6R140 Heavy Duty
Six-Speed
Transmission

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

Class-exclusive Live Drive Power Take Off (PTO) provision is available to run auxiliary equipment any time the engine is running.

All-new TorqShift® six-speed transmission features bigger and stronger gears, including double overdrive.
**Six Ratios - Ready to Work**

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

### Gear Ration Table

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<th>RATIO</th>
<th>STEP</th>
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**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)

(exploded view)
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