

GROUP 8 MAIN CONTROL VALVE

1. MECHANICAL TYPE

1) REMOVAL AND INSTALL

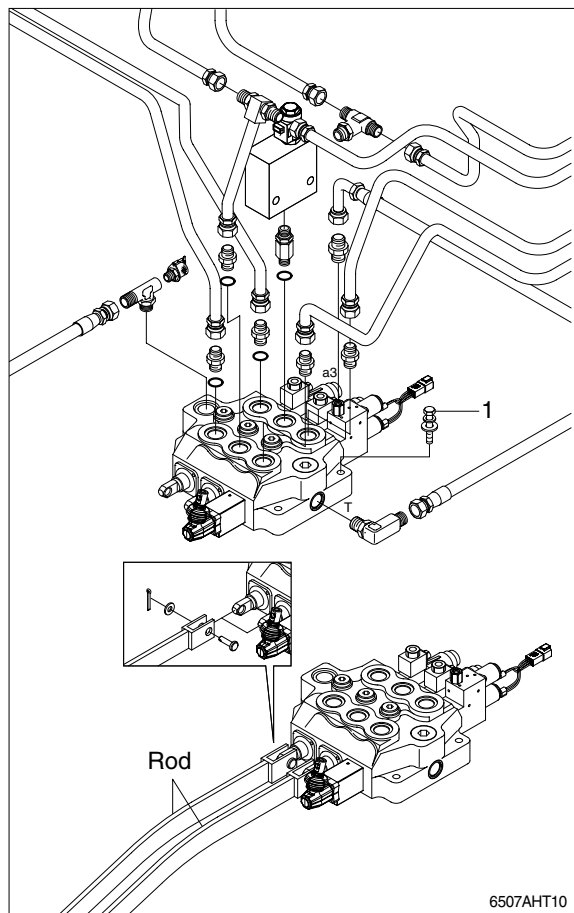
(1) Removal

▲ If engine is running or full up pressure into hydraulic system, absolutely does not repair or tighten hose, fitting.
As hydraulic line explode, dangerous accident may occur.

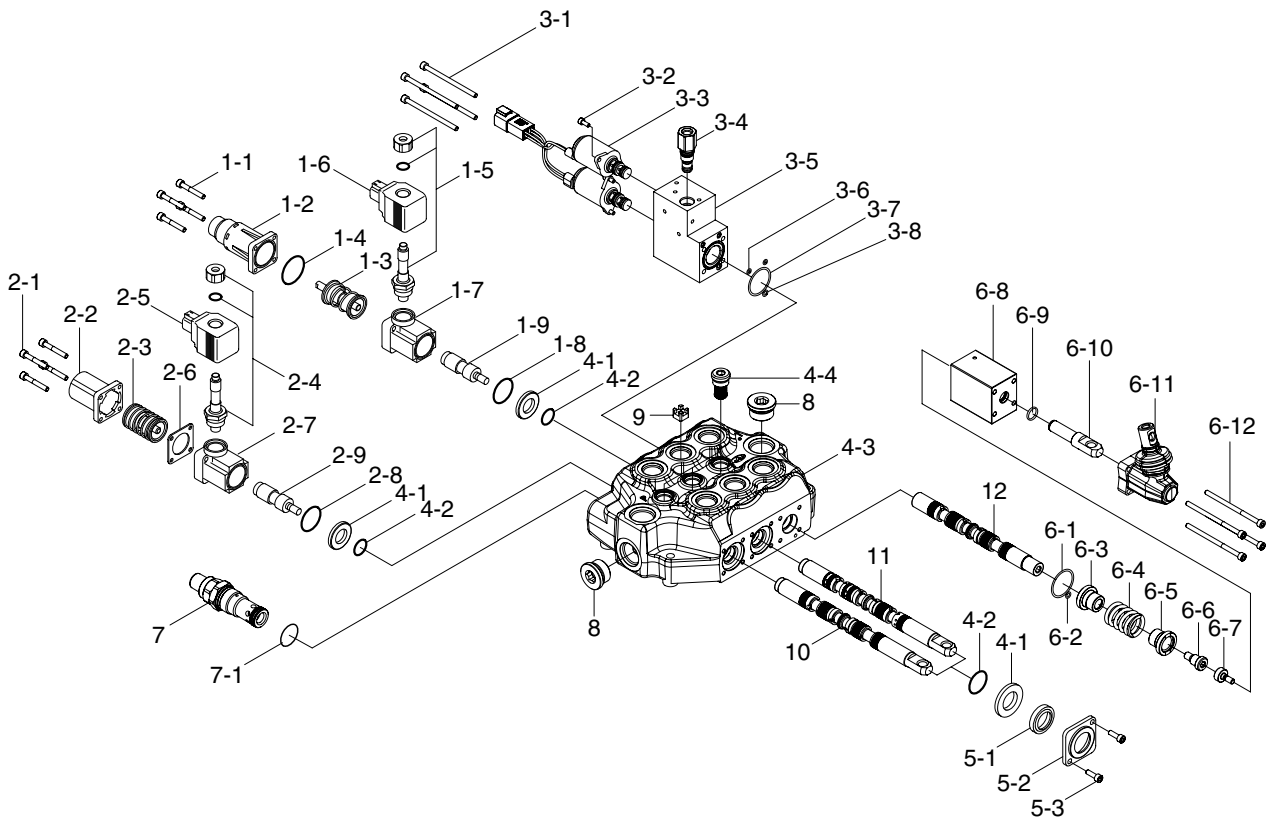
- ① Lowered the bucket on the ground.
- ② Shut off engine and raise the seat bar.
- ③ Raising canopy and remove the front cover.
For raising and lowering of the canopy, refer to page 4-14 of the operator's manual.
- ④ Separate the linkage connecting valve spool with control lever.
- ⑤ Separate the hydraulic inlet and outlet line of main control valve.
- ⑥ Loosen the mounting bolt(1).
- ⑦ Take off the valve and put it on the work bench.

(2) Install

- ① Install the valve and tighten the mounting bolt(1).
 - Tightening torque : $2.5 \pm 0.5 \text{ kgf} \cdot \text{m}$
($18.1 \pm 3.6 \text{ lbf} \cdot \text{ft}$)
- ② Assemble the inlet and outlet hoses.
- ③ Connect the cable between valve spool and control lever.



2) STRUCTURE

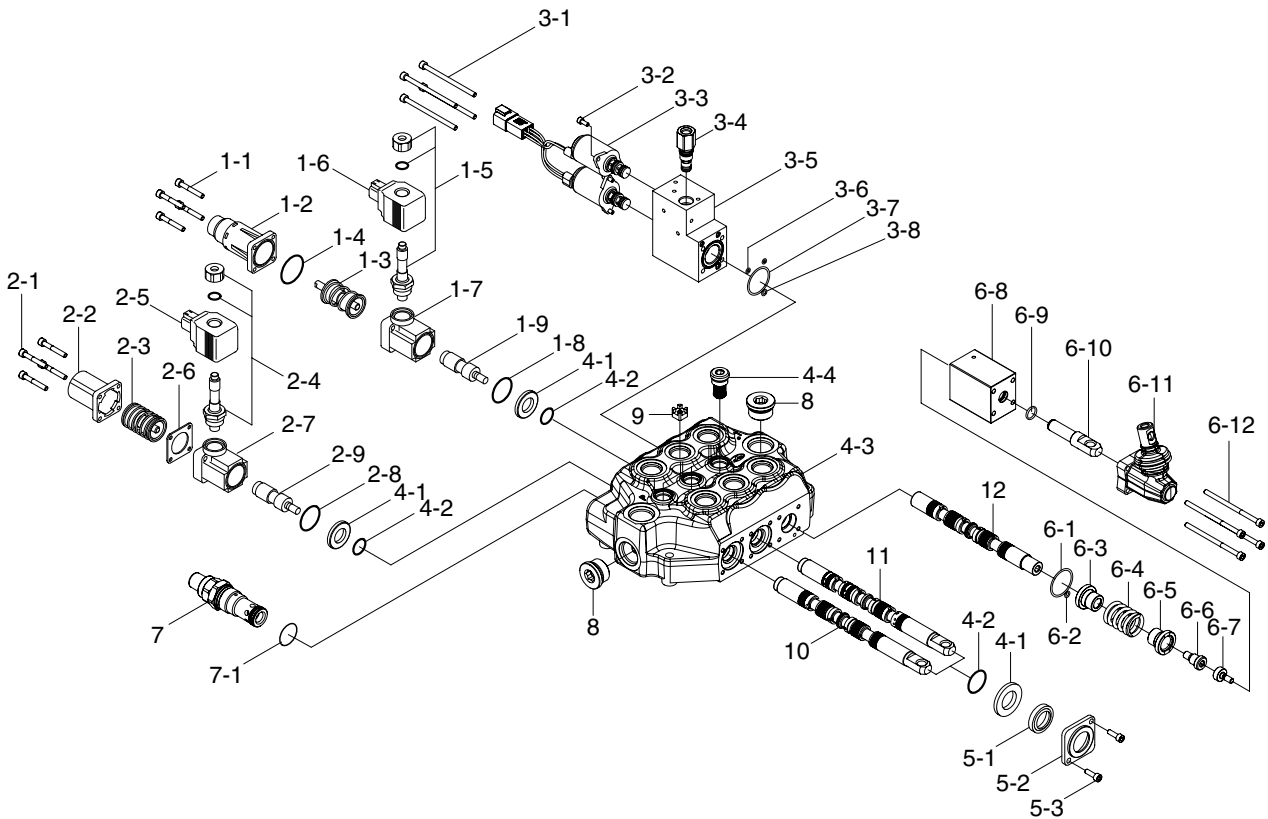


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1-1	Screw	2-6	Seal	4-3	Body	6-9	O-ring
1-2	End cap kit	2-7	Spacer	4-4	Load check valve	6-10	Emergency pin
1-3	Detent kit	2-8	O-ring seal	5-1	Dust wiper	6-11	Lever
1-4	O-ring	2-9	Joint	5-2	Flange	6-12	Screw
1-5	Spool assembly	3-1	Screw	5-3	Screw	7	Main relief valve
1-6	Coil	3-2	Screw	6	Plastic cover	7-1	O-ring
1-7	Spacer	3-3	Solenoid valve kit	6-1	O-ring	8	Plug
1-8	O-ring seal	3-4	Joint	6-2	O-ring	9	Orifice
1-9	Joint	3-5	End cap	6-3	Bushing	10	Bucket spool
2-1	Screw	3-6	O-ring	6-4	Spring	11	Boom spool
2-2	End cap	3-7	O-ring	6-5	Bushing	12	Auxiliary spool
2-3	Spring kit	3-8	O-ring	6-6	Screw		
2-4	Spool assembly	4-1	Ring	6-7	Block screw		
2-5	Coil	4-2	O-ring	6-8	End cap		

3) DISASSEMBLY AND ASSEMBLY

(1) Boom spool



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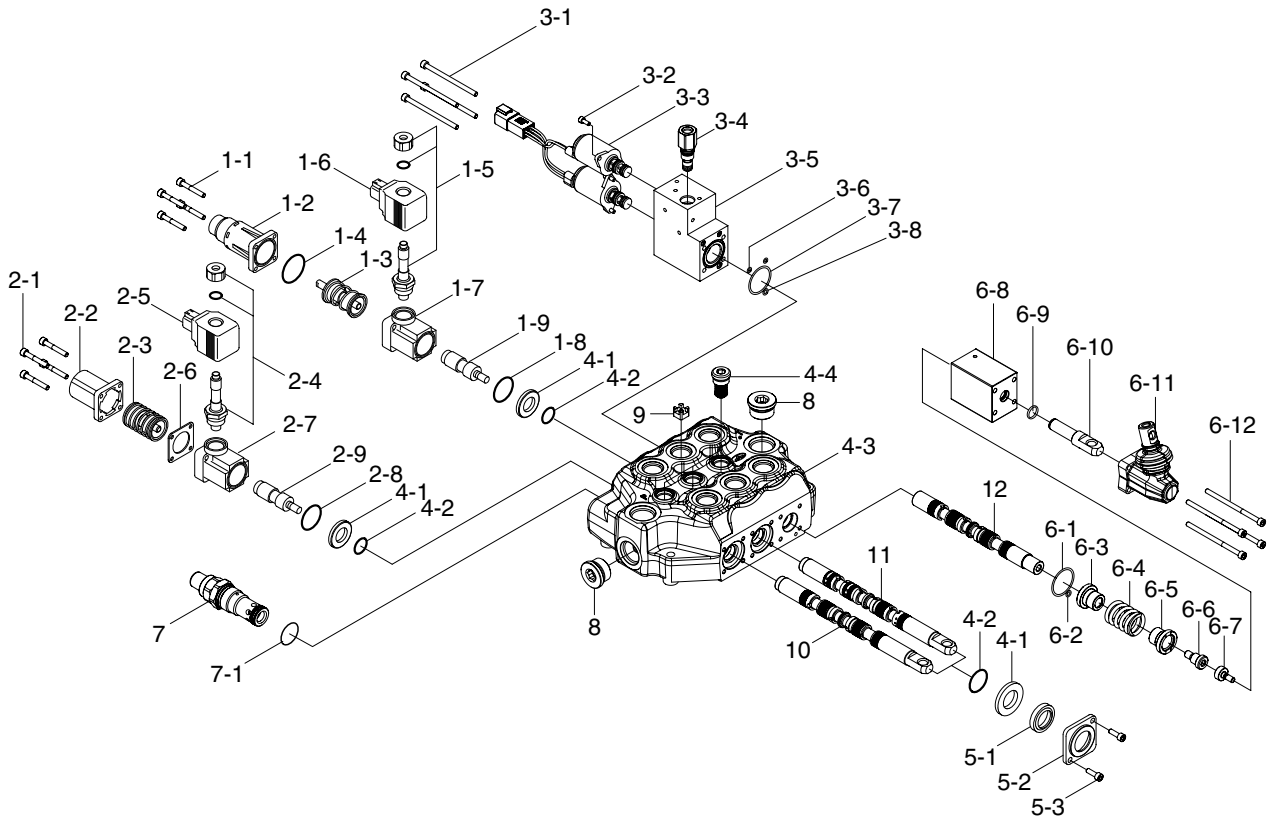
- Disassembly

- ① Remove the end cap(1-2) by removing the four mounting screws(1-1).
- ② Remove the detent kit(1-3), spacer(1-7), O-ring seal(1-8), joint(1-9), ring(4-1) and O-ring(4-2).
- ③ Carefully remove the boom spool(11) from the valve body(4-3) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ④ Remove the ring(4-2) and the O-ring(4-1) from the valve body(4-3) using care not to scratch the bore and not to contaminate the bore with foreign.
- ⑤ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(4-2) and ring(4-1) with clean oil. Pinch the lubricate O-ring and insert the O-ring and the ring into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the boom spool(11) to the body(4-3).
- ③ Insert the detent kit(1-3) to end cap(1-2). Assemble the joint, O-ring seal, spacer.
Assemble the detent kit(1-3) and tighten torque to 2.5kgf · m(7.38lbf · ft).
- ④ After assembly check for operation of the spring by pushing down on the detent. This should compress the spring and should return when released. Apply grease(Castro sphereol TN) to the spring and bushes.
- ⑤ Place the end cap(1-2) over the assembly and install the mounting screws(1-1) and tighten torque to 0.7kgf · m(53.5lbf · ft).

(2) Bucket spool



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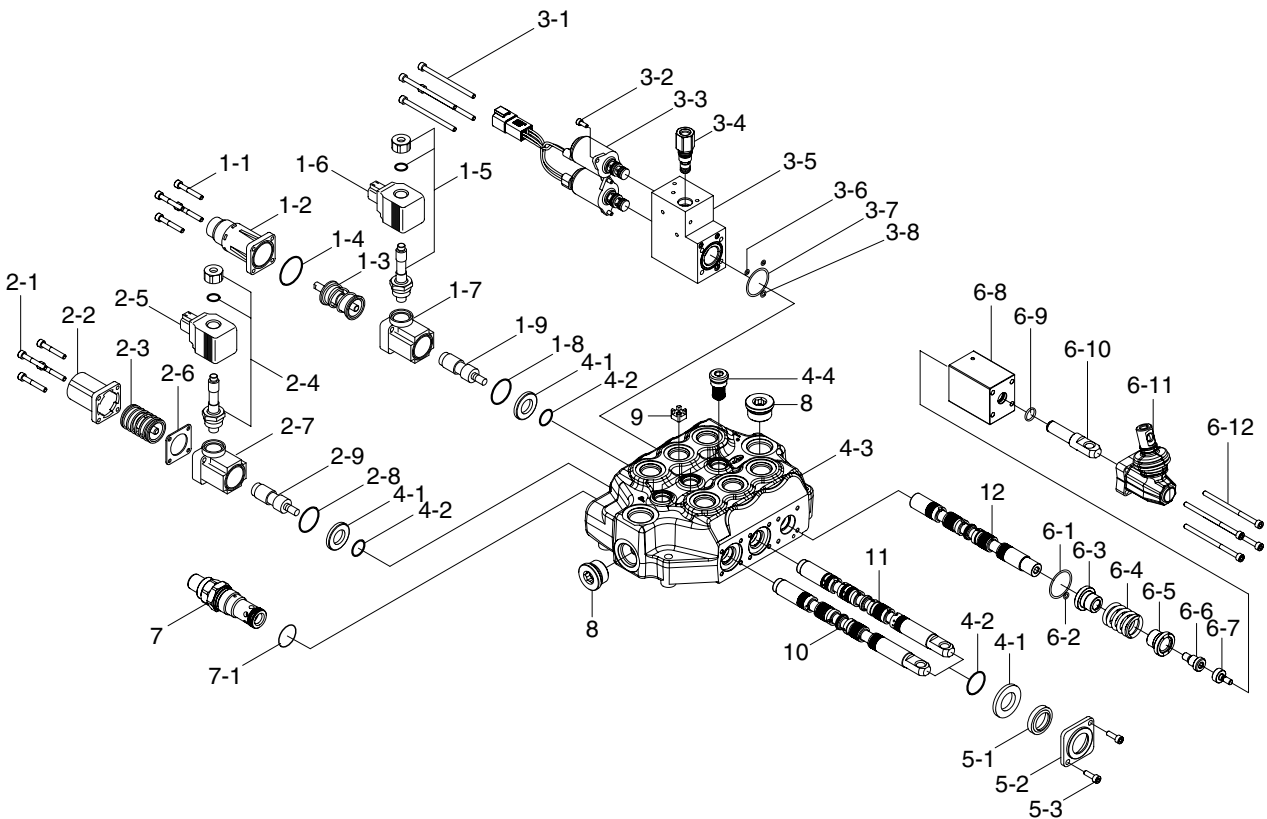
- Disassembly

- ① Remove the end cap(2-2) by removing the four mounting screw(2-1).
- ② Remove the spring kit(2-3), spacer(2-7), O-ring seal(2-8), joint(2-9), ring(4-1) and O-ring(4-2).
- ③ Carefully remove the bucket spool(10) from the valve body(4-3) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ④ Remove the ring(4-1) and the O-ring(4-2) from the valve body(4-3) using care not to scratch the bore and not to contaminate the bore with foreign.
- ⑤ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(4-2) and ring(4-1) with clean oil. Pinch the lubricate O-ring and insert the O-ring(4-2) and the ring(4-1) into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the bucket spool(10) to the body(4-3).
- ③ Insert the spring kit(2-3) to end cap(2-2). Assemble joint(2-9), O-ring seal(2-8), spacer(2-7) and seal(2-6). Assemble the spring kit(2-3) and tighten torque to 2.5kgf · m(7.38lb · ft).
Apply grease(Castrol spherol TN) to the spring and bushes.
- ④ Place the end cap(2-2) over the assembly and install the mounting screws(2-1) and tighten torque to 0.7kgf · m(54.2lb · ft).

(3) Auxiliary spool



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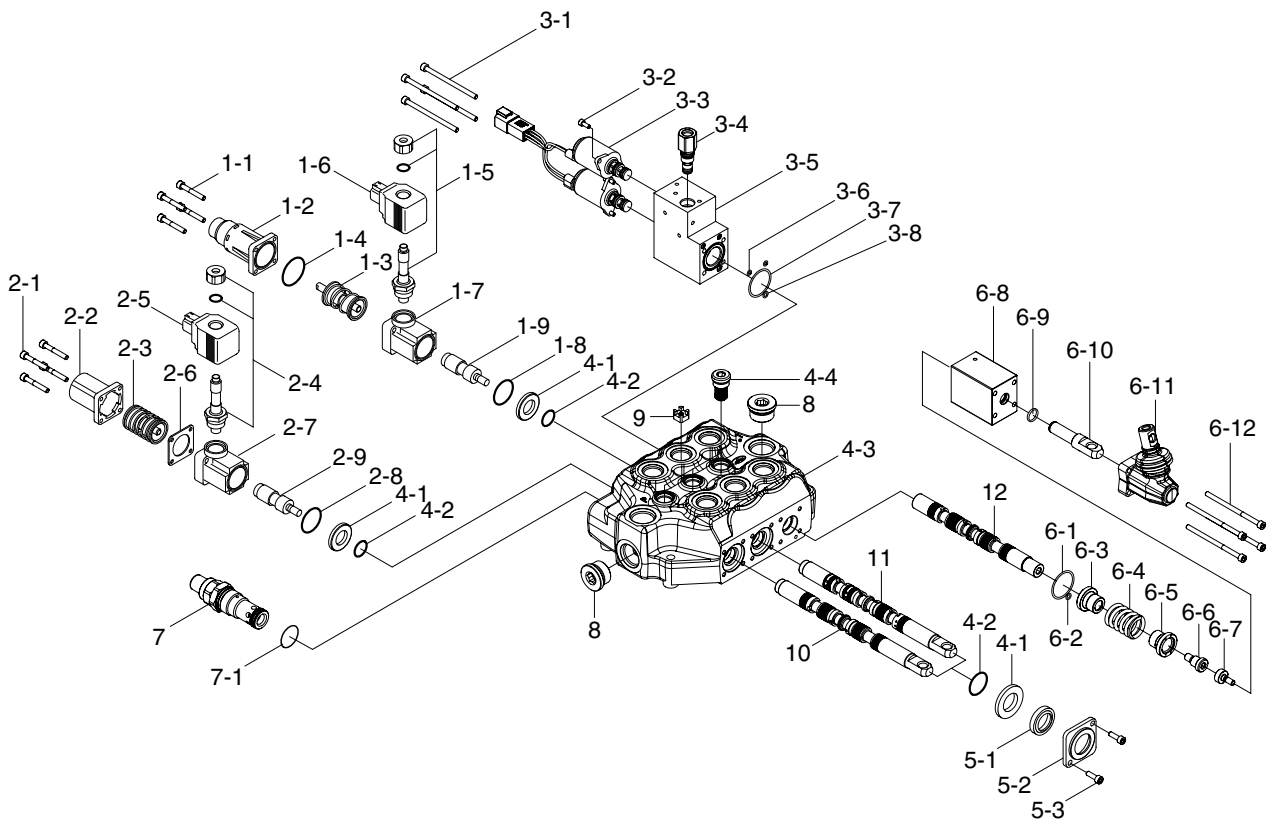
- Disassembly

- ① Remove the end cap(3-5) by removing the four mounting screws(3-1).
- ② Carefully remove the auxiliary spool(12) from the valve body(4-3) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ③ Remove the O-ring(3-6, 3-7, 3-8) from the valve body(4-3) using care not to scratch the bore and not to contaminate the bore with foreign.
- ④ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(4-2) with clean oil. Pinch the lubricate O-ring and insert the O-ring(3-6, 3-7, 3-8) into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the auxiliary spool(12) to the body(4-3).
- ③ Place the end cap(3-5) over the assembly and install the mounting screws(3-1) and tighten torque to 0.7kgf · m(54.2lbf · ft).

(4) Load check valve



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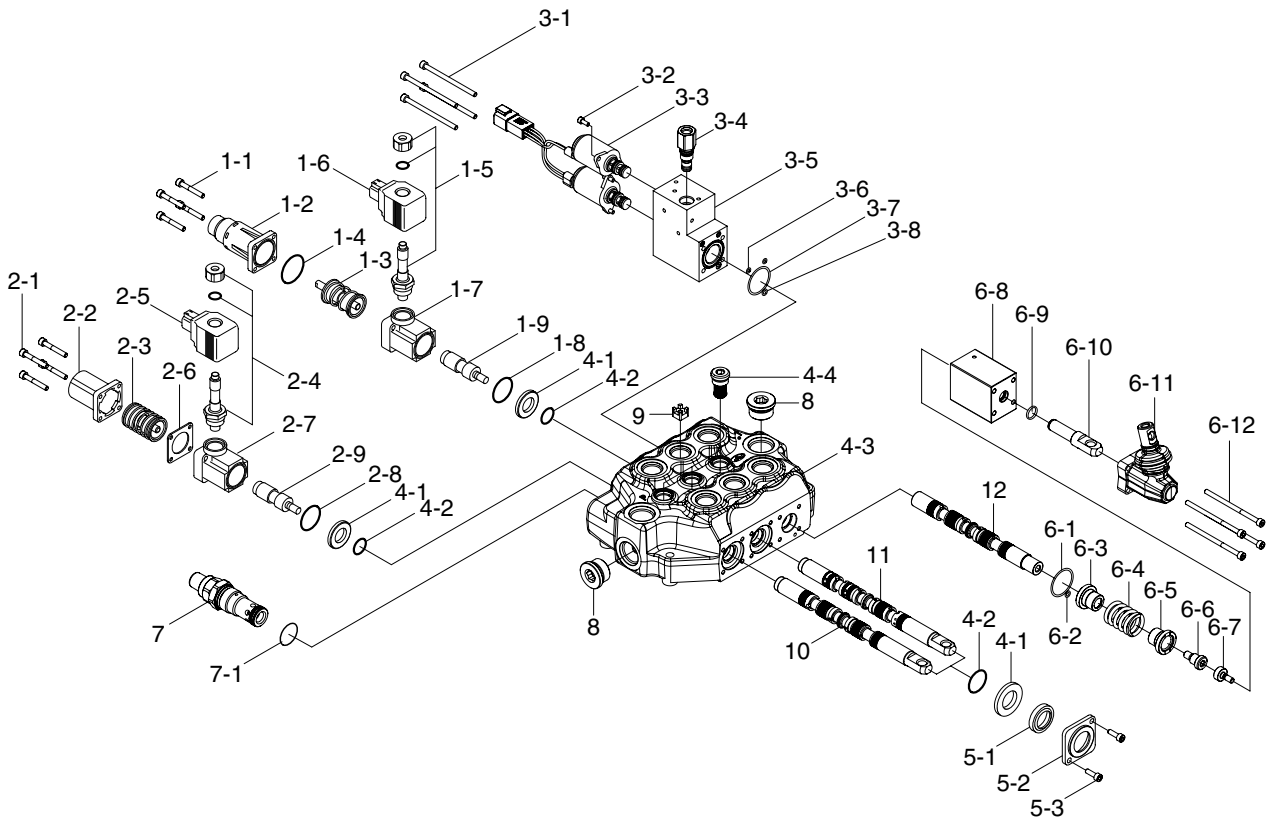
- Disassembly

- ① Locate the check valve(4-4, 3position) on top surface of the main control valve.
- ② Remove the check valve kit(4-4).
- ③ Remove and discard the O-ring from the valve kit(4-4).

- Assembly

- ① Clean all parts with a suitable solvent and dry all the parts.
- ② Lubricate the new O-ring with clean oil and install onto the valve kit(4-4).
- ③ Install the valve kit(4-4) into the control valve and tighten torque to 3.1kgf · m(22.4lbf · ft).

(5) Main relief valve



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- Disassembly

- ① Remove the main relief valve(7).
- ② Remove and discard the O-ring(7-1) from the main relief valve assy(7).

- Assembly

- ① Lubricate the new O-ring with clean oil and install onto the main relief valve(7).
- ② Install the main relief valve into the valve body(4-3) and tighten torque to 4.3kgf · m(31.1lbf · ft).

2. PILOT TYPE

1) REMOVAL AND INSTALL

(1) Removal

⚠ If engine is running or full up pressure into hydraulic system, absolutely does not repair or tighten hose, fitting.
As hydraulic line explode, dangerous accident may occur.

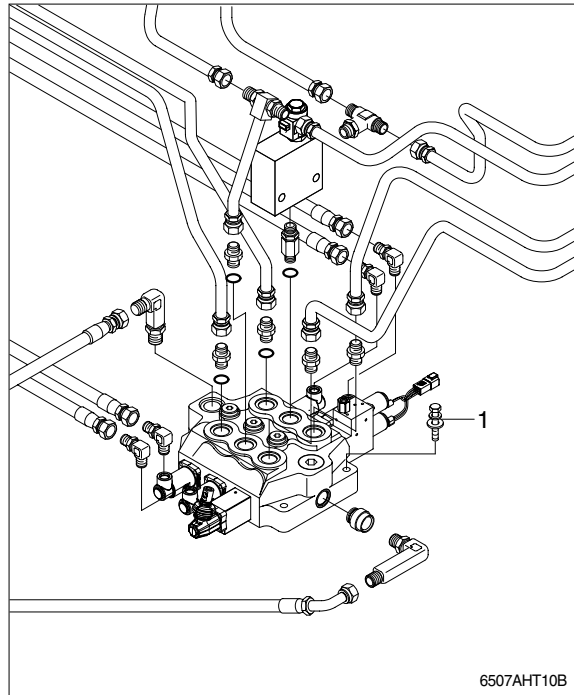
- ① Lowered the bucket on the ground.
- ② Shut off engine and raise the seat bar.
- ③ Raising canopy and remove the front cover.
For raising and lowering of the canopy, refer to page 4-14 of the operator's manual.
- ④ Separate the linkage connecting valve spool with control lever.
- ⑤ Separate the hydraulic inlet and outlet line of main control valve.
- ⑥ Loosen the mounting bolt(1).
- ⑦ Take off the valve and put it on the work bench.

(2) Install

- ① Install the valve and tighten the mounting bolt(1).
 - Tightening torque : $2.5 \pm 0.5 \text{ kgf} \cdot \text{m}$
($18.1 \pm 3.6 \text{ lbf} \cdot \text{ft}$)
- ② Assemble the inlet and outlet hoses.
- ③ Connect the cable between valve spool and control lever.

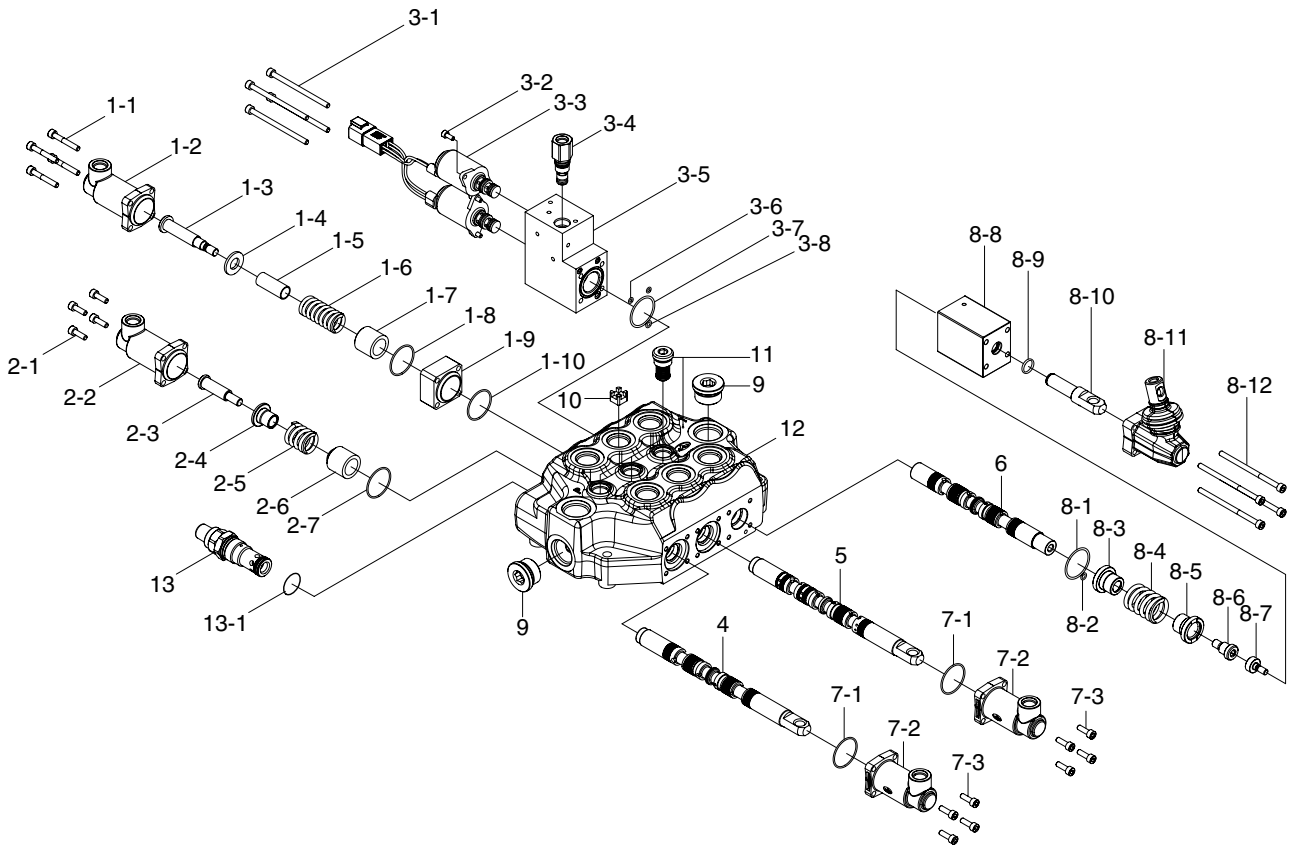


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2) STRUCTURE

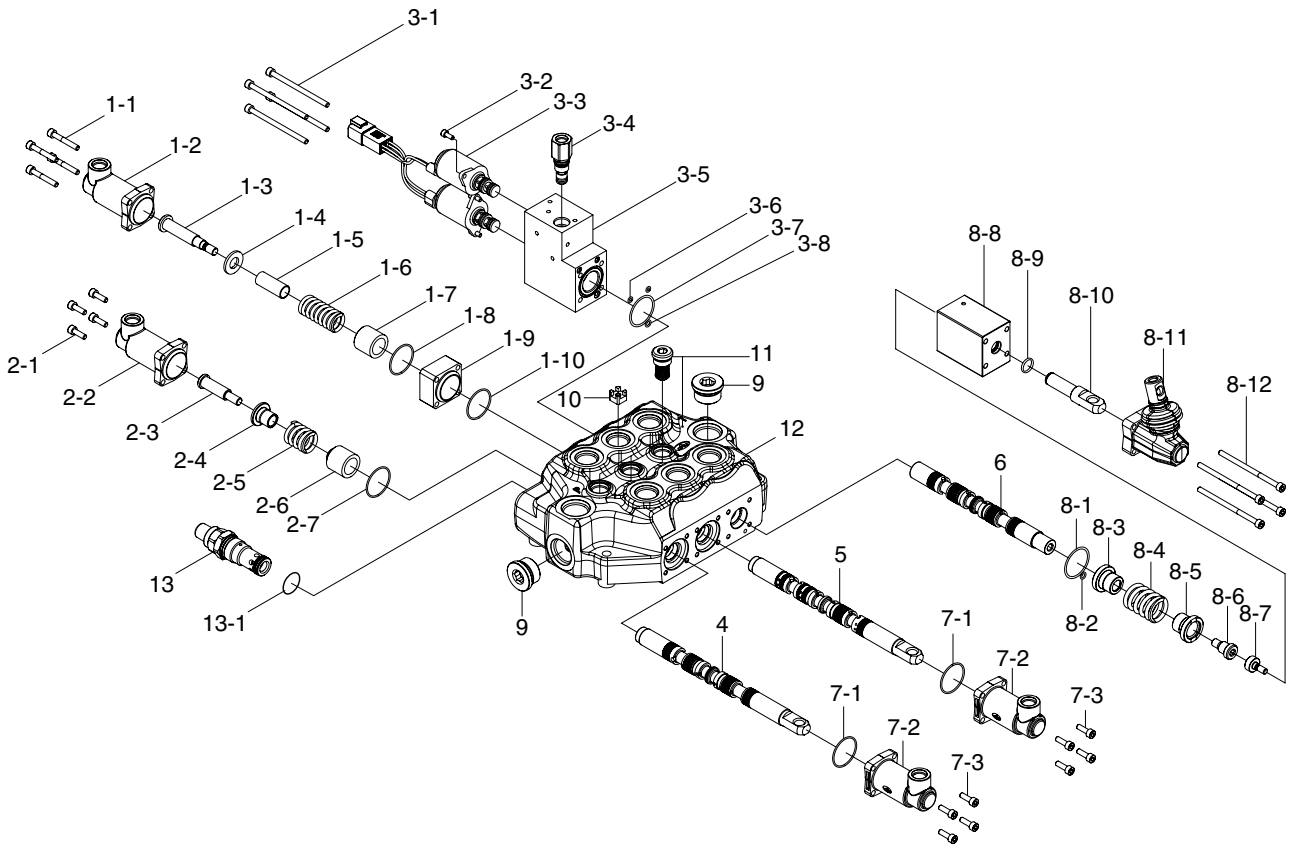


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1-1	Screw	2-4	Spring bushing	5	Boom spool	8-9	O-ring
1-2	End cap	2-5	Spring	6	Auxiliary spool	8-10	Emergency pin
1-3	Screw	2-6	Spool bushing	7-1	O-ring	8-11	Lever
1-4	Ring	2-7	O-ring	7-2	End cap	8-12	Screw
1-5	Spring bushing	3-1	Screw	7-3	Screw	9	Plug
1-6	Spring	3-2	Screw	8-1	O-ring	10	Orifice
1-7	Bushing	3-3	Solenoid valve kit	8-2	O-ring	11	Load check valve
1-8	O-ring	3-4	Joint	8-3	Bushing	12	Body
1-9	Spacer	3-5	End cap	8-4	Spring	13	Main relief valve
1-10	O-ring	3-6	O-ring	8-5	Bushing	13-1	O-ring
2-1	Screw	3-7	O-ring	8-6	Screw		
2-2	End cap	3-8	O-ring	8-7	Block screw		
2-3	Screw	4	Bucket spool	8-8	End cap		

3) DISASSEMBLY AND ASSEMBLY

(1) Boom spool



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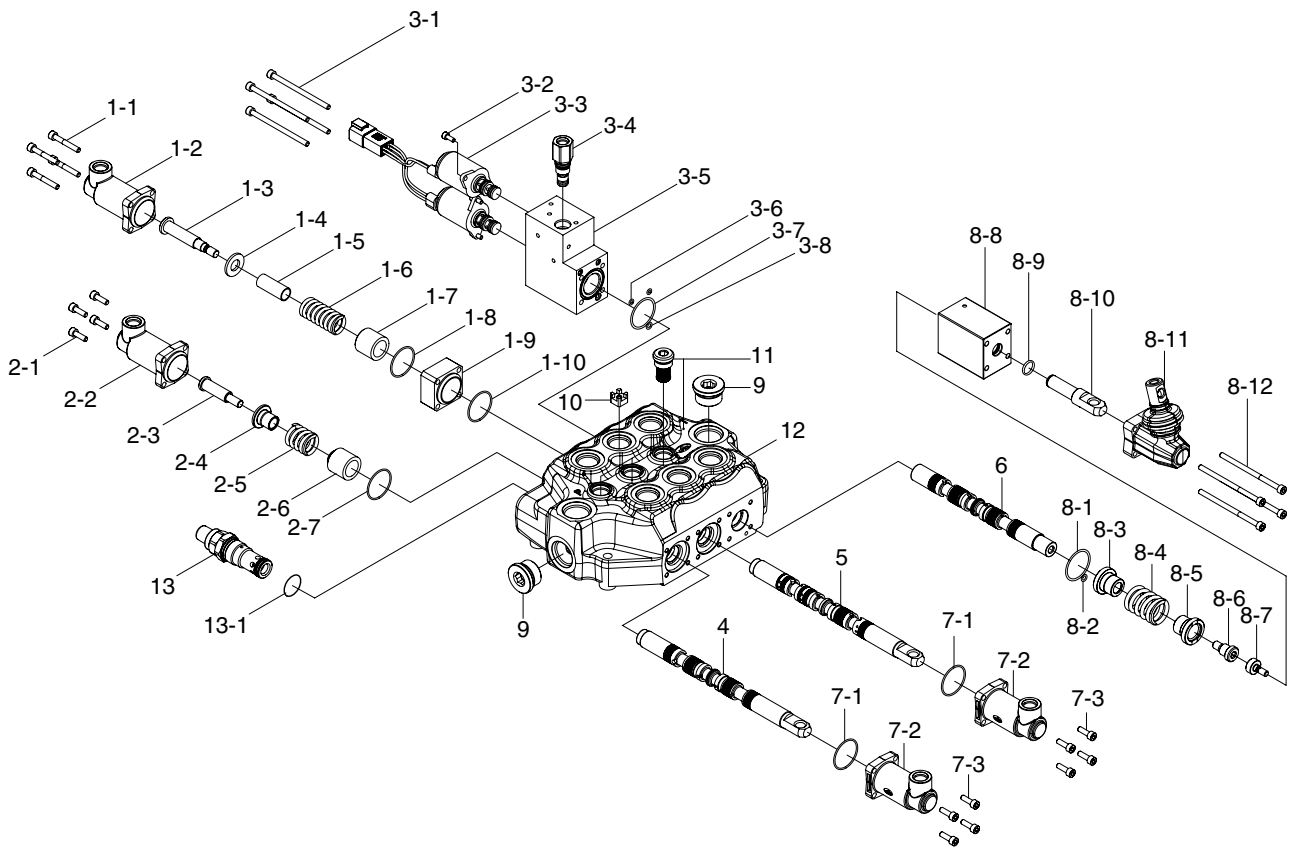
- Disassembly

- ① Remove the end cap(1-2) by removing the four mounting screws(1-1).
- ② Remove the O-ring seal(1-8), spacer(1-9) and O-ring(1-10).
- ③ Carefully remove the boom spool(5) from the valve body(12) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ④ Remove the O-ring(1-10) from the valve body(12) using care not to scratch the bore and not to contaminate the bore with foreign.
- ⑤ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(1-10) with clean oil. Pinch the lubricate O-ring and insert the O-ring and the ring into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the boom spool(5) to the body(12).
- ③ Insert(1-3)~(1-7) to end cap(1-2). Assemble the O-ring(1-8).
- ④ After assembly check for operation of the spring by pushing down on the detent. This should compress the spring and should return when released. Apply grease(Castro spheerol TN) to the spring and bushes.
- ⑤ Place the end cap(1-2), spacer(1-9) and O-ring over the assembly and install the mounting screws(1-1) and tighten torque to 0.7kgf · m(53.5lbf · ft).

(2) Bucket spool



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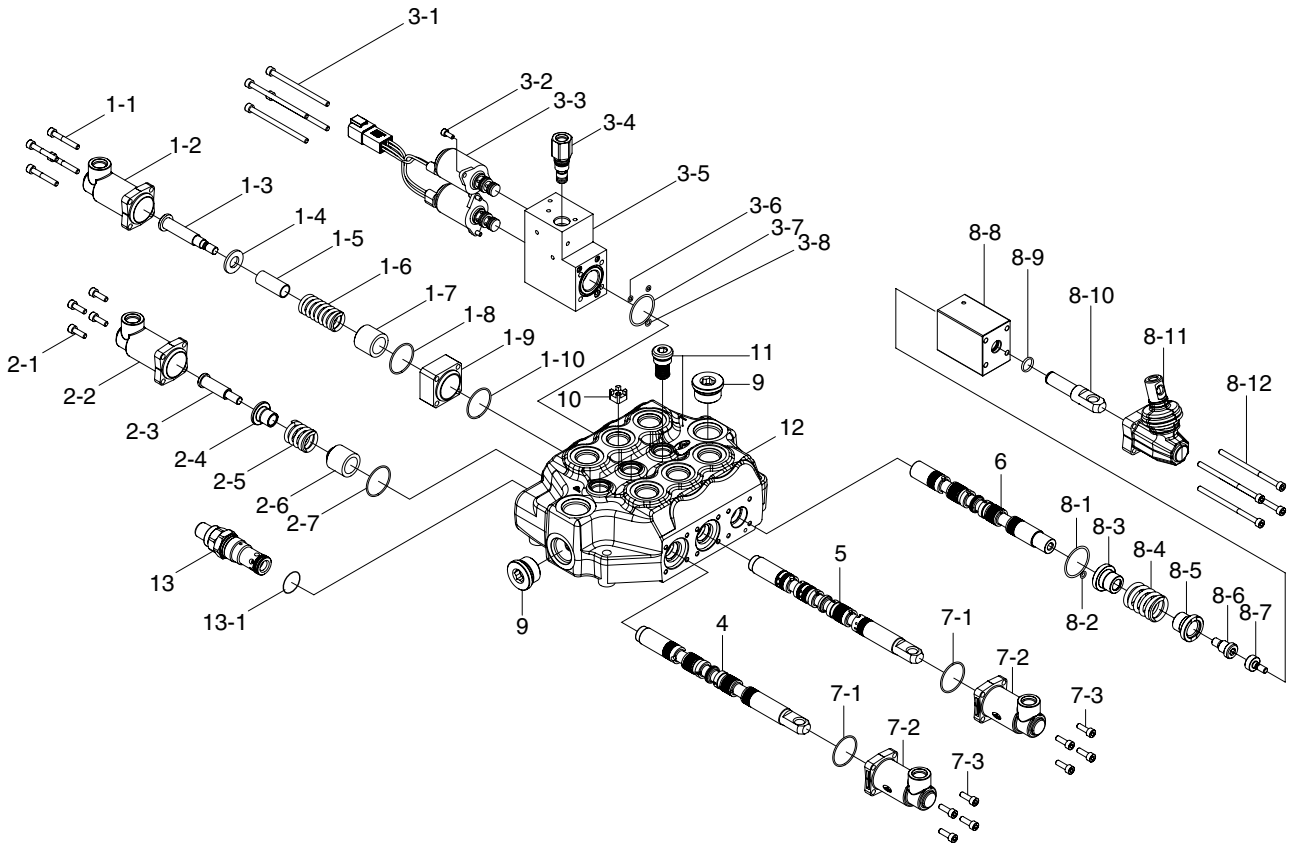
- Disassembly

- ① Remove the end cap(2-2) by removing the four mounting screw(2-1).
- ② Carefully remove the bucket spool(4) from the valve body(12) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ③ Remove the O-ring(2-7) from the valve body(12) using care not to scratch the bore and not to contaminate the bore with foreign.
- ④ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(2-7) with clean oil. Pinch the lubricate O-ring and insert the O-ring(2-7) into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the bucket spool(4) to the body(12).
- ③ Insert the screw(2-3)-bushing(2-6) to end cap(2-2). Assemble the O-ring(2-7).
- ④ Place the end cap(2-2) over the assembly and install the mounting screws(2-1) and tighten torque to 0.7kgf · m(54.2lbf · ft).

(3) Auxiliary spool



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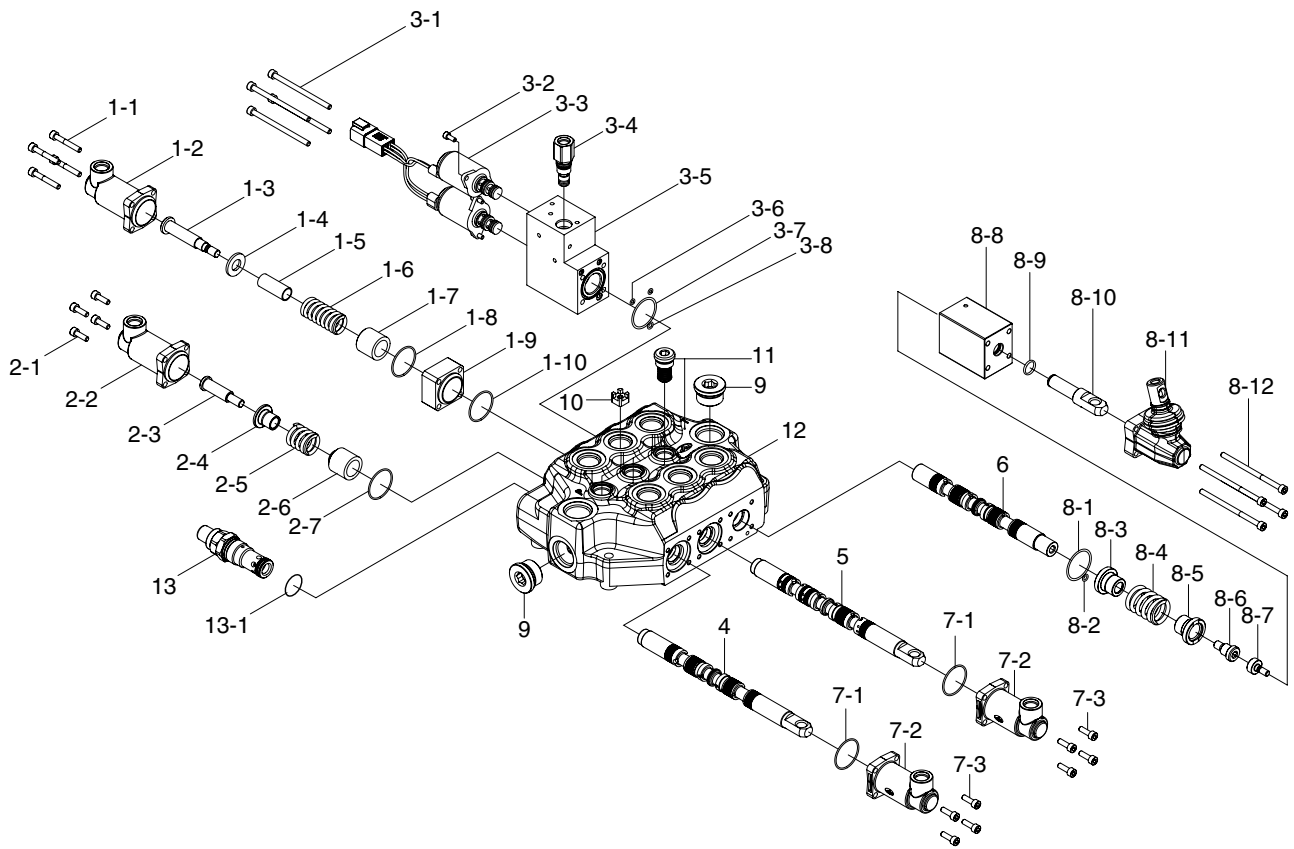
- Disassembly

- ① Remove the end cap(3-5) by removing the four mounting screws(3-1).
- ② Carefully remove the auxiliary spool(6) from the valve body(12) and inspect. If spool shows any signs of wear or scoring the entire valve must be replaced.
- ③ Remove the O-ring(3-6, 3-7, 3-8) from the valve body(12) using care not to scratch the bore and not to contaminate the bore with foreign.
- ④ Clean and dry all parts with a suitable solvent. Use petroleum based fuel or mineral spirits.

- Assembly

- ① Lubricate the new O-ring(3-7) with clean oil. Pinch the lubricate O-ring and insert the O-ring(3-6, 3-7, 3-8) into the groove in the front and in the back of the valve. Use care not to cut or nick the O-ring during assembly.
- ② Insert the auxiliary spool(6) to the body(12).
- ③ Place the end cap(3-5) over the assembly and install the mounting screws(3-1) and tighten torque to $0.7\text{kgf} \cdot \text{m}$ ($54.2\text{lb} \cdot \text{ft}$).

(4) Load check valve



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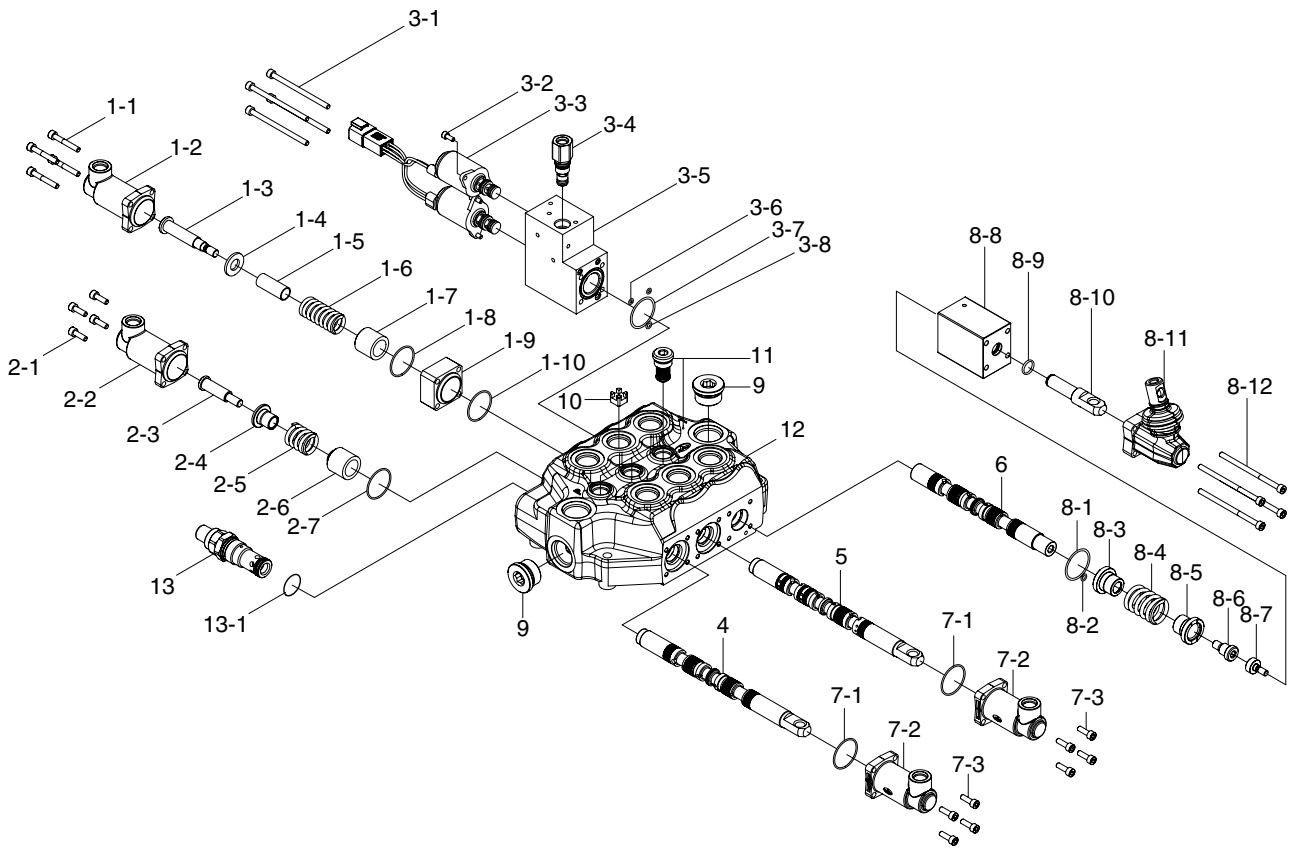
- Disassembly

- ① Locate the check valve(11, 3position) on top surface of the main control valve.
- ② Remove the check valve kit(11).
- ③ Remove and discard the O-ring from the valve kit(11).

- Assembly

- ① Clean all parts with a suitable solvent and dry all the parts.
- ② Lubricate the new O-ring with clean oil and install onto the valve kit(11).
- ③ Install the valve kit(11) into the control valve and tighten torque to $3.1\text{kgf} \cdot \text{m}$ ($22.4\text{lbf} \cdot \text{ft}$).

(5) Main relief valve



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- Disassembly

- ① Remove the main relief valve(13).
- ② Remove and discard the O-ring(13-1) from the main relief valve assy(13).

- Assembly

- ① Lubricate the new O-ring with clean oil and install onto the main relief valve(13).
- ② Install the main relief valve into the valve body(12) and tighten torque to $4.3\text{kgf} \cdot \text{m}$ ($31.1\text{lb} \cdot \text{ft}$).