JVC Dynamic Drum gearbox features and settings

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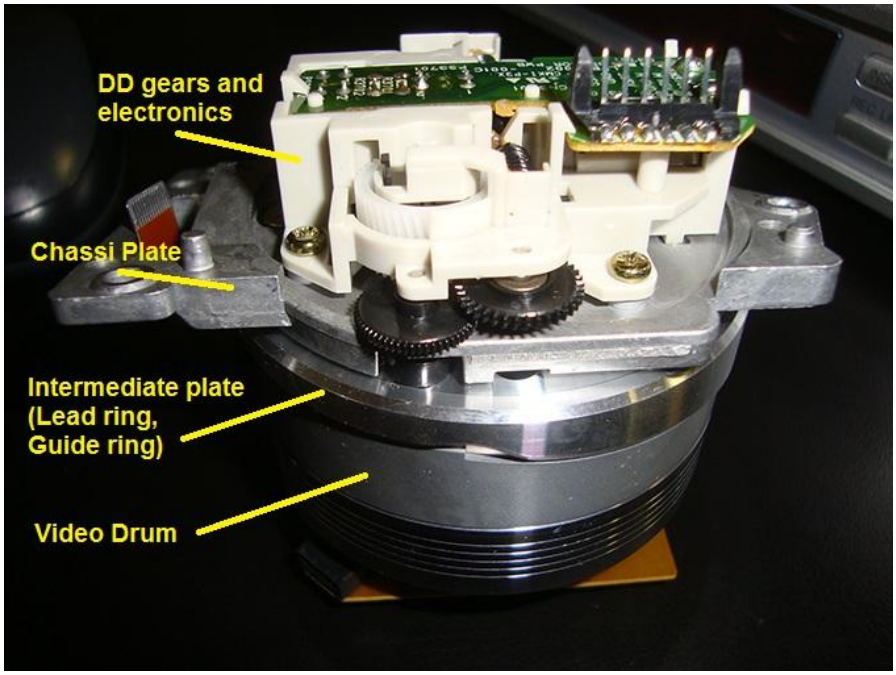

Fig. 1. Dynamic Drum parts. Picture by "dellsam34, 6th Jun 2019" from article https://forum.videohelp.com/threads/393383-JVC-Dynamic-Drum-Ultimate-Fix

The Dynamic Drum gearbox is mounted to Video Drum using 3 Philips screws of which 2 are visible in Fig. 1.

The main factor affecting drum/tape alignment is the gear screws shown on Fig. 2. If removing the Dynamic Drum gearbox from Video Drum, these gear screws must remain screwed into Video Drum – DON'T TOUCH OR TURN THESE SCREWS!

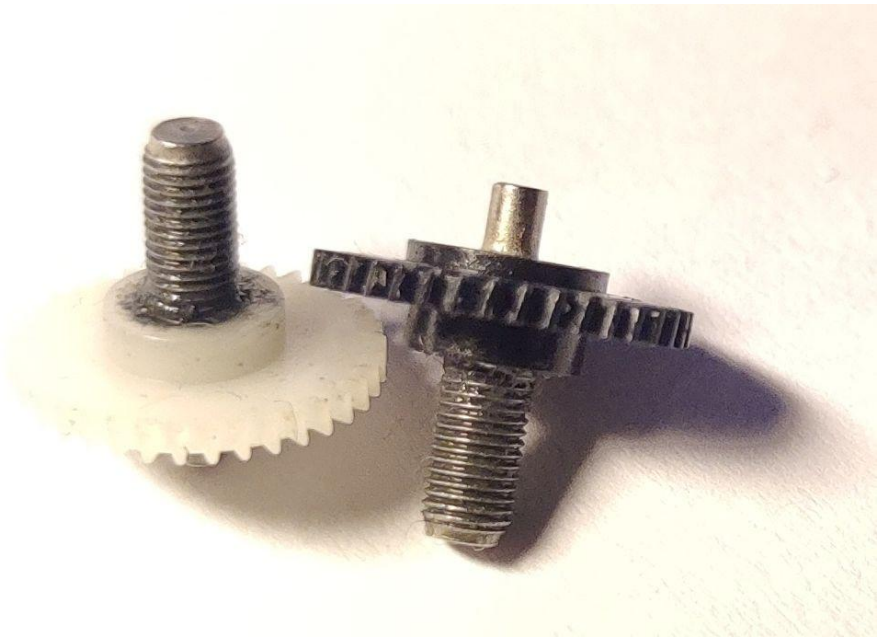

Fig. 2. Dynamic Drum gear screws removed. The gears on these gear screws are the most heavily loaded components in DD gearbox, because, when rotated by the gear drive, they tilt the drum and keep it in the last tilted position, but it's actually the fine threads, that keep the position, not the teeth.

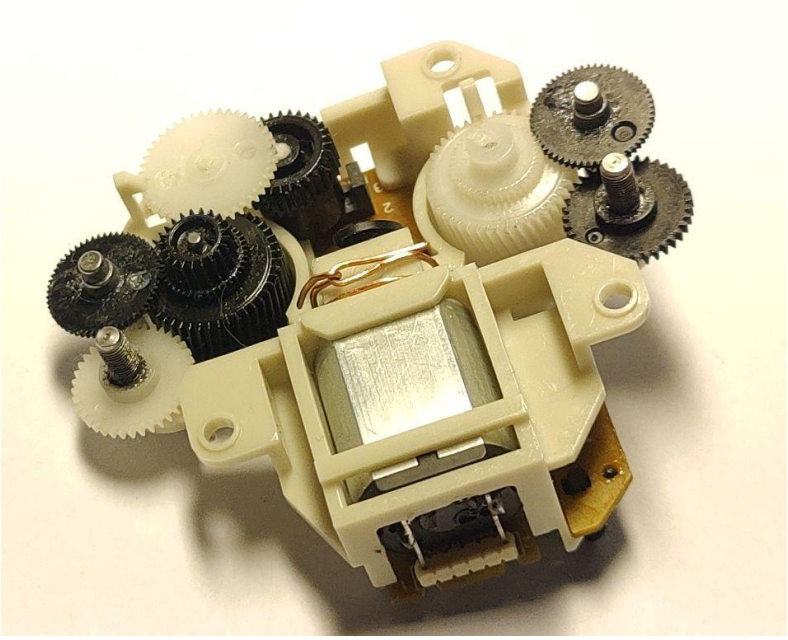

Fig. 3. Dynamic Drum gearbox with all gears in their correct locations. (Gear screws screwed off from Video Drum and placed to gear box.)

In Fig. 3, gear screws have been screwed off from Video Drum, but **DON'T DO IT** and if you do it, count their exact position, i.e. how many turns out, when screwing off. Otherwise you will end up adjusting the alignment, which is easy for the tape path (guide post supply side), but can be tricky for Dynamic Drum gearbox' correct function. Please note, that when making alignment, tracking needs to be reset in central position: *Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. This also brings tracking to the center.*

If permanently removing the Dynamic Drum gearbox and the gear screws, spring loaded screws shown in Fig. 4. may need to be turned inwards (1/4 turn both) to minimize any play (clearance) from Video Drum tilt. Primarily adjust one of these screws, if drum tilt position (neutral position) gets misaligned after removing gear screws and the DD gearbox.

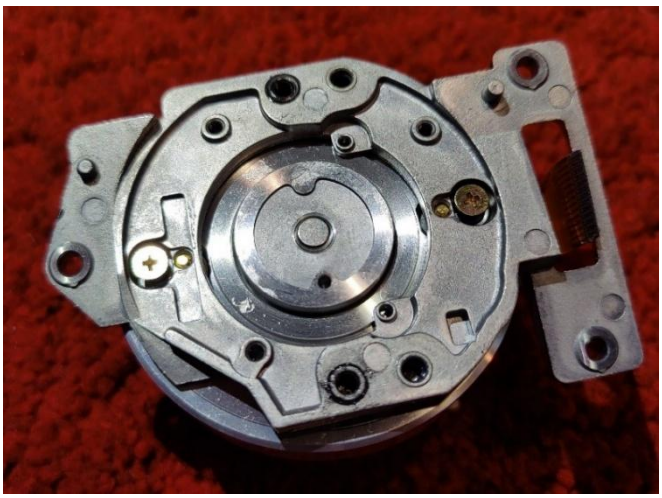

Fig. 4. Spring loaded screws, which snap the Video Drum back to neutral position.

If the spring loaded screws are correctly adjusted (by factory), neutral position is also the center position of Video Drum tilt. Gears screws work against the spring loaded screws, which means, that if neutral position deviates from center position, there may be non-symmetric load on the spring loaded screws. If this is the case and gear screws are removed, the spring load will balance and the Video Drum will tilt from center position to neutral position. To compensate for this and if there is noise bar in the picture or the picture gets scrambled, the primary measure shall be to adjust one of the spring loaded screws clockwise or counterclockwise, until adjustment will bring the Video Drum neutral position into center position. After this the picture should be OK, but if not, only as a secondary measure adjust the alignment on guide roller supply side.

As the Dynamic Drum gear box is based on worm gear and finally on 2 gear screws, the drum will always keep it's tilt position after stopping – it will not return to neutral position by itself and not even if the gear box is removed provided that the 2 gear screws are not removed.

Starting position of the gear box

If the gears from the gearbox will be disassembled or removed for investigation or repair, it is important to know, that there must be certain alignment between the worm gear "propeller" (first photoelectric sensor) and the final black gear with half cycle cover ring, that runs past the second photoelectric sensor. The gears must be set in position illustrated on Fig. 5. prior to mounting the gearbox back to Video Drum.

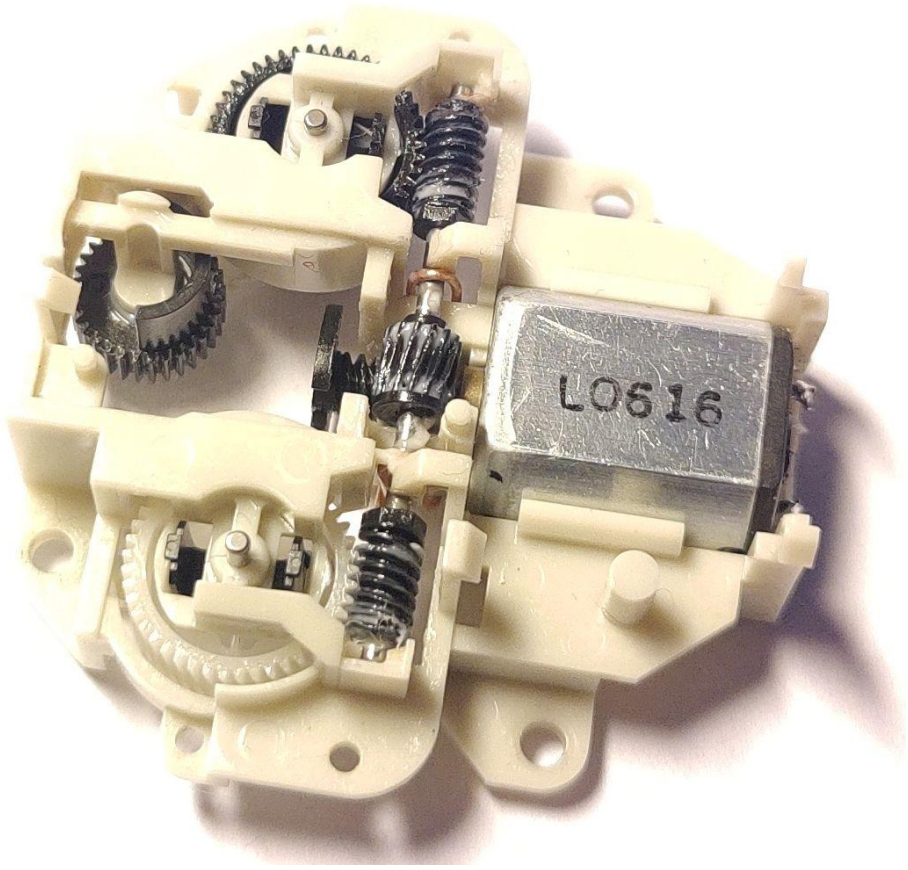

Fig. 5. Alignment position of worm wheel propeller (vertical) and half circle cover ring (edge mid of photoelectric sensor) = Startup position of Dynamic Drum gearbox.

Replacing Dynamic Drum gearbox with DD emulator

Fig. 6. DD emulator generates the signals needed by IC3001 SYSTEM CONTROL MICRO PROCESSOR and triggered by IC3501 DD MOTOR VOLTAGE CTL. If the signals are missing, the VCR will shut off after 3 seconds and will no longer run.

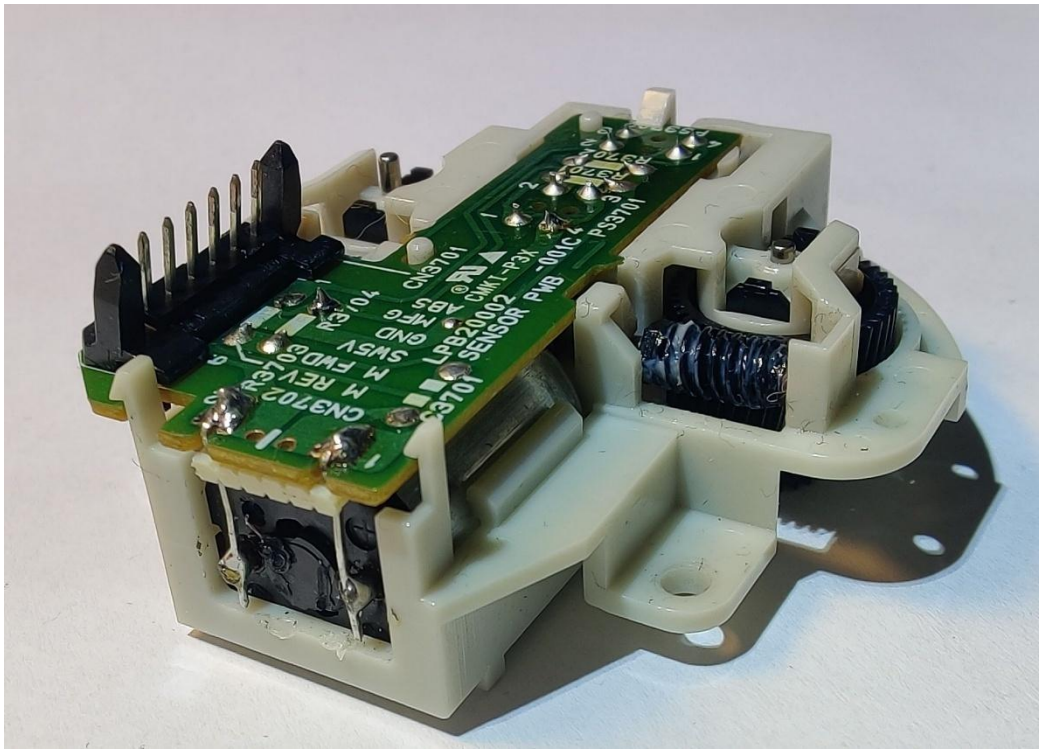

Fig. 7. Dynamic Drum gearbox.

If the gearbox stays mounted to Video Drum, the connector CN3701 (Fig. 7.) shall be removed, because main board connector (socket) CN3501 must be free for ribbon cable coming from DD emulator . The

easiest thing will be to snap off the PCB from gearbox after first desoldering the 2 wires to motor from motor side, shown on Fig. 7..

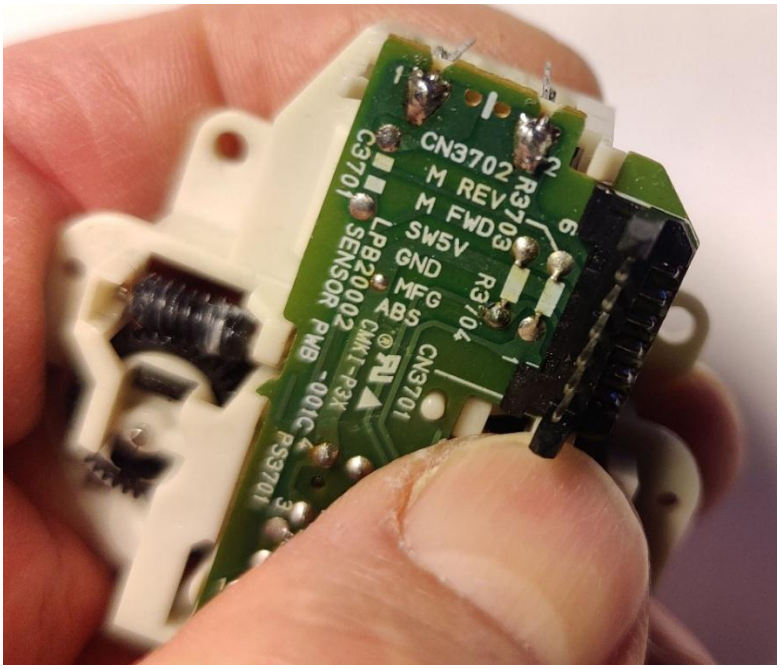

Fig. 8. After desoldering the motor wires, snap off the PCB by carefully bending back the clip under thumb and then slide to right.

Fig. 8. illustrates how the PCB can be removed the easiest: only bend a single clip, where the thumb finger is, carefully backwards: then slide the top of PCB to the right and PCB will pass the 2 top clips and can be raised. Raise it from top first and finally pull off from bottom clip. So you only need to bend that one clip, the other clips clip off when sliding the PCB.

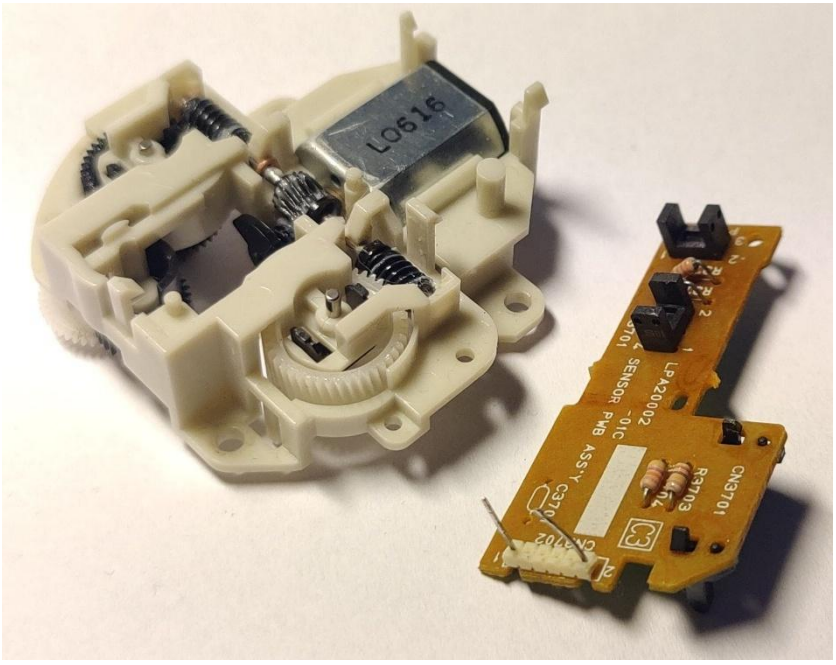

Fig. 9. PCB removed. The circuit only contains 4 resistors and 2 photosensors.

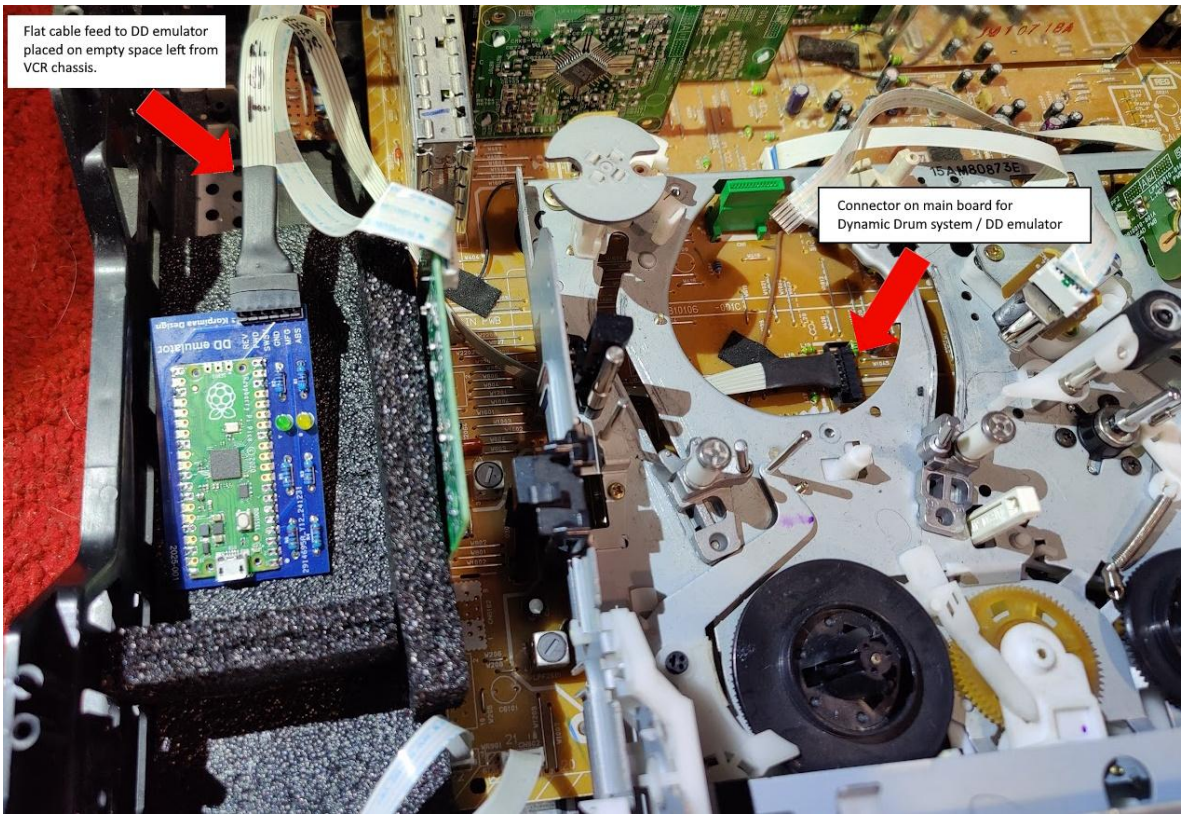

Fig. 10. Mounting of DD emulator to an empty isolated space inside VCR. Cable connects to main board connector socket CN3501 made free by removing Dynamic Drum PCB with connector CN3701.

The DD emulator is plug and play: no settings or adjustments are needed. Once connected with ribbon cable to CN3501, you can just leave it and forget it “under the hood”.

When operating the VCR with DD emulator connected and with Dynamic Drum system disabled, it can be noted immediately, that various picture search modes are actually of quite good quality on all tape speeds SP, LP and EP without functional Dynamic Drum system. This is the benefit of digital signal processing on these JVC VCRs and TBC (Time Base Corrector). The picture is always very stable.

Without functional Dynamic Drum system the following modes are without noise bars:

- Pause/still frame
- Frame by frame forward
- Frame by frame reverse. (Manual tracking adjustment may be necessary)
- 2x play forward

The following modes have small visible stripes or noise bars:

- 5x, 7x and 9x picture search forward and reverse -- SP best, bigger noise bars on LP and EP.

The Dynamic Drum has no tilt function in STOP, PLAY, FW and REW modes, thus there is no added benefit of Dynamic Drum system when playing back tapes recorded on other devices -- normal tracking range will take care of compatibility.