The Automotive V-Belt - Continued

B. Heavier duty water pumps.
C. Higher output alternators and generators.
D. Power steering pumps.
E. Air conditioning compressors. Polyester reinforcement, which contracts when heated, is extremely desirable in belts for air conditioner drives.
F. Emission control air pumps.

2. High power, high performace engines operating at higher temperatures, creating higher under hood temperatures.
3. More rapid acceleration and deceleration.
4. Higher average belt speeds.
5. Crowding of drives which sometimes reduces the arc of contact between pulley and belt below acceptable levels.
6. Bending around small diameter pulleys.

Typical Belt Failures

SEPARATION. Lower sides of belt excessively worn, exposing tensile member to wear. Belt layers separated. Belt can turn over and break or slip off drive easily.

SLIP BURN. Cover is burned off and the rubber and tensile members are exposed. Can be caused by too low belt tension or excessively worn pully grooves. Grease on belt or pulley can also cause spin-burn.

TENSILE BREAK. Usually caused by forcing belt over pulley during installation, a high shock load, or a foreign object getting between the bottom of the groove and the belt. Drive take-up should be loosened completely for belt installation and belt fitted to pulleys.

WORN OR ROUGH PULLEY GROOVES. Cover worn off in spots; what is left of the cover is a very rough and jagged area. Foreign material like sand or gravel sticking to oily or greasy belt and pulley can also cause this excess wear. Cleaning drive components regularly can help prevent this.

WEATHERING. Typical of a belt that has been in severe and extended service. Sides and bottom have numerous small cracks, extending through cover only.

PULLY DIAMETER TOO SMALL. Deep bottom cracks appear about every three inches. The cover is worn off the lower half of the sidewall. Often the angle of the belt is different from that of the pulley, causing excessive wear of the power part of that belt. These cracks create "hinge" points where flexing becomes excessive. A belt with cracks can break without warning. Where two or more belts operate as a pair or set, never replace a single belt–always replace belts in pairs or sets.

PASSENGER COMFORT–AIR CONDITIONING

Refrigerant and Principles of Refrigeration

An automobile air conditioner is basically a refrigerator which has been adapted for use in an automobile. It is a sealed system that contains a fluid called Freon (or Refrigerant-12). This fluid is circulated through the system and removes the heat from inside the passenger car and transfers it to outside air.

There are two principles of refrigeration:

A. Heat will always travel to cold.
Cold is the absence of heat. (Instead of putting "cold" into a car, we remove heat.)
B. A liquid changing to a gas will absorb heat. (Producing cold.)

The fluid in the system, Freon-12, has been selected because of its low boiling point and its ability to quickly change from a liquid to a gas and back to a liquid. In so doing, it can absorb and dissipate heat rapidly. When Freon is lost from the system, it cannot "cool" until the leak is found, repaired and fresh Freon put into the system.

By referring to Figure 10, you can quickly identify the major components of the automobile air conditioning system. These are:

Figure 10 - A. Filter-Drier.
For storing, filtering and drying Freon.
Figure 10 - B. Expansion Valve
The "carburetor" of the system.
Figure 10 - C. Evaporator.
Where Freon changes from liquid to gas absorbing cold.
Figure 10 - D. Compressor.
The heart of the system. Where Freon is pumped up. Turned by an electro-magnetic clutch.
Figure 10 - E. Condenser.
Where Freon in a hot-gas form gives up its heat to outside air and reverts back to liquid.