AUDIO SYSTEM

DESCRIPTION

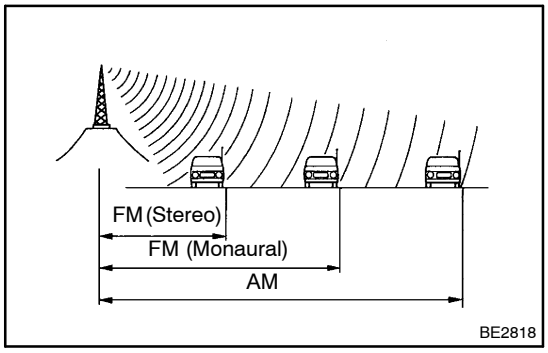
05BBE–01

1. RADIO WAVE BAND

The radio wave bands used in radio broadcasting are as follows:

Frequency	30 kHz	300 kHz	3 MHz	30 MHz	300 MHz
Designation	LF	MF	HF	VHF	
Radio wave		AM ⟷		FM ⟷	
Modulation	Amplitude modulation			Frequency modulation	

LF: Low Frequency
MF: Medium Frequency
HF: High Frequency
VHF: Very High Frequency

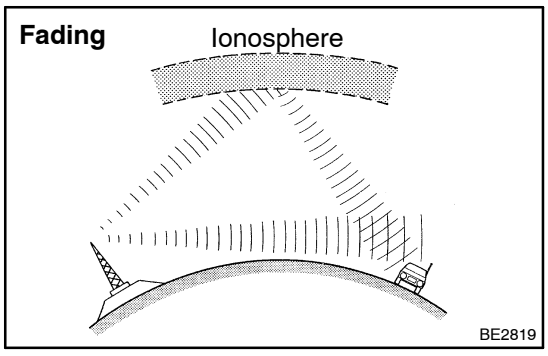


2. SERVICE AREA

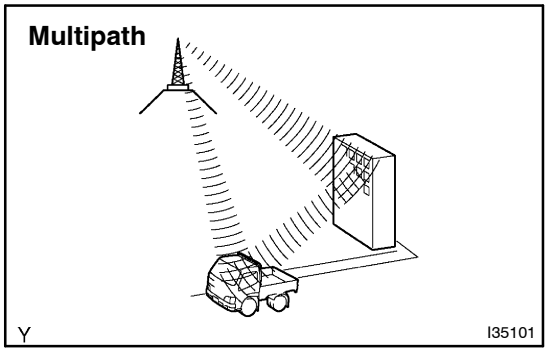
There are great differences in the size of the service areas for AM and FM broadcasts. Sometimes FM stereo broadcasts cannot be received in an area where AM broadcasts can be received very clearly.
Not only does FM stereo broadcasts have the smallest service area, but they also pick up static and other types of interference (”noise”) easily.

3. RECEPTION PROBLEMS

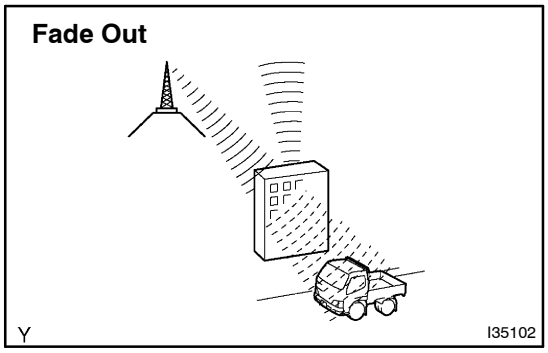
HINT:
Besides the problem of static, there are also the problems called ”fading”, ”multipath” and ”fade out”. These problems are caused not by electrical noise but by the nature of the radio waves themselves.



(a) Fading
Besides electrical interference, AM broadcasts are also susceptible to other types of interference, especially at night. This is because AM radio waves bounce off the ionosphere at night. These radio waves then interfere with the signals from the same transmitter which reach the vehicle’s antenna directly. This type of interference is called ”fading”.



(b) Multipath
Interference caused by reflection of radio waves against obstructions is called ”Multipath”. Multipath occurs when radio signals emitted from the broadcast transmitter antenna are reflected against tall buildings or mountains and interfere with other signals which is to be received directly.



(c) Fade Out
Because of the frequency higher than that of AM, FM radio wave tends to be reflected against obstructions such as tall buildings or mountains. For this reason, FM signals often seem to gradually disappear or fade out as the vehicle goes behind those obstructions. This phenomenon is called ”fade out”.

4. NOISE PROBLEMS

(a) For noise troubleshooting, it is very important to clearly understand the customer’s claim. Use the following table to diagnose the phenomenon.

Radio wave	Condition in which noise occurs	Probable cause
AM	Noise occurs at a specific place.	Strong possibility of foreign noise.
	Noise occurs when listening to faint broadcasting.	The same program may be broadcasted by some local stations. If the program is the same, one of those may be tuned in.
FM	Noise occurs only at night.	Strong possibility of beat from a distant broadcasting.
	Noise occurs at a specific place while driving.	Strong possibility of multipath noise and fading noise caused by changes of FM frequency.

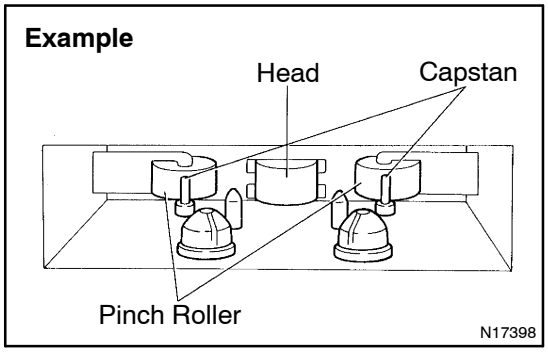
HINT:
If the condition where the noise occurs does not meet any of the above, find out the cause based on ”Reception Problems”. Refer to the description about Multipath and Fading mentioned previously.

5. COMPACT DISC PLAYER

(a) Compact disc (hereafter called ”CD”) players use a laser beam pick–up to read the digital signals recorded on the CD and reproduce analog signals of the music, etc. There are 12 cm (4.7 in.) and 8 cm (3.2 in.) discs available for the CD player.

HINT:
Never attempt to disassemble or apply oil to any part of the player unit. Do not insert any object into the magazine except for a disc.

NOTICE:
CD players use an invisible laser beam which could cause hazardous radiation exposure. Be sure to operate the player correctly as instructed.

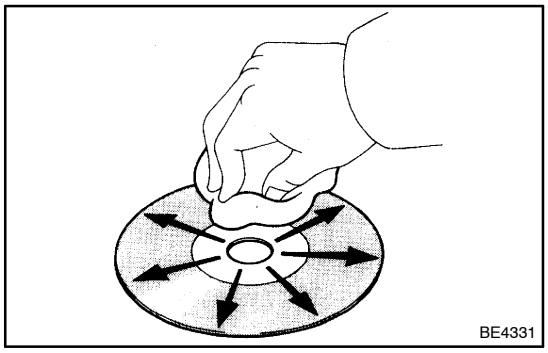


6. MAINTENANCE

Tape Player / Head Cleaning:

(a) Raise the slot cover with your finger.
Using a pencil or similar object, push in the guide.

(b) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.



7. MAINTENANCE

CD Player / Disc Cleaning:

If a disc gets dirty, clean the disc by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:

Do not use a conventional record cleaner or anti–static preservative.