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OPERATION OF THE U.S. GEAR DUAL RANGE™ AUXILIARY TRANSMISSION

The U.S. Gear Dual Range Auxiliary Transmission is a highly versatile unit offering a variety of separate and distinct final drive ratios while providing the necessary strength requirements that are mandatory in many vehicle applications. The 20% Overdrive OR Underdrive ratios are uniquely designed to complement the driveline of your vehicle while, at the same time, retaining the existing factory, direct-drive ratios.

The Dual Range is designed to offer you the option of selecting up to twice the number of forward and reverse driving ratios. However, unlike many auxiliary transmissions, the Dual Range offers you these ratios **WHEN YOU NEED THEM!** And, by maintaining a 35,000 lb. GCVW (Gross Combined Vehicle Weight) rating, the Dual Range sets the standard as the heaviest unit in the industry.

The Dual Range is an electronically-controlled, mechanically-shifted transmission which when operated properly, can provide a controlled shift between auxiliary and direct ratios. This shift can be accomplished at ANY speed; however, because the unit requires a certain level of gear rotation to ensure proper gear alignment, **THE UNIT SHOULD NEVER BE SHIFTED WHILE THE VEHICLE IS STOPPED!**

Although the unit is adaptable to both manual and automatic transmissions, the methods of operation of these two, distinct types of transmission applications are very different.

> ***AUTOMATICS*** - In automatic applications, the main shift from direct to auxiliary range (or vice versa) is accomplished through the utilization of a high-torque spring lever assembly. This spring assembly, which is loaded by the electronically-controlled shift motor rotating a worm gear (drive screw assembly), then forces a collar gear (slider), which couples the output shaft to the direct input gear, to mesh with the auxiliary ratio output gear. This complete action is induced when the control module inside the vehicle is actuated.
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> To shift the Dual Range:
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> 1) While the vehicle is moving and the driveline is under load (the accelerator is depressed), push the control module button on the transmission control lever.
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> 2) **WAIT APPROXIMATELY 2 SECONDS!** This will allow the spring assembly to load the Dual Range shift mechanism.
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> 3) Quickly, relax the pressure on the accelerator pedal and then re-apply full pressure. This action will NOT require the removal of your foot from the accelerator pedal.

It should be noted that the quicker this complete action can be accomplished the more likely the unit will be to shift smoothly. If properly shifted, a CLUNK should be noticeable upon gear change along with an obvious change in engine RPM.

When using the Dual Range to split-shift from 1st O/D to 2nd Direct, or similar change, it is strongly suggested that the automatic transmission be shifted to the higher gear prior to shifting the Dual Range from HIGH to LOW. This will allow for more flexibility in driveline stress and ensure proper load transferral to the subsequent gear.

MANUALS - As with automatics, the internal shift design of the unit (and the mechanics of the shifting) remain the same; however, the method of electronically inducing the shift mechanism does, in fact change.

To shift the Dual Range:

1) While the vehicle is moving and the driveline is loaded, either pull UP or push DOWN on the shift actuation switch connected to the transmission lever.

2) **WAIT APPROXIMATELY 2 SECONDS!** This will allow the Dual Range shift assembly to load.

3) Quickly, flash the clutch pedal to briefly relax the driveline pressure. Complete depression of the clutch pedal is not required and can cause substantial momentum loss.

Again a small CLUNK and a change in engine RPM should be noticeable upon the gear change.

***** NOTE *****

If using the Dual Range to split-shift in the manual applications, at least 2-seconds should still be given for the spring assembly to load prior to clutch depression. However, because the clutch depression during the shift of the manual transmission will completely relax the driveline, it is not necessary that the primary transmission be shifted to the higher gear before the Dual Range is engaged.

It is very important in any application that the shift assembly of the unit be allowed to load before the driveline pressure is relaxed. Failure to do so will cause all of the shift load to be transferred to the shift motor, which is not designed to accept this load on a prolonged basis.

By providing for the use of additional gearing with minimal effort, the Dual Range Auxiliary Transmission offers complementary driving ratios to, in most cases, an already over-taxed driveline. By using gearing as a "partner" with your engine's horsepower, properly operated, the Dual Range can give you miles of worry-free service and substantial gains in both performance and economy.

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Send your questions and comments to: info@usgear.com

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