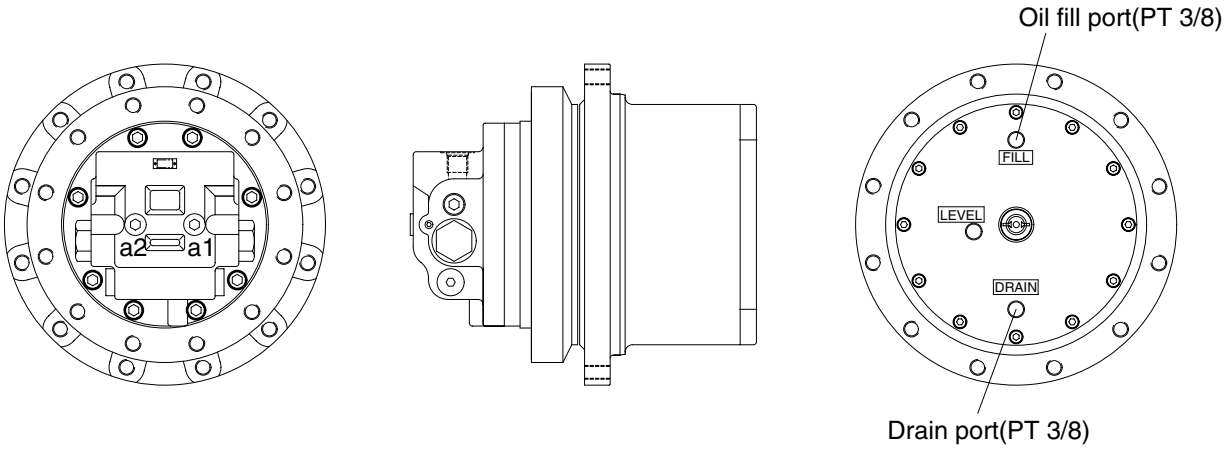
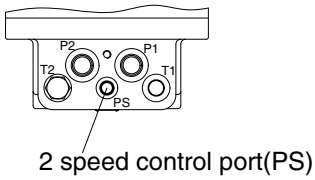
GROUP 4 TRAVEL DEVICE

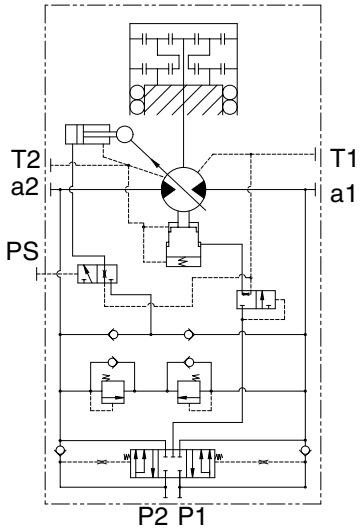
1. CONSTRUCTION

Travel device consists travel motor and gear box.

Travel motor includes brake valve, parking brake and high/low speed changeover mechanism.







Port	Port name	Port size
P1	Main port	PF 1/2
P2	Main port	PF 1/2
a1, a2	Gauge port	PT 1/4
T1, T2	Drain port	PF 3/8
PS	2 speed control port	PF 1/4

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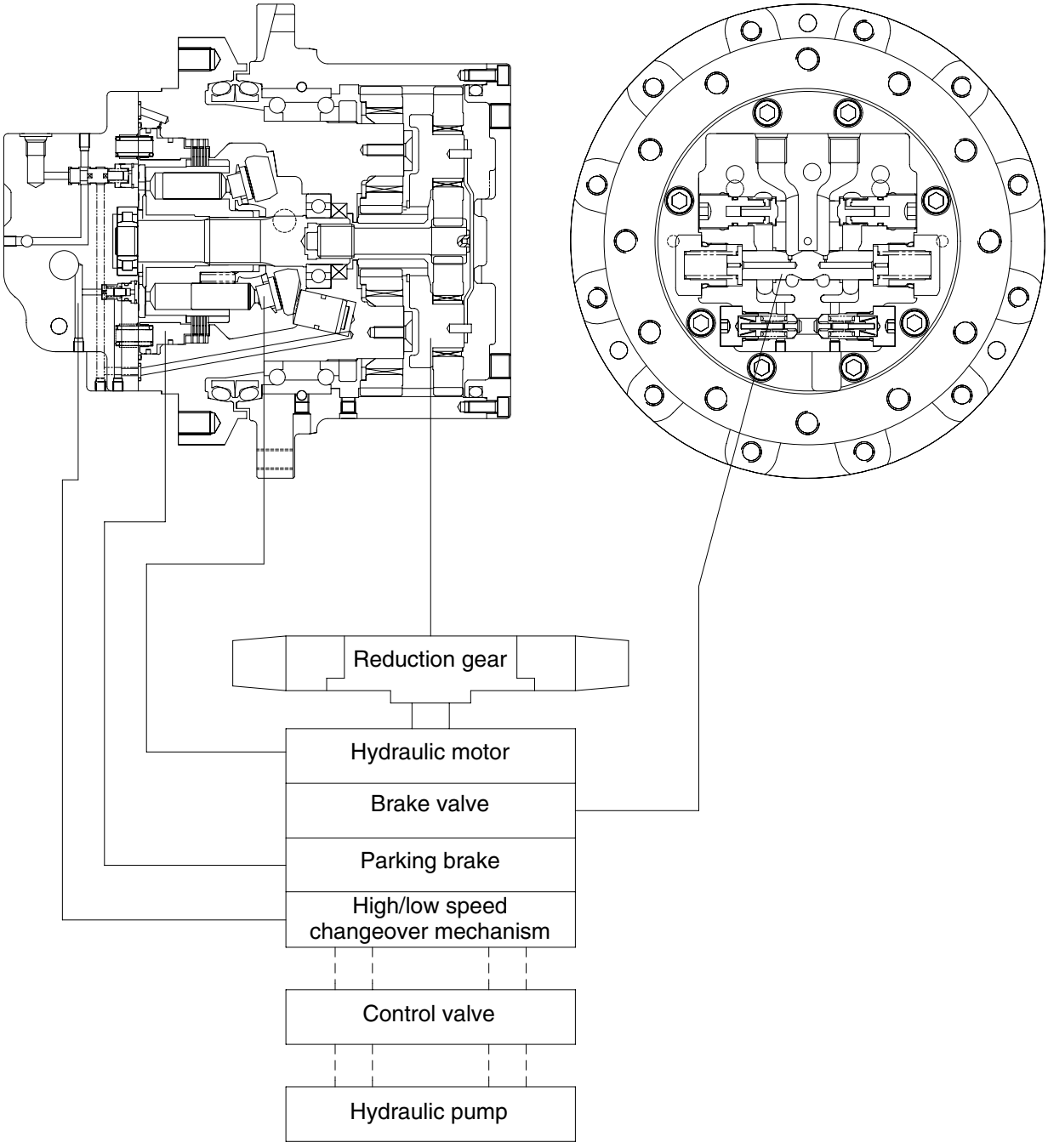
1) BASIC STRUCTURE



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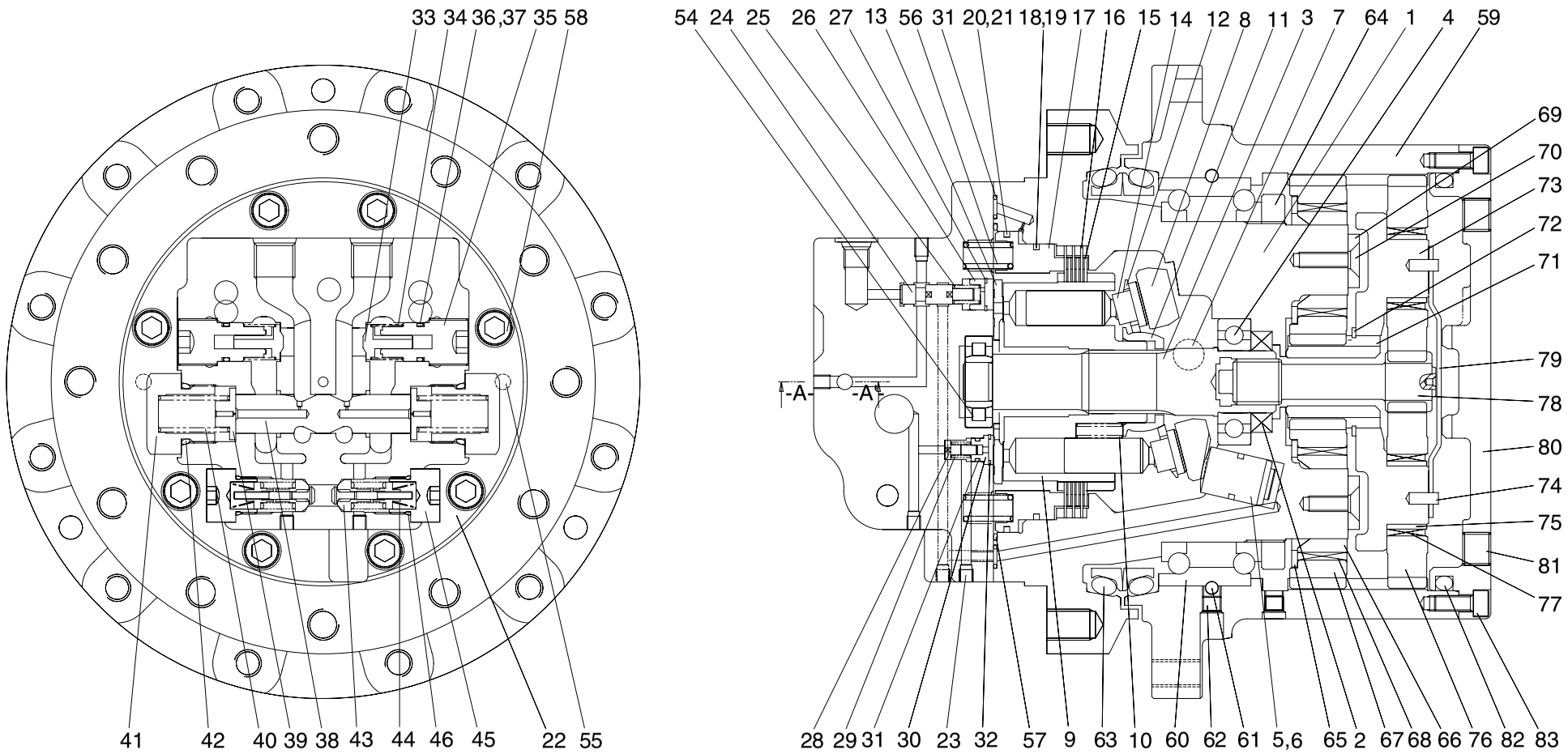

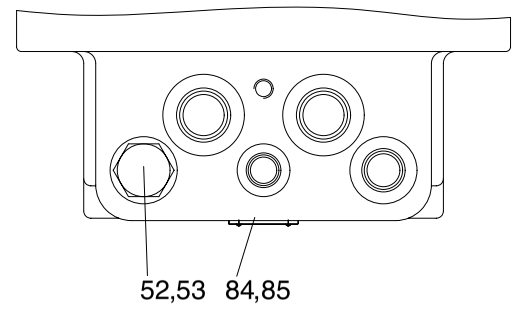

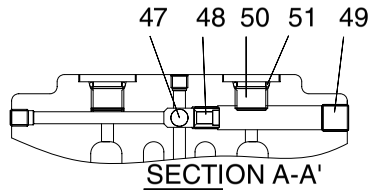

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1	Shaft casing	16	Parking plate	31	O-ring	45	Plug	59	Ring gear	73	Carrier
2	Oil seal	17	Parking piston	32	Snap ring	46	O-ring	60	Angular bearing	74	Spring pin
3	Shaft	18	O-ring	33	Check	47	Steel ball	61	Steel ball	75	Collar
4	Bearing	19	Back up ring	34	Spring	48	Check seat	62	Plug	76	Planetary gear(B)
5	Swash piston	20	O-ring	35	Plug	49	Plug	63	Floating seal	77	Needle bearing
6	Piston ring	21	Back up ring	36	O-ring	50	Plug	64	Nut	78	Drive gear
7	Swash steel ball	22	Rear cover	37	Back up ring	51	O-ring	65	Washer	79	Thrust plate
8	Swash plate	23	Plug	38	Main spool	52	Roller bearing	66	Collar	80	Ring gear cover
9	Cylinder block	24	Spool	39	Spring seat	53	O-ring	67	Planetary gear(A)	81	Plug
10	Spring	25	Spring	40	Spring	54	Hex plug	68	Needle bearing	82	O-ring
11	Ball guide	26	Stopper	41	Plug	55	Parallel pin	69	Plate	83	Wrench bolt
12	Set plate	27	Snap ring	42	O-ring	56	Spring	70	Bolt	84	Name plate
13	Valve plate	28	Check	43	Relief valve assembly	57	O-ring	71	Sun gear	85	Rivet
14	Piston assembly	29	Spring	44	Spring	58	Wrench bolt	72	Snap ring	86	Seal kit
15	Friction plate	30	Seat								

2. PRINCIPLE OF DRIVING

1) GENERATING THE TURNING FORCE

The high hydraulic supplied from a hydraulic pump flows into a cylinder(9) through valve casing of motor(22), and valve plate(13).

The high hydraulic is built as flowing on one side of Y-Y line connected by the upper and lower sides of piston(14).

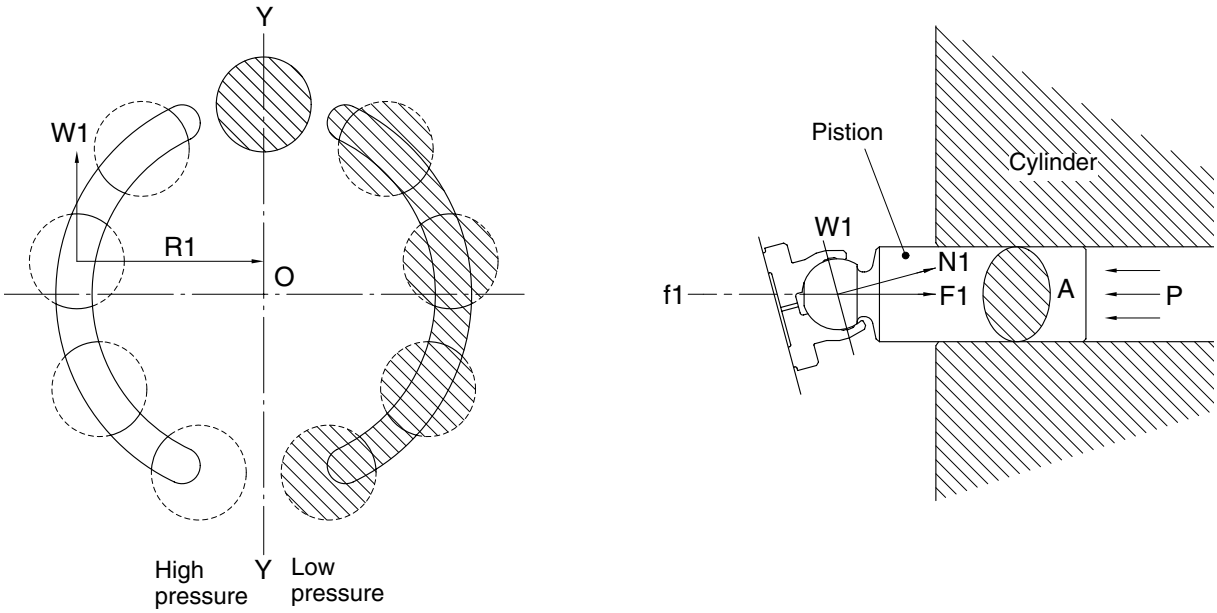
The high hydraulic can generate the force, F1 = P × A(P : Supplied pressure, A : water pressure area), like following pictures, working on a piston.

This force, F1, is divided as N1 thrust partial pressure and W1 radial partial pressure, in case of the plate(8) of a tilt angle, α.

W1 generates torque, T = W1+R1, for Y-Y line connected by the upper and lower sides of piston as following pictures.

The sum of torque(ΣW1 × R1), generated from each piston(4~5pieces) on the side of a high hydraulic, generates the turning force.

This torque transfers the turning force to a cylinder(9) through a piston; because a cylinder is combined with a turning axis and spline, a turning axis rotates and a turning force is sent.



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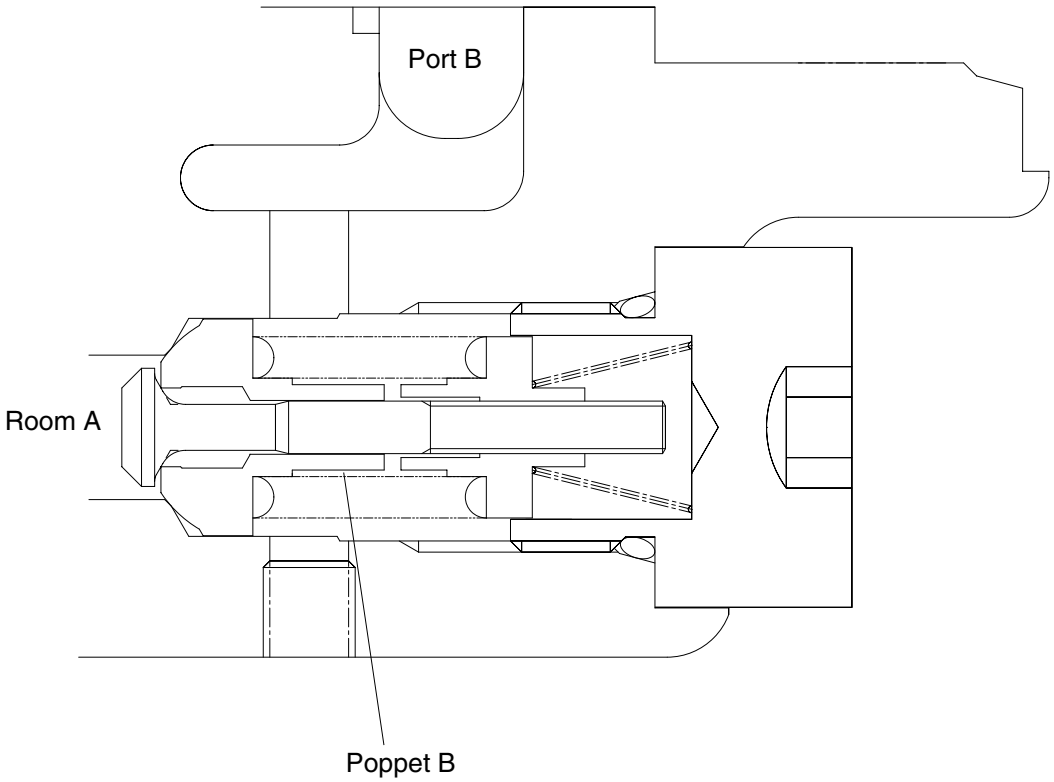
2) WORKING OF RELIEF VALVE

Relief valve carries on two functions of followings.

(1) It standardizes a pressure in case of driving a hydraulic motor ; bypasses and extra oil in a motor inlet related to acceleration of an inertia to an outlet.

(2) In case of an inertia stopped, it forces an equipment stopped, according to generating the pressure of a brake on the projected side.
Room A is always connected with port A of a motor. If the pressure of port is increased, press poppet B. And if it is higher than the setting pressure of a spring, the oil of an hydraulic flows from room A to port B, because poppet A is detached from the contact surface of seat A.



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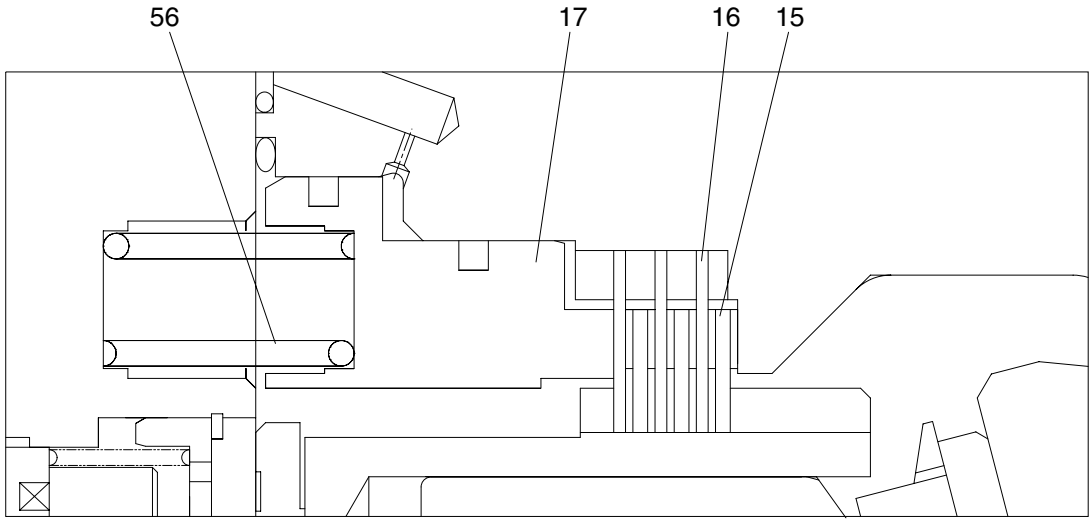
3) WORKING OF BRAKE

Brake operates the pressure supplied through SPOOL(simultaneous peripheral operation online) installed in rear cover(22) to the part of parking piston(17) and releases a brake.
When the pressure does not work, the brake always runs.
The force of a brake is generated by the frictional force among a plate(16), brake piston(17) and a cylinder block(9) connected through spline which are fixed by shaft casing(1) with friction plate(15).
When a pressure does not work on the part of piston, brake spring presses brake piston; oil in a brake room flows into the drain of a motor through an orifice; in that time, brake piston compresses a frictional plate(15) and a detached plate in the middle of shaft casing and brake piston according to the force plate springs(56); finally, it makes a frictional force.
This frictional force helps the brake fixing a turning axis(3) connected by a cylinder and spline operated.



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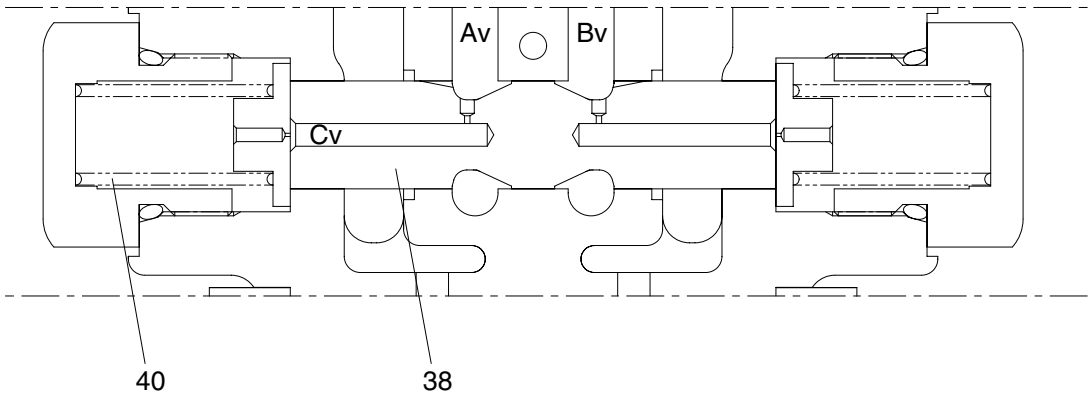
4) COUNTERBALANCE VALVE

Av port is connected into a hydraulic pump and Bv port is into a tank. Hydraulic pump supplying oil is come into Av → Cv room. In accordance with SPRING FORCE(40) that is working on the spool's side it moves to the SPOOL(38) on the right side which is medium position and that time MOTOR is turning.

When the SPOOL(38) is come back to the medium position that time hydraulic motor is stopped.

In accordance with SPOOL's returning speed and shape control the working oil that is returning from hydraulic motor smoothly stopping the motor.



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