Driver Instructions

Fuller UltraShift Transmissions
TRDR0940
May 2008
RTO-1X910X-AS3
RTLO-1X918X-AS3
RTLO(M)-1X913X-DM3
RTO(M)-1X910X-DM3
F(O)-X406X-DM3
F(O)-X405X-DM3
F(O)-X406X-AW3
F(O)-X505X-HVP
F(O)-X506X-HVP
FO(M)-1XD313E-LEP
F(M)-1XD310B-LST
Warnings & Cautions

Warnings & Cautions

Read the entire driver instructions before operating this transmission.

Before starting a vehicle always be seated in the driver's seat, select “N” or “P” on the shift control, and set the parking brakes.

If engine cranks in any gear other than Neutral or Park, service your vehicle immediately!

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

For safety reasons, always engage the service brakes prior to selecting gear positions from "N" or “P”

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

Before operating the PTO, refer to “Transmission Power Take Off Operation”.

Battery (+) and (-) must be disconnected prior to any type of welding on any UltraShift™ equipped vehicle.

It is a requirement that the driver of a commercial vehicle specified under paragraph A sections 1-6 of FMCSA regulation 392.10 need only cross railroad grade crossings in a gear that permits the vehicle to complete the crossing without a change of gears.

This can only be achieved by utilizing the Manual “M” or Hold “H” mode. Please refer to pages 2, 12 and 13 for correct manual and hold mode operation.
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warnings &amp; Cautions</td>
<td>0</td>
</tr>
<tr>
<td>Shift Console Positions</td>
<td>1</td>
</tr>
<tr>
<td>Gear Display</td>
<td>3</td>
</tr>
<tr>
<td>Start-up and Power Down</td>
<td>5</td>
</tr>
<tr>
<td>Driving Tips</td>
<td>7</td>
</tr>
<tr>
<td>Park Mode</td>
<td>11</td>
</tr>
<tr>
<td>Reverse Mode</td>
<td>12</td>
</tr>
<tr>
<td>Drive Mode</td>
<td>13</td>
</tr>
<tr>
<td>MANUAL Mode</td>
<td>14</td>
</tr>
<tr>
<td>Hold Mode</td>
<td>15</td>
</tr>
<tr>
<td>LOW or 1 Mode</td>
<td>16</td>
</tr>
<tr>
<td>Transmission Power Take Off (DM)</td>
<td>17</td>
</tr>
<tr>
<td>Transmission Power Take Off (AW3)</td>
<td>18</td>
</tr>
<tr>
<td>General Model Information</td>
<td>19</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>21</td>
</tr>
<tr>
<td>Proper Lubrication</td>
<td>23</td>
</tr>
<tr>
<td>Proper Wet clutch Lubrication</td>
<td>25</td>
</tr>
<tr>
<td>Vehicle Towing</td>
<td>27</td>
</tr>
<tr>
<td>Extended Warranty Form</td>
<td>28</td>
</tr>
</tbody>
</table>
**Operation**

**Shift Console Positions**

<table>
<thead>
<tr>
<th>Button not used</th>
<th>R - Reverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTO Indicator</td>
<td>N - Neutral</td>
</tr>
<tr>
<td>Service Indicator</td>
<td>D - Drive</td>
</tr>
<tr>
<td>Upshift</td>
<td>MANUAL</td>
</tr>
<tr>
<td>Downshift</td>
<td>LOW</td>
</tr>
</tbody>
</table>

**R** Selects Reverse gear once vehicle speed is less than 2 mph.

**N** Selects Neutral

**D** Selects the default starting gear and automatically selects gears between the starting gear and top gear.

**Manual** Allows the driver to hold current gear and manually select the appropriate gear for road conditions using the up/down buttons. MANUAL mode should be used whenever the driver wants to select the shifts instead of letting UltraShift select them automatically. For example, when the driver is moving around the yard, over railroad tracks, or on steep grades. (See the “Manual Mode” section for more details.)

**Low** Transmission downshifts at the earliest opportunity for maximum engine braking.

**Service** The service indicator alerts the driver of potential transmission problems.

**Up/Down Buttons** Used in the MANUAL mode to select upshifts and downshifts and to change start gear, if available.

**PTO** Power Take Off is activated and transmission is ready for PTO operation. (See “Transmission Power Take Off” section for more details.)

---

**WARNING**

_UltraShift™ initiates upshifts from “MANUAL” and “LOW” for engine over speed protection. Some engines do not use the Eaton engine overspeed protection._
**Operation**

**Park Model (HVP) Cable Shifter Positions**

- P - Park
- R - Reverse
- N - Neutral
- D - Drive
- H - Hold
- 1 or Low

P  Park
R  Selects Reverse gear once vehicle speed is less than 2 mph.
N  Selects Neutral
D  Selects the default starting gear and automatically selects gears between the starting gear and top gear.
H  Hold the transmission in current gear.
1 or Low Transmission downshifts at the earliest opportunity for maximum engine braking. Does not allow the transmission to upshift.
Operation

Gear Display

The Gear Display shows the current gear position of the transmission. The Gear Display will flash the target gear position of the transmission when in neutral during a shift.

Down arrows on the Gear Display indicate the transmission is waiting to verify decreased input shaft speed, before a gear engagement from Neutral can be completed.

The “DASH” or “Double DASH” indicates the transmission may be torque locked in gear (see “Service and Maintenance Locked in Gear” section for more details).
Park Model (HVP) Gear Display

For park model, the gear display will show the selected mode in the left character and the current gear in the right character. See examples below:
Operation

Start-up and Power Down

Start-up

1. Turn the ignition key to “ON” and allow the UltraShift to power-up.
   - Engine cranking is delayed until the transmission power-up is complete and the gear display shows a solid “N” or “P”

2. Start the engine.
3. Apply service brake.
   - If the service brake is not applied while selecting a starting gear, the initial start gear will not be found and the driver will have to re-select Neutral and press the brake while re-selecting the desired mode.

4. Select the desired mode and starting gear on the shift console.

Note: Medium Duty transmissions only allow a 1st gear start option.

5. Release the vehicle parking brakes.
6. Release service brake and apply accelerator.
   - The transmission is not intended to provide hill-hold capability. The service brakes should be used to stop and hold the vehicle on an incline. To prevent the vehicle from rolling when starting on an incline, place both feet on the brake pedal before sliding the right foot to the throttle pedal. Gradually back off the brake while applying as little throttle as necessary to move along the incline.
Power Down

1. Select Neutral or Park on the shift control.
   • If gear display does not show solid “N” or “P”, neutral or park has not yet been obtained.

Note: Neutral or Park should always be reached before UltraShift power down is performed except in cases of emergency.

2. Always set the vehicle parking brakes since park is only a secondary means of preventing vehicle movement. The clutch is disengaged when the engine is either idling or stopped and there is nothing to prevent vehicle movement.

3. Turn off the ignition key and allow the engine to shut down.

Note: If Neutral or Park is not selected when the ignition is keyed off, a tone will sound for up to 2 minutes.
**Operation**

**Driving Tips**

**Proper Starting Gear**

Choose a starting gear appropriate for the load and grade conditions while at a stop in either Drive or MANUAL mode by using the up/down buttons. Refer to Drive mode for detailed information.

**Note:** 1st gear is the only starting gear available on Medium-Duty transmissions.

**Skip Shifting**

Performed in MANUAL by pressing the shift button more than once. Refer to the MANUAL mode section for detailed information.

**Note:** Skip shifts are not always available for Medium-Duty transmissions.

**Optimal Engine Braking**

The LOW mode can be selected while moving. This initiates downshifts as soon as possible at a higher rpm. Refer to the Low mode section for detailed information.

**Skid Conditions**

If a skid condition occurs, the UltraShift senses the vehicle speed dropping rapidly. In this case, the UltraShift delays downshifting. To prevent automatic shifts under hazardous road conditions Manual or Hold mode should be selected.

**Cruise Control**

The UltraShift is totally compatible with cruise control. If a shift is required while cruise control is active, cruise is temporarily interrupted while the shift is performed and then automatically resumed after the shift.

**Manual Mode**

In Manual mode, UltraShift allows the driver to hold current gear and manually select the appropriate gear for road conditions using the up/down buttons. Manual mode should be used whenever the driver wants to select the shifts instead of letting UltraShift select them automatically. Examples include when the driver is moving around the yard, over railroad tracks, or on steep grades.

**Note:** Manual upshifts and downshifts are not available on the Park Model (HVP).
Load Based Shifting

In Drive, the UltraShift will adapt to the changing conditions of the vehicle. Right after power-up or after changing loads, UltraShift needs to learn the new conditions. While learning, it may hold a gear instead of upshifting. Simply push the Up button to start the upshift. It may take three or four shifts for the UltraShift to learn the new conditions. After that it will handle upshifts and downshift automatically.

Depending on conditions, UltraShift can activate the engine brake in order to bring the engine down faster for an upshift. This can happen even if the engine brake dash switch is OFF.

Coast Mode

When coasting to a stop in lower gears with your foot off the throttle, UltraShift may not finish downshifting until the driver gets back on the throttle. The system will automatically track vehicle and engine speed during this time and engage the appropriate gear when the throttle is re-applied. This is normal operation for the UltraShift when in Drive “D” mode only.

IMPORTANT DRIVER NOTICE

Clutch Protection

Even though this truck does not have a clutch pedal, it still has a mechanical clutch. As the driver slowly increases and decreases engine rpm from a stop, the clutch is engaging and disengaging, just like slipping the clutch with an AutoShift or a manual transmission.

If the vehicle is operated for long periods between engine idle and 1000 rpm during take off, the driver is slipping the clutch which gets the clutch HOT. If the clutch starts to get too hot, a warning tone will sound and a “C” and then an “A” will flash on the gear display (Clutch Abuse) - See Figure 1. This is an indication that the driver is abusing the clutch and it is getting too hot to operate - potentially resulting in a failure.
If a “C” and then an “A” shows on the gear display during vehicle operation, stop the vehicle for at least two minutes and let the clutch cool down. Continuing operation with the “C” and “A” flashing on the gear display will cause the clutch to become even hotter and the transmission may attempt to downshift into a lower start gear and/or limit the engine to idle speed until the clutch cools (approximately 3 minutes). Repeated incidents of clutch abuse may cause the clutch to fail and render the truck immobile, resulting in extended down time.

Below are some examples of situations that may initiate clutch abuse, and instructions on how to avoid them:

<table>
<thead>
<tr>
<th>Example</th>
<th>How to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding on hills using the throttle rather than the service brake</td>
<td>Use the service brakes to hold on the hill. To start moving, apply the throttle and release the brakes as you feel the truck start to pull.</td>
</tr>
<tr>
<td>Moving trailer tandems</td>
<td>Be sure to always start off in 1st gear when moving forward, and Low Reverse (R1 on Gear Display - Heavy Duty) when moving backwards.</td>
</tr>
<tr>
<td>Hooking up a trailer</td>
<td>Always be sure the trailer is high enough to back under. Use Low Reverse (R1 in Gear Display - Heavy Duty).</td>
</tr>
</tbody>
</table>

**Clutch Calibration**

The AW3 system automatically adjusts for clutch wear. An automatic calibration occurs each time the unit is powered up when the following conditions are reached: the engine is at normal operating temperature, the vehicle must be stopped, the engine is at idle, neutral is selected on the shift console. Calibration may take up to two minutes to complete. You may notice the engine slows and returns to normal idle several times during calibration. It is acceptable to stop calibration by selecting a driving mode.
Operation

Park Mode

Park Mode is a secondary system to prevent unwanted vehicle movement. The vehicle parking brake system is the primary system to prevent unwanted vehicle movement.

The vehicle must be at a complete stop before “Park” mode is selected.

To disengage “Park” mode the vehicle foot brake must be pressed before “Drive” or “Reverse” is selected.
Reverse Mode

The vehicle should be stopped before Reverse is selected. If the driver requests Reverse above 2 mph, the shift is not performed until the speed has dropped below 2 mph.

Each time Reverse is selected from Neutral, the default Reverse gear is engaged.

Heavy Duty Only

While the vehicle is stopped in Reverse, the up/down buttons are used to change the reverse gear. This selection is only maintained until another mode is selected. The driver should only select higher Reverse gears if appropriate for the vehicle loading and road conditions.

There is a speed limit on the reverse engagements, yet the driver can effectively rock the vehicle by selecting from reverse to drive and drive to reverse.
Operation

Drive Mode

Depending on the transmission model and shift configuration there may be alternate forward starting gears available. While the vehicle is stopped in Drive, the up/down buttons are used to change the starting gear. This selection becomes the default starting gear until it is changed by the driver again, or the UltraShift is powered down.

**Note:** 1st gear is the only available start gear on Medium Duty transmissions.

In Drive mode, all upshifts and downshifts are performed automatically based on vehicle and transmission conditions.

The driver can advance a shift (by about 75 rpm) by pressing the proper up/down button (up for upshifts, down for downshifts) when the transmission is within 75 rpm of the load based shift point.

The Gear Display shows the status of the shift:

- The current gear is displayed solid.
- At the start of the shift, the current gear is displayed solid until the transmission is pulled to the neutral position.
- While the transmission is in neutral and synchronizing for the target gear, the target gear is flashed.
- When the shift is complete, the new current gear is displayed solid.
Operation

MANUAL Mode

MANUAL mode should be used when the driver wants to select the shifts instead of letting UltraShift select them automatically. For example, when the driver is moving around the yard, over railroad tracks, on steep grades, or slippery surfaces.

Selecting MANUAL from Neutral:

• As described in Drive mode, the starting gear can be changed in exactly the same way in MANUAL mode.

Note: 1st gear is the only available start gear in MANUAL mode for Medium Duty transmissions.

• If MANUAL mode is selected from a stop, the starting gear is maintained - no automatic shifts are performed, except for conditions noted below.

• The driver can request shifts using the proper up/down button (up for upshifts, down for downshifts). The upshift or downshift is performed by the UltraShift provided the resulting engine speed is not outside of defined limits. For upshifts, the resulting engine speed must be greater than 900 rpm; for downshifts, the resulting engine speed must be less than engine rated speed.

Selecting MANUAL from Drive or LOW while moving:

• If MANUAL mode is selected while moving, the current gear is maintained - no shifts are performed, except for conditions noted below.

• As described above, the driver can request shifts using the proper up/down button (up for upshifts, down for downshifts) within the same limits described.

Some engines do not use the Eaton engine overspeed protection.

Transmission Manual Override:

• If the vehicle is being back driven (vehicle coasting and being pushed by the load) and the engine is approaching a higher than normal level (approximately 300 rpm above rated speed), the UltraShift overrides the MANUAL position and performs an upshift to prevent engine damage.

• If the gear being maintained is higher than the starting gear, and the driver depresses the throttle pedal, the UltraShift system will override the MANUAL mode and shift to the best available gear if the engine lugs excessively.
**Operation**

**Hold Mode**

Hold mode should be used when the driver wants to hold the current gear instead of letting the UltraShift select them automatically. For example, when the driver is moving around the yard, over railroad tracks, on steep grades, or slippery surfaces.

**Selecting Hold from Neutral:**

- If Hold mode is selected from a stop, the starting gear is maintained - no automatic shifts are performed, except for conditions noted below.
- 1st gear is the only start gear available for medium-duty transmissions.

**Selecting Hold from Drive or LOW while moving:**

- If Hold mode is selected while moving, the current gear is maintained - no shifts are performed, except for conditions noted below.

**WARNING**

Some engines do not use the Eaton engine overspeed protection.

**Transmission Hold Override:**

- If the vehicle is being back driven (vehicle coasting and being pushed by the load) and the engine is approaching a higher than normal level (approximately 300 rpm above rated speed), the UltraShift overrides the Hold position and performs an upshift to prevent engine damage.
- If the gear being maintained is higher than the starting gear, and the driver depresses the throttle pedal, the UltraShift system will override the Hold mode and shift to the best available gear if the engine lugs excessively.
LOW or 1 Mode

LOW mode should be used any time you want to maximize engine braking and minimize the use of the brake pedal. For example, when driving down long grades or when coming to a stop.

Selecting LOW from Neutral or Park:

- If LOW mode is selected from Neutral or Park while stopped, the starting gear is always the lowest available gear. The starting gear cannot be changed in LOW mode.
- If LOW mode is selected from Neutral or Park while stopped, the lowest available gear is maintained - no shifts are performed, except for conditions noted below.

Note: 1st gear is the only start gear available in LOW mode for Medium Duty transmissions.

Note: LOW mode can be used while climbing steep grades to achieve higher downshift points (transmission will downshift sooner).

Selecting LOW from Drive or MANUAL while moving:

- If LOW mode is selected while moving, no upshifts are performed, except for override conditions noted below.
- Downshifts are performed at higher rpm's than normal to enhance engine braking. The downshift point is chosen so engine speed after the shift is about 50 rpm below engine rated speed.

Some engines do not use the Eaton engine overspeed protection.

Transmission LOW Override

- If the vehicle is being back driven (vehicle coasting and being pushed by the load) and the engine is approaching a higher than normal level (approximately 300 rpm above rated speed), the UltraShift overrides the LOW position and performs an upshift to prevent engine damage.
- If the gear being maintained is higher than the starting gear, and the driver depresses the throttle pedal, the UltraShift system will override the LOW mode and shift to the best available gear if the engine lugs excessively.
Transmission Power Take Off (DM)

**CAUTION**

This transmission is not approved for PTO applications that would require the engine to operate at less than 1000 rpm for Heavy Duty transmissions and 1200 rpm for Medium Duty transmissions.

**Stationary PTO Operation**

The transmission countershaft PTO is used in this application.

To engage the PTO for stationary operation perform the following steps:

1. Apply the parking brake.
2. Select “D” on the Shift Control (this stops countershaft rotation for PTO engagement).
3. Select the transmission PTO switch.
4. Select “N” on the Shift Control.
5. Raise engine speed up to a minimum of 1000 rpm for Heavy Duty transmissions and 1200 rpm for Medium Duty transmissions to operate the PTO. Remote throttle controls are not approved for use with UltraShift.

**Mobile PTO operation**

The Transmission countershaft PTO is used in this application and provides limited mobile operation in the start gears.

To engage the PTO for mobile operation perform the following steps:

1. Depress service brake.
2. Release parking brake.
3. Select “MANUAL” on the Shift Control (this stops countershaft rotation for PTO engagement).
4. Select the transmission PTO switch.
5. Select “MANUAL”, “Neutral” or “Reverse”, as required for vehicle movement.
7. Raise engine speed to move vehicle / operate PTO. Remote throttle controls are not approved for use with UltraShift.
Transmission Power Take Off (AW3)

This transmission is not approved for PTO applications that would require the engine to operate at less than 1200 rpm.

Stationary PTO Operation
The transmission countershaft PTO is used in this application.

To engage the PTO for stationary operation perform the following steps:

1. Apply the parking brake.
2. Select “D”, “MANUAL”, or “LOW” on the Shift Control (this stops countershaft rotation for PTO engagement).
3. Select the transmission PTO switch.
4. Select “N” on the Shift Control.

Mobile PTO operation
The Transmission countershaft PTO is used in this application and provides limited mobile operation in the start gears.

To engage the PTO for mobile operation perform the following steps:

1. Depress service brake.
2. Release parking brake.
3. Select “MANUAL” on the Shift Control (this stops countershaft rotation for PTO engagement).
4. Select the transmission PTO switch.
5. Select “MANUAL”, “Neutral” or, “Reverse”, as required for vehicle movement.
7. Raise engine speed to move vehicle / operate PTO. Remote throttle controls are not approved for use with UltraShift.

Split Shaft PTO Operation (Stationary Only)
To engage the transmission for split shaft operation, perform the following steps:

1. Select “D” on the Shift Control.
2. Select PTO switch.
Service & Maintenance

General Model Information

Nomenclature

Note: 5-speed transmissions are not available with an overdrive. 5-speed transmissions are direct drive.
Tag Location

The blank spaces provided below are for recording transmission identification data and part numbers of maintenance items. All Fuller® Transmissions are identified by the model and serial number. This information is stamped on the transmission identification tag and affixed to the case.

DO NOT REMOVE OR DESTROY THE TRANSMISSION IDENTIFICATION TAG.

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

Transmission Model ________________________________
Transmission Serial Number ________________________________
Troubleshooting

Diagnostics
In the event there is a problem with the UltraShift, there are three primary tasks the driver should perform:

1. Note the driving condition under which the problem occurred.
2. Note the condition of the UltraShift under which the problem occurred (i.e. operation mode (Drive, MANUAL, LOW), current gear, engine speed, etc).
3. Reset system.

Transmission Reset Procedure
In some cases, proper transmission operation can be restored by “resetting” the transmission Electronic Control Unit (ECU). Use the following procedure to reset the ECU.

1. When it is safe to do so, stop the vehicle.
2. Place the transmission shift lever in Neutral “N” and turn the ignition key to the “off” position.
3. Wait at least 2 minutes.
4. Restart the engine.
5. If the problem continues, contact a service facility to have the vehicle and transmission system evaluated.

Product Diagnostic Mode “PD”
In the event the transmission is put in Product Diagnostic Mode, a “PD” will be displayed on the gear display, and the truck will not start. Use the following procedure to exit Product Diagnostic Mode:

1. Select Neutral “N” and turn the key off.
2. Wait at least 2 minutes.
3. Turn the key on and power the system up.
4. Verify there is an “N” on the gear display.
5. Start the engine.
Locked in Gear

If the truck is shut down or stalls in gear, the UltraShift may become locked in gear. The transmission will attempt to get to Neutral during the next power up if the shifter is in Neutral. If Neutral is achieved, a solid “N” appears on the Gear Display. If Neutral can not be achieved, a “DASH” or “Double DASH” will appear on the display and the engine will not start. If a dash appears during power up and the lever is in Neutral try the following:

1. Select Neutral, “N.” Turn the key OFF and let the transmission power down for at least 2 minutes.
2. Depress the brake pedal.
3. Release the parking brake.
4. Select Neutral.
5. Turn the key to the ON position.
6. The transmission will attempt to shift into Neutral once you turn the key ON, but you may have to slightly release the brake pedal to help let the torque off the drive line.
7. Once it reaches Neutral a solid “N” will appear on the Gear Display and the truck will start. If a dash still appears after this procedure take the vehicle to a local service center.
Service & Maintenance

Proper Lubrication

Proper lubrication procedures are key to a good all-around maintenance program. If the lubricant is not doing its job or if the lubricant level is ignored, all the maintenance procedures in the world are not going to keep the transmission running or assure long transmission life.

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

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

1. Maintain lubricant level and inspect regularly.
2. Follow maintenance interval chart.
3. Use the correct grade and type of lubricant.
4. Buy lubricant from an approved dealer.

Mixing of Oil Types

Never mix engine oils & gear oils in the same transmission.

Engine oils and gear oils may not be compatible; mixing can cause breakdown of the lubricant and affect component performance. When switching between types of lubricants, all areas of each affected component must be thoroughly flushed.

Note: For a list of Eaton Approved Synthetic Lubricants, see TCMT-0021 or call 1-800-826-HELP (4357).

Note: Additives and friction modifiers must not be introduced.
Proper Transmission Lubrication Level

Make sure the transmission lubricant is level with the bottom of the fill opening. Being able to reach the lubricant with your finger does not mean the lubricant is at the proper level.

If the transmission operating angle is more than 12°, improper lubrication can occur. The operating angle is the transmission mounting angle in the chassis plus the grade (expressed in degrees).

Any time the transmission operating angle of 12° is exceeded for an extended period of time, the transmission must be equipped with an oil pump or cooler kit to insure proper lubrication.

Lube Change Intervals

Lubricant changes should be based on a combination of the intervals shown in TCMT-0021 Lubrication Specification MANUAL, and user judgement based on the application and operating environment. Extending drain intervals beyond those shown in the tables is not recommended and will put warranties at risk.

Note: Vocational service applications are those which require components to be consistently operated at heavy loads, in contaminated environments or on steep grades. For these applications, the Vocational Service section should be used.
Proper Wetclutch Lubrication

Vehicle should be on level ground when checking oil level.

**Note:** Only Medium-Duty AW3 transmissions use a dipstick.

**View of the Oil Dipstick**

![Image of oil dipstick](image167x487to424x535)

**Checking WetClutch Oil Level**

- The Wetclutch fluid is checked using the dipstick located in the engine compartment.
- Place transmission in neutral.
- Allow the engine to idle at 700 to 800 RPM for a minimum of two minutes.
- Check WetClutch fluid with engine idling.
- Insure transmission temp is 60° to 120°F (16° to 49°C).
- WetClutch fluid level is correct if fluid is within the cold band.
- If fluid level is below the COLD-ADD mark, then correct fluid level and check for leaks.

The WetClutch system uses Synthetic Dexron III to be installed through the fill tube only.

The Gear box system uses Eaton RoadRanger CD50 or equivalent to be installed through the gear case side.

<table>
<thead>
<tr>
<th>Lubrication Change and Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIGHWAY USE</strong></td>
</tr>
<tr>
<td>First 1,000 to 1,500 miles</td>
</tr>
<tr>
<td>Every 2,500 miles</td>
</tr>
<tr>
<td>Every 150,000 miles or every 3 years</td>
</tr>
</tbody>
</table>

Refer to TCMT-0021 for additional lubrication information.
Operating Temperatures

On vehicles equipped with a transmission oil temperature gauge, the temperature is normally below 225°F; however, intermittent sump temperatures to 250°F do not harm the transmission.

When the average temperature of the transmission oil exceeds the temperature limits as stated above, more frequent oil changes may be needed.

The following conditions in any combination can cause the recommended transmission oil temperatures to be exceeded:

1. Operating the transmission in a "stall" condition; i.e., extended operation while in gear with the vehicle stopped or slowly moving.
2. High density of starts and stops at slow operating speed.
3. Minimal cooler capacity and/or restricted flow to the transmission oil cooler.
4. Exhaust system too close to the transmission.
5. Improper oil level/incorrect oil.
Service & Maintenance

Vehicle Towing

When towing the vehicle, the output shaft of the transmission must not be allowed to spin or turn. If the vehicle is towed with the drive wheels still in contact with the road surface, the vehicle axle shafts or driveline must be removed or disconnected.

WARNING

Serious Internal transmission damage can result from improper vehicle towing.

Correct

INCORRECT
Extended Warranty Form

Purchased Warranty Registration Form

For extended warranty pricing and coverages, please visit our website at www.Roadranger.com or reference these warranty documents:
See TCWY-0900 for purchased warranty requirements, limitations, exclusions, and pricing.
See TCWY-0800 for general warranty information, claim processing procedures, and part requirements.
- Vehicles registered from the 13th month through the 24th month of service require payment of a $100.00 USD/ $120 CAN fee plus the extended warranty coverage price.
- Vehicles registered from the 25th month through the 36th month of service require payment of a $300.00 USD/ $350 CAN fee plus the extended warranty coverage price.

Required Registration Information

IMPORTANT: To ensure this warranty registration can be processed, please provide complete and accurate answers to ALL information requested below. Failure to do so will cause delays in registering the vehicle.

OWNER __________________________________ DEALER _________________________________
Address _________________________________ Address ________________________________
City ____________________ State/Prov. _____ City ____________________ State/Prov. _____
Postal Code __________________ Postal Code __________________
Phone __________________________ Phone ___________________________
Email: __________________________________ Email: __________________________________

Vehicle & Component Information

NOTE: Not all Vocations are eligible for Extended Warranty Coverage.

Vehicle Vocation: (Check one) City Delivery   Heavy Haul   Line Haul
Construction   Mining   Oil Field   Line Haul
Logging   Refuse   Other ____________________________________________

OEM:  ___________________ Current Mileage:   ________________
         Transmission Model: _________________________ Trans Serial No. _______________
Clutch Mfg. : Model _______________

Remittance Instructions

Checks should be made in U.S. or CAN funds and made payable to Eaton Corporation. Checks may be written by the dealer or the owner. Checks and registration forms should be mailed to the appropriate address listed below:

United States   Canada
Eaton Corporation   Eaton Corporation
Attn: Warranty Registration   Attn: Warranty Registration
P.O. Box 93531   P.O. Box 2473, Station A
Chicago, IL 60673-3531   Toronto, Ontario, M5W2K6
Check #:   Check #:   Check Date:   Check Date:   Check Amt.:   Check Amt.: USD/ CAN Funds

Before signing below, please read this section carefully!

I/we understand the terms of this warranty and acknowledge the following:
This warranty is only valid if the vehicle is used in the vocation/application selected. This warranty is only valid if the clutch and/or transmission are properly maintained. This includes maintaining proper adjustment, the use of required lubricants, adhering to prescribed lubricant change schedules and keeping lubricant at prescribed levels at all times.
I may be required to provide proof that lubricants have been changed at the required intervals.
This warranty is only valid for verifiable defects in material or workmanship. This warranty does not cover failures due to operator error or abuse, improper maintenance or adjustments, drive line vibration or torsional activity, improper driveline angles, unauthorized alterations to the warranted product or failures caused by other components.
This warranty might be subject to other requirements, limits and exclusions.

DEALER Contact Signature: ____________________________ OWNER Signature: ____________________________
DEALER (Printed): ____________________________ Date: ____________________________
DEALER Contact Phone: ____________________________ www.Roadranger.com

08/05
TCWY-0750
08/05