



5R110W 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. **Readaptation skipped or done with the wrong tool.** A programmer or code reader will not do it.
4. **Tires and gearing that do not match.** Oversized tires without matching gears overload the driveline.

Tools required

- **Snap-on scanner or equivalent bidirectional scan tool** for readaptation. **A programmer or code reader will not work.** Do not begin the installation without access to one.
- 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
- ☐ Arrange the cooler hot flush
- ☐ Confirm your tire size and gear ratio meet Section 8
- ☐ 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 resulting from any of these is not covered.
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2. Cooler System Preparation — REQUIRED

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

The 5R110W requires a **complete system flush**. A new cooler alone is only half the system.

- **Hot-flush the cooler and both cooler lines.** We use a hot flush machine, which circulates hot oil and briefly reverses flow to clear foreign material. **This is the only approved method.** Blowing the lines out with solvent is not sufficient and leaves contaminants behind. Pouring ATF through the cooler is not sufficient.
- **Flush the heat exchanger in the radiator.** It holds debris from the failed transmission and will feed it back into the new unit. This step gets skipped constantly and it is the reason units come back.
- **Job 1 6.4L and 6.0L trucks: replace the inline filter on the cooler lines.** Do not reuse it.

We always recommend a new transmission cooler, especially if 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 warrantied 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.

5R110W 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. Ground Cable — REQUIRED

Ford Super Duty trucks have well-known grounding issues that lead to premature pump failure.

- Connect the **included ground cable to one of the starter bolts** and to the **negative battery terminal**.
- Ensure all connections are clean and free from corrosion.

5. 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.

Plan on 15 to 17 quarts to complete the fill

(approximately 18 to 20 quarts total system capacity, less the ~3 quarts already in the converter, and varying with cooler, pan, and configuration)

Fill procedure:

1. Add **5 to 7 quarts** to the transmission before starting the engine
2. Start the engine, run **5 to 10 seconds**, shut it off, add more fluid
3. Repeat until the level is correct, then bring to final level with the engine running

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.

Running the pump dry for even a brief moment will cause severe damage to the pump bushing, gears, and converter neck. Ensure the pump is adequately lubricated at all times. This damage is not covered.

6. Readaptation — REQUIRED

Perform readaptation using a Snap-on scanner or equivalent bidirectional scan tool.

A programmer or code reader will not perform readaptation.

The vehicle must not be driven until readaptation is complete. Driving before readaptation causes significant internal damage that is not covered under warranty.

Record completion on your warranty registration form.

7. Break-In Procedure — REQUIRED FOR WARRANTY VALIDITY

After readaptation:

- Perform **20 cycles** of shifting from 1st through 5th, then 5th back down to 1st, under **light throttle. Do not exceed 50% throttle.**
- Bring the vehicle to a gradual stop between cycles rather than braking hard.
- Once shifts are consistently smooth, it is safe to tow or increase throttle.

Some slip or flare on cold shifts in the first days is normal while the TCM adapts. If it has not cleared once shifts smooth out, call us before you drive it hard.

8. 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.

9. 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.
- 2003 and 2004 cores are not accepted. Your core must be a 2005 or newer unit or the core charge will not be refunded.

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

10. 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, VIN, mileage, tire size, gear ratio, tuning, service records, and a description of what happened.

11. 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.