



GUIDANCE NOTE No. 3: GEARS

Here are some guidelines for Observers on how to teach Associates to change gear in different types of vehicle.

Manual

The Advanced Driver Course logbook says lots on this topic for manual cars, but here are the items GAM requires and those that we recommend.

Required:

1. Use engine braking on long descents in order to control speed without using the brakes if possible (please note that the Associate needs to be aware of the signals they give – brake lights should signal that the car is slowing, not maintaining a constant speed).
2. Block change down into the appropriate gear after S in IPSGA; i.e. do not change sequentially down through multiple gears, especially while braking.
3. Block change into suitable cruising gear after acceleration if appropriate; likewise, if you have reached your target speed in 4th, no need to change via 5th before selecting 6th.
4. Control the speed of the gear change; neither too fast or too slow.

Recommended:

1. Thumb-up when changing from even to odd gears; thumb-down when changing from odd to even.
2. Rev-matching on down-shifts to perform a smoother change; particularly when performing block changes and the differential in engine speed will be greater.

Unacceptable:

1. Double de-clutch; this is no longer required unless the vehicle is very old and has no synchromesh (or similar).
2. Excessive use of engine braking for slowing the vehicle (as this provides no signals to those behind that the vehicle is slowing).

Automatic

There are a very wide variety of automatic gearboxes on the market with a dizzying array of technologies and controls available; it is up to the Associate to learn what controls are available and how to use them to the best advantage. Information on the nature of the automatic gearbox and how the Associate will use it on the drive should be articulated as a part of the cockpit drill.



Required:

1. There is no free-lunch for the G in IPSGA in any automatic: you must be in the appropriate gear to negotiate the hazard before negotiating the hazard – therefore we need the Associate to either use manual controls or *prompt* the gearbox to shift.

Recommended:

1. Prompt the gearbox to shift by ensuring we are off the brake and have positive pressure on the accelerator about 5m prior to turning to give the gearbox time to react and perform its downshift(s), if required. Not only will this provide a good G in IPSGA but it will also help with S and A.
2. Use sport mode if available to make more timely and appropriate changes.
3. Use manual override if available in addition to the above if the car is likely to be slow making the gear change (typically down) decision.

Scoring:

Clutch and changing gear: N/A

Choice of gear: score based on how well the Associate uses the various modes of operation and/or manual overrides.

Timing of changes: as per choice of gear, are they reading the road well and using the available controls just in time rather than just too late.

Constantly Variable Transmission (CVT)

CVT gearboxes effectively have an infinite number of gears and attempt to select the most appropriate of these at any given time. As per conventional automatics, the technology used to achieve this will vary from manufacturer to manufacturer with new innovations coming over time. Therefore, as with automatics, it is up to the associate to learn what controls are available and how to use them to the best advantage. As per the advice for automatic transmission, this should be articulated as a part of the cockpit drill.

Required:

1. If there is some form of override to retard the car or limit the gearing is used, this should be used to control speed on long descents in preference to braking. It should not be used to slow the vehicle as the will not be appropriate signals given.

Scoring

Clutch and changing gear: N/A

Choice of gear: this can be marked if the car has some form of control (i.e. Toyota's have a "B" mode) and the Associate make good use of it.

Timing of changes: as per choice of gear, are they reading the road well and using the available control just in time rather than just too late.



Non-gear (e.g. electric)

Most electric cars are gearless, with enough torque to be able to travel from 0 to V_{\max} without need for gearing or clutch. Therefore, there are no gear considerations.

Clutch and changing gear: N/A

Choice of gear: N/A

Timing of changes: N/A

Any car

1. If a car has a gear-change indicator, do not change gear when it tells you to, but as a part of your plan – the systems that provide these recommendations have no *situational awareness* and only uses engine speed as a consideration.
2. When cruising (long straights), *rest the engine* by selecting a high gear.
3. When making braking vs. gear choices, be conscious of the information given (in this case, brake lights); brake lights should signal that the car is slowing down.