



**TORQSHIFT**

**6R140 Heavy Duty  
Six-Speed  
Transmission**

**Al Bruck, Transmission Engineering Manager  
Dick Boerema, Transmission Durability Supervisor**



# LEADERSHIP



- **F-Series: Best selling truck in U.S. for 32 years; in Canada for 43 years**
- **33 million sold in 60 years**
- **Largest customer base: 9 million strong**
- **More trucks on road with 250,000 miles**



# SUPER DUTY CUSTOMER

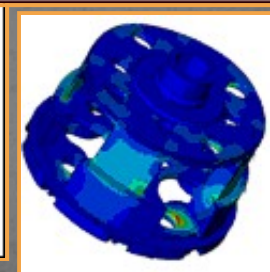
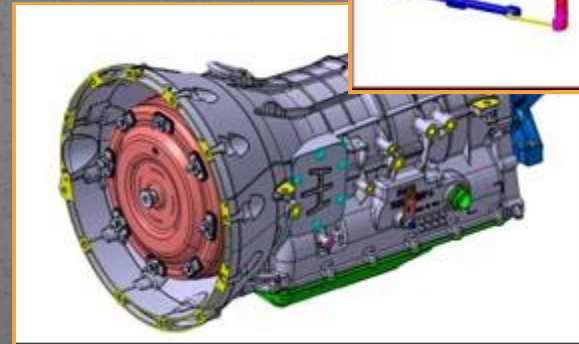
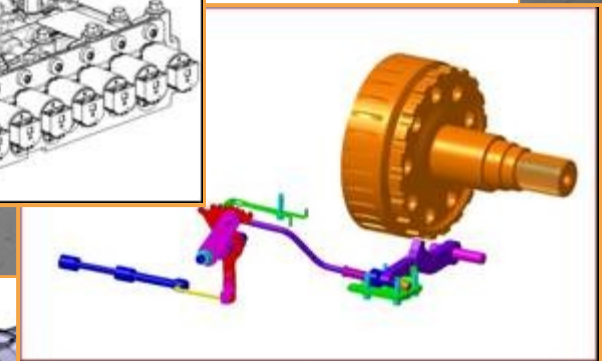
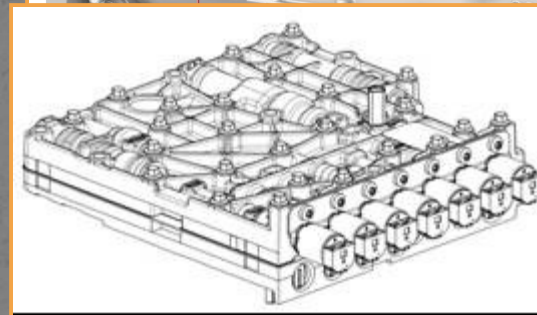
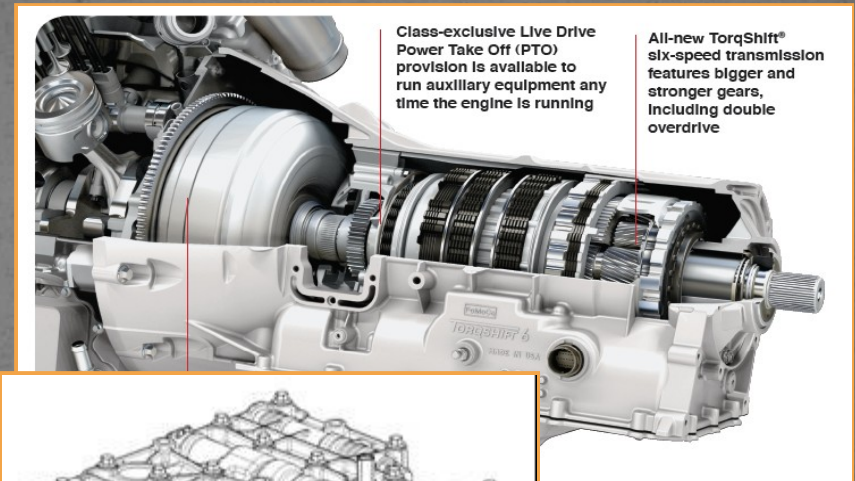
- 60% of commercial segment drives Super Duty
- They build America's infrastructure
- Wyoming energy company tows 21,000 lbs to natural gas wells
- Florida utility company tows "swamp buggies" and goes off-road
- Texas construction firm hauls away thousands of pounds concrete
- Chassis cab upfitted as fire trucks, dump trucks, tow trucks, aerial trucks





# Transmission TECHNOLOGY

- **Designed and built by Ford**
- **Proven efficient powerflow**
- **Deep first gear with double overdrive**
- **One-piece deep-skirt case**
- **Sinter-brazed gear carriers w/ high power density**
- **Long-travel converter damper w/closed piston**
- **Dual media filter extends change interval to 150K miles**
- **Integrated Live-Drive PTO**
- **Greater capability and ~25 lbs lighter than Allison 1000**
- **Tested to 250,000 miles**

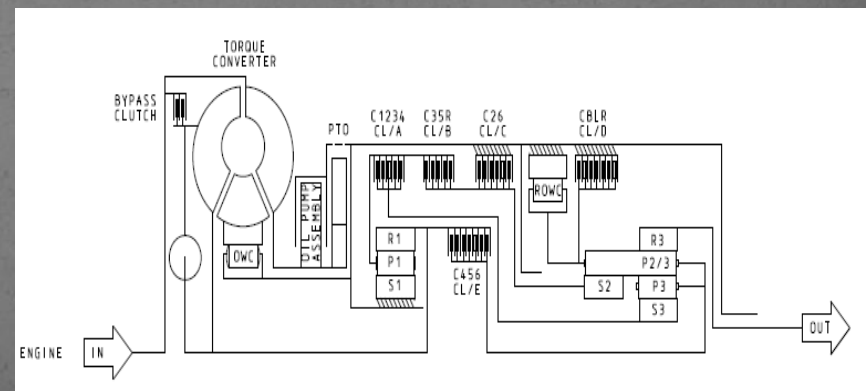


# Six Ratios - Ready to Work

GEAR	RATIO	STEP
1	3.974	
2	2.318	1.714
3	1.516	1.529
4	1.149	1.319
5	0.858	1.339
6	0.674	1.273
R	-3.28	

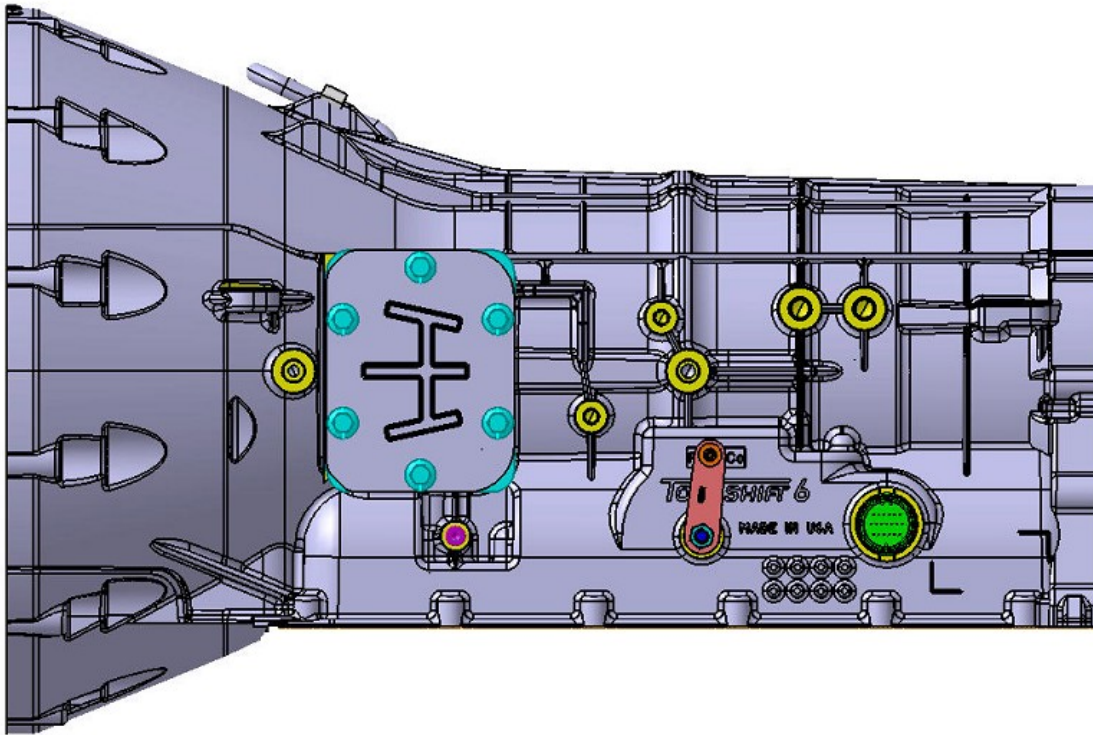
- Deep first gear to get your load moving
- Double overdrive for better fuel economy
- Even steps; 5.89 ratio span for balanced performance

**Ratio Span: 5.89**



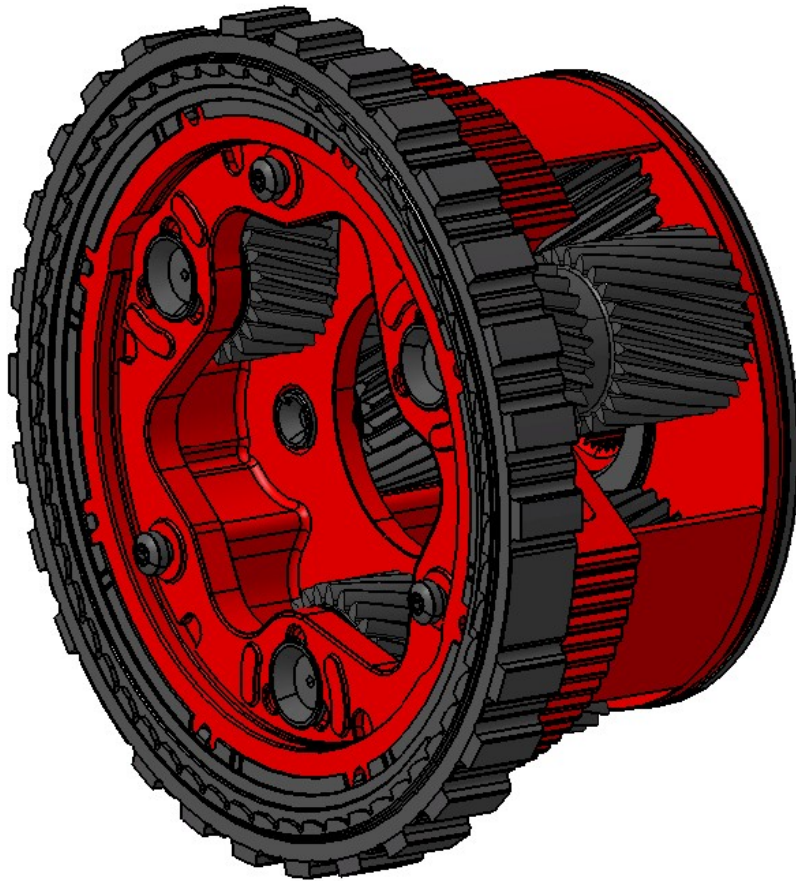


# One-Piece Deep Skirt Case



- **Optimized strength and weight**
- **Greater stiffness for improved NVH**
- **Eliminates fasteners and leak points**
- **Rear flange allows direct attachment to 4x4 T-case and slip yoke**

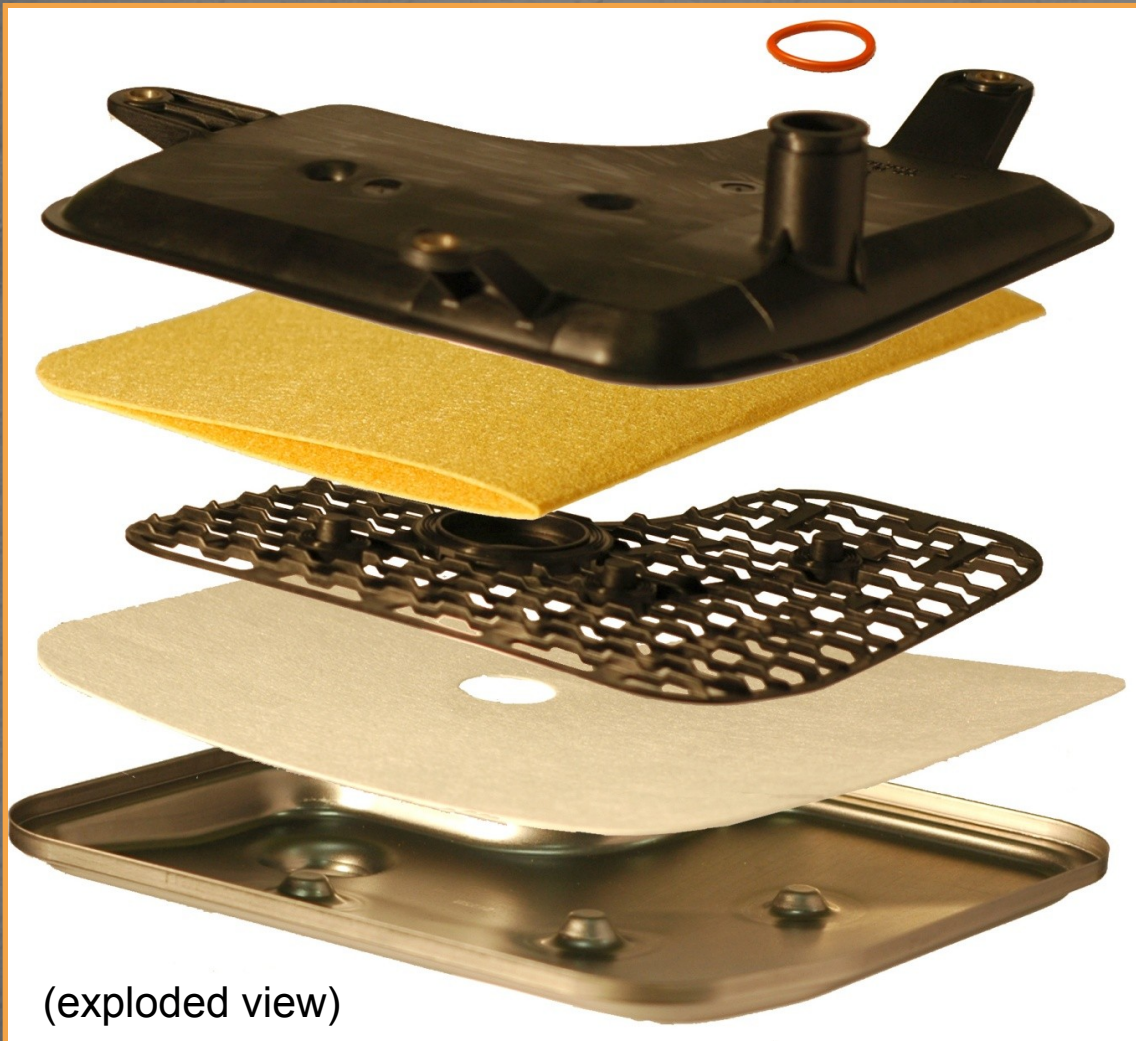
# ROCK SOLID: Sinter-brazed carrier delivers the torque



- **High power-density Raveneaux gear carrier**
- **Powder metal components are sinter-brazed to form rigid structure**
- **Highly engineered structure vs. cast iron**
- **Transfers the high torque of 6.7-liter diesel engine**
- **Manages high shift speeds of 6.2-liter gas engine**



# 150,000-mile Maintenance Schedule

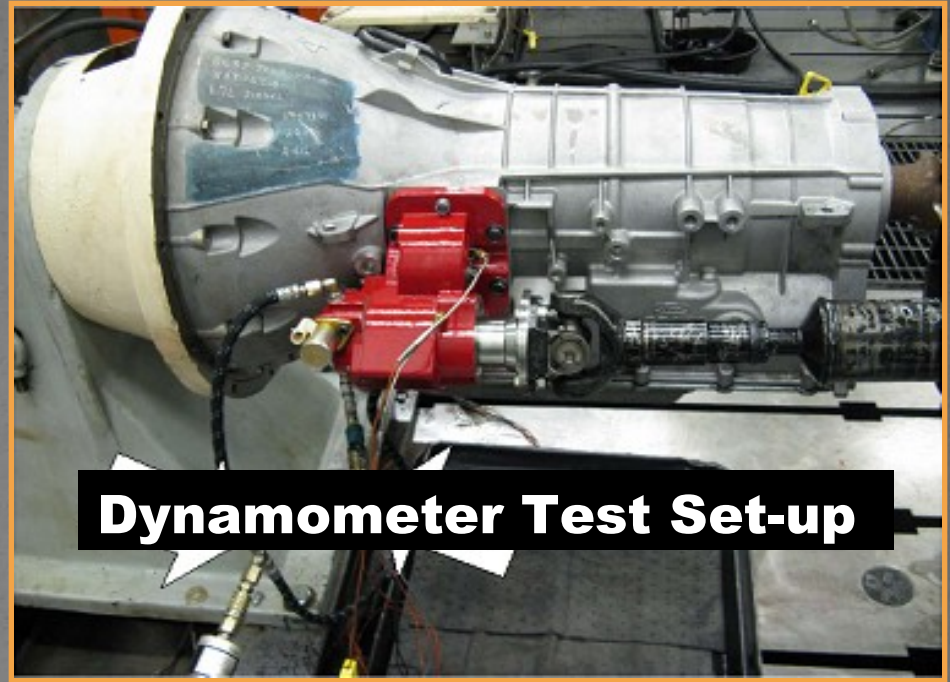
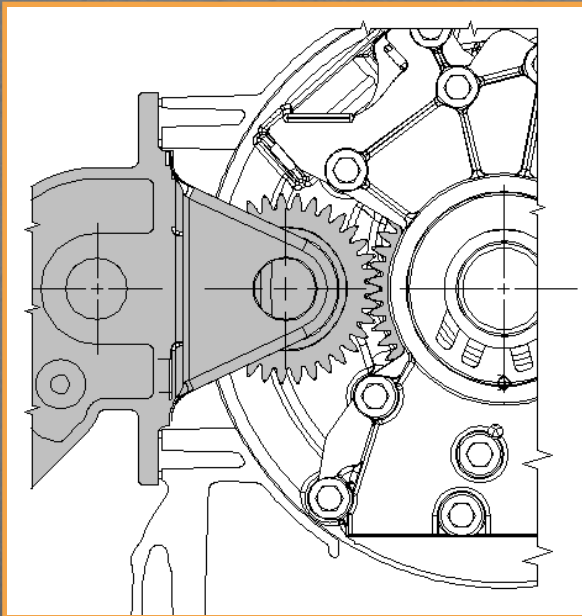


- **Lower cost of ownership**
- **More time on the road**
- **High-efficiency dual media (patent pending)**



# Exclusive Live Drive PTO

- **Super Duty segment exclusive**
- **Available on 6.7-liter diesel**
- **Output gear linked directly engine crankshaft**



- **Capable of stationary and mobile PTO operation**
- **Continues to deliver power when stopped, in drive**
- **Ideal for salt spreaders, snow plows, dump trucks**

# EFFICIENCY = Fuel Economy

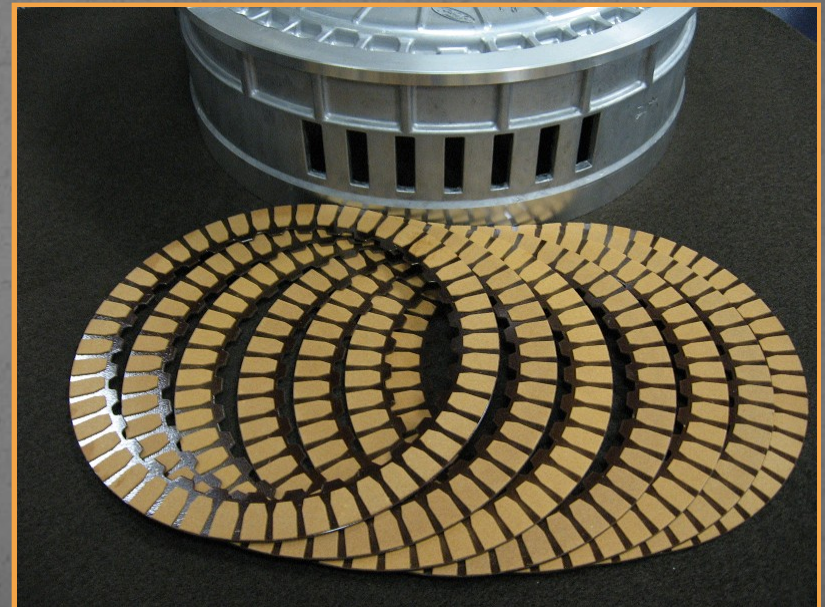


## POSILOK TORQUE CONVERTER

- Closed piston provides greater lock-up control
- Long-travel turbine damper enables 900 rpm lock-up speeds

## LOWER SPIN LOSSES

- Low relative clutch speeds
- Optimized fluid drain back
- Unique waved / segmented friction reduces drag





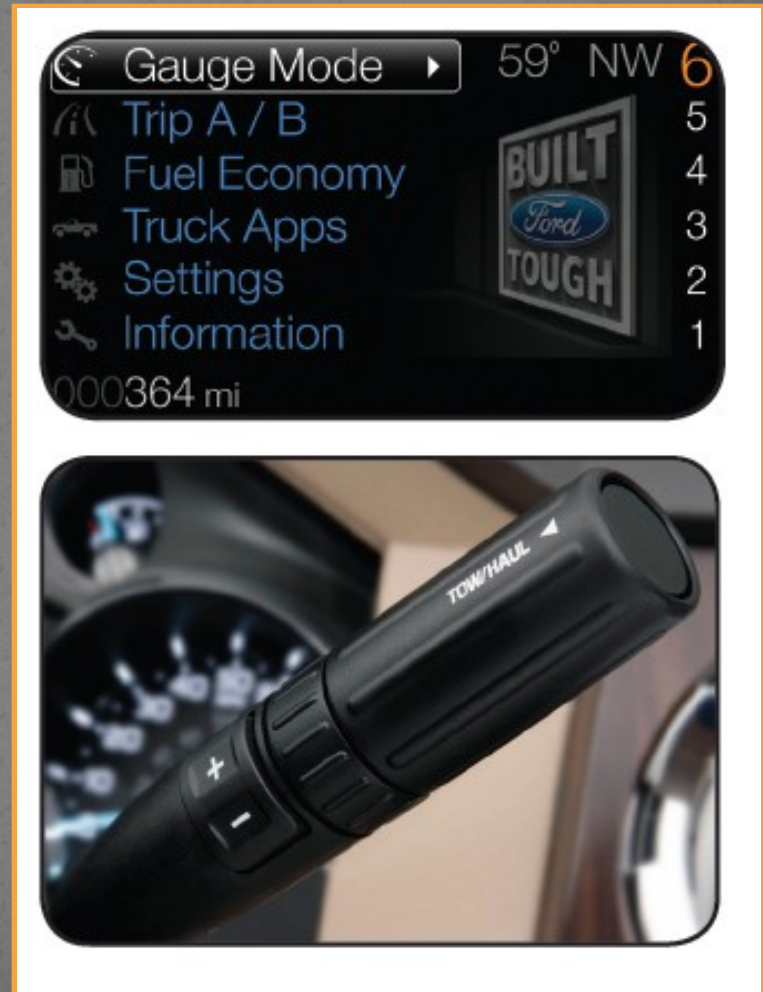
# SELECT SHIFT = Convenience, Control

## Progressive range select

- Tap down to reduce range
- Displays range and actual gear state
- Limits shifting when towing on grades

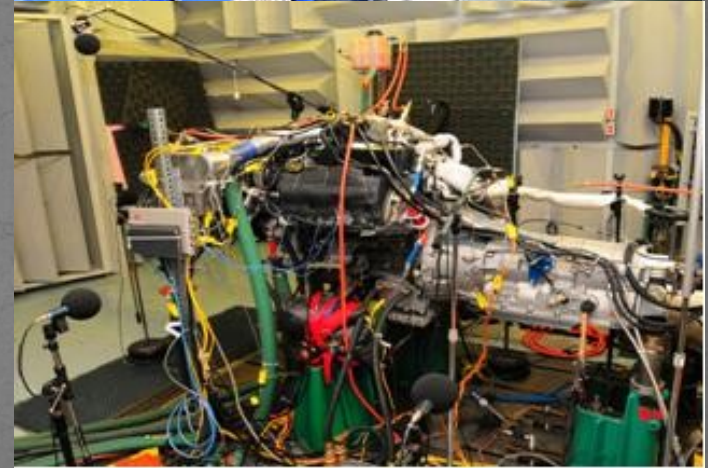
## Manual Mode

- Operates like a manual transmission
- Pull Level to “M” position
- Tap to select and hold gear
- Aggressive converter lock
- Provides manual control



# TESTED FORD TOUGH

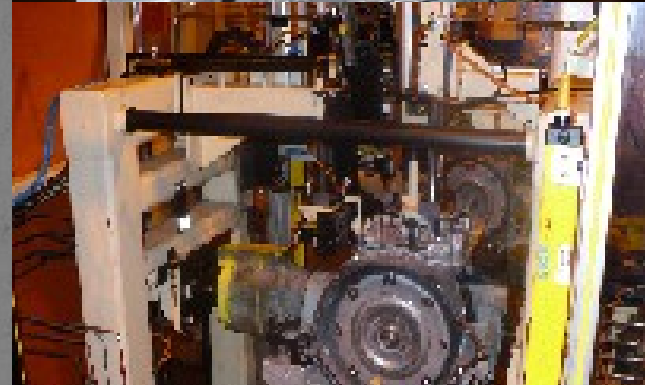
- Design criteria defined by real world customer use – load / towing profiles, driving styles, road types
- Extensive CAD, CAE testing; analytical signoff before first prototype
- Subsystems tested millions of cycles to exceed customer-correlated duty cycle
- Cold weather tested to -40F
- Gears torture-tested at continuous max engine torque for hundreds of hours
- 250,000-mile transmission key life test w/ 6.7-liter diesel





# BUILT FORD TOUGH

- **Built at Sharonville Ohio Transmission Plant**
- **Flexible manufacturing capability**
- **Data-driven Quality Operating Systems based on key process input variables and output metrics**
- **Extensive training of experienced machining and assembly technicians**
- **100% hot tested**
- **Extensive supplier quality verification and validation**





# THE WHOLE PACKAGE

