

### 7.2 Models 129 and 140, up to M.Y. 1993

	Page
<b>Diagnosis</b>	
Function Test .....	11/1
Complaint Related Diagnostic Chart .....	12/1
Diagnostic Trouble Codes .....	13/1
<b>Electrical Test Program</b>	
Component Locations .....	21/1
Preparation for Test .....	22/1
Call Placement/Reception Test .....	23/1
Antenna Test .....	24/1
Speaker Test .....	25/1
Audio Switchover Test .....	26/1
Harness Test .....	27/1
Hands-Free Microphone Test .....	28/1

### Diagnosis – Function Test

1. Battery voltage 11–14 V.
2. Fuses F20-6, F22/2-1 (Model 129) or Fuses F3-28, F4-10 (Model 140) okay.

Test step/Test scope	Test condition	Nominal value	Possible cause/Remedy <sup>1)</sup>
⇒ 1.0 Wake-up tone/display	Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b> Known good service area.	Wake-up tone heard through speakers. Display shows all characters, then <b>Power On.</b>	27
⇒ 2.0 Tri-band antenna (M11)	Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b>	Antenna extends	24 ⇒ 2.0
⇒ 3.0 <b>No Srvc</b> indicator	—	—	Verify carrier service, 24 ⇒ 1.0
⇒ 4.0 <b>ROAM</b> indicator	—	—	Verify Telephone Number, SID number and carrier selection, 24 ⇒ 1.0
⇒ 5.0 IDC keypad	Press random assortment of keys on IDC	Struck key appears on display of IDC	27
⇒ 6.0 Keypad Touchtone® audio	Press random assortment of keys on IDC	An audible Touchtone® can be heard through the speakers (not the handset)	25 ⇒ 1.0 (Model 129) 25 ⇒ 4.0 (Model 140) 27

<sup>1)</sup> Observe Preparation for Test, see 22.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Test step/Remedy <sup>1)</sup>
In-dash controller (IDC) display is blank		11
No keypad response on IDC display	Wiring IDC (A35/3)	11 ⇒ 5.0
Feature or memory failure		11
ROAM indicator stays on	Antenna	11 ⇒ 4.0
No Srvc indicator stays on	Antenna	11 ⇒ 3.0
Error code on IDC display		13
Constant intercept tone		11 23
Constant fast busy/reorder tone		11 23
Can not place any calls		11 23 ⇒ 1.0 24
Can not receive any calls		11 23 ⇒ 2.0 24
Poor reception quality, static <sup>2)</sup>		11 23 ⇒ 1.0 24

1) Observe Preparation for Test, see 22.

2) Usually this type of complaint is due to limitations of the cellular system. Find out if complaint is limited to specific geographic areas.

Diagnosis – Complaint Related Diagnostic Chart

Complaint/Problem	Possible cause	Test step/Remedy <sup>1)</sup>
Frequently dropped calls <sup>2)</sup>		11 23 ⇒ 1.0 24
Antenna will not extend or retract	Wiring Antenna	11 24 ⇒ 2.0
Radio does not mute with incoming or outgoing calls		26
No microphone audio at IDC	Ensure that handset is properly seated in cradle	28 27
No speaker audio	Ensure that handset is properly seated in cradle	23 25 ⇒ 1.0 (Model 129) 25 ⇒ 4.0 (Model 140) 26
No mouthpiece audio at handset		27
No earpiece audio at handset		27
Poor audio quality		11 23 25 ⇒ 1.0 (Model 129) 25 ⇒ 4.0 (Model 140)
No Touchtone® audio from keypad		11 23 25 ⇒ 1.0 (Model 129) 25 ⇒ 4.0 (Model 140) 27

<sup>1)</sup> Observe Preparation for Test, see 22.

<sup>2)</sup> Usually this type of complaint is due to limitations of the cellular system. Find out if complaint is limited to specific geographic areas.

## 7.2 Cellular Telephone (CTEL)

Models 129 and 140, up to M.Y. 1993

### Diagnosis – Diagnostic Trouble Codes (DTC's)

DTC's will automatically appear in the IDC display if a malfunction occurs.  
If a DTC is present the CTEL will not function.

There is *no* diagnostic mode for DTC retrieval.

DTC	Possible cause	Test step/Remedy <sup>1)</sup>
1	Transmitter/receiver malfunction (ROM)	27 ⇒ 1.6
2	Transmitter/receiver malfunction (RAM)	27 ⇒ 1.6
3	NAM malfunction	Reprogram NAM, 27
4	ESN malfunction	Verify ESN with carrier, 27
5	Transmitter/receiver memory malfunction (EE/PROM)	27 ⇒ 1.6
6	Transmitter/receiver output power malfunction	24, 27 ⇒ 1.6
7	In-dash controller (IDC) malfunction	27
8	Transmitter/receiver output power control malfunction	24, 27 ⇒ 1.6

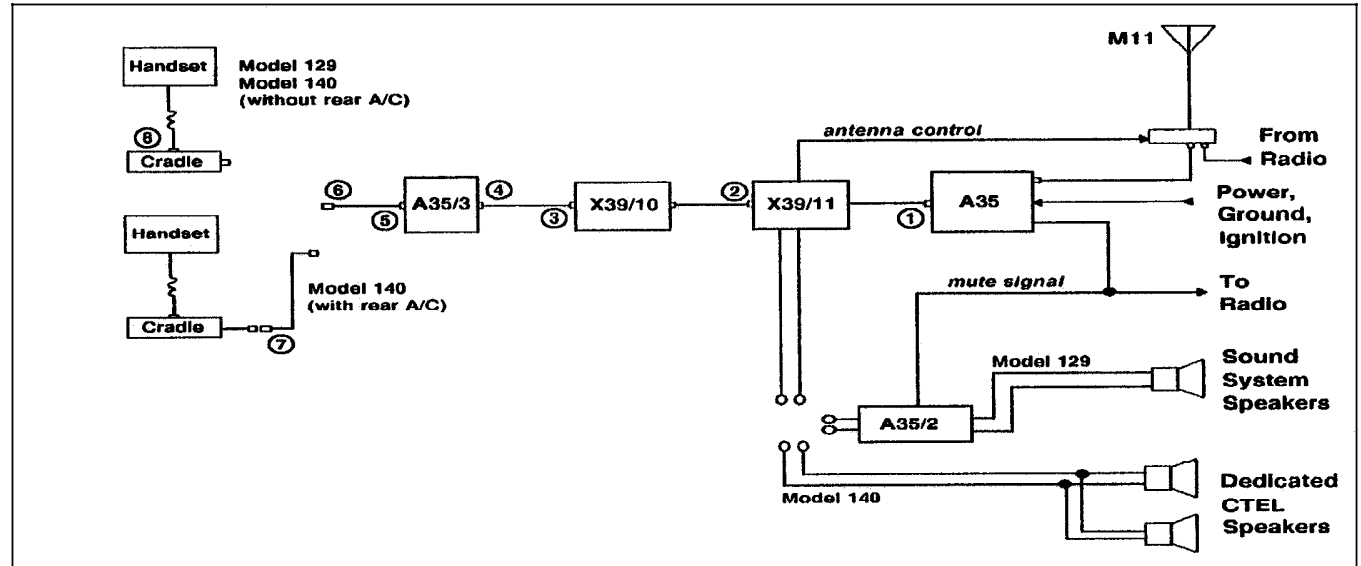
<sup>1)</sup> Observe Preparation for Test, see 22.

## 7.2 Cellular Telephone (CTEL)

Models 129 and 140, up to M.Y. 1993

### Electrical Test Program – Component Locations

Test Points - Test Handset or  
Test Headset to CTCL



Test point	Description of connection	Replaceable component
1	Input to Transmitter/receiver (A35) from CTCL junction box (X39/11)	TR (A35)
2	Input to CTCL junction box (X39/11) from IDC (A35/3)	Junction box (X39/11)
3	Input to IDC/junction box separation point (X39/10)	Wiring from A35/3 to X39/11
4	Harness at IDC	Wiring from A35/3 to X39/11
5	Input to IDC from CTCL handset cradle (A34/2)	IDC (A35/3)
6	Harness at CTCL handset cradle (models w/o rear A/C)	Wiring from A35/3 to A34/1
7	Harness at CTCL handset cradle (models with rear A/C)	Armrest extension harness
8	Handset input to CTCL cradle (not accessible with rear A/C)	CTCL cradle (A34/2)

**Electrical Test Program – Preparation for Test**

1. Battery voltage 11–14 V.
2. Fuses F3-28, F4-10 okay (Model 140).  
Fuses F20-6, F22/2-1 okay (Model 129).
3. Known good service area.
4. Good ground contact.
5. Check harness and antenna connections for good contact.
6. Verify NAM programming.

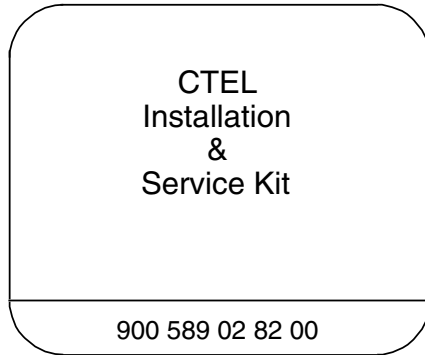
Electrical wiring diagrams :  
 Electrical Troubleshooting Manual, Model 129,  
 Electrical Troubleshooting Manual, Model 140.

**Special Tools**



903 589 02 21 00

Headset



CTEL  
 Installation  
 &  
 Service Kit

900 589 02 82 00



CTEL  
 Installation  
 &  
 Service Kit  
 Upgrade - MY 94

900 589 03 82 00

**Conventional tools, test equipment**

Description	Brand, model, etc.
Digital multimeter <sup>1)</sup>	Fluke models 23, 83, 85, 87

<sup>1)</sup> Available through the MBUSA Standard Equipment Program.

## 7.2 Cellular Telephone (CTEL)

Models 129 and 140, up to M.Y. 1993

### Electrical Test Program – Call Placement/Reception Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Call placement</b> In Use indicator		Ignition: <b>ON</b> Radio: <b>ON</b> CTEL: <b>ON</b> Handset securely in cradle. Known good service area. Place call from CTEL to landline telephone (vehicle should be outside). Call is in progress.	Indicator lights up.	24, 27.
1.1	Audio switchover		Call is in progress.	Radio is muted, <b>TEL</b> appears on radio faceplate.	26
1.2	Intercept tone (alternating high/low tone)		Call is in progress.	No audible tone heard.	Number dialed incorrectly, Cellular service not activated: contact carrier.
1.3	Fast-busy signal		Call is in progress.	No fast-busy signal heard.	If fast-busy signal: cellular system busy (no open channel), contact carrier if problem persists.



Electrical Test Program – Call Placement/Reception Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.4	Hands-free function		Call went through to landline telephone. Handset securely in cradle.	Hands-free microphone functions.  Audio heard through vehicle CTEL speakers.	27, 28.  25 ⇒ 1.0 (model 129), 25 ⇒ 4.0 (model 140), Wiring.
1.5	Handset function		Call went through to landline telephone. Remove handset from cradle.  Terminate telephone call (Press <i>END</i> ).	Handset is functional. No audio through vehicle CTEL speakers.	27

## 7.2 Cellular Telephone (CTEL)

Models 129 and 140, up to M.Y. 1993

### Electrical Test Program – Call Placement/Reception Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.0	<b>Call reception</b> Audio switchover		Ignition: <b>ON</b> Radio: <b>ON</b> CTEL: <b>ON</b> Handset securely in cradle. Known good service area. Place call from landline telephone to CTEL (vehicle should be outside). Call is in progress. Incoming radio mute feature programmed in second menu.	Radio is muted, <b>TEL</b> appears on radio faceplate.	Verify Menu programming, 26
2.1	Ringing tone		Call is in progress.	Audible ringing is heard through vehicle CTEL speakers.	25 ⇒ 1.0 (model 129) 25 ⇒ 4.0 (model 140)
2.2	IDC display		Call is in progress.	IDC display indicates <b>INC CALL PRESS SNO</b> and display backlighting flashes.	Contact carrier, 27.

## Electrical Test Program – Call Placement/Reception Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.3	Hands-free function		Call went through to CTCL. Handset securely in cradle.	Hands-free microphone functions.  Audio heard through vehicle CTCL speakers.	27, 28.  25 ⇒ 1.0 (model 129), 25 ⇒ 4.0 (Model 140), Wiring.
2.4	Handset function		Call went through to CTCL. Remove handset from cradle.  Terminate telephone call (Press <i>END</i> ).	Handset is functional. No audio through vehicle CTCL speakers.	27

### Electrical Test Program – Antenna Test

If customer complaint is limited to a specific geographic location or condition, explain limitations of CTEL (radio-telephone) to customer.

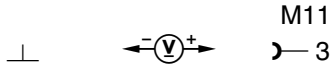
If customer complaint is regarding chronic static or frequently dropped calls, which are not limited to a specific geographic area, contact carrier.

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Antenna</b> Ground		Ignition: <b>OFF</b> Radio: <b>OFF</b> CTEL: <b>OFF</b> Known good service area. Temporarily disconnect <i>Radio and Telefon</i> connection coax cables from antenna splitter (A28/1).	< 0.3 Ω	Loosen lower antenna mounting bracket. Tighten mast tube until resistance is < 0.3 Ω. Retighten lower bracket. Reconnect coax cables.
1.1	Cable		Disconnect antenna coax cable from A28/1 and TR (A35). Replace with known good cable.	<b>No Serv</b> indicator does not come on.  Reception and quality improve.	Indicator stays ON: ⇒ 1.2.  Indicator goes OFF: Replace antenna coax cable.  Reception does not improve: ⇒ 1.2  Reception improves: Replace antenna coax cable.

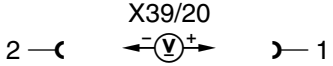
Electrical Test Program – Antenna Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.2	Cable		Disconnect antenna coax cable from A35. Connect magnetic mont test antenna to A35. Place test antenna on trunk lid with lid closed.		Indicator stays ON: contact arrier. Indicator goes OFF: Replace antenna.
2.0	<b>Antenna</b> Radio control		Ignition: <b>ON</b> Radio: Cycle <b>ON/OFF</b> CTEL: <b>OFF</b>	Antenna extends and retracts with cycling of radio.	⇒ 2.1
2.1	Radio control		Disconnect antenna control wire from junction box (X39/11) and antenna. Radio: Cycle <b>ON/OFF</b> CTEL: <b>OFF</b>	Antenna extends and retracts with cycling of radio.	Nominal value OK: ⇒ 2.3.  Nominal value not okay: see DM, Vol. 3, Drivetrain, Body & Accessories Electrical, Chassis & Body ⇒ EB-02.06.
2.2	CTEL control		CTEL: Cycle <b>ON/OFF</b> Radio: <b>OFF</b>	Antenna extends and retracts with cycling of CTCL.	⇒ 2.3

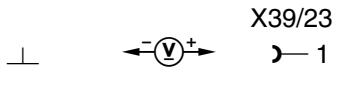
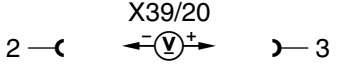
### Electrical Test Program – Antenna Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.3	CTEL control		CTEL: <b>ON</b> CTEL: <b>OFF</b>	11 – 14 V < 1 V	Nominal values OK: Replace antenna. Nominal values not OK: Replace X39/11.

Electrical Test Program – Speaker Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Model 129 Speakers</b>		Radio: <b>ON</b> CTEL: <b>OFF</b>	Radio audio is heard through all speakers.	⇒ 2.0
2.0	<b>Model 129 Audio switchover relay module (A35/2) Wiring</b>		Check for proper connection of relay harness.	Radio audio is heard through all speakers.	⇒ 2.1
2.1	Wiring		Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b> Press <i>C</i> (clear) to generate an audio tone.	CTEL audio is heard through left front door speaker group (H4/1) and left front speaker (H4/9).	⇒ 2.2
2.2	Voltage supply Circuit 30	 <p>X39/20 2 —( )— ←(V)+— ( )— 1</p>	Ignition: <b>ON</b> Radio: <b>ON</b> CTEL: <b>ON</b> Do not disconnect X39/20. Take reading from back of connector.	11 – 14 V	Nominal value OK: ⇒ 2.5  Nominal value not OK: Wiring, Fuse (F22/2-1).

Electrical Test Program – Speaker Test

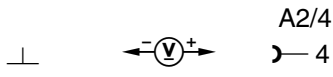
⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
2.3	Voltage supply Control voltage		Do not disconnect X39/23. Take reading from back of connector.	11 – 14 V	Nominal value OK: ⇒ 2.5  Nominal value not OK: Wiring.
2.4	Control voltage		Enter 611 Press <i>SND</i> .	< 1 V	Nominal value OK: ⇒ 2.5  Nominal value not OK: 26
2.5	<b>Model 129</b> <b>Audio switchover relay</b> <b>module (A35/2)</b>		Install known good relay.	Audio returns.	Audio: Replace A35/2.  No audio: Replace relay harness.
3.0	<b>Model 129</b> <b>CTEL junction box (X39/11)</b>		Disconnect speaker wire connector (2) from X39/11. Connect test headset to X39/11 at connector 2. Press <i>C</i> (clear) to generate an audio tone.	Audio tone heard over test headset.	Nominal value OK: ⇒ 2.5  Nominal value not OK: ⇒ 3.1
3.1			Connect test headset to test point #2. Press <i>C</i> (clear) to generate an audio tone.	Audio tone heard over test headset.	Nominal value okay: Replace X39/11  Nominal value not OK: 27



Electrical Test Program – Speaker Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
4.0	<b>Model 140 Speakers</b>		Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b> Connect test headset to CTEL speaker harness. Press IDC keys to generate an audio tone.	Keytone audio is heard through headset.	Nominal value OK: Speakers, Wiring.  Nominal value not OK: ⇒ 4.1
4.1	Wiring		Disconnect speaker output wiring from X39/11. Connect to test headset. Press IDC keys to generate an audio tone.	Keytone audio is heard through headset	Nominal value OK: Wiring.  Nominal value not OK: ⇒ 5.0
5.0	<b>Model 140 CTEL junction box (X39/11)</b>		Connect test headset to test point #2. Press IDC keys to generate an audio tone.	Audio tone heard over test headset.	Nominal value OK: Replace X39/11  Nominal value not OK: 27

Electrical Test Program – Audio Switchover Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Audio switchover</b> NAM programming		Ignition: <b>ON</b> Radio: <b>ON</b> CTEL: <b>ON</b> Known good service area. Verify NAM option programming (data step 8 of programming guide) Model 129=1110 Model 140=1100  Enter <i>611</i> Press <i>SEND</i>	Radio mutes	⇒ 1.1  Note: The radio will not mute during incoming calls unless <i>Incoming Mute</i> is activated in the second menu.
1.1	Control voltage		Disconnect 5-pole connector on back of radio. Enter <i>611</i> Press <i>SEND</i>	< 1 V	Nominal value OK: ⇒ 1.2  Nominal value not OK: ⇒ 1.3
1.2	Radio		Radio: <b>ON</b> CTEL: <b>OFF</b> Disconnect 5-pole connector on back of radio. Momentarily ground pin 4 on back of radio.	Radio mutes and <b>TEL</b> is indicated in radio display.	Nominal value OK: ⇒ 1.3  Nominal value not OK: ⇒ Replace radio

Electrical Test Program – Audio Switchover Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.3	Wiring	A35 2 —┐    ←⊗→ A2/4 ┘— 4	Disconnect 5-pole connector on back of radio. Disconnect connector 2 from A35.	< 1 Ω	Nominal value OK: 27  Nominal value not OK: Wiring

Electrical Test Program – Harness Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>CTEL handset (A34/1)</b>		Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b> Known good service area. Connect test handset to test point #6 (test point #7 on models with rear A/C).	CTEL is functional via test handset.	Nominal value okay: Replace A34/1  Nominal value not okay: ⇒ 1.1
1.1	Wiring		Connect test handset to test point #5.	CTEL is functional via test handset.	Nominal value okay: Wiring Nominal value not okay: ⇒ 2.0
2.0	<b>In-dash controller (IDC, A35/3)</b>		Connect test handset to test point #4.	CTEL is functional via test handset.	Nominal value okay: Replace A35/3  Nominal value not okay: ⇒ 2.1
2.1	Wiring		Connect test handset to test point #3.	CTEL is functional via test handset.	Nominal value okay: Wiring Nominal value not okay: ⇒ 2.2
2.2	Wiring		Connect test handset to test point #2.	CTEL is functional via test handset.	Nominal value okay: Wiring Nominal value not okay: ⇒ 3.0

Electrical Test Program – Harness Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
3.0	<b>CTEL junction box (X39/11)</b>		Connect test handset to test point #1.	CTEL is functional via test handset <sup>1)</sup> .	Nominal value okay: Replace X39/11  Nominal value not okay: Replace A35/3.

<sup>1)</sup> Antenna control and hands-free speaker will not function.

Electrical Test Program – Hands-Free Microphone Test

⇒	Test scope	Test connection	Test condition	Nominal value	Possible cause/Remedy
1.0	<b>Hands-free microphone</b> IDC (A35/3)		Ignition: <b>ON</b> Radio: <b>OFF</b> CTEL: <b>ON</b> A/C: <b>OFF</b> Known good service area. Handset securely in cradle. Place call from CTEL to landline telephone (vehicle should be outside).	Audio is heard on landline telephone with minimal “echo”.	Speaker volume set too high producing “echo” effect, ⇒ 1.1.
1.1	Wiring		Connect test microphone to test point #5.	Audio is heard on landline telephone with minimal “echo”.	Replace A35/3 <sup>1)</sup>

<sup>1)</sup> In extreme cases only, it may be necessary to permanently install a remote hands-free microphone at the top of the driver’s side A-pillar to reduce “echo”, road noise, vehicle noise, etc. to an acceptable level. This installation requires prior Regional approval.