

# INSTALLATION MANUAL

REF NO.	BA02011A
DATE	May 31, 2003

(C)

*This Manual supersedes previous issuance, BA02011, dated July 9, 2002 which should be discarded.*

**SUBJECT:** REPAIR PROCEDURE OF FRONT AND REAR BRAKE TIME LAG

**PURPOSE:** To modify the activation time lag between the front and rear brakes.

**APPLICATION:** WA800-3LC Wheel Loader Serial Number A50001 thru A50024  
WA900-3LC Wheel Loader Serial Number A50001 thru A50021

**FAILURE CODE:** 2C40CD

**DESCRIPTION:** Release a new brake control system that will improve the performance relationship between the front and rear brakes.

**INTRODUCTION:** This revised control system uses the tandem right brake valve to activate all four brakes and the single left brake valve to pilot operate the right brake valve.

This new control system will provide improved brake operation and increased brake life by eliminating any pressure differential and brake apply pressure time lag between the front and rear brakes.

## LIST OF PARTS

### New Parts

Item	New Part	Description	Qty	Old Part
①	427-43-27180	JOINT .....	1	---
②	07235-10422	ELBOW .....	1	---
③	07002-12034	SEAL RING .....	12	⊙
④	427-43-27910	TUBE .....	1	---
⑤	427-43-27920	TUBE .....	1	---
⑥	427-43-27930	TUBE .....	1	---
⑦	427-43-27980	BRACKET .....	1	---
⑧	01010-81020	BOLT .....	2	---
⑨	01643-31032	WASHER .....	8	---
⑩	07283-32236	CLIP .....	1	---
⑪	07108-20411	HOSE .....	1	07108-20409
⑫	07235-10422	ELBOW .....	1	07230-20422
⑬	07042-30108	PLUG .....	1	---

Item	New Part	Description	Qty	Old Part
14	421-43-27970	HOSE .....	1	---
15	361-18-21430	PROTECTOR .....	1	---
16	07235-50315	ELBOW .....	1	424-43-27340
17	428-43-37430	ELBOW .....	1	---
18	07626-00415	HOSE .....	2	---
19	42A-16-11210	PLATE .....	1	---
20	04435-52110	CLIP .....	6	---
21	01435-01016	BOLT .....	5	---
22	427-43-27190	JOINT, FRONT .....	1	---
23	01010-81095	BOLT .....	2	---
24	07626-00406	HOSE .....	2	07624-004A7
25	07626-00405	HOSE .....	2	07624-00406
26	421-43-22690	BRACKET .....	1	---
27	427-43-27190	JOINT, REAR .....	1	---
28	427-43-27870	BRACKET .....	1	---
29	427-43-27990	BRACKET, FLOOR SUPPORT .....	1	---
30	427-43-27890	BLOCK .....	1	427-43-27750
31	07002-13334	SEAL RING .....	1	⊙
32	427-43-27200	RIGHT TANDEM VALVE .....	1	426-43-27101
33	425-43-37200	LEFT SINGLE VALVE .....	1	426-43-27101
34	20S-62-31340	CONNECTOR .....	1	07230-20422
35	07102-21004	HOSE .....	1	07102-21003
36	07623-00605	HOSE .....	1	07621-00603
37	01571-01016	SEAT .....	1	---
38	419-43-12130	SEAT .....	1	---

**Retained Parts - ♣**

Item	Retained Part	Description	Qty
39	421-43-22430	ELBOW .....	1
40	421-43-22942	SWITCH, STOP .....	1
41	419-06-21121	SWITCH, CUT OFF .....	1
42	20R-62-11360	ELBOW .....	1
43	415-15-14331	ELBOW .....	2

Item	Retained Part	Description	Qty
44	421-43-27870	CONNECTOR .....	1
45	421-43-27860	CONNECTOR .....	1
46	07108-20613	HOSE .....	2
47	01435-01016	BOLT .....	3
48	427-06-12440	BRACKET .....	1
49	144-A74-1460	CLIP .....	2
50	07283-32738	U BOLT .....	1
51	07283-32736	U BOLT .....	2
52	01435-01020	BOLT .....	4
53	01643-31032	WASHER.....	8
54	01597-01009	NUT .....	8
55	04434-52712	CLIP .....	2
56	07235-11034	ELBOW .....	1
57	07102-20612	HOSE .....	1
58	07238-10628	CONNECTOR .....	1
59	01435-01030	BOLT .....	6

<https://hespareparts.com/>

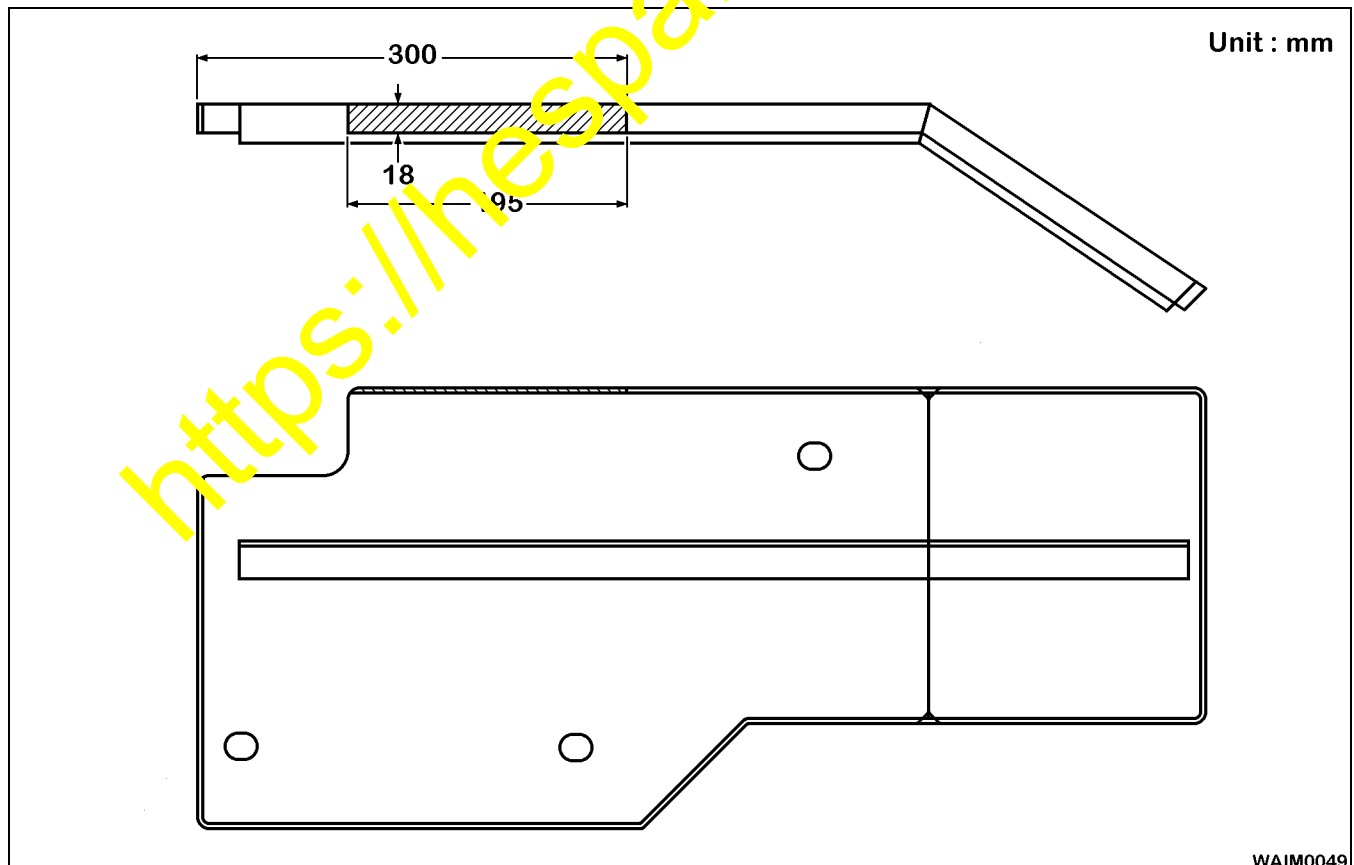
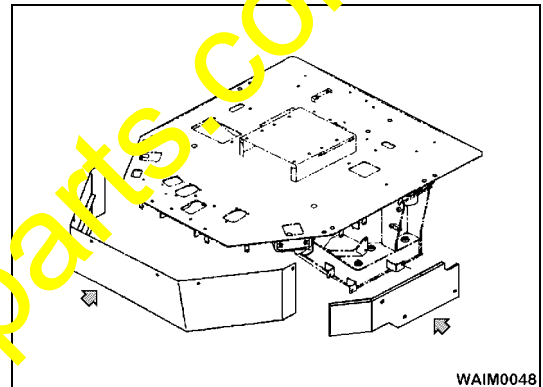
## REWORK PROCEDURE

**⚠ WARNING!** Stop the machine on level ground, lower the work equipment to the ground, then put wheel blocks securely under the tires to keep the machine from rolling.

**⚠ WARNING!** Before loosening or removing any brake piping items, the hydraulic pressure of the brakes and the brake system accumulators must be relieved. After properly blocking all wheels to prevent the machine from moving, operate the brake pedal, full apply and release, until all oil pressure is discharged from the accumulators.

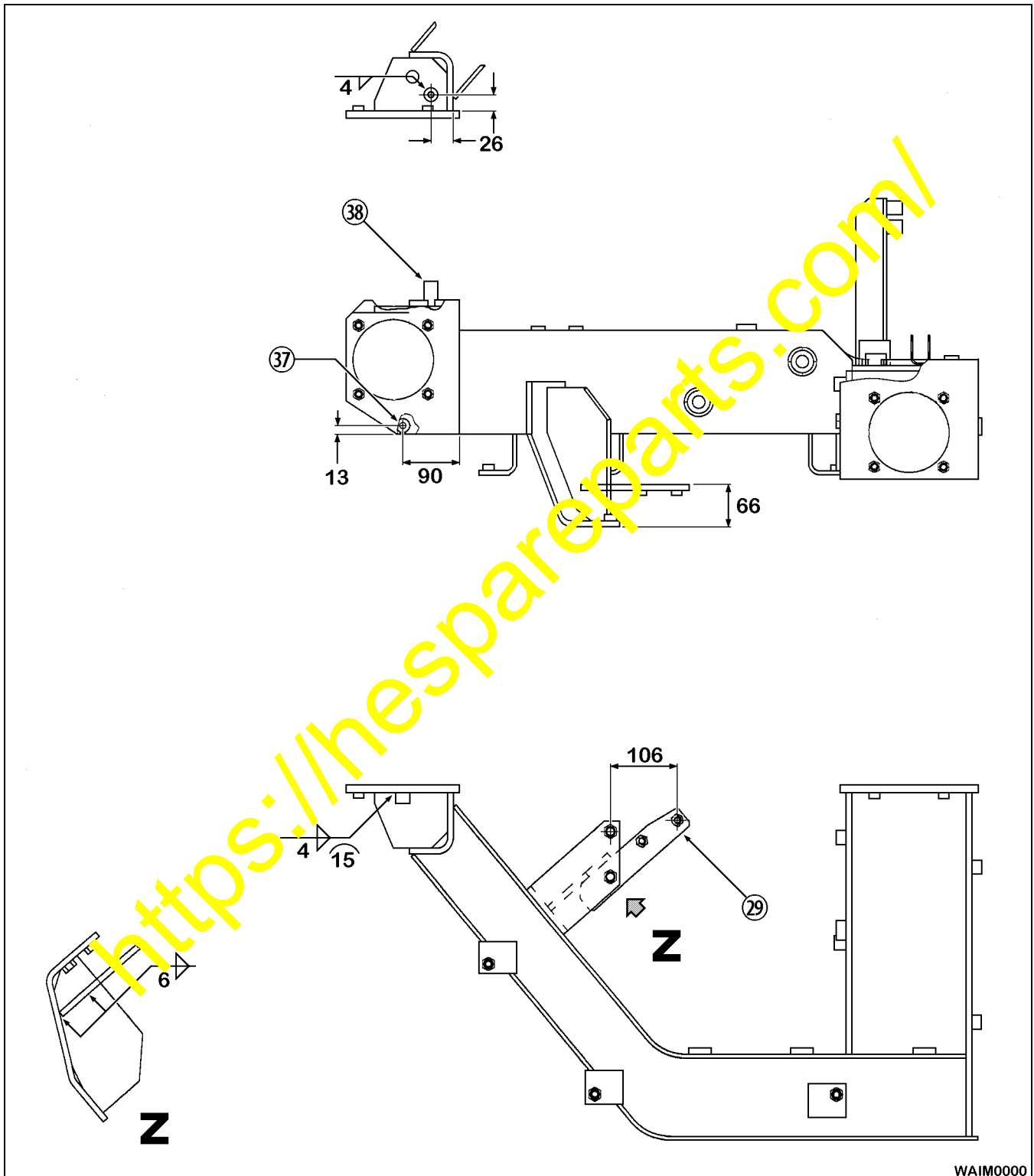
### Left Floor Cover Rework

1. Remove the front and left covers from below the floor frame.
2. Remove the hatched area at the dimensions shown from the left cover.



## Left Floor Support Rework

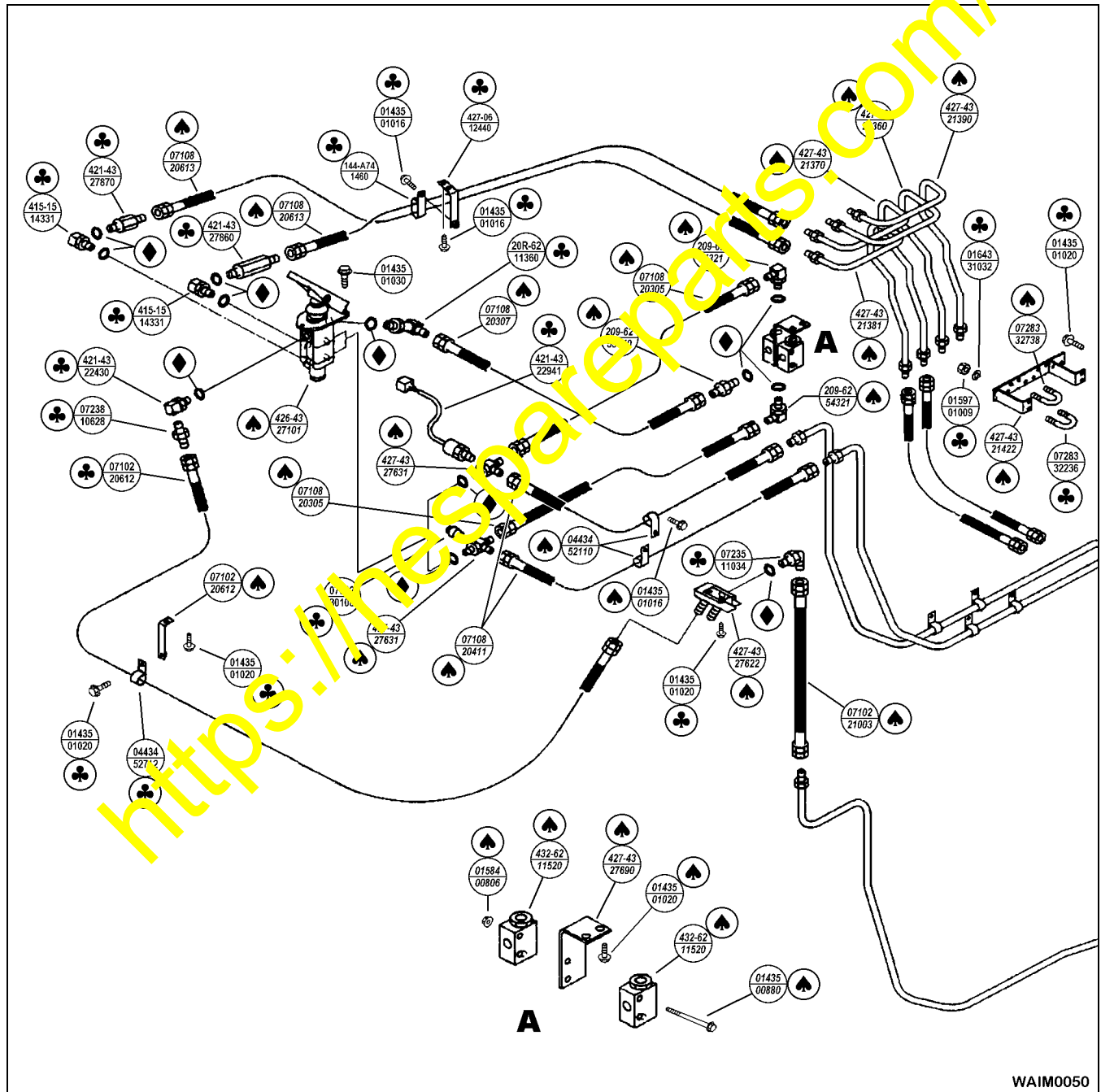
1. Rework of the left floor support as per the instructions given below. After finishing the rework, retouch the painting.



## Removal of Brake Oil Piping

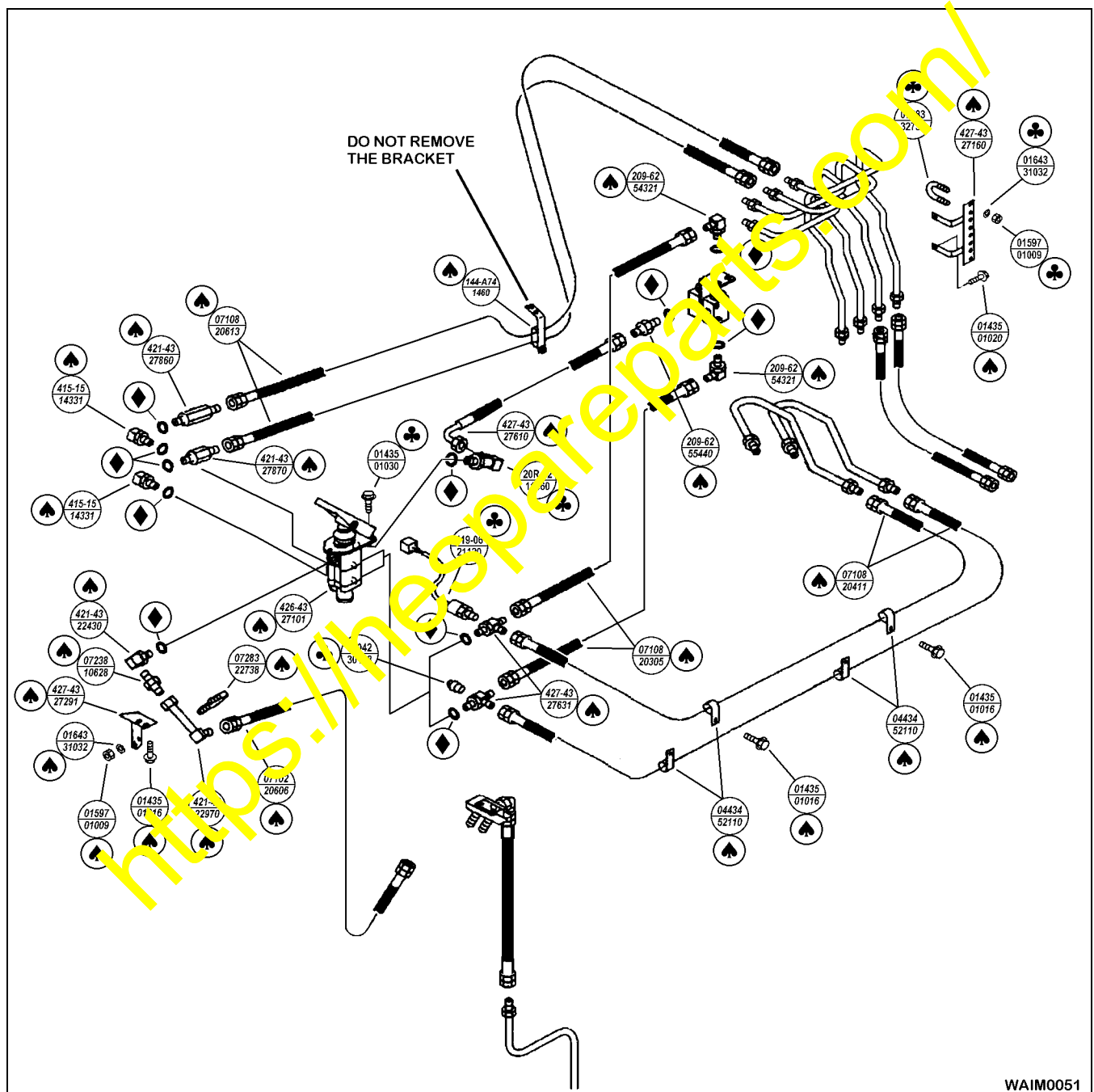
### RIGHT BRAKE PEDAL CONNECTIONS (1 of 2)

♣	Remove and retain these parts for future use. Since the parts are being reused when reinstalling the brake oil piping, store them carefully.
♠	Remove these parts ( <i>in italics</i> ), replace with the new ones from the parts listing or discard. After removing the piping parts, cover the openings securely so that dust, water, etc. may not enter into the circuits.
♦	Remove, discard and replace all seal rings used that are required for the reassembly of the new or retained parts.




**LEFT BRAKE PEDAL CONNECTIONS (2 of 2)**

♣	Remove and retain these parts for future use. Since the parts are being reused when reinstalling the brake oil piping, store them carefully.
♠	Remove these parts ( <i>in italics</i> ), replace with the new ones from the parts listing or discard. After removing the piping parts, cover the openings securely so that dust, water, etc. may not enter into the circuits.
♦	Remove, discard and replace all seal rings used that are required for the reassembly of the new or retained parts.

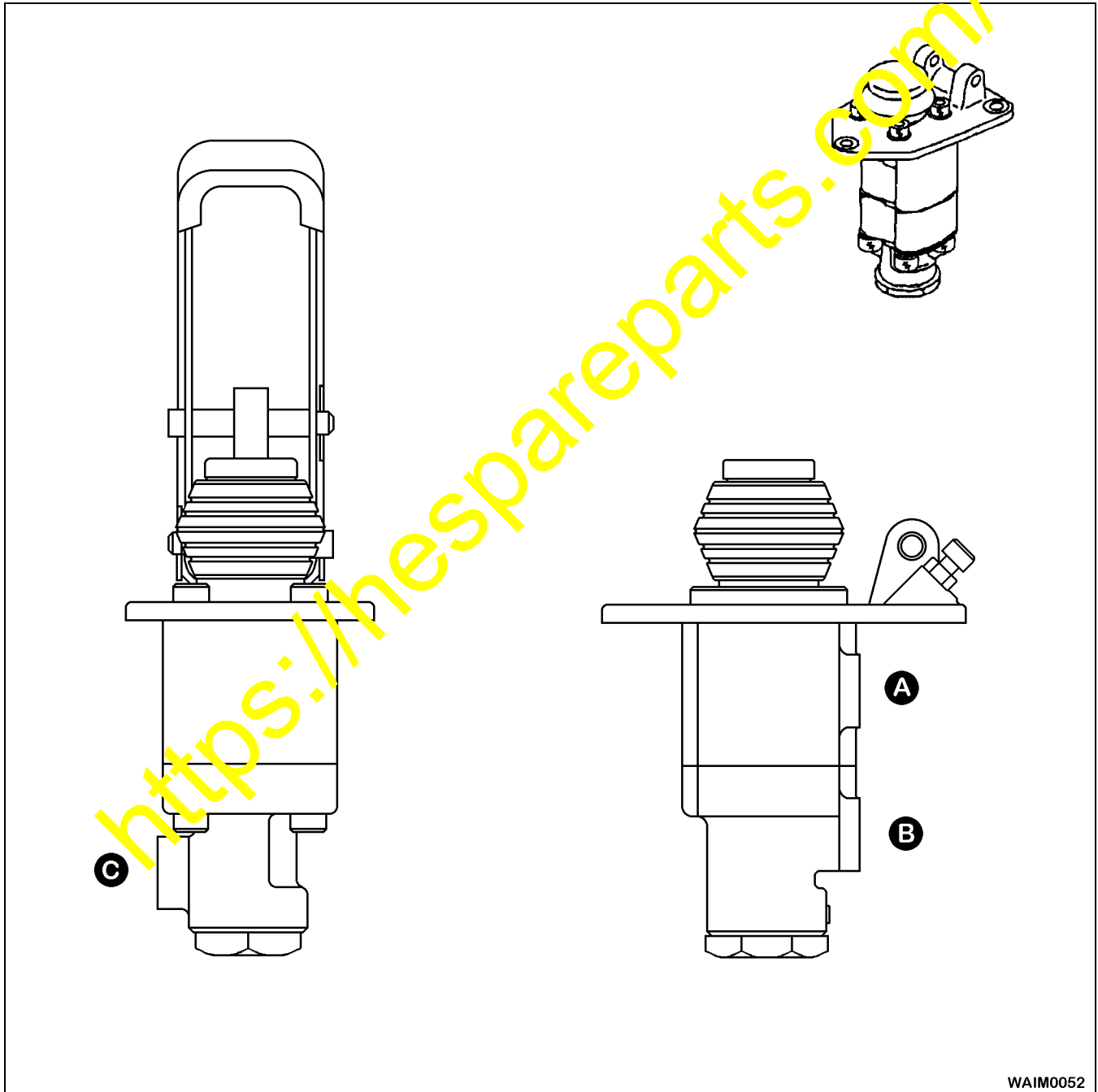


## INSTALLATION

1. Install the brake piping per the following.

 <b>N•m</b>	<b>Bolt Torque:</b>	
	M10 bolts .....	34 to 74 N•m
	M12 bolts .....	54 to 123 N•m
	<b>Flare Nut Torque:</b>	
	27 mm hex .....	58.9 to 95.1 N•m
	30 mm hex .....	147.1 to 205.9 N•m
	33 mm hex .....	147.1 to 245.1 N•m
	<b>Seal Ring Fitting Torque:</b>	
	20 mm thread .....	83.3 to 102.9 N•m
	24 mm thread .....	122.5 to 161.7 N•m
	33 mm thread .....	362.6 to 480.2 N•m

### Ports at Left Brake Valve



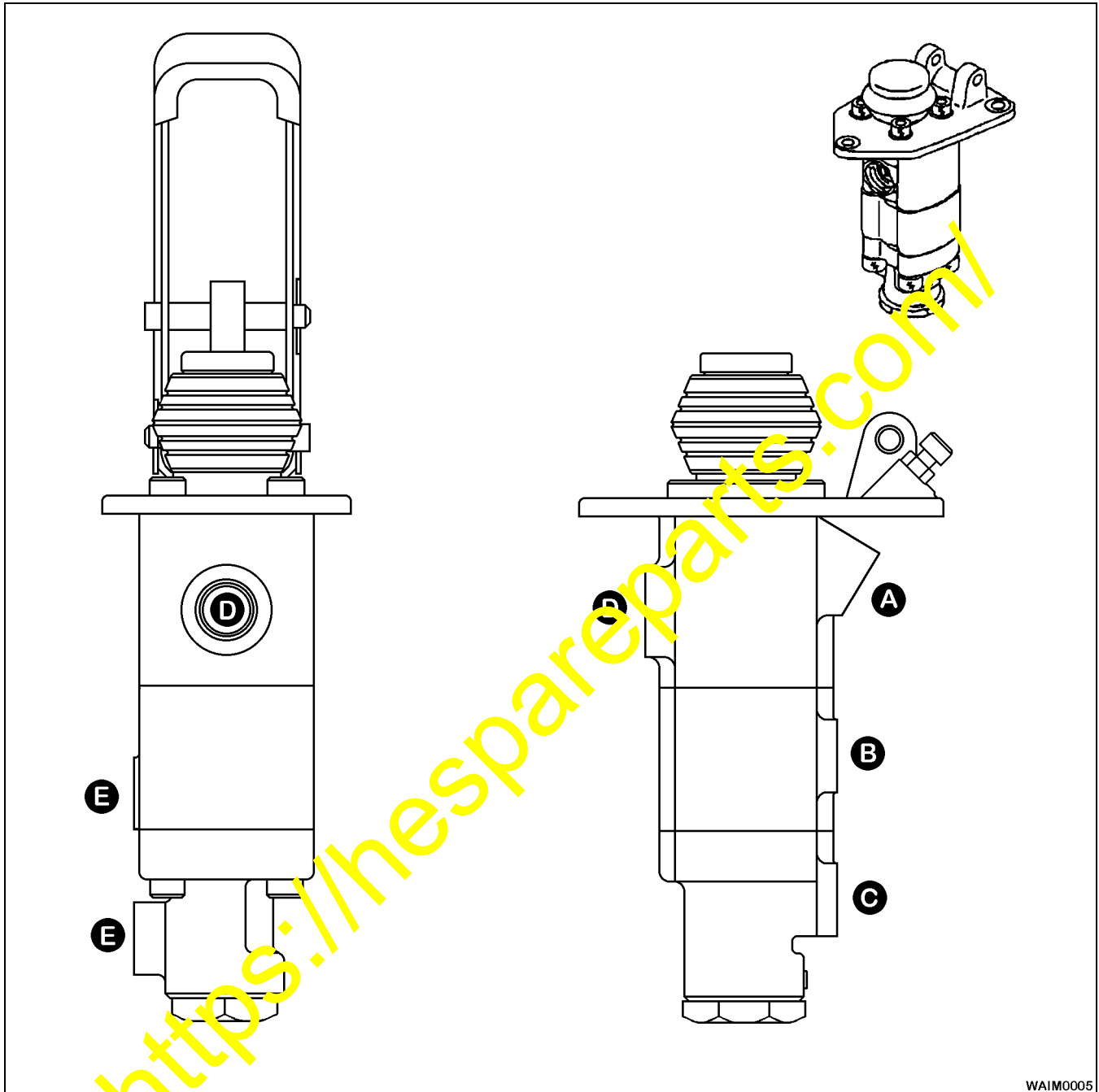
WAIM0052

**A.** Drain Port

**B.** Brake Port

**C.** Accumulator/Supply Port

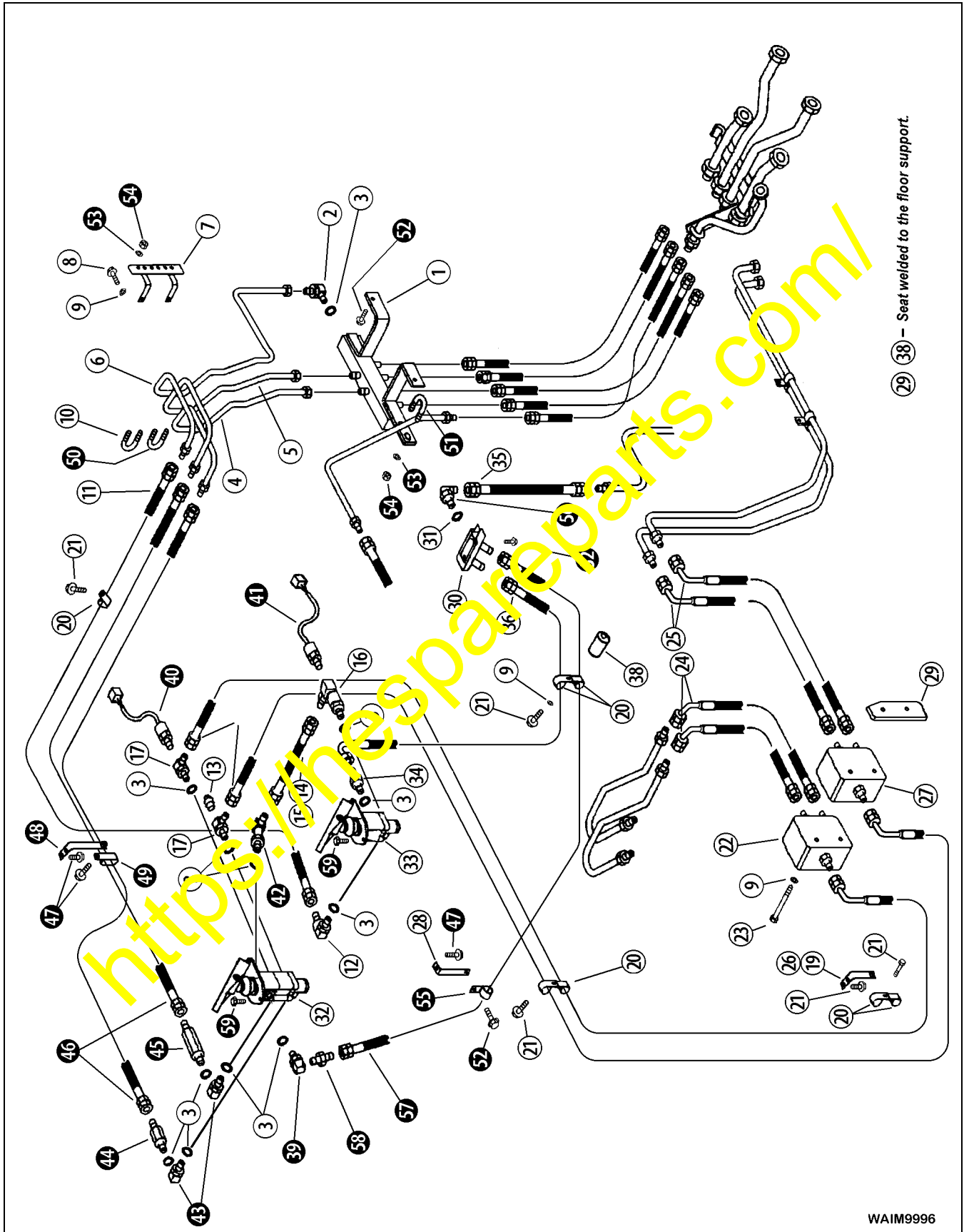


**Ports at Right Brake Valve**

WAIM0005

- A. Pilot Port
- B. To Front Brakes
- C. To Rear Brakes
- D. Drain
- E. Supply from Accumulator

### Brake Piping



WA1M9996

## BLEEDING AIR FROM THE BRAKE CIRCUIT

**⚠ WARNING!** Apply the parking brake and put wheel blocks securely under the tires.

**⚠ WARNING!** When the engine is running, never bleed air from the slack adjuster because the drive shift is rotating.

★ When the brake circuit lines are disconnected, bleed the air from the system following the procedure described below.

1. Check the oil level in the sight gauge(s) on the side surface of the brake oil tank.

★ Oil level sight gauge ① when the engine stops, ten hours or more after stopping the engine. Oil level sight gauge ② while the engine is running, five minutes or more after starting the engine.

2. Start the engine and charge the pressure in the accumulator, about 30 seconds at the high idle speed.

3. Stop the engine and insert one end of each vinyl hose ③ in the bleeders ④ of the slack adjuster ⑤, then insert the other end into a appropriate catch container.

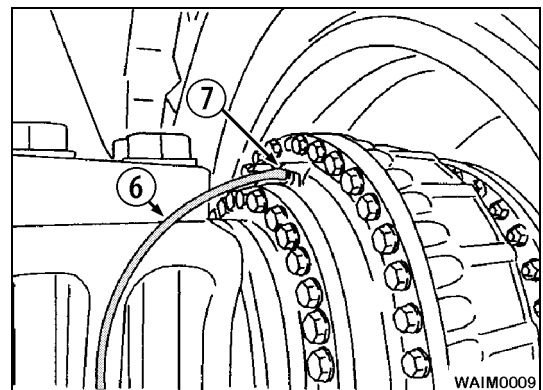
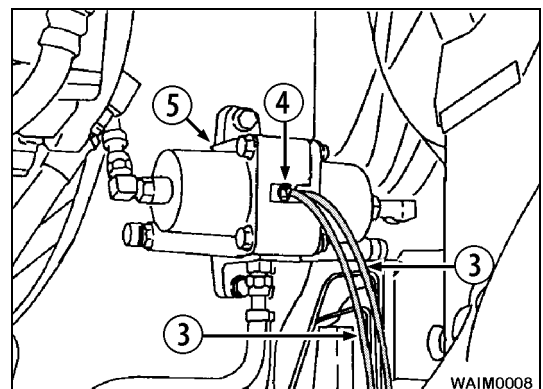
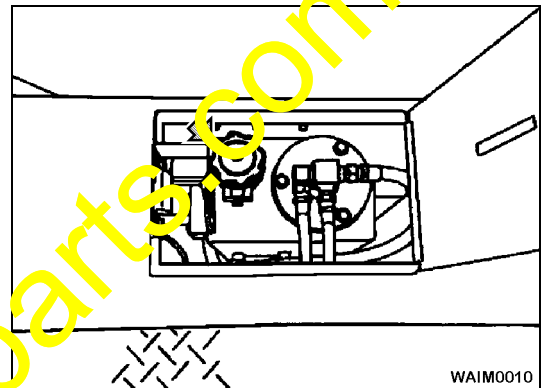
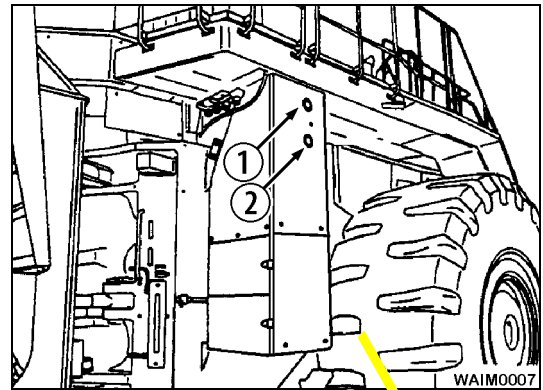
4. Depress the left brake pedal, loosen the bleeder screw, and bleed the air. Tighten the screw, then release the brake pedal slowly.

★ Carry out this operation with two workers, one worker to depress the brake pedal, and the other worker to bleed the air from the bleeder screw. Use the left brake pedal. If the brake oil level goes down, refill to keep full.

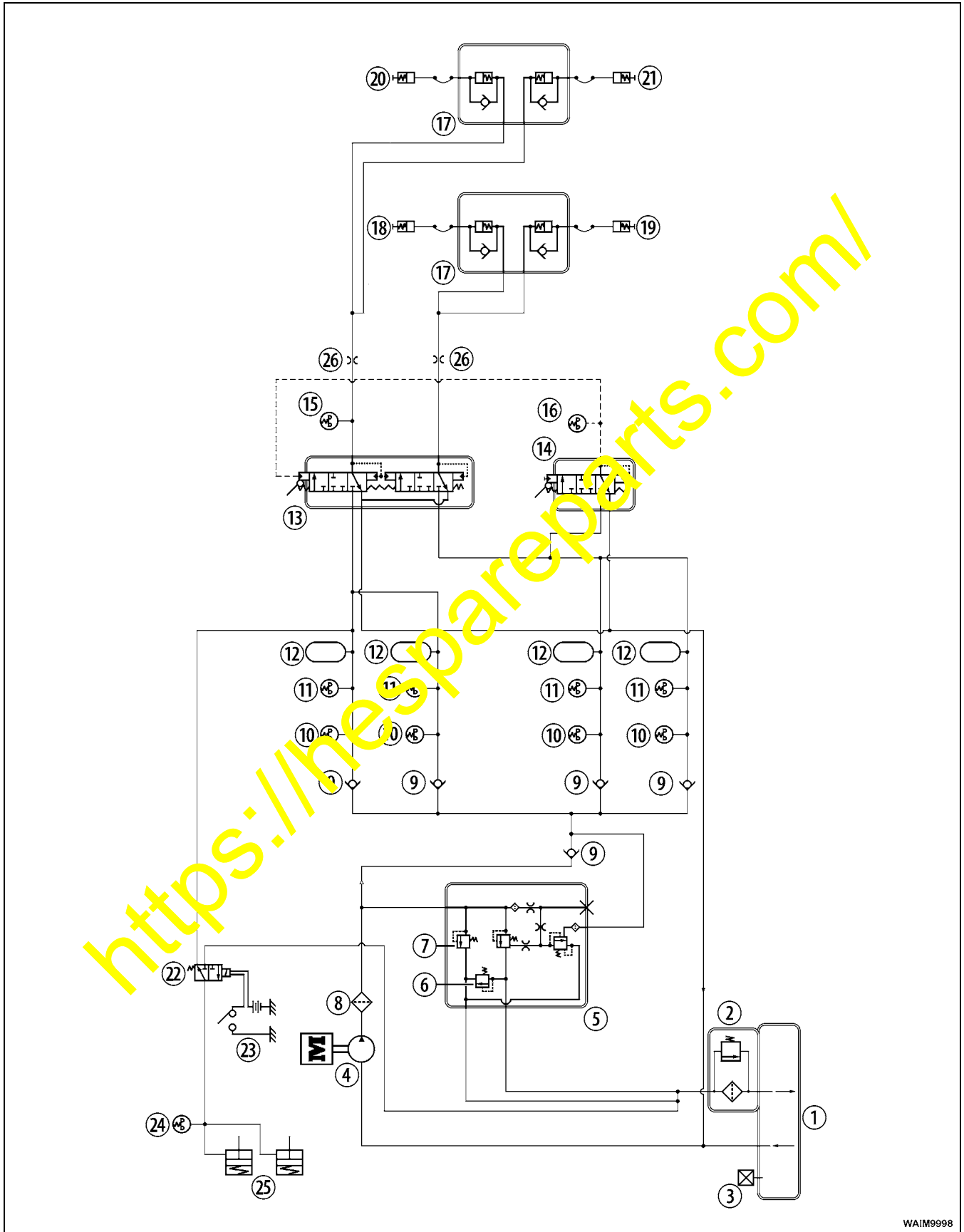
5. Repeat this operation until no more air bubbles come out with the fluid from the vinyl hose, then depress the pedal fully and tighten the bleeder screw while the oil is flowing out.

6. Similarly, bleed air from the slack adjuster on the opposite side and bleed ⑥ and ⑦ off each wheel.

★ If the accumulator pressure goes down, start the engine and charge the accumulator. After completion of the air bleed operation, run the engine at low idle, check the brake oil level, and add oil if necessary.



### HYDRAULIC BRAKE CIRCUIT DIAGRAM



WAIM9998

## Circuit Diagram Legend

①	Brake Oil Tank .....	Oil level	With the engine stopped.....	27 L
			With the engine running .....	14.5 L
②	Filter with By-Pass Valve			
③	Tank Breather			
④	Brake Circuit Pump.....	Capacity at Rated RPM.....	27.7 L/min	
⑤	Accumulator Charge Valve .....	Cut In Pressure .....	60 kg/cm <sup>2</sup>	
		Cut Out Pressure.....	100 kg/cm <sup>2</sup>	
⑥	PPC Relief Valve .....	Release Pressure.....	38 kg/cm <sup>2</sup>	
⑦	Safety Relief Valve.....	Release Pressure.....	180 kg/cm <sup>2</sup>	
⑧	Pump Strainer			
⑨	Check Valve			
⑩	Parking Brake Switch.....	Switch Closes.....	32 to 42 kg/cm <sup>2</sup>	
		Switch Opens .....	35 to 45 kg/cm <sup>2</sup>	
⑪	Low Pressure Switch .....	Switch Closes.....	40 to 50 kg/cm <sup>2</sup>	
		Switch Opens .....	50 to 60 kg/cm <sup>2</sup>	
⑫	Accumulator.....	Gas Capacity.....	6 L	
⑬	Right Foot Valve			
⑭	Left Foot Valve			
⑮	Stop Lamp Switch.....	Switch Closes.....	3.5 to 4.5 kg/cm <sup>2</sup>	
		Switch Opens .....	5 to 6 kg/cm <sup>2</sup>	
⑯	Transmission Cut Off Switch.....	Switch Closes.....	14.25 to 15.25 kg/cm <sup>2</sup>	
		Switch Opens .....	9.25 to 10.75 kg/cm <sup>2</sup>	
⑰	Slack Adjuster.....	Oil Capacity per wheel .....	206 cc	
⑱	Left Rear Brake			
⑲	Right Rear Brake			
⑳	Left Front Brake			
㉑	Right Front Brake			
㉒	Parking Brake Solenoid Valve			
㉓	Push Button On/Off Switch			
㉔	Pilot Lamp Switch .....	Switch Closes.....	3.5 to 4.5 kg/cm <sup>2</sup>	
		Switch Opens .....	5 to 6 kg/cm <sup>2</sup>	
㉕	Parking Brake			
㉖	Orifice			