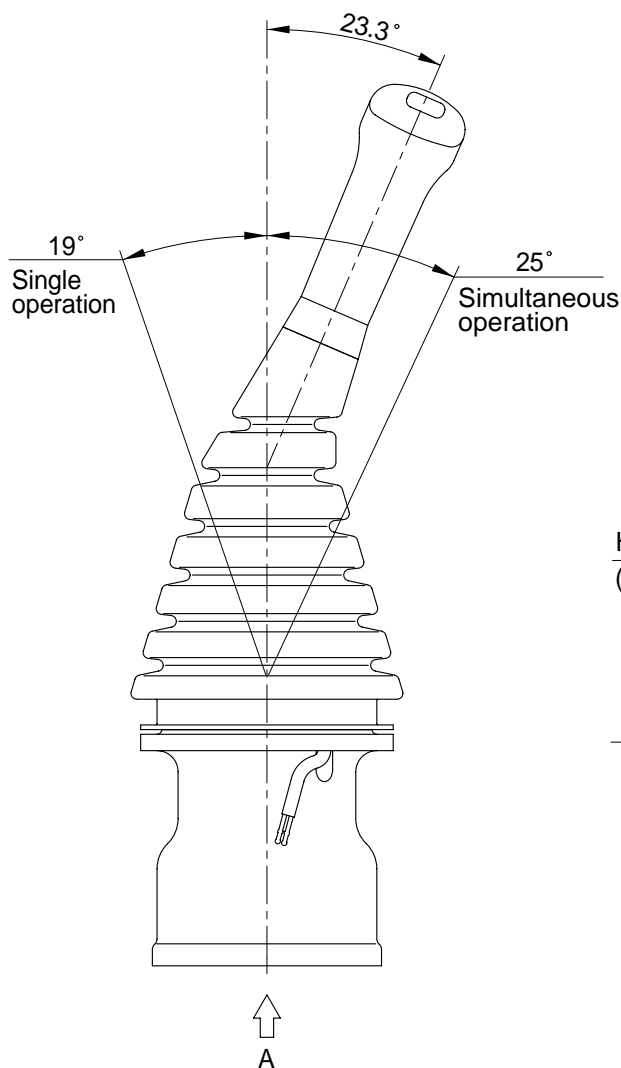


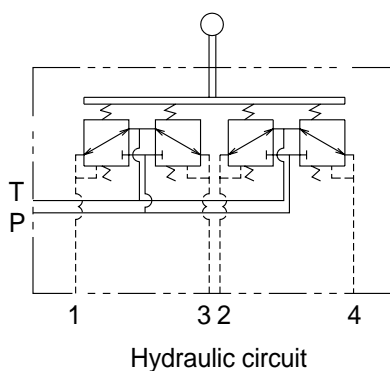
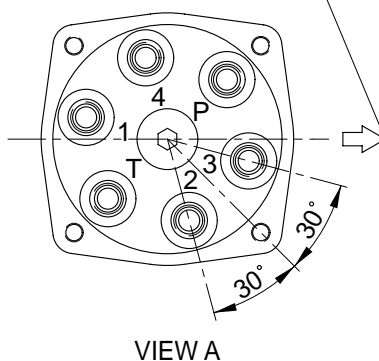
## GROUP 5 RCV LEVER

### 1. STRUCTURE

The casing has the oil inlet port P(Primary pressure) and the oil outlet port T(Tank). In addition the secondary pressure is taken out through ports 1,2,3 and 4 provided at the bottom face.



Handle bending direction  
(No. push rod direction)



Port	LH	RH	Port size
P	Pilot oil inlet port	Pilot oil inlet port	PF 1/4
T	Pilot oil return port	Pilot oil return port	
1	Left swing port	Bucket out port	
2	Arm in port	Boom down port	
3	Right swing port	Bucket in port	
4	Arm out port	Boom up port	

## CROSS SECTION

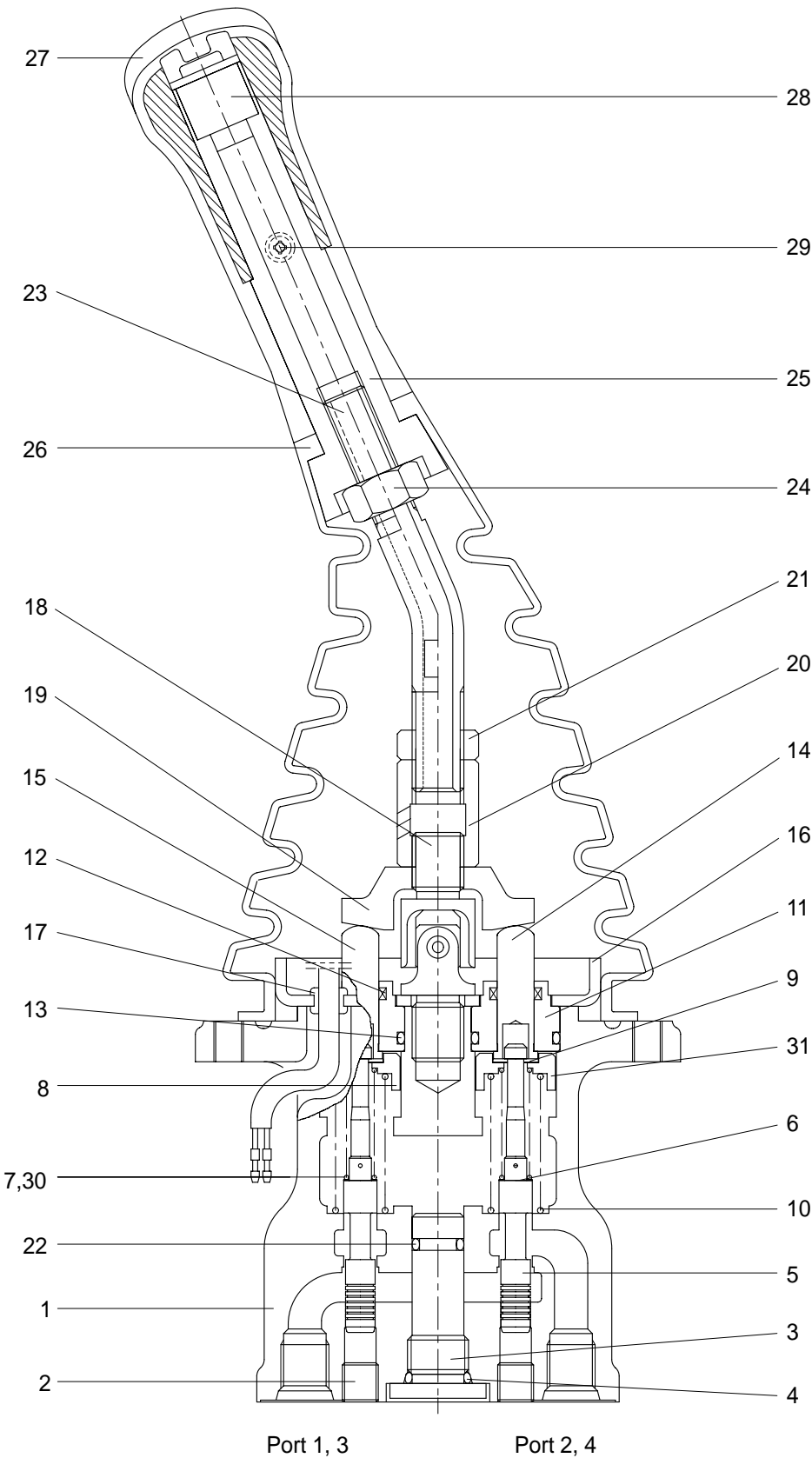
The construction of the pilot valve is shown in the attached cross section drawing. The casing has vertical holes in which reducing valves are assembled.

The pressure reducing section is composed of the spool(5), spring(7, 30) for setting secondary pressure, return spring(10), stopper(9), spring seat(8, 31) and shim(6). The spring for setting the secondary pressure has been generally so preset that the secondary pressure is 5 to 20.5kgf/cm<sup>2</sup> (Depending on the type). The spool is pushed against the push rod(14, 15) by the return spring.

When the push rod is pushed down by tilting the handle, the spring seat comes down simultaneously and changes setting of the secondary pressure spring.

1	Case	12	Rod seal	22	O-ring
2	Plug	13	O-ring	23	Handle connector
3	Plug	14	Push rod	24	Nut
4	O-ring	15	Push rod	25	Insert
5	Spool	16	Plate	26	Boot
6	Shim	17	Bushing	27	Handle
7	Spring	18	Joint assembly	28	Switch assembly
8	Spring seat	19	Swash plate	29	Screw
9	Stopper	20	Adjusting nut	30	Spring
10	Spring	21	Lock nut	31	Spring seat
11	Plug				

CROSS SECTION



## **2. FUNCTIONS**

### **1) FUNDAMENTAL FUNCTIONS**

The pilot valve is a valve that controls the spool stroke, direction, etc of a main control valve. This function is carried out by providing the spring at one end of the main control valve spool and applying the output pressure(Secondary pressure) of the pilot valve to the other end.

For this function to be carried out satisfactorily, the pilot valve is composed of the following elements.

- (1) Inlet port(P) where oil is supplied from hydraulic pump.
- (2) Output ports(1,2,3 & 4) to apply pressure supplied from inlet port to ends of control valve spools.
- (3) Tank port(T) necessary to control the above output pressure.
- (4) Spool to connect output port to inlet port or tank port.
- (5) Mechanical means to control output pressure, including springs that work on the above spools.

### **2) FUNCTIONS OF MAJOR SECTIONS**

The functions of the spool(5) are to receive the supply oil pressure from the hydraulic pump at its port P, and to change over oil paths to determine whether the pressure oil of port P is led to output ports 1,2,3 & 4 or the output port pressure oil to tank port T.

The spring(7, 30) works on this spool to determine the output pressure.

The change the deflection of this spring, the push rod(14, 15) is inserted and can slide in the plug (11).

For the purpose of changing the displacement of the push rod through the plate(19) and adjusting nut(20) are provided the handle(27) that can be tilted in any direction around the fulcrum of the universal joint(18) center.

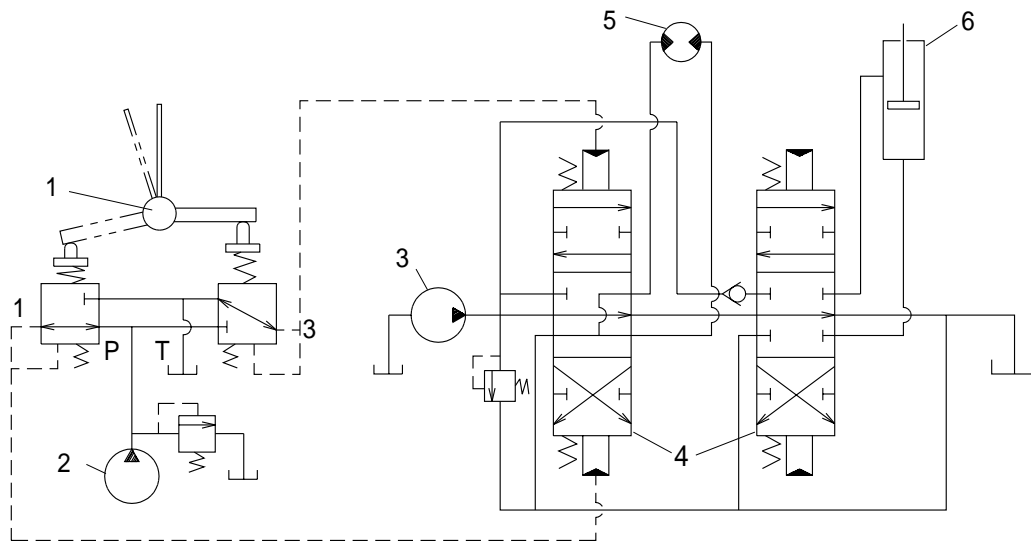
The spring(10) works on the case(1) and spring seat(8) and tries to return the push rod(14, 15) to the zero-displacement position irrespective of the output pressure, securing its resetting to the center position.

This also has the effect of a reaction spring to give appropriate control feeling to the operator.

### 3) OPERATION

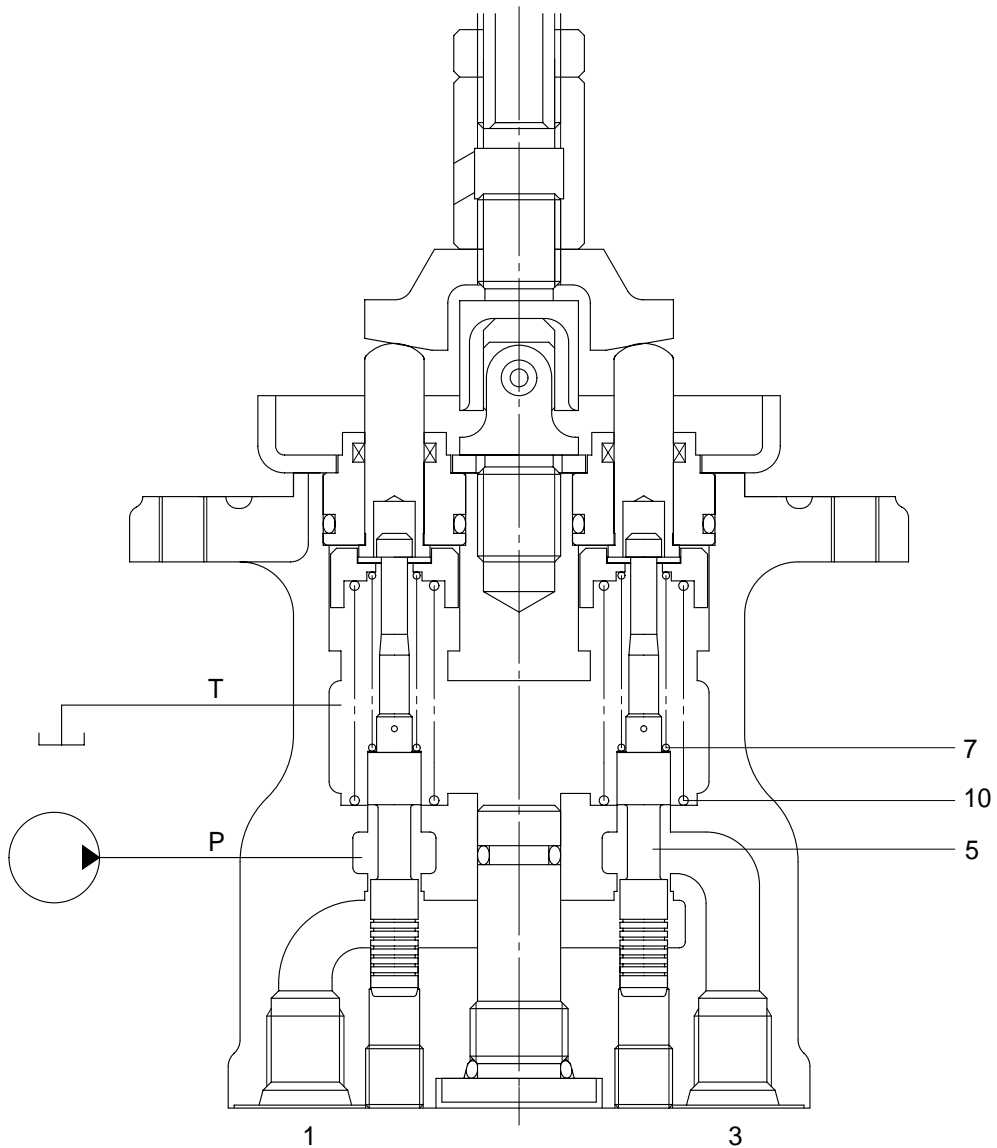
The operation of the pilot valve will be described on the basis of the hydraulic circuit diagram shown below and the attached operation explanation drawing.

The diagram shown below is the typical application example of the pilot valve.



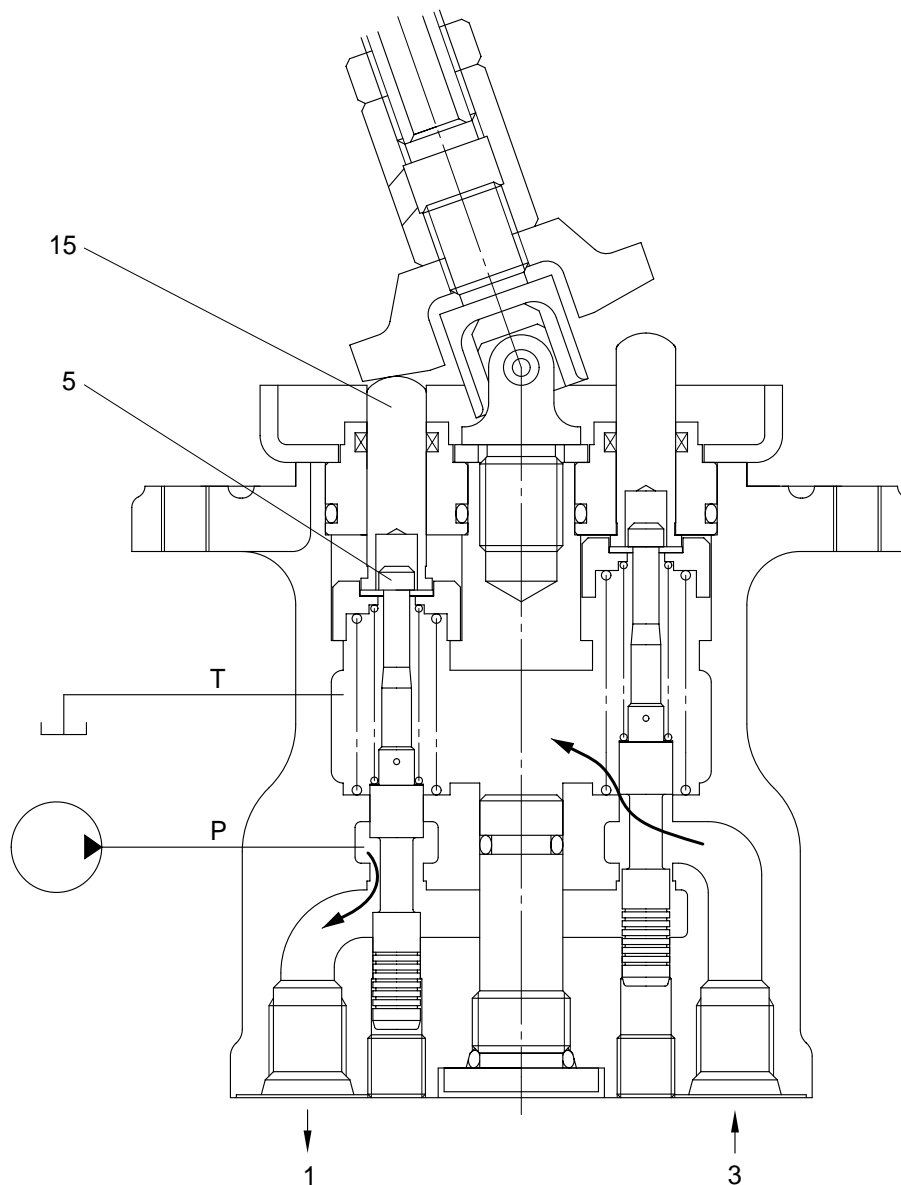
- |   |             |   |                    |   |                    |
|---|-------------|---|--------------------|---|--------------------|
| 1 | Pilot valve | 3 | Main pump          | 5 | Hydraulic motor    |
| 2 | Pilot pump  | 4 | Main control valve | 6 | Hydraulic cylinder |

**(1) Case where handle is in neutral position**



The force of the spring(7) that determines the output pressure of the pilot valve is not applied to the spool(5). Therefore, the spool is pushed up by the spring(10) to the position of port(1,3) in the operation explanation drawing. Then, since the output port is connected to tank port T only, the output port pressure becomes equal to tank pressure.

## (2) Case where handle is tilted



When the push rod(15) is stroked, the spool(5) moves downwards.

Then port P is connected with port(1) and the oil supplied from the pilot pump flows through port(1) to generate the pressure.

When the pressure at port(1) increases to the value corresponding to the spring force set by tilting the handle, the hydraulic pressure force balances with the spring force. If the pressure at port(1) increases higher than the set pressure, port P is disconnected from port(1) and port T is connected with port(1). If it decreases lower than the set pressure, port P is connected with port(1) and port T is disconnected from port 1.

In this manner the secondary pressure is kept at the constant value.

Besides, in some type, when the handle is tilted more than a certain angle, the upper end of the spool contacts with the inside bottom of the push rod and the output pressure is left to be connected with port P.