

STEERING GEAR SERVICE NEWS
(KAWASAKI ELECTRO-HYDRAULIC STEERING GEAR)

NO.:E8-07-005

SUBJECT : Maintenance and Check of Pump Neutral Position for E Series Steering Gear

It has been reported that aboard a vessel provided with an E Series (electrical pump control) steering gear, the rudder was slightly moving when the operation was changed from FU (Follow-up Mode: normal steering) to NFU (Non Follow-up Mode) in a short period after ship's delivery.

This was caused by deviation of the pump neutral position resulting from movement of the adjusting pin of the pump control unit. Deviation of the neutral position, if it occurs, does not necessarily result in drastic reduction of the steering function on account of the feedback control, and is difficult to be found. But this deviation can be confirmed in the NFU operation, so we would like you to add the new check items below to your items to be checked before voyage.

In relation to this, the adjustment procedure has been partially changed from the conventional one, so you are requested to proceed with the adjustment work from now on referring to the attached new adjustment procedure.

[Steering gear types to be applied]

FE and RE Types

New check items to be added before voyage

- ① Check that the rudder (ram) is almost stopped in the NFU (Non-Follow-Up Mode) before voyage.

This can be checked by setting the steering mode of the steering stand on the bridge to NFU, keeping the steering lever to the zero-degree steering angle position, and operating one unit of the pump.

- ② On that occasion, if movement of the rudder (ram) reaches 0.5 degrees/min or more, proceed with the adjustment referring to the attached "Instruction for Zero-Adjustment of Pump Control Unit (OO905532)."

KAWASAKI HEAVY INDUSTRIES, LTD.
PRECISON MACHINERY COMPANY
CUSTOMER SERVICE DEPARTMENT

KAWASAKI ELECTRO-HYDRAULIC STEERING GEARS
INSTRUCTION FOR ZERO ADJUSTMENT
OF PUMP CONTROL UNIT

1. Start the electric motor for Servo Pump first, then start the electric motor for Main Pump.
Caution: Don't turn on the electric power of Control Box.

Note: If the same starting button is used to turn on both Servo Pump and Main Pump, sequential control system is provided so as to start Main Pump after the power of Servo Pump is turned on. Also check this sequential control system.

Under this condition, Steering Gear shall be at unload condition. If Steering Gear is moved, however, unload valve must have malfunction. In this case, stop each electric motor immediately and check the unload valve of valve unit (Fig.2).

2. Confirm if the pressure of Servo Pump is 1.8 - 2.0 MPa{18 - 20 kgf/cm²} when Pump Control Unit (Fig.1) is at neutral position. In case that it is different from the above mentioned value, adjust the relief valve for Servo Pump of Valve Unit (Fig.2).

Note: When the servo piston of Pump Control Unit is moving, the pressure is down to almost 1.0MPa{10 kgf/cm²} at the moment.

3. Turn the pump control knob on Torque Motor (Fig.1. 2704) to the right side limit by hand, then release the knob. Confirm if the knob returns to neutral position. Also check to the left side limit as same procedure.

The pump control knob returns at different speeds to the right side or to the left side due to the differences in oil passage. This is not a fault.

4. Turn the pump control knob right and left slightly, and confirm if Torque Motor is at neutral position.
5. Push in the emergency manual button (red) of unload valve, fix it with lock nut (Fig.2), so that Steering gear is on load condition. And ensure that ram is not moved under this condition.

Pump Control Unit was already adjusted to zero position at our works. However, if it is necessary to re-adjust the unit, adjust it according to the following procedure.

5-(1) Remove the protective cap (Fig.1) of zero position adjust unit in the Pump Control Unit.

5-(2) Grab the adjusting pin (Fig.1, 2802) with large monkey spanner (about 300 mm), and turn to the right or left slightly to find where the ram stops.

Don't loosen set bolts (Fig.1, 2816, 3 pcs) of the adjusting pin before the adjustment.

5-(3) If set bolts of the adjusting pin are loosened, tighten the three set bolts to $6.9 \text{ N} \cdot \text{m}$ $\{70 \text{ kgf} \cdot \text{cm}\}$ uniformly by using torque wrench, then turn the adjusting pin to adjust to zero position.

Notice : Set bolts (Fig.1, 2816) must NOT be tightened after the adjustment of adjusting pin.

6. Release the lock nut of unload valve, so that Steering Gear is unload condition.

