



Competency 2

Transmission In Motion (Automatic and Automated Transmissions)

Lesson Objective:

- Determine the type of transmissions, automatic or automated, as well as their capacities depending on their applications.

Automated Transmission:

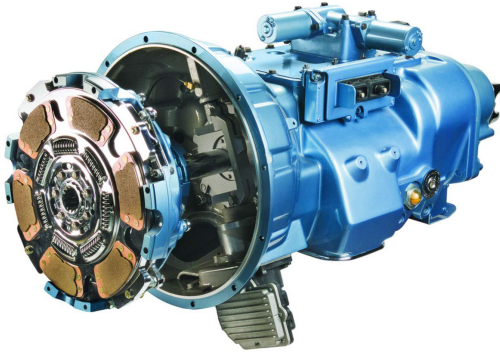
This kind of gearbox combines a traditional manual gearbox with a gear change actuator and a computer-controlled clutch. It is widely used in the field of transportation.

Advantages: More freedom for the driver, makes it easier to drive a tractor semi-trailer and eliminates the stress of shifting.

Disadvantages: Backing up **can be** more difficult and prolonged maneuvering at very low speeds can cause the **clutch to overheat**. In addition, it challenges the driving of heavy vehicles. Indeed, since driving is similar to that of an automobile, the notion of **anticipating maneuvers** can be quickly forgotten. For example, since the driver does not have to perform downshifts, this can result in turning maneuvers at **too high** a speed.

Main Manufacturers:

Eaton (10 to 18 forward gears)



[Reference document on the use of this transmission.](#)

[Vidéo fr.](#)

[Video en.](#)

This transmission control selector is generally installed on Freightliner trucks. Positioned under the steering wheel making it very ergonomic, it also allows manual gear changes. It has even a LOW mode.

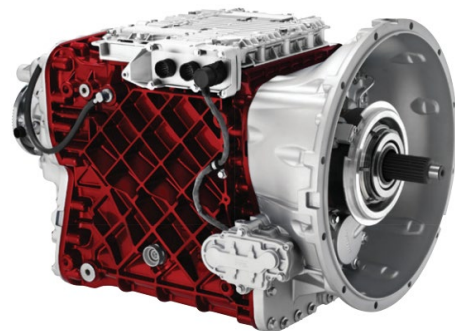


MDrive from Mack and I-Shift from Volvo (12 to 14 forward gears)

Reference document on the use of this transmission.

[Mack](#)

[Volvo](#)



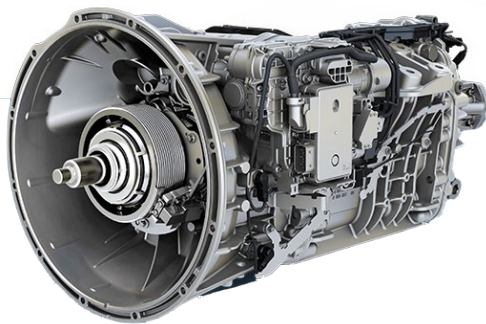
Mack M-Drive transmission control selector found on the dashboard.



I-Shift transmission control selector installed at Volvo. Positioned near the side of the driver's seat, it allows manual gear changes in addition to having an Eco/Performance mode.



Detroit DT12

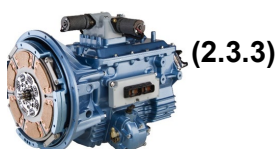


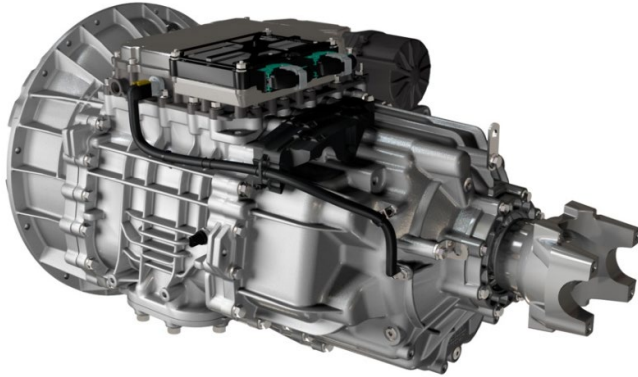
[Reference document on the use of this transmission](#)

Detroit DT12 transmission control selector typically installed at freightliner and Western Star. Installed under the steering wheel making it very ergonomic, it allows manual gear changes as well as engine brake operation.



Eaton-Cummins Endurant and Paccar (Eaton-Cummins) (11 to 12 forward gears)



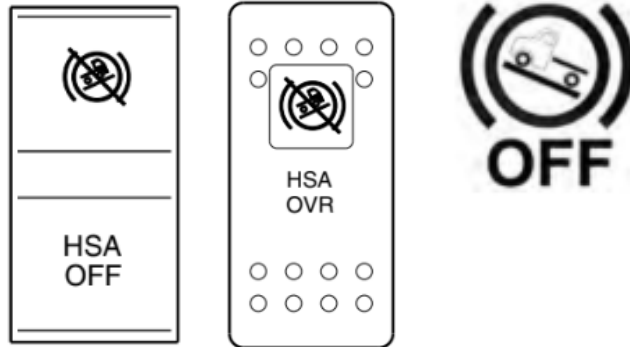


[Reference document on the use of this transmission](#)

Transmission control selector typically installed at Kenworth and Peterbilt. Positioned under the steering wheel making it very ergonomic, it allows manual gear changes as well as engine brake operation.



HSA (*Hill Start Aid*)



These transmissions generally have a system called HSA (**Hill Start Aid**). When starting on a slope, the driver has a delay of about 3 seconds to apply the accelerator after releasing the service brakes. After this time, the brakes will be released, and the vehicle will start to move according to the incline of the slope.

However, it is possible to cancel or override this system by pressing the HSA-**OFF** or HSA-**OVR** switch.



AUTOMATIC TRANSMISSION AND CONTROL SELECTORS:

This type of transmission is like that of automobiles. It generally has fewer gears than automated transmissions, between 5 and 10. They are mostly found in vocational transportation: school and urban buses, garbage and recycling trucks, municipal services, etc. Therefore, on vehicles affected by very frequent starts and stops.

Advantages: Very efficient at low speeds, especially when backing up. Flawless performance in difficult conditions and very robust.

Disadvantages: None for the driver.

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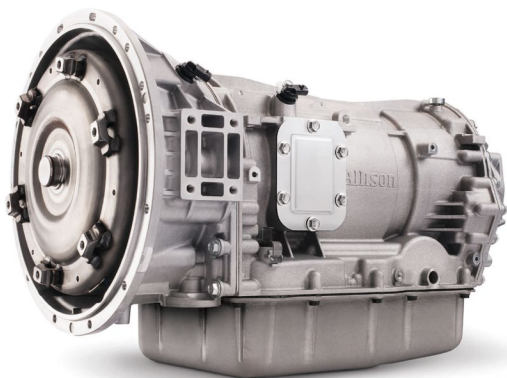
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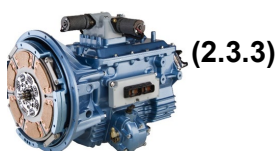
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Allison



[Reference document on the use of this transmission](#)



Transmission and Control Selectors



USE: Recommended operating methods for an automated transmission to prevent overuse and overheating of the clutch.

When driving at very low speed, especially loaded, avoid constantly pressing and releasing the accelerator. Instead use the programmed low speed control mode or choose a lower gear.

During prolonged stops, reduce declutching time, instead use neutral.

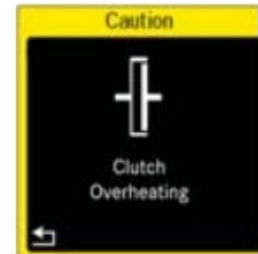
When waiting to start moving on a slope, do not use the accelerator to prevent the vehicle from moving. Always use the service brake.

When the vehicle is backing up and you need to go forward, first apply the service brakes (brake pedal) to stop the vehicle then return to the accelerator.

Always respect the maximum total loaded mass limit established by the manufacturer. Some transmissions, one example: DT-12 “Direct Drive”, has a maximum gross combined weight (GCW) of only 36 300 kg (80 000 lb) .



Attention: Watch out for indications of clutch overuse.



When these indicators come on in the instrument panel, it means that the clutch is overheating, and the clutch may stop working. A protection system can then momentarily disengage the clutch, to allow it to cool. It will therefore be impossible, under these conditions, to move the vehicle.

Automated Transmission

Automated transmissions also allow the use of new technologies such as:

- Adaptive cruise control.
- Predictive cruise control.
- Engine brake management while using the cruise control.
- E-Coast;
- Multiple programming.
- And a lot of development possibilities to make vehicles more and more autonomous.

