

Fuller Heavy Duty Transmissions TRDR0500

June 2014

RT-7608LL Series
RT-8908LL Series
RTO, RTX-1X608LL Series
RTO, RTX-1X708LL Series
RTO-1X908LL Series



Powering Business Worldwide

BACKED BY

Roadranger

SUPPORT

Warnings and Cautions



Read the entire driver instructions before operating this transmission.

Set the parking brakes before starting a vehicle, always be seated in the driver's seat, move the shift level to neutral, and depress the master clutch.

If engine cranks in any gear other than neutral or without the master clutch depressed, service your vehicle neutral safety start circuit immediately.

Before working on a vehicle or when leaving the cab with the engine running, place the transmission in neutral and set the parking brakes, and block the wheels.

Do not release the parking brake or attempt to select a gear until the air pressure is at the correct level.

When parking the vehicle or leaving the cab, always place the shift lever in neutral and set the parking brakes.

TOWING: To avoid damage to the transmission during towing, disconnect the driveline.

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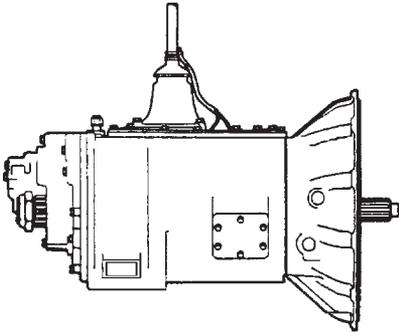
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Reference Numbers

Tag Information

Transmission model designation and other transmission identification information are stamped on the transmission tag. To identify the transmission model designation and serial number, locate the tag on the transmission and then locate the numbers as shown.



WARNING: Do not remove or destroy the transmission identification tag.

The blank spaces provided below are for recording transmission identification data and part numbers of maintenance items. Have these reference numbers handy when ordering replacement parts or requesting service information:

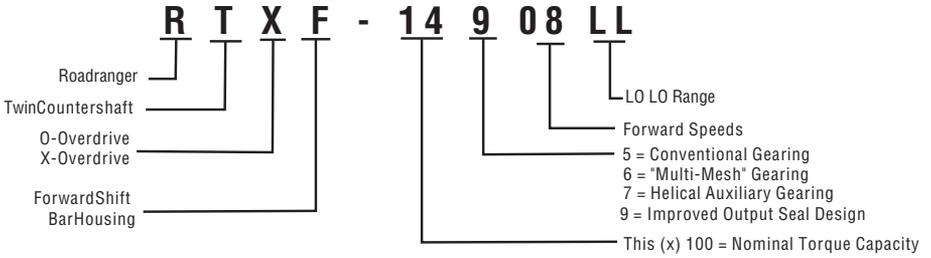
Transmission Model: _____

Transmission Serial Number: _____

Every effort has been made to ensure the accuracy of all information in this brochure. However, Eaton Corporation makes no expressed or implied warranty or representation based on the enclosed information. Any errors or omissions may be reported to Technical Service, Eaton Corporation, P.O. Box 4013, Kalamazoo, Michigan 49003-4013.

Model Designations

Nomenclature



General Information

Models in this series provide eight forward speeds and three reverse, consisting of a five-speed front section and a three-speed auxiliary section. The auxiliary section contains LO and HI range ratios, plus an extra deep reduction gear.

The LO gear set in the front section is used only as a starting gear. The other four ratios are used twice—once in LO range and once again in HI range.

Shifting is simple and easy with the Roadranger repeat "H" shift pattern. After shifting out of LO, the gear shift lever position for 5th is the same as 1st, 6th the same as 2nd, 7th the same as 3rd, and 8th the same as 4th.

The range knob or range lever is used once during an upshift sequence and once during a downshift sequence. LO-LO is selected with the dash-mounted deep reduction lever or the Roadranger valve deep reduction button on the shift lever. The LO-LO shift should only be made with the transmission in LO range and the shift lever in the LO speed gear position.

Always preselect the range shift. After preselection, the transmission will automatically make the synchronizer range shift as the shift lever passes through neutral.

General Information

Transmission Features

Range Shift

The range lever selects LO or HI range. It is used once during an upshift sequence and once during a downshift sequence.

Preselect

IMPORTANT: Always preselect all range shifts when upshifting or downshifting. Pre-selection requires that the range lever is moved to the needed position before starting the shift.

Pre-selected range shifts are completed automatically as the lever is moved through neutral and into the next gear. Pre-selecting all range shifts prevents damage to the transmission and provides for smoother shifts.

Optional Equipment

For easier and faster gear engagement while the vehicle is standing still, some Eaton® Fuller® transmissions may be equipped with either a Countershaft Brake or a Clutch Brake.

Countershaft Brake (Used with push-type clutches)

The control button is mounted on the shift lever just below the shift knob. To operate, disengage the clutch, press down the control button, and shift into LO or reverse. This is an air operated mechanical brake which slows down the transmission gearing by forcing a piston against the countershaft PTO gear. Never use the Countershaft Brake when upshifting or downshifting. Use only for initial gear engagement when the vehicle is standing still.

Clutch Brake (Used with pull-type clutches)

The clutch brake is applied by fully depressing the clutch pedal to the floor board. When applied the brake slows down and can stop the transmission front box gearing. It is a disc-type brake incorporated into the clutch and transmission drive gear assemblies. Never use the Clutch Brake when upshifting or downshifting. Use only for initial gear engagement when the vehicle is standing still.

Shift Lever Positions

Shift Positions

RTO 1X608LL Series
RTO 1X708LL Series

**Eaton® Fuller®
Transmissions**

8SPEED + LO & LO-LO (RTO)

DEEP REDUCTION SELECTOR (LO-LO)

RANGE SELECTOR

IN
OUT

HI
LO

PRE-SELECT ALL RANGE SHIFTS
(MOVE RANGE SELECTOR **BEFORE** MOVING SHIFT LEVER)

UPSHIFTING
START WITH RANGE SELECTOR DOWN
SHIFT 1-0-1-2-3-4 RAISE RANGE SELECTOR
SHIFT 5-6-7-8

DOWNSHIFTING
SHIFT 8-7-6-5 MOVE RANGE SELECTOR DOWN
SHIFT 4-3-2-1-LO

DO NOT CHANGE RANGE WHILE MOVING IN REVERSE

WARNING PUT TRANSMISSION IN NEUTRAL BEFORE STARTING ENGINE

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RT 7608LL Series
RT 8908LL Series
RTX 1X608LL Series
RTX 1X708LL Series
RTO 1X908LL Series

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WARNING PUT TRANSMISSION IN NEUTRAL BEFORE STARTING ENGINE

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Operation

Driving Operation

Driving Tips

- Always use normal double-clutching procedures when making lever shifts.
- Always select an initial starting gear that provides sufficient reduction for the load and terrain.
- Never slam or jerk the shift lever to complete gear engagements.
- Never coast with the shift lever in the neutral position.
- Never downshift at too high of a road speed.
- Never move the range lever with the shift lever in neutral while the vehicle is moving.
- Never make a range shift while moving in reverse.
- In most cases, depending on the engine and axle ratios, you can save valuable fuel by operating the vehicle at less than governed RPM while cruising in 8th.
- For models equipped with the dash-mounted deep reduction valve, NEVER move its lever to the “IN” position while the transmission is in HI range.
- Never move the shift lever to LO speed gear position when the transmission is in HI range.

Double-Clutching Procedure

When ready to make a shift:

1. Depress pedal to disengage clutch.
2. Move the shift lever to neutral.
3. Release pedal to engage clutch.*
 - a. Upshifts—decelerate engine until engine RPM and road speed match.
 - b. Downshifts—accelerate engine until engine RPM and road speed match.
4. Quickly depress pedal to disengage clutch and move shift lever to next gear speed position.
5. Release pedal to engage clutch.

Note: *By engaging the clutch with the shift lever in the neutral position, the operator is able to control the mainshaft gear RPM since it is regulated by engine RPM. This procedure helps the operator match the mainshaft with the driveline.

Initial Start-Up



WARNING: Before starting a vehicle, always be seated in the driver's seat, move the shift lever to neutral.



CAUTION: Before moving a vehicle, make sure you understand your shift pattern configuration.

1. Make sure the shift lever is in neutral and the parking brakes are set.
2. Turn on the key switch to start the engine.
3. Allow the vehicle air pressure to build to the correct level. Refer to your "Operator and Service Manual" supplied with the truck.
4. Apply the service brakes.
5. Make sure the range lever is down in the LO range position.



Range Lever MUST be in the LO Range position for LO Range.

6. Make sure the deep reduction lever/button is in the "Out/Rearward" position. OR, in the "In/Forward" position if you want to start in LO-LO under adverse conditions.

Lever in "OUT" or Button in REARWARD position for LO RANGE operation.

Lever in "IN" or Button in FORWARD position for DEEP REDUCTION ONLY.



7. Depress the clutch pedal to the floor.
8. Move the shift lever to desired initial gear.
9. Release the parking brakes on the vehicle.
10. Slowly release the clutch pedal and apply accelerator.

Operation

In the following instructions, it is assumed that the driver is familiar with operating heavy-duty trucks and tractors, and can coordinate the shift lever movement and clutch pedal to make smooth gear engagements while upshifting or downshifting.



CAUTION: Never move the range lever with the shift lever in neutral while the vehicle is moving.

Upshift Procedure

LO-LO to LO...

1. Move the deep reduction lever/button to the “Out/Rearward” position and immediately release the accelerator, depress the clutch pedal once to break torque, and re-engage the clutch. The transmission shifts from deep reduction to LO range when synchronous is reached. Then accelerate.

Range shift—LO to HI Range (4th to 5th)...

2. When in last gear position for LO range and ready for the next upshift, pull up the Range Lever and move the shift lever, double-clutching, to the next higher speed position according to your shift pattern. As the shift lever passes through neutral, the transmission will automatically shift from LO to HI range.



CAUTION: Never move the shift lever to the LO speed gear position after HI range preselection, or at anytime the transmission is in HI range.

Downshift Procedure

1. Move the shift lever, double-clutching, to the next desired gear position in HI range.

Range shift from HI Range to LO Range (5th to 4th)...

2. While in 5th and ready for the next downshift, preselect LO range, push the range preselection lever down.
3. Move the shift lever, double-clutching, to the next desired gear position in LO range. As the shift lever passes through neutral, the transmission automatically shifts from HI range to LO range.
4. Continue downshifting, double-clutching, to the next desired gear position in LO range.

LO to LO-LO...

5. DO NOT downshift into LO-LO from LO unless operating conditions make it necessary. LO-LO can be obtained with the transmission in LO range and the shift lever in the LO speed gear position by moving the deep reduction lever/button to the "In/Forward" position. Then immediately release the accelerator, depress the clutch pedal once to break torque, re-engage the clutch and accelerate. The transmission shifts from LO to LO-LO when synchronous is reached.

Lubrication

Proper Lubrication

The Key to Long Transmission Life

Proper lubrication procedures are the key to a good all-around maintenance program.

Eaton® Fuller® Transmissions are designed so that the internal parts operate in an oil circulating bath created by the motion of the gears and shafts.

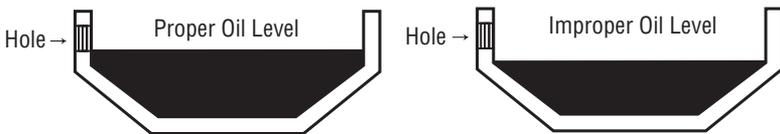
All parts will be properly lubricated if these procedures are closely followed:

- Maintain oil level. Inspect regularly.
- Follow maintenance interval chart.
- Use the correct grade and type of oil.
- Buy from a reputable dealer.

Maintain Proper Oil Level

Make sure oil is level with the filler opening. Being able to reach oil with your finger does not mean oil is at proper level. **(One inch of oil level is about one gallon of oil.)**

When adding oil, never mix engine oils and gear oils in the same transmission.



For additional lubrication information, see TCMT-0021.

If your vehicle has a transmission oil filter, you must change the filter when fluid or lubricant is changed.

Additive and friction modifiers must not be introduced. Never mix engine oils and gear oils in the same transmission.

The use of lubricants not meeting these requirements will affect warranty coverage.

For a list of Eaton Approved Synthetic Lubricants see TCMT-0020 or call 1-800-826-HELP (4357).

Operating Temperatures with Oil Coolers

Operating at temperatures above 250° F (120°C) causes loaded gear tooth temperatures to exceed 350°F (177°C) which will ultimately destroy the heat treatment of the gears. Temperatures above 250°F (120°C) should be regarded as a warning of inadequate cooling. If the elevated temperature is associated with unusual operating conditions that will reoccur, a cooler should be added, or the capacity of the existing cooling system increased.

The following conditions in any combination can cause operating temperatures of over 250°F:

- Operating consistently at slow speed.
- High ambient temperatures.
- Restricted air flow around transmission.
- Exhaust system too close to transmission.
- High horsepower operation.

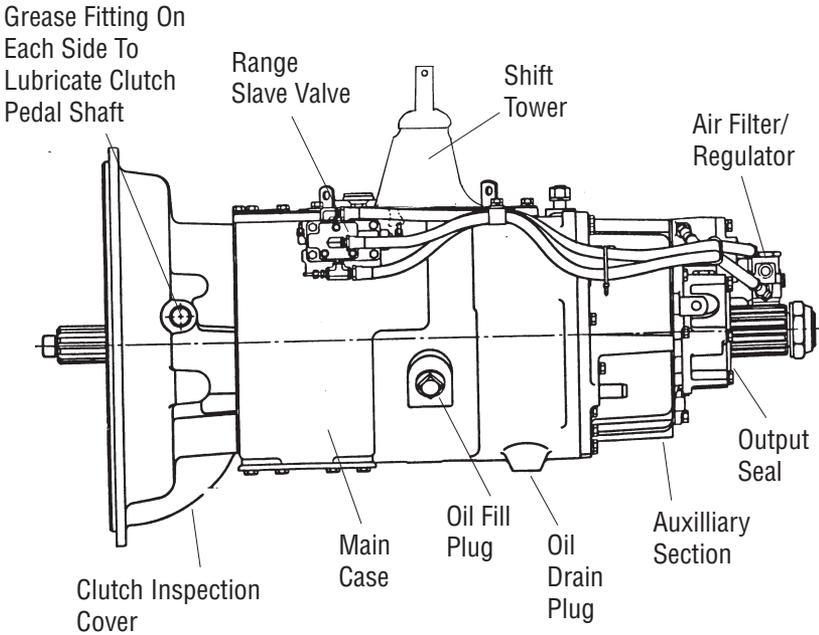
External oil coolers are available to reduce operating temperatures when the above conditions are encountered.

Oil Cooler Chart

Transmission Oil Coolers are:
Recommended
• With engines of 350 H.P. and above.
Required
• With engines 399 H.P. and above and GCW's over 90,000 lbs.
• With engines 399 H.P. and above and 1400 lbs. ft. or greater torque.
• With engines 450 H.P. and above.

Service & Maintenance

Maintenance Checks



Clutch Housing Mounting

- Check all capscrews of the clutch housing flange for looseness.

Clutch Release Bearing (Not Shown)

- Remove hand hole cover and check radial and axial clearance in release bearing.
- Check relative positive of thrust surface of release bearing with thrust sleeve on push-type clutches.

Service & Maintenance

Clutch Pedal Shaft and Bores

- Pry upward on shafts to check wear.
- If excessive movement is found, remove clutch release mechanism and check bushing on bores and wear on shafts.

Lubricant

- Change at specified service intervals.
- Use only the types and grades recommended.

Filler and Drain Plugs

- Remove filler plugs and check level of lubricant at specified intervals. Tighten filler and drain plugs securely.

Capscrews and Gaskets

- Check all capscrews, especially those on P.T.O. covers and rear bearing covers for looseness which would cause oil leakage.
- Check P.T.O. opening and rear bearing covers for oil leakage due to faulty gasket.

Shift Lever

- Check for looseness and free play in housing. If lever is loose in housing, proceed to check the Shift Lever Housing Assembly.

Service & Maintenance

Shift Lever Housing Assembly

- Check tension spring and washer for set and wear.
- Check the shift lever spade pin and slot for wear.
- Check bottom end of shift lever for wear and check slot of yokes and blocks in shift bar housing for wear at contact points with shift lever.

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For spec'ing or service assistance, call 1-800-826-HELP (4357) or visit www.eaton.com/roadranger. In Mexico, call 001-800-826-4357.

Roadranger: Eaton and trusted partners providing the best products and services in the industry, ensuring more time on the road.

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