

SMOOTH SHIFTING FOR HONDA FOURS

How to Get Just One Neutral on DOHC 750s and 900s

By Joe Minton



Few new engines have been as trouble-free as the double-overhead-camshaft four-cylinder Honda engine introduced in 1978. It is smooth, reliable and delivers outstanding performance in capable hands. Honda has installed this engine in Super Sports, chopper-styled cruisers and touring bikes and has sleeved and stroked it into 750 and 900cc displacement categories. It has served well, but it has one large and ugly wart on its character. When shifted vigorously, it can deliver a neutral when the rider expected third or fourth gear.

Virtually every magazine road test of these bikes has mentioned missing a

shift or two (usually at the dragstrip). Recently we learned of a cure for the Honda DOHC four's irritating tendency to miss shifts just when the rider wants them most.

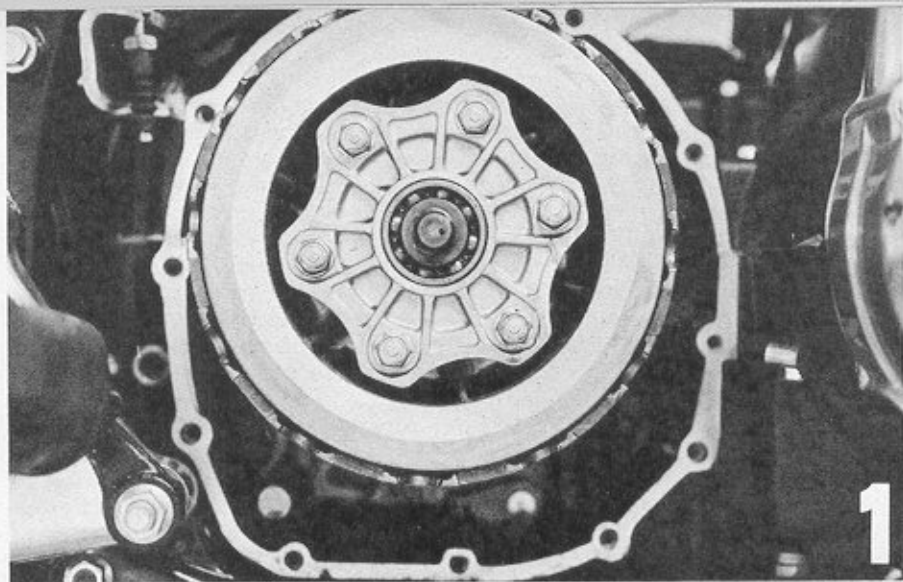
This modification has been made to several 750 and 900F models and various riders, including members of our staff, have declared it a rousing success. The procedure is simple for an experienced backyard mechanic. If you do not have the confidence or tools to tackle it yourself, take the job to a Honda mechanic you trust and let him do it. Honda is working on a production-line change for 1982, but that won't help if you already own a DOHC

CB750 or CB900. Fortunately, you can fix yours now.

STEP 1: Drain the oil. Remove the brake pedal, shift lever, clutch cover and the six bolts holding the clutch throw-out bearing and clutch springs. Now, replace two of the springs with stacks of washers or other spacers and tighten two of the clutch-spring bolts on them so that the clutch plates are clamped firmly together. This allows you to use the engine as a brake or to put the gearbox in gear and hold the rear wheel to prevent the clutch from turning while you loosen the clutch-hub nut. Loosen and remove the center nut that holds the clutch hub to the transmission input shaft. Remove the two bolts, spacers, clutch hub and basket. The shift mechanism is now accessible.

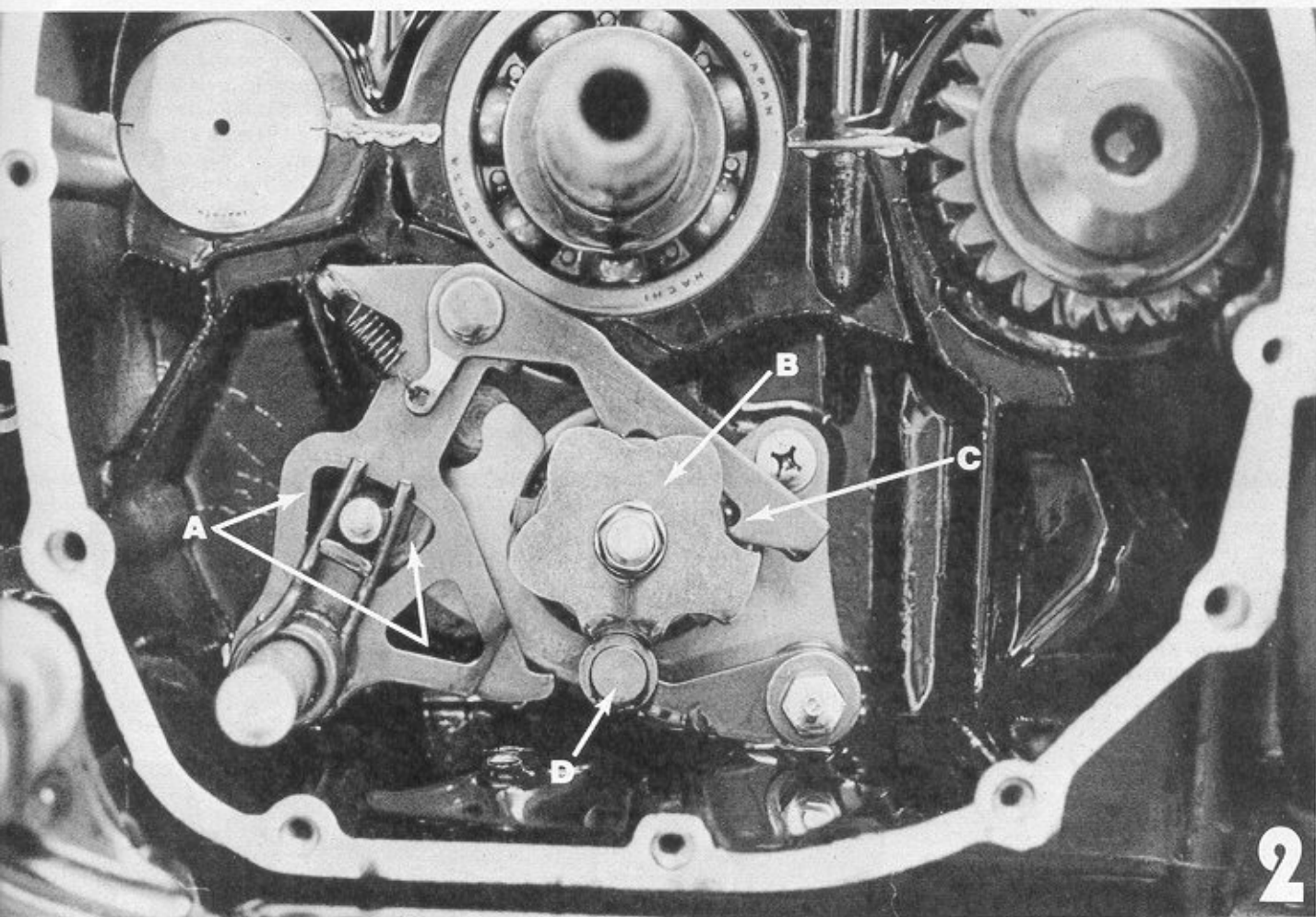
STEP 2: Shift the transmission by moving the shift spindle with your fingers. Note that the window in the shift spindle will strike the centering-spring pin before the drum is turned far enough for the positioning roller to bottom in the cam-plate at the end of the shift drum. Normally, the inertia of the shift drum is enough to complete the shift (the spring-loaded positioning roller helps). However, under the strain of a dragracing shift or when the rider gets a little enthusiastic on a twisty road, the drum may not move far enough to ensure complete engagement of the shift dogs on the gears, and a missed shift results. By modifying the window in the shift spindle to allow more travel, the drum will be turned by the direct action of the shift lever until the gears are positively engaged. Thus, no more missed shifts.

STEP 3: Pull the shift spindle out and clamp it in a padded vise. Use a Dremel tool or drill motor and a half-inch-diameter grinding stone to remove material from the area contacted by the centering-spring pin. The steel of the shift spindle is very hard and must be ground instead of filed. A small stone can be purchased at a hobby shop or your local Sears store. Remove a *small*

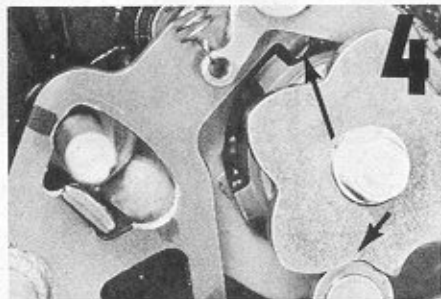


amount of material from the edge of the window. Clean the spindle of *all* grinding debris and reinstall it. Again check to see if the drum is turned far enough to center the positioning roller in the bottom of one of the cam grooves in the end of the shift drum. Note that the shift drum will be forced to finish the shift by the action of the spring-loaded positioning roller. Hold the drum against this effect with your fingers as you use the spindle to move the drum. By doing this, you can be sure that the drum is moved positively into position by the action of the shift spindle.

STEP 4: Honda has prevented over-shifting with clever tabs on the shift



The arrows (A) indicate the areas of the shift-spindle window that must be ground away so that the shift-drum cam (B) will be pushed, or pulled, by the shift pawl (C) into correct position over the shift-drum centering roller (D).



drum that engage similar tabs of the shift spindle if the drum continues past its correct position. It is possible that the end of the tab on the shift spindle will contact the shift drum before you are finished grinding the window. If this occurs, remove small amounts of material from the end of the tab on the spindle so that it will not rub on the drum and interfere with shifting.

STEP 5: Reinstall the clutch, cover, shift lever, brake lever and oil. Go out and ride with the knowledge that if you do blow something, it won't be a shift. M