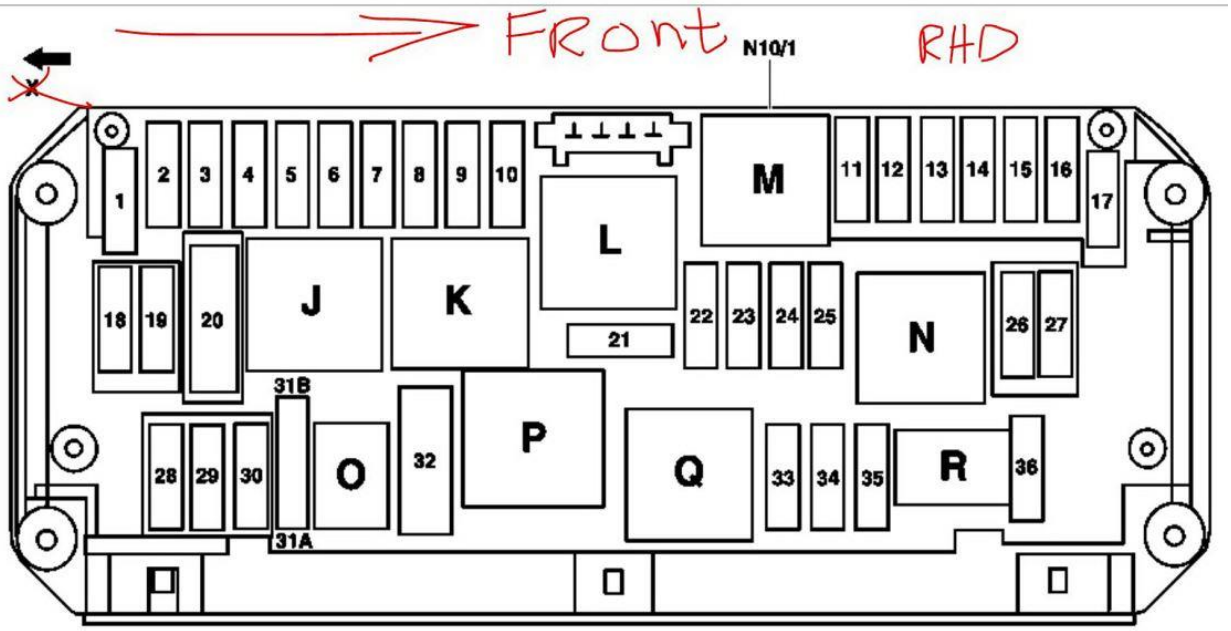
To Print and to be kept in the car.
Valid for E400 W212.065 Year 2014 M276 3.0 TT Right Hand Drive.
VIN is MHL212065EJ004768 / WDD2120656L037906

FRONT SAM



Fuse no 20 and no 32. Fuse extra large, 40A N000-000 00 4215 Maximum fuse E-40

Relay, at Front SAM, position J, K & P A 002 542 87 19
Function J : **Circuit 15 relay (N10/1kJ)**
Function K : **Circuit 15R relay (N10/1kK)**
Function P : **Valid for engine 272:** Secondary air injection relay (N10/1kP)
M276 3.0 TT does not have secondary air pump.

Relay, at Front SAM, position L & N A 002 542 72 19
Function L : Wiper park position heater relay (N10/1kL)
My car does not have wiper heater option U709
Function N : **Engine circuit 87 relay (N10/1kN)**

Relay, at Front SAM, position M A 002 542 76 19
Function M : **Starter circuit 50 relay (N10/1kM)**

Relay, at Front SAM, position Q A 002 542 74 19
Function Q : **Transmission oil auxiliary pump relay (N10/1kQ)**

Relay, at Front SAM, position O & R A 002 542 83 19
Function O : Horn relay (N10/1kO)
Function R : **Chassis circuit 87 relay (N10/1kR)**

Circuit or power line description

30	Positive power, continuous, not via any relay or switch.
30g	Starts at F32 PreFuse Block. 30g is the output of K2 relay. Only 2 power lines served by K2 for W212, MR2 with F162 of 150 amps to Front SAM terminal 8S and IG1 with F163 of 150 amps to Rear SAM terminal 2V.
30z	A unique Circuit 30 but having a Z label on it. Only 1 such power line in W212, which is for Fuse 27 feeding the ECM Engine Computer N3/10. It is at Front SAM N10/1, but its power source from F32 is a dedicated fuse, with dedicated power delivery cable and at ECM its use is also dedicated purely for Fuse 27.
31	Return line to battery negative or ground
50	Circuit to starter solenoid get this special number
15	A circuit or powerline which is an output of a Relay* (*at Front SAM or Rear SAM). Basically a switched circuit, with a relay as the switch. Power of this relay is from Circuit 30.
15R	A circuit or powerline which is an output of a Relay* (*at Front SAM or Rear SAM). The power for this relay is from Circuit 30, but the coil activation is by another relay upstream of it. Basically a double relay circuit.
87F	Circuit 87F is like Circuit 15, via a relay. Seems for transmission, but for some models it is for fuel control unit module N118 too.
87M	Circuit 87M is like Circuit 15 too, via a relay. However it seems it is dedicated to engine operation.

From **ov00.01-p-1001-28daa**, *Abbreviations of signal and circuit designations for wiring diagrams*

30 Battery voltage, positive (continuous positive)
30z Circuit 30, 1st input
30g Switched positive, fused

15 Not mentioned
15R Switched positive, in ignition position 1, 2 & 3
15R(1) Circuit 15R(1)

31 Return line to battery negative or ground, direct
50 Starter control (direct)

87 Input (Circuit 87)
87F Circuit 87 F (NAT control unit) *NAT in MB speak is transmission.
87M 87 Motor electronics

Note : In a Bosch or Hella Relay (German), a relay pin 30 is always as power input. 87 is the output, 87a is the other output in case of 5 pin relay which can be 87 is N/O and 87a is N/C. Pin 85 and 86 are always the coil of the relay. *N/O = Normally Open N/C = Normally closed*.

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 1
Troublecode read **by iCarsoft MB V2.0** (trouble code description may differ with a Xentry)
Names of modules on iCarsoft MB V2.0 also is not 100% accurate. It has many old modules names.

NOTE 1 : iCarsoft still uses old non 641 Dynamic LED module ID. They call it E1n1 for left light.
Under Xentry the left is called E1n9 – Left Headlamp (SG-SW-L).
Under Xentry the right side is called E2n9 – Right headlamp (SG-SW-R).

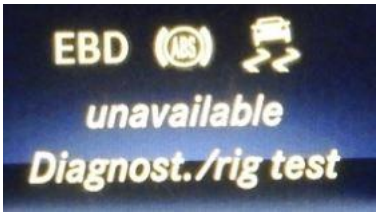
NOTE 2 : The MASTER (*sort of) of the headlight is the left one, hence the right headlight often does not produce any troublecode.*

NOTE 3 : Unless I specifically stated **Engine Can Start**, that means the test conducted was only with Ignition key in position 2, ready to crank.

Fuse 1. 25 amps. From 30. UNUSED in my car. For Left Hand Drive cars only, supposedly to HVAC Blower Fan (A32n1), but for my car the HVAC Blower gets power from F32 FuseBlock from F160 of 50 amps, at terminal Pin 1 connector 3I (I as in i).

Fuse 2. 30 amps. From 30. Supposedly to Left rear door control unit (N69/3) if up to year 2010.
It is to Front Right Door N69/2 if based on module number as per N10/1 Front SAM schematic and the real physical door. Note, my car is a Right Hand Drive.

When fuse blown, the Instrument Cluster will show : EDB + ABS + ESP plus some, as per photo.



<< This warning only appear for a short while. During test, car was with engine OFF and ignition in position 2* (*before crank).

All 4 power windows of all 4 doors, lost their function.
Driver's seat adjustment function is lost.

Rear view mirror adjustment is lost for both mirrors. This door power lock won't work.

Touch sensor on door handle for Keyless Go still works. All car doors still can be locked with FOB key, but front right door (driver's) power lock button won't go down or up. Troublecodes……

Under DCU-RF-Right front door N69/2 : ***LINK ERROR***

Under ESP module N30/4 :
C035200 *The CAN data from the control module 'DCU-RF-Right front door N69/2' is faulty*

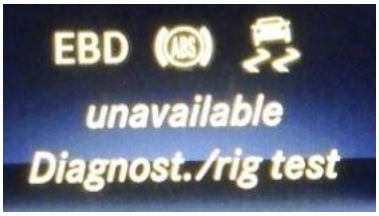
Under all 3 other doors module N69/1 (Left Front), N69/3 (Left Rear) and N69/4 (Right Rear) and also Panoramic sliding sunroof module PSD (A98) , all 4 trigger the same troublecode :
C20487 *Communication with control module 'Right front door' has a mailfunction. The message is missing.*

Under Front SAM N10/1 : **U020400** *Communication with control module 'Right front door' has a mailfunction*
Under Rear SAM N10/2 : **U020000** *Communication with control module 'Right front door' has a mailfunction*

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 2

Fuse 3. 30 amps. From 30. Supposedly to Right front door control unit (N69/2), if up to year 2010. **It is to Left Rear Door N69/3** if based on module number as per N10/1 Front SAM schematic and the real physical door.

When fuse blown, the Instrument Cluster will show : EDB + ABS + ESP plus some, as per photo.



<< This warning only appear for a short while. During test car was with engine OFF and ignition in position 2* (*before crank).

Power Window won't work. Power lock won't work.
Touch sensor on door handle for Keyless Go still works.

However, the troublecode reporting module is only the Rear SAM N10/2.
Under Rear SAM N10/2 : **U020100** *Communication with control module 'Left rear door' has a mailfunction.*

Fuse 4. 20 amps. From 15. From output of Relay J. UNUSED in my car . Diesel or M157 engine only.

Fuse 5. 7.5 amps. From 15. From output Relay J. For circuit 15 power feed to Rear SAM 10/2.

Troublecode if the fuse blown :
B21F286 *The state Circuit 15 is unreasonable. There is an incorrect signal*
This fuse #5 from N10/1 Front SAM pin 6 at connector 7I (I as in i) , goes to Rear SAM pin 18 of connector 9I (I as in i) and labeled as line 15 (power wire via a relay) at Rear SAM. The arrow suggest the wiring directionality is from Front SAM to Rear SAM. What is the actual function of fuse #5 for Rear SAM and what other functions or modules can be brought down or de-activated by loss of fuse #5, is unknown. Fuse #5 goes into the Rear SAM logic board, hence no way to know its function's totality.

Fuse 6. 10 amps. From 15. From output of Relay J. UNUSED in my car
Diesel or Natural Gas engine only.

Fuse 7. 20 amps. From 15. From output of Relay J. Fuse 7 as power source for pin 30 of relay M (*starter circuit 50/solenoid*). So, failure to crank can be from a blown fuse 7 or Relay M burnt out contact, **granted** Relay J which is the most upstream is not defective. Relay M coil pins 85 and 86 are controlled by ECM N3/10.

Fuse 8. 7.5 amps. From 15R. From output of relay K.
Supplemental Restrain System, SRS (N2/10) or airbags & seat belts.

When fuse blown, Instrument Cluster will show :
Restraint sys mailfunction. Consult workshop.
Troublecode under SRS (N2/10) will be :
B210013 *Circuit 15 has a malfunction. There is an open circuit.*

Fuse 15. 7.5 amps. From 30g. Also supplies to N2/10 SRS module.
So this fuse 15 seems to be a 2nd power source for SRS module N2/10.

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 3

Fuse 9. 15 amps. From 15R. From output of relay K. Supposedly glove compartment socket (X58/31).
UNUSED - This option is not available in my car.

Fuse 10. 30 amps. From 15R. From output of relay K. Wiper motor (M6/1)
When fuse blown, Instrument Cluster will show : **Wiper mailfunctioning**
Troublecode under Front SAM will be :
U115300 *Communication with windshield wiper for the front windshield has a malfuntion*

Fuse 11. 7.5 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to…….

This fuse only supply the Audio Command 5" display, not the media player of amplifier.
So music can still sound, but display shut off. No troublecode or warning at Instrument Cluster if fuse blown.

Fuse 12. 7.5 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to ……

AA. HVAC control panel. N22/7

BB. Upper Control Panel N72/1. Not true, it is only the Rotary Driving Ligh switch S1, but only for the Left/Right parking light section of that the S1. The AUTO or both parking lights and manual low beam selector is still working.

CC. Automatic transmission transmission mode button (S16/12) for Sport/Eco/Manual.

When fuse 12 blown AA to CC won't work, but there is no warning on Instrument Cluster.

Troublecode under Front SAM N10/1 :
U11A700 *Communication with the lower control panel has a malfunction*

Troublecode Under Air Conditioning module N22/7 : **LINK ERROR**

Troublecode under Engine Control Module SAM N3/10 :
C16487 *Communication with the air conditioning has a mailfuntion. The message is missing.*

Troublecode under Transmission Control Module 722.9 :
U016400 *Communication with the air conditioning has a mailfuntion*

Troublecode under Panoramic sliding sunroof module PSD (A98):
C16487 *Communication with the air conditioning has a mailfuntion. The message is missing.*

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 4

Fuse 13. 7.5 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to …. Steering column tube module control unit (N80)

<< This warning appear and stay, at Instrument Cluster.
During test car was with engine OFF and ignition in position 2* (*before crank).

When fuse 13 blown : **Engine can start, but ……..**
01. Transmission stay in park, can't engage any gear.
02. All wiper controls not working.
03. High Beam lever switch momentary pull-to-ON or permanent push down-to-ON won't work.
04. Horn won't work.
05. All other multimedia buttons on steering wheel won't work.
06. Telescopic and up/down steering tube, won't work.
07. Probably cruise control won't work. I can't test that.

What if, fuse 13 blown when car is at cruise speed ?
What happen to the transmission, what gears will it select ? Unknown. I dare not try ☺

Troublecode under Engine Control Module SAM N3/10 :
U021287 *Communication with steering column module has a mailfuntion. The message is missing.*

Troublecode under Transmission Control Module 722.9 : 2 codes.
U014600 *Communication with the central gateway has a mailfunction.*
NOTE : There is no troublecode at Central Gateway module as per iCarsoft MB V2.0

U012600 *Communication with steering column module has a mailfuntion*

Under ESP (N30/4) : 3 similar codes !
C060100 *No CAN data was received from control module N80 (Steering column tube modile control module)*
C0601100 *No CAN data was received from control module N80 (Steering column tube modile control module)*
C040100 *No CAN data was received from control module N80 (Steering column tube modile control module)*

Under IC - Instrument Cluster (A1) :
U021287 *Communication with steering column module has a mailfuntion. The message is missing*

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 5

Fuse 14. 7.5 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to……. Electronic Stability Program control unit (N30/4)

<< This warning appear and stay, at Instrument Cluster.
During test car was with engine OFF and ignition in position 2* (*before crank).

Run Flat Indicator Inoperative also pops out.

When fuse 14 blown, troublecodes at …….

Under Engine Control Module SAM N3/10 :
U012287 *Communication with control module 'Traction system' has a mailfunction. The message is missing.*

Under Transmission Control Module 722.9 : 2 codes.
U012100 *Communication with ESP has a mailfunction*
U0155531 *Communication with the instrument cluster has a mailfunction. The signal is not present.*

Under ESP Electronic Stability Proigram (N30/4) : **LINK ERROR**

Under IC - Instrument Cluster (A1) :
U012187 *Communication with ESP has a mailfunction. The message is missing*

Under XALWA-L Left Headlight module (E1n1) :
U012100 *Communication with ESP has a mailfunction*
UO15500 *Communication with the instrument cluster has a mailfunction*

Under EPS – Electric Power Steering (N68) :
U012200 *Communication with control module "Traction system' has a mailfunction*

Under A76 – RevETR-LF Left Front Reversible Emergency Tensioningh Retractor & also
Under A76/1 – RevETR-RF Right Front Reversible Emergency Tensioningh Retractor :
510608 *No CAN data was received from control module N30/4 (Electronic Stability Program control module)*

There was no troublecode at Front or Rear SAM.

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 6

Fuse 15. 7.5 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to……. Supplemental restraint system control unit (N2/10)

<< This warning appear and stay, at Instrument Cluster.
During test car was with engine OFF and ignition in position 2* (*before crank).

Engine can start.

When fuse 15 blown, troublecodes at …….

Under SRS – Supplemental Inflatable Restraint System (N2/10) :
B210F00 *Input 'Circuit 30 has a mailfunction*
Note : As to why communication is still possible with SRS N2/10 module is because SRS module has 2 power sources. See Fuse 8.

FUSE 16. 5 amps. From 30g. UNUSED - This option is not available in my car.

FUSE 17. 30 amps. From 30g. From output of F32 relay K2>>150 amps F156 of MR2 , to N10/1 Front SAM to……. Panoramic sliding roof control module (A98)
When fused blown, the Pano Roof stop working.

The troublecode under PSD Panoramic Sliding Sunroof Control Module (A98) : ***LINK ERROR***

Under XALWA-L Left Headlight module (E1n1)
Yes, a headlight is involved.
U014600 *Communication with the central gateway has a mailfunction*
The meaning of central gateway is very probably the Front SAM.
I can communicate with CGW/ZGW but there is no troublecode, same case as Fuse 13.
There is a high possibility that iCarsoft MB V2.0 is not accurate when describing a mailfunction to a "central gateway". There is a Chassis Gateway N93/7, but many other modules can act as a Gateway, example Front SAM N10/1 or Engine computer N3/10 , this is per document :
Overall network (GVN) function GF00.19-P-0001FL

Under Front SAM N10/1 : 2 codes
U023100 *Communication with the rain/light sensor has a mailfunction.*
B221D08 *The rain sensor has a mailfunction. There is a signal or the message is faulty.*
So probably this is why the left headlight claimed communication with the central gateway has a mailfunction, it is not getting Rain Sensor data from Front SAM.

The Pano Roof connects to the N70/3 Overhead Control Unit as per pe54.21-p-2107-97dab. There at N70/3 there is a Rain/Light Sensor B38/2. In my car, the option Code 628 Automatic High Beam Switch Plus (IHC+) probably uses the light sensor, hence the Left Headlight must report troublecode.

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 7

Fuse 18. 7.5 amps. From 30. Powering these :

- Upper control panel control unit (N72/1), where Hazard Ligh switch is.
- B03 Option - Transmission oil auxiliary pump (N10/1kQ) relay's **coil** , not power.

Auxillary trans oil pump is only used when ECO algo kills the engine say at a traffic light and algo expects no delay from transmission, hence the electric trans oil pump is operated.

<< This warning appear and stay, at Instrument Cluster.
During test car was with engine OFF and ignition in position 2*
(*before crank).

With Fuse 18 blown :
The entire row Upper control panel control unit (N72/1), where Hazard Ligh switch is stop working.

Troublecodes under TCM 722.9 Transmission Control Module :
Note : In Xentry this module is called : Y3/8n4 Fully Integrated transmission control (VGS)
U113800 *Communication with control module ? Electrical oil pump in transmission has a malfunction.*

Under the Front SAM N10/1 : 3 codes
B284E14 *The relay coil 'Reserve' has a malfunction. There is a short circuit to ground or an open circuit*.
U115100 *Communication with switch group 'Warning system' has a malfunction*
U115400 *Communication with the upper control panel has a malfunction*

Fuse 19. 20 amps. From 30. UNUSED in my car
It is a 722.9 transmission., so does not apply.
My car does not come with steering lock N26/5 AFAIK… ☺

Fuse 20. 40 amps. From 30. UNUSED in my car Supposedly ESP, if Left Hand Drive car.
Right Hand Drive get ESP big power from F32 PreFuse F159 at 50 amps, terminal I2 (I as in i).

Fuse 21. 7.5 amps. From 15R. From output of relay K.

- Brake Light Switch S9/1
- Glove compartment lamp E13/1 via its door switch S17/9

When fuse 21 blown :
A. Brake light switch works, my car is 30th Aug 2013 production so it is different from those up to 28th Feb 2013.

B. Glove compartment lamp E13/1 won't work. No warning on Instrument Cluster.
No troublecode at all can be found when scanned.

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 8

Fuse 22, 23,24, 25 and 27 are for : N3/10 Engine ECM/ECU aka Engine computer.
CRITICAL MODULE WITH MORE THAN 1 FUSES SUPPLYING POWER TO IT

A circuit from 87M means

Fuse 22. 15 amps. From 87M. For ECM N3/10 and Cooling Fan.
A. Electrical connector for interior harness and engine wiring harness (X26). X26 is a more upstream harness for **Z7/36z1** circuit 87 M2e connector sleeve.

B. Cooling Fan 650 or 800 watt, its integrated control M4/7 only. Main power of this fan is from F32 PreFuse block, from fuse F154 of 100 amps to terminal MR4.M276 engine.
Since I did not simulate the blown fuse with engine running, I do not know what troublecode can this cooling fan reports.

Tested with Ignition key in position 2 , ready to crank. I did not try to run the engine.
When fuse 22 blown, no warning on instrument cluster as car engine is not running.

Troublecodes under ECM N3/10 engine computer : 7 codes
P059700 *The coolant thermostat has an electrical fault or open circuit*
P005000 *The output for the heater of oxygen sensor 1 (cylinder bank 2), has an electrical fault or open circuit*
P003000 *The output for the heater of oxygen sensor 1 (cylinder bank 1), has an electrical fault or open circuit*
P023A00 *Actuation "Coolant pump of charge air cooler" has an electrical fault or open circuit*
P06DA00 *Actuation of the valve of the oil pump in the combustion engine has an electrical fault or open circuit*
P044400 *The purge valve of the evaporative emission control system has an open circuit*
P003300 *The output for the switchover valve of bypass flap 'Charge air' has an electrical fault*

I am sure if engine is running and the fuse 22 blown, more troublecodes will be logged.
Example, the 2 downstream oxygen sensors (sensor 2 for both banks 1 and 2) are also powered by fuse 22 and it is not yet shown. Only when engine is running and fuel/air metering in close loop, then more failure information will be revealed.

Fuse 23. 20 amps. From 87M. For ECM N3/10.
M276 engine. Electrical connector for interior harness and engine wiring harness (X26)
X26 is a more upstream harness for **Z7/38z1** Circuit 87 M1i connector sleeve

Fuse 24. 15 amps. From 87M. For ECM N3/10.
M276 engine. Electrical connector for interior harness and engine wiring harness (X26)
X26 is a more upstream harness for **Z7/35z1** Circuit 87 M1e connector sleeve

Fuse 25. 15 amps. From 87M. For ECM (N3/10). Circuit 87 connector sleeve **Z7/73z1**
If fuse blown : No warning or any troublecode, poor idling at cold start of engine first 20 seconds.
I wonder what more negative impact will happen when in normal cruise speed, this Fuse 26 get blown ?

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 9

Fuse 22, 23,24, 25 and 27 are for : AA. N3/10 Engine ECM/ECU aka Engine computer.
CRITICAL MODULE WITH MORE THAN 1 FUSES SUPPLYING POWER TO IT

Fuse 27. 7.5 amps. From 30z. For ECM N3/10.

30z is a special mention. Its power source is not from Front SAM, it is direct from F32 PreFuse Box, fuse #F153 of 60 amps for terminal/pin MR6. From terminal/pin MR6 it has its own dedicated 6mm wire to Front SAM as input wire for terminal 12S. Front SAM only provides a parking space for Fuse 27 and a short connection, but F27 does not take power from Circuit 30 or 30g of front SAM.

When fuse 27 blown, the ignition key totally won't work even in position 1, 2 or crank.
Its like total DC power loss. Instrument Cluster totally died.

Can't communicate via scanner to car computers. Its like a safety shut down is conducted by the car.
Its all **LINK ERROR.** When fuse re-installed , **historic** troublecode stored are :

Under Engine Control Module SAM N3/10 : No fault code found.

Under IC Instrument Cluster A1 : 2 codes
B226629 *The drive authorization data are unreasonable. There is an invalid signal.*
U016887 *Communication with the electronic lock has a malfunction.*

Under SCM – Steering Column Module N80 and Right Front Door Module N69/2 and Left Front Door Module N69/1 and MFK – Multi Function Camera A40/11 :
U016887 *Communication with the electronic lock has a malfunction.*

Under ESP – Selectronic Stability Program N30/4 : 2 codes
C084000 *The power supply circuit 15 is not OK.*
C066300 *One or more signals sent from control module CGW[ZGW] via the CAN bus is unreasonable*

Under SRS – Supplemental Inflatable Restraint System N210 :
B220600 *The current vehicle identification number is incorrect or not present.*

Under EPS – Electric Power Steering N68 & KDS – Trunk Lid Control N121
U016800 *Communication with the electronic lock has a malfunction.*

========== Engine ECM related FUSES ends here ==========

Fuse 26. 20 amps. From 30g. For Code 510 Audio CD with 6 disk changer.
When fuse 26 blown :
Audio system won't work. No warning on instrument cluster.

Troublecodes :
Under Audio or COMAND A40/8 : **LINK ERROR**
Under IC Instrument Cluster A1 :
U014787 *Communication with the telematics gateway has a malfunction. The message is missing.*

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 10

Fuse 28. 7.5 amps. From 30. For Instrument Cluster A1

When fuse 28 blown, Instrument Cluster goes totally dark. So no warning can be shown on it ☺
Engine can start and gears can engage. It seems this fuse will not bring a car down.

Troublecodes : Really a lot because many modules talk to Instrument Cluster

Under Instrument Cluster A1 : **LINK ERROR**

Under ECM engine computer N3/10 : 3 codes
U014687 *Communication with the central gateway has a mailfunction. The message is missing*
U01558F *Communication with the instrument cluster has a mailfunction. The signal or message is erratic*
U015587 *Communication with the instrument cluster has a mailfunction. The message is missing*

Under FSCU Fuel Pump Control Unit N118 and TCM Transmission Control Module 722.9 and
Air Conditioner N22/7 and Left Headlight E1n1 and Air Conditioning N22/7
and EPS Electric Power Steering N68 and SCM Steering Column Module N80 and Front SAM N10/1 and Rear SAM N10/2 :
Note : In Xentry this TCM is called : Y3/8n4 Fully Integrated transmission control (VGS)
U015500 *Communication with the instrument cluster has a mailfunction.*

Under ESP Electronic Stability Program N30/4 : 7 codes , all are the same description
C057300 , C03D199 , C03E100 , C03F100 , C057100 , 058100 , C03F200
No CAN data received from control modiule A1 (Instrument Cluster)

Under SRS Supplemental Inflatable Restraint System N2/10 :
U111000 *The vehicle speed signal was not received*
U015500 *Communication with the instrument cluster has a mailfunction*

Under ESA Electric Seat Adjusment Driver N32/1 & ESA Electric Seat Adjustment Front Passenger seat N32/2 & MFK Multi Function Camera A40/11 & PSD Pano Sliding Roof A98
C15587 *Communication with the instrument cluster has a mailfunction. The message is missing*

Under KDS Trunk Lid Control N121 :
C14600 *Communication with the central gateway has a mailfunction*
I wonder what module is deemed as a CENTRAL GATEWAY for N121 Trunk Lid Control ?

Under Left Front Reversible Emergency Tensioning Retractor A76 & The RIGHT side one A76/1 :
530309 & **520200** *No CAN data was received from the control module A1 (Instrument Cluster)*

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 11

Fuse 29. 10 amps. From 15. UNUSED
Fuse 30. 10 amps. From 15. UNUSED
Fuse 29 and Fuse 30 are for Left and Righ side of older generation headlight before MY 2014.
My car has the Dynamic LED 641, so both fuses at Rear SAM.

FUSE 31B. 15 amps. From 30. Mine is **31B** by position. If a 31A, its power is from 15R.
Switched through the horns relay (N10/1kO). Correct, from Relay O (O as in Oscar) it then goes to fuse 31B and then to *Left fanfare horn (H2) & Right fanfare horn (H2/1).*
There is no troublecode or warning on Instrument Cluter when this fuse or blown or relay removed/defective.

Fuse 32. 40 amps maxi fuse, the big one. From 30. UNUSED – Not valid for my engine model

Fuse 33. 10 amps. 87F. From output pin #87 of Relay R.
For 7 speed, Fully integrated transmission control controller unit (Y3/8)

Test condition : Ignition key position 2, ready to crank. Engine not started.
When fuse 33 is blown, there is no warning on instrument cluster, this is strange.
The gear engagement from Park to D or to R is possible as shown on Instrument Cluster, the mechanism can be heard engaged. I wonder why is gear change possible if the transmission control unit has no power from fuse 33 and has no back up power from any other fuse.

The proximity radar of Parking System N62, the rear one goes full blast showing all lights lighted up including the red ones and keeps beeping as though as there is an object that close. The front promixity radar does not beep, but does show some lights lighted up. This N62 parking radar usually only works with engine running and if transmission in gear.

Troublecodes……

Under the Transmission Control Module 722.9 as per iCarsoft MB v2.0 : **LINK ERROR**

Under ESP Electronic Stability Program N30/4 :
C037100 & C06A100 *No CAN data was received from the control module Transmission*
C038500 *One or more signals sent from control module Engine via the CAN bus is unreasonable*
C074300 *The coding of control module N30/4 ESP is faulty*
An Autel scanner reading a A220 MB model 176.005, a **C074300** is described as :
The global variant coding could not be read from the CAN bus.

Under IC Instrument Cluster A1 & EPS Electric Power Steering N68
U010100 *The communication with the control device 'transmission' has a mailfunction*

Continue next page for fuse 33…….

FRONT SAM FUSE LIST + Power source ID + via which Relay if any – Section 11

Continuation for Fuse 33…….

Under Left Headlight E1n1 :
U014600 *Communication with the central gateway has a malfunction*
Scanning the so called Central Gateway CGW/ZGW shows no code in it ☺

Fuse 34. 7.5 amps. From 87F. UNUSED – Not valid for my engine model
Fuse 35. 7.5 amps. From 87F. UNUSED – Only for Hybrid
Fuse 36. 7.5amps. From 87F. UNUSED - This option is not available in my car.

END OF FRONT SAM FUSES INFORMATION

Next page is for Critical Module with more than 1 fuse supplying it
&
Relays, and circuits fed by them

CRITICAL MODULE WITH MORE THAN 1 FUSES SUPPLYING POWER TO IT
N3/10 Engine ECM/ECU aka Engine computer.

Fuse no 27. 7.5amps. From 30z. Direct to N3-10 ECM pin 16, connector block F.

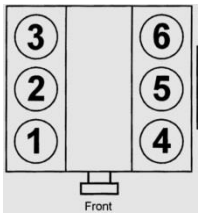
*Other fuses where ECM is switching at negative/ground and fuses are **via Relay N**, Engine Circuit 87M. The relay N is commanded (coil 85 or 86) by negative voltage, by the ECM N3/10 pin 27, connector block F. So, all the fuses below : F25, F24, F23 and F22 are 12V+ postive feed direct to sensors/components and the ECM switched the ground or negative side only.*

Fuse 25. 15 amps. For **Z7/73z1** Circuit 87 connector sleeve.
This fuse is very tricky visually. It is pin out no 10 from N10/1. In M276.8 (3.0 TT) N3/10 ECM specific schematic pe07.08-p-2101-97daq, this fuse is not shown as a fuse, but is shown only as pin 10 out of N10/1 connected to connector sleeve **Z7/73z1** single 2.5mm wire becoming 3 of 1.5mm wires into N3/10 pin 1,3 and 5 at connector block F. I believe this fuse is for some sensors +5V reference via regulators, example MAP, Temperature-s and those low power ones.

Fuse no 24. 15amps. For **Z7/35z1** Circuit 87 M1e connector sleeve, feeding :
- Ignition Coils cylinder 4, 5 and 6 (T1/4 , T1/5 & T1/6)
- Left Intake Camshaft Hall sensor (B6/4)
- Left exhaust Camshaft hall sensor(B6/6)
- Left intake Camshaft solenoid (Y49/4)
- Left exhaust Camshaft Solenoid (Y49/6)

Fuse no 23. 20amps, for **Z7/38z1** Circuit 87 M1i connector sleeve, feeding :
- Ignition Coils cylinder 1, 2 and 3 (T1//1, T1/2 & T1/3)
- Right Intake Camshaft Solenoid (Y49/5)
- Right Exhaust Camshaft Solenoid (Y49/7)
- Right intake Camshaft Hall sensor (B6/5)
- Right exhaust Camshaft Hall sensor (B6/7)

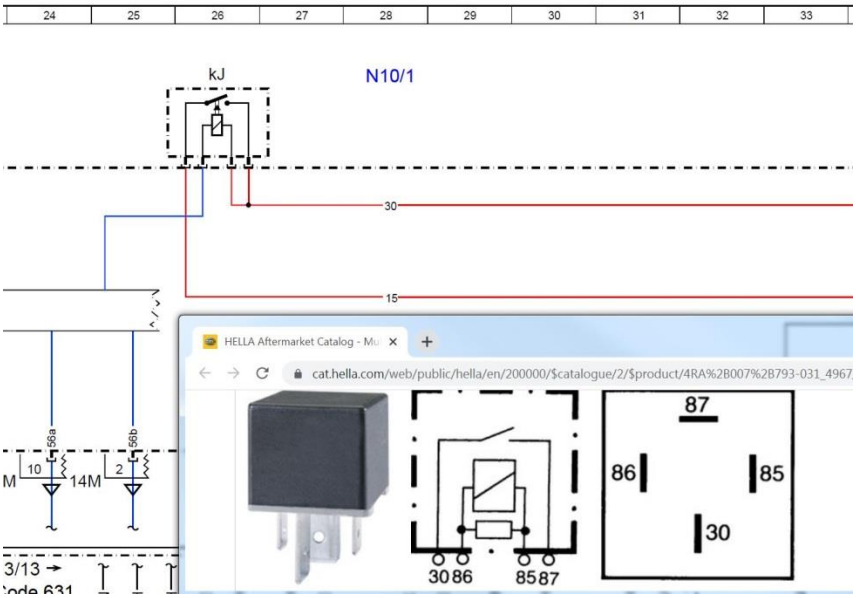
Fuse no 22. 15amps for **Z7/36** & **Z7/36z1** circuit 87 M2e connector sleeve, feeding :
- Purge control valve (Y58/1)
- Coolant circulation pump relay (K60)
- Left bypass air switchover valve (Y101/1)
- Right bypass air switchover valve (Y101/2)
- Boost pressure control transducer (Y31/5)
- Coolant Thermostat Heating Element (R48)
- Left oxygen sensor heater downstream of CAT (G3/5r1) , so this is Bank 2 sensor 2.
- Right oxygen sensor heater downstream of CAT (G3/6r1) , so this is Bank 1 sensor 2.
- Right oxygen sensor heater upstream of CAT (G3/4r1) , so this is Bank 1 sensor 1.
- Left oxygen sensor heater upstream of CAT (G3/3r1) , so this is Bank 2 sensor 1.
- Right bypass air switchover valve (Y101/2)
- Engine oil pump valve (Y130)

Cylinder 

number

Defective Relay/s Simulation, those at FRONT SAM

Relay J. Function J : **Circuit 15 relay (N10/1kJ)**
When relay J is removed to simulate pin 30 contact failure, its pin 87 which is the output of the contact, will then produce loss of power to circuit 15.
In this writing, pin 30 has to be assumed as power input for relay contact points following DIN standard, but physical connection of pin 30 and 87 at Front SAM maybe different in respect which one is being used as input or output.



Fuses which will loose power if Relay J (circuit 15) goes blown :

- Fuse 29, 10 amps. Right headlight (E2), is not in use. Mine at Rear SAM.
- Fuse 30, 10 amps. Left headlight (E1), is not in use. Mine at Rear SAM.
- Fuse 5, 7.5 amps. See fuse list. **Important fuse**
- Fuse 6, 10 amps. UNUSED by my car
- Fuse 7, 20 amps and Relay M pin 30 (starter) and also **Relay R** pin 85 or 86 which is relay's coil for ***chassis circuit 87F*** . See fuse & relay list. **Very Critical fuse.**
- **Unpowering of Relay R** (chassis circuit 87F) will also unpower Fuse 33 **Very Critical fuse**, Fuse 36, & Fuse 35

Instrument Cluster Warning will appear as :
Car skidding icon and **Inoperative. See Owner's Manual and Run Flat Indicator Inoperative**
We can't crank the starter. Ignition switch can achieve position 2, yes.

Diagnostic Trouble Code issued by icarsoft MB v2.0 with the loss of Relay J :

Under ECM N3/10: **U300E00** *Input signal Cirucit 15 ON is unreasonable.*
Under Fuel Pump Control Unit N118 : **U042700** *Unreasonable data received from the electronic ignition lock*
Under TCM (Transmission) 722.9 : No code but **LINK ERROR**, so no communication is happening.
Note : In Xentry this TCM is called : Y3/8n4 Fully Integrated transmission control (VGS)

Continue to next page…….

Defective Relay/s Simulation, at FRONT SAM

Continuation of ……. Loss of Relay J . Function J : **Circuit 15 relay (N10/1kJ)**

Under ESP (N30/4) : Plenty, 9 of DTC Codes !!!
C037100 No CAN data was received from control module 'Transmission'
C06A100 No CAN data was received from control module 'Engine'.
C084100 The power supply of circuit 15 is not OK.
C03A600 The CAN data from control module 'Engine' is faulty
C03A200 The CAN data from control module 'Engine' is faulty
C03A300 The CAN data from control module 'Engine' is faulty
C038200 The CAN data from control module 'Engine' is faulty
C039200 The CAN data from control module 'Engine' is faulty
C074300 The coding of control module 'N30/4 (Electronic Stability Program control module)' is faulty

Under IC - Instrument Cluster (A1).
U010100 The communication with the control device 'transmission' has mailfunction

Under EPS – Electric Power Steering (N68)
U041600 Unreasonable data were received from control module 'Traction Control".
U041100 Unreasonable data were received from engine control module
U010100* The communication with the control device 'transmission' has mailfunction
(*the same code as under Instrument cluster)

Under Front SAM (N10/1)
B212118 Relay 1 "Circuit 15R' has a mailfunction. The Limit for current has not been attained.

Under Rear SAM (N10/2)
B21F286 The state 'Circuit 15' is unreasonable. There is an incorrect signal

Under SRS N2/10 should be the same as fuse 8 blown.
Restraint sys mailfunction. Consult workshop.
Troublecode under SRS (N2/10) will be :
B210013 *Circuit 15 has a malfunction. There is an open circuit.*

==========

1. FRONT SAM N10/1 RELAYS - EASY VIEW

	Power Source or	Relay ID	Output	Primary : To Fuses or Relay power input	Primary Function or Fuse	Secondary, Function
1	Circuit 30	Relay J	Circuit 15	Fuse 5 >>	To Rear SAM N10/2 and Fuse 4	Fuse 4 - Not In Use
				Fuse 6	Not In Use	
				Fuse 7 >>	Relay M, input power and becoming Circuit 50 of 87M. Relay M coil is powered by Circuit 87M, which 87M is the power output of Relay N but wiring is thru Engine Computer N3/10 and not direct wired	Starter Motor Solenoid M1, pin 50.
				Fuse 29	Not In use	
				Fuse 30	Not in use	
				To Relay R, but its coil only. Output of Relay R becomes Circuit 87F	So failure of Relay J will also take down Relay R coil's latching operation	
2	Circuit 30	Relay R	Circuit 87F , Chassis	Fuse 33	Fully integrated transmission control controller unit (Y3/8)	
				Fuse 34	Not In use	
				Fuse 35	Not in use	
				Fuse 36	Not in use	
3	Circuit 15 from Relay J	Relay M	Circuit 50 of 87M	See relay J		
4	Circuit 30	Relay N	Circuit 87M, engine	Fuse 22	For ECM, oxygen sensors & etc of connector Z7/36z1 and Cooling Fan module M4/7. Negative switched. **See N3/10 Engine Computer CRITICAL MODULE** ...	**So, simple summary is : If Relay J goes bad on its contact points pin 30 and pin 87, or its coil 85 + 86 burnt out. The relays downstream of it will be inoperative either by loss of power or lost of latching signal : Relay M, R, and N**
				Fuse 23	For ECM, Bank1 - Ignition Coils + Camshaft sensors , connector Z7/38z1. Negative switched.	
				Fuse 24	For ECM, Bank2 - Ignition Coils + Camshaft sensors , connector Z7/35z1. negative switched	
				Fuse 25	For ECM, possibly for sensors	

1. FRONT SAM N10/1 RELAYS - EASY VIEW

	Power Source or Input	Relay ID	Output	Primary : To Fuses or Relay power input	Primary Function or Fuse	Secondary, Function
5	Circuit 30	Relay K	Circuit 15R	Fuse 8	SRS - Supplemental Restraint System N2/10	
				Fuse 9	**Not In use**	
				Fuse 10	Wiper Motor M6/1	
				Fuse 10, shared with	Power for input of Relay L, Wiper Park Heater R2/10	Wiper Park heater R2/10. So a heater short circuit and Fuse 10 blown, will create power loss to wiper motor too. **My car does not have this heater**
				Fuse 21	Brake Light Switch S9/1 & Glove Compt Lamp E13/1 via door switch S17/9	
				Fuse 31A	My car has 31B. So 31A does not exist.	
6	Circuit 15R from Relay K	Relay L	See Relay K			
	Circuit 30 & Fuse 31B	Relay O	To device	via Fuse 31B	Horn, unit Left and Right. H2 & H2/1	
7	**Fuse 91 of Rear SAM**	Relay Q	To device	B03 Start Stop Option Only - Auxillary Transmission Oil Pump N89 which is only used during engine STOP of ECO-START-STOP sequence. The **coil's (pin 85/86)** of this relay is powered by Fuse 18 of Front SAM. Power input of the relay comes from Rear SAM fuse 91.		
8	Circuit 30 & Fuse 32	Relay P	To device	**Not used in my car**	M272 only, air pump or secondary air injection.	
					END	

2. FRONT SAM FUSES , EXCLUDING THE ONE VIA RELAYS WITHIN FRONT SAM

From F32 fuse number &	F32 Terminal Number	Via K2 Relay at F32 ?	FRONT SAM - Connector number and Circuit number	To Fuses number and function	
F153 , 60 amp	MR6	No	12S, 6mm cable. Circuit 30z	Fuse 27 - To Circuit 30z of Front SAM N10/1 at power input connector 12S. This is direct to Fuse 27 for Engine Computer ECM N3/10 Logic Board power feed	
F154 , 150 am	MR7	No	16S, 16mm cable. Circuit 30	Fuse 1 - Unused in my car	
				Fuse 2 - Front Right Door Control Unit N69/2	
				Fuse 3 - Left Rear Door Control Unit N69/3	
				Fuse 18 - Upper control panel control unit (N72/1), where Hazard Light switch is & - B03 Option - Transmission oil auxiliary pump relay (N10/1kQ)	
				Fuse 19 - Unused in my car	
				Fuse 20 - Unused in my car	
				Fuse 28 - Instrument Cluster A1	
				Fuse 31A or 31B, as power input for Relay O. It is 31B for my car. Both Horns H2 & H2/1	
				Fuse 32 , as power input for Relay P - Unused in my car	
F156, 150 am	MR2 / MGR2	YES	8S, 10mm cable. Circuit 30g	Fuse 11 - 5" Display of Audio/Infotainment System. Only the display.	If K2 Relay fail, all Circuit 30g at front and rear SAM will loose power.
				Fuse 12 - HVAC Control Panel N22/7, Only Left or Right Parking light & Transmission Mode S/E/M button	
				Fuse 13 - Steering column tube module control unit (N80)	
				Fuse 14 - Electronic Stability Program control unit (N30/4)	
				Fuse 15 - Supplemental restraint system control unit (N2/10). Note Fuse 8 is also for SRS, as 2nd power source	
				Fuse 16 - Unused in my car	
				Fuse 17 - Panoramic Roof control module A98	
				Fuse 26 - Audio System	

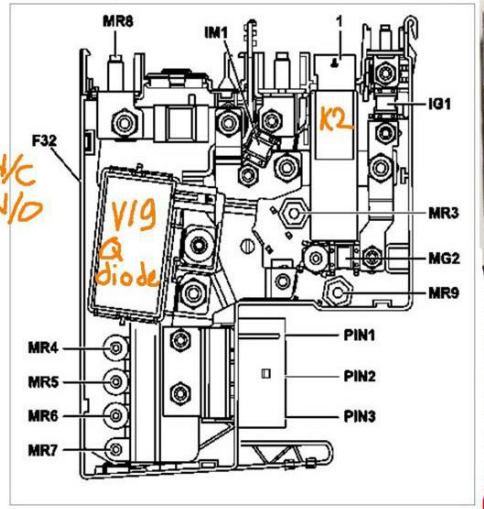
F32 PREFUSE - EASY VIEW. Model 212 (except 212.095/098/298) with code B03 (ECO start/stop function)

Power Source	F32 Terminal Number	Fuse No & rating	Description or function or destination device
Main Battery	B1	uses N/C Relay V19 Q Diode for B03 option	You won't find B1 terminal label on the F32 Document ***GF54.15-P-1256-07F Fuse assignment of front prefuse box,*** **but** it is shown in Wiring Diaghram of F32 pe54.15-p-2502-97daa

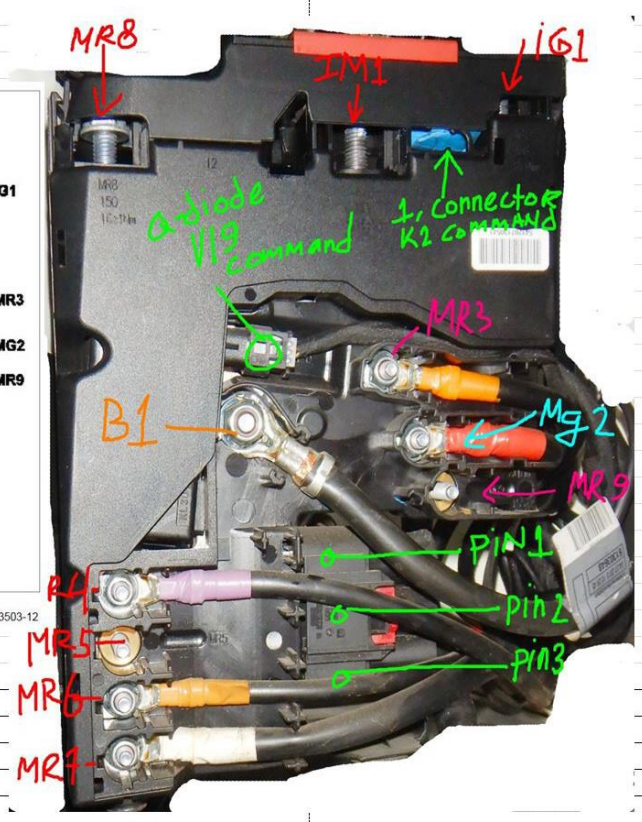
Model 212 (except 212.095/098/298) with code B03 (ECO start/stop function)

F32 Front electrical prefuse box

V19 is normally closed N/C
K2 is normally Open N/O

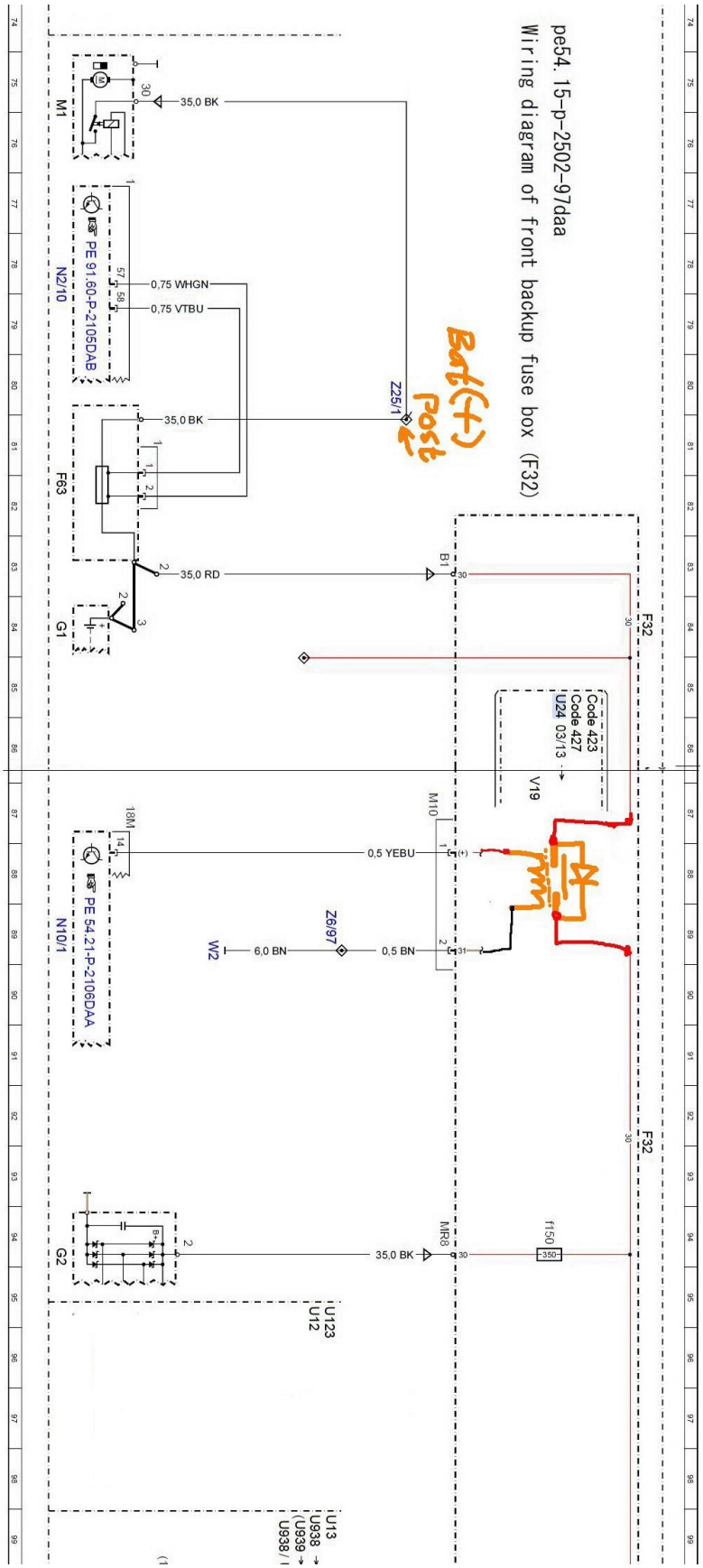


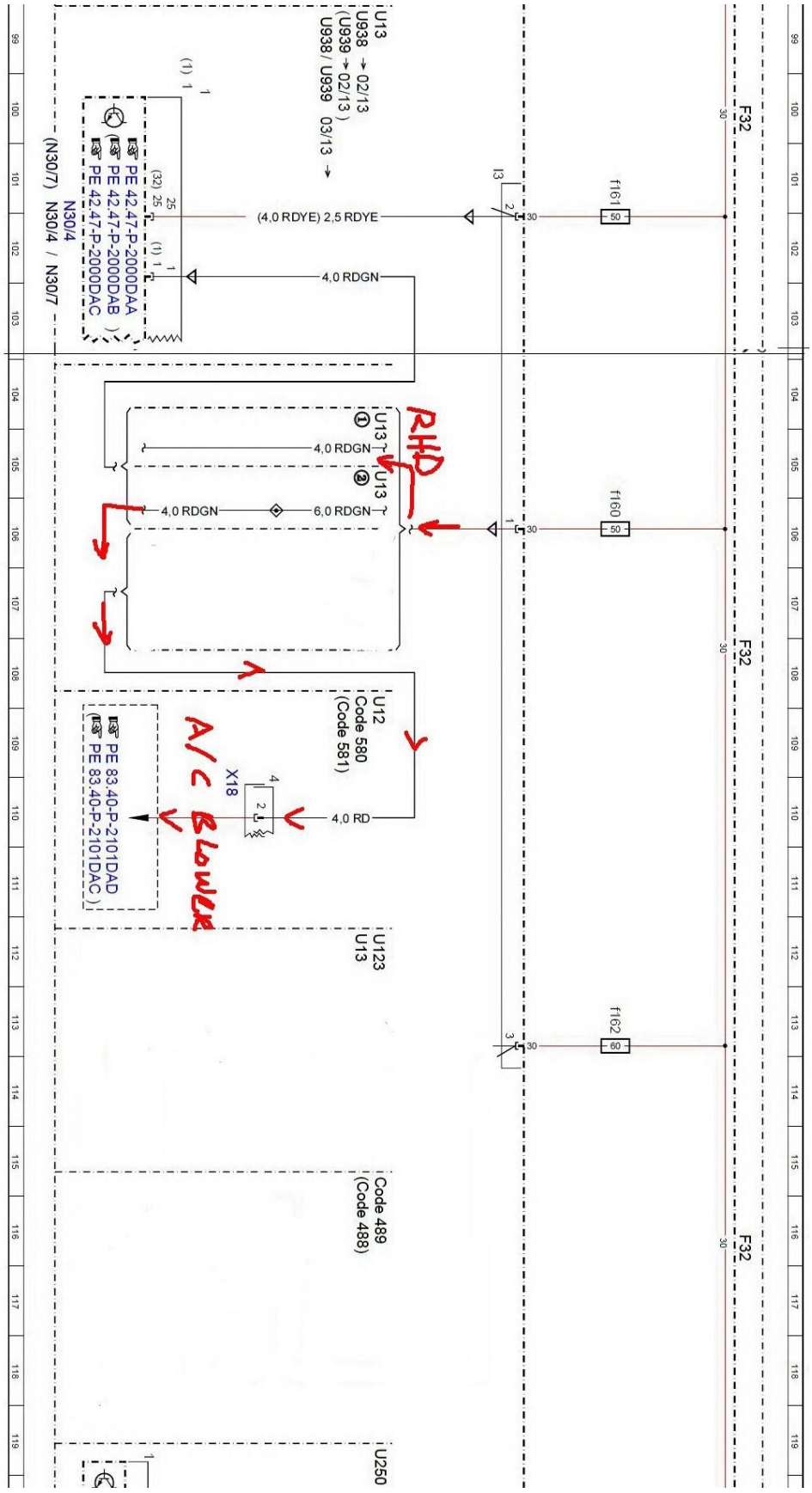
P54.15-3503-12

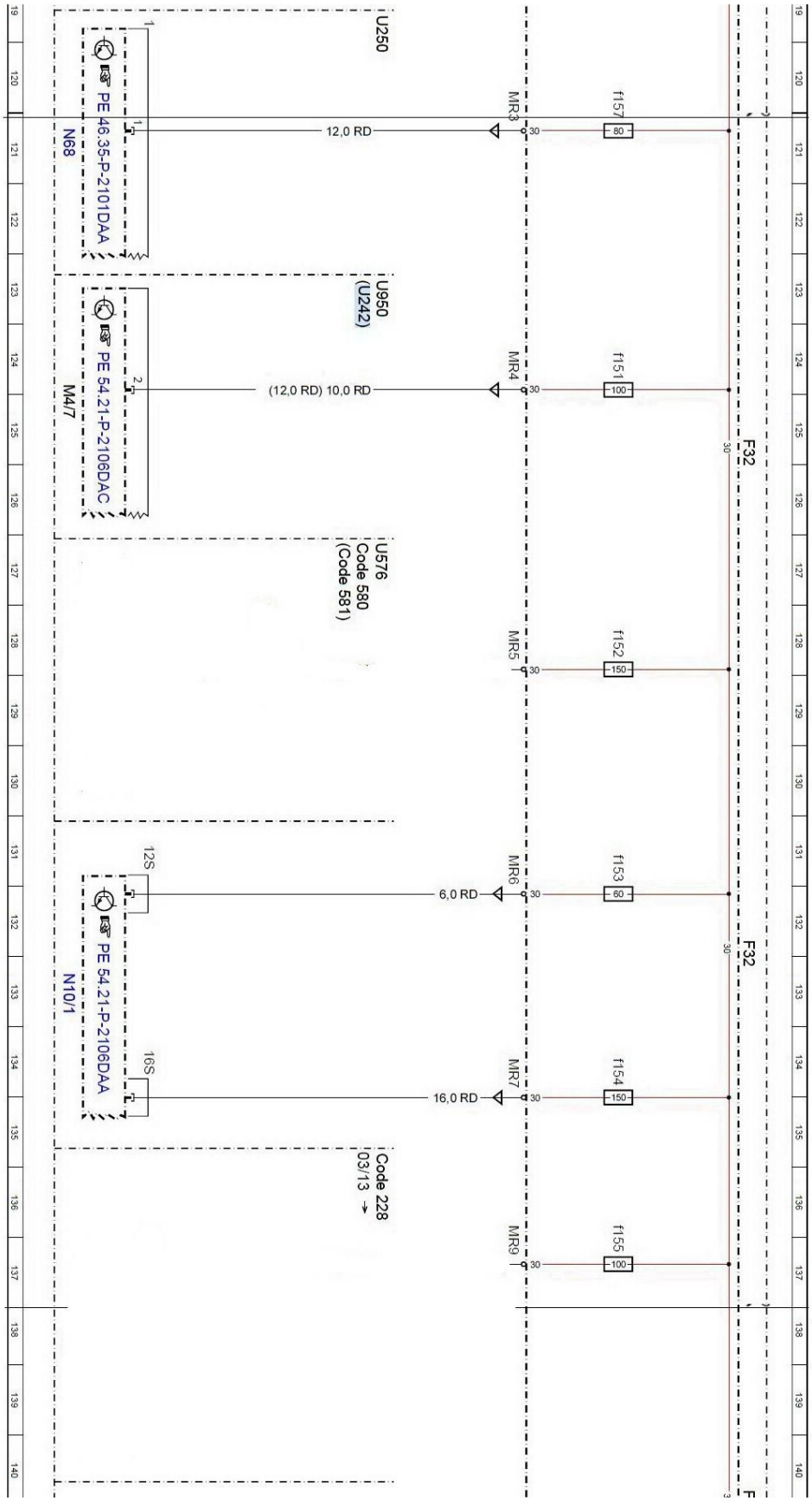


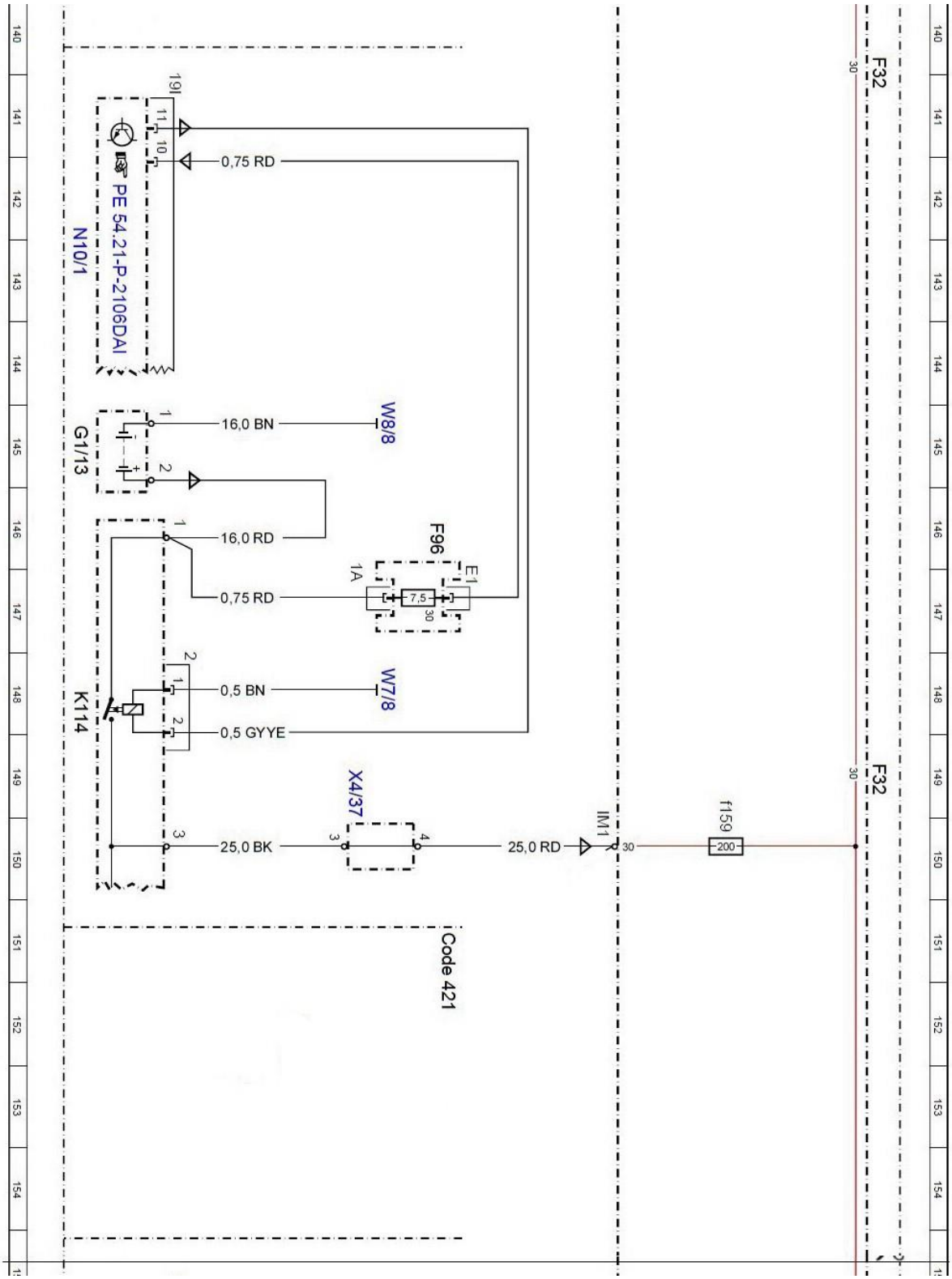
F32 PREFUSE - EASY VIEW. Model 212 (except 212.095/098/298) with code B03 (ECO start/stop function)

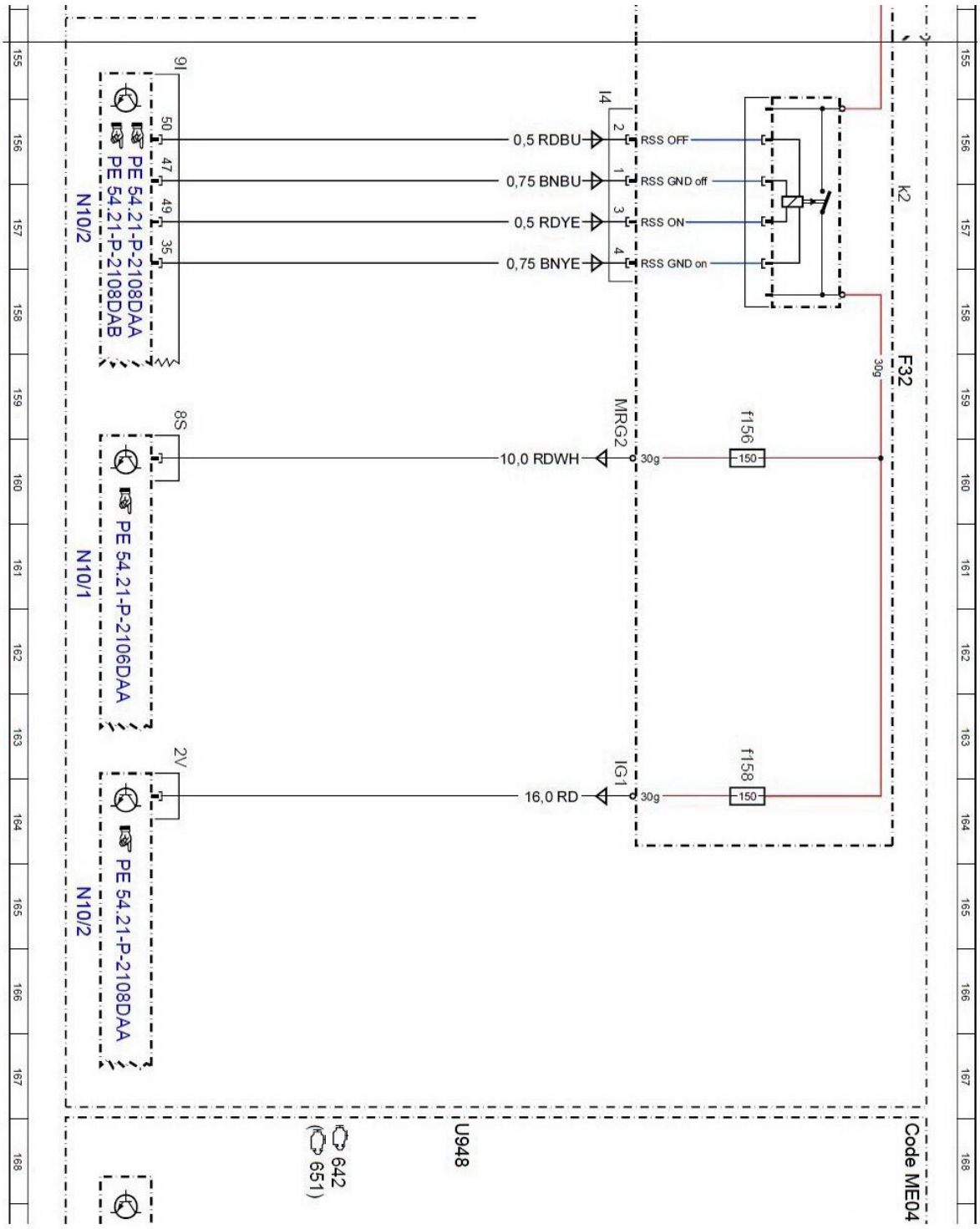
	Power Source	F32 Terminal Number	Fuse No & rating	Description or function or destination device	
	Alternator	MR8	F150, 350 amps	From alternator, to protect battery if alternator diode set set goes bad which is equal to battery positive being shorted to ground	
	Battery	IM1	F159, 100 or 200 amps	To Circuit 30 which goes to K114 parallel relay of 12 Ah trunk battery of ECO start stop cars.	
	Battery	IG1	F158, 150 amps	**Via K2 relay**. To circuit 30**g** of Rear SAM N10/2 power input connector 2V	If K2 Relay fail, all Circuit 30g at front and rear SAM will loose power. The time out or disconnection of K2 Relay can take up to 2 hours from key removal and car goes to sleep. So beware when testing for heavy parasitic load which IF the device/s are powered by 30g circuit, we can't wait for the K2 to really sleep, we have to find it while K2 is still CLOSED.
	Battery	MG2 or MRG2	F156, 150 amps	**Via K2 relay**. To circuit 30**g** of Front SAM N10/1 power input connector 8S	
	Battery	MR3	F157, 80 amps	To Electric Power Steering N68, as main power source	
	Battery	MR9	SPARE	Unused in my car	
	Battery	Pin 1	F160, 50 amps	To HVAC Blower in cabin passenger side kick panel, as main power source	
	Battery	Pin 2	F161, 50 amps	To ESP - Electronic Stability Program Control Unit N30/4	
	Battery	Pin 2	F162, 60 amps	Unused in my car	
	Battery	MR4	F151, 100 amps	To M4/7 radiator cooling fan, as main power source	
	Battery	MR5	F152, 150 amps	Unused in my car	
	Battery	MR6	F153, 60 amps	To Circuit 30**z** of Front SAM N10/1 at power input connector 12S. This is direct to Fuse 27 for Engine Computer ECM N3/10 Logic Board power feed	
	Battery	MR7	F154, 150 amps	To Circuit 30 of Front SAM N10/1 at power input connector 16S	


pe54.15-p-2502-97daa
Wiring diagram of front backup fuse box (F32)
Batt(+) post
M1
30
35,0 BK
N2/10
PE 91.60-P-2105DAB
0,75 WHGN
0,75 VTBU
Z25/1
F63
35,0 BK
35,0 RD
G1
B1
F32
Code 423
Code 427
U24 03/13
V19
M10
18M
0,5 YEBU
N10/1
PE 54.21-P-2106DAA
Z6/97
W2
6,0 BN
0,5 BN
G2
MR8
35,0 BK
f150
350
U123
U12
U13
U938
U939
U938/


F32
f161
f160
f162
(4,0 RDYE) 2,5 RDYE
4,0 RDGN
4,0 RDGN
6,0 RDGN
4,0 RD
RHD
A/C Blower
X18
U13
U938 → 02/13
(U939 → 02/13)
U938 / U939 03/13 →
PE 42.47-P-2000DAA
PE 42.47-P-2000DAB)
PE 42.47-P-2000DAC
N30/4
(N30/7) N30/4 / N30/7
U12
Code 580
(Code 581)
PE 83.40-P-2101DAD
PE 83.40-P-2101DAC)
U123
U13
Code 489
(Code 488)
U250


U250
PE 46.35-P-2101DAA
N68
12,0 RD
MR3
f157
80
U950
(U242)
PE 54.21-P-2106DAC
M4/7
(12,0 RD) 10,0 RD
MR4
f151
100
F32
U576
Code 580
(Code 581)
MR5
f152
150
125
PE 54.21-P-2106DAA
N10/1
6,0 RD
MR6
f153
60
16S
16,0 RD
MR7
f154
150
Code 228
03/13
MR9
f155
100


F32
30
F32
30
19
11
10
0,75 RD
PE 54.21-P-2106DAI
N10/1
W8/8
16,0 BN
G1/13
16,0 RD
F96
E1
1A
7,5
30
0,75 RD
W7/8
0,5 BN
K114
0,5 GYYE
X4/37
IM1
30
f159
200
25,0 BK
25,0 RD
Code 421



END 3 Aug 2021