

Replacement of Idler Bearings

By: Don Steger

Photos by: Nancy Steger

TOOLS REQUIRED

13 mm wrench
19 mm thin open end wrench
Medium hammer
Soft mallet
Ratchet and 11 mm socket
Deep socket matching outside diameter of bearing
Snapping pliers, large
Grease, white lithium
Wire brush
Safety glasses

To diagnose possible bearing failure, after removing the belt, spin each of the

pulleys by hand to determine if they freely turn. If noisy or rough rotation, failure is evident, and you should replace the bearings. If one is bad, automatically replace both.

- 1) Access engine compartment.
- 2) Locate idler bearings below air conditioning compressor. (Photo 1)
- 3) Loosen pulley brackets by using ratchet socket and do not remove bracket.
- 4) Remove the air conditioning belt.
- 5) Take the open end 19 mm wrench and remove the nuts on the backside of pulley brackets. (Photo 2)
- 6) Lubricate bearings with penetrating oil to facilitate removal of pins. (Photo 3)

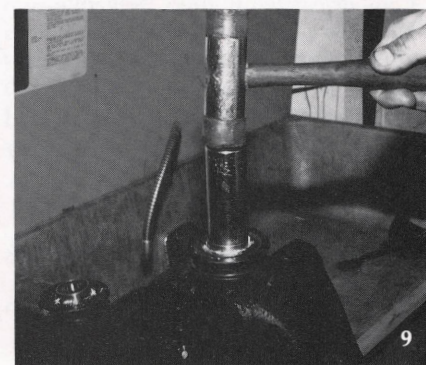
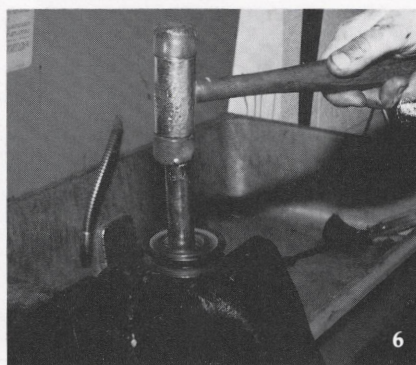
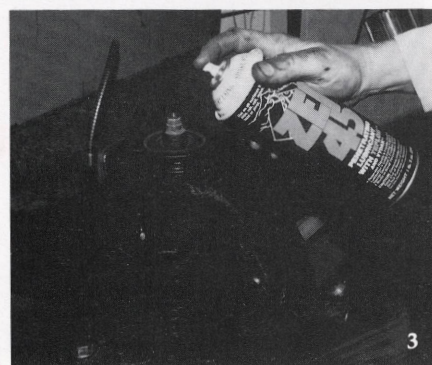
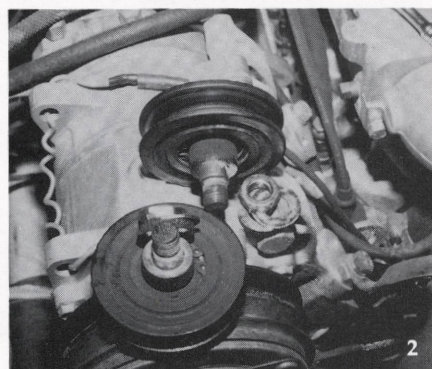
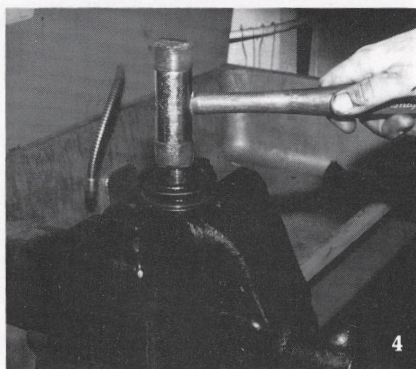
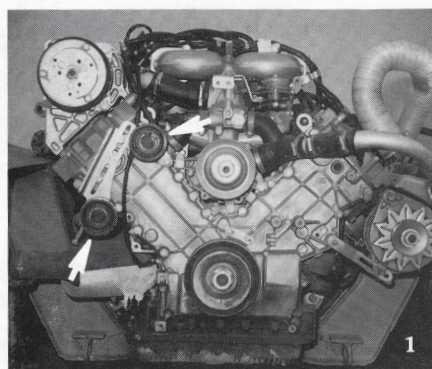
- 7) Remove pins with the soft mallet. (Photo 4)

CAUTION: Do not damage the threads.

CAUTION: Wear protective safety glasses when removing and installing snaprings. Place snapping pliers in carefully with finger over one side and snapping over other, carefully remove snapping on both sides. (Photo 5)

- 8) Place pulley and bearing assembly on bench vise. Open to clear the outside diameter of bearing. Place the socket with outside diameter nominally the same size of outside of bearing race and drive old bearing out both units. (Photo 6)

- 9) Use the wire brush to clean the pins. Remove all accumulated dirt from



pins and clean with rag. (Photos 7 & 8)

10) Lubricate mating surfaces of bearing and pulley with white lithium grease.

11) Install one snapping to one side. Turn over and install new bearing inside center pulley and drive bearing carefully in with deep socket with same outside diameter as the outside diameter of bearing outer race. (Photos 5 & 9)

CAUTION: Bearing can be damaged by improper mating of surfaces of socket.

12) Install second snapping.

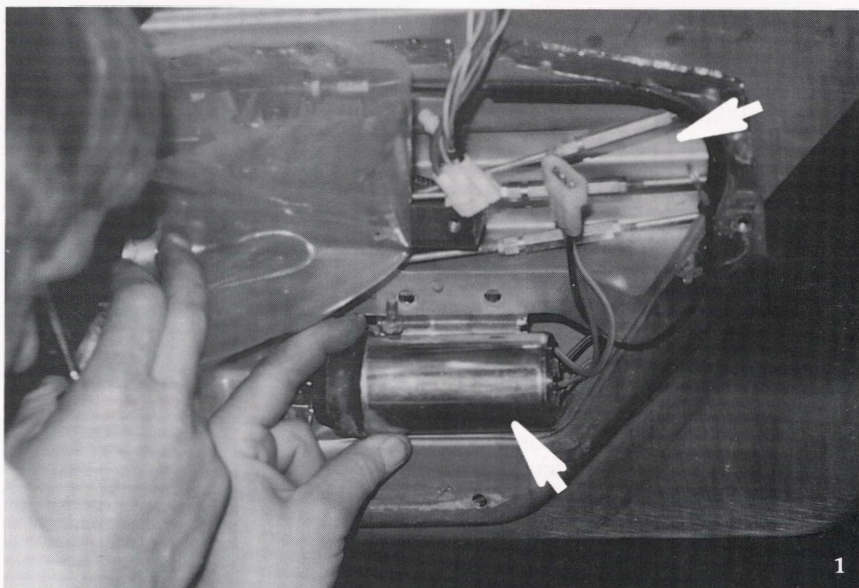
13) Lubricate the mating surfaces of mounting pins and inside diameters of bearings with white lithium grease. (Photo 10)

14) Carefully install pin by hand. (Photo 10)

CAUTION: If hammer is used to drive the pin to the center of the bearing, this will cause indentations on the inside bearing race.

15) Install spacer with beveled edge toward bearing and install pulley assemblies back in original brackets. There are two washers on the backside of the bracket. Install fat washer first, thin washer second, and then the nut. (Photo 11)

16) Reinstall belt and tighten pulley brackets.



New and Improved Door Lock Control Unit

by Marc Goldstone

Photos by Kjell Myhre

Technical Assistance by Don Steger

Are you getting tired of the \$150.00 plus repair cost of replacing a door lock solenoid, only to have a solenoid burn out again at a later time? For some, in frustration, the solution has been to disconnect the control unit allowing only manual operation of the door locks.

The location of the door solenoid within the door is shown in photo #1. The trim pad and armrest were removed to expose the door's interior. The solenoid was found to be bad prior to disassembly of the door by measuring the resistance of the coil at the door lock control unit. If the resistance of any one coil is less than 1 OHM that winding is shorted. The resistance of both windings in series will be 2 OHMS. If the resistance of any one coil is greater than 2 OHMS there may be a faulty ground connection within the wiring harness. This must be corrected. (See article in this issue on diagnosis and repair of ground faults.)

The cause of the burned out solenoid is the design of the existing control unit which is located in the relay compartment behind the passenger seat, see photo #4. The control unit operates by allowing a pulse of current to reach the solenoids each time the door switches (located within the door) make electrical contact. When

shipped from the factory the door linkages were in alignment. After several years on the road these linkages have gone out of adjustment. The poor alignment of these linkages, also shown in photo #1, causes the switch assembly on the bellcrank to make intermittent contact. Each time contact is made current flows through the solenoids. During activation, with approximately 120 watts being dissipated within the windings of each solenoid, it is easy to see why the insulation on the winding melts if defective replacement solenoids should be installed (see photo #5). The second and to date less frequent failure mode is for the relay contacts within the control unit to become pitted due to the 25 Amp currents and inductive surges induced by the solenoids.

The solution is the board on the right as compared with the problem unit on the left in photo #6. The new unit is provided with some smarts to allow it to distinguish between a real door lock request and one caused by an intermittent contact. This was possible with the use of an SR Latch (a one bit memory cell) to remember whether the last switch closure was to lock or unlock the doors. Should another switch closure occur to the same state the circuit will ignore it. Only one current pulse will reach the solenoids. Should the door switch be manually activated to the opposite state the control unit will again pulse the solenoid. Overheating of the coils is therefore eliminated. Of course, if the

CONTINUED ON PAGE 36

