

## FLUID FLOW EXPLANATION

The fluid flows by gravity from the reservoir ① to the "tee" fitting on the front of the hydrostatic pump ④⑤ . The tee fitting at the hydrostatic pump ④⑤ routes the fluid to the charge pump ⑤⑩ and to the hydraulic pump ⑤② , also return fluid comes from the right hydrostatic motor ⑦ , hydraulic filter ③⑥ and case drain coupler ⑬ .

The hydraulic pump ⑤② is a 2-stage "gear type" pump and is driven by a shaft through the hydrostatic pump ④⑤ . The fluid from the hydraulic pump ⑤②<sup>a</sup> goes to the main relief valve ③⑤ and to the control valve ②⑨ . When all the spools of the control valve ②⑨ are in neutral position, the fluid goes through the control valve power beyond port ②⑥ to the front auxiliary valve ⑨ .

When the lift arms are being raised, the hydraulic pump ⑤②<sup>a</sup> fluid flow is directed to the base end of the lift cylinders ②⑩ . The fluid from the rod end of the lift cylinders ②⑩ returns to the bucket position valve ②① and is directed to the center of the flow-control spool ②③ . The flow-control spool ②③ and flow adjustment valve ②② directs this flow. A percentage of the fluid is directed over the flow adjustment valve ②② to position the bucket. The rest of the fluid is directed through the orifice in the flow-control spool ②③ and on to the return port of the control valve ②⑨ (lift section).

The fluid from the flow-control spool ②③ and flow adjustment valve ②② are against the un-loading spool/pressure relief valve ②⑤ . The un-loading spool/pressure relief valve ②⑤ moves to allow extension of the tilt cylinder ①⑨ as the lift cylinders ②⑩ raise the lift arms. The un-loading spool/pressure relief valve ②⑤ is to relieve fluid from the base end of the tilt cylinder ①⑨ if the bucket is fully rolled out and the lift cylinders ②⑩ are still extending.

When the cylinders ①⑨ ②⑩ reach the end of the stroke, the fluid attains the setting of the main relief valve ③⑤ , which will open and let the fluid by-pass the circuit and go to the hydraulic filter ③⑥ which is joined by return fluid from the front auxiliary valve ⑨ when in use. When the spool goes back to neutral position, there is fluid available for the other sections of the control valve ②⑨ .

The return fluid goes through the hydraulic filter ③⑥ and joins the reservoir ① fluid at the tee fitting. The hydraulic filter ③⑥ has a by-pass valve ③⑨ to allow fluid flow when the fluid will not go through the filter element (plugged). The differential pressure switch ③⑧ is connected (electrically) to the operating system unit. The check valve ③⑦ is there to prevent the reservoir ① from draining when servicing the hydraulic filter ③⑥ .

The charge pump ⑤⑩ fluid is called "charge supply fluid". Charge fluid flows from the charge pump ⑤⑩ to the port block ④③ where it is against the cold oil by-pass valve ④④ . The cold oil by-pass valve ④④ will open when the fluid is cold and is too thick for fluid flow to go through the oil cooler ⑤③ . The charge fluid flows through the oil cooler ⑤③ and to the port block ④③ .

The charge fluid is routed from the port block ④③ to the front auxiliary control valve ⑨ and to the control valve ②⑨ . When the electrical solenoids ①① are energized, the charge pressure will shift the spool in the the front auxiliary control valve ⑨ allowing hydraulic pressure fluid to flow to either the male or female quick couplers ①⑥ . Return fluid from the quick couplers ①⑥ and control valve ②⑨ fluid returns to the hydraulic filter ③⑥ . Also when