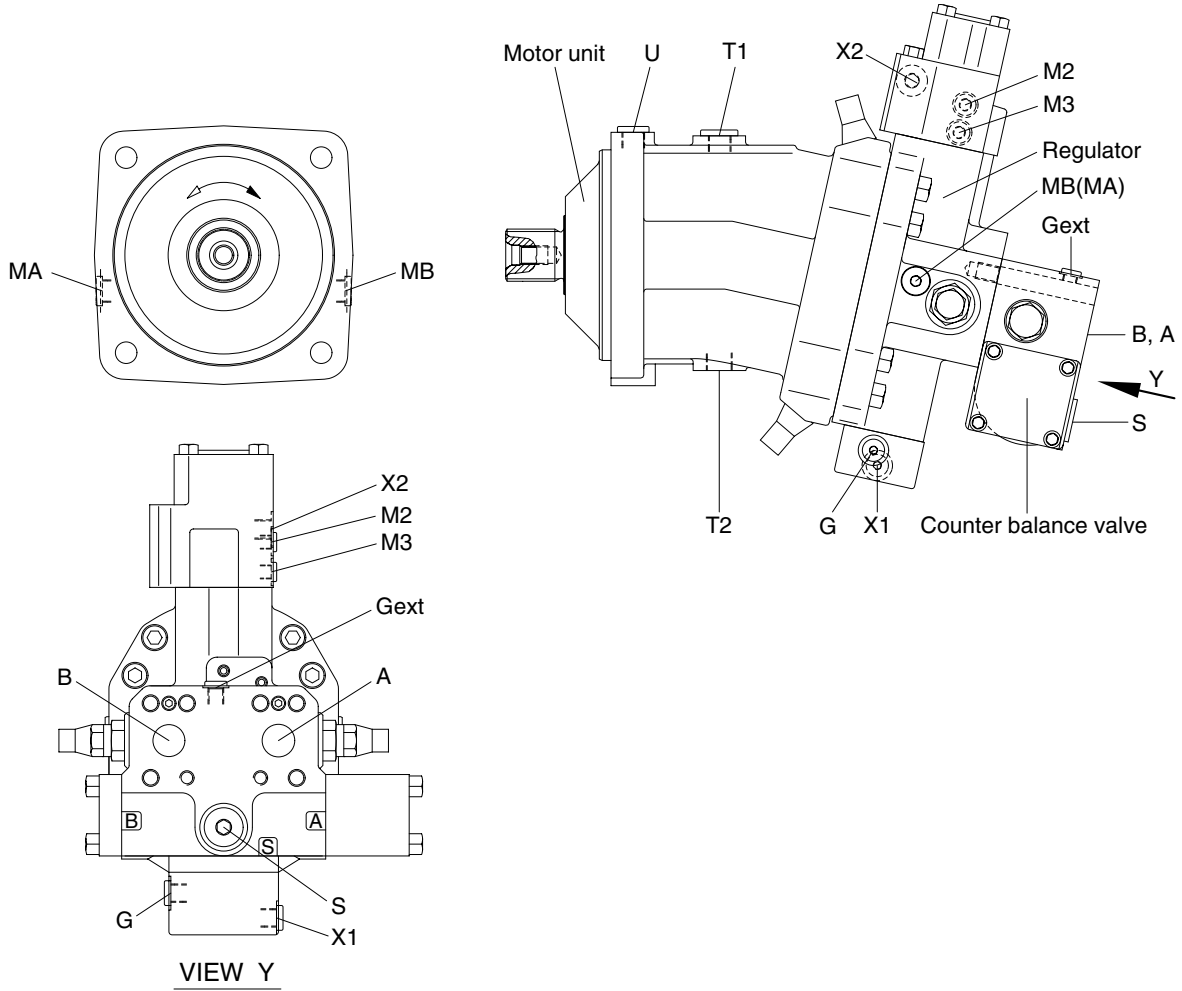


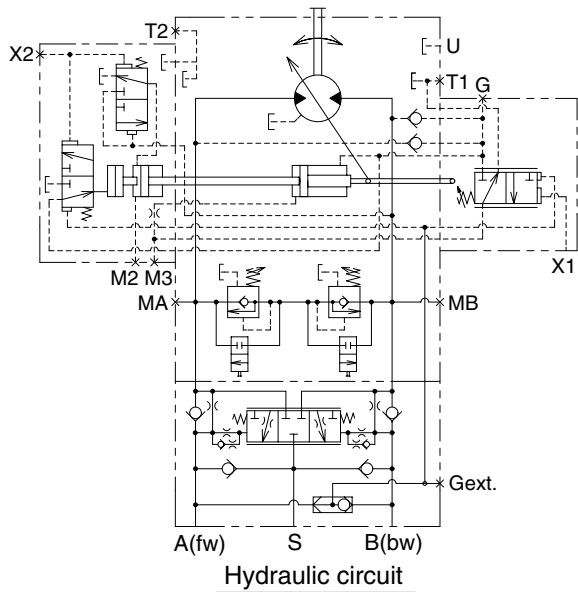
GROUP 4 TRAVEL MOTOR

1. CONSTRUCTION

Travel motor consists motor unit, regulator and counter balance valve.

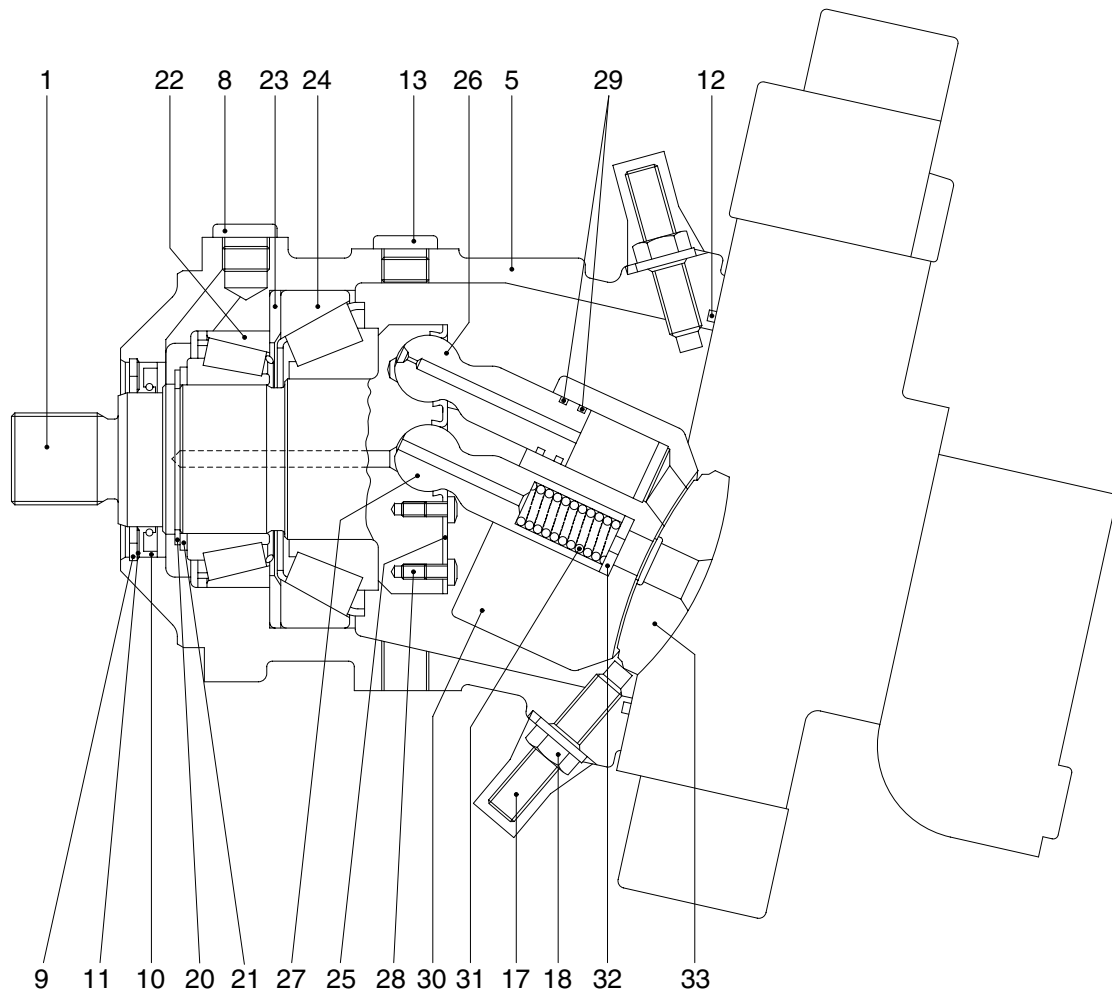


17W92TR01



Port	Port name	Port size
A, B	Main port	SAE 1 1/4"
G	N.A	M14 × 1.5 - 12
M1	Gauge port	M14 × 1.5 - 12
X1	Pilot pressure port	M14 × 1.5 - 12
X2	Pilot pressure port	M14 × 1.5 - 11.5
T1	Drain port	PF 3/4 - 17
T2	Drain port	PF 3/4 - 12
U	Flushing port	PF 1/2 - 16
S	Make up port	M27 × 2.0 - 16
MA, MB	Gauge port	M18 × 1.5 - 12
M2, M3	Gauge port	M10 × 1.0 - 8
Gext	Brake release port	M12 × 1.5 - 12.5

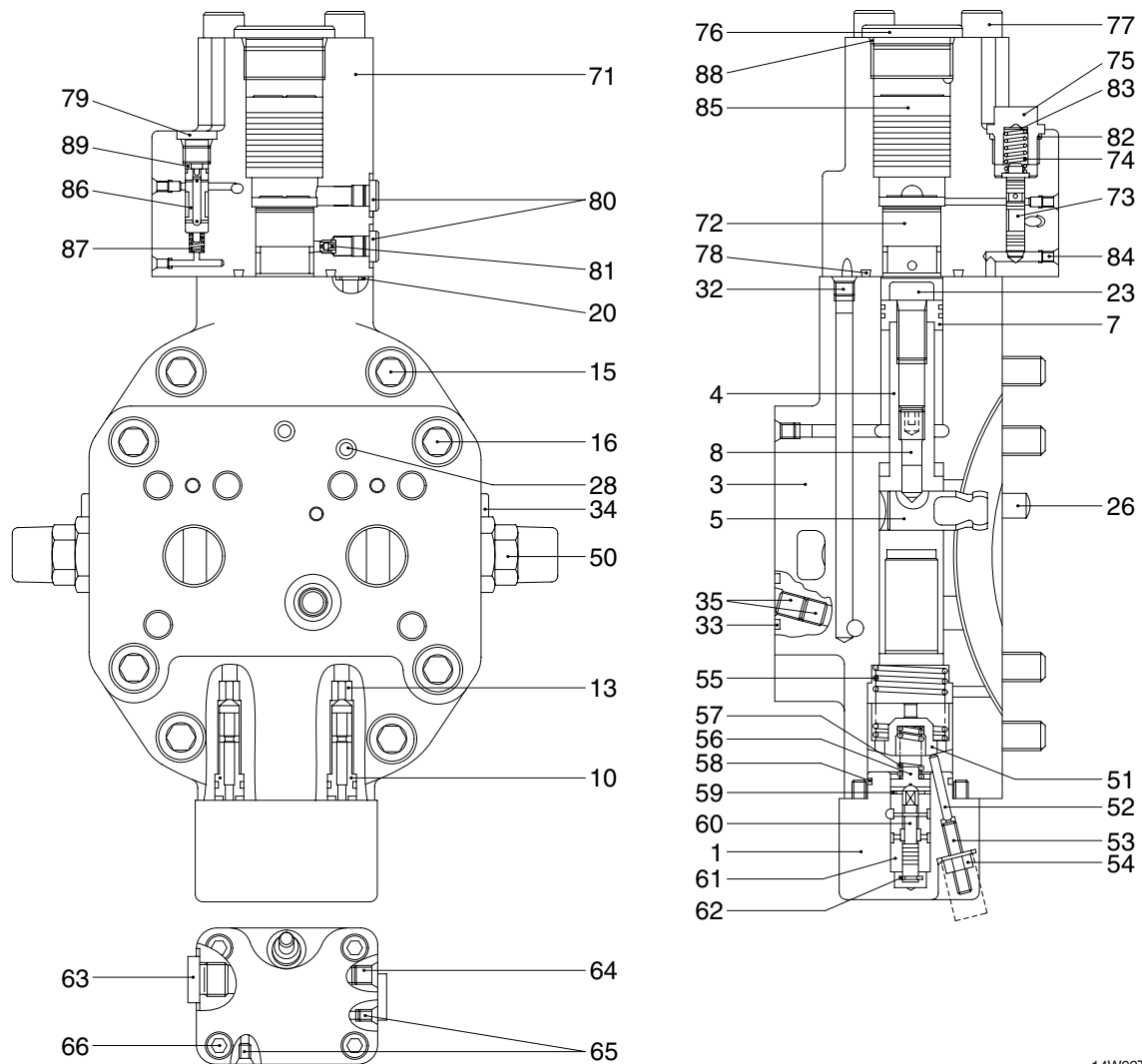
1) MOTOR UNIT



14W92TR02

- | | | | | | |
|----|-----------------|----|----------------------|----|--------------------|
| 1 | Drive shaft | 17 | Threaded pin | 26 | Piston |
| 5 | Housing | 18 | Seal lock nut | 27 | Center pin |
| 8 | Locking screw | 20 | Retaining ring | 28 | Pan head screw |
| 9 | Retaining ring | 21 | Back up plate | 29 | Steel sealing ring |
| 10 | Shaft seal ring | 22 | Taper roller bearing | 30 | Cylinder block |
| 11 | Back up plate | 23 | Shim | 31 | Pressure spring |
| 12 | O-ring | 24 | Taper roller bearing | 32 | Adjustment shim |
| 13 | Locking screw | 25 | Retaining plate | 33 | Control lens |

2) REGULATOR



1	Control housing	50	Relief valve	72	Piston
2	Stroke limiter	51	Adjusting bushing	73	Control piston
3	Port plate	52	Cylinder pin	74	Pressure spring
4	Positioning piston	53	Threaded pin	75	Locking screw
5	Positioning trunnion	54	Seal lock nut	76	Locking screw
7	Piston	55	Pressure spring	77	Socket head screw
8	Threaded pin	56	Spring collar	78	O-ring
10	Check valve	57	Pressure spring	79	Locking screw
13	Valve seat	58	O-ring	80	Locking screw
15	Socket head screw	59	Retaining ring	81	Orifice
16	Socket head screw	60	Control piston	82	O-ring
20	O-ring	61	Control bushing	83	Shim
23	Socket head screw	62	Retaining disc	84	Double break off pin
26	Cylinder pin	63	Locking screw	85	Piston
28	Double break off pin	64	Double break off pin	86	Control piston
32	Double break off pin	65	Double break off pin	87	Pressure spring
33	O-ring	66	Socket head screw	88	O-ring
34	Locking screw	71	Housing	89	Shim

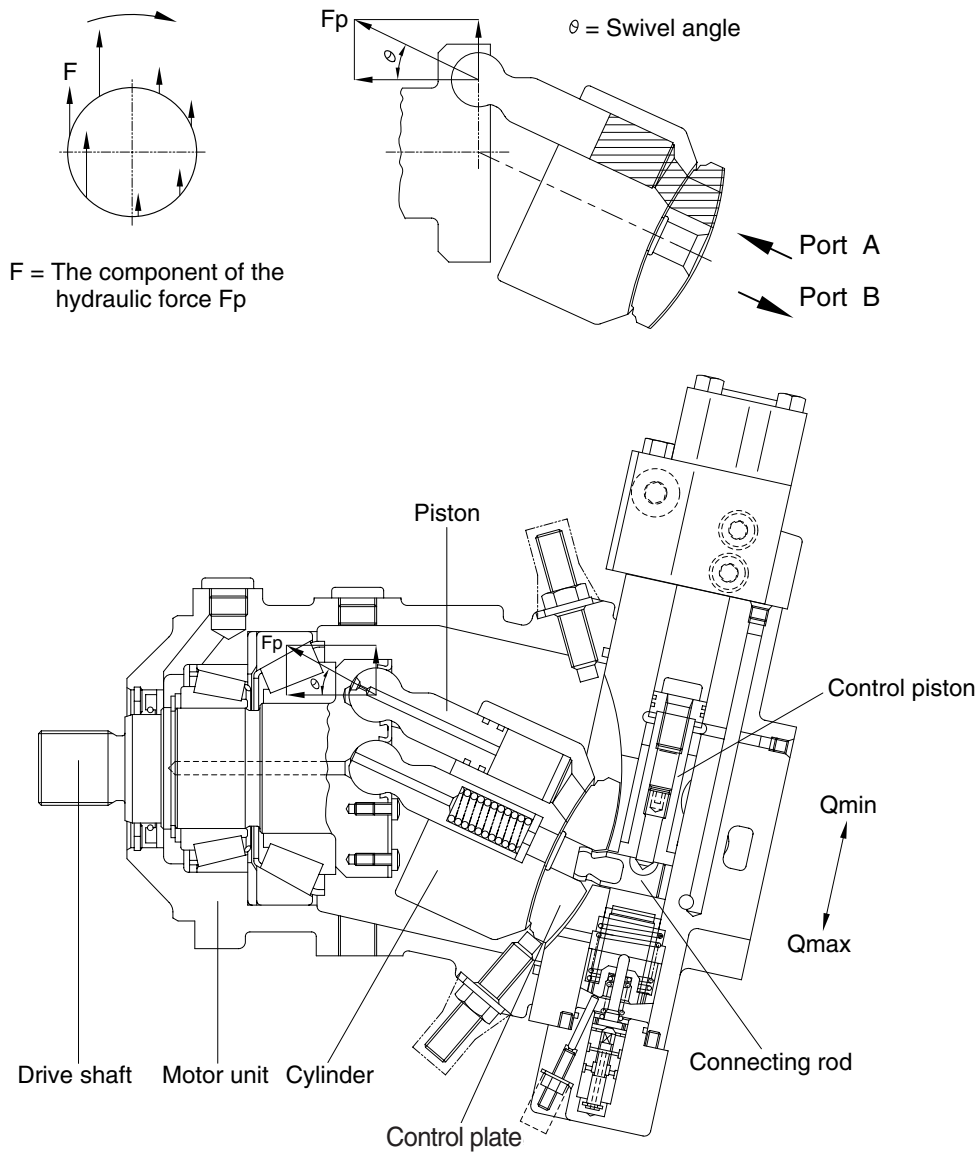
14W92TR03

2. TRAVEL MOTOR FUNCTION

The direction of the drive shaft rotation is dependent on which is the port, port A or port B, the pressure oil shall be connected to.

When the pressure oil is led into the cylinder in which seven pistons are flexibly mounted in a circular formation, pistons press the shaft and set it in rotation. One piston travels one stroke during one rotation, which results in that oil is sucked and discharged. As each of seven pistons continuously acts such movement in turn, the drive shaft can do rotary movement smoothly. The component of the hydraulic force acting on the piston produces turning effect. Therefore, as the swivel angle becomes larger, the turning effect becomes larger. In addition, as the travel angle becomes larger, the displacement becomes larger, which results in that the operating speed becomes slower.

The control plate is connected to the control piston by means of the connecting rod, and the swivel angle is dependent on the position of the control piston.



14W92TR05

3. REGULATOR FUNCTION

HA function

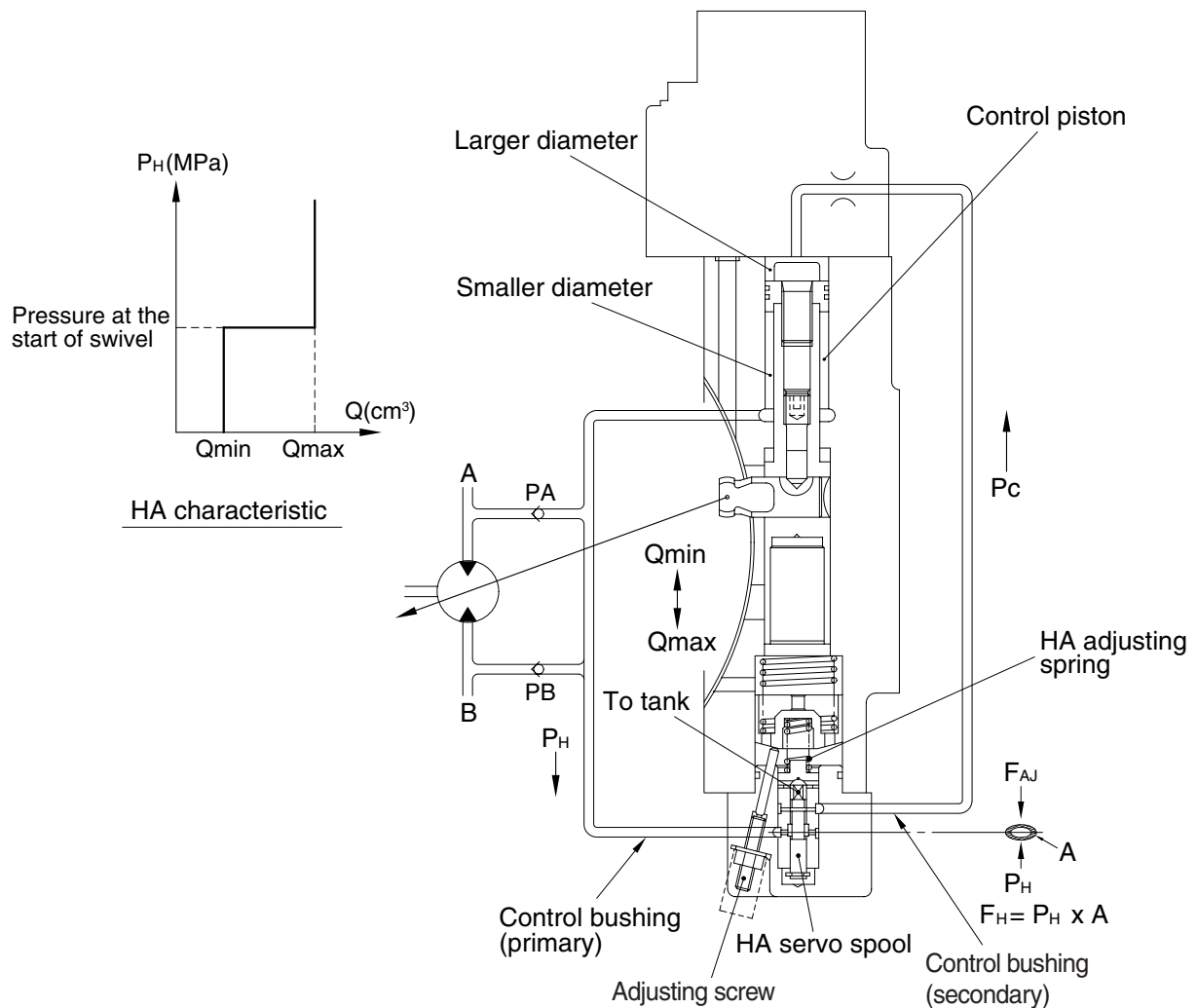
By sensing the load, the displacement varies.

HA operation

The high pressure P_H at the either side of port A or port B is selected by the shuttle valve fitted in the counter balance valve, and it is led into the smaller diameter of the control piston and the spool.

If the circuit pressure value is lower than the pressure value at the start of swivel, the control pressure P_c acting on the larger diameter of the control piston becomes zero, and thus the swivel angle is the minimum. On the contrary, if the circuit pressure value is higher than the pressure value at the start of swivel, the spool is shifted and the control pressure increases, which causes the control piston to move toward the larger swivel angle.

The traveling speed is variable in proportion to the load pressure, by means of the function above. When the load pressure is high, for example, at starting or at climbing a slope, the swivel angle is set to be the maximum, and the torque is be the maximum. And as the load pressure drops down, the swivel angle is getting smaller, which results in higher speed of traveling. When the load pressure is low, for example, traveling on the flat, the swivel angle is set to be the minimum, which results in the maximum speed of traveling.



14W92TR06

4. RETARDING FUNCTION

When the travel motor operates as a pump at putting on a brake or going down a hill, it causes braking pressure (counter pressure). By using this braking pressure, the displacement will be a little bit larger, which results in a better braking performance. We call that retarding function.

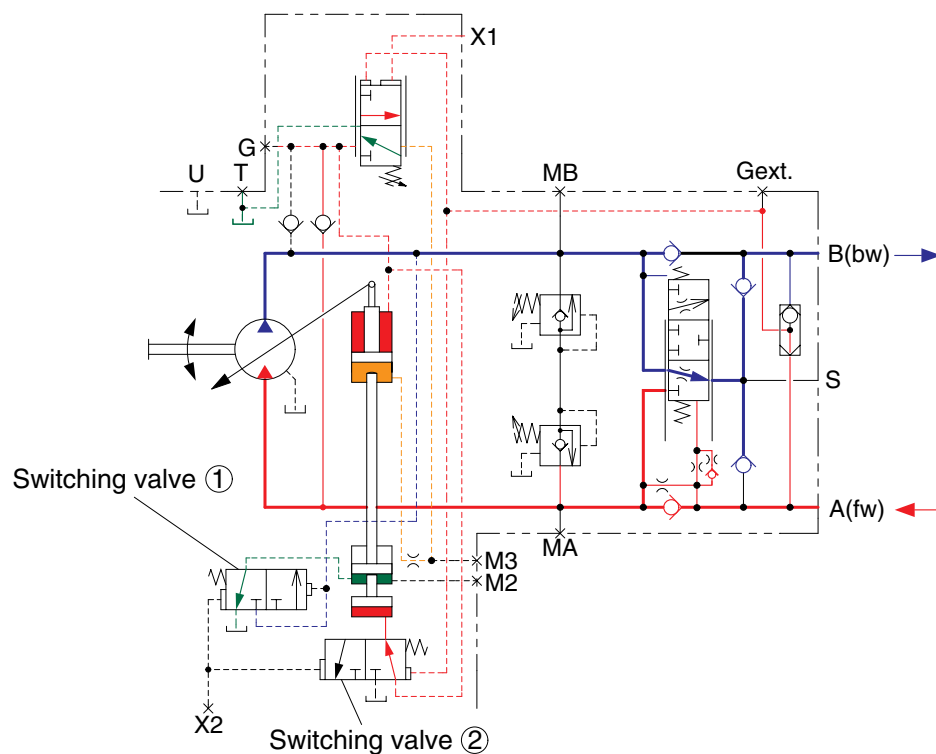
Because there are some concerns that the cavitation occurs when the variation of the displacement is large, it is necessary to select the proper displacement (Q_{mid}) with considering the conditions and the feeling over the real machine.

In running at port A pressurized (Fig TR07), the pressure at port MB becomes a high pressure at the brake. When that pressure exceeds the setting pressure of the switching valve ①, the switching valve ① shifts and the high pressure line connects with port M2. This causes the control piston to move toward the larger swivel angle and thus the displacement becomes a middle displacement (Q_{mid}) (Fig TR08). In this case, the pressure at port X2 is unloaded.

We recommend that the pressure at the start of swivel be about 2 MPa lower than the setting pressure of the switching valve ① and the setting pressure of relief valve be about 4 MPa higher than the setting pressure of the switching valve ①. Furthermore, by pressurizing port X2, the switching valve ① is kept off-state and the displacement doesn't changes (Fig TR09).

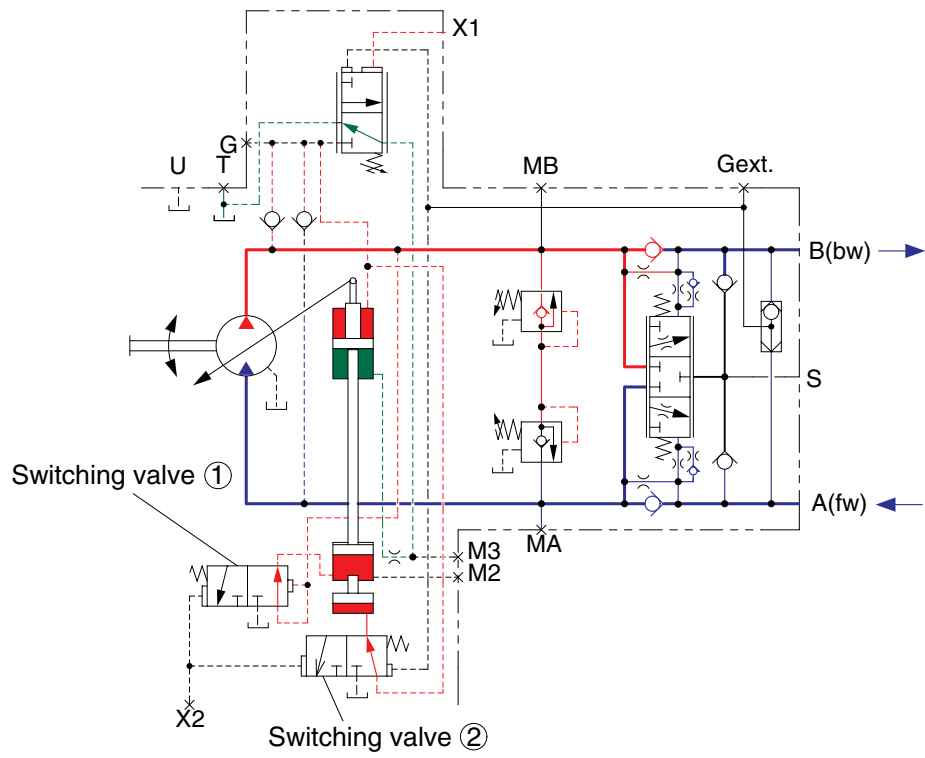
※ : The switching valve ② has the function to select the displacement in proportion to the gear ratio (first gear or second gear), by pressurizing port X2, the switching valve ② becomes on-state and the minimum displacement at first gear is selected.

1) IN RUNNING : Port X2 : unloaded



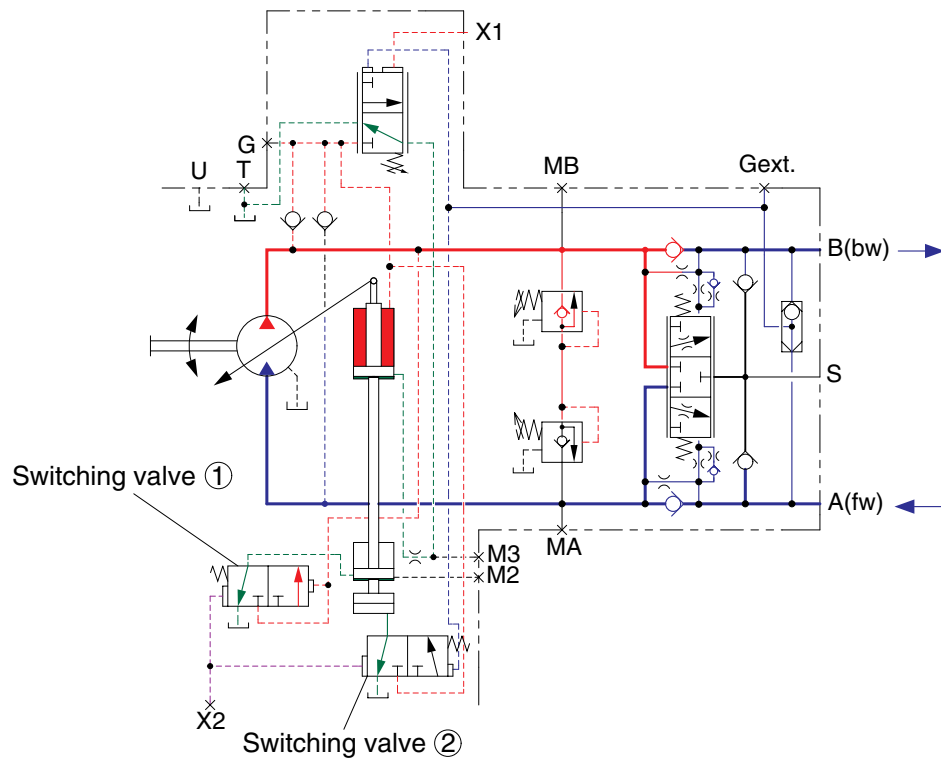
14W92TR07

2) IN BRAKING : Port X2 : unloaded



14W92TR08

3) IN BRAKING : Port X2 : pressurized



14W92TR09