

# Automatic Transmissions Introduction

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AUMT 2325 & 2332 Automatic  
Transmission

## Introduction:

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- The purpose of a transmission:
  - Transmit power from the engine to the drive wheels.
  - To disconnect the running engine from the drive wheels during gear changes
  - Reverse the direction of power flow when the vehicle must backup
  - Multiply engine torque as needed

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## Compare and Contrast

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### ☐ Manual system

- Provides multiple gear ratios
- Multiplies torque through use of gear ratios
- Gear changes provided by driver

### ☐ Automatic system

- Provides multiple gear ratios
- Multiplies torque through use of gear ratios
- Multiplies torque through the use of a torque converter
- Provides automatic gear changes

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## Gear ratios

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### ☐ Overdrive:

- Input rpm is lower than the output

### ☐ Underdrive

- Input rpm is higher than the output

### ☐ Direct drive

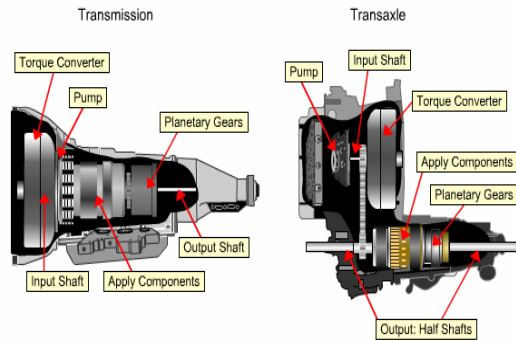
- Input rpm is equal to the output

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# Transmission and Transaxles

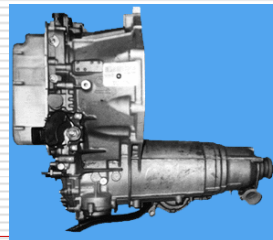
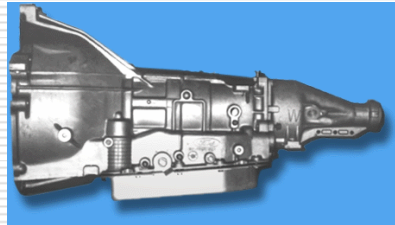
- ❑ A transmission consists of:
  - Torque converter
  - Planetary gearsets
- ❑ A transaxle consists of:
  - Torque converter
  - Planetary gearset
  - Final drive gearset
  - differential



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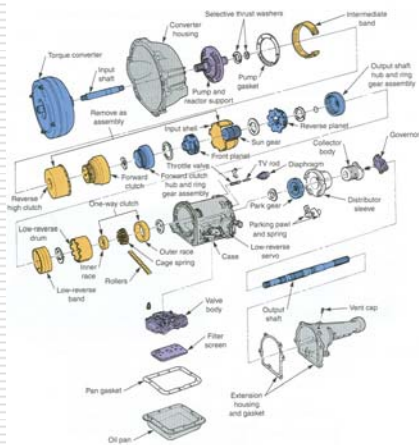
## Transmission External Components

- ❑ TSS/ISS
- ❑ Torque converter
- ❑ TR/DTR
- ❑ OSS/VSS
- ❑ Vent
- ❑ Fluid level indicator
- ❑ Pan
- ❑ Servo covers
- ❑ Pressure taps



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# Transmission Internal Components



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# Transmission Internal Components

- |  |   |
|--|---|
| <input type="checkbox"/> Converter housing | <input type="checkbox"/> Ring gear      |
| <input type="checkbox"/> Pump              | <input type="checkbox"/> Planets        |
| <input type="checkbox"/> Torque converter  | <input type="checkbox"/> Sun gear       |
| <input type="checkbox"/> Input shaft       | <input type="checkbox"/> Shell          |
| <input type="checkbox"/> Band              | <input type="checkbox"/> Case           |
| <input type="checkbox"/> Clutch            | <input type="checkbox"/> One way clutch |
| <input type="checkbox"/> Drum              | <input type="checkbox"/> Valve body     |
| <input type="checkbox"/> Hub               | <input type="checkbox"/> Filter         |
| <input type="checkbox"/> Output shaft      | <input type="checkbox"/> Sump           |

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## Ford Transmission Numbering

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1. The First digit is the number of available forward gears
2. The second is mounting style RWD or FWD
3. The third is the torque capacity
4. The fourth is left for gear ratio ranges (wide from narrow) and shifting schemes (synchronous/non synchronous)

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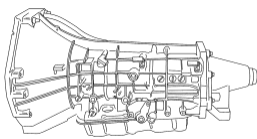


## Ford RWD Automatics

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- ☐ C3
- ☐ A4LD
- ☐ 4R44E
- ☐ 5R55E
- ☐ 5R55W
- ☐ 5R55S

- ☐ The C3 originally started as a three speed, the A4LD was created by adding an additional planetary set.
- ☐ The final renditions are 5 and 6 speed units.



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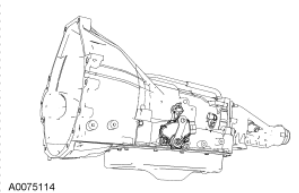
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## Ford RWD Automatics



- ☐ AOD
- ☐ AODE
- ☐ 4R70W
- ☐ 4R75E



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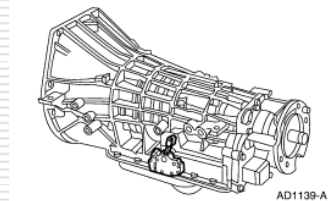
- ☐ Has always been a four speed with overdrive.
- ☐ The early AOD used hydraulic controls for all internal operations
- ☐ The AODE started the electronic controls.
- ☐ The latest model 4R75E is used in newest model Fords

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## Ford RWD Automatics

- ☐ C6
- ☐ E40D
- ☐ 4R100
- ☐ 4R110W
- ☐ TORQSHIFT



AD1139-A

- ☐ The C6 geartrain produced 3 forward speeds.
- ☐ The E40D added an additional planet set to create a 4 speed with electronic controls.
- ☐ The latest Torqshift is the highest load handler, and has 6 speeds.

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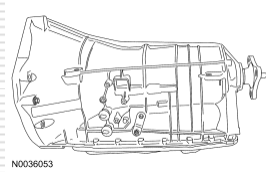


## Ford RWD Automatics

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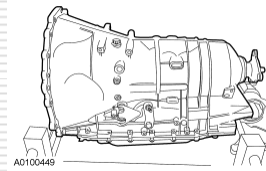
### ☐ 6R60

- ZF transmission
- Used in 2006 Explorer/Mountaineer



### ☐ 6HP26

- ZF transmission
- Used in 2005 Navigator and Expedition models



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## Ford FWD Automatics

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### ☐ AXOD\*

### ☐ AXODE\*

### ☐ AX4S\*

### ☐ AX4N\*

### ☐ CD4E

### ☐ 4F27E

### ☐ 4F50N

### ☐ 6F50(GM/Ford)

### ☐ FNR5

### ☐ 6Speed

- ☐ AXOD used hydraulic controls(1985).

- ☐ AXODE started the integration of electronics

- ☐ The latest models 4F50N and AX4S are used in the Taurus and Freestar

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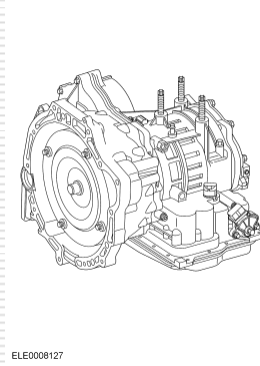
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## Ford FWD Automatics

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### □ 4F27E

- Exclusively a Focus transmission
- New design.



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## GM Transmission Numbering

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- First Placing:
  - Number of transmission gears
- Second Placing:
  - Mounting type, Transversely/Longitudinally
- Torque Rating:
  - NM, number multiplied by 10= rating in NM's
- Control Type:
  - Electronic, used to differentiate between older hydraulic transmission designs and their newer electronic cousins.

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## GM RWD Automatics

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- ☐ 700R4
- ☐ 4L60E
- ☐ 4L65E

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## GM RWD Automatics

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- ☐ LT1000

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## GM FWD Automatics

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- ☐ 125C
- ☐ 3T40E
- ☐ 4T60E

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## GM FWD Automatics

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- ☐ 4L80E
- ☐ 6L80E

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## Ford FWD Automatics

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### ☐ CD4E

- Very old transmission
- Used in Probe originally
- Currently used in the Escape



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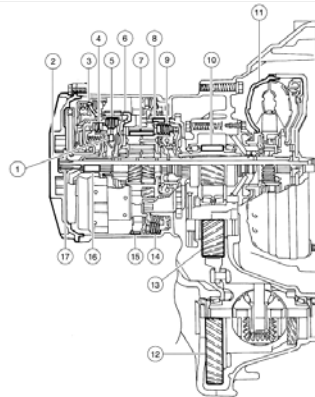
## Ford FWD Automatics

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### ☐ 4EAT

### ☐ F4E-III

- Escort transmissions



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## Fluid Types

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- ☐ Type A
- ☐ Type CJ
- ☐ Type F
- ☐ Dextron
- ☐ Dextron II
- ☐ Dextron IIE
- ☐ Dextron III
- ☐ XT-9-QMM5 (Mazda)
- ☐ Mercon
- ☐ Mercon V XT-5-QM
- ☐ Mercon Synthetic
- ☐ Mercon SP XT-6-QSP
- ☐ CVT XT-7-QFC
- ☐ Motorcraft Premium transmission fluid. XT-8-QAW

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## Transmission Fluid

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- ☐ The purpose of fluid:
  - Lubricate
  - Cool
  - Transfer power
  - Disperse particles
  - Anti-oxidation
  - Friction modification
  - Impact dampening

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# Transmission Fluid

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## ☐ Transmission fluid components:

- Anti-foam agents
- Anti-wear agents
- Corrosion inhibitors
- Dispersants
- Friction-modifiers
- Oxidation stabilizers
- Seal swell controllers
- Viscosity index improvers
- Magnesium

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## Checking the level with dipstick

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- ☐ Vehicle at operating temperature
- ☐ Level surface
- ☐ Engine running
- ☐ In park or neutral
- ☐ Use cross hatching on stick
- ☐ Notches or holes are for cold level

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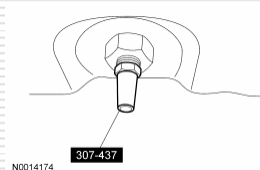
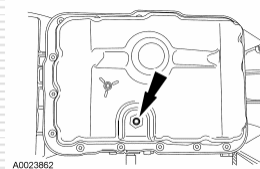
## Checking the level without a dipstick

- ❑ Tools:
  - WDS/PDS/NGS
  - Air nozzle
  - Fluid transporter/evacuator/injector
  - Fill plug adapter

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## Checking the level without a dipstick

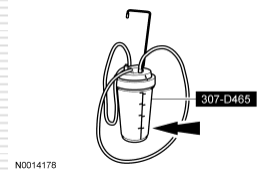
- ❑ Using WDS monitor TFT, obtain 80-120°F
- ❑ Move range selector into each gear allowing for engagement
- ❑ Return to park
- ❑ Remove stand pipe plug
- ❑ Install stand pipe adapter



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## Checking the level without a dipstick

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