



6R140 Transmission Installation Instructions

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STOP — READ BEFORE YOU START

Four things kill new transmissions. All four are on you, and none of them are covered.

1. **A cooler that was not hot-flushed.** Debris from your old unit goes straight into this one.
2. **A torque converter that is not fully seated.** It destroys the front pump the moment you start the truck.
3. **A valve body strategy that was never programmed.** Wrong shift pressures, burned clutches, denied claim.
4. **Tires and gearing that do not match.** Oversized tires without matching gears overload the driveline.

Tools required

You must have a tool capable of flashing the transmission to complete this installation. Do not proceed without one.

Any of the following will do it:

- **Ford IDS** scan and flash tool
- **FORScan**
- **Most Snap-on scanners**

A programmer or code reader will not re-flash the transmission or program the strategy. If you do not have access to one of the tools above, arrange time at a Ford dealer before you start.

Also needed:

- Hot flush machine, or a shop that has one
- Dial caliper or machinist's rule for converter depth verification

Before you begin

- ☐ Read this entire document and the Rudy's Built Transmission Limited Warranty
- ☐ Confirm the unit is correct for your year, engine, cab configuration, and PTO status
- ☐ Confirm access to IDS, FORScan, or a capable Snap-on scanner for the re-flash and strategy programming
- ☐ Arrange the cooler hot flush
- ☐ Confirm your tire size and gear ratio meet Section 9

- ☐ Have your tuning sorted before the truck moves under its own power
- ☐ **Register your unit with Rudy's within 45 days of purchase. No registration, no coverage.**
- ☐ **Have it installed by a professional shop and keep the itemized invoice. No proof of professional installation, no warranty.**

Professional installation is required for warranty coverage. No claim will be approved without the installing shop's itemized invoice. You are welcome to install this yourself, but doing so forfeits coverage. Call us before you order if that is your plan.

Questions during install: (866) 757-6537. Call before you improvise. We would far rather talk you through it than deny a claim.

1. Prepare the Vehicle

After removing the old transmission, before anything goes back in:

- **Verify both dowel pins are properly positioned in the motor plate.** This is what aligns the new transmission. Missing dowel pins cause early failure and that failure is not covered.
- **Clean all electrical connections** related to the transmission and transfer case. Poor or loose connections cause early failure that is not covered.
- **Inspect all u-joints, carrier bearings, transmission mount, and motor mounts.** Worn u-joints, a failed double cardon joint, or an out-of-balance driveshaft are the usual cause of cracked cases. Damage to the transmission or transfer case resulting from any of these is not covered.

2. Cooler System Preparation — REQUIRED

If you initiate a warranty claim and the cooler and lines were not flushed, your claim will be denied.

Failure to properly flush the transmission oil cooler system leads to erratic operation and premature failure.

Either of the following is acceptable:

Option A — Hot flush. We use a hot flush machine, which circulates hot oil and briefly reverses flow to clear foreign material from the cooler. **This is the only approved flushing method.** Blowing the lines out with solvent is not sufficient. Pouring ATF through the cooler is not sufficient. Flush the cooler, both lines, and the radiator heat exchanger.

Option B — New cooler. Install a new transmission cooler and thoroughly clean the cooler lines.

We recommend a new cooler on any truck where the previous transmission had a major failure or high mileage.

Not permitted: aftermarket external transmission filters, restricted cooler lines, or any cooler circuit modification we have not approved in writing. Gear train damage from restricted flow is not covered.

3. Torque Converter — Do Not Remove It

Your transmission ships with the torque converter installed, fully seated, and verified by us before it left the building.

Every Rudy's transmission is sold with a converter, and we prefill and preinstall it before it ships. We do this because front pump damage from converter misalignment is the most common way a new transmission gets destroyed on install, and that damage is not covered by us or by the converter manufacturer.

Do not remove the converter. Do not substitute another one.

Removing the converter we installed, or running any other converter with this unit, voids your transmission coverage and typically voids the converter manufacturer's coverage as well.

Your torque converter is warranted by the company that built it, not by Rudy's. Refer to the converter manufacturer's warranty documentation that shipped with your unit for its coverage terms.

Seated depth — reference only

You should not need this. It is here so you can confirm the converter has not shifted if the transmission was dropped, set down on its bellhousing face, or otherwise mishandled in transit.

Lay a straightedge across the bellhousing face of the transmission and measure from the face of the transmission to the face of the converter where it bolts to the flexplate.

6R140 fully seated: 0.875" - 0.900"

If your measurement is short of spec, stop and call us at (866) 757-6537 before you go any further.

Never use the bellhousing bolts to draw the converter into engagement. The transmission must come up flush to the block by hand, with no gap. If there is a gap, the converter is not seated.

Record your measured depth on the warranty registration form.

4. Re-Flash and Strategy Programming — REQUIRED

The transmission must be re-flashed before the truck resumes normal operation, and the new valve body strategy must be programmed. Use Ford IDS, FORScan, or a capable Snap-on scanner, or have it done at a Ford dealer.

Neglecting this disrupts the shift programming, which leads to broken parts and a voided warranty. An unprogrammed strategy leaves the truck running shift pressures and timing that do not match the valve body actually in it.

Follow Ford instruction sheet #SK-BC3P-7A100-AB in full, including the drive cycle relearn. Failure to follow it will result in transmission failure and voids the warranty.

Any warranty claim must include proof of compliance with this requirement. Record the strategy code on your warranty registration form.

5. Transmission Fluid

Use any fluid licensed to the Ford Mercon LV specification.

Motorcraft is not required. Any properly licensed Mercon LV fluid is acceptable.

What matters is licensing, not the label. A licensed fluid carries a Ford license number and appears on Ford's list of licensed Mercon LV products. Phrases like *compatible with*, *meets or exceeds*, or *for use in applications requiring Mercon LV* are marketing claims with no testing behind them.

Do not use universal or multi-vehicle ATF. Fluid formulated to satisfy a dozen specifications at once compromises the friction characteristics this transmission depends on. In a built unit running higher clamp loads, that shows up as shudder, flaring or harsh shifts, and accelerated clutch wear.

Failures traced to non-licensed or universal fluid are not covered. Record the brand and total quantity used on your warranty registration form.

Your converter arrives prefilled

We prefill the torque converter before we install it, so the pump is never started dry. Do not attempt to fill, drain, or remove it.

This means **you need roughly 3 quarts less fluid than you would with an empty converter.** Total system capacity is unchanged — the first 3 quarts are already in the truck when it arrives.

Quantity to have on hand

Configuration	Total system capacity	Plan on adding
Stock pan	18 quarts $\pm$ 1	15 quarts $\pm$ 1
Deep pan	26 quarts $\pm$ 1	23 quarts $\pm$ 1

Buy an extra quart or two beyond what you think you need. Coming up short mid-fill with the engine running is how people end up running a pump low.

Fill Procedure

To avoid overfilling:

1. Remove the dipstick.
2. Add approximately **7 quarts** for a stock pan, **11 quarts** for a deep pan.
3. Apply the parking brake.
4. Start the engine and let it run at normal curb idle.
5. With the service brakes applied, shift to NEUTRAL, set the parking brake, and keep the engine at curb idle.
6. Add fluid until it reaches the hash marks on the dipstick.
7. Reinsert the dipstick and check the level. If low, add fluid until it reaches the MIN mark. **Both sides of the dipstick must read level** — if one side is higher, oil has collected on the dipstick tube. Allow it to drain and recheck.
8. Shift between DRIVE and REVERSE 4 to 5 times with the parking and service brakes applied, then return to NEUTRAL.

- 9. Recheck the level.
- 10. Drive the vehicle until the fluid reaches normal operating temperature.
- 11. With the engine at curb idle, selector in NEUTRAL, parking brake applied, recheck the level.

CAUTION: Do not overfill. Overfilling causes fluid foaming and shifting problems. Once the level is correct, shut the engine off, release the parking brake, and reinstall the dipstick in the fill tube.

Running the pump dry for even a brief moment will damage the pump bushing, gears, and converter neck. This damage is not covered. Prefilling the converter at our end removes the biggest cause of this, but it is still on you to keep fluid in it through the fill procedure.

6. Break-In Procedure — REQUIRED FOR WARRANTY VALIDITY

500-mile break-in period

Use stop-and-go driving with light to moderate throttle before performing any high-throttle upshifts.

- Accelerate from a stop to 6th gear at **25% throttle**, then bring the vehicle to a gradual stop. **Repeat 10 times.**
- Accelerate from a stop to 6th gear at **50% throttle**, then bring the vehicle to a gradual stop. **Repeat 5 times.**

Relearn

The relearn process takes **5 days**, with overnight cool-down periods required before it completes.

You may experience slip or flare on the 1-2, 2-3, and 3-4 shifts when the transmission is cold, particularly in the morning, until the TCM adapts. **This is normal.** Once it resolves, you can safely exceed 50% throttle.

It is normal for the transmission to require some mid and heavy throttle driving after the initial break-in to fully adapt to those throttle positions.

If the slip or flare has not cleared after the relearn period, call us before you drive it hard.

7. Tires, Gearing, and Tuning

Oversized tires without matching gearing put excessive leverage on the overdrive clutch and shorten the life of the unit, badly so when towing. **Running outside this table voids coverage.**

Tire Size	Minimum Ratio	Recommended
Up to 33"	3.55	3.73
35"	3.73	4.10
37"	4.10	4.30
Larger than 37"	4.30	Call us before you build

The heavier the wheel and tire package, the more stress the transmission absorbs.

Tuning. The vehicle must be properly tuned for this transmission at the power level it was built for. Failures from absent tuning, improper tuning, or tuning that puts the transmission in the wrong gear are not covered.

Power limits. This unit was built and sold for a specific power level. Operating above it voids coverage. Nitrous and trans-brake use are not authorized unless the unit was specifically built and purchased for it.

8. Core Return

Your core charge is refunded in full when we receive an acceptable core.

- **Drain the core completely of all fluid.** Cores arriving with fluid may be refused or assessed a cleaning charge.
- **The core must be complete.** Missing components reduce or eliminate the refund.
- **Call us at (866) 757-6537 when your core is ready for pickup** so we can issue the RMA and arrange the freight. Do not ship a core back without contacting us first.
- **Return within 30 days** of delivery of your new unit.
- **If your transmission arrived in a plastic shipping crate, that crate is ours and must go back with the core.** Cores returned without it are charged **\$350**. Crate supply is limited, so some units ship strapped to a pallet instead — if yours came on a pallet, there is no crate to return and no charge.
- Package the core to survive freight. Damage from inadequate packaging is your responsibility.

Cracked, incomplete, or unrebuildable cores do not receive a refund.

9. If Something Goes Wrong

Call us before you diagnose or repair anything.

(866) 757-6537

Work performed before you contact us is not eligible for coverage, even if the underlying failure would have been covered. This is the single most common reason we have to deny an otherwise valid claim.

We will help diagnose the failure. If it is covered, we issue an **RMA number**. Nothing comes back to us without one. Write it on the outside of the shipment and include it with the paperwork inside.

From there you can either send the unit in for inspection, or purchase a replacement immediately and receive a refund after inspection if the failure is found to be covered.

Have ready: your Rudy's sales order, the installing shop's itemized invoice, your registration confirmation, proof of the IDS re-flash and strategy programming, VIN, mileage, tire size, gear ratio, tuning, service records, and a description of what happened.

10. Register Your Unit

Your warranty registration must reach us within 45 days of purchase or you have no coverage.

The form is in your crate. Return it to support@rudysdiesel.com.

Following these instructions carefully is what gives you a successful installation and a transmission that lasts. Skipping steps is what brings it back to us.