

# INSTALLATION MANUAL

REF NO.	BA02004
DATE	Jan. 2, 2002

**SUBJECT:** INTRODUCTION OF INSTALLATION KIT FOR NEW ECSS

**PURPOSE:** To introduce the installation kit necessary when making field installation of the new Electronic controlled Suspension System (ECSS)

**APPLICATION:** WA450-3 Wheel Loader, S/N 53001 and up  
WA450-3MC Wheel Loader, S/N A31001 and up  
WA470-3 Wheel Loaders, S/N 50001 thru 53999

**FAILURE CODE:** 5A00Z9

**DESCRIPTION:**

We have prepared a new Electronic Controlled Suspension System (ECSS) kit ((1) one accumulator type) which is superior in the overflowing preventive function and in the operator's riding comfort as compared with the existing ECSS ((2) two accumulator type).

This kit is applicable when installing the new ECSS to the machines not being equipped with the ECSS at all or to the machines already equipped with the existing ECSS ((2) accumulator type).

When making field installation of the new ECSS kit, follow the procedures outlined in this **INSTALLATION MANUAL**.

<https://thespareparts.com/>

## 2. List of parts

## [1. List of parts commonly needed regardless of the status of the machine]

Part No.	Part Name	Q'ty	Remarks
421-S99-2293	Valve	1	
01435-01270	Bolt	3	
418-54-13220	Washer	6	
418-54-13151	Cushion	6	
418-54-13161	Cushion	3	
428-64-15110	Collor	3	
01580-11210	Nut	3	
421-S99-3161	Bracket	1	
23S-61-35430	Elbow	1	
07002-12434	O-ring	1	
07236-10522	Elbow	1	
07002-12434	O-ring	1	
07236-10422	Elbow	1	
07002-12434	O-ring	1	
421-S99-2390	Valve	1	
07235-10425	Elbow	1	
07002-12434	O-ring	1	
124-49-32341	Elbow	1	
07002-12434	O-ring	1	
721-32-03040	Accumlator	1	
09639-A2573	Plate	1	
421-S99-3132	Clip	1	
421-S99-3122	Bracket	1	
01435-01225	Bolt	2	
01594-01008	Nut	2	
07235-10522	Elbow	1	
07002-12434	O-ring	1	
421-62-24150	Tube	1	
07000-13035	O-ring	2	

Part No.	Part Name	Q'ty	Remarks
07000-13032	O-ring	2	
421-62-23111	Tube	1	
07002-12434	O-ring	1	
421-62-24170	Elbow	1	
07000-13038	O-ring	1	
07000-13045	O-ring	1	
421-62-24160	Bracket	1	
07000-12060	O-ring	1	
07000-13048	O-ring	1	
07235-10522	Elbow	1	
07002-12434	O-ring	1	
421-62-24141	Tube	1	
07000-13045	O-ring	1	
07000-13035	O-ring	2	
421-62-24131	Tube	1	
07000-13045	O-ring	1	
07000-13035	O-ring	2	
01435-01225	Bolt	6	
421-S99-3150	Bracket	1	
01435-01225	Bolt	2	
01010-81230	Bolt	1	
01643-31252	Washer	1	
01435-01280	Bolt	2	
07123-00505	Hose	1	
07123-00404	Hose	1	
07123-00510	Hose	1	
417-963-2860	Protector	1	
07000-13032	O-ring	2	
07124-01009	Hose	1	
417-963-2860	Protector	1	
07000-13032	O-ring	2	

Part No.	Part Name	Q'ty	Remarks
07124-01008	Hose	1	
01643-51032	Washer	16	
07372-21035	Bolt	16	
07371-31049	Frang	8	
07123-00411	Hose	1	
01435-01016	Bolt	1	
07095-20627	Cushion	1	
04434-53411	Clip	1	
01435-01016	Bolt	2	
07095-20420	Cushion	2	
04434-52711	Clip	2	
421-S99-3540	Wiring harness	1	"ADD ON FRAME" harness
08036-21414	Clip	1	
08034-20536	Band	5	
01435-01016	Bolt	1	
04434-52110	Clip	1	
154-54-18510	Seat	1	F. frame rework
286-35-11610	Sea	6	
425-46-12L40	Sea	3	
01571-01016	Seat	1	
08036-C2845	Clip	1	
08053-C(51)	Clip	1	

[2. List of parts needed only in case the machine is not being equipped with the ECSS at all]

Part No.	Part Name	Q'ty	Remarks
421-S99-2410	Tube	1	
421-S99-2450	Tube	1	
421-S99-3530	Wiring harness	1	"ADD ON FLOOR" harness
08034-20519	Band	5	
7823-43-1001	Controller	1	The exclusive controller for the ECSS
01435-00816	Bolt	4	
421-S99-2160	Bracket	2	
01435-00816	Bolt	4	
421-S99-2310	Wiring harness	1	Model selection connector
08037-03614	Grommet	1	
569-06-61960	Relay	1	
287-06-16420	Clip	1	
01435-00612	Bolt	1	
01571-01016	Seat	1	For reworking of the rear frame
08053-00910	Clip	2	
7823-62-9012	Plate	1	Decal in Japanese
7823-62-9063	Plate	1	Decal in English

[ 3. List of parts needed in case the machine is being equipped with the exclusive controller for the ECSS (the controller is being installed underneath the operator's seat) ]

Part No.	Part Name	Q'ty	Remarks
421-S99-3530	Wiring harness	1	"ADD ON FLOOR" harness
08034-20519	Band	5	
421-S99-2310	Wiring harness	1	Model selection connector
08037-03614	Grommet	1	
569-06-61960	Relay	1	
287-06-16420	Clip	1	
01435-00612	Bolt	1	

[ 4. List of parts needed only in case the machine is being equipped with the combination transmission-ECSS controller (the combination transmission-ECSS controller being installed inside the RH console) ]

Part No.	Part Name	Q'ty	Remarks
7823-14-1006	Controller	1	Transmission + ECSS controller
421-S99-3550	Wiring harness	1	Adaptor harness

[Precautions to take before starting the modification work]

In case the machine to be subjected to the modification is equipped with the ECSS carrying the accumulator charging mechanism, it becomes necessary to release pressure from the circuits before starting disconnection work for the pipings of the circuits connecting to the work equipment and neighboring equipment.

Check the machine regarding the above point and when pressure releasing work is found necessary, do not fail to release pressure following the pressure releasing procedures outlined in the Service News indicated below.

BT97032 "New ECSS kit installation procedures"

Referring Section:

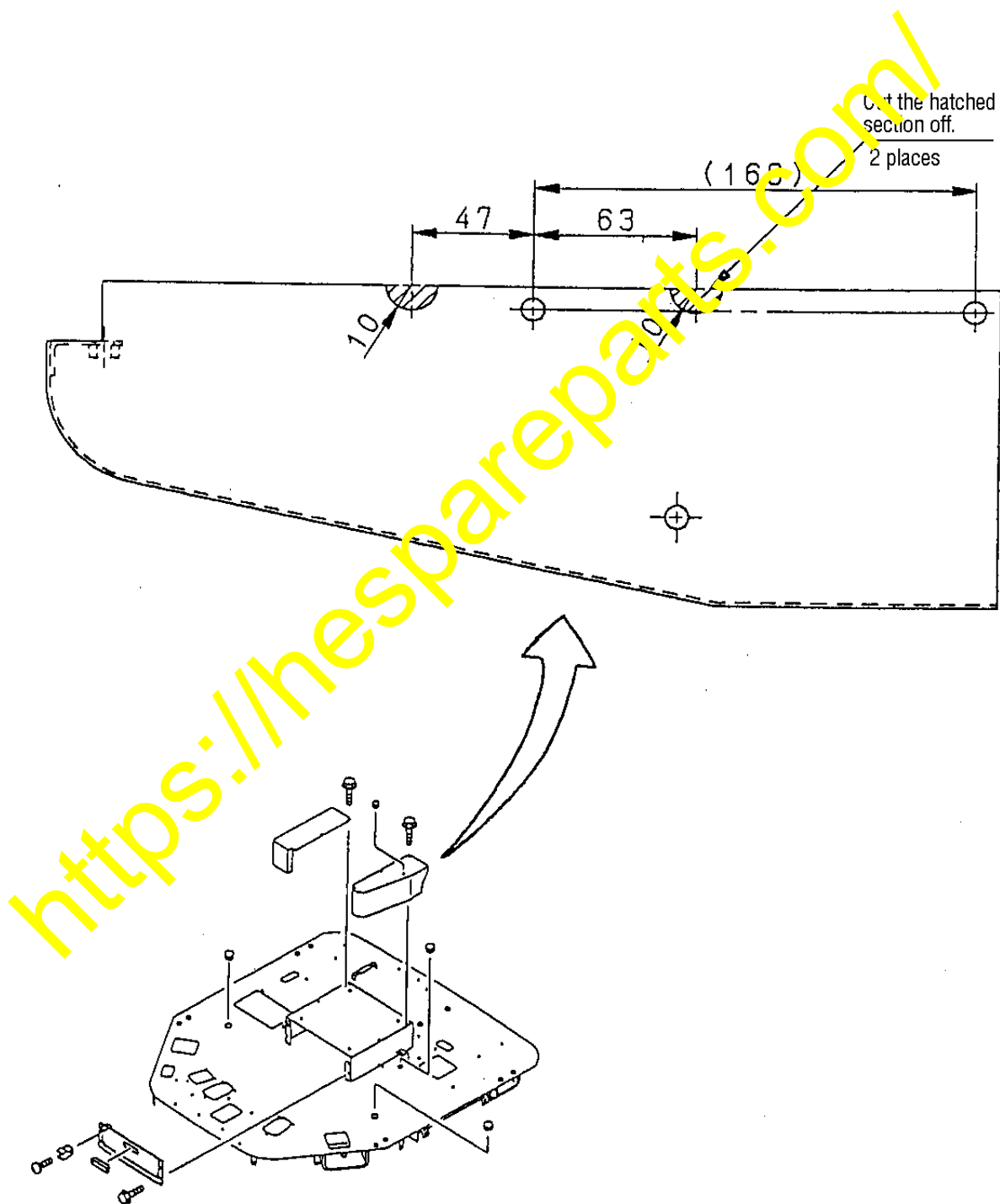
"Operational precautions for the pressure releasing switch installed in the accumulator circuit"

### 3. Reworking procedures

- 1) Reworking with the cover  
Cut the hatched sections off from the cover located on the LH side of the seat support being installed to the floor.

Note) This rework is not necessary in case the machine is already equipped with the ECSS.

<<Note>> Ordering for the new cover (421-S99-2610) can substitute this reworking.

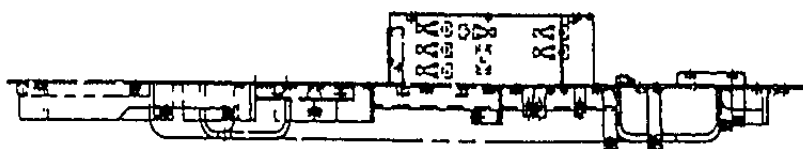
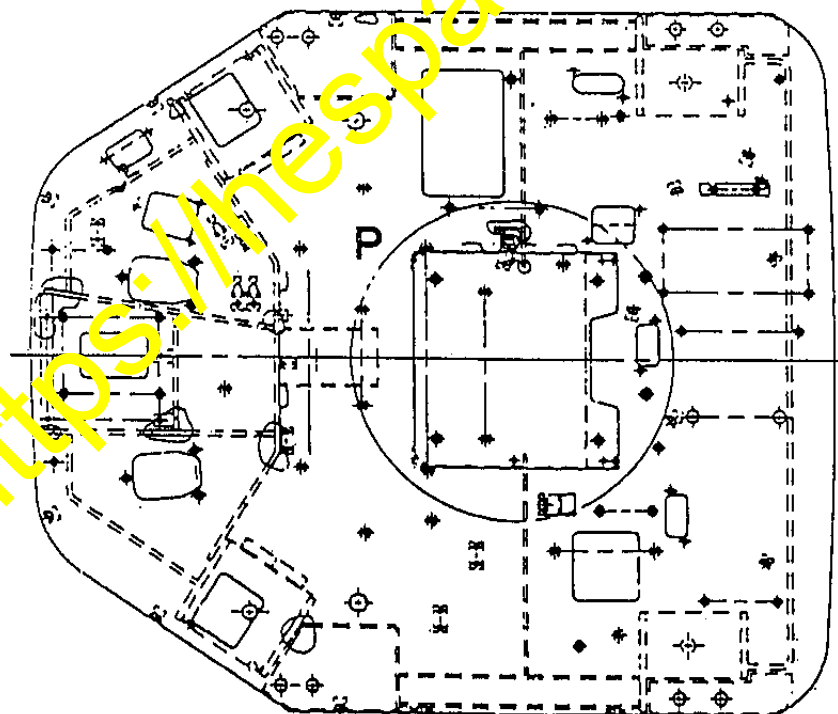
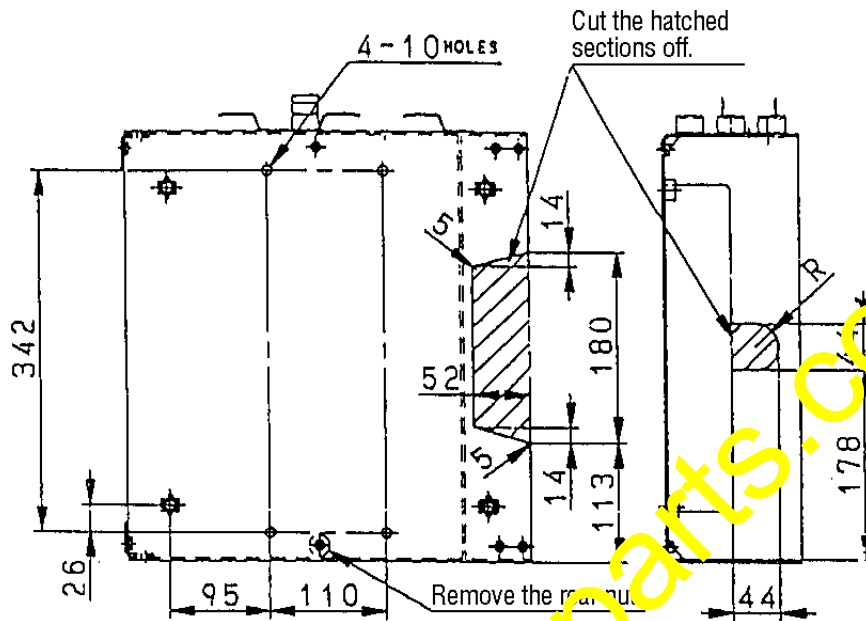


2) Reworking with the floor

- ① Cut off the hatched sections (at 2 places).
- ② Remove the rear nut (at 1 place).
- ③ Drill  $\phi 10$  holes (at 4 places).

Note)

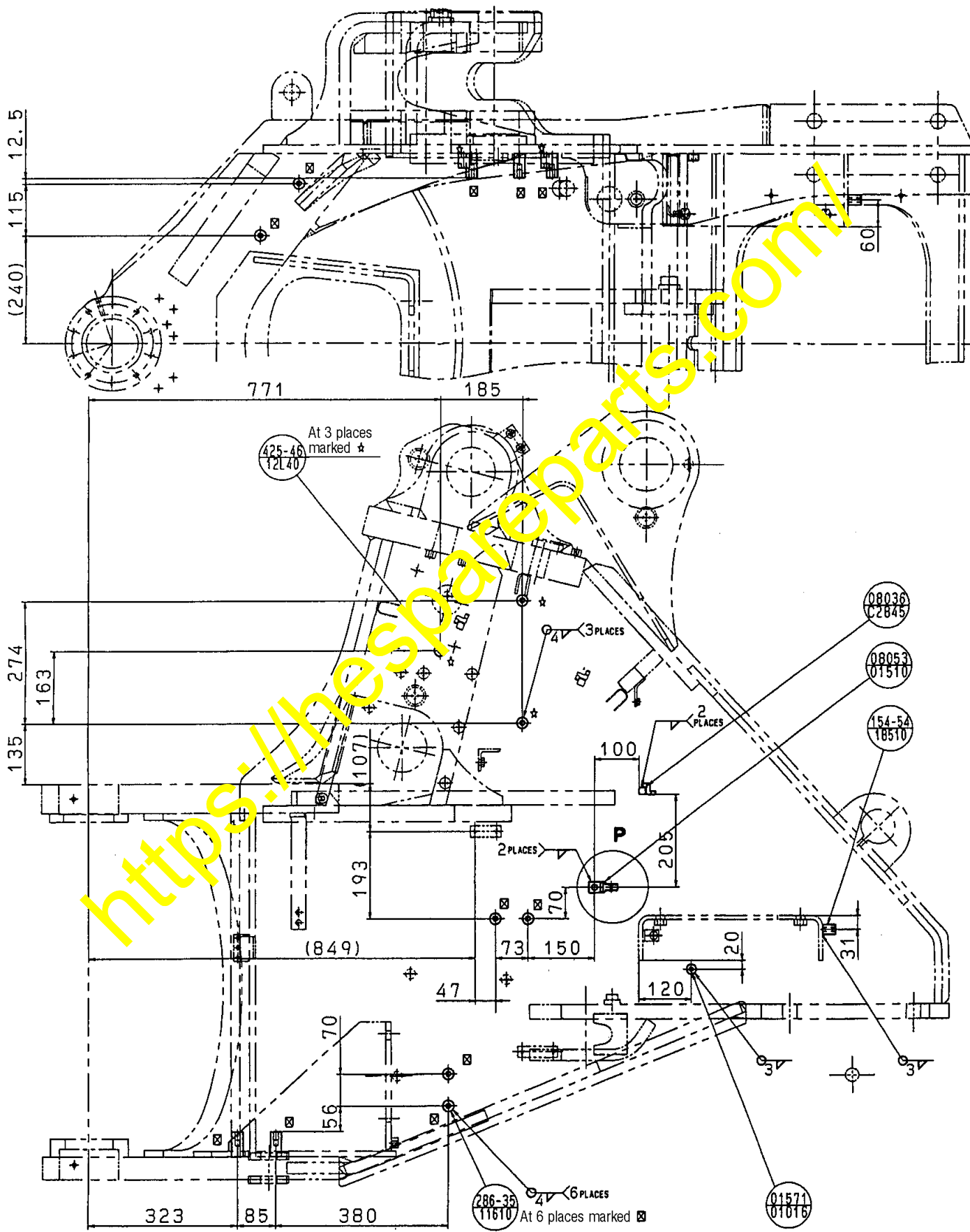
This rework is not necessary in case the machine is already equipped with the ECSS.





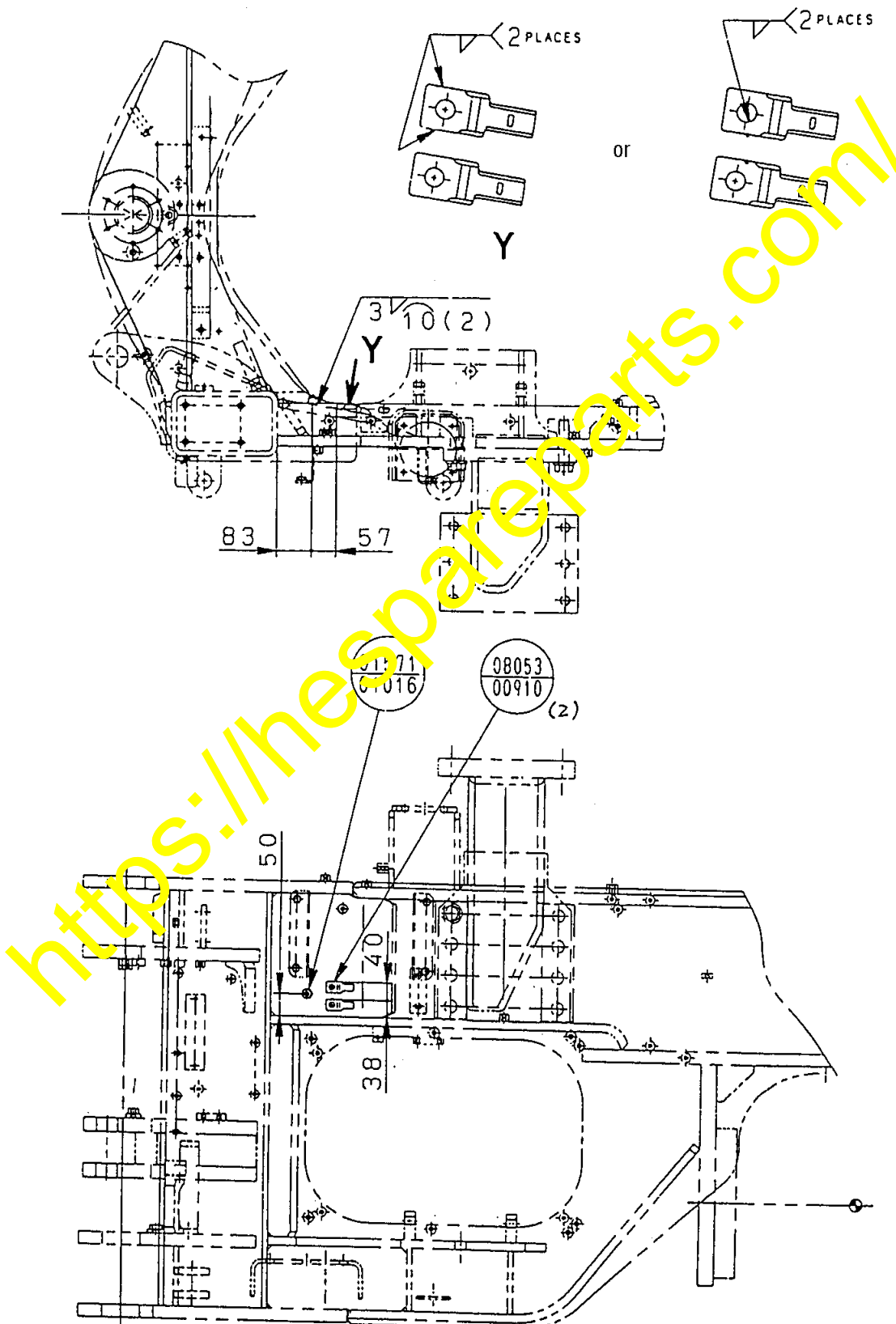
3) Reworking with the front frame

Weld the prepared parts according to the instructions in the schematic diagrams indicated below.



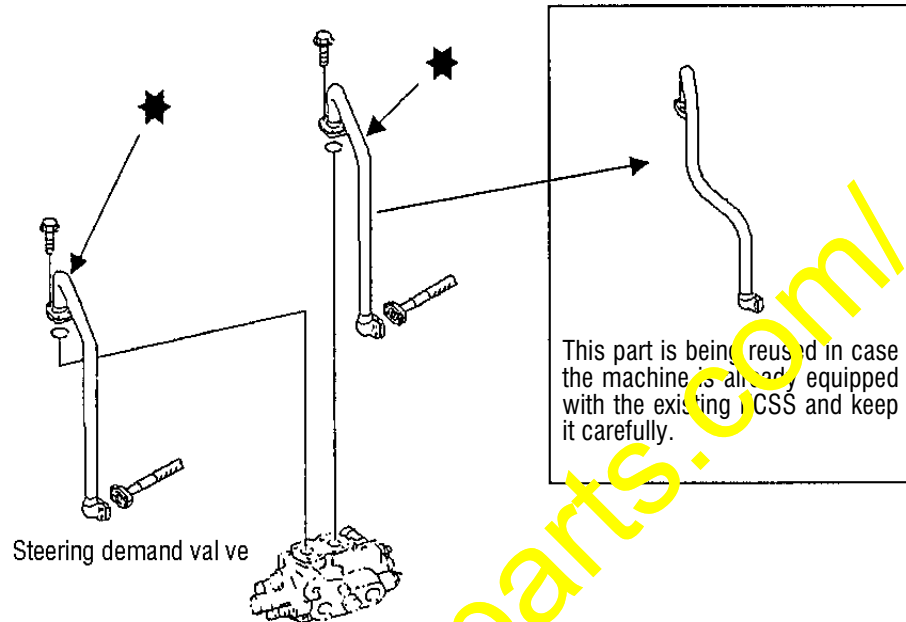
- 4) Reworking with the rear frame  
Weld the prepared parts according to the instructions in the schematic diagrams indicated below.

Note) This rework is not necessary in case the machine is already equipped with the ECSS.

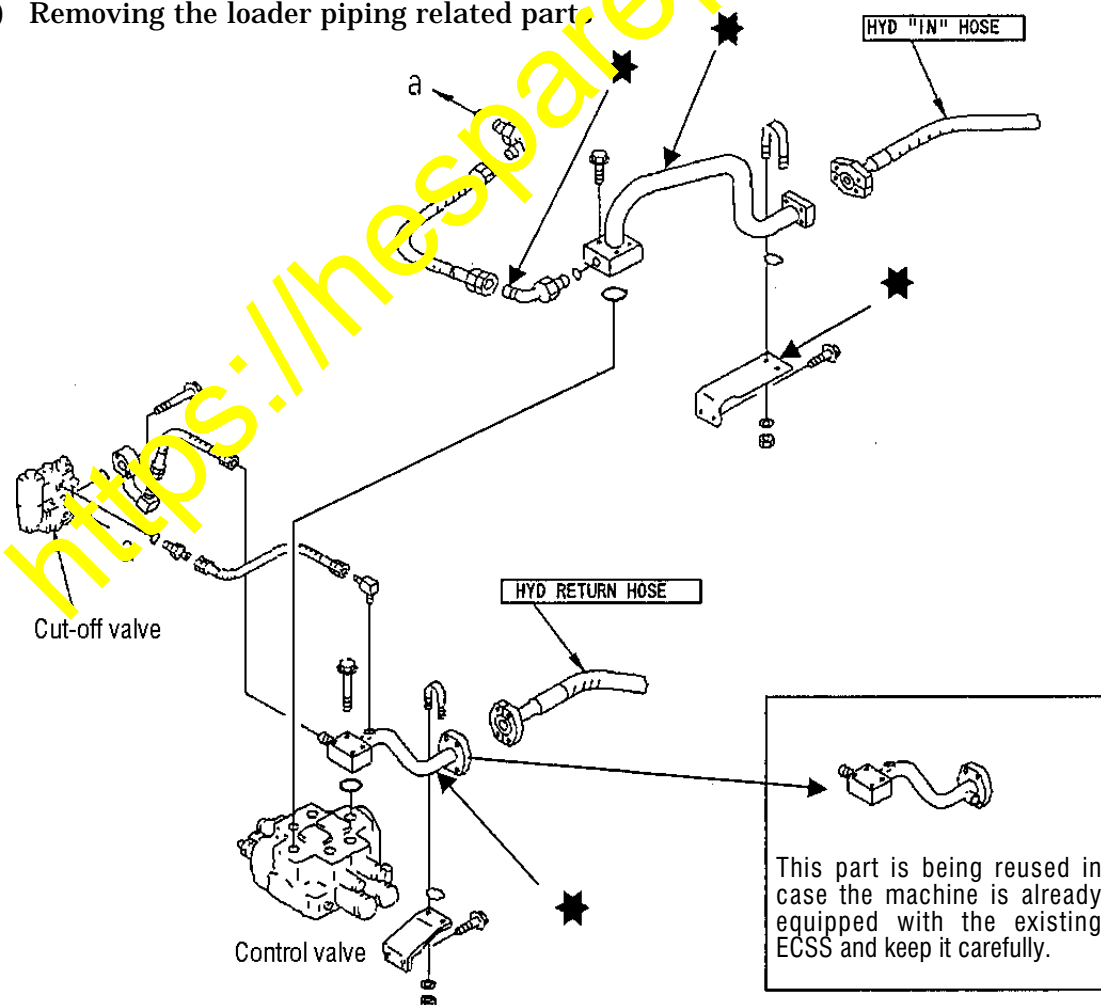


4. Removing the parts which need to be removed for this modification  
 Remove the parts marked ★.  
 Keep the other parts carefully since they are being reused.

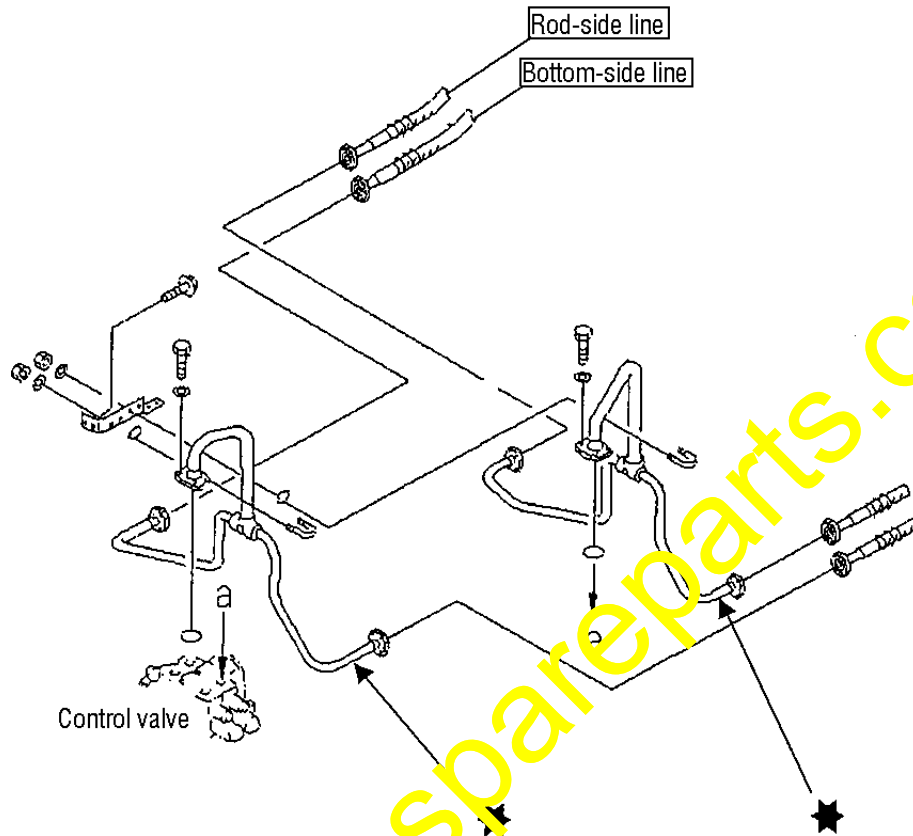
1) Removing the steering tube



2) Removing the loader piping related part.

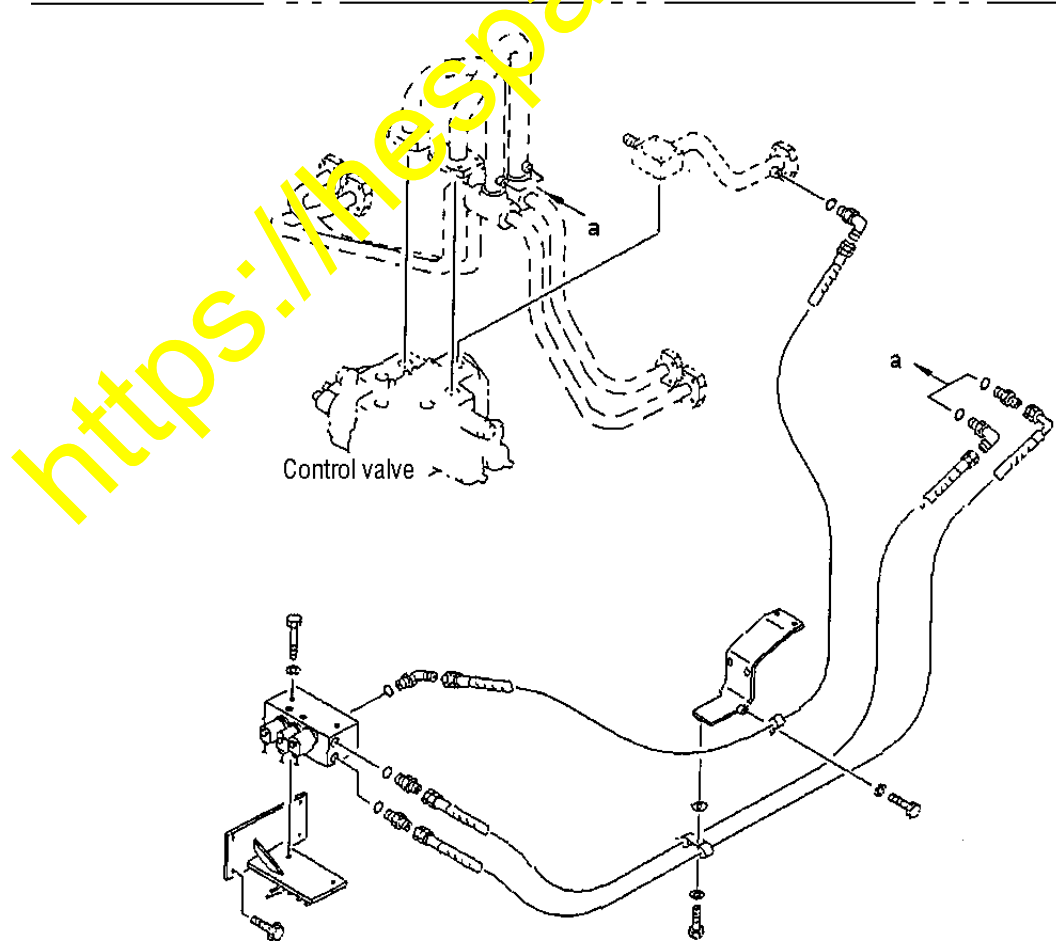
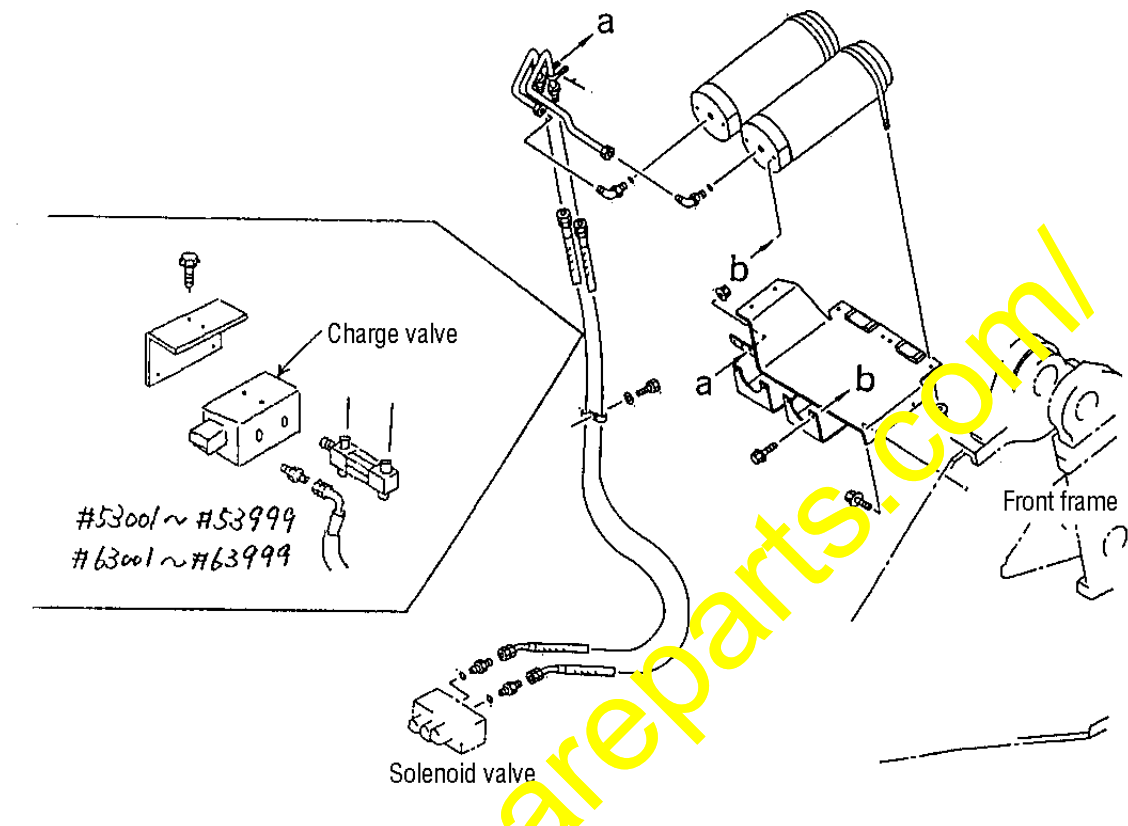


3) Removing the boom piping



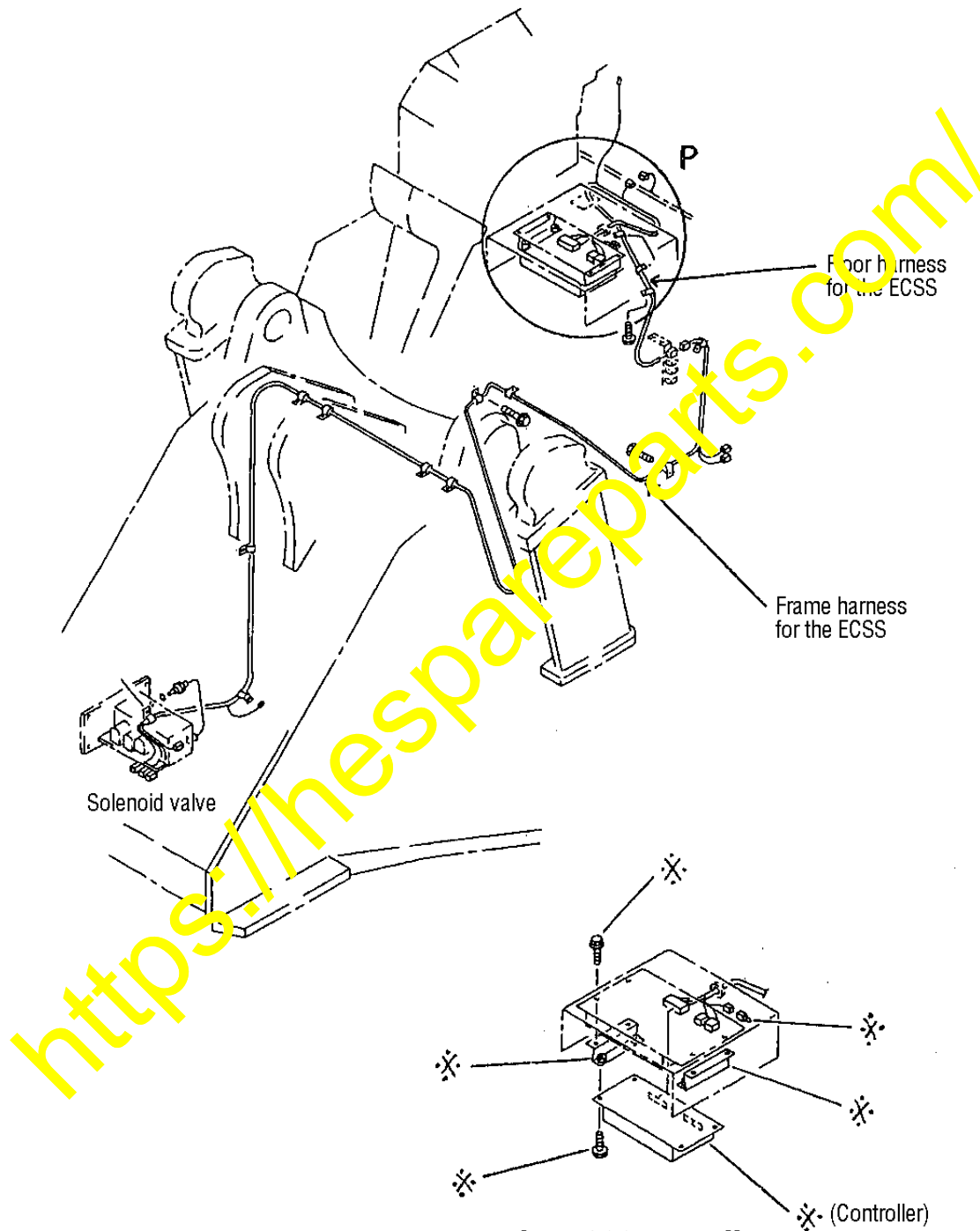
4) Removing the current ECSS related parts

In case the machine is equipped with the current ECSS, remove the parts shown in the schematic diagrams indicated below.



5) Removing the current ECSS related parts (harnesses and relevant parts)

- [1] In case the machine is being equipped with the exclusive controller for the ECSS]  
Remove the frame harness and floor harness for the ECSS as are shown in the schematic diagrams indicated below.



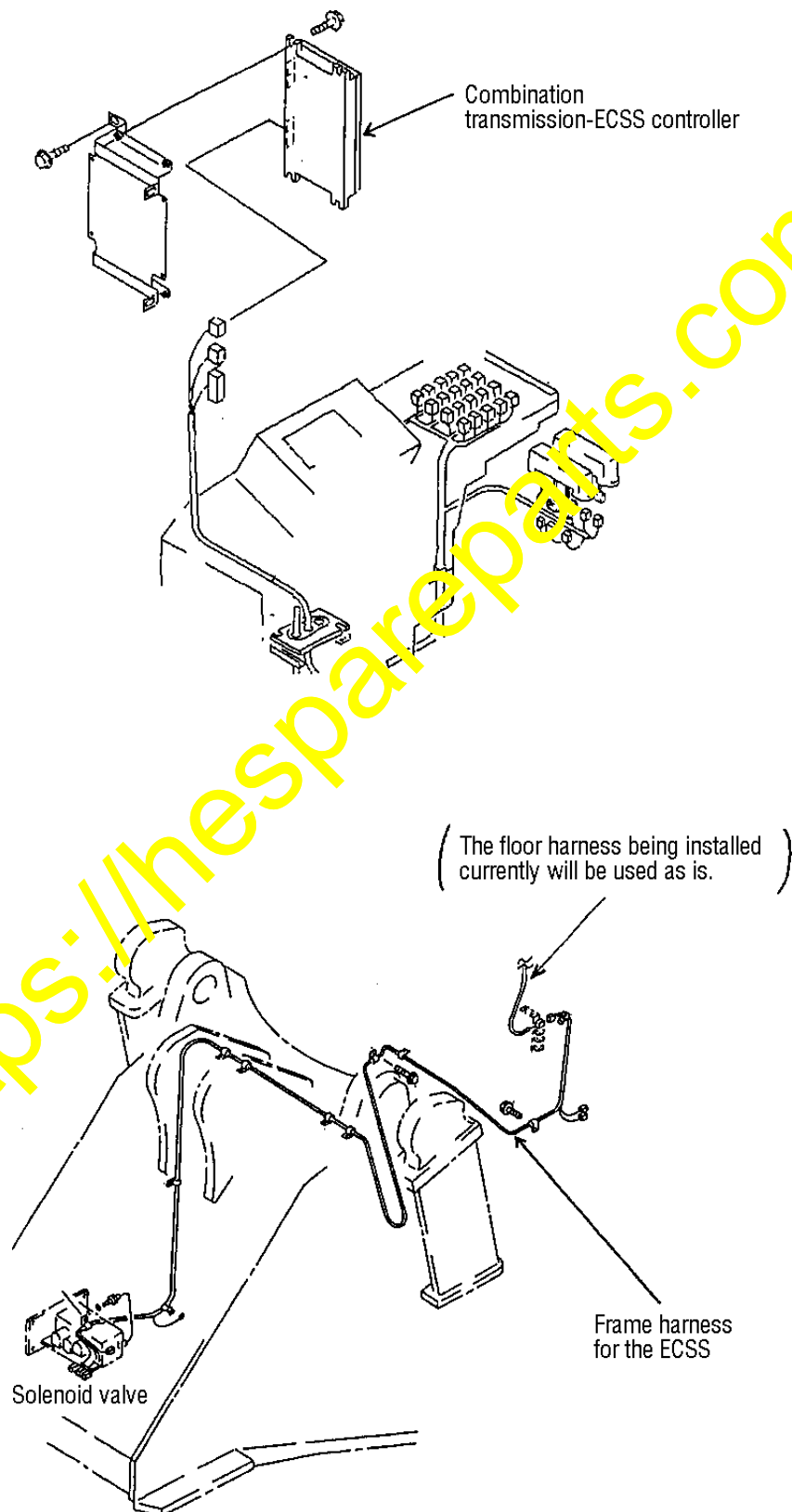
Do not remove the ECSS controller and the neighboring parts marked ※ since they are being reused.

Detail "P"

- [ 2) In case the machine is being equipped with the combination transmission-ECSS controller ]

controller

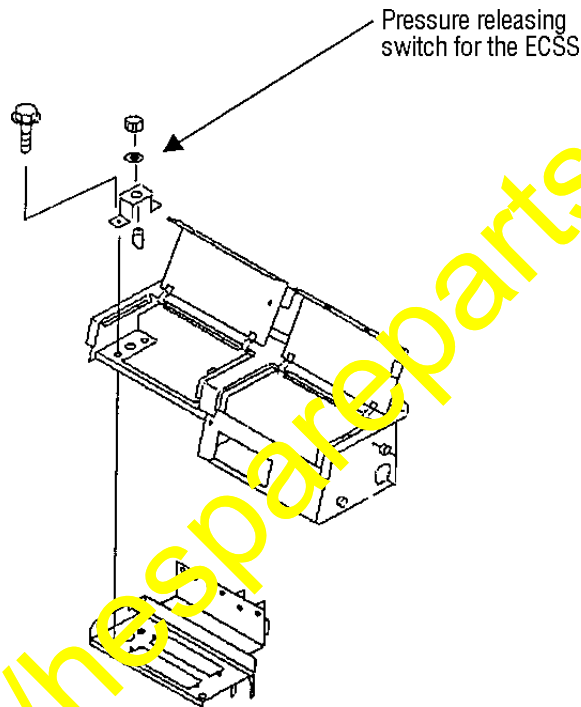
Remove the frame harness for the ECSS and the controller as are shown in the schematic diagrams indicated below.



3) Removing the pressure releasing switch for the ECSS

[ Serial numbers of the applicable machines:  
Machines equipped with the ECSS among those which are carrying the serial  
numbers of #53001 thru #53999 ]

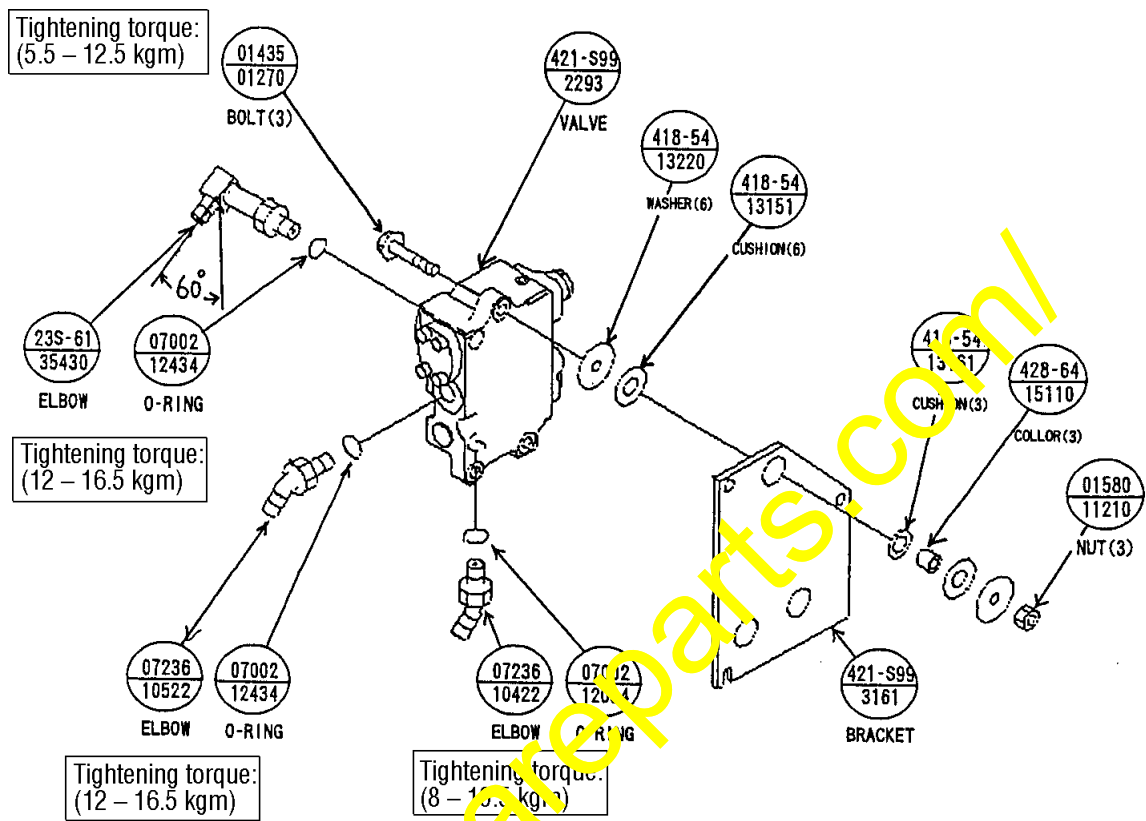
Remove the pressure releasing switch for the ECSS located inside the fuse box.



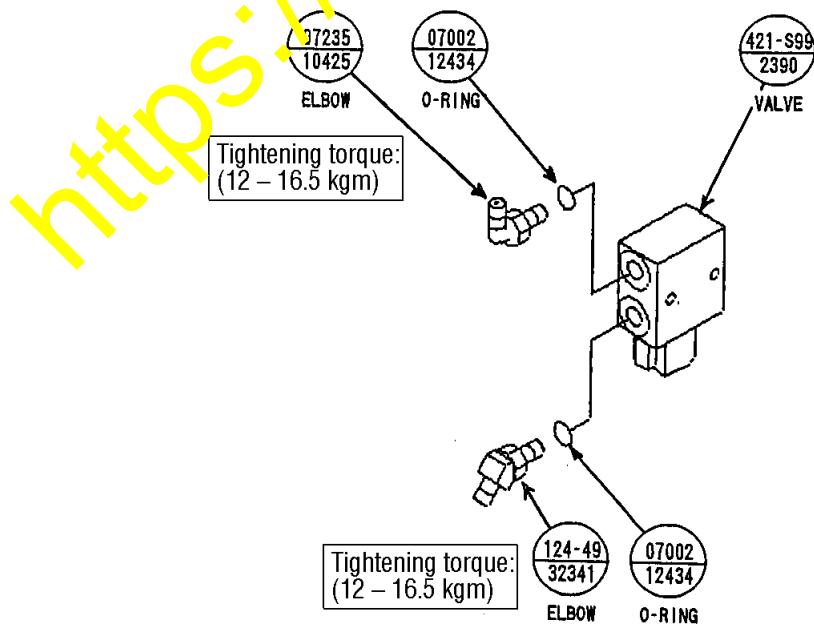


5. Installing the prepared parts

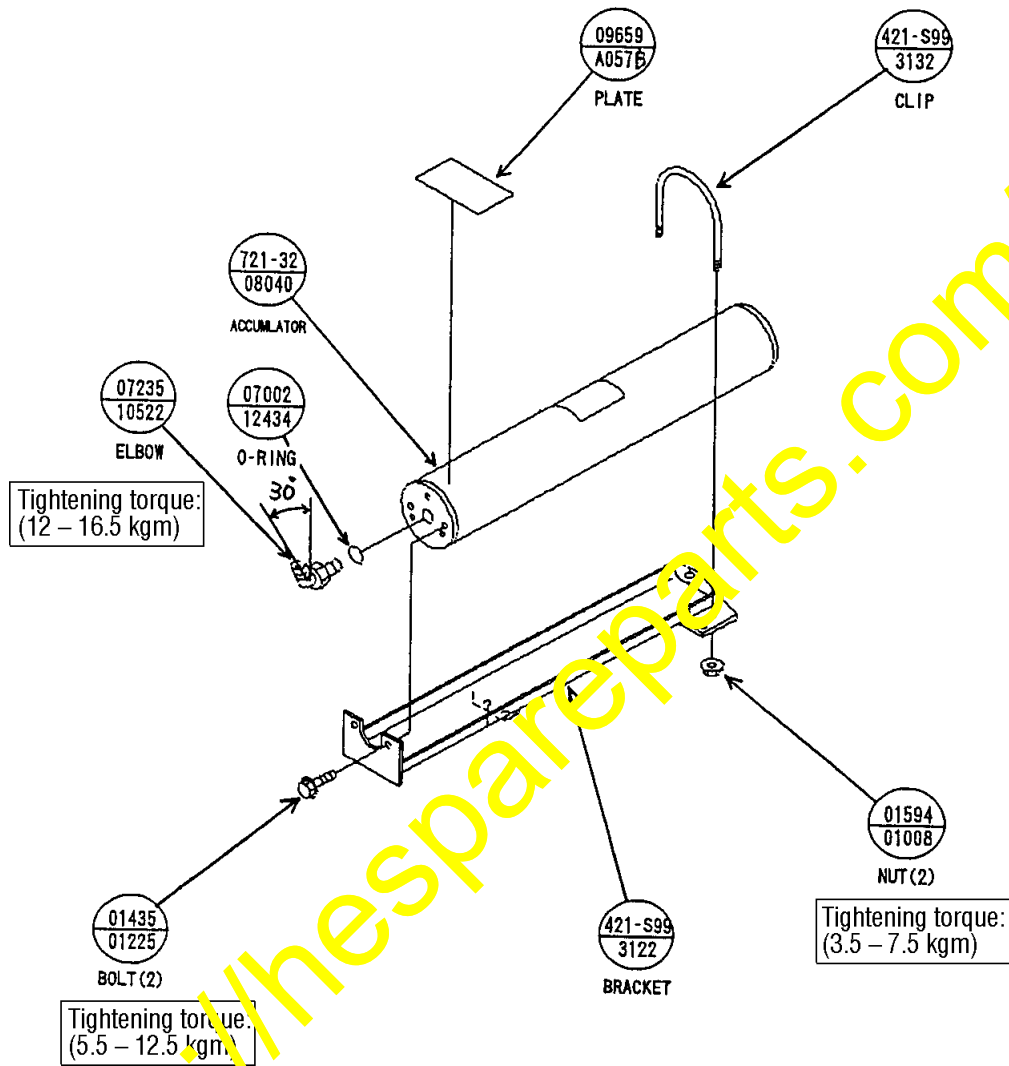
1) Installing the parts connecting to or attached to the ECSS valve



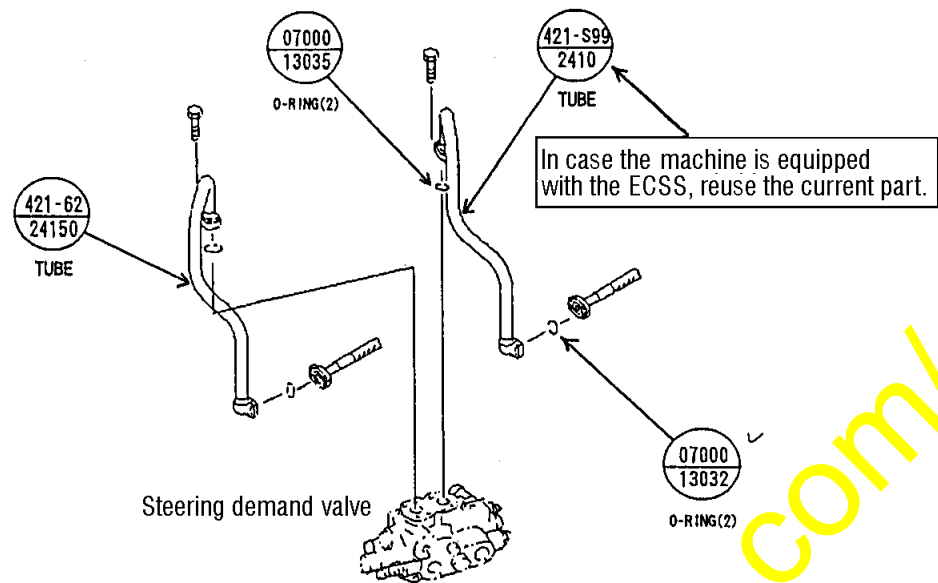
2) Installing the parts connecting to or attached to the charge control valve



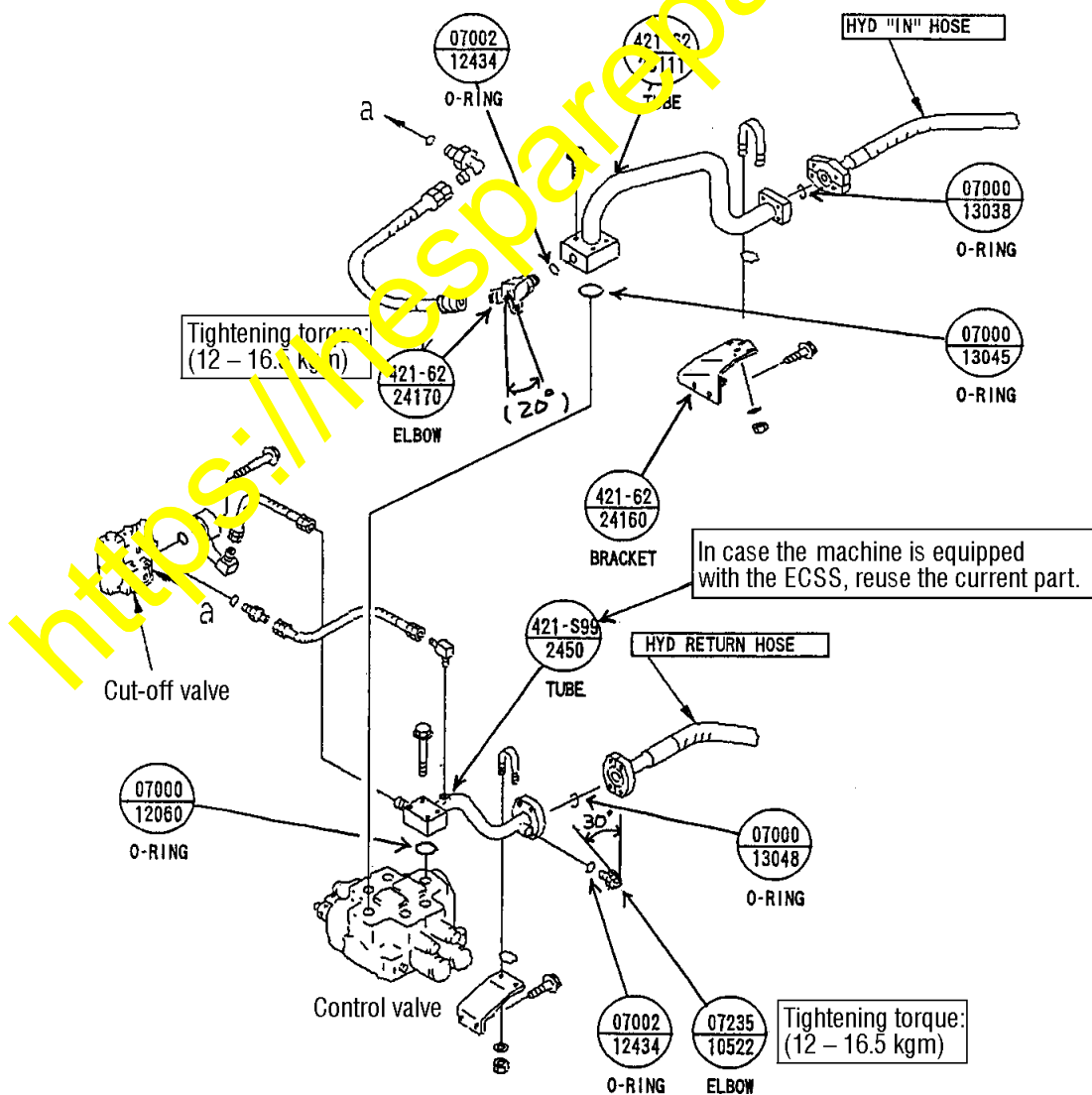
3) Installing the parts connecting to or attached to the accumulator



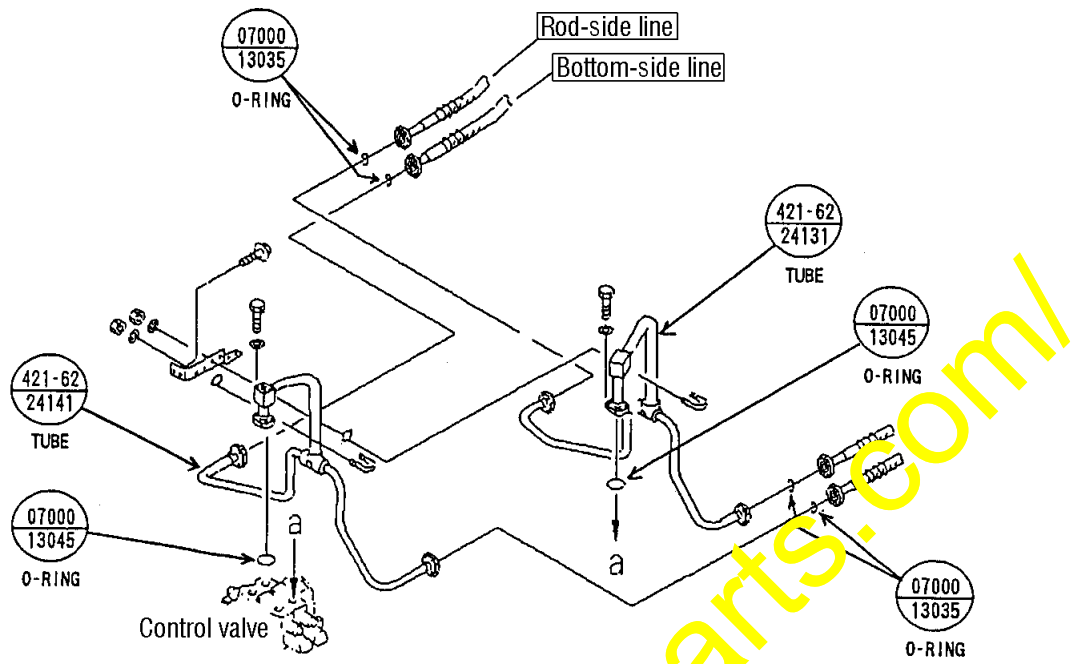
4) Installing the steering circuit tube



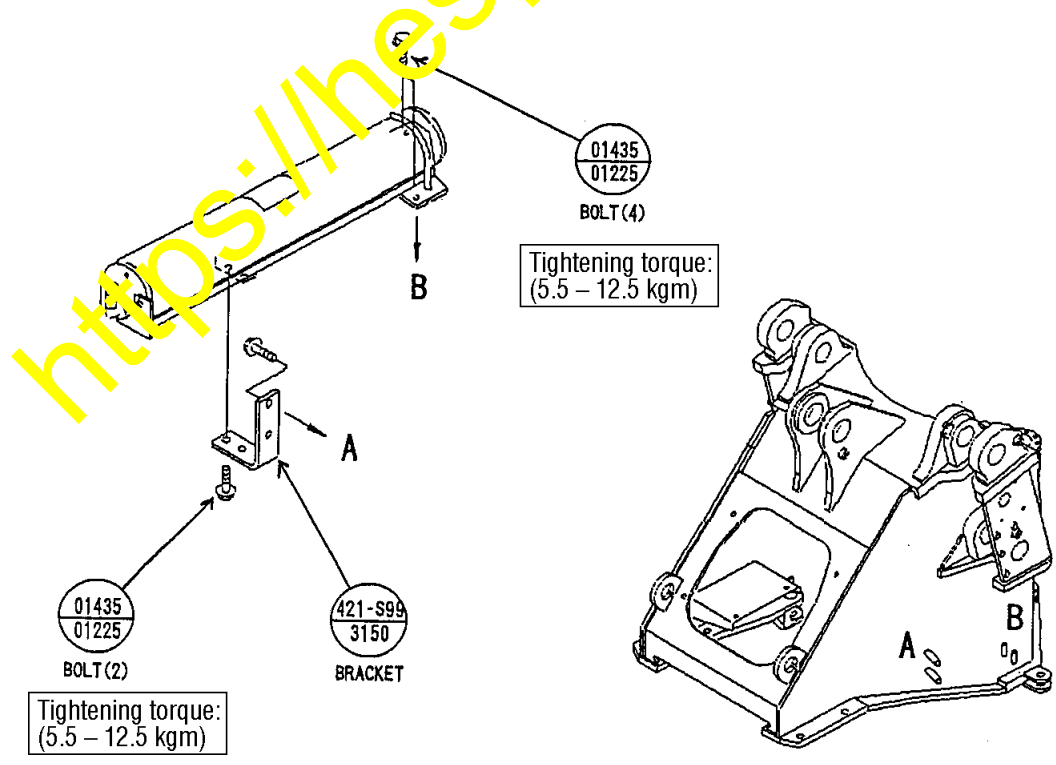
5) Installing the loader piping related parts



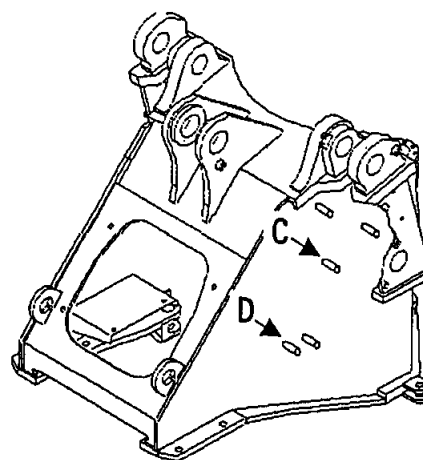
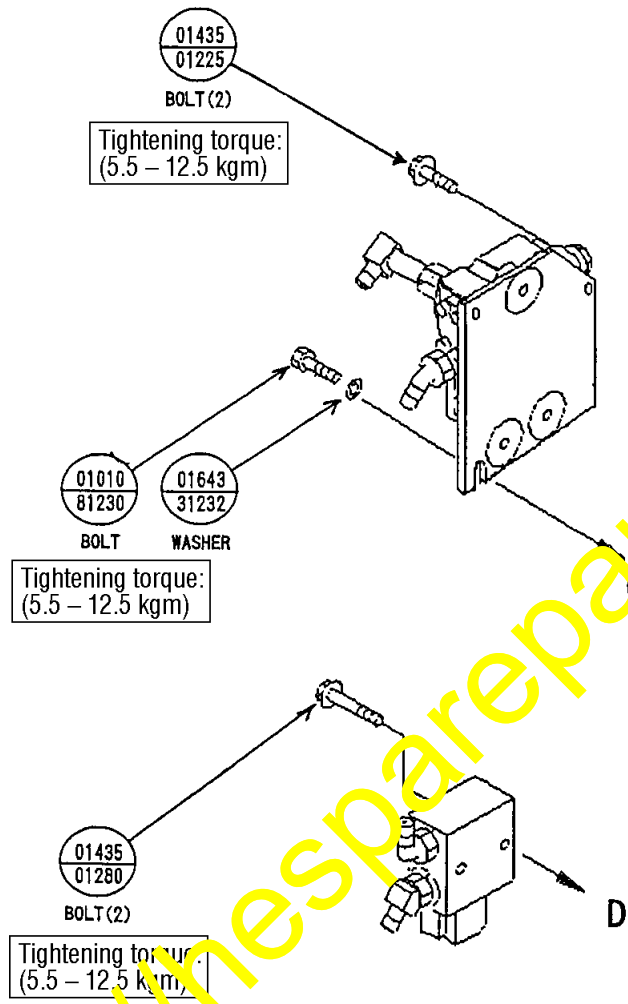
### 6) Installing the boom piping



### 7) Installing the accumulator

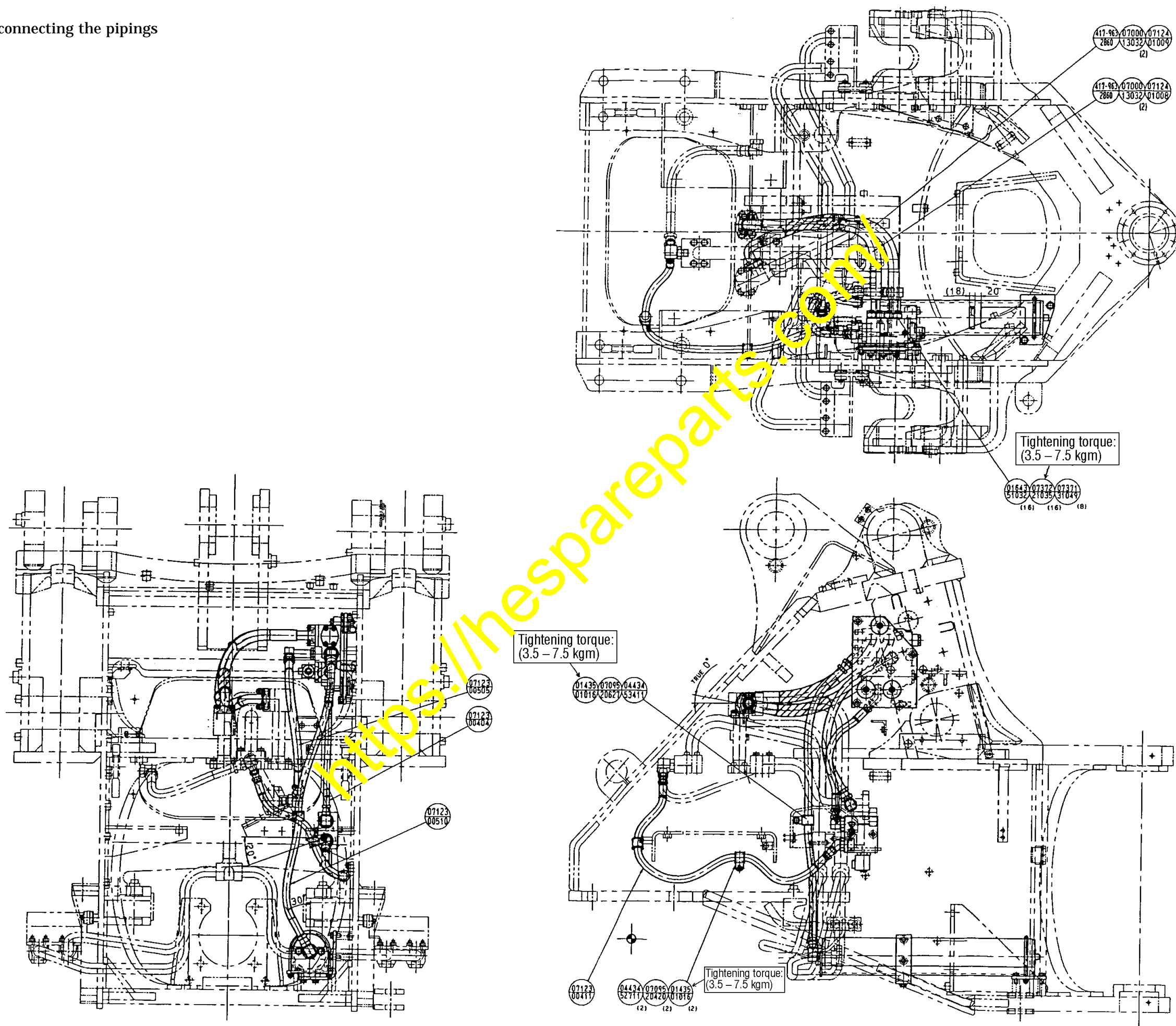


8) Installing the ECSS and the charge control valve



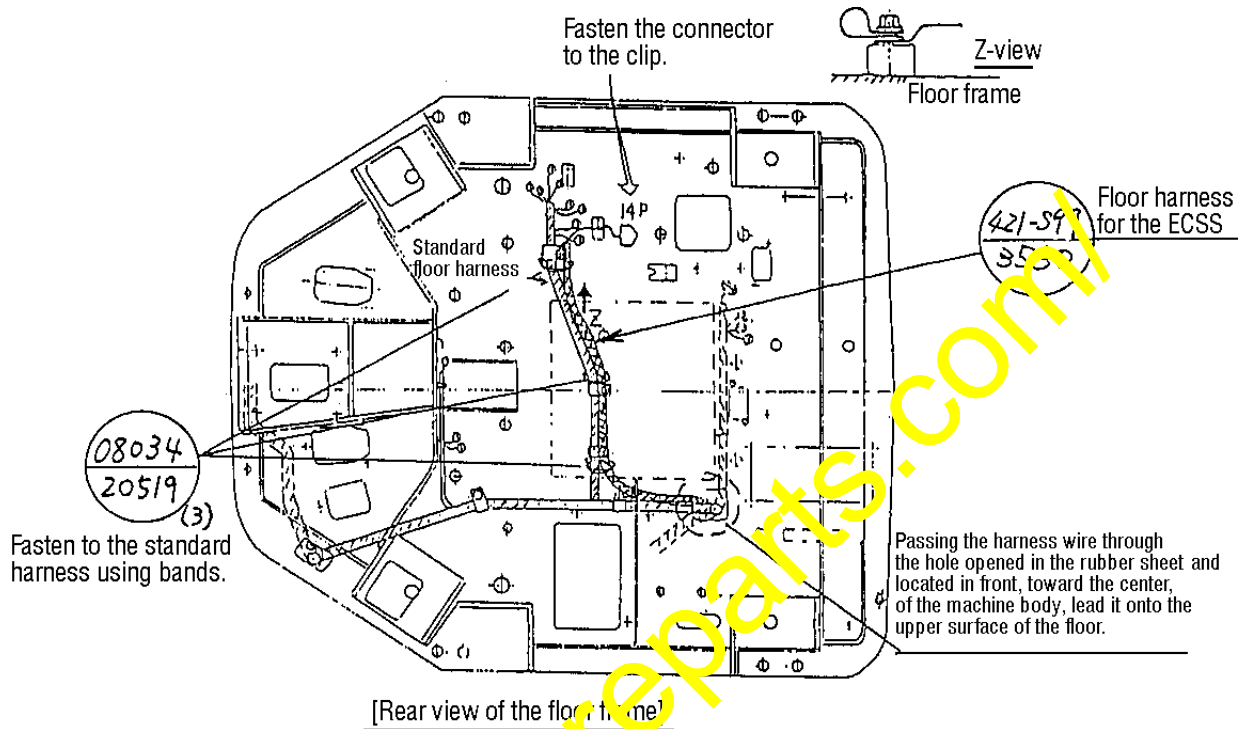
<https://mespareparts.com/>

9) Arranging and connecting the pipings

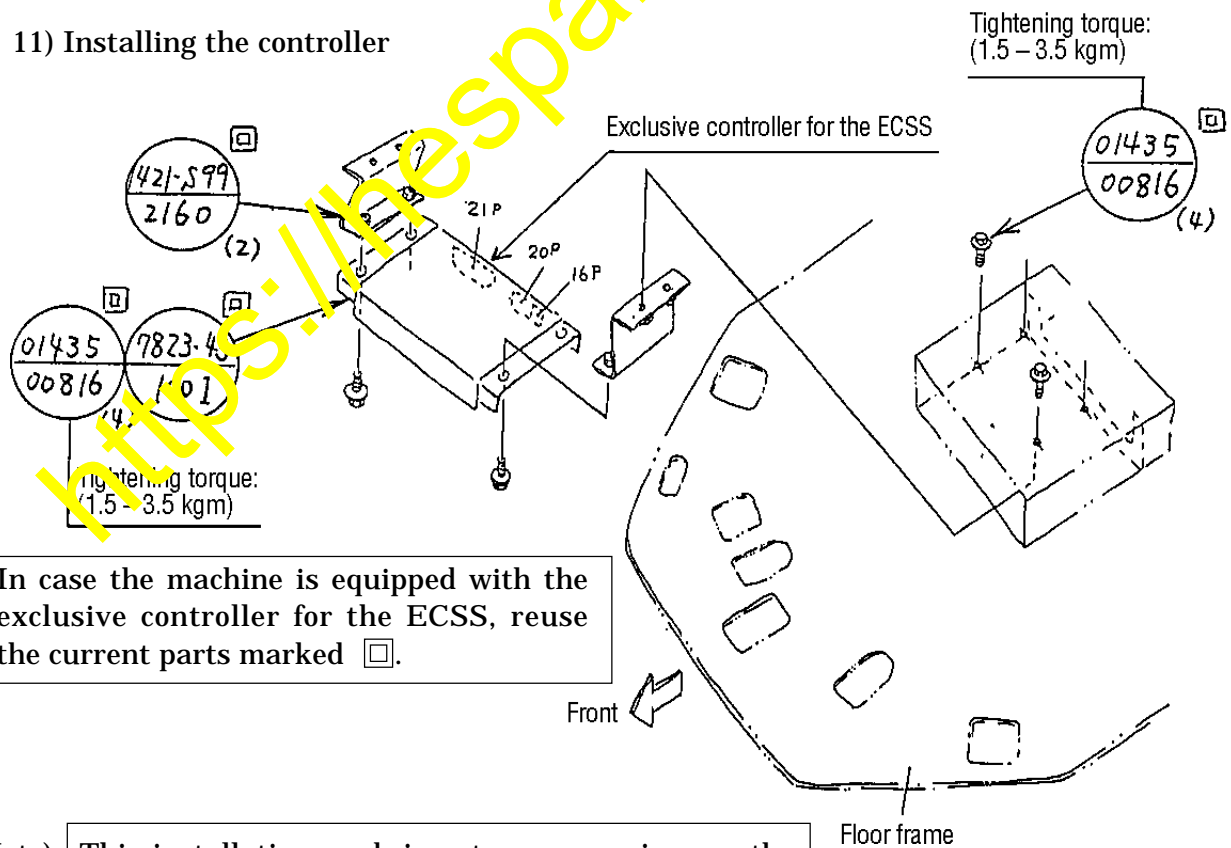


10) Arranging and connecting the floor harness for the ECSS (underneath the floor)

This work is not necessary in case the machine is equipped with the ECSS carrying the combination transmission-ECSS controller.



11) Installing the controller

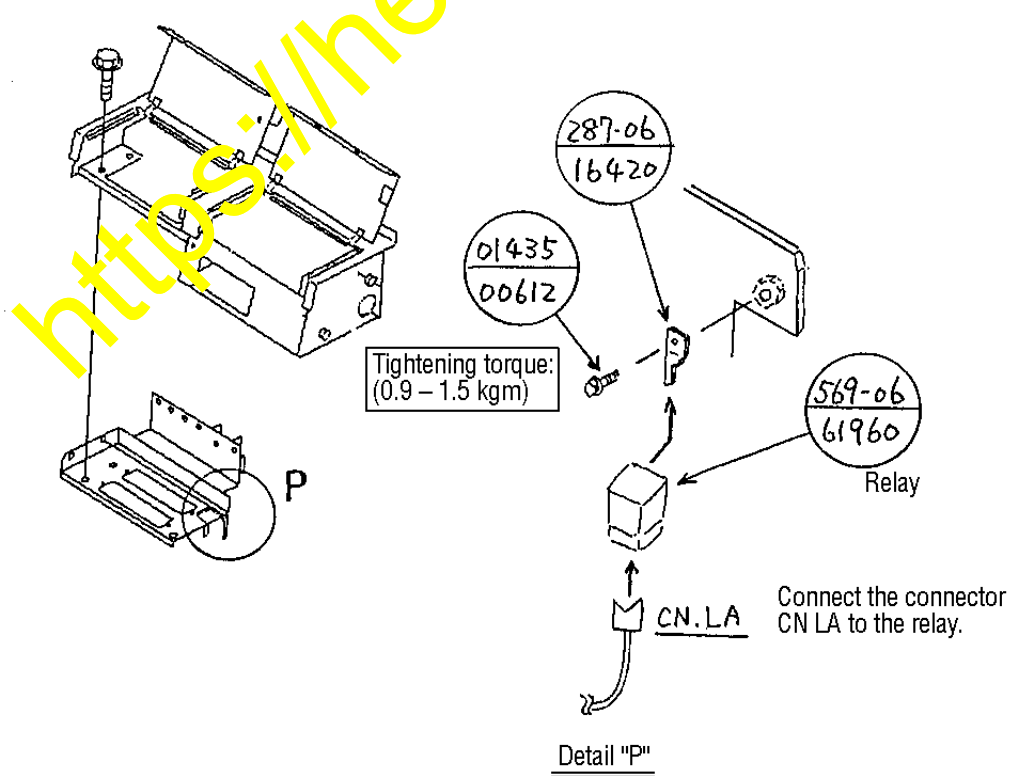
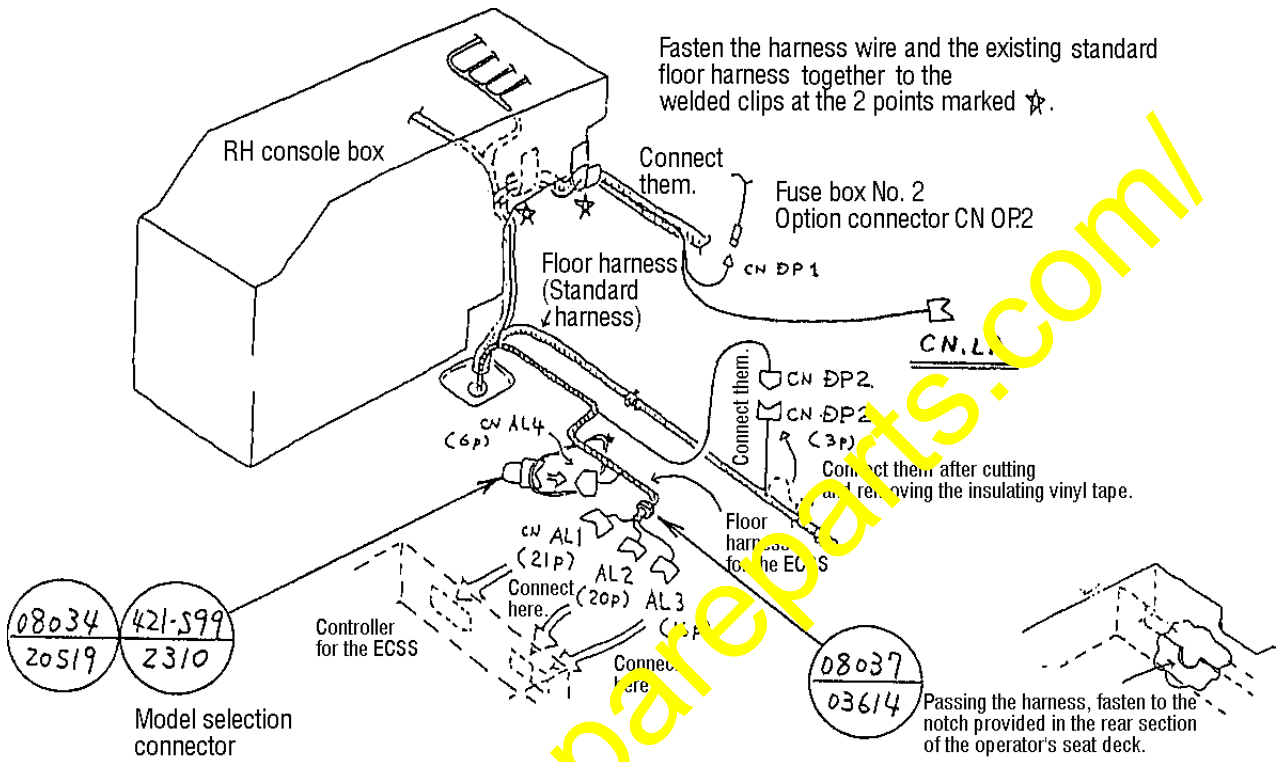


In case the machine is equipped with the exclusive controller for the ECSS, reuse the current parts marked .

Note) This installation work is not necessary in case the machine is equipped with the ECSS carrying the combination transmission-ECSS controller.

12) Arranging and connecting the floor harness for the ECSS (inside the RH console box)

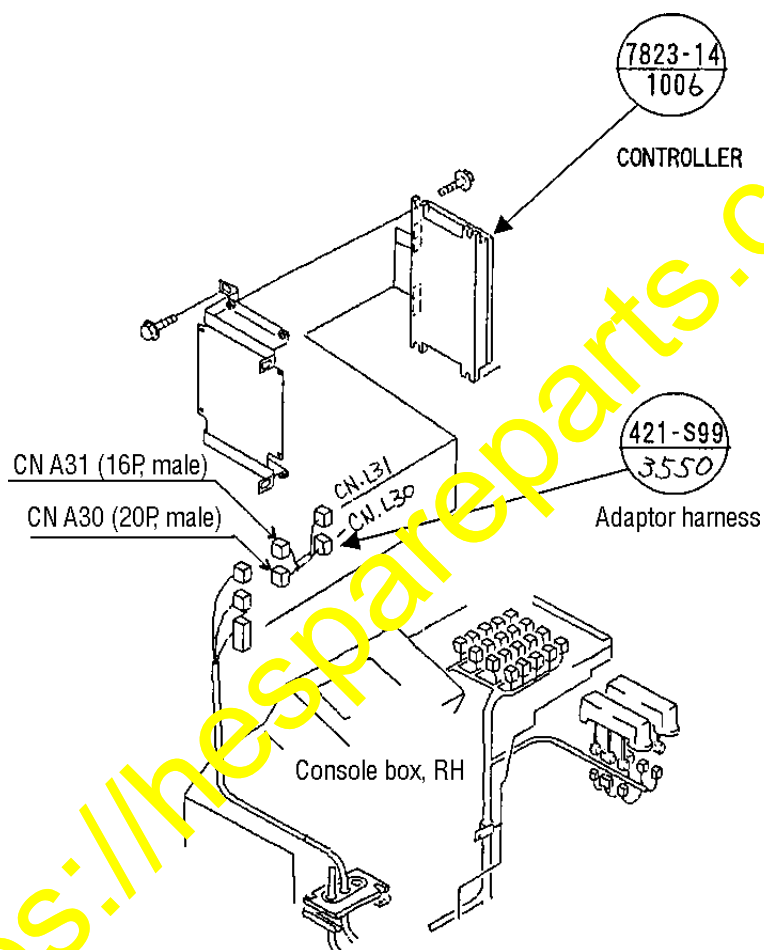
Note) This installation work is not necessary in case the machine is equipped with the ECSS carrying the combination transmission-ECSS controller.





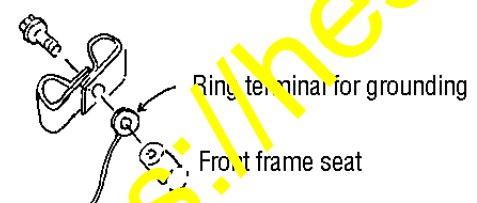
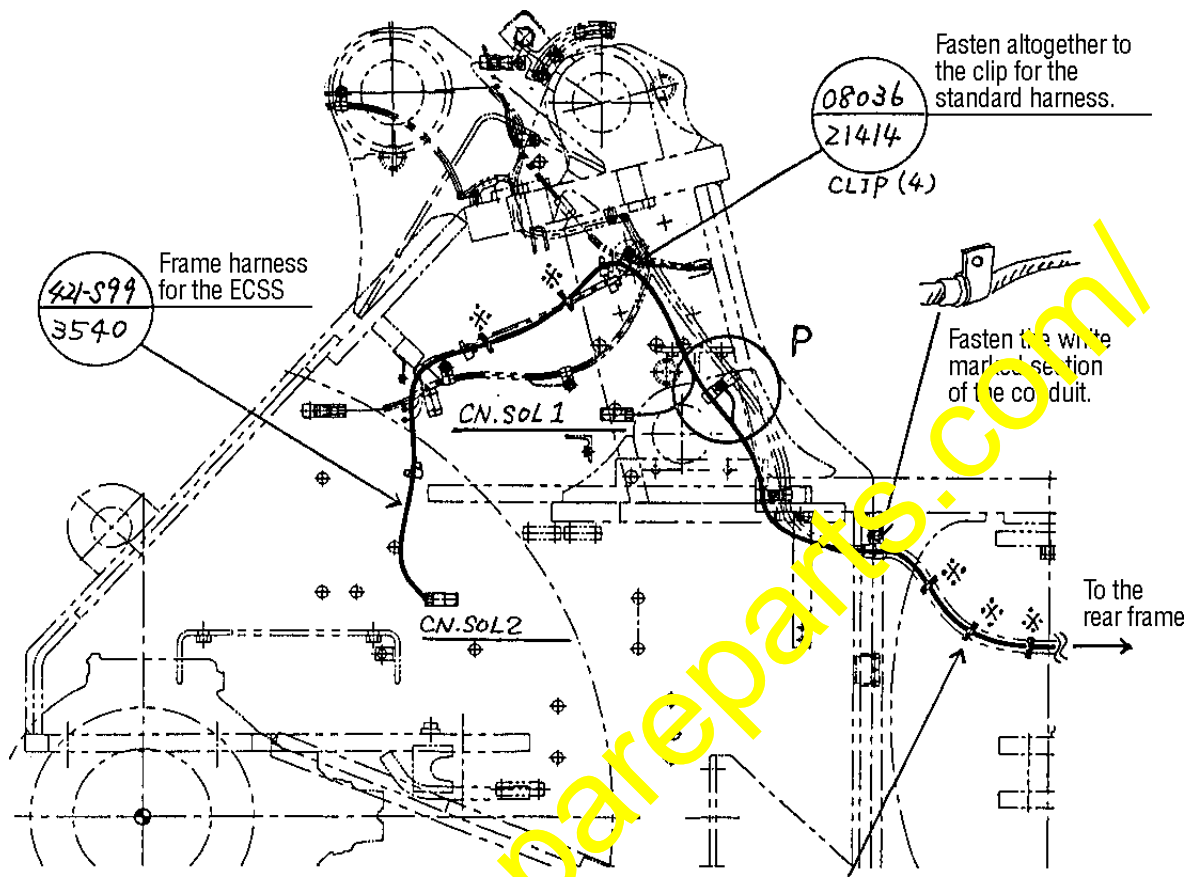
13) Installing the controller for the transmission (combination transmission-ECSS controller) and connecting the adaptor harness

Note) This installation work is necessary only in case the machine is equipped with the ECSS carrying the combination transmission-ECSS controller.



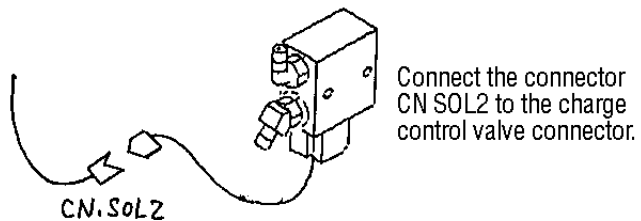
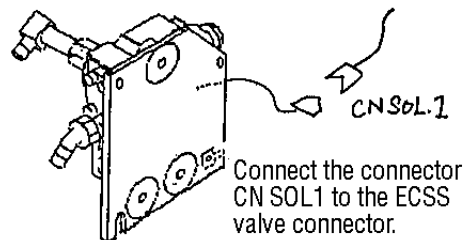
14) Arranging and connecting the frame harness for the ECSS

- Lay out frame harness for the ECSS along the existing standard harness on the LH surface inside the front frame and fasten the frame harness.

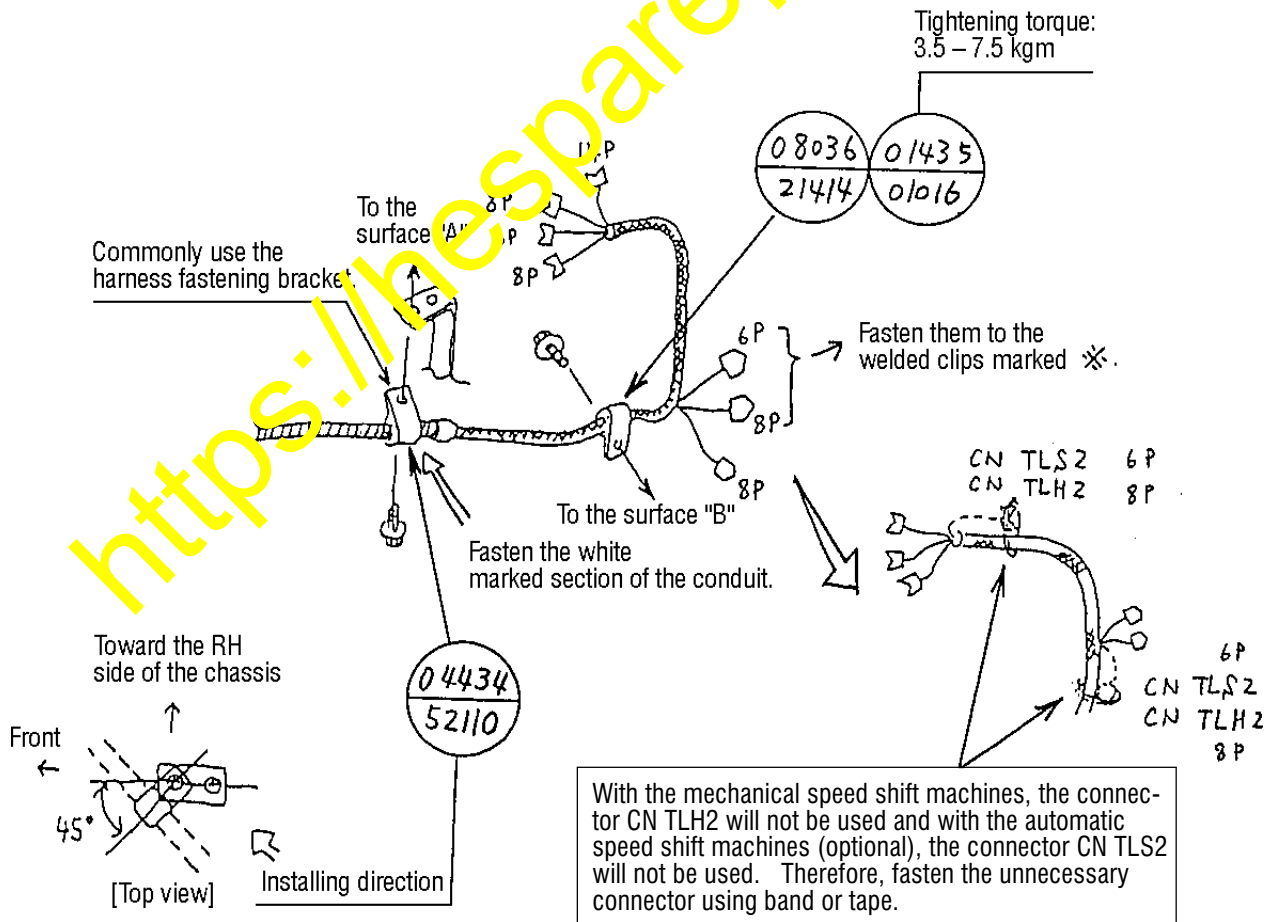
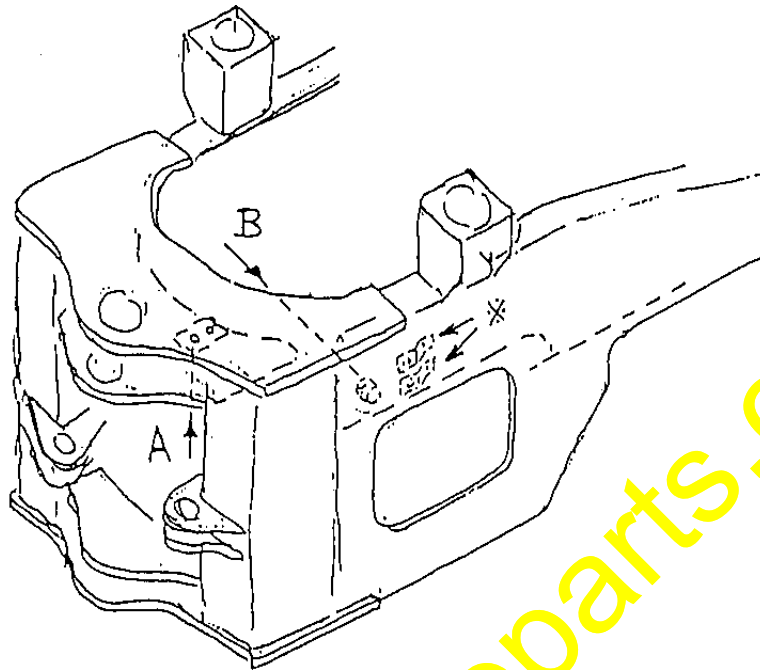


Note: Remove paint from the surface of the seat adjoining the grounding terminal.

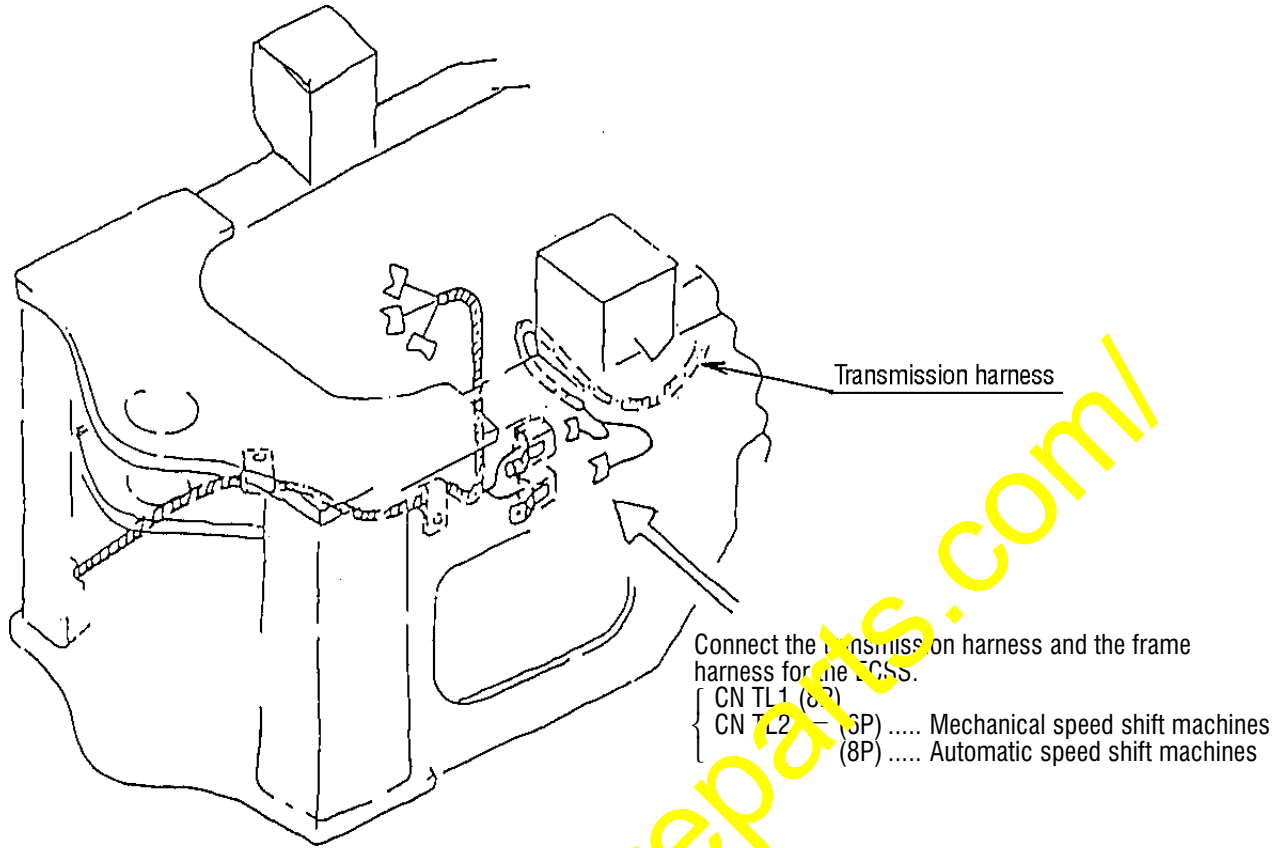
Detail "P"



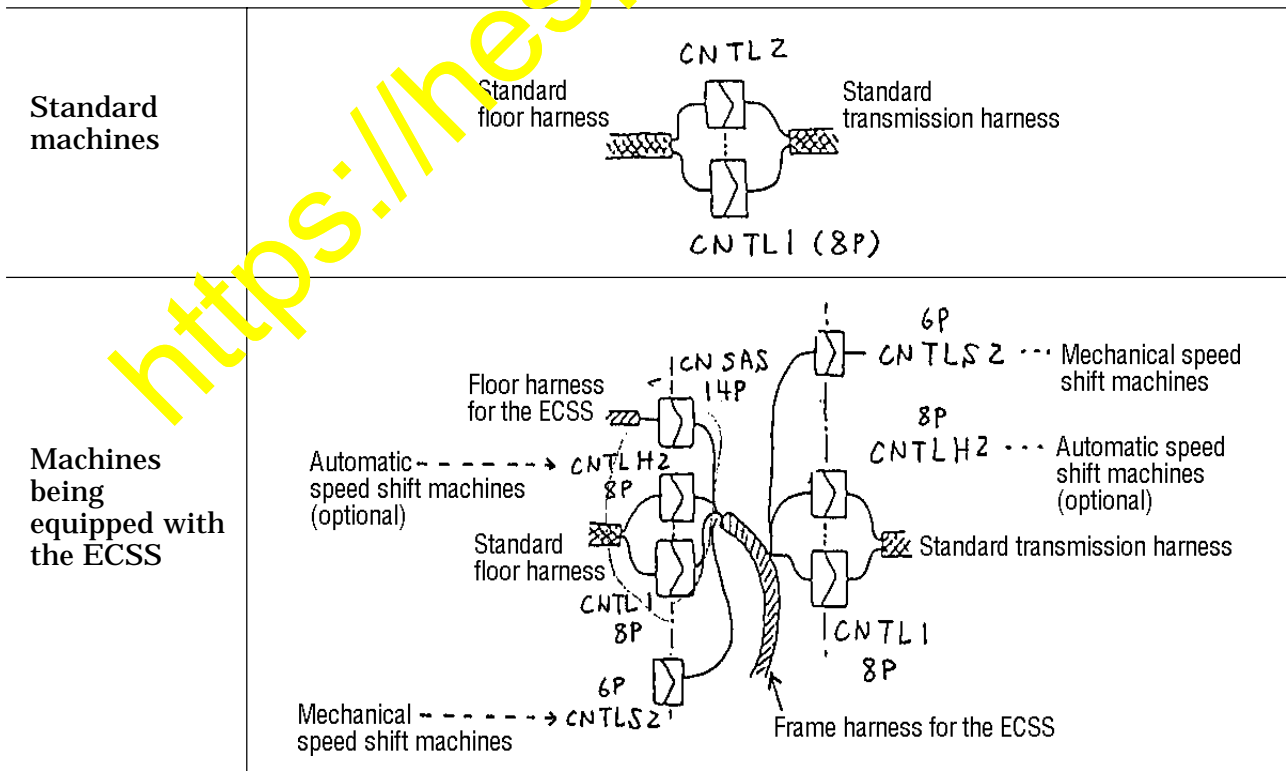
15) Arranging and connecting the frame harness for the ECSS (rear frame area) Part 1.  
 <<Note>> Be careful since the connections are different between the mechanical speed shift machines and the automatic speed shift machines (optional).



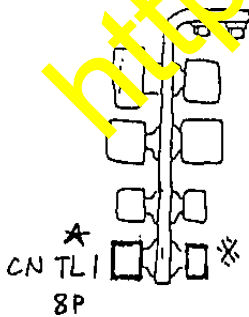
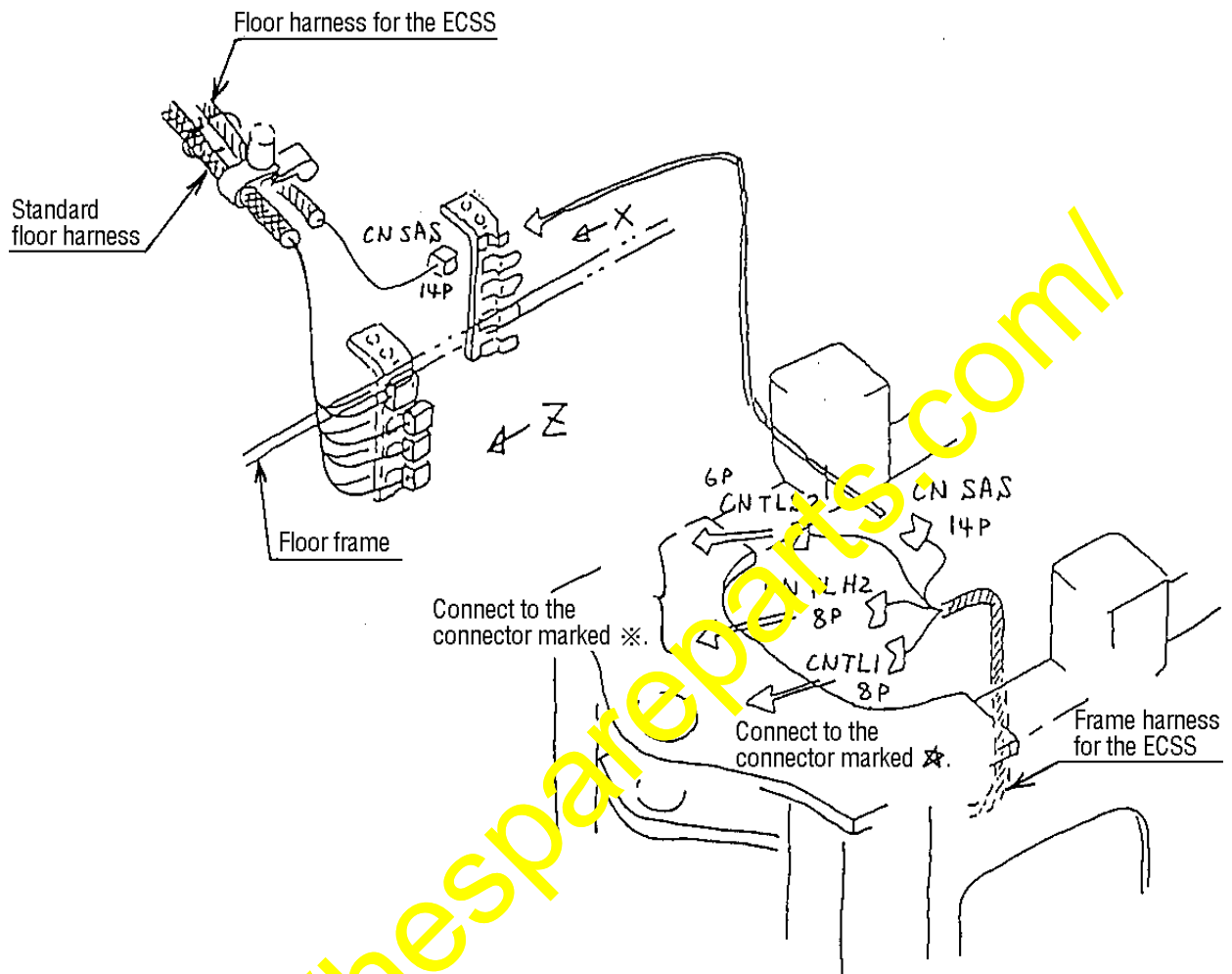
16) Arranging and connecting the frame harness for the ECSS (rear frame area) Part 2.



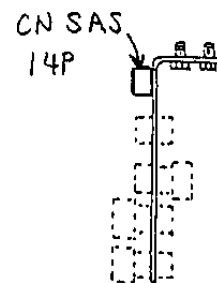
<<Note>> Connect the connector CN TLS2 (6P) in case of the mechanical speed shift machines and connect the connector CN TLH2 (8P) in case of the automatic speed shift machines



17) Arranging and connecting the frame harness for the ECSS (rear frame area) Part 3.  
 <<Note>> Be careful since the connections are different between the mechanical speed shift machines and the automatic speed shift machines (optional).



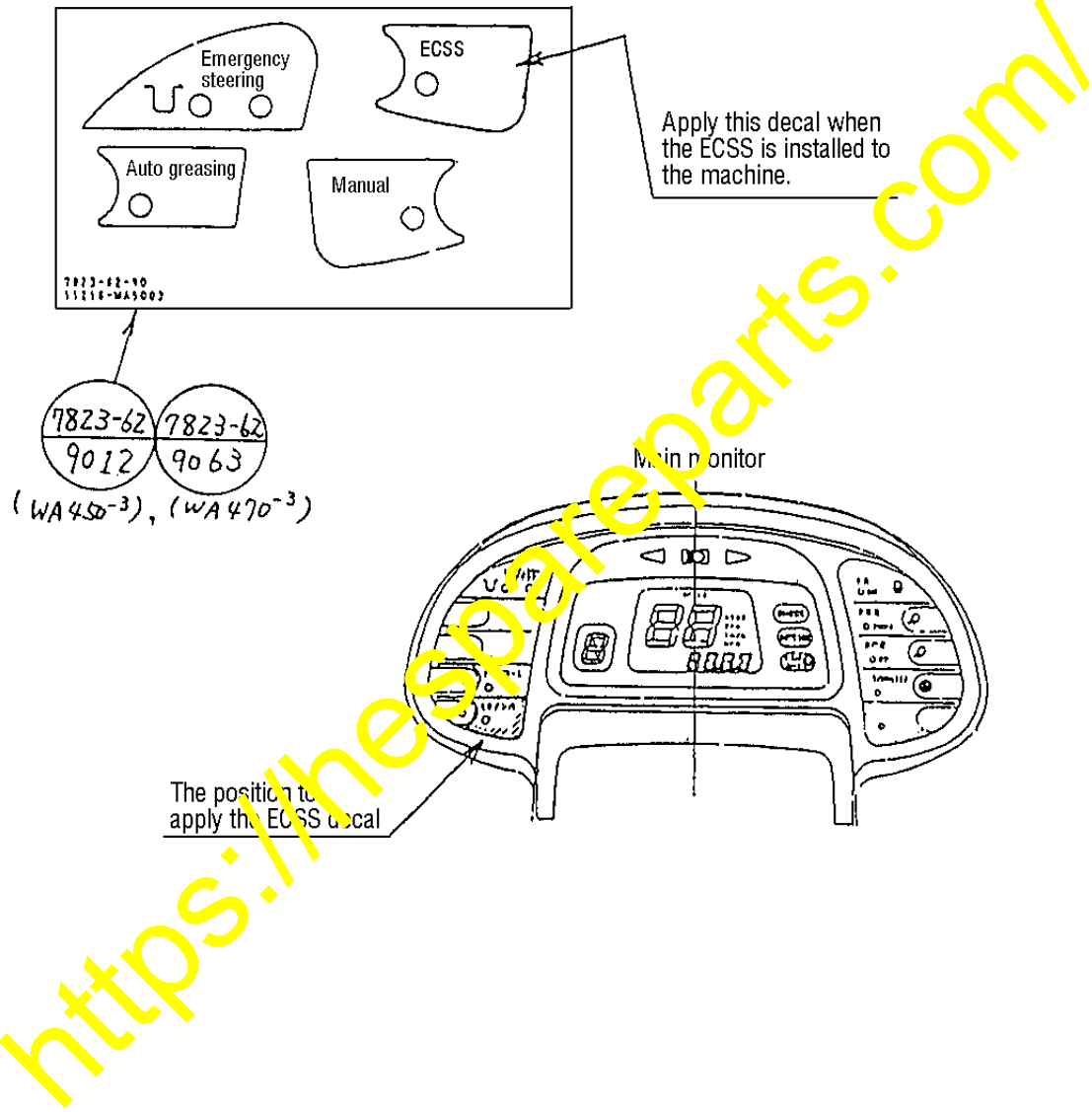
Z-view



X-view

18) Applying the decal for the ECSS to the main monitor panel

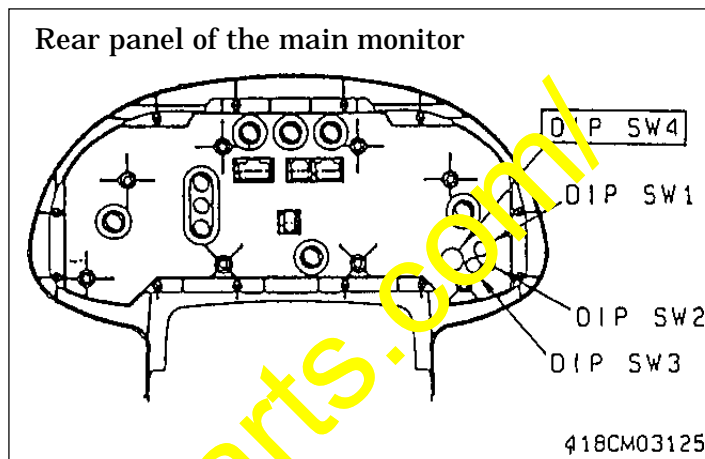
Note) Application of this decal is not necessary in case the subject machine is already equipped with the ECSS.



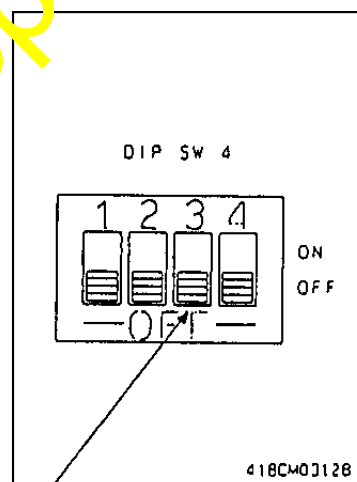
## 6. Setting the dip switch located on the rear side of the main monitor

Note) This setting is not necessary in case the machine is already equipped with the ECSS.

- (1) When the ECSS is installed, it is necessary to change the setting of the dip switch located on the rear side of the main monitor.



- (2) How to change the setting



Change the setting of the switch  
unit 3 of the DIP SW4 to:  
ON → "OFF"

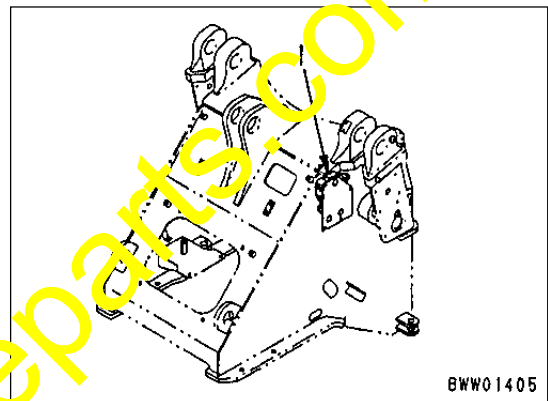
[Caution]

Releasing the residue pressure from the ECSS circuits


When disconnecting the pipings of the ECSS circuits and when removing the ECSS valve, be sure to release residue pressure from respective circuits.

- 1) Lower the bucket to touch the ground and insert tire wedges underneath respective tires in order not to let the machine move.
- 2) Be sure to stop the engine when releasing the residue pressure.

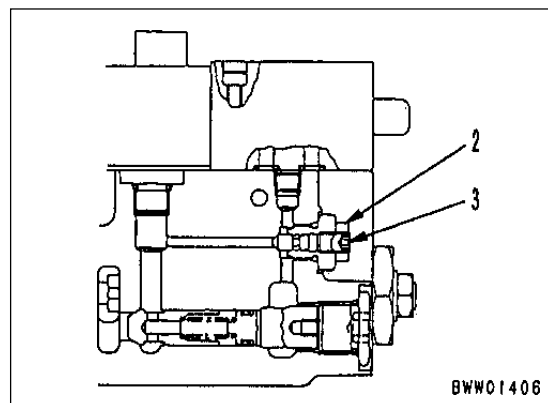
- 3) Loosen the locknut (2) for the ECSS valve (1).
- 4) Loosen the adjust screw (3) by 1/2 to 1 turn to release pressure from the accumulator.
  - The locknut (2) and the adjust screw (3) are painted red.



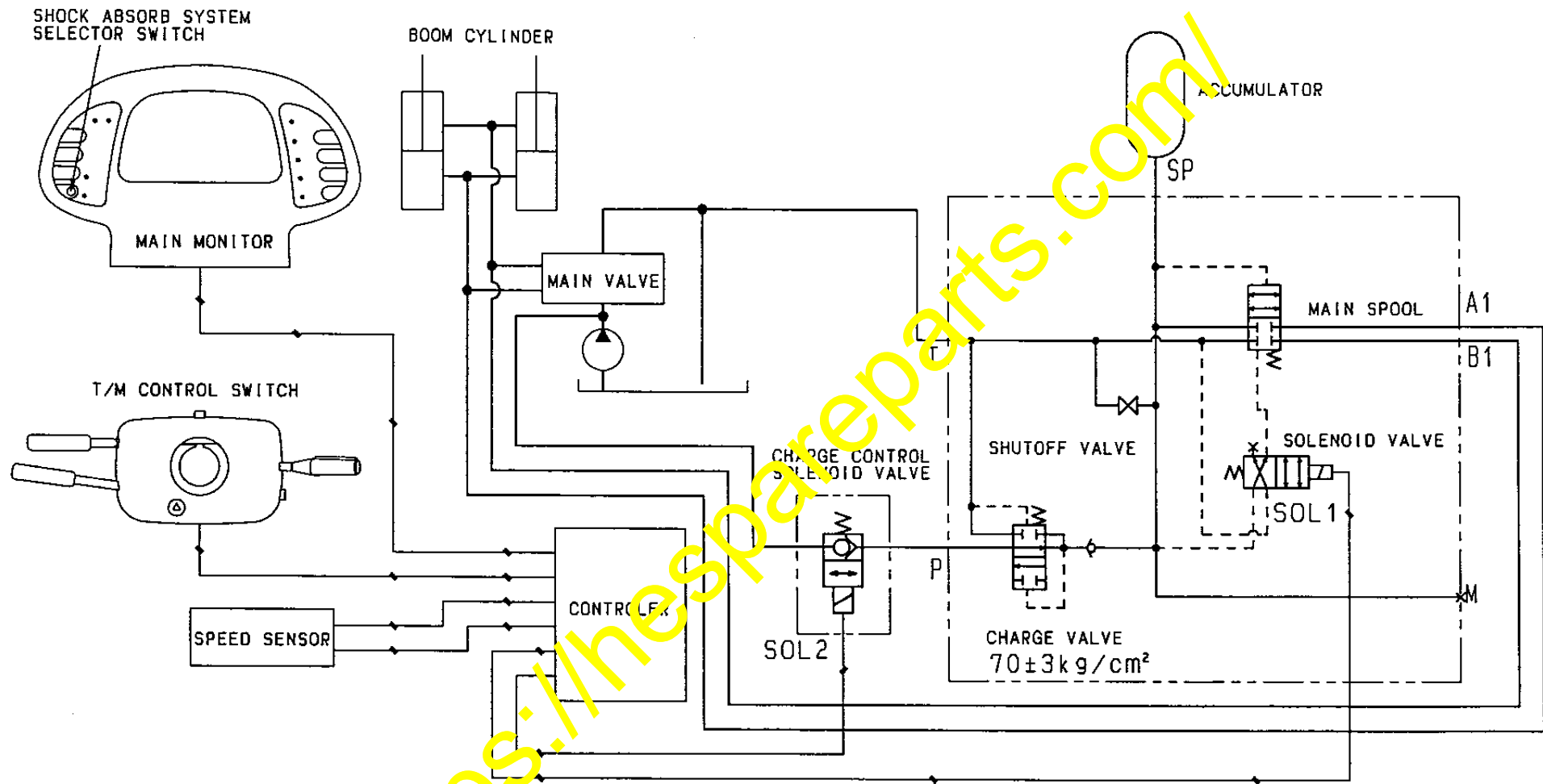
- 5) After finishing release of the residue pressure, turn back the adjust screw (3) to the original position and tighten the locknut (2) securely.

 Locknut:

$12.7 \pm 0.6 \text{ Nm}$  { $1.3 \pm 0.06 \text{ kgf.m}$ }







Speed gear	Travel speed (km/h)	SOL 1	SOL 2	Remark
1	0 - Max	OFF	ON	Not function
2 - 4	0 - 5	OFF	ON	Not function
	5 - Max	ON	OFF	ACC function

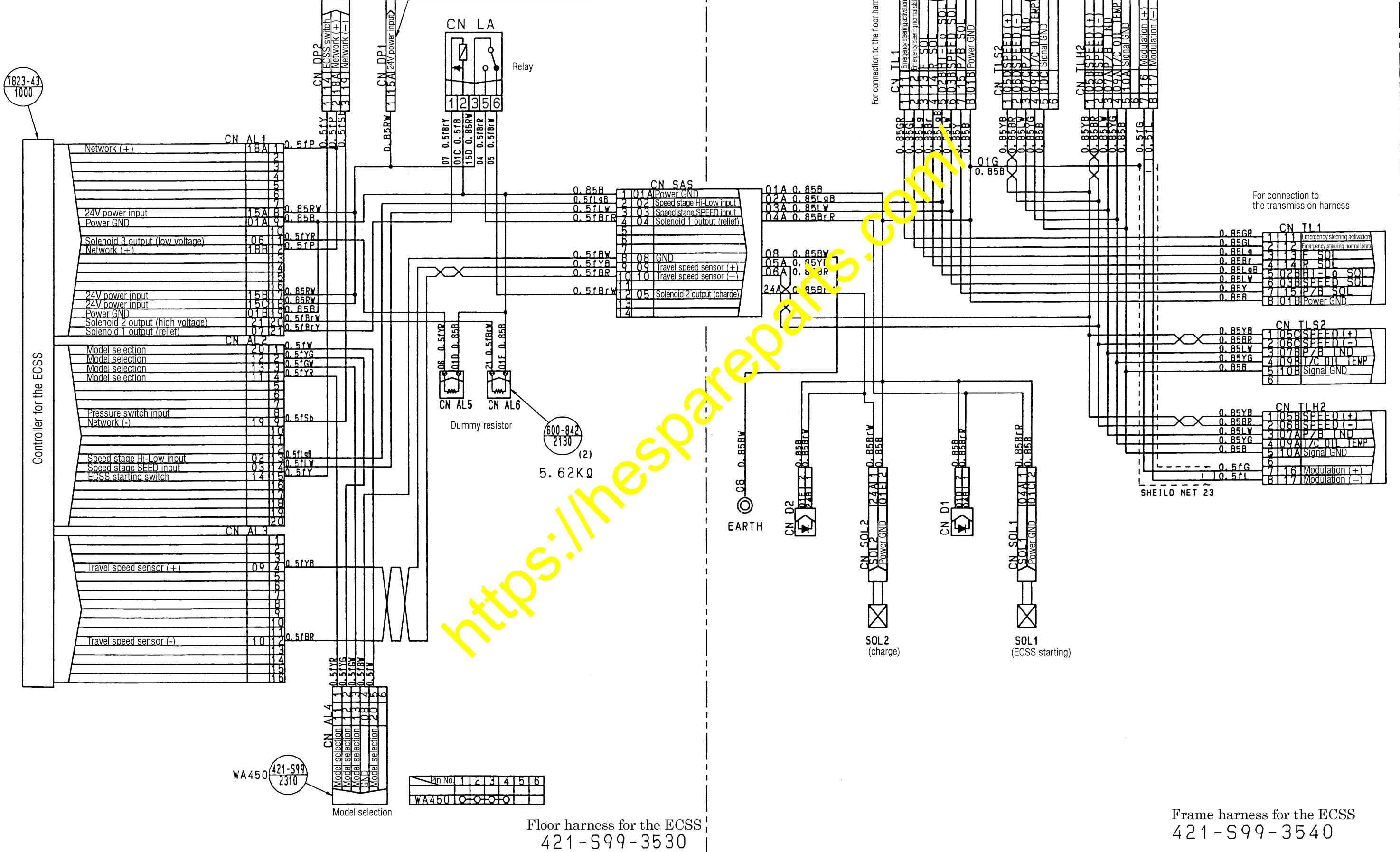
(An enlarged diagram is being attached as page 35.)

(An enlarged diagram is being attached as page 36.)

Machines equipped with the exclusive controller for the ECSS

For connection to the floor harness

Connect to the unused terminal among CN OP3 thru OP5 in the fuse box (421-06-22470).

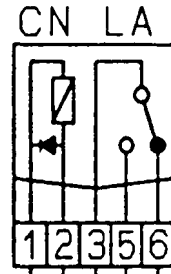


Machines equipped with the exclusive controller for the ECSS

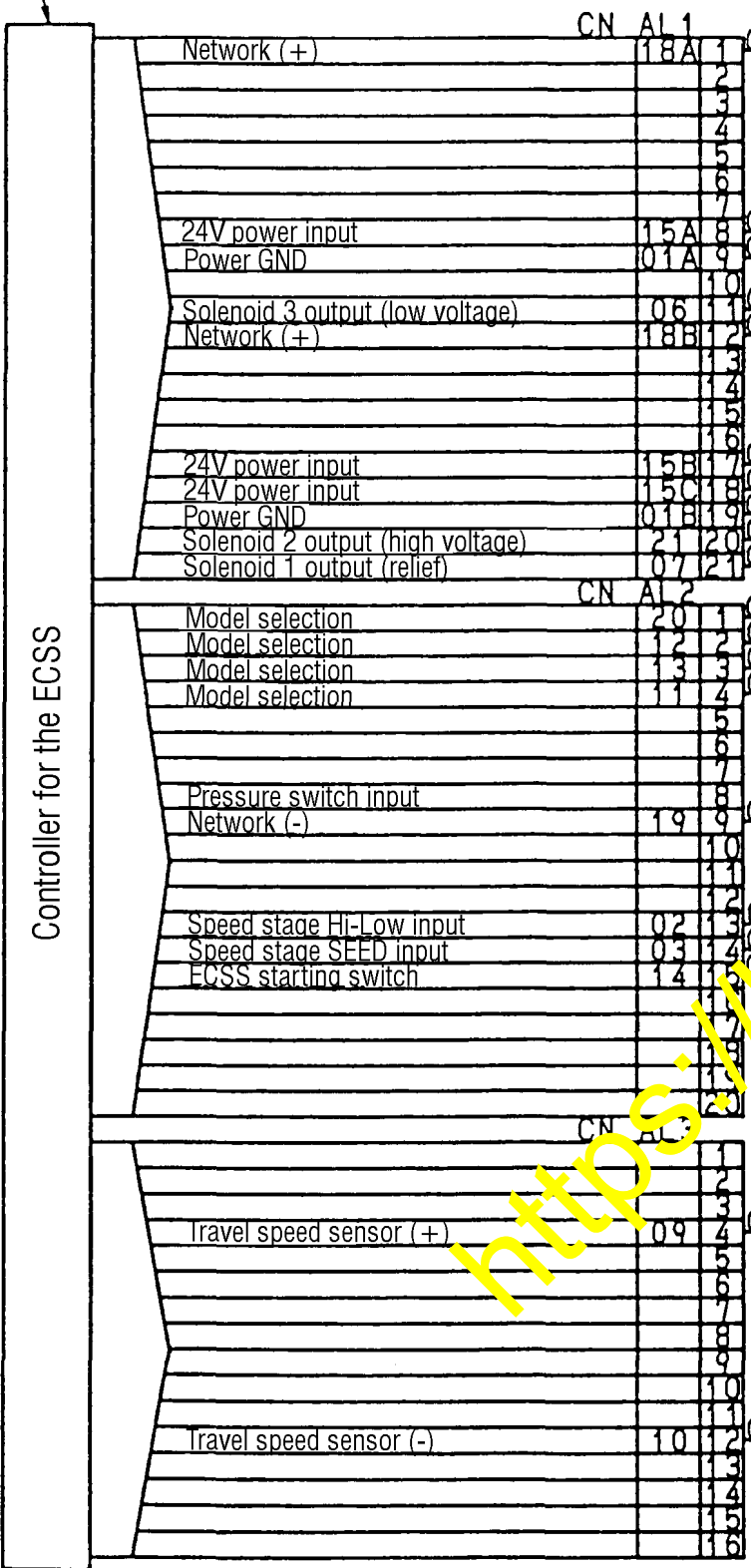
For connection to the floor harness

Connect to the unused terminal among CN OP3 thru OP5 in the fuse box (421-06-22470).

7823-43  
1000



Relay

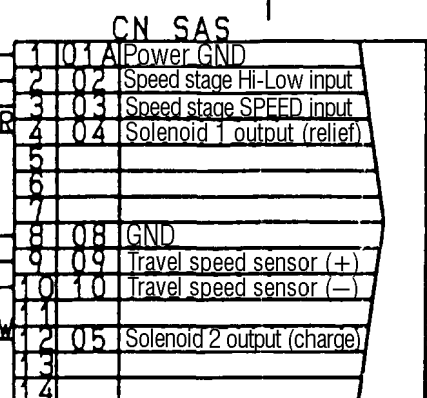


CN AL1

CN AL2

CN AL3

CN AL4

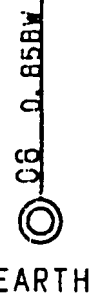


CN AL5

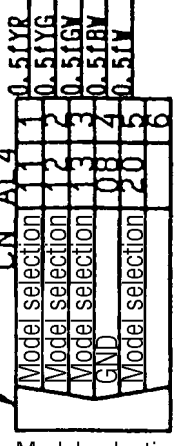
CN AL6

Dummy resistor

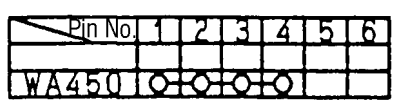
600-842  
2130  
(2)  
5.62KΩ



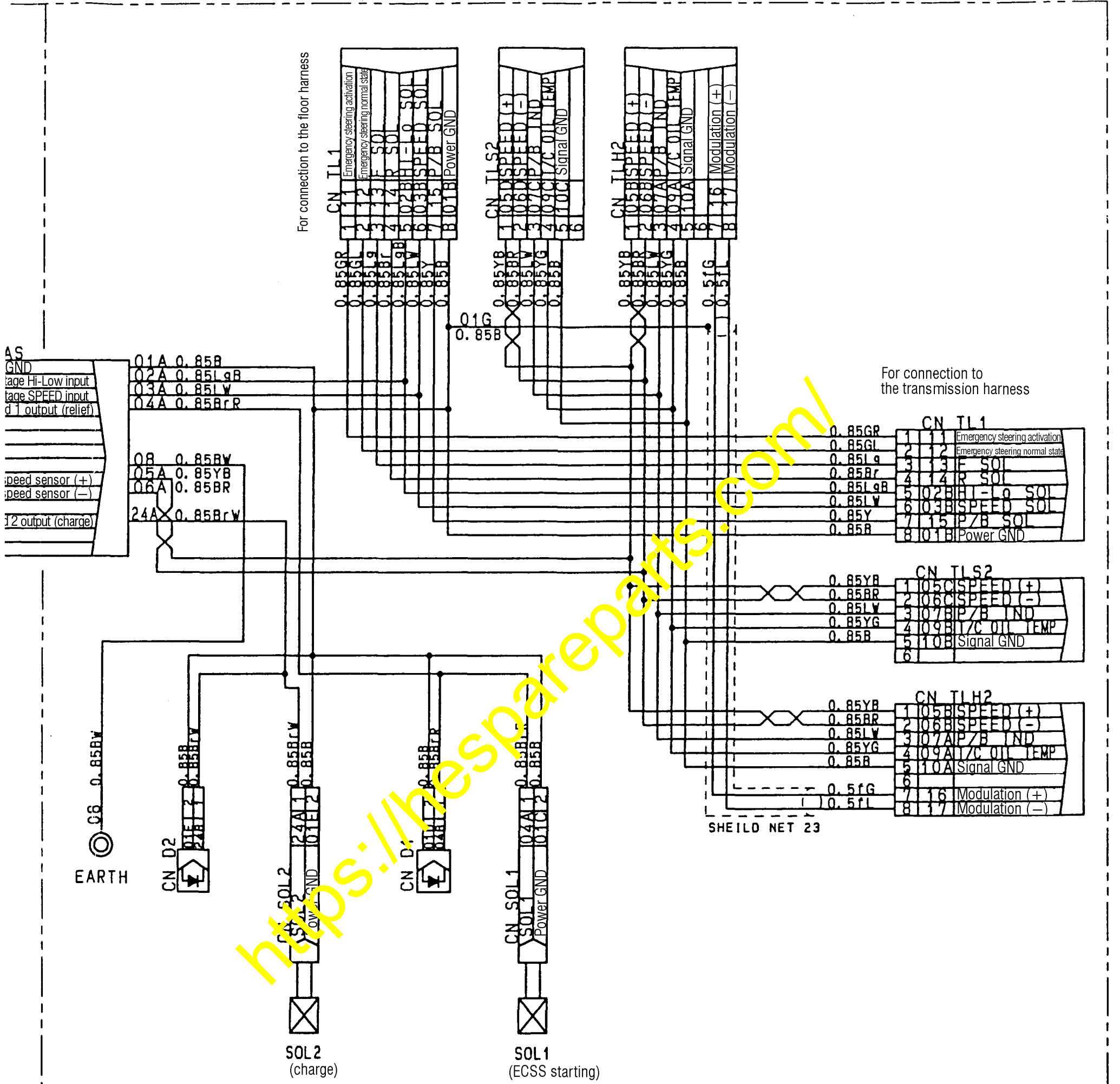
WA450 421-599  
2310



Model selection



Floor harness for the ECSS  
421-599-3530

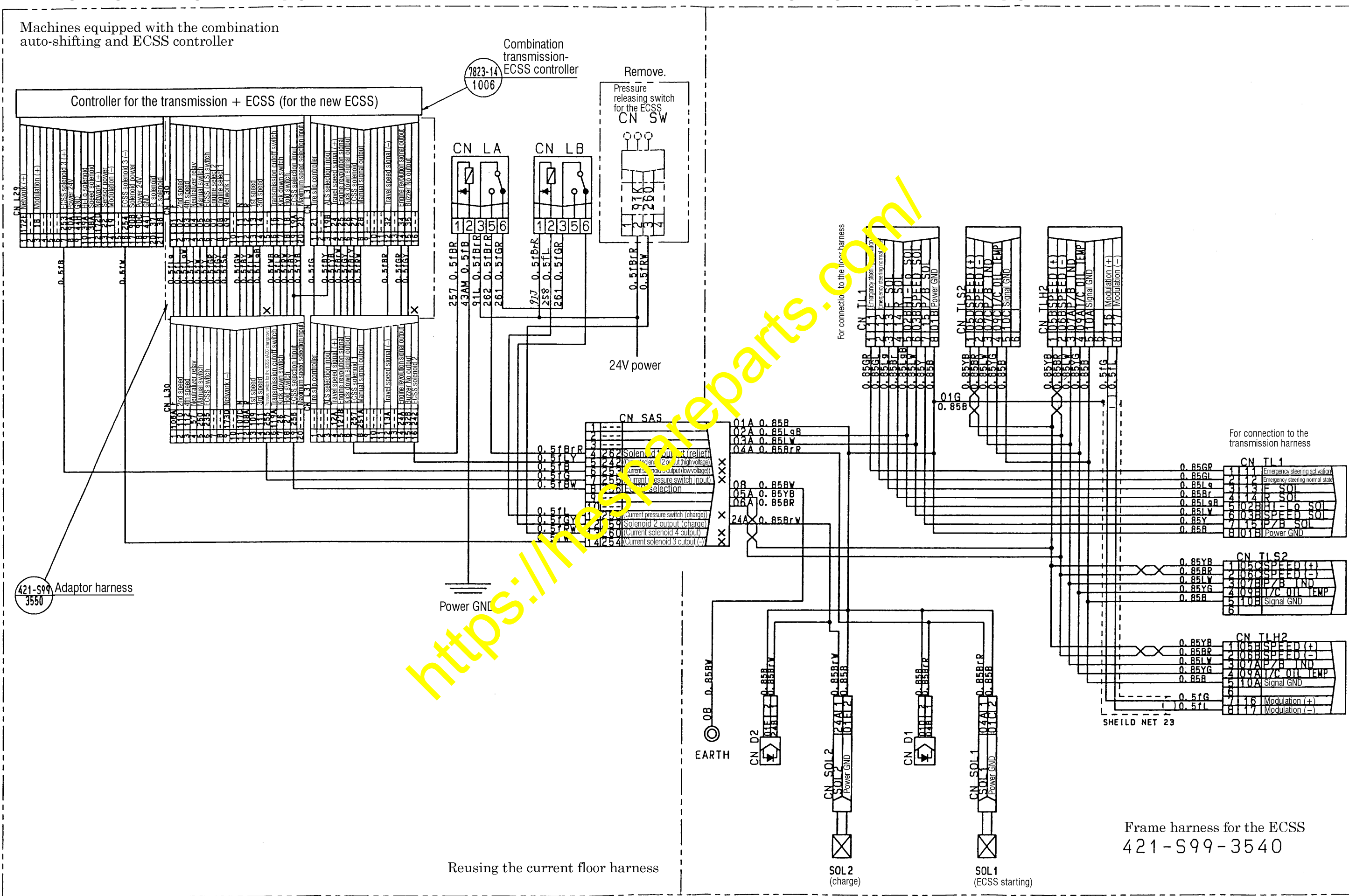


Frame harness for the ECSS  
421-S99-3540



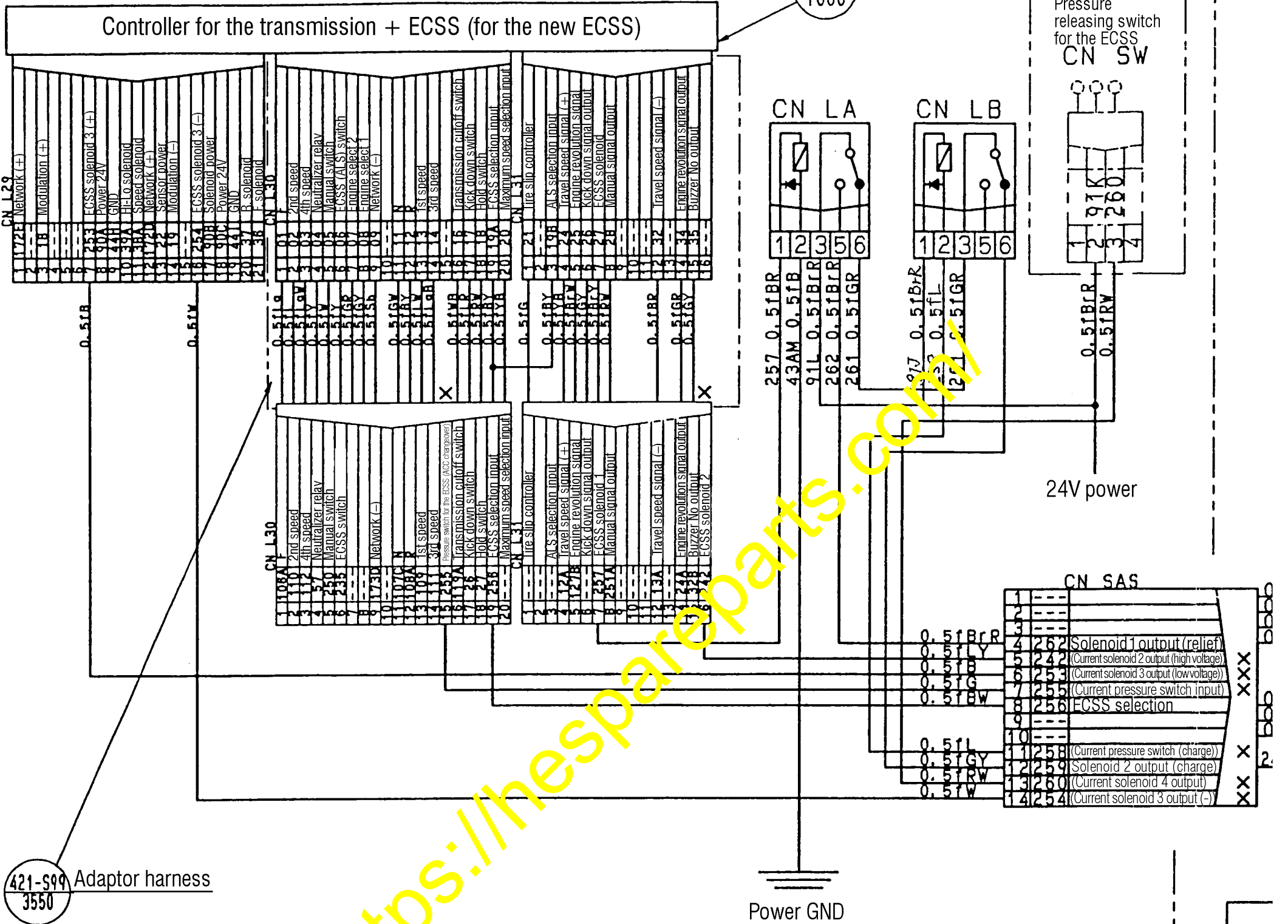
(An enlarged diagram is being attached as page 38.)

(An enlarged diagram is being attached as page 39.)



Machines equipped with the combination auto-shifting and ECSS controller

Combination transmission-ECSS controller



421-599 Adaptor harness  
3550

Power GND

0.8 0.85BV  
EARTH

Reusing the current floor harness

