Dual centering plate steering is difficult to adjust or operate.

Problem or Situation:

Neutral difficult to adjust or engine pulls down when started.

High hydrostatic lever effort or levers return slowly.

Cannot attain full reverse speed.

Tracking difficult to adjust.

Machine difficult to control in tight quarters.

Solution:

With machine on blocks, disconnect hydro links (KV19242 and KV19238) from hydro arms (KV13485) on front and rear hydro pumps. With the engine running, move each of the hydro arms froward and back to insure the effort is equal and full travel attained. Check forward and reverse wheel speed to insure they approximately equal. Reason: This insures full and free operation of hydrostatic pumps.

Insure plastic bushings (KV11139) on top centering plates and mating guide pins (KV16703) are in good condition. Reason: Wear or damage can cause binding of the centering plate or difficulty in maintaining neutral adjustment.

Insure the hydrostatic arms (KV13485) are tight on the swash plate shafts (KV17869). Reason: A loose arm will result in difficulty in maintaining the neutral adjustment.

Insure neutral adjustment screws (KV11142) have a flat surface. If a step is worn in the head of the adjusting screw, replace it with a hardened adjusting screw (KV21362). Reason: A worn step on the screw head makes neutral adjustment difficult and hard to maintain. In extreme situations the mating ball bearing (AT23189) may need to be shimmed upward with washers to insure full ball bearing to adjusting screw contact, and therefore more surface area contact.

Check the diameter of the hole for the centering spring bushing (KV16779) in the top centering plate (KV20107). The diameter of the hole on 260 and 270's is 29.6 +/- 0.15 mm (1.165 +/- 0.006 in). The 240 and 250 plate will be either 29.6 +/- 0.15 (1.165 +/- 0.006) in or 30.65 mm +/- 0.25 mm (1.207 +/- 0.010 in). If the top plate is "fishtailing" excessively and has the large hole, install a new plate (KV20107) to tighten the fit with the centering spring bushing. Reason: An oversize hole will make neutral adjustment difficult because the top centering plate will fishtail excessively when the hydro lever is moved. A small amount of fishtailing of the top centering plates is normal.

Adjust neutral per normal instructions with the hydro linkage disconnected. Reason: This insures neutral can be attained with no outside influences from the external linkage. The centering plate to mounting plate gap is normally 2.5 - 3.5 mm (approximately 1/8 in). If one hydro arm returns quicker than the other, the gaps on the front and rear centering plates can be adjusted to a slightly different dimension to equalize spring tension and speed of return.

With the external links (KV19242 and KV19238) disconnected from the hydro pumps, move the hydro linkage to insure all pivots are free. Replace any ball joints (KV16380 or KV16381) on the dampers or linkage that are tight. Insure that the ball joints will rotate as well as swivel. Reason: Tight ball joints result in higher lever effort and slower lever return. A test is to loosen the cap screw through the ball joint slightly and move the lever to determine if the ball joint is tight restricting movement. Also insure there is no interference between the linkage and other components. On 260 and 270 machines the springs (KV17868) on each end of the bellcrank shaft are to be discarded when 00KV010 Steering PIP is installed.

Insure there is clearance between Foam Pad (KV12120) located under the seat and the heads of the cap screws that attach the KV12236 adjustment screw bar to the centering plate. Reason: If there is interference the steering may not return to neutral due to the interference.

Disconnect dampers (KV17852) and operate rods manually to insure both dampers have approximately equal force versus time on extend and retract movement. Reason: Unequal or high resistance dampers can cause higher lever effort or slow lever return.

Damper test: Hang the shock, where the rod will be extending downward. Apply a twenty (20) pound weight to the rod and measure the length of time to fully extend the shock. Max time: 2 seconds. Next, stand the shock up so the rod will be pushed into the shock. Apply a twenty (20) pound weight and measure the time to fully collapse the shock. Max time: 2 seconds. If shock exceeds these maximums, it can still be used, but will cause higher lever efforts.

Connect the hydro links to the hydro arms and adjust the hydro lever position as described in normal instructions. Check if the right link (KV20742) moves upward at the hydro arm (KV13485) when moving the hydro lever resulting in lost motion. Replace or shorten the bushing (KV16819) if needed, but do not shorten to the point the link clevis clamps onto the rubber bushing of the hydro arm. Reason: Lost motion will delay movement of the right side swash plate.

If the right bellcrank contacts the auxiliary hydraulic line located at the 240 or 250 main control valve when in reverse, insure the engine is centered on its mounts. If the engine mounts are correct, the line can be bent to provide clearance. This problem is more likely on a high flow machine because of the larger auxiliary tube diameter. If bending the line is not practical, replace the line with KV20664 line on standard flow machines or KV20666 on high flow machines.

Reverse speed can be up to 15% slower than forward. If reverse speed is a concern, insure adjustments of tracking and the hydro lever positions are correct. Inspect the clevis on the right bellcrank (KV19327) to hydro link (KV19242) for clearance with the weld on the bellcrank. Grind some material off of link clevis if needed to provide clearance, or order KV20742 link. Reverse (or forward) speed can also be limited by bottoming of the dampers (KV17852). Disconnect the dampers and move the linkage to determine if the dampers limit the distance of the linkage movement. If dampers are bottoming out, the number of washers (24M7106) under the ball joints (KV16381) can be changed, but insure adequate thread engagement of the ball joint is maintained. If full linkage travel cannot be obtained by adjusting the number of washers, the bottom mounting hole for the dampers can be moved up 16.4 mm on the 240 or 250 to provide additional reverse speed, or the mounting bracket can be replaced with KV20084 bracket. The bracket change would only be necessary on machines with the 00KV010 Steering PIP which have early production steering mounting brackets.

Check that clearance between the non-anchored end of the bellcrank shaft (KV16717) and the steering mounting bracket is a maximum of 1 mm. Reason: Excess clearance due to a worn hole will result in loss of tracking, difficult adjustment of detent, or less positive lever to hydro control. Welding a JD8554 locking collar to the steering mounting bracket and tightening the lock screw can eliminate the movement of the non-anchored end.

Insure the cap screws retaining the KV20751 Pillow Blocks to the frame are tight. If the pillow blocks are loose, tracking will be difficult to adjust and maintain because the hydro lever and linkage will be able to change position slightly.

Insure the clearance between the detent collar (KV19308) and the bellcrank (KV19327) tube containing the detent ball is approximately 1.5 - 2 mm. Bend the tube bracket if needed. Reason: This to insure the detent is not too tight or too loose resulting in difficulty releasing the levers from one another in a turn or lack of one hand control operation.

Insure the threads in the detent ball housing extend only 20 - 22 mm into the housing. If the threads extend further, use a small ball grinder to remove the lower threads. Also insure the detent ball housing is packed with lithium grease. Reason: This prevents the detent spring from lodging on the threads and causing the detent ball to lock making separation of the hydro levers difficult.

After adjusting tracking, insure the hydro levers are aligned when pulled fully forward. If not, the lever position adjustment will need to be changed. Always readjust the tracking stop screws after adjusting the lever position links (KV16389).

Insure there is no linkage contact with the auxiliary hydraulic control cable. Reroute cable if needed. Reason: Contact can prevent the linkage staying in detent.

Do "Ball Detent Adjustment" last in the adjustment procedure (after lever position and tracking adjustment). Leave the set screws on the detent collar loose until ready to adjust the detent. Do the detent adjustment with the hydro levers in neutral. Reason: Doing detent adjustment last results in more accurate and easier adjustment of the tracking.

Additional Information:

If the both hydrostatic levers are released when driving at full speed forward, the skid steer will turn to the left slightly as it comes to a stop. When going in reverse and releasing the levers the machine will abruptly turn to the left because of less weight on the front. Reason: The right hydro steering link (KV19242) is longer than the left link (KV19238) and travels at an angle requiring more time to return to neutral. Releasing the levers is not a normal or recommended practice.

When accelerating forward from a stop the skid steer may turn to the right slightly. Reason: The right hydro link (KV19242) is longer than the left link (KV19238) and travels at an angle requiring slightly more time to react.

A machine that is sitting on a slope with the engine running and the brake disengaged can slowly creep down the incline even thought the neutral adjustment is correct.