

Answer Key

Testname: MDA8_SHORT6

1) A detent is usually a spring-loaded ball or bullet-shaped rod that is pushed into one of a series of three notches or a spring-loaded lever with three notches that drop over a cam. The detents are used to locate the internal shift forks in one of their three positions—neutral plus a gear to each side.

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2) A rear-wheel-drive (RWD) manual transmission includes the following four shafts:

1. A cluster gear, countershaft gear or layshaft (a British term).
2. The input shaft, also called a main drive gear or clutch shaft.
3. The output shaft, also called a main shaft.
4. The reverse idler shaft.

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3) The power passes through two gear sets. In all gear speeds but one, the power flows from the main drive gear (input) to the cluster gear and then from the cluster gear to the main shaft (output).

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4) Synchronizer assembly includes the following:

- a hub
- a sliding sleeve
- a blocker ring, also called stop ring or synchronizer ring
- keys
- springs

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5) The synchronizer goes through three stages during a shift:

A. As the shift is selected, the synchronizer sleeve moves toward the speed gear. If the speeds of the sliding sleeve (main shaft) and the speed gear (counter shaft) are not identical, the speed difference will cause the tapered cone to “misalign” the teeth of the sleeve, the stop ring, and the speed gear. This “blocks” the shift. When the speeds are equal, the thrust is released on the tapered surface, which now allows the alignment of the sliding sleeve teeth, the stop ring teeth, and the speed gear teeth, which allows the shift to be completed.

B. The sleeve overcomes the force of the detent key springs as the shift linkage continues to move it toward the gear. This allows the stop ring to relax and move slightly so that the sleeve splines begin to engage the coupling teeth on the stop ring. At this point, the coupling teeth on the stop ring and the speed gear may not line up with each other.

C. Once the sleeve, stop ring, and gear are all turning at the same speed, it takes just a small movement between the stop ring and gear to align the coupling teeth and allow the sleeve to slip completely over both sets. The speed gear is now locked to the output shaft through the synchronizer stop ring and sleeve.

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