

# The Dowdles' Dream

BY CAROL MAXWELL & E.S. GURDJIAN, F76350

**An Eagle bus conversion project proved no match for this multiskilled FMCAer and his wife.**



One day on his way to work, Leon Dowdle, F170939, of Texarkana, Texas, saw some one working on an 01 Eagle bus. Leon and his wife, Ginny, had owned a variety of trailers and fifth wheels, so they were familiar with the RV lifestyle. When he stopped to learn more about the Eagle bus, Leon met diesel mechanic Leroy Waldrum, F150562, who has since become Leon's good friend and a fellow member of FMCA's Southwestern Bus Nuts chapter. This meeting sparked Leon's passion for Eagles. In 1991 the Dowdles were planning to retire in three years. They had decided they wanted an Eagle bus, but to fit it in their budget they would have to

restore and convert their own. Leon noted that he asked a lot of people a lot of questions to learn as much as he could before he tackled this project. He was advised to purchase a later Eagle bus, at least a Model 10, with an automatic transmission and power steering. At the time, these models cost between \$35,000 and \$50,000, which was out of the Dowdles' budget.

Leon came from a family of builders and had spent many years in the construction trade. He is one of those people who can fix or build anything, so he was not apprehensive about converting an older bus. He finally found the perfect bus for them — a

1975 05 Eagle —from Greyhound in Dallas, Texas. The 05 had been used by Trailways Package Express for hauling cargo and a limited number of passengers. It had been out of service since 1990. Greyhound had removed the back 20 seats and added Model 10 end caps, a side loading door, and a partition for cargo. The engine, a naturally aspirated Detroit Diesel 8V71 with 76,000 miles, had been changed in 1989. Greyhound provided recent service records, and the bus seemed to be mechanically sound. The brake drums and linings looked new, and the front suspension appeared to have been recently rebuilt.



Photos courtesy of Leon and Ginny Dowdle



*Leon and Ginny Dowdle performed a Cinderella-like transformation on a 1975 05 Eagle bus. The bus went from cargo and passenger hauler to a sparkling home on wheels.*

During the conversion process, Leon still had a full-time job, so he worked on the bus in the evening and on week-ends. Although Leon primarily prefers to work alone, Ginny, a retired art teacher, helped out when he needed an extra pair of hands. She also made a videotape that documents the entire conversion.

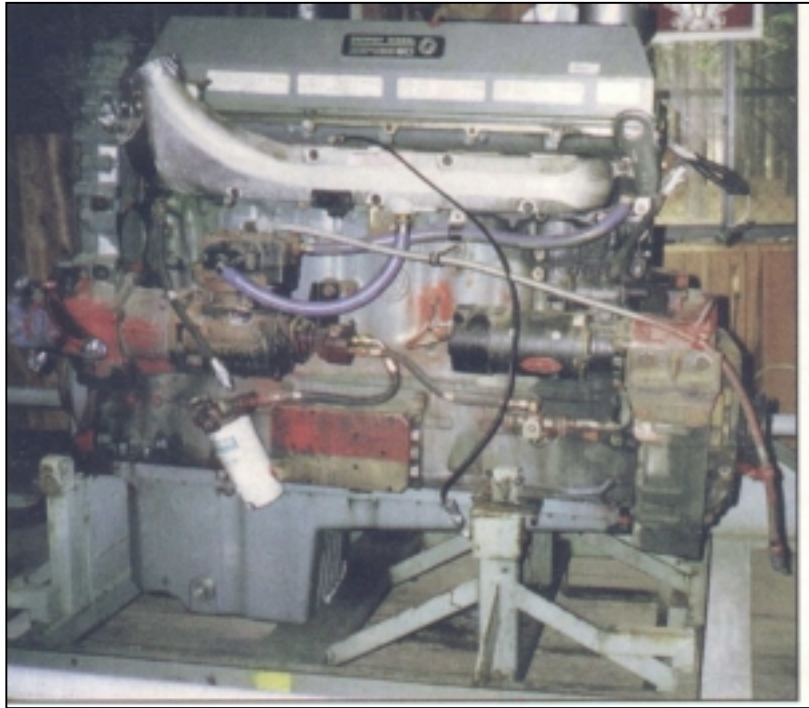
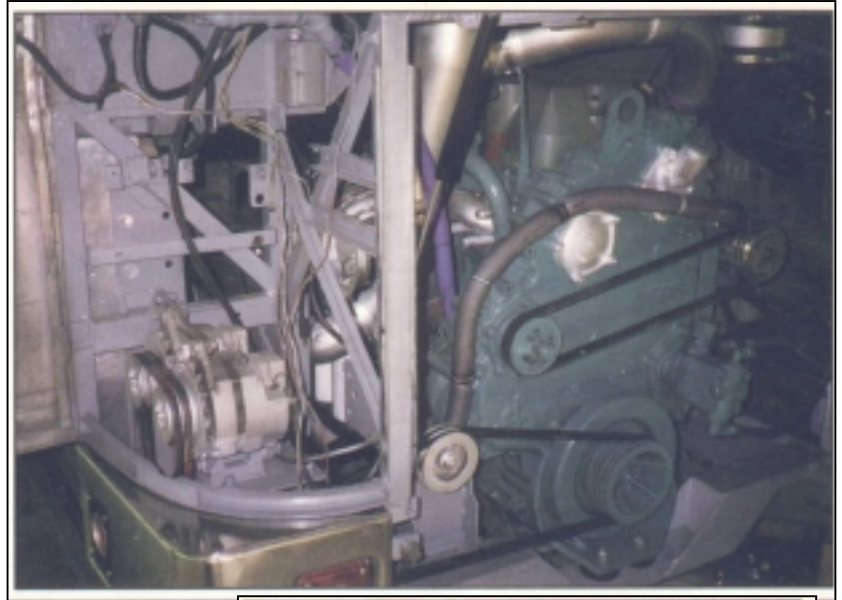
Texarkana does get some snow during the winter months, so Leon built a protective structure on a cement pad adjacent to the garage to house the bus. The first step of the conversion was to remove the seats and the existing interior and exterior panels to expose the entire frame. Leon sandblasted the frame to remove rust

and then painted it with primer. This work is easy to describe in just two sentences, but it took several painstaking months to perform.

The exterior work began with raising the roof. Leon knew it could be done, but he wasn't quite sure how. He asked many more questions and relied on common sense and his construction experience. According to Leon, the fiberglass work on the end caps was very difficult. Still, he did all the work himself, aided by a friend's verbal instructions. He now says that if he were doing another restoration, he would hire someone else to do the fiberglass, or install new caps. Sanding is a terrible job, and the fiberglass scatters everywhere like thousands of pine needles.

Always resourceful, Leon found a single piece of salvage aluminum at a good price for the exterior skin. Ginny's impressive video footage shows Leon using a series of ropes to lift and hold the aluminum, and a come-along to stretch it so he could tack it in place. New extruded siding was added from the bay door hinges downward. At this point, Leon measured for new windows and placed an order. After Leon completed the outer skin, he installed the windows.

The next major project was the coach interior. The Dowdles adapted a production motorhome floor plan that closely met their needs, and they laid it out on the floor with tape. Next, they purchased appliances and fixtures. The Dowdles bought these



*The mechanics of the Dowdles' conversion are illustrated here in various stages. One of the major changes Leon made was to remove the old Detroit Diesel 8V71 engine and replace it with a Detroit Diesel Series 60 engine (above). Changes were made to the Allison 740 transmission to adapt it to the higher-torque engine, and a new radiator and charge air cooler were installed.*

items a year before their planned installation, because they needed to be on hand to measure for fit. No matter what a product's specifications state, Leon said, the actual measurements may vary slightly. Since a coach has very tight tolerances, these measurements are crucial. For the 12-volt-DC electrical system,

a #10 wire pair was run from front to rear above the windows. These wires were weather-coated industrial braid. Loops were dropped at intervals where the need for a 12-volt-DC supply was anticipated. At the center of the coach, the wires split for two circuits across the width of the coach. AC wires were

run along both sidewalls below the windows, with proposed outlet areas in the kitchen, living room, bedroom, and bath. The AC wires were then pulled to a breaker box in the clothes closet.

The walls and ceiling are layered with foam insulation, window framing,



engineering drawings of the required angle, motor mount positions, and information on adapting the transmission to the Series 60 engine.

The Series 60 had a truck application oil pan, which was not appropriate for a motor coach. When Leon started shopping for the shallow coach oil pan, he found them to be very expensive. The fleet price was quoted at more than \$1,600, but he finally managed to find a pan for \$1,400. The oil pickup tube and bracket added another \$300.

While preparing to install the new pan, Leon decided to inspect the rod and main bearings. Although they showed little wear, he decided to replace the bearings while the pan was removed. The cost of the new bearings was \$325. An oil dipstick and oil fill spout were also needed.

Around this time, Leon met Richard Higgins, the Detroit Diesel representative in the Dallas area, who suggested purchasing an installation application manual. The manual cost \$80 but provided valuable information.

After Leon furnished certain specifications, such as rear end ratio, tire size, type of transmission, and the transmission serial number, Mr. Higgins conducted a performance evaluation and recommended the changes needed to adapt the 740 transmission to the higher torque engine, per Detroit Diesel specifications. He also recommended that Industrial Automatic, C7772, an Allison dealer in Irving, Texas, do the transmission work. The modifications included changing the stator and the pump, and reprogramming the valve body to change and modify the shift schedule. Some rebuilt parts were used. The total cost was \$2,200, although this amount would have been higher if all new parts had been used.

The final engine work included adjusting the valves and changing the Jake brake springs, as recommended by Detroit Diesel. That cost \$65. The Prevost part #550688, purchased from Prevost EXPAR for \$275. A third pulley, which is aligned with the crankshaft pulley and the fan hub pulley, is used to pull two 130-amp alternators that are mounted side by

total price of purchasing the Series 60 engine, modifying it for a bus installation, and adapting the transmission was \$17,370.

After the engine was ready to be installed, Leon prepared the coach to receive the new transmission-engine assembly. He removed the old engine and radiator and then cleaned and repainted the engine compartment. The floor under the bed was raised approximately 10 inches to provide clearance for the taller engine. Other than minor modifications and re-carpeting, no other changes were made to the coach interior.

Some hoses and wiring had to be relocated and extended to fit the new engine. The power steering pump on the 8V71 engine is positioned on the back of the engine, toward the front of the coach. The power steering pump on the Series 60 engine is on the front of the engine, toward the rear of the coach. This meant that the power steering hydraulic lines had to be extended. The air dryer was also moved to the rear of the coach, and the air lines were extended to it.

Eagle Coach Corporation, C3031, makes motor mounts for the 102-inch-wide coach, but because Leon's coach is a 96-inch-wide model, he had to fabricate his own motor mounts. The location, angles, and alignment of the engine were determined from specifications obtained from Eagle and Mr. Henry. Leon used a 4-inch channel iron that measured 3/8-inch thick. He decided to use the same kind of motor mounting assemblies that were used in the original truck application; those assemblies were purchased new and installed on the fabricated brackets. Next, the transmission was assembled to the engine. This required a crankshaft hub for the Series 60 engine. The hub was the only part required to adapt the installation of the transmission to the engine. A new driveline was purchased from Eagle Coach Corporation and connected to the side above the miter box.

After three months, the radiator and charge air cooler arrived. These components were temporarily mounted in place while Leon built and installed the radiator mounting

transmission. The engine, transmission, and driveline were then rolled into position for an alignment and length check. The engine must be far enough into the engine compartment to allow for proper alignment of the miter-box drive belts.

The driveline was then coupled to determine how much travel remained in the slip joint. Leon already had been advised by Spicer Engineering that it was important not to bottom out the driveline at the slip joint and that a minimum of 1 1/8 inches of travel was required. When Leon measured, he had 1 1/4 inches — a full 1/8 inch to spare! At this time all dimensions were confirmed. The engine was rolled back out, and Leon drilled the holes needed to attach the motor mount assemblies to the frame rails. The engine was then rolled in and checked for fit. Leon noted that the fan hub was not compatible with the fan of choice, so he ordered a Model 10 fan hub from Eagle Coach. This hub is compatible with the nine-blade plastic fan. At the same time, he ordered the current production radiator and charge air cooler assembly.

Leon was told there would be at least a two-month wait to receive the radiator assembly. During this time, he modified the engine compartment to accept the new radiator and charge air assembly. He received the fan and fan hub along with an installation drawing, so he was able to install those parts without difficulty.

When the engine compartment modifications were completed, Leon decided to install the engine while waiting for the radiator. Once the engine was installed, he determined where to mount the truck-style air breather. He found that this breather was less expensive and an easier fit than the coach-style air breather. The air intake tube was modified to enable mounting the breather above the air dryer and under the air intake box on the curb side. The miter box was brackets. The final positions of the radiator and charge air cooler were set to maintain clearance with the fan. Leon then fabricated piping to extend to and from the charge air cooler and the engine; he installed the piping with

fabricated support brackets. He then installed the air piping from the filter to the turbocharger.

Radiator-to-engine pipe is expensive, so Leon utilized less expensive, used pipe, which he cut and welded to fit the Series 60 application. He then purchased a head tank for a Western Star truck application, which he mounted on the street side where the old air intake box had been. Vent lines from the radiator high point, the thermostat housing, and the water pump positive head pressure supply were connected to the head tank. A coolant level sensor was wired to the electronic control module (ECM) of the Detroit Diesel electronic control system (DDEC) and installed in the tank.

Leon determined the belt length needed to extend from the engine drive pulley to the miter box and from the miter box to the fan hub. Fan speed was set at 89 percent of engine rpm by sizing the drive pulleys according to Detroit Diesel specifications. He used a three-belt system to the miter box and a two-belt system to the fan hub. The extra belt from the engine to the miter box was used to drive the two alternators.

Now it was time to install the DDEC ECM module. This involved pulling 22 14-gauge wires from the engine

compartment to the dash. These wires deliver power to the cruise control, Jake Brake, engine check lights, stop engine light, override button, code indicator, and diagnostics connector. All connections were soldered and sealed with heat-shrink tape to minimize any additional resistance.

Finally the engine, transmission, and radiator were filled with fluids. Initially, only water was used in the radiator while checking for leaks. The engine was pre-lubricated before Leon attempted the first start. After several tries, the engine fired. When no water leaks were detected, the water in the coolant system was drained and the system was refilled with a 50-50 antifreeze solution.

Because of the gearing of the rear end and transmission, higher rpm from the engine were required for top end speed. Leon removed the ECM and took it to a Detroit Diesel service center, where it was reprogrammed for coach application per Detroit Diesel specifications. This resulted in increasing the peak engine rpm from 1,800 to 2,100. In the truck application, the engine was rated at 425 horsepower at 1,800 rpm, but with the increase to 2,100 rpm, its rating was decreased to 400 horsepower.

Next, Leon found that whenever the cruise control was set with an rpm

resulting in a speed in excess of 35 mph, the "check engine" light illuminated. This was caused by a vehicle speed sensor incompatibility and was corrected by programming the ECM to sense rpm for cruise control rather than for vehicle speed. However, this reprogramming deleted the fast idle function. The fast idle function was restored by rewiring with proper resistors through the fast idle switch.

The final modification to the engine involved installing Eagle original-equipment skid plates to provide extra protection for the engine and oil pan, and to give additional support to the frame.

Since completing this major undertaking, Leon and Ginny Dowdle have enjoyed many miles of trouble-free travel in their Eagle — even to Alaska. Leon's building skills and ability to improvise, coupled with Ginny's eye for style, have created an elegant bus conversion that is worth more than two times their actual out-of-pocket costs.

Leon offers to share any information he has accumulated with folks who are seriously considering doing their own conversion or repowering a coach. He can be reached at 2804 Jonathan, Texarkana, TX 75501; (903) 838-0437.