

Electric

Car Servicing: A/C & Heating

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Air conditioning has become the mainstream on cars since the 1990s, and of course, a car with a premium price tag and showcasing the latest technology can't be sold without it. Traditionally, a refrigerant compressor is driven by a belt from the engine, and an electromagnetic clutch allows the compressor to be disconnected when the pressure is outside the limits, when full engine power is demanded, or when the driver switches it off. In recent years, this has been replaced by the variable displacement compressor on many cars, which controls the flow of refrigerant similar to a suction control valve on a high pressure diesel pump.

When a hybrid engine stops, there is no way to drive the re-

frigerant compressor. The first generation Toyota Prius avoided this particular problem by keeping the engine running when the air conditioning was on. This rather inelegant solution was much improved on the second-generation car, by the addition of an electric refrigerant compressor.

An air conditioning compressor draws a similar amount of power to a starter motor, so when running for long periods it's far more practical and efficient to run this from the high voltage system than attempt a 12V supply. Toyota's system uses a three-phase motor, powered by an A/C supply from the inverter. There's no need for a clutch, because of course the car can spin the compressor's motor at whatever speed it desires.