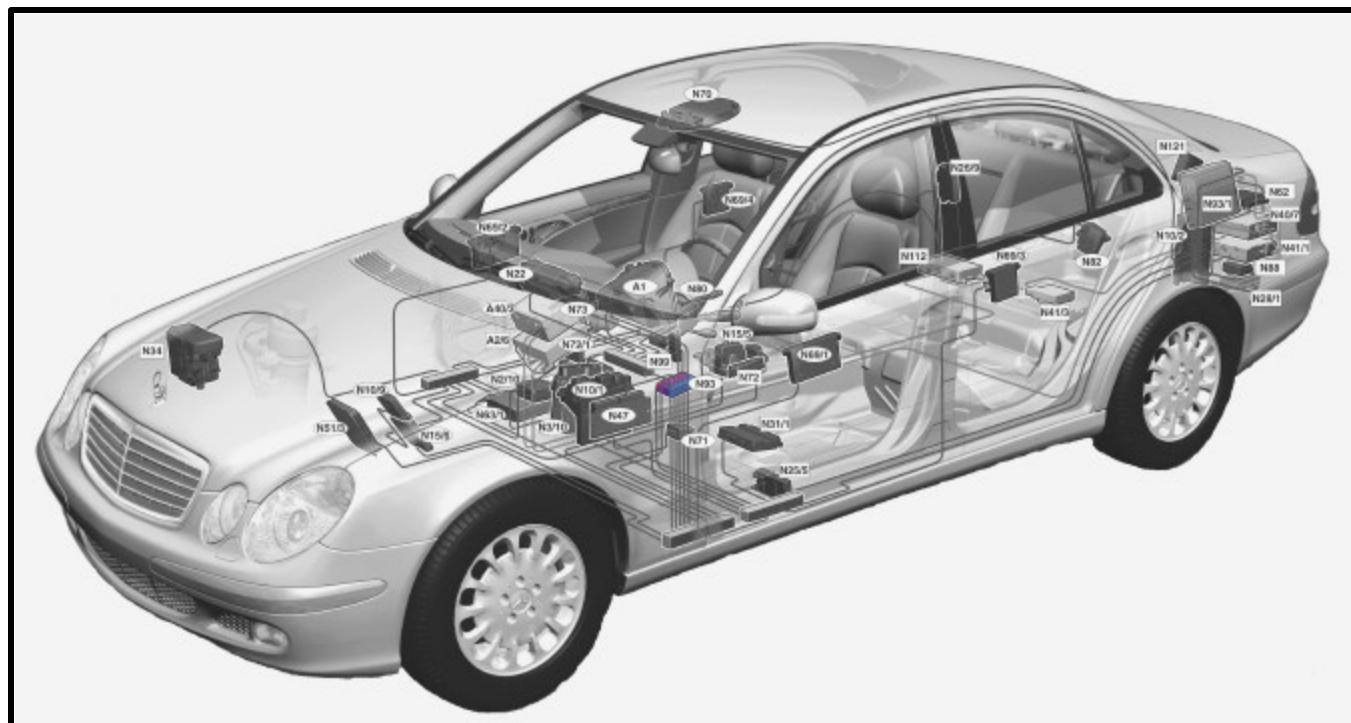




Mercedes-Benz

MOST System



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What is MOST?

- The MOST acronym is derived from the words:
“Media Oriented System Transport”
- An evolution of the fiber optic ring and electrical wake-up configuration used in the D2B system
- A communication standard created by DCAG, Becker, and other corporations (unlike D2B that was exclusive to MB)
- One of the vehicle communication networks:
 - connecting the audio system to other vehicle networks

Note: MOST system may also be referred to as NTG 1
(New Telematics Generation 1)

MOST Introduction

- Introduced from beginning of E Class (W211) production
- Future models will change to or be introduced with MOST

MY 2003	W211			
MY 2004	C215	W220	W/V240 ①	
MY 2004 (April / May)	W/S/CL203			
MY 2005	R171 ②	C/A209	W219 ③	R230
MY 2006	W164 ④	X164 ⑤	W251 ⑥	

① Front audio system only

② New SLK

③ CLS

④ New M Class

⑤ New G Class

⑥ Grand Sports Tourer

Note: This information is preliminary and subject to change.

SLR will be introduced with D2B system and no current plans to change to MOST.

Advantages Over D2B

- Reduced development cost due to communication standard for multiple manufacturers
- Multiple manufacturers able to supply components
- Faster transmission of data, with even higher rates possible (*see chart*)
- More devices possible (*see chart*)
- Reduced possibility of complete failure:
 - additional wake-up method
 - failure mode in MOST components (watchdog function)
- Longer fiber optic cable length possible (*see chart*)

Comparison: D2B vs. MOST

Description	D2B	MOST
Data Transmission rate	Up to 5.65Mbps	Up to 24.8Mbps
Maximum number of devices	6	64 ①
Minimum fiber bend radius	25mm	Do not kink
Maximum fiber optic length	33ft w/o in-line connector 10ft with 3 in-line connectors	69ft w/o in-line connector 13ft with 3 in-line connectors
Bus Master	Radio/COMAND	Audio 20* or Audio Gateway (AGW)
Gateway to CAN B & Diagnostic interface	Radio/COMAND	Audio 20* or Audio Gateway (AGW)
Wake-up method	Electrical	Electrical <i>or</i> optical
Berger fiber optic tester	Can be used	Cannot be used
Passive fiber optic connector for testing purposes	A000 545 33 84	A000 545 44 84

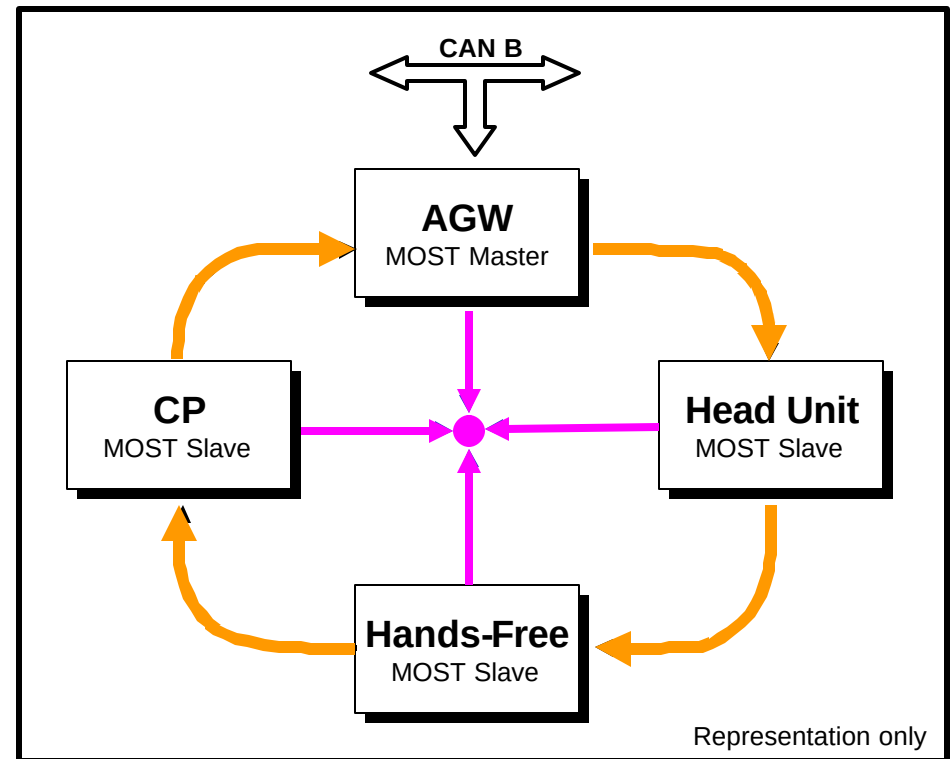
① Currently have capabilities to configure up to 16 locations

* W/S/CL203, R171 with HU entry class Audio 20

Basic Network Principle

Network generally consists of:

- MOST master
 - AGW or Audio 20 HU
- MOST slave components
 - HU (if AGW fitted)
 - Communications Platform (CP)
 - Hands-Free Module (HFM)
- Optical cables connect components in a single ring
- Components are all connected by an electrical wake-up circuit
- Each component supplies voltage to wake-up circuit



- Additional components can be added to the optical ring:
 - CD changer
 - Navigation
 - Satellite radio
 - etc...

MOST Component Manufacturers

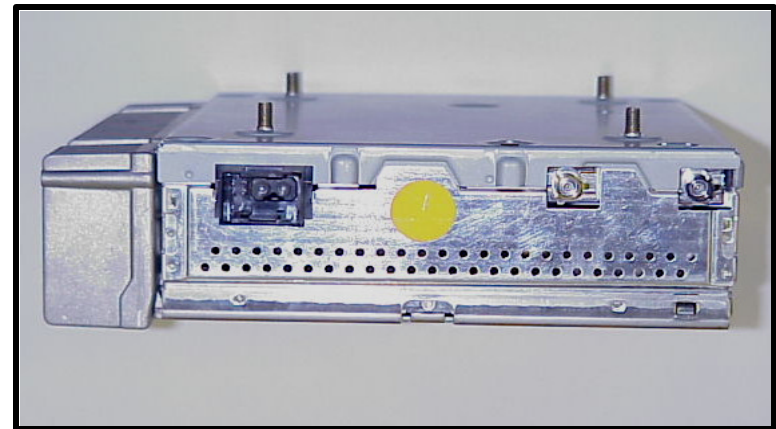
- Audio Gateway (AGW), (N93/1) - *Harman/Becker*
- Compact Disc Changer (CDC), (A2/6) – *Alpine*
- Head Unit, HU (A2/56) or COMAND - *Harman/Becker* *Siemens* *Alpine*
- Navigation drive / processor (N41/1) - *Harman/Becker*
- Communications Platform (CP), (N112) - *Motorola*
 - Handset Support Electronics (HSE)
 - TELE AID
 - Global Positioning System (location of car for TELE AID)
- Hands Free Module (HFM), (A35/1) - *AKG*
or
Voice Control System (VCS), (A35/11) - *Temic/Motorola*
- Satellite Digital Audio Receiver (SDAR), (N87/5) – *Delphi*
- Sound Amplifier (V220 / C215 MY 2004) - *Bose*

Bus Master

- Bus master of MOST system:
 - Audio 20 Head unit (HU)
(MOST entry class)
or
 - Audio Gateway (AGW)
(Audio 50, COMAND, MCS II)
- Various versions of AGW are available for use in various models or equipment level in USA:
 - Maybach
 - Audio system without Logic 7
 - Audio system with Logic 7
 - Audio system with separate sound amplifier



Audio 20 HU



AGW

Note: AGW installation location varies with model.

Bus Master

Bus master is responsible for:

- Storing the ring configuration
- Provides voltage for it's wake-up line
- Monitors electrical wake-up line for ring start request from slave component
- Issuing an electrical wake-up signal
- Issuing a 'ring start' optical message
- Maintaining 'ring lock' after 'ring start'
- Switching off the ring
- Determining & storing fault codes related to itself and ring errors
- Diagnostic gateway for MOST components
- Gateway between MOST components & CAN B
- Performing a diagnostic wake-up upon request from SDS / DAS

Bus Master

- In addition to being the MOST bus master the AGW (or Audio 20 HU) incorporates:
 - Radio tuner
 - Sound amplifier*
 - Sound adjustment controls*:
 - speed dependant volume
 - DRO (Dynamic Range Optimization)
- AGW can be flashed for future MOST developments or enhancements
- Refer to DTB bulletins for latest enhancement software release
(as of 02/04 SW 49/03 DTB P-B-82.85/325)

* Incorporated in separate sound amplifier if fitted



Location: Left side trunk (W211 shown)

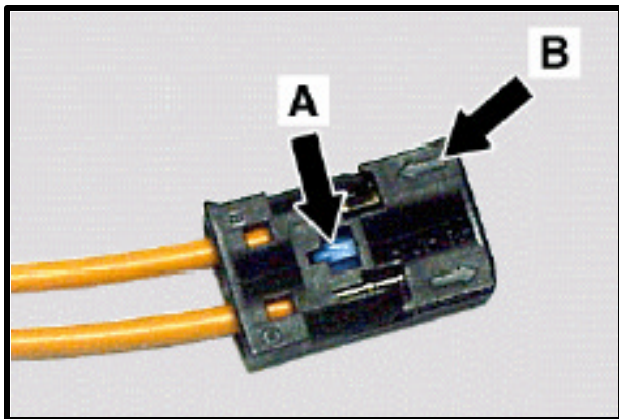
Bus Slaves

In addition to normal role of the MOST component, the bus slaves are responsible for:

- Providing voltage for it's wake-up line
- Monitoring electrical wake-up line for 'ring start' request
- Issuing an electrical wake-up signal for 'ring start' request
- Monitoring FOT IN for optical 'ring start' message at all times
- Maintaining 'ring lock' after 'ring start'
- Failure mode / Watchdog function
- Determining & storing fault codes related to itself
- Communicate diagnostic information when requested on the MOST network
- Respond to a diagnostic wake-up, upon request from master

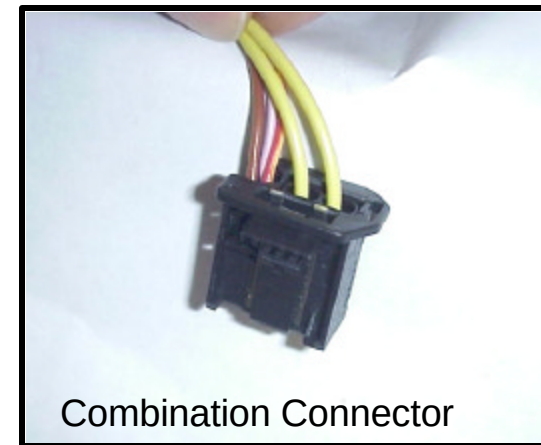
Note: All MOST components have an internal temperature sensor that will shut down the component if it reaches 194°F.

Optical Cable



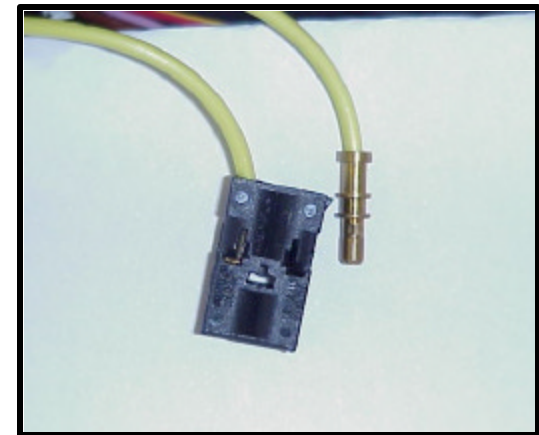
A = Release tab

B = Direction of data flow



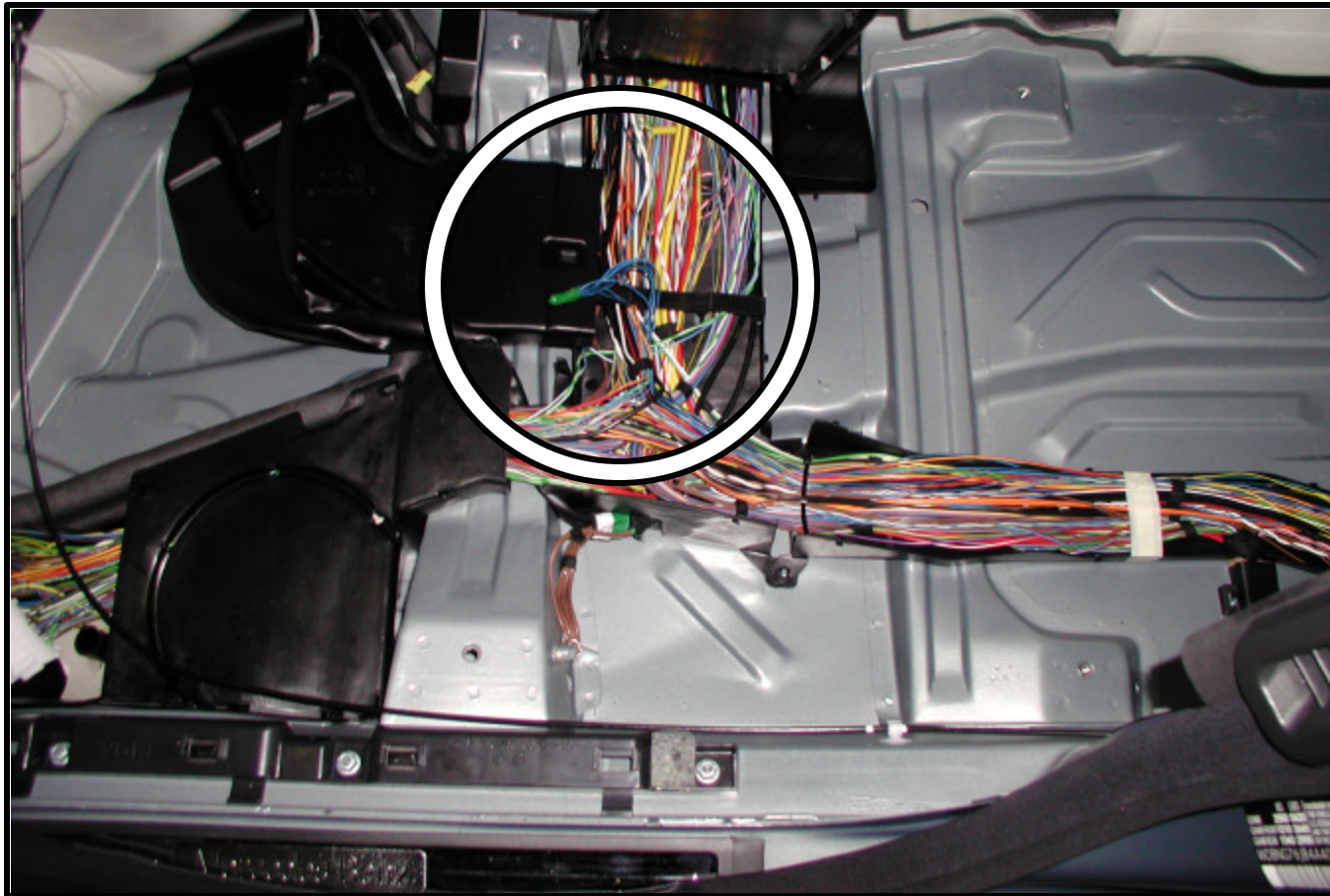
Combination Connector

- Not interchangeable with D2B
- Manufactured with tighter tolerances (more durable than D2B cables)
- May be combined with electrical connector (combination connector)
- Different plastic ferrules from D2B
- Both ends are clear in color
 - light at cable = input to device
 - no light at cable = output from device



Electrical Wake-Up

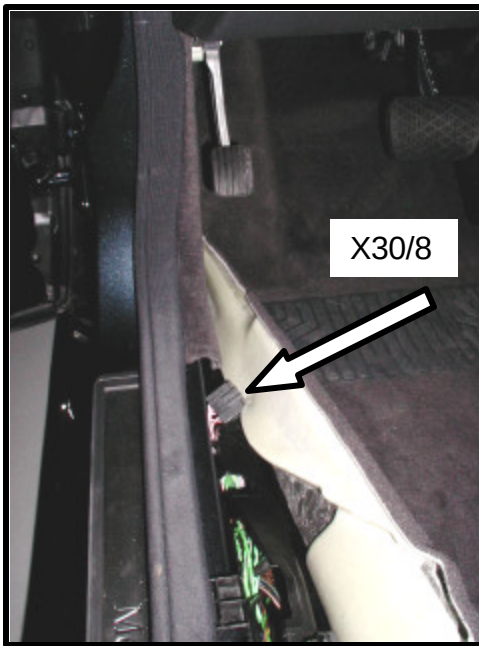
- Wake-up lines are connected by a Z splice on C215/V220 (Z35/10)
- Wire colors - Blue / Black



Location: Under driver seat (V220 shown)

Electrical Wake-Up

- Wake-up lines are connected by X30/8 connector plug on W/S211
Part # A003 546 20 40
- Wire color - Pink



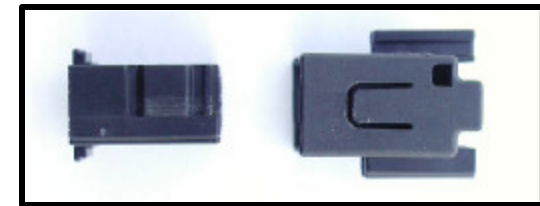
Location: Clipped onto left front sill trough (S/W211)



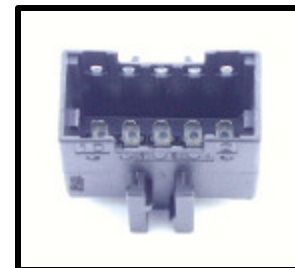
Bridge cover engaged
connecting wake-up lines



Bridge cover pulled up
disconnecting wake-up lines



Bridge cover removed
showing two lock positions

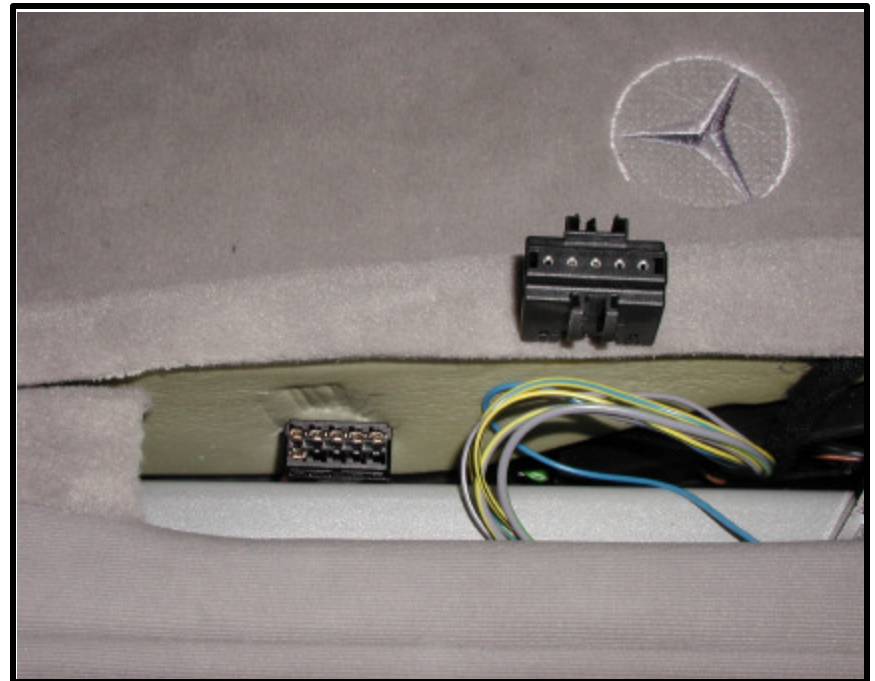


Bridge cover showing
connecting bridge



Wake-Up Connector X30/8

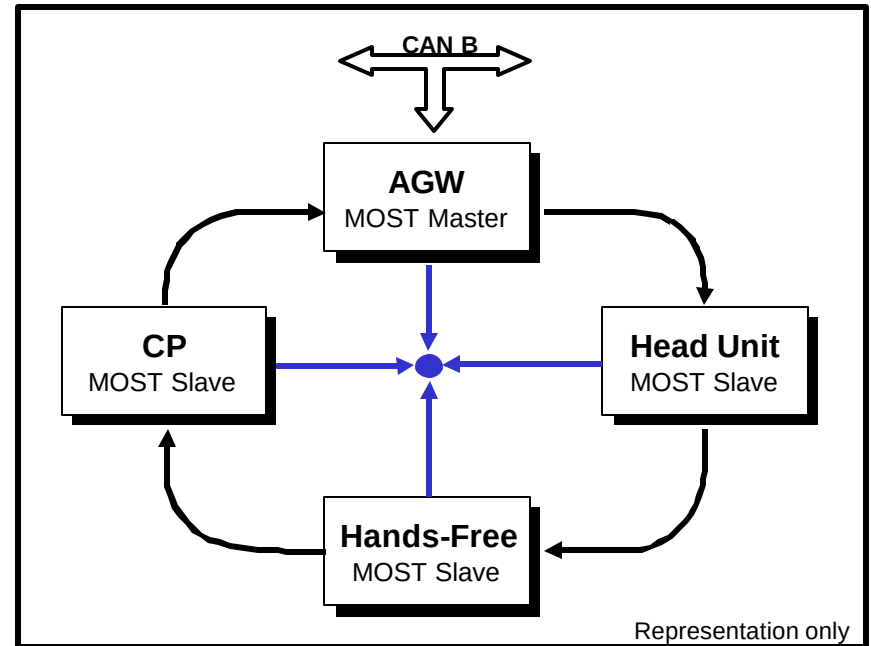
- X30/8 has provisions for up to 10 wake-up lines
- Number of wake-up lines varies with model year and country code:
 - USA MY 03 W211 = 6
 - USA MY 04 W/S211 = 7
- As vehicles are pre-wired for optional equipment, you may find that only some of the wake-up lines have voltage on when checked (with the bridge cover removed)
- Voltage measured may be anywhere from battery voltage to ~4.5 volts



Location: Right front sill trough (W211)

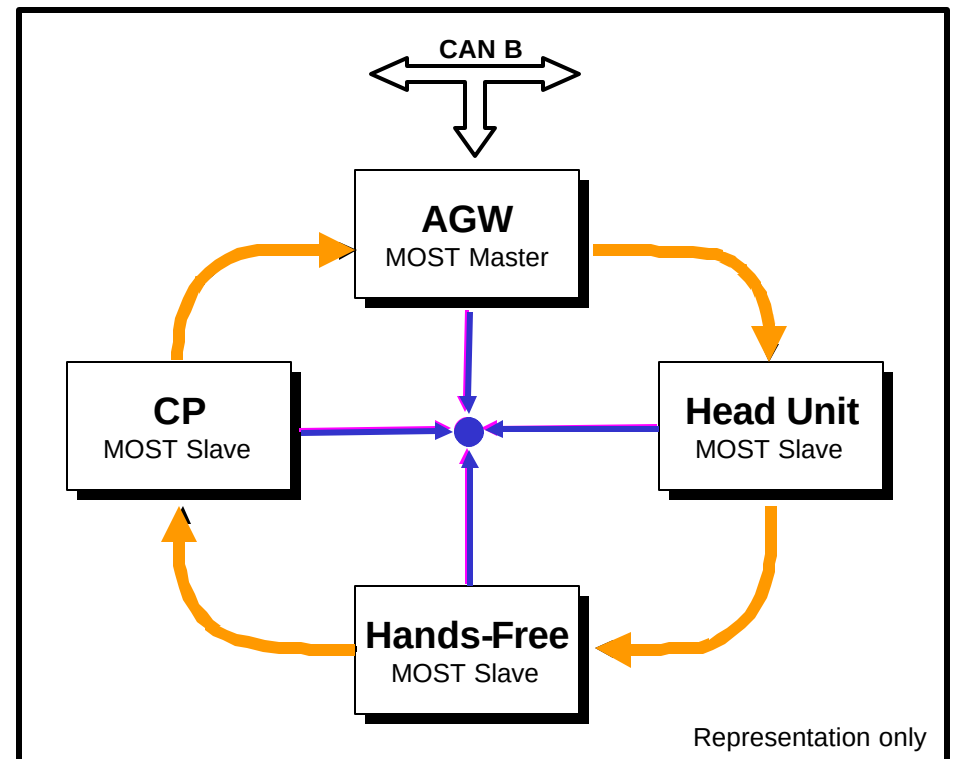
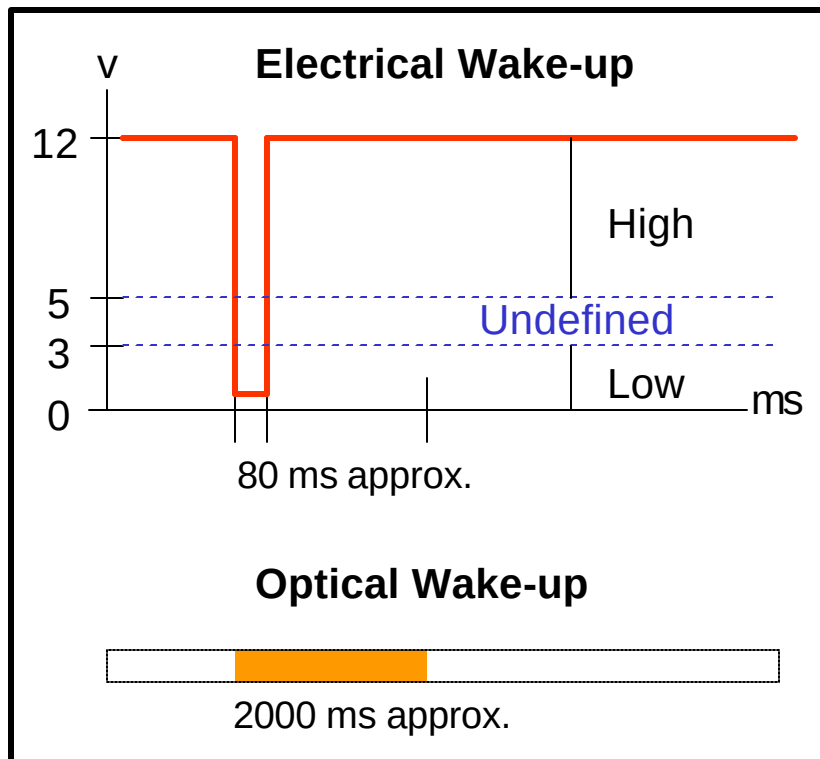
MOST Wake-Up

- Optical bus is awakened when bus master recognizes:
 - CAN B active
 - terminal 15R/15 ON
 - electrical wake-up request from a MOST component
- All MOST components have capability to request a wake-up via electrical wake-up line
- MOST slave components monitor receiving FOT, as well as the electrical wake-up line when system is OFF
- MOST slave components will wake-up if they receive an electrical wake-up or an optical wake-up pulse
- Bus master will not respond to an optical wake-up pulse



MOST Wake-Up

1. Electrical and optical wake-up pulse are sent simultaneously
2. Components wake-up and pass message around ring to master
3. If master receives optical message back, then initiates and maintains “ring lock”



Ring Failure

Version Coding & Configuration

Electrical fault

Optical fault

Failure Mode / Watchdog Function

Configuration & Version Coding

- In order for the ring to function properly, the master MUST know the number of components on the ring and ORDER of those components with respect to the master.
- Refer to the latest Service Information or bulletin for the correct configuration:

Currently:

Date:	August 2000 & October 2002
Document No.:	SI-82.64/135 & S-B-82.70/135B
Group:	82

NOTE: Improper version coding and / or incorrect sequencing of components may result in intermittent and / or abnormal operation of the ring.

Configuration

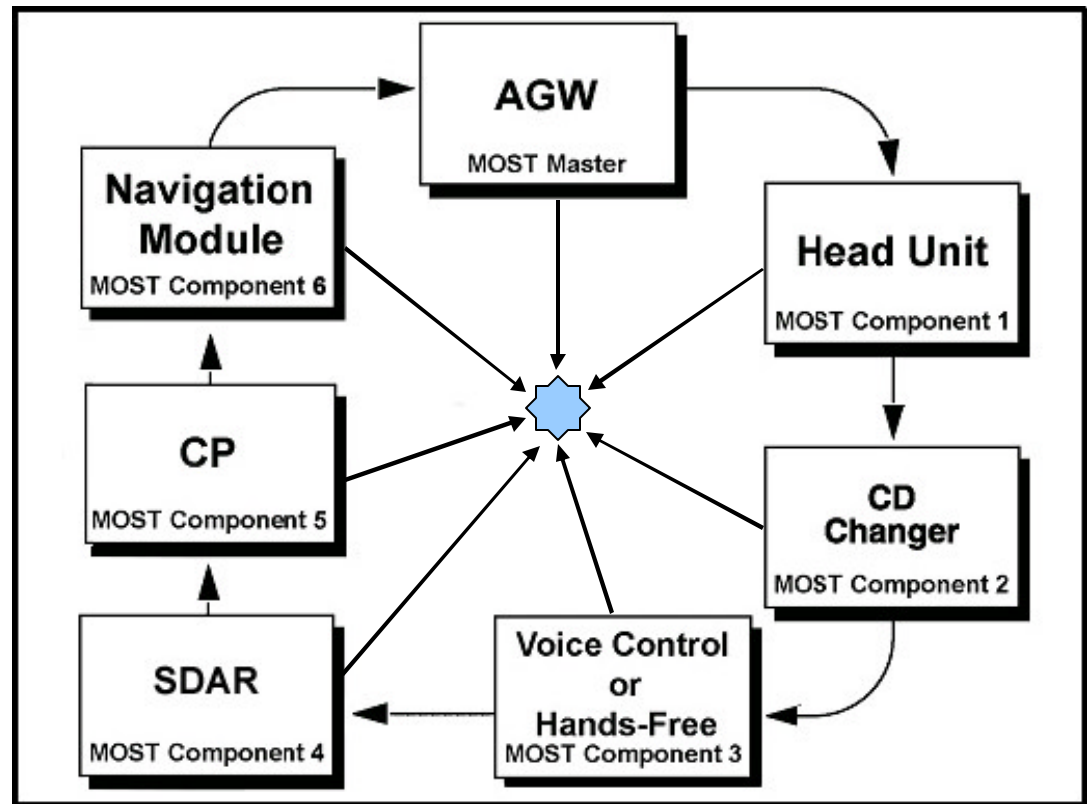
Vehicle	211.070	Control unit	AGW
Actual configuration of MOST components			
Component	Specified value	Actual value	
MOST master	Audio gateway	Audio gateway	
Component 1	COMAND or AUDIO	COMAND or AUDIO	
Component 2	CD changer	CD changer	
Component 3	Telecommunications	Telecommunications	
Component 4	Voice control system	Voice control system	
Component 5	Vacant	Vacant	
...	Vacant	Vacant	

Always check ring configuration is correct and corresponds to equipment level using SDS / DAS.

Ring Configuration

W/S 211 MOST Ring configuration

- Optical ring connects components like D2B
- Audio Gateway* is master
- Others components are slave units
- Electrical wake-up line is connected in a star topology similar to D2B
- Each component supplies voltage to wake-up line



★ = Wake-up line connector - X30/8

SDAR = Satellite radio module

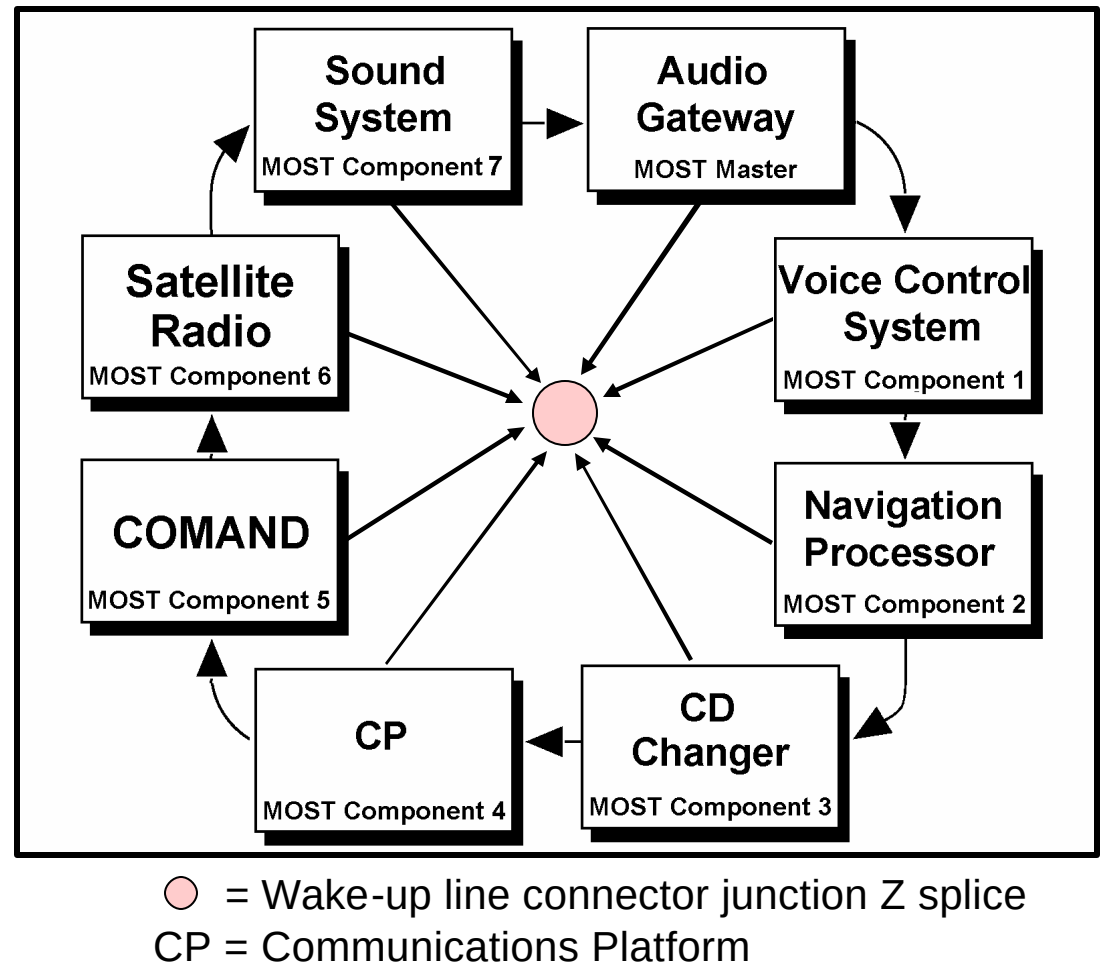
CP = Communications Platform

* MY2005 C Class with Audio 20 will incorporate MOST master in radio head unit.

Ring Configuration

- Optical ring connects components like D2B
- Audio Gateway* is master
- Others components are slave units
- Electrical wake-up line is connected in a star topology similar to D2B
- Each component supplies voltage to wake-up line

C215 / V220 MOST Ring configuration



* MY2005 C Class with Audio 20 will incorporate MOST master in radio head unit.

Electrical Fault on Wake-Up Line

- If the electrical wake-up line has an open circuit or is shorted to power, the ring could still be started using the optical wake-up pulse from the master:

Note: Only slave units can be woken up by an optical wake-up pulse.

- Optical wake-up pulse is sent when:
 - CAN B is active
 - or
 - terminal 15R / 15 ON
- Master can respond to an optical message on the ring, as long as the ring was active (e.g. Press Power button on HU)
- What might the customer complaint be in this case?

“At times the radio will not switch on”

- DTC's may provide a fault code associated with the wake-up line

Electrical Fault on Wake-Up Line

- If the electrical wake-up line has a short to ground:

Scenario 1 - system may operate as if there was an open or short to positive (see previous page).

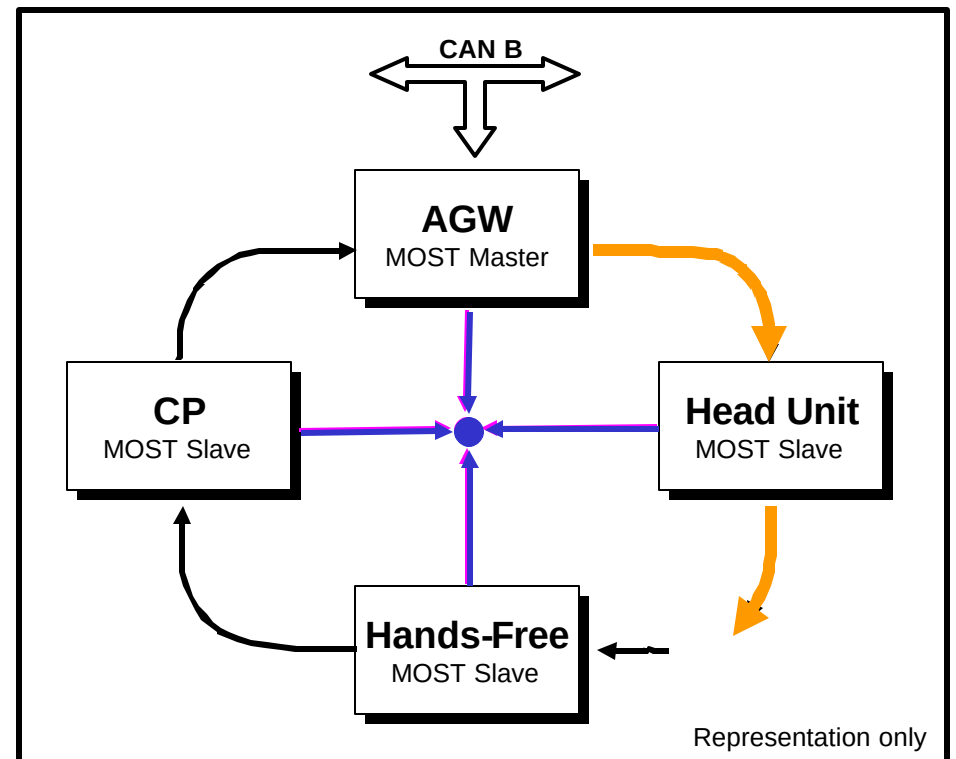
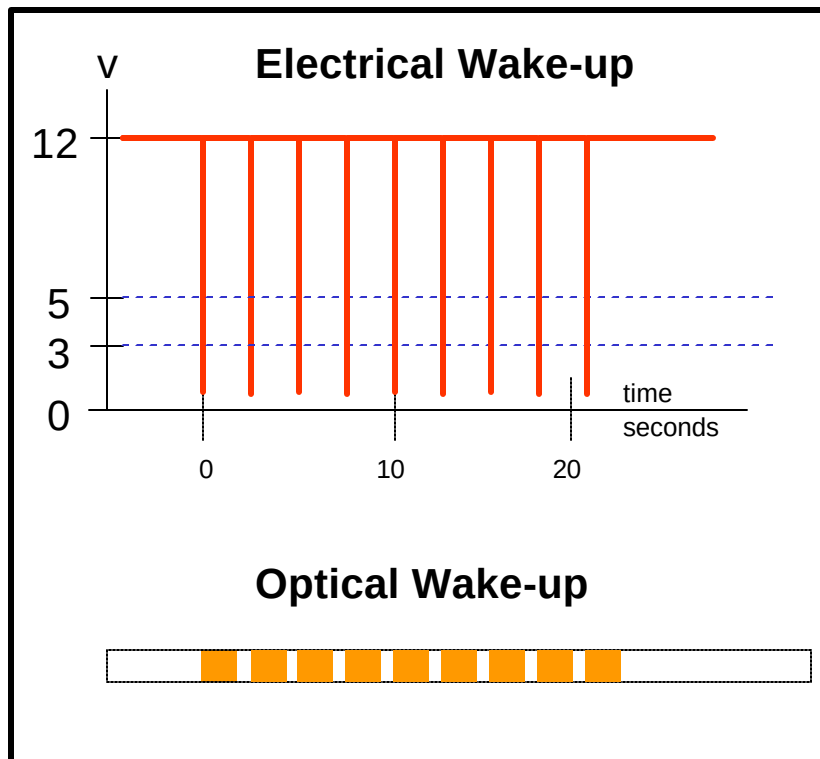
Scenario 2 - may cause CAN B to remain active and when audio system turned on, will shortly switch off again (as seen at the head unit) no audio

Scenario 3 - if the audio system is operating with CAN B inactive and then a fault happens that shorts the wake-up line to ground, the sound may cut out after ~65 seconds. The audio screen will remain unchanged but 30 – 40 seconds later CAN B will become active. If the audio system is switched off and then switched on again the audio system will act like scenario 2 above.

These scenarios are based on practical experience with select vehicles – subject to change

Optical Fault

- Optical ring will not achieve ring lock if optical ring is open
- Master will attempt ring start, if ring start is not successful within 2.5 seconds, master will retry
- Master will attempt ring start 9 times

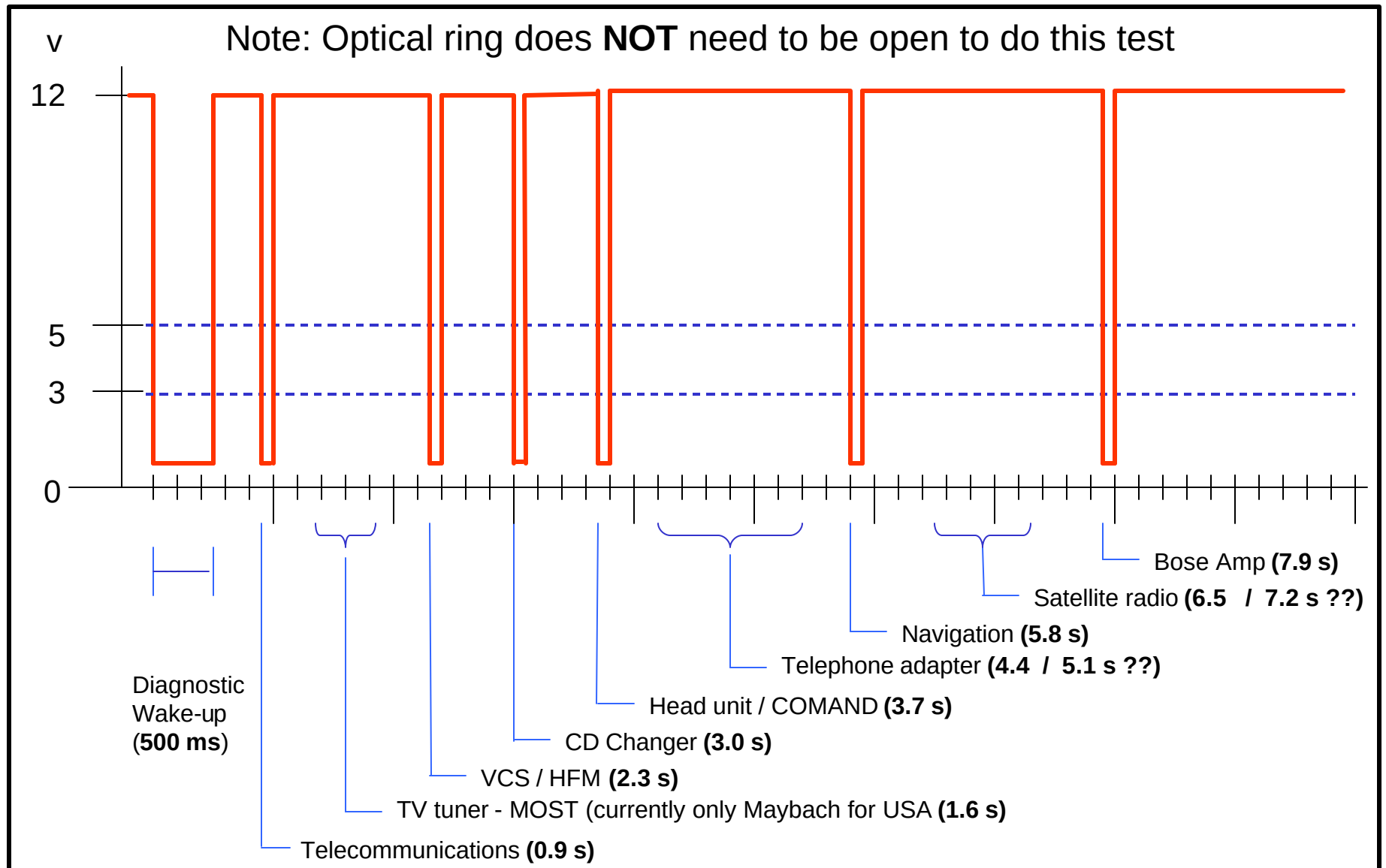


Fault Detection

- Components are programmed to send a optical roll call message if ring lock is not achieved after 9 ring start attempts
- Master determines appropriate fault code based on components it heard back from on the optical ring similar to D2B
- Checking DTC's may provide a fault code associated with location of ring break
- To determine if problem is electrical or optical perform:
“Check of wake-up line to the MOST components”

Note: The optical ring does not have to be opened to perform this test

Diagnostic Wake-Up



Electrical or Optical Fault?

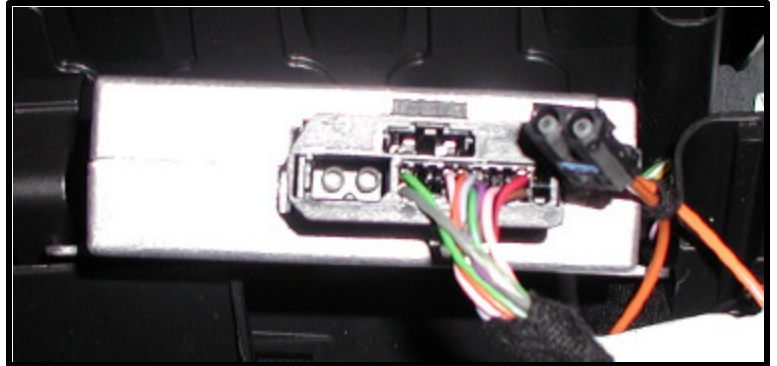
Vehicle	211.070	Control unit	AGW
Check of wake-up line to the MOST components			
No.	Name	Actual values	
451	Telecommunications (Fixed installation cellular telephone)	- ✓ -	
455	TV tuner (Not valid for (J))	NO REACTION	
459	Voice control system / Hands-free system (Not valid for (J))	- ✓ -	
463	CD changer *	- ✓ -	
467	COMAND or AUDIO *	- ✓ -	
475	Telephone adapter for portable CTCL	NO REACTION	
479	Navigation processor (Only in connection with COMAND) (Not valid for (J)) *	- ✓ -	
487	Satellite radio (USA) *	NO REACTION	

NO REACTION = Component not fitted or electrical problem at component
 - ✓ - = Component responded (electrically OK)

Note: 1) Test takes longer to perform than the equivalent D2B test because the test is performed twice, with the results of the second test being displayed.

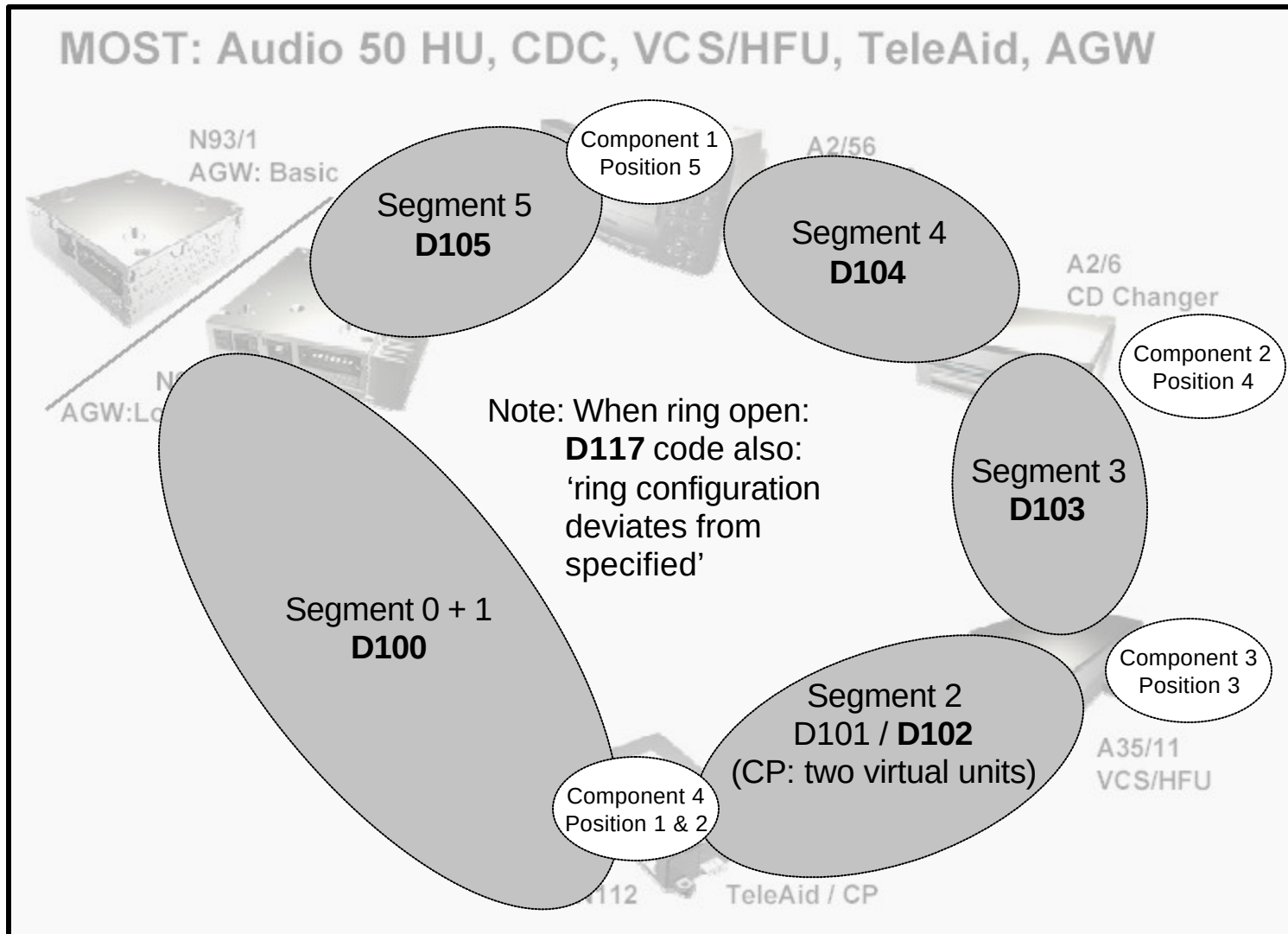
2) *COMAND HU (v220) / CDC (w/s211) / Navigation (w/s211) / Satellite radio (w/s211)
 does not always respond to this test, even if there is no current problem.

Visual Check of MOST Ring

- Remove optical plug connector from one of the MOST components, ensure the electrical part is still connected
 - Switch ON the head unit or restart optical ring with DAS
 - Observe fiber end of removed connector watching for optical flashes
 - What you *should* see:
 - 9 + flashes indicate that MOST circuit is *probably* OK up to that component (incoming optical cables and preceding components)*
- 
- Also observe the component's cable connector socket (FOT)
 - 1 or more flashes from the component after the 9 flashes occur at the cable indicates:
 - Component's power and ground connections are OK
 - Master has successfully awakened component
 - Component's FOT is attempting to inform Master that it is **OK** *

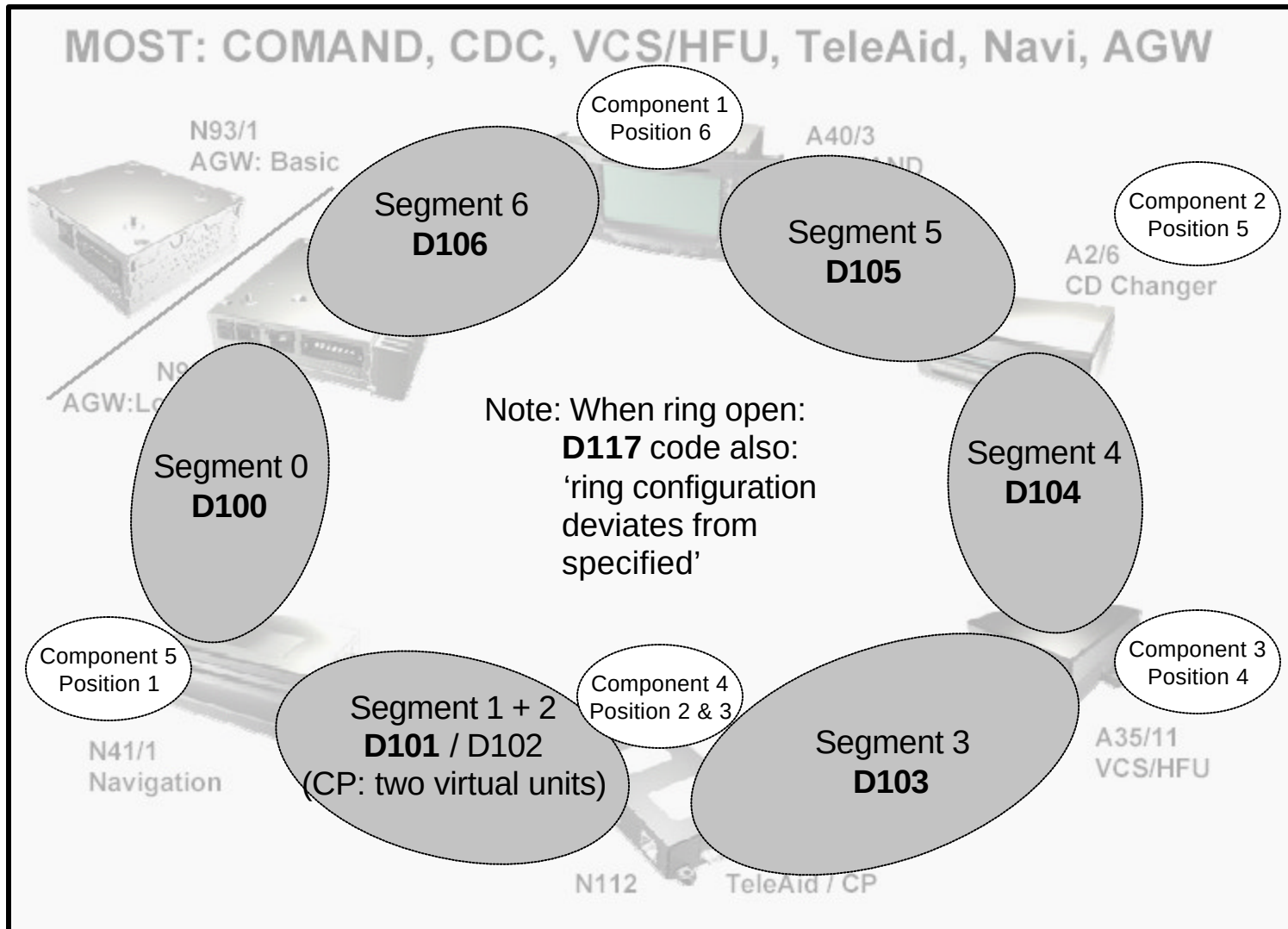
* *Note: This visual check simply verifies the presence of light signals.*

Fault Detection



Fault code is referenced to vehicle configuration to display correct component text on DAS

Fault Detection



Fault code is referenced to vehicle configuration to display correct component text on DAS

Watchdog Function

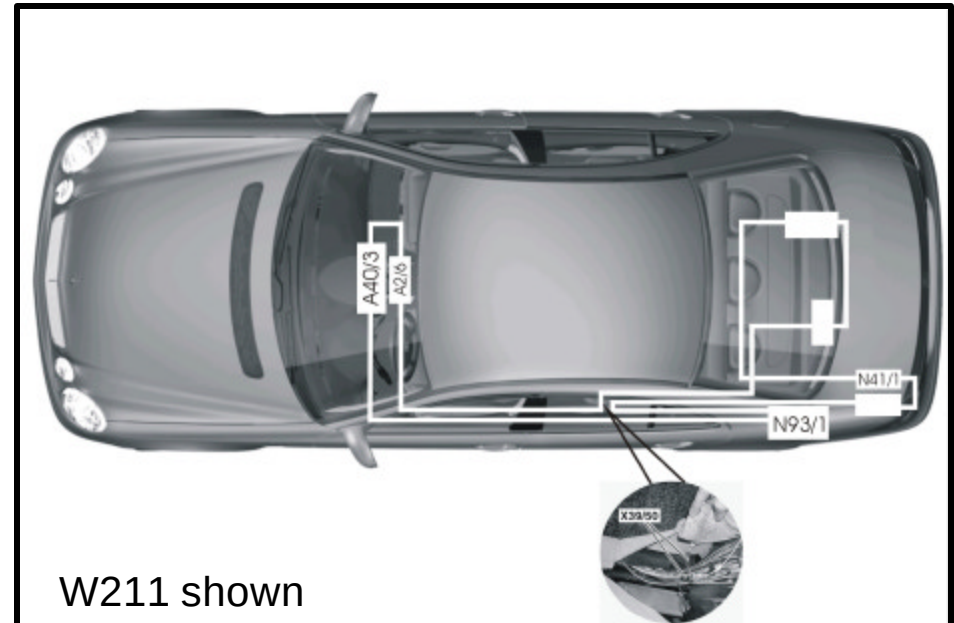
- MOST components have a watchdog function built in
- If a component produces a fault that could cause a network failure, a hardware reset is initiated for that individual component
- Hardware reset may resolve fault and network is re-established
- Each time a hardware reset is performed a fault code and error counter is set in the individual component
- If hardware reset is unsuccessful, component will switch into a bypass mode - repeater mode
- Advantage: ring lock is not lost

Note: Component must have power and ground to operate!

W/S 211 Optical Cable Routing

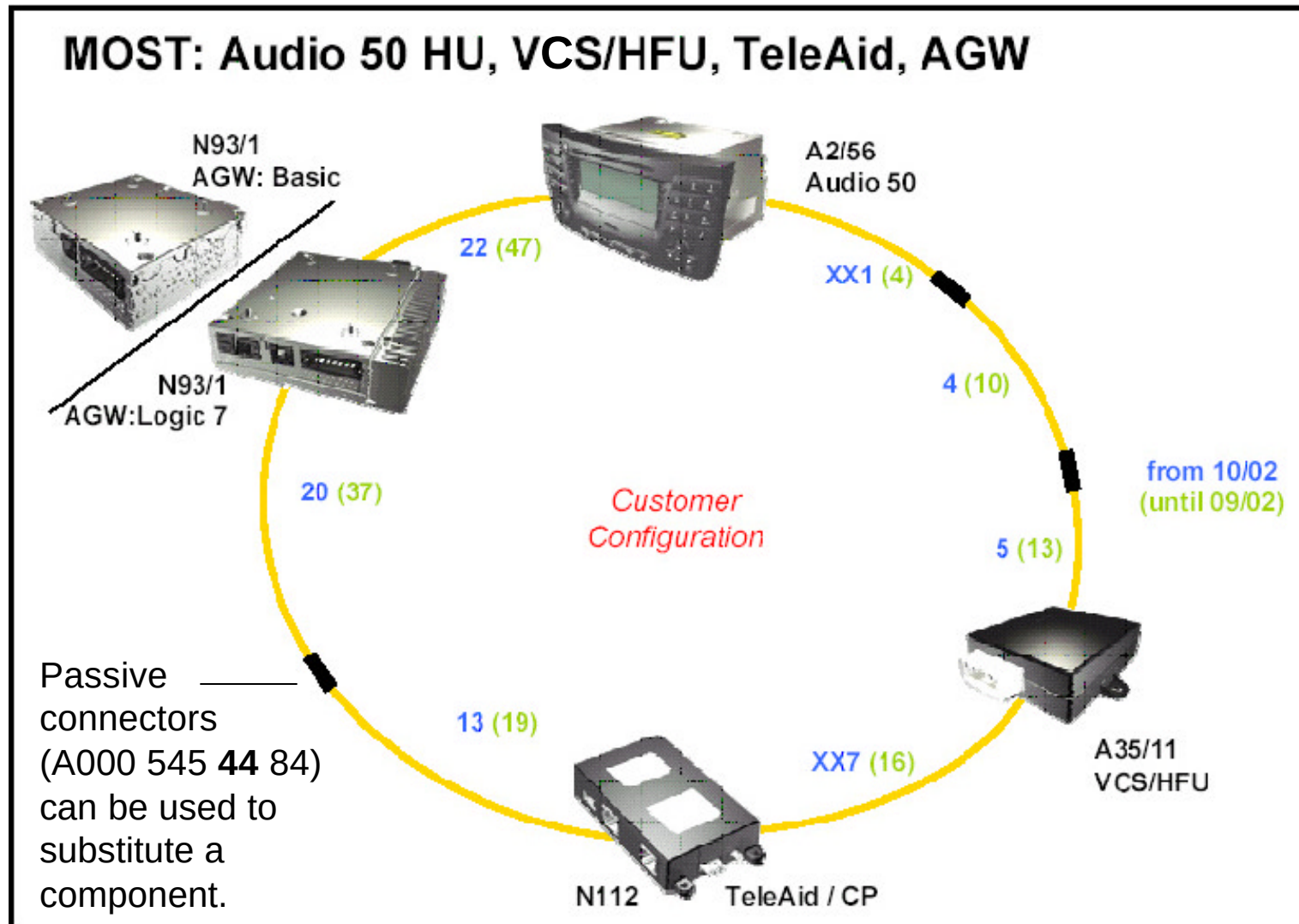
Optical cables:

- generally run down left side of vehicle
- have identification number printed on them



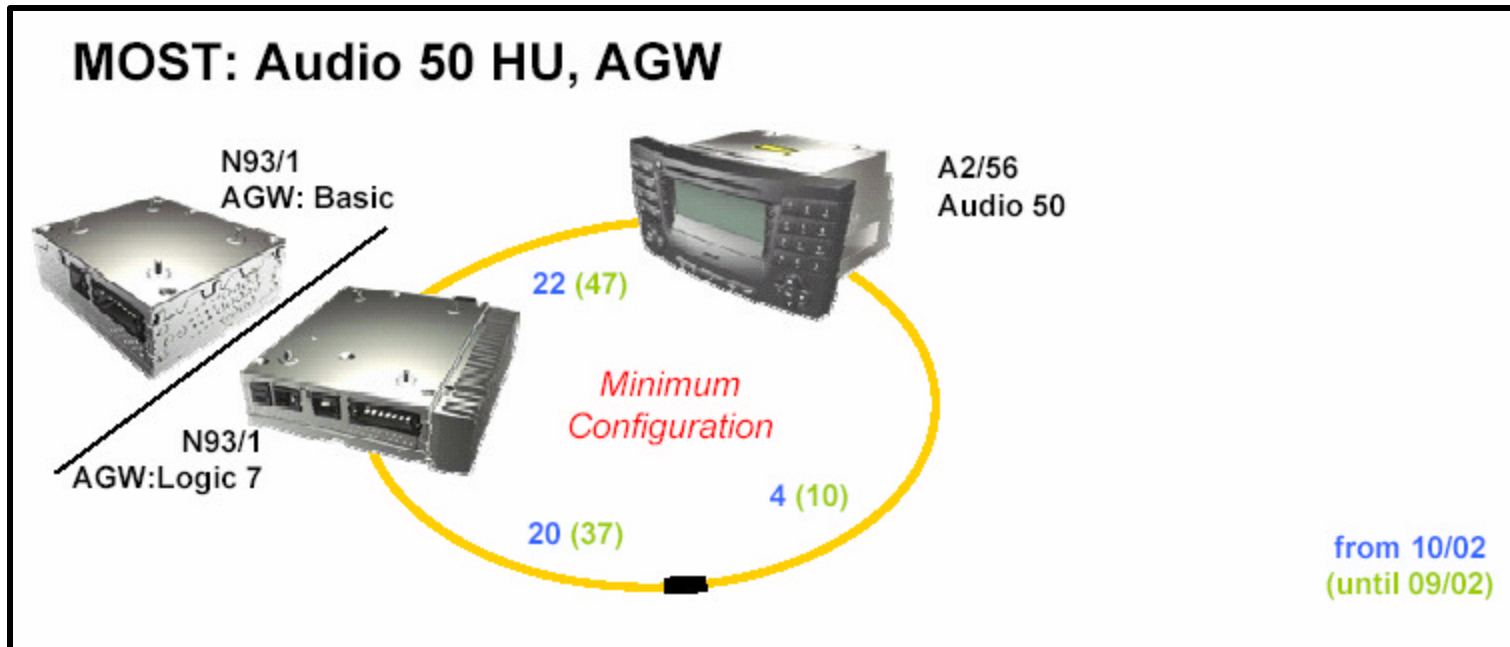
Location: Left rear door sill

W/S 211 Optical Cable Routing



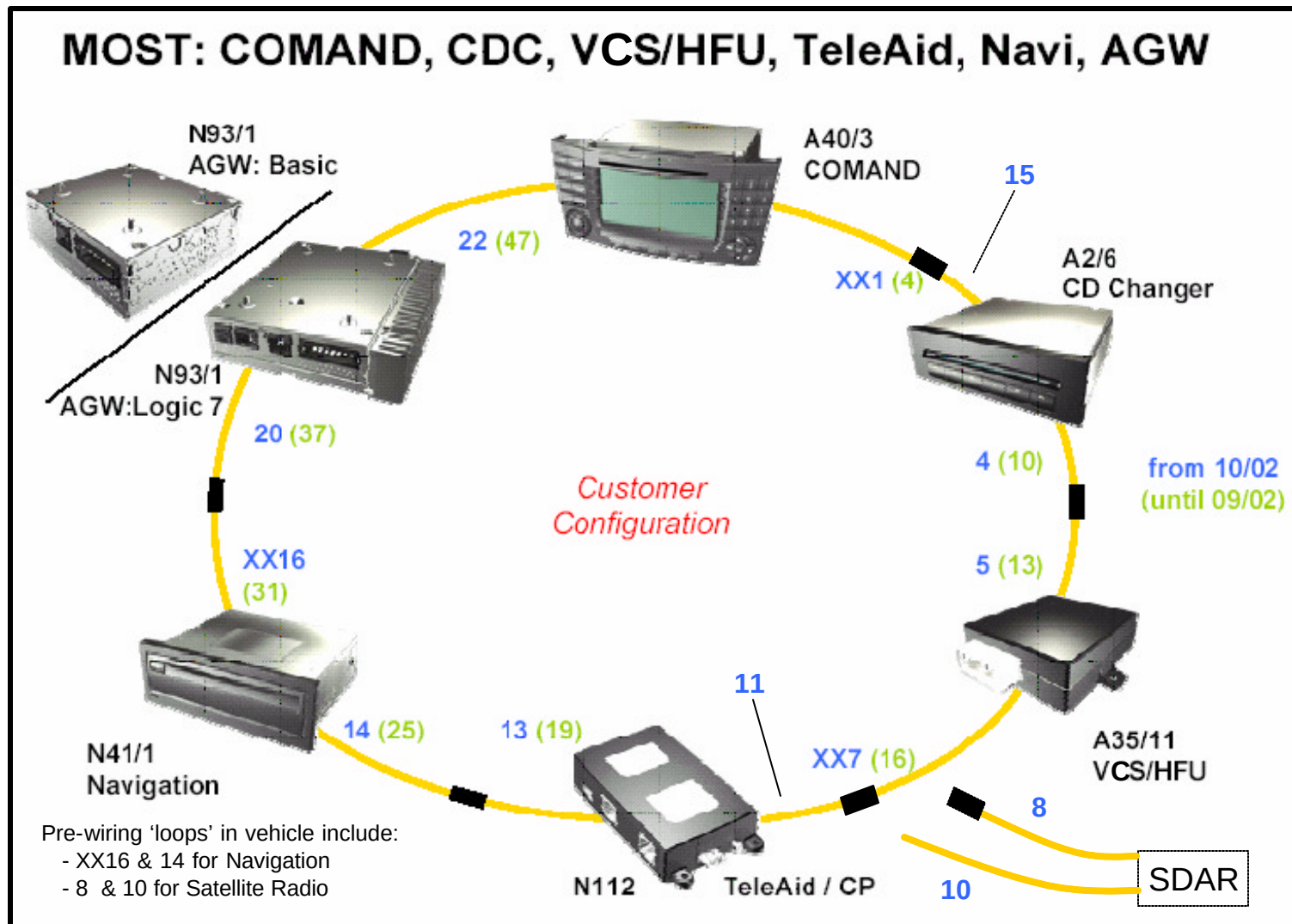
MY 03 - This information is subject to change.

W/S 211 Optical Cable Routing



- Numbers printed on the optical cables can be used to quickly identify and reconfigure the ring to a minimum configuration for diagnosis purposes
- Example above shows optical cable marked 4 and 20 were connected together
- This can be easily done at the left rear door sill area

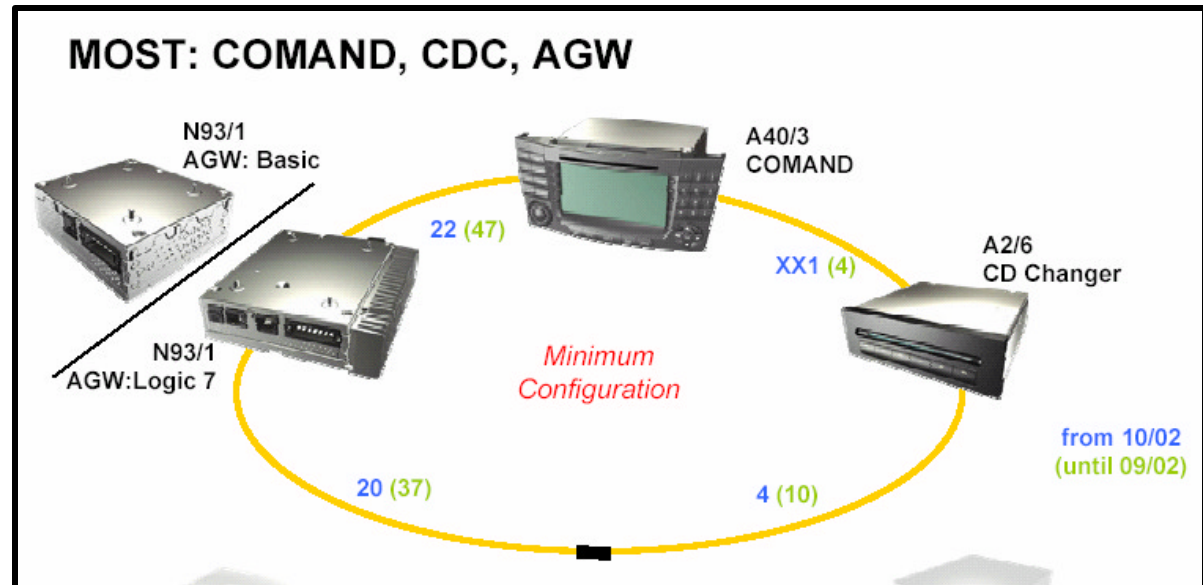
W/S211 Optical Cable Routing



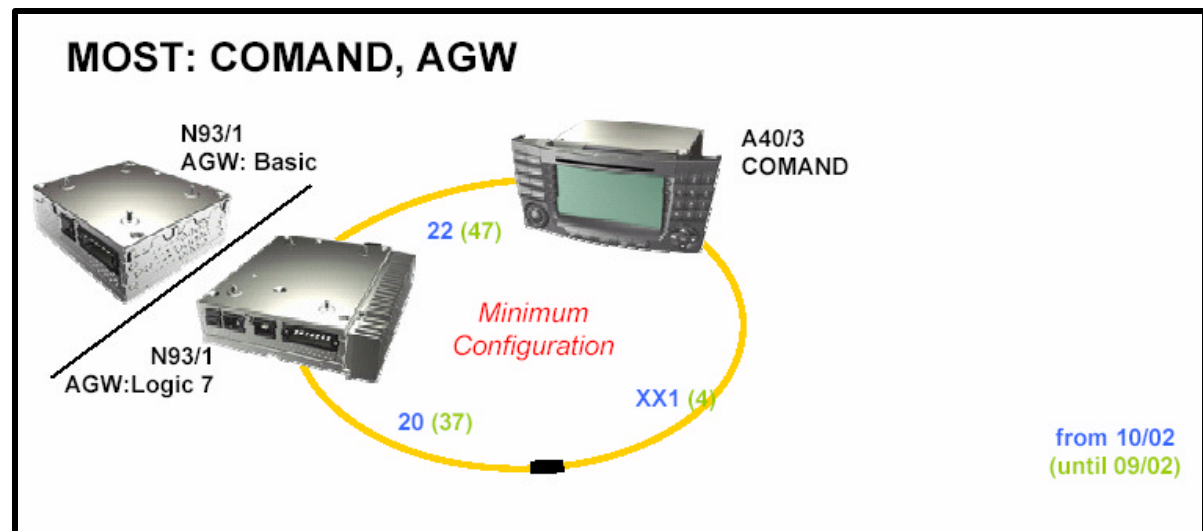
MY 04 - This information is subject to change.

W/S211 Optical Cable Routing

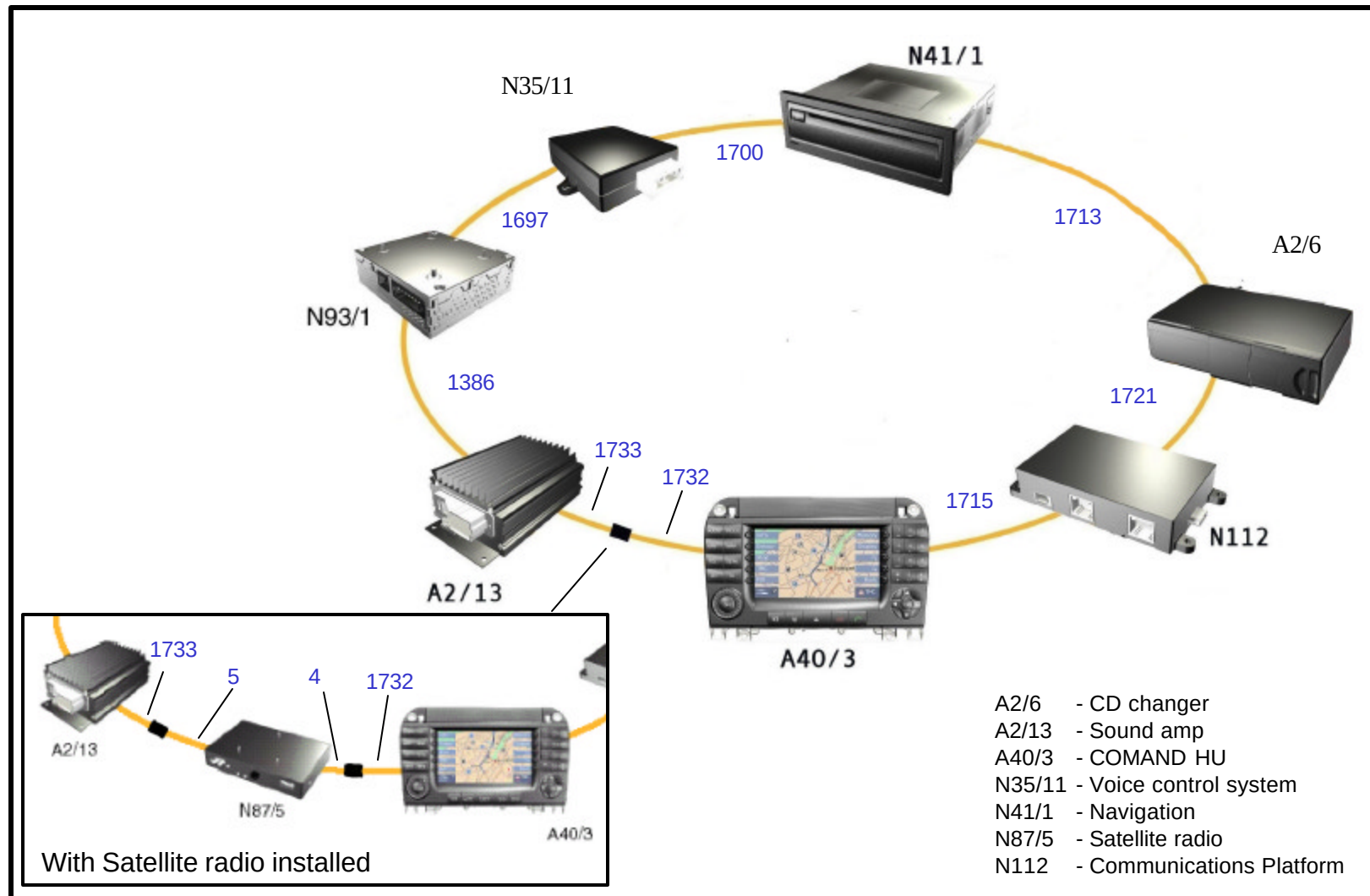
If vehicle equipped
with CDC



If vehicle not
equipped with CDC



V220 Optical Cable Routing



This information is subject to change.

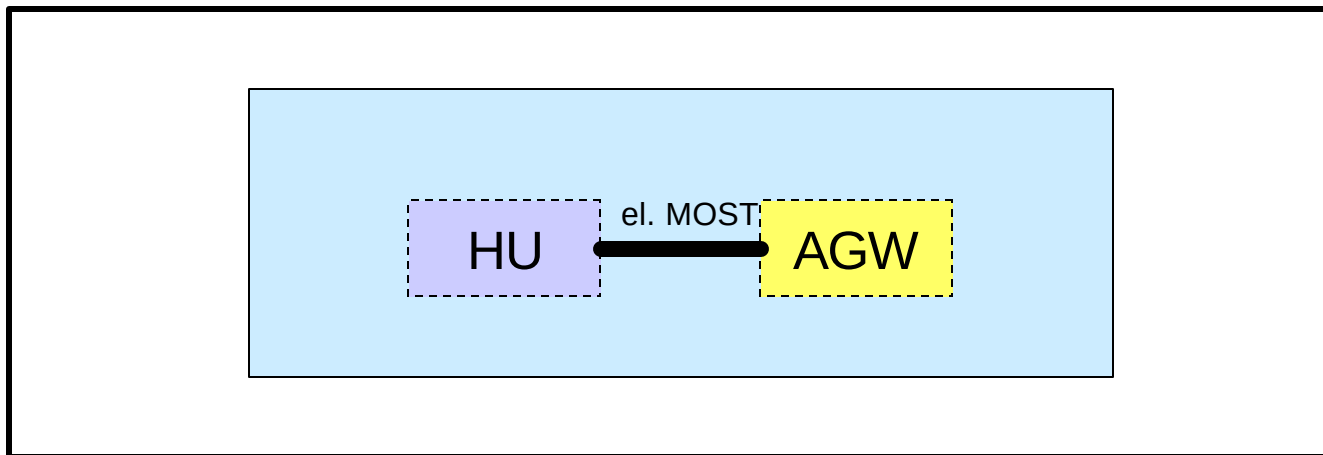
MCS II (MOST - NTG2)



New Telematics Generation 2 (NTG2) is the name given to the next generation of MOST.

NTG 2

- Audio units that are NTG 2 currently are the Audio 20 and MCS II units installed in MY2005 C Class (203 MOPF), MY2005 CLK Class (209 MOPF) and the new M Class (W164)
- Main difference as compared to NTG 1 is that the head unit and the AGW are contained within one unit
- HU and AGW communicate over a 'el. MOST' node within the unit



NTG 2

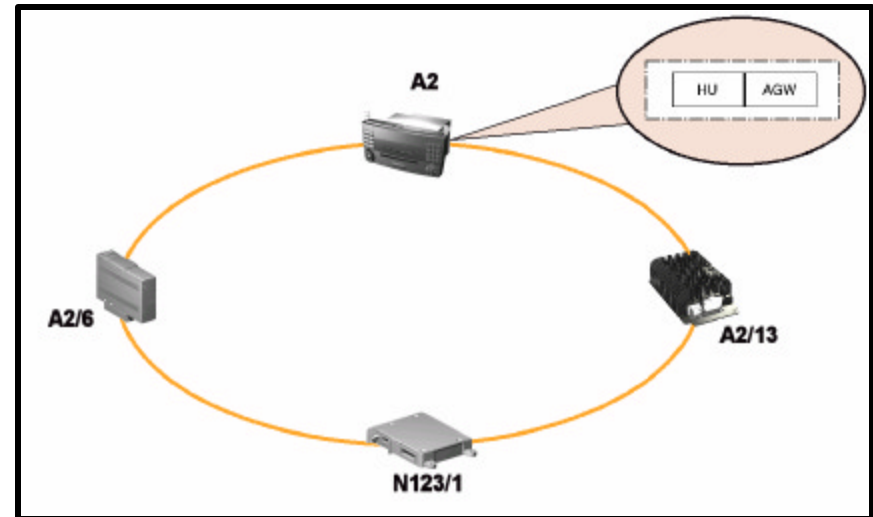
- Not all Audio 20 units are NTG 2, for example the new SLK (R171) uses the Audio 20 that is still a NTG 1 system.
- Example below shows one possible way to determine if you have a NTG 2 system. Note the description for Audio 20.

Vehicle	203.064	Control unit	HUAGW
Audio, video, navigation and telematics (List of control modules found)			
Audio 20 with integrated audio gateway (display and operating unit, MOST network management, diagnosis gateway, radio tuner)			
CDC - CD changer			
CTEL - Telephone adapter for portable CTCL (UHI)			
TELE-AID - Emergency call , Stolen vehicle tracking , MB Info , Tele diagnosis / Roadside assistance , Mobility account , Remote door unlocking			
<i>List of all control modules.</i>			
<i>Control module versions of the MOST components</i>			
<i>Overview images</i>			
<i>Restart of optical ring</i>			

Note: Subject to change

Specified Configuration Note

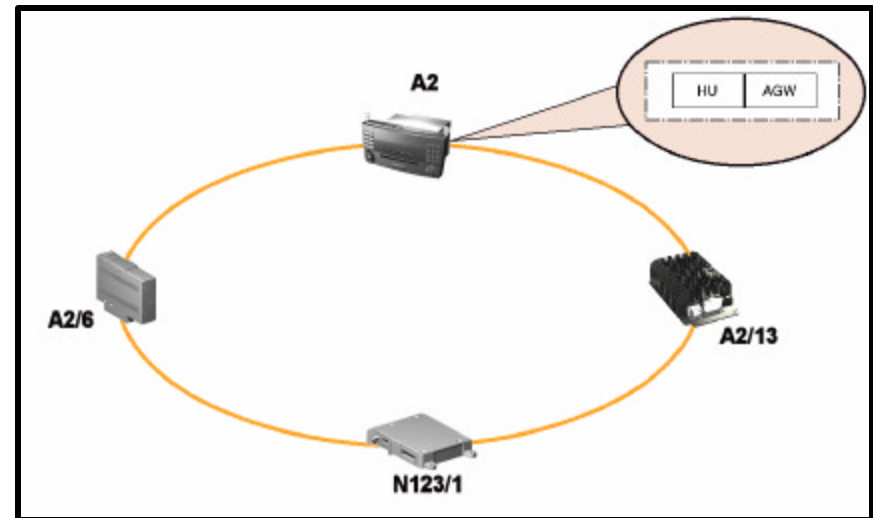
- If the MOST specified configuration is not coded for any components on the MOST ring then the ring will not be active.
- In this example the sound amplifier (A2/13), CDC (A2/6) & Phone (N123/1) would not be seen as the system considers the HU & AGW are the complete ring
- As the sound amplifier is on the MOST ring no sound would be heard or any CDC or phone functions would work



Vehicle	203.064	Control unit	AGW
Specified configuration of MOST components			
		Coding	
MOST master		Audio gateway or Audio 20 with CD drive	
Component 1		Vacant	
Component 2		Vacant	
Component 3		Vacant	
Component 4		Vacant	
Component 5		Vacant	
Component 6		Vacant	
Component 7		Vacant	
Component 8		Vacant	
Component 9		Vacant	
Component 10		Vacant	
Component 11		Vacant	
Component 12		Vacant	
Component 13		Vacant	
Component 14		Vacant	
Component 15		Vacant	

Specified Configuration Note

- Once a component is specified on the MOST ring, then the ring will become active and function as known from NTG 1 system
- Even if only one of the three MOST components was configured the optical ring would be active and the master would report the actual configuration does not match the specified configuration
- Always ensure the specified configuration is correct for the vehicle options



Vehicle	203.064	Control unit	AGW
Specified configuration of MOST components			
		Coding	
MOST master		Audio gateway or Audio 20 with CD drive	
Component 1		Sound system	
Component 2		Telecommunications (ECE , USA)	
Component 3		CD changer	
Component 4		Vacant	
Component 5		Vacant	
Component 6		Vacant	
Component 7		Vacant	
Component 8		Vacant	
Component 9		Vacant	
Component 10		Vacant	
Component 11		Vacant	
Component 12		Vacant	
Component 13		Vacant	
Component 14		Vacant	
Component 15		Vacant	

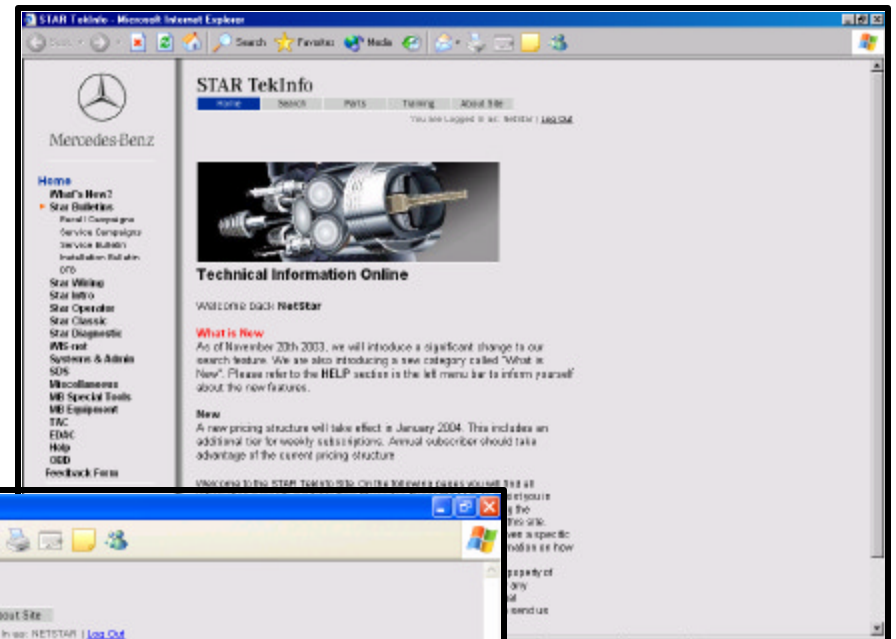
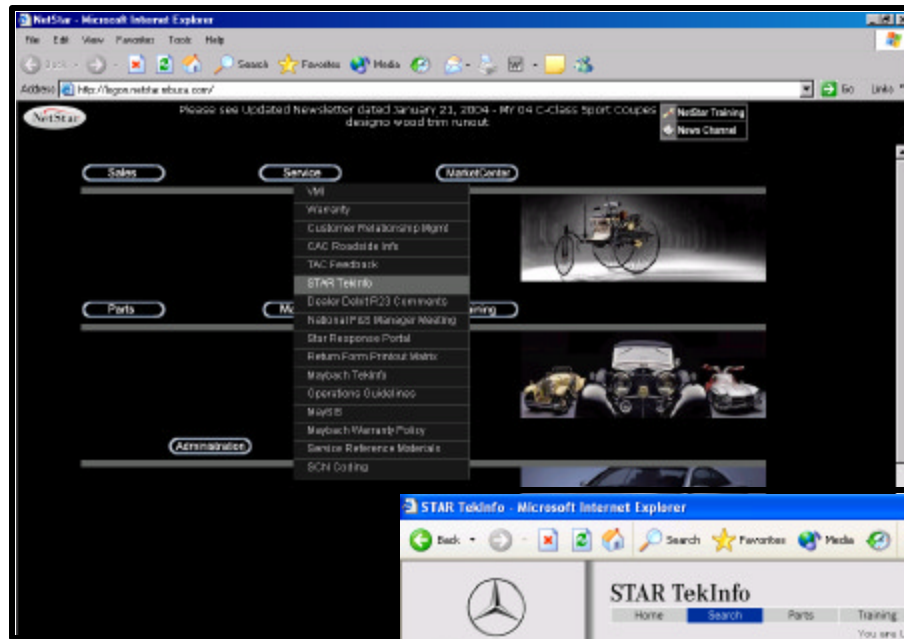
Diagnostic Resources

NetStar

DAS

EDAC

EDAC



STAR TekInfo - Microsoft Internet Explorer

Mercedes-Benz

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EDAC: All

Issue Date	Document	Type	Size	Description
03-25-2004	Parts Authorization List	PDF	90kb	List of parts needing authorization by EDAC
03-25-2004	Diagnostic Guide for 722.9 (MAG 2) Transmission	APP	4MB	Revision: Updated and modified Model 211, 070, 215, 375; 220, 170/175, 230, 475 Diagnostic Guide - Failure Tree MAG 2
03-02-2004	Power Steering Diagnostic Guide	APP	9MB	Diagnosis Model 203, 211 and 220 Power Steering Diagnostic Guide - Failure Tree
02-05-2004	Command Diagnostic Tree version 2.5 SCL-Class	APP	3MB	Diagnosis Guide 2.5 UBA BCL NY 2000 - 2002 Version 1.0
11-21-2003	Diagnostic Guide Model 220 Telematics	APP	730kb	Diagnosis Model 220 COMMAND Telematics Diagnostic Guide - Failure Tree
11-20-2003	Check List Before Calling EDAC	PDF	97kb	EDAC Application Check List Before Making a Call to EDAC Center
10-28-2003	Diagnostic Guide Model 211 Telematics	APP	8MB	Diagnosis Model 211 COMMAND Telematics Diagnostic Guide - Failure Tree Version 1.8
09-05-2003	Diagnostic Guide for Model 163 (M-Class) Telematics	APP	1MB	Revised Model 163 (M-Class) - Failure Tree Diagnostic for MCS-Telematics

1-8 of 8 Documents

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Service Tip

- Previous MB owners may complain that their new vehicle equipped with MOST does not allow them to change the setting between Station Search or Memory presets in the Instrument Cluster settings.
- Although some MOST equipped vehicles can be version coded with SDS / DAS to display the option in the Instrument Cluster, changing the setting will have no effect on the function.



- Only station search by frequency is supported with MOST

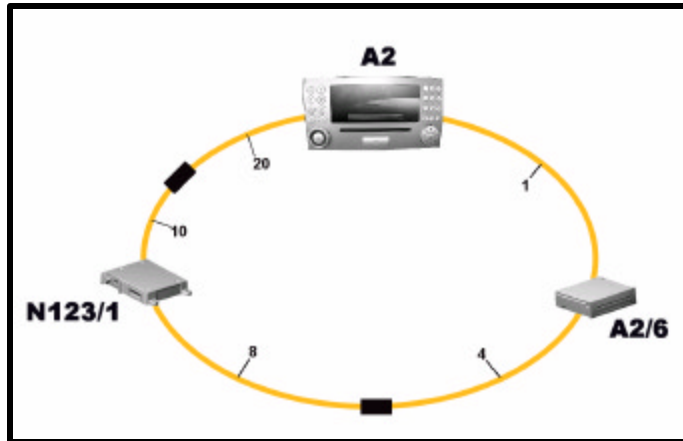
Reference Section

The following pages contain preliminary details on:

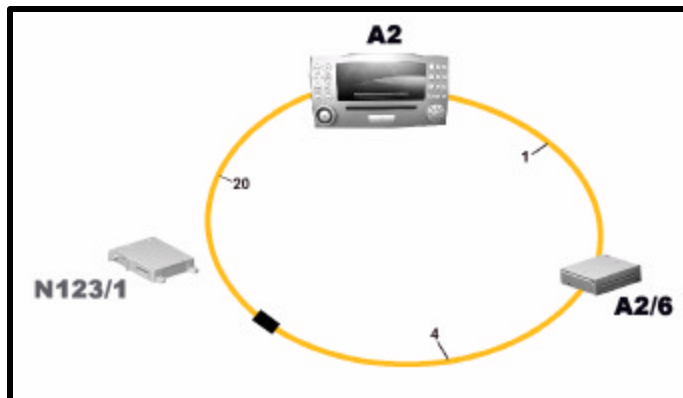
- Optical cable numbering for:
 - MY 2005 Model 171 with Audio 20 (NTG 1)
 - MY 2005 Model 171 with COMAND (NTG 1)
 - MY 2005 Model 203 with Audio 20 (NTG 2)
 - MY 2005 Model 203 with COMAND (NTG 2)

(This equipment will not be offered in USA but may be similar to the MCS II layout that USA will have)

Audio 20 in Model 171 (NTG 1)

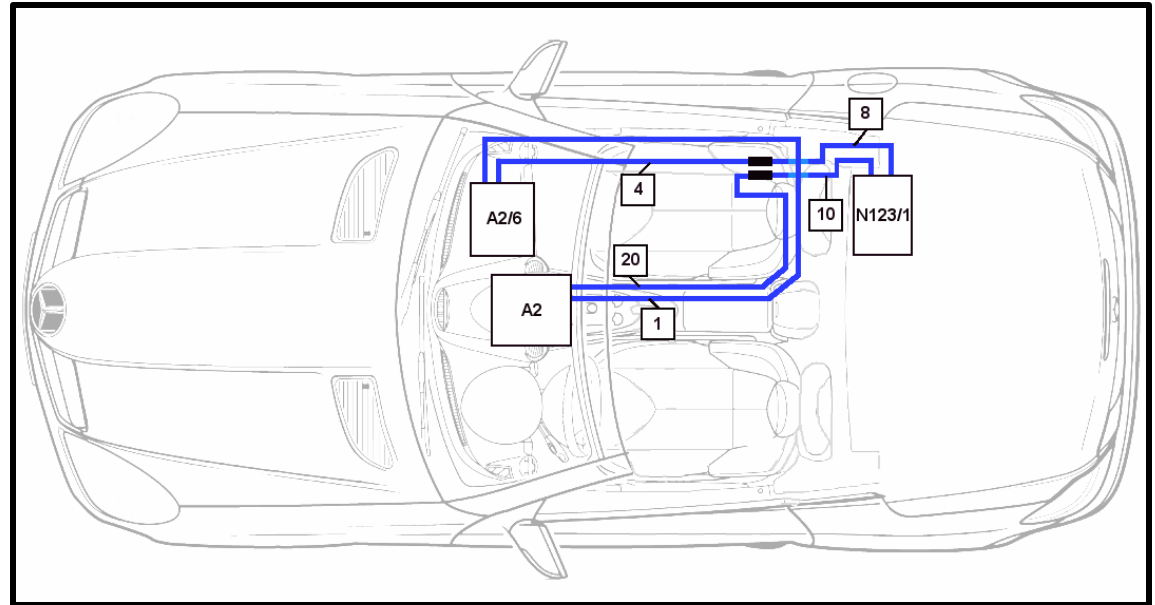


Typical configuration if CD Changer and phone fitted.



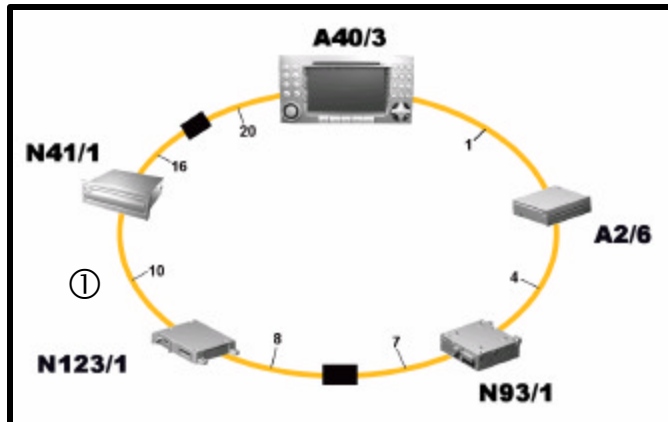
Minimum configuration by connecting optical cable 4 to 20 under passenger seat eliminating phone (if fitted)

- A2 - Radio (Audio 20)
- A2/6 - CD Changer
- N123/1 - Smart cradle control module (UHI)

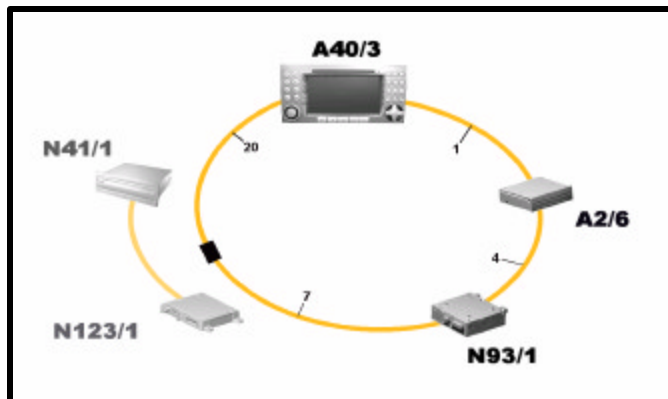


Note: Preliminary information from European model

COMAND in Model 171 (NTG 1)

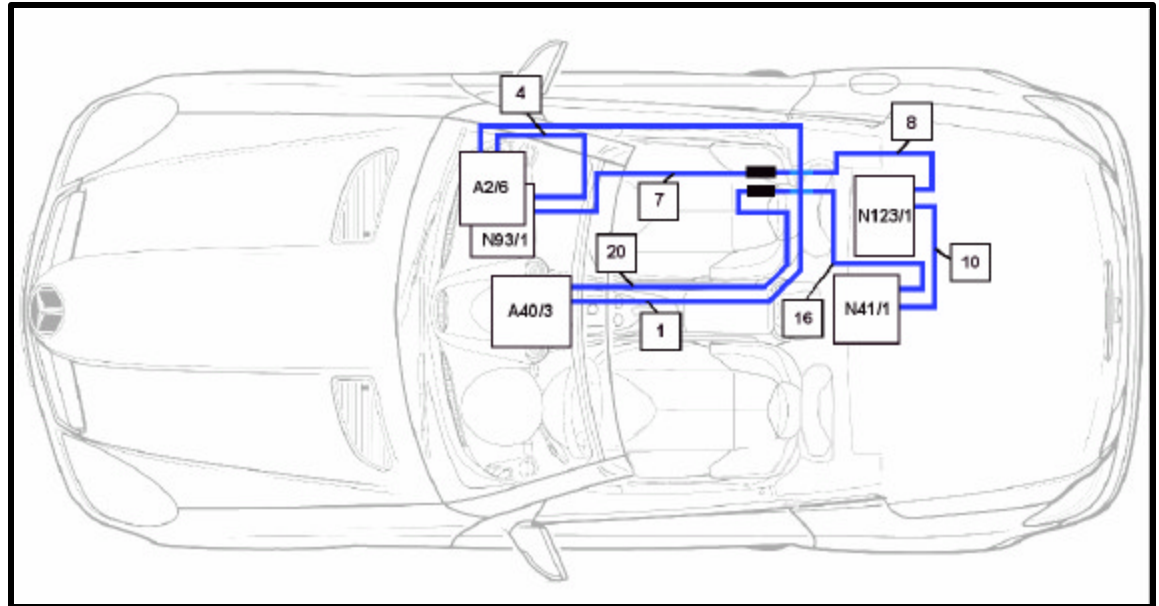


Typical configuration if CD Changer
NAV processor & phone fitted.



Minimum configuration by connecting
optical cable 7 to 20 under passenger
seat eliminating phone & NAV
processor (if fitted)

- A2/6 - CD Changer
- A40/3 - COMAND HU
- N41/1 - NAV processor
- N93/1 - Audio gateway
- N123/1 - Smart cradle control module (UHI)

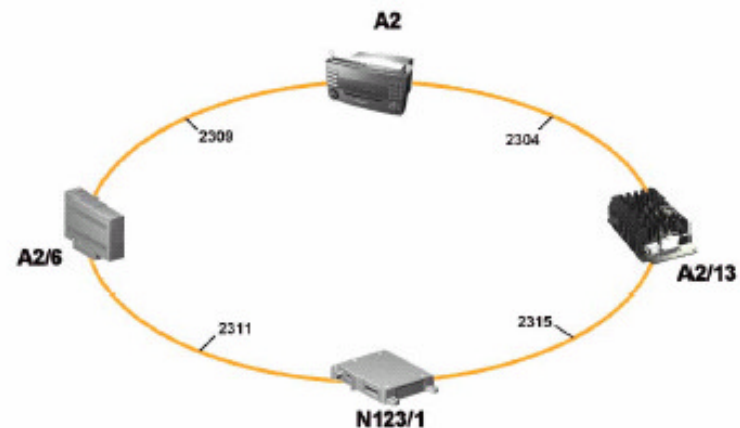
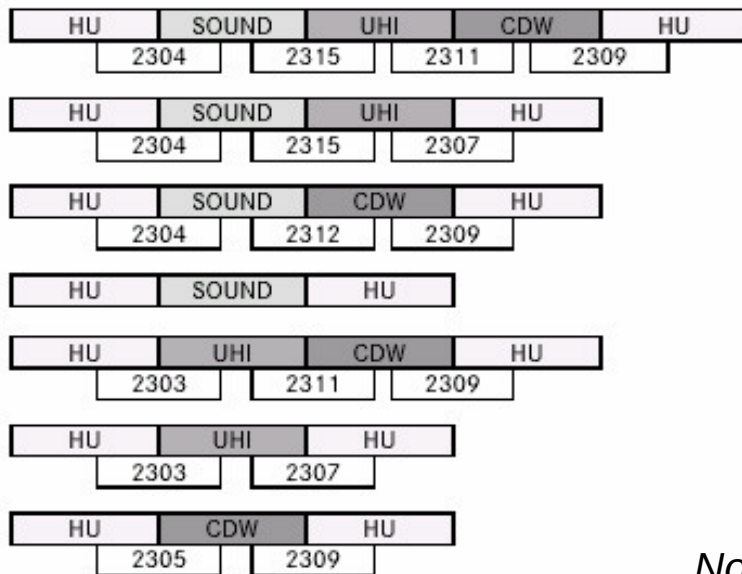
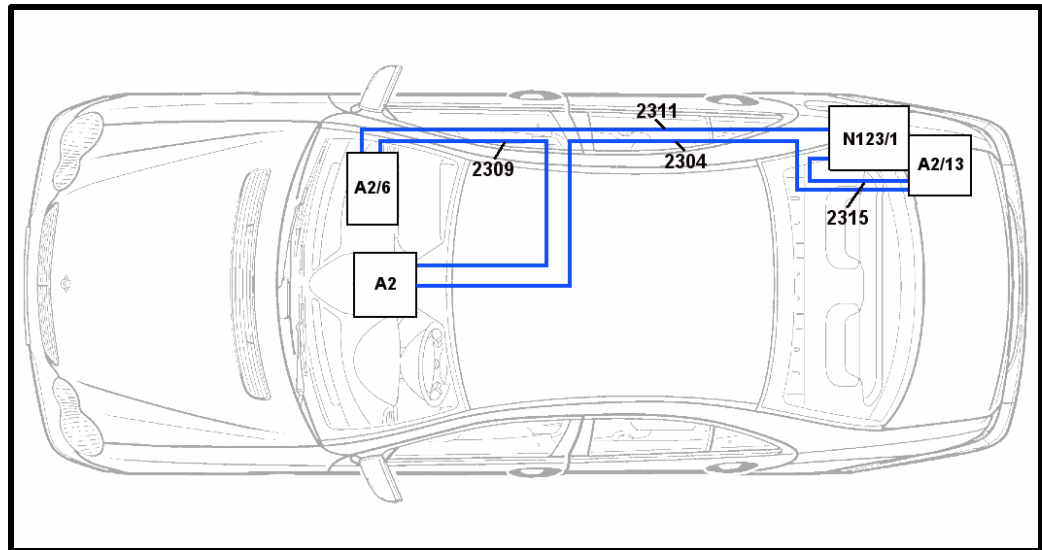


① Optional VCS and SAT expected to be installed
here on the ring

Note: Preliminary information from European model 50

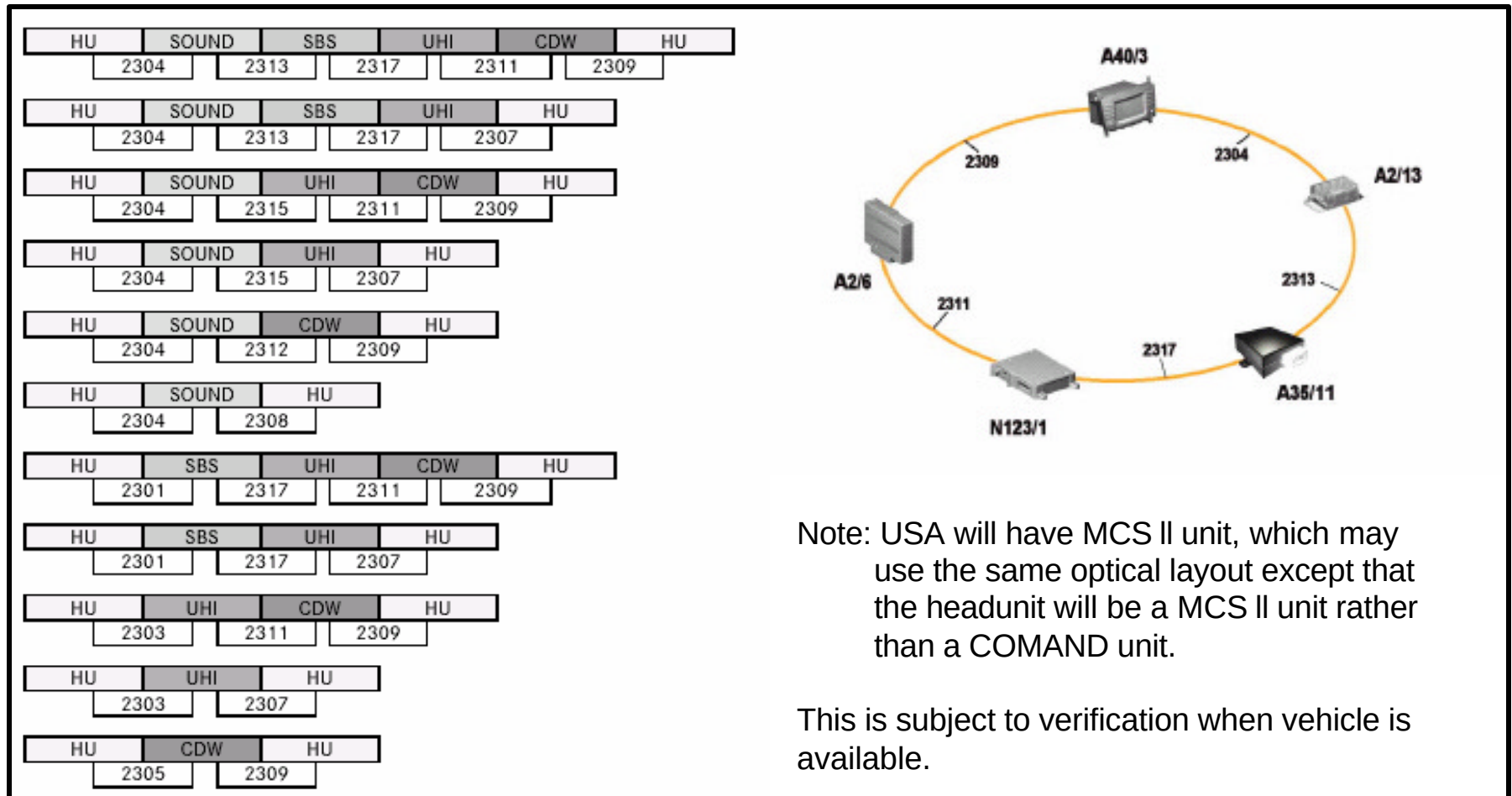
Audio 20 in Model 203 (NTG 2)

- A2 - Audio 20 (HU)
- A2/6 - CD Changer (CDW)
- A2/13 - Sound amplifier
- N123/1 - Smart cradle control module (UHI)



Note: Preliminary information from European model

COMAND in Model 203 (NTG 2)



Note: Preliminary information from European model