



Eaton® Fuller®

Heavy Duty Transmissions

Driver Instructions

Fuller Heavy Duty Transmissions
FTS- XX108LL
June 2009



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 lever to neutral, and depress the master clutch.

If the 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 vehicle or when leaving the cab with the engine running, place the transmission in neutral, 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.

If your vehicle is equipped with a remote throttle, before operation, the transmission must be in neutral.

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

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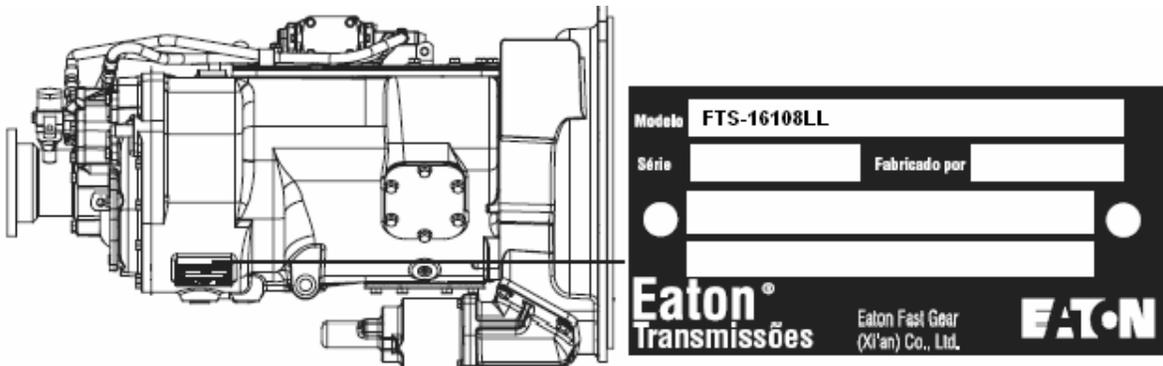
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Every effort has been made to ensure the accuracy of all information in this brochure. However, Eaton Corporation makes no expressed or implied warranty or representation based on the enclosed information. Any errors or omissions may be reported to Technical Service. Phone: 0800-170551.

Identification Tag

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.

DO NOT REMOVE OR DESTROY THE TRANSMISSION IDENTIFICATION TAG.



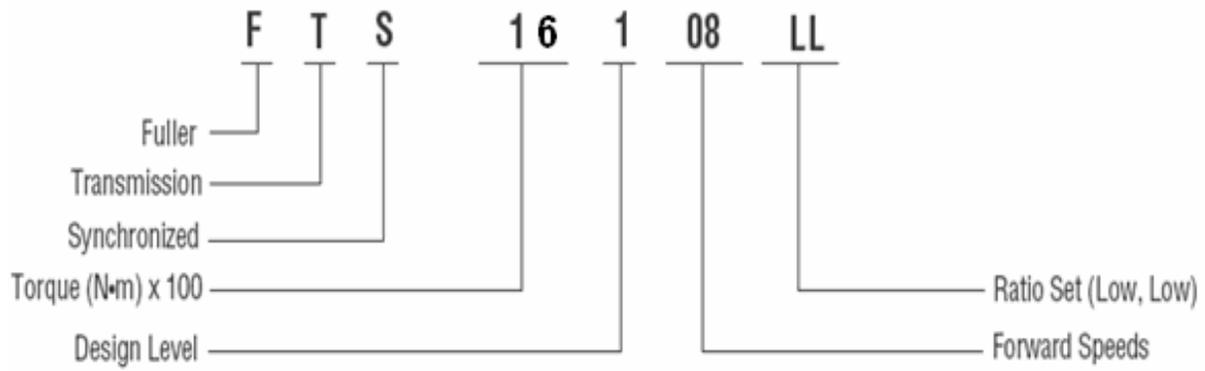
Record transmission identification data. Have these reference numbers handy when ordering replacement parts or requesting service information.

Transmission Model _____

Transmission Serial Number _____

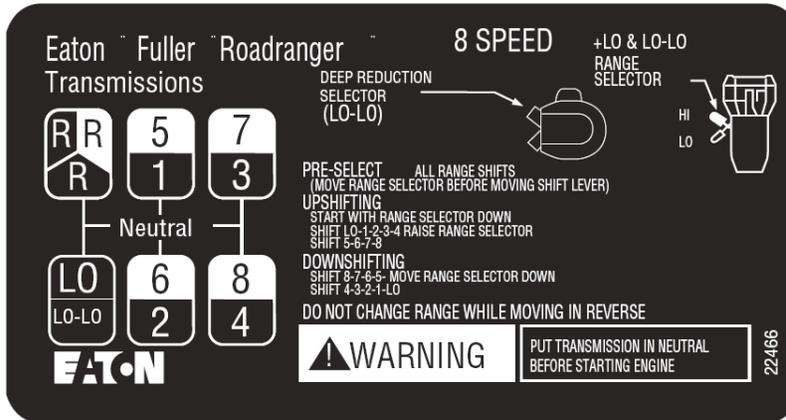
Model Designation

Nomenclature:



Shift Lever Positions

Shift Positions



Button back - deep reduction not selected



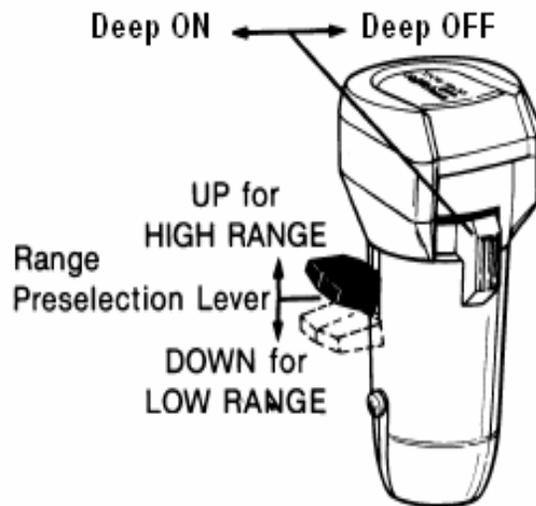
Button forward - deep reduction selected



Shift Controls

Roadranger Valve (A-6815)

Deep Reduction Button



General Information

Model in this series provide eight forward speeds and three reverse, consisting of a 5-speed front section and a 3-speed auxiliary section. The auxiliary section contains LO and HI range ratios, plus a deep reduction.

The range ratio LO is used only as a starting gear in severe conditions. The other four ratios are used once in LO range and once again in HI range. The button is used once during the upshift sequence and once during the downshift sequence.

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

To obtain deep reduction (LO-LO), first make sure range selection lever is down for low range. Then, move deep reduction button forward.

High Speed Downshift Protection

The Orion control module is equipped with advanced diagnostic features to evaluate the integrity of the system and provide operator feedback of a system fault. In addition, if the fault shall result in a condition that compromise the reliability of the transmission or result in a safety risk, the system logic will compensate and default to a safe mode. The diagnostic capability of the control module includes identification of the following component failures. The service light used for identification of a component failure is on for 2 seconds upon vehicle start up to allow for identification of a service light burn-out.

Prevent Deep Reduction when is selected High range

To prevent transmission damage and operator confusion, the system is designed to avoid the deep reduction when is selected high range. This is prevented by a mechanical interlock in the master control valve that prevents selection of this configuration. However, the DFMEA analysis indicated that there are electrical and pneumatic failure modes that can result in this configuration. The control module is equipped with logic to recognize this and automatically shift the transmission to high range.

General Information

Optional Equipment:

By-pass System

When in downshift protection, the transmission will engage high range in the first opportunity and will keep it until the source of the failure is gone. To avoid stop the vehicle under inconvenient condition the by-pass was created, it will by pass the down shift protection and allow to drive the vehicle – only in low range – to a place where the repair can be done. To turn on the by-pass system the driver must stop the vehicle, use the parking brake and turn on the by-pass key (inside the vehicle cabin).

Shift Pattern Diagram

A shift pattern diagram should be in your vehicle. If it has been lost, a replacement may be obtained by writing to:

Eaton Corporation

Truck Components

Rua Clark, 2061, Bairro Macuco – CEP 13279-400.

Valinhos - São Paulo - Brasil.

Fone: 0800-170551.

Please specify shifting controls used and transmission model number when making request.

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.

Preselect

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

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

Operation

Driving Tips

- 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 move the shift lever to the LO speed gear position while operating in HI range.
- 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.
- Avoid downshifting at high speed, because these damage the synchronizer elements.

Operation

Initial Start Up

Special Instructions

Before starting a vehicle always be seated in the driver's seat, move the shift lever to neutral, and set the parking brakes.

Before moving a vehicle, make sure you understand your shift pattern configuration. A shift label should be in your vehicle's cab. If not, refer to General Information to order one.

Procedure

1. Make sure the shift lever is in neutral and the parking brakes are set.
2. Turn on the key switch, 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 down in the LO Range position for LO range.

Operation

6. Make sure that reduction button is turned to backward. Or turned to forward, when is necessary to move vehicle in LO-LO in adverse conditions:
 - Button turned to backward for work in LO;
 - Button turned to forward for work in LO-LO.
7. Press the clutch.
8. Move the shift lever to start position.
9. Disengage the park brake.
10. Disengage the clutch when simultaneously accelerate the vehicle.

Operation

In the instructions below, is assumed that the driver is familiarized with the operation of Heavy Duty trucks and Towing and can control the shift lever and the clutch to obtain exact and smooth shifts, in upshifting and downshifting.

Upshifting

LO-LO to LO...

1. Move the LO-LO button to backward and simultaneously disengage the accelerator, press clutch until half point to stop the torque transmission and then disengage the clutch. The transmission will turn the LO-LO system to LO system, as soon the synchronization is finished. After this, accelerate the vehicle

System change – low housing (LO) to high housing (HI)

2. When is achieved the last shift of the low system, press button up (HI) to select the high system and move the shift lever as the diagram shows. When the shift lever pass in the neutral, the transmission will turn automatically change LO to HI.

Warning: Never move the shift lever to LO after that the high range (HI) was pre-selected, or during the operation of the high range.

Operation

Downshifting

1. Disengage the accelerator and press the clutch, to stop torque transmission of the engine. Disengage the pedal to join clutch. Continue driving the vehicle, downshifting when it's necessary.

System change – Hi housing (HI) to low housing (LO)

2. With the transmission in high system and ready to the next downshifting, preselect the down system, pressing button down.
3. Move the shift lever to the next position wanted in the low system (LO). When the shift lever passes the neutral position, the transmission will change automatically to the high system (HI) to low system (LO).
4. Continue to downshifting to next position wanted at low system (LO).

LO to LO-LO...

5. Do not downshift LO to LO-LO, if the operational and floor conditions not demand this downshift. The LO-LO can work in the low system with the shift lever in the LO position, moving the button forward. After, disengage the accelerator, press once the clutch until half point, to stop the torque transmission and disengage to join the clutch. The transmission will change LO to LO-LO as the synchronization is finished.

Lubrication

Proper Lubrication... the Key to long transmission life

Proper lubrication procedures are the key to a good all-around maintenance program. If the improper lubricant is used or if the lubricant level is ignored, general maintenance will not keep the transmission running properly or assure long transmission life.

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

Thus, all parts will be amply lubricated if these procedures are closely followed:

1. **Maintain oil level. Inspect regularly**
2. **Change oil regularly.**
3. **Use the correct grade and type of oil.**
4. **Buy from a reputable dealer.**

Lubrication

* To obtain a reputable lubricate dealers list, write to:

Eaton Corporation
Truck Components
 Rua Clark, 2061, Bairro Macuco – CEP 13279-400.
 Valinhos - São Paulo - Brasil.
 Phone: 0800-170551.

Product	Type of Lubricate	Specification	Lubrication change HIGHWAY USE	Lubrication change OFF-HIGHWAY USE
FTS-16108LL	Mineral	MIL-PRF-2104H (SAE 50)	62500 miles or 1 year	31250 miles or 1 year
	Mineral	CAT TO-4 (SAE 40 or SAE 50)	62500 miles or 1 year	31250 miles or 1 year
	Mineral	API CF-4 (SAE 40 or SAE 50)	62500 miles or 1 year	31250 miles or 1 year

**Additives and friction modifiers are not recommended for use in Eaton Fuller transmissions.
 Never mix engine oil with gear oil in a transmission.**

Lubrication

Proper Oil level

Make sure Oil is level with filler opening. Because you can reach oil with you fingers does not mean oil is at proper level. **One inch f oil level is about one gallon of oil.**

Draining Oil

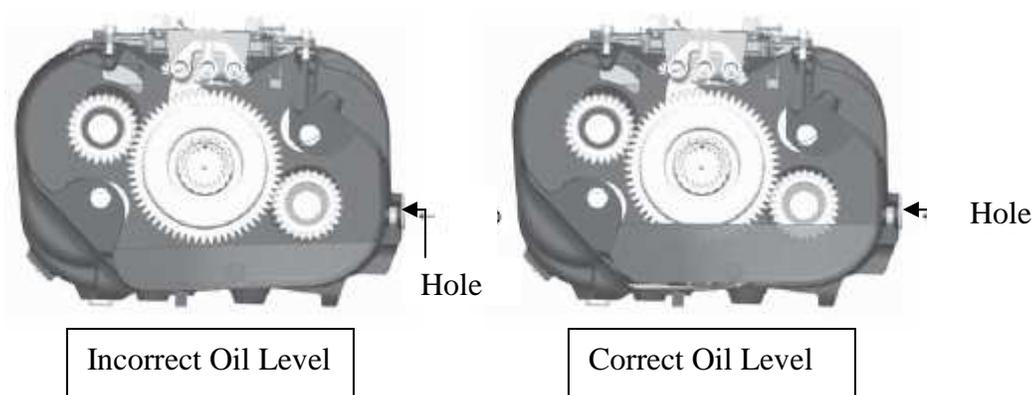
Drain transmission while oil is warm. To drain oil removes the drain plug at bottom of case. Clean the drain plug before re-installing.

Refilling

Clean case around filler plug and remove plug from side of case. Fill the transmission to the level of the filler opening, as shown below.

The exact amount of oil will depend on the transmission inclination and model. Do not over fill-this will cause oil to be forced out of the transmission.

The oil level of the transmission FTS-16108LL is around 4 gallons.



When adding oil, types and brands of oil should not be mixed because of possible incompatibility.

Preventive Maintenance

The maintenance items below must be observed to prevent fails in transmission, resulting in unnecessary repairs that are not covered for warranty.

1. Air System and Connections

- Check daily for leaks, worn hoses and air lines; repair instantly.
- If the vehicle has air dehumidification checks if the system is working correctly. Repair as needed.
- Check and repair air compressor as is needed, preventing that lubricate oil enter in the air system of the vehicle.

2. Clutch Housing Mounting

- Check all capscrews of clutch housing for looseness.

3. Clutch Release Bearing (Not Shown)

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

4. 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 bore and wear on shafts.

5. Lubricant

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

Preventive Maintenance

6. Filler and Drain Plugs

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

7. Capscrews and Gaskets

- Check all capscrews, especially those on PTO covers and rear bearing covers for looseness which would cause oil leakage.

8. Gear Shift Lever Housing

- Remove air lines at air valve. Remove the gear shift lever housing assembly from the transmission.
- Check the tension spring and washer for set and wear.
- Check the gear shift lever spade pin and slot for wear.
- Check bottom end of gear shift lever for wear and check slot of yokes and blocks in shift bar housing for wear at contact points with shift lever.

General Inspection

- In the lubricate intervals of vehicle chassis, check the looseness and loss of capscrews and fasten elements of the transmission, especially the transmission capscrews of the engine.

Preventive Maintenance

