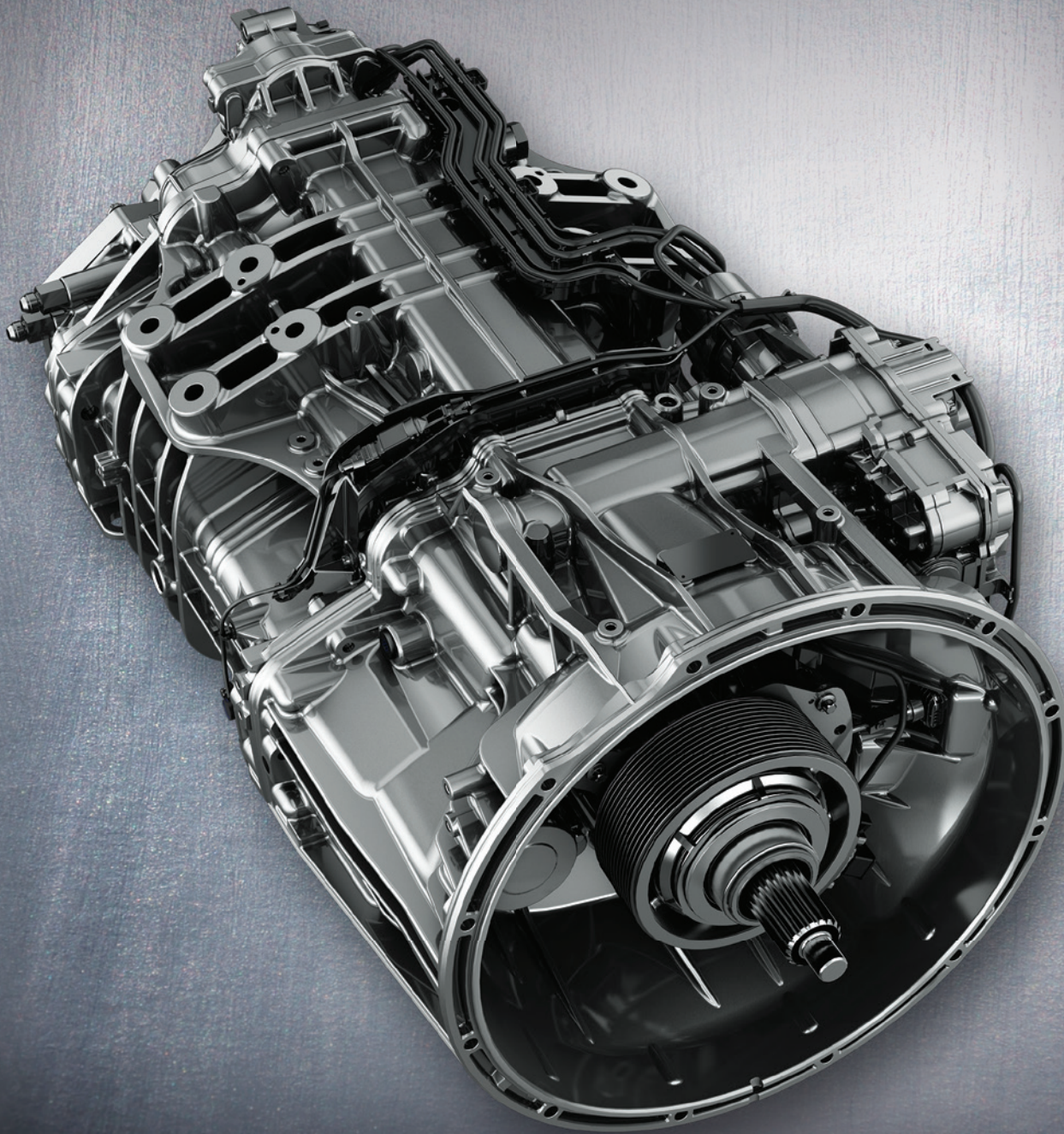


# DETROIT™ DT12™ TRANSMISSION

**12**  
Speeds

FROM  
**1250-2050**  
lb-ft Torque Input

**DIRECT or OVER**  
Drive



**DETROIT™**  
DEMAND PERFORMANCE™

# THE DETROIT™ AUTOMATED MANUAL TRANSMISSION

# THE BEST OF

DETROIT IS PROUD TO OFFER THE DT12™ AUTOMATED MANUAL TRANSMISSION. ENGINEERED AND BUILT WITH PRECISION. OPTIMIZED FOR PERFORMANCE AND EFFICIENCY.

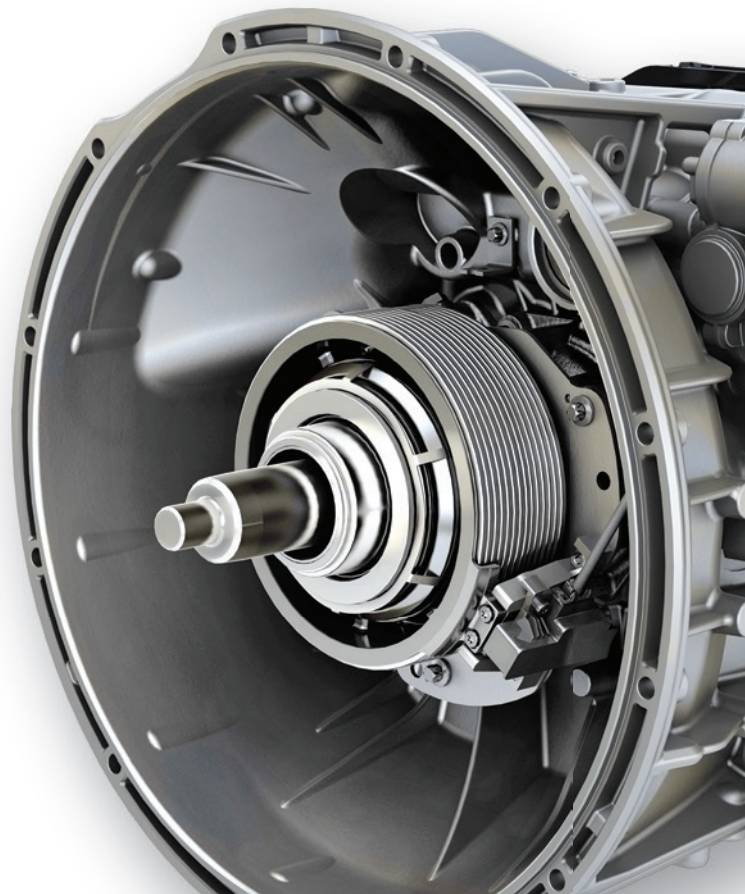
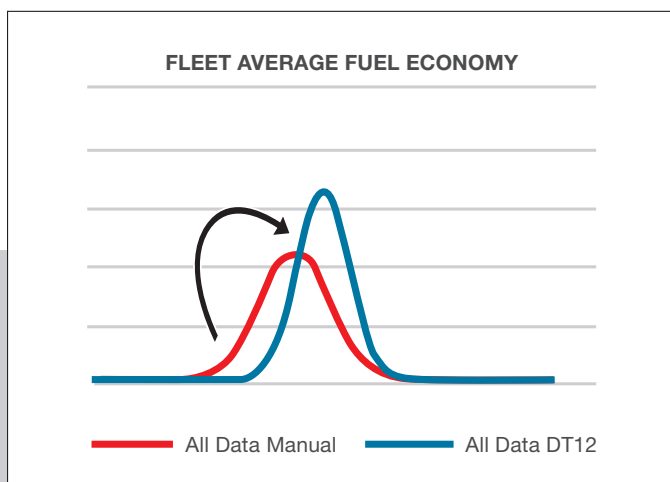
## WHAT'S AN AUTOMATED MANUAL TRANSMISSION?

An automated manual transmission (AMT) combines a traditional clutch-actuated manual gearbox with a computer-controlled shift actuator and clutch. The best shift patterns are selected electronically to provide optimal power and fuel efficiency. An AMT is a proven technology used around the world. At Detroit, we believe it represents the next generation. With computer-controlled shifting and clutch engagement, only two pedals are needed to operate the truck: brake and accelerator.

## WHY CONSIDER AN AMT?

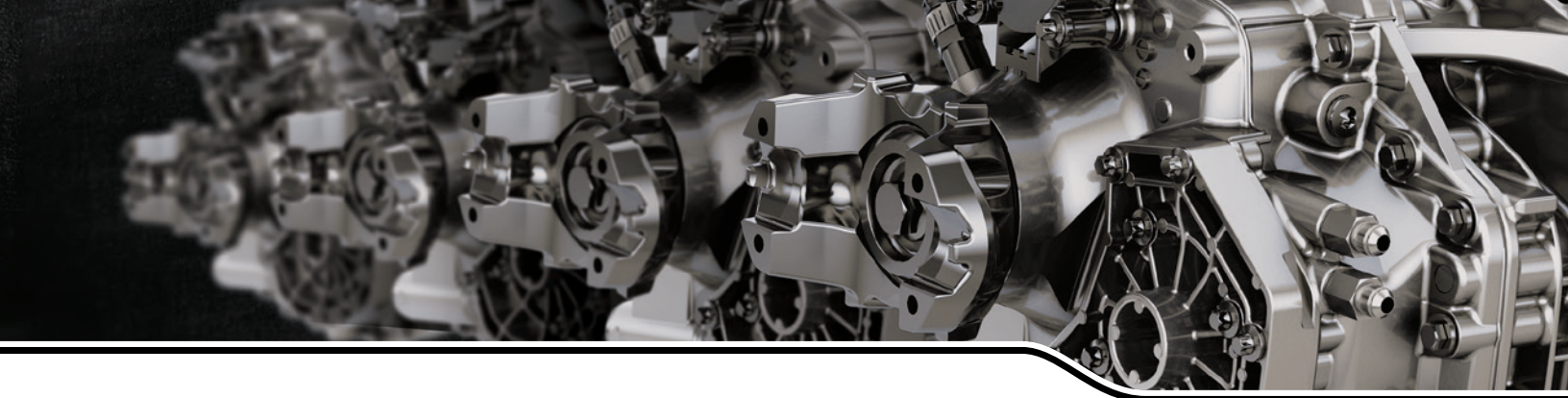
An automated manual transmission is more fuel-efficient, especially when you average fuel consumption over an entire fleet traveling a variety of routes. Automated control of the clutch improves shift quality and leads to longer clutch life. And it's easier to operate, making it ideal for drivers of all experience levels.

## DT12 FUEL ECONOMY IMPROVEMENT



The DT12 will narrow the bell curve of your drivers' fuel economy. Fleets should see fuel economy improvements for new and lead-footed drivers.

Note: Numbers are for demonstration purposes only. Not based on actual testing.



# BOTH WORLDS

## EASE AND ECONOMY GO INTO HIGH GEAR.

At Detroit, we are focused on providing our customers with the most efficient powertrain components possible. The Detroit DT12 provides efficiency in three ways: fuel economy, durability and ease of operation.

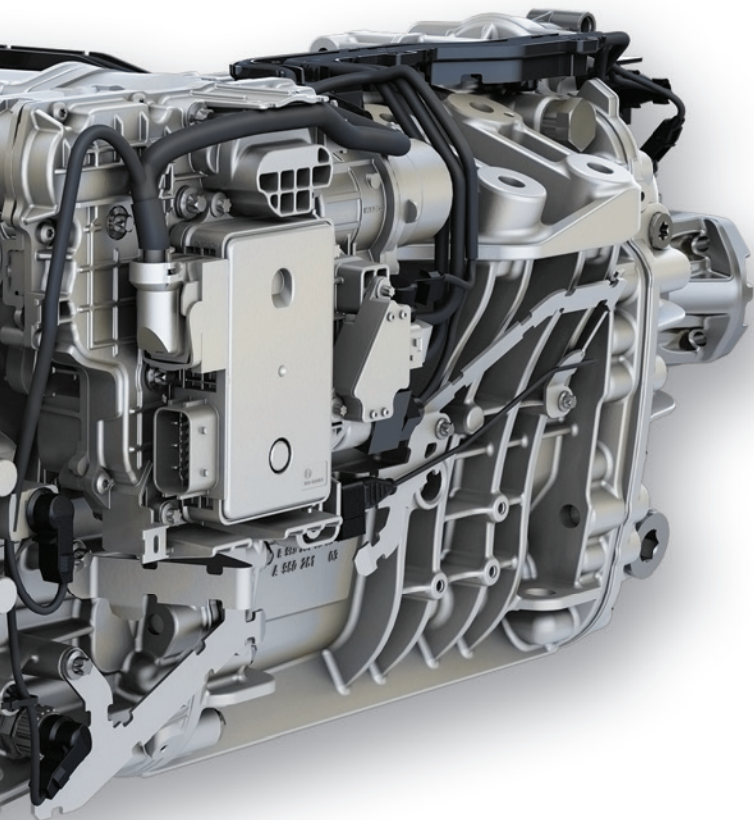
We understand how fleets work and how they succeed. Any incremental increase in fuel economy can make a huge impact on profitability. Our engineers have made significant strides to reduce fuel consumption with this new transmission.

A fleet's bottom line also is affected by the durability and longevity of its vehicles. The operation of our DT12 was designed to limit unnecessary wear and tear. The smoother the action, the more efficient the results.

Driver recruitment, training and performance play crucial roles in fleet efficiency. That's why we chose to offer an AMT. It's easy to master, so drivers can reach their optimal performance sooner.

The Detroit DT12 is part of our complete line of powertrain components that also includes our famous engines and our full line of axles. When you spec your truck with the entire package, you can expect an even greater level of efficiency, from operational performance to maintenance and warranty service.

Ultimate efficiency goes beyond managing fuel consumption. It's the result of knowledge and ingenuity. That's what makes this transmission different.



**ULTIMATE EFFICIENCY:  
IT'S THE RESULT OF  
KNOWLEDGE AND INGENUITY.**

# ENGINEERED FOR ECONOMY

THE DETROIT DT12 IS A 12-SPEED, AUTOMATED MANUAL TRANSMISSION WITH SHORTER GEAR STEPS. THE DETROIT DT12 WAS DESIGNED WITH A NUMBER OF INNOVATIVE EFFICIENCY FEATURES TO ACHIEVE OPTIMAL FUEL ECONOMY.

**Optional Direct Drive.** In top gear, the transmission operates as a direct drive, sending engine input directly through the main shaft. This feature, along with the “superfinished” gears in the new DT12, creates an even greater mesh between gears, which reduces parasitic losses and increases fuel efficiency.

**Powertrain Communication.** The transmission communicates in real time with the proprietary powertrain network and motor-control module to optimize efficiency throughout the entire powertrain.

**eCoast.** Helps maximize fuel efficiency by allowing the vehicle to coast down grades. The engine operates at idle speeds while maintaining momentum. Sophisticated transmission electronics ensure safe operation in all driving conditions.

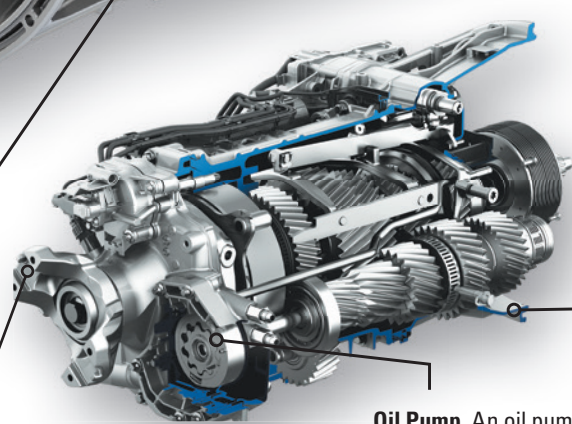
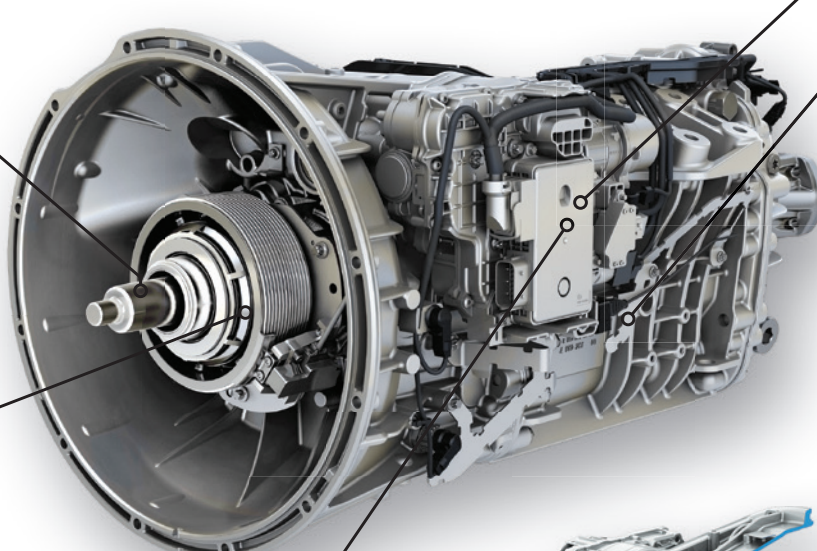
**Skip Shift.** To increase shifting efficiency, the electronic powertrain controls automatically skip unnecessary gears. This helps increase acceleration to achieve cruising speed quickly and smoothly. This also lets the driver begin the acceleration in the appropriate start gear based on load and grade.

**Active Driveline Protection.** The Transmission Control Module (TCM) calculates the torque wind-up in the driveline and regulates with engine torque control for enhanced driving comfort and less driveline wear. The TCM even limits torque in severe surface conditions, protecting the driveline.

**Total Weight.** The Detroit DT12 provides a weight advantage over traditional designs. The aluminum housing and single countershaft help save weight, allowing for even more payload efficiency.

**Transmission Oil.** The factory oil fill required for the new DT12 in the new Cascadia and Western Star 5700 can be reduced by a total of 1.6 to 3.2 qts depending on DT12 version. This reduces oil churning and oil bathing friction within the transmission case. The new DT12 transmission also now comes standard from the factory with 75W85 instead of 75W90.\*

**Oil Pump.** An oil pump, powered by the countershaft, delivers oil directly to the gears. This is more precise and efficient than bathing all of the gears in oil.



\*Check with your dealer on oil restrictions required for transmission servicing.

## VARIABLE-SPEED CRUISE CONTROL

The DT12 incorporates variable-speed cruise control, which allows the engine brake to regulate speed to achieve optimal driving efficiency. With the engine brake set to off, drivers can choose from the three settings on the cruise control limit switch located on the dash:

**LOW** is ideal for steep grades. The engine brake slows the truck at a low threshold, e.g., +3 mph.

**MEDIUM** is ideal for rolling hills. The engine brake slows the truck at a higher threshold, e.g., +6 mph.

**OFF** is ideal for flat terrain or areas with noise restrictions. The engine brake is disabled while in cruise.

Variation level can be changed as a parameter in the TCM. Using these settings helps control downhill speed and takes advantage of uphill momentum. The TCM will determine the right amount of engine braking required, or may be overridden using the engine brake selection on the shift lever.

## INTELLIGENT POWERTRAIN MANAGEMENT

Intelligent Powertrain Management (IPM) knows the route ahead and will accelerate, preselect gears, eCoast and brake the engine to maximize efficiency. Using preloaded terrain maps, IPM will adjust the following to ensure the truck is carrying the most efficient momentum into road conditions ahead.

- DT12 shift strategy
- eCoast
- Engine torque output
- Engine braking level

Since IPM is integrated with cruise control, there are ideal driving situations and terrains where the fuel efficiency benefit is greatest. Also, the more time spent in cruise control, the more effectively IPM will work.

- High top gear and top-1 gear times
- High cruise control times
- Rolling terrain
- Mountainous terrain
- Varying speed limits

Normal Driving Situation	Driver Decision	Intelligent Powertrain Management
Approaching a grade	Downshift and accelerate	Hold gear (DT12 can shift while climbing) and minimal acceleration (calculated within CPC)
Cresting a hill	Upshift and resume cruise control	eCoast over the summit and engine brake when speed approaches CC-band limit
Rolling hills	Accelerate uphill and decelerate downhill	Transition from deceleration to acceleration (and vice versa) while still on grade to carry momentum into the next hill

# DRIVEN TO PERFORM

The DT12 is engineered for enhanced flexibility and drivability.

The term “automated” means a pneumatic clutch and shift actuator actually shift the transmission for you. This allows faster and smoother gear shifts than electronic actuation.

Drivers can choose between shift modes depending on the package spec'd with the DT12:

**ECONOMY PACKAGE** only includes automated economy mode. Shifts happen automatically and keep RPMs to an efficient level.

**STANDARD PACKAGE** includes automated economy and manual shift modes, for when terrain or conditions need manual control.

**PERFORMANCE PACKAGE** includes the standard package plus automated performance mode, with higher RPM shifts to take full advantage of available power and torque. A kickdown accelerator pedal is also included that downshifts or holds a lower gear at full throttle.

## ADDITIONAL PERFORMANCE FEATURES:

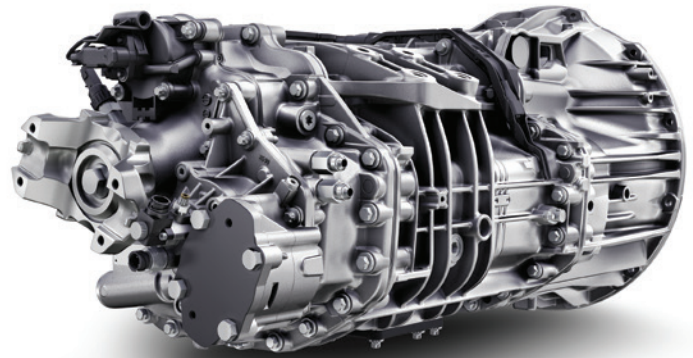
**CREEP MODE** modulates the clutch to improve low-speed maneuverability, ideal for backing up to a loading dock or maneuvering through tight city traffic. All the driver has to do is let off the brake pedal.



Creep Mode makes backing up to a loading dock safe and easy.

**POWER TAKE-OFF** for the DT12 is designed for use in the Bulk Haul Tractor Trailer market, specifically targeting these applications: liquid trailers, dry goods (e.g., sugar or flour), wet goods (e.g., fish meal), and moving floors. The Detroit DT12 Direct Drive and Overdrive transmissions are available with a custom-designed rear-mount-only PTO.\* This PTO option is available for order only on OBD2016/GHG2017 Freightliner Cascadia and Western Star 5700 models. The DT12 with PTO is available for stationary operation on fully paved surfaces only. The DT12 PTO comes with 30-month/300,000-mile standard warranty.

\*If an aftersales PTO installation is desired, a factory-installed PTO Prep Kit is also available for OBD2016/GHG2017 Freightliner Cascadia and Western Star 5700 models only.



## SERVICE TAKEN TO A HIGHER LEVEL

Detroit transmissions are sold and serviced by an unmatched network of knowledgeable sales people and expert factory-trained technicians at hundreds of locations throughout the United States and Canada. We also offer a live Customer Support Call Center.

Detroit offers outstanding parts availability, and transmission owners enjoy comprehensive warranty coverage—including fast, hassle-free processes—and expedited parts and service for critical downtime situations.

## WARRANTY COVERAGE

Detroit is known for designing and manufacturing products that set industry standards. We are proud of that, and believe that quality is the surest way to maintain long-lasting relationships with our customers.

Our transmissions come with the following standard warranty:

- DT12 GCW greater than 110,000 lb.: 5 years / 500,000 miles
- DT12 GCW less than or equal to 110,000 lb.: 5 years / 750,000 miles

The clutch comes with a three-year / 350,000-mile warranty.

# INNOVATIONS IN SAFETY

Detroit DT12 Specifications	
Speeds	12 forward / 4 reverse
Torque Ratings	1250–2050 lb-ft
Gear Ratios / Overall Ratio	Direct Drive: 14.93 - 1 / 14.93 Overdrive: 11.67 - 0.78 / 14.96
GCW Limits	Direct Drive: 80,000 lb. Overdrive: 130,000 lb.*
Dry Weight	518–639 lb.

\*With a dual-plate clutch. Application approval required.

## KEEP DRIVERS SAFE AND FLEETS MOVING.

The DT12 includes a variety of innovative safety features that help protect the driver and entire vehicle, as well as enhance the driving experience. Because the transmission is automated, new drivers experience a shorter learning curve. Various driver interfaces have been designed to reduce driver fatigue, including a true two-pedal system along with convenience features like the shift lever and cruise control. Other advanced features include:

**HILL START AID** When stopped on grades of 6% or more, the vehicle is prevented from rolling backward on uphill grades or forward on a downhill grade.

**AUTO NEUTRAL** When the parking brake is engaged or the vehicle is shut down, the transmission electronically commands neutral gear. The shifter must be moved to N (neutral) before the truck is started again.

**DETROIT™ CONNECT VIRTUAL TECHNICIAN<sup>SM</sup> DIAGNOSTIC SERVICES** Prevents unsafe driving situations from occurring by alerting the driver to engine or transmission faults that could cause damage.



The shift lever includes gear, auto/manual mode and engine brake selection for excellent ergonomics.



If the vehicle is stopped on an incline, the Hill Start Aid prevents rollback.

## VIRTUAL TECHNICIAN

Our factory-installed Virtual Technician onboard diagnostic system takes the guesswork out of transmission repair. When a truck's transmission check light illuminates, information is sent to you and the Detroit Customer Support Center (CSC), where a trained representative can diagnose the issue, recommend service and even contact the nearest authorized locations with parts in stock. The CSC can tell you if you need to pull over, so you don't cause further damage, or if you can stay on the road. Put simply, it's like having a technician in every truck.

Virtual Technician's optional Visibility Package is a fleet management system that offers access to the Ground Traffic Control website. This groundbreaking system captures latitude, longitude, time and odometer readings for your trucks. With pinpoint accuracy, the system records vehicle stops, speeds, routes traveled, mileage by state, excessive idling, fuel consumption and other onboard events. The Visibility Package helps you manage your business more efficiently.



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## EMPOWERED BY DETROIT

Here at Detroit, we've built our reputation by building high-quality products that perform beyond expectations. Today, you'll find our components in Freightliner and Western Star trucks on roads and at job sites around the globe.

Our people and our continuous pursuit of innovation are powerful driving forces. Our engineering and manufacturing expertise are world-class. Our service network is expansive and responsive. That's why we continue to grow and evolve. It's also why we now offer a full line of products: engines, axles, transmissions and advanced technologies. That's right. The company that makes the heart of the truck now gives you the arms, legs and backbone to go with it. So, if you demand it all, demand Detroit.

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**Detroit™ DT12™ Transmission** has 12 forward gears and two standard reverse gears that can be shifted automatically or manually. Shifting and clutch actuation are computer controlled and there is no clutch pedal needed to operate the vehicle.

Automatic shifts are selected for fuel economy or engine power. The DT12 will not automatically shift gears in reverse but requires the driver to manually shift.

To manually shift the transmission, push the lever away to request a downshift, or pull the lever toward you to request an upshift.

In all cases, shifts depend on the following factors: engine speed, accelerator pedal position, engine brake operation, vehicle load status, and road grade.

### Power Up and Shift into Gear

1. With the parking brake set and Neutral (N) selected on the shifter stalk, turn the ignition switch to the ON position. Before cranking, wait for the bulb check and gauge sweep to complete.
2. Start the engine.
3. Apply the service brake.
4. Engage Drive or Reverse with the shifter stalk.
5. Release the parking brake.
6. Release the service brake and apply the accelerator.

### Gear Display Window

The gear display window shows the current transmission gear and drive mode.



Refer to the DTNA Driver's Manual for Complete Information on all of the Vehicle Controls

### Drive Modes

There are three drive modes:

(1) Automatic Economy, (2) Automatic Performance, (3) Manual  
(Available drive modes are dependent on vehicle configuration.)

The default mode is Automatic Economy. To engage Auto Performance, simply press the end of the shifter stalk towards the steering column where the A & M are shown. The transmission will automatically return to Automatic Economy from Auto Performance, once throttle demand is reduced. To select Manual drive mode, press and hold the end of the shifter stalk. You will know whether the requested drive mode change was successful based on the display in the gear display window of the instrument cluster (Cascadia) or interactive dash display (New Cascadia).

### eCoast

eCoast is a feature that can improve fuel economy (with or without cruise control). When conditions permit, the transmission shifts to Neutral and the engine goes to idle. When the conditions listed below terminate eCoast, the transmission will automatically select and shift into the proper gear. When eCoast is active, an "E" is displayed in the gear display window on the instrument cluster (Cascadia) or in the interactive dash display (New Cascadia).

The eCoast function does not initiate when any of the following occur:

- the accelerator pedal is pressed.
- the service brake pedal is pressed.
- the engine brake is in use.
- the speed limiter is active and the maximum speed is exceeded.
- PTO (if equipped) is in use.
- eCoast is disabled if the DPF is in regeneration mode.
- Steep downhill grades
- Below 50 mph

### Suggested Shift

In Manual mode only, a suggested shift is displayed to indicate the most economical gear available. The suggested shift is the number of up or down arrows from the current gear with a maximum of three up or down arrows.

### Creep Mode

Creep mode allows the vehicle to be maneuvered automatically at very slow speeds. To begin using it from a parked position, shift from neutral to either drive or reverse, release the service brakes, and briefly depress and release the accelerator pedal. Creep mode will be engaged and the vehicle will begin to move.

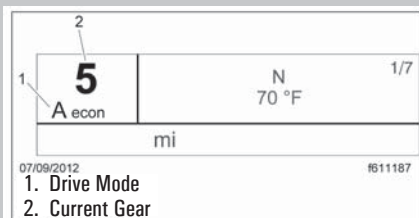
When slowing down from higher speeds in drive or reverse, remember that Creep mode will be in effect at lower speeds. Use the service brakes to completely stop the vehicle.

### Cruise Descent Control

Descent Control will help control vehicle and engine speed when descending a grade.

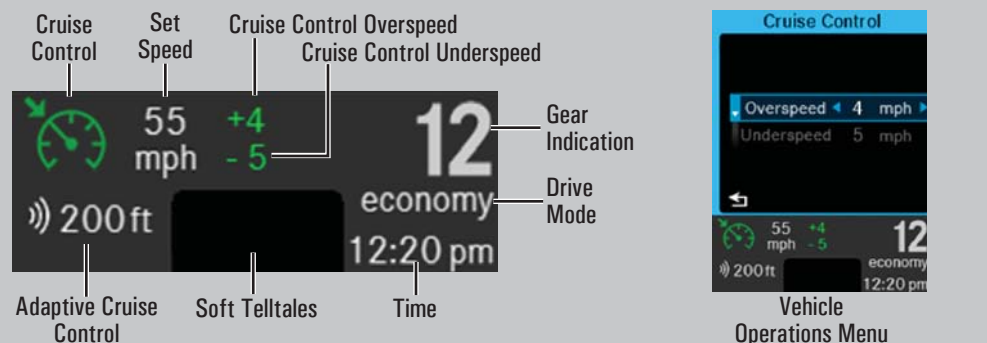
- If cruise descent control is activated with engine brake/shifter stalk in position 1:
  - Descent control is active and all levels of engine brake are available.
  - If the engine brake/shifter stalk is moved to a higher level position, descent control is cancelled entirely.
  - Once descent control is canceled, the engine brake/shifter stalk position becomes a manual engine brake request.
  - If the engine brake/shifter stalk is rolled back to the 0 position, vehicle is not returned to cruise.
- If cruise descent control is activated with engine brake/shifter stalk in position 2 or 3:
  - Descent control is active and all levels of engine brake are available.
  - If the engine brake/shifter stalk is moved to a lower level position, descent control remains in operation with all levels of automated engine brake shift available and any manual position is ignored.
  - If the engine brake/shifter stalk is rolled back to position 0, vehicle is returned to normal cruise.
- Cruise descent control does not utilize the CC band switch (Classic Cascadia) functionality and does not fuel the engine on descent.

### Instrument Cluster Display - Cascadia



1. Drive Mode
2. Current Gear

### Interactive Dash Static Display Area - New Cascadia - Interactive Dash Display Cards

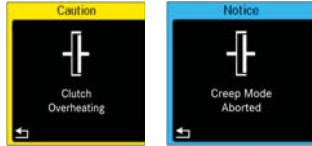


### Clutch Abuse Protection

A vehicle equipped with a Detroit transmission does not have a clutch pedal, but still has a clutch that is operated automatically and can be damaged by abusive driver actions. To protect the clutch, the vehicle has a series of clutch abuse alerts that warn the driver and restricts functionality when needed for events including...

- Extended periods in Creep Mode
- Slipping the clutch (using accelerator pedal to hold vehicle on a hill, for example)
- Mitigating high clutch temperatures

Dash Display  
Pop-ups for  
New Cascadia

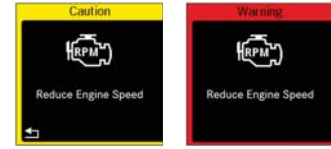


**IMPORTANT:** The transmission system will disable Creep Mode if it determines the clutch temperature is too high. A display message notifies the driver when creep mode is about to be aborted.

### Engine Overspeed Alerts

To help protect the engine, the system has display messages to notify the driver when the engine has exceeded certain thresholds and needs to be slowed down before significant engine damage occurs. There are two warnings, one at 2300 rpm and another at 2500 rpm.

Dash Display  
Pop-ups for  
New Cascadia



### Low Transmission Air Warning

Pneumatic controls are used to shift the transmission. If there is a loss of air pressure, a warning is displayed and the quality of gear shifts may degrade.

### Hill Start Aid Feature

The DT12 comes standard with a Hill Start Aid feature. Hill Start Aid engages and holds the service brakes of the tractor and trailer on grades greater than 3% to allow the driver time to transition from the service brake to the accelerator pedal. This feature prevents the vehicle from rolling backwards and permits the driver time to safely pull away from an intersection. Hill Start Aid will release brakes after 3 seconds. Hill Start Aid also works in reverse when backing up an incline greater than 3%.

**Note:** When a vehicle with a DT12 transmission is starting from a stop, the transmission automatically selects the proper launch gear based on mass calculation and grade. It is not uncommon for the transmission to start in a gear other than first.

#### TIPS FOR AVOIDING CLUTCH ABUSE

Example	Tip
Holding the vehicle stationary on an uphill slope	Use the service brakes, not the accelerator pedal.
Starting off on an uphill slope	To start moving, accelerate and release the brakes as the vehicle begins to move.
Hooking up to a trailer	Ensure the trailer is raised high enough to back under, and use first gear reverse.
First start after attaching a trailer	Start in first gear.
Do not overuse Creep Mode, and deactivate it when warned. If warned, stop the vehicle or apply throttle until clutch is completely closed.	

### Engine Brake Control

- Is set using the shifter stalk.
- To activate automatically the shifter stalk must be perpendicular to the steering column or in the upmost position.
- The driver can operate the engine brakes manually by moving the shifter stalk in a clockwise direction. There are 3 detents for low, medium and high engine braking (see diagram.)
- When the shifter stalk is in the auto position and the cruise control is set, the engine braking is dictated by the parameters settings for the optional Cruise Control Band Switch.
- The engine brake does not provide precise control of the vehicle, and is not a substitute for service brakes.



- “Auto”
- ↓ Detent 1 Low
- ↓ Detent 2 Med
- ↓ Detent 3 Max

### Auto-Neutral

If the parking brake is set with the transmission in gear for 5 seconds, an “N” will flash on the instrument cluster (Cascadia) or interactive dash display (New Cascadia) to warn of imminent Auto-Neutral. After 10 seconds, the transmission shifts to Neutral and activates the buzzer for 1 second. After Auto-Neutral is engaged, the driver must select “N” on the shifter stalk and reselect “D” to engage gear. The purpose of this feature is to prevent the driver from leaving the transmission in gear when parked.

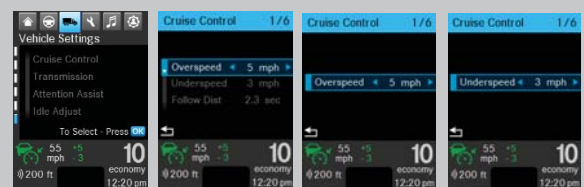
### Cascadia: Cruise Control Band Switch

The DT12 has an optional 3-position Cruise Control Band Switch on the B-panel which allows the driver to control the hysteresis of the vehicle speed above the cruise control set point prior to engaging the engine brakes.

- To function properly, the shifter stalk needs to be in the Auto or fully upward position.
- Default settings are 3mph, 5mph and no engine brake retardation above the cruise control set point. If different settings are desired, they can be changed with the appropriate Detroit DiagnosticLink® tools.
  - The 3mph position is recommended for steep grades
  - The 5mph position is recommended for rolling terrain
  - No engine retardation setting is recommended for flat terrain
- If no CCB Band switch, default setting is 5mph above cruise control set point.

### New Cascadia: Cruise Control - Interactive Dash Display Cards

1. Select the Vehicle Operations Icon from the main menu.
2. Toggle down and select Cruise Control.
3. Select Overspeed for upper speed setting.
4. Go back and select Underspeed for lower speed setting.



Vehicle  
Settings Menu

Cruise Control  
Menu

Refer to the DTNA Driver's Manual for Complete  
Information on all of the Vehicle Controls