

**GENERAL  
MOTORS**

# PRODUCT SERVICE BULLETIN

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Engine Electrical

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**SERVICE**

SUBJECT  
AC ACNITER SPARK PLUG INFORMATION

TO ALL GENERAL MOTORS DEALERS

Car Lines Affected: All 1969 Domestic and U.S. Imported Passenger Cars

Effective with 1969 Production, all passenger cars are Factory equipped with the new AC ACNITER (resistor) spark plugs. Additionally, all 1969 General Motors vehicles continue to use TVRS cable in conjunction with the new ACNITER plugs. TVRS cable performed a reasonable reduction in TV and radio interference from ignition. The use of ACNITER spark plugs, along with resistor ignition cables and a modified distributor rotor gap, provide a higher degree of radio frequency interference (R.F.I.) suppression. Thus, the purpose of the General Motors change is to further reduce ignition radio frequency interference signals (hereafter R.F.I.) that could interfere with radio and TV reception.

Through the years as radio and TV communications have grown both in use and sophistication, the need for increased R.F.I. suppression has also grown. As a result, AC developed the ACNITER spark plug incorporating a new sealed-in monolithic resistor for these advanced applications. These same ACNITER plugs are also compatible for past model vehicles that used resistor spark plugs only.

The individual components -- distributor, TVRS cable, and ACNITER plugs are covered briefly in the following:

1. Each distributor, as furnished from Delco-Remy, has a considerably widened gap between the end of the rotor and the pick-up contacts in the cap. This prevents the residual energy in the coil from creating a secondary (follow-up) spark across the cap contacts. Repeat sparking simply creates added noise in ignition systems and is one of the sources of R.F.I.
2. All 1969 General Motors vehicles continue to use TVRS cable as used for the past many years. Testing shows this amount of resistance in the cable is very satisfactory for use with AC's ACNITERS. TVRS cable has been left in the system to provide radio frequency suppression from the coil outlet to the terminal of the spark plug.
3. All 1969 General Motors passenger cars are Factory equipped with AC ACNITER (resistor) spark plugs. This may be surprising since one of the old adages in the industry has always said "Never use resistor spark plugs and resistor cables together". AC spark plugs, stenciled with the name ACNITER on the insulator, are a breed of resistor spark plugs different from the types offered over these past many years. The new ACNITERS have a lower resistance than the former design plus a hermetically sealed resistor with high stability.

Questions can be expected from all levels of the trade, particularly so on resistor vs. non-resistor spark plugs, and the use of both TVRS cable and ACNITERS together. Modern vehicle design, together with General Motors' continuing awareness of the need to better serve our customers, dictates the need for further improvement in the reduction of R.F.I. Extensive testing has shown the increased benefits toward R.F.I. reduction with the use of the TVRS cable-ACNITER combination. It has also clearly indicated that the ignition system performance has not been compromised.

**KEEP THIS BULLETIN HANDY FOR FUTURE REFERENCE**

The following information may be helpful when answering questions which may be asked concerning the new General Motors ignition system and the ACNITER spark plug.

### Description

The ACNITER is a new sealed-in monolithic resistor spark plug. The AC spark plug used as original equipment prior to 1969 was built with an electrically conductive, pressure tight seal between the centre electrode and upper terminal. The new acniter spark plug is built in a similar manner, however, the structure is more complex with a resistor seal sandwiched between two conducting glass seals.

### Advantages

ACNITERS reduce the R.F.I. popping sounds in AM-FM and FM-Stereo radios and reduce electrode erosion. FM and FM-Stereo radios are particularly prone to this noise. Not only is the interference reduced to your vehicle radio, but interference to your neighbour's TV and radio is likewise reduced. ACNITERS also reduce the amount and rate of electrode erosion which is an increasing cause of spark plug replacement. ACNITERS also provide a longer duration for capacitive energy discharge and can improve ignition.

### Function

Fractions of a second before a spark plug is required to "fire", the ignition system begins supplying energy to the plug, thus raising the voltage applied to the plug. This energy is stored by the spark plug and ignition cable in what electrical engineers call the distributed capacitance of the cable and plug. This electrical phenomenon is similar to the simple case of filling a long water trough from a faucet located at one end. In the case of non-resistor spark plugs, the instant the spark is initiated, the energy stored in the spark plug is very rapidly discharged into the spark gap. This rapid discharge of energy causes the radiation of R.F.I. and spark plug electrode erosion. Furthermore, this energy is discharged so rapidly that there may not be a combustible mixture present at the spark plug gap the moment the energy is discharged. Therefore, under many driving conditions, this energy is of little value in initiating combustion. This is analogous to rapidly removing the end of the trough that is opposite the water faucet and allowing water to flow rapidly out of the trough.

When ACNITER spark plugs are used, the energy stored in the spark plug is not allowed to discharge so rapidly, resulting in a reduction of the R.F.I. level and electrode erosion is minimized. The duration of the discharge is extended, increasing the probability of a combustible mixture being in the gap during the discharge. Thus, the energy is more likely to initiate combustion while electrode erosion and radio frequency interference are minimized. The use of ACNITER spark plugs and TVRS cable is similar to constructing numerous baffles in the water trough to restrict the flow of water from the trough when the end of the trough is removed.

### Comparison

Resistor spark plugs of other types do not provide as high a degree of R.F.I. suppression, as great a reduction in electrode erosion or as effective metering of the capacitive energy as ACNITERS. Engineering analysis and laboratory tests show the effectiveness of a resistor increases as it is placed closer to the spark plug firing gap. The resistor in the ACNITER is placed low in the shell whereas most cartridge type resistors are located high in the insulator. The ACNITER resistor is located where it does the most good.

### Past Model Usage

ACNITERS will significantly reduce the R. F. I. level radiated from older vehicles and thus improve radio reception. There will also be ignition improvement because of better metering of the energy discharge.

### Use Of Resistor Plugs In Place Of ACNITERS

In an emergency, however, it is not recommended. There is generally degradation at higher ohms resistance. It has been found that the nominal resistance for the new ACNITERS is the maximum required for 1969 General Motors systems so the addition of still higher resistance spark plugs (such as our old "resistors") does nothing to help. Remember, 1969 General Motors cars are also equipped with resistance cable.

Where Dealers have a small inventory of older AC resistor spark plugs still on hand, they should use them on past applications prior to 1969.

### Fouling

Extensive testing under controlled laboratory conditions and vehicle road tests with ACNITER spark plugs have not shown any increased sensitivity to fouling.

### Replacing An ACNITER Spark Plug With A Conventional Spark Plug

The level of radiated radio frequency interference will, of course, increase significantly. As stated before, in vehicles equipped with AM, FM, or FM-Stereo radios, the owner may notice a popping sound on the radio. The benefits of metering the capacitive energy discharge to the spark plug will also be lost.

Product Service Department,  
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