DEVELOPMENT OF A REMOTE CONTROL SYSTEM FOR SWITCHING ON/OFF HYDRAULIC PUMPS IN THE CABIN AND EQUIPMENT HYDRAULIC CIRCUITS OF THE AMK-24/56-131 AERODROME MULTI-PURPOSE AIR CONDITIONING UNIT

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In modern conditions, particular attention is paid to improving the quality, reliability, and durability of airfield technical flight support equipment, including airfield multipurpose air conditioners. This task is complex and is included in the list of priority issues of significant state importance.

When replacing the cardan drive of the cabin circuit with a hydrostatic drive using a tandem section of the NSh100-100D-4 gear pump and the GMSh90-3 hydraulic motor, a tandem-type hydraulic pump with two sections is installed on the power take-off shaft of the gearbox. Their type is axial-piston (plunger) with an adjustable swash plate.

During the operation of the hydrostatic transmission (HST), the rotation of Section No. 1 and Section No. 2 of the tandem hydraulic pump is transmitted from the internal combustion engine of the ZIL-131N vehicle, and the working fluid (WF) is pumped to the hydraulic motors in the direction of the cabin and equipment circuits, depending on the required operating mode of the airfield multipurpose air conditioner (AMAC). Stepless adjustment of the pump's displacement and the direction of WF supply for hydraulic motor rotation is achieved using a follow-up principle regulator with mechanical feedback (FB) between the control device (servo valve) installed in the control unit located in the AMAC cabin and the hydraulic cylinder that directly acts on the pump's swash plate. The servo valve of the hydraulic distributor is actuated remotely by proportional solenoids, which simplifies the kinematic connections between the pump and the operator (replacing mechanical linkages with electrical wiring) and automates the operation of the HST.

Thus, we install pumps with 'constant pressure' regulators in the HST of the ABK's technological equipment, equipped with an automatic 'constant power' regulator, which ensures constant power at the pump shaft by redistributing hydraulic power parameters - flow and pressure. The signal for the corresponding change in hydraulic power components in the regulator is the external load on the HST's hydraulic actuator.

The automatic 'constant power' regulator is used in non-reversible axial-piston pumps with a swash plate design manufactured by the Vinnytsia Aggregate Plant (Vinnytsia), featuring a hydraulic flow limiter. In this system, displacement control is performed by the operator by generating pressure in the cavity within a range of 0.69 to 1.89 MPa using an external pressure-reducing valve.