

INSTALLATION MANUAL

REF NO.	BA02024
DATE	December 6, 2002

SUBJECT: THREE SPOOL VALVE INSTALLATION

PURPOSE: To introduce local installation procedure for the three spool valve.

APPLICATION: WA380-5L Wheel Loader Serial Number A52001 and up

FAILURE CODE: 6370Z9

DESCRIPTION: This manual describes the installation procedure for the three spool valve which has been newly developed as an option. This package includes an additional one spool valve, piping and work equipment control lever.

PARTS LIST

Item	Part No.	Description	Qty
①	709-91-00120	VALVE, SERVICE.....	1
②	700-92-11780	BOLT, VALVE TIE.....	2
③	700-92-11780	BOLT, VALVE TIE.....	2
④	07000-13038	O-RING, BETWEEN VALVE.....	8
⑤	19M-61-35150	ELBOW.....	2
⑥	07042-30108	PLUG.....	2
⑦	07002-12034	O-RING.....	2
⑧	02896-11009	O-RING.....	2
⑨	423-877-2130	PLATE.....	1
⑩	07283-31537	CLIP.....	2
⑪	07283-51523	CLIP.....	2
⑫	01596-00807	NUT.....	4
⑬	01643-50823	WASHER, FLAT.....	4
⑭	419-13-17910	SPACER.....	2
⑮	423-877-2540	RUBBER.....	1
⑯	421-62-12120	PLATE.....	1
⑰	01010-81060	BOLT, MOUNTING - M10x60.....	1
⑱	01643-31032	WASHER, FLAT - M10.....	32
⑲	423-877-3311	TUBE.....	1
⑳	07000-13035	O-RING.....	2
㉑	07372-21035	BOLT, MOUNTING - M10x35.....	32
㉒	01643-51032	WASHER, FLAT - M10.....	32

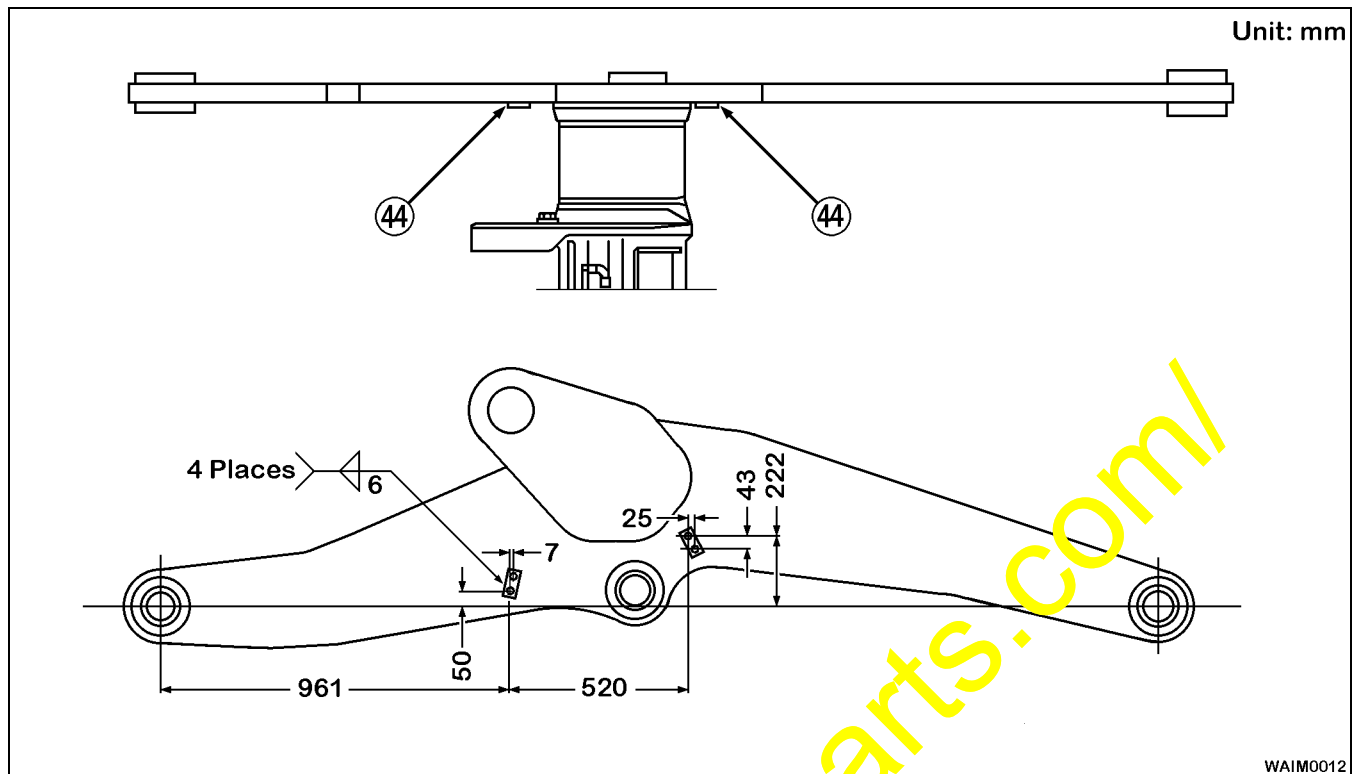
Item	Part No.	Description	Qty
23	423-877-2321	TUBE, LEFT	1
24	423-877-2310	TUBE, RIGHT.....	1
25	423-877-2210	BRACKET	1
26	01010-81050	BOLT, MOUNTING - M10x50	2
27	419-43-17930	CUSHION, TOP	2
28	417-54-13470	SPACER.....	2
29	415-64-13130	CUSHION, BOTTOM	2
30	419-43-17920	WASHER.....	4
31	01584-01008	NUT, HEX - M10.....	2
32	423-877-2231	BRACKET, LEFT	1
33	423-877-2221	BRACKET, RIGHT.....	1
34	07283-33450	CLIP	4
35	07283-33450	SEAT	4
36	01597-01009	NUT, HEX - M10.....	8
37	01010-D1025	BOLT, MOUNTING - M10x25.....	8
38	01643-71032	WASHER, FLAT - M10.....	8
39	423-877-3340	HANGER, TUBE	1
40	01571-01016	SEAT, FRONT FRAME.....	2
41	01573-10205	SEAT, FRONT FRAME.....	1
42	01573-20207	SEAT, FRONT FRAME.....	2
43	423-46-21D50	PLATE, HANGER.....	1
44	419-877-1710	SEAT, BOOM TUBE CLAMP.....	4
45	423-877-3100	TUBE.....	2
46	07378-11000	HEAD	2
47	07000-13032	O-RING	6
48	07371-31049	FLANGE, SPLIT	12
49	423-877-2430	BRACKET	4
50	01010-81025	BOLT, MOUNTING - M10x25	8
51	07125-01014	HOSE	2
52	23S-43-51110	LEVER.....	1
53	23S-43-51240	NUT	1
54	01546-10812	NUT, HEX - M8.....	1

Item	Part No.	Description	Qty
⑤	01643-50823	WASHER, FLAT - M8	1
⑤	421-877-3460	BRACKET	1
⑤	421-877-3450	COVER.....	1
⑤	421-877-3410	LEVER.....	1
⑤	421-43-38720	AWNING, LEVER.....	3
⑥	702-16-03370	VALVE, PILOT	1
⑥	421-877-3430	ELBOW	1
⑥	07000-12011	O-RING	4
⑥	418-43-28281	NIPPLE.....	2
⑥	07260-20998	HOSE	1
⑥	11Y-09-11140	CLIP	2
⑥	02896-11008	O-RING	4
⑥	02754-00204	HOSE	1
⑥	421-877-3440	TEE	1
⑥	07260-20908	HOSE	1
⑦	421-09-31770	TEE	1
⑦	11Y-62-12140	NIPPLE.....	2
⑦	423-877-3520	HOSE	2
⑦	08210-01202	WIRE, SPIRAL HOSE	2
⑦	08210-01204	WIRE, SPIRAL HOSE	2
⑦	423-877-3320	TUBE.....	1
⑦	423-877-3330	TUBE.....	1
⑦	04434-51510	CLIP	4
⑦	01010-81020	BOLT, MOUNTING - M10x20	3
⑦	08034-20010	STRAP, TIE	AR

REWORK**Boom**

Weld the prepared seats ④ to the inside surface of the boom plate at the positions shown, symmetrically on the left and right sides.

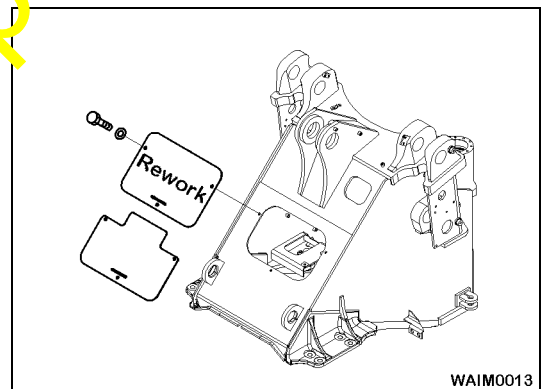
Boom part number after the rework.....423-877-A380



WAIM0012

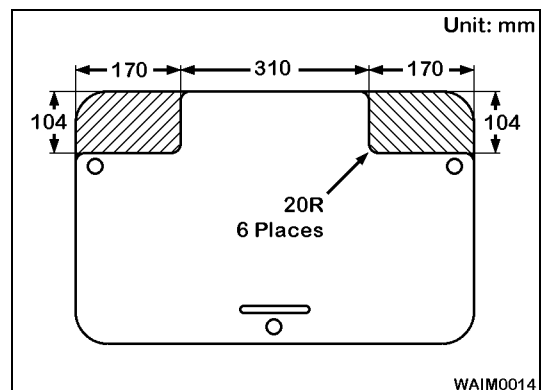
Front Frame Cover

1. Remove the front cover and hardware and rework.



WAIM0013

2. Cut the hatched sections off of the front cover at the dimensions shown.
Cover part number after the rework..... 423-46-31190

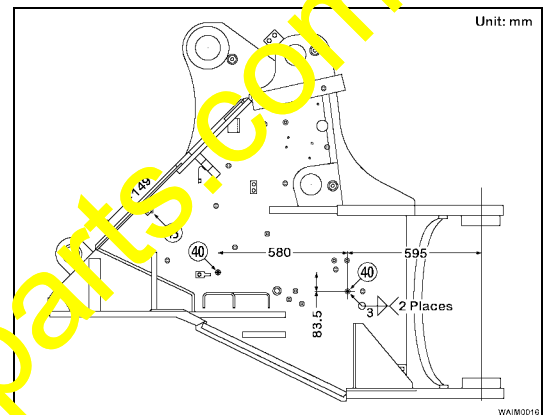
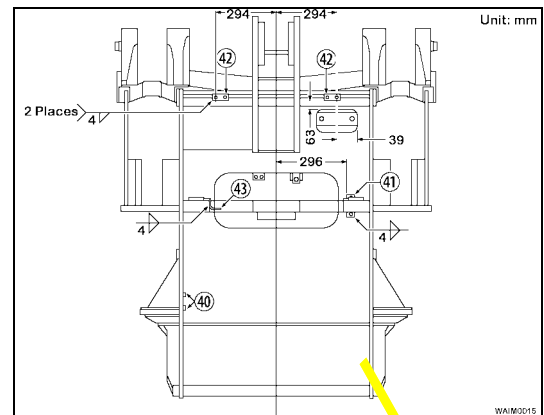


WAIM0014

Front Frame

1. Weld the prepared seats (40, 41, 42 and 43) to the front frame at the positions shown.

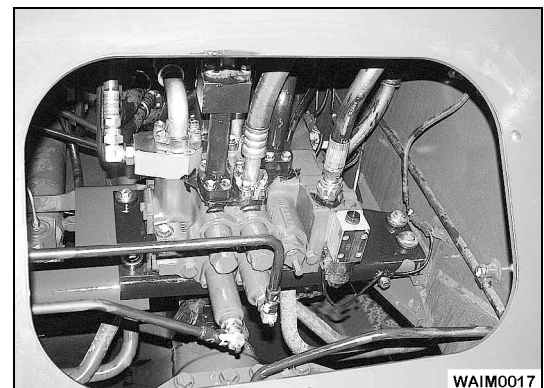
Front frame part number after the rework..... 423-877-3110



EQUIPMENT CONTROL VALVE

Removal

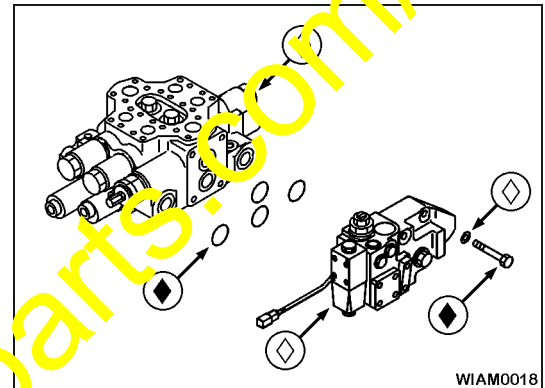
1. Preparations before removing the equipment control valve from the machine body.
 - a. Measure the control lever movements and the operating force referring to **Testing and Adjustment** in the Shop Manual and record the measured values.
 - b. Clean the outside of the control valve so that foreign substances do not enter into the inside of the control valve when removing. Especially, the concave sections at the contact surfaces should be carefully brushed. Mark the ports and piping for identification purposes before removing the control valve from the machine body.
2. Refer to the Shop Manual for removal of the equipment control valve.



Disassembly

1. Prepare clean washing oil, tool and torque wrench. Refer to the Shop Manual regarding the torques which are not mentioned and to the Parts Book regarding replacement parts (seals, etc.).
2. Carry out the work on the control valve at an indoor site free from dust and dirt and be sure to wash the outside of the control valve cleanly before starting the disassembly work.
3. Remove the four bolts and separate the two spool control valve and the end valve. Retain the valves and washers. Discard the bolts and the between section seals.
4. Be careful not to damage the machined surfaces (o-ring seal contact surfaces) of the disassembled sections. If there are burrs, etc. on the contact surfaces, remove them using an oil stone.

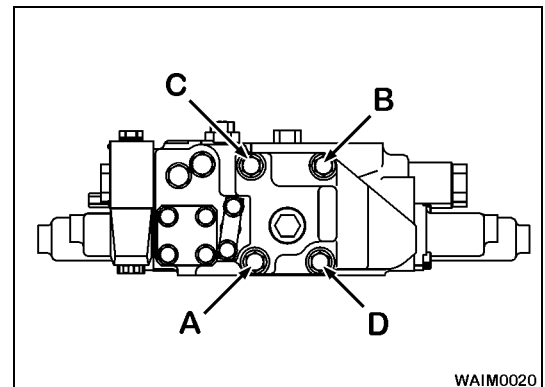
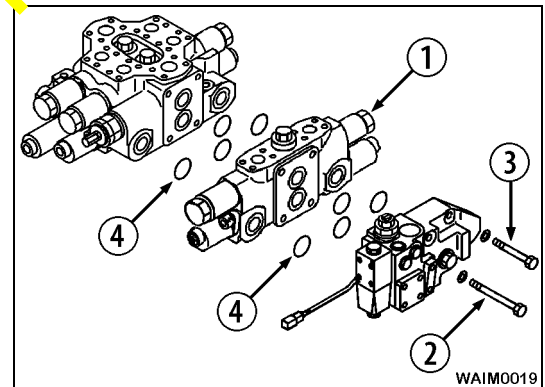
◇	Retain these parts for future use.
◆	Discard these parts and replace with new ones from the list.

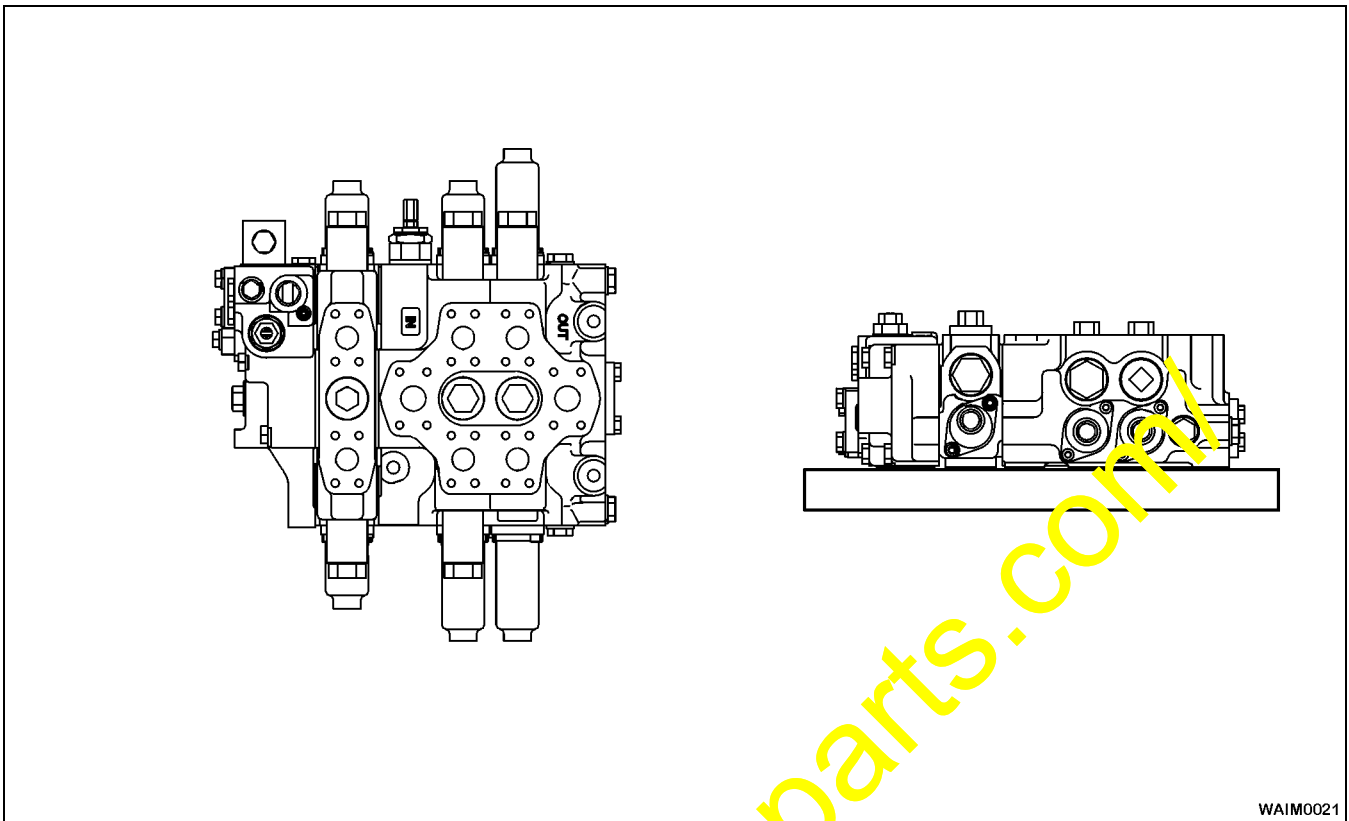


Reassembly

1. Position the two spool valve section on a flat surface plate. If each section is not aligned on a surface plate, spool return failure, operating force failure, etc. may occur.
2. Coat the between section o-rings ② with amber grease and install in the grooves in the two spool valve section. Align the third spool valve section ① to the two spool valve section. Coat the between section o-rings ④ with amber grease and install in the grooves in the third spool valve section. Align the end valve and temporarily fasten them together with the four bolts ① and ③ and previous removed washers. When assembling the third spool valve section, pay attention to the contact surfaces of the o-ring ports.
3. Tighten the four bolts in four passes in the sequence of **A, B, C** and **D**.

	N•m	1st pass.....	18 N•m
		2nd pass.....	54 N•m
		3rd pass.....	86 N•m
		4th pass.....	108 N•m



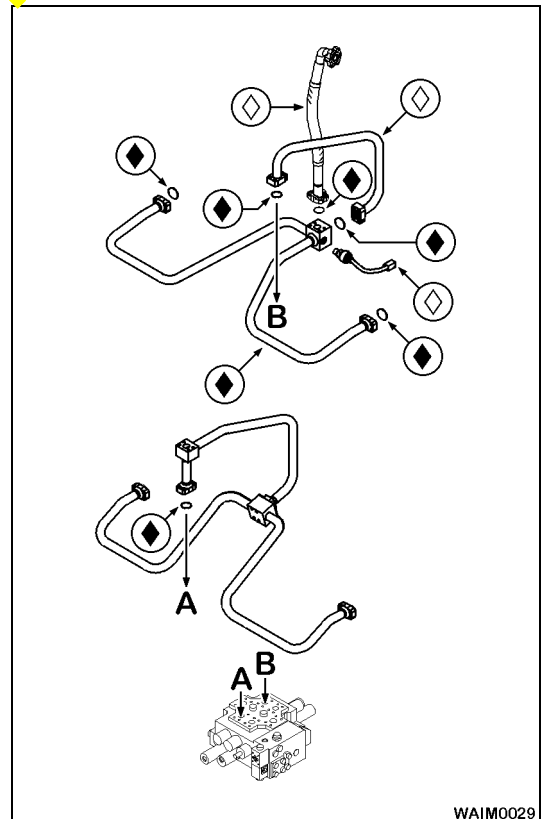


WAIM0021

BOOM LINES AT CONTROL VALVE

1. Remove and discard the parts marked **◆**. Parts marked **◇** are to be reused.

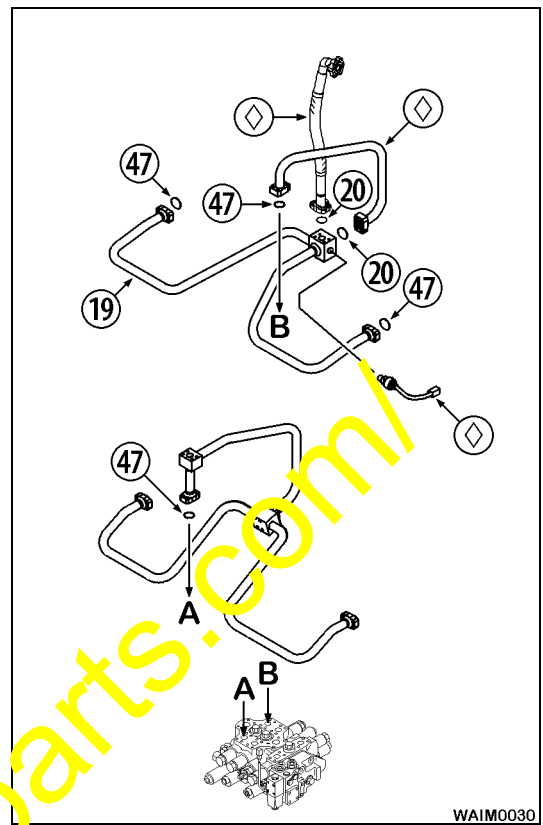
◇	Retain these parts for future use.
◆	Discard these parts and replace with new ones from the list.



WAIM0029

2. Install the numbered parts (items in the parts list) shown.

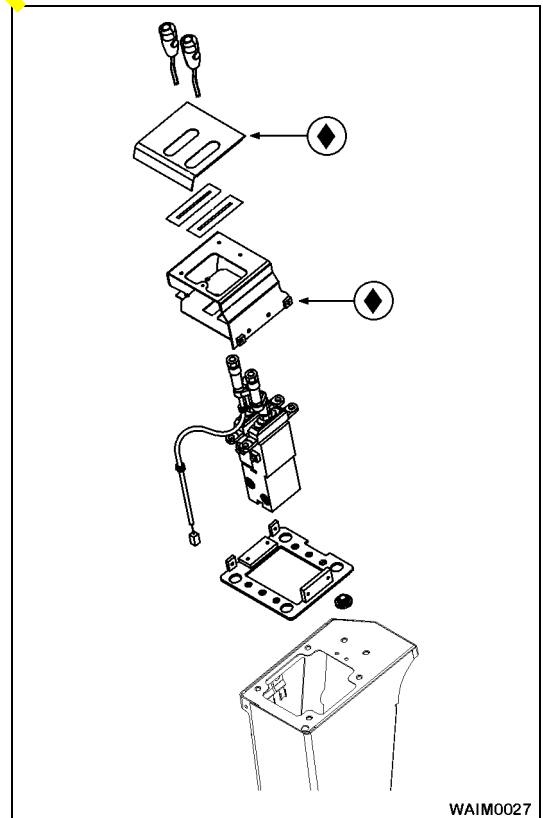
H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.



WORK EQUIPMENT CONTROLS

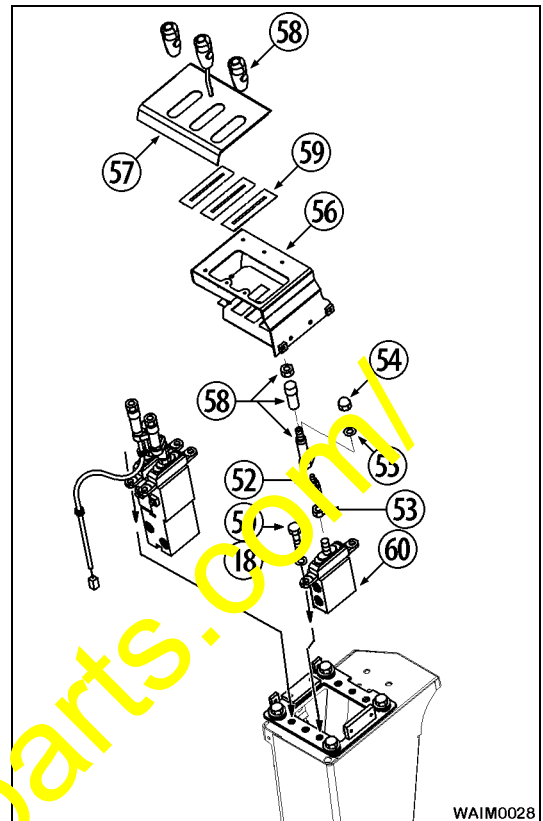
1. Remove and discard the parts marked ◆. Retain all mounting hardware that was removed.

◆	Discard these parts and replace with new ones from the list.
---	--

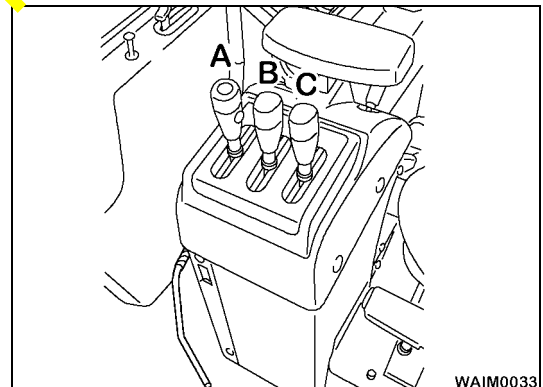


2. Install the numbered parts (items in the parts list) shown.

H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.



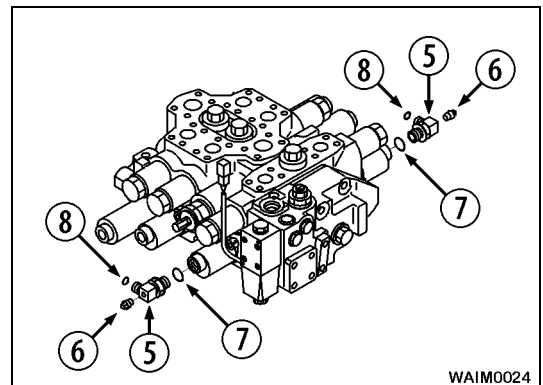
- A. Boom Control Lever
- B. Bucket Control Lever
- C. Attachment Control Lever



PPC PIPING

Equipment Control Valve PPC Fittings

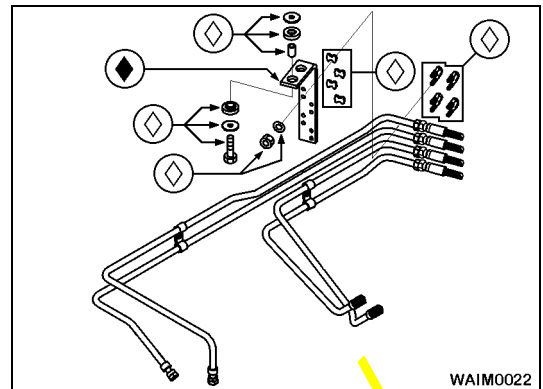
1. Install elbows ⑤ with o-rings ⑦, ⑧ and plug ⑥ at each end of the third valve section.




On Front Frame

1. Remove and discard the parts marked \blacklozenge . Parts marked \diamond are to be reused.

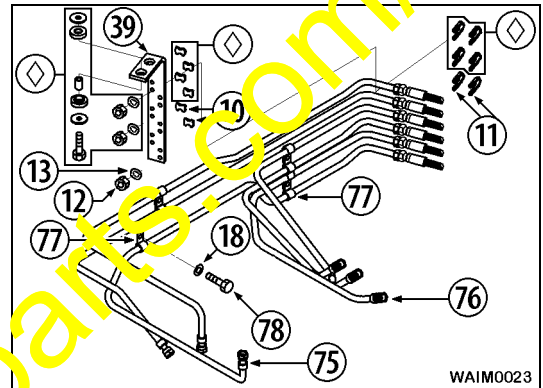
\diamond	Retain these parts for future use.
\blacklozenge	Discard these parts and replace with new ones from the list.



2. Install the numbered parts (items in the parts list) shown.

 **N•m** U bolt nuts $\textcircled{12}$ 8.8 to 17.7 N•m

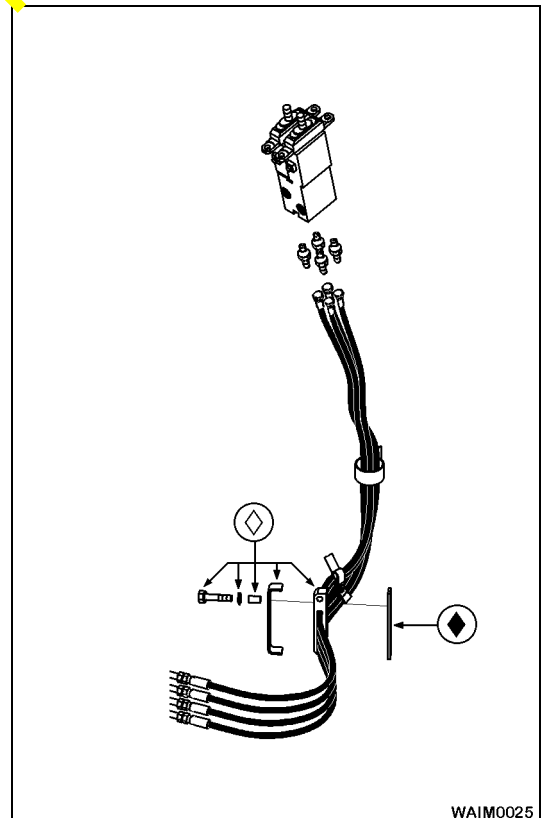
H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.



On Floor Plate

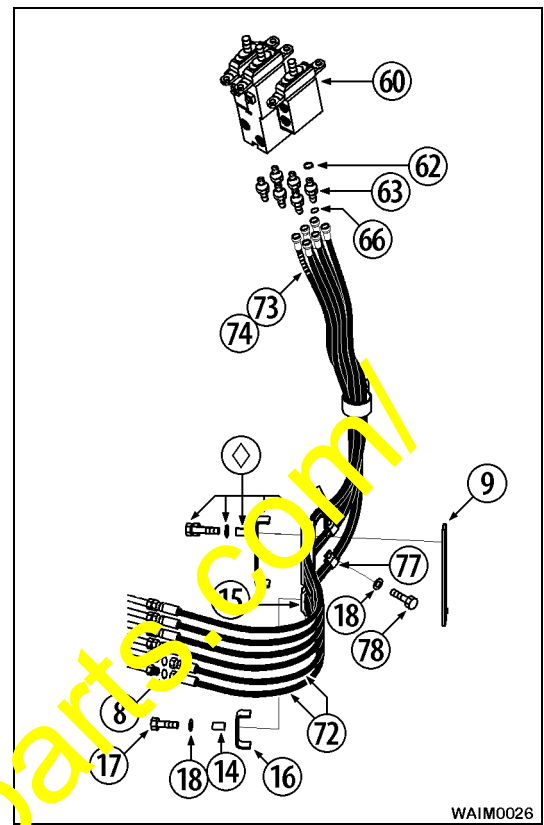
1. Remove and discard the parts marked \blacklozenge . Parts marked \diamond are to be reused.

\diamond	Retain these parts for future use.
\blacklozenge	Discard these parts and replace with new ones from the list.



2. Install the numbered parts (items in the parts list) shown.

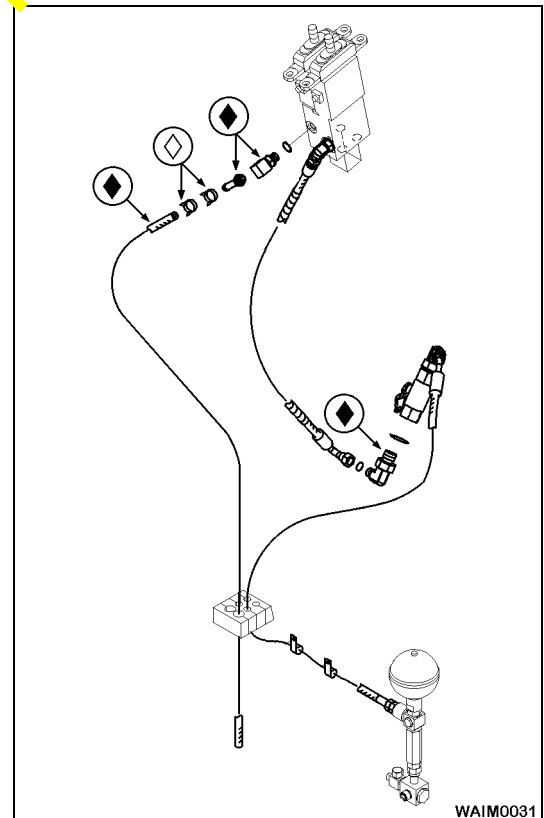
H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.



PPC Valve Supply

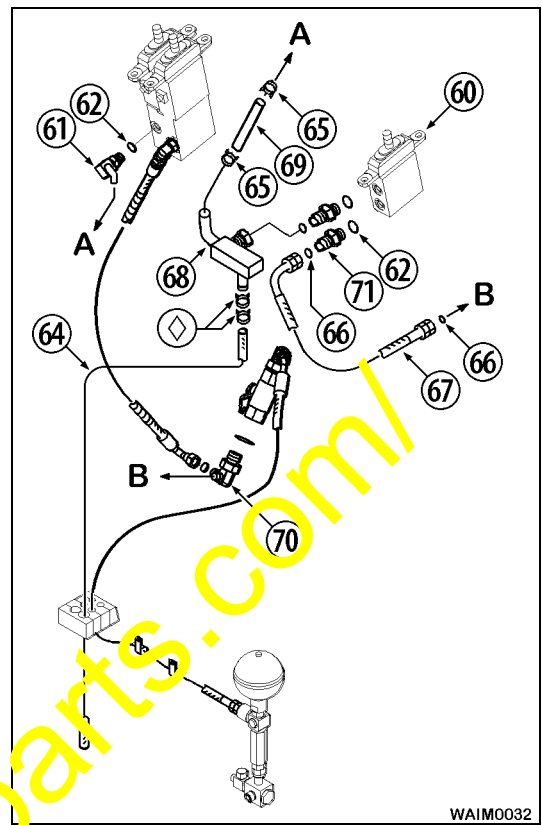
1. Remove and discard the parts marked ◆. Parts marked ◇ are to be reused.

◇	Retain these parts for future use.
◆	Discard these parts and replace with new ones from the list.



2. Install the numbered parts (items in the parts list) shown.

H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.

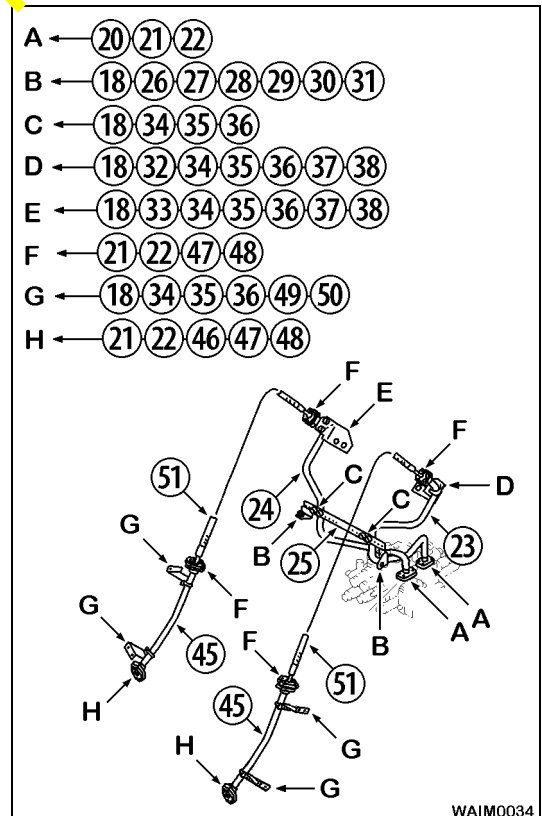


WAIM0032

THIRD SPOOL PIPING

1. Install the numbered parts (items in the parts list) shown.

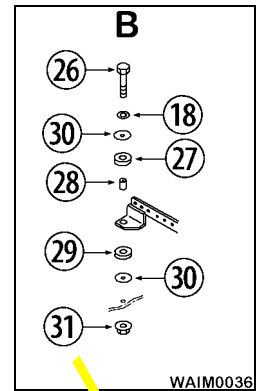
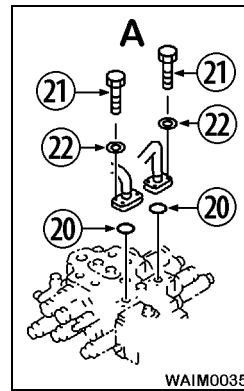
H Tightening torque for the bolts, nuts, tubing and hoses without designations should be as per the Standard Tightening Torque in the shop manual.



WAIM0034

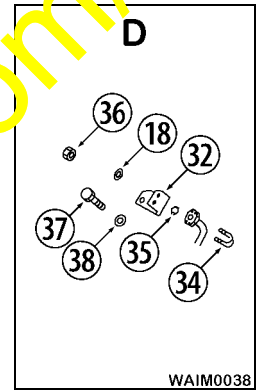
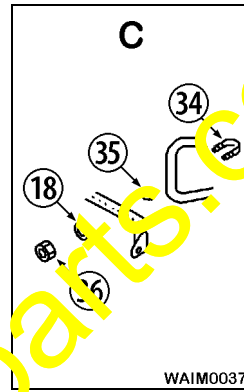
A ← 21 22 23

B ← 18 26 27 28 29 30 31



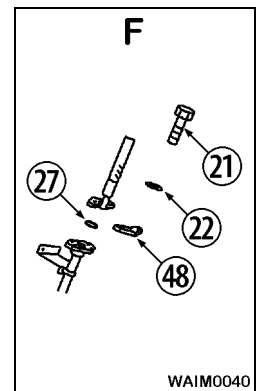
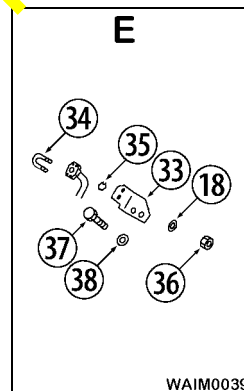
C ← 18 34 35 36

D ← 18 32 34 35 36 37 38



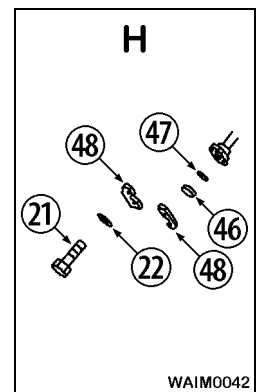
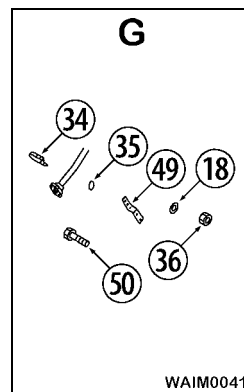
E ← 18 33 34 35 36 37 38

F ← 21 22 47 48



G ← 18 34 35 36 37 38 39 40

H ← 21 22 26 47 48



<https://hespareparts.com/>