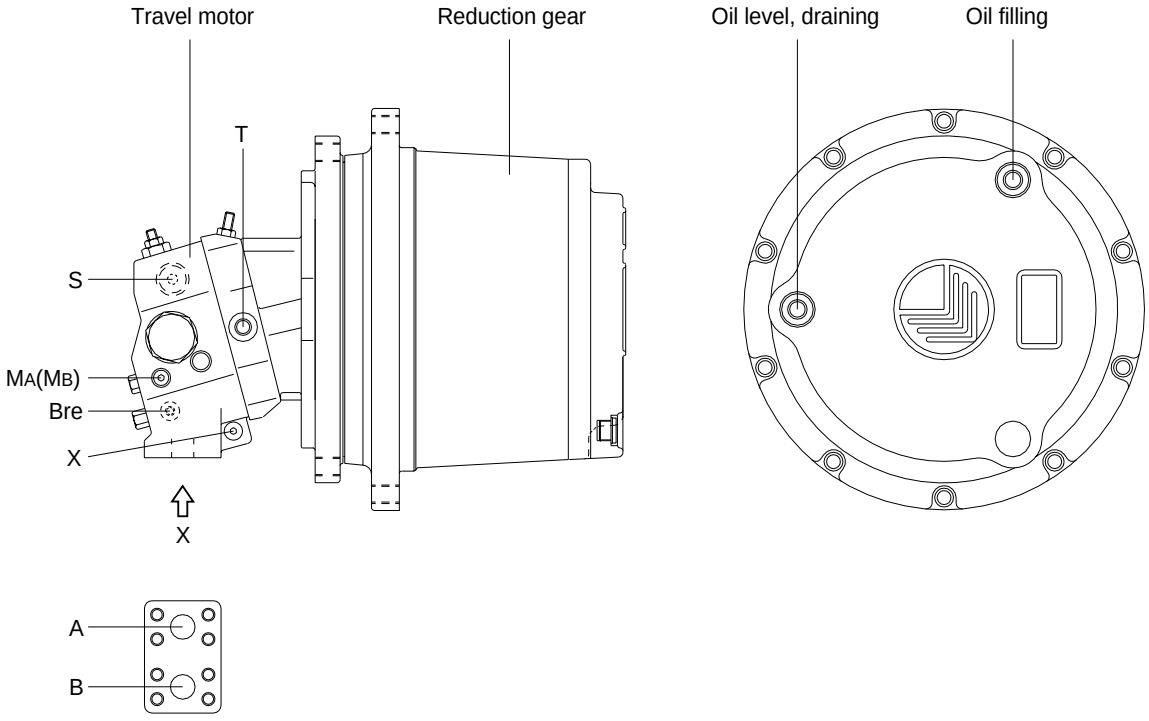
GROUP 4 TRAVEL DEVICE

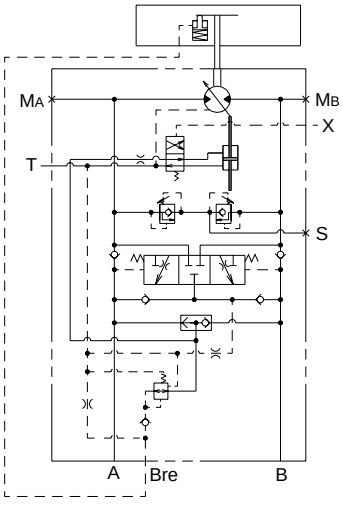
1. CONSTRUCTION

Travel device consists travel motor and gear box.

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



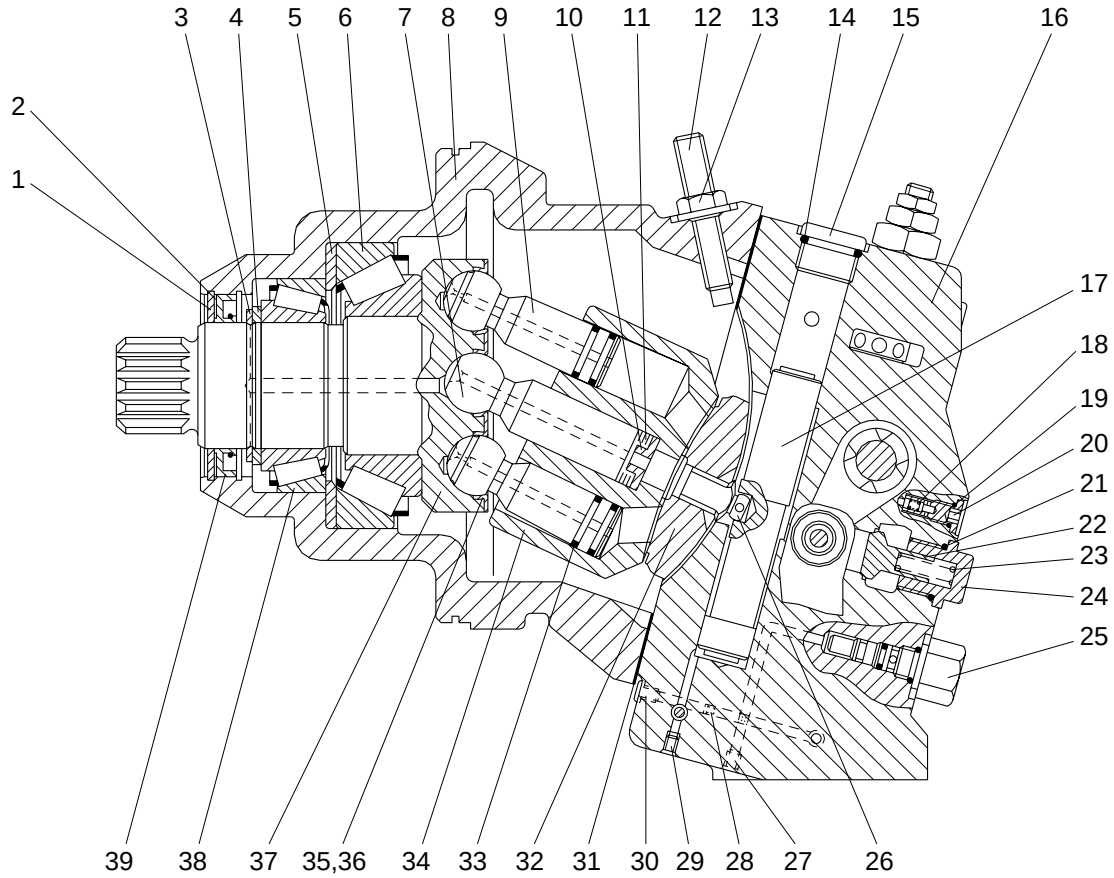
VIEW X



Hydraulic circuit

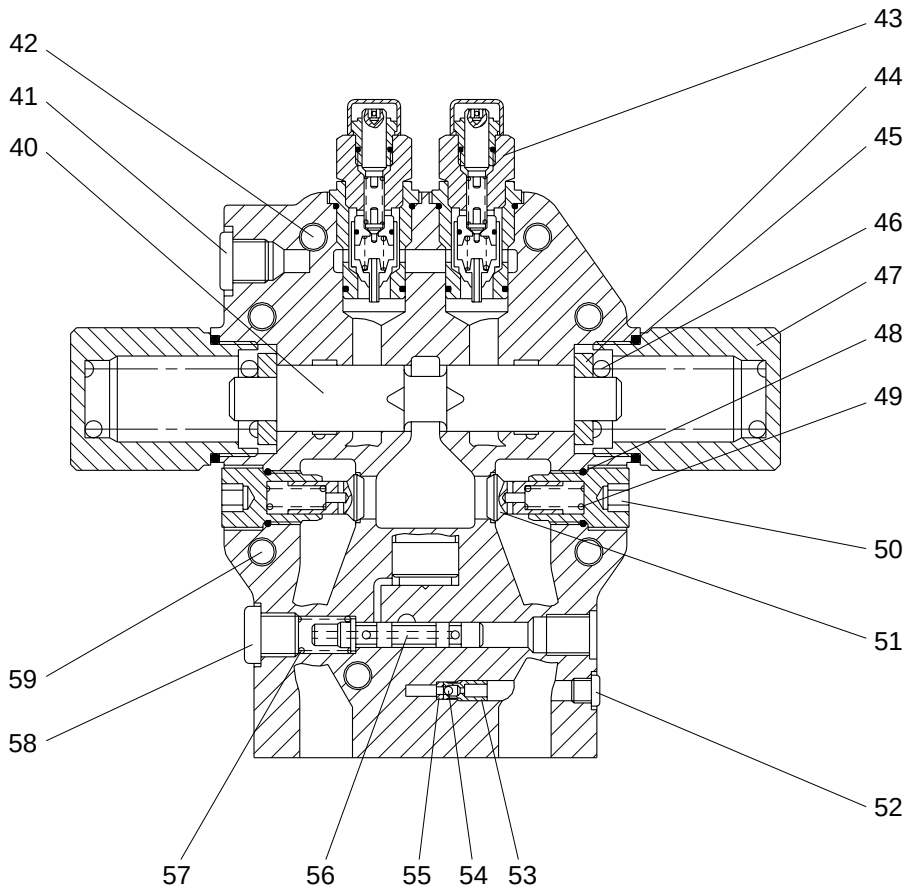
Port	Port name	Port size
A	Main port	SAE 6000psi 1"
B	Main port	SAE 6000psi 1"
MA,MB	Gauge port	M14 × 1.5
T	Drain port	M18 × 1.5
X	2 speed control port	M14 × 1.5
Bre	Brake release port	M14 × 1.5

1) TRAVEL MOTOR(1/2)



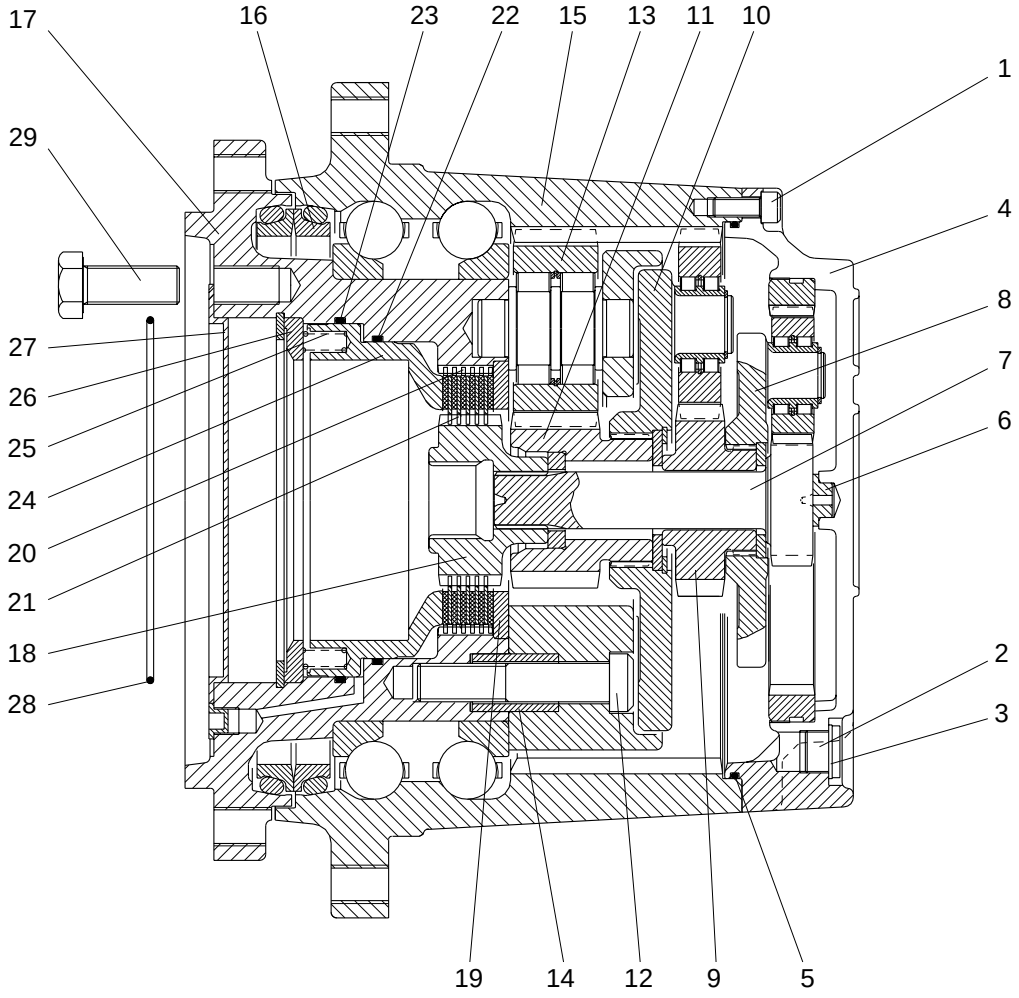
1	Retainer	14	O-ring	27	Double break off pin
2	Shim	15	Lock nut	28	Orifice
3	Retainer	16	Port plate	29	Double break off pin
4	Back up plate	17	Positioning piston	30	Lock screw
5	Shim	18	Spring	31	Gasket
6	Taper roller bearing	19	O-ring	32	Control lens
7	Center pin	20	Valve screw	33	Steel seal
8	Housing	21	O-ring	34	Cylinder
9	Piston	22	Valve poppet	35	Retaining plate
10	Spring collar	23	Spring	36	Screw
11	Cup spring	24	Lock screw	37	Drive shaft
12	Threaded pin	25	Assembly set	38	Taper roller bearing
13	Lock nut	26	Positioning trunnion	39	Seal

TRAVEL MOTOR(2/2)



40	Brake piston	47	Lock screw	54	Ball
41	Lock screw	48	O-ring	55	Bushing
42	Socket head screw	49	Spring	56	Control piston
43	Pressure relief valve	50	Lock screw	57	Spring
44	Washer	51	Valve poppet	58	Lock screw
45	O-ring	52	Lock screw	59	Socket head screw
46	Spring	53	Valve screw		

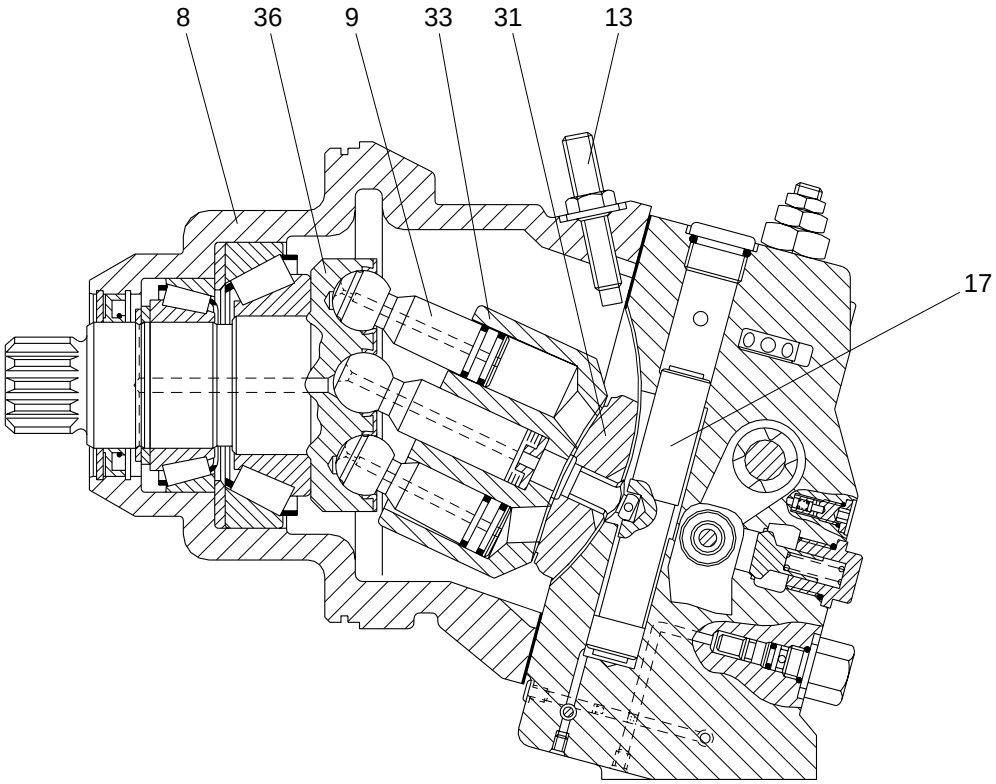
2) REDUCTION GEAR



1	Screw	11	Sun gear	21	Steel ring
2	Bleeder plug	12	Screw	22	O-ring
3	Washer	13	3rd reduction gear	23	O-ring
4	Cover set	14	Bushing	24	Piston
5	O-ring	15	Bearing assembly	25	Spring
6	Pad	16	Lifetime seal	26	Disc pushing
7	Sun gear	17	Hub	27	Circlip
8	1st reduction gear	18	Shaft brake	28	O-ring
9	Sun gear	19	Disc pushing	29	Screw
10	2nd reduction gear	20	Sinteriz disc		

2. FUNCTION

1) HYDRAULIC MOTOR(plug-in motor with intergrated counter balance valve)



The variable displacement motor has a rotary group in bent axis design.
The torque is generated directly at the drive shaft(36).
The cylinder barrel(33) is driven by a tapered piston(9) arrangement.
The change of displacement is generated by the control lens(31) via positioning piston(17). The control lens(31) slides on a circular shaped surface.

In case of constant pump flow volume and high pressure
- the output speed is increased at smaller swivel angle, the torque is reduced
- the torque rises at swivel angle increase, the output speed is decreased.

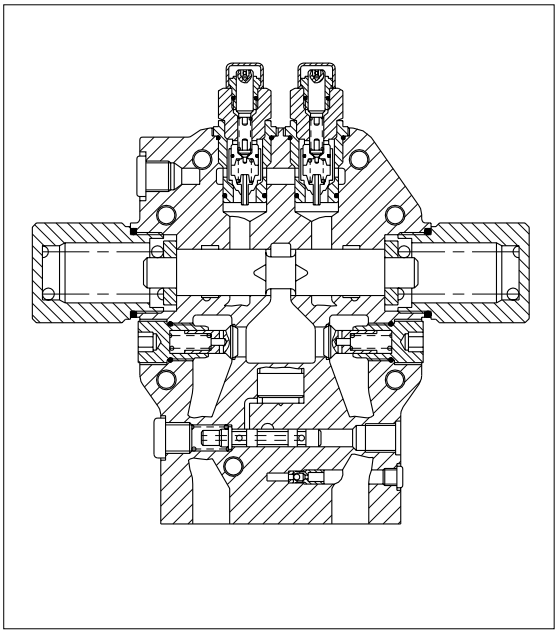
The max. swivel angle is 25° , the min. swivel angle is 5° .

The variable displacement motor with integrated counterbalance valve is designed to be operated in open loop.

The min. displacement is limited by a threaded pin(13) in the housing(8). Min. displacement is set according to customer's requirement. Stepless adjustment to various higher values is possible.
※ Reduction to smaller displacement may result in overspeeding the motor.

2) PORT PLATE

With hydraulic two-speed control, integrated counterbalance valve and secondary pressure relief valves, gauge and boosting ports, control pressure ports, brake release pressure ports and service ports.



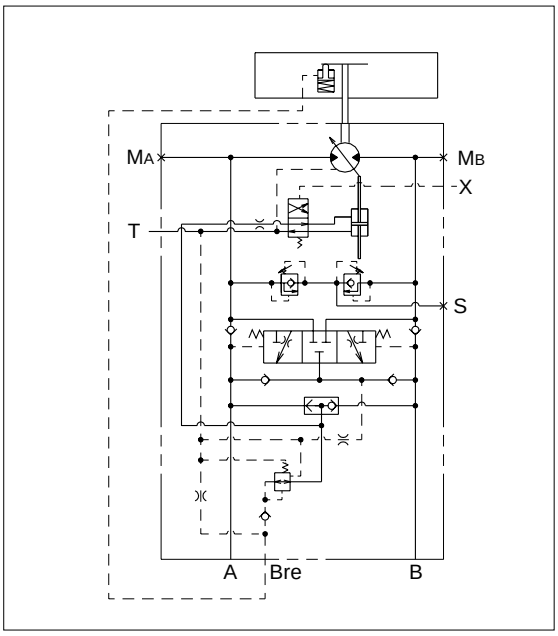
3) HYDRAULIC TWO-SPEED CONTROL

Operated by control pressure at port X a 4/2 directional valve guides high pressure to the positioning piston to switch the motor from min. to max. displacement and vice versa.

At control pressure 0bar at port X the motor is at max. displacement.
At control pressure > 10bar at port X the motor is at min. displacement.
Intermediate positions are not possible.

The necessary positioning energy is taken from the respective high pressure side via shuttle valve. For this an operating pressure of at least 15bar is necessary.

Swivelling results in a change of the displacement.
Swivel time is controlled by an orifice.



4) COUNTERBALANCE VALVE(for traveling)

Integrated into the port plate including a brake release valve.
In case of downhill traveling or deceleration of the vehicle a counterbalance valve avoids overspeeding and cavitation of hydraulic motors.

5) FUNCTION AS TO CIRCUIT DIAGRAM

Check valves in the inlet line A and B for by-passing of the counterbalance valve.
At traveling forward the return oil flow is controlled by a counterbalance spool. At drop in inlet pressure the counterbalance spool throttles the return oil flow. The motor is locked. The oil flow behind the spool is led to the low pressure side via an additional check valve. Same function for traveling forward and backward. For limitation of the max. pressure during braking operation two cross-over relief valves are installed. Cavitation can be prevented via cross-over relief valves functioning as a check valve. A brake release valve pressurized by one of the inlet pressure sides via shuttle valve buids up a maximum of 30-50bar to release parking brake. The brake release valve delays the engagement of parking brake after travelling.