



 **CFMOTO**



**800NK**

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# 1. Introduction



Zircon black



Starlight white

As the fifth member of the CFMOTO NK family, 800NK inherited the sporty look of the NK family. 189kg of bike's weight, two-way quick shift, Slipper Clutch, high-performance sports shock absorption setting, it takes into account fierce street riding, mountain road curve driving and short and medium distance riding.

For riding more fun, the 800NK advanced model equipped with a 8-inch MMI dashbord, which can pair with phone via bluetooth to navigation, call the contacts, control music, etc. Besides, the T-box, with a built-in 4G module and 6D sensor, can realize real-time viewing of bike's location, riding condition, OTA upgrade, etc.

## 2. Specifications

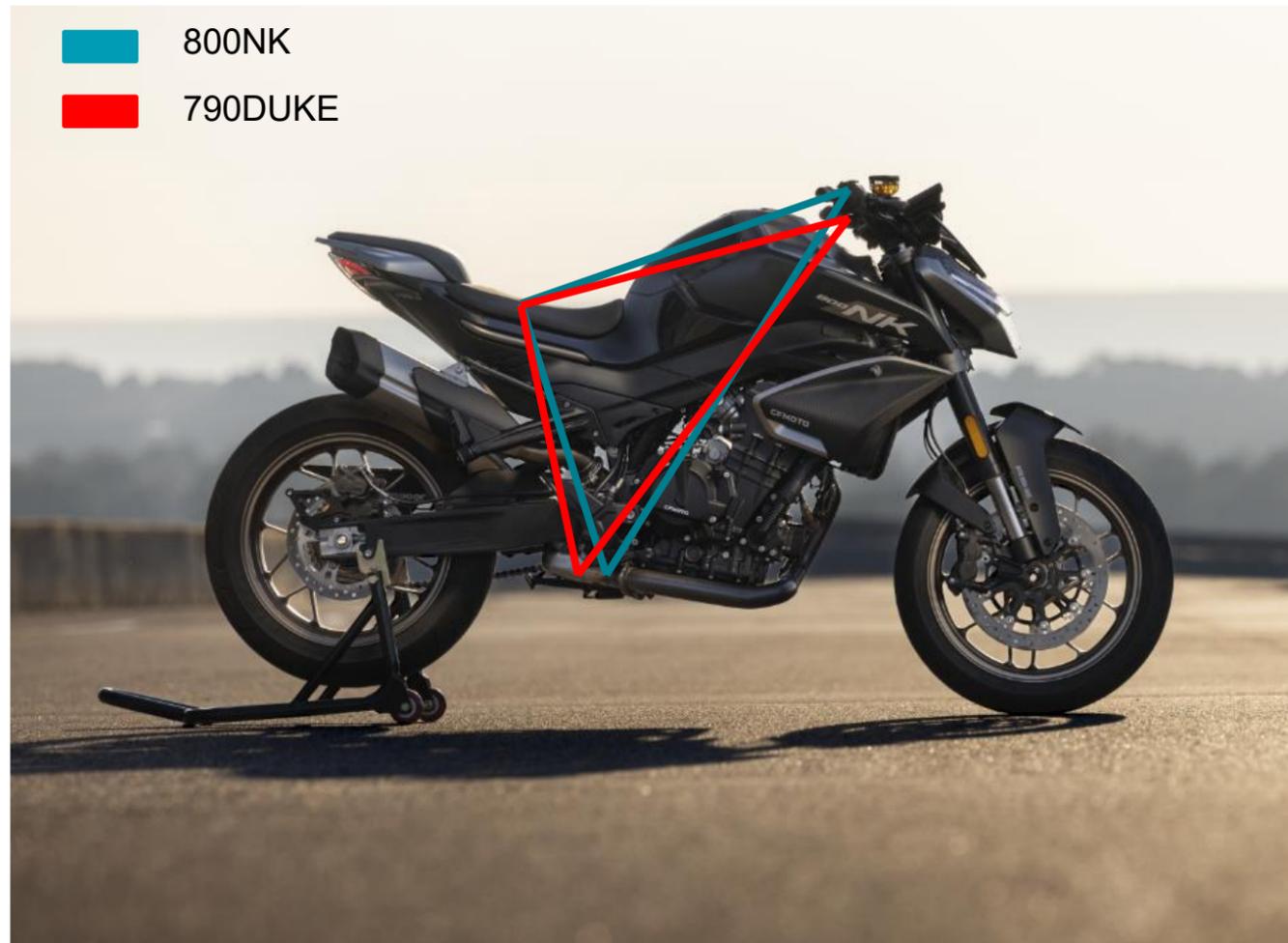
Body work		
Model	800NK	800NK ADVANCED
Length x Width x Height	2146mm × 818mm × 1120mm	
Seat height	800mm/820mm	
Min. Ground Clearance	150mm	
Front Rake	24.5°	
Curb Weight	186Kg	189Kg
Steering handle	Ordinary integrated handle	Aluminium alloy handle
steering damper	-	Base
QSS	-	Base
8" MMI	-	Base
Keyless start	-	Base
Front Brake	Double discs with J.Juan 4-piston Radial Mount Calipers	
	Front brake disc diameter: 320mm	
Rear Brake	Single disc with J.Juan 2- piston floating caliper	
	Rear brake disc diameter: 260mm	
Shock Absorber	KYB adjustable Inverted telescopic fork front and rear	
Tires	Front: MAXXIS Supermaxx ST2 120/70 R17	
	Rear: MAXXIS Supermaxx ST2 180/55 R17	
Tire Pressure	250kPa	
	280kPa	
Battery	12V11.2Ah	

Engine	
Model	288MW
Type	Parallel twin cylinder, liquid cooled, 4-stroke
Vlave train	Chain drive DOHC 8 valves
Displacement	799ml
Bore × Stroke	72mm × 55.2mm
Maximum Power	74kw/9000rpm
Maximum Torque	81N·m/8000rpm
Compression Ratio	12.7:1
Fuel Supply	EFI
Transmission	6-gear constant mesh transmission
Idle Speed	1400 ± 140r/min
Engine Oil Capacity	Oil change with filter: 2.8L
	Overhaul: 2.9L
Fuel Capacity	15L



# 3. Body work

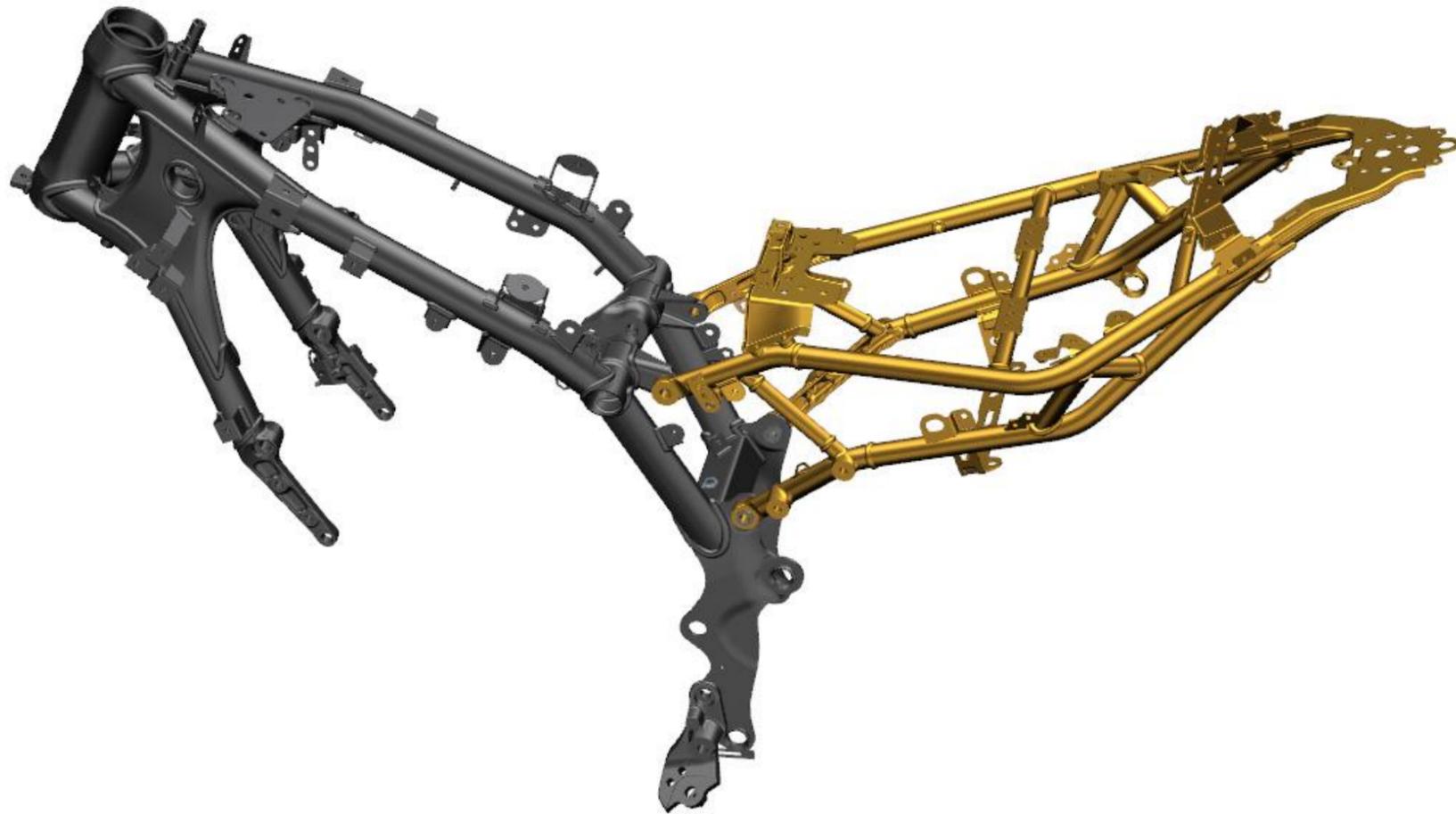
## 3.1 Exterior



For more the soft and comfortable,800NK's riding triangle is adjusted by setting a lower footpeg and higher handlebar compare with the 790DUKE.however, 800NK still retains some radical style.

# 3. Body work

## 3.2 Chassis

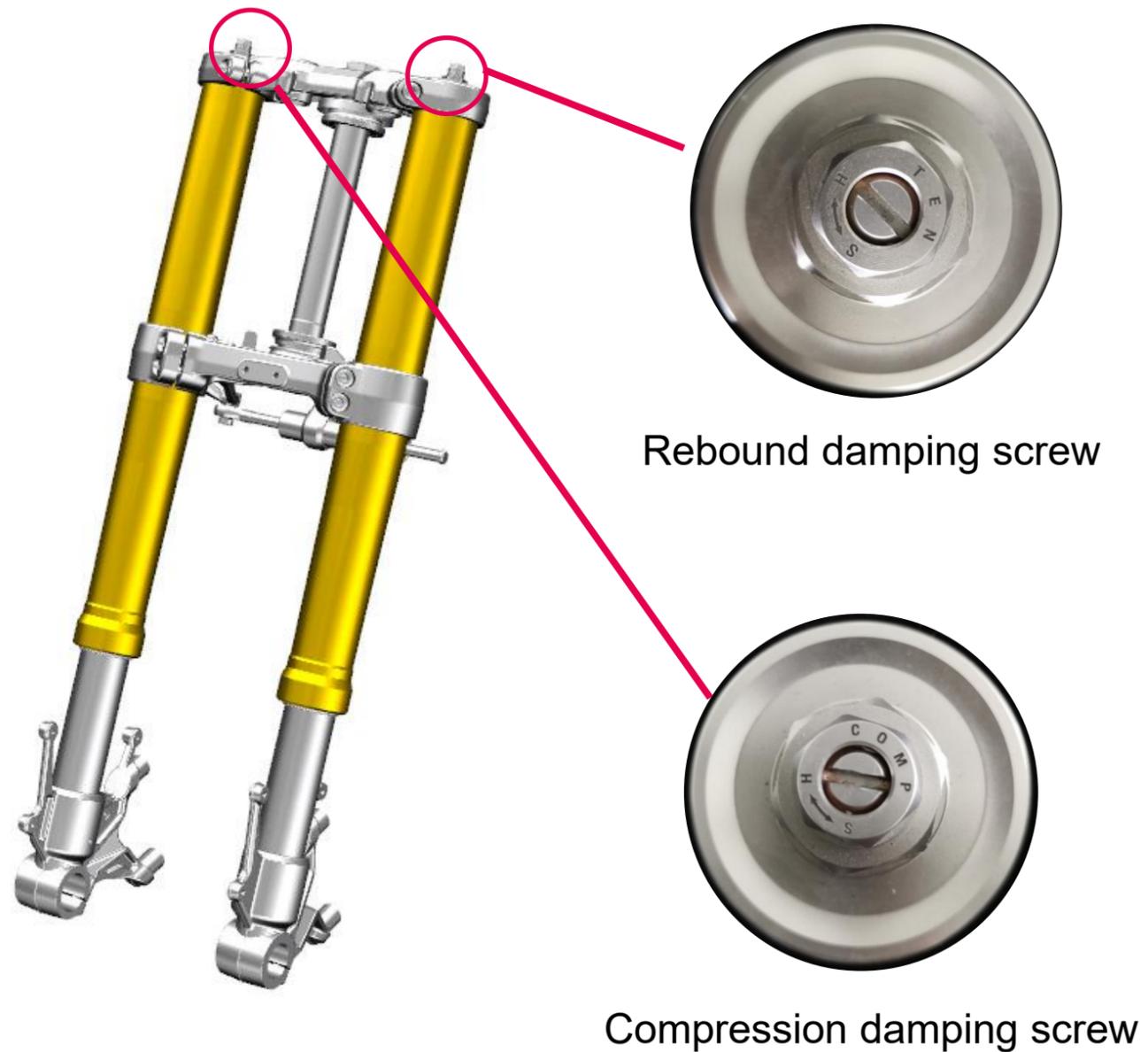


The chassis is developed with a purpose of rigidity and lightweight. The chassis is made by high-strength chromium-molybdenum alloy steel, characterized by high stiffness and thinner tube thickness.

The newly designed subframe is a kind of individual structure fixed on the chassis by 4 bolts, which is welded by the CR-MO alloy steel. The weight is only 4.75kg. The torque of the 4 bolts is 50N·m with thread locker.

# 3. Body work

## 3.3 Suspension



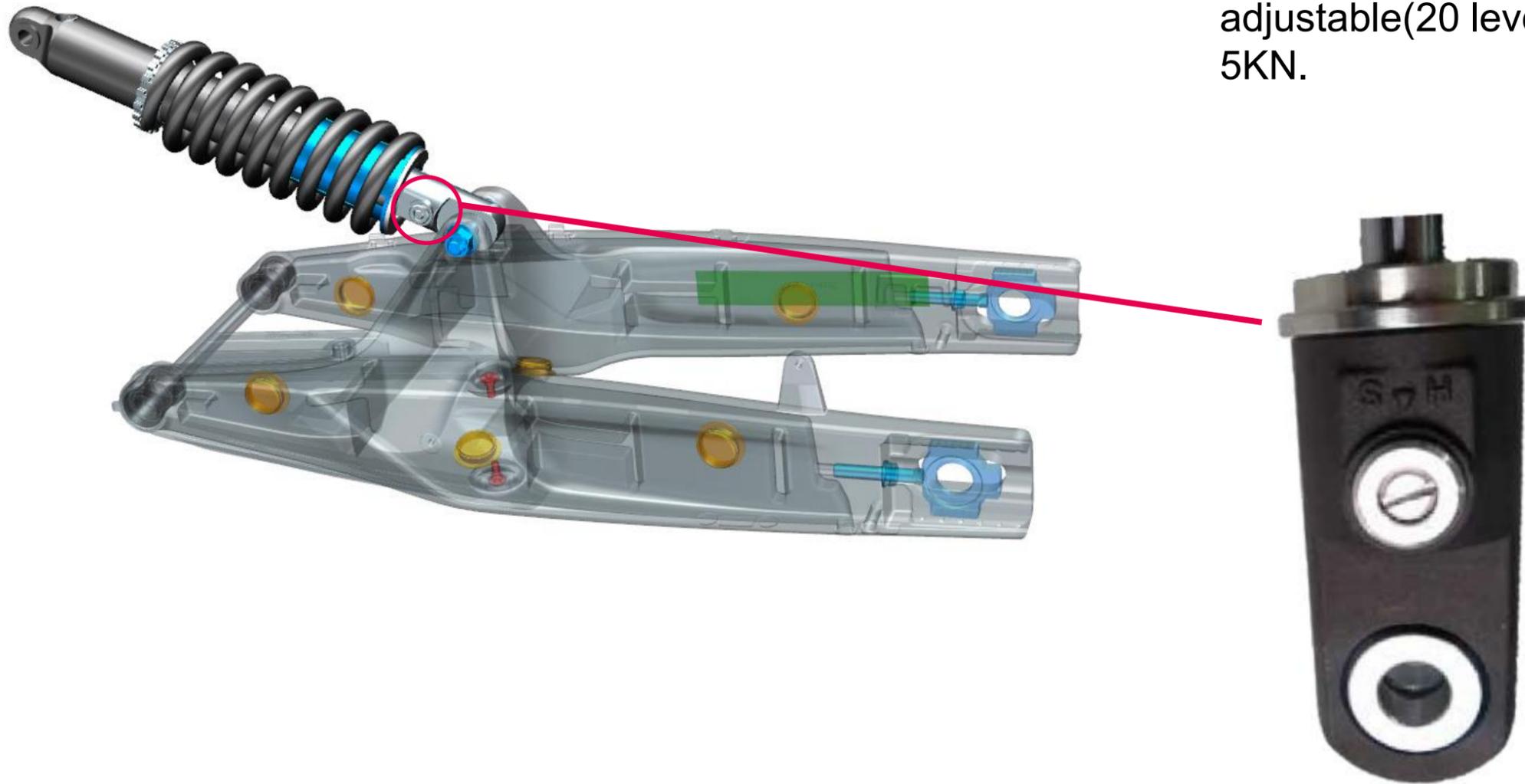
The suspension of the 800NK adopts KYB shock absorption, and the preload and damping of the front is adjustable.

- rebound damping adjustable for 20 clicks on LH
- compression damping adjustable for 20 clicks on RH

Adjusting the damping clockwise or counterclockwise with a flat screwdriver.

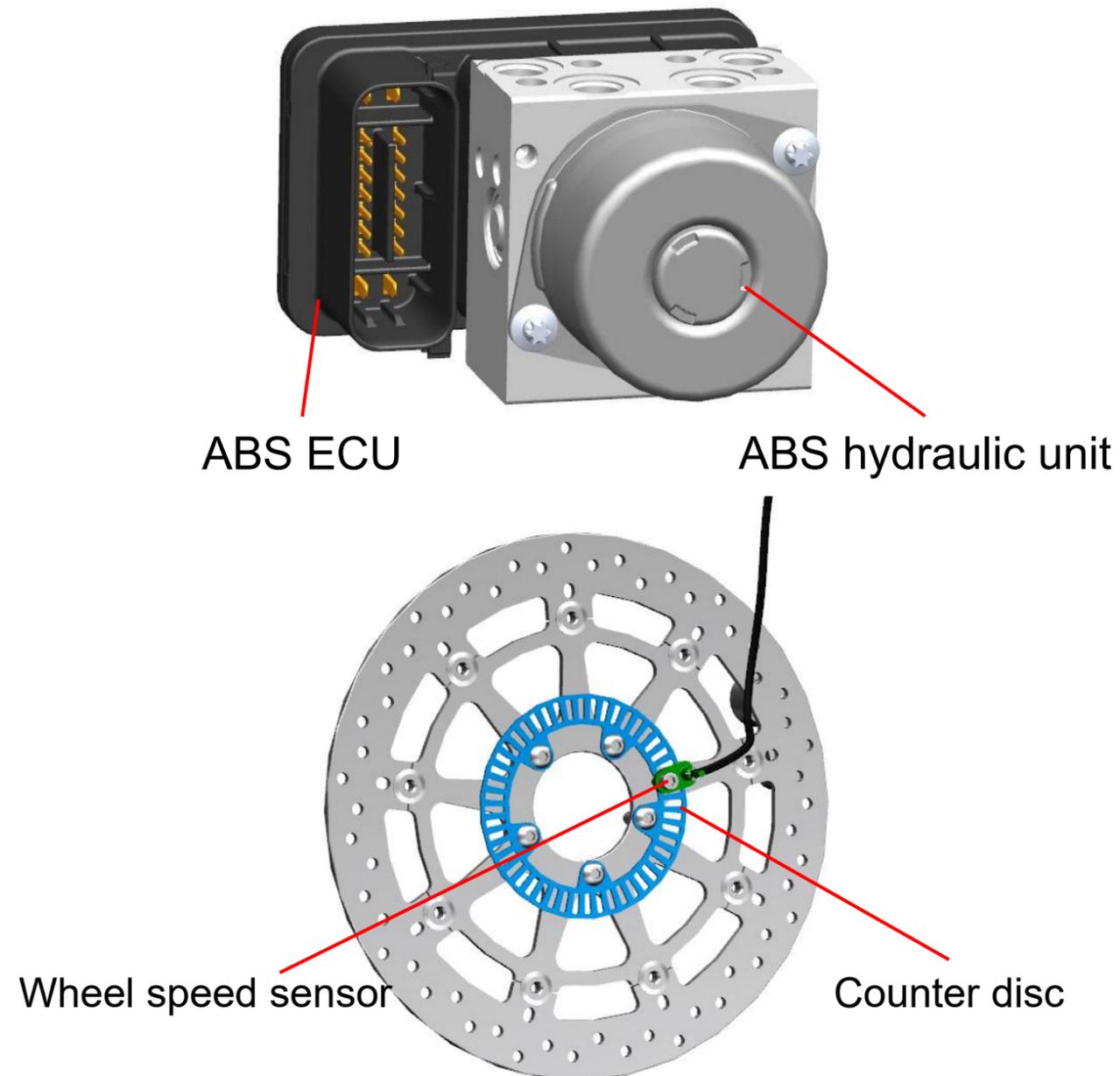
# 3. Body work

## 3.3 Suspension



## 3. Chassis

### 3.4 Braking system

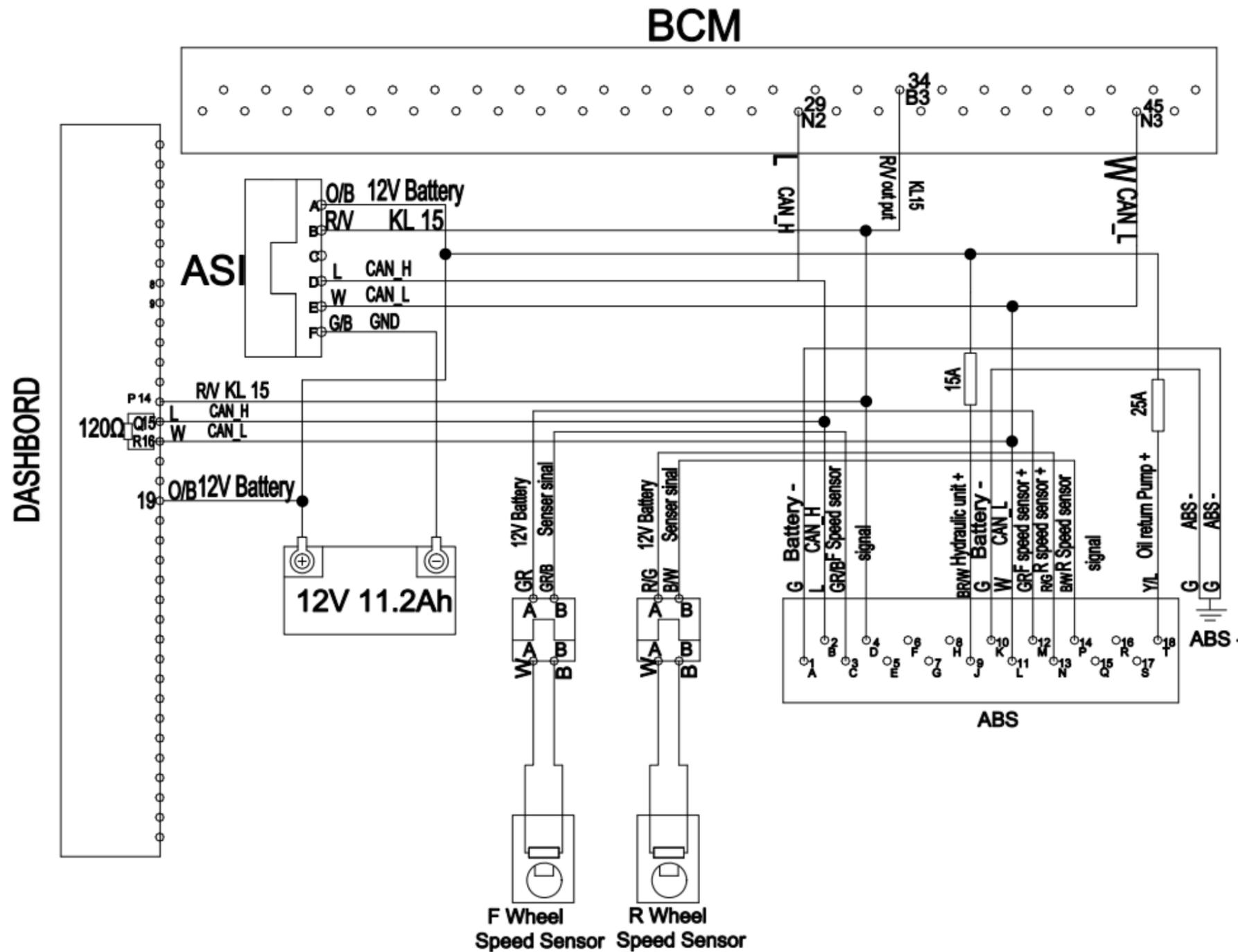


The ABS used on 800NK is same with what is used on 800MT on hardware. The one-piece **BOSCH ME17 ABS ECU** and ABS hydraulic unit is not repairable, therefore it is very importance that the service procedures for brake fluid replacement and air bleeding are followed.

Besides the ABS ECU and ABS hydraulic unit, the ABS system consists of wheel speed sensors and counter discs on both front and rear wheel that detect wheels rotational speed. They feed their information back to the ABS ECU by hard wire. If a wheel is found to be at risk of locking up, the ABS ECU will activate the ABS hydraulic unit to reduce the braking pressure applied to the brake calipers by the rider. This controls wheel speed within a safe range and preserves the gyrostatic effect of the wheels, keeping the bike stable even on varying surfaces.

# 3. Chassis

## 3.4 Braking system



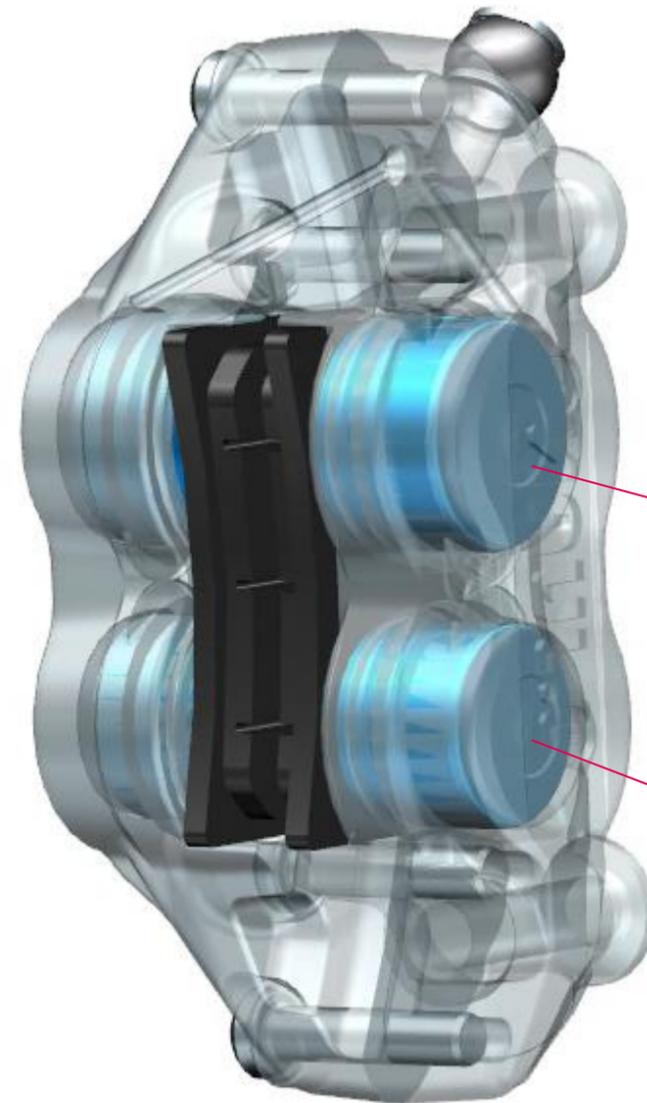
The dashboard received the wheel speed signal sent by ABS ECU via CAN bus to calculate the bike speed. The ABS ECU pick up the front wheel speed signal priority to display the bike speed, if the front wheel speed signal lost or abnormal, the ABS ECU will send the rear wheel speed signal to the dashbaord as a option.

This is the diagram of braking system, and for 800NK, when the ABS starts, the signals are transmitted to the ASI(Auxiliary signal indicator) through the CAN bus, and the indicators on both sides of the dashbord flash red light to remind the rider ABS to be triggered.



## 3. Chassis

### 3.4 Braking system

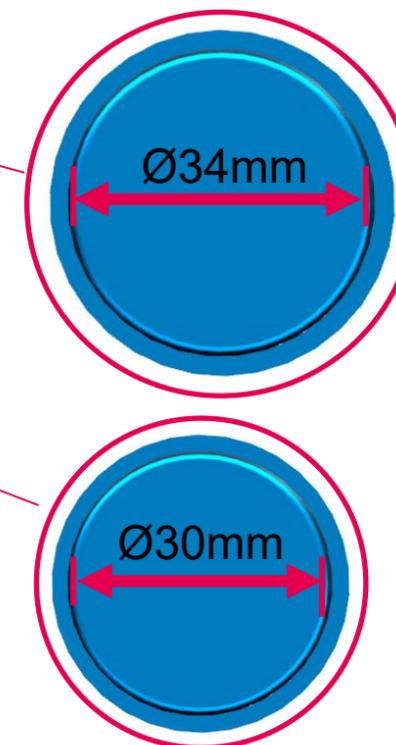


The radially mounted front **J.Juan<sup>®</sup> caliper** works with double **320mm** floating brake disc via two **Ø34mm** and two **Ø30mm** pistons, provides powerful braking force and lighter under spring weight.

The rear braking uses a single piston floating caliper with a 260mm single disc.

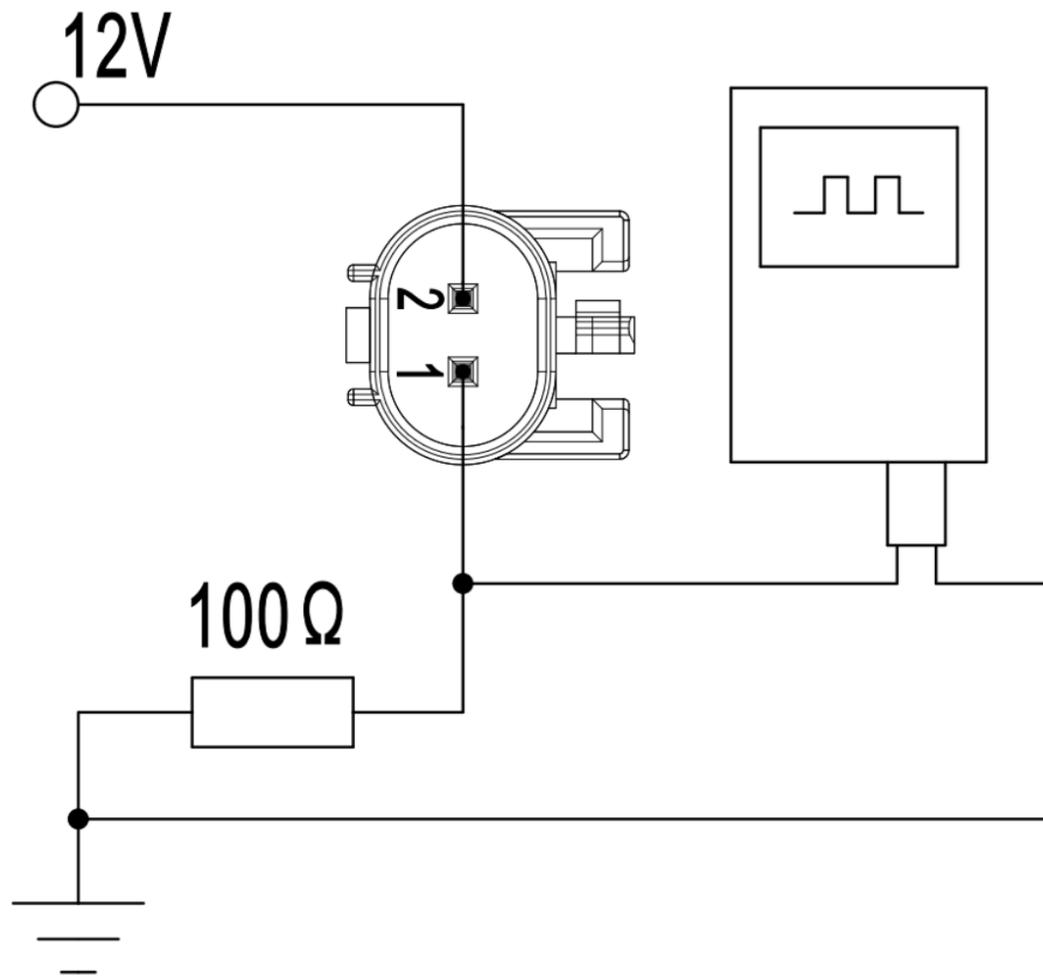
It is recommended to always use the original CFMOTO brake fluid--**DOT5.1**

800NK use J.Juan<sup>®</sup> caliper, works with double **320mm** floating brake disc via two **Ø34mm** and two **Ø30mm** pistons. Make sure always use DOT5.1 brake fluid.

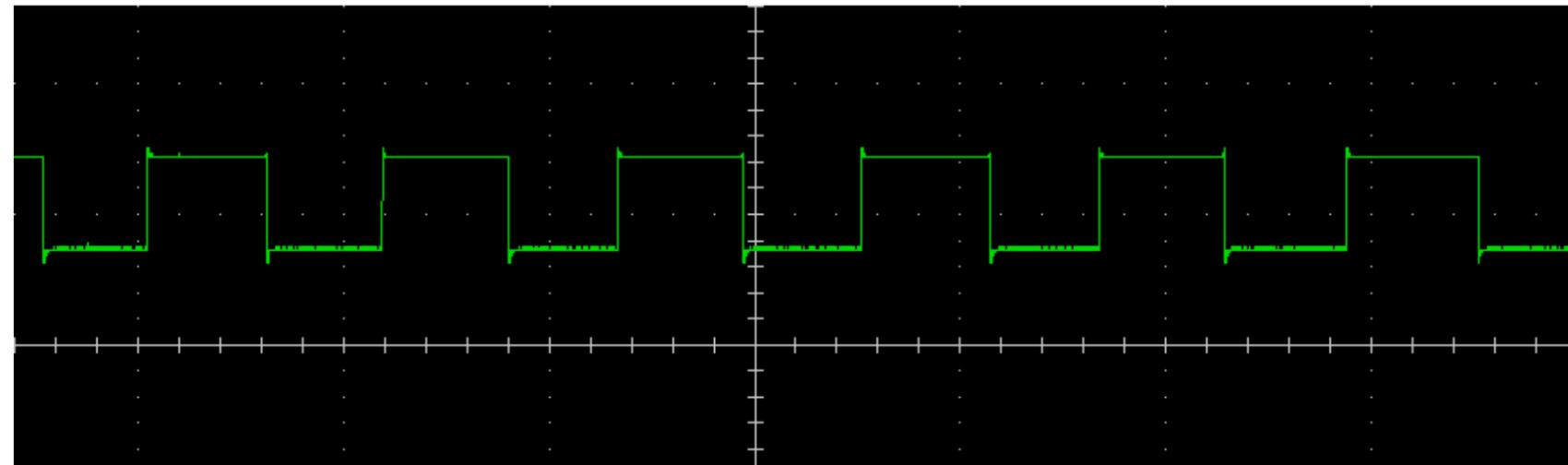


## 3. Chassis

### 3.4 Braking system



The core element of the wheel speed sensor is a Hall element, but what different with other Hall element sensors (TPS, for example) is that the sensor here only has 2 terminals instead of 3 terminals. The test method of the wheel speed sensor on motorcycle is as shown in diagram. Turn the wheel after connect the 100Ω pull-down resistor and oscilloscope, the signal generated by the Hall element will display on the oscilloscope. Screenshot as below can be taken as a reference.



## 3. Chassis

### 3.5 Tires

#### Tires

Front: MAXXIS Supermaxx ST2 120/70 R17

Rear: MAXXIS Supermaxx ST2 180/55 R17

#### Tire pressure

Front: 250kPa

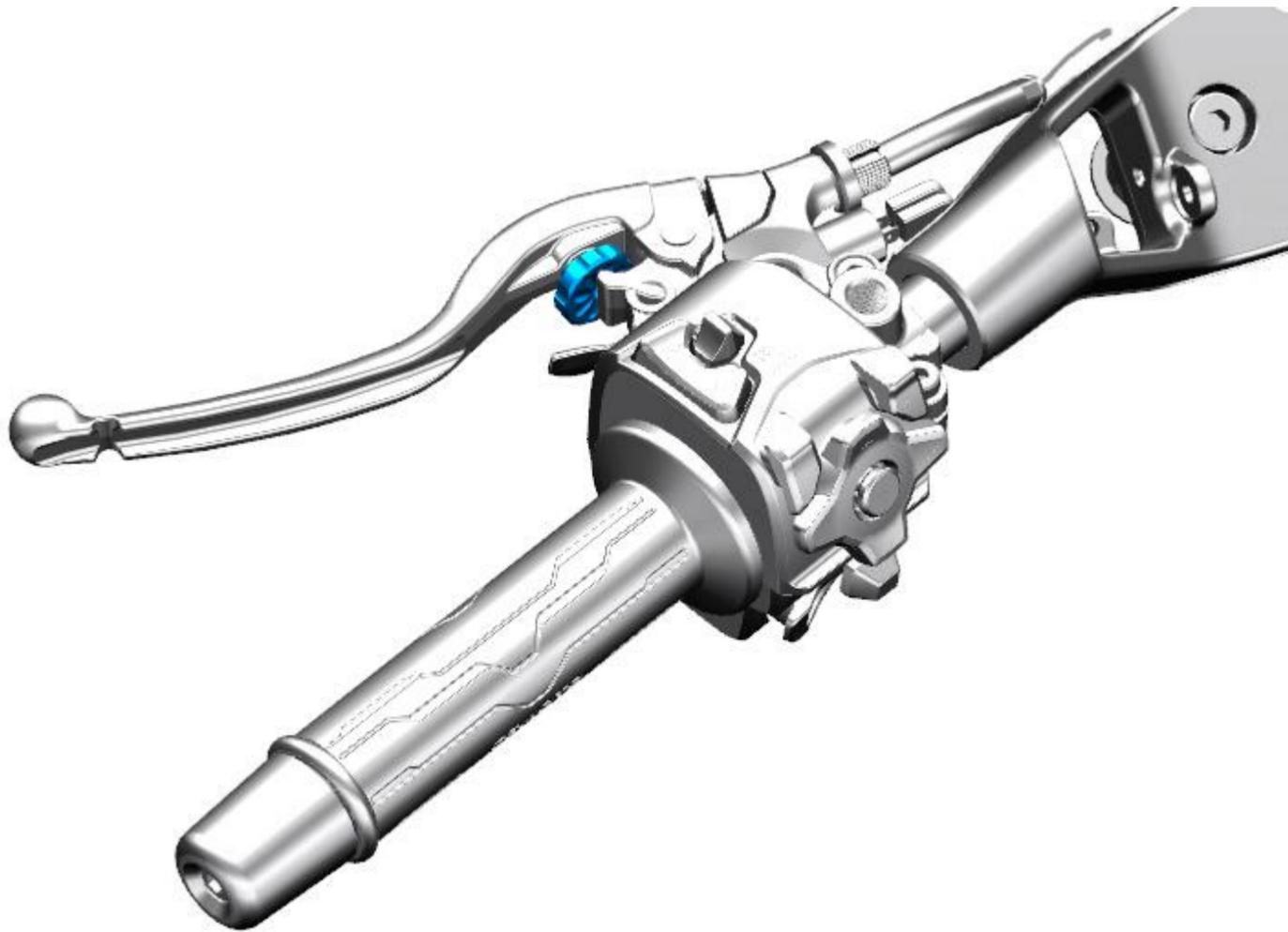
Rear: 280kPa

The all new tire is developed by MAXXIS, which aims at provides agile handling and high grip both on street and tracks. The shape of the MAXXIS tyre is more sporty, while the sleeker shape also provides flexibility for commuting. While ensuring a certain degree of durability, MAXXIS also provides a high Angle limit, as long as there is no fierce riding, grip is very good, in the paved road for friction travel, riding on mountain road can be assured to boldly go to the corner with a larger Angle if the use of MAXXIS to riding on the mountain road, Note that you can experience the pleasure of a large Angle of overturning as you slow down early when entering the corner and accelerate slowly when out of the corner.

800NK new tire was manufactured by MAXXIS Supermaxx, same front and rear use 17inchs wheel size. Can provides agile handling and high grip both on street and tracks.

## 3. Chassis

### 3.6 Handlebar



800NK both the clutch and brake lever are each adjustable now in order to fit all size riders.

# 4. Engine

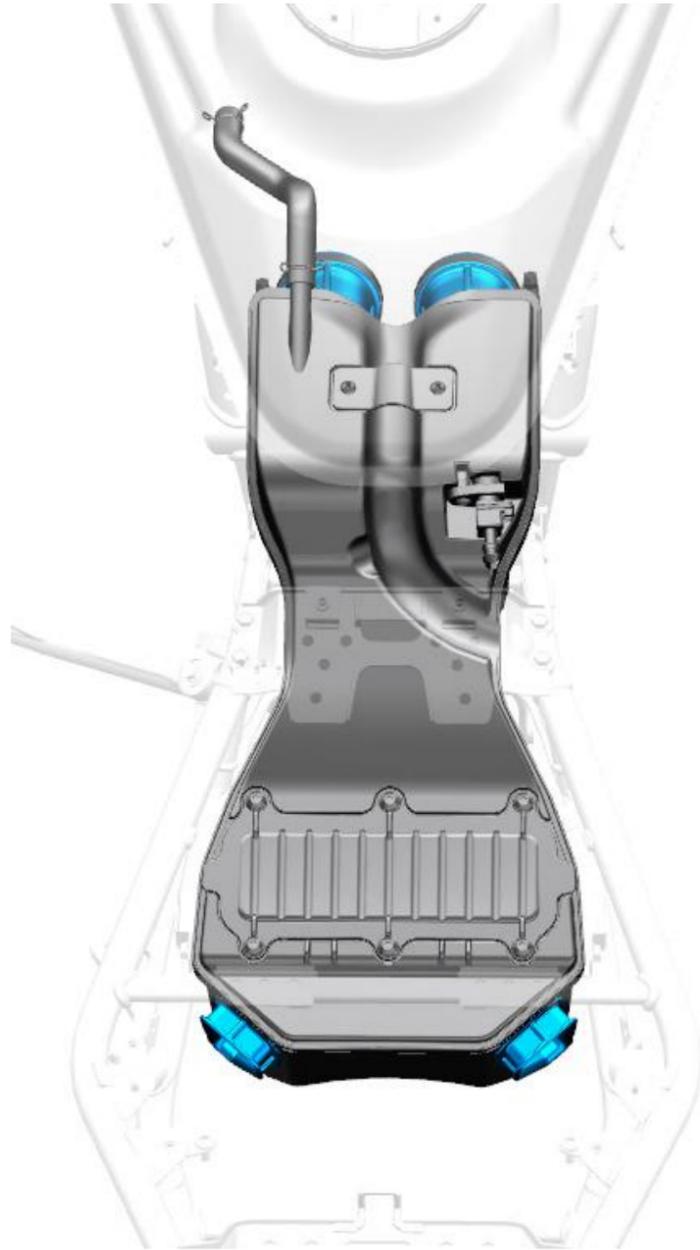
## 4.1 Introduction

The 288MW engine generates 100.6 Hp and 81N·m, it stands for Liquid Cooled 8 valve compact and it is the most compact twin in it's class. The engine was tuned for torque, giving it a lot of power. The open deck Nikasil cylinders are integrated into the horizontally split crankcases made of high pressure cast aluminium, allowing a decrease of the wall thickness for overall engine weight reduction.



# 4. Engine

## 4.2 Intake & Exhaust

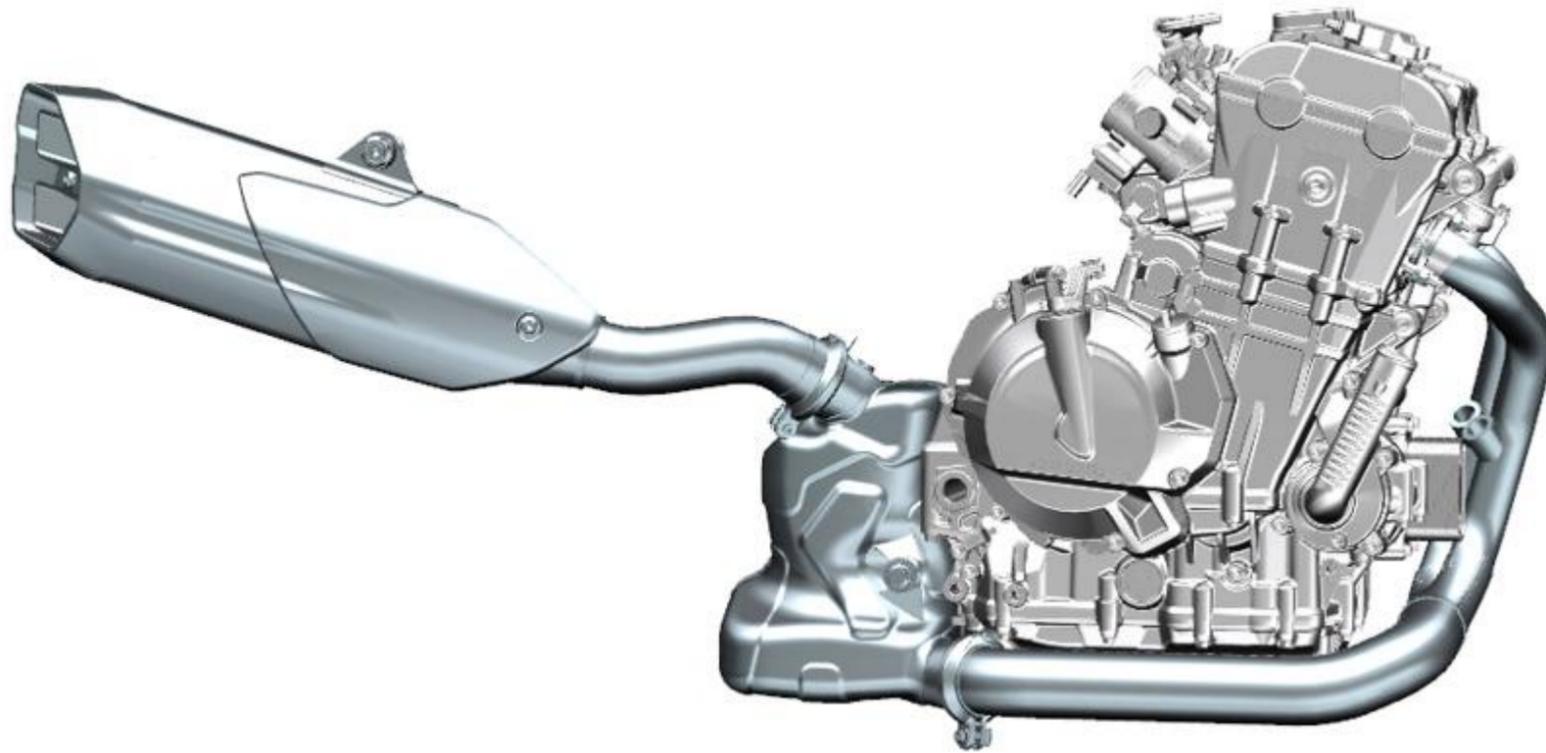


The air filter box is located just under the Rider seat, which is easy to access by remove the saddle and battery for maintenance friendly.

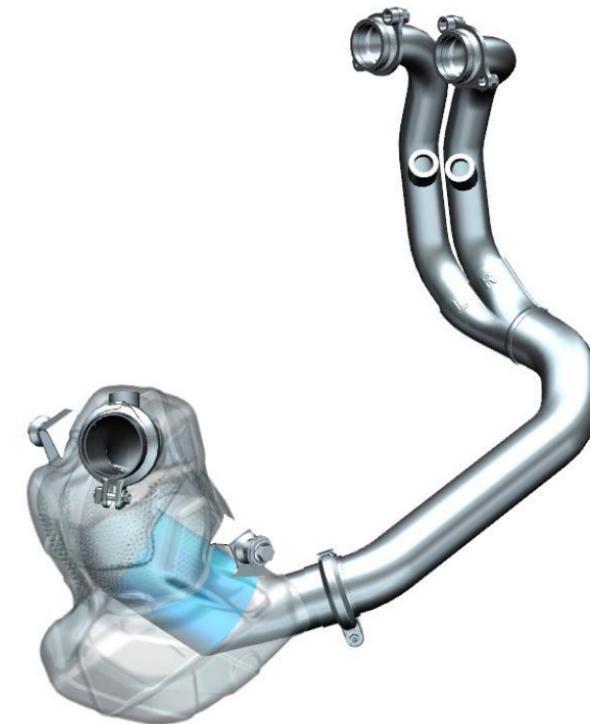


# 4. Engine

## 4.2 Intake & Exhaust

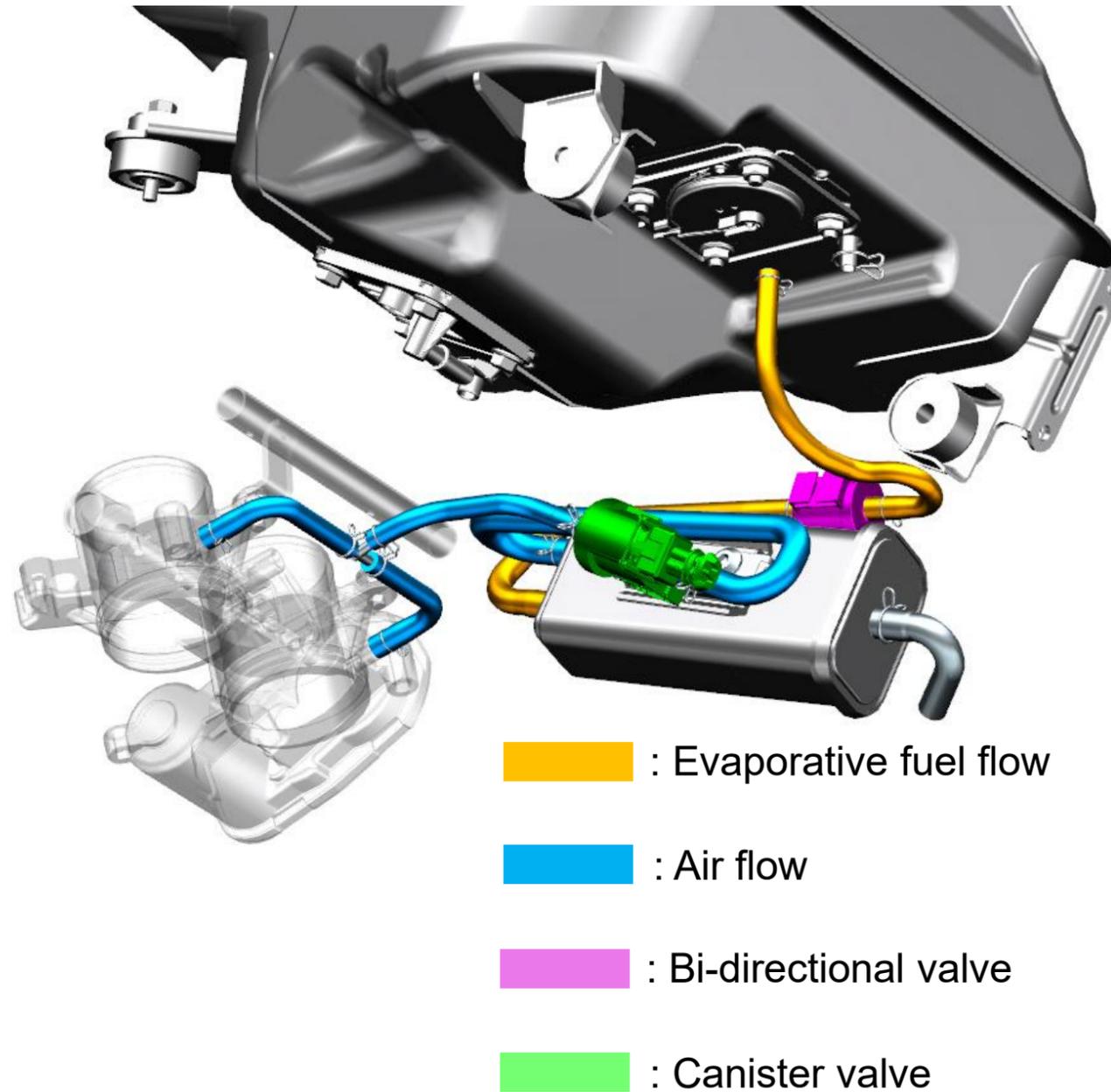


The exhaust pipes are routed through the bottom of the engine, where the catalytic converter is under the oil pan. The exhaust gas are monitored by the ECU via oxygen sensors and then the harmful emissions are converted to harmless gas by the catalytic converter. The dual exhaust pipes make the engine torque output linear and smoother.



# 4. Engine

## 4.2 Intake & Exhaust

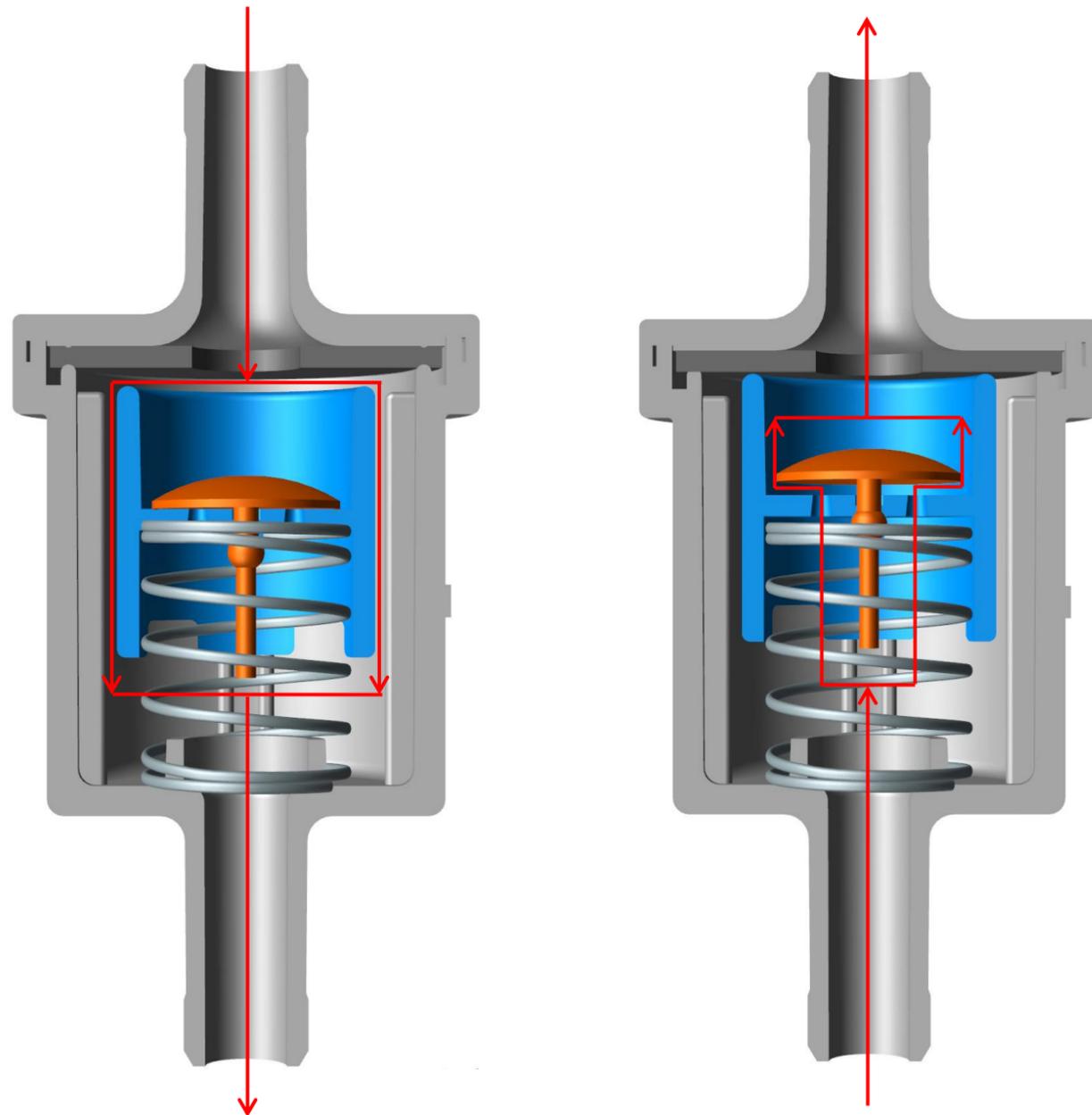


In order to comply with emission standards of some regions, an activated carbon canister is fitted to the 800NK.

Evaporative fuel from the fuel tank are adsorbed by the canister and under some certain running conditions the canister valve is actived by ECU, the emissions are drawn into the throttle body to be burnt.

# 4. Engine

## 4.2 Intake & Exhaust



Note the install direction of the bi-directional valve, the arrow should point from fuel tank to the canister.

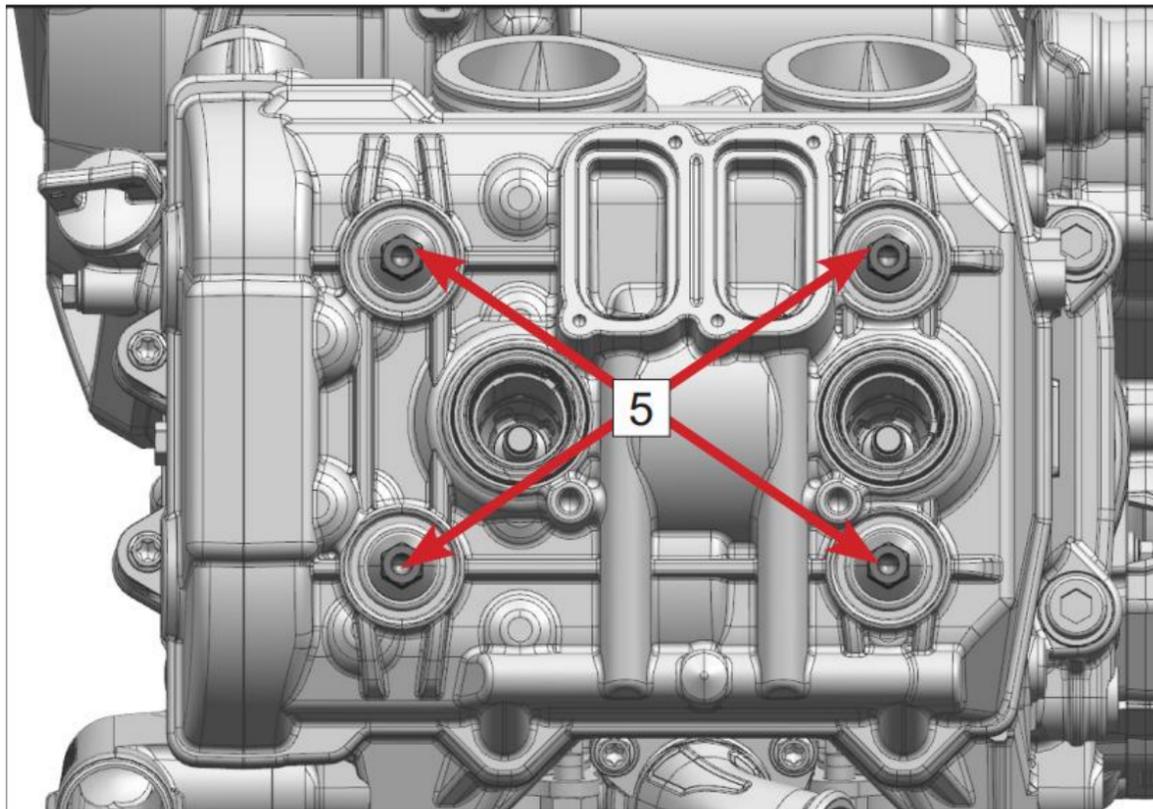
Even the bi-directional valve can be opened on both direction to balance the pressure on the fuel tank, but the opening pressure is different:

- ① In the arrow direction, where the evaporative emission flows from fuel tank to canister, the valve opening pressure is higher as it needs to overcome spring elasticity, that can avoid too much fuel flows to canister when the bike tumble.
- ② With fuel consumed and fuel level decrease, there will be a vacuum inside the fuel tank, air will from canister to fuel tank to balance the pressure. The valve opening pressure is lower now as it just need to left the rubber washer to open the valve.



# 4. Engine

## 4.3 Cylinder head



Remove screws 5 with gaskets. Take off the valve cover with the valve cover seal. The 8 valve DOHC cylinder head contains twin chain driven camshafts and two spark plugs (one per cylinder). The steel valves are actuated by DLC (Diamond-Like Carbon) coated finger followers, which allow the use of smaller cams to reduce the rotating masses on the camshafts, but without losing opening time on the valves. To keep the timing chain tensioned, the engine uses a hydraulic chain tensioner. The secondary balancer shaft which is actuated by the exhaust camshaft sits between the two camshafts.

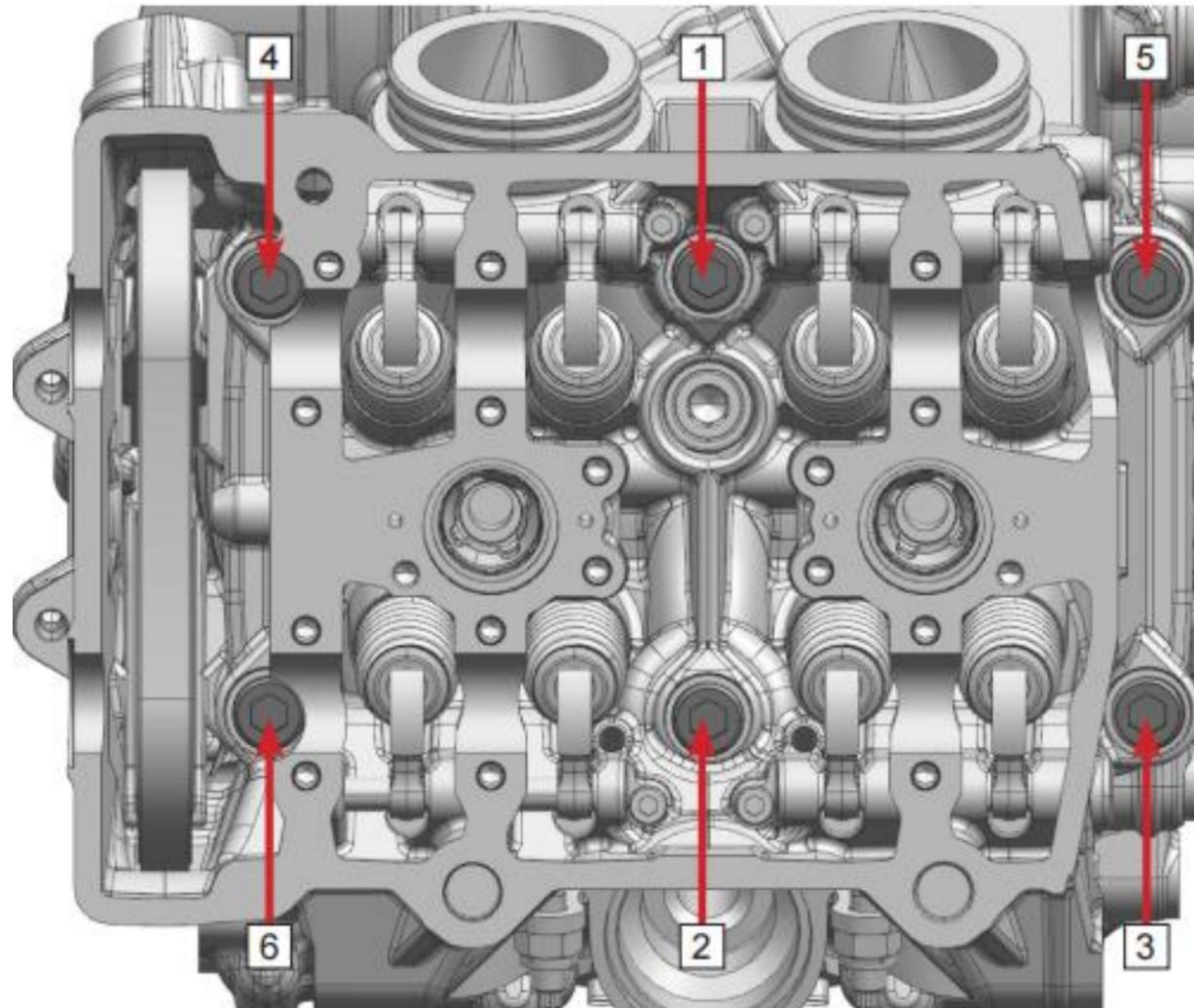
➤ Valve clearance(cold):

IN: 0.08~0.15mm

EX: 0.15~0.20mm

# 4. Engine

## 4.3 Cylinder head



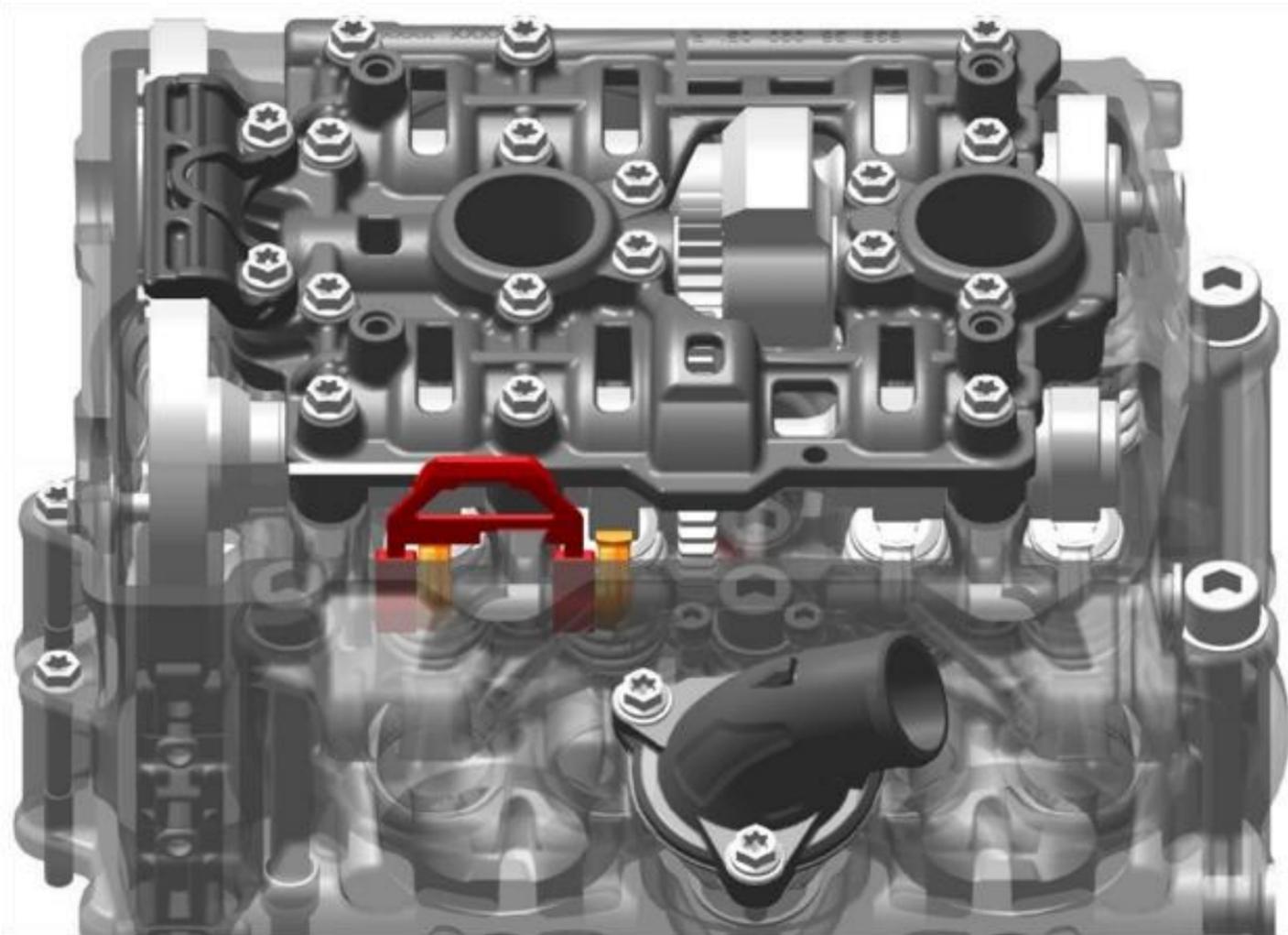
»NOTE:

The six M11x1.5 cylinder head screws must be replaced with new ones every time the cylinder head is disassembled and always use new cylinder head screws.

Screw, cylinder head	M10x1.25	<p>Tightening sequence: Observe tightening sequence.</p> <p>1st stage 5 N•m</p> <p>2nd stage 15 N•m</p> <p>3rd stage 90°</p> <p>4th stage 90°</p> <p>Collar greased / thread oiled</p>
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# 4. Engine

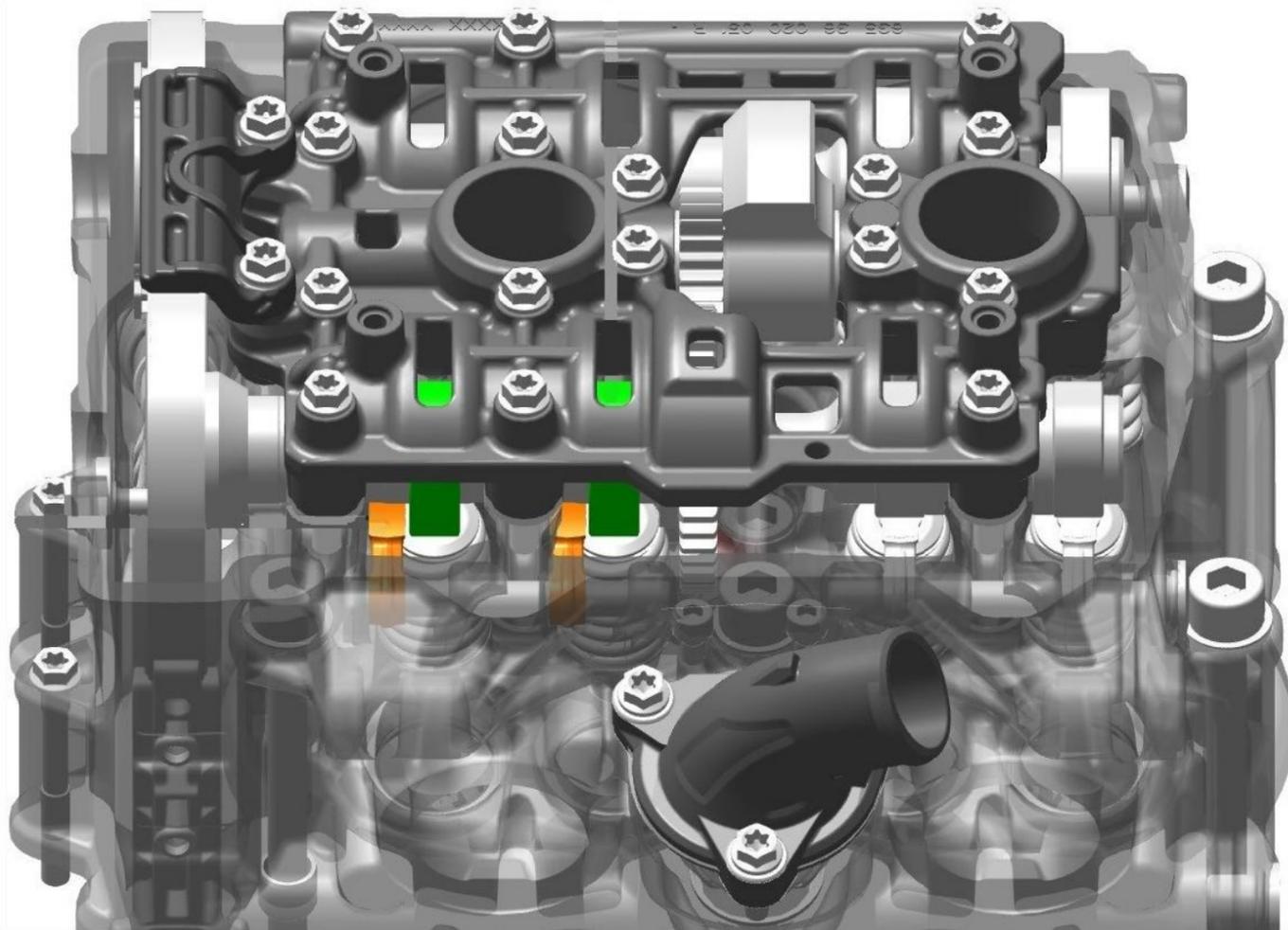
## 4.4 Camshafts



To avoid any damage to the camshaft bridge (such as warping or deformation), before loosening the retaining screws, remove the tensioner first, the pressure created by the exhaust valves on the camshaft exhaust cams(next page,green) in cylinder two must be relieved. To do this, set cylinder two to TDC, remove the security clip(red) , and slide the cam followers (yellow) towards the camshaft sprocket.

# 4. Engine

## 4.4 Camshafts

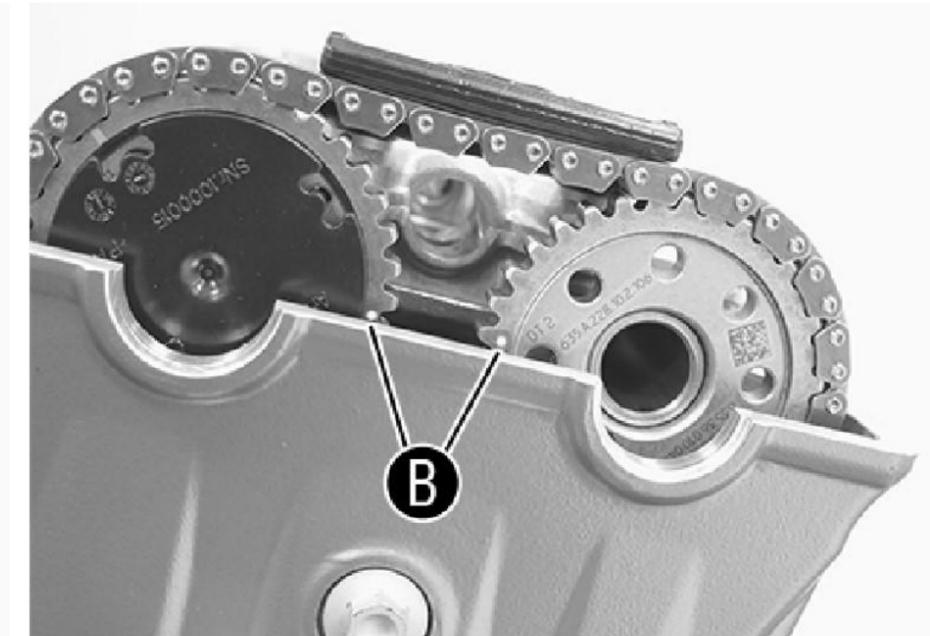
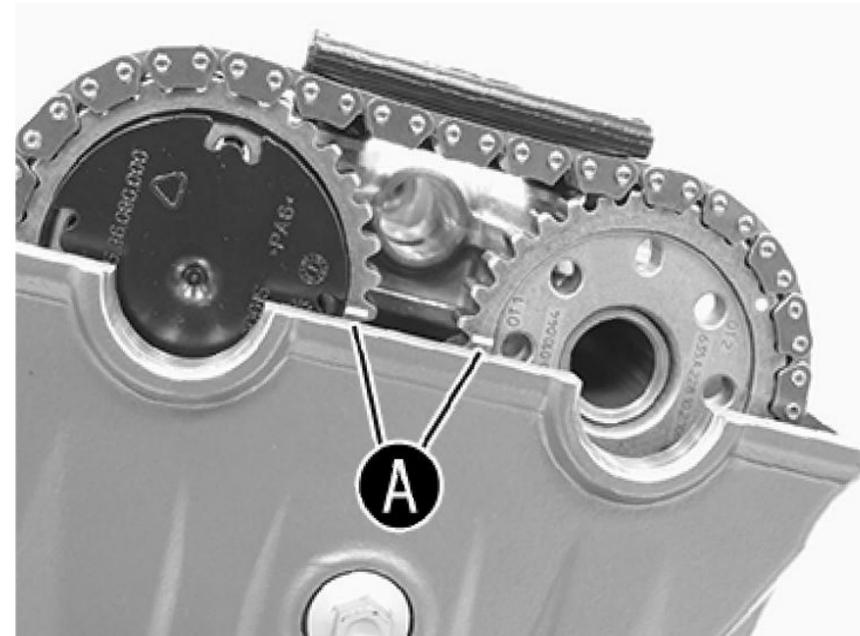


### PROCEDURE:

Remove the security clip and slide the cam followers towards the camshaft sprocket.

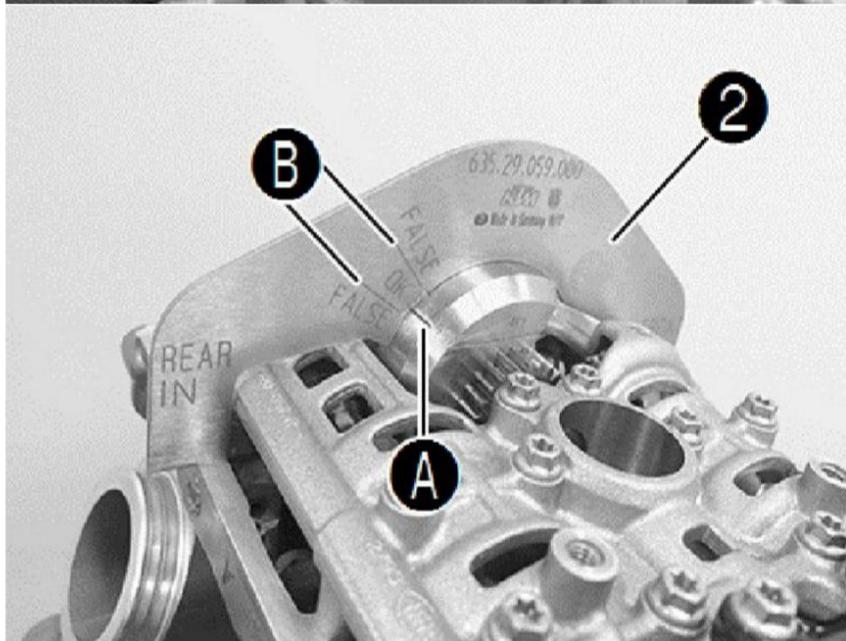
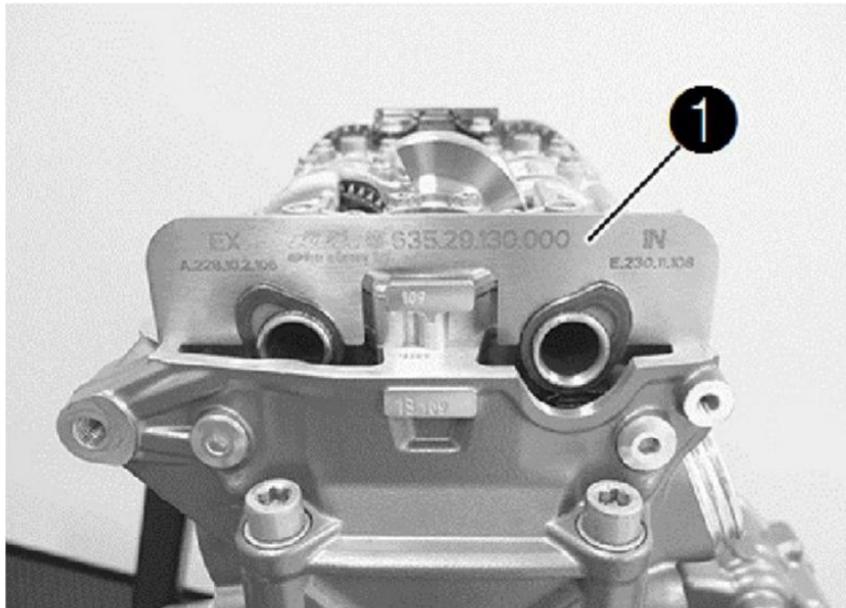
In timing position, the mark "IN" and "EX" on the camshaft should towards to the intake and exhaust side respectively and parallel with the cylinder head top surface, meanwhile the mark  $\sim|H$  on the crankshaft should align with the slot mark of the timing view on the clutch cover.

Remove camshaft bridge and continue, finally remove the timing chain, with engine disassembly as described in the repair manual.



# 4. Engine

## 4.4 Camshafts



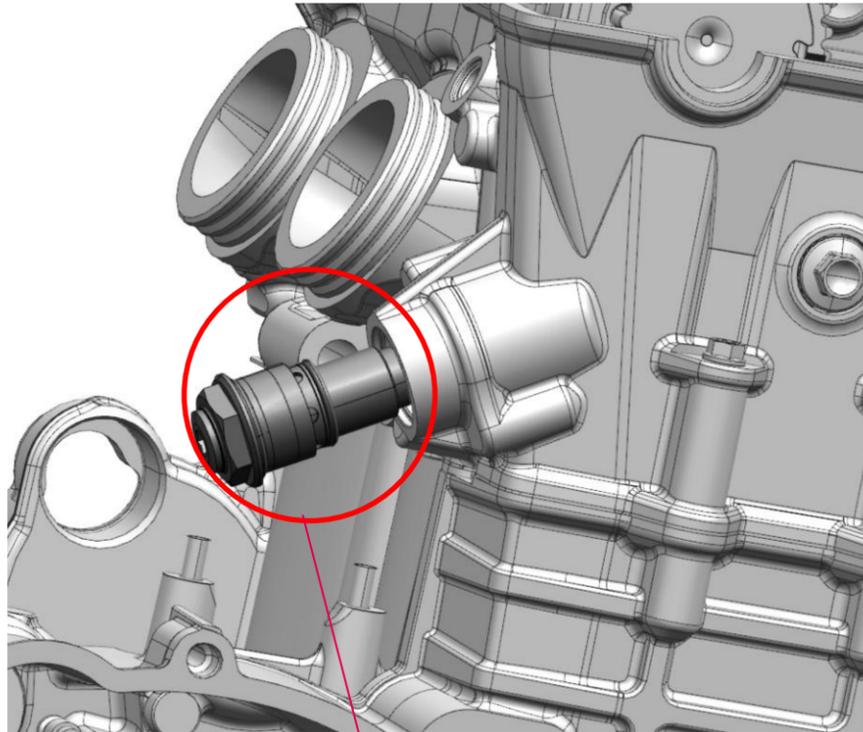
After installing the bridge, the camshaft timing and the upper balancer shaft timing must be checked using the special tools:

- ①ST14 for camshafts and
- ②ST13 for balancer shaft.

The (A)mark on the balancer shaft has to be in between the two lines(B) marked on the special tool.

## 4. Engine

### 4.5 Install hydraulic tensioner



When installing the hydraulic tensioner, it must be compressed, with 2~3mm of compression reserved. After installation, tap moderately with  $\Phi 8$ mm iron bar from the central screw hole to release the hydraulic tensioner. This position is necessary for installation.

If the timing chain tensioner is now pressed in once more (while it is installed) and then pulled out no more than halfway (preventing it from coming out fully), the latching system locks and the timing chain tensioner can no longer be compacted; this function is necessary to ensure sufficient tension of the timing chain, even at low oil pressure.

# 4. Engine

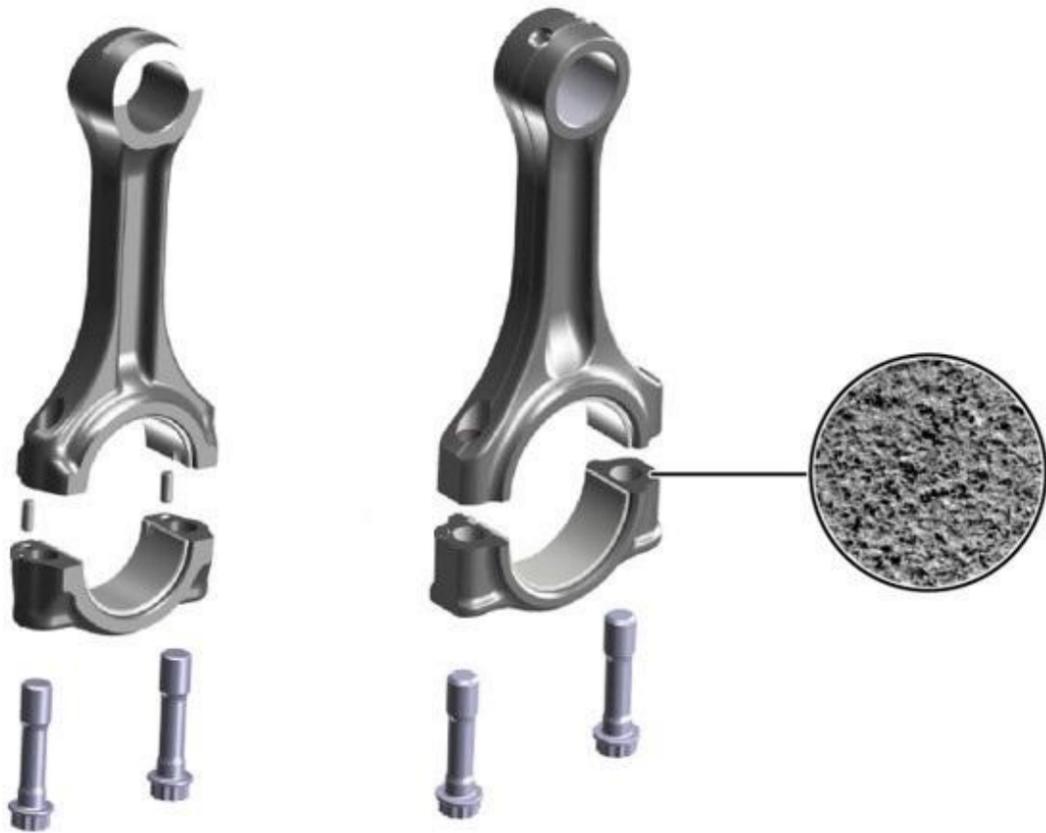
## 4.6 Piston



Forged aluminium pistons with three piston rings, combined with a chrome ceramic coated piston pin allow for reduced piston weight and thus reducing reciprocating mass. Reduced reciprocating mass results in a faster revving engine and allows for a lighter and smaller crankshaft.

# 4. Engine

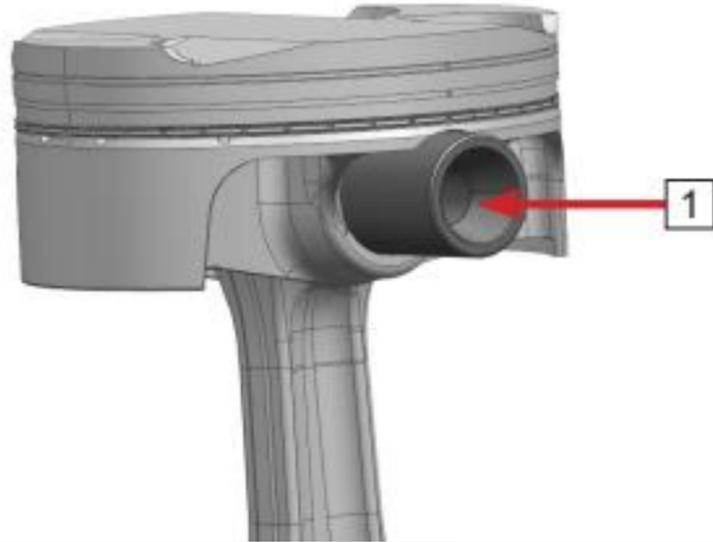
## 4.6 Piston



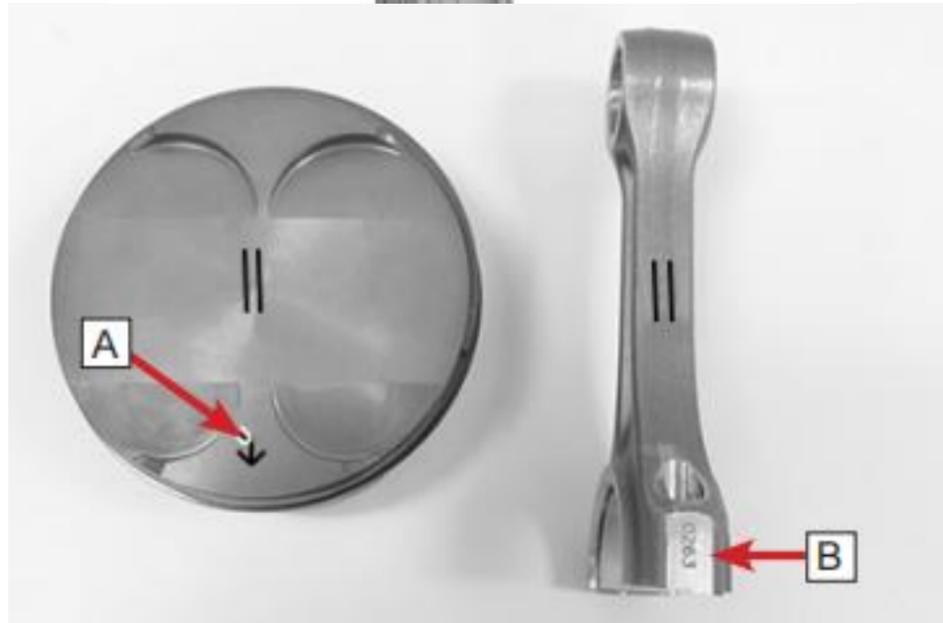
The cracking connection rod has the advantages of accurate positioning, high reduction degree, more reliable operation of the connecting rod shoe and longer service life.

# 4. Engine

## 4.6 Piston



Mount piston pin (1).  
The piston marking (A) and lettering (B)  
of the connecting rod point forward after assembly.



# 4. Engine

## 4.6 Piston



The inertia generated by the movement of the piston over the circlip can compress it and remove it from its place if it is installed incorrectly, generating serious damage to the engine. The open end of the 'circlip' must be installed upwards; in this way the inertia of the movement instead of compressing the 'circlip' expands it by securing it inside the installation slot.

### NOTE:

If you tighten the mating surfaces in the wrong direction, the complete connecting rod must be replaced!

## 4. Engine

### 4.6 Piston



The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.

This number must be installed towards the front of the engine (exhaust side) to easily remember the installation position. Mating surfaces are matched perfectly when installed correctly.

Screw, conrod bearing M8

1st stage: 5 N•m (3.7 lbf•ft)

2nd stage: 15 N•m (11.1 lbf•ft)

3rd stage: 90°

Collar and thread oiled

## 4. Engine

### 4.6 Piston

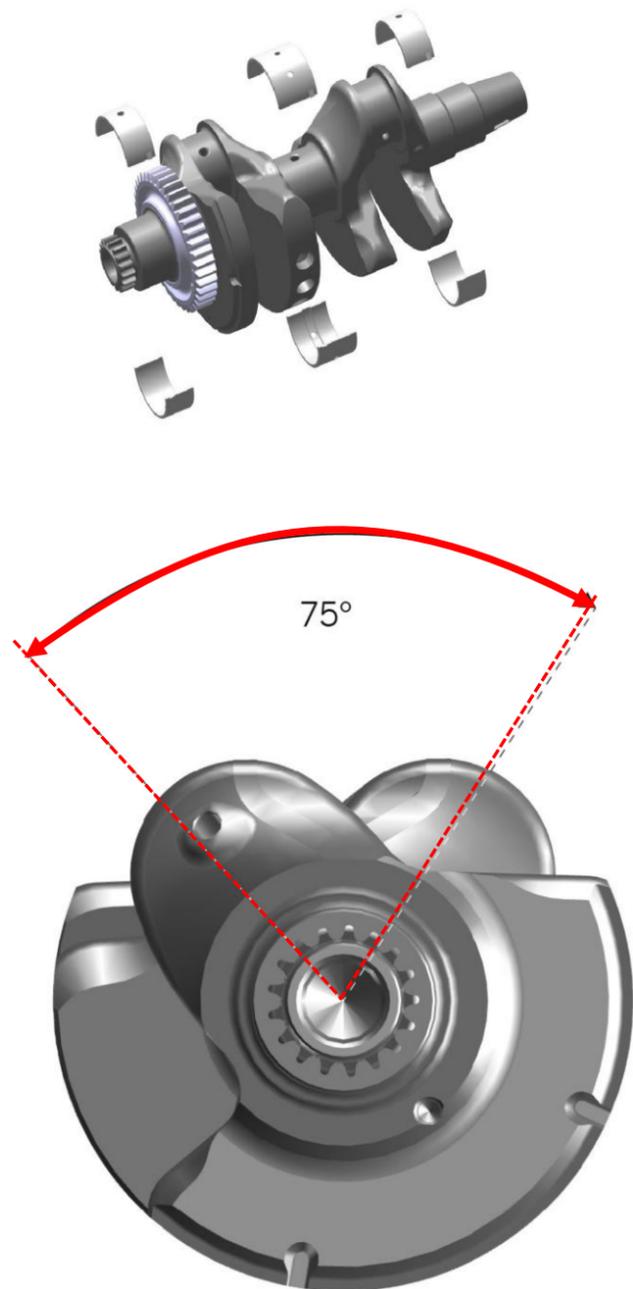
When a new connecting rod is installed, the mating surfaces must be cleaned with a wire brush to eliminate any metal residue produced during the cracking process. When installing the connecting rods, the mating surfaces must be free of oil to achieve a perfect fit between the two surfaces.

If you tighten the mating surfaces in the wrong direction, the complete connecting rod must be replaced!



## 4. Engine

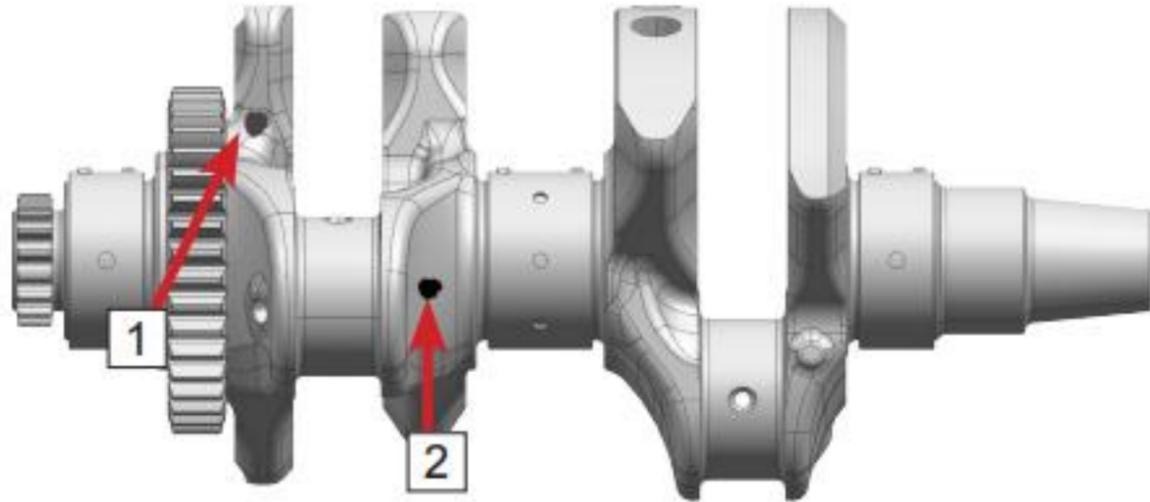
### 4.7 Crankshaft



The 75° forged one-piece crankshaft with plain bearings is designed to be light and to reduce the rotating masses inside the engine, allowing the engine to change the RPM's faster and therefore improving the throttle response when accelerating or decelerating. Because of the 75° connecting rod journals angle, the ignition system fires from compression TDC in cylinder one to cylinder two every 435°, and from compression TDC in cylinder two to cylinder one every 285°, creating a similar power delivering and sound characteristic as the V-twin engine the.

# 4. Engine

## 4.7 Crankshaft



Selecting the main bearing shells

New crankshaft

Select the new bearing shells according to color coding (1)

Color coding (2) refers to the conrod bearing.

Used crankshaft

Measure all main bearing shells and select the new bearing shells accordingly.

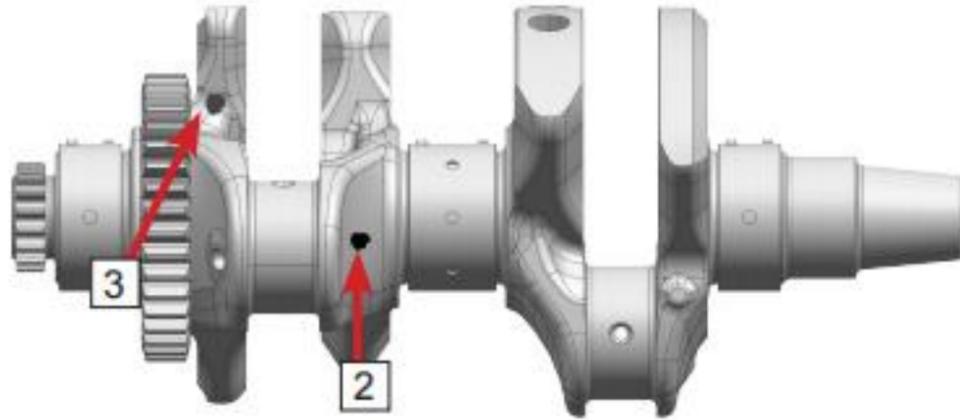
### Crankshaft-main bearing diameter

Blue:37.985mm~37.995mm

Red : 37.995mm~38.005mm

## 4. Engine

### 4.7 Crankshaft



#### New crankshaft

Select the new bearing shells according to color coding(2)

Color coding (3) refers to the conrod bearing.

#### Used crankshaft

Measure all main bearing shells and select the new bearing shells accordingly. The matching method is showed as a chart chart.



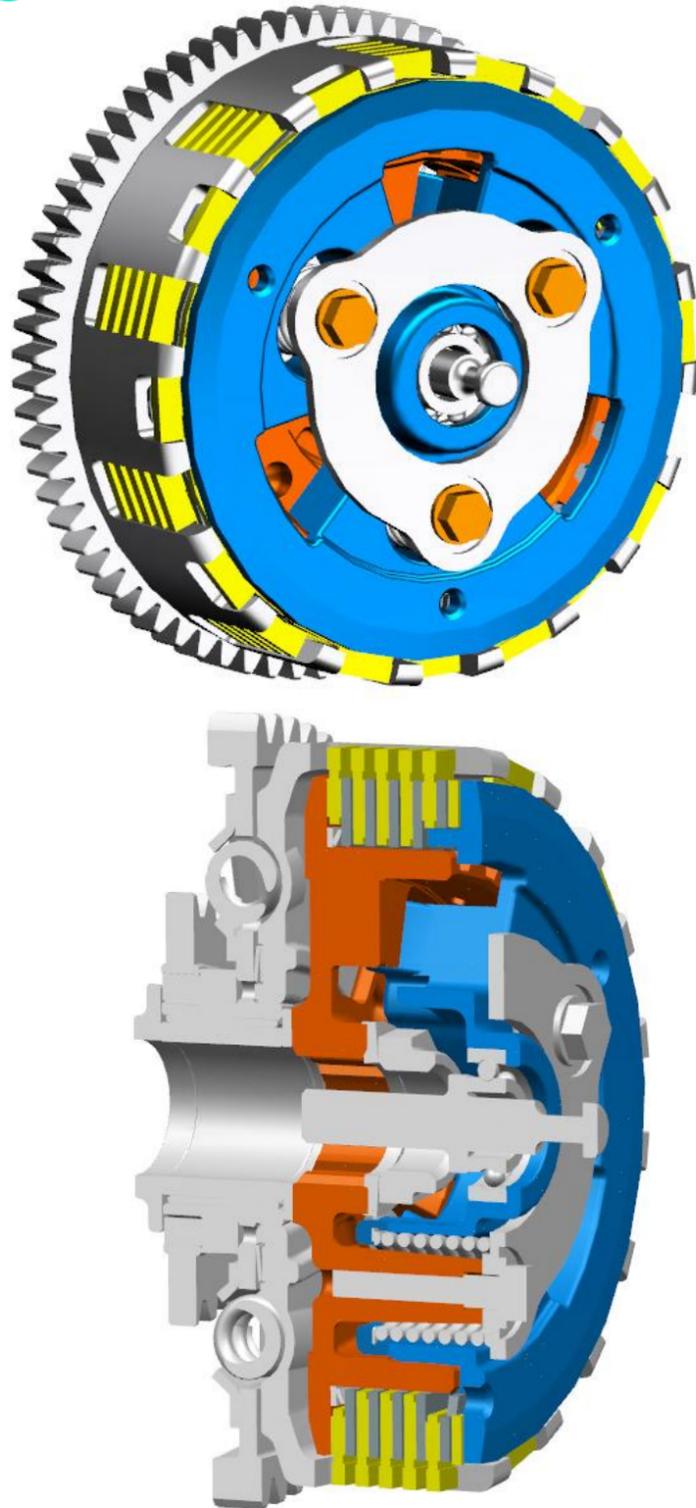
#### Crankshaft-crank pin diameter

Blue: 37.983mm~37.993mm

Red : 37.993mm~38.003mm

## 4. Engine

### 4.8 Clutch

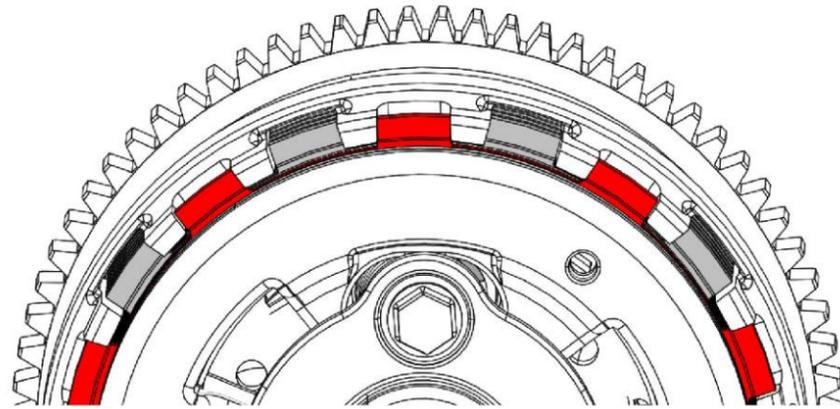


The 800NK is equipped with a slipper clutch. Under acceleration, the assist ramps pull the pressure plate towards the inner hub working in conjunction with the three clutch springs to compress the clutch plates and discs. This function allows to use lighter spring force which provides a lighter clutch feel.

Under excessive engine braking, which can occur as a result of excessive downshifts, the slipper ramps push the pressure plate away from the clutch hub. This relieves pressure on the clutch plates allowing them to slip which helps to reduce back-torque and keeps the rear tire from hopping and locking up.

# 4. Engine

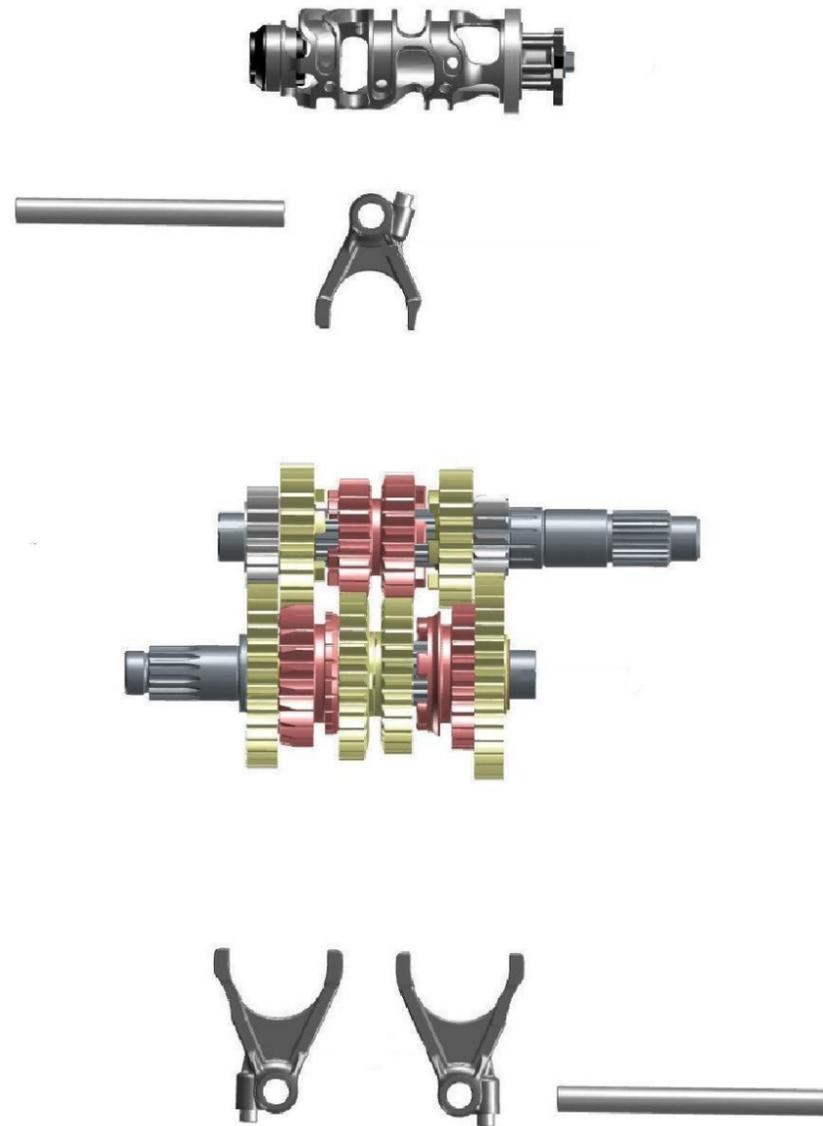
## 4.8 Clutch



The last friction plate has to be installed offset from the rest of the stack to reduce sounds during clutch operation.

# 4. Engine

## 4.9 Transmission



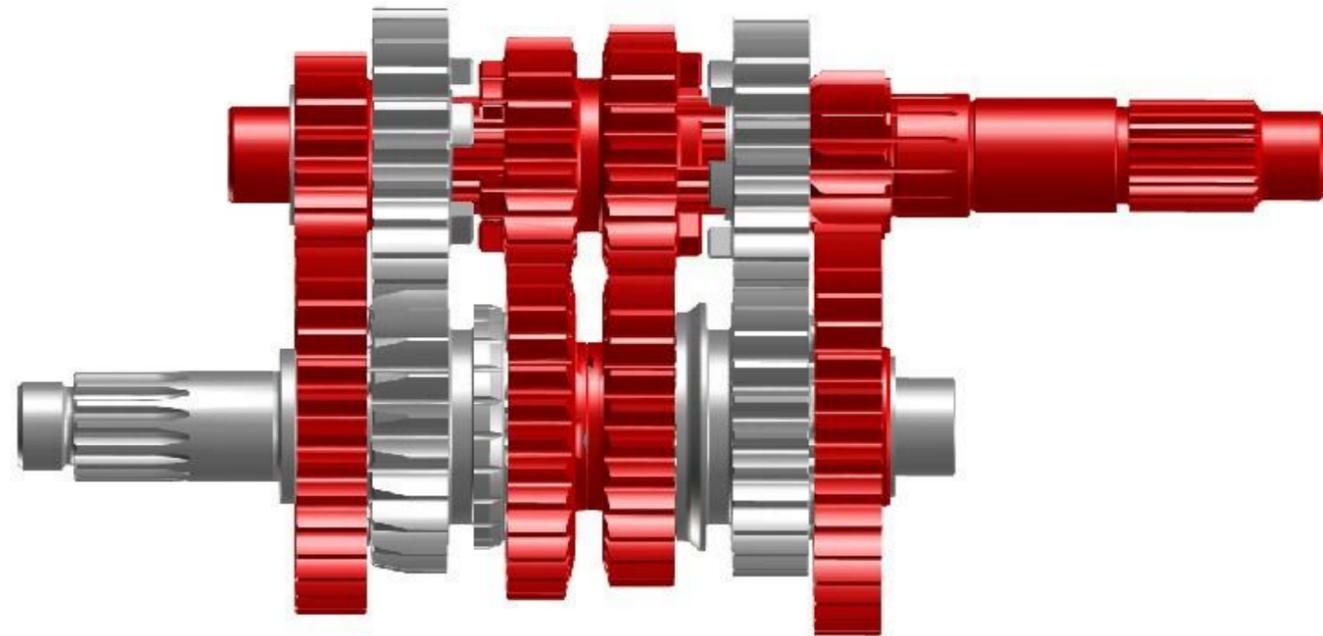
The six-speeds sequential gearbox is essentially composed of two shafts; an Input shaft , connected to the engine through the clutch, and an Output shaft ending with the sprocket. On these shafts are positioned twelve gears (six for each shaft since the transmission is six-speed) that are divided into six nonsliding idler gears (yellow), two non-sliding fixed gears (grey), and three sliding fixed rotational gears (red).

Latterly sliding fixed rotationally gears (three) are moved by the shift forks, in turn driven by the shift drum , to select the desired gear.

When a fork moves the gears to the right or left, it engages with the adjacent wheel through gear dogs.

# 4. Engine

## 4.9 Transmission



The 12 gear wheels are made of forged alloy steel-chromium nickel, and then case hardened. This results in a high durability and toughness.

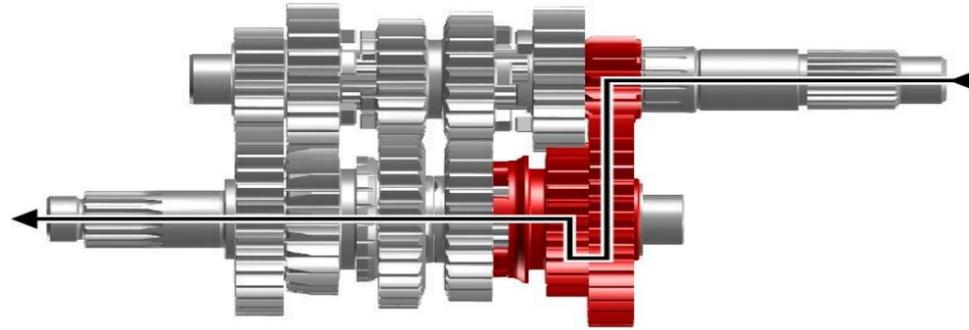
The power flow through the gears is shown below:

### Neutral

When the transmission is in neutral position, the Input and Output shafts spin independently of each other.

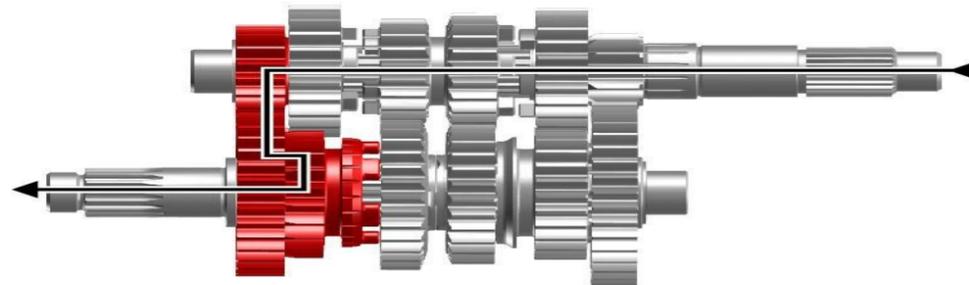
# 4. Engine

## 4.9 Transmission



### 1st Gear

When the transmission is in first gear, power-flow enters from the fixed first gear on the Input shaft, and then transferred to the non-sliding idler first gear on the output shaft, through to the dogs on the sliding, fixed rotation gear, then via the sliding gear splines to the output shaft.

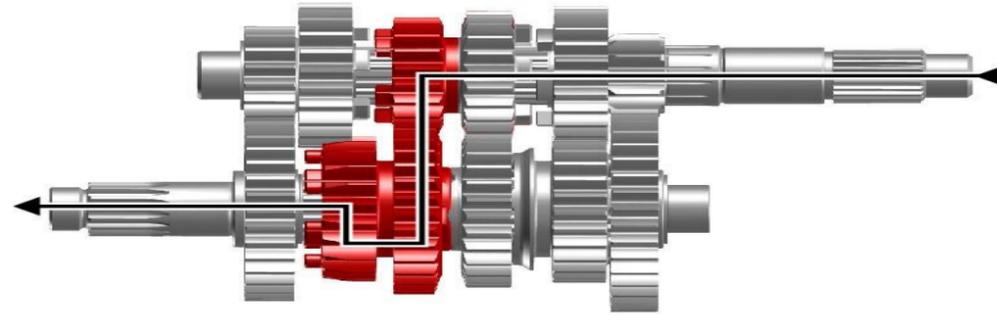


### 2nd Gear

In second gear, power-flow enters from the fixed second gear on the Input shaft, then transferred to the freewheeling second gear on the output shaft, through to the dogs on the sliding, fixed rotation gear, then via the sliding gear splines to the output shaft.

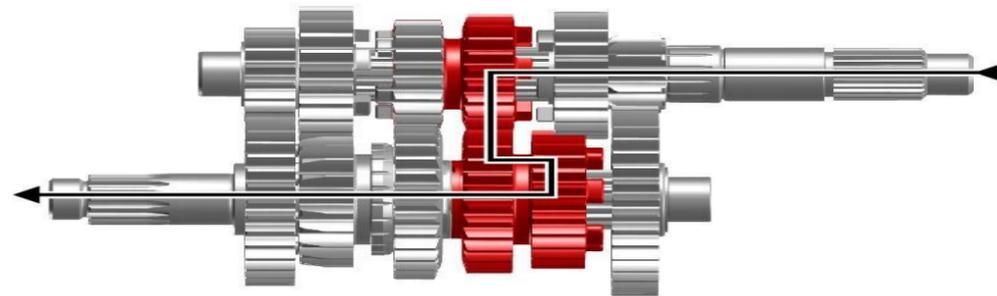
# 4. Engine

## 4.9 Transmission



### 3rd Gear

In third gear, power-flow enters the Input shaft to the splines of the sliding, fixed rotation third gear on the Input shaft, then transferred to the non-sliding idler third gear on the output shaft, through to the dogs on the sliding, fixed rotation gear, then via the sliding gear splines to the output shaft.

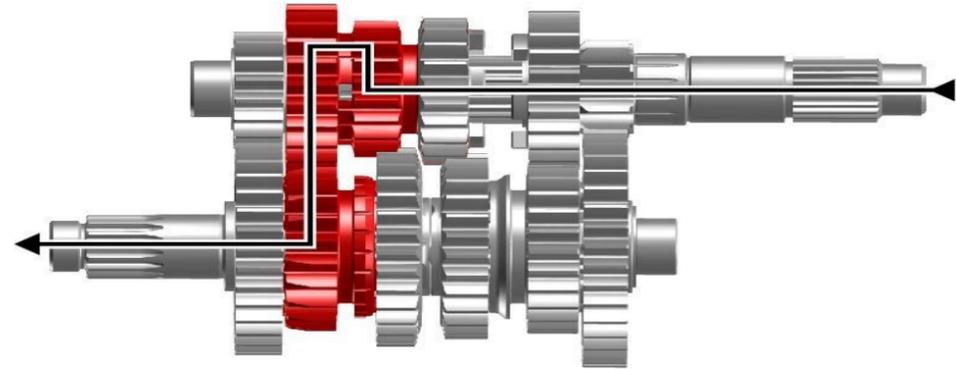


### 4th Gear

In fourth gear, power-flow enters the Input shaft to the splines of the sliding, fixed rotation gear through the dogs to the idler fourth gear on the Input shaft, then transferred to the sliding, fixed rotational fourth gear to the sliding gear splines of the output shaft.

# 4. Engine

## 4.9 Transmission



### 5th Gear

In fifth gear, power-flow enters the Input shaft to the splines of the sliding, fixed rotation fifth gear on the Input shaft, then transferred to the non-sliding idler fifth gear on the Output shaft to the dogs of the sliding, fixed rotation gear splines, to the output shaft

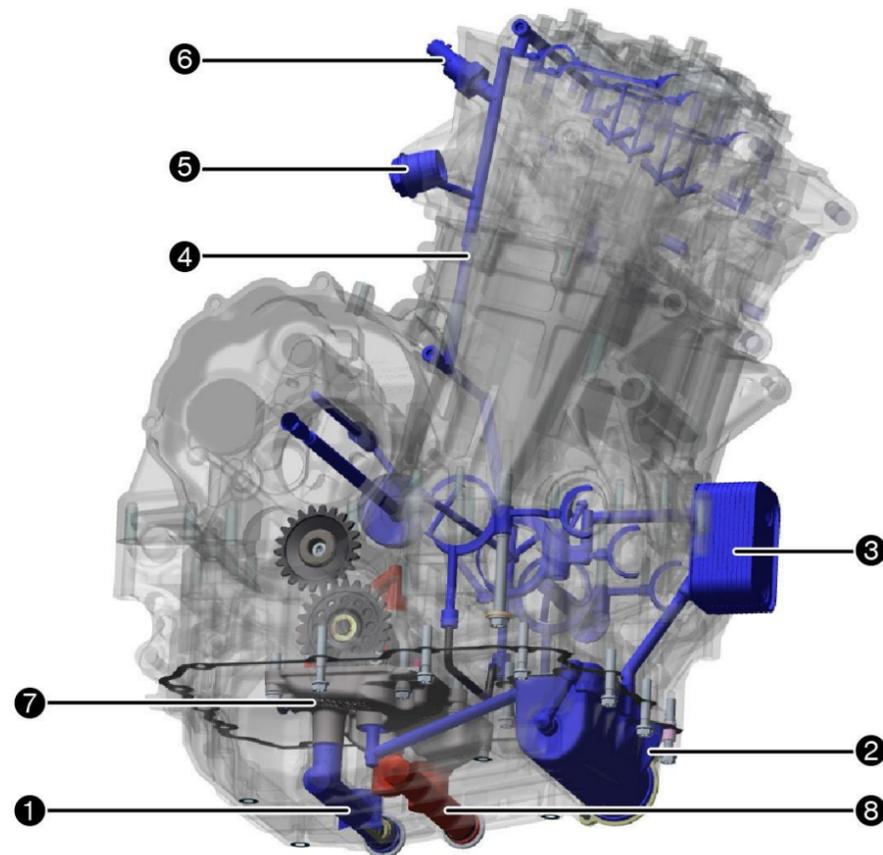


### 6th Gear

In sixth gear, power-flow enters from the Input shaft to the splines of the sliding, fixed rotation gear dogs, to the non-sliding idler sixth gear, then transferred to the sliding fixed rotation sixth gear which is splined to the Output shaft.

# 4. Engine

## 4.10 Oil passage



Oil is forced-fed to the lubrication circuit by an Eaton-type pump. The oil is sucked by the pressure pump through the oil screen ① and sent to the paper filter ②. From here the oil flows into the heat exchanger ③, where the oil temperature is reduced maintaining oil cooling efficiency.

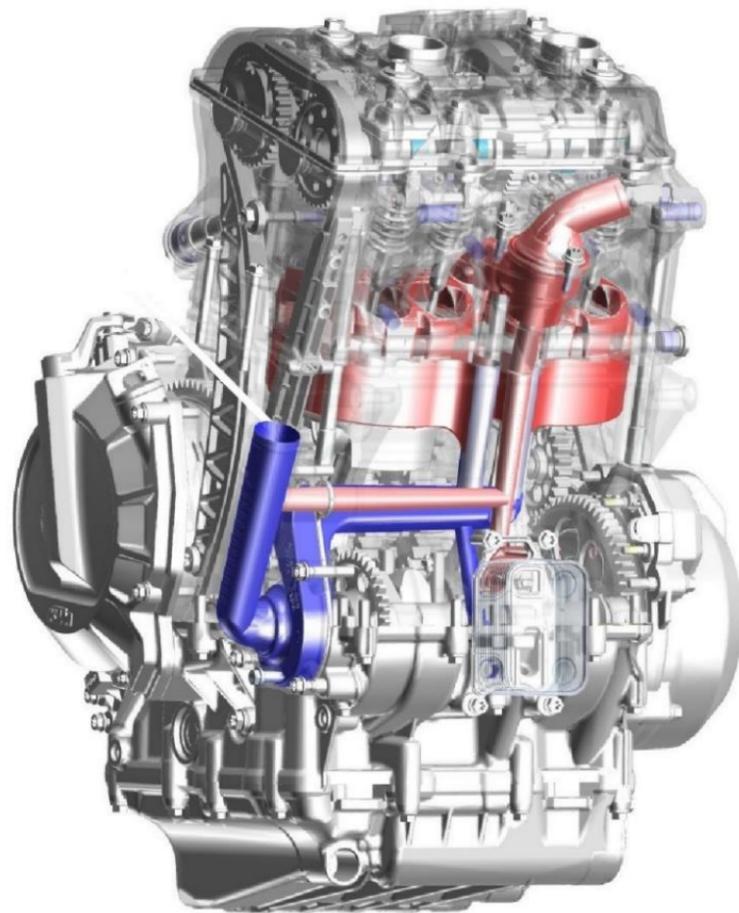
The first parts to receive lubrication are the crankshaft and the primary counterbalancer. The oil comes through the lubrication channels on the crankcases and passes through the holes in the plain bearings creating a lubricating film between the bearing surface and the crank pins.

At the same time the oil flows to the clutch to cool down the friction plates and steel discs and also to the gear box to lubricate the drive train.

The last part to receive lubrication is the cylinder head; the oil travels through the transfer line ④ and reaches the hydraulic chain-tensioner ⑤ to maintain a constant tension on the timing drive chain by means of oil pressure. The oil pressure sensor is located ⑥ close to the camshafts because if the oil pressure is too low at this point, the camshafts do not receive enough lubrication, resulting in damage to the cylinder head.

# 4. Engine

## 4.11 Cooling system

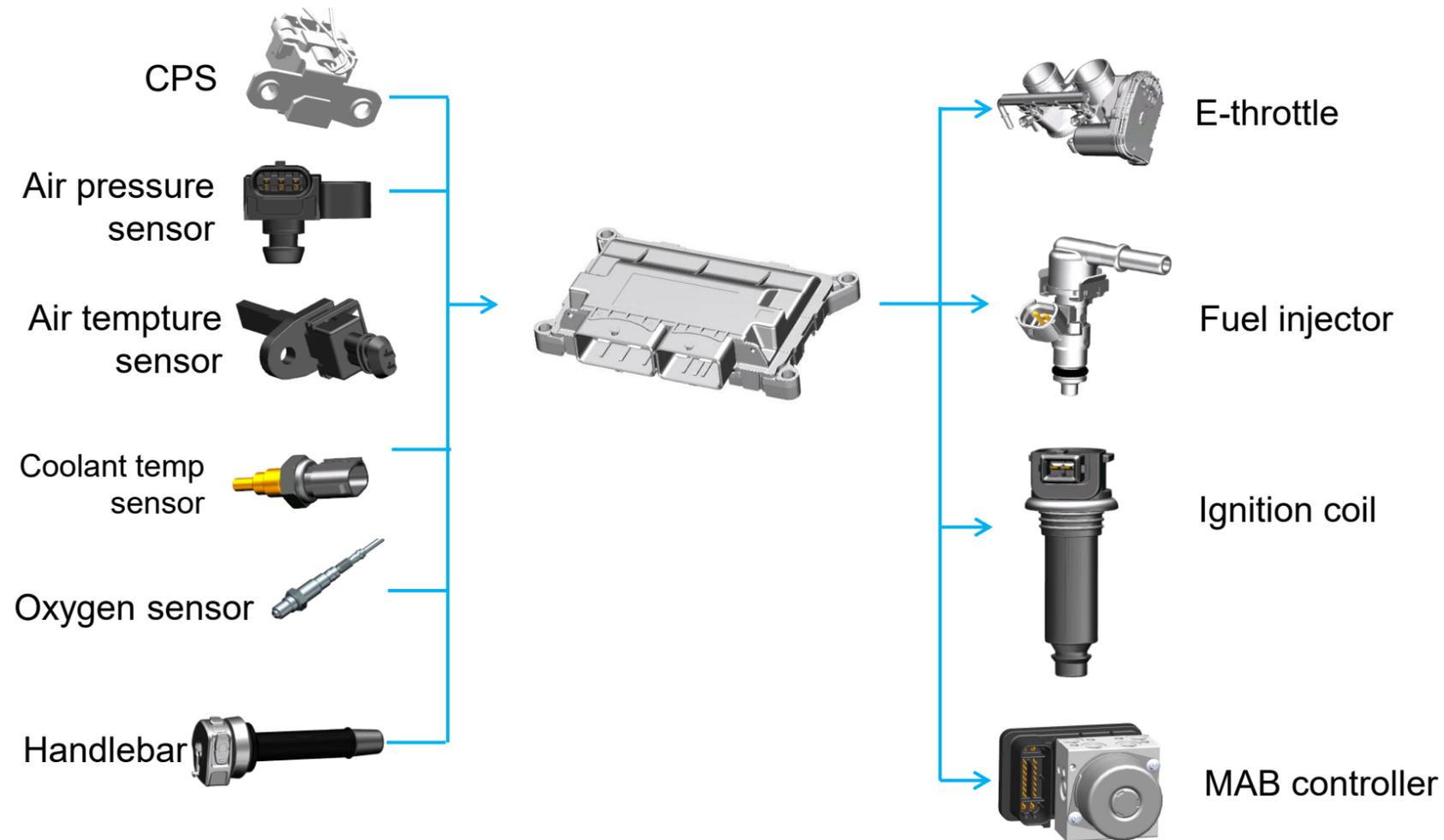


The cooling system contains 1.5 liters of coolant. The thermostat is closed if the temperature of the coolant is below 72°C. It is circulated by a water pump around the open deck cylinders and cylinder head in a close loop, controlled by the thermostat, to reach the working temperature more efficiently.

The thermostat starts to open at 72°C and is fully open at 85°C. When the thermostat starts to open, the coolant flows to the radiator where its temperature is reduced.

# 5. Electronic system

## 5.1 ECU



The ECU of the 800NK is BOECH ME17 where just located under the front seat. The ECU processes the information from the sensors, allowing it to control all system functions such as fuel supply and ignition to ensure a perfect combustion in the engine.

The EFI system overview is as shown in left.

# 5. Electronic system

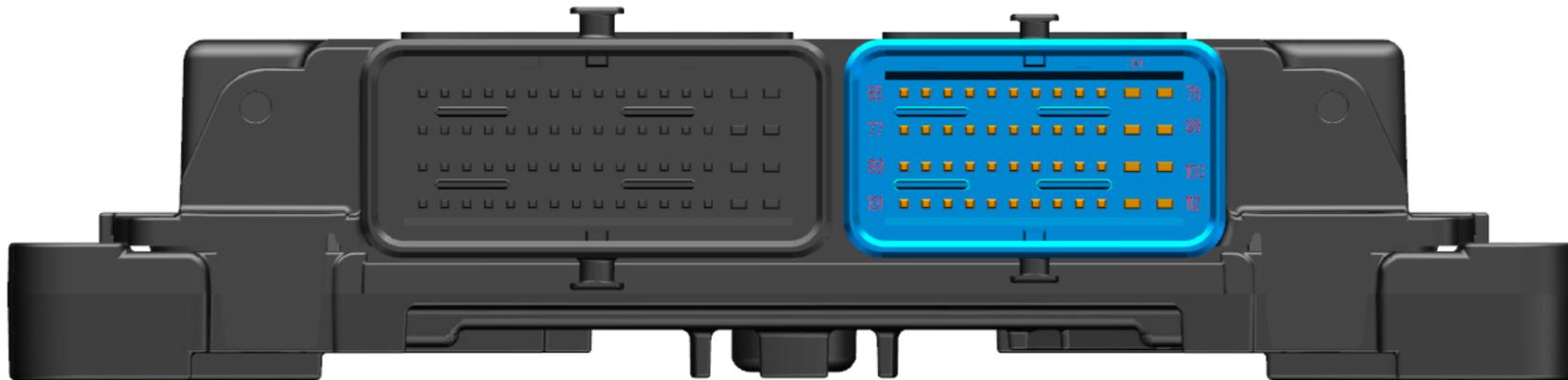
## 5.1 ECU



PIN	Function	PIN	Function
1	CAN_H	36	APS 2 5V power
5	Main relay	37	APS 1 5V power
7	APS 1 GND	41	Fuel pump relay
10	Speed input	42	HEADLAMP relay
15	Main relay power supply 1	43	Oxygen sensor 2 GND
16	Main relay power supply 2	44	Clutch switch
17	CAN_L	45	APS 1
20	Battery power supply	47	Air intake pressure sensor 2 GND
21	Oxygen sensor 2	48	Oxygen sensor 2 heating
23	Break switch	58	Starter control output
25	Break lamp switch	59	APS 2 signal
29	Sidestand switch	63	ECU GND2
30	APS 2	64	ECU GND1
35	Ignition switch		

# 5. Electronic system

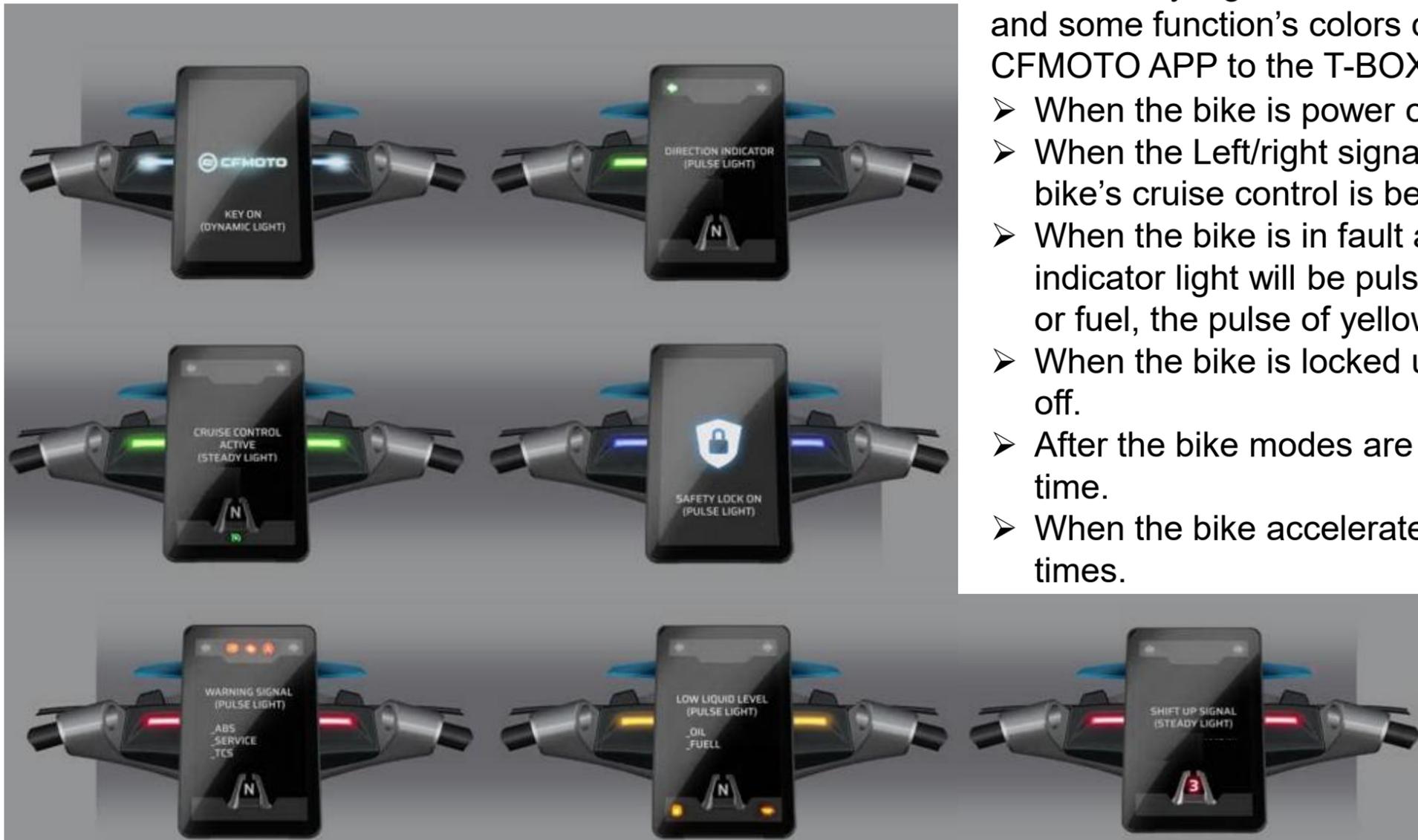
## 5.1 ECU



PIN	Function	PIN	Function
68	Fuel injector 1	96	CPS A
72	Fuel injector 2	97	CPS B
73	Oxygen sensor 1 heating	98	Gear shifts sensor
75	Throttle actuator A	99	Ignition coil 2 control
77	TPS 1	100	Ignition coil 1 control
78	TPS 2	101	Coolant temp. signal
79	CPS signal	102	Air intake temp. signal
80	Oxygen sensor 1 GND	103	Gear sensor
83	CPS GND	104	Oxygen sensor 1 signal
84	ECU GND	107	TPS 5V power supply
85	Air intake pressure sensor 1 GND	108	Gear sensor 5V power supply
86	TPS GND	109	Air intake pressure sensor 1 5V power supply
87	Throttle actuator B-	111	GND
91	Air intake pressure 1 signal	112	GND
94	Canister valve control		

# 5. Electronic system

## 5.2 ASI(Auxiliary signal indicator)



The auxiliary signal indicator is located on both sides of the bike's dashboard, and some function's colors can be customized by connecting the dashboard or CFMOTO APP to the T-BOX (if equipped).

- When the bike is power on, the indicator breathes twice and then goes off.
- When the Left/right signal is on, the green shows pulse light. However, when bike's cruise control is being activated, the green light will be steady on.
- When the bike is in fault alarm (ABS or other electronic system failure), the indicator light will be pulsed red light. When the bike is insufficient in coolant or fuel, the pulse of yellow light will be displayed.
- When the bike is locked up, the pulse blue light breathes one time then goes off.
- After the bike modes are switched successfully, the indicator breathes one time.
- When the bike accelerates, the indicator turns green and breathes for 3 times.

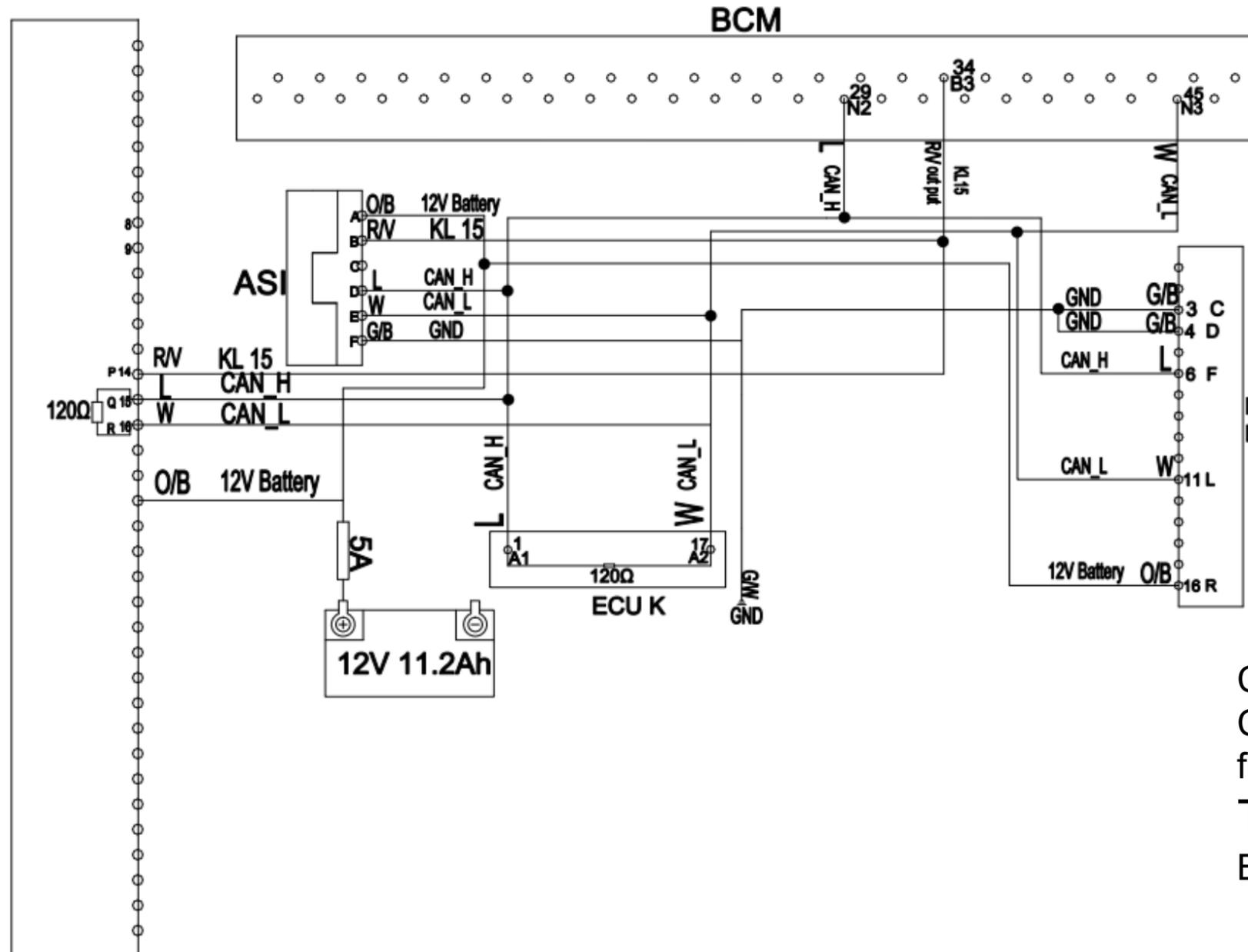
The new 800NK is equipped with ASI, which called auxiliary signal indicator. It can display different states of the vehicle through different lights, and different colors of lights can be customized by yourself.

# 5. Electronic system

## 5.2 ASI(Auxiliary signal indicator)

According to the different colors of MMI indicator, auxiliary signal indicator shows the corresponding color, currently preliminarily set five colors: red/yellow/green/white/blue

ASI is connected to dashbord by CAN bus. The power supply includes battery power supply and KL15 power supply

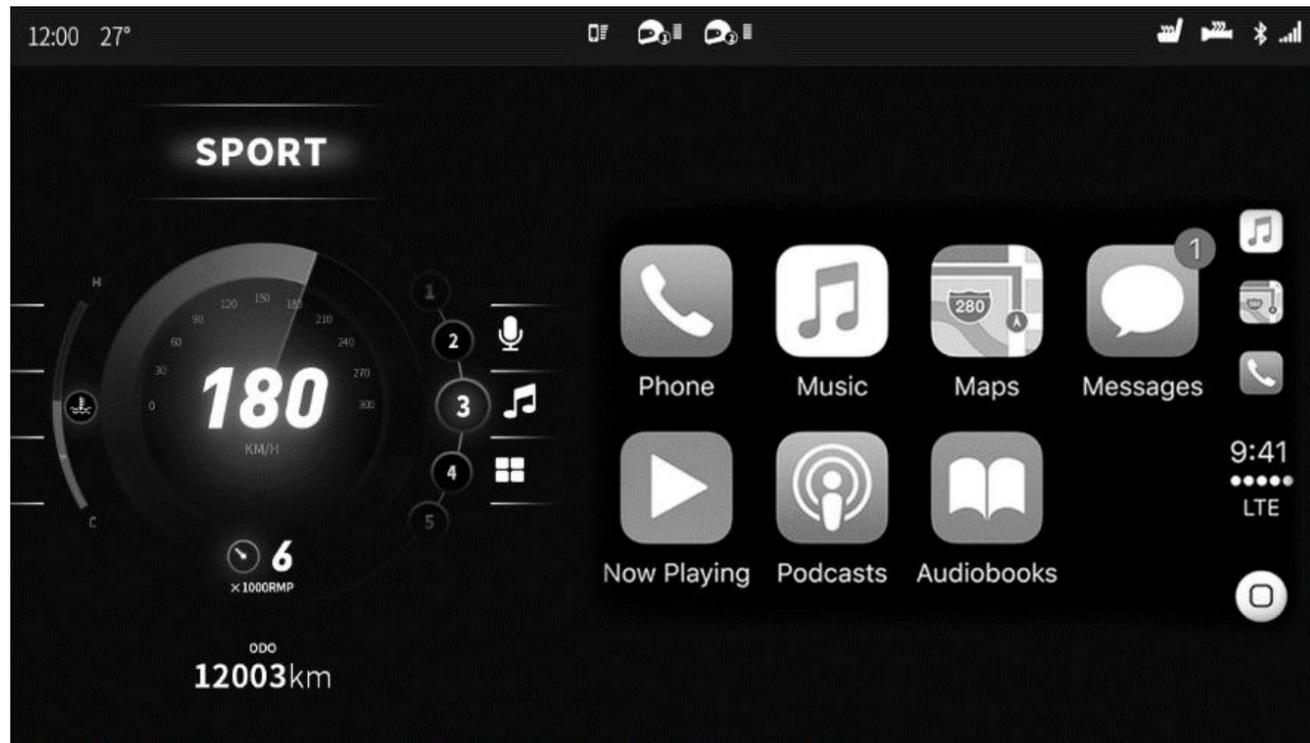


Click APP to split screens. Click to enter Setting. Then enter the display setting. Click "Auxiliary indicator Setting" to set the screen brightness and auxiliary functions. Some scenes can be customized with 16 different colors.

This is the diagram of ASI, which is connected to the dashboard through CAN BUS. Below is the lighting customization page of the APP.

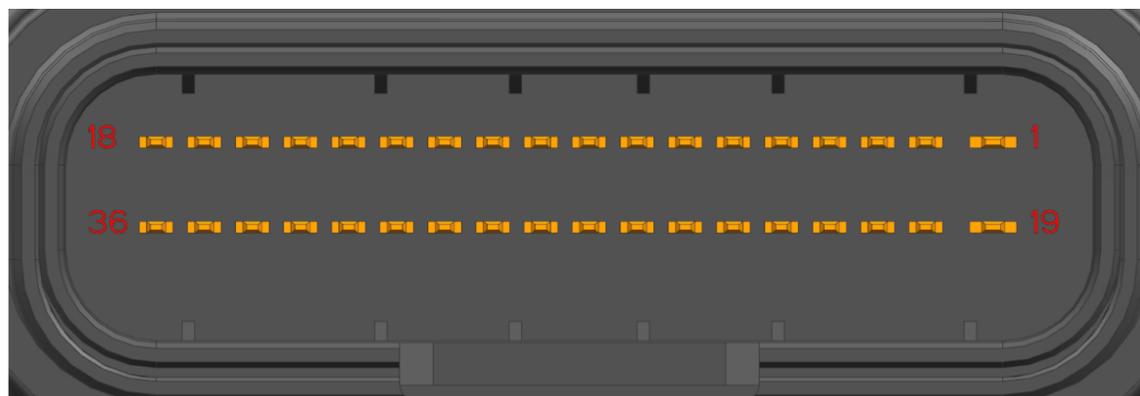
# 5. Electronic system

## 5.3 Dashboard



The MMI (multi-media Interface) is a MultiMedia interactive system through which the rider can control every electronic device and functional equipment on the bike.

From audio volume adjustment to GPS navigation (Built-in navigation module, with the GNSS antenna to navigate the bike), even more, the bike offers a wealth of luxury and comfort functions that can be perfectly intelligently interacted through the MMI system.



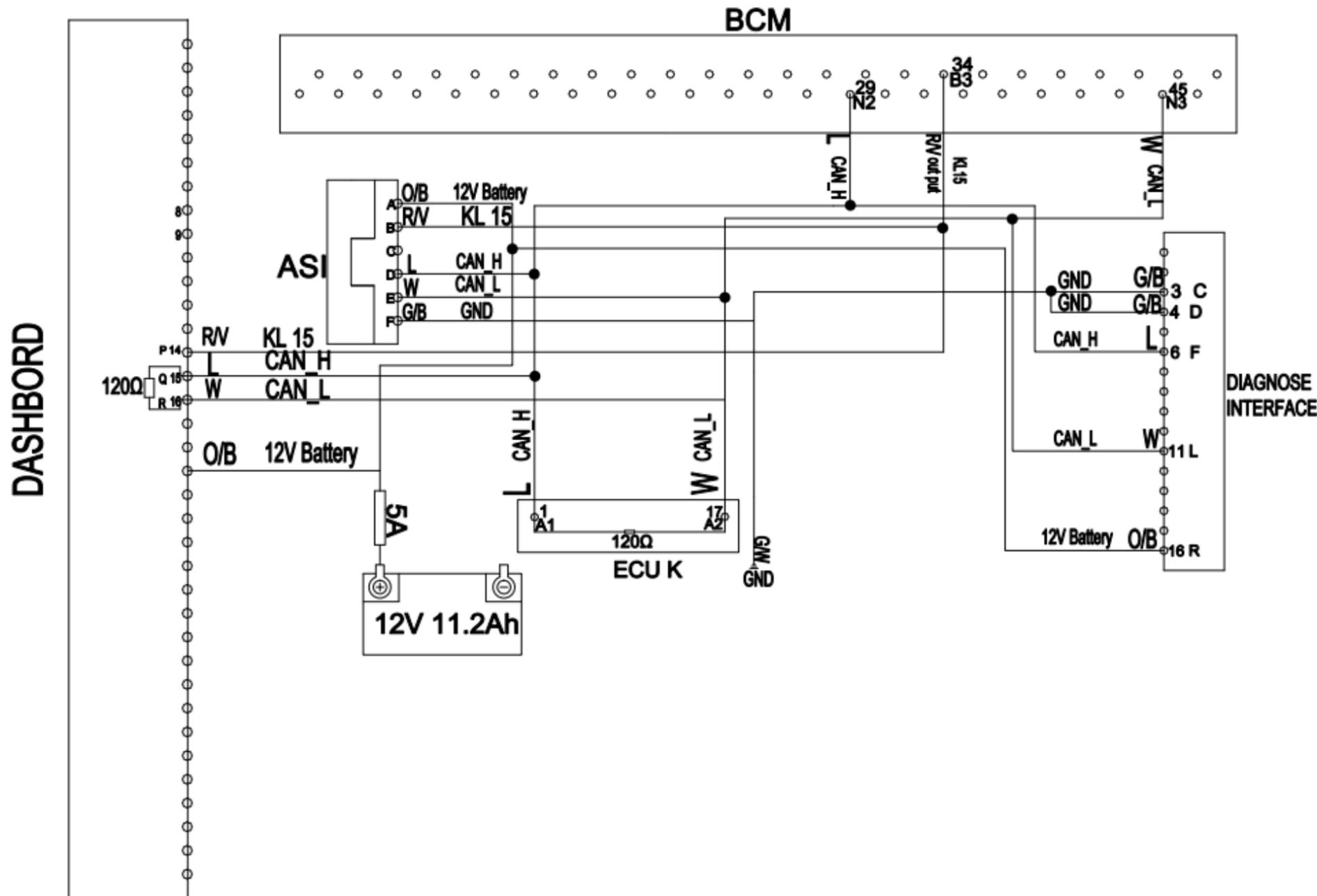
PIN	FUNCTION
1	GND
2	Button 1/UP
3	Button 2/RH
4	Button 3/DOWN
5	Button 4/LH
7	Button 5/Fn
8	Button 7/user-defined
14	KL15
15	CAN_H
16	CAN_L
19	12V battery power

Main functions of MMI:

- Bluetooth
- Multimedia service
- Map navigation
- Mobile Internet
- Speech recognition
- Glove touch

# 5. Electronic system

## 5.3 Dashboard

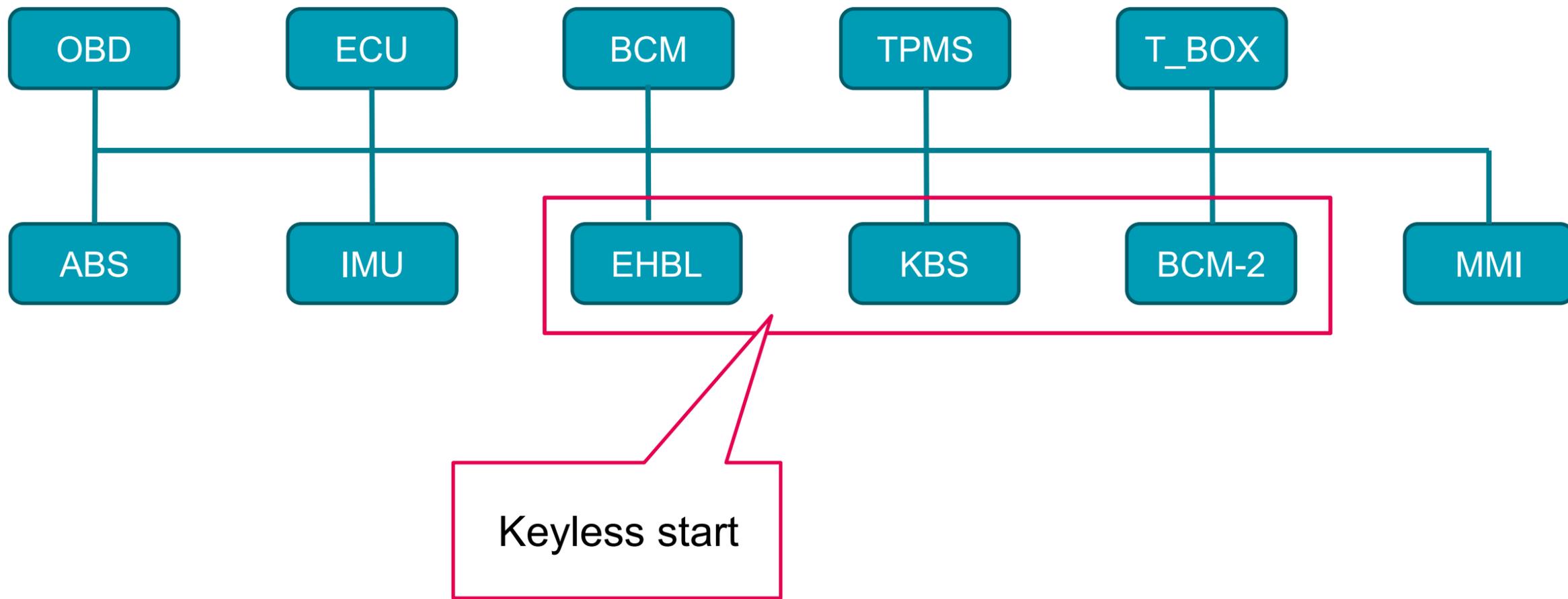


Tips:

Logic circuit/power is the BCM 12V power(KL15) provides to the dash, and when the bike is unlocked, light up the dashboard and ASI will display a white pulse light. If bike is locked, and the dash is only powered by battery. The dash itself doesn't have Bluetooth, the Bluetooth icon indicates the phone is paired with BCM.

# 5. Electronic system

## 5.4 CAN bus



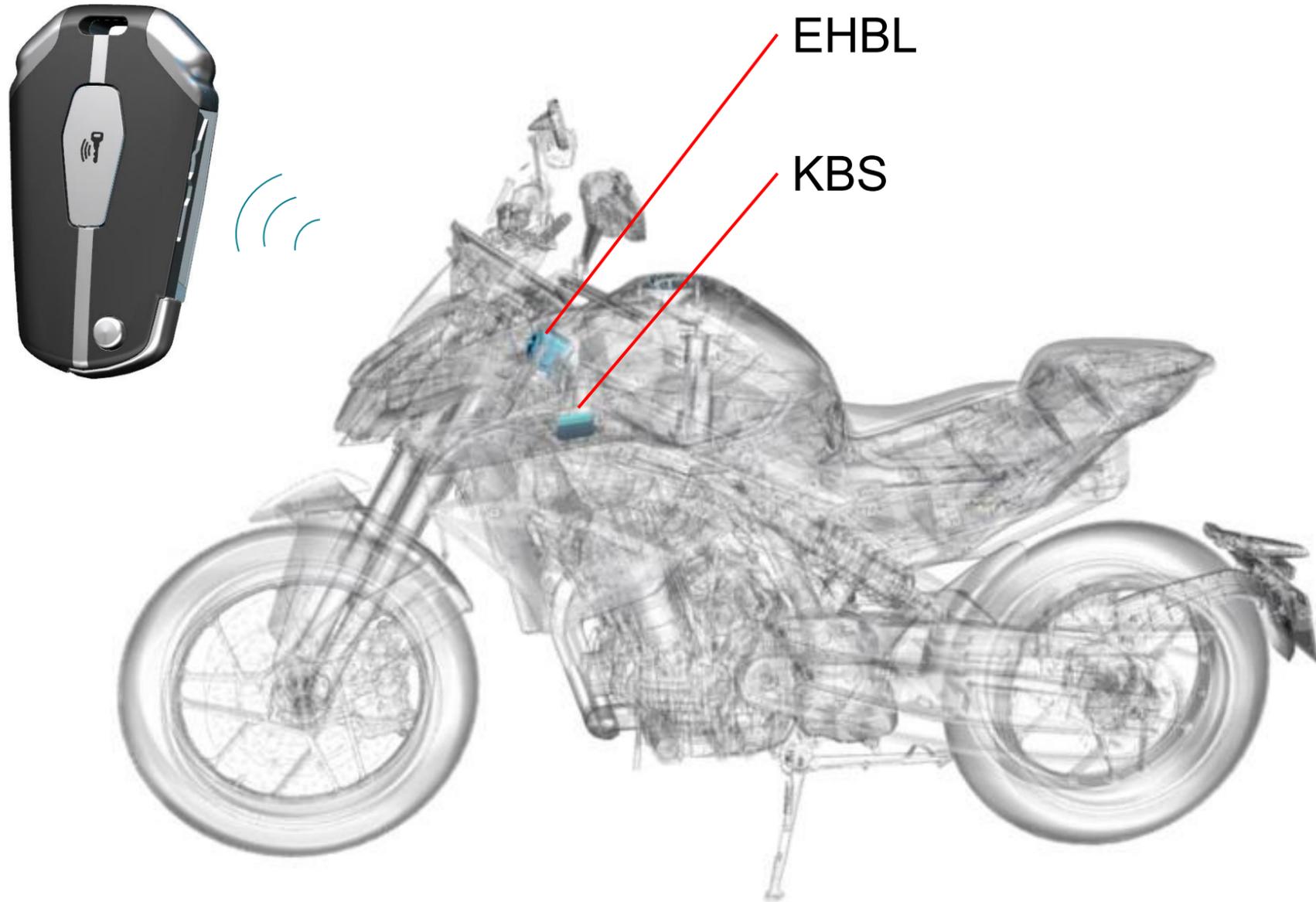
The 800NK's communication adopts CAN bus, communication rate is 500kbps.

CAN-BUS system realizes data sharing and real-time interaction among 11 switches. This allows for more precise, safe and reliable control of the entire vehicle.

The CAN-BUS communication network is shown on the left.

# 5. Electronic system

## 5.5 Keyless start

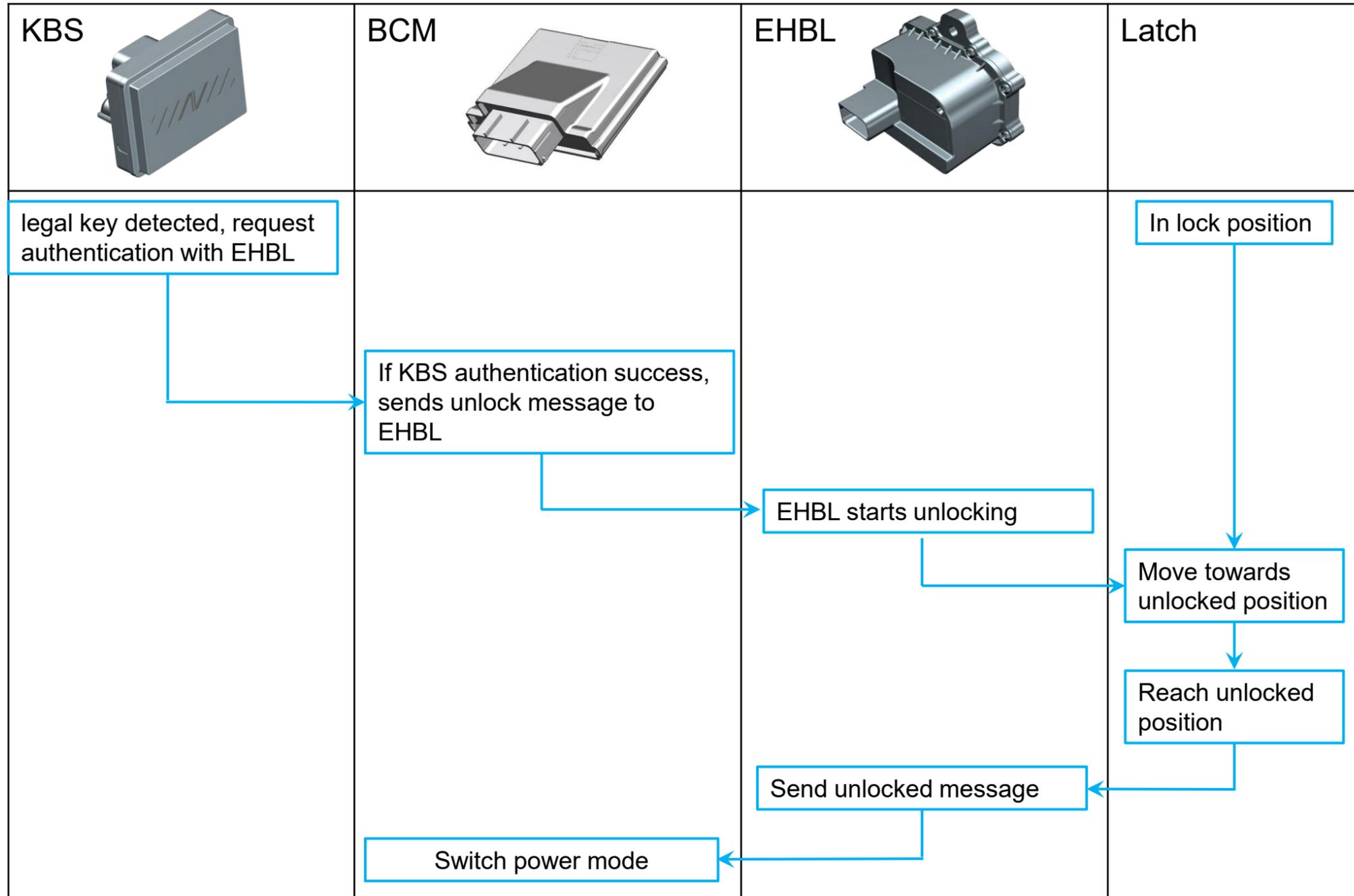


The entire keyless start system can include KBS(key base station),EHBL(Electronic handlebar lock),induction key and ECU, BCM.

- 1.Induction key and Key base station for remote car search (open area: 80m)
- 2.It has network management function and can be controlled remotely by APP.

# 5. Electronic system

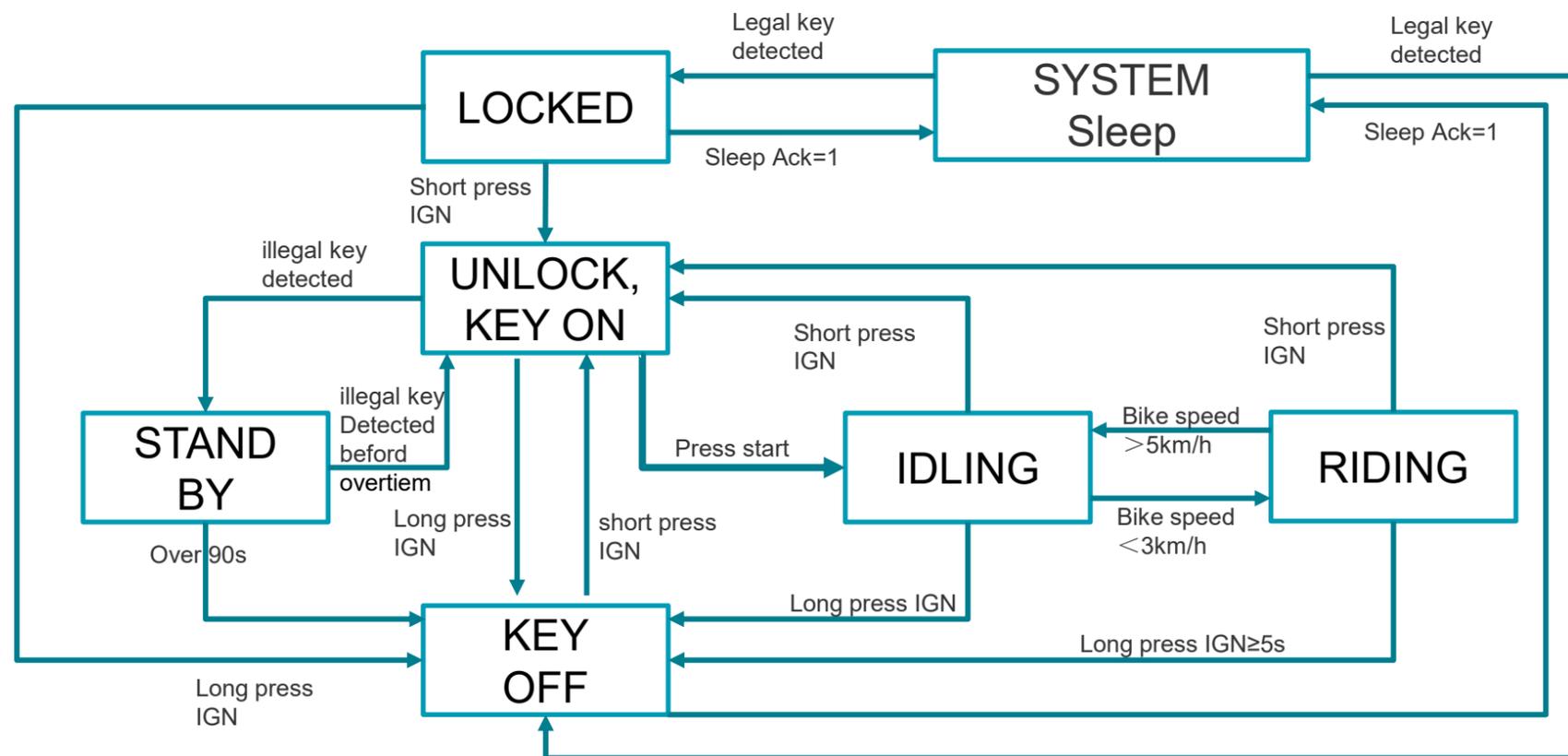
## 5.5 Keyless start



The EHBL can be unlocked by KBS or Bluetooth®, both of them need to be authenticated by BCM, which logic is as shown in diagram.

# 5. Electronic system

## 5.5 Keyless start



### Power-on control

The control logic of keyless startup is that when the bike is in the state of power off, if the key is within the monitoring range (80m, empty place), the bike will enter the locked state; if the key is outside the detection range at this time, the bike will enter the state of stand by, if the key is not detected within 90s, it will return to the state of power off.

Press the IGN button to unlock the bike and power on it. Then you can press the start button to start the bike and enter the idle state. Long press IGN key in idle state, the bike will power off. If in riding state, the power will be cut off by pressing IGN for more than five seconds.

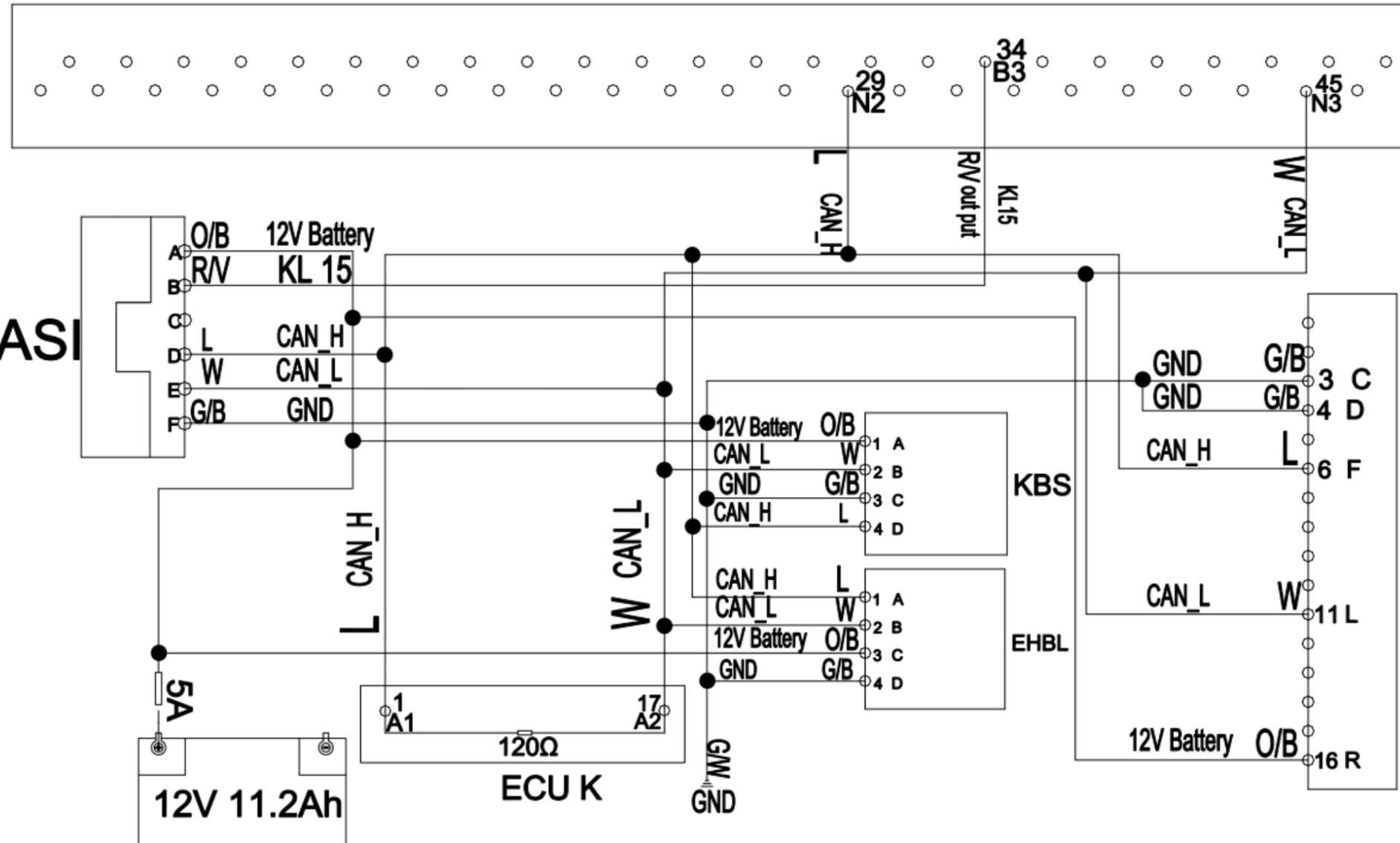
### Tips:

When rider out off bike, The bike will power off automatically after the side stand is put down.

# 5. Electronic system

## 5.5 Keyless start

### BCM



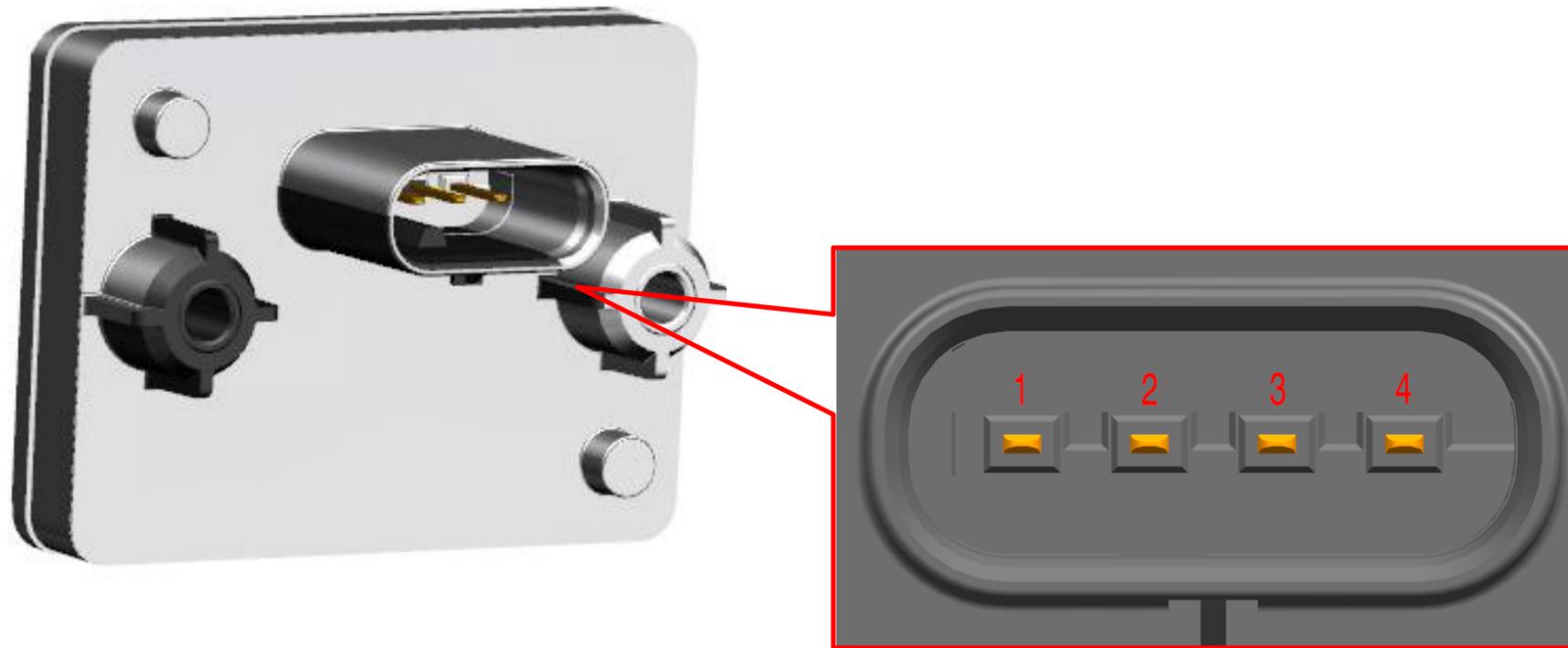
### Power-on control

When KBS receives the signal from the Bluetooth key, it will send EHLB's message to unlock the steering stem through the CAN bus, and then the bike can be powered on normally. After powered on, BCM will send startup's message to ASI through the CAN bus, and the ASI's lights on both sides will flash white. At this point, the bike can be normal ignition and running.



# 5. Electronic system

## 5.6 KBS



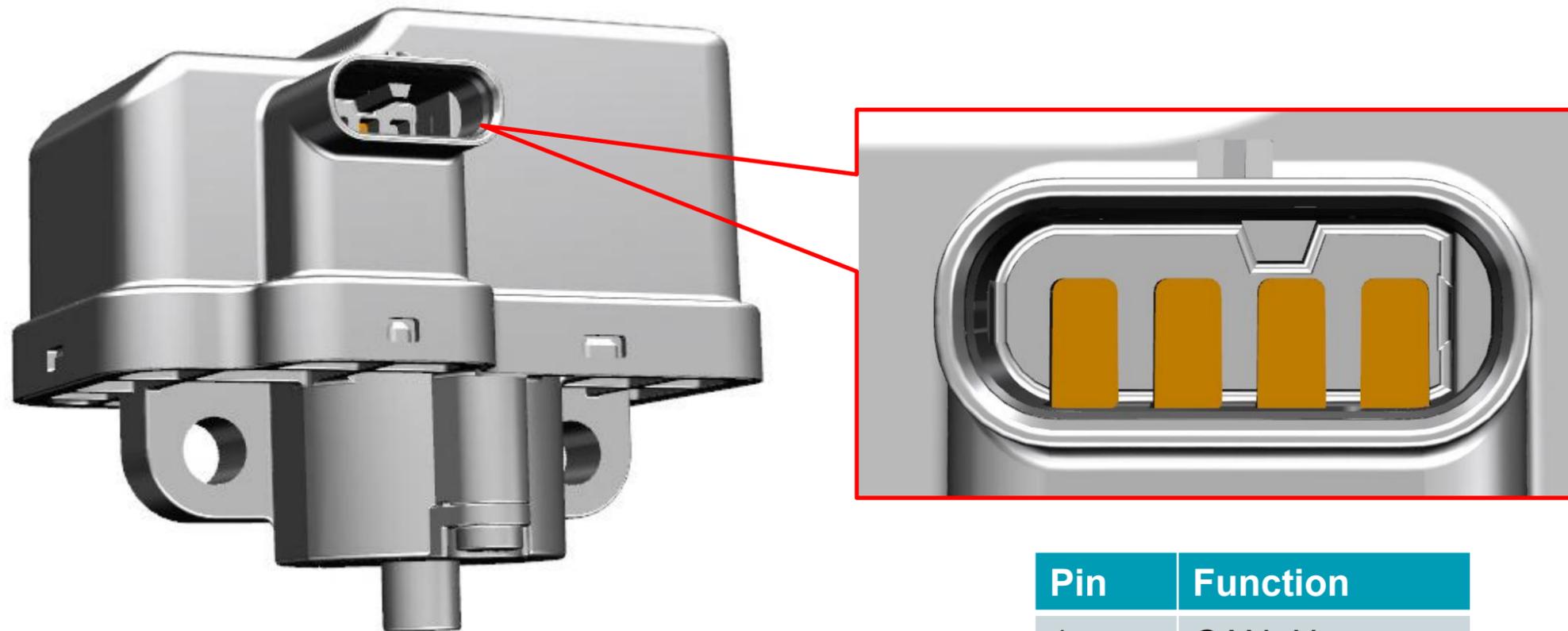
Pin	Function
1	12V Power
2	GND
3	CAN-H
4	CAN-L

The KBS(Key base station) is arranged at the left deco plate of the fuel tank. When the key is out of power, it can also unlock the car by matching the chip inside the key (Bluetooth or KBS near field communication,50m)

- Pin 1: 12V Power.
- Pin 2: GND
- Pin 3: CAN\_H;
- Pin 4: CAN\_L

# 5. Electronic system

## 5.7 EHBL



EHBL (electrical handlebar lock) is an electrical handlebar lock, which controls the lock steering stem.

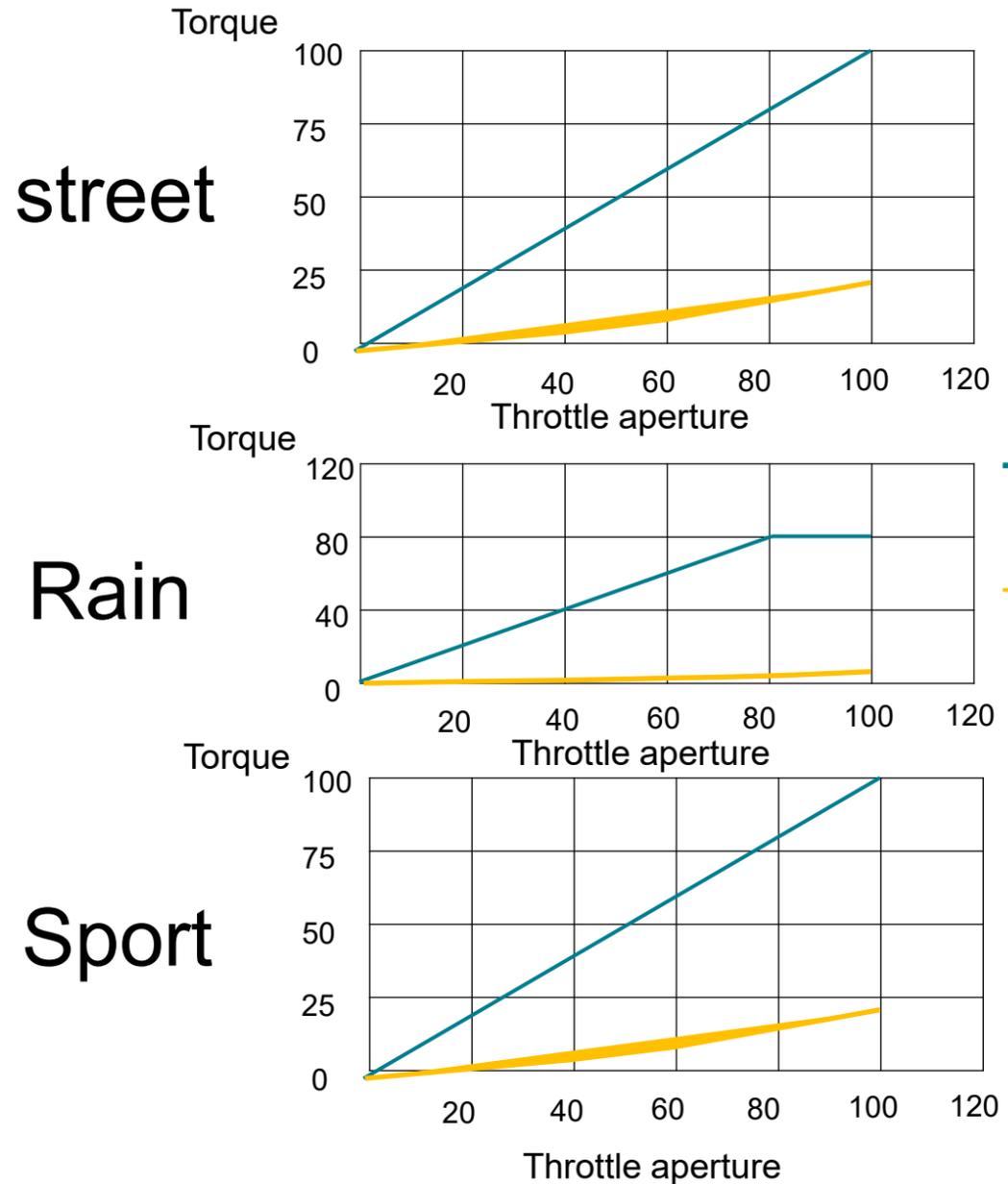
When the KBS sends the message that the bike is unlocked to the EHBL via the CAN bus, the steering stem of the bike will be unlocked.

- Pin 1: CAN\_H;
- Pin 2: CAN\_L
- Pin 3: 12V power
- Pin 4: GND

Pin	Function
1	CAN_H
2	CAN_L
3	12V power
4	GND

# 5. Electronic system

## 5.8 Riding model

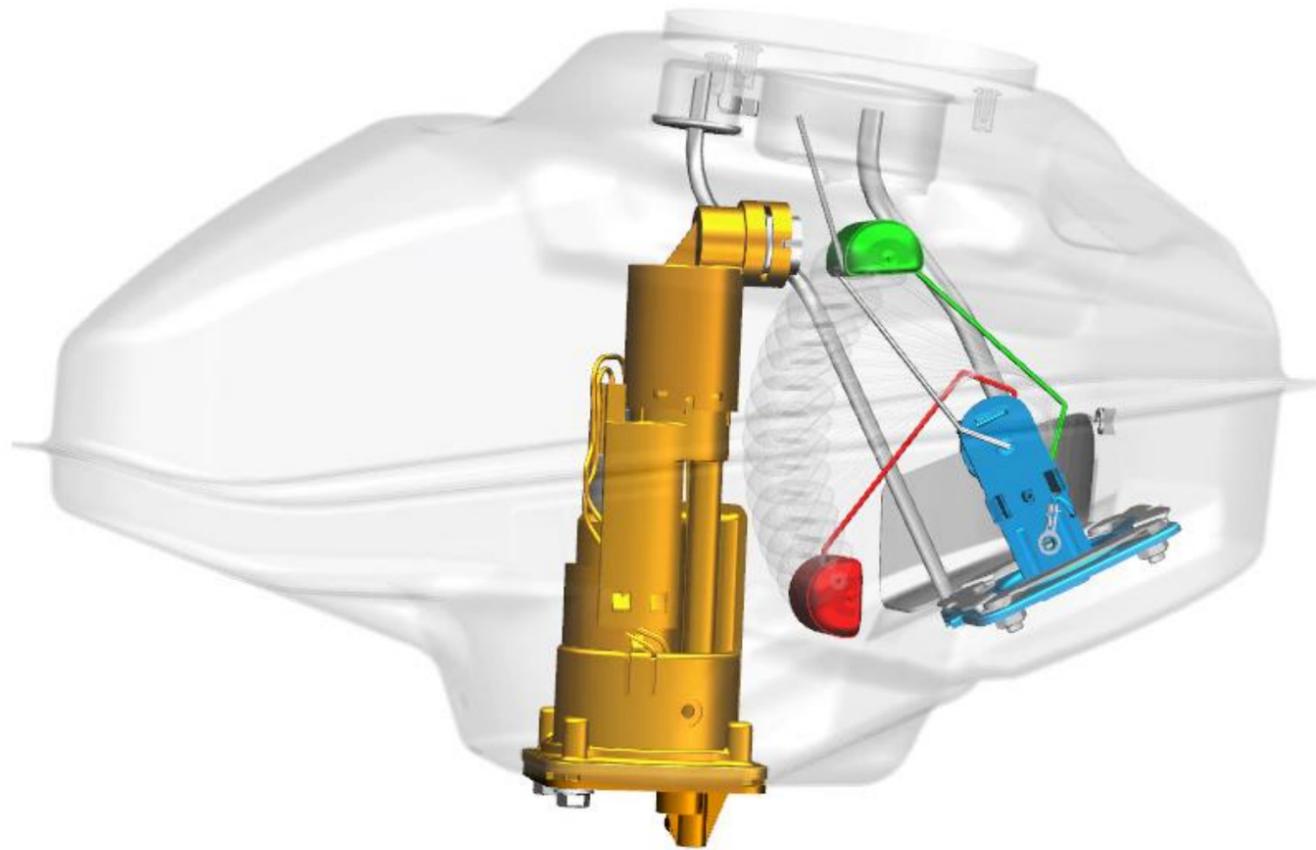


The 800NK has three riding model, which are street, rain, sport and another one is user-defined. user –defined riding model can set your own preferred throttle response and power output. Different riding modes correspond to different throttle responses.



# 5. Electronic system

## 5.9 Fuel tank



The 800NK use **15L** steel fuel tank with fuel pump and fuel level sensor inside of it.

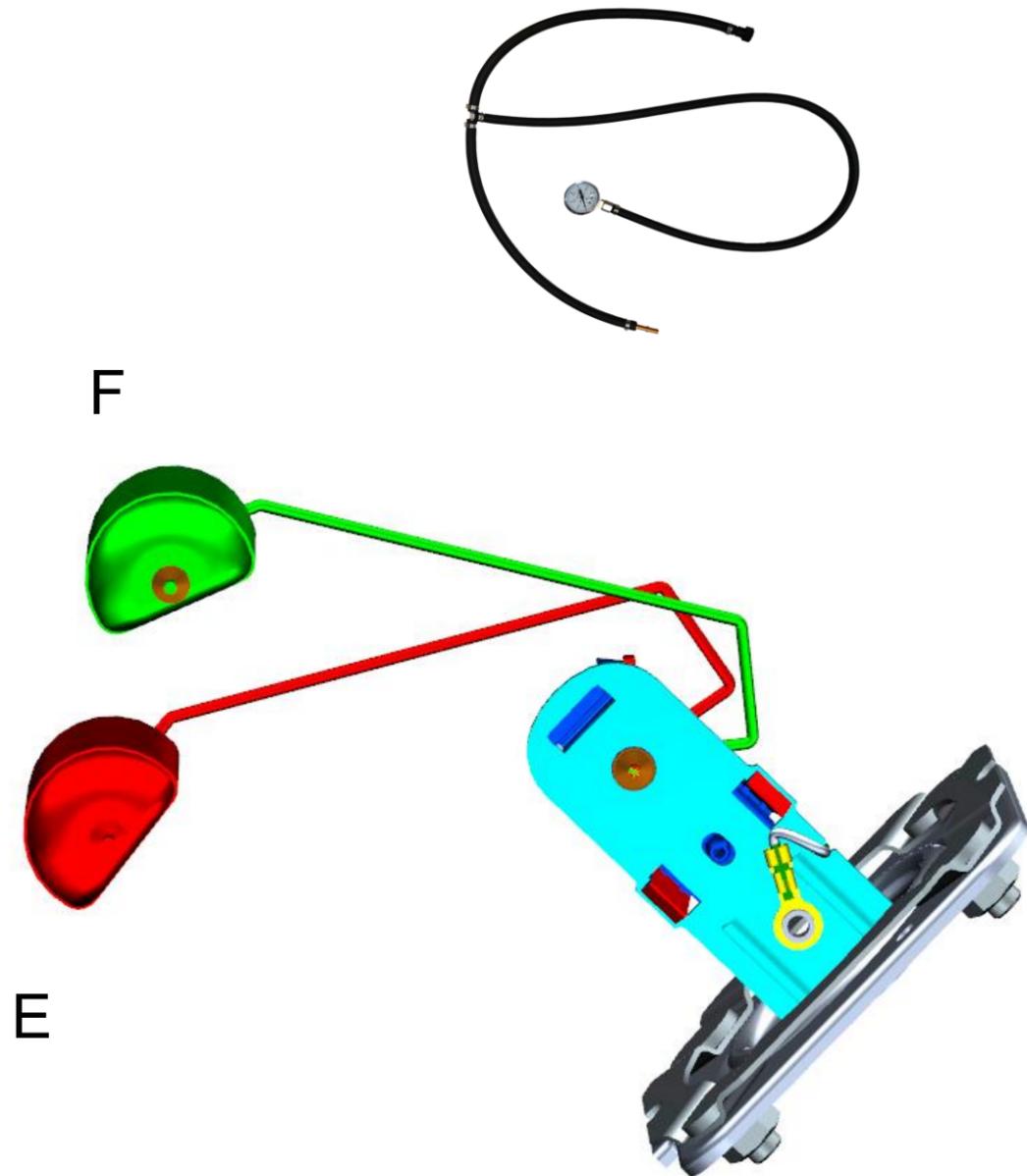
The electric fuel pump is used to pump fuel from the fuel tank to the injectors. Fuel pressure must be within specifications so the injectors can deliver the correct amount of fuel into the engine for the engine to run correctly. A decompression valve is used to make sure the fuel is delivered in correct pressure, the excessive pressure will be released back to fuel tank as soon as it upto 4.0bar. Too low pressure will starve the engine, causing it to run lean, misfire, hesitate or stall. Too much fuel pressure can cause the engine to run rough, increased fuel consumption and increased emissions.

The in-tank location helps muffle the buzzing noise produced by the electric pump motor, and immersing the pump in fuel helps lubricate and cool the pump motor. This type of pump is not a positive-displacement pump, so it produces no pulsations, runs very smoothly and quietly.

The 800NK use **15L** steel fuel tank with fuel pump and fuel level sensor inside of it.

# 5. Electronic system

## 5.9 Fuel tank



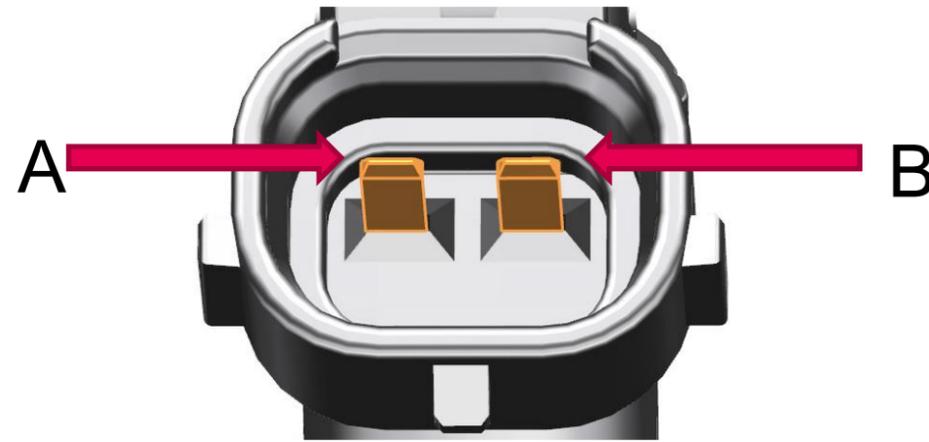
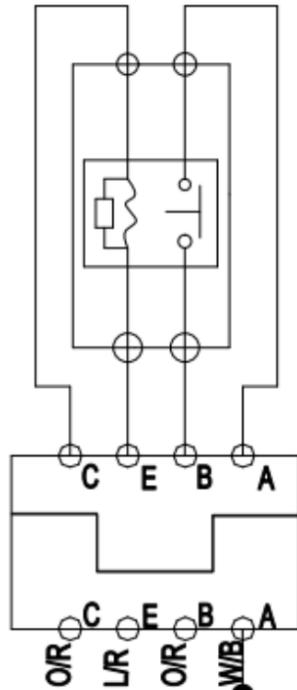
A fuel pressure gauge 0GR0-000000-922-100 is required to test the fuel pressure.

The fuel level sensor is made by thick-film resistor. Compare with last generation that made by winding resistance wire, the thick-film resistor fuel level sensor is more accurate and stable during detect the fuel level.

# 5. Electronic system

## 5.10 Fuel injector

### Main raly

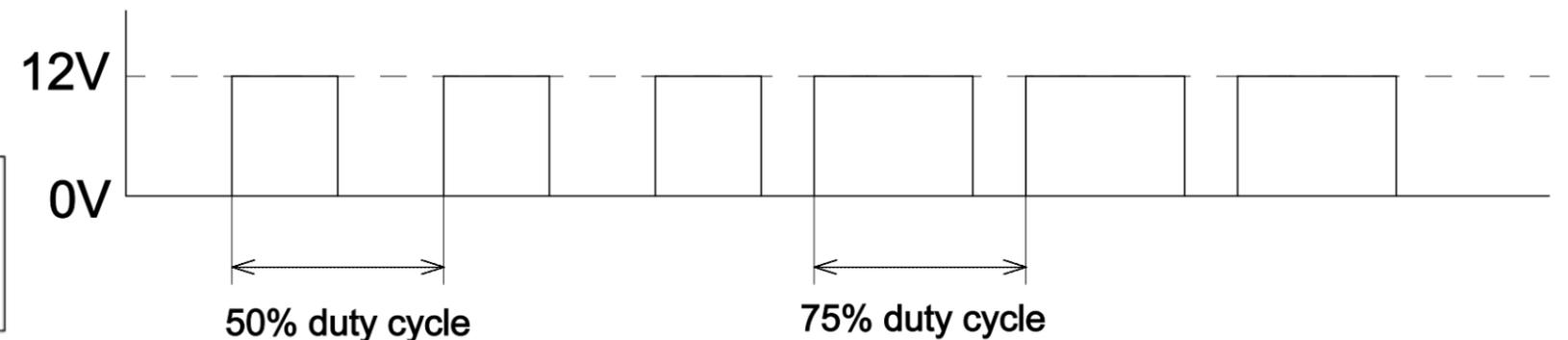
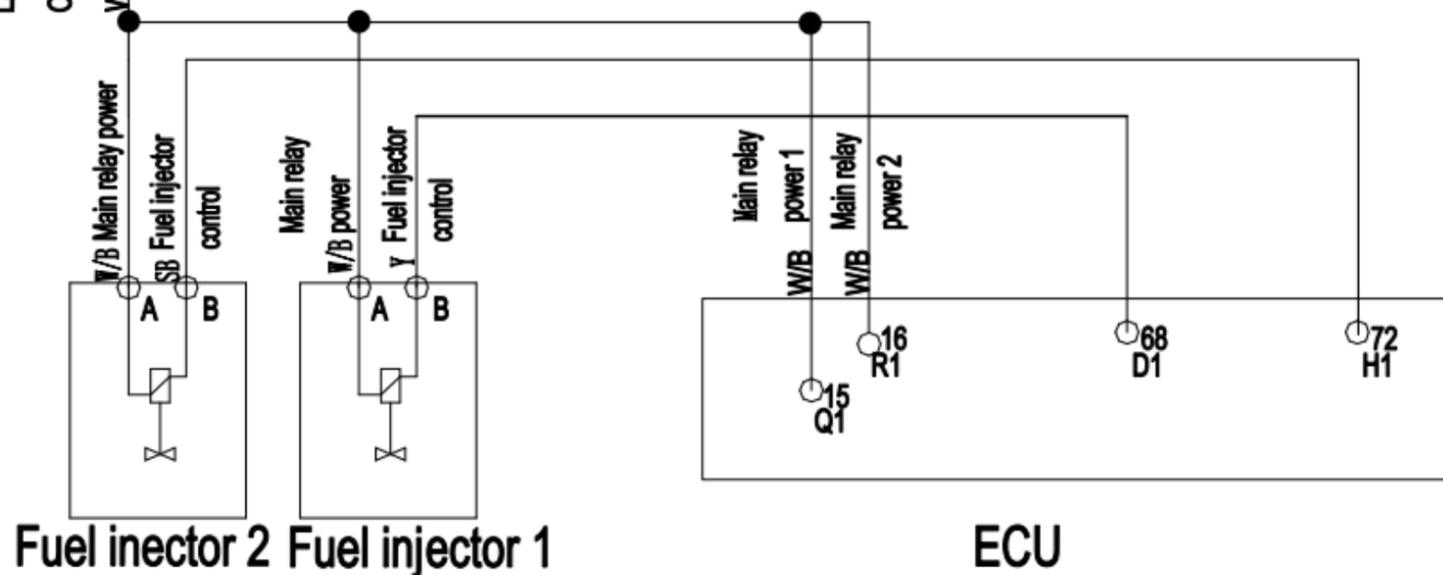


Pin	Function
A	Main relay Power
B	Signal

The fuel injector is a solenoid valve basically, which controlled by PWM signal sent out from ECU. The signal pulse width can be read in the datastream.

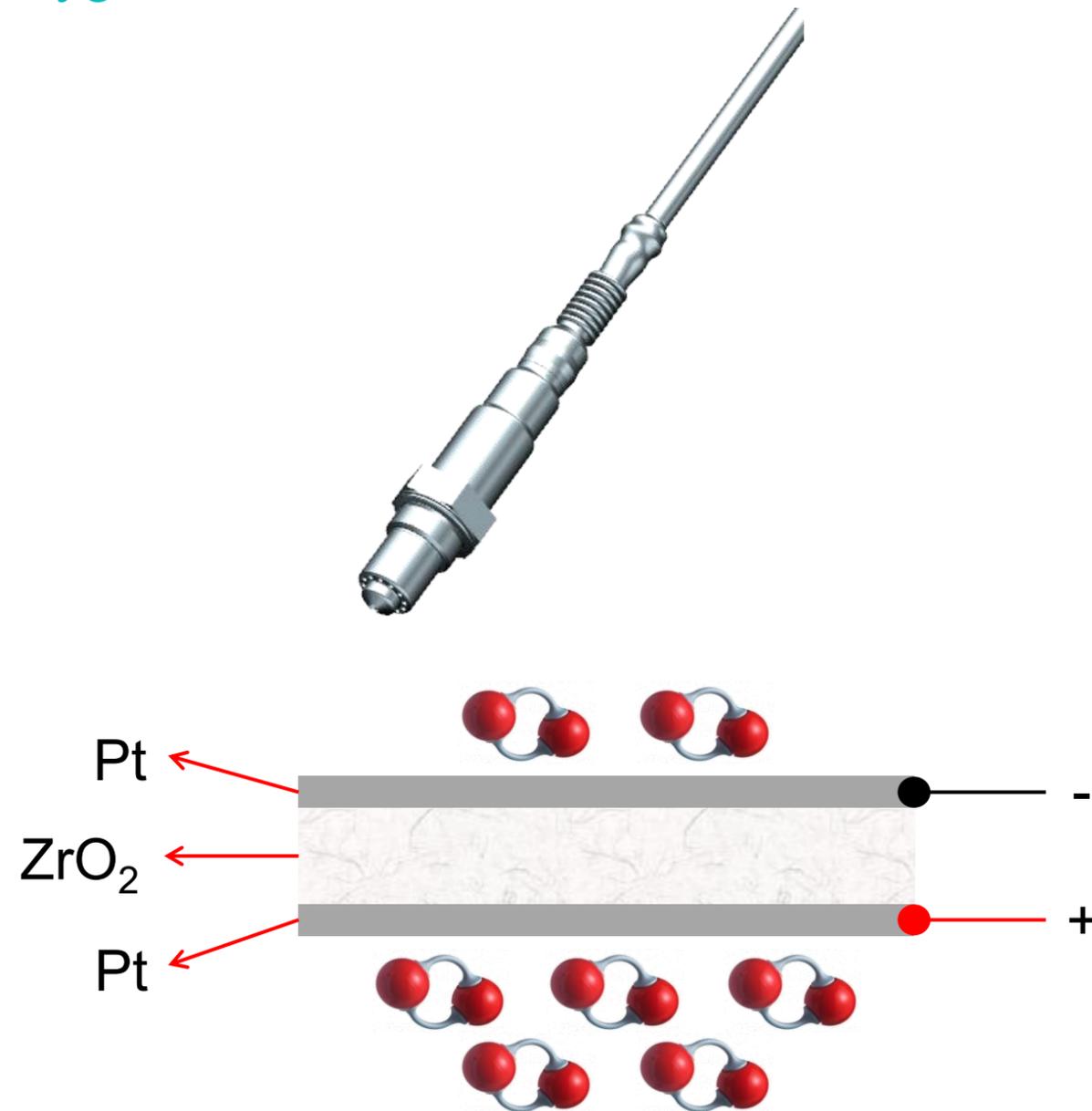
The injector is powered by the main relay and connect to the ECU pin 15(injector 1)and pin 16(injector 2), signal controlled by the ECU pin 68(injector 1) and pin 72(injector 2).

The resistanse between the two pins on the injector is about 12Ω(at 20°C), which can be tested by a digital multimeter to judge if a injector is abnormal.



# 5. Electronic system

## 5.11 Oxygen sensor



After the combustion process, the resulting exhaust gas is measured by the ECU through an oxygen sensor. The oxygen sensors detect the exhaust oxygen quantity and generate different voltage signal in different oxygen concentration, ECU takes this signal and adjusts the mixture to keep the exhaust gases as close as possible to the perfect combustion. The remaining unburnt exhaust gas are converted to harmless gas by the catalyst in the muffler.

The core parts of the oxygen sensor is a zirconium dioxide ( $ZrO_2$ ) tube with platinum electrode on both side as shown in pic, the inside of the  $ZrO_2$  ventilate to the atmosphere while the outside is immersed by exhaust gas. After the oxygen sensor is heated to  $350^{\circ}C$  or higher, the sensor will be activated.

The output voltage will increase with the atmosphere and exhaust gas oxygen differences goes higher:

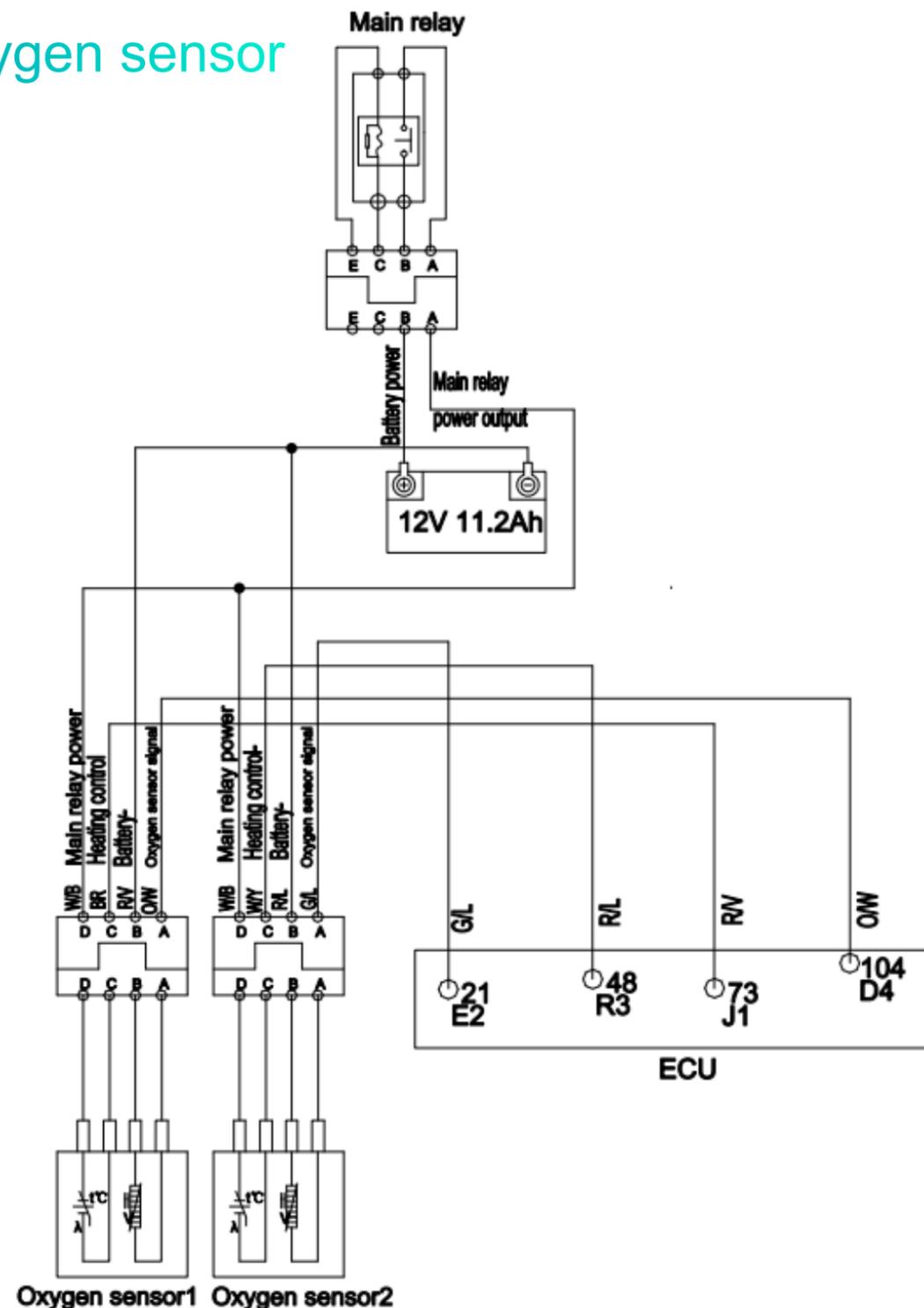
- $\lambda > 1$ ,  $O_2$  sensor output voltage  $U < 0.1V$ ;
- $\lambda < 1$ ,  $O_2$  sensor output voltage will increase,  $U_{max} \approx 0.8V$ .

The voltage can be read in the datastream.

The tightening torque is usually between 40-60N and with thread locker.

# 5. Electronic system

## 5.11 Oxygen sensor

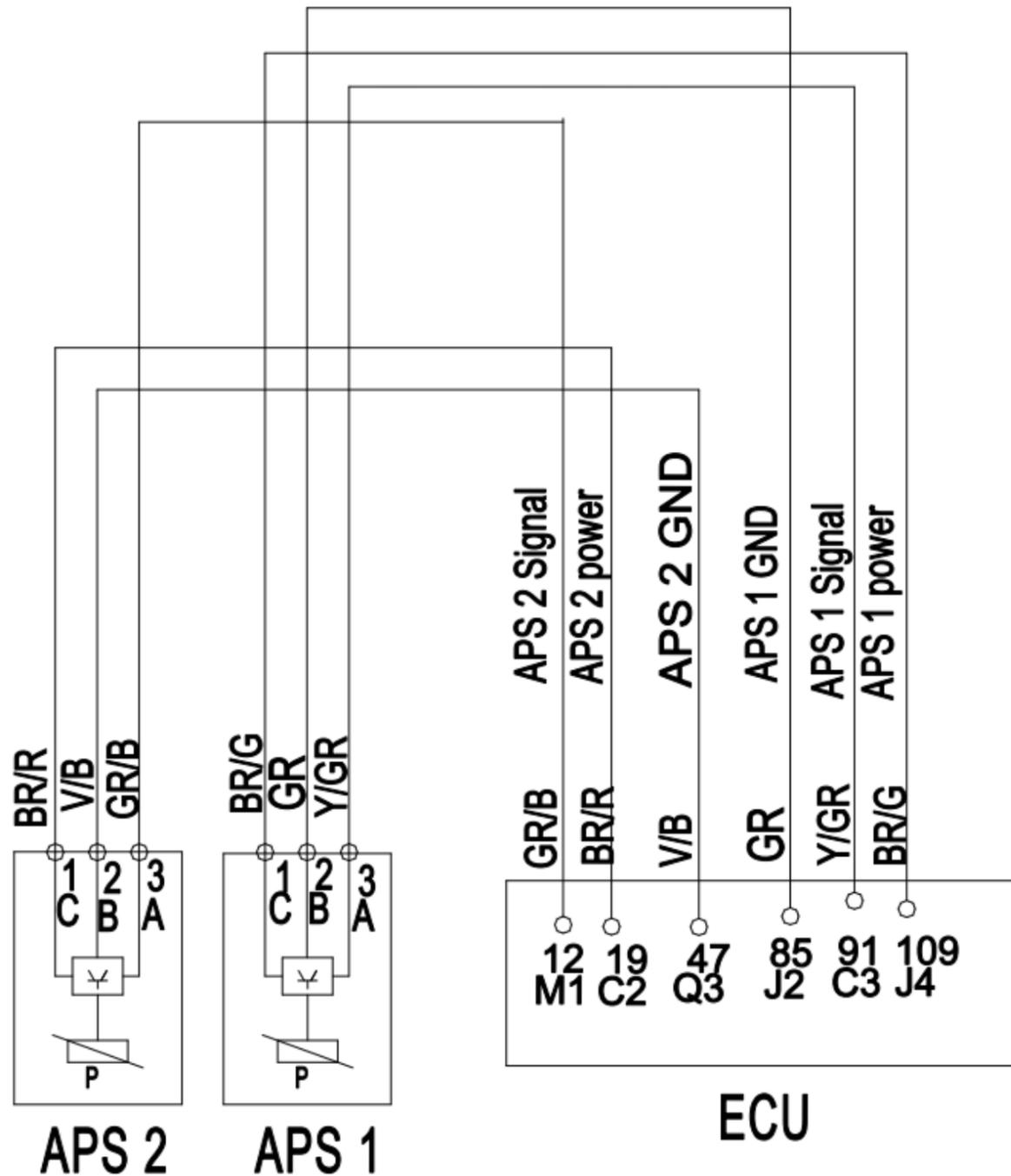


The oxygen sensor is more than 150 degrees to work normally, and the engine cold start temperature is low, the oxygen sensor working temperature can not reach, at this time, the engine fuel consumption will increase and emissions also become bad, in order to reduce the engine idle fuel consumption and air pollution, heating the oxygen sensor to make it reach the working state in advance. After the engine temperature reaches the normal working temperature, the oxygen sensor is also in the exhaust gas temperature to more than 930 degrees, at this time, there is no need to heat the oxygen sensor, because the exhaust gas temperature is enough to allow the oxygen sensor to maintain 150~930 degrees of temperature, then the ECU will close the oxygen sensor heating line. Also, the exhaust gas temperature cannot be higher than 930 degrees.

- Pin D: Powered by key-on power supply from main relay.
- Pin C: Heating control line, Controlled by pin J1 (bank 1) and R3 (bank 2) in ECU.
- Pin A: Controlled by pin D4 (bank 1) and E2 (bank 2) in ECU.
- Pin B: Grounded to the battery -.

# 5. Electronic system

## 5.12 APS



The APS measures the air pressure to calculate the exact air mass entering the engine cylinder, that makes the air-fuel ratio to be controlled with more precision. The air pressure can be read in the datastream.

- Pin 1: The 5V power is supplied by the pin C2(APS 2) pin J4(APS 1) of the ECU.
- Pin 2: The GND is grounded to the pin Q3(APS 2)pin J2(APS 1) in the ECU.
- Pin 3: The air pressure signal is sent to the pin M1(APS 2)pin J4(APS 1) in the ECU.



Pin	Function
1	5V Power
2	Ground
3	Signal

# 6. Maintenance

## 6.1 Break-in maintenance

The break-in period is the first 1000 kms, the maintenance items after this period are as follows:

Engine		
Engine oil and oil filter	1000	Replace
Idle	1000	Inspect
Coolant	1000	
Throttle system	1000	
Electrical system		
Functions of electrical parts	1000	Inspect
Battery	1000	
Fuses and relays	1000	
Brake system		
Brake discs	1000	Inspect
Brake pads	1000	
Brake fluid level	1000	
Brake lever	1000	Inspect for free travel
Brake hoses	1000	Inspect for damage and leakage
Wheels		
Tire condition	1000	Inspect
Tire pressure	1000	

Suspension system		
Rear shock absorber and front forks	1000	Inspect for leakage
Cooling system		
Coolant level	1000	Inspect
Coolant	1000	
Radiator fan function	1000	
Coolant hoses	1000	
Steering system		
Steering bearings	1000	Inspect
Other parts		
Diagnosis connector	1000	Check by connecting the PDA
Mobile parts	1000	Lubricate, inspect for flexibility
Bolts and nuts	1000	Inspect for fastness
Cables and wires	1000	Inspect for damage, bending and routing

# 6. Maintenance

## 6.2 Periodic maintenance

Engine			
Engine oil and oil filter	12M	15000	Replace
Oil Strainer	12M	15000	Clean
Clutch	-	15000	Inspect
Idle	-	15000	Inspect
Coolant	12M	15000	Inspect
	48M	-	Replace
Throttle system	-	10000	Inspect
Throttle valve	-	15000	Clean
Air filter element	12M	15000	Replace
Spark plug	-	30000	Replace
Valve clearance		30000	Inspect
Electrical system			
Functions of electrical parts	12M	10000	Inspect
Battery	6M	5000	
Fuses and relays	6M	5000	
Wires	12M	10000	Inspect for damage, bending and routing

Brake system			
Front and rear brake system	12M	10000	Inspect
Brake discs	12M	10000	
Brake pads	12M	10000	
Brake fluid level	12M	10000	Inspect for free travel
	12M	10000	
	12M	10000	
Brake fluid	24M	-	Replace
Wheels			
Tire condition	12M	10000	Inspect
Tire pressure	12M	10000	
Wheel bearings	-	10000	

# 6. Maintenance

## 6.2 Periodic maintenance

Suspension system			
Suspension system	-	5000	Inspect
Rear shock absorber and front forks	12M	10000	Inspect for leaking
Cooling system			
Coolant level	12M	10000	Inspect
Radiator fan function	12M	10000	
Coolant hoses	12M	10000	
Frame system			
Frame	-	30000	Inspect

Steering system			
Steering bearings	12M	10000	Inspect
Chain			
Chain lubrication	-	600	Inspect after Riding in wet road
Chain Tightness	-	1000	Inspect
Chain, rear sprocket and engine sprocket wear condition	12M	10000	
Chain guard	12M	10000	
Other parts			
Diagnosis connector	12M	10000	Check by connecting the PDA
Mobile parts	12M	10000	Lubricate, inspect for flexibility
Bolts and nuts	12M	10000	Inspect for fastness
Cables and wires	12M	5000	Inspect for damage, bending and routing
Pipes, ducts, hoses and sleeves	12M	10000	Inspect for cracks, sealing and routing



determined,  
progressive,  
more fun.