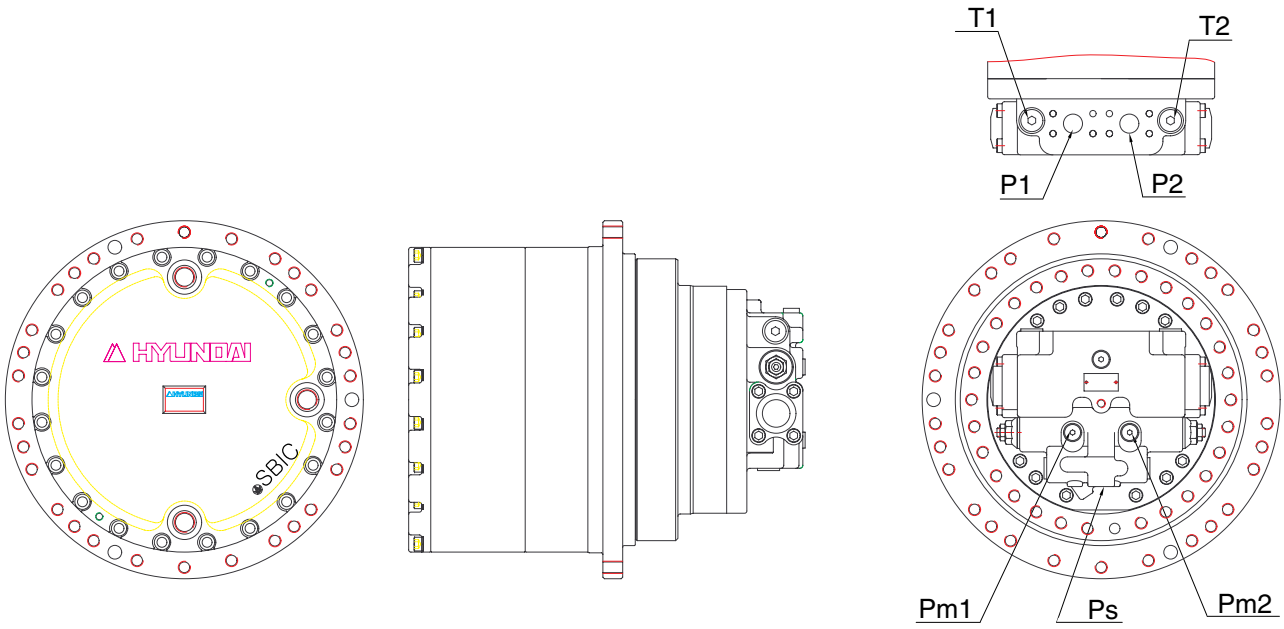
GROUP 4 TRAVEL DEVICE

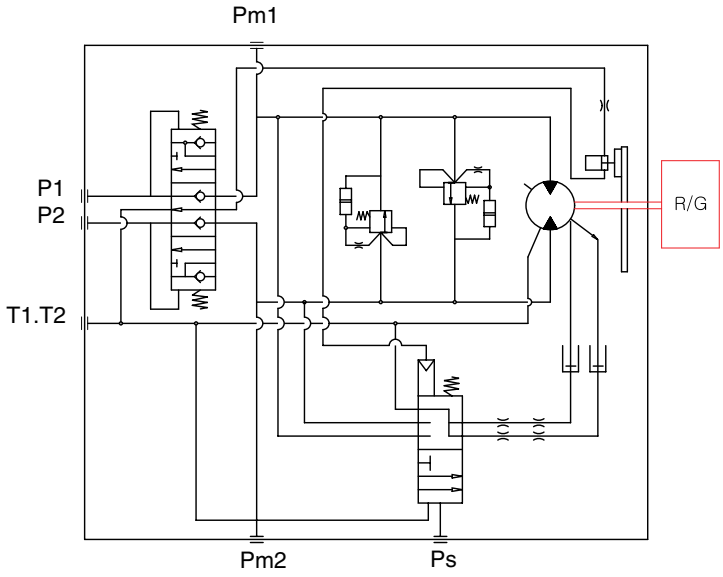
1. STRUCTURE

A hydraulic motor includes five followings.

- Part of rotary generating turning force
- Part of a valve of relief
- Part of Brake
- Part of a valve of counterbalance
- Part of plowing changeover
- Part of auto changeover



21078TM12



21078TM04

Port	Port name	Port size
P_1, P_2	Main port(IN)	SAE 4694psi
P_2, P_1	Main port(OUT)	SAE 4694ps
Pm_1, Pm_2	Gauge port	PF 1/4
T_1, T_2	Prain port	PF 1/2
Ps	2 speed control port	PF 1/4

2. PRINCIPLE OF DRIVING

2.1 Generating the turning force

The high hydraulic supplied from a hydraulic pump flows into a cylinder(10) through valve casing of motor(29), and valve plate(77).

The high hydraulic is built as flowing on one side of Y-Y line connected by the upper and lower sides of piston(18).

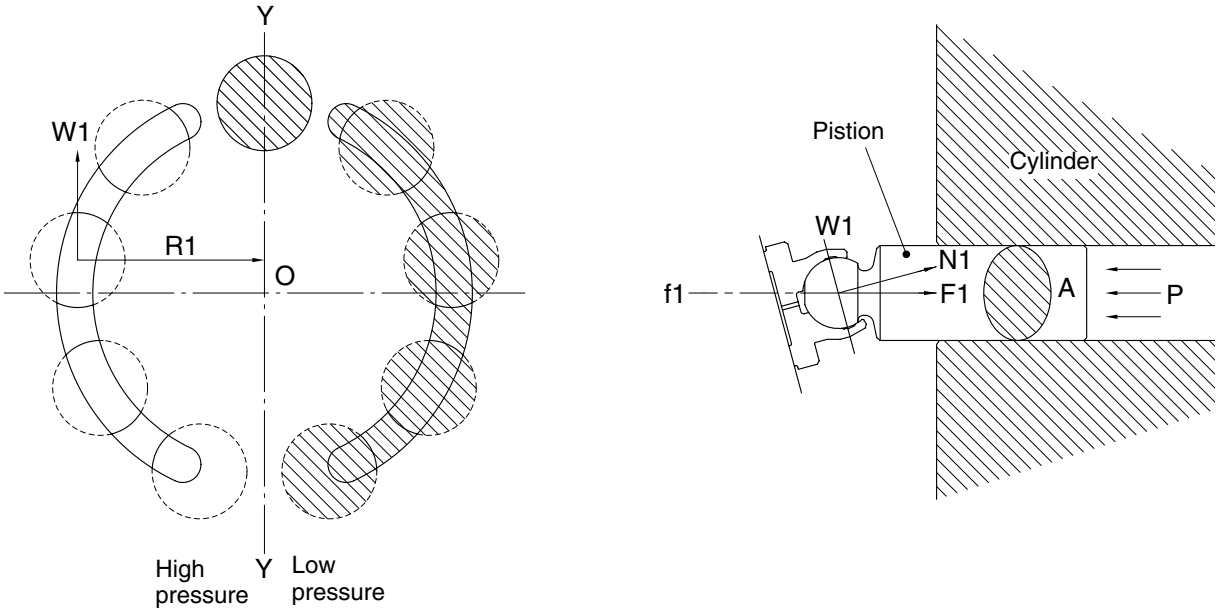
The high hydraulic can generate the force, F1 = P × A(P : Supplied pressure, A : water pressure area), like following pictures, working on a piston.

This force, F1, is divided as N1 thrust partial pressure and W1 radial partial pressure, in case of the plate(09) 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(10) through a piston; because a cylinder is combined with a turning axis and spline, a turning axis rotates and a turning force is sent.



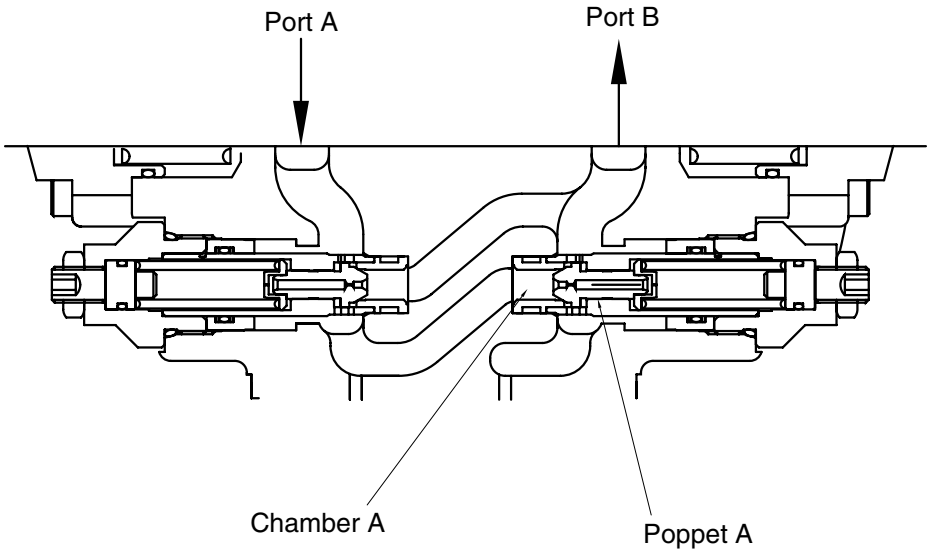
21078TM05

2.2 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 A. 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.



21078TM06

2.3 Working of negative brake

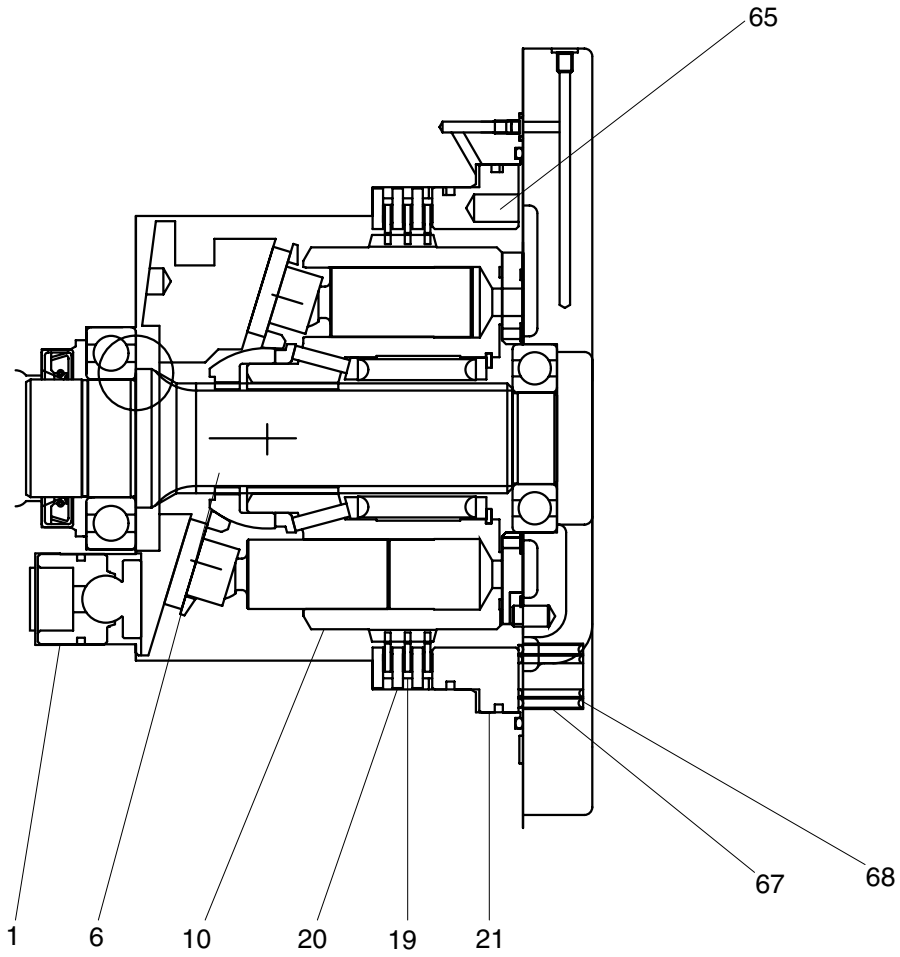
Negative brake operates the pressure supplied through SPOOL(simultaneous peripheral operation online) installed in valve casing(29) to the part of brake piston(21) and releases a brake.

When the pressure does not work, the brake always runs.

The force of a brake is generated by the frictional force among a plate(20) fixed by shaft casing, brake piston(21) and a frictional plate(19) connected through spline outside a cylinder(10).

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 and a detached plate in the middle of shaft casing and brake piston according to the force that presses 10 pieces of brake springs(68, 67); finally, it makes a frictional force.

This frictional force helps the brake fixing a turning axis(06) connected by a cylinder and spline operated.

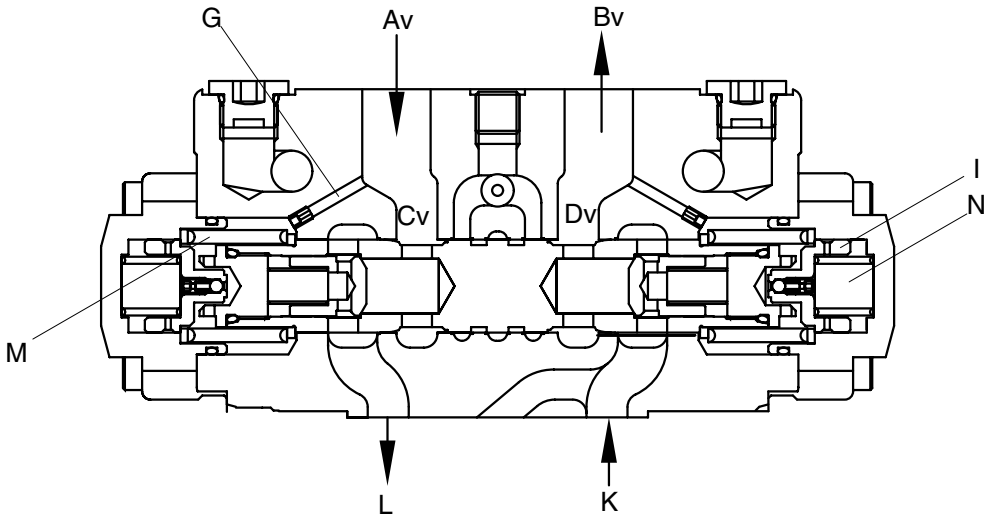


21078TM07

2.4 Counterbalance valve

Av port is connected into a hydraulic pump; Bv port is into a tank.

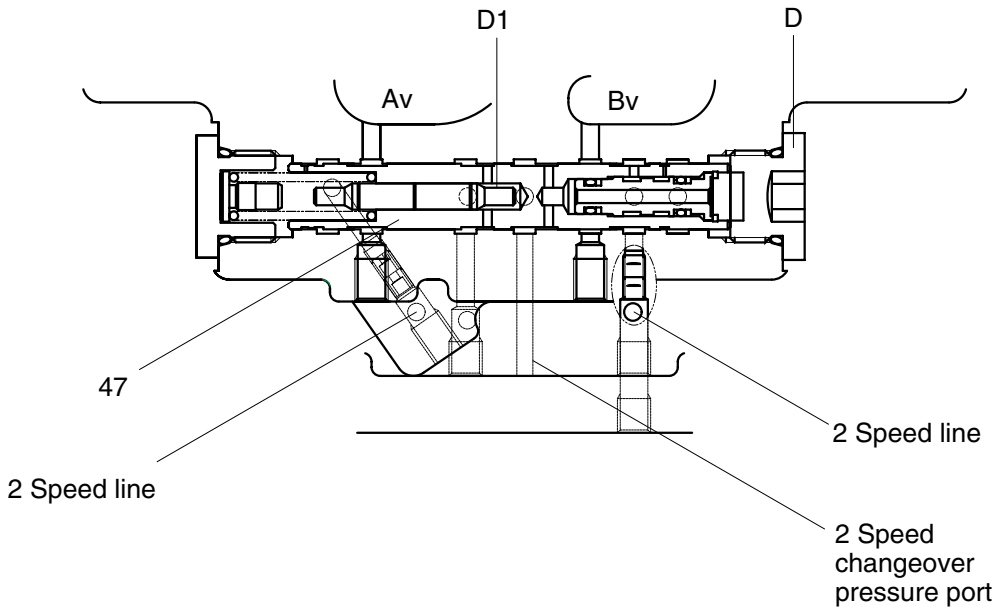
An oil supplied to a hydraulic pump presses check valve on Av → Cv; through L port, is provided to a hydraulic motor. It makes a hydraulic motor circulated. However, the oil pressure out of a pump is increased and transferred to spring room, M, through the path, G, because negative brake is working on. If the pressure of room M is over the power of spring that keeps spool medium, spool moves to the right side.
An oil in room N is sent to room M by orifice I and discharged from G line to a tank.
So spool moves to the right. The oil flows as the way of K → Bv.



21078TM08

2.5 Working description of automatic switch(at normal speed)

Due to no pressure on pilot now, spool(47) is not working.



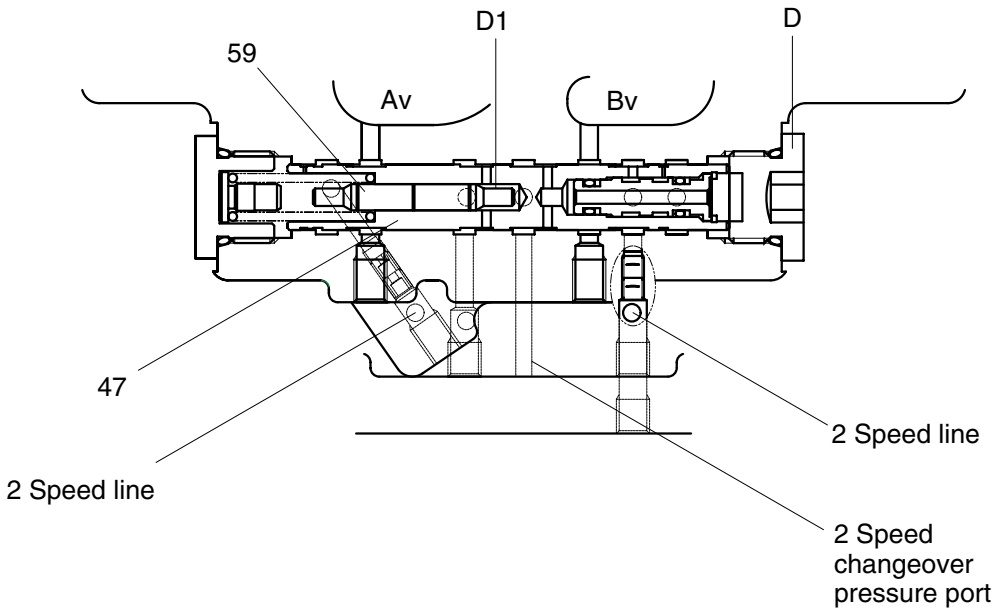
(Normal Speed)

21078TM09

2.6 Working description of automatic switch(at high speed)

At normal speed, once the hydraulic oil which is through the inner path of spool(47) flows into high speed switching pressure port(The pressure of external pilot : Pi = 35kgf/cm^2) spool(47) moves from right to left.

At high speed, turning pressure of motor(D1) is over 250kgf/cm^2, when the power forcing to spool(59) (Pressure, P1) is stronger than spool(47) and spool(59) is pushed out, after then spool(47) moves from left to right. So it is switched.



(High Speed)

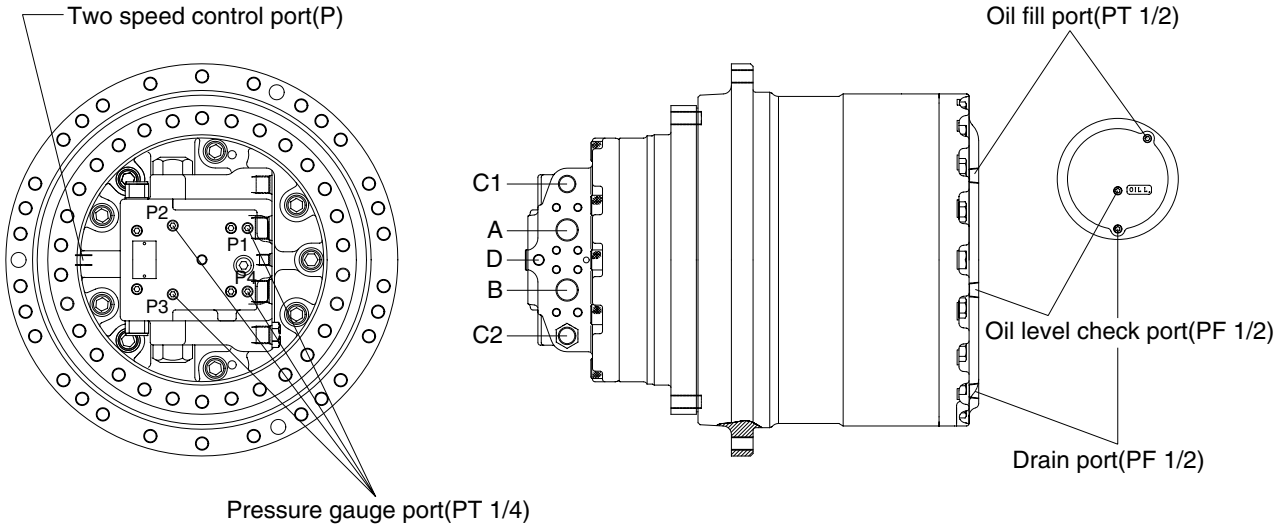
21078TM10

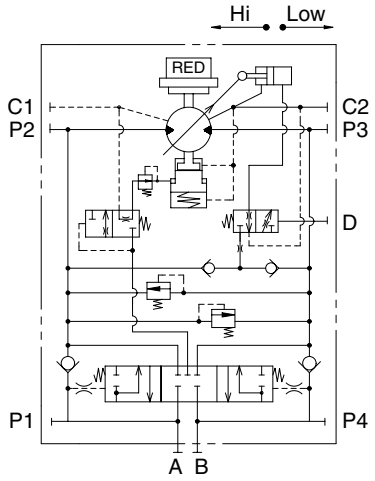
GROUP 4 TRAVEL DEVICE(TM40VC)

1. CONSTRUCTION

Travel device consists travel motor and gear box.

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



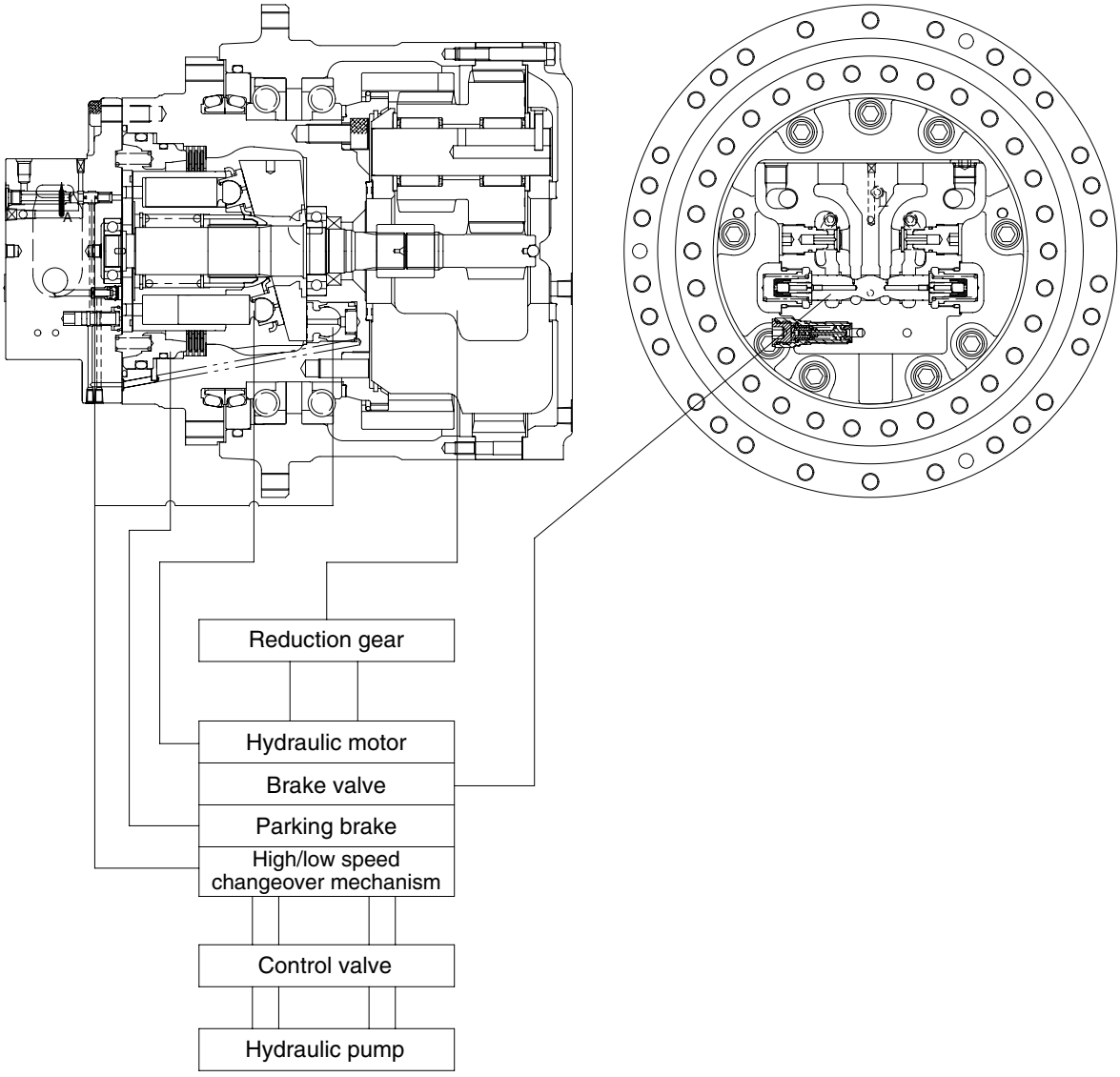


Hydraulic circuit

Port	Port name	Port size
A	Main port	SAE 5000psi 1"
B	Main port	SAE 5000psi 1"
P1, P2	Gauge port	PT 1/4
P3, P4	Gauge port	PT 1/4
C1, C2	Drain port	PF 1/2
D	Drain port	PF 1/4
P	2 speed control port	PT 1/8

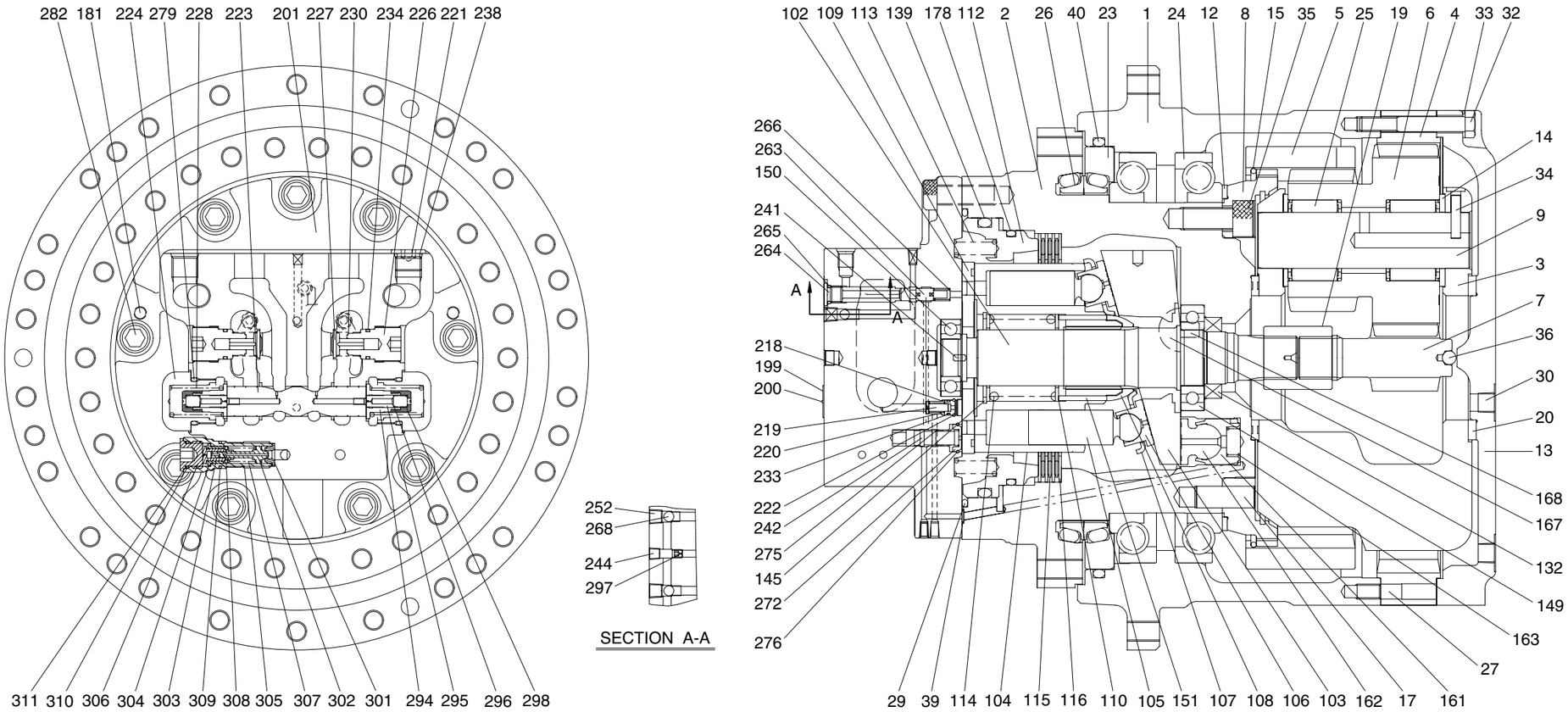
21C72TM01

1) BASIC STRUCTURE



21C72TM02

2) STRUCTURE



21C72TM03

1	Hub	19	Coupling	39	O-ring	115	Friction plate	181	Parallel pin	263	Valve	298	Stopper
2	Spindle	20	Thrust plate	40	O-ring	116	Mating plate	201	Rear flange	264	RO plug	301	Seat
3	Carrier	23	Seal ring	102	Shaft	132	Oil seal	224	Stopper	265	O-ring	302	Plunger
4	Ring gear A	24	Ball bearing	103	Swash plate	139	O-ring	226	Plug	266	Spring	303	Rod
5	Ring gear B	25	Needle bearing	104	Cylinder block	145	Snap ring	227	Check valve	268	Steel ball	304	Piston
6	Cluster gear	26	Floating seal	105	Piston	149	Ball bearing	228	Spring	272	Valve seat	305	Body
7	Sun gear	27	Pin	106	Shoe	150	Ball bearing	230	Spring	275	Spring	306	Plug
8	Coupling gear	29	O-ring	107	Retainer plate	151	Roller	233	O-ring	276	Ring	307	Spring
9	Shaft	30	PT plug	108	Thrust ball	161	Piston	234	O-ring	279	O-ring	308	Shim
12	Distance piece	32	Hexagon bolt	109	Timing plate	162	Shoe	238	O-ring	282	Hexagon socket bolt	309	O-ring
13	Cover	33	Spring washer	110	Washer	163	Spring	241	Pin	294	Stopper	310	O-ring
14	Thrust collar	34	Pin	112	Piston	167	Pivot	242	Valve	295	Spool	311	Back up ring
15	Ring	35	Hexagon socket bolt	113	Spring	168	Parallel pin	244	PT plug	296	Spring		
17	Pin	36	Steel ball	114	Spring	178	O-ring	252	PT plug	297	Orifice		