Disconnect the current hose (③) from the transmission ass'y.
- (4) Remove the O-ring (at 2 places) from the face seal section and replace with new O-rings.
- (5) Temporarily tighten the newly prepared hose and make sure it is not being twisted.
- (6) Tighten the hose nut section. Be careful not to twist the hose while tightening the hose nut. (Tightening torque: 177 – 245 Nm {18 – 25 kgm})
- (7) Install the hose clip. Refer to "Cross Section C-C" in Fig. 9.
- (8) When installing the hose, check the shapes (②, ③, ④, ⑤, ⑥ and ⑦ in Fig. 9) to make sure interference is not occurring with other parts.

If anything is not satisfactory, arrange the hose shapes adjusting the mounting angles of the hoses and the angles of the clips.

[Fig. 9]



11.3 Regarding the "hose connecting between the flow control valve and the transmission filter" and the "hose connecting between the transmission filter and the transmission valve"

<Applicable machine model: WA450-5, WA470-5 and WA480-5>

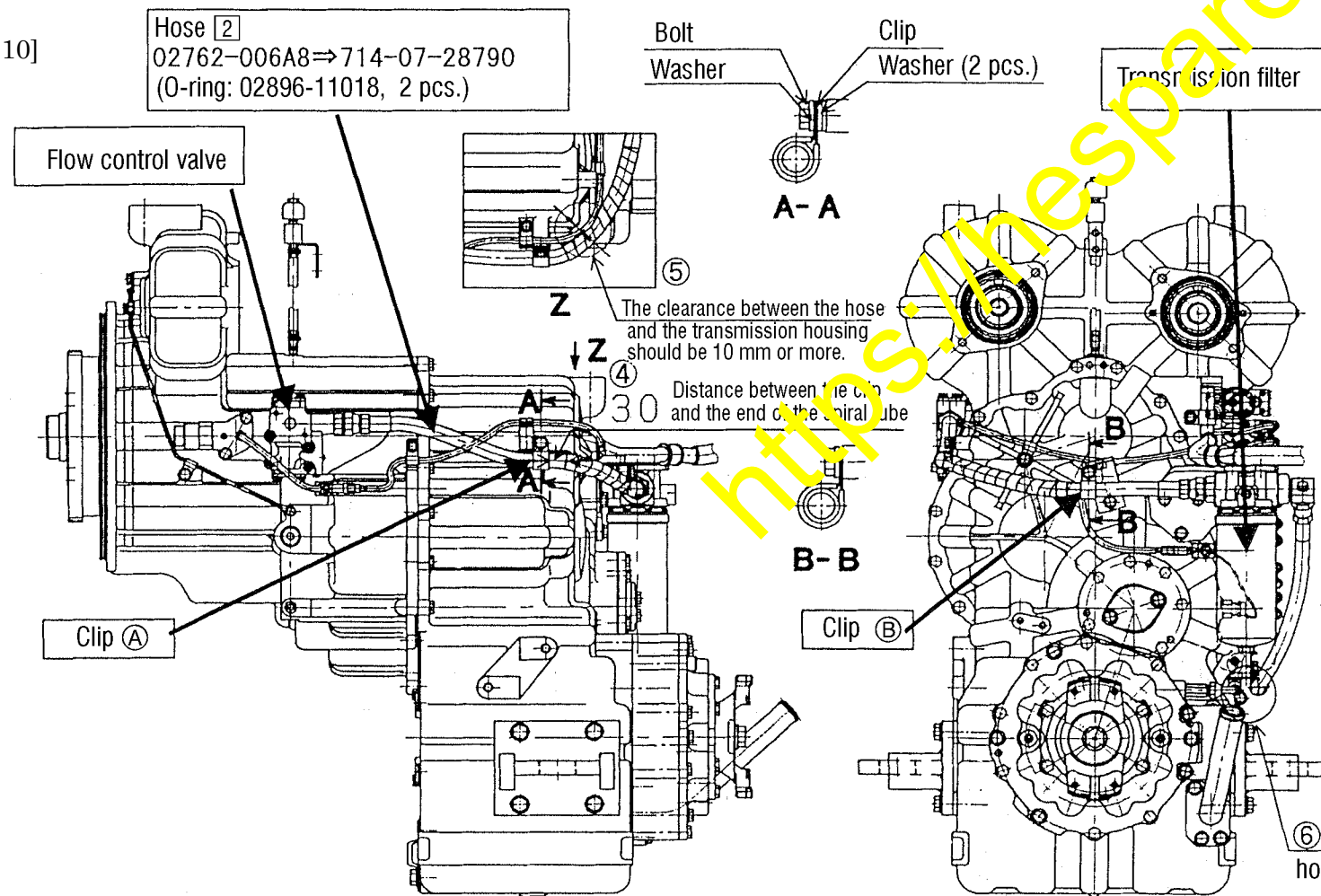
11.3.1. The hose connecting between the flow control valve and the transmission filter (hose [2])

- (1) Wash around the both ends of the hose. (While conducting the replacement work for the hose, be fully careful not to allow entry of sand, dust, etc. into the inside of the ass'y.)
- (2) Disconnect the two hose clips (sections A and B).
- (3) Disconnect the current hose ([2]) from the transmission ass'y.
- (4) Remove the O-ring (at 2 places) from the face seal section and replace with new O-rings.
- (5) Protect the newly prepared hose following the procedure being indicated in Fig. 11.
- (6) Temporarily tighten the newly prepared hose and make sure the hose is not being twisted.
- (7) Tighten the hose nut section. Be careful not to twist the hose while tightening the hose nut. (Tightening torque: 177 – 245 Nm {18 – 25 kgm})
- (8) Install the hose clips at two places. Refer to "Cross Section A-A" and "Cross Section B-B" in Fig. 10 for the direction of the clips.
- (9) When installing the hoses, check the shapes (4 and 5 in Fig. 10) to make sure interference is not occurring with other parts.
If anything is not satisfactory, arrange the hose shapes adjusting the mounting angles of the hoses and the angles of the clips.

<11.3.1. (5) Procedure to protect the hose [2]>

- (1) Wind the spiral tube [2] (714-07-28780) around the newly prepared hose [1] (714-07-28790) at 20 mm pitch.
- (2) Fasten both ends of the spiral tube using vinyl adhesive tape (black color) [3].

[Fig. 10]



11.3.2. The hose connecting between the transmission filter and the transmission valve (Hose [3])

- (1) Wash around the both ends of the hose. (While conducting the replacement work for the hose, be fully careful not to allow entry of sand, dust, etc. into the inside of the ass'y.)
- (2) Disconnect the hose clip (at the section C).
- (3) Disconnect the current hose ([3]) from the transmission ass'y.
- (4) Remove the O-ring (at 2 places) from the face seal section and replace with new O-rings.
- (5) Temporarily tighten the newly prepared hose and make sure it is not being twisted.
- (6) Tighten the hose nut section. Be careful not to twist the hose while tightening the hose nut. (Tightening torque: 177 – 245 Nm {18 – 25 kgm})
- (7) Install the hose clip. Refer to "Cross Section C-C" in Fig. 10.
- (8) When installing the hoses, check the shapes (6, 7, 8, 9 and 10 in Fig. 10) to make sure interference is not occurring with other parts.
If anything is not satisfactory, arrange the hose shapes adjusting the mounting angles of the hoses and the angles of the clips.

[Fig. 11]

