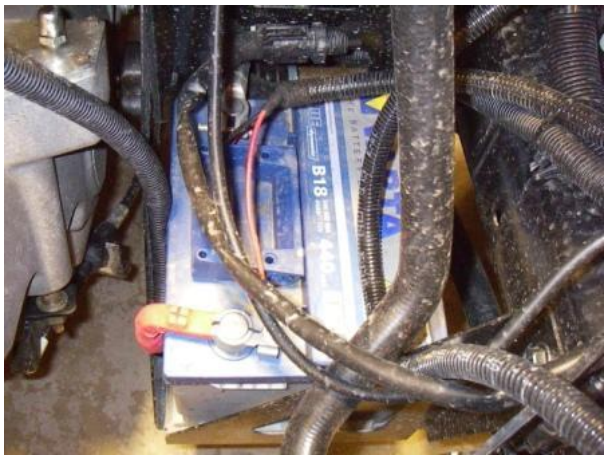
Chapter G

Electrical 12 Volt

G.1 12 V battery

G.1.1 Disassembling – 12 V battery

- Disconnect the pole shoes.
- Loosen the fastener on the bracket.



G.1.2 Assembling – 12 V battery

Assemble in reverse order.

Tightening torques:
- pole = 7 Nm
+ pole = 7 Nm
Battery fastener = 7 Nm

Requirement for new 12 V battery:
Mechanical: B18
Electrical: 42 - 50 Ah.

G.1.3 Temperature sensor

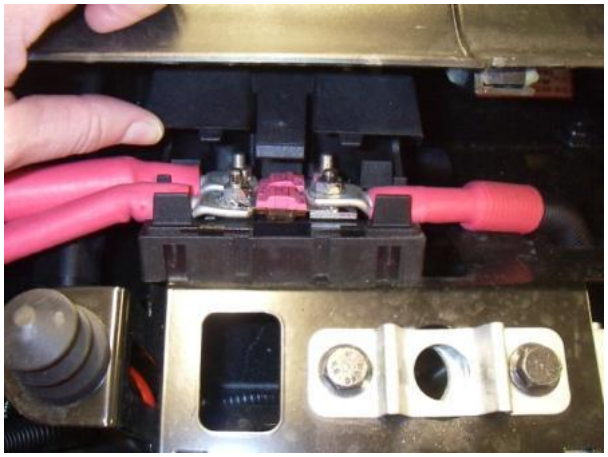
The temperature sensor is located just above the 12 V battery and sends information about the ambient temperature to the PCU. The PCU is using this signal to adjust the charging of the 12 V battery.

- The sensor is loosened by pulling the clip from the bracket or pulling the sensor loose from the clip.
- Disconnect the cable.

G.2 Fuses

The 12 V fuses are located at the following places:

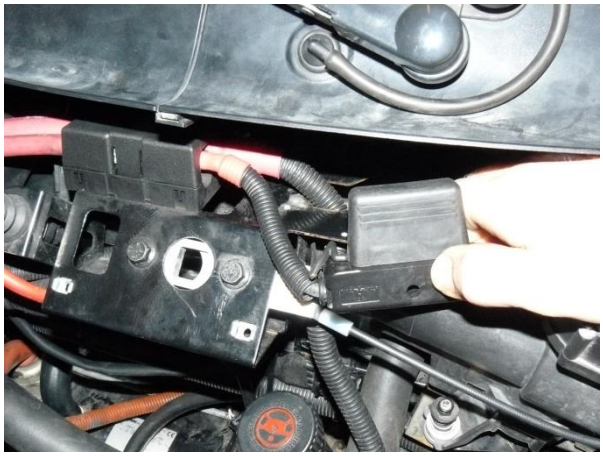
- From the 12 V battery in a fuse box in the motor compartment.
- Separate fuse for power steering (option) just beside the fuse box.
- Separate fuse for heated windscreen (option) just behind the fuse box.
- Under the lid in the glove box inside the coupé.



G.2.1 Fuse box

There are two fuses in the fuse box between the windscreen and the hood latch. They are both 125 A. The fuse at the back is between the PCU and 12 V battery protecting the 12 V battery against overcurrent from the DCDC in the PCU. The fuse at the front is between the 12 V battery and the rest of the 12 V components; this circuit goes to the fuses in the coupé via a junction box. Cars with heated windscreen (option) have in addition a cable to this from the battery side of the fuse box.

Tightening torques:
Cable fasteners = 1,2 Nm
Fasteners for the box = 1,9 Nm



G.2.2Power steering

Cars with power steering have positive 12 V cable with a fuse just after the fuse box. The fuse is 80 A.

G.2.3 Heated windscreen

Behind the fuse box there is a separate box for the heated windscreen (option) fuse. The fuse is 60 A.

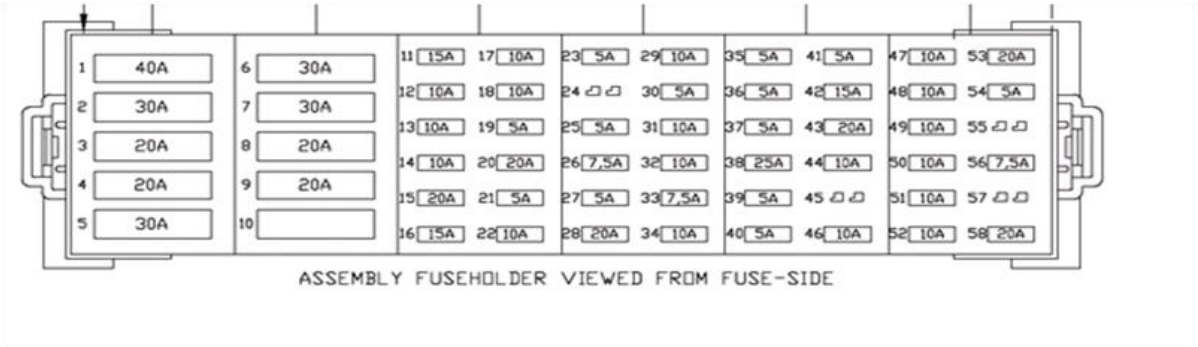
Tightening torques:
Cable fasteners = 1,2 Nm
Fasteners for the box = 1,9 Nm

G.2.4 Glove box

The fuses are located under the lid in the glove box at the passenger's side.

See numbering below.

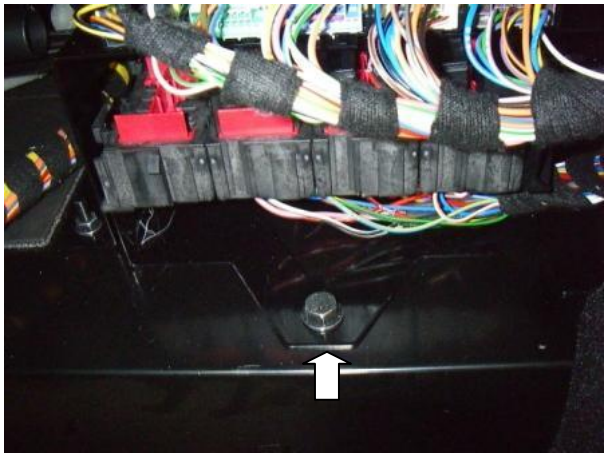
1	6	11	17	23	29	35	41	47	53
2	7	12	18	24	30	36	42	48	54
3	8	13	19	25	31	37	43	49	55
4	9	14	20	26	32	38	44	50	56
5	10	15	21	27	33	39	45	51	57
		16	22	28	34	40	46	52	58



ASSEMBLY FUSEHOLDER VIEWED FROM FUSE-SIDE

Nr	Fuse type	A	Name
1	Maxi	40	Main fuse for key switch
2	Maxi	30	ABS pump
3	Maxi	20	ABS valve control
4	Maxi	20	Heated rear window
5	Maxi	30	Heated rear window, interior light and horn
6	Maxi	30	Start bypass relay
7	Maxi	20	Heater blower
8	Maxi	20	Window washer motor and washer pump
9	Maxi	20	Electrical windows
10	Maxi	20	Condensato fan AC (option)
11	Mini	15	Brake light switch
12	Mini	10	Vacuum pump brake servo
13	Mini	10	Water pump cooling system
14	Mini	10	Main light switch
15	Mini	20	Central locking (GEM)
16	Mini	15	Indicator lights (GEM)
17	Mini	10	Instrument panel
18	Mini	10	BMI, RAC-unit
19	Mini	5	Diagnose contact, climate control (CDCM)
20	Mini	20	Radio pin A7
21	Mini	5	PATS, BMI reset switch
22	Mini	10	Airbag module
23	Mini	5	Indicators
24			Not in use
25	Mini	5	Radiator fans (via relay R4 / R5)
26	Mini	7,5	Cooling fan traction battery/BMI
27	Mini	5	Water pump heating system
28	Mini	20	Radioator fan 1
29	Mini	10	Brake lights
30	Mini	5	Gearshift releaser
31	Mini	10	Instrument panel pin 23, radio pin A4

Nr	Fuse type	A	Name
32	Mini	10	Rear fog light switch
33	Mini	7,5	Electrical mirrors
34	Mini	10	Main light swith, hazard
35	Mini	5	Key in RUN position; PCU, PATS, relay R6
36	Mini	5	Key in RUN position; BMI, diagnose contact
37	Mini	5	ABS, heater blower and climate control (CDCM)
38	Mini	25	12V outlet
39	Mini	5	Key in RUN position; indicators, instrument panel, RAC-unit
40	Mini	5	Key switch start signal to PCU
41	Mini	5	Interior light
42	Mini	15	Horn
43	Mini	20	Wiper rest position relay R15
44	Mini	10	Reverse lamp
45	Mini	20	Heated windscreen (option)
46	Mini	10	License plate lamps
47	Mini	10	Parking light right side front and right side rear
48	Mini	10	Parking light left side front and left side rear
49	Mini	10	High beam right side
50	Mini	10	High beam left side
51	Mini	10	Dimmed beam right side
52	Mini	10	Dimmed beam left side
53	Mini	20	Driving lights
54	Mini		Not in use
55	Mini	15	Sunroof (option)
56	Mini	7,5	Inertia switch
57	Mini		Not in use
58	Mini	20	Radiator fan 2



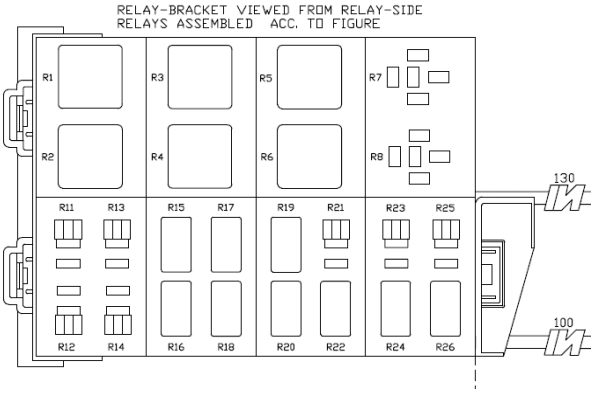
G.3 Relays

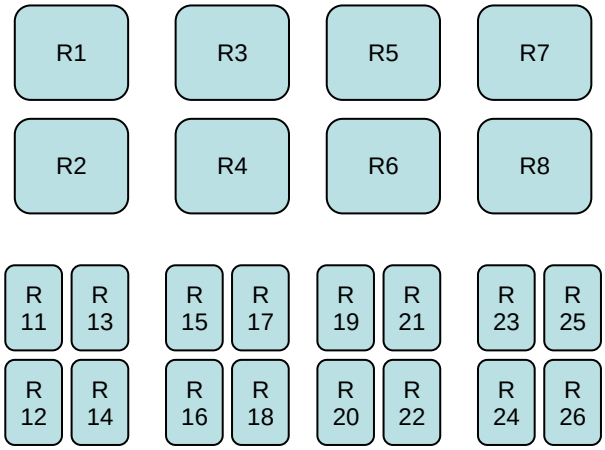
The relays are located below the knee bolster on the passenger's side towards the bulkhead.

The relays are mounted on a bracket which can be removed by loosening a fastener.

- Loosen the fastener and pull the bracket out with the relays.

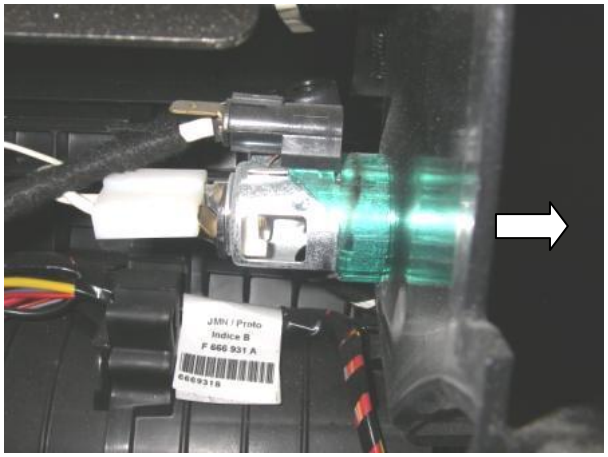
Tightening torque = 20 Nm





Nr/type/Name
R1/Maxi/Heater blower speed 2
R2/Maxi/Heater blower
R3/Maxi/Radiator fan, high speed
R4/Maxi/Radiator fan, low speed
R5/Maxi/Heater rear window
R6/Maxi/ Run/start (init. By key run, circuit from junction box to brake pedal switch, then to gear selector solenoid, PCU signal, brake lights and ABS)
R7/Maxi/Airconditioning (option)
R8/Maxi/Heated windscreen
R9/N.A.
R10/N.A.
R11/Mini/Free
R12/Mini/Free
R13/Mini/Free

Nr/type/Name
R14/Mini/Free
R15:Wiper motor park (init. By limit switch in wiper motor-> signal to GEM to turn off wiper)
R16/Mini/Wiper motor
R17/Mini/Power saving, interior light dimming
R18/Mini/Alarm and horn
R19/Mini/High beam
R20/Mini/Dimmed beam
R21/Mini/Driving lights
R22/Mini/Reverse lights
R23/Mini/Free
R24/Mini/Pump – heating circuit
R25/Mini/Free
R26/Mini/Pumps – cooling circuit



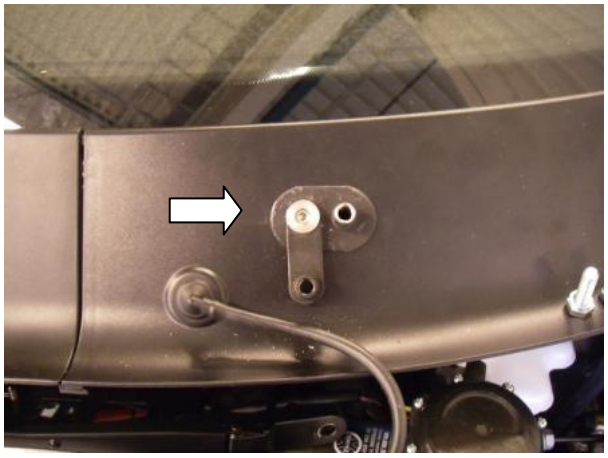
G.4 12 V outlet

To disassemble the 12 V outlet the instrument panel must be removed first.

To replace:

- Disconnect the 12 V battery.
- Disconnect the cables and push the 12 V outlet into the glove box.

There are hooks between the metal and the green part but they are difficult to separate. The black cover will probably break when you are trying to remove the green part.



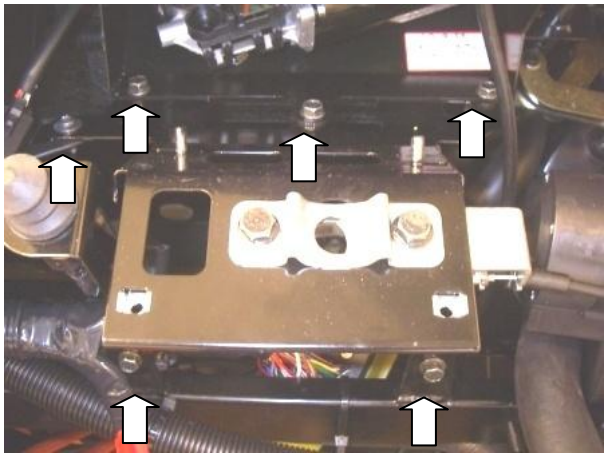
G.5 Wiper motor

G.5.1 Disassembling – wiper motor

- Open the hood and disconnect 12 V battery.
- Loosen and remove both wiper arms.
- Loosen the small arm on the wiper mechanism (see picture).

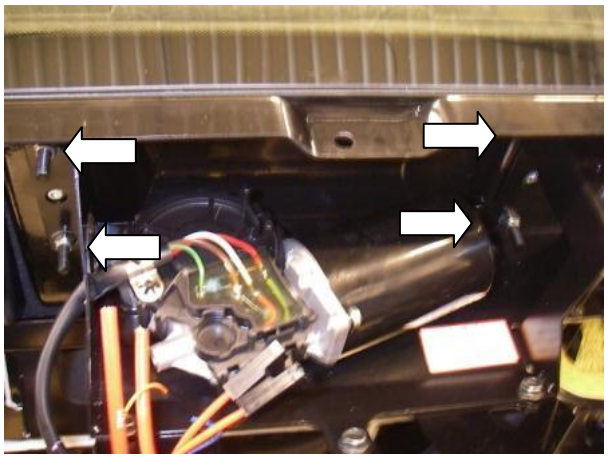
- Remove the leaf sreen below the windscreen. This is fastened with five fasteners as shown in the picture.
- Remove the air duct.

- Disconnect the wiper motor.



To access the wiper motor you first have to loosen the hood latch bracket with the junction box.

Without the junction box the bracket looks like the picture to the left. Loosen the six fasteners indicated by the arrows.



Loosen the four fasteners for the wiper motor bracket. The wiper motor can then be removed complete with bracket.

The motor can be separated from the bracket when it is out of the car.

G.5.2Assembling – wiper motor

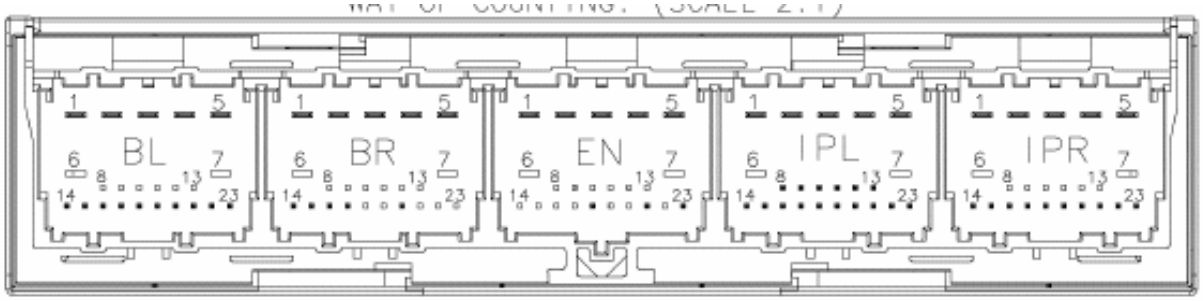
Assemble in reverse order.

Tightening torques:
Fasteners motor bracket to bulkhead = 9 Nm
Fasteners motor bracket = 7 Nm

G.6 GEM

GEM means Generic Electric Module. This module controls the signals to the following electrical components and *indicators*:

- Electrical windows
- Wiper motor
- Remote door opener
- Electrical mirrors
- Indicators
- Interior light
- *Airbag lamp*
- *Key inserted*
- *Open door*
- *Seat belts*
- *Belt reminder*
- *Dimmed beam/driving lights*



GEM CONNECTOR CAVITY	WIRE HARNESS CONNECTOR NUMBER	COLOUR
BL	1S7T-14489-E_	GREY
BR	1S7T-14489-F_	GREEN
EN	1S7T-14489-G_	BLUE
IPL	1S7T-14489-H_	NATURAL
IPR	1S7T-14489-J_	BROWN

G.6.1 Disassembling - GEM

The GEM is located on the el bracket towards the bulkhead inside the car on the passenger's side.

- Disconnect the five contacts by tiliting the yellow locking straps and then pull the contacts out.

- Loosen the fasteners locking the bracket around the GEM and pull the GEM out. On the picure only the right fastener is visible. You'll find a similar fastener on the left side too.

G.6.2 Assembling - GEM

Assemble in reverse order.

Plugs and contacts have different guidance to avoid incorrect connections.

NOTE that the new GEM must be configured.

Tightening torques:
Fasterners = 1,9 Nm

G.6.3 Configuring new GEM

- Connect the diagnostic tool.
- Choose *"Configuring new GEM".*
- Choose Norwegian configuration for cars in the Norwegian market.

IMPORTANT: All keys with remote control for the car must be re-programmed after replacing the GEM.
If the car owner didn't bring all keys with remote control, the owner can program them later himself.

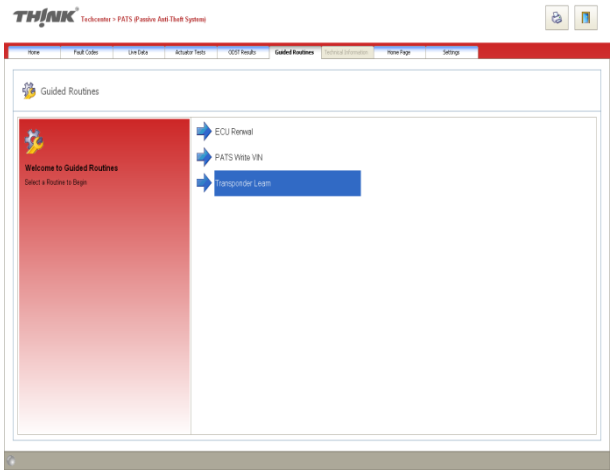
After key programming the GEM funcionality must be checked.

G.6.4 Programming keys with remote control

1) Delete all keys with remote control: Twist the key quickly four times between position 0 and II (within 5 seconds). The car will confirm by a sound.
2) Press the open or close button on the first key. The car will confirm by a sound.
3) Press the open or close button on the next key. The car will confirm by a sound.
4) Repeat point 3) until all key are programmed.
5) Wait 10 seconds and the programming is finished.

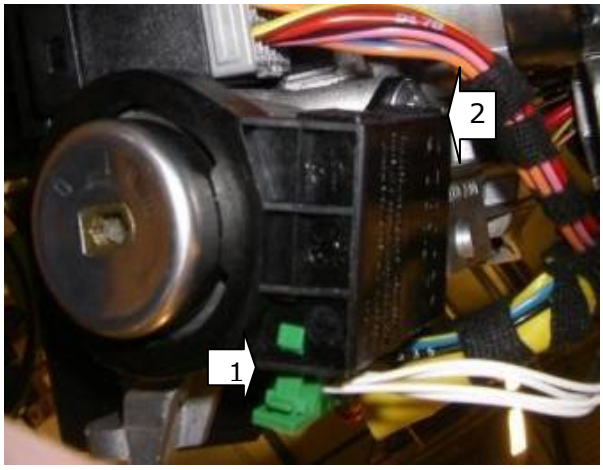
G.6.5 Funcionality test

- Connect the diagnostic tool.
- Choose *"Test GEM functionality"*
- Follow the instructions.



G.7 Immobilizer

THINK City is equipped with a passive anti theft device. The system consists of a sender called Transceiver, a control unit called EEC-V and coded keys. The transceiver reads the key code and is sending this to the EEC-V. The EEC-V then approves the key if it is the correct one and sends "Drive enable"-signal to the PCU. If someone is trying to start the car with a not approved key, the following error code will appear: "Theft Detected, Vehicle Immobilized", and the car will not start. "Transponder Learn" must be executed to accept the key. See chapter Z.



G.7.1 Disassembling - transceiver

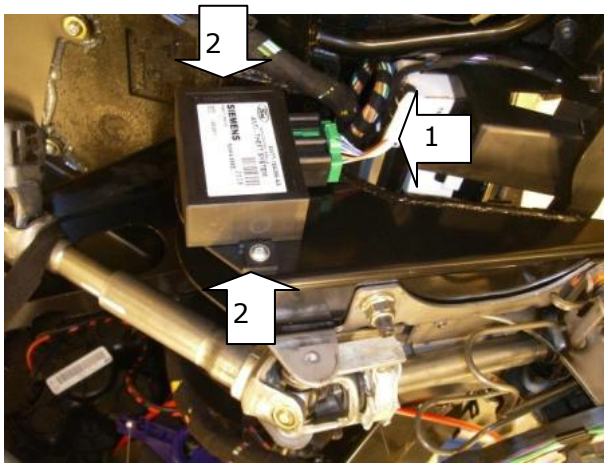
The transceiver can be replaced without reprogramming any units. The transceiver is located on the ignition switch.

- Disconnect the contact (1).
- Loosen the fastener (2).
- Pull the transceiver out.

G.7.2Assembling - transceiver

Assemble in reverse order.

Tightening torque:
Transceiver to bracket = 1,9 Nm



G.7.3Disassembling - EEC-V

The unit is located beside the steering column against the driver's door.

- Turn the ignition off.
- Disconnect the 12 V battery.

- Disconnect the contact on the EEC-V (1).
- Remove the fasteners on the EEC-V (2) – one on each side of the unit.

G.7.4Assembling - EEC-V

Assemble in reverse order.

Tightening torque:
The EEC-V to bracket = 1,9 Nm

What to do if an EEC-V needs to be replaced....

- disconnect battery cable
- replace EEC-V
- reconnect battery cable
- cycle a PATS ignition key to RUN to program the first key.
  NOTE: make sure both keys are not placed together while cycling, this may cause code 13(B1600) or 14(B1602).
- cycle the other PATS ignition key again to program the second key and start the vehicle.

G.7.5Programming new EEC-V

To program a new EEC-V:

1) Insert one of the keys in the ignition and turn it to RUN position. Make sure there are no other keys close to the key in the ignition.
2) Turn the key back to OFF position and take it out. Put it away outside the car.
3) Insert key number 2 in the ignition and turn it to RUN position.

- **Transceiver**
  - » Energizes ignition key electronics thru the circular antenna.
  - » Reads ignition key code and sends it to the EEC.
  - » Can be replaced **without** any reprogramming.
- **EEC-V**
  - » Communicates with ignition transceiver to verify key code thru two signal wires.
  - » Enables fuel pump/injectors and Starter motor if valid ignition start.
  - » Disables fuel pump/injectors and Starter motor if drive-away theft is attempted.

Error codes:

- Theft Indicator Flashing Fault Codes (FFC)

FFC	DTC	Description
11	B1681	Transceiver signal not detected (probable cause: Transceiver not connected or defective, wiring damage)
12	B2103	Transceiver antenna not connected (probable cause: internal antenna damaged)
13	B1600	Encoded ignition key code not detected (probable cause: using non-encoded ignition key, damaged key or non-encrypted wedge key)
13	B2431	Key programming failure (defective ignition key or weak transceiver module)
14	B1602	Partial detection of encoded ignition key (probable cause: key issue or Transceiver issue)
15	B1601	Unprogrammed encoded ignition key detected (leave ignition on for 20 seconds before trying a programmed key, in *Anti-Scan Mode*)
21	B1213	Number of encoded ignition keys programmed to EEC is below minimum required (2)
--	B1342	ECU is defective (EEPROM in PCM is not working- replace PCM)

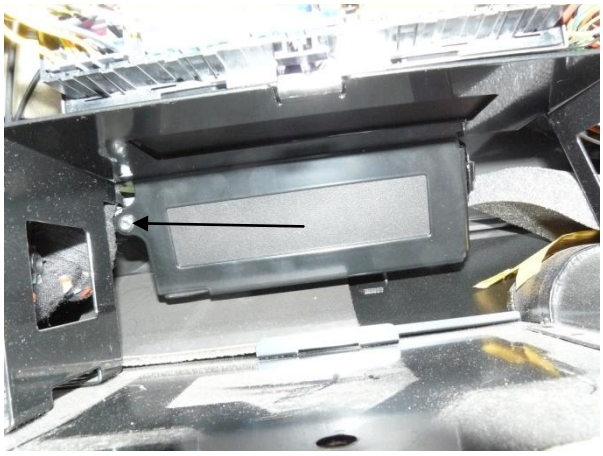
G.8 RAC-Unit

RAC is an abbreviation for Remote Acquisition Control.

The system consist of the RAC-unit itself, microphones, speaker and antenna. On the side of the RAC-U there is installed a SIM card.

G.8.1 Disassembling – RAC-U

- Disconnect the contacts on the RAC-U.
- Loosen the relay box fastener and remove the relay box.



- Remove the RAC-U fastener.
- Pull the unit out.

G.8.2 Assembling – RAC-U

- Write down the serial number and IMEI number on the new RAC-U.
- Insert the correct SIM card.
- Inform THINK about the new RAC-U (IMEI, serial number, phone number and VIN).

Assemble in reverse order.

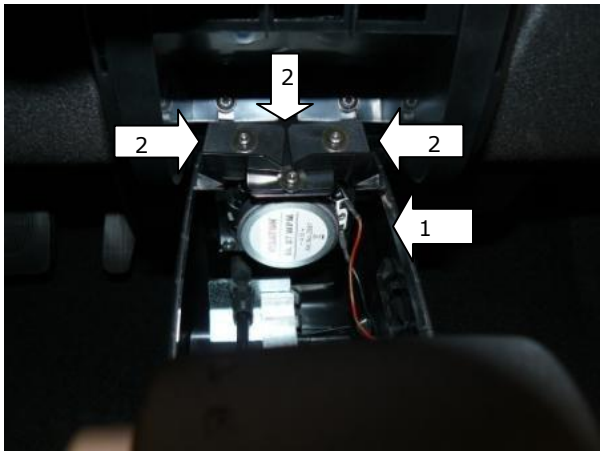
Tightening torques:
RAC-U fastener = 1,9 Nm
Relay bracket fastener = 20 Nm

G.8.3 Disassembling - microphones

The microphones are glued to the windscreen, just below the mirror. They must be cut loose.

G.8.4Assembling - microphones

- Remove any remainding glue and clean with Betaclean 3300.
- Remove the paper cover and place the microphone.
- Fasten the cable with tape along the roof and down the A pillar.



G.8.5Disassembling – RAC speaker

The speaker is located below the heater control panel and in front of the gearshift.

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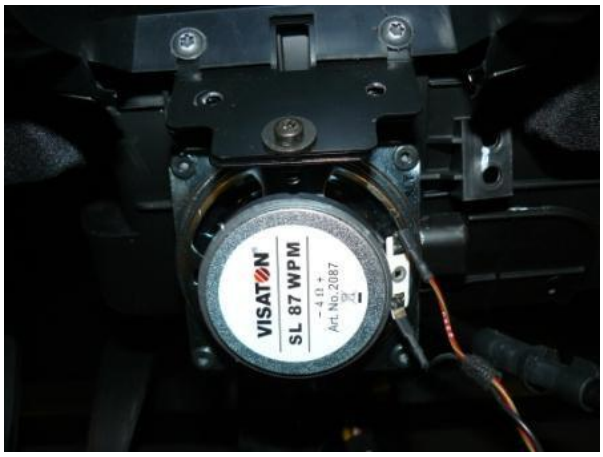
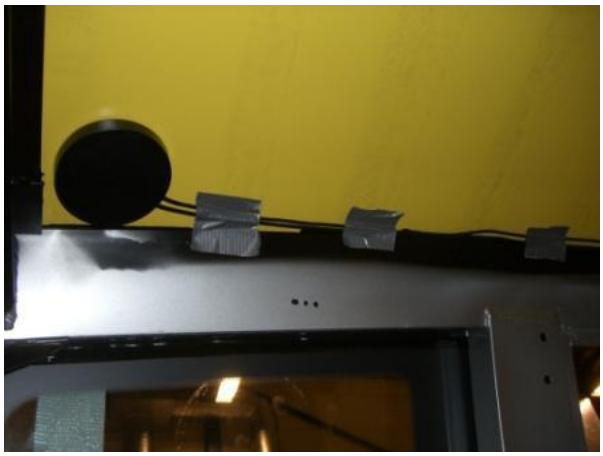
- Remove the gearshift cover (see section H.3).
- Remove speaker cables (1).
- Remove the speaker bracket fasteners (2).



G.8.6 Assembling – RAC speaker

Assemble in reverse order.

Tightening torque = 1,9 Nm



G.8.7 Disassembling - GPRS/GSM antenna

The antenna is fastened with double-sided tape and must be cut loose. The cables can not be disconnected from the antenna, and it must be removed as a complete unit.

The antenna cables are routed as shown in the pictures.

G.8.8Assembling – GPRS/GSM antenna

- Route and fasten the cables as shown in the pictures.
- Remove the paper cover and fasten the antenna at the roof.

G.9 Horn

THINK City is equipped with two horns installed on the front bumper armature.

G.9.1Disassembling - horn

- Disconnect the cables.
- Remove the horn fasteners.

G.9.2 Assembling - horn

Assemble in reverse order.

Tightening torque = 7 Nm