

The Hetman Wrench: Instructions for Use

The clutch replacement should begin by positioning the gearbox with the shield facing upwards. Remember to secure vents to prevent oil spillage, especially from the mechatronic module, as it can cause permanent damage.

1. First, remove the retaining ring of the upper hub of the clutch disc.
2. Remove the hub of the clutch disc; remove the retaining ring from the shaft.
3. Put the support sleeve "A" on the shaft, then install the 3 hooks on the clutch basket.
4. Use knurled nuts to screw the wrench to the hooks.
5. Remove the clutch basket from the hollow shaft by inserting the pin of the wrench/instrument. Remove the clutch basket with the disc.
6. Remove the small thrust bearing with the shim.
7. Remove the large thrust bearing with the shim and the trip lever.
8. Remove the two screws of the yoke; remove the yoke and the trip lever with the pilot sleeve.
9. Remove the ball joint seat of the trip lever. Check seals of the shaft.
10. Remove the accumulated dirt. Apply a small amount of grease on the splines of the input shafts.
11. Begin mounting by installing a new ball joint seat of the trip lever.
12. Install a new, small trip lever with the pilot sleeve and a new yoke.
13. Tighten the new bolts with a torque of $8\text{Nm} + 90^\circ$.
14. Ensure the correct position of the trip lever in the ball joint seat and on the follower of the mechatronic module.
15. Install a new large trip lever with the thrust bearing.
16. Ensure the correct position of the trip lever in the ball joint seat and on the follower of the mechatronic module.
17. Insert the thickest 2.8 mm shim into the large thrust bearing.
18. Apply the setting gauge "B" to the large thrust bearing. Place a weight on the setting gauge and check whether the setting template can be slipped into the groove of the retaining ring on the shaft. The setting template should be inserted to the groove gently and without pressure on the gauge or the weight.
19. If this is not possible, replace the mounted shim with one size thinner and try again to insert the setting template to the groove. Repeat this process until the setting template can be inserted into the groove of the retaining ring.
20. If the setting template can be installed correctly, check the levers' play. They should move max. 0.1 mm. Take into account the individual tolerance of the clutch 1, K1.
21. The value of the tolerance can be found on the clutch. It is referred to as K1 and varies between -0.40 mm and + 0.40 mm. In accordance with the sign + or -, subtract or add the individual value of the tolerance to the selected thickness of the shim. A shim with the calculated size should be inserted into the large thrust bearing of the clutch K1. Make sure that the shim is placed in the cavity provided for this purpose.
22. Insert the thickest 2.8 mm shim into the small thrust bearing of the clutch K 2; make sure that the plastic cogs are sitting in the grooves of the shim. Position and insert the small thrust bearing of the clutch K2. Make sure that the plastic cogs are placed in the grooves of the thrust bearing. If the shims do not have cogs, first place the bearing, and then the shim on the bearing.
23. Apply the setting gauge "A" on the small thrust bearing. Put the weight on the setting gauge. Check if the setting template can be inserted into the groove of the retaining ring on the shaft. Take into account the individual tolerance of the clutch 2, K2, similarly as with the clutch K1. Install the shim with the calculated size and the small thrust bearing; make sure that the cogs are placed in the grooves of the shim and the thrust bearing.
24. Put the new clutch basket on the shaft. Check if the clutch is properly fitted on the shaft. To do this, measure the distance between the top edge of the inner ring of the clutch and the frontal area of the shaft. The distance cannot exceed 8 mm.
25. Place the thrust sleeve "B" on the inner raceway of the clutch bearing.
26. Put flanged nuts on the three screwed pins at intervals of approx. 120 degrees to the gearbox housing.
27. Mount the wrench disc to the pins using three spacers.
28. Press the clutch by turning the pin through the sleeve "B" until the groove of the retaining ring is visible in one of the holes of the sleeve.
29. Tighten the pin using a torque wrench with a max. torque of 21 Nm.
30. Install the retaining ring on the shaft with the narrow gap facing upwards.
31. Check the stroke of the lower clutch disc, K2. To do this, mount the sensor on the housing box, set the measurement tip on the bottom of the clutch disc and reset the dial gauge. Use two hooks to grab the lower clutch disc, lift up in parallel until its stop and read the stroke value on the sensor gauge. Measurements should be made in three locations at 120° intervals. The stroke value must be between 0.3 and 1.0 mm.
32. Install the hub of the upper clutch disc (K1), paying attention to the wider tooth, and insert the retaining ring.
33. Check the stroke of the upper clutch disc, similarly as in the case of the lower disk.
34. If the stroke is in the range of 0.3 to 1.0 mm, the replacement procedure has been completed properly and the housing can be mounted.
35. If the stroke of any disc is different, dismount the clutch and readjust.

The toolkit is covered by a Lifetime Manufacturer's Warranty.*

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