eLEARN

AIRBAG

191 - Giulietta

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AIR BAG - DESCRIPTION

The vehicle is equipped with an electronic control system that governs the activation of specific containment devices in the event of frontal or side impact.

The restraint system - in the most complete version - includes the following for frontal protection:

- driver and passenger front air bags with two-stage activation;

- front seat belts with dual pretensioner and load limiter;

- rear seat belts with load limiter;

- decentralised supplementary front impact detection sensor.

The most comprehensive version of the side protection system comprises:

- two Side Bags on the front seats;

- two window bags housed in the under-roof side members;

- two impact detection sensors located in the central pillar.

The front protection system features new Air Bag Smart 2 activation software that automatically adapts activation parameters according to impact severity.

The driver and passenger front air bags feature dual-stage activation;

- when the impact is of moderate severity, the electronic control unit controls the first air bag activation stage and then, following a significant temperature increase, the second stage so that the energy discharged onto the occupant is not harmful;

- for very severe impacts, the control unit activates the second stage after a small temperature rise, i.e. almost immediately, so that as much of the occupant's kinetic energy as possible can be absorbed before he or she strikes the steering wheel or dashboard.

A supplementary ECS “Early Crash Sensor” on the front beam also helps the electronic control unit to operate more quickly than a conventional system so that the airbag activation stage is completed before the occupant's body begins to move towards the steering wheel or dashboard.

The control unit is located under the centre console and is securely fastened to the body: in this way the deceleration sensors located inside the unit are near the centre of gravity and detect the deceleration for the entire vehicle accurately.

There are two stages for the two front Air Bag modules: the first intervenes at an initial impact level, the second in the event of a more serious impact.

The driver's air bag module is located in the middle of the steering wheel.It is fitted on a rocker plate that is also used to control the horns. The plate houses a metal container that contains the folded bag and the gas generation device that inflates the bag.

A clock spring allows the connecting cables for the air bag module to follow the rotation of the steering wheel without danger of breaking.

The passenger air bag is located on the dashboard, and is fastened directly to the vehicle crossmember by means of a special bracket.

The side bag protects the chest area and also - together with the door panels - protects critical areas of the body such as the ribs and abdomen. Its position on the seat always ensures maximum efficacy irrespective of seat position, even if the seat occupant is not seated correctly, because bag opening dynamics minimise the risk of body damage due to impact against the body.

The window bags are activated together with the side bags and place themselves between the occupant and the vehicle to prevent the head coming into contact with highly intrusive objects such as glass, pillars etc.

Because the window bags extend from the front pillar to the luggage compartment, they protect front and rear passengers. The window bag system offers the best performance due to the broad area covered and their ability to be self-supporting even without a backing.

Activation of the seat belt pretensioners is controlled by the same strategy as the air bags.

The pretensioners are designed to take up slack in the seat belt to ensure it holds the occupant against the backrest from the first moments of impact, thus reducing movement inside the passenger compartment.

This vehicle features a first pretensioner on the front seat belt reels; a second pretensioner, again electronically controlled, pyrotechnic type, acts on the seat belt mounting third point, dramatically reducing the forward movement of the pelvis and legs and, therefore the violence of the impact of the shins and knees against the lower part of the dashboard.

In addition, the combined action of the two pretensioners, working at different points, almost totally eliminates slackness of the seat belt, keeping the effect of the occupant slipping under the seat, known as the submarining effect, to a minimum.

The control unit is equipped with a self-diagnostic function:

- it detects and stores faults;

- it recognises the various components and the fault type;

- it indicates the onset of faults by means of the special warning light.

The activation of the system following a particularly serious impact is memorised by the control unit.

When the system self-diagnosis function detects a fault or an impact is recorded, the control unit sends a signal, via the CAN, for the Air Bag fault warning light located on the instrument panel.

Similarly, it lights up the passenger Air Bag disabled warning light and the seat belts not fastened warning light - SBR function:

The Seat Belt Reminder comprises a buzzer which, lights up the warning light in the instrument panel and flashes warning the driver and the front passenger that their seat belt is not fastened.

A reminder is present over the internal rear view mirror to inform all passengers, by means of a visual and acoustic indication, including the rear seat passengers, to fasten their seat belts.

The two side warning lights are associated to the front seats, while the three central warning lights are associated to the seat passengers.

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The red and green warning lights work as follows:

- off if the seat belts are fastened at key-on;

- red if the front seat belts are not fastened;

- red blinking (rear seats only) if the seat belts are unfastened

- green if the seat belts are fastened

The information for the five switches located on the seat belt buckles and the passenger presence sensor are used for the SBR function and do NOT in any way affect the Air Bag activation logic.

If it is absolutely vital to transport a baby in the front seat, the front passenger Air Bag and the side bag can be deactivated as well as the front passenger seat belt pretensioner.

The passenger Air Bag disabling function is activated via the setup menu in the instrument panel, not using the key!

When it is deactivated the warning light in the instrument panel comes on.

For more details

See descriptions 5580C AIR BAG SYSTEM

The system control unit supply lines are protected by a specific Body Computer fuse.

When operations are carried out to the Air Bag system, the following safety recommendations must be closely followed. For more details

Op. 5580C AIR BAG SYSTEM

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AIR BAG - FUNCTIONAL DESCRIPTION

The control unit for Air Bag system M060 receives a supply controlled by the ignition (INT) at pin 2 of connector A from the line protected by fuse F50 of the Body Computer M001.

Pin 1 connector A is connected to the specific earth C050.

The "early crash" sensor K039 detects light impacts and communicates them to the control unit M060 - pins 9 and 8 of connector A of M060.

When, according to the control logic, the two sensors and the sensors incorporated into the actual control unit detect a slight frontal impact, the control unit sends signals for the intervention of the front modules in the first stage:

- to the driver's side Air Bag Q009, through the clock spring on the steering wheel D047 (from pins 23 and 24 of connector A of M060);

- to the passenger side Air Bag Q011 (from pins 19 and 20 of connector A of M060);

- to the driver's side front pretensioners Q020 and Q024 (from pins 9-10 and 11-12 of connector B of M060)

- to the passenger side front pretensioners Q021 and Q025 (from pins 7-8 and 5-6 of connector B of M060).

If a more serious frontal impact is detected, the control unit sends signals for the intervention of the front modules in the second stage:

- to the driver's side Air Bag Q009, through the clock spring on the steering wheel D047 (from pins 21 and 22 of connector A of M060);

- to the passenger side Air Bag Q011 (from pins 17 and 18 of connector A of M060).

The side impact detection sensors K066 (driver's side) and K067 (passenger side) send signals to pins 19-20 and 18-17 respectively of connector B of the control unit M060.
When, on the basis of the control logic, a side impact of a certain severity is detected, the control unit sends signals for the intervention of the modules:

- to the driver's front Side Bag Q030 (from pins 13-14 of connector B of M060);

- to the passenger side front Side Bag Q031 (from pins 15-16 of connector B of M060);

- to the driver's Head Bag Q040 (from pins 3 and 4 of connector B of M060)

- to the passenger Head Bag Q041 (from pins 2 and 1 of connector B of M060).

The structure of the seats which house the Side Bags is connected to earth C050.

The switches on the front driver's seat belt I046 and the passenger seat belt I047 are connected to the control unit at pins 22 and 24 respectively of connector B of M060, whilst pin 21 provides the reference earth.

The passenger presence sensor K065 interrupts the seat belt signal if there is no passenger.

The switches on the rear seat belts I145, I146 and I147 are connected to the control unit at pins 30, 29 and 27 respectively of connector B of M060; pin 23 provides the reference earth.

The control unit M060, from pins 3 and 1 of connector A, is connected, through the CAN line, to the Body Computer M001 and to the instrument panel E050.

When the system self-diagnosis function detects a fault or an impact is recorded, the control unit M060 sends a signal, via the CAN, for the Air Bag fault warning light located in the instrument panel E050.

Similarly, it lights up the passenger Air Bag disabled warning light and the seat belts not fastened warning light.

The LIN serial line leaves pin 4 of the instrument panel E050 connecting with the "seat belts unfastened display" E083 located near the interior rear view mirror.

The E083 has an "ignition-operated" supply (INT) from the line protected by fuse F37 of the Body Computer M001.

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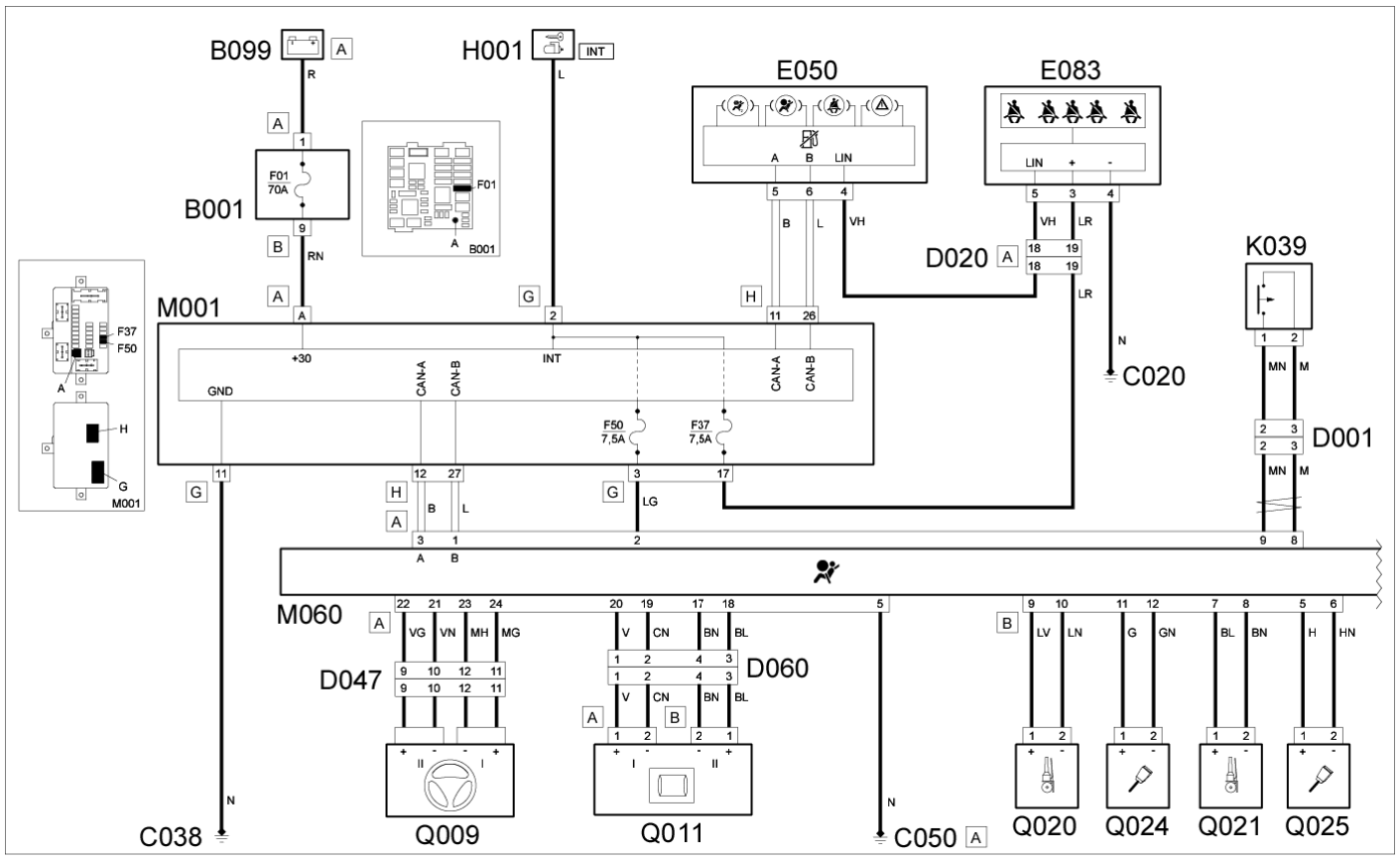
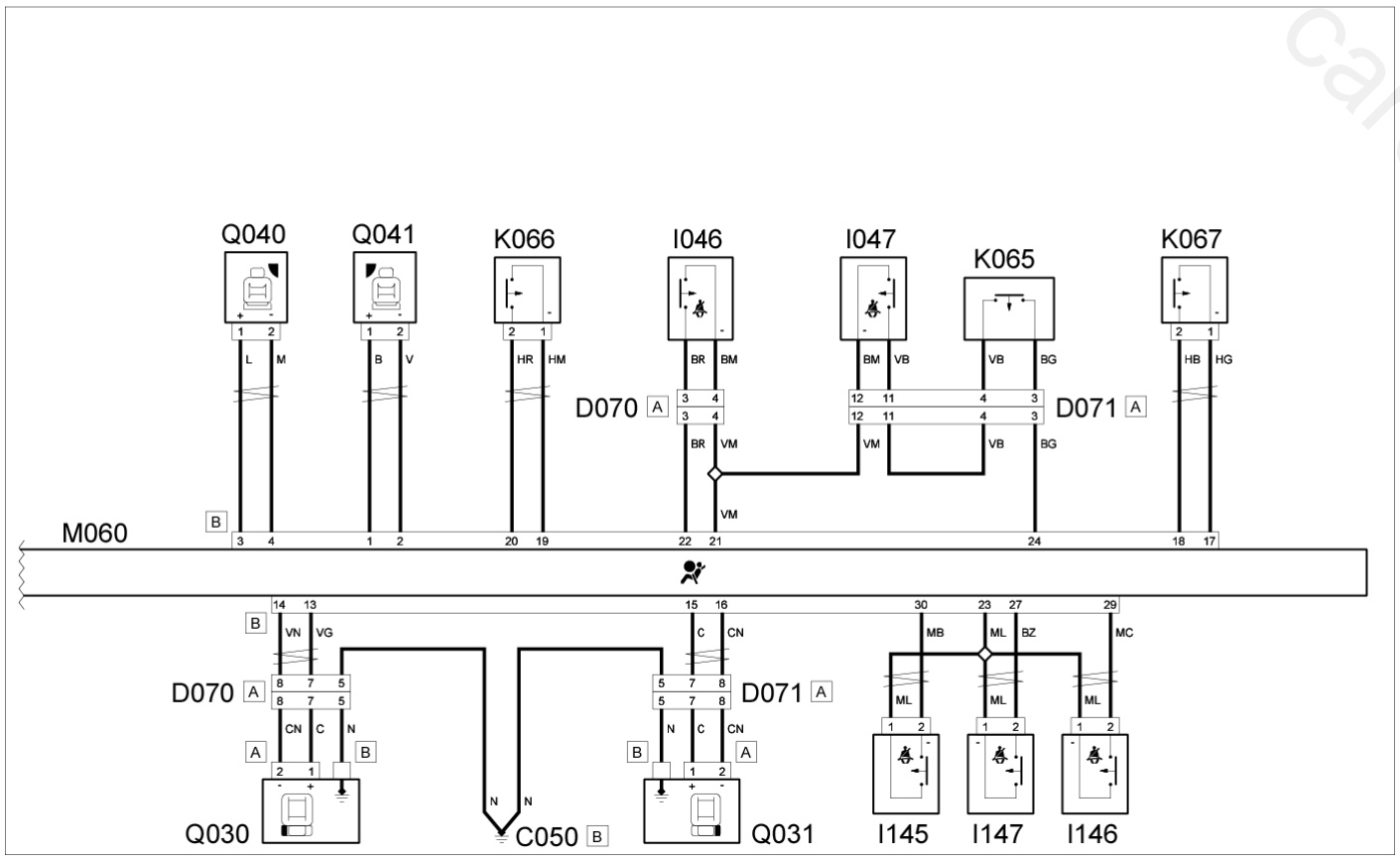
AIR BAG - WIRING DIAGRAM





Component Code	Description	Reference to the operation
B001	JUNCTION UNIT	Op. 5505A28 CONTAINER FOR ADDITIONAL JUNCTION UNIT IN ENGINE COMPARTMENT - R.R.
B099	MAXI FUSE BOX ON BATTERY	Op. 5530B40 SUPPLY BOX ON BATTERY (LINK BATTERY AND FUSE BOX) - R R
C020	PASSENGER SIDE DASHBOARD EARTH	-
C038	EARTH ON CENTRE TUNNEL	-
C050	AIR BAG SYSTEM EARTH	-
D001	FRONT/DASHBOARD COUPLING	-
D020	DASHBOARD/REAR COUPLING	-
D047	CLOCK SPRING COUPLING	Op. 5550A10 STALK UNIT ASSEMBLY - R+R
D060	AIR BAG COUPLING	-
D070	DRIVER'S SEAT COUPLING	-
D071	PASSENGER SEAT COUPLING	-
E050	INSTRUMENT PANEL	Op. 5560B10 CONTROL PANEL - R+R
E083	DISPLAY FOR FASTENED SEAT WARNING	Op. 7065A33 DISPLAY FOR UNFASTENED SEAT BELT - R. R.
H001	IGNITION SWITCH	Op. 5520A18 IGNITION SWITCH CONTACT CARRIER LOCK BARREL - R.R.
I046	DRIVER'S SEAT BELT SWITCH	Op. 7065A14 ANCHORAGE ROD FOR , (ONE), FRONT SEAT BELT LEFT OR RIGHT - R.R.
I047	PASSENGER SEAT BELT SWITCH	Op. 7065A14 ANCHORAGE ROD FOR , (ONE), FRONT SEAT BELT LEFT OR RIGHT - R.R.
I145	LEFT REAR SEAT BELT WARNING LIGHT SWITCH	Op. 7065B21 LEFT REAR SEAT BELT MOUNTING ROD - R.R.
I146	RIGHT REAR SEAT BELT WARNING LIGHT SWITCH	Op. 7065B22 CENTRE SEAT BELT ANCHORAGE LINK - R+R
I147	MIDDLE REAR SEAT BELT WARNING LIGHT SWITCH	Op. 7065B23 RIGHT REAR SEAT BELT MOUNTING ROD - R.R.
K039	FRONT AIR BAG SENSOR	Op. 5580C10 DECELERATION SENSOR FOR AIR BAG (ONE), L/H OR R/H - R+R

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K065	PASSENGER PRESENCE SENSOR	Op. 7065A34 PASSENGER PRESENCE SENSOR ON FRONT SEAT FOR INDICATING SEATBELT UNFASTENED R R
K066	SIDE BAG SENSOR, DRIVER'S SIDE	Op. 5580C40 SIDE BAG SENSOR (ONE), LH OR RH - R.R.
K067	SIDE BAG SENSOR, PASSENGER SIDE	Op. 5580C40 SIDE BAG SENSOR (ONE), LH OR RH - R.R.
M001	BODY COMPUTER	Op. 5505A35 MAIN BODY COMPUTER/JUNCTION UNIT - R.R.
M060	AIR BAG CONTROL UNIT	Op. 5580C14 AIR BAG ECU - R+R
Q009	DRIVER'S AIR BAG	Op. 5580C18 AIR BAG MODULE - R+R
Q011	AIR BAG IN DASHBOARD (PASSENGER SIDE)	Op. 5580C22 AIR BAG MODULE - PASSENGER SIDE - R.R
Q020	DRIVER'S FRONT SEAT BELT PRETENSIONER	Op. 7065A12 FRONT SEAT BELT (ONE), LEFT OR RIGHT, WITH PRETENSIONER ON REEL - R.R.
Q021	PASSENGER SIDE FRONT SEAT BELT PRETENSIONER	Op. 7065A12 FRONT SEAT BELT (ONE), LEFT OR RIGHT, WITH PRETENSIONER ON REEL - R.R.
Q024	DRIVER'S AIR BAG	Op. 7065A13 PRETENSIONER FOR LUMBAR BRANCH OF ONE SEAT BELT, LEFT OR RIGHT - R.R.
Q025	PASSENGER SIDE FRONT SEAT BELT MOUNTING PRETENSIONER	Op. 7065A13 PRETENSIONER FOR LUMBAR BRANCH OF ONE SEAT BELT, LEFT OR RIGHT - R.R.
Q030	DRIVER'S SIDE BAG	Op. 5580C44 FRONT SIDE BAG MODULE (ONE) LH OR RH - R.R
Q031	PASSENGER SIDE BAG	Op. 5580C44 FRONT SIDE BAG MODULE (ONE) LH OR RH - R.R
Q040	DRIVER'S HEAD BAG	Op. 5580C52 WINDOW BAG MODULE (ONE) LH OR RH - R.R WITH INTERFERING PARTS REMOVED
Q041	PASSENGER HEAD BAG	Op. 5580C52 WINDOW BAG MODULE (ONE) LH OR RH - R.R WITH INTERFERING PARTS REMOVED

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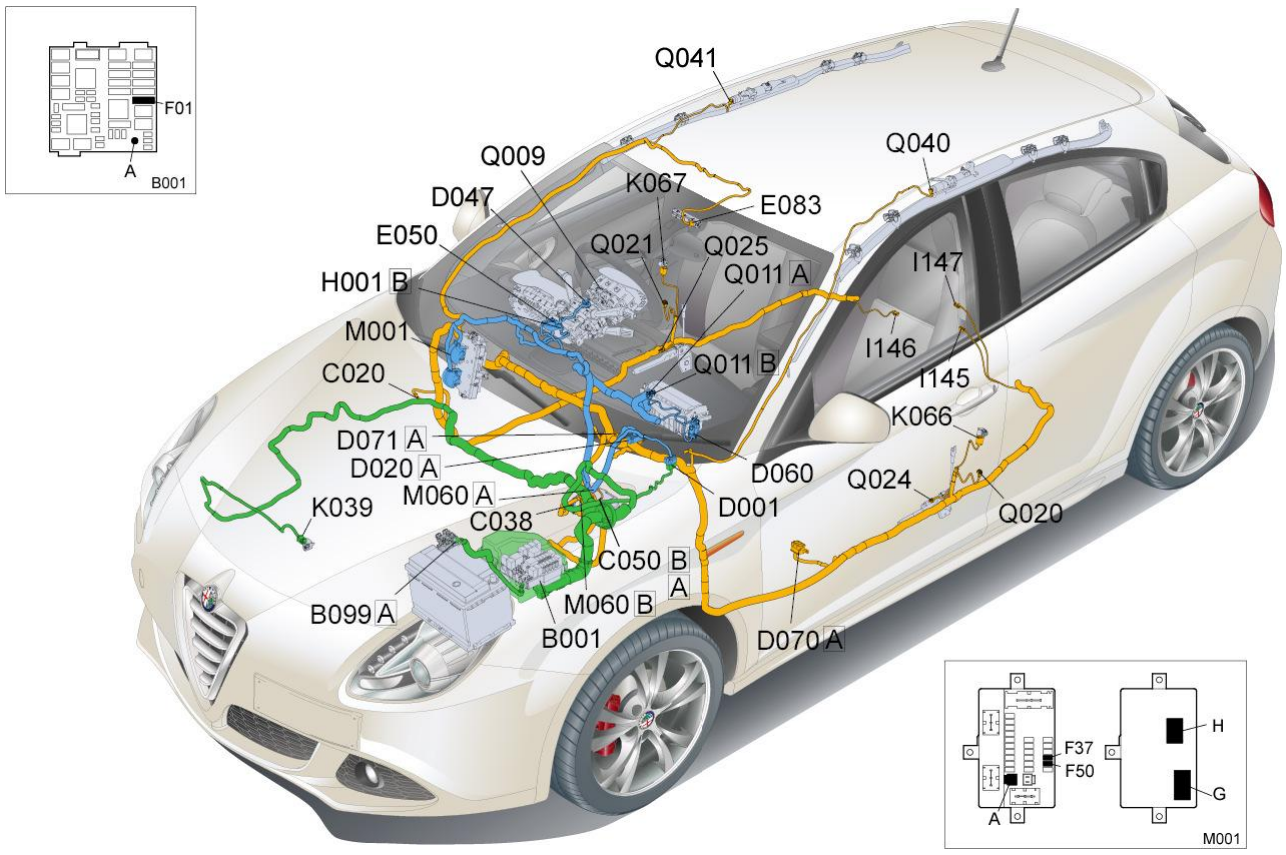
AIR BAG - COMPONENT LOCATION



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