

# PARTS & SERVICE NEWS

REF NO. AA99060

DATE May 14, 2004

(C)

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**SUBJECT:** IMPROVED MAINTAINABILITY OF TRANSMISSION SOLENOID VALVE ASSEMBLY

**PURPOSE:** To introduce improved transmission clutch changing over solenoid valve assemblies (hereafter called "S/V") with enhanced maintenance ease.

**APPLICATION:** WA100-3 Wheel Loaders, S/N 60001 and up  
 WA120-3L Wheel Loaders, S/N A20083 and up  
 WA150-3 Wheel Loaders, S/N 60001 and up  
 WA180-3 Wheel Loaders, S/N 50001 and up  
 WA180-3L Wheel Loaders, S/N A80001 thru A80357  
 WA180PT-3L Wheel Loaders, S/N A85001 thru A85107  
 WA200-3 Wheel Loaders, S/N 60001 and up  
 WA250-3 Wheel Loaders, S/N 50001 and up, 65001 and up  
 WA250-3L Wheel Loaders, S/N A70001 thru A70391  
 WA250PT-3L Wheel Loaders, S/N A75001 thru A75207  
 WA300-3 Wheel Loaders, S/N 51001 and up

**FAILURE CODE:** DW2099

**DESCRIPTION:**

This **PARTS & SERVICE NEWS** introduces transmission clutch changing over solenoid valve assemblies with enhanced maintenance ease improvement.

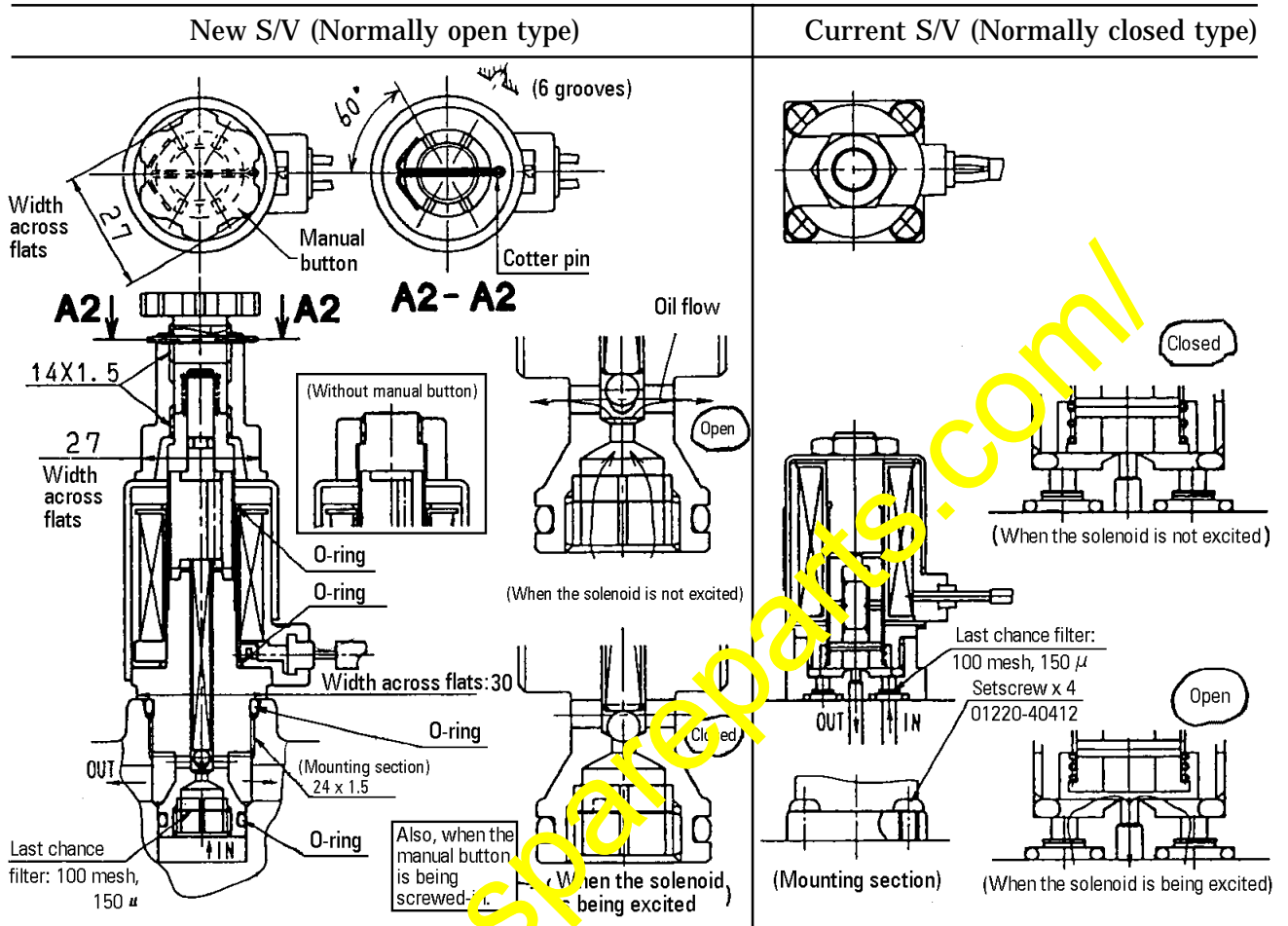
## 2. List of parts

No.	Part No.	Part Name	Q'ty	Remarks
1	714-11-15030 (714-11-15020)	Valve, T/M ass'y (Valve, T/M ass'y)	1 (1)	WA100-3, WA120-3 WA150-3, WA180-3
2	714-13-15030 (714-13-15000)	Valve, T/M ass'y (Valve, T/M ass'y)	1 (1)	WA200-3, WA200-3Y
3	714-16-25030 (714-16-25000)	Valve, T/M ass'y (Valve, T/M ass'y)	1 (1)	WA300-3CS, WA320-3CS WA300RT-3, WA320-DZ-3
4	714-11-16200 (714-11-16101)	Valve, lower ass'y (Valve, lower ass'y)	1 (1)	} For common use with the above T/M valve assemblies No. 1 ~ 3, applicable to all the above models.
5	01011-81015 (01011-81025)	Bolt (Bolt)	5 (6)	
6	01010-81085 (01011-81030)	Bolt (Bolt)	4 (1)	
7	(01011-81005)	(Bolt)	(1)	
8	(01011-81010)	(Bolt)	(1)	
9	01643-31032 (01643-31032)	Washer (Washer)	10 (6)	
10	(419-15-16670)	(Plate, lock)	(1)	
11	195-30-34260	Washer	1	
12	714-11-16900 (714-11-16701)	Valve solenoid ass'y (Valve solenoid ass'y)	1 (1)	
13	714-11-16811 (714-11-16810)	Bracket (Bracket)	1 (1)	
14	01010-80816 (01010-80816)	Bolt (Bolt)	2 (2)	
15	01643-30823 (01643-30823)	Washer (Washer)	2 (2)	
16	714-11-16800	Valve solenoid ass'y	1	
17	714-11-16830 (17A-15-17271)	Valve solenoid (Valve solenoid)	2 (2)	
18	714-11-16840 (17A-15-17271)	Valve solenoid (Valve solenoid)	2 (2)	
19	07000-E2016	O-ring	1	
20	714-11-16850	O-ring	1	
21	714-11-16860	O-ring	1	
22	714-11-16870	O-ring	1	
23	419-15-16551 (419-15-16551)	Gasket lower, L (Gasket lower, L)	1 (1)	

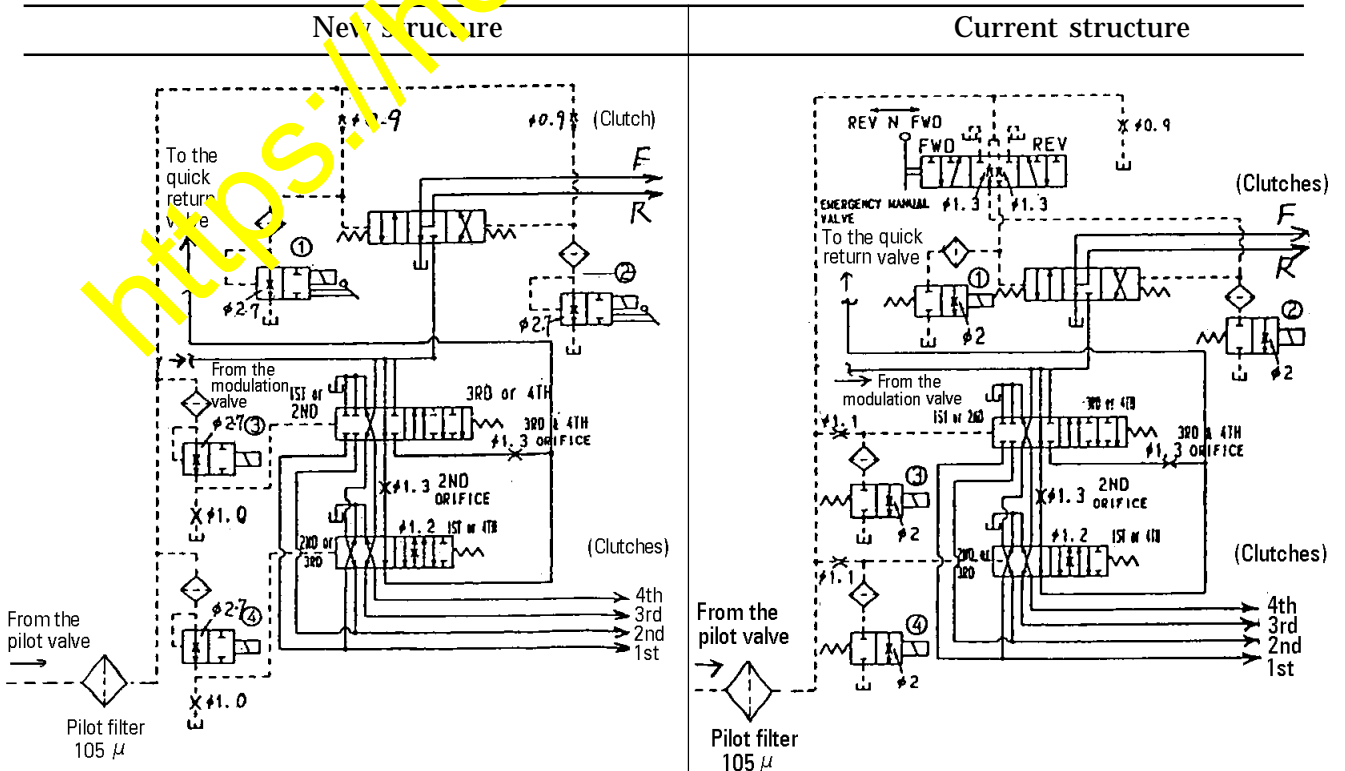


3-2) Independent structure of the S/V  
(For the reference purpose)

With the new S/V, the oil flow circuit will be opened when the solenoid is not excited and the oil flow circuit will be closed when the solenoid is excited or when the manual button is screwed-in. (The sequences are in reverse from those of the current solenoid valve)



3-3) Hydraulic circuit diagrams (for reference purposes)



4-2) Emergency travel operations (when using the new manual operation mechanism)

Normally, speed shift operations are carried out by electric signals. However, if the vehicle becomes unworkable due to electric circuit failure, the vehicle can be operated manually by the following operations.

**Warning**

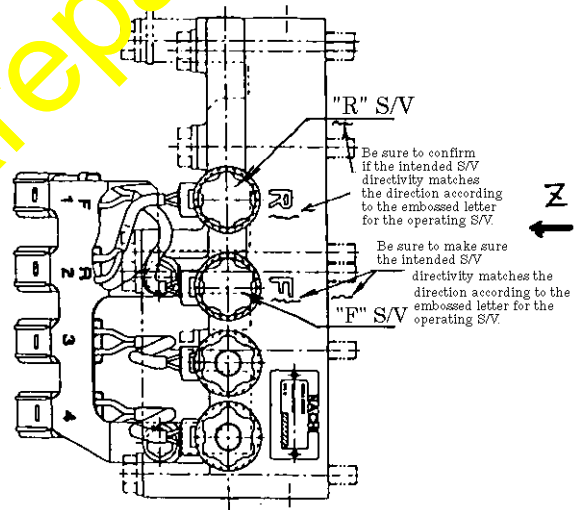
- When emergency travel becomes necessary, be sure to keep the engine stopped until it becomes ready to move the vehicle.
- When starting the engine, be sure to step-in the brake pedal. Also, always check the area around the machine to confirm safety.
- This operation should only be done as a last-chance effort to bring the vehicle to the nearest service facility when electric circuit failure has occurred making normal speed shifting unworkable. Do not make this emergency manual operation for any other purposes.
- Be sure to keep the speed shift lever at the neutral position.

**IMPORTANT**

**When emergency travel becomes necessary, ask your Komatsu dealer or his representative to do it for you or have them give you the necessary to do it yourself, following the procedures found in this Service News.**

(Operation procedures)

- 1) Turn "ON" (activate) the parking brake switch and set the speed-shift lever to the neutral position.
- 2) Choose the direction to move the vehicle ("F" or "R").
- 3) Remove the cotter pin engaging with the S/V for the chosen traveling direction to screw-in its manual button as far as it goes. (Refer to the sketch drawings given on page 4 and to the schematic diagram indicated at right.)

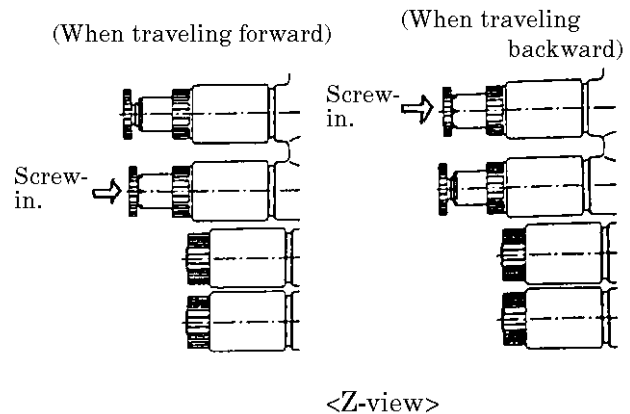


**[Caution]**

**When doing the above, be sure to identify the "F" S/V or "R" S/V by the embossed letter "F" or "R" located on the upper surface of the valve body.**

(The embossing reading "F" exists beside the position where the "F" S/V is being installed. This is same with the "R" S/V also.)

- 4) While stepping-in the brake pedal, start the engine, release the parking brake and slowly release the brake pedal to let the vehicle move. (Shift to the 2nd speed stage when doing this.)
- 5) After finishing the necessary emergency travel, return the manual button back to the original neutral position and lock it to the position using the cotter pin. (Refer to page 5.)





5. Replacement procedures (The part codes used on this page correspond to the item numbers in the list of necessary parts indicated on page 3.)

5-1) When replacing the S/V assembly in the assembly form (When replacing the 714-11-16701 with the 714-11-16900)

- (1) Disconnect the chassis harness connectors from the harness connectors of the four units of the S/V units of the current S/V assembly before removing the current S/V assembly loosening its setbolts.
- (2) Clean to remove dirt from the mating surface to the removed S/V assembly and replace the gasket ⑭ with a new part.
- (3) Detach the bracket ⑬ from the new S/V assembly temporarily.  
(With the connectors installed as they are)
- (4) Install the new S/V together with the plate (419-06-12840: reused part) using the bolts ⑤ and ⑥ and washers ⑨ and ⑩. (Tightening torque: 6 – 7.5 kgm)
- (5) Install the bracket ⑬ using the bolts ⑭ and washers ⑮. (Tightening torque: 2.8 – 3.5kgm)
- (6) Connect the connectors (No. 1 through No. 4) of the chassis side harness to the S/V side connectors matching to the stamped numbers (1 through 4) on the bracket.

5-2) When the bracket is not attached to the supplied new S/V assembly (When replacing the 714-11-16701 with the 714-11-16800)

Procedures (1) and (2): Same as the above section 5-1).

- (3) Install the new S/V assembly (714-11-16800) following the same procedure according to the above 5-1)-(3).
- (4) Install the current bracket ⑬ (the new and current brackets are interchangeable and the current bracket can be reused) using the bolts ⑭ and washers ⑮ (these parts are also to be reused).  
(Tightening torque: 2.8 – 3.5 kgm)
- (5) Clip to fasten the S/V connectors to respective positions under the bracket according to the illustrated designations in the schematic diagram titled "<New S/V>" indicated below. (The sequence is the same as with the current S/V.)

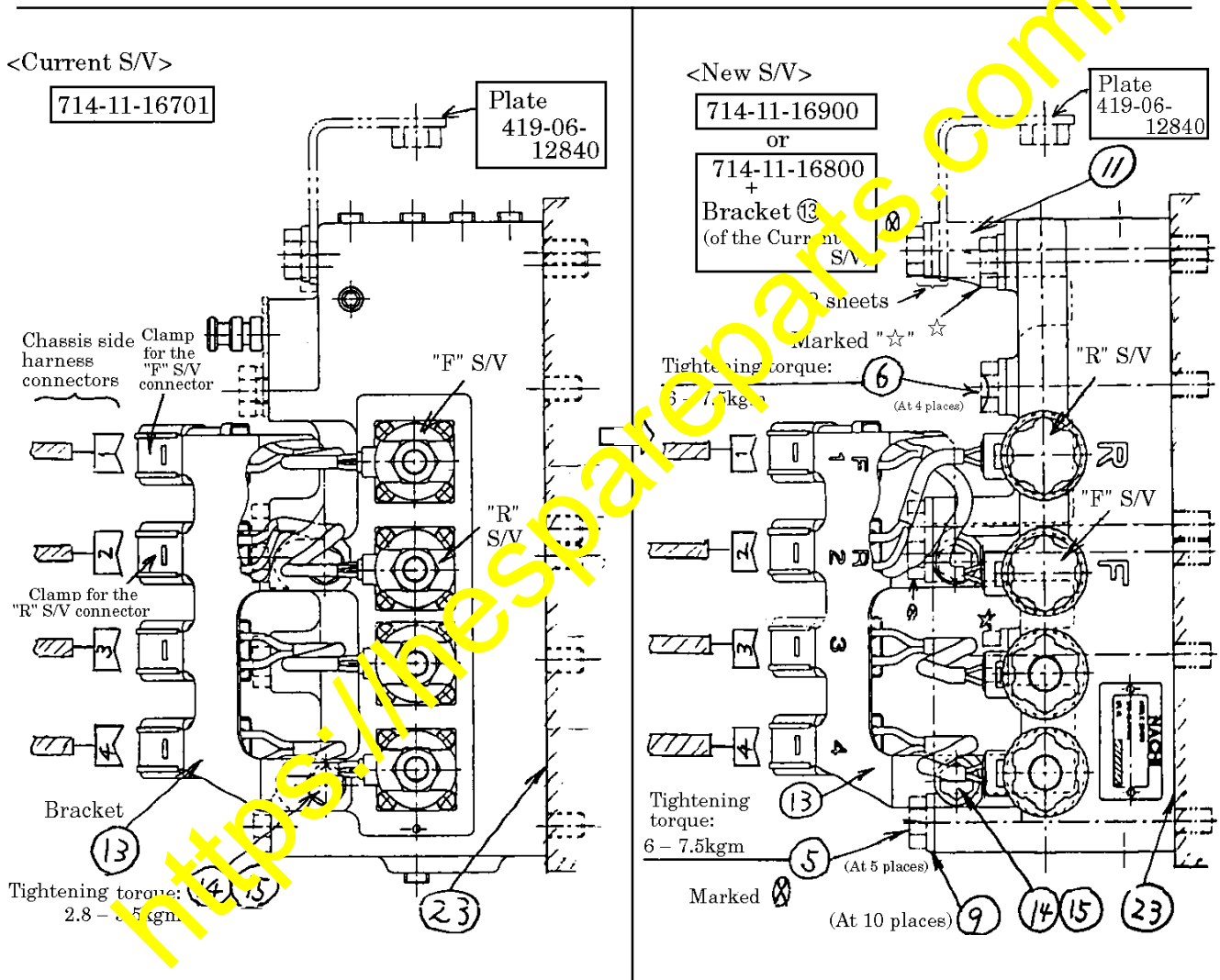
**[Caution]**

Since the locations of installation for the "F" S/V and the "R" S/V will become reversed between the <New S/V> and the <Current S/V>, cross the harness wires for the "F" and "R" connectors before making respective connections.

(The bracket ⑬ being attached to the <New S/V> is therefore stamped "F, R, 1, 2, 3, 4", different from the bracket which was attached to the <Current S/V>.)

<Be sure to make connections properly.>

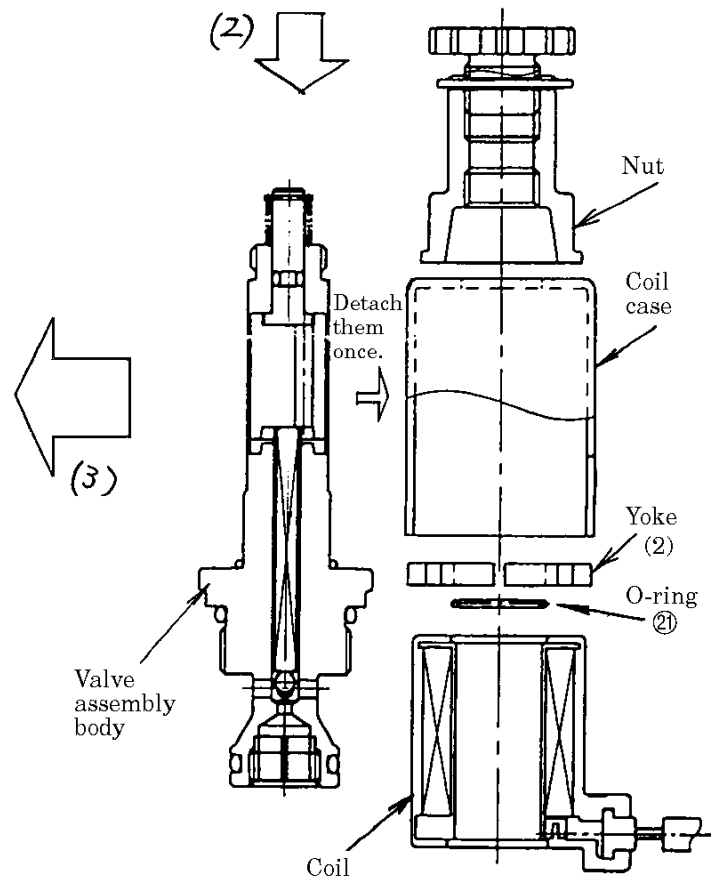
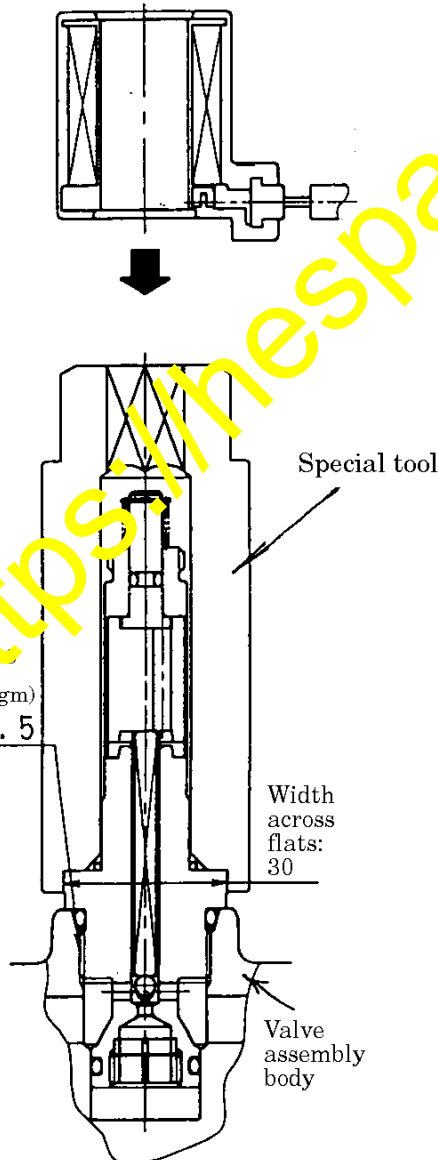
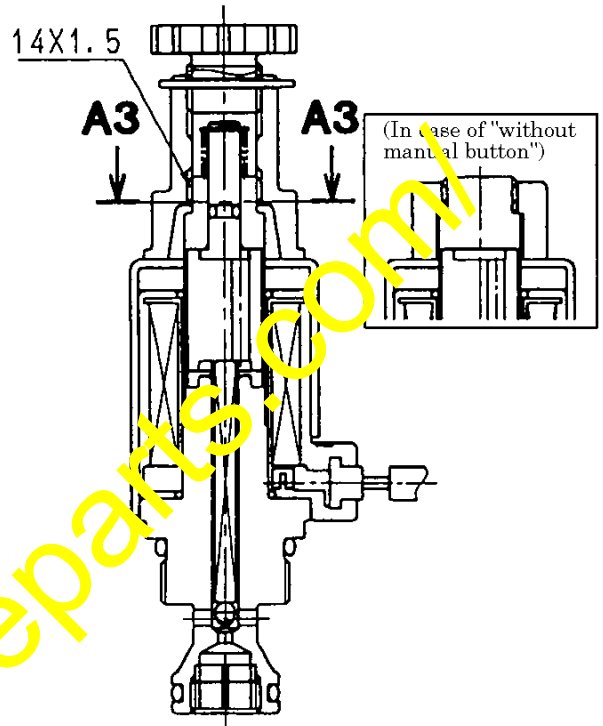
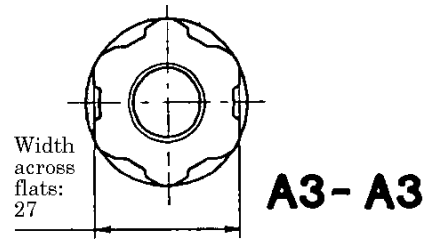
(6) Connect the chassis side harness connectors to the S/V side connectors same as the way they were being connected with the <Current S/V>.



5-3) When replacing the independent solenoid valve units

(When replacing the independent solenoid valve units 714-11-16830 and 714-11-16840 with the new S/V assembly 714-11-16900)

- (1) Remove the solenoid valve units (current solenoid valve units) from the S/V assembly. (Always use the special tool illustrated below.)
- (2) Detach the nut (width across flats: 27), coil case, yoke (2), O-ring (2) and coil temporarily from the prepared new solenoid valve units (New solenoid valve units).
- (3) Install the valve element into the mating slot in the valve assembly body ( $24 \times 1.5$ ) using the special tool. Tightening torque: 1.8 - 2.4kgm (Refer to page 11 regarding the detailed structure of the special tool.)



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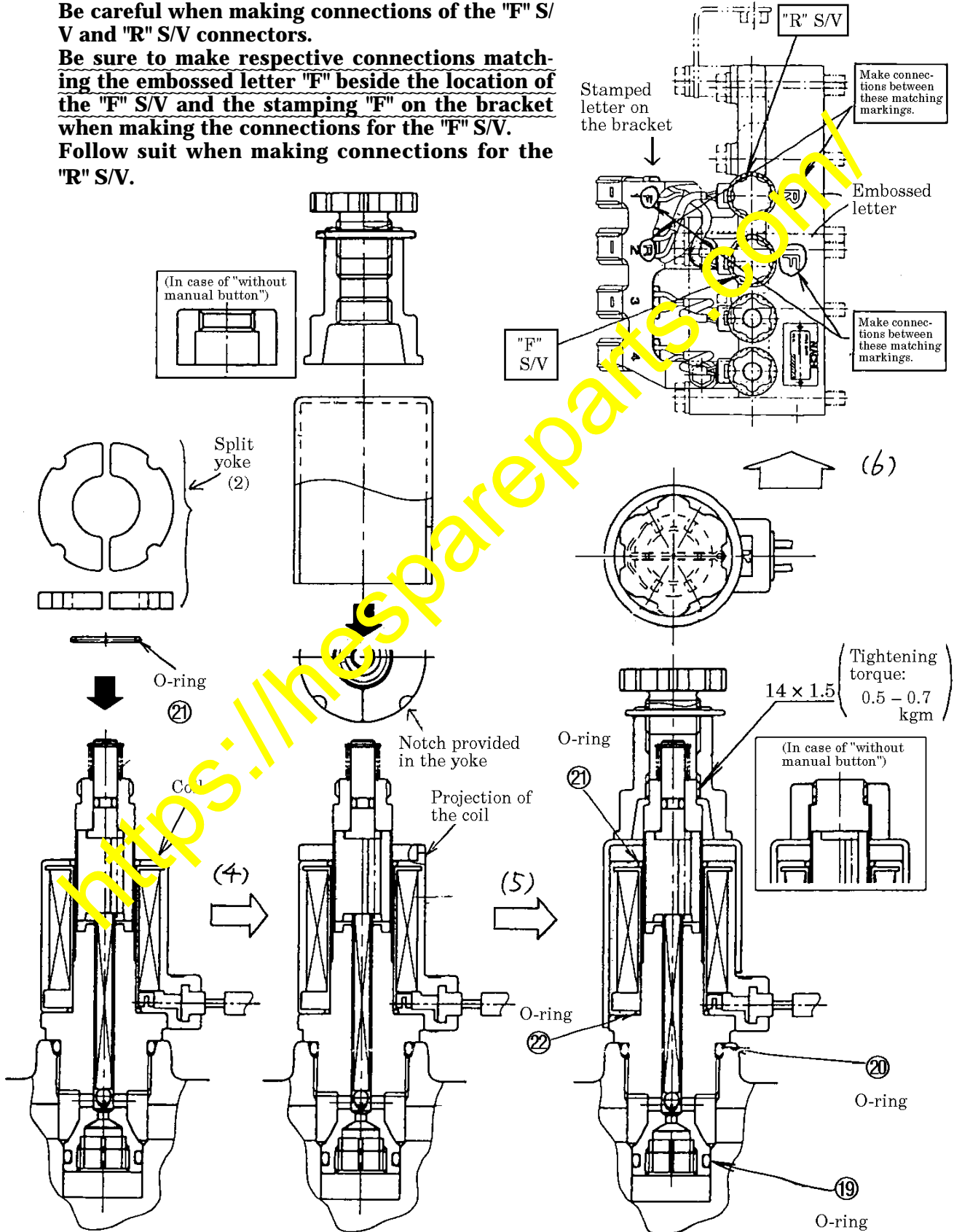
- (4) Reassemble and reinstall the coil, O-ring ⑳ and yoke (2).  
When doing this, match the projections (at 4 places) to the notches provided in the split yokes (2).
- (5) Reinstall the coil case and the nut. (Nut tightening torque: 0.5 – 0.7kgm)
- (6) Install the S/V connectors to the bracket following the illustrated designations given at right.

**[Caution]**

Be careful when making connections of the "F" S/V and "R" S/V connectors.

**Be sure to make respective connections matching the embossed letter "F" beside the location of the "F" S/V and the stamping "F" on the bracket when making the connections for the "F" S/V.**

**Follow suit when making connections for the "R" S/V.**



- (7) When the O-rings ⑱ through ㉓ were damaged while replacing the independent solenoid valve units, replace them with new counterparts. Meanwhile, since the diameters of the ㉑ and ㉒ are very close, you can distinguish them by checking the following points.

No.	Part numbers	Identification markings	Inner diameter	Thickness
㉑	714-11-16860	Nil	14.5	1.5
㉒	714-11-16870	A green dot	15.5	1.5

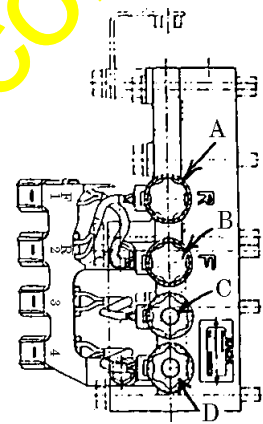
When performing the replacement work for the independent solenoid valve units, detach the S/V assembly once whenever possible.

(When reinstalling the S/V assembly, replace gasket ㉔ with a new gasket.)

However, the following solenoid valve units being used for the following vehicle models can be replaced with the subject S/V assembly being installed to the chassis as follows.

No.	Vehicle models	Replaceable solenoid valve unit types
1	WA100-3, WA120-3, WA150-3, WA180-3	All 4 types
2	WA200-3, WA200-3Y, WA300-3CS, WA300-RT-3, WA320-3CS, WA320-DZ-3	A, B, C

(As for the solenoid valve unit type "D" according to the Category 2) of the above listing, the coil may interfere with the suction tube and the S/V assembly needs to be removed once before replacing this solenoid valve unit type "D".



6. Fabrication drawing for the special tool  
 - The tool necessary for installation of the solenoid valve units to the valve assembly body.

**Note) We will not hold ourselves responsible for any failures or accidents occurring from the special tool fabricated according to this drawing.**

1. Chamfer undesignated edges at 0.3 × 0.3.  
 2. The hardness after quenching or tempering should be HRC 40±3.

Dimensional tolerance (for cutting)	
Nominal dimension ranges	Medium grade tolerance
0.5 or more and 6 or less	±0.1
More than 6 and 30 or less	±0.2
More than 30 and 120 or less	±0.3

HEAT TREATMENT 1225001400	MATERIAL SCM435H
PART NAME INSTALL TOOL	Q'TY 1
793-215-1110	

0.6 kg