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REPAIR OF COMBINE HARVESTERS FOR GRINDING GRAIN, GRAIN PROCESSING PRODUCTS AND FEED INGREDIENTS

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To grind grain at grain processing plants, roller mills, grain crushers and other equipment are used. At the feed mills, all types of grain, corn in heads of cabbage, oilcakes, mineral raw materials are crushed using a crusher hammer (DDO, DDA, DMB and others).

Repair of roller machines. The machine is cleaned before disassembling for repair. Disassembly is carried out in the following sequence: remove the upper and lower covers, remove the brushes, shields, valves, the bottom of the feed box. Disconnect the screw of parallel approach of the rollers from the piston rod of the hydraulic machine. Loosen the nuts tightening the damping spring, remove the steering gear from the machine. Unscrew the horizontal tie bolts and remove the right and left upper inserts. Remove the guard from the drive and the sheepskin coat from the gear drive and grinding rollers. The pulleys pull together the drive pulley and gear wheels, as well as the covers from the upper bearing housings, loosen the lug bushings, suspend the upper roller, remove the bearings and remove the upper grinding roller with the help of the hoist. Fasten and remove the bottom inserts. The lower roller is suspended, fastened and removed from the axles of the bearing housing. Take out the bottom roller. Remove the automatic hydraulic control. Attach and remove the circlips and feed roller bearing housings, and then remove the feed rollers. Having fastened the clamps,

remove the feed tube. Remove the float and the system of levers, remove the sector valve, the power regulation mechanism. If necessary, take out the halt - dump shaft.

After disassembly, the machine and its components are cleaned again. Cracks appear in the machine bed during operation and break off, they are eliminated by one of the existing methods of welding cast iron. In the course of long-term operation, fastenings are loosened, door frames, handles and hinges are destroyed, gelatinization with products of grinding of the aspiration channels and the walls of the bed takes place. A bed with large cracks is discarded. Replace damaged doors and hinges.

During the operation of the feeding mechanism, the necks of the rollers, bearings, gear, seating surfaces in the gearbox covers are triggered in it. Fork fingers and clutch teeth are triggered. The wear of the gear wheel and the shank of the feed roller drive leads to the failure of the mechanism for switching on these rollers when the grinding rollers come to rest-dump. In the power regulation mechanism, the screw of micrometric regulation of the sector valve of its hinged joints, as well as the feed rollers, is jammed as a result of winding fiber materials that enter the machine along with the grinding products.

After disassembly, the feeding mechanism is cleaned before repair. Worn bearings, springs are replaced. Gears, rollers, claw clutch are renewed. Eliminate all misalignments, adjust the sector valve and screw mechanisms. Instead of worn out bolts and screw fasteners, new ones are installed. Oil change in gearboxes. After repair, the feeding mechanism is assembled and adjusted, and not adjusted while the mill is running.

During the operation of the steering mechanism, the thread of the nuts is triggered and pulled, the teeth of the ratchet wheel, the eccentric drum. There are cases of screw bending and rudder destruction due to improper disassembly of the machine. Defective screws and nuts are replaced. With a slight bend, the screw is straightened, the stripped thread is calibrated. The steering wheel, ratchet wheel and pawl are replaced with new ones. After the repair, the assembly is assembled, the damping spring in the working position is tightened to a force of 3.00 - 4.00 kN.

In the inter-roller gear transmission, due to improper selection, loose fit, misalignment of the gears, as well as due to loose keys and lack of lubrication, teeth are triggered and destroyed. The loosening of the keys leads to an axial displacement of the gears, which rub the sheepskin coat, breaking its tightness. Large and small gears with worn out teeth are replaced. Instead of worn out keyways, new ones are made, shifting them by 90-120°. The worn grooves of the dowels on the roll necks are renewed by melting them and subsequent turning and milling. Crumpled and deformed keys are replaced with new ones.

The gears are selected in such a way that in the pressed position of the grinding rollers the tops of the teeth of one gear do not rest against the depressions of the other, and the center-to-center distance of the gears is less than the center-to-center distance of the rollers, no more than 2 mm. When selecting gears, the gear ratio must correspond to the purpose of the machine.

The hydraulic automat and the feeding mechanism fail due to improper operation, poor inspection and oil leakage. most often gears, bearings, gear pump rollers, spool roller and housing wear out in a hydraulic machine. If the cover does not

fit tightly, the oil becomes contaminated, which leads to the closure of the channels, the seizure of the walls of the hydraulic cylinder and the disruption of the interaction of all units. The teeth of the large intermediate gear of the pump drive, the clutch cams are triggered.

Worn bearings, gaskets are replaced. Gears, rollers, cam clutch, gear pump housing, spool roller renew. The hole for the spool is rubbed with cast iron laps, and the roller itself is rubbed against the bushing. The spool is ground in accordance with the bore size for the minimum fit of the 1st accuracy class.

During the operation of the machine, the hinged joints of the levers are triggered, they are jammed, the guide plates of the floats are destroyed and deformed, the feathers of the float are destroyed. The levers disassembled for repair are cleaned of adhering product, achieving ease in the operation of the hinge joints. New feathers are welded onto the float to replace the damaged ones or the entire float is replaced. Deformed guide plates on the floats are straightened or made new from sheet steel. The worn out brush mechanism is replaced with self-supporting brushes.

Repair of grinding rollers. Grinding rollers are the main working element of all types of roller machines.

During the operation of the machine due to friction, the rollers heat up, heat is transferred to the roller bearings, as a result of which they wear out intensively and damage their cages, cages and rollers. Premature bearing failure is also facilitated by frequent misalignments of the rollers, their vibration, and excessive interference with the plug of the self-aligning sleeve. Vibration from loose bearings will result in roll spraying, shearing of fastening bolt threads, bearing housings, and shearing of threads in the machine bed. Due to distortions, one-sided spraying of the surface of the rollers takes place. Incorrect operation will lead to premature spraying of the drum reefs.

The penetration of foreign solid objects between the drums during operation causes the axlebox shank to break down. Inhomogeneity of the metal, poor quality of heat treatment of the surface of the rollers leads to a change in shape and the formation of an ellipse-like and barrel-shaped surface.

Replace damaged bearings, pins, bolts. In the bearing housings, a thread of repair size is cut. The roll necks are welded and grinded to the nominal size. The worn surface of the rollers is ground and reefs are re-cut. If it is impossible to use the repair size of the rollers, they are fused with high-carbon electrodes in gas-flame protection, after mechanical treatment they are subjected to thermochemistry processing (borating + hardening). The hardness of the renewed surface must be at least HRC 45-50. The roughness is applied to the working surface of the rollers using corundum bars of different grain sizes or by an electric spark method.

After repair, the machine is checked at idle speed. In this case, there should be no overheating of the bearings, knocking in the gears, the steering spring should be compressed without permanent deformation. When working under load, the product is uniformly dispensed over the entire width of the machine. The machine must operate without noticeable vibration, noise and knocking.

Crusher repair. During the operation of crushers, the following are intensively triggered: feeder, rotor with hammers, bearings, sieves and decks. To repair individual parts, the crusher is disassembled. The feeder is disassembled by removing the drive

motor, performing the mechanism, disassembling the rail valve and the drive mechanism. The gate valves are replaced together with the rack.

During operation, the rotor with hammers is triggered the most in comparison with other crusher units. When the hammers are worn out, they are returned 180°, this operation can be repeated 3 times, so all four corners of the hammer will work without disturbing the balance of the rotor. When replacing worn hammers, the rotor is balanced. For this, sets of hammers that are on one rod are weighed. Two sets of closest weight are installed on diametrically opposite bearing rollers of the crusher rotor in one plane.

The rotor shaft is balanced and balanced statically and dynamically. After repair, before starting, check the direction of rotation of the rotor. The crusher must operate without vibration and noise.