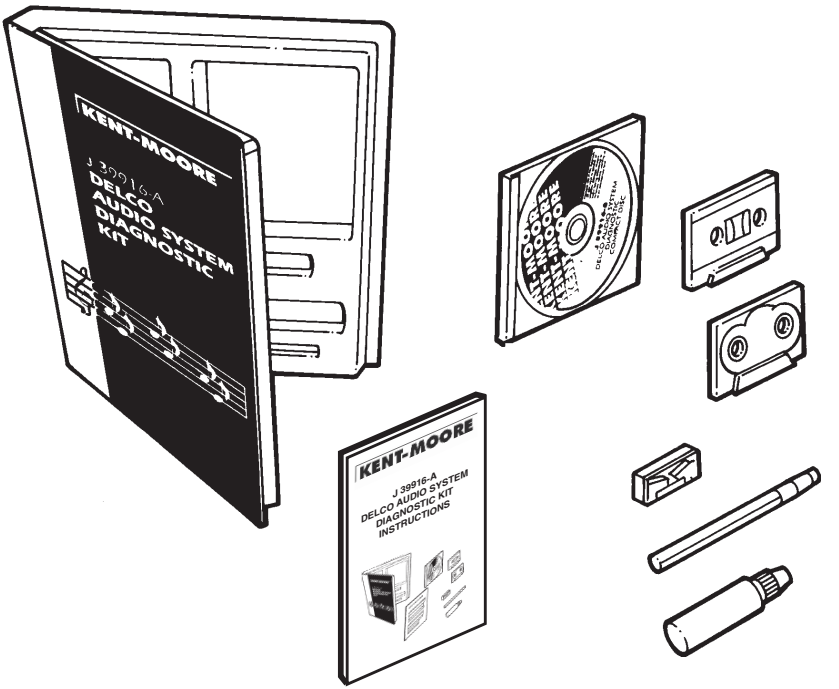
KENT-MOORE

J-39916-A
DELCO AUDIO SYSTEM DIAGNOSTIC KIT INSTRUCTIONS



J-39916 Delco Audio System Diagnostic Kit

The Delco Audio System Diagnostic Kit was developed to diagnose the Delco Active Audio System and Delco Audio Systems with a pre-recorded diagnostic cassette tape or compact disc (CD). Refer to the appropriate GM service manual for specific instructions.

Instruction Book Contents:

A. Cassette Player Preparation
B. Cassette Tape Diagnostics
C. Compact Disc Diagnostics
D. Service Parts List

A. CASSETTE PLAYER PREPARATION
(This preparation will ensure proper diagnosis)

Inspection of the player must take place before using the cleaning and diagnostic cassettes. Using a light source, carry out a visual check through the cassette entry flap and ensure that there is not debris inside the player and that tape is not wrapped around the capstan.

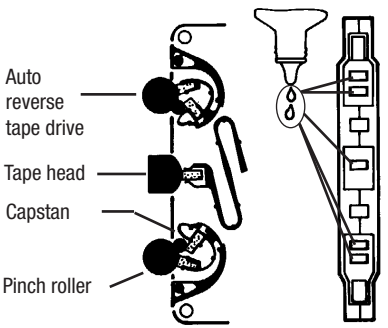
Before proceeding with the diagnostic cassette, the tone head, pinch wheel(s) and capstan(s) must be cleaned. To do this, use the head cleaning cassette as follows:

1. Put two (2) drops of the cleaning solution on each felt pad.
2. Insert the cleaning cassette into the cassette deck and play for 20 seconds. (Press "play" button if the deck does not start automatically. For auto reverse decks, engage the "auto reverse" feature and clean for another 20 seconds.)
3. Remove the head cleaning cassette. Now allow 2 - 3 minutes of drying time before proceeding.

NOTE: It is recommended that the head cleaning cassette is used every 10 to 15 hours of play time.

Replace cleaning cartridges when the felt pads look dirty.

The diagnostic cassette can now be played and will highlight problems with audio reproduction.



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B. CASSETTE TAPE DIAGNOSTICS

Cassette Tape Contents

Side 1 Active Audio System Diagnostics

General Instruction/Introduction

Front Bass Speaker Test Instructions
- Bass Speaker Test (50 Hz Tone)

Front Mid-range Speaker Test Instructions
- Mid-range Speaker Test (500 Hz Warble Tone)

Front Tweeter Speaker Test Instructions
- Tweeter Speaker Test (9kHz Spectral Tone)

Rear Bass Speaker Test Instructions
- Bass Speaker Test (50 Hz Tone)

Rear Mid-range Speaker Test Instructions
- Mid-range Speaker Test (500 Hz Warble Tone)

Rear Tweeter Speaker Test Instructions
- Tweeter Speaker Test (9kHz Spectral Tone)

Combined Test Instructions
- Combined Test (Combination Tone)

NOTE: Diagnostic Chart is on Back of Diagnostic Kit Storage Case

Side 2 Audio System Diagnostics

General Instructions/Introduction

Bass Speaker Test Instructions
- Bass Speaker Test (50 Hz Tone)

Mid-range Speaker Test Instructions
- Mid-range Speaker Test (500 Hz Warble Tone)

Tweeter Speaker Test Instructions
- Tweeter Speaker Test (9kHz Spectral Tone)

Combined Test Instructions
- Combined Test (Combination Tone)

Speaker and Grill Rattle Test Instructions
- Speaker and Grill Rattle Test (Fast Sweep)
- Speaker and Grill Rattle Test (Slow Sweep)

Motor Speed Test Instructions
- Motor Speed Test

Tape Head Cleaning Procedures

Noise Diagnostics Test Instructions
- Noise Diagnostics Test (recorded quiet)

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DIAGNOSTIC TEST TAPE

The Diagnostic Test Tape (PN J-39916-1) Side 2 has been developed to diagnose several audio complaints. The test tape will prompt the technician through the following tests. It will be helpful to view these tests before proceeding.

FUNCTION

- Bass/Subwoofer test
- Mid range speaker test
- Door tweeter test
- All speaker test
- Speaker buzz and rattle test
- Motor speed test
- Instructions on Tape Head Cleaning Procedures
- Noise diagnosis

Always compare the front speakers to front, and rear speakers to rear. Don't compare front speaker to rear speaker because they could be different speakers or their mounting environment could cause them to sound different.

The three basic tones used to test and evaluate coaxial speakers, or other complex speaker systems are a bass (50 Hz sine) tone, mid (500 Hz warble) tone, and a tweeter (9kHz spectral) tone. The combination tone is a blend of the above three tones.

BASS SPEAKER TEST - (50 Hz sine)

The 50 Hz tone is used to evaluate the bass response of an audio system. This tone is also helpful in evaluating audio systems which have separate subwoofer amplifiers and speakers.

MID-RANGE SPEAKER TEST - (500 Hz warble tone)

The 500 Hz warble tone is used for the evaluating of mid-range speaker response. This tone is qualified as a warble tone because it has different audio characteristics than a sine tone. This tone produces a warble sound. At these mid-range frequencies, it is better to use a warble tone than a sine wave because the location of warble tone source, such as a speaker, is easier to identify. A normal sine tone can set up a standing wave within a vehicle which can make it difficult to determine its source location.

TWEETER SPEAKER TEST - (9kHz spectral zone)

The 9kHz spectral tone is used for tweeter or high frequency evaluation. This tone sounds like a group of crickets chirping. This type of tone is used for two reasons. One, much like the warble tone, it is easy to locate its source, and two, this type of tone is easier to identify for those people with high end hearing loss problems.

(Continued)

ALL SPEAKER TEST - (Combination tone)

The combination tone can be used for numerous audio problems such as distorted or no sound from a speaker or speakers. When using the combination tone, comparative AC voltage measurements can be made on the speaker terminals, provided the fade and balance controls are in the detent position. With these voltage measurements, a determination can be made in the diagnosis of speaker or amplifier.

SPEAKER/GRILL RATTLE TEST - (50 Hz to 8kHz swept sine)

The next portion of the tape can be used to diagnose speaker and grill rattles. The first test is two variable frequency tones played back to back. The second test is a variable frequency tone, but frequency change is at a much slower rate. Both tests can be used to repair a speaker rattle or buzz. If the problem has already been isolated, the fade and balance controls can be set to the proper location and the test tones can be played in the specific problem area.

MOTOR SPEED - (Timed section in tape)

There is a two minute time period marked in this section of tape for the purpose of checking the cassette tape motor speed. This portion of the diagnostic tape can be used to verify or resolve problems when a customer complains that the audio from the cassette tape sounds abnormal. In some cases, improper tape motor speed can cause audio abnormalities. If the time taken for this test is between one minute and fifty-six seconds to two minutes and one second, the tape motor speed is within tolerance.

TAPE HEAD CLEANING PROCEDURES

The recommended time interval for cleaning is fifteen hours for best performance, and every fifty hours to prevent damage to the tape head. The preferred tape head cleaner is available as part of the Audio System Diagnostic Kit, Part Number
J-39916-2.

NOISE DIAGNOSTICS - (Dead Space)

This portion can be used for noise diagnostics, such as alternator whine, switch pops, etc. This portion of the diagnostic tape may be used in conjunction with the audio diagnostics section of the service manual.

(Continued)

C. COMPACT DISC DIAGNOSTICS

Compact Disc Contents

Track 1	General Instructions/Introduction
Track 2	Bass Speaker Test Instructions
Track 3	Bass Speaker Test (50 Hz tone)
Track 4	Mid-range Speaker Test Instructions
Track 5	Mid-range Speaker Test (500 Hz warble tone)
Track 6	Tweeter or High Frequency Speaker Test Instructions
Track 7	Tweeter or High Frequency Speaker Test (9kHz Spectral Tone)
Track 8	Combined Test Instructions
Track 9	Combined Test (combination tone)
Track 10	Speaker and Grill Rattles Test Instructions
Track 11	Speaker and Grill Rattles Test (fast sweep)
Track 12	Speaker and Grill Rattles Test (slow sweep)
Track 13	Noise Diagnostics Test Instructions
Track 14	Noise Diagnostics Test (recorded quiet)

DIAGNOSTIC TEST CD

The Diagnostic Test CD (PN J-39916-8) has been developed to diagnose several audio complaints. The test CD will provide the technician with test tones for the following tests. It will be helpful to view these tests before proceeding.

FUNCTION

- Bass/subwoofer test
- Mid range speaker tests
- Door tweeter test
- All speaker test
- Speaker buzz and rattle test
- Noise diagnosis

- It will also be useful in the diagnosis of coaxial speakers.

Warning: Improper use of this diagnostic CD can result in speaker or amplifier damage. Always begin testing procedures using minimum volume, working up to an appropriate level.

Each signal will be played for five minutes, starting with the low frequency tone. Use the fade and balance controls to evaluate the speakers. For example, when the test signal begins, fade full front and check the speaker response of the right, and left speakers with the balance control. Then, fade full rear and check the rear speakers in the same manner. There should be enough time to check all speakers with each signal. If the signal ends, and the test is not completed, simply replay the necessary signal.

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Always compare the front speakers to front, and rear speakers to rear. Don't compare the front speaker to rear speaker because they could be different speakers or their mounting environment could cause them to sound different.

The three basic tones used to test and evaluate base level speakers, or other complex speaker systems are a bass (50 Hz sine) tone, mid (500 Hz warble) tone, a tweeter (9kHz spectral) tone. The combination tone is a blend of the above three tones.

BASS SPEAKER TEST - (50 Hz sine)

The 50 Hz tone is used to evaluate the bass response of an audio system. This tone is also helpful in evaluating audio systems which have separate subwoofer amplifiers and speakers.

MID-RANGE SPEAKER TEST - (500 Hz warble tone)

The 500 Hz warble tone is used for the evaluation of mid range speaker response. This tone is qualified as a warble tone because it has different audio characteristics than a sine tone. This tone produces a warble sound. At these mid-range frequencies, it is better to use a warble tone than a sine wave because the location of warble tone source, such as a speaker, is easier to identify. A normal sine tone can set up a standing wave within a vehicle which can make it difficult to determine its source location.

TWEETER TEST - (9kHz spectral tone)

The 9kHz spectral tone is used for tweeter or high frequency evaluation. This tone sounds like a group of crickets chirping. This type of tone is used for two reasons. One, much like the warble tone, it is easy to locate its source, and two, this type of tone is easier to identify for those people with high end hearing loss problems.

ALL SPEAKER TEST - (Combination tone)

With the combination tone, you will be able to quickly diagnose overall audio performance in a vehicle. This tone can be used for numerous audio problems, such as distorted or no sound from speaker or speakers. Listening to the combination tone, you should be able to hear three distinct sounds. A low pitch steady tone of 50 Hz, a medium frequency warbling tone of 500 Hz, and a high frequency hiss or cricket type of sound about 9kHz. Concentrate on the appropriate element of the test signal; Low, Medium, or High as you listen to the different speaker locations by means of the fade and balance controls. This tone can be an excellent signal to use in the diagnosis of coaxial speakers. For example, if a coaxial speaker is not functioning properly, a direct comparison of the right to left speaker, or visa versa, can determine if the tweeter or woofer in the speaker assembly is inoperative.

(Continued)

Also, when using the combination tone, comparative AC voltage measurements can be made on the speaker terminals, provided the fade and balance controls are in the detent position. With these voltage measurements, a determination can be made in the diagnosis of speaker or amplifier. If the amplifier system of the vehicle is operating normal, the AC voltages should be very close or the same in value.

SPEAKER/GRILL RATTLE TEST - (50 Hz to 2kHz swept sine)

This portion of the CD can be used to diagnose speaker and grill rattles. The first test is two variable frequency tones played back to back which can help you find or verify a speaker rattle or buzz. Tone two is also a sweep, but frequency change is at a much slower rate. This can be used in the repair of a speaker rattle or buzz. If the problem has already been isolated, the fade and balance controls can be set to the proper location and the test tones can be played in the specific problem area.

NOISE DIAGNOSTICS - (Dead Space)

This portion can be used for noise diagnostics; such as alternator whine, switch pops, etc. This portion of the diagnostic CD may be used in conjunction with the audio diagnostics section in the service manual.

D. SERVICE PARTS LIST - Available from Kent-Moore 1-800-345-2233

J-39916 Delco Audio System Diagnostic Kit:

- J-39916-1 Diagnostic Cassette Tape
- J-39916-2 Cleaning Cassette
- J-39916-3 Cleaning Fluid
- J-39916-4 Cleaning Refill Pads
- J-39916-5 Wax Pencil
- J-39916-6A Storage Case
- J-39916-7B Instructions
- J-39916-8 Diagnostic Compact Disc