

EN

FANTIC
250

WORKSHOP MANUAL

GENERAL WARNINGS

1. FOREWORD

This manual has been compiled by Fantic Motor for use by Fantic Motor dealers and their specialist personnel. It is presumed that people using this documentation for repairing and servicing Fantic Motor vehicles have a basic grasp of the principles and mechanical procedures involved in repairing vehicles.

If personnel are unfamiliar with these basics, the resulting repair work or servicing may be inadequate or unsafe. Fantic Motor has an ongoing policy of product improvement. All Fantic Motor dealers will be notified of any significant amendments or changes made to the vehicles' characteristics or repair procedures, which will be published in future editions of the manual.



Fantic Motor reserves the right to amend or make changes, at any time and without prior notice, to the models described, to specifications and to design data, while this will not affect the essential features described and illustrated herein.



Operators are required to read this manual and to follow the instructions herein to the letter. The manufacturer is not liable for injury to people and/or damage to property, and is not liable for damage incurred by the product in the event of failure to observe the instructions featured herein.



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2. SYMBOL CONVENTIONS USED IN THE MANUAL

This manual features warnings and technical notes preceded by the following symbols depending on the warning's contents:



Warning concerning the procedure described and the specific safety rules: indicates procedures that must be followed in order to avoid damage to the vehicle or possible injury to the person repairing the vehicle.



Note providing information on the procedure described and on the vehicle's characteristics: gives useful information designed to help make the procedure easier and clearer.



Equipment: note advising the user of the need to use special tools for the procedure described.



Measurement: note illustrating the values of one or more measurements to be adhered to or to be checked for the procedure described.



Torque setting: note illustrating one or more torque setting values referring to the procedure described.



Consumable: note illustrating names, types and/or quantity of consumables (such as oil, fuel, sealants, additives, etc.) to be used for the procedure described.

The terms right or left always refer to the motorcycle's direction of travel, as though you were sitting on the bike.

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**SAFETY
RULES****CHAPTER 1**

Carbon monoxide



Exhaust fumes contain carbon monoxide, a poisonous gas that can cause death. Consequently, when performing procedures with the engine running, make sure you are in the open air, or in a suitable, well-ventilated room, never in an enclosed space. If you are working indoors, use an extraction system to remove exhaust fumes.

Fuel



The fuel used is highly flammable and is explosive under certain conditions. Perform refuelling and maintenance procedures in a properly ventilated area with the vehicle switched off. Do not smoke while refuelling and when you are around fuel vapours: avoid contact with naked flames, sparks and any other source that could cause fuel to ignite or explode.



Dispose of fuel responsibly and keep out of reach of children.

Hot parts



The engine and certain other parts get very hot and remain hot for some time even after the engine has been switched off. Before performing any work around the engine or exhaust system, put on insulating gloves or wait for the parts in question to cool down.

Spent engine and transmission oil



The engine and transmission oil used is harmful to health if breathed in or swallowed: it is also an irritant and can have serious consequences if it comes into contact with skin.

Do not spill or release to the environment.

If swallowed, do not induce vomiting, instead seek emergency medical attention immediately, indicating the cause and manner of the accident.

After contact with skin, wash the affected part immediately with soap and water, repeating the operation until there is no trace of oil on the affected part.

After contact with eyes or ears, flush affected parts immediately with plenty of water: seek emergency medical attention immediately, indicating the cause and manner of the accident.

After contact with clothing, remove any affected garments and wash parts of the body in contact with contaminated clothing with plenty of soap and water. Put on new clothing and wash the affected clothing with appropriate products as soon as possible.

Always use suitable hand protection when performing maintenance work.

Keep out of reach of children.

Spent engine and transmission oil must be placed in a sealed container and taken to the nearest service station or to a waste oil collection centre, where authorized personnel will handle its disposal.

CHAPTER 1

SAFETY RULES

Brakes



Brake fluid can damage the vehicle's painted, plastic or rubber surfaces. Protect these parts with a clean rag when performing certain procedures.

Always wear safety eyewear and, should brake fluid accidentally come into contact with eyes, flush immediately with plenty of cold, clean water, and seek immediate medical advice. Keep out of reach of children.

Clean break pads in a properly ventilated area, aiming the jet of compressed air so that you are not breathing in dust produced by friction material wear. While said material does not contain asbestos, breathing in the dust is still harmful.

Battery electrolyte and hydrogen gas



Battery electrolyte is toxic and caustic. On contact with skin, it can cause burns as it contains sulphuric acid. Wear gloves and protective clothing.

Should electrolyte liquid come into contact with skin, wash with plenty of cold water.

Protect eyes, as battery liquid can cause blindness. Should it come into contact with eyes, flush with water for fifteen minutes and seek the advice of an eye specialist without delay.

The battery gives off explosive gases: you are advised to keep flames, sparks and any other sources of heat well away. When charging or performing maintenance on the battery, make sure the place where you are working is sufficiently ventilated.

Keep out of reach of children.

Battery liquid is corrosive. Do not spill it, especially on plastic parts.

Dispose of waste liquid regularly.

Coolant



Under certain conditions, the ethylene glycol in engine coolant is combustible its flame is not visible. Should the ethylene glycol ignite, you will not see any flame, but it can still cause severe burns.

Do not spill engine coolant on the exhaust system or engine parts. They may be hot enough to cause the coolant to ignite and burn without a visible flame. Coolant (ethylene glycol) can cause skin irritation and is poisonous if swallowed. Keep out of reach of children. Do not remove the radiator cap while the engine is still hot. The coolant is pressurized and could scald you.

Keep your hands and clothing well away from the cooling fan as it starts automatically.

General precautions and warnings



Operators performing repair work must wear suitable clothing to avoid the risk of injury when working on moving parts (for instance, loose clothing that can get caught).

Do not wear personal items (for instance, rings, wristwatches, etc.) while performing repair work on the vehicle, especially on the electrical system.



Keep the work area tidy, so that you don't have items left lying around on the floor getting in the way of repair work.

Wipe up any spilled oil, grease or other fluids on the floor in work areas to avoid people slipping on them.

When compressing or releasing springs, only use strictly suitable tools to prevent the operator being injured in the process.

Do not inhale vapours given off by cleaning fluids: they can be highly toxic. Make sure the work area is suitably ventilated.

Wear eye protection when using power tools, such as drills or grinders.



For each operation, use suitable cleaning products, making sure they are approved.

2.1 MAINTENANCE

Always use original Fantic Motor spare parts, and lubricants recommended by the manufacturer. Non-original spare parts can damage the vehicle.

Always use new gaskets, oil seals and O-rings during assembly.

Following removal, clean parts with non-flammable solvents.

Lubricate all work surfaces before assembly, except valve keepers.

All surfaces that have gaskets, oil seals or O-rings must be cleaned with special care.

Carefully inspect all circlips prior to refitting them, replacing any that are misshapen. Only use new gudgeon pin clips after each use.

Following reassembly, make sure that all parts have been installed correctly and are working perfectly.

Always use top-quality equipment. To lift the vehicle, use purpose-built, legally compliant equipment that meets national and local standards.

When performing any work on the vehicle that involves the electrical system, make sure the electrical connections have been made correctly, especially the earth and battery connections.



Only use the specific tools designed for this vehicle.

For removal, servicing and assembly procedures, use metric tools only.
Metric screws, nuts and pins are not interchangeable with imperial fasteners.

2.2 PREPARATION PRIOR TO WORK

Prior to removal work, thoroughly clean parts in order to remove all traces of dirt, dust, mud or foreign matter.

When taking the vehicle apart, always keep mating parts together, namely gears, cylinders, pistons and other parts that fit together perfectly due to everyday wear. These mating parts must always be reused together, or replaced altogether.

During work, keep tools close to hand, preferably in the order you will need them and, whatever the case, never leave them on the vehicle or in a place that is hidden or awkward to reach.

Keep your zone area clean and tidy.



When taking the motorcycle apart, clean all parts and place them in containers in the order they are removed, so as to make the assembly procedure easier and ensure all parts are fitted correctly. Where necessary, mark parts or locations that could get mixed up when it comes to reassembly.

CHAPTER 2

MAINTENANCE RULES



Keep all parts away from sources of heat.

Do not lift the vehicle by its licence plate bracket, to avoid damage.



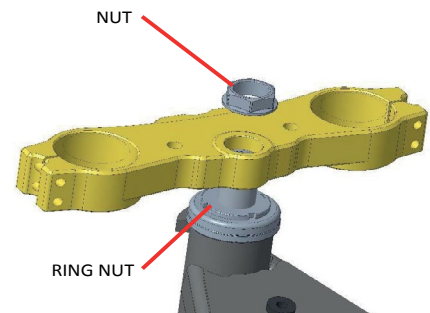
Use suitable tools and cleaning products.

2.3 TORQUE SETTINGS

Part	Screw	Torque setting Nm
Triple clamp screw	M8 (08.8)	18
Front brake caliper screws	M8 (10.9)	25 + Loctite 243
Wheel axle	M14	50
Rear wheel axle nut	M17	80
Fork axle clamp screws	M8 (08.8)	25
Handlebar bolts	M8 (08.8)	25
Handlebar bolts	M10 (08.8)	45
Clutch/Brake pump collars	M6 (10.9)	10
Engine mounting screws diameter 10	M10	45
Engine mounting screws diameter 8	M8	25
Swingarm pivot bolt	M14	60
Linkage	M12	50
Rear shock	M10 upper	40
	M10 lower	40 + Loctite 243
Sprocket screws	M8 (10,9)	25
Front brake disc screws	M8	25 + Loctite 243
Rear brake disc screws	M6	10 + Loctite 243
Kickstand screw	M8 (10.9)	25
Rear brake lever screw	M10 (8.8)	40

STEERING STEM FASTENING SEQUENCE:

1. Tighten the ring nut to 25Nm;
2. Loosen the ring nut ½ a turn;
3. Retighten the ring nut to 8 Nm;
4. Fit the upper triple clamp;
5. Tighten the top nut to 80 Nm.

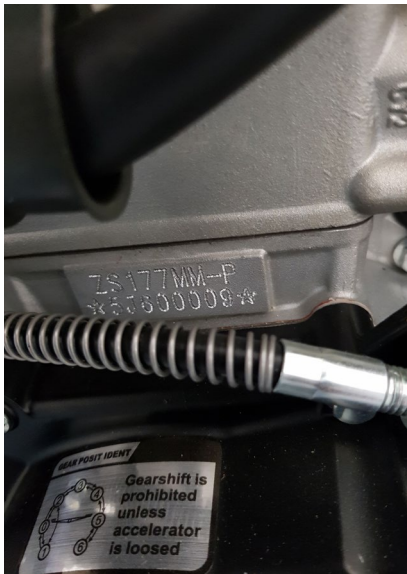


Fantic Motor vehicles have vehicle and engine identification numbers.

FANTIC MOTOR S.r.l
L3e-A1
e11*168/2019*00256*00
ZFMTL250MGT000000
81.9 dB(A) 4125 min⁻¹
9.7 kW max. 270 kg

Vehicle identification number (VIN)

The chassis number can be found on the steering head.

**Engine identification number**

Each FANTIC MOTOR vehicle also has an engine ID number that can be found on the top left-hand side of the crankcase.



Use only original Fantic Motor spare parts; for all lubrication needs, use Fantic Motor-recommended grease and oil. While other makes of product may look similar and do the same job, their quality may be inferior.



GASKETS, OIL SEALS AND O-RINGS

- When performing general repair work on the engine, replace all gaskets, O-rings and oil seals. In addition, clean all mating surfaces and the edges of seals and O-rings.
- Prior to reassembly, lubricate mating parts and bearings with oil. Apply grease to the lips of seals.

WASHERS, LOCK PLATES AND COTTER PINS

When removing washers, lock plates and cotter pins, replace them with new parts. Locking tabs must be bent against the surfaces of the relevant nut or bolt once they have been tightened correctly.

BEARINGS AND OIL SEALS

- Fit bearings and oil seals with the part numbers or brand markings facing out, namely turned to the visible side. When installing oil seals, smear their lips with a fine coating of lithium grease.
- To avoid damaging the rolling surfaces, do not dry bearings with compressed air.

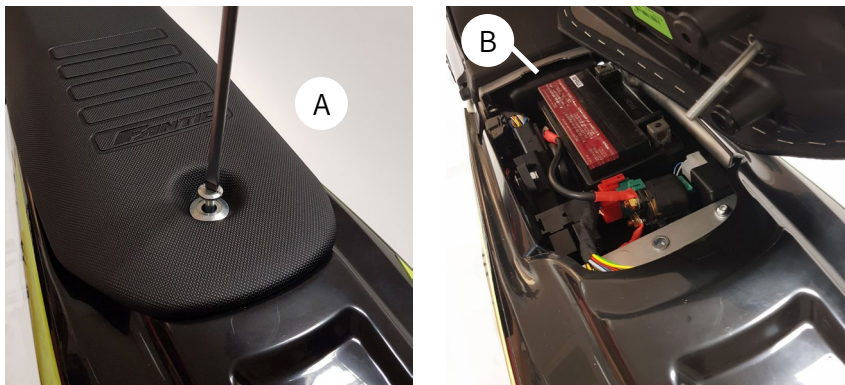
CIRCLIPS

- Check all circlips before fitting them. Always replace any circlips that have to be removed.
- Replace misshapen circlips when installing a new circlip.
- Check that the flat edge is on the opposite side to the point where pressure is applied.

To provide access to certain areas of the vehicle for inspection and work, you need to remove the relevant parts as follows:

5.1 REMOVING THE SEAT

Remove the fastening screw (A) pictured and remove the seat by sliding it backwards to release it from the hook on the tank and the bracket (B).



5.2 REMOVING THE REAR FENDER

Once you have removed the seat as described in section 5.1 "Removing the seat", unscrew the three fastening screws, two of which are on the left and right side of the bike (marked C in the photo), and the central one D located under the seat.



CHAPTER 5

BODYWORK
REMOVAL

5.3 REMOVING THE RADIATOR SHROUDS

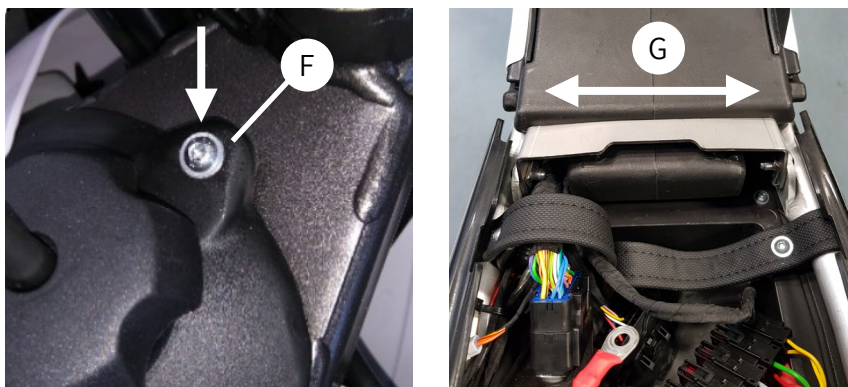
Once you have unscrewed the two screws 5 securing the tank's rear mount, unscrew screws a,b,c,d, starting on the right side, followed by the left.



5.4 REMOVING THE FUEL TANK

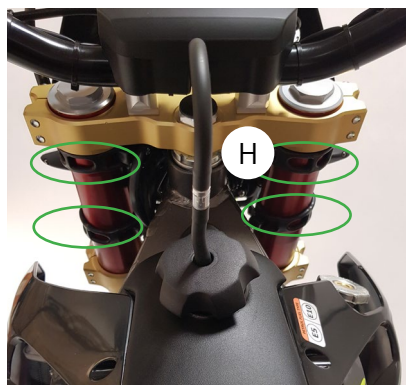
Unscrew screw F securing the tank to the frame, and the two mounting screws G; remove the fuel valve line and pull out the tank, turning it in the direction of the fuel valve.

NB: You will need to have removed the radiator shrouds



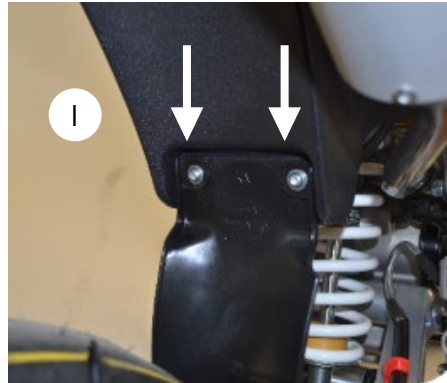
5.5 REMOVING THE HEADLIGHT ASSEMBLY

Release the four cable clamps H and disconnect the headlight connector.

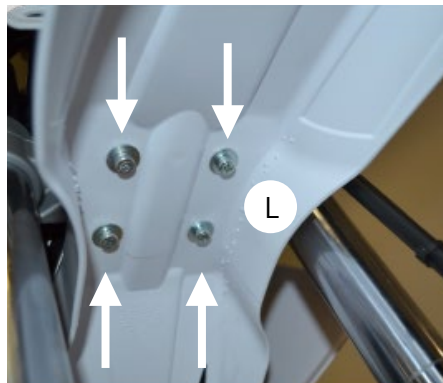


5.6 REMOVING THE MUD FLAP

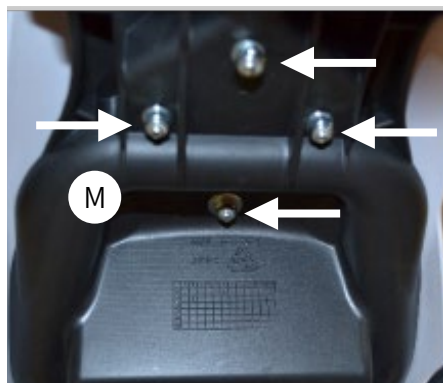
Unscrew the two screws "I" securing it to the mudguard. To make performing this procedure easier, it is best to remove the air filter (see sect. 6) so that you can tighten the nut located on the inside.

**5.7 REMOVING THE FRONT MUDGUARD**

Unscrew the four screws L securing the mudguard.

**5.8 REMOVING THE LICENCE PLATE BRACKET**

Once you have removed the rear fender, unscrew the four screws M securing it to the rear subframe. Unplug the tail lights from the connector and remove the licence plate bracket.

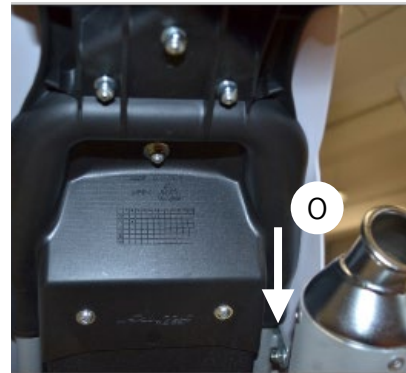
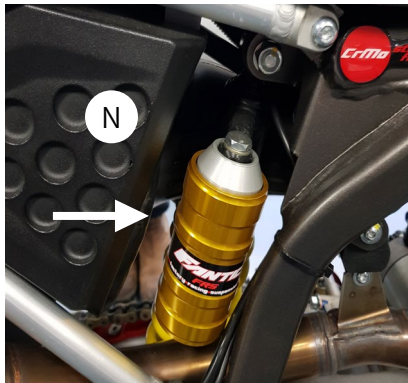


CHAPTER 5

BODYWORK
REMOVAL

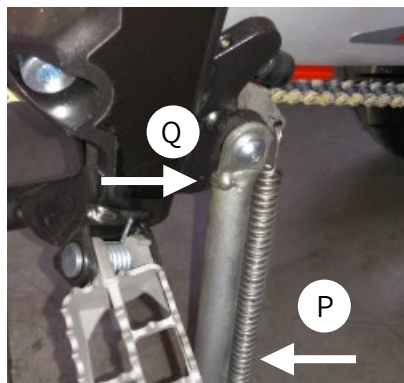
5.9 REMOVING THE REAR SUBFRAME

Unscrew the four screws N securing it to the frame (two each side) and the screw O connecting it to the silencer.



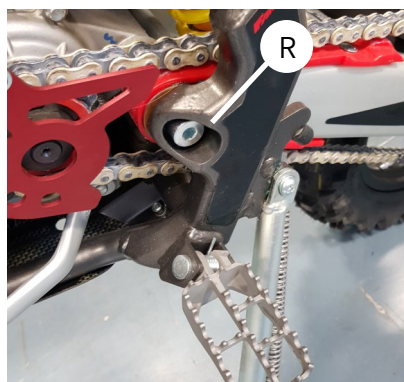
5.10 REMOVING THE KICKSTAND

Remove spring P and unscrew screw Q securing the kickstand to the frame and remove the actual kickstand



5.11 REMOVING THE SWINGARM PIVOT BOLT

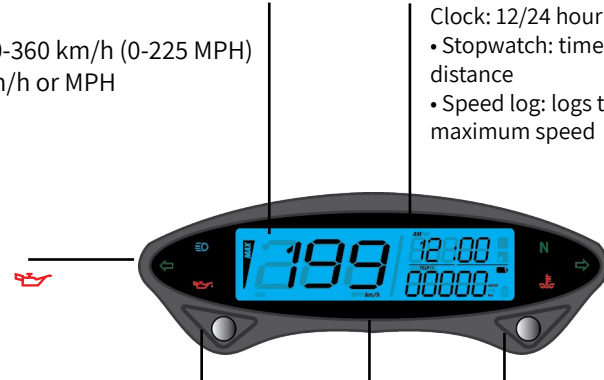
Unscrew nut R and slide the bolt out from the side opposite the nut.



DASHBOARD

CHAPTER 6





6.1 DASHBOARD TL 250 CARBURETTOR KOSO DB EX-O2



Speedometer

- Display range: 0-360 km/h (0-225 MPH)
- Display unit: km/h or MPH

Warning lights

- Full beam (Blue) 
- Directional Indicators (Green) 
- 2-stroke oil level (Red) 
- Neutral light (Green) 

SELECT button

- Pressing the SELECT button while on the main screen allows you to switch between the information displayed: 12/24 hour clock mode, speedometer log, stopwatch and MAX. record

Odometer

- Display range: 0-99,999 km (miles), automatic reset after 99,999 km (miles)
- Display unit: 1 km (mile) Trip meter
- Display range: 0-999.9 km (miles), automatic reset after 999.9 km (miles)
- Display unit: 0.1 km (mile)

Instrument battery level

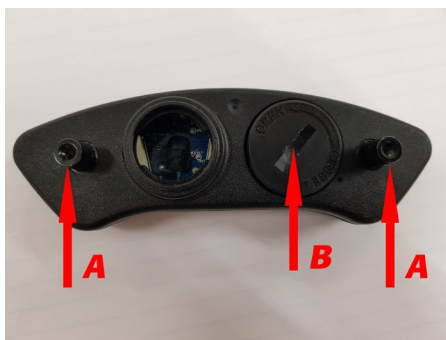
- Display range: 4 levels.

ADJUST button

- Pressing the Select button while on the main screen allows you to switch between the information displayed: odometer, A/B trip meter, total hour meter and A/B trip hour meter
- Hold the key down for 3 seconds while on the A/B trip screen to reset this hour meter.
- Hold the key down for 3 seconds while on the A/B trip hour meter screen to reset this hour meter.

Clock: 12/24 hour mode

- Stopwatch: time taken to cover the set distance
- Speed log: logs the average speed and maximum speed



2 REPLACING THE BATTERY

When the battery level is low, replace it by proceeding as follows:

1. Remove the instrument from its mount by unscrewing the two fastening screws (A).
2. Remove the battery cover (B), using a coin or flat-blade screwdriver to unscrew it.
3. Replace the battery (C mod.2032) and refit the cap, making sure you also refit the seal (D) in its seat.

Once done, refit the instrument.

3 DASHBOARD FUNCTIONS

3.1 HOW TO USE THE ADJUST BUTTON



- Pressing the **Adjust** button while on the main screen allows you to toggle between the instrument's speedometer and trip functions.
- Once you are on the trip screen, pressing the **Adjust** button allows you to switch between displaying trip A and trip B.
- If you are on trip A, holding the **Adjust** button down for 3 seconds resets trip A.

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DASHBOARD



- Pressing the **Adjust** button allows you to switch between displaying trip A and trip B.
- Holding the **Adjust** button down for 3 seconds resets trip B.



- Pressing the **Adjust** button allows you to switch between displaying trip B and the total hour meter.



- Pressing the **Adjust** button allows you to switch between displaying the total hour meter and trip A hour meter.
- Holding the **Adjust** button down for 3 seconds resets the trip A hour meter.



- Pressing the **Adjust** button allows you to switch between displaying the trip A hour meter and trip B hour meter.
- Holding the **Adjust** button down for 3 seconds resets the trip B hour meter.



- Pressing the **Adjust** button again allows you to switch from the trip B hour meter screen to the main screen.

3.2 HOW TO USE THE SELECT BUTTON

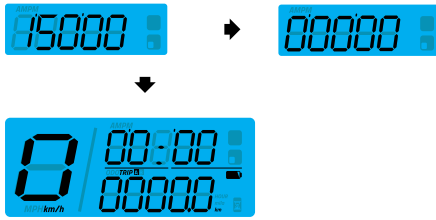


- Holding the **Select** button down for 3 seconds while on the main screen allows you to choose the 12/24 hour function.

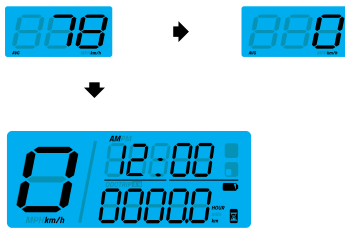


NB: If you choose 24 hour mode, the AM/PM symbols will not appear.

- Pressing the **Select** button while on the main screen allows you to switch from the clock function to the stopwatch function.
- Holding the **Select** button down for 3 seconds resets the stopwatch.



- Pressing the **Select** button allows you to switch from the stopwatch function to the speed measuring function.
- Holding the **Select** button down for 3 seconds resets the speed measuring device.



NB: Average speed and maximum speed are shown in turns at 3-second intervals.

- Pressing the **Select** button again allows you to switch from the speed measuring screen to the main screen.

3.3 HOW TO USE THE ADJUST + SELECT X 3 BUTTON

TYRE CIRCUMFERENCE SETUP



Pressing the **Adjust + Select X 3** button while on the main screen allows you to access tyre circumference and detection point setup (to set different tyre sizes).



- Pressing the **Adjust** button takes you to the tyre circumference setup submenu.



Press the **Adjust** button until you are over the digit you want to edit. In this example, the circumference of the tyre is 1,300 mm.



NB: The circumference of the rear tyres must be set to 2090 mm and 9 pulses for supermotard models, and to 2290 mm and 9 pulses for enduro models.

Digits must be set working from left to right.

- In this example, the circumference has been changed from 700 mm to 1,700 mm.
- Pressing the **Select** button saves the change made.
- Pressing the **Adjust** button three times takes you to tyre detection point setup

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DASHBOARD

3.4 TYRE DETECTION POINT SETUP



- Press the **Select** button to edit the digit, entering the number 1
NB: the detection point can be changed in the range 1 to 9.



- Pressing the **Adjust** button takes you back to the tyre circumference and detection point menu

3.5 CLOCK SETUP



- To switch from the speed menu to the clock menu press the **Adjust** button.



- Then press the **Select** button to enter the clock setup submenu.



- Press the **Select** button to set the hour you want. In this example, we are setting the hour to 14:00.

NB: hour setting range: 0-24Hrs.

NB: setting sequence: Hours > tens of minutes > single minutes.



- Pressing the **Adjust** button takes you to the minute setting menu



- Press the **Select** button to set the minutes you want. In this example, we are setting the time to 14:05

NB: minute setting range: 0-59 minutes.



- The time has now gone from 14:00 to 14:05
- Pressing the **Adjust** button takes you back to the Clock setup page.



- Press the **Select** button to switch from the Clock menu to the Test menu (distance setup for stopwatch).

DASHBOARD**CHAPTER 6**

- Press the **Adjust** button to enter stopwatch distance setup. In this example, we will be changing the distance from 300 to 350.



- Press the **Adjust** button to go back to the stopwatch setup menu.
- Press the **Select** button to save the changes.

NB: distance setting range: from 100m to 2,000 m.



- From the stopwatch page, hold the **Adjust** button down for 3 seconds to go back to the main menu.



CHAPTER 6

Maximum speed record

- Display range : 0 ~ 360 km/h (0 ~ 225 mile)

Maximum RPM record

- Display range : 0 ~ 15,000 RPM

Speedometer

- Display range : 0 ~ 360 km/h (0 ~ 225 mile)

Indication light

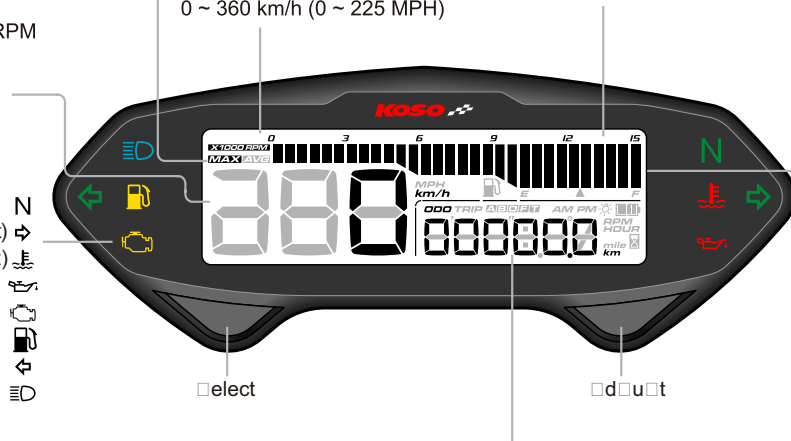
- Neutral (green light)
- Right indication light (green light)
- Water temperature (red light)
- Motor oil (red light)
- Engine (yellow light)
- Fuel (yellow light) not used
- Left indication light (green light)
- High beam light (blue light)

Average speed record

- Recording range : 0 ~ 360 km/h (0 ~ 225 MPH)

Tachometer

- Display range : 0 ~ 10,000 RPM · 0 ~ 12,000 RPM · 0 ~ 15,000 RPM



- Setting range : 100Ω · 250Ω · 270Ω · 510Ω · 1200Ω · SWITCH · USER

- Setting range : when lower than (including) setting value, fuel level symbol will blink

- Setting range : when lower than (including) setting value, fuel level symbol will blink
- Setting range : when lower than (including) setting value, fuel level symbol will blink

Odometer

- Display range : 0 ~ 99999.9 km (mile), return to zero upon exceed.
- Display unit : 0.1 km (mile)

Trip meter A · B

- Display range : 0 ~ 999.9 km (mile), return to zero upon exceed.
- Display unit : 0.1 km (mile)

Tachometer

- Display range : 0 ~ 15,000 RPM
- Display unit : 10 RPM

Voltmeter

- Display range : DC 8.0 V ~ 16.0 V
- Display unit : 0.1 V

Internal ODO

- Display range : 0 ~ 99999.9 km (mile), user unadjustable
- Display unit : 0.1 km (mile)
- Setting range : 0 ~ 999.9 km (mile)
- Setting unit : 0.1 km (mile)

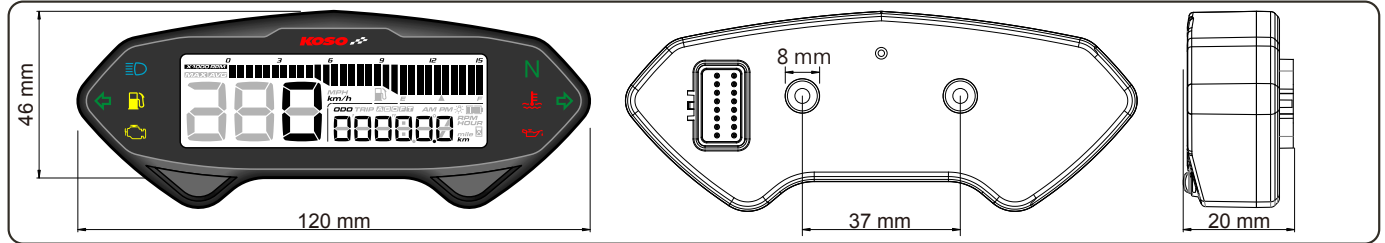
- Display range : 0 ~ 999.9 km (mile), return to zero upon exceed.
- Display unit : 0.1 km (mile)
- Display range : 0 ~ 999.9 km (mile), return to zero upon exceed.
- Display unit : 0.1 km (mile)

BASIC FUNCTION INSTRUCTION

● Speedometer	Display range : 0 ~ 360 km/h (0 ~ 225 MPH) Will blink when exceed range. Display unit : 1 km (mile)	● Fuel level	Setting range : 100Ω · 250Ω · 270Ω · 510Ω · 1200Ω · SWITCH · USER
○ Display internal	<0.5 second	○ Staged fuel gauge	Setting range : 10 stage display Warning range : Fuel level warning stage below (including) setting value, fuel level symbol will blink.
○ Odometer	Display range : 0 ~ 99,999.9 km (mile), return to zero upon exceed. Display unit : 0.1km (mile)	○ Digital fuel gauge	Setting range : 0 ~ 100 % Setting unit : 10 %
○ Trip meter A · B	Display range : 0 ~ 999.9 km (mile), return to zero upon exceed. Display unit : 0.1km (mile)	○ Low fuel warning	Setting range : 10 ~ 50 %, when lower than (including) setting value, fuel level symbol will blink. Setting unit : 10%
● Motor oil maintenance millage	Display range : SI unit : 500 (~8000 km, user adjustable) ~ -999 km, automatic decrease according to the increase of total millage. Display range : Inch : 300 (~ 5000 mile user adjustable) ~ -999 km, automatic decrease according to the increase of total millage. Display unit : 1 km (mile)	● Volt meter	Display range : DC8.0 V ~ 16.0 V Display unit : 0.1V
○ Maximum speed record	Display range : 0 ~ 360 km (0 ~ 225 mile) Display unit : 1 km (mile)	● Internal ODO	Display range : 0~99999.9 km (mile), user unadjustable Display unit : 0.1 km (mile)
○ Average speed record	Recording range : 0 ~ 360km/h (0 ~ 225 MPH)	● External ODO	Setting range : 0~99999 km (mile) Setting unit : 1km (mile)
○ Tire circumference	Setting range : 300 ~ 2,500 mm Setting unit : 1 mm	● Backlight color	Display range: white
○ Sensitive point	Setting range : 1 ~ 20 points Setting range : 1 point	● Effective voltage	DC 12 V
● Tachometer	Display range : 0 ~ 15,000 RPM Display unit : 10 RPM	● Effective temperature range	+60 °C
○ Display internal	<0.5 second	● Meter standard	JIS D 0203 (S2)
○ Stage tachometer	Display range : 0 ~ 10,000 RPM · 0 ~ 12,000 RPM · 0 ~ 15000 RPM Display unit : 0 ~ 10,000 RPM (333 RPM each stage) 0 ~ 12,000 RPM (400 RPM each stage) 0 ~ 15,000 RPM (500 RPM each stage)	● Meter size	120 x 46 x 20 mm
○ MAX RPM record	Display range : 0 ~ 15,000 RPM Display unit : 10 RPM	● Meter weight	Around 240 g
○ The RPM input signal number setting	Setting range : P-0.5,P-1~P-25	● Indicator light	Neutral (green light) Right indication light (green light) Water temperature (red light) Motor oil (red light) High beam light (blue light) Left indication light (green light) Fuel (yellow light) Engine (yellow light)
○ The RPM input pulse	Setting range : lo-Act, Hi-Act		
● Total hour meter	Display range : 0 ~ 99,999.9 hour Display unit : 0.1 hour		
○ Hour meter A · B	Display range : 0 ~ 9,999.9 hour Display unit : 0.1 hour		

NOTE Any design and specification changes will not be notify.

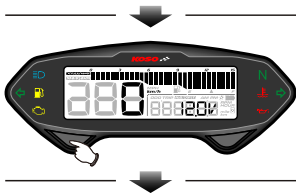
3-3 Meter size



3-4 Select button function instruction



- In the clock screen, press the **Select button** one time to enter the volt screen.
- In any screen, press and hold the **Select buttons for 3 seconds** to switch between rpm and fuel bar screen.



- In the volt screen, press the **Select button** one time to enter the fuel level screen.



- In the fuel level screen, press the **Select button** one time to go back to the clock screen.



- In the clock screen.

3-5 Adjust button function instruction



- In the ODO screen, press the **Adjust button** to enter the Trip A screen.
- In the ODO screen, press the **Select+Adjust buttons for 3 seconds** to enter settings (Please refer to 4).



- In the Trip A screen, Press the **Adjust button** to enter the Trip B screen.
- Press and hold the **Adjust button for 3 seconds** to reset Trip A screen.



- In the Trip B screen, press the **Adjust button** to enter the oil maintenance mileage screen.
- Press and hold the **Adjust button for 3 seconds** to reset Trip B screen.



- In the oil maintenance mileage screen, press the **Adjust button** to enter the total hour meter screen.
- Press and hold the **Adjust button for 3 seconds** to reset oil maintenance mileage screen.



- In total hour meter screen, press the **Adjust button** to enter the hour meter A screen.



- In the hour meter A screen, press the **Adjust button** to enter the hour meter B screen.
- Press and hold the **Adjust button for 3 seconds** to reset hour meter A screen.



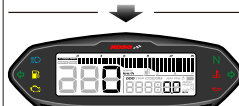
- In the hour meter B screen, press the **Adjust button** to enter the Max. record screen.
- Press and hold the **Adjust button for 3 seconds** to reset hour meter B screen.



- In the Max. record screen, press the **Adjust button** one time to enter the Average speed record screen.
- Press and hold the **Adjust button for 3 seconds** to reset Max. record screen.



- In the Average speed record screen, press the **Adjust button** one time to enter the ODO screen.
- Press and hold the **Adjust button for 3 seconds** to reset Average speed record screen.



- In the ODO screen.

CHAPTER 6

3-6 The settings screen description

- Total millage screen - Press and hold the **Select + Adjust** button for 3 seconds to enter setting screen.
- Press the **Adjust** button to select setting screen for Circumference and sensing point setting, RPM pulse setting, Fuel gauge resistance setting (Fuel level manual setting / Fuel level resistance auto detection setting / Fuel warning setting), Backlight brightness setting, Oil maintenance mileage setting, Speed unit setting, External ODO, Internal ODO.
- In any setting screen, hold the **Select** button for 3 seconds to return to main screen.

NOTE In settings screen, button is not pressed in 30 seconds, or speed > 3 km/h, will automatically return to main screen.

NOTE After exiting settings screen, it will record the parameters.

4 Enter settings and function index menu

- Press and hold the **Select + Adjust** button for 3 seconds to enter setting screen.

4-1 Circumference and sensing point setting

- Press the **Select** button to enter the circumference and sensing point setting screen.

CAUTION!

- Please measure the tire circumference (The tire you will install the sensor on) and make sure the number of magnet sensor point (You could install the magnet into the disc screw or the sprocket screw.)
- The speed displayed on the meter will be affected by the setting, please make sure the setting number is correct before you make the setting.

⚠ Please reset this setting value when you change a different size tire.

- **Example** : If the tire circumference is 1,300 mm.
- Press the **Select** button to choose the setting number.
- **EX.** Now the tire circumference is setting from 1,000 mm.
- ⚠ Now the digit in thousands setting number is flashing!

NOTE Setting range : 300 ~ 2,500 mm
Setting unit : 1 mm

PS.

- You could define the valve as the starting point and the terminal point to measure the wheel circumference with a measuring tape.

- Press the **Adjust** button to choose the setting number.

- Press the **Select** button to enter the sensor point setting.
- **EX.** The circumference setting is changed from 1,000 mm to 1,300 mm.

- **Example** : If the sensor point is setting 6P.
- Press the **Adjust** button to choose the setting number.
- **EX.** Now the sensor point is setting from 1P.

⚠ Now the setting value is flashing!

NOTE Sensitive point : 1 ~ 20

- Press the **Select** button to go back to the circumference and sensing point setting screen.
- **EX.** Now the sensor point is setting from 1P to 6P.

- Press the **Adjust** button to enter next operation setting.

DASHBOARD

CHAPTER 6

4-2 RPM pulse setting



- Press the **Select** button to enter the RPM pulse setting screen.



- **EX.** You want to connect the RPM signal wire to the pick up signal and there are 13 flywheel signals per turn.
- Press the **Adjust** button to choose the setting number.

△ Currently setting value will blink.

NOTE Setting range: 0.5 ~ 1 ~ 25

The setting value	The corresponding stroke and pistons number	The corresponding RPM signal number per ignition
0.5	4C-1P	2 RPM signals per 1 ignition.
1	2C-1P 4C-2P	1 RPM signal per 1 ignition.
2	2C-2P 4C-4P	1 RPM signal per 2 ignition.
3	2C-3P 4C-6P	1 RPM signal per 3 ignition.
4	2C-4P 4C-8P	1 RPM signal per 4 ignition.
5	4C-10P	1 RPM signal per 5 ignition.
6	2C-6P 4C-12P	1 RPM signal per 6 ignition.

CAUTION! Most of the 4-cycle bikes with one single piston are igniting every 360 degree once, so the setting should be the same as the bike with 2-cycle and one piston engine.



- Press the **Select** button to enter waveform setting screen.
- **EX.** Setting engine ignition angle from P-1 to P-13.



- **Example :** To set waveform to high waveform (Hi-Act).
- Press the **Adjust** button to choose the setting number.

△ Currently setting value will blink.

NOTE Setting range : Hi-Act ~ Lo-Act

NOTE During RPM signal detection, if there is any bad sensing or interference, please select another RPM sensing waveform.



- Press the **Select** button to enter rpm stage setting screen.
- **EX.** Setting from high wave (Hi-Act) to low wave (Lo-Act).



- **Example :** To set rpm stage value as 10,000 RPM.

- Press the **Select** button to choose the setting number.

- **EX.** Current rpm stage value is 15,000 RPM.

△ Currently setting value will blink.

NOTE Setting range : 10,000 ~ 12,000 ~ 15,000 RPM *



- Press the **Adjust** button to choose the setting number.



- Press the **Select** button to return to rpm stage setting screen.
- **EX.** Setting rpm stage value from 15,000 RPM to 10,000 RPM.



- Press the **Adjust** button to enter next operation setting.

CAUTION!

- Fuel gauge resistance setting
- Fuel level manual setting
- Fuel level resistance auto detection setting
- Fuel warning setting

All Functions related to the fuel are disabled in this vehicle

Fuel level Setting range : SWITCH
SW

4-4 Backlight brightness setting



- Press the **Select** button to enter the backlight brightness setting screen.



- Press the **Select** button to go back to the backlight brightness setting screen.
- **EX.** The backlight brightness setting is changed from 5 (100%) to 3 (60%).



- **Example :** You want to set the brightness at 60 % (3).
- Press the **Adjust** button to choose the setting number.

Currently setting value will blink.

NOTE Setting range : 1 (Darkest) ~ 5 (Brightest), 5 different levels available. Setting unit : 20% per level. The backlight brightness will change immediately after you set the value.



- Press the **Adjust** button to enter next operation setting.

CHAPTER 6

4-5 Oil maintenance mileage setting



● Press the **Select** button to enter the oil maintenance mileage setting screen.

⚠ Currently setting value will blink.

NOTE ● 2-stroke motor oil mileage is indicated by external signal warning (motor oil indicator will lit).
● 4-stroke motor oil mileage is internally set by the chronograph.



● Example : To set motor oil mileage value as 4T.
● Press the **Adjust** button to choose the setting number.
● EX. Current motor oil mileage is 2T.
⚠ Currently setting value will blink.

NOTE Setting range : 2T / 4T



● Press the **Adjust** button to choose the setting number.



● Press the **Select** button to enter 4T motor oil mileage setting main screen.
● EX. Setting motor oil mileage value from 2T to 4T.



● Press the **Select** button to go back oil maintenance mileage setting screen.
● EX. Setting motor oil mileage parameter from 1,000 to 1,500.



● Example : To set motor oil mileage parameter as 1,500.
● Press the **Select** button to choose the setting number.
● EX. Current motor oil mileage parameter is 1,000.



● Press the **Adjust** button to enter next operation setting.

4-6 Speed unit setting



● Press the **Select** button to enter the speed unit setting screen.



● Press the **Select** button to go back speed unit setting screen.
● EX. The speed unit setting is changed km/h - km to MPH - mie.



● Press the **Adjust** button to choose the setting number.



● Press the **Adjust** button to enter next operation setting.

4-7 External ODO



● Press the **Select** button to enter the external ODO setting screen.



● Press the **Select** button to the external ODO setting screen.
● EX. The external ODO is changed 0 to 12,500 km.



● Example : To set external total mileage value to 12,500 km.
● Press the **Select** button to choose the setting number.
⚠ Currently setting value will blink.

NOTE Setting range : 0 ~ 99,999 km (mile)



● Press the **Adjust** button to enter next operation setting.



● Press the **Adjust** button to choose the setting number.

4-8 Internal ODO



- Example : Current internal ODO is 50,000 km.
- Press the Select button three seconds to go back to ODO screen.

⚠ User unable to adjust and clear internal ODO.

NOTE Setting range : 99999.9 km (mlie).



- The main screen.

5 Trouble shooting

The following situation do not indicate malfunction of the meter. Please check the following before taking it in for repair.

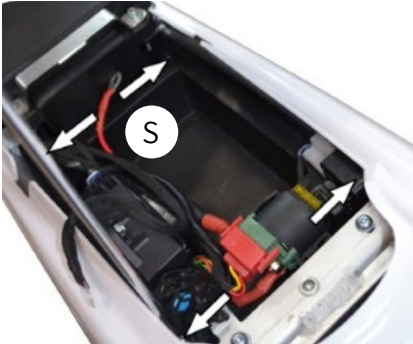
Trouble	Check item	Trouble	Check item
The meter doesn't work when the power is on.	<ul style="list-style-type: none"> ● The power doesn't supply to the meter. →Please make sure the wiring is connected. ● The wiring and fuse are not broken. →The battery is broken or the battery is too old to supply enough power (DC 8 V) to make the meter work. 	Tachometer does not appear or appear incorrectly	<ul style="list-style-type: none"> ● Please check the RPM sensor wiring is connected correctly. ● Please check the spark plug is R type or not. If not, please replace the spark plug with the R type spark plug. ● Please check your setting. →Please refer to the manual 4-2 RPM pulse setting.
The meter shows wrong information.	<ul style="list-style-type: none"> ● Check the voltage of your battery, and make sure the voltage is over DC 8 V. 	The odometer and trip meter is not accumulated or accumulated wrong data.	<ul style="list-style-type: none"> ● It is possible that the permanent power wire is not connected well. →Please check the red positive wire is connect well or not.
Speed does not appear or appear incorrectly.	<ul style="list-style-type: none"> ● Make sure the speed sensor is connected properly. →Please check if speed sensor is connected and working properly. Also check whether the cable of speed sensor has broken or lose or not. ● Check the tire-size setting. →Refer to the manual 4-1 circumference and sensing point setting. 	Fuel gauge does not appear or appear incorrectly.	<ul style="list-style-type: none"> ● Check the wiring harness. →Is the wire connected properly. ● Check the tire-size setting.
The odometer and trip meter are not accumulated or accumulated the wrong data.	<ul style="list-style-type: none"> ● It is possible that the permanent power wire is not connected properly. →Check if the red positive wire is connect properly. 		

* If the problem is not resolved after following the steps shown above, please contact your local distributor for assistance.

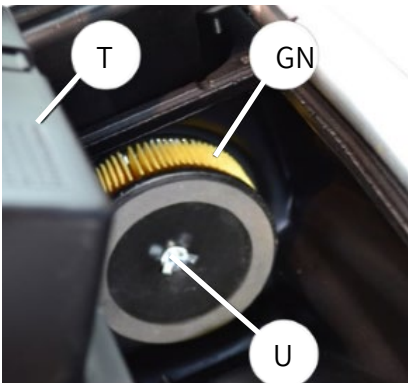
CHAPTER 7

**AIR FILTER
REMOVAL**

To get to the filter, you will need to:



- Remove the seat, see section 5.1.
- Free the battery box by unscrewing the 4 screws S shown in the photo.



Lift the battery box T, moving it to the side as illustrated in figure 3.

NB: clean the inside of the airbox with a cloth before pulling out the filter to stop dust and foreign objects entering the intake.

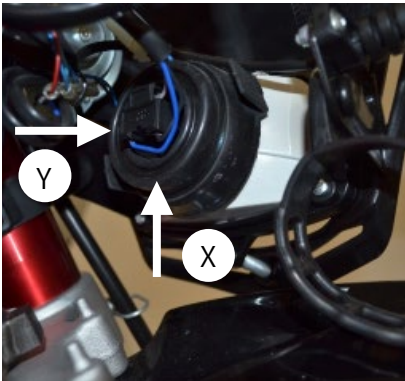
- Unscrew and remove the screw (U).
- Pull out the filter (V)



WARNING: THIS TYPE OF FILTER IS NOT DESIGNED TO BE CLEANED: IT IS MEANT TO BE REPLACED EVERY 5000 KM (1250 MI) FOR ROAD USE, AND AT LEAST EVERY 1000 KM FOR OFF-ROAD USE.

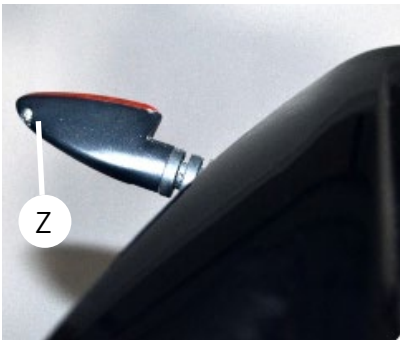
Replace the filter (V) with a new one of the same type.

WARNING: After each job, check that you have not left anything inside the airbox.



8.1 CHANGING THE HEADLIGHT BULB ON THE CARBURETTOR MODEL

- Unplug light X from the connector
- Remove the rubber cover Y installed to protect the bulb.
- Turn the light assembly anticlockwise and remove the blown bulb.
- Insert a new light, being careful not to touch the actual bulb to avoid compromising efficiency, and turn the assembly clockwise as far as it will go.
- Refit the rubber cover you removed earlier.
- **The LED headlight is only fitted on electronic injection models and its lights cannot be replaced: where necessary, the whole headlight assembly must be replaced**



8.2 CHANGING DIRECTION INDICATOR LIGHT BULBS

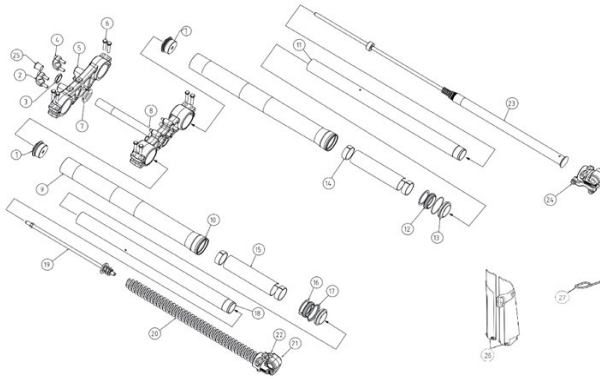
- Unscrew screw Z and remove the clear part.
- Replace the light bulb with a new one of the same type.

CHAPTER 9

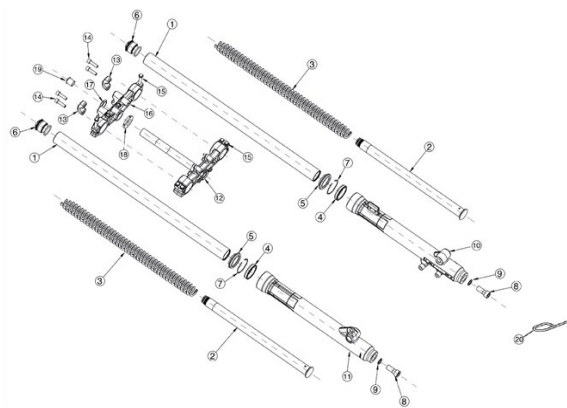
**FORK
DISASSEMBLY**

Disassemble the fork parts in the order shown in the figure:

9.1 CASA COMPETIZIONE FORK TL 250 CARBURETTOR AND INJECTION



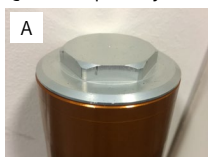
9.2 CASA PERFORMANCE FORK TL 250 CARBURETTOR



MODELS UP TO 2018	CASA	Q.O ml	T.F	PERFORMANCE	Q.O ml	T.F	COMPETIZIONE	Q.O ml	T.F
50 ENDURO/ SUPERMOTARD	Ø41 usd	400	A	Ø 40 traditional	180	A	adjustable	370	A
				Ø 41 usd	430LH 450RH	B			
125 ENDURO/ SUPERMOTARD	Ø41 usd	400	A	Ø 40 traditional	180	A	adjustable	370	A
				Ø 41 usd	430LH 450RH	B			
250 ENDURO/ SUPERMOTARD	Ø 41 usd	400	A	X	X	X	adjustable	X	X
	Ø 43 usd	500							

NOTES

Q.O ml = quantity of oil in ml per leg **T.F** = type of fork



A= Cap type A, cap on outside of tube

B= Cap type B, cap within tube

LH= left RH=right



9.3 CHANGING FORK OIL

To change the oil, proceed as follows:

1. With the wheel removed, loosen the screws AA fastening the leg.
2. Slide out the leg and remove the top cap AB.
3. Turn the leg upside down and allow all the oil to drain out.
4. Fill with oil (370 ml for the Casa and Competizione models; 180 ml for the Performance models, per leg)
5. Screw the top cap AB back on.
6. Refit the leg.
7. Tighten the screws AA.



9.4 DISASSEMBLING THE FORK LEGS

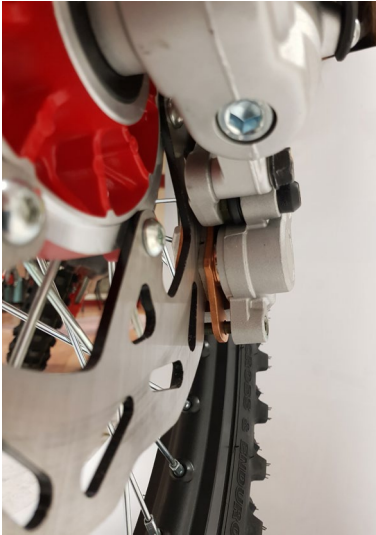
i This procedure is valid for both forks.

1. Remove the left fork from the vehicle, empty the oil from the fork, and remove it from the outer tube. Next, clamp the inner tube in a vice - using suitable protection - and heat the axle clamp with a heat gun.
2. Now unscrew the axle clamp.
3. Remove the cartridge unit from the bottom end of the inner tube and check that the O-ring inside the axle clamp is in its seat and in good condition.
4. Reassemble the fork, using medium-strength Loctite on the thread where the tube and axle clamp mate.



CHAPTER 10

**BRAKING
SYSTEM**



10.1 FRONT BRAKE

Check

To check front brake wear, simply inspect the caliper, looking from the front of the bike, from where you should just be able to make out the ends of the two pads, which should have at least a 2mm-thick lining. Any less than this and you should change the pads immediately.

NOTE: Perform the check at the intervals set out in the Scheduled maintenance chart given in the owner's manual.

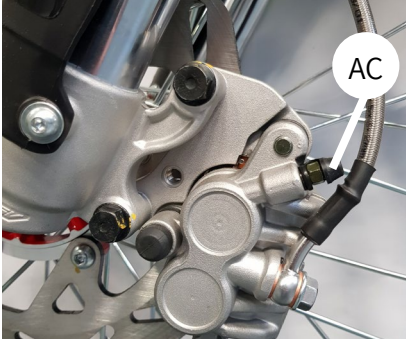


10.2 REAR BRAKE

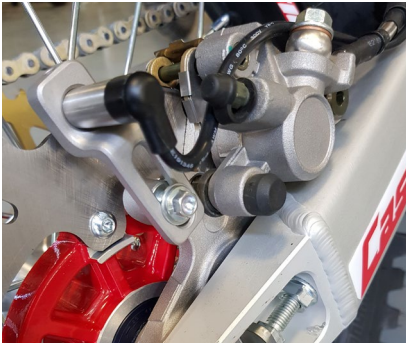
Check

To check rear brake wear, simply inspect the caliper, looking down from above, from where you should just be able to make out the ends of the two pads, which should have at least a 2mm-thick lining. Any less than this and you should change the pads immediately.

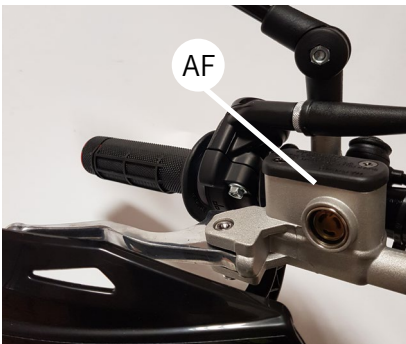
NOTE: Perform the check at the intervals set out in the Scheduled maintenance chart.

**BRAKE PAD
REPLACEMENT****CHAPTER 11****11.1 FRONT BRAKE**

- Unscrew the bolts AC
- Remove the pads from the caliper

**11.2 REAR BRAKE**

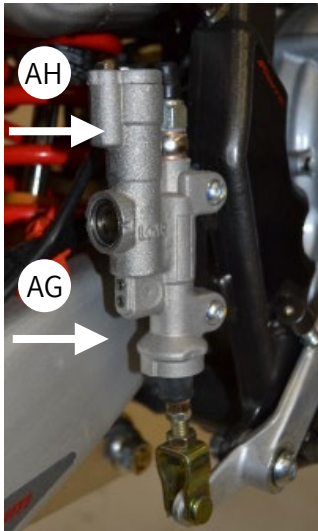
- Remove the rear wheel.
- Remove the pads from the caliper

**11.3 FRONT OIL LEVEL**

Check for oil through the sight glass AD. The minimum oil level should never drop below the reference mark on the sight glass AD. To restore the proper oil level, top up by unscrewing the two screws AE, lifting the cap AF, and pouring oil inside.

CHAPTER 11

BRAKE PAD
REPLACEMENT

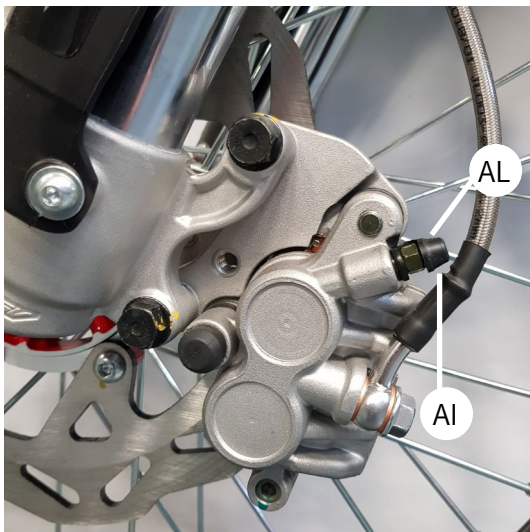


11.4 REAR OIL LEVEL

Check for oil through the oil reservoir AG. The oil level should never be allowed to drop below the minimum level mark on the reservoir AG. Top up oil as required through the filler cap AH.

If the brake lever feels spongy when pulled, the issue may be an air bubble in the braking system. You need to contact an authorized garage as soon as possible.

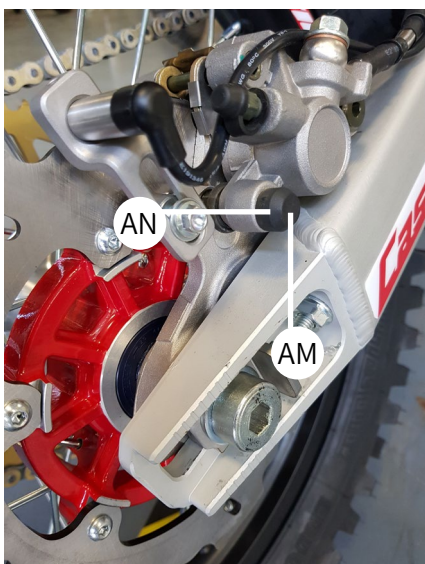
NOTE: For replacement intervals, refer to the Scheduled maintenance chart and use recommended lubricants (see owner's manual)



11.5 BLEEDING THE FRONT BRAKE

To bleed the front brake system, proceed as follows:

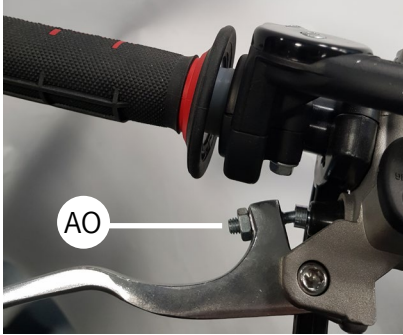
- Remove the rubber cap AI from the valve AL.
- Open the oil reservoir's cap.
- Insert one end of a hose in the valve AL, and the other inside a container.
- Unscrew the valve AL (with the lever pulled) and pump the brake lever until you get a steady stream of oil coming out without any air bubbles: during this operation, it is important you do not release the lever completely, and keep topping up the brake pump reservoir to make up for the oil coming out.
- Tighten the valve back up and remove the hose.
- Refit the cap.



11.6 BLEEDING THE REAR BRAKE

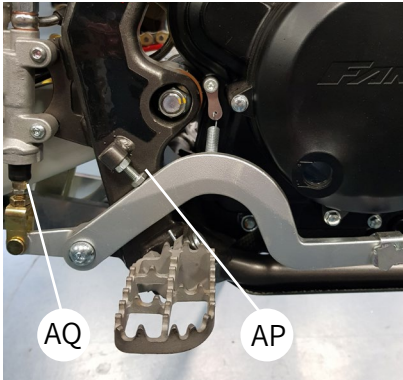
To bleed the rear brake system, proceed as follows:

- Remove the rubber cap AM.
- Open the oil reservoir's cap.
- Insert one end of a hose in the valve AN, and the other inside a container.
- Unscrew the valve AN (with the lever pulled) and pump the brake lever until you get a steady stream of oil coming out without any air bubbles: during this operation, it is important you do not release the lever completely, and keep topping up the brake pump reservoir to make up for the oil coming out.
- Tighten the valve back up and remove the hose.
- Refit the cap.

BRAKE
ADJUSTMENT**CHAPTER 12****12.1 ADJUSTING THE BRAKES****12.1.1 Front brake**

The front brake is a hydraulically operated disc model and hence does not require any adjustment. If you wish to adjust the position of the lever, use adjuster AO.

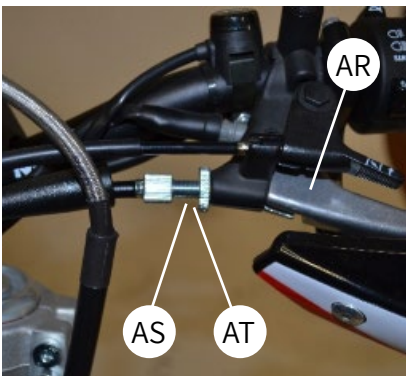
Make sure you keep at least 5 mm of play on the lever.

**12.1.2 Rear brake**

The rear brake is a hydraulically operated disc model.

You can adjust the height of the pedal by turning the adjusters AP and AQ.

Make sure you keep at least 5 mm of play on the pedal lever.

12.2 ADJUSTING THE CLUTCH

The only operation you can perform on the clutch is to adjust the position of the lever AR.

You can perform this adjustment by turning the adjuster AS. If you are making adjustments with the adjuster screw, it is important, once you have finished, to make sure you tighten up the lock nut AT so as to lock the adjuster screw in the desired position.

NOTE: The clutch must have between 0.4 mm and 0.6 mm of play.

CHAPTER 12

BRAKE ADJUSTMENT

12.3 CHECKING AND ADJUSTING STEERING PLAY



Check steering head play at regular intervals by pushing the forks forward and back as illustrated in the figure.

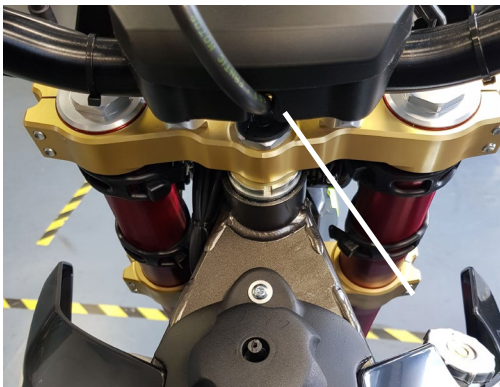
If you notice any play, make the relevant adjustment by proceeding as follows:

- Loosen the triple clamp's 4 screws AU
- Loosen the nut AV

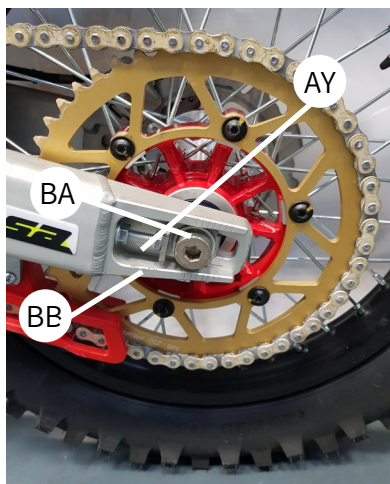
Adjust play by turning ring nut AZ

Repeat the procedure in the reverse order to tighten everything up again.

NOTE: When performed correctly, the adjustment, in addition to eliminating unwanted play, should not cause stiffness or jerkiness when the handlebars are turned: make sure you refit the bolts the right way round as this can alter the handlebar position.



12.4 CHAIN TENSIONING

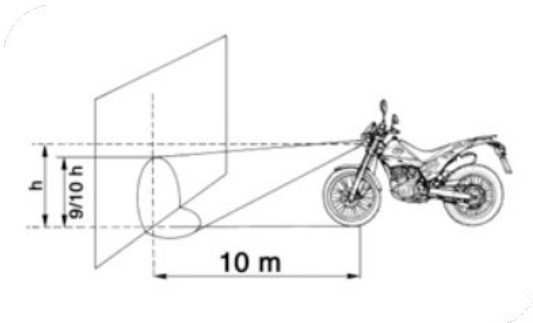


To improve the service life of the drive chain, it is advisable to check its tension at regular intervals.

Always keep it clean, removing dirt buildup, and lubricate it. If there is more than 30 mm of slack in the chain, tension it as required.

- Loosen nut BA
- Loosen nuts AY on both swingarms
- Turn nut BB until you are happy with the chain tension
- Repeat the procedure with nut BB on the other swingarm until the wheel is perfectly aligned
- Tighten nut BA on both swingarms.

12.5 HEADLIGHT BEAM



- The headlight beam is adjusted by hand
- The height of the beam should be checked at regular intervals. It can be adjusted vertically only.
- Place the vehicle (parallel to the ground, but not on its stand) 10 m from a vertical surface
- Measure the height from the centre of the headlight to the ground and mark the wall with a cross 9/10 of this height up the wall
- Turn on the headlight set to dipped, sit on the bike, and check that the beam shining on the wall is just under the cross marked on the wall.

12.6 CARBURETTOR



12.6.1 IDLING (adjusting idling speed)

NOTE: Perform this adjustment while the engine is warm.

- Connect a rev counter.
- Start the engine and run it steadily at a speed of between 1250 and 1550 rpm, turning the screw illustrated in the figure (BC) accordingly.

Slow jet	45
Main jet	70
Choke jet	42
Float level	12 mm

CHAPTER 13

ENGINE REMOVAL
FROM FRAME



NOTE:

THE HEAD, CYLINDER, CLUTCH AND IGNITION CAN BE REMOVED WITHOUT HAVING TO REMOVE THE ENGINE FROM THE FRAME.

- CLEAN THE MOTORCYCLE THOROUGHLY BEFORE COMMENCING REMOVAL.

- TO WORK ON THE MOTORCYCLE, SIT IT ON AN APPROPRIATE STAND

- Unscrew screws BD fastening the exhaust pipe to the cylinder outlet

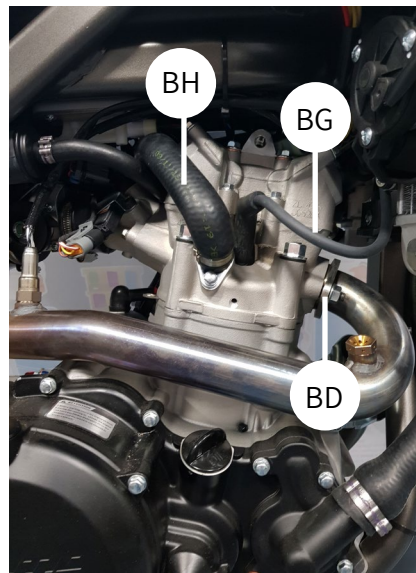
Note:

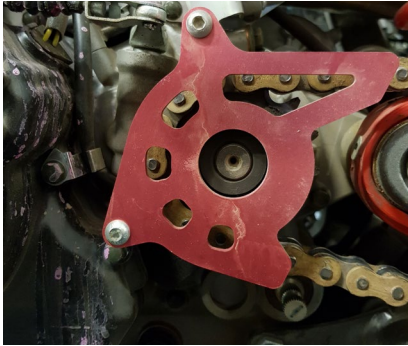
Empty the coolant into a clean container, it can be reused again later

- Remove the radiator cap BE.

- Unscrew the coolant drain screw BF located on the engine cylinder and drain the coolant into a container.

- Disconnect the spark plug connector BG and disconnect the coolant hoses BH found on both sides of the engine.



**ENGINE REMOVAL
FROM FRAME****CHAPTER 13**

- Clean up any trace of coolant that might have spilled onto the engine, frame or wheels.

- Remove the screws and take off the drive sprocket guard BL.
- Remove the sprocket and chain.

Note:

Make a mental note of the drive sprocket's position before removing it. You will need to refit it in the same position to get the same wear direction.

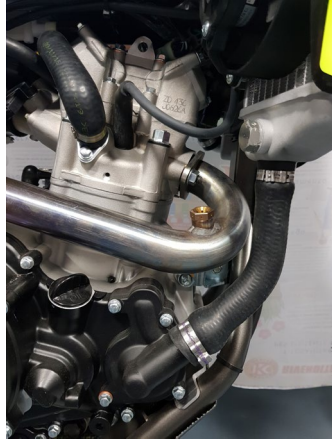
- Disconnect the engine's cabling and clutch cable BM.
- Disconnect the carburettor from the intake BN.



Remove the screws fastening the engine to the frame in the order described in the figure BO.

CHAPTER 13

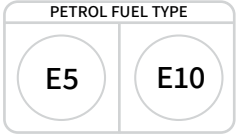
**ENGINE REMOVAL
FROM FRAME**



Place the engine in a suitable position for removal and pull it out.



ENGINE
MAINTENANCE
CHAPTER 14
14.1 ENGINE SPECIFICATIONS

Specification	Value(s)
MAIN PARTS	
Engine type	single cylinder 4 stroke
Number of cylinders	1
Total displacement	250 cc
Bore/Stroke	77x53.6 mm
Compression ratio	11.20:1
Starter type	electric
Idling speed	1200±100 rpm
Cooling type	liquid cooled
Coolant (quantity)	1.5 l (0.32 UK gal, 0.39 US gal)
Clutch	multi-plate, wet
Lubrication system	wet sump, forced pressure controlled by trochoid pump
Engine oil	Quantity (disassembled) 1.5 l (0.32 UK gal, 0.39 US gal) Without oil filter change 0.95 l (0.20 UK gal, 0.25 US gal) With oil filter change 1 l (0.21 UK gal, 0.26 US gal)
Gearbox type	mechanical/6 speed
Gear ratios	1 st gear ratio 1:7.52 2 nd gear ratio 2 1:5.24 3 rd gear ratio 3 1:3.88 4 th gear ratio 4 1:3.20 5 th gear ratio 5 1:2.79 6 th gear ratio 6 1:2.56 Final gear ratio 3.857 Total gear ratio in highest gear 9.14
Drive chain	520 Regina, model 135 ZRA, 112 links
Air filter	paper
Fuel	premium petrol (octane n° min.98) <div style="text-align: right;">  </div>
TL 250 injection	Athena 34mm single-body electronic injection, single-point injector.
TL 250 Carburettor	36mm diameter constant vacuum carburettor
Tank capacity (including reserve)	8.5 l/1 l
Fuel reserve capacity	1 l

CHAPTER 14

ENGINE MAINTENANCE

14.2 VEHICLE OPERATION AND MAINTENANCE ON CARBURETTOR VERSION

1. Check the oil level. When the average oil level drops below the bottom line marked on the sight glass, add lubricating oil.
2. Nominal weight: it is recommended that nominal weight not exceed 150 kg
3. Starting:
 - A. Start the engine (using the electric starter) with the bike in neutral. Do not start the engine with the bike in any gear. This can cause mechanical damage (damage to the clutch, etc.) and personal injury.
 - B. Pull the choke when the engine is cold. **Skip this step if the engine is warm.**
 - C. To start the engine over winter, follow the cold engine starting procedure described above. Leave the engine idling for 3 to 5 minutes and do not put it into gear until the engine has had time to warm up.
4. Keep the engine idling for 3/5 seconds after starting the engine. Do not run the engine at high revs and speeds until it has had time to warm up. Do not keep the clutch pulled half way for any length of time. This results in premature, abnormal clutch wear.
5. It is very important to run-in the engine. Under no circumstances should you use the bike at full throttle until it has done 500 km. Maintenance must be carried out when the bike has reached 500 km. Check and adjust valve clearance, and clutch disengagement; clean the oil filter screens and check that the fine filter is clean, installing a new one where necessary, to keep the engine in proper working order.
6. Check the cylinder bolt tightening torque once the run-in period is over. For engine NC 250, the M10 bolts must be tightened to a torque in the 55 to 60 N · m range. Inspect the spark plug when the bike has done 2000 km. Clean the electrodes of carbon deposits and check the gap between them, which should usually be between 0.7 and 0.8 mm. The spark plug has a service life of 5000 km.
7. Lubricating oil change procedure
Change the lubricating oil when the bike has done 500 km. The lubricating oil brand must match that provided by the manufacturer. Do not use lubricating oil of poorer quality.
Oil change procedure:
 - A. Remove the cap from both oil filter screens on the left and right. Remove the filter screen with needle-nose pliers and remove the drain cap. Give the oil a few minutes to drain out of the engine completely.
 - B. Fit the filter screens on both sides and fasten them in place with the relevant caps. Tighten the cap to a torque of 11 to 13 N · m. Apply 3 - 4 drops of fluid sealant to the drain cap, too, before fastening it and fit it on the relevant hole. Tighten the drain cap to a torque of 24 to 27Nm.
 - C. Remove the oil filler cap from the right crankcase and pour in 1500 ml of lubricating oil, checking the level. Keep filling until the oil level reaches the top mark on the sight glass. Lastly, refit the filler cap on the right crankcase and screw it on tightly.
8. Adjusting idling speed
 - A. Warm the engine up to its normal running temperature. Connect the rev counter and adjust idling speed to 1500 rpm by turning the fuel adjuster screw.
9. How to use the electric starter
Only use the electric starter with the bike in neutral. Do not hold the electric start button down for more than 5s! This can damage the battery, engine, clutch and gearbox. Note: check that the battery is sufficiently charged.
10. Changing gears: never change gears with the clutch engaged and the throttle open! This can result in mechanical damage to the gears and drive chain, etc.

11. Check the condition of the spark plug once the motorcycle has done 1000 km. Remove encrusted carbon deposits and check the gap between the two electrodes, which should usually be between 0.7 and 0.8 mm. The spark plug has a service life of 5000 km.

12. How to use the clutch

Do not ride with the clutch pulled only part of the way! This can result in excessive wear to the clutch assembly, making it slip, or at least burn. Clutch noise should be constant and consistent with engine idling. You may notice a bit of clutch noise when starting / switching off the vehicle. The sound disappears as soon as engine speed stabilizes.

13. Maintenance:

- A.** Change oil every 5,000 km following the run-in period. Change oil before it starts to deteriorate. Check oil level before each ride. Fill the crankcase with lubricant when the oil level drops below the bottom line on the sight glass.
- B.** Check coolant level before each ride. Open the radiator cap to check whether there is enough coolant inside the radiator or not. If there isn't, top up as required and restart the engine. A good antifreeze must be used over winter to stop the water freezing.
- C.** Check and adjust valve clearance. Generally speaking, valve clearance is factory set before delivery. Adjust values when something unusual happens: 0.05 mm to 0.07 mm.
- D.** Carburettor cleaning: clean the carburettor by dismantling it completely following evident trouble with engine power delivery, or when it is not running evenly. Remove the carburettor from the motorcycle before cleaning the outside. Take it apart, part by part, and clean all parts one by one, washing them with petrol and blowing compressed air inside all petrol and air channels. During removal and disassembly, do not touch the float arm, the float arm pin and other positions.
- E.** Air filter: clean or replace the air filter every 1000 km. Inspect all the air filter's mating surfaces for airtightness to ensure air enters the cylinder through the air cleaner only. Keep the air filter clean as this is where dust stops and builds up.
- F.** Clean the spark plug: clean and adjust the spark plug every 1000 km. Leave the spark plug to soak in petrol for 3-4 hours to soften the carbon deposits, which you should then remove with a scraper. Brush the spark plug with petrol and dry it. The spark plug must be replaced at regular intervals per the owner's manual.
- G.** Inspect all bolts and tighten any that have come loose.
- H.** Clean and check the oil filter and screens every 1000 km.

(1) Replace them in good time if they are damaged;

(2) Cleaning method

- A.** Cleaning filter screens: remove the filter screen caps from the left and right crankcases and remove the filters with needle-nose pliers; wash the screens with clean petrol to remove all impurities; refit them in their slots and screw the fastening caps back on. Tighten the filter screen caps to a torque of between 11 and 13 N · m.
- B.** Cleaning the oil filter: remove the 2 nuts and remove the oil filter cap with a screwdriver. Remove the fine oil filter parts and wash them with clean petrol to remove all impurities; once clean, refit it in its slot. Make extra sure you refit the filter with the opening facing out from the engine before fastening it in place with its cap. Tighten the 2 nuts to a torque of between 7 and 9 N · m. When riding in challenging conditions, the filter cleaning interval should be reduced accordingly. The clean oil filter screen can be reused. Make sure you check the oil level following inspection and cleaning. If oil level has dropped below the bottom line marked on the sight glass, idle the engine for 20 seconds and check the oil level again. If oil level is still below the bottom line marked on the sight glass, add oil.

Note: refit the filter with the opening facing out from the engine

CHAPTER 14

ENGINE MAINTENANCE

14.3 SECTION 5 COOLING SYSTEM TROUBLESHOOTING

Symptoms: poor engine power, water temperature gauge indicator continually in the red, boiling coolant coming out of the radiator (to be expected when the indicator suddenly moves into the red) Causes of water overheating:

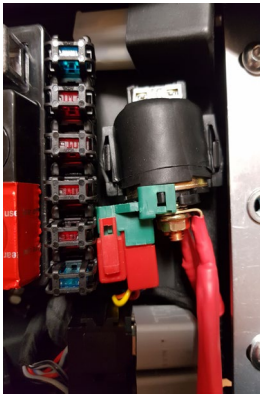
1. Thermostat broken;
2. Radiator cap damaged;
3. Radiator clogged or cooling fan jammed;
4. No coolant in radiator;
5. Cylinder coolant hose or passages encrusted;
6. Water pump not working properly;
7. Fans installed incorrectly or damaged;
8. Radiator fins dirty;
9. Air pockets in the radiator's coolant circuit.

Causes of water temperature gauge malfunction:

1. Water temperature gauge or heat detection element performing poorly;
2. Thermostat performing poorly.

Causes of water leaks:

1. Ineffective mechanical seal;
2. Damaged O-ring, which leads to poor sealing and water leaks where the water pump cap mates with the cover;
3. Break in water hose;
4. Cylinder gasket damaged. Open the radiator cap and try pulling the throttle a bit. If you see a lot of water coming out of the radiator inlet, the cylinder gasket is damaged and must be replaced with a new one;
5. Hose clamp damaged; insufficient tightness resulting in water leaks. Tighten the clamp or install a new one.

CHAPTER 15**ELECTRICAL DEVICES****15.1 LOCATION OF FUSES**

The fuses BP are located under the seat and, to gain access to them, you will need to remove the seat as described in section 5.1.

WARNING: Before replacing the blown fuse, identify and eliminate the fault causing it to blow. Never replace the fuse with different materials (for instance, a piece of electric wire).

Check the fuse if you are experiencing issues with starting or lights.

**15.2 NOTES ON THE BATTERY**

To replace the battery BR, remove the seat as described in section 5.1.

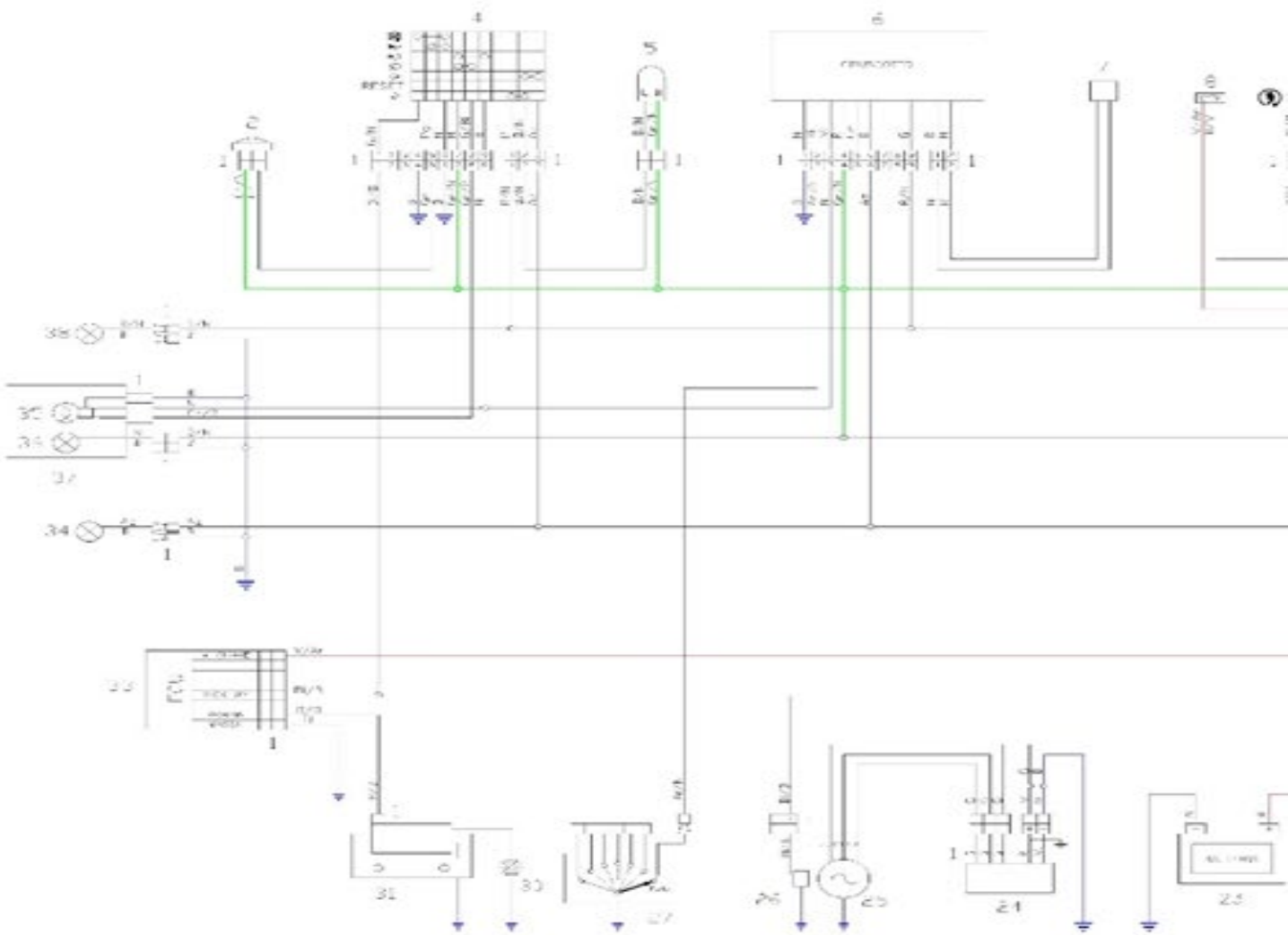
Insert the battery in the relevant slot under the seat (location illustrated in the photo, left)

Connect the black terminal to the negative (-), and the red terminal to the positive (+).

Refit the seat, being careful not to squash the battery's positive cable as this could cause the system to melt.

15.3 WIRING DIAGRAM - TL 250 4-STROKE 2016

SCHEMA ELETTRICO TL 250 4

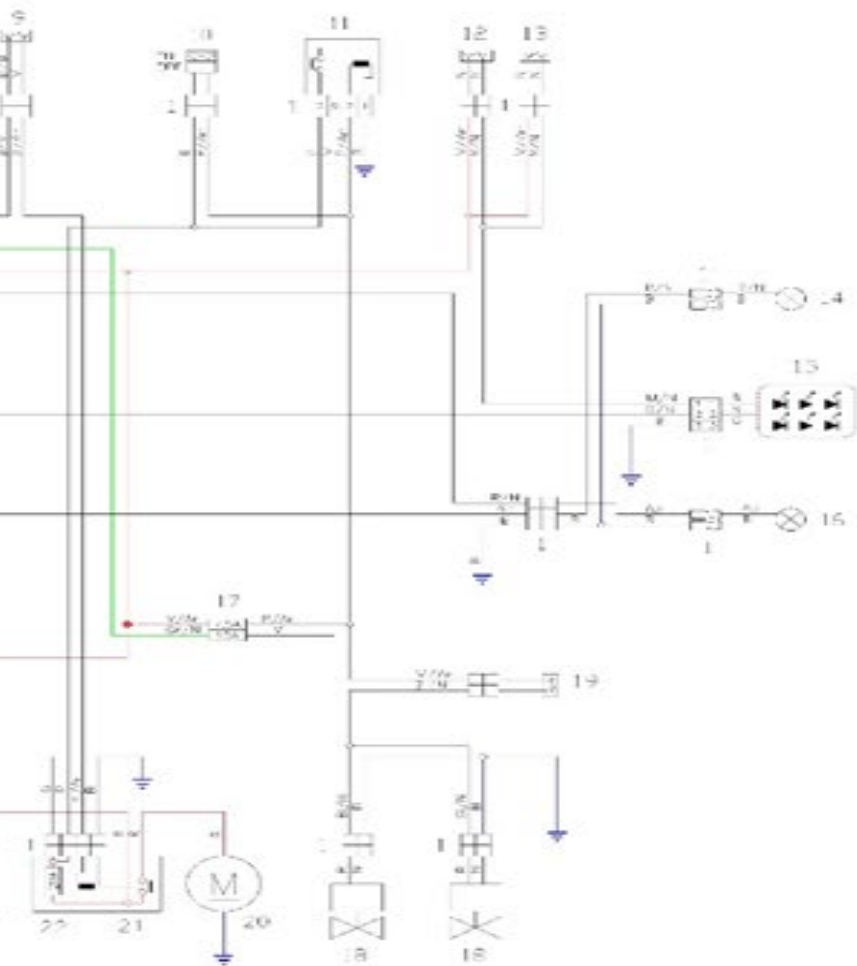


CHAPTER 15

ELECTRICAL DEVICES

AT "2016"

REV.0 del 03/05/'16.



LEGENDA

- 1 CORRETTORI MULTIFRE
- 2 CLAXON
- 3 SERVOCILIO SX
- 5 TERMISTENZA
- 6 CRUSCOTTO
- 7 SENSORE VELOCITA'
- 8 INTERRUPTORE FRIZIONE
- 9 PULSANTE START
- 10 COMBINAZIONE A CHI AV
- 11 RELÈ CARICHI
- 12 INTERRUITTORE STOP ANTERIORE
- 13 INTERRUITTORE STOP POSTERIORE
- 14 INDICATORE DI DIREZIONE POST. DX
- 15 PANELLE POSTERIORE
- 16 INDICATORE DI DIREZIONE POST. SX
- 17 FUSIBILI SECONDARI
- 18 VENTOLA
- 19 INTERRUITTORE TRANCIVETTRICO
- 20 MOTORE AVVAMENTO
- 21 INTERRUITTORE AVVAMENTO
- 22 FUSIBILI PRINCIPALI
- 23 BATTERIA
- 24 TROCCATORE DI TRUSSIONE
- 25 GENERATORE
- 26 POK UP
- 27 INTERRUITTORE CAMBIO IN FOLIE
- 30 CAVOTIA
- 31 BARRA DI ACC-NEON
- 32 CENTRALE CDI
- 34 INDICATORE DI DIREZIONE ANT. SX
- 35 LAMPADA ARIA/ACQUA
- 36 LAMPADA LUCE DI POSIZIONE
- 37 PANELLE ANTERIORE
- 38 INDICATORE DI DIREZIONE ANT. DX

FUSIBILI PRINCIPALI

- 100A** - RICARICA BATTERIA
- RELÈ CARICHI
- CHIAVE
- 15A** - VENTOLA
- CRUSCOTTO
- INDICATORI DI DIREZIONE
- LUC. VEICOLI
- CLAXON
- 15A** - LUC. STOP
- AVVAMENTO VEICOLI
- ALIMENTAZIONE RELÈ SPEGNIMENTO
- CDI

LEGENDA COLORAZIONE SCHEMA

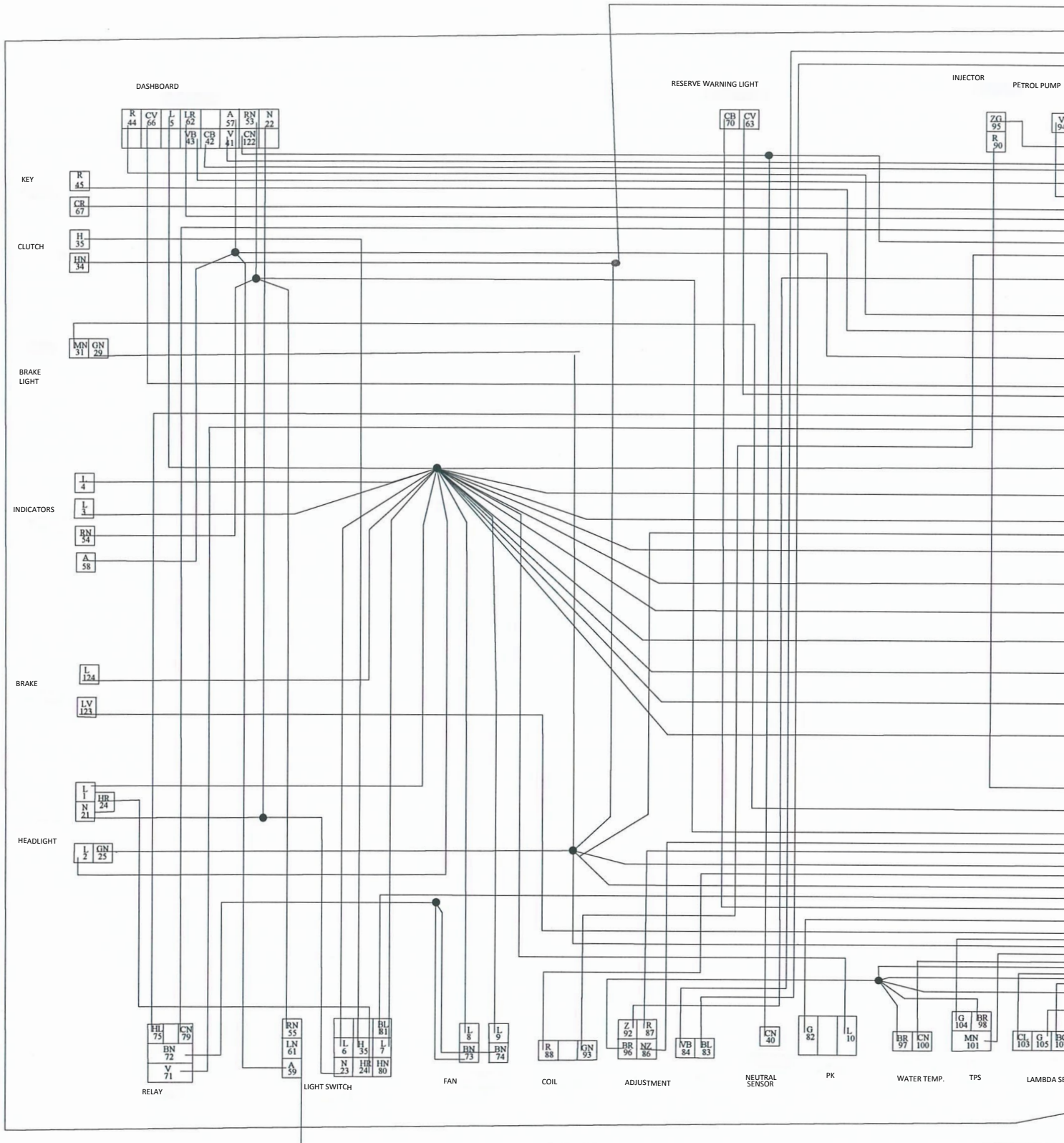
- Rosso** = Carichi Fusibile da 7,5A
- Blu** = Massa
- VERDE** = Carichi Fusibile da 15A

COLORE DEI CAVI

- | | | | |
|----|---------|----|---------|
| Ar | ARANCIO | M | MARRONE |
| Az | AZZURRO | N | NERO |
| B | BLU | R | ROSSO |
| Bi | BIANCO | V | VERDE |
| G | GIALLO | Vl | VIOLA |
| Gr | GRIGIO | Ro | ROSA |

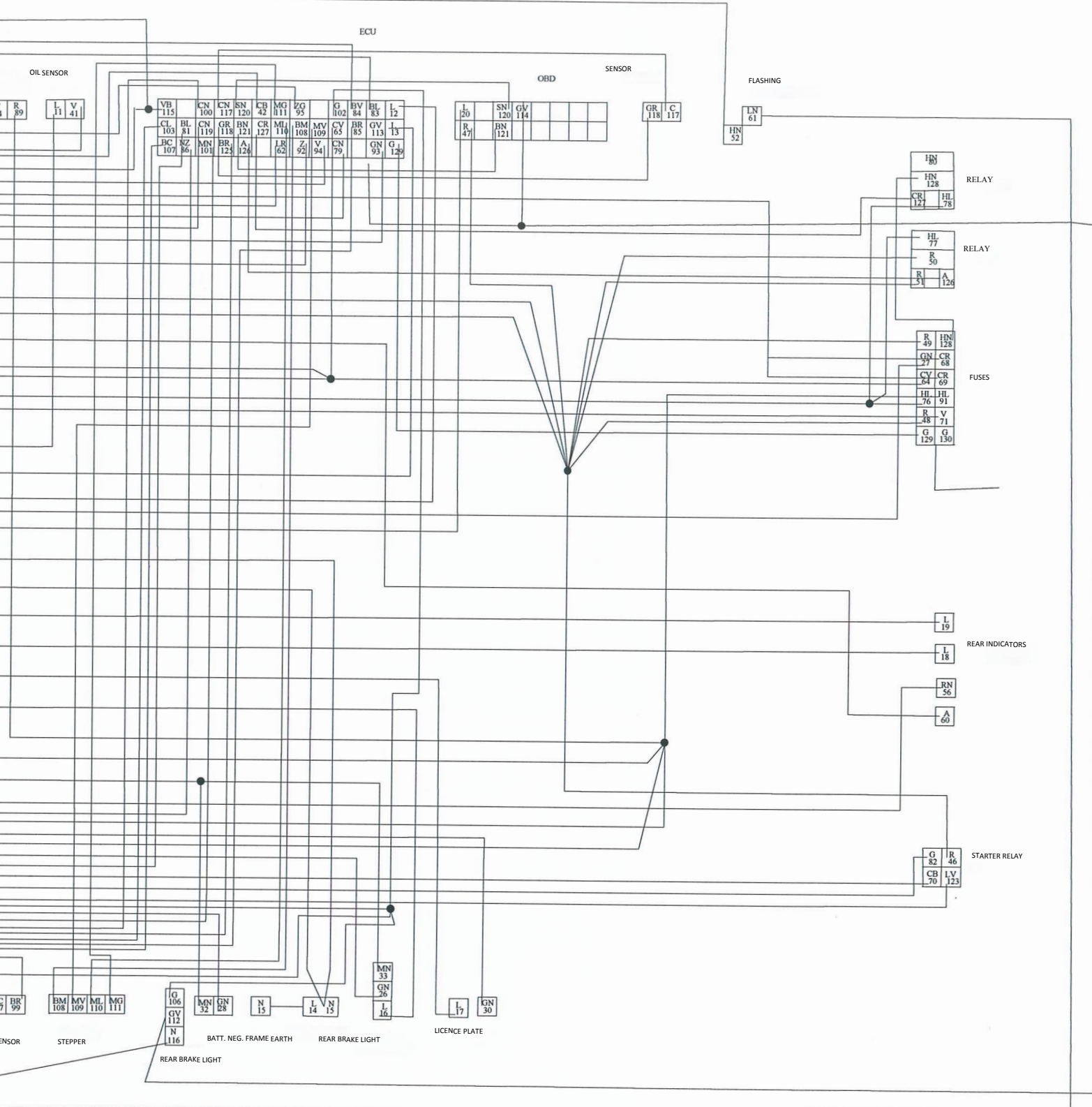
ELECTRICAL DEVICES

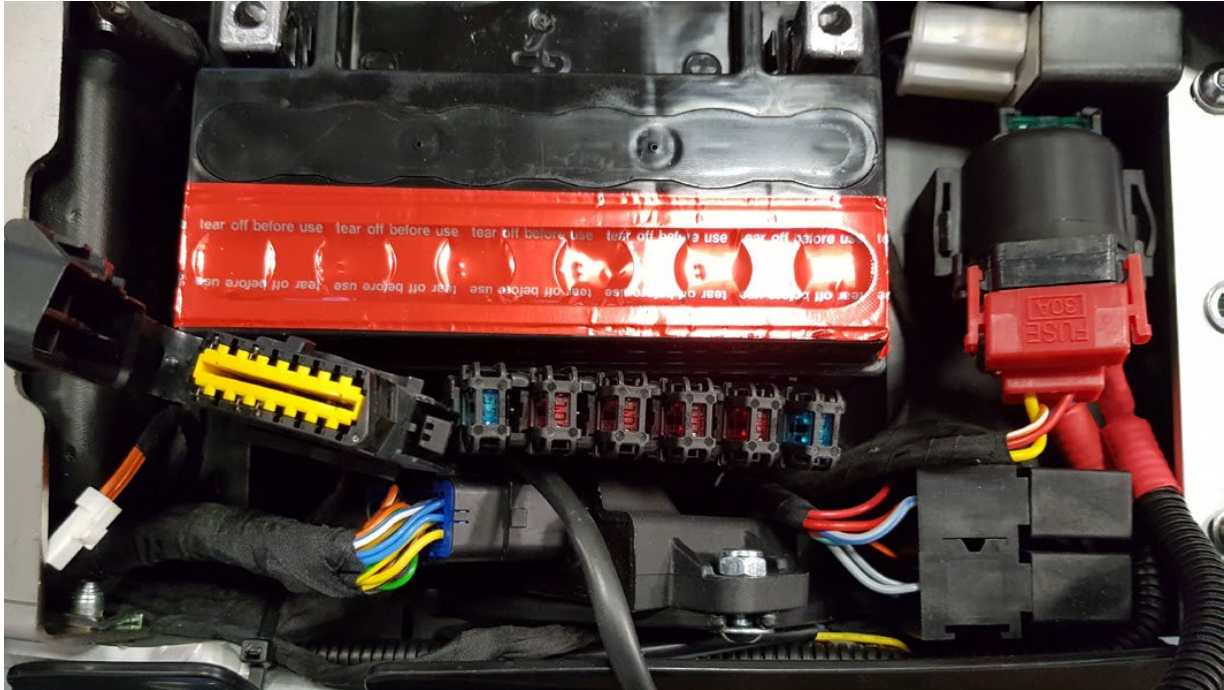
CHAPTER 15



CHAPTER 15

ELECTRICAL DEVICES





Main cable routing: rear, under-seat compartment, fuses and relays, ECU and tail lights

CHAPTER 15

ELECTRICAL DEVICES



15.5 O.B.D. connector

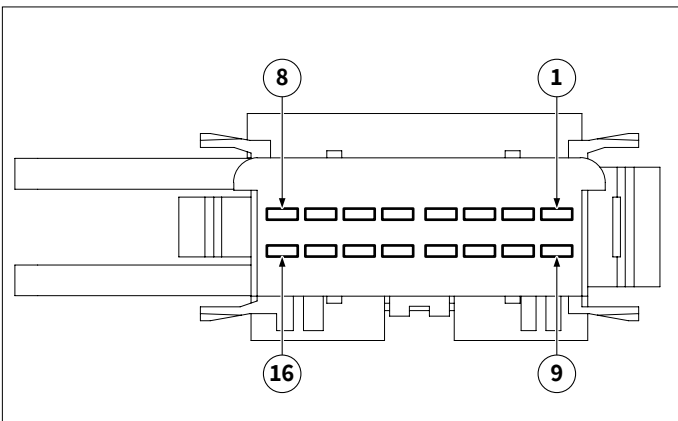


The OBD (On-Board Diagnostic) connector is the communication port used to connect the testers required for self-diagnostics.

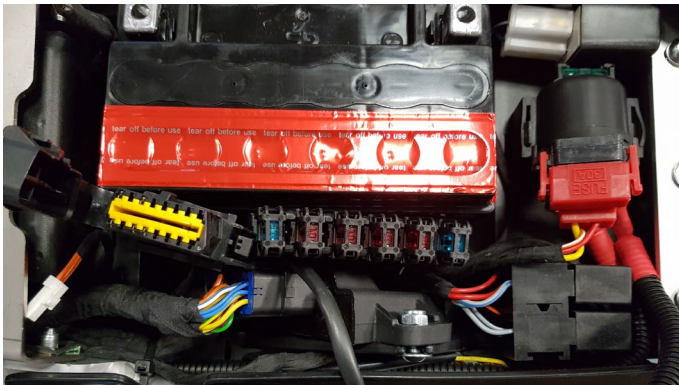
The OBD connector is located under the seat. Remove the seat to gain access to it.



To connect the diagnostic tester, open the cover protecting the diagnostic port and plug in the device.



Pin	Colour	Function
1		
2		
3		
4	BK	Earth
5	VT-BK	Earth
6	LB	CAN H line
7	PK	Diagnostics line K
8		
9		
10		
11		
12		
13		
14	WH	CAN L line
15		
16	RD	Diagnostic port power (Vbatt)

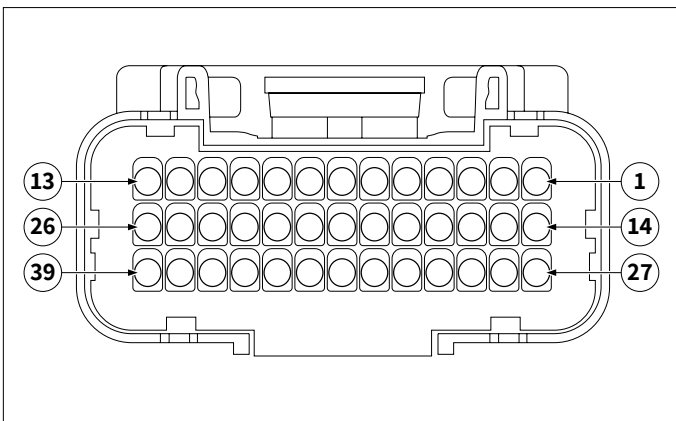


15.5.1 ECU

The ECU (electronic injection) is located under the seat - refer to the procedures below:

- Removing the seat
- Ignition module

To check the ECU's wires, you are advised to unplug the connector from the module.



Pin	Colour	Function
1	N	Power ground
2	Bi	Pick Up input signal
3	N	Pick Up sensor ground
4	V-Bi	Sensor power supply
5	-	-
6	Ar-N	Fuel injector control signal
7	B-V	Stepper motor signal D
8	Vi	Engine warning signal (MIL warning light)
9	Az	CAN Line H
10	Ro-N	Reception signal (RX) RS232 communication interface
11	Vi-B	Reference ground RS232 communication interface
12	-	-
13	B-Bi	Vehicle speed output signal
14	N	Power ground
15	Vi-N	External connectors ground
16	Vi-N	Sensors ground
17	M-Vi	Key consent exit signal
18	V	Stepper motor signal B
19	V-Bi	Stepper motor signal A
20	V-N	Stepper motor signal C
21	Gr-B	Lights relay control signal (85)
22	Bi	CAN Line L
23	B-G	Transmission signal (TX) RS232 communication interface
24	Bi	Signal from neutral gearshift switch
25	-	-
26	B-M	Air pressure input signal
27	R-V	Injection unit direct supply from fuse 6
28	G-N	Coil control signal
29	-	-
30	G-R	Engine cooling fan control signal
31	B-N	Fuel pump control signal
32	Bi	Control signal (-) oxygen sensor heater
33	M-R	Vehicle speed output signal
34	-	-
35	G-V	ECR consent signal
36	Bi-N	Side kickstand position signal
37	G-B	Throttle position control signal
38	N	Oxygen sensor input signal
39	B-N	Air temperature input signal

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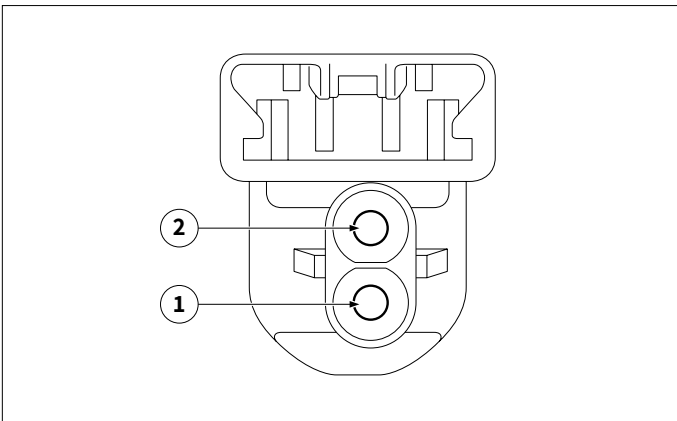


15.5.2 Rear ABS sensor

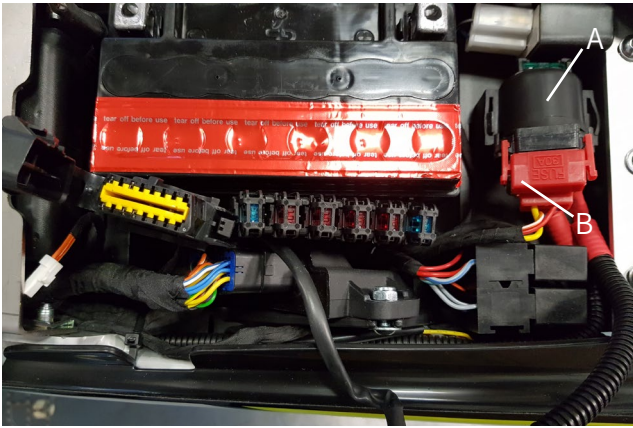
The rear ABS sensor's connector is located in the middle of the vehicle, just above the engine case, and can be accessed directly.



To run instrumental tests, you may need to cut one or more cable clamps to release the connector from the frame.



Pin	Colour	Function
1	GY-BK	Rear ABS sensor (-) reference signal
2	YL	Rear ABS sensor (+) signal



15.5.3 FUSES AND RELAYS

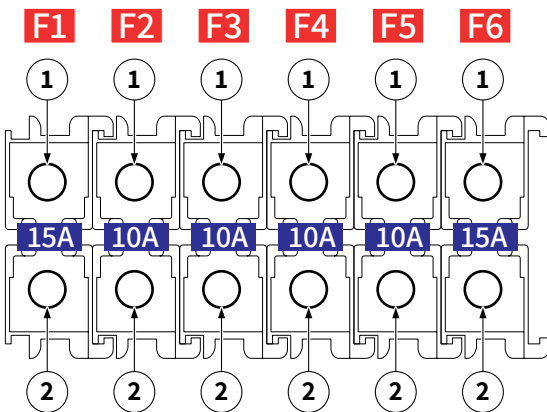
To check fuses, set the ignition switch to OFF to avoid the risk of a short-circuit.

Remove the seat and the fuse box cover.

Remove one fuse at a time and check if the filament is broken. Replace the fuse, if damaged, with a fuse with the same amperage rating.



Do not repair defective fuses and never use a fuse with a different power rating to that specified as this could cause a short-circuit, and would thus be a fire hazard.



Fuse layout

A. Main fuse (30 A)

B. Main spare fuse (30 A)

1. ECU fuse (direct injection) (15 A)

2. Cooling fan fuse (10 A)

3. Petrol pump fuse, electronic injection system and OBD port (10 A)

4. Key-operated switch fuse (10 A)

5. Running lights fuse (10 A)

6. Headlight and tail light fuse (15 A)

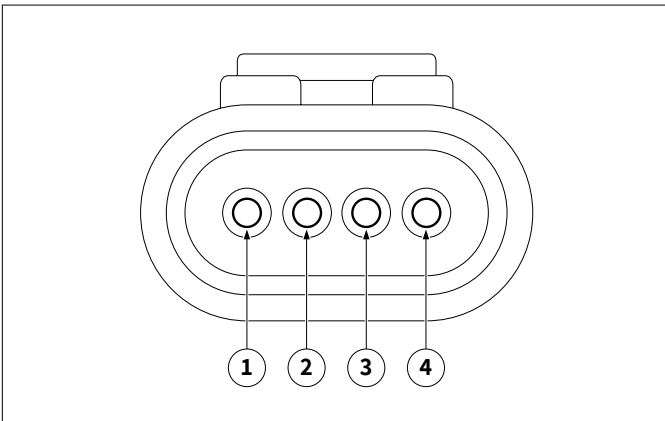
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15.5.4 Stepper motor

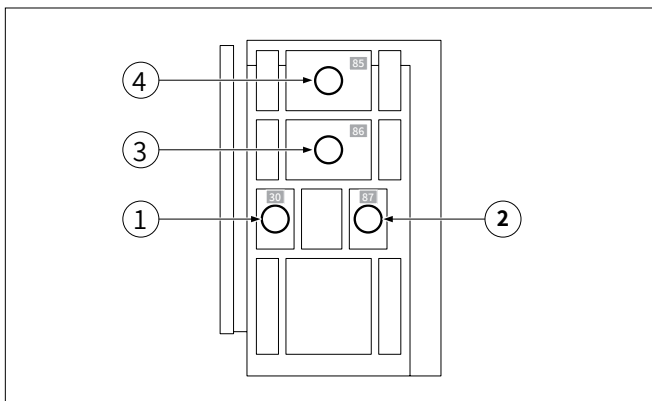
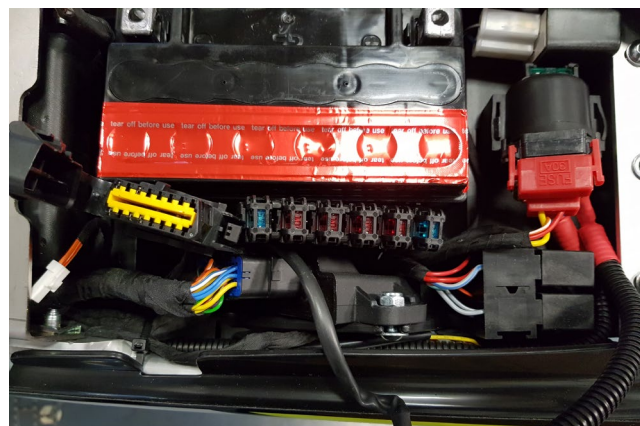
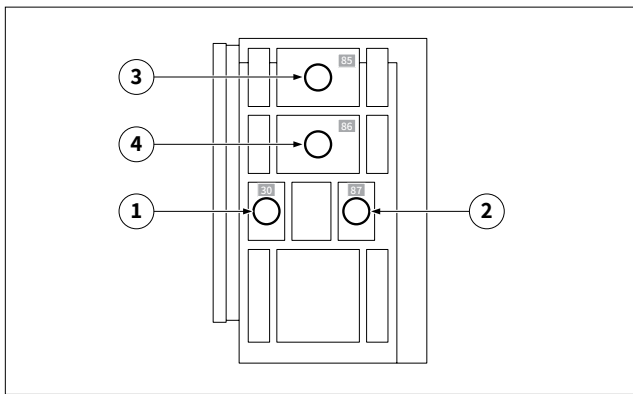
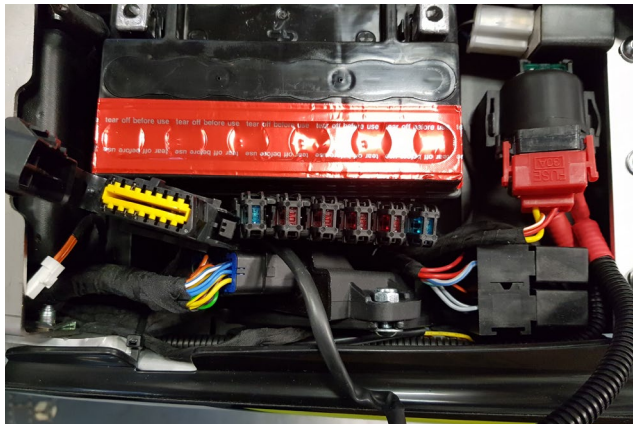
The stepper motor is fitted on the throttle body: the stepper motor connector is located under the tank on the left-hand side of the vehicle and can be accessed directly.



Pin	Colour	Function
1	GN-WH	Stepper motor signal A
2	GN	Stepper motor signal B
3	GN-BK	Stepper motor signal C
4	BL-GN	Stepper motor signal D

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15.5.5 Lights contactor

The lights contactor is located under the seat. Remove the seat to gain access to it.



The contactor and its connector can be replaced individually.

The contactor type is: 30A normally open.

Pin [1*]	Pin [2*]	Colour	Function
1	85	GY-BL	Lights logic enabling signal (85) from ECU
2	86	RD-WH	Lights contactor enabling input (86)
3	30	RD-YL	Power supply protected by fuse 2 for lights logic (30)
4	87	RD-GN	Lights logic relay (87) enabling signal (+)

15.5.6 Radiator fan contactor

The radiator fan contactor is located under the seat. Remove the seat to gain access to it.



The contactor and its connector can be replaced individually.

The contactor type is: 30A normally open.

Pin [1*]	Pin [2*]	Colour	Function
1	85	GY-BL	Cooling fan control signal from ECU (85)
2	86	RD-WH	Lights contactor enabling input (86)
3	30	RD-YL	Power supply protected by fuse 2 for lights logic (30)
4	87	RD-GN	Lights logic relay (87) enabling signal (+)

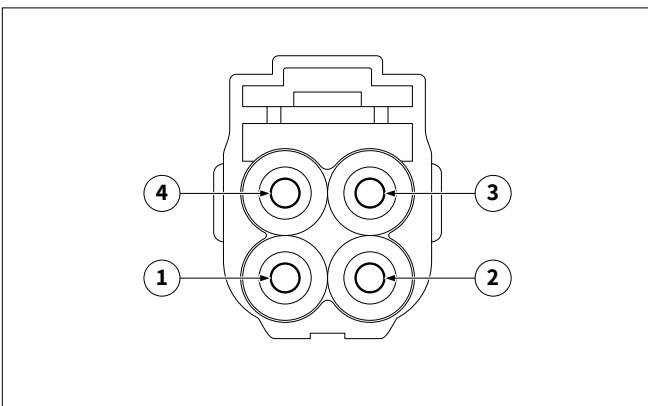


The contactor has two pin identification modes, one sequential [1*] and one functional [2*].

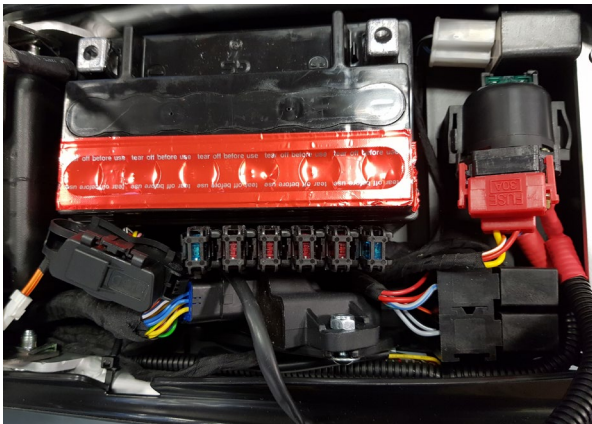


15.5.7 Lambda sensor

The lambda sensor connector is located under the tank, right behind the cylinder head cover, and can be accessed directly.



Pin	Colour	Function
1	BL	Lambda sensor heater control signal (-)
2	WH-RD	Power supply protected by fuse 3 for lambda sensor
3	VT-BK	Earth
4	BK	Lambda sensor output signal



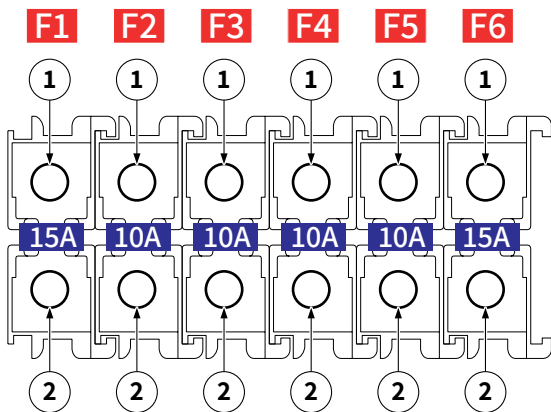
15.6 Fuses and relays

To check fuses, set the ignition switch to OFF to avoid the risk of a short-circuit. Remove one fuse at a time and check if the filament is broken. Replace the fuse, if damaged, with a fuse with the same amperage rating.

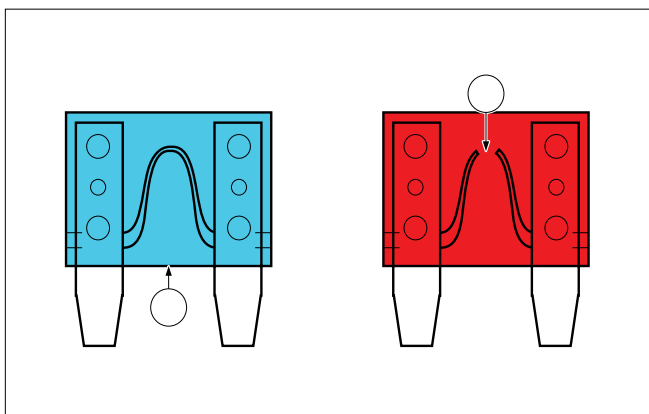
Fuse layout

Fuses are located under the seat: remove the seat to gain access to them.

- A. Main fuse (30A)
- B. Fuse box
- C. Main spare fuse (30A)
- D. Spare fuses (2A, 7.5A, 30A)



Fuse	A	Description
F1	15A	ECU fuse (direct injection)
F2	10A	Cooling fan fuse
F3	10A	Petrol pump fuse, electronic injection system and OBD port
F4	10A	Key-operated switch fuse
F5	10A	Running lights fuse
F6	15A	Headlight and tail light fuse

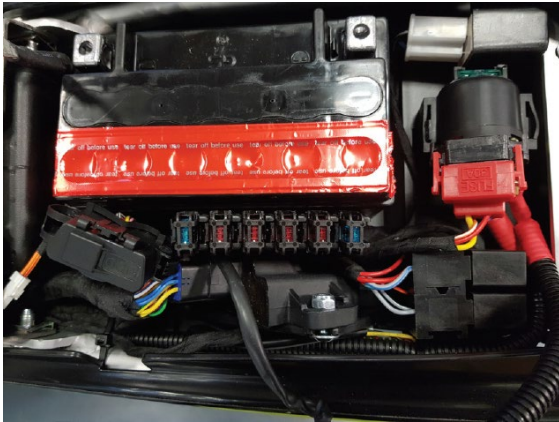


Do not repair defective fuses and never use a fuse with a different power rating to that specified as this could cause a short-circuit, and would thus be a fire hazard.

You can tell a blown fuse "F" from a fully working fuse "E" by the internal filament, which is burned through or broken.

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15.7 Battery

15.7.1 Replacing the battery

Remove:

- Seat.

Remove screw "A" and disconnect the negative cables.

Remove screw "B" and disconnect the positive cables.

Remove the battery.



Repeat the procedure in reverse to refit.

15.7.2 Notes on the battery

The battery provided is sealed and there is no way of checking the acid level.



If the battery is malfunctioning, you are advised to replace it.

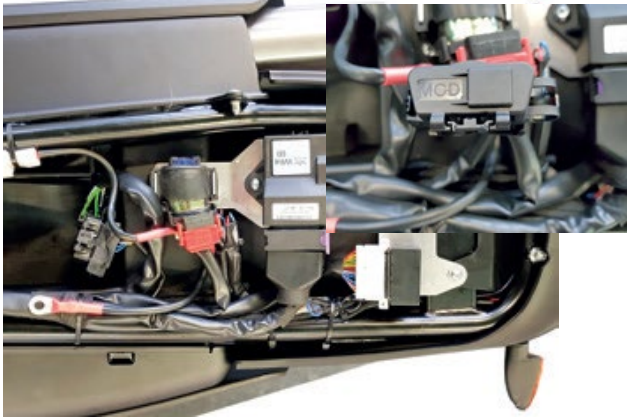


Never attempt to open or tamper with the battery.

Battery liquid is corrosive.

Do not spill it, especially on plastic parts.

Keep out of reach of children.



15.8 Diagnostic port and instrument connection

To run diagnostics on the vehicle, you will need to access the diagnostic port and plug in a recognized diagnostic tester.

The diagnostic port "A" is located under the seat, in the space between the battery and fuse box.

To connect the diagnostic tool, pull the OBD port slightly out of the space in the battery compartment and open the protective cover "B".



Option with wireless TEXA handheld tool

Plug the wireless device "C" into the diagnostic port "A". Switch on the wireless device and turn the key to "ON". Run diagnostics using the handheld tool.



Option with TEXA wired device

Plug the device "D" into the diagnostic port "A" using the data communication cable "E".

Turn the vehicle's key to "ON".

Run diagnostics using the PC set up for this purpose.



THE VEHICLE WITH THE CARBURETTOR FUEL SYSTEM HAS NO DIAGNOSTIC CONNECTIONS FOR CHECKING ELECTRONIC FAULTS

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15.9 Removing the fuel tank

Remove the right- and left-hand radiator shrouds.
Remove the seat.
Remove the mudguard and side panels.
Remove the battery.
Remove the rear seat bracket securing the tank.
Remove the tank's front screw.



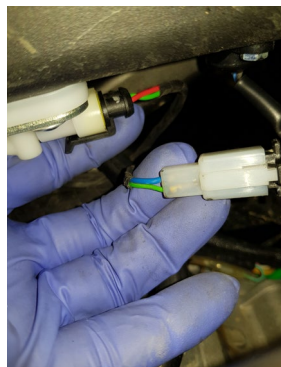
15.9.1

Lift the rear of the tank so that the petrol pump fitting is above the frame.



15.9.2

Using the special pliers, release the tank fitting.



15.9.3

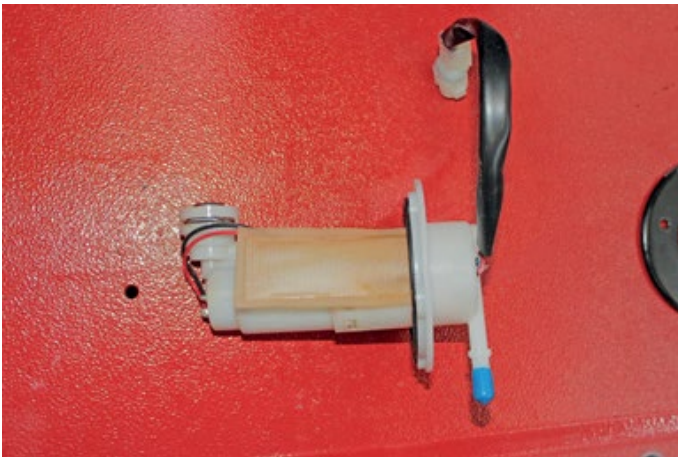
Unplug the petrol and reserve pump electrical connector.



Before refitting, check that the fuel line is positioned correctly, it should be unrestricted vertically.

**15.9.4**

Unscrew the four screws on the petrol pump flange.



**The fuel strainer does not need replacing.
Repeat the procedure in reverse to refit.**



Special pliers for releasing the fuel line.

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15.10 REMOVING THE ELECTRONIC INJECTION

15.10.1 Removing the injector

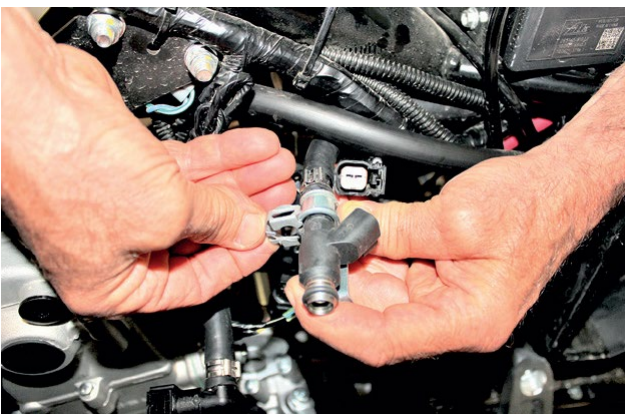
Remove the fastening screw "A" and disconnect the fuel injector from the flange on the engine.



Unplug the fuel injector's connector "B".



There may be some fuel left inside the injector and its line.



Release the retaining spring "C" from the injector.



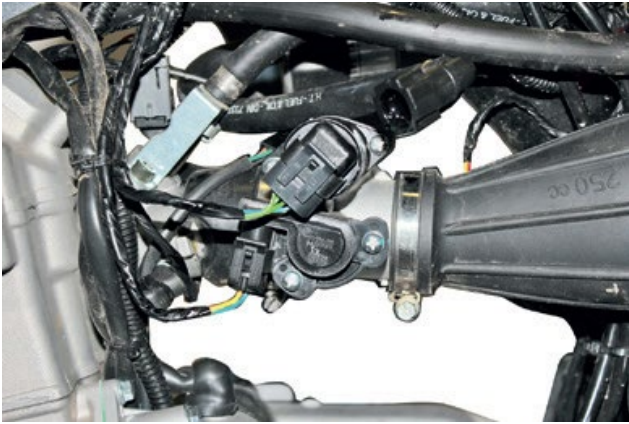
Remove the fuel injector "D" from its fuel line "E".



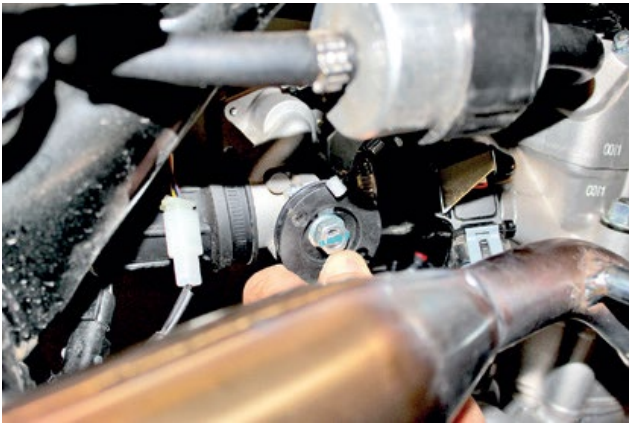
Repeat the procedure in reverse to refit.



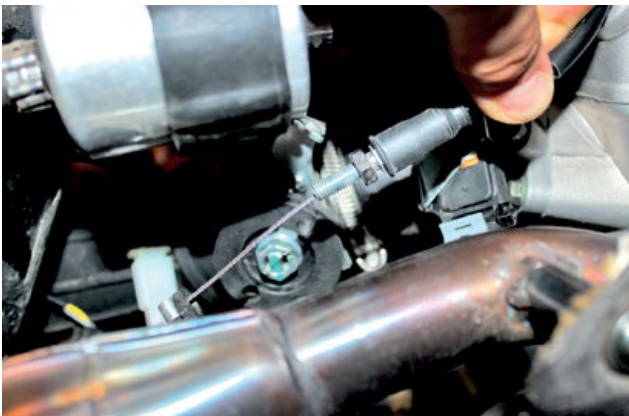
Replace the O-rings "F" every time you remove the fuel injector.

**15.10.2 Removing the throttle body**

Disconnect the stepper motor's connector "A" and the TPS's connector "B".
Loosen the metal clamps "C".



Pull the throttle cable pin "D" out of the fitting "E" on the throttle body.



Fully unscrew the nut "F" fastening the throttle cable.
Release the throttle cable "G" from the bracket "H" on the throttle body.



Remove the throttle body "I" from the manifolds.



Repeat the procedure in reverse to refit.

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15.10.3 Removing the MAP sensor

Remove the screw "A" and release the MAP sensor from its slot on the engine.



Disconnect the connector "B" and the retaining bracket "C" from the MAP sensor.



Repeat the procedure in reverse to refit.

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15.11 ERROR CODES
15.11.1 Ignition module Error codes table

i The following list contains all the codes programmed in the ignition module, in addition to those available for this model of motorcycle.

ERROR CODE	ERROR
P0001	Fuel volume regulator control - circuit open
P0002	Fuel volume regulator control - circuit range/performance
P0003	Fuel volume regulator control - circuit low
P0004	Fuel volume regulator control - circuit high
P0005	Control circuit of the fuel shut-off valve interrupted
P0006	Low voltage of the fuel shut-off valve control circuit
P0007	High voltage of the fuel shut-off valve control circuit
P0008	Engine position system performance (bank 1)
P0009	Engine position system performance (bank 2)
P000A	Camshaft A position, slow response (bank 1)
P000B	Camshaft B position, slow response (bank 1)
P000C	Camshaft A position, slow response (bank 2)
P000D	Camshaft B position, slow response (bank 2)
P000E	Fuel flow regulator control, learning limit exceeded
P000F	Pressure relief valve of the supply system activated
P0016	Crankshaft position - camshaft position correlation (bank 1 sensor A)
P0017	Crankshaft position - camshaft position correlation (bank 1 sensor B)
P0018	Crankshaft position - camshaft position correlation (bank 2 sensor A)
P0019	Crankshaft position - camshaft position correlation (bank 2 sensor B)
P001A	A Camshaft profile control circuit, open (bank 1)
P001B	A Camshaft profile control circuit, low (bank 1)
P001C	A Camshaft profile control circuit, high (bank 1)
P001D	A Camshaft profile control circuit, open (bank 2)
P001E	A Camshaft profile control circuit, low (bank 2)
P001F	A Camshaft profile control circuit, high (bank 2)
P0026	Intake valve control solenoid - circuit range/performance (bank 1)
P0027	Exhaust valve control solenoid - circuit range/performance (bank 1)
P0028	Intake valve control solenoid - circuit range/performance (bank 2)
P0029	Exhaust valve control solenoid - circuit range/performance (bank 2)
P002A	B Camshaft profile control circuit, open (bank 1)
P002B	B Camshaft profile control circuit, low (bank 1)
P002C	B Camshaft profile control circuit, high (bank 1)
P002D	B Camshaft profile control circuit, open (bank 2)
P002E	B Camshaft profile control circuit, low (bank 2)
P002F	B Camshaft profile control circuit, high (bank 2)
P0030	Oxygen sensor heater circuit
P0031	Oxygen sensor heater circuit
P0032	Oxygen sensor heater circuit
P0036	Heated oxygen sensor heater for bank 1 sensor 2
P0037	Heated oxygen sensor heater control circuit (bank 1 sensor 2) low
P0038	Heated oxygen sensor heater control circuit (bank 1 sensor 2) high
P003C	Camshaft Profile Control Performance/Stuck Off - Bank 1
P003D	A Camshaft Profile Control Circuit Performance/Stuck Off - Bank 1
P003E	Camshaft Profile Control Performance/Stuck Off - Bank 2

ERROR CODE	ERROR
P003F	A Camshaft Profile Control Circuit Performance/Stuck Off - Bank 2
P0040	Oxygen sensor signals swapped - bank 1 sensor 1/bank 2 sensor 1
P0041	Oxygen sensor signals swapped - bank 1 sensor 2/bank 2 sensor 2.
P0042	Oxygen Heater Control Circuit (HO2S) Bank 1 Sensor 3
P0043	Oxygen Heater Control Circuit Low (bank 1 sensor 3)
P0044	Oxygen heater control circuit high (bank 1 sensor 3)
P0050	Oxygen Heater Control Circuit (HO2S) Bank 2 Sensor 1
P0051	Heated oxygen sensor heater control circuit (bank 2 sensor 1) low
P0052	Heated oxygen sensor heater control circuit (bank 2 sensor 1) high
P0053	Oxygen sensor heater resistance (bank 1 sensor 1)
P0054	Oxygen sensor heater resistance (bank 1 sensor 2)
P0055	Oxygen sensor heater resistance (bank 1 sensor 3)
P0056	Oxygen Sensor heater circuit (bank 2 sensor 2)
P0057	Heated oxygen sensor heater control circuit (bank 2 sensor 2) low
P0058	Heated oxygen sensor heater control circuit (bank 2 sensor 2) high
P0059	Oxygen sensor heater resistance (bank 2 sensor 1)
P005A	B Camshaft Profile Control Performance/Stuck Off - Bank 1
P005B	B Camshaft Profile Control Stuck On - Bank 1
P005C	B Camshaft Profile Control Performance/Stuck Off - Bank 2
P005D	B Camshaft Profile Control Stuck On - Bank 2
P0060	Oxygen sensor heater resistance (bank 2 sensor 2)
P0061	Oxygen sensor heater resistance (bank 1 sensor 3)
P0062	Oxygen Sensor heater circuit (bank 2 sensor 3)
P0063	Oxygen Heater Control Circuit Low (bank 2 sensor 3)
P0064	Oxygen heater control circuit high (bank 2 sensor 3)
P0068	MAP/MAF - throttle position correlation
P0069	Manifold absolute pressure - barometric pressure correlation.
P006A	Manifold absolute pressure - mass or volume air flow correlation
P006B	Manifold absolute pressure-exhaust pressure correlation
P0070	Ambient air temperature sensor circuit
P0071	Ambient air temperature
P0072	Ambient air temperature sensor (low signal)
P0073	Ambient air temperature sensor (high signal)
P0074	Ambient air temperature sensor circuit
P0075	Suction valve control solenoid valve (bank 1)
P0076	Low voltage of the suction valve control solenoid valve circuit (bank 1)
P0077	High voltage of the suction valve control solenoid valve circuit (bank 1)
P0078	Exhaust valve control solenoid valve (bank 1)
P0079	Exhaust Valve Control Solenoid Circuit Low (bank 1)
P007A	Charge Air Cooler Temperature Sensor Circuit
P007B	Charge Air Cooler Temperature Sensor Circuit Range/Performance
P007C	Charge Air Cooler Temperature Sensor Circuit Low
P007D	Charge Air Cooler Temperature Sensor Circuit High
P007E	Charge Air Cooler Temperature Sensor Circuit Intermittent/Erratic
P007F	Charge Air Cooler Temperature Sensor Bank1/Bank2 Correlation
P0080	Exhaust valve control solenoid - circuit high (Bank 1)
P0081	Suction valve control solenoid valve (bank 2)
P0082	Low voltage of the suction valve control solenoid valve circuit (bank 2)
P0083	High voltage of the suction valve control solenoid valve circuit (bank 2)

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ERROR CODE	ERROR
P0084	Exhaust valve control solenoid valve (bank 2)
P0085	Exhaust valve control solenoid - circuit low (bank 2)
P0086	Exhaust valve control solenoid - circuit high (Bank 2)
P0089	Fuel pressure regulator efficiency
P008A	Low pressure fuel system pressure - Too low
P008B	Low pressure fuel system pressure - Too high
P008C	Fuel cooler pump control circuit - open
P008D	Fuel cooler pump control, circuit low
P008E	Fuel cooler pump control, circuit high
P008F	Engine Coolant Temperature/Fuel Temperature Correlation
P0090	Fuel metering solenoid valve [circuit open]
P0091	Fuel metering solenoid valve [short-circuit to ground]
P0092	Fuel metering solenoid valve [positive short-circuit]
P0093	Fuel System Leak Detected - Large Leak
P0094	Fuel System Leak Detected - Small Leak
P0095	Intake air temperature sensor 2
P0096	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE
P0097	Intake air temperature sensor 2 low input
P0098	Intake air temperature sensor 2 high input
P0099	Intake air temperature sensor 2 - circuit intermittent/irregular
P009A	Intake Air Temperature/Ambient Air Temperature Correlation
P009B	Fuel Pressure Relief Control Circuit/Open
P009C	Fuel Pressure Relief Control Circuit Low
P009D	Fuel Pressure Relief Control Circuit High
P009E	Fuel Pressure Relief Control Performance/Stuck Off
P009F	Fuel Pressure Relief Control Stuck On
P00A0	Charge Air Cooler Temperature Sensor Circuit
P00A1	Charge Air Cooler Temperature Sensor Circuit Range/Performance
P00A2	Charge Air Cooler Temperature Sensor Circuit Low
P00A3	Charge Air Cooler Temperature Sensor Circuit High
P00A4	Charge Air Cooler Temperature Sensor Circuit Intermittent/Erratic
P00A5	Intake air temperature sensor 2 circuit
P00A6	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE
P00A7	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW
P00A8	Intake air temperature sensor 2 - circuit high
P00A9	Intake air temperature sensor 2 - circuit intermittent/irregular
P00AA	Intake air temperature sensor 1 circuit
P00AB	Intake air temperature sensor 1 - Circuit range/performance
P00AC	Intake air temperature sensor 1 - circuit low
P00AD	Intake air temperature sensor 1 - circuit high
P00AE	Intake air temperature sensor 1 - circuit intermittent
P00B1	Radiator coolant temperature sensor circuit
P00B2	Radiator coolant temperature sensor circuit out of range
P00B3	Radiator Coolant Temperature Sensor Circuit Low
P00B4	Radiator Coolant Temperature Sensor Circuit High
P00B5	Radiator Coolant Temperature Sensor Circuit Intermittent/Erratic
P00B6	Radiator Coolant Temperature/Engine Coolant Temperature Correlation
P00B7	Engine Coolant Flow Low/Performance
P00B8	Manifold absolute pressure - mass or volume air flow correlation

ERROR CODE	ERROR
P00B9	Low pressure fuel system pressure - Too low
P00BA	Low Fuel Pressure - Forced Limited Power
P00BB	Fuel Injector Insufficient Flow - Forced Limited Power - high current.
P00BC	Mass or Volume Air Flow A Circuit out of nominal range - Air flow too low
P00BD	Mass or Volume Air Flow A Circuit out of nominal range - Air flow too high
P00BE	Mass or Volume Air Flow B Circuit out of nominal range - Air flow too low
P00BF	Mass or Volume Air Flow B Circuit out of normal range - Air flow too high
P0100	Mass or Volume Air Flow Circuit
P0101	Mass or Volume Air Flow Circuit Range/Performance
P0102	Air mass metering, circuit low
P0103	Air mass or volume air metering - signal high
P0104	Mass or volume air flow, intermittent circuit
P0105	Manifold absolute pressure / Barometric pressure
P0106	Manifold absolute pressure (MAP) / Barometric pressure - range/performance problem
P0107	Manifold absolute pressure
P0108	Manifold absolute pressure
P0109	Manifold absolute pressure (MAP) / Barometric pressure intermittent circuit
P010A	Mass or Volume Air Flow B Circuit
P010B	Mass or Volume Air Flow B Circuit Range/Performance
P010C	Mass or Volume Air Flow B - circuit low.
P010D	Mass or Volume Air Flow B - circuit high.
P010E	Mass or Volume Air Flow B Circuit Intermittent/Erratic.
P010F	Mass or Volume Air Flow Sensor "A"/"B" Correlation
P0110	Intake air temperature sensor
P0111	Intake air temperature sensor 1 - Circuit range/performance
P0112	Air temperature sensor
P0113	Air temperature sensor
P0114	Intake air temperature sensor 1 - circuit intermittent
P0115	Engine coolant temperature
P0116	Engine Coolant Temperature Sensor Circuit Range/Performance problem
P0117	Engine coolant temperature
P0118	Engine coolant temperature
P0119	ECT Sensor Circuit signal Intermittent
P011A	Engine Coolant Temperature Sensor 1/2 Correlation
P011B	Engine Coolant Temperature/Intake Air Temperature Correlation
P011C	Charge Air Temperature/Intake Air Temperature Correlation - Bank 1
P011D	Charge Air Temperature/Intake Air Temperature Correlation - Bank 2
P0120	Throttle position sensor
P0121	Throttle position sensor range/performance (main/secondary)
P0122	Throttle position sensor
P0123	Throttle position sensor
P0124	Throttle position sensor circuit - intermittent signal
P0125	Insufficient coolant temperature for closed loop fuel control
P0126	Insufficient coolant temperature for stable operation
P0127	Intake air temperature too high
P0128	Coolant thermostat (coolant temperature below thermostat regulating temperature).
P0129	Barometric pressure too low
P0130	Oxygen sensor heating circuit (bank 1, sensor 1)

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ERROR CODE	ERROR
P0131	Oxygen sensor
P0132	Oxygen sensor
P0133	Oxygen sensor control circuit slow response (Bank 1 Sensor 1)
P0134	Oxygen sensor
P0135	Oxygen sensor heating circuit (bank 1, sensor 1)
P0136	Oxygen sensor heating circuit (bank 1, sensor 2)
P0137	Heated oxygen sensor heater control circuit (bank 1 sensor 2) low
P0138	Heated oxygen sensor heater control circuit (bank 1 sensor 2) high
P0139	Oxygen sensor control circuit slow response (Bank 1 Sensor 2)
P013A	Oxygen sensor 2 slow response - rich to lean
P013B	Oxygen sensor 2 slow response - lean to rich
P013C	Oxygen sensor 2 slow response - rich to lean
P013D	Oxygen sensor 2 slow response - lean to rich
P013E	Oxygen sensor delayed response - rich to lean
P013F	Oxygen sensor delayed response - lean to rich
P0140	Oxygen sensor heater circuit no activity detected (bank 1 sensor 2)
P0141	Oxygen sensor heating circuit (bank 1, sensor 2)
P0142	Oxygen sensor heating circuit (bank 1, sensor 3)
P0143	Oxygen Heater Control Circuit Low (bank 1 sensor 3)
P0144	Oxygen heater control circuit high (bank 1 sensor 3)
P0145	Oxygen sensor control circuit slow response (Bank 1 Sensor 3)
P0146	Oxygen sensor heater circuit no activity detected (bank 1 sensor 3)
P0147	Oxygen sensor heating circuit (bank 1, sensor 3)
P0148	Fuel delivery error
P0149	Fuel timing error
P014A	Oxygen sensor delayed response - rich to lean
P014B	Oxygen sensor delayed response - lean to rich
P014C	Oxygen sensor 2 slow response - rich to lean
P014D	Oxygen sensor 2 slow response - lean to rich
P014E	Oxygen sensor 2 slow response - rich to lean
P014F	Oxygen sensor 2 slow response - lean to rich
P0150	Oxygen Heater Control Circuit (HO2S) Bank 2 Sensor 1
P0151	Heated oxygen sensor heater control circuit (bank 2 sensor 1) low
P0152	Heated oxygen sensor heater control circuit (bank 2 sensor 1) high
P0153	Oxygen sensor circuit slow response (bank 2 sensor 1)
P0154	Oxygen sensor heater circuit no activity detected (bank 1 sensor 2)
P0155	Oxygen sensor heating circuit (bank 2, sensor 1)
P0156	Oxygen sensor heating circuit (bank 2, sensor 2)
P0157	Heated oxygen sensor heater control circuit (bank 2 sensor 2) low
P0158	Heated oxygen sensor heater control circuit (bank 2 sensor 2) high
P0159	Oxygen sensor control circuit slow response (Bank 2 Sensor 2)
P015A	Oxygen sensor delayed response - rich to lean
P015B	Oxygen sensor delayed response - lean to rich
P015C	Oxygen sensor delayed response - rich to lean
P015D	Oxygen sensor delayed response - lean to rich
P0160	Oxygen sensor heater circuit no activity detected (bank 2 sensor 2)
P0161	Heated oxygen sensor heater control circuit (bank 2 sensor 2) high
P0162	Oxygen sensor heating circuit (bank 1, sensor 3)
P0163	Oxygen Heater Control Circuit Low (bank 2 sensor 3)

ERROR CODE	ERROR
P0164	Oxygen heater control circuit high (bank 2 sensor 3)
P0165	Oxygen sensor circuit slow response (bank 2 sensor 3)
P0166	Oxygen sensor heater circuit no activity detected (bank 2 sensor 3)
P0167	Oxygen sensor heating circuit (bank 2, sensor 3)
P0168	Fuel temperature too high
P0169	Incorrect fuel composition
P0170	Fuel trim malfunction (bank 1).
P0171	System too lean - bank 1
P0172	System too rich, Bank 1
P0173	Fuel trim malfunction (bank 2).
P0174	System Too Lean, Bank 2
P0175	System too rich, Bank 1
P0176	Fuel composition sensor
P0177	Fuel composition sensor circuit range/performance
P0178	Fuel composition sensor circuit low
P0179	Fuel composition sensor circuit high
P0180	Fuel temperature sensor A circuit
P0181	Fuel temperature sensor A circuit range/performance
P0182	Fuel temperature sensor A circuit - signal low
P0183	Fuel temperature sensor A circuit - signal high
P0184	Fuel temperature sensor A circuit intermittent
P0185	Fuel temperature sensor B circuit
P0186	Fuel temperature sensor B circuit range/performance
P0187	Fuel temperature sensor B circuit - signal low
P0188	Fuel temperature sensor B circuit - signal high
P0189	Fuel temperature sensor B circuit signal intermittent
P018A	Fuel pressure sensor "B" circuit
P018B	Fuel Pressure Sensor B Circuit, Range/Performance
P018C	Fuel Pressure Sensor B Circuit, Low
P018D	Fuel Pressure Sensor B Circuit, High
P018E	Fuel Pressure Sensor B - Circuit Intermittent/Erratic
P018F	Fuel system over pressure relief valve frequent activation
P0195	Engine oil temperature sensor circuit
P0196	Engine oil temperature sensor
P0197	Engine Oil Temperature Sensor Circuit - Low signal
P0198	Engine Oil Temperature Sensor Circuit, High Input
P0199	Engine oil temperature sensor circuit, intermittent
P0200	Injector circuit
P0201	Injectors
P0202	Injector circuit 2
P0203	Injector circuit 3
P0204	Injector circuit 4
P0205	Injector circuit 5
P0206	Injector circuit 6
P0207	Injector circuit 7
P0208	Injector circuit 8
P0209	Injector 9
P020A	Injection timing - Cylinder 1
P020B	Injection timing - Cylinder 2

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ERROR CODE	ERROR
P020C	Injection timing - Cylinder 3
P020D	Injection timing - Cylinder 4
P020E	Injection timing - Cylinder 5
P020F	Injection timing - Cylinder 6
P0210	Injector 10
P0211	Injector 11
P0212	Injector 12
P0213	Cold Start Injector 1
P0214	Cold Start Injector 2
P0215	Engine Shutoff Solenoid circuit
P0216	Fuel injection timing
P0217	Engine over temperature
P0218	Transmission Over temperature
P0219	Engine overspeed condition
P0220	Throttle position sensor B
P0221	Throttle position sensor B, range/performance problem
P0222	Throttle position sensor B circuit, input low
P0223	Throttle position sensor B circuit, input high
P0224	Throttle position sensor B, circuit intermittent
P0225	Throttle position sensor C
P0226	Throttle position sensor C, range/performance problem
P0227	Throttle position sensor C circuit, input low
P0228	Throttle position sensor C circuit, input high
P0229	Throttle position sensor C circuit, intermittent
P022A	Charge Air Cooler Bypass Control A - circuit open
P022B	Charge Air Cooler Bypass Control A Circuit - low.
P022C	Charge Air Cooler Bypass Control A Circuit - high.
P022D	Charge Air Cooler Bypass Control B - circuit open.
P022E	Charge Air Cooler Bypass Control B - circuit low.
P022F	Charge Air Cooler Bypass Control B - circuit high.
P0230	Fuel pump relay circuit
P0231	Fuel pump relay control circuit - low voltage
P0232	Fuel pump relay control circuit - high voltage
P0233	Fuel pump relay - circuit intermittent
P0234	Engine supercharer condition - limit exceeded
P023A	Charge air cooler coolant pump control - circuit open
P023B	Charge air cooler coolant pump control - circuit low
P023C	Charge air cooler coolant pump control - circuit high
P023F	Fuel Pump Secondary Circuit, Open
P024A	Charge air cooler bypass control A - range/performance.
P024B	Charge air cooler bypass control A stuck
P024C	Fault in the charge air cooler bypass position sensor A circuit
P024D	Charge air cooler bypass position sensor A - circuit range/performance.
P024E	Charge air cooler bypass position sensor A - circuit low.
P024F	Charge air cooler bypass position sensor A - circuit high.
P025A	Fuel pump module control - circuit open
P025B	Fuel pump module control - circuit range/performance
P025C	Fuel pump module control - circuit low
P025D	Fuel pump module control - circuit high

ERROR CODE	ERROR
P0261	Injector control circuit 1 - low voltage
P0262	Injector 1 control circuit - high voltage
P0263	Cylinder 1 injection / balance
P0264	Injector control circuit 2 - low voltage
P0265	Injector 2 control circuit - high voltage
P0266	Cylinder 2 injection / balance
P0267	Injector control circuit 3 - low voltage
P0268	Injector 3 control circuit - high voltage
P0269	Cylinder 3 injection / balance
P0270	Injector control circuit 4 - low voltage
P0271	Injector 4 control circuit - high voltage
P0272	Cylinder 4 injection / balance
P0273	Injector control circuit 5 - low voltage
P0274	Injector 5 control circuit - high voltage
P0275	Cylinder 5 injection/balance
P0276	Injector control circuit 6 - low voltage
P0277	Injector 6 control circuit - high voltage
P0278	Cylinder 6 injection/balance
P0279	Injector control circuit 7 - low voltage
P0280	Injector 7 control circuit - high voltage
P0282	Injector control circuit 8 - low voltage
P0283	Injector 8 control circuit - high voltage
P0285	Injector control circuit 9 - low voltage
P0286	Injector 9 control circuit - high voltage
P0288	Injector control circuit 10 - low voltage
P0289	Injector 10 control circuit - high voltage
P0291	Injector control circuit 11 - low voltage
P0292	Injector 11 control circuit - high voltage
P0294	Injector control circuit 12 - low voltage
P0295	Injector 12 control circuit - high voltage
P0297	Vehicle Overspeed Condition
P0298	Engine Oil Over Temperature
P029A	Cylinder 1 balancing - Fuel trim at max limit
P029B	Cylinder 1 balancing - Fuel trim at min limit
P029C	Cylinder 1 balancing - Injector restricted
P029D	Cylinder 1 balancing - Injector leaking
P029E	Cylinder 2 balancing - Fuel trim at max limit
P029F	Cylinder 2 balancing - Fuel trim at min limit
P02A0	Cylinder 2 balancing - Injector restricted
P02A1	Cylinder 2 balancing - Injector leaking
P02A2	Cylinder 3 balancing - Fuel trim at max limit
P02A3	Cylinder 3 balancing - Fuel trim at min limit
P02A4	Cylinder 3 balancing - Injector restricted
P02A5	Cylinder 3 balancing - Injector leaking
P02A6	Cylinder 4 balancing - Fuel trim at max limit
P02A7	Cylinder 4 balancing - Fuel trim at min limit
P02A8	Cylinder 4 balancing - Injector restricted
P02A9	Cylinder 4 balancing - Injector leaking
P02AA	Cylinder 5 balancing - Fuel trim at max limit

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P02AB	Cylinder 5 balancing - Fuel trim at min limit
P02AC	Cylinder 5 balancing - Injector restricted
P02AD	Cylinder 5 balancing - Injector leaking
P02AE	Cylinder 6 balancing - Fuel trim at max limit
P02AF	Cylinder 6 balancing - Fuel trim at min limit
P02B0	Cylinder 6 balancing - Injector restricted
P02B1	Cylinder 6 balancing - Injector leaking
P02CC	Cylinder 1 fuel injector offset learning at min limit
P02CD	Cylinder 1 fuel injector offset learning at max limit
P02CE	Cylinder 2 fuel injector offset learning at min limit
P02CF	Cylinder 2 fuel injector offset learning at max limit
P02D0	Cylinder 3 fuel injector offset learning at min limit
P02D1	Cylinder 3 fuel injector offset learning at max limit
P02D2	Cylinder 4 fuel injector offset learning at min limit
P02D3	Cylinder 4 fuel injector offset learning at max limit
P02D4	Cylinder 5 fuel injector offset learning at min limit
P02D5	Cylinder 5 fuel injector offset learning at max limit
P02D6	Cylinder 6 fuel injector offset learning at min limit
P02D7	Cylinder 6 fuel injector offset learning at max limit
P02EE	Cylinder 1 injector circuit range/performance
P02EF	Cylinder 2 injector circuit range/performance
P02F0	Cylinder 3 injector circuit range/performance
P02F1	Cylinder 4 injector circuit range/performance
P02F2	Cylinder 5 injector circuit range/performance
P02F3	Cylinder 6 injector circuit range/performance
P0300	Random/multiple cylinder misfire detected
P0301	Cylinder 1 misfire detected
P0302	Cylinder 2 misfire detected
P0303	Cylinder 3 misfire detected
P0304	Cylinder 4 misfire detected
P0305	Cylinder 5 misfire detected
P0306	Cylinder 6 misfire detected
P0313	Misfire detected with low fuel
P0314	Single Cylinder Misfire (Cylinder not Specified)
P0315	Crankshaft position system - variation not learned
P0316	Engine misfire detected on startup
P0317	Rough Road Hardware Not Present
P0318	Rough road sensor A
P0319	Rough road sensor B
P0320	Crankshaft position sensor (CKP)
P0321	Crankshaft position sensor circuit range/performance
P0322	Ignition/Distributor Engine Speed Input Circuit - No Signal
P0323	Ignition/Distributor Engine Speed Input Circuit Intermittent
P0324	Knock control system error
P0325	Knock sensor bank 1
P0326	Knock Sensor 1 Circuit Range/Performance - (bank 1).
P0327	Knock Sensor Circuit bank 1 - low signal
P0328	Knock sensor 1 circuit - high input (bank 1).
P0329	Knock sensor 1 - circuit intermittent (bank 1).

ERROR CODE	ERROR
P032A	Knock sensor 3 - circuit
P032B	Knock sensor 3 circuit, range/performance
P032C	Knock sensor 3 circuit, low
P032D	Knock sensor 3 circuit, high
P032E	Knock sensor 3 circuit, intermittent
P0330	Knock sensor 2 circuit (bank 2)
P0331	Knock sensor - circuit range/performance (bank 2)
P0332	Knock sensor 2 - circuit low (Bank 2)
P0333	Knock sensor 2 - circuit high (Bank 2)
P0334	Knock sensor 2 - intermittent circuit (Bank 2)
P0335	Crankshaft position sensor
P0336	Crankshaft position sensor circuit range/performance
P0337	Crankshaft position sensor - signal too weak
P0338	Crankshaft position sensor - signal too strong
P0339	Ignition/Distributor Engine Speed Input Circuit Intermittent
P033A	Knock sensor 4 - circuit (bank 2)
P033B	Knock sensor 4 - circuit range/performance (bank 2).
P033C	Knock sensor 4 - circuit low (bank 2).
P033D	Knock sensor 4 - circuit high (bank 2).
P033E	Knock sensor 4 - circuit intermittent (bank 2).
P0340	Camshaft position sensor A signal (bank 1)
P0341	Camshaft Position Sensor A Circuit Range/Performance (Bank 1)
P0342	Camshaft Position Sensor A Circuit - low input (bank 1 or single sensor).
P0343	Camshaft position sensor A - circuit high (bank 1 or single sensor).
P0344	Camshaft position sensor A - circuit intermittente (bank 1 or single sensor).
P0345	Camshaft position sensor A signal (bank 2)
P0346	Camshaft position sensor circuit (bank 2) - range/performance
P0347	Camshaft Position Sensor A Circuit, Low Input (Bank 2)
P0348	Camshaft Position Sensor A Circuit, High Input (Bank 2)
P0349	Camshaft position sensor A - circuit intermittent (bank 2).
P0350	Ignition coil - primary/secondary circuit
P0351	Ignition coil A primary/secondary circuit malfunction
P0352	Ignition coil B primary/secondary circuit malfunction
P0353	Ignition coil C primary/secondary circuit malfunction
P0354	Ignition coil D primary/secondary circuit malfunction
P0355	Ignition coil E primary/secondary circuit malfunction
P0356	Ignition coil F primary/secondary circuit malfunction
P0357	Ignition coil G primary/secondary circuit malfunction
P0358	Ignition coil H of the primary/secondary circuit malfunction
P0359	Ignition coil I of the primary/secondary circuit
P0360	Ignition coil J of the primary/secondary circuit
P0361	Ignition coil K of the primary/secondary circuit
P0362	Ignition coil L of the primary/secondary circuit
P0363	Misfire detected - fueling disabled
P0365	Camshaft position sensor B circuit (bank 1)
P0366	Camshaft Position Sensor B Circuit Range/Performance (bank 1).
P0367	Camshaft Position Sensor B Circuit, Low Input (Bank 1)
P0368	Camshaft Position Sensor B Circuit, High Input (Bank 1)
P0369	CMP B sensor circuit signal intermittent (bank 1)

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ERROR CODE	ERROR
P0370	Timing Reference High Resolution Signal A
P0371	Timing Reference High Resolution Signal A Too Many Pulses
P0372	Timing Reference High Resolution Signal A Too Few Pulses
P0373	Timing Reference High Resolution Signal A Intermittent/Erratic Pulses
P0374	Timing Reference High Resolution Signal A No Pulses
P0375	Timing Reference High Resolution Signal B
P0376	Timing Reference High Resolution Signal B Too Many Pulses
P0377	Timing Reference High Resolution Signal B Too Few Pulses
P0378	Timing Reference High Resolution Signal B Intermittent/Erratic Pulses
P0379	Timing Reference High Resolution Signal B No Pulses
P037D	Glow Plug Sense Circuit
P037E	Glow Plug Sense Circuit Low
P037F	Glow Plug Sense Circuit High
P0380	Glow plug/heater, circuit A
P0381	Glow plug/heater indicator circuit
P0382	Glow Plug/Heater, circuit B
P0383	Glow Plug Control Module Control - circuit low
P0384	Glow Plug Control Module Control - circuit high
P0385	Crankshaft Position Sensor B Circuit
P0386	Crankshaft Position Sensor B Circuit Range/Performance
P0387	Crankshaft Position Sensor B - signal too weak
P0388	Crankshaft Position Sensor B Circuit Low - signal too strong
P0389	Crankshaft Position Sensor B Circuit Intermittent
P0390	Crankshaft position (bank 2, sensor B)
P0391	Camshaft position sensor B circuit range/performance (bank 2)
P0392	Camshaft Position Sensor B Circuit Low (bank 2)
P0393	Camshaft Position Sensor B Circuit High (bank 2)
P0394	Camshaft Position Sensor B Circuit Intermittent (bank 2)
P0410	Secondary air injection system
P0411	Secondary air injection system - incorrect flow detected
P0412	Secondary Air Injection System Switching Valve A Circuit
P0413	Secondary Air Injection System Switching Valve A Circuit Open
P0414	Secondary Air Injection System Switching Valve A Circuit Shorted
P0415	Secondary Air Injection System Switching Valve B Circuit
P0416	Secondary Air Injection System Switching Valve B Circuit Open
P0417	Secondary Air Injection System Switching Valve B Circuit Shorted
P0418	Secondary Air Injection System Control A Circuit
P0419	Secondary Air Injection System Control B Circuit
P041F	Secondary Air Injection System Switching Valve A Circuit - Low
P0420	Catalyst System Efficiency Below Threshold (bank 1)
P0421	Warm Up Catalyst Efficiency Below Threshold (bank 1)
P0422	Catalyst System Efficiency Below Threshold (bank 1)
P0423	Warm Up Catalyst Efficiency Below Threshold (bank 1)
P0424	Heated Catalyst Temperature Below Threshold (bank 1)
P0425	Catalyst Temperature Sensor (bank 1)
P0426	Catalyst Temperature Sensor Range/Performance (bank 1)
P0427	Catalyst temperature sensor (bank 1) - signal too weak
P0428	Catalyst temperature sensor (bank 1) - signal too strong
P0429	Catalyst heater control circuit (bank 1)

ERROR CODE	ERROR
P042A	Catalyst temperature sensor circuit
P042B	Catalyst temperature sensor circuit, range/performance (sensor 1)
P042C	Catalyst temperature sensor circuit, low (sensor 1)
P042D	Catalyst temperature sensor circuit, high (sensor 1)
P0430	Catalyst System Efficiency Below Threshold (bank 2)
P0431	Warm Up Catalyst Efficiency Below Threshold (bank 2)
P0432	Catalyst System Efficiency Below Threshold (bank 2)
P0433	Warm Up Catalyst Efficiency Below Threshold (bank 2)
P0434	Heated Catalyst Temperature Below Threshold (bank 2)
P0435	Catalyst Temperature Sensor (bank 2)
P0436	Catalyst Temperature Sensor Range/Performance (bank 2)
P0437	Catalyst temperature sensor (bank 2) - signal too weak
P0438	Catalyst temperature sensor (bank 2) - signal too strong
P0439	Catalyst heater control circuit (bank 2)
P043A	Catalyst temperature sensor circuit
P043B	Catalyst temperature sensor circuit, range/performance (sensor 1)
P043C	Catalyst temperature sensor (low)
P043D	Catalyst temperature sensor (high)
P043E	Evaporative Emission System Leak Detection Reference Orifice - Low Flow
P043F	Evaporative Emission System Leak Detection Reference Orifice - High Flow
P0440	Evaporative emission system
P0441	Evaporative Emission System - Incorrect Purge Flow
P0442	Evaporative Emission System - Leak Detected (small leak)
P0443	EVAP system purge fault
P0444	Evaporative emissions purge valve
P0445	Evaporative emissions purge valve [short circuit]
P0446	Evaporative emissions purge valve
P0447	Evaporative emissions purge valve [circuit open]
P0448	Evaporative emissions purge valve [short circuit]
P0449	Evaporative emissions purge valve
P044F	Switching valve circuit A secondary air injection, High
P0450	Evaporative emission pressure sensor
P0451	Evaporative emissions system - pressure sensor range/performance
P0452	Evaporative Emission System Pressure Sensor - Switch Low
P0453	Evaporative Emission System Pressure Sensor - Switch High
P0454	Evaporative Emission System Pressure Sensor/Switch - Intermittent
P0455	Evaporative Emission System Leak Detected - large leak
P0456	Evaporative Emission System - Leak Detected - very small leak
P0457	Evaporative Emission System - Leak Detected (fuel cap loose/off)
P0458	Evaporative Emission System Purge Control Valve
P0459	Evaporative Emission System Purge Control Valve
P0460	Fuel level sensor
P0461	Fuel level sensor - range/performance
P0462	Fuel Level Sensor Circuit Low Input
P0463	Fuel Level Sensor Circuit High Input
P0464	Fuel Level Sensor Circuit - Intermittent
P0465	EVAP filter purge valve malfunction
P0466	Evaporative emissions purge valve - range/performance
P0467	Evaporative emissions purge valve - signal too low

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ERROR CODE	ERROR
P0468	Evaporative emissions purge valve - signal too high
P0469	Evaporative emissions purge valve - intermittent
P046A	Catalyst temperature sensor 1/2 correlation
P046B	Catalyst temperature sensor 1/2 correlation
P0470	Exhaust gas pressure sensor circuit
P0471	Exhaust gas pressure sensor - range/performance problem
P0472	Exhaust gas pressure sensor - signal too weak
P0473	Exhaust gas pressure sensor - signal too strong
P0474	Intermittent signal for exhaust gas pressure sensor
P0475	Exhaust pressure control valve
P0476	Exhaust pressure control valve - out of nominal range
P0477	Exhaust pressure control valve - signal too weak
P0478	Exhaust pressure control valve - signal too strong
P0479	Exhaust pressure control valve - erratic error
P047A	Exhaust pressure sensor B circuit
P047B	Exhaust Pressure Sensor B - Circuit Range/Performance.
P047C	Exhaust Pressure Sensor B - Circuit Low.
P047D	Exhaust Pressure Sensor B - Circuit High.
P047E	Exhaust Pressure Sensor B - Circuit Intermittent/Erratic.
P047F	Exhaust Pressure Control Valve Stuck Open
P0480	Cooling Fan 1 Control Circuit
P0481	Cooling Fan 2 Control Circuit
P0482	Cooling Fan 3 Control Circuit
P0483	Cooling fan rationality check malfunction
P0484	Cooling Fan Circuit Over Current
P0485	Fan Power/Ground Circuit
P048A	Exhaust Pressure Control Valve A Stuck Closed
P048B	Exhaust Pressure Control Valve Position Sensor/Switch Circuit
P048C	Exhaust Pressure Control Valve Position Sensor/Switch CircuitRange/Performance
P048D	Exhaust Pressure Control Valve Position Sensor/Switch Circuit, Low
P048E	Exhaust Pressure Control Valve Position Sensor/Switch Circuit, High
P048F	Exhaust Pressure Control Valve Position Sensor/Switch CircuitIntermittent/Erratic
P0491	Secondary air injection system (bank 1)
P0492	Secondary air injection system (bank 2)
P0493	Engine coolant fan motor - fan overspeed (clutch locked)
P0494	Engine coolant fan motor - fan speed low
P0495	Engine coolant fan motor - fan speed high
P0496	Evaporative Emission System High Purge Flow
P0497	Evaporative Emission System Low Purge Flow
P0498	Evaporative Emission System Vent Valve Control Circuit Low
P0499	Evaporative Emission System Vent Valve Control Circuit High
P049F	Exhaust Gas Recirculation B Flow
P04AA	Exhaust Pressure Control Valve B Position Sensor/Switch Circuit Intermittent/Erratic
P0500	Vehicle speed sensor circuit (VSS)
P0501	Vehicle Speed Sensor Range/Performance
P0502	Vehicle speed sensor - low input
P0503	Vehicle speed sensor - intermittent/erratic/high
P0504	Brake Switch A/B correlation

ERROR CODE	ERROR
P0505	Idle air stepper motor
P0506	Idle Air Control System RPM Lower Than Expected
P0507	Idle Air Control System RPM Higher Than Expected
P0508	Idle Air Control System Circuit Low
P0509	Idle air stepper motor
P050A	Cold Start Idle Air Control System - Performance
P050B	Cold Start Ignition Timing - Performance
P050C	Cold Start Engine Coolant Temperature - Performance
P050D	Cold Start Rough Idle
P050E	Cold Start Engine Exhaust Temperature Too Low
P050F	Brake Assist Vacuum Too Low
P0510	Closed Throttle Position Switch
P0511	Idle Air Control Circuit
P0512	Starter Request Circuit
P0513	Incorrect Immobilizer Key
P0514	Battery Temperature Sensor Circuit Range/Performance
P0515	Battery temperature sensor circuit
P0516	Battery temperature sensor - circuit low
P0517	Battery temperature sensor - circuit high
P0518	Idle Air Control Circuit, Intermittent
P0519	Idle Air Control System Performance
P051A	Crankcase Pressure Sensor Circuit
P051B	Crankcase Pressure Sensor Circuit Range/Performance
P051C	Crankcase Pressure Sensor Circuit Low
P051D	Crankcase Pressure Sensor Circuit High
P051E	Crankcase Pressure Sensor Circuit - Intermittent
P051F	Positive Crankcase Ventilation Filter Restriction
P0520	Engine oil pressure switch/sensor - circuit
P0521	Engine Oil Pressure Sensor/Switch Range/Performance
P0522	Engine Oil Pressure Sensor/Switch Low
P0523	Engine Oil Pressure Sensor/Switch High
P0524	Engine oil pressure too low
P0525	Cruise Control Servo Control Circuit Range/Performance
P0526	Fan Speed Sensor Circuit
P0527	Fan Speed Sensor Circuit - Range/Performance
P0528	Fan Speed Sensor Circuit No Signal
P0529	Fan Speed Sensor Circuit Intermittent
P052A	Cold Start A Camshaft Position Timing Over-Advanced - bank 1
P052B	Cold Start A Camshaft Position Timing Over-Advanced - bank 2
P052C	Cold Start A Camshaft Position Timing Over-Advanced - bank 1
P052D	Cold Start A Camshaft Position Timing Over-Advanced - bank 2
P052E	Positive Crankcase Ventilation Regulator Valve Performance
P053A	Positive Crankcase Ventilation Heater Control - Circuit Open
P053B	Positive Crankcase Ventilation Heater Control - Circuit Low
P053C	Positive Crankcase Ventilation Heater Control - Circuit High
P0540	Intake Air Heater A Circuit
P0541	Intake Air Heater A Circuit - Low.
P0542	Intake Air Heater A Circuit - high.
P0543	Intake Air Heater A Circuit Open

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ERROR CODE	ERROR
P0547	Exhaust Gas Temperature Sensor Circuit (bank 2 sensor 1)
P0548	Exhaust Gas Temperature Sensor Circuit Low (bank 2 sensor 1)
P0549	Exhaust Gas Temperature Sensor Circuit High (bank 2 sensor 1)
P054A	Cold Start B Camshaft Position Timing Over-Advanced - bank 1
P054B	Cold Start B Camshaft Position Timing Over-Advanced - bank 2
P054C	Cold Start B Camshaft Position Timing Over-Advanced - bank 1
P054D	Cold Start B Camshaft Position Timing Over-Advanced - bank 1
P0550	Power steering pressure/switch circuit
P0551	Power steering pressure sensor/switch circuit range/performance
P0552	Power steering pressure sensor/switch circuit low
P0553	Power Steering Pressure Sensor/Switch Circuit High
P0554	Power Steering Pressure Sensor/Switch Circuit Intermittent
P0555	Brake Booster Pressure Sensor Circuit
P0556	Brake Booster Pressure Sensor Circuit Range/Performance
P0557	Brake Booster Pressure Sensor Circuit Low
P0558	Brake Booster Pressure Sensor Circuit High
P0559	Brake Booster Pressure Sensor Circuit Intermittent
P0560	System voltage malfunction
P0561	System voltage unstable
P0562	System Voltage Low
P0563	System Voltage High
P0564	Cruise Control Multi-Function Input A Circuit
P0565	Cruise Control "On" Signal
P0566	Cruise Control "Off" Signal
P0567	Cruise Control "Resume" Signal
P0568	Cruise Control "Set" Signal
P0569	Cruise Control "Coast" Signal
P056A	Cruise Control "Increase Distance" Signal
P056B	Cruise Control "Decrease Distance" Signal
P0570	Cruise Control "Accelerate" Signal
P0571	Brake Switch A Circuit
P0572	Brake Switch A Circuit Low
P0573	Brake Switch A Circuit High
P0574	Cruise Control System - Vehicle Speed Too High
P0575	Cruise Control Input Circuit
P0576	Cruise Control Input Circuit Low
P0577	Cruise Control Input Circuit High
P0578	Cruise Control Multi-Function Input Circuit Stuck
P0579	Cruise Control Multi-Function Input A Circuit Range/Performance
P0580	Cruise Control Multi-Function Input A Circuit Low
P0581	Cruise Control Multi-Function Input A Circuit High
P0582	Cruise Control Vacuum Control Circuit/Open
P0583	Cruise Control Vacuum Control Circuit Low
P0584	Cruise Control Vacuum Control Circuit High
P0585	Cruise Control Multi-Function Input A/B Correlation
P0586	Cruise Control Vent Control Circuit/Open
P0587	Cruise Control Vent Control Circuit Low
P0588	Cruise Control Vent Control Circuit High
P0589	Cruise Control Multi-Function Input B Circuit

ERROR CODE	ERROR
P0590	Cruise Control Multi-Function Input Circuit Stuck
P0591	Cruise Control Multi-Function Input B Circuit Range/Performance
P0592	Cruise Control Multi-Function Input B Circuit Low
P0593	Cruise Control Multi-Function Input B Circuit High
P0594	Cruise Control Servo Control Circuit/Open
P0595	Cruise Control Servo Control Circuit Low
P0596	Cruise Control Servo Control Circuit High
P0597	Thermostat Heater Control Circuit/Open
P0598	Thermostat Heater Control Circuit Low
P0599	Thermostat Heater Control Circuit High
P0600	Serial Communication Link
P0601	Internal Control Module Memory Check Sum Error
P0602	Control Module Programming Error
P0603	Internal Control Module Keep Alive Memory (KAM) Error
P0604	Internal Control Module Random Access Memory (RAM) Error
P0605	Internal Control Module Read Only Memory (ROM) Error
P0606	Control Module Processor
P0607	Control Module Performance
P0608	Control Module VSS Output A
P0609	Control Module VSS Output B
P060A	Internal Control Module Monitoring Processor Performance
P060B	Internal Control Module A/D Processing Performance
P060C	Internal control unit - main processor performance
P060E	Internal Control Module Throttle Position Performance
P060F	Internal Control Module Coolant Temperature Performance
P0610	Control Module Vehicle Options Error
P0611	Fuel Injector Control Module Performance
P0612	Fuel Injector Control Module Relay Control
P0613	TCM Processor
P0614	ECM/TCM Incompatible
P0615	PStarter Relay Circuit
P0616	Starter Relay Circuit Low
P0617	Starter Relay Circuit High
P0618	Alternative Fuel Control Module KAM Error
P0619	Alternative Fuel Control Module RAM/ROM Error
P061A	Internal Control Module Torque Performance
P061B	Internal Control Module Torque Calculation Performance
P061C	Internal Control Module Engine RPM Performance
P061D	Internal Control Module Engine Air Mass Performance
P061E	Internal Control Module Brake Signal Performance
P061F	Internal Control Module Throttle Actuator Controller Performance
P0620	Generator Control Circuit
P0621	Generator Lamp/L Terminal Circuit
P0622	Generator Field/F Terminal Circuit
P0623	Generator Lamp Control Circuit
P0624	Fuel Cap Lamp Control Circuit
P0625	Generator Field/F Terminal Circuit Low
P0626	Generator Field/F Terminal Circuit High
P0627	Fuel Pump A Control Circuit/Open

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ERROR CODE	ERROR
P0628	Fuel Pump A Control Circuit Low
P0629	Fuel Pump A Control Circuit/Open
P062A	Fuel Pump A Control Circuit Range/Performance
P062B	Internal Control Module Fuel Injector Control Performance
P062C	Internal Control Module Vehicle Speed Performance
P062D	Fuel Injector Driver Circuit Performance Bank 1
P062E	Fuel Injector Driver Circuit Performance Bank 2
P062F	Internal Control Module EEPROM Error
P0630	VIN Not Programmed or Incompatible - ECM/PCM
P0631	VIN Not Programmed or Incompatible - TCM
P0632	Odometer Not Programmed or Incompatible - ECM/PCM
P0633	Immobilizer Key Not Programmed - ECM/PCM
P0635	Power Steering Control Circuit
P0636	Power Steering Control Circuit Low
P0637	Power Steering Control Circuit High
P0638	Throttle Actuator Control Range/Performance (Bank 1)
P0639	Throttle Actuator Control Range/Performance (Bank 2)
P063A	Generator Voltage Sense Circuit
P063B	Generator Voltage Sense Circuit Range/Performance
P063C	Generator Voltage Sense Circuit Low
P063D	Generator Voltage Sense Circuit High
P0640	Intake Air Heater Control Circuit
P0641	Sensor Reference Voltage A Circuit/Open
P0642	Sensor Reference Voltage A Circuit Low
P0643	Sensor Reference Voltage A Circuit High
P0648	Immobilizer Lamp Control Circuit
P0649	Speed Control Lamp Control Circuit
P064A	Fuel Pump Control Module
P064C	Glow Plug Control Module
P064D	Internal Control Module Oxygen Sensor Processor Performance Bank 1
P064E	Internal Control Module Oxygen Sensor Processor Performance Bank 2
P064F	Unauthorized Software/Calibration Detected
P0650	Malfunction Indicator Lamp (MIL) Control Circuit
P0651	Sensor Reference Voltage B Circuit/Open
P0652	Sensor Reference Voltage B Circuit Low
P0653	Sensor Reference Voltage B Circuit High
P0654	Engine RPM Output Circuit
P0655	Engine Hot Lamp Output Control Circuit
P0656	Fuel Level Output Circuit
P0657	Actuator Supply Voltage A Circuit/Open
P0658	Actuator Supply Voltage A Circuit Low
P0659	Actuator Supply Voltage A Circuit High
P065A	Generator System Performance
P065B	Generator Control Circuit Range/Performance
P065C	Generator Mechanical Performance
P065D	Reductant System Malfunction Lamp Control Circuit
P065E	Intake Manifold Tuning Valve Performance
P065F	Intake Manifold Tuning Valve Performance
P0660	Intake Manifold Tuning Valve Control Circuit/Open (Bank 1)

ERROR CODE	ERROR
P0661	Intake Manifold Tuning Valve Control Circuit Low (Bank 1)
P0662	Intake Manifold Tuning Valve Control Circuit High (Bank 1)
P0663	Intake Manifold Tuning Valve Control Circuit/Open (Bank 2)
P0664	Intake Manifold Tuning Valve Control Circuit Low (Bank 2)
P0665	Intake Manifold Tuning Valve Control Circuit High (Bank 2)
P066A	Cylinder 1 Glow Plug Control Circuit Low
P066B	Cylinder 1 Glow Plug Control Circuit High
P066C	Cylinder 2 Glow Plug Control Circuit Low
P066D	Cylinder 2 Glow Plug Control Circuit High
P066E	Cylinder 3 Glow Plug Control Circuit Low
P066F	Cylinder 3 Glow Plug Control Circuit High
P0670	Glow plug control module circuit
P0671	Cylinder 1 Glow Plug Circuit/Open
P0672	Cylinder 2 Glow Plug Circuit/Open
P0673	Cylinder 3 Glow Plug Circuit/Open
P0674	Cylinder 4 Glow Plug Circuit/Open
P0675	Cylinder 5 Glow Plug Circuit/Open
P0676	Cylinder 6 Glow Plug Circuit/Open
P067A	Cylinder 4 Glow Plug Control Circuit Low
P067B	Cylinder 4 Glow Plug Control Circuit High
P067C	Cylinder 5 Glow Plug Control Circuit Low
P067D	Cylinder 5 Glow Plug Control Circuit High
P067E	Cylinder 6 Glow Plug Control Circuit Low
P067F	Cylinder 6 Glow Plug Control Circuit High
P0683	Glow Plug Control Module to PCM Communication Circuit
P0684	Glow Plug Control Module to PCM Communication Circuit Range/Performance
P0685	ECM/PCM power relay control circuit open
P0686	ECM/PCM Power Relay Sense Circuit Low
P0687	ECM/PCM Power Relay Control Circuit High
P0688	ECM/PCM Power Relay Sense Circuit/Open
P0689	ECM/PCM Power Relay - Circuit Low
P068A	ECM/PCM Power Relay De-Energized Performance - Too Early
P068B	ECM/PCM Power Relay De-Energized Performance - Too Late
P0690	ECM/PCM Power Relay Sense Circuit High
P0691	Fan 1 Control Circuit Low
P0692	Fan 1 Control Circuit High
P0693	Fan 2 Control Circuit Low
P0694	Fan 2 Control Circuit High
P0695	Fan 3 Control Circuit Low
P0696	Fan 3 Control Circuit High
P0697	Sensor Reference Voltage C Circuit/Open
P0698	Sensor Reference Voltage C Circuit Low
P0699	Sensor Reference Voltage C Circuit High
P069E	Fuel Pump Control Module Requested MIL Illumination
P069F	Throttle Actuator Control Lamp Control Circuit
P06A3	Sensor Reference Voltage D Circuit/Open
P06A4	Sensor Reference Voltage D Circuit Low
P06A5	Sensor Reference Voltage D Circuit High
P06A6	Sensor Reference Voltage A Circuit Range/Performance

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ERROR CODE	ERROR
P06A7	Sensor Reference Voltage B Circuit Range/Performance
P06A8	Sensor Reference Voltage C Circuit Range/Performance
P06A9	Sensor Reference Voltage D Circuit Range/Performance
P06AF	Torque Management System - Forced Engine Shutdown
P06B0	Sensor Power Supply A Circuit/Open
P06B1	Sensor Power Supply A Circuit Low
P06B2	Sensor Power Supply A Circuit High
P06B3	Sensor Power Supply B Circuit/Open
P06B4	Sensor Power Supply B Circuit Low
P06B5	Sensor Power Supply B Circuit High
P06B6	Internal Control Module Knock Sensor Processor 1 Performance
P06B7	Internal Control Module Knock Sensor Processor 2 Performance
P06B8	Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error
P06B9	Cylinder 1 Glow Plug Circuit Range/Performance
P06BA	Cylinder 2 Glow Plug Circuit Range/Performance
P06BB	Cylinder 3 Glow Plug Circuit Range/Performance
P06BC	Cylinder 4 Glow Plug Circuit Range/Performance
P06BD	Cylinder 5 Glow Plug Circuit Range/Performance
P06BE	Cylinder 6 Glow Plug Circuit Range/Performance
P06C5	Cylinder 1 Glow Plug Incorrect
P06C6	Cylinder 2 Glow Plug Incorrect
P06C7	Cylinder 3 Glow Plug Incorrect
P06C8	Cylinder 4 Glow Plug Incorrect
P06C9	Cylinder 5 Glow Plug Incorrect
P06CA	Cylinder 6 Glow Plug Incorrect
P06D1	Internal Control Module Ignition Coil Control Performance
P0700	Transmission Control System (MIL Request)
P0701	Transmission Control System Range/Performance
P0702	Transmission Control System Electrical
P0703	Brake Switch B Circuit
P0705	Transmission Range Sensor A Circuit (PRNDL Input)
P0706	Transmission Range Sensor A Circuit Range/Performance
P0707	Transmission Range Sensor A Circuit Low
P0708	Transmission Range Sensor A Circuit High
P0709	Transmission Range Sensor A Circuit Intermittent
P0715	Input/Turbine Speed Sensor A Circuit
P0716	Input/Turbine Speed Sensor A Circuit Range/Performance
P0717	Input/Turbine Speed Sensor A Circuit No Signal
P0718	Input/Turbine Speed Sensor A Circuit Intermittent
P0719	Brake Switch B Circuit Low
P071A	Transmission Mode Switch A Circuit
P071B	Transmission Mode Switch A Circuit Low
P071C	Transmission Mode Switch A Circuit High
P071D	Transmission Mode Switch B Circuit
P071E	Transmission Mode Switch B Circuit Low
P071F	Transmission Mode Switch B Circuit High
P0720	Output Speed Sensor Circuit
P0721	Output Speed Sensor Circuit Range/Performance
P0722	Output Speed Sensor Circuit No Signal

ERROR CODE	ERROR
P0723	Output Speed Sensor Circuit Intermittent
P0724	Brake Switch B Circuit High
P0725	Engine Speed Input Circuit
P0726	Engine Speed Input Circuit Range/Performance
P0727	Engine Speed Input Circuit No Signal
P0728	Engine Speed Input Circuit Intermittent
P072A	Stuck in Neutral
P072B	Stuck In Reverse
P0730	Incorrect Gear Ratio
P0736	Reverse Incorrect Ratio
P0737	TCM Engine Speed Output Circuit
P0738	TCM Engine Speed Output Circuit Low
P0739	TCM Engine Speed Output Circuit High
P073D	Unable to Engage Neutral
P073E	Unable to Engage Reverse
P073F	Unable To Engage Gear 1
P0740	Torque Converter Clutch Circuit/Open
P0741	Torque Converter Clutch Circuit Performance/Stuck Off
P0742	Torque Converter Clutch Circuit Stuck On
P0743	TCM Engine Speed Output Circuit
P0744	Torque Converter Clutch Circuit Intermittent
P074A	Unable To Engage Gear 1
P074B	Unable To Engage Gear 3
P074C	Unable To Engage Gear 4
P074D	Unable To Engage Gear 5
P074E	Unable To Engage Gear 6
P074F	Unable To Engage Gear 7
P077A	Output Speed Sensor Circuit - Loss of Direction Signal
P077B	Output Speed Sensor Circuit - Direction Error
P0780	Shift Error
P0781	Gear shift 1-2
P0782	Gear shift 2-3
P0783	Gear shift 3-4
P0784	Gear shift 4-5
P0785	Shift Timing Solenoid A
P0786	Shift Timing Solenoid A Range/Performance
P0787	Shift Timing Solenoid A Low
P0788	Shift Timing Solenoid A High
P0789	Shift Timing Solenoid A Intermittent
P078A	Shift Timing Solenoid B
P078B	Shift Timing Solenoid B Range/Performance
P078C	Shift Timing Solenoid B Low
P078D	Shift Timing Solenoid B High
P078E	Shift Timing Solenoid B Intermittent
P0790	Normal/Performance Switch Circuit
P0791	Intermediate Shaft Speed Sensor A Circuit
P0792	Intermediate Shaft Speed Sensor A Circuit Range/Performance
P0793	Intermediate Shaft Speed Sensor A Circuit No Signal
P0794	Intermediate Shaft Speed Sensor A Circuit Intermittent

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ERROR CODE	ERROR
P0800	Transfer Case Control System (MIL Request)
P0801	Reverse Inhibit Control Circuit
P0802	Transmission Control System MIL Request Circuit/Open
P0805	Clutch Position Sensor Circuit
P0806	Clutch Position Sensor Circuit Range/Performance
P0807	Clutch Position Sensor Circuit Low
P0808	Clutch Position Sensor Circuit High
P0809	Clutch Position Sensor Circuit Intermittent
P080A	Clutch Position Not Learned
P080B	Upshift/Skip Shift Solenoid Control Circuit Range/Performance
P080C	Upshift/Skip Shift Solenoid Control Circuit Low
P080D	Upshift/Skip Shift Solenoid Control Circuit High
P0810	Clutch Position Control Error
P0811	Excessive Clutch A Slippage
P0812	Reverse Input Circuit
P0813	Reverse Output Circuit
P0814	Transmission Range Display Circuit
P0815	Upshift Switch Circuit
P0816	Downshift Switch Circuit
P0817	Starter Disable Circuit/Open
P0819	Up and Down Shift Switch to Transmission Range Correlation
P081A	Starter Disable Circuit Low
P081B	Starter Disable Circuit High
P081C	Park Input Circuit
P081D	Neutral Input Circuit
P081E	Excessive Clutch B Slippage
P0826	Up and Down Shift Switch Circuit
P0827	Up and Down Shift Switch Circuit Low
P0828	Up and Down Shift Switch Circuit High
P084F	Park/Neutral Switch Output Circuit
P0850	Park/Neutral Switch Input Circuit
P0851	Park/Neutral Switch Input Circuit Low
P0852	Park/Neutral Switch Input Circuit High
P0856	Traction Control Input Signal
P0857	Traction Control Input Signal Range/Performance
P0858	Traction Control Input Signal Low
P0859	Traction Control Input Signal High
P085A	Gear Shift Control Module B Communication Circuit
P085B	Gear Shift Control Module B Communication Circuit Low
P085C	Gear Shift Control Module B Communication Circuit High
P085D	Gear Shift Control Module A Performance
P085E	Gear Shift Control Module B Performance
P0860	Gear Shift Control Module A Communication Circuit
P0861	Gear Shift Control Module A Communication Circuit Low
P0862	Gear Shift Control Module A Communication Circuit High
P0863	TCM Communication Circuit
P0864	TCM Communication Circuit Range/Performance
P0865	Transmission control module (TCM) communication circuit - low
P0866	Transmission control module (TCM) communication circuit - high

ERROR CODE	ERROR
P0880	Transmission control module power input signal
P0881	Transmission control module (TCM) power input signal - range/performance
P0882	Transmission control module (TCM) power input signal - low
P0883	Transmission control module (TCM) power input signal - high
P0884	Transmission control module (TCM) power input signal - intermittent
P0885	TCM Power Relay Control Circuit/Open
P0886	TCM Power Relay Control Circuit Low
P0887	TCM Power Relay Control Circuit High
P0888	TCM Power Relay Sense Circuit
P0889	TCM Power Relay Sense Circuit Range/Performance
P0890	TCM Power Relay Sense Circuit Low
P0891	TCM Power Relay Sense Circuit High
P0892	TCM Power Relay Sense Circuit Intermittent
P0893	Multiple Gears Engaged
P0894	Transmission Component Slipping
P0895	Shift Time Too Short
P0896	Shift Time Too Long
P0898	Transmission Control System MIL Request Circuit Low
P0899	Transmission Control System MIL Request Circuit High
P0900	Clutch Actuator Circuit/Open
P0901	Clutch Actuator Circuit Range/Performance
P0902	Clutch Actuator Circuit Low
P0903	Clutch Actuator Circuit High
P0914	Gear Shift Position Circuit
P0915	Gear Shift Position Circuit Range/Performance
P0916	Gear Shift Position Circuit Low
P0917	Gear Shift Position Circuit High
P0918	Gear Shift Position Circuit Intermittent
P0919	Gear Shift Position Control Error
P0920	Gear Shift Forward Actuator Circuit/Open
P0921	Gear Shift Forward Actuator Circuit Range/Performance
P0922	Gear shift forward actuator - circuit low
P0923	Gear shift forward actuator - circuit high
P0924	Gear Shift Reverse Actuator Circuit/Open
P0925	Gear shift reverse actuator - circuit range/performance
P0926	Gear shift reverse actuator - circuit low
P0927	Gear shift reverse actuator - circuit high
P0928	Gear shift lock solenoid/actuator control circuit, Open
P0929	Gear Shift Lock Solenoid Circuit, Range/Performance
P092A	Gear shift lock solenoid/actuator control circuit B, Open
P092B	Gear shift lock solenoid circuit BRange/Performance
P092C	Gear shift lock solenoid/actuator control circuit B, low
P092D	Gear shift lock solenoid circuit B, High
P0930	Gear Shift Lock Solenoid Circuit, Low
P0931	Gear Shift Lock Solenoid Circuit, High
P0932	Hydraulic pressure sensor circuit
P0933	Hydraulic pressure sensor, range/performance
P0934	Hydraulic pressure sensor circuit, low input
P0935	Hydraulic pressure sensor circuit, high input

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		P20A0	Ri
		P20A1	Ri

ERROR CODE	ERROR
P0936	Hydraulic pressure sensor - circuit intermittent
P0937	Hydraulic oil temperature sensor circuit
P0938	Hydraulic oil temperature sensor - range/performance
P0939	Hydraulic Oil Temperature Sensor Circuit, Low Input
P0940	Hydraulic Oil Temperature Sensor Circuit, High Input
P0941	Hydraulic oil temperature sensor - circuit intermittent
P0942	Hydraulic pressure unit
P0943	Hydraulic pressure unit cycling period too short
P0944	Hydraulic pressure unit - loss of pressure
P0945	Hydraulic pump relay - circuit open
P0946	Hydraulic pump relay - range/performance
P0947	Hydraulic pump relay - circuit low
P0948	Hydraulic pump relay - circuit high
P0A00	Motor electronics coolant temperature sensor circuit
P0A01	Motor electronics coolant temperature sensor - circuit range/performance
P0A02	Motor electronics coolant temperature sensor - circuit low
P0A03	Motor electronics coolant temperature sensor - circuit high
P0A04	Motor electronics coolant temperature sensor - circuit intermittent
P0A05	Motor electronics coolant pump control circuit, open
P0A06	Motor electronics coolant pump control - circuit low
P0A07	Motor electronics coolant pump control - circuit high
P0A0A	High voltage system interlock circuit
P0A0B	High-voltage system interlock - circuit performance.
P0A0C	High-voltage system interlock - circuit low.
P0A0D	High-voltage system interlock - circuit high.
P0A0E	High-voltage system interlock - circuit intermittent.
P0A0F	Engine failed to start
P0A14	Engine mount A control circuit, open
P0A15	Engine mount control circuit - low
P0A16	Engine mount control circuit - high
P0A17	Motor torque sensor circuit
P0A18	Motor torque sensor - circuit range/performance
P0A19	Motor Torque Sensor Circuit Low
P0A1A	Generator Control Module
P0A1D	Hybrid Powertrain Control Module
P0A1E	Starter/Generator Control Module
P0A1F	Battery Energy Control Module
P0A20	Motor Torque Sensor Circuit High
P0A21	Motor Torque Sensor Circuit Intermittent
P0A22	Generator Torque Sensor Circuit
P0A23	Generator Torque Sensor Circuit Range/Performance
P0A24	Generator Torque Sensor Circuit Low
P0A25	Generator Torque Sensor Circuit High
P0A26	Generator Torque Sensor Circuit Intermittent
P0A36	Generator Temperature Sensor Circuit
P0A37	Generator Temperature Sensor Circuit Range/Performance
P0A38	Generator Temperature Sensor Circuit Low
P0A39	Generator Temperature Sensor Circuit High
P0A3A	Generator Temperature Sensor Circuit Intermittent

ERROR CODE	ERROR
P0A3B	Alternator over-temperature
P0A3E	Generator Inverter Over Temperature
P0A4B	Generator Position Sensor Circuit
P0A4C	Generator Position Sensor Circuit Range/Performance
P0A4D	Generator Position Sensor Circuit Low
P0A4E	Generator Position Sensor Circuit High
P0A4F	Generator Position Sensor Circuit Intermittent
P0A50	Generator Position Sensor Circuit Overspeed
P0A59	Generator Current Sensor Circuit
P0A5A	Generator Current Sensor Circuit Range/Performance
P0A5B	Generator Current Sensor Circuit Low
P0A5C	Generator Current Sensor Circuit High
P0A6F	Generator Phase U Current
P0A70	Generator Phase U Current Low
P0A71	Generator Phase U Current High
P0A72	Generator Phase V Current
P0A73	Generator Phase V Current Low
P0A74	Generator Phase V Current High
P0A75	Alternator - Phase W - Current
P0A76	Alternator - Phase W - Low current
P0A77	Alternator - Phase W - High current
P0A7A	Alternator inverter performance
P0A7B	Battery Energy Control Module Requested MIL Illumination
P0A7C	Motor Electronics Over Temperature
P0A80	Replace Hybrid Battery Pack
P0A92	Hybrid Generator Performance
P0A93	Inverter A Cooling System Performance
P0A95	High Voltage Fuse
P0AB6	Engine Mount B Control Circuit/Open
P0AB7	Engine Mount B Control Circuit Low
P0AB8	Engine Mount B Control Circuit High
P0AB9	Hybrid System Performance
P0AC4	Hybrid Powertrain Control Module Requested MIL Illumination
P0AFF	System Voltage Too Low for Voltage Step Down Conversion
P0B33	High Voltage Service Disconnect Circuit
P0B34	High Voltage Service Disconnect Circuit Performance
P0B35	High Voltage Service Disconnect Circuit Low
P0B36	High Voltage Service Disconnect Circuit High
P0B37	High Voltage Service Disconnect Open
P0B38	Motor Electronics Coolant Pump B Control Circuit/Open
P0B39	Motor Electronics Coolant Pump B Control Circuit Low
P0B3A	Motor Electronics Coolant Pump B Control Circuit High
P0BCC	Generator Inverter Temperature Sensor Circuit
P0BCD	Generator Inverter Temperature Sensor Circuit Range/Performance
P0BCE	Generator Inverter Temperature Sensor Circuit Low
P0BCF	Generator Inverter Temperature Sensor Circuit High
P0BD0	Generator Inverter Temperature Sensor Circuit Intermittent/Erratic
P0C2F	Internal Control Module Drive Motor/Generator - Engine Speed Sensor Performance
P0C31	Inverter B Cooling System Performance

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ERROR CODE	ERROR
P205B	Reductant Temperature Sensor Circuit Range/Performance
P205C	Reductant Tank Temperature Sensor Circuit Low
P205D	Reductant Tank Temperature Sensor Circuit High
P205E	Reductant Temperature Sensor Circuit Intermittent
P205F	Reductant System Performance Bank 2
P2060	Reductant Injection Air Pump Control Circuit Low
P2061	Reductant Injection Air Pump Control Circuit High
P2062	Reductant/Regeneration Supply Control Circuit/Open
P2063	Reductant/Regeneration Supply Control Circuit Low
P2064	Reductant/Regeneration Supply Control Circuit High
P2065	Fuel Level Sensor B Circuit
P2066	Fuel Level Sensor B Performance
P2067	Fuel Level Sensor B Circuit Low
P2068	Fuel Level Sensor B Circuit High
P2069	Fuel Level Sensor B Circuit Intermittent
P206A	Reductant Quality Sensor Circuit
P206B	Reductant Quality Sensor Circuit Range/Performance
P206C	Reductant Quality Sensor Circuit Low
P206D	Reductant Quality Sensor Circuit High
P206E	Intake Manifold Runner Control Stuck Open (Bank 2)
P206F	Intake Manifold Runner Control Stuck Closed (Bank 2)
P2070	Intake Manifold Tuning (IMT) Valve Stuck Open
P2071	Intake Manifold Tuning (IMT) Valve Stuck Closed
P2074	Manifold Absolute Pressure/Mass Air Flow - Throttle Position Correlation at Higher Load
P2075	Intake Manifold Tuning (IMT) Valve Position Sensor/Switch Circuit
P2076	Intake Manifold Tuning (IMT) Valve Position Sensor/Switch Circuit - Range/Performance
P2077	Intake Manifold Tuning (IMT) Valve Position Sensor/Switch Circuit low
P2078	Intake Manifold Tuning (IMT) Valve Position Sensor/Switch Circuit High
P2079	Intake Manifold Tuning (IMT) Valve Position Sensor/Switch Circuit Intermittent
P207A	Intake Manifold Runner Performance, Bank 2
P207B	Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance (Bank 2)
P207C	Intake Manifold Runner Control Circuit Low (Bank 2)
P207D	Intake Manifold Runner Control Circuit High (Bank 2)
P207E	Intake Manifold Runner Position Sensor/Switch Circuit Intermittent (Bank 2)
P207F	Reductant Quality Performance
P2080	Exhaust Gas Temperature Sensor Circuit Range/Performance(bank 1 sensor 1)
P2081	Exhaust Gas Temperature Sensor Circuit Intermittent(bank 1 sensor 1)
P2082	Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 2 Sensor 1)
P2083	Exhaust Gas Temperature Sensor Circuit Intermittent (Bank 2 Sensor 1)
P2084	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 1 Sensor 2
P2085	Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 2
P2086	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 2 Sensor 2
P2087	Exhaust Gas Temperature Sensor Circuit Intermittent Bank 2 Sensor 2
P2088	A Camshaft Position Actuator Control Circuit Low Bank 1
P2089	A Camshaft Position Actuator Control Circuit High Bank 1
P208A	Reductant Pump Control Circuit/Open

ERROR CODE	ERROR
P208B	Reductant Pump Control Range/Performance
P208C	Reductant Pump Control Circuit Low
P208D	Reductant Pump Control Circuit High
P208E	Reductant Injection Valve Stuck Closed Bank 1 Unit 1
P208F	Reductant Injection Valve Stuck Closed Bank 2 Unit 1
P2090	B Camshaft Position Actuator Control Circuit Low (Bank 1)
P2091	B Camshaft Position Actuator Control Circuit High (Bank 1)
P2092	A Camshaft Position Actuator Control Circuit Low (Bank 2)
P2093	A Camshaft Position Actuator Control Circuit High (Bank 2)
P2094	B Camshaft Position Actuator Control Circuit Low (Bank 2)
P2095	B Camshaft Position Actuator Control Circuit High (Bank 2)
P2096	Post Catalyst Fuel Trim System Too Lean Bank 1
P2097	Post Catalyst Fuel Trim System Too Rich Bank 1
P2098	Post Catalyst Fuel Trim System Too Lean Bank 2
P2099	Post Catalyst Fuel Trim System Too Rich Bank 2
P209A	Reductant Injection Air Pressure Sensor B Circuit
P209B	Reductant Injection Air Pressure Sensor B Circuit Range/Performance
P209C	Reductant Injection Air Pressure Sensor B Circuit Low
P209D	Reductant Injection Air Pressure Sensor B Circuit High
P209E	Reductant Injection Air Pressure Sensor A/B Correlation
P209F	Reductant Tank Heater Control Circuit Performance
P20A0	Reductant Purge Control Valve Circuit /Open
P20A1	Reductant Purge Control Valve Performance
P20A2	Reductant Purge Control Valve Circuit Low
P20A3	Reductant Purge Control Valve Circuit High
P20A4	Reductant Purge Control Valve Stuck Open
P20A5	Reductant Purge Control Valve Stuck Closed
P20A6	Reductant Injection Air Pressure Control Valve Circuit/Open
P20A7	Reductant Injection Air Pressure Control Valve Performance
P20A8	Reductant Injection Air Pressure Control Valve Circuit Low
P20A9	Reductant Injection Air Pressure Control Valve Circuit High
P20AA	Reductant Injection Air Pressure Control Valve Stuck Open
P20AB	Reductant Injection Air Pressure Control Valve Stuck Closed
P20AC	Reductant Metering Unit Temperature Sensor Circuit
P20AD	Reductant Metering Unit Temperature Sensor Circuit Range/Performance
P20AE	Reductant Metering Unit Temperature Sensor Circuit Low
P20AF	Reductant Metering Unit Temperature Sensor Circuit High
P20B0	Reductant Metering Unit Temperature Sensor Circuit Intermittent/Erratic
P20B1	Reductant Heater Coolant Control Valve Circuit/Open
P20B2	Reductant Heater Coolant Control Valve Performance
P20B3	Reductant Heater Coolant Control Valve Circuit Low
P20B4	Reductant Heater Coolant Control Valve Circuit High
P20B5	Reductant Metering Unit Heater Control Circuit/Open
P20B6	Reductant Metering Unit Heater Control Circuit Performance
P20B7	Reductant Metering Unit Heater Control Circuit Low
P20B8	Reductant Metering Unit Heater Control Circuit High
P20B9	Reductant Heater A Control Circuit/Open
P20BA	Reductant Heater A Control Circuit Performance
P20BB	Reductant Heater A Control Circuit Low

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ERROR CODE	ERROR
P20BC	Reductant Heater A Control Circuit High
P20BD	Reductant Heater B Control Circuit/Open
P20BE	Reductant Heater B Control Circuit Performance
P20BF	Reductant Heater B Control Circuit Low
P20C0	Reductant Heater B Control Circuit High
P20C1	Reductant Heater C Control Circuit/Open
P20C2	Reductant Heater C Control Circuit Performance
P20C3	Reductant Heater C Control Circuit Low
P20C4	Reductant Heater C Control Circuit High
P20C5	Reductant Heater D Control Circuit/Open
P20C6	Reductant Heater D Control Circuit Performance
P20C7	Reductant Heater D Control Circuit Low
P20C8	Reductant Heater D Control Circuit High
P20C9	Reductant Control Module Requested MIL Illumination
P20CA	Reductant Injection Air Pressure Leakage
P20CB	Exhaust Aftertreatment Fuel Injector A Control Circuit/Open
P20CC	Exhaust Aftertreatment Fuel Injector A Control Performance
P20CD	Exhaust Aftertreatment Fuel Injector A Control Circuit Low
P20CE	Exhaust Aftertreatment Fuel Injector A Control Circuit High
P20CF	Exhaust Aftertreatment Fuel Injector A Stuck Open
P20D0	Exhaust Aftertreatment Fuel Injector A Stuck Closed
P20D1	Exhaust Aftertreatment Fuel Injector B Control Circuit/Open
P20D3	Exhaust Aftertreatment Fuel Injector B Control Circuit Low
P20D4	Exhaust Aftertreatment Fuel Injector B Control Circuit High
P20D6	Exhaust Aftertreatment Fuel Injector B Stuck Closed
P20D7	Exhaust Aftertreatment Fuel Supply Control Circuit/Open
P20D8	Exhaust Aftertreatment Fuel Supply Control Performance
P20D9	Exhaust Aftertreatment Fuel Supply Control Circuit Low
P20DA	Exhaust Aftertreatment Fuel Supply Control Circuit High
P20DB	Exhaust Aftertreatment Fuel Supply Control Stuck Open
P20DC	Exhaust Aftertreatment Fuel Supply Control Stuck Closed
P20DD	Exhaust Aftertreatment Fuel Pressure Sensor Circuit
P20DE	Exhaust Aftertreatment Fuel Pressure Sensor Circuit Range/Performance
P20DF	Exhaust Aftertreatment Fuel Pressure Sensor Circuit Low
P20E0	Exhaust Aftertreatment Fuel Pressure Sensor Circuit High
P20E1	Exhaust Aftertreatment Fuel Pressure Sensor Circuit Intermittent/Erratic
P20E2	Exhaust Gas Temperature Sensor 1/2 Correlation Bank 1
P20E3	Exhaust Gas Temperature Sensor 1/3 Correlation Bank 1
P20E4	Exhaust Gas Temperature Sensor 2/3 Correlation Bank 1
P20E5	Reductant Injection Air Pressure Too Low
P20E6	Reductant Injection Air Pressure Too Low
P20E7	Reductant Injection Air Pressure Too High
P20E8	Reductant Pressure Too Low
P20E9	Reductant Pressure Too High
P20EA	Reductant Control Module Power Relay De-Energized Performance - Too Early
P20EB	Reductant Control Module Power Relay De-Energized Performance - Too Late
P20F4	Reductant Consumption Too Low
P20F5	Reductant Consumption Too High

ERROR CODE	ERROR
P20F6	Reductant Injection Valve Stuck Open (Bank 1 Unit 1)
P20F7	Reductant Injection Valve Stuck Open (Bank 2 Unit 1)
P2100	Throttle Actuator A Control Motor Circuit/Open
P2101	Throttle Actuator A Control Motor Circuit Range/Performance
P2102	Throttle Actuator A Control Motor Circuit Low
P2103	Throttle Actuator A Control Motor Circuit High
P2104	Throttle Actuator Control System - Forced Idle
P2105	Throttle Actuator Control System - Forced Engine Shutdown
P2106	Throttle Actuator Control System - Forced Limited Power
P2107	Throttle Actuator Control Module Processor
P2108	Throttle Actuator Control Module Performance
P2109	Throttle/Pedal Position Sensor A Minimum Stop Performance
P210A	Throttle Actuator B Control Motor Circuit
P210B	Throttle Actuator B Control Motor Circuit Range/Performance
P210C	Throttle Actuator B Control Motor Circuit Low
P210D	Throttle Actuator B Control Motor Circuit High
P210E	Throttle/Pedal Position Sensor/Switch C/F Voltage Correlation
P210F	Oxygen Sensor Signal Biased/Stuck Rich(bank 1 sensor 1)
P2110	Throttle Actuator Control System - Forced Limited RPM
P2111	Throttle Actuator Control System - Stuck Open
P2112	Throttle Actuator Control System - Stuck Closed
P2113	Throttle/Pedal Position Sensor B Minimum Stop Performance
P2114	Throttle/Pedal Position Sensor C Minimum Stop Performance
P2115	Throttle/Pedal Position Sensor D Minimum Stop Performance
P2116	Throttle/Pedal Position Sensor E Minimum Stop Performance
P2117	Throttle/Pedal Position Sensor F Minimum Stop Performance
P2118	Throttle Actuator Control Motor Current Range/Performance
P2119	Throttle Actuator A Control Motor Circuit Range/Performance
P2120	Throttle/Pedal Position Sensor/Switch D Circuit
P2121	Throttle/Pedal Position Sensor/Switch D Circuit Range/Performance
P2122	Throttle/Pedal Position Sensor/Switch D Circuit Low
P2123	Throttle/Pedal Position Sensor/Switch D Circuit High
P2124	Throttle/Pedal Position Sensor/Switch D Circuit Intermittent
P2125	Throttle/Pedal Position Sensor/Switch E Circuit
P2126	Throttle/Pedal Position Sensor/Switch E Circuit Range/Performance
P2127	Throttle/Pedal Position Sensor/Switch E Circuit Low
P2128	Throttle/Pedal Position Sensor/Switch E Circuit High
P2129	Throttle/Pedal Position Sensor/Switch E Circuit Intermittent
P212A	Throttle Position Sensor/Switch G Circuit
P212B	Throttle Position Sensor/Switch G Circuit Range/Performance
P212C	Throttle Position Sensor/Switch G Circuit Low
P212D	Throttle Position Sensor/Switch G Circuit High
P212E	Throttle Position Sensor/Switch G Circuit Intermittent
P2130	Throttle/Pedal Position Sensor/Switch F Circuit
P2132	Throttle/Pedal Position Sensor/Switch F Circuit Low
P2133	Throttle/Pedal Position Sensor/Switch F Circuit Intermittent
P2134	Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation
P2135	Throttle/Pedal Position Sensor/Switch A/C Voltage Correlation
P2137	Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation

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ERROR CODE	ERROR
P2138	Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation
P2139	Throttle/Pedal Position Sensor/Switch D/F Voltage Correlation
P213E	Fuel Injection System Fault - Forced Engine Shutdown
P213F	Fuel Pump System Fault - Forced Engine Shutdown
P2140	Throttle/Pedal Position Sensor/Switch E/F Voltage Correlation
P2146	Fuel Injector Group A Supply Voltage Circuit/Open
P2147	Fuel Injector Group A Supply Voltage Circuit Low
P2148	Fuel Injector Group A Supply Voltage Circuit High
P2149	Fuel Injector Group B Supply Voltage - Circuit Open
P214C	Long-term adaptation fuel mixing - bank 1
P214D	Long-term adaptation fuel mixing - bank 1
P2150	Fuel Injector Group B Supply Voltage Circuit Low
P2151	Fuel Injector Group B Supply Voltage Circuit High
P2152	Fuel Injector Group C Supply Voltage Circuit/Open
P2153	Fuel Injector Group C Supply Voltage Circuit Low
P2154	Fuel Injector Group C Supply Voltage Circuit High
P2155	Fuel Injector Group D Supply Voltage Circuit/Open
P2156	Fuel Injector Group D Supply Voltage Circuit Low
P2157	Fuel Injector Group D Supply Voltage Circuit High
P2158	Vehicle Speed Sensor B
P2159	Vehicle Speed Sensor B Range/Performance
P215A	Vehicle Speed - Wheel Speed Correlation
P215B	Vehicle Speed - Output Shaft Speed Correlation
P215C	Output Shaft Speed - Wheel Speed Correlation
P2160	Vehicle Speed Sensor B Circuit Low
P2161	Vehicle Speed Sensor B Intermittent/Erratic/High
P2162	Vehicle Speed Sensor A/B Correlation
P2163	Throttle/Pedal Position Sensor A Maximum Stop Performance
P2164	Throttle/Pedal Position Sensor B Maximum Stop Performance
P2165	Throttle/Pedal Position Sensor C Maximum Stop Performance
P2166	Throttle/Pedal Position Sensor D Maximum Stop Performance
P2167	Throttle/Pedal Position Sensor E Maximum Stop Performance
P2168	Throttle/Pedal Position Sensor F Maximum Stop Performance
P2169	Exhaust Pressure Regulator Vent Solenoid Control Circuit/Open
P216A	Fuel Injector Group E Supply Voltage Circuit/Open
P216B	Fuel Injector Group E Supply Voltage Circuit Low
P216C	Fuel Injector Group E Supply Voltage Circuit High
P216D	Fuel Injector Group F Supply Voltage Circuit/Open
P216E	Fuel Injector Group F Supply Voltage Circuit Low
P216F	Fuel Injector Group F Supply Voltage Circuit High
P2170	Exhaust Pressure Regulator Vent Solenoid Control Circuit Low
P2171	Exhaust Pressure Regulator Vent Solenoid Control Circuit High
P2172	Throttle Actuator Control System - Sudden High Air Flow Detected
P2173	Throttle Actuator Control System - High Air Flow Detected
P2174	Throttle Actuator Control System - Sudden Low Air Flow Detected
P2175	Throttle Actuator Control System - Low Air Flow Detected
P2176	Throttle Actuator Control System - Idle Position Not Learned
P2177	System Too Lean Off Idle Bank 1
P2178	System Too Rich Off Idle Bank 1

ERROR CODE	ERROR
P2179	System Too Lean Off Idle Bank 2
P217A	Fuel Injector Group G Supply Voltage Circuit/Open
P217B	Fuel Injector Group G Supply Voltage Circuit Low
P217C	Fuel Injector Group G Supply Voltage Circuit High
P217D	Fuel Injector Group H Supply Voltage Circuit/Open
P217E	Fuel Injector Group H Supply Voltage Circuit Low
P217F	Fuel Injector Group H Supply Voltage Circuit High
P2180	System Too Rich Off Idle Bank 2
P2181	Cooling System Performance
P2182	Engine Coolant Temperature Sensor 2 Circuit
P2183	Engine Coolant Temperature Sensor 2 Circuit Range/Performance
P2184	Engine Coolant Temperature Sensor 2 Circuit Low
P2185	Engine Coolant Temperature Sensor 2 Circuit High
P2186	Engine Coolant Temperature Sensor 2 Circuit Intermittent/Erratic
P2187	System Too Lean at Idle (Bank 1)
P2188	System Too Rich at Idle Bank 1
P2189	System Too Lean at Idle (Bank 2)
P2190	System Too Rich at Idle Bank 2
P2191	System Too Lean at Higher Load Bank 1
P2192	System Too Rich at Higher Load Bank 1
P2193	System Too Lean at Higher Load Bank 2
P2194	System Too Rich at Higher Load Bank 2
P2195	Oxygen Sensor Signal Biased/Stuck Lean (Bank 1 Sensor 1)
P2196	Oxygen Sensor Signal Biased/Stuck Rich (Bank 1 Sensor 1)
P2197	Oxygen Sensor Signal Biased/Stuck Lean (Bank 2 Sensor 1)
P2198	Oxygen Sensor Signal Biased/Stuck Rich (Bank 2 Sensor 1)
P2199	Intake Air Temperature Sensor 1/2 Correlation
P21AC	Long-term fuel correction under too high load (Bank 1)
P21AD	Long-term fuel correction under too lean load (Bank 1)
P21CC	Long-term fuel correction at minimum too rich (Bank 1)
P21CD	Long-term fuel correction at idle too low (Bank 1)
P21E0	Long-term fuel correction - not plausible signal (Bank 1)
P21EB	Long-term fuel correction - no signal (Bank 1)
P21EC	Long-term fuel correction - high signal (Bank 1)
P21ED	Long-term fuel correction - low signal (Bank 1)
P2226	Barometric pressure sensor circuit
P2227	Barometric pressure sensor circuit, range/performance
P2228	Barometric pressure sensor circuit, low
P2229	Barometric pressure sensor circuit, high
P222A	Barometric pressure sensor B circuit out of nominal range
P222B	Barometric pressure sensor B circuit low
P222C	Barometric pressure sensor B circuit high
P222D	Barometric pressure sensor B circuit intermittent/erratic
P222E	Barometric pressure sensor A/B correlation
P2230	Barometric pressure sensor - circuit intermittent
P2231	Heated oxygen sensor heater (HO2S) Bank 1 Sensor 1
P2232	Heated oxygen sensor heater (HO2S) Bank 1 Sensor 2
P2233	Heated oxygen sensor heater (HO2S) Bank 1 Sensor 3
P2234	Heated oxygen sensor heater (HO2S) Bank 2 Sensor 1

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ERROR CODE	ERROR
P2235	Heated oxygen sensor heater (HO2S) Bank 2 Sensor 2
P2236	Heated oxygen sensor heater (HO2S) Bank 2 Sensor 3
P2237	Heated oxygen sensor current (bank 1 sensor 1)
P2238	Heated oxygen sensor current (bank 1 sensor 1)
P2239	Heated oxygen sensor current (bank 1 sensor 1)
P2240	Heated oxygen sensor current (bank 2 sensor 1)
P2241	Heated oxygen sensor current (bank 2 sensor 1)
P2242	Heated oxygen sensor current (bank 2 sensor 1)
P2243	Oxygen sensor reference voltage circuit (Bank 1 sensor 1)
P2244	Oxygen sensor reference voltage, Performance - Bank 1, Sensor 1
P2245	Oxygen sensor reference voltage circuit low - Bank 1, Sensor 1
P2246	Oxygen sensor reference voltage circuit, high - Bank 1 Sensor 1
P2247	Oxygen sensor reference voltage circuit, open - Bank 2, Sensor 1
P2248	Oxygen sensor reference voltage, Performance - Bank 2, Sensor 1
P2249	Oxygen sensor reference voltage circuit, low- Bank 2 Sensor 1
P224F	Barometric pressure sensor "B" circuit
P2250	Oxygen sensor reference voltage circuit, high - Bank 2 Sensor 1
P2251	Heated oxygen sensor current (bank 1 sensor 1)
P2252	Heated oxygen sensor current (bank 1 sensor 1)
P2253	Heated oxygen sensor current (bank 1 sensor 1)
P2254	Heated oxygen sensor current (bank 2 sensor 1)
P2255	Heated oxygen sensor current (bank 2 sensor 1)
P2256	Heated oxygen sensor current (bank 2 sensor 1)
P2257	Secondary Air Injection System Control A Circuit Low
P2258	Secondary Air Injection System Control A Circuit High
P2259	Secondary Air Injection System Control B Circuit Low
P2260	Secondary Air Injection System Control B Circuit High
P2264	Water in Fuel Sensor Circuit
P2265	Water in Fuel Sensor Circuit Range/Performance
P2266	Water in Fuel Sensor Circuit Low
P2267	Water in Fuel Sensor Circuit High
P2268	Water in Fuel Sensor Circuit Intermittent
P2269	Water in Fuel Condition
P226A	Water in Fuel Lamp Control Circuit
P2270	Oxygen Sensor Signal Biased/Stuck Lean (Bank 1 Sensor 2)
P2271	Oxygen Sensor Signal Biased/Stuck Rich (Bank 1 Sensor 2)
P2272	Oxygen Sensor Signal Biased/Stuck Lean (Bank 2 Sensor 2)
P2273	Oxygen Sensor Signal Biased/Stuck Rich (Bank 2 Sensor 2)
P2274	Oxygen Sensor Signal Biased/Stuck Lean (Bank 1 Sensor 3)
P2275	Oxygen Sensor Signal Biased/Stuck Rich (Bank 1 Sensor 3)
P2276	Oxygen Sensor Signal Biased/Stuck Lean (Bank 2 Sensor 3)
P2277	Oxygen Sensor Signal Biased/Stuck Rich (Bank 2 Sensor 3)
P2278	Oxygen Sensor Signals Swapped (Bank 1 Sensor 3)
P2279	Intake Air System Leak
P2283	Injector Control Pressure Sensor Circuit
P2284	Injector Control Pressure Sensor Circuit Range/Performance
P2285	Injector Control Pressure Sensor Circuit Low
P2286	Injector Control Pressure Sensor Circuit High
P2287	Injector Control Pressure Sensor Circuit Intermittent

ERROR CODE	ERROR
P2288	Injector Control Pressure Too High
P2289	Injector Control Pressure Too High - Engine Off
P228A	Fuel Pressure Regulator 1 - Forced Engine Shutdown
P228B	Fuel Pressure Regulator 2 - Forced Engine Shutdown
P228C	Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too Low
P228D	Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too High
P228E	Fuel Pressure Regulator 1 Exceeded Learning Limits - Too Low
P228F	Fuel Pressure Regulator 1 Exceeded Learning Limits - Too High
P2290	Injector Control Pressure Too Low
P2291	Injector Control Pressure Too Low - Engine Cranking
P2292	Injector Control Pressure Erratic
P2293	Fuel Pressure Regulator 2 Performance
P2294	Fuel Pressure Regulator 2 Control Circuit/Open
P2295	Fuel Pressure Regulator 2 Control Circuit Low
P2296	Fuel Pressure Regulator 2 Control Circuit High
P2297	Oxygen Sensor Out of Range During Deceleration (Bank 1 Sensor 2)
P2298	Oxygen Sensor Out of Range During Deceleration (Bank 2 Sensor 1)
P229A	Fuel Pressure Regulator Exceeded Control Limits - Pressure Too Low
P229B	Fuel Pressure Regulator Exceeded Control Limits - Pressure Too High
P229C	Fuel Pressure Regulator Exceeded Learning Limits - Too Low
P229D	Fuel Pressure Regulator Exceeded Learning Limits - Too High
P2300	Ignition coils
P2301	Ignition coils
P2302	Ignition Coil A Secondary Circuit
P2303	Ignition Coil B Primary Control Circuit Low
P2304	Ignition Coil B Primary Control Circuit High
P2305	Ignition Coil B Secondary Circuit
P2306	Ignition Coil C Primary Control Circuit Low
P2307	Ignition Coil C Primary Control Circuit High
P2308	Ignition Coil C Secondary Circuit
P2309	Ignition Coil D Primary Control Circuit Low
P2310	Ignition Coil D Primary Control Circuit High
P2311	Ignition Coil D Secondary Circuit
P2312	Ignition Coil E Primary Control Circuit Low
P2313	Ignition Coil E Primary Control Circuit High
P2314	Ignition Coil E Secondary Circuit
P2315	Ignition Coil F Primary Control Circuit Low
P2316	Ignition Coil F Primary Control Circuit High
P2317	Ignition Coil F Secondary Circuit
P2318	Ignition Coil G Primary Control Circuit Low
P2319	Ignition Coil G Primary Control Circuit High
P2320	Ignition Coil G Secondary Circuit
P2321	Ignition Coil H Primary Control Circuit Low
P2322	Ignition Coil H Primary Control Circuit High
P2323	Ignition Coil H Secondary Circuit
P2324	Ignition Coil I Primary Control Circuit Low
P2325	Ignition Coil I Primary Control Circuit High
P2326	Ignition Coil I Secondary Circuit
P2327	Ignition Coil J Primary Control Circuit Low

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ERROR CODE	ERROR
P2483	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 1 Sensor 5
P2484	Exhaust Gas Temperature Sensor Circuit Intermittent/Erratic Bank 1 Sensor 5
P2485	Exhaust Gas Temperature Sensor Circuit/Open Bank 2 Sensor 5
P2486	Exhaust Gas Temperature Sensor Circuit Low Bank 2 Sensor 5
P2487	Exhaust Gas Temperature Sensor Circuit High Bank 2 Sensor 5
P2488	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 2 Sensor 5
P2489	Exhaust Gas Temperature Sensor Circuit Intermittent/Erratic Bank 2 Sensor 5
P2500	Generator Lamp/L-Terminal Circuit Low
P2501	Generator Lamp/L-Terminal Circuit High
P2502	Charging System Voltage
P2503	Charging System Voltage Low
P2504	Charging System Voltage High
P2505	ECM/PCM Power Input Signal
P2506	ECM/PCM Power Input Signal Range/Performance
P2507	ECM/PCM Power Input Signal Low
P2508	ECM/PCM Power Input Signal High
P2509	ECM/PCM Power Input Signal Intermittent
P250A	Engine oil level sensor circuit
P250A	Long term fuel trim - range/performance
P250B	Engine Oil Level Sensor - Circuit Range/Performance
P250C	Engine oil level sensor - circuit low
P250D	Engine oil level sensor - circuit high
P250E	Engine oil level sensor - circuit intermittent/erratic
P250F	Engine oil level too low
P2510	ECM/PCM power relay sense - circuit range/performance
P2511	ECM/PCM power relay sense - circuit intermittent
P2512	Event Data Recorder Request Circuit, Open
P2513	Engine oil level sensor - circuit low
P2514	Engine oil level sensor - circuit high
P2525	Vacuum Reservoir Pressure Sensor Circuit
P2526	Vacuum Reservoir Pressure Sensor Circuit Range/Performance
P2527	Vacuum Reservoir Pressure Sensor Circuit Low
P2528	Vacuum Reservoir Pressure Sensor Circuit High
P2529	Vacuum Reservoir Pressure Sensor Circuit Intermittent
P252A	Engine Oil Quality Sensor Circuit
P252B	Engine Oil Quality Sensor - Circuit Range/Performance
P252C	Engine oil quality sensor - circuit low
P252D	Engine oil quality sensor - circuit high
P252E	Engine oil quality sensor - circuit intermittent/erratic
P252F	Engine oil level too high
P2530	Ignition Switch Run Position Circuit
P2531	Ignition Switch Run Position Circuit Low
P2532	Ignition Switch Run Position Circuit High
P2533	Ignition Switch Run/Start Position Circuit
P2534	Ignition Switch Run/Start Position Circuit Low
P2535	Ignition Switch Run/Start Position Circuit High
P2536	Ignition Switch Accessory Position Circuit
P2537	Ignition Switch Accessory Position Circuit Low

ERROR CODE	ERROR
P2538	Ignition Switch Accessory Position Circuit High
P2539	Low Pressure Fuel System Sensor Circuit
P253F	Engine Oil Deteriorated
P2540	Low Pressure Fuel System Sensor Circuit Range/Performance
P2541	Low Pressure Fuel System Sensor Circuit Low
P2542	Low Pressure Fuel System Sensor Circuit High
P2543	Low Pressure Fuel System Sensor Circuit Intermittent
P2544	Torque Management Request Input Signal A
P2545	Torque Management Request Input Signal A Range/Performance
P2546	Torque Management Request Input Signal A Low
P2547	Torque Management Request Input Signal A High
P2548	Torque Management Request Input Signal B
P2549	Torque Management Request Input Signal B Range/Performance
P254F	Engine Hood Switch Circuit
P2550	Torque Management Request Input Signal B Low
P2551	Torque Management Request Input Signal B High
P2552	Throttle/Fuel Inhibit Circuit
P2553	Throttle/Fuel Inhibit Circuit Range/Performance
P2554	Throttle/Fuel Inhibit Circuit Low
P2555	Throttle/Fuel Inhibit Circuit High
P2556	Engine Coolant Level Sensor/Switch Circuit
P2557	Engine Coolant Level Sensor/Switch Circuit Range/Performance
P2558	Engine Coolant Level Sensor/Switch Circuit Low
P2559	Engine Coolant Level Sensor/Switch - Circuit High
P2560	Engine Coolant Level Sensor/Switch Circuit
P256A	Engine Idle Speed Selector Sensor/Switch Circuit/Open
P256B	Engine Idle Speed Selector Sensor/Switch Range/Performance
P256C	Engine Idle Speed Selector Sensor/Switch Circuit Low
P256D	Engine Idle Speed Selector Sensor/Switch Circuit High
P256E	Engine Idle Speed Selector Sensor/Switch Circuit Intermittent/Erratic
P257A	Vacuum Reservoir Control Circuit/Open
P257B	Vacuum Reservoir Control Circuit Low
P257C	Vacuum Reservoir Control Circuit High
P257D	Engine Hood Switch Circuit Range/Performance
P257E	Engine Hood Switch Circuit Low
P257F	Engine Hood Switch Circuit High
P2583	Cruise Control Front Distance Range Sensor Single Sensor or Center
P2584	Fuel Additive Control Module Requested MIL Illumination
P2585	Fuel Additive Control Module Warning Lamp Request
P258A	Vacuum Pump Control Circuit/Open
P258B	Vacuum Pump Control Range/Performance
P258C	Vacuum Pump Control Circuit Low
P258D	Vacuum Pump Control Circuit High
P258F	Torque Management Request Output Signal
P2591	Cruise Control Front Distance Range Sensor Left
P2592	Cruise Control Front Distance Range Sensor Right
P2600	Coolant Pump A Control Circuit/Open
P2601	Coolant Pump A Control Circuit Range/Performance
P2602	Coolant Pump A Control Circuit Low

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ERROR CODE	ERROR
P2603	Coolant Pump A Control Circuit High
P2604	Intake Air Heater A Circuit Range/Performance
P2605	Intake Air Heater A Circuit Open
P2606	Intake Air Heater B Circuit Range/Performance
P2607	Intake Air Heater B Circuit Low
P2608	Intake Air Heater B Circuit High
P2609	Intake Air Heater System Performance
P260F	Evaporative System Monitoring Processor Performance
P2610	ECM/PCM Internal Engine Off Timer Performance
P2611	A/C Refrigerant Distribution Valve Control Circuit/Open
P2612	A/C Refrigerant Distribution Valve Control Circuit Low
P2613	A/C Refrigerant Distribution Valve Control Circuit High
P2614	Camshaft Position Signal Output Circuit/Open
P2615	Camshaft Position Signal Output Circuit Low
P2616	Camshaft Position Signal Output Circuit High
P2617	Crankshaft Position Signal Output Circuit/Open
P2618	Crankshaft Position Signal Output Circuit Low
P2619	Crankshaft Position Signal Output Circuit High
P261A	Coolant Pump B Control Circuit/Open
P261B	Coolant Pump B Control Circuit Range/Performance
P261C	Coolant Pump B Control Circuit Low
P261D	Coolant Pump B Control Circuit High
P2620	Throttle Position Output Circuit/Open
P2621	Throttle Position Output Circuit Low
P2622	Throttle Position Output Circuit High
P2623	Injector Control Pressure Regulator Circuit/Open
P2624	Injector Control Pressure Regulator Circuit Low
P2625	Injector Control Pressure Regulator Circuit High
P2626	Oxygen Sensor Pumping Current Trim Circuit/Open (Bank 1 Sensor 1)
P2627	Oxygen Sensor Pumping Current Trim Circuit Low (Bank 1 Sensor 1)
P2628	Oxygen Sensor Pumping Current Trim Circuit High (Bank 1 Sensor 1)
P2629	Oxygen Sensor Pumping Current Trim Circuit/Open (Bank 2 Sensor 1)
P2630	Oxygen Sensor Pumping Current Trim Circuit Low (Bank 2 Sensor 1)
P2631	Oxygen Sensor Pumping Current Trim Circuit High (Bank 2 Sensor 1)
P2632	Fuel Pump B Control Circuit /Open
P2633	Fuel Pump B Control Circuit Low
P2634	Fuel Pump B Control Circuit High
P2635	Fuel Pump A Low Flow/Performance
P2636	Fuel Pump B Low Flow/Performance
P2637	Torque Management Feedback Signal A
P2638	Torque Management Feedback Signal A Range/Performance
P2639	Torque Management Feedback Signal A Low
P2640	Torque Management Feedback Signal A High
P2641	Torque Management Feedback Signal B
P2642	Torque Management Feedback Signal B - Range/Performance
P2643	Torque Management Feedback Signal B Low
P2644	Torque Management Feedback Signal B High
P2645	A Rocker Arm Actuator Control Circuit/Open Bank 1
P2646	A Rocker Arm Actuator System Performance/Stuck Off Bank 1

ERROR CODE	ERROR
P2647	A Rocker Arm Actuator System Stuck On Bank 1
P2648	A Rocker Arm Actuator Control Circuit Low Bank 1
P2649	A Rocker Arm Actuator Control Circuit High Bank 1
P264A	A Rocker Arm Actuator Position Sensor Circuit Bank 1
P264B	A Rocker Arm Actuator Position Sensor Circuit Range/Performance Bank 1
P264C	A Rocker Arm Actuator Position Sensor Circuit Low Bank 1
P264D	A Rocker Arm Actuator Position Sensor Circuit High Bank 1
P264E	A Rocker Arm Actuator Position Sensor Circuit Intermittent/Erratic Bank 1
P2650	B Rocker Arm Actuator Control Circuit/Open Bank 1
P2651	B Rocker Arm Actuator System Performance/Stuck Off Bank 1
P2652	B Rocker Arm Actuator System Stuck On Bank 1
P2653	B Rocker Arm Actuator Control Circuit Low Bank 1
P2654	B Rocker Arm Actuator Control Circuit High Bank 1
P2655	A Rocker Arm Actuator Control Circuit/Open Bank 2
P2656	A Rocker Arm Actuator System Performance/Stuck Off Bank 2
P2657	A Rocker Arm Actuator System Stuck On Bank 2
P2658	A Rocker Arm Actuator Control Circuit Low Bank 2
P2659	A Rocker Arm Actuator Control Circuit High Bank 2
P265A	B Rocker Arm Actuator Position Sensor Circuit Bank 1
P265B	B Rocker Arm Actuator Position Sensor Circuit Range/Performance Bank 1
P265C	B Rocker Arm Actuator Position Sensor Circuit Low Bank 1
P265D	B Rocker Arm Actuator Position Sensor Circuit High Bank 1
P265E	B Rocker Arm Actuator Position Sensor Circuit Intermittent/Erratic Bank 1
P2660	B Rocker Arm Actuator Control Circuit/Open Bank 2
P2661	B Rocker Arm Actuator System Performance/Stuck Off Bank 2
P2662	B Rocker Arm Actuator System Stuck On Bank 2
P2663	B Rocker Arm Actuator Control Circuit Low Bank 2
P2664	B Rocker Arm Actuator Control Circuit High Bank 2
P2665	Fuel Shutoff Valve B Control Circuit/Open
P2666	Fuel Shutoff Valve B Control Circuit Low
P2667	Fuel Shutoff Valve B Control Circuit High
P2668	Fuel Mode Indicator Lamp Control Circuit
P2669	Actuator Supply Voltage B Circuit /Open
P266A	A Rocker Arm Actuator Position Sensor Circuit Bank 2
P266B	A Rocker Arm Actuator Position Sensor Circuit Range/Performance Bank 2
P266D	A Rocker Arm Actuator Position Sensor Circuit High Bank 2
P266E	A Rocker Arm Actuator Position Sensor Circuit Intermittent/Erratic Bank 2
P2670	Actuator Supply Voltage B Circuit Low
P2671	Actuator Supply Voltage B Circuit High
P2672	Injection Pump Timing Offset
P2673	Injection Pump Timing Calibration Not Learned
P2674	Injection Pump Fuel Calibration Not Learned
P2678	Coolant Degassing Valve Control Circuit/Open
P2679	Coolant Degassing Valve Control Circuit Low
P267A	B Rocker Arm Actuator Position Sensor Circuit Bank 2
P267B	B Rocker Arm Actuator Position Sensor Circuit Range/Performance Bank 2
P267C	B Rocker Arm Actuator Position Sensor Circuit Low Bank 2
P267D	B Rocker Arm Actuator Position Sensor Circuit High Bank 2
P267E	B Rocker Arm Actuator Position Sensor Circuit Intermittent/Erratic Bank 2

ELECTRICAL DEVICES
CHAPTER 15

ERROR CODE	ERROR
P2680	Coolant Degassing Valve Control Circuit High
P2681	Engine Coolant Bypass Valve Control Circuit/Open
P2682	Engine Coolant Bypass Valve Control Circuit Low
P2683	Engine Coolant Bypass Valve Control Circuit High
P2684	Actuator Supply Voltage C Circuit/Open
P2685	Actuator Supply Voltage C Circuit Low
P2686	Actuator Supply Voltage C Circuit High
P2687	Fuel Supply Heater Control Circuit/Open
P2688	Fuel Supply Heater Control Circuit Low
P2689	Fuel Supply Heater Control Circuit High
P268A	Fuel Injector Calibration Not Learned/Programmed
P268B	High Pressure Fuel Pump Calibration Not Learned/Programmed
P268C	Cylinder 1 Injector Data Incompatible
P268D	Cylinder 2 Injector Data Incompatible
P268E	Cylinder 3 Injector Data Incompatible
P268F	Cylinder 4 Injector Data Incompatible
P2690	Cylinder 5 Injector Data Incompatible
P2691	Cylinder 6 Injector Data Incompatible
P2696	Injector Data Incompatible
P2697	Exhaust Aftertreatment Fuel Injector A Control Circuit/Open
P2698	Exhaust Aftertreatment Fuel Injector A Control Performance
P2699	Exhaust Aftertreatment Fuel Injector A Control Circuit Low
P269A	Exhaust Aftertreatment Fuel Injector A Control Circuit High
P269B	Exhaust Aftertreatment Glow Plug Control Circuit/Open
P269C	Exhaust Aftertreatment Glow Plug Control Performance
P269D	Exhaust Aftertreatment Glow Plug Control Circuit Low
P269E	Exhaust Aftertreatment Glow Plug Control Circuit High
P269F	Exhaust Aftertreatment Glow Plug Circuit/Open
P26A0	Exhaust Aftertreatment Glow Plug Performance
P26A1	Exhaust Aftertreatment Glow Plug Circuit Low
P26A2	Exhaust Aftertreatment Glow Plug Circuit High
P2711	Unexpected Mechanical Gear Disengagement
P2712	Hydraulic Power Unit Leakage
P2745	Intermediate Shaft Speed Sensor B Circuit
P2746	Intermediate Shaft Speed Sensor B Circuit Range/Performance
P2747	Intermediate Shaft Speed Sensor B Circuit No Signal
P2748	Intermediate Shaft Speed Sensor B Circuit Intermittent
P2749	Intermediate Shaft Speed Sensor C Circuit
P2750	Intermediate Shaft Speed Sensor C Circuit Range/Performance
P2751	Intermediate Shaft Speed Sensor C Circuit No Signal
P2752	Intermediate Shaft Speed Sensor C Circuit Intermittent
P2756	Torque Converter Clutch Pressure Control Solenoid
P2757	Torque Converter Clutch Pressure Control Solenoid Control Circuit Performance/Stuck Off
P2758	Torque Converter Clutch Pressure Control Solenoid Control Circuit Stuck On
P2759	Torque Converter Clutch Pressure Control Solenoid Control Circuit Electrical
P2760	Torque Converter Clutch Pressure Control Solenoid Control Circuit Intermittent
P2761	Torque Converter Clutch Pressure Control Solenoid Control Circuit/Open

ERROR CODE	ERROR
P2762	Torque Converter Clutch Pressure Control Solenoid Control Circuit Range/Performance
P2763	Torque Converter Clutch Pressure Control Solenoid Control Circuit High
P2764	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low
P2765	Input/Turbine Speed Sensor B Circuit
P2766	Input/Turbine Speed Sensor B Circuit Range/Performance
P2767	Input/Turbine Speed Sensor B Circuit No Signal
P2768	Input/Turbine Speed Sensor B Circuit Intermittent
P2769	Torque Converter Clutch Circuit Low
P2770	Torque Converter Clutch Circuit High
P2783	Torque Converter Temperature Too High
P2784	Input/Turbine Speed Sensor A/B Correlation
P2785	Clutch Actuator Temperature Too High
P2786	Gear Shift Actuator Temperature Too High
P2787	Clutch Temperature Too High
P2789	Clutch A Adaptive Learning at Limit
P278A	Kick down switch circuit
P278B	Kick down switch - circuit range/performance
P278C	Kick down switch - circuit low
P278D	Kick down switch - circuit high
P278E	Kick down switch - circuit intermittent/irregular
P278F	Clutch B Adaptive Learning at Limit
P2790	Gate Select Direction Circuit
P2791	Gate Select Direction Circuit Low
P2792	Gate Select Direction Circuit High
P2793	Gear Shift Direction Circuit
P2794	Gear Shift Direction Circuit Low
P2795	Gear Shift Direction Circuit High
P279A	Transfer Case Gear High Incorrect Ratio
P279B	Transfer Case Gear Low Incorrect Ratio
P279C	Transfer Case Gear Neutral Incorrect Ratio
P2800	Transmission Range Sensor B Circuit (PRNDL Input)
P2801	Transmission Range Sensor B Circuit Range/Performance
P2802	Transmission Range Sensor B Circuit Low
P2803	Transmission Range Sensor B Circuit High
P2804	Transmission Range Sensor B Circuit Intermittent
P2805	Transmission Range Sensor A/B Correlation
P2806	Transmission Range Sensor Alignment
P280A	Transmission Range Sensor A Circuit Not Learned
P280B	Transmission Range Sensor B Circuit Not Learned
P2853	Clutch A Pressure Discharge Performance
P2854	Clutch B Pressure Discharge Performance
P2855	Clutch A Pressure Charge Performance
P2856	Clutch B Pressure Charge Performance
P2857	Clutch A Pressure Engagement Performance
P2858	Clutch B Pressure Engagement Performance
P2859	Clutch A Pressure Disengagement Performance
P285A	Clutch B Pressure Disengagement Performance
P2A00	Oxygen Sensor Circuit Range/Performance (Bank 1, Sensor 1)
P2A01	Oxygen Sensor Circuit Range/Performance (Bank 1, Sensor 2)

CHAPTER 15

ELECTRICAL DEVICES

ERROR CODE	ERROR
P2A02	Oxygen Sensor Circuit Range/Performance (Bank 1, Sensor 3)
P2A03	Oxygen Sensor Circuit Range/Performance (Bank 2, Sensor 1)
P2A04	Oxygen Sensor Circuit Range/Performance (Bank 2, Sensor 2)
P2A05	Oxygen Sensor Circuit Range/Performance (Bank 1, Sensor 3)
P2A06	Oxygen Sensor Negative Voltage Bank 1 Sensor 1
P2A07	Oxygen Sensor Negative Voltage - Bank 1 Sensor 2
P2A08	Oxygen Sensor Negative Voltage - Bank 1 Sensor 3
P2A09	Oxygen Sensor Negative Voltage - Bank 2 Sensor 1
P2A10	Oxygen Sensor Negative Voltage - Bank 2 Sensor 2
P2A11	Oxygen Sensor Negative Voltage - Bank 2 Sensor 3
P3000	Manufacturer Controlled DTC, bank 1
P3100	Manufacturer Controlled
P3200	Manufacturer Controlled
P3300	Manufacturer Controlled
P3400	Cylinder deactivation system
P3401	Cylinder 1 Deactivation/Intake Valve Control Circuit/Open
P3402	Cylinder 1 Deactivation/Intake Valve Control Circuit Performance
P3403	Cylinder 1 Deactivation/Intake Valve Control Circuit Low
P3404	Cylinder 1 Deactivation/Intake Valve Control Circuit High
P3405	Cylinder 1 Exhaust Valve Control Circuit/Open
P3406	Cylinder 1 Exhaust Valve Control Circuit Performance
P3407	Cylinder 1 Exhaust Valve Control Circuit Low
P3408	Cylinder 1 Exhaust Valve Control Circuit High
P3409	Cylinder 2 Deactivation/Intake Valve Control Circuit/Open
P3410	Cylinder 2 Deactivation/Intake Valve Control Circuit Performance
P3411	Cylinder 2 Deactivation/Intake Valve Control Circuit Low
P3412	Cylinder 2 Deactivation/Intake Valve Control Circuit High
P3413	Cylinder 2 exhaust valve control - circuit open
P3414	Cylinder 2 Exhaust Valve Control Circuit Performance
P3415	Cylinder 2 exhaust valve control - circuit low
P3416	Cylinder 2 exhaust valve control - circuit high
P3417	Cylinder 3 Deactivation/Intake Valve Control Circuit/Open
P3418	Cylinder 3 Deactivation/Intake Valve Control Circuit Performance
P3419	Cylinder 3 Deactivation/Intake Valve Control Circuit Low
P3420	Cylinder 3 Deactivation/Intake Valve Control Circuit High
P3421	Cylinder 3 exhaust valve control - circuit open
P3422	Cylinder 3 Exhaust Valve Control Circuit Performance
P3423	Cylinder 3 exhaust valve control - circuit low
P3424	Cylinder 3 exhaust valve control - circuit high
P3425	Cylinder 4 Deactivation/Intake Valve Control Circuit/Open
P3426	Cylinder 4 Deactivation/Intake Valve Control Circuit Performance
P3427	Cylinder 4 Deactivation/Intake Valve Control Circuit Low
P3428	Cylinder 4 Deactivation/Intake Valve Control Circuit High
P3429	Cylinder 4 exhaust valve control - circuit open
P3430	Cylinder 4 Exhaust Valve Control Circuit Performance
P3431	Cylinder 4 exhaust valve control - circuit low
P3432	Cylinder 4 exhaust valve control - circuit high
P3433	Cylinder 5 Deactivation/Intake Valve Control Circuit/Open
P3434	Cylinder 5 Deactivation/Intake Valve Control Circuit Performance

ERROR CODE	ERROR
P3435	Cylinder 5 Deactivation/Intake Valve Control Circuit Low
P3436	Cylinder 5 Deactivation/Intake Valve Control Circuit High
P3437	Cylinder 5 exhaust valve control - circuit open
P3438	Cylinder 5 Exhaust Valve Control Circuit Performance
P3439	Cylinder 5 exhaust valve control - circuit low
P3440	Cylinder 5 exhaust valve control - circuit high
P3441	Cylinder 6 Deactivation/Intake Valve Control Circuit/Open
P3442	Cylinder 6 Deactivation/Intake Valve Control Circuit Performance
P3443	Cylinder 6 Deactivation/Intake Valve Control Circuit Low
P3444	Cylinder 6 Deactivation/Intake Valve Control Circuit High
P3445	Cylinder 6 exhaust valve control - circuit open
P3446	Cylinder 6 Exhaust Valve Control Circuit Performance
P3447	Cylinder 6 exhaust valve control - circuit low
P3448	Cylinder 6 exhaust valve control - circuit high
P3497	Cylinder deactivation system bank 2

ELECTRICAL DEVICES
CHAPTER 15
15.11.2 ABS module error code table

ERROR CODE	ERROR	ADDITIONAL DESCRIPTION
C1013	Rear suction valve	
C1014	Internal error: solenoid valve relay fault	
C1014	Rear exhaust valve	
C1015	Internal error: recirculation pump failure	
C1017	Front suction valve	
C1018	Front exhaust valve	
C1019	Valve relay error	
C1021	Internal error: control unit failure	
C1024	Speed comparison between front and rear wheel: excessive difference	
	Deviazione sensore di velocità ruote	
C1025	Wheel speed sensor deviation	
C1031	Rear wheel speed sensor: electrical diagnosis (circuit open or shorted to negative or shorted to positive)	
C1032	Rear wheel speed sensor: functional diagnosis (not plausible signal)	
C1033	Front wheel speed sensor: electrical diagnosis (circuit open or shorted to negative or shorted to positive)	
C1034	Front wheel speed sensor: functional diagnosis (not plausible signal)	
C1035	Pump motor	Malfunction
C1042	Front wheel speed sensor	Not plausible
C1043	Front wheel speed sensor	Short circuit to ground
C1044	Rear wheel speed sensor	Not plausible
C1045	Rear wheel speed sensor	Short circuit to ground
C1048	Internal error: rear circuit output solenoid valve fault	
C1049	Internal error: front circuit output solenoid valve fault	
C1052	Internal error: rear circuit inout solenoid valve fault	
C1052	Supply voltage (low voltage)	
C1053	Supply voltage (high voltage)	
C1054	Internal error: front circuit input solenoid valve fault	
C1055	Control unit malfunction	
C1058	Supply voltage (low voltage)	
C1059	Supply voltage (high voltage)	
C1089	Coding error	
C1092	IMU sensor [Wrong fitting]	
C1094	IMU Sensor [Wrong Signal]	
C1331	Internal error: pressure sensor failure	
C1332	Internal error: pressure sensor failure (offset)	
C1333	Internal error: pressure sensor failure (power supply)	
C1E11	CAN line	bus off
C1E12	CAN message (ABS mode switching) absent	
C1E13	CAN bus checksum anomaly	
C1E14	Signal anomaly caused by checksum error/stall counter	
C1E15	CAN line	ABS mode switch
C1E16	CAN line	Vehicle code
C1E17	CAN bus time out combined instrument	
C1E59	Incorrect control unit coding	
C1D90	Front speed sensor	Electric malfunction

CHAPTER 15

ELECTRICAL DEVICES

ERROR CODE	ERROR	ADDITIONAL DESCRIPTION
C1D91	Front speed sensor	The signal changes intermittently
C1D92	Front speed sensor	The signal decays periodically
C1D93	Front speed sensor	Lack of signal or speed detected too low with respect to the rear wheel
C1D94	Front speed sensor	No acceleration after pressure reduction
C1D95	Front speed sensor	Excessive speed detected
	Sensore di velocità posteriore	Malfunzionamento elettrico
C1D9A	Front wheel pressure sensor circuit	
C1DA0	Rear speed sensor	Electric malfunction
C1DA1	Rear speed sensor	The signal changes intermittently
C1DA2	Rear speed sensor	The signal decays periodically
C1DA3	Rear speed sensor	
C1DA4	Rear speed sensor	Signal not plausible
C1DAA	Rear wheel pressure sensor circuit	
C1DD3	ECU software error	
C1DF0	Recirculation pump	
C1DF1	Recirculation pump	
C1DF2	Generic hardware error inside the control unit	
C1DF4	Low electric voltage	
C1DF5	Generic hardware error inside the control unit	
C1DF7	High electric voltage	
C1E5A	ABS switch	Failuire
U1347	CAN transmission error	Timeout
U2921	CAN error: controller error	
U2922	CAN error: line fault (bus off)	
U2924	CAN error: no reception from the dashboard	
U2925	CAN error: no reception from the injection control unit	
U2926	Key + (connect to the injection control unit diagnosis)	
U2927	Key - (connect to the injection control unit diagnosis)	
U2928	IMU sensor [Signal not plausible]	
U2929	IMU sensor [Timeout]	
U3930	On board network undervoltage	
U3931	On board network overvoltage	
U3932	CAN message	Timeout
U3933	CAN message	Timeout / Wrong DLC / Checksum / Corrupt Data / Counter
U3934	CAN message	Timeout
U3935	CAN message	Signal error
U301F	Generic hardware error inside the control unit	
U30CB	PIN code check	KL 30 voltage too low

16.1 BIKE DOESN'T START/STARTING DIFFICULTY

16.1.1 FUEL SYSTEM CARBURETTOR VERSION

Problem	Specific Area Involved	Cause
FUEL SYSTEM IGNITION SYSTEM	Fuel tank	<ul style="list-style-type: none"> • Empty • Tank breather clogged • Fuel deteriorated, contains water or contaminated with foreign matter
	Fuel valve	<ul style="list-style-type: none"> • Fuel line clogged • Fuel valve clogged • Break in vacuum line or line positioned incorrectly
	Carburettor	<ul style="list-style-type: none"> • Fuel deteriorated, contains water or contaminated with foreign matter • Slow jet clogged • Air lines clogged • Incorrect pilot air screw adjustment • Pilot air passage clogged • Poor valve seat seal • Incorrect fuel level adjustment • Choke jet clogged • Air leaking in
	Automatic choke	<ul style="list-style-type: none"> • Atomizer malfunctioning • Ignition unit malfunctioning • Thermal cutout malfunctioning
	Air filter	<ul style="list-style-type: none"> • Air filter dirty • Air filter not positioned properly
	Battery	<ul style="list-style-type: none"> • Battery not charged correctly • Battery faulty
	Fuse	Blown or faulty connection
	Spark plug	<ul style="list-style-type: none"> • Inadequate gap between electrodes • Electrodes worn • Break in cable between terminals • Spark plug cap faulty • Incorrect heat range
	Ignition coil	<ul style="list-style-type: none"> • Primary/secondary coil broken or cut • High voltage cable faulty • Ignition coil body broken
	Ignition system	<ul style="list-style-type: none"> • Ignition unit faulty • Pick-up coil faulty • Flywheel woodruff key broken • Ignition coil broken
	Switches	<ul style="list-style-type: none"> • ON/OFF switch faulty • Front/rear brake switch faulty • Kickstand switch faulty
Electrical system	<ul style="list-style-type: none"> • Battery terminal loose • Loose connections • Incorrect earthing • Electrical system broken 	

CHAPTER 16

TROUBLESHOOTING

Product	Specific Area Involved	Cause
COMPRESSION SYSTEM	Cylinder and cylinder head	<ul style="list-style-type: none"> • Spark plug loose • Cylinder head loose • Cylinder head gasket broken • Cylinder gasket broken • Cylinder worn, damaged or seized
	Piston and piston rings	<ul style="list-style-type: none"> • Piston worn • Piston ring worn or broken • Piston ring stuck • Piston seized or damaged
	Valve system	<ul style="list-style-type: none"> • Incorrect valve clearance adjustment • Valves leaking • Poor valve and valve seat contact • Incorrect valve timing • Valve spring broken • Valve seized
IDLING MALFUNCTIONING	Carburettor	<ul style="list-style-type: none"> • Slow jet loose or clogged • Carburettor coupler damaged • Carburettor coupler clamp tightened incorrectly • Incorrect idling speed adjustment • (Pilot screw) (Throttle stop screw) (CO test) • Incorrect throttle cable adjustment • Carburettor flooded
	Automatic choke	<ul style="list-style-type: none"> • Atomizer malfunctioning • Choke wax malfunctioning • Ignition unit faulty • PTC thermistor faulty
	Air filter	<ul style="list-style-type: none"> • Filter dirty • Spark plug faulty • High voltage cable faulty • Ignition unit faulty • Starter malfunctioning
	Valve system	Incorrect valve clearance adjustment

TROUBLESHOOTING

CHAPTER 16

16.2 POOR PERFORMANCE AT MID RANGE AND HIGH SPEED

Product	Specific Area Involved	Cause
POOR SPEED PERFORMANCE	Ignition system	<ul style="list-style-type: none"> • Spark plug fouled • Incorrect heat range • Ignition unit faulty • Pick-up coil faulty • Ignition coil faulty
	Fuel system	<ul style="list-style-type: none"> • Fuel tank breather clogged • Air filter dirty • Jet clogged • Incorrect fuel level adjustment • Incorrect carburettor air line adjustment
	Air filter	Filter dirty
	Compression system	<ul style="list-style-type: none"> • Cylinder worn • Piston ring worn or stuck • Cylinder head gasket broken • Cylinder gasket broken • Carbon deposits • Incorrect valve clearance adjustment • Incorrect valve and valve seat contact • Incorrect valve timing
	Engine oil	<ul style="list-style-type: none"> • Incorrect oil level (too low or too high) • Unsuitable quality (oil with low viscosity) • Oil deteriorated • Lubrication lines clogged
	Brakes	The brake jams

CHAPTER 16

TROUBLESHOOTING

16.3 OVERHEATING OR EXCESSIVE COOLING

Product	Specific Area Involved	Cause
OVERHEATING	Ignition system	<ul style="list-style-type: none"> • Incorrect gap between electrodes • Incorrect spark plug heat range • Ignition unit faulty
	Fuel system	<ul style="list-style-type: none"> • Poor fuel mixture • Incorrect fuel level adjustment • Air filter dirty
	Compression system	<ul style="list-style-type: none"> • Carbon deposits • Incorrect valve timing • Incorrect valve clearance adjustment
	Engine oil	<ul style="list-style-type: none"> • Incorrect oil level • Unsuitable oil quality (high viscosity) • Poor oil quality
	Brakes	Brakes jammed
	Cooling system	<ul style="list-style-type: none"> • Thermostat faulty • Thermal cutout faulty • Incorrect coolant level (low) • Radiator faulty (clogged, damaged) • Radiator cap faulty • Impeller shaft deformed • Fan motor disconnected

16.4 DEFECTIVE BRAKING/POOR BRAKING

Product	Specific Area Involved	Cause
POOR BRAKING	Front brake Rear brake	<ul style="list-style-type: none"> • Brake pads worn • Brake disc worn • Air in brake fluid • Brake fluid leak • Brake pump faulty • Caliper mounts faulty • Connection screw loose • Break in brake line • Brake pads fouled with oil • Brake disc fouled with oil

TROUBLESHOOTING

CHAPTER 16

16.5 FRONT FORK MALFUNCTIONING

Product	Specific Area Involved	Cause
OIL LEAKS	FRONT FORK	<ul style="list-style-type: none"> • Tube deformed, damaged or oxidized • Leg damaged or broken • Oil seals damaged • Hex bolt loose • Cap O-ring damaged
MALFUNCTIONING		<ul style="list-style-type: none"> • Tube deformed • Leg deformed • Fork spring damaged • Hydraulic cylinder deformed • Incorrect oil viscosity (too high) • Incorrect oil level
	Cooling system	<ul style="list-style-type: none"> • Fan motor not working • Thermostat faulty • Thermal cutout faulty • Incorrect coolant level (low) • Radiator faulty (clogged, damaged) • Radiator cap faulty • Impeller shaft deformed • Fan motor disconnected

16.6 STEERING INSTABILITY

Product	Specific Area Involved	Cause
STEERING INSTABILITY	Handlebars	Mounting screw loose
	Steering stem	Steering stem bolt loose or overtightened Lower triple clamp deformed Bearings or races damaged
	Front fork	Incorrect front wheel balancing Fork spring broken Fork deformed
	Wheels	Incorrect wheel balancing Rim deformed Uneven tyre wear Bearings loose Wheel axle loose or bent Incorrect tyre pressure
	Frame	Deformed Steering bearings damaged
	Swingarm	Bearings faulty Swingarm deformed
	Rear shock absorber	Spring weak Incorrect spring preload adjustment Oil leaks
	Bodywork	Bodywork damaged Incorrect assembly

CHAPTER 16

TROUBLESHOOTING

16.7 STARTER MOTOR NOT WORKING

Product	Specific Area Involved	Cause
STARTER MOTOR IS NOT WORKING	Battery	<ul style="list-style-type: none"> • Insufficient battery capacity • Battery faulty
	Fuse	Blown, faulty connection
	Switches	<ul style="list-style-type: none"> • ON/OFF switch faulty • Kickstand switch faulty • Front/rear brake switch faulty • Ignition circuit breaker relay faulty • Ignition relay faulty
	Electrical system	<ul style="list-style-type: none"> • Battery terminals loose • Loose connections • Faulty earthing • Electrical system broken
	Engine	Engine seized

16.8 FAULTY INDICATOR SYSTEM AND LIGHTING

16.8.1 DIM HEADLIGHT

- Unsuited bulb
- Too many electrical accessories
- Trouble charging
- Rectifier/regulator faulty
- Battery faulty
- Electrical system connections done incorrectly
- Incorrect earthing
- ON/OFF switch or light switch faulty
- Bulb past its best

16.8.2 BLOWN BULB

- Unsuited bulb
- Battery faulty
- Rectifier/regulator faulty
- Incorrect earthing
- ON/OFF switch faulty
- Bulb past its best

16.8.3 DIRECTION INDICATORS NOT FLASHING

- Incorrect earthing
- Insufficient battery capacity
- Faulty fuse
- Direction indicator switch faulty
- Direction indicator relay faulty
- Electrical system broken, incorrect connection.
- Bulb blown

TROUBLESHOOTING

16.8.4 DIRECTION INDICATORS STAY ON

- Direction indicator relay faulty
- Insufficient battery capacity (almost dead)
- Bulb blown (front or rear)

16.8.5 DIRECTION INDICATORS FLASHING TOO SLOW

- Direction indicator relay faulty
- Insufficient battery capacity (almost dead)
- Unsuited bulb
- ON/OFF switch and/or direction indicator switch faulty

16.8.6 DIRECTION INDICATORS FLASHING TOO FAST

- Unsuited bulb
- Direction indicator relay faulty

16.8.7 HORN DOES NOT WORK

- Battery faulty
- Main fuse and/or horn switch faulty
- Incorrect horn adjustment
- Horn faulty (coil burned, incorrect connection)
- Electrical system broken

CHAPTER 17

PRODUCTS



Use lubricating products and fluids that meet specifications that are equivalent or superior to those given. These directions also apply to any top-ups.

Product	Specifications	Remarks
4-stroke engine and transmission oil	SAE 10W30,10W40,15W40, 20W40, 20W50, API service SG or better, JASO MA standard	Do not use mineral oils.
Grease for bearings, couplers, joints and linkage	Lithium grease	
Coolant	Antifreeze made from an ethylene glycol solution with organic additives	Do not thin with water.
Fork oil	Fork oil grade 15W	
Drive chain lubricant	Spray-on drive chain grease	
Brake oil	Brake fluid DOT 4 or 5.1	
Electric contact cleaner	Contact cleaner	
Fuel	95 or 98 premium unleaded petrol	
Paste for sealing engine covers on crankcase	Three Bond 1215®	
Medium fastener locking compound	Medium-strength threadlocker	
Strong fastener locking compound	Strong threadlocker	
Bolt release lubricant	Protective lubricating release agent	
Anti-friction lubricant for torque tightening screws	Generic engine oil	
Lubricant for rubber parts, oil seals and O-rings	Lithium soap grease	
Battery terminals	White Vaseline grease	
Vehicle washing	Pressure wash with room temperature water Eco-friendly mild liquid soap	Do not use aggressive cleaners.
Cleaning outside of braking system (discs and pad seats)	Disc Brake Cleaner Spray	Do not use to clean brake pads or plastic parts.

18.1 REMOVING THE ENGINE FULLY

Place the vehicle on a central stand and support the weight at the back with straps and a hoist.

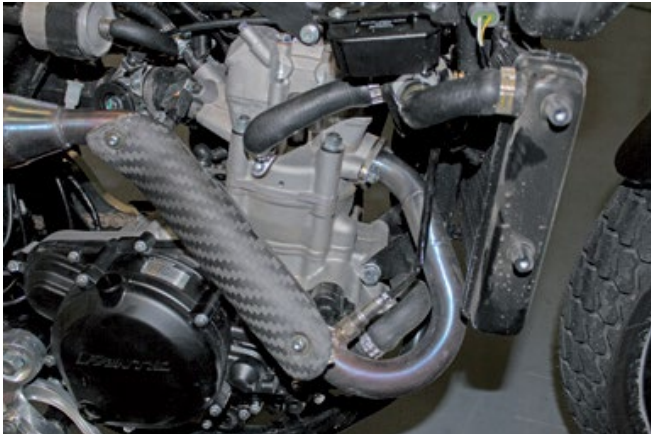
Remove:

- Seat
- Tank
- Exhaust system

Remove the air hose "A" and clutch cable "B".



Remove the two cooling system hoses "C".



Remove the engine earthing cable "D".

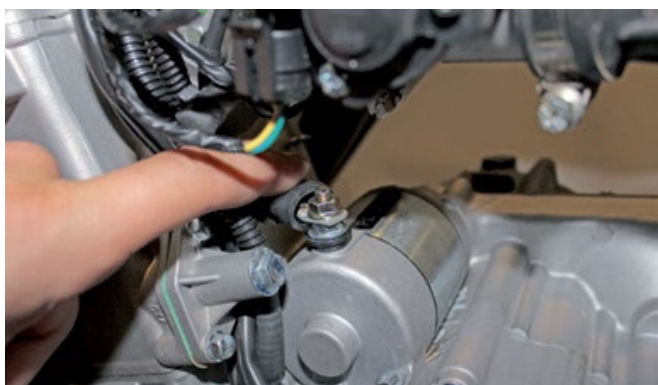


CHAPTER 18

ENGINE



Remove the neutral sensor "E".



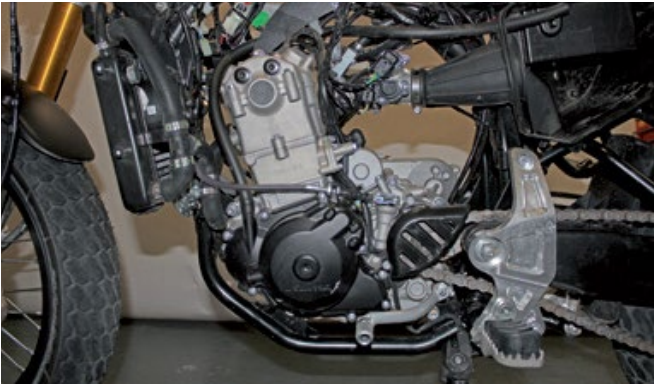
Remove the starter motor wire "F".



Disconnect the pick-up and alternator connectors "G" and "H".



Remove the spark plug boot "I".



Remove the three engine mounts "J" and swingarm bolt "K".
Remove the engine from the vehicle.

Torque settings:

- M10 screws: 50 Nm (5.0 m•kg, 36 ft•lb)
- M8 screws: 27 Nm (2.7 m•kg, 20 ft•lb)

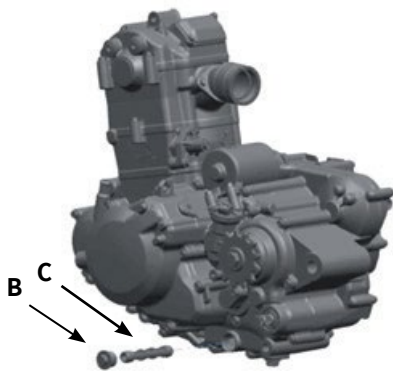
Repeat the procedure in reverse to refit.



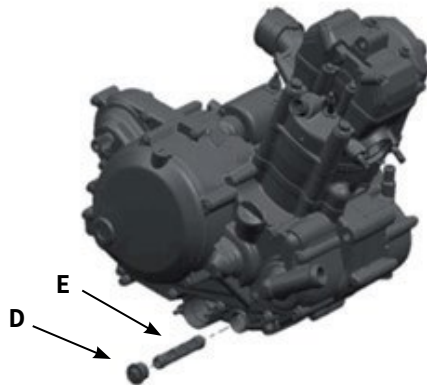
18.2 CHANGING ENGINE OIL AND ENGINE OIL FILTERS

Stand the motorcycle perfectly upright.

Remove the M16 oil drain bolt "A" from the bottom of the engine.



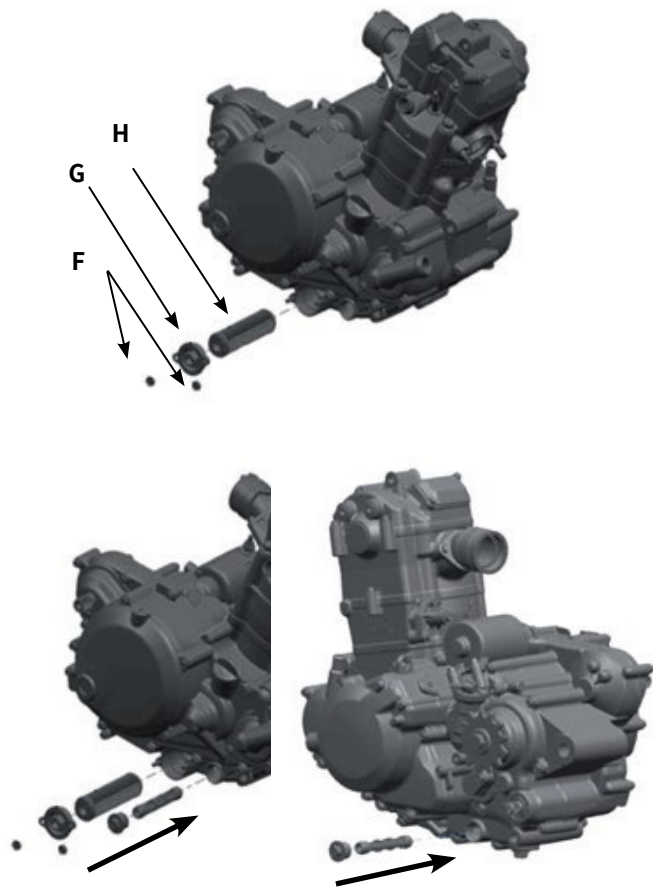
Remove the M20 bolt "B" from the primary filter on the engine's left-hand side and remove the primary filter "C".



Remove the M20 bolt "D" from the primary filter on the engine's right-hand side and remove the primary filter "E".

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Remove the two M5 bolts "F" on the engine's right-hand side and remove the spring "G" and filter "H".

This is a paper filter.

Drain the oil for 5 min or wait until there is no more oil. Meanwhile, clean the primary filter and prepare a new fine filter.

Refit all the previously removed parts in the order you took them out.

Install the filter with the black plastic facing in.

Measure 1500-1600 ml of oil with the measuring cup and fill the engine through the filler opening on the clutch cover.



18.3 ENGINE OIL LEVEL

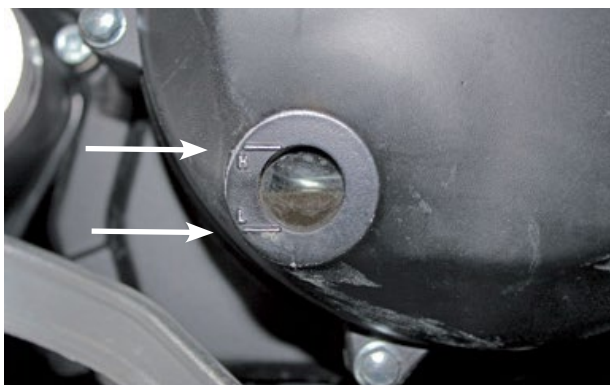
Put the bike into neutral and run the engine for 2 minutes, then switch it off.

Keep the vehicle completely vertical.

Wait 5 minutes with the vehicle stationary.

Check whether the oil level falls between the H and L marks.

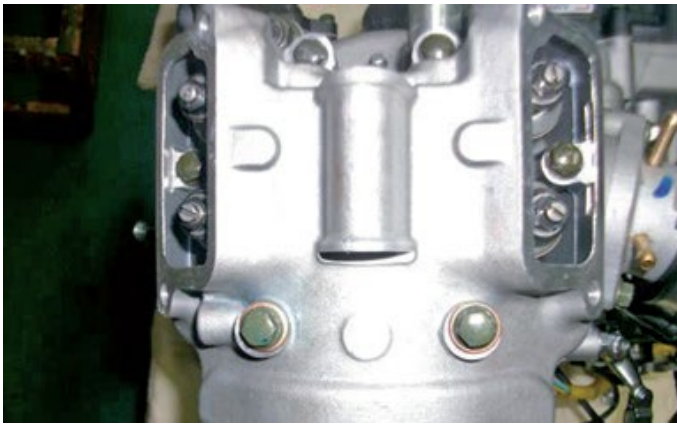
If it does, it means there is sufficient engine oil.



**18.4 CYLINDER HEAD AND VALVE****18.4.1 Remove the cylinder head cover**

Remove the four M6×20 bolts from the valve covers on the intake and exhaust sides respectively.

Remove the valve covers from the cylinder head on the intake and exhaust sides respectively.



Remove the two M6×60 bolts, two M6×35 bolts, and four M6×30 bolts from the cylinder head cover.

Remove the cylinder head cover.

**18.4.2 Remove the cylinder head**

Remove the cylinder head gasket and cam chain's rubber part.
Remove the locating plate's M6×16 bolt and 6.5×1.5×18 washer.



Remove the two M6×20 bolts from the tensioner and remove the tensioner bolt, the tensioner assembly and the tensioner gasket.
Lift the cam chain off the sprocket.

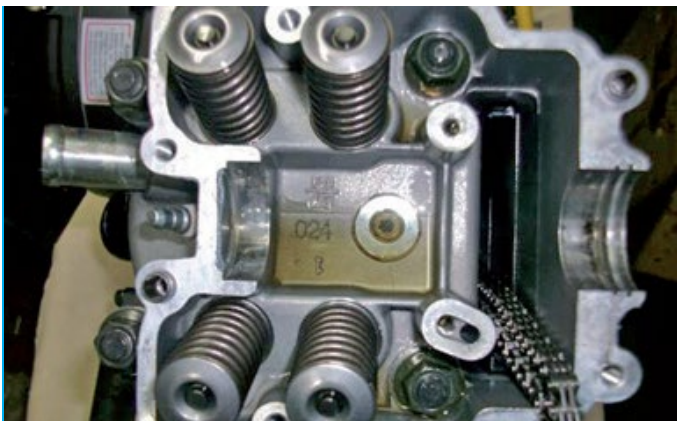
Remove the camshaft assembly.

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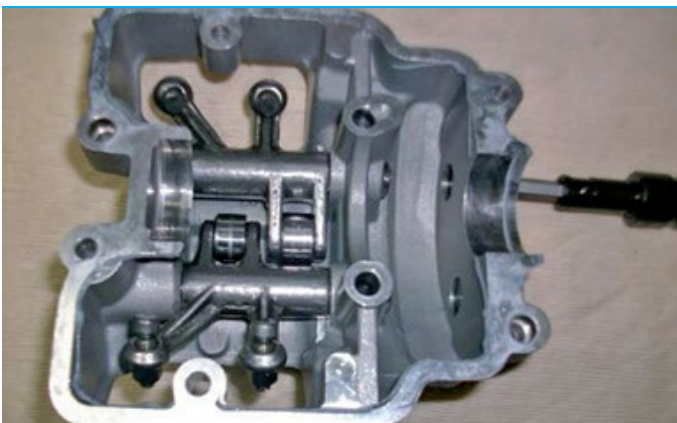


Remove the M6×25 bolt from the cylinder head and block.



Remove the four M10×1.25 nuts and remove the four 10.5×2×20 washers belonging to the bolts.
Remove the cylinder head.

18.4.3 Cylinder head cover disassembly



Remove the two M14×1 bolts from the locating plate on the rocker arm shaft on the cylinder head cover.
Remove the intake and exhaust rocker arm shaft and intake and exhaust rocker arm.

18.4.4 Disassemble the cylinder head

Use the special tool to press down on the spring and remove the valve keepers, springs and valves.



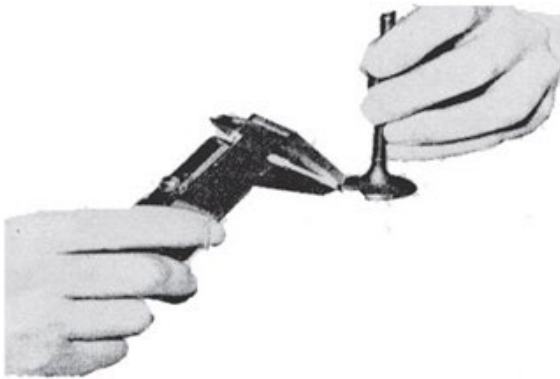
Suitably mark all parts removed and make sure you refit them in their original position



18.4.5 Inspect the valve and valve spring

Check that the valve is not bent or burned, and that the stem is not excessively worn, and measure the outside diameter of the stem.

Service limit value: Ø 4.94 mm



Seating surface width service limit: 1.5 mm.

In the event the valve's contact surface is very rough or features excessive wear and corrosion, and there is poor valve seating, it is hard to get the desired seal and you will need to install a new valve.

**Measure the valve spring's free length:
48.35 mm**

Service limit value Spring: 47.5 mm



18.4.6 Inspect the rocker arm and rocker arm shaft

Check the rocker arm for wear or damage and inspect the rocker arm roller's axial clearance. In the event of significant wear or damage, or excessive rocker arm roller axial clearance, you will need to install a new rocker arm.

Check the rocker arm shaft for wear.

If you find significant wear, you will need to install a new one.



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18.4.7 Inspect the camshaft parts

Check the surface of the camshaft for wear or damage, and make sure that the bearings on both sides of the camshaft are not rotating slower than they should.

If you find significant wear or see the bearings are having trouble rotating, you will need to install new camshaft parts.

Check the decompressor exhaust valve gear assembly for cracks or breakage, and make sure that the exhaust valve centrifugal system and shaft have not come loose.

In either of these cases, you will need to install a new exhaust valve assembly.

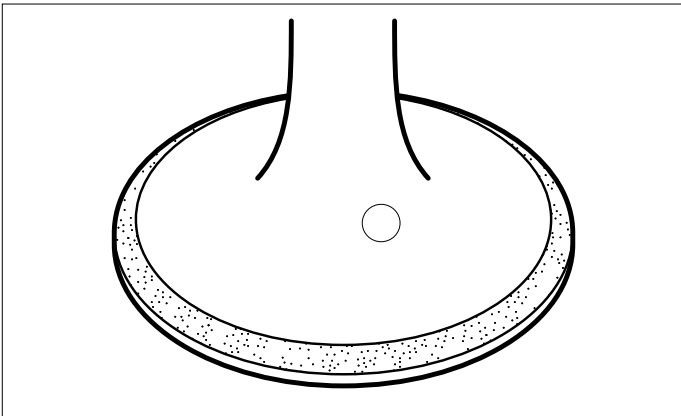


18.4.8 Inspect the cylinder head

Check whether the cylinder head has a poor airtight seal. If this is the case, you will need to install a new cylinder head or valve.

Check the spark plug hole and valve seat for cracks.

Check the cylinder for warp, and measure the flatness of the cylinder head using a straight edge and a feeler gauge.



18.4.9 Inspect and lap the valve seat

Clean the combustion chamber to remove carbon deposits.

Coat the valve seat "A" with a thin, even layer of red ink and carefully insert the valve in the seat, tapping on the valve and holding it still. Then spin it round and check whether there are any breaks in the marking it leaves on the valve's contact surface. If this is the case, lap the valve seat.

First, clean the intake and exhaust valve seats to remove carbon deposits, then apply abrasive material to the valve seat and attach the rubber suction cup on the end of the lapping tool to the valve.

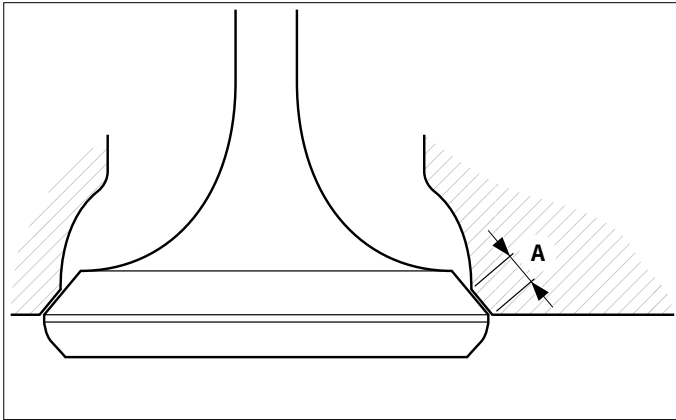


18.4.10 Inspect the valve guide

Measure the inside diameter "A" of each valve guide using a dial-gauge and perform the required checks.

Service limit value: \varnothing 5,035 mm

Remove carbon deposits that have built up on the valve guide before measuring the guide's diameter.



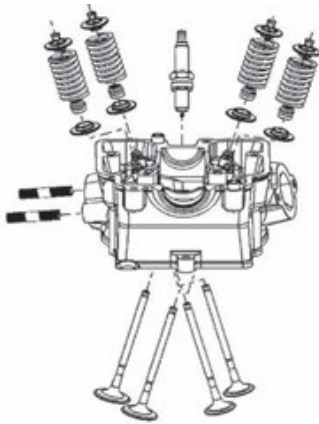
18.4.11 Measure the width of the valve seating surface

Service limit value: 1.5 mm

If the valve seat width "A" is inadequate or the seat is pitted, it must be lapped to ensure a proper seal.



Make sure that lapping results in a sealing line between the valve and the seat it travels inside. If this is not the case, lap as required. If you are unhappy with the result, install a new valve or a new cylinder head.



18.4.12 Assemble the cylinder head

Fit the lower valve spring seat and the oil pan on the valve guide. Insert the intake and exhaust valve stem, applying lubricant, inside the valve guide. Fit the valve spring, upper retainer and valve keepers.



Press down the spring with a valve lifter before inserting the keepers in the spring.

To stop the valve spring becoming permanently deformed, keep the spring slightly compressed. Compress just enough to allow you to insert the valve keepers.

Check that the keepers are wedged in properly. Check that the assembled cylinder head assembly provides a good seal against air leaks. If there are no leaks, proceed to the next step.

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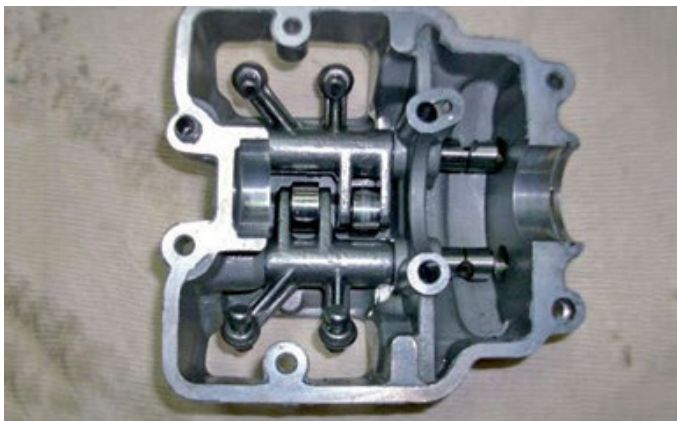
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18.4.13 Assemble the cylinder head cover

Insert the intake and exhaust rocker arms in the cylinder head cover in the direction shown by the arrows before pushing them through the cover, matching them up with the intake and exhaust rocker arm shaft holes.

As the arrow shows, they are at a tangent to the rocker arm shaft. Keep the tangents pointing towards the upper holes in the head cover during the rocker arm shaft's assembly.

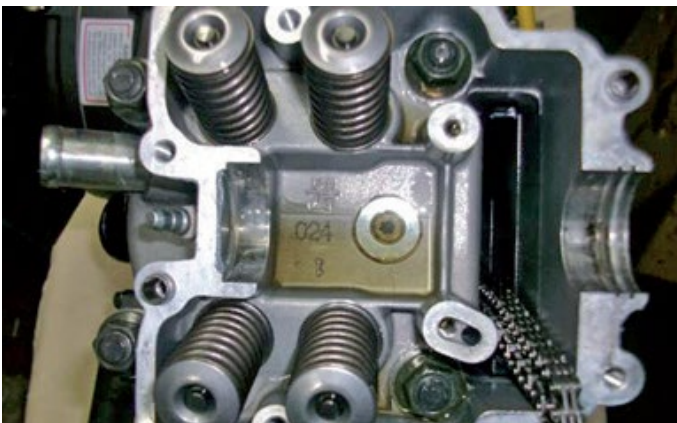


Next, insert the rocker arm shaft locating plate on the head cover and tighten the bolt.

Insert the rocker arm shaft with the tangent side facing the hole in the head cover. Once the head cover has been fitted, turn the rocker arm. The rocker arm must be able to turn freely, without requiring any effort.

Torque setting:

**Rocker arm shaft setting plate bolts 16 ~ 20 Nm
(1.6 ~ 2 kgf·m, 11.8 ~ 14.7 lbf·ft)**



13.4.14 Install the cylinder head

Remove the head's old gasket and install a new one over the locating stud.

Install the cylinder head, fit the washers and nuts.

Be careful no dust or foreign objects get inside the cylinder.

Torque setting:

**Nuts on pin for fastening head to engine
55 ~ 60 Nm (5.5 ~ 6 kgf·m, 40.5 ~ 44.2 lbf·ft)**

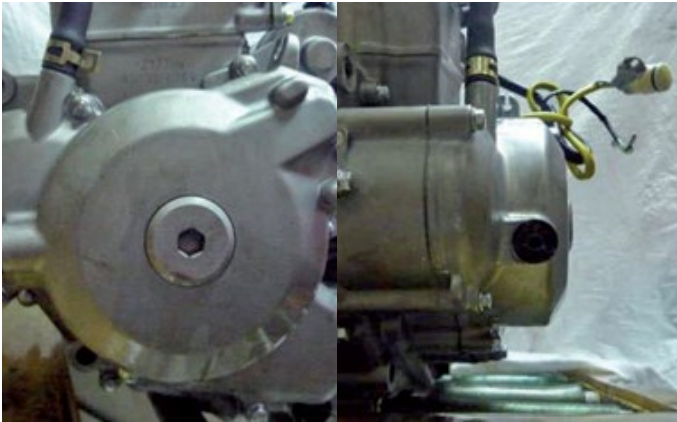


Insert the cylinder-cylinder block M6×25 bolts in the holes and tighten them.

Torque setting:

**Bolts fastening head to cylinder block
11 ~ 13 Nm (1.1 ~ 1.3 kgf·m, 8.1 ~ 9.6 lbf·ft)**

Install the camshaft on the head before fitting the cam chain on the camshaft sprocket, then check that timing is set correctly. If it is not, adjust until it is set correctly.



18.4.15 Adjusting timing

1. Remove cap "D" from the left access hole, as well as cap "C".



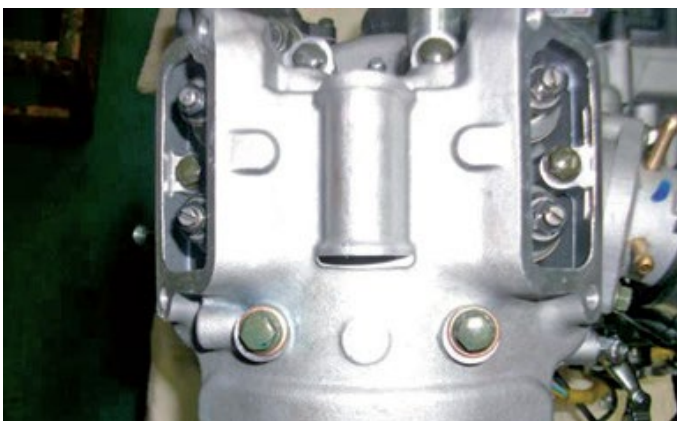
2. Turn the magnet lock nut using the relevant spanner and check whether the timing index "-" on the rotor "E" (on the left) is lined up with the central index mark on the cover "F".



3. Once the above-mentioned mark is lined up, check that the mark "G" and the mating surface are on the same plane.

Timing is only correct once the conditions in points 2 and 3 are met.

Install the tensioner on the cylinder block by inserting it in the relevant hole and tightening it up with the two M6×20 bolts before positioning the tensioner spring, O-ring and bolt.



18.4.16 Install the cylinder head cover

Coat the cylinder head cover's mating side with an even layer of silicone sealant.

Place the cover on the cylinder head.

Torque setting:

Cylinder head cover fastening bolts

11 ~ 13 Nm (1.1 ~ 1.3 kgf·m, 8.1 ~ 9.6 lbf·ft)

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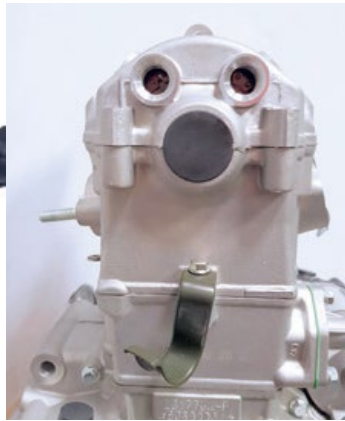
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**Adjust intake and exhaust valve clearance:
0.04 to 0.06 mm.**

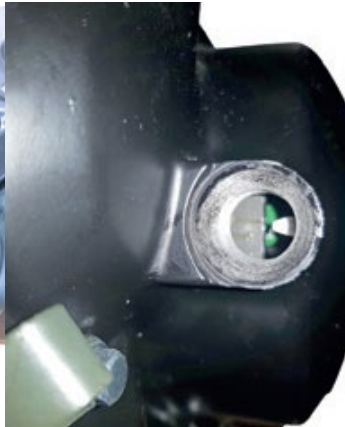
Fit the valve cap on the cylinder head cover and tighten.

**Torque setting:
Cylinder head cover fastening bolts
11 ~ 13 Nm (1.1 ~ 1.3 kgf·m, 8.1 ~ 9.6 lbf·ft)**



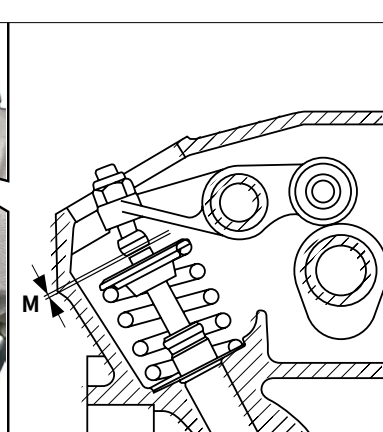
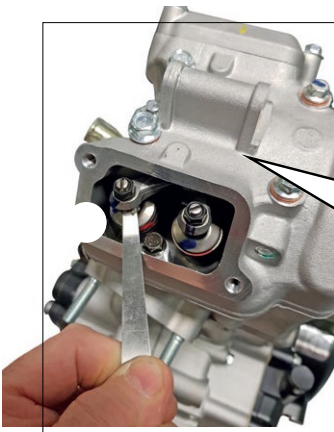
18.4.17 Checking and adjusting tappets

With the engine cold, on the left-hand side of the engine, remove caps "A" and "B" from the ignition cover, caps "C" and "D" from the tappet cover, covers "E" on the head, and the spark plug.



Insert the special key "F" in the hole in the cover. Rotate the engine anticlockwise and match up points "G" and "H".

Point "I" corresponds to the timing position at engine ignition.



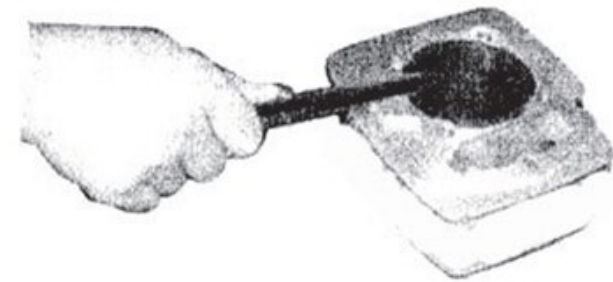
Insert the feeler gauge "L" and adjust to the correct value.
Tappet adjustment thickness "M": 0.5 mm to 0.7 mm.



18.5 CYLINDER AND PISTON

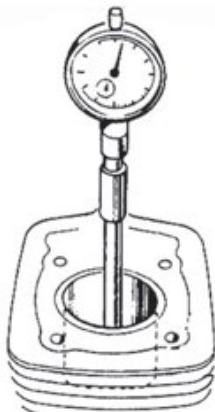
18.5.1 Remove the cylinder

Remove the chain tensioner and cylinder block.



Using a scraper, scrape off any residues left by the gasket on the surface of the cylinder.

Deposits are easier to remove after soaking in petrol. Be careful not to damage the cylinder's contact area when performing this job.



18.5.2 Inspect the cylinder block

Check the cylinder block for wear or damage. Measure the cylinder's inside diameter at three separate points - namely, at the top, in the middle and at the base - along the piston's full stroke. Measure the cylinder's inside diameter at two points at right angles to each other.

Service limit value: \varnothing 77,018 mm

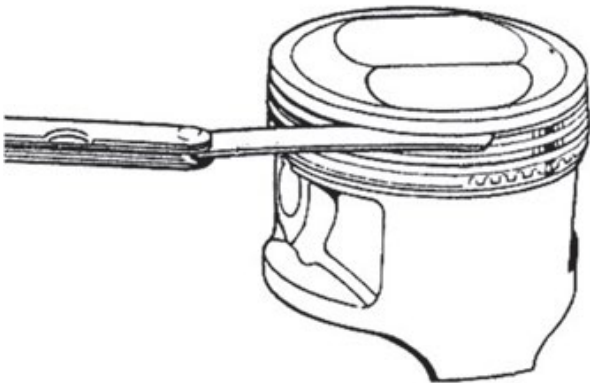
18.5.3 Remove the piston

Remove the gudgeon pin clip using pliers and remove the gudgeon pin and the piston. When you remove the gudgeon pin clip, be careful not to let it fall into the crankcase.



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18.5.4 Inspecting the piston and rings

Remove the piston rings:
Take care not to damage the piston rings during removal.
Measure the piston ring-to-groove clearance.

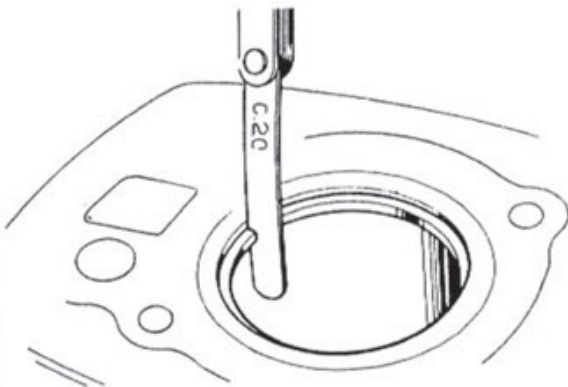
Service limit value:

Top ring: 0.08 mm

2nd ring: 0.08 mm

Oil ring: 0.08 mm

Check the piston for wear or cracks and check the seat for wear.



Install the ring on the cylinder.

Service limit value:

Top ring: 0.5 mm

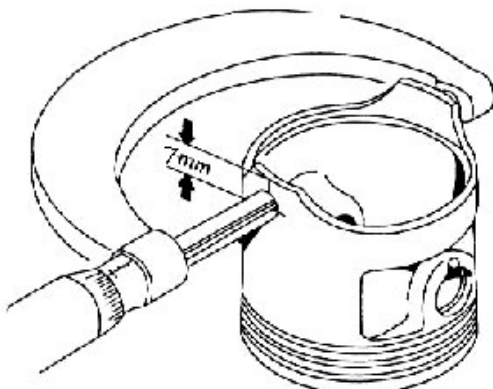
2nd ring: 0.5 mm

Oil ring: 1.4 mm



Measure the inside diameter of the gudgeon pin bore.

Service limit value: \varnothing 16,015 mm

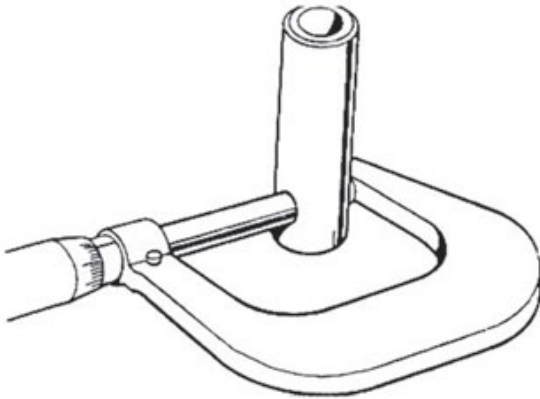


Measure the outside diameter of the piston 7 mm from the base of the piston's skirt.

Service limit value: \varnothing 76.94 mm

Measure the cylinder-to-piston clearance.

Service limit value: 0.1 mm

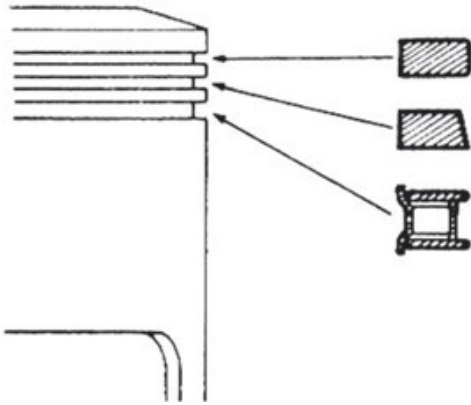


Measure the outside diameter of the gudgeon pin.

Service limit value: 15.99 mm

Measure the piston-to-gudgeon pin clearance.

Service limit value: 0.025 mm



18.5.5 Install the piston rings

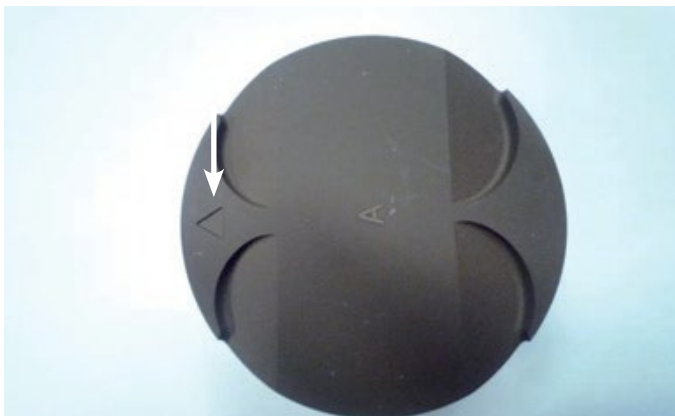
Clean the piston ring grooves.
Install the piston rings.

Do not mix up the top and 2nd piston rings. Install the top and 2nd piston rings with the markings facing the piston head. The piston rings should be able to turn freely once installed.



The gap in the oil ring should line up correctly with the gaps in the spacers.

Install the spacers before the oil ring, installing the side rails last.



18.5.6 Install the piston

Install the piston, the gudgeon pin and the new clips.

Install the piston with the side marked "◀" facing the exhaust. The gudgeon pin clip end gap should face down. Install new clips if they are badly misshapen.

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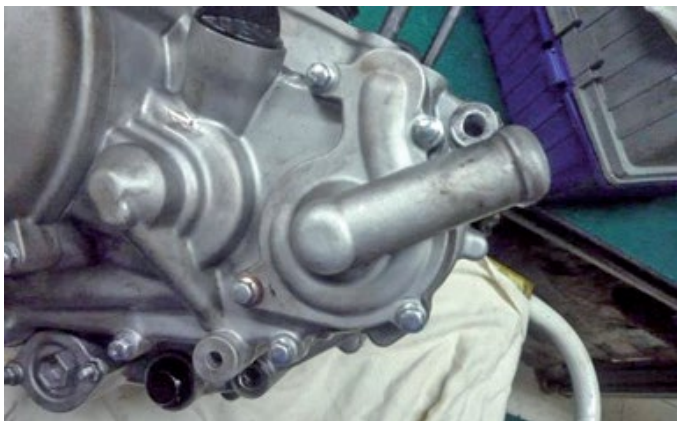
18.5.7 Install the cylinder block

Install the cylinder block locating bush and new cylinder gaskets. Coat the cylinder block, piston and piston ring with an even layer of oil.

Set the gaps of all piston rings at a 120° angle to each other and lower the cylinder block into place.

Position the chain guide.

Do not damage the piston rings while installing the cylinder block.



18.5.8 CLUTCH, DRIVE GEAR, FREEWHEEL, OIL PUMP AND GEARSHIFT

18.5.8.1 Remove the water pump impeller

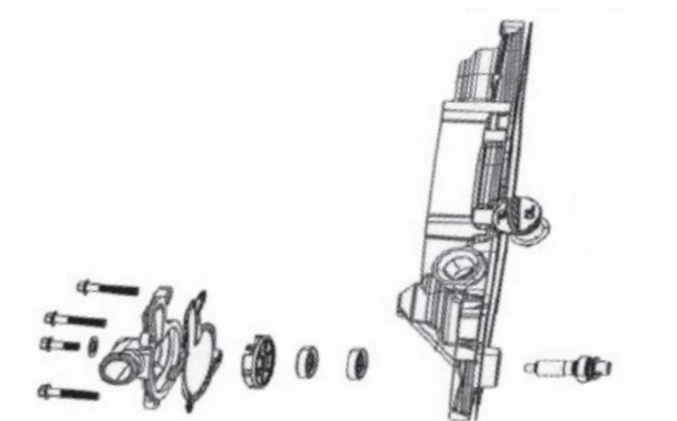
Remove the drain bolt from the pump cover, drain the refrigerant via the bolt, and remove the pump cover and impeller until water stops coming out.



18.5.9 Remove the crankcase cover on the engine's right-hand side.

Drain all the oil (remove the right and left oil filters, release the filter assembly from the crankcase, and wait for all the oil to drain out).

Remove the screws on the cover and the crankcase on the right-hand side of the engine.



18.5.10 Remove the water pump shaft, the water seal assembly and the oil seal

Remove the circlip from the groove in the hole in the water pump shaft and remove the shaft.

Remove the water seal assembly and oil seal from the hole in the water pump shaft.



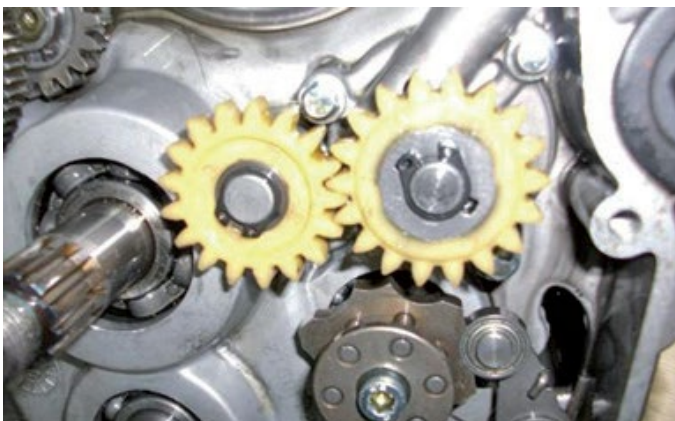
18.5.11 Remove the clutch

Remove the clutch pressure plate after unscrewing the bolts from the plate two at a time in diagonally opposite positions. Then remove the clutch push rod and friction plate. Remove the lock nut and clutch spacer. Remove the clutch hub, clutch outer, outer guide and clutch spacer. Remove the clutch push rod from the central hole in the mainshaft.



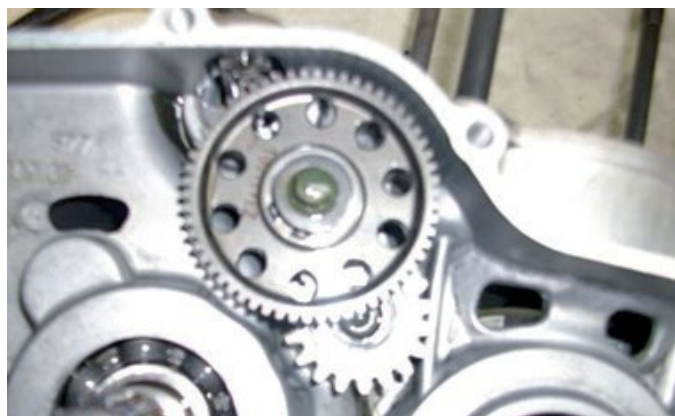
18.5.12 Remove the drive gear, freewheel and starter gear

Remove the drive gear's lock nut and relevant washer. Remove the freewheel and starter gear. Remove the starter gear spacer together with the actual gear when you remove the gear assembly, and be very careful with the washer.



18.5.13 Remove the oil pump on the right side

Remove the oil pump's intermediate gear and the oil pump gear assembly circlip. Remove the oil pump intermediate gear washer, intermediate gear and gear assembly. Remove the 3 screws from the oil pump cover plate on the right side and remove the cover plate assembly and the oil pump inner and outer rotor assembly. On the internal or external side of the oil pump intermediate gear shaft, there is an oil pump intermediate gear washer. Be very careful with the circlip, washer and oil pump assembly you have removed.



18.5.14 Remove the step gear

Remove the circlip from the groove in the step gear shaft and remove the step gear washer before removing the gear.

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18.5.15 Remove the starter motor

Remove the screw fastening the starter motor and remove the motor.

18.5.16 Remove the gearshift

Remove the screws fastening the shift star.
Remove the shift lever components.
Remove the screws fastening the index plate assembly and remove the washer and the index plate assembly.



18.5.17 Inspect the crankcase cover on the right side

Check the right-hand crankcase cover oil gasket for damage. If the gasket is damaged, replace it.
Check the oil seal on the clutch cover on the outer end of the crankshaft, where necessary replace the oil seal with a new one with the marking facing out.
Check the starter shaft oil seal for damage. If the seal is damaged, replace it.

18.5.18 Inspect the water pump shaft, impeller, water seal assembly and oil seal

Check the oil pump impeller for damaged or loose connections. If there is any such issue, replace the impeller.
Check the water seal assembly and oil seal for damage and check the water pump shaft for excessive wear or warp. If there is any such issue, replace the water seal assembly, oil seal and water pump shaft.



Tips for installing the water seal assembly, oil seal and water pump shaft:

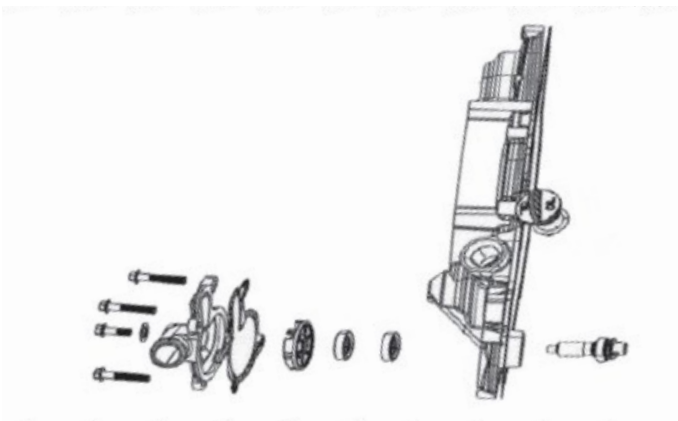
Apply a moderate amount of oil inside the water pump shaft hole, press and insert the oil seal using the special tool, while the outer side of the gasket faces out.

Press and insert the pump shaft water seal system using the special tool. When installing the water seal system, keep the outer side marking facing in.

Apply a little silicone lubricating grease to the water seal system's main lip.

Press and insert a new water pump shaft using the special tool.

Insert the circlip in the relevant groove in the water pump shaft hole: the water pump shaft should turn freely once installed.



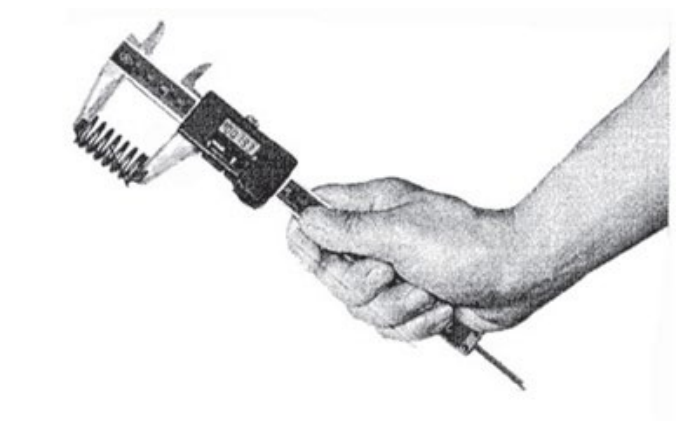
18.5.19 Inspect the starter shaft

Check the starter shaft for wear. If the engine has an electric starter system, there is no need to check the starter shaft gear for wear.

18.5.20 Inspect the clutch spring

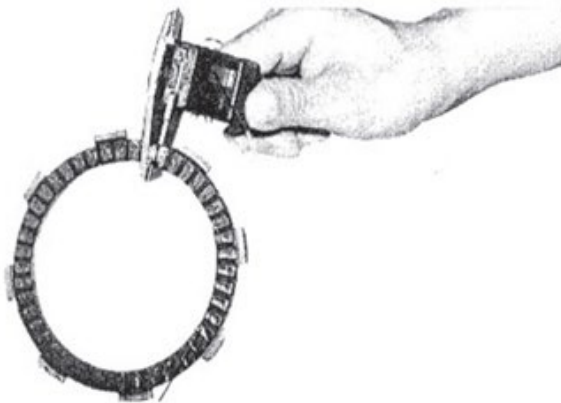
Measure the clutch spring's free length.

Service limit value: 32.3 mm



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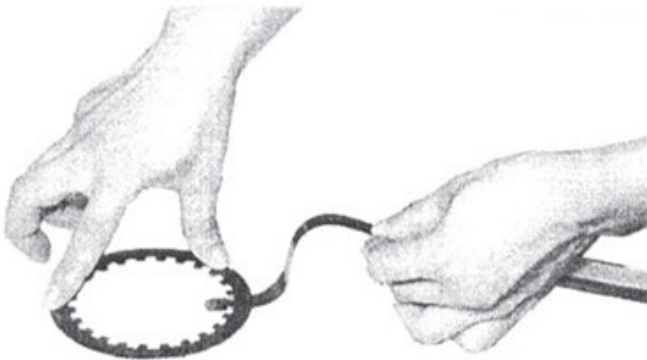
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18.5.21 Inspect the clutch disc

If there is anything wrong with the clutch disc, replace it. Measure the thickness of each disc.

Service limit value: 2.85 mm



Check the surface of the clutch disc for warp. Use a feeler gauge for inspection.

Service limit value: 0.14 mm



Check clearance between the clutch basket and clutch disc.

Service limit value: 0.6 mm



18.5.22 Inspect the clutch basket

Check the clutch basket fingers for notching due to friction. If there is significant notching, replace the outer.

18.5.23 Inspect the drive gear

Check the drive gear for wear or damage. If there is significant notching, replace it.

**18.5.24 Inspect the freewheel**

Remove the circlip from the outer side of the freewheel and check the components for wear or damage.

18.5.25 Inspect the primary starter gear

Check the primary starter gear for wear or damage.

**18.5.26 Inspect the oil pump on the right side of the engine case**

Check the oil pump's inner rotor for wear or damage. If there is significant notching, replace it.

Check the oil pump's intermediate gear and gear assembly for cracks. If there is any issue, replace them.

Check the oil pump cover on the right side for wear or damage. If there is any issue, replace it.

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18.5.27 Inspect the starter motor and step gear.

Check the starter motor's teeth for damage and check the step gear for wear or damage.

18.5.28 Inspect the gearshift

Check the index plate roller for wear or for impeded movement.

18.5.29 Assemble the kickstarter spindle

Insert the kickstarter spindle in the relevant opening in the right side of the engine case. If the motorcycle has an electric starter, you can skip this step.

18.5.30 Assemble the step gear

Slip the step gear onto the relevant spindle on the right side of the engine case.

Fit the step gear's washer on its outer side.

Insert the circlip in the groove on the step gear shaft.

18.5.31 Assemble the gearshift

Fit the drive shaft, then insert the shift drum and the shift star.

Line up the gap with the drum's pin, insert the fastening screw and tighten it.

Insert the shift lever and adjust the lever if the gear sequence is incorrect. Carry on with assembly if the gear sequence is correct.

18.5.32 Assemble the oil pump on the right side of the engine case

Insert the oil pump pin in the relevant hole in the pump shaft.

Insert the rotor assembly in the opening in the right side of the engine case and secure the oil pump cover plate assembly on the rotor using the three M5×18 screws.

Install the oil pump rotor with the inner and outer rotors' side with the markings facing in the same direction.

Torque setting: Oil pump cover plate screws: 7 to 9 Nm

While assembling the cover plate, make sure the pump shaft can turn freely.

Fit the oil pump gear assembly on the pump shaft and insert a circlip in the groove in the pump shaft.

Slide the oil pump intermediate gear washer onto the gear shaft before fitting the actual gear. Next, slide the intermediate gear washer onto the gear before inserting the circlip in the groove in the gear shaft.

18.5.33 Assemble the freewheel

Fit the shim on the freewheel's outer.

During assembly, make sure the shim is positioned correctly.

18.5.34 Install the primary gear and freewheel

Slide the primary gear's washer onto the right end of the crankshaft.

Slide the primary gear and freewheel onto the right end of the crankshaft.

Coat the primary gear's hole with a layer of lubricating grease before installing the primary gear.

18.5.35 Install the drive gear

Slide the drive gear onto the right end of the crankshaft.
Fit the drive gear lock nut washer on the drive gear.
Apply sealant to 3-4 threads of the drive gear lock nut.

Torque setting: Drive gear lock nuts: 150 to 160 Nm

18.5.36 Install the clutch

Slide the clutch basket washer, clutch outer guide, clutch hub and clutch hub washer onto the mainshaft.

Coat the clutch outer guide's inner ring with a layer of lubricating grease.

Slide the clutch hub and basket lock nut washer onto the mainshaft and apply sealant to 3-4 threads of the basket lock nut, then fit and tighten the nut on the mainshaft.

Torque setting: Clutch lock nuts: 80 to 90 Nm

Insert the clutch disc in the clutch hub and in the clutch outer before inserting the clutch push rod into the central hole in the mainshaft.

Next, insert the clutch push rod into the central hole in the mainshaft before inserting the thrust bearing and washer on the push rod.
Fit the clutch pressure plate, relevant spring, screw and tighten the pressure plate screws with a torque wrench.

Torque setting: Clutch pressure plate screws: 8 to 10 Nm

18.5.37 Assemble the starter motor

Coat the ends of the starter motor teeth troughs with an even layer of oil before installing the motor, and secure in place with 2 bolts.

Torque setting: Starter motor mounting bolts: 11 to 13 Nm.

18.5.38 Install the crankcase cover on the right side

Remove the old gasket from the crankcase on the right side and replace it.
Fit the crankcase cover on the right side and secure with ten M6×30 bolts.

Torque setting: Right crankcase cover bolts: 11 to 13 Nm

Slide the water pump impeller onto the pump shaft and tighten it.

Insert the water pump cover gasket before installing the cover and secure it with three M6×35 bolts and one M6×20 bolt.

Torque setting: Water pump impeller bolts: 2 to 4 Nm

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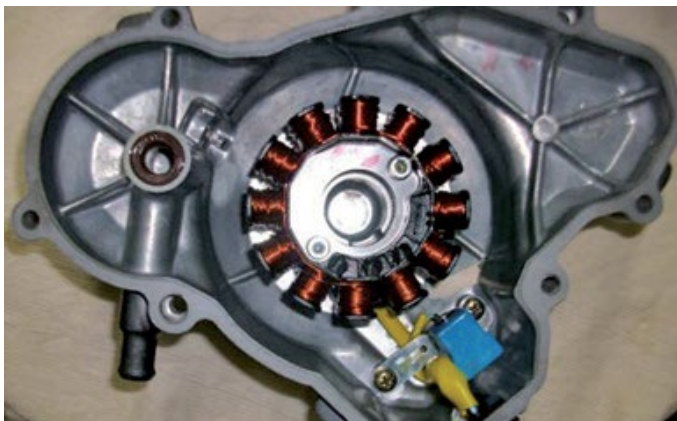
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18.6 GENERATOR, CRANKSHAFT BALANCING AND DRIVEN GEAR

18.6.1 Remove the crankcase cover on the left side

Remove the bolts fastening the cover on the front and left and remove the left side crankcase cover.



18.6.2 Remove the generator stator

Remove the two M5×10 screws from the sensor. Remove the two M5×30 screws from the stator coil and remove the generator stator assembly from the left side crankcase cover.



18.6.3 Remove the generator rotor

Remove the lock nut from the magnet rotor and remove the rotor using the special tool.

You must only use the special tool to remove the rotor. Do not hammer the rotor.

If the magnet is knocked accidentally during removal or assembly - for instance, if it is dropped or if a foreign object bangs against it - replace it.



18.6.4 Remove the balancer drive gear and driven gear

Remove the cam chain and chain tensioning plate before removing the lock nut and washer from the balancer drive gear. Remove the crankshaft gear and balancer drive gear. Remove the balancer drive gear's lock nut and flat washer. Remove the balancer driven gear (23), spacer (24), and the key (25).

**18.6.5 Remove the oil pump on the left side**

Remove the 3 screws from the oil pump cover plate on the left side.

Remove the oil pump cover plate and the oil pump rotor assembly on the left side.

Be very careful with the oil pump pin.

18.6.6 Inspect the crankcase cover on the left side

Check the balancer shaft oil gasket on the left side crankcase cover for damage. If there is any issue, replace it.

18.6.7 Inspect the generator rotor and stator

Check the magnet stator magnetic strip for cracks or damage. If there is any issue, install a new generator rotor. Check the generator rotor for wear or damage. If there is any issue, install a new generator rotor.

18.6.8 Inspect the balancer drive gear and driven gear

Check the balancer drive gear and driven gear for wear or damage.

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18.6.9 Inspect the left side oil pump

Check the left side oil pump for wear or damage.

Check the oil pump cover plate for wear or damage.

18.6.10 Install the left side oil pump

Insert the oil pump in the relevant openings in the left side.

Secure the oil pump cover plate on the left side by tightening the three M5×10 screws.

Install the oil pump rotor with the inner and outer rotors' side with the markings facing in the same direction.

Torque setting: Oil pump cover plate screws on left side: 7 to 9 Nm.

While assembling the cover plate, make sure the pump shaft can turn freely.

18.6.11 Install the balancer drive gear and driven gear

Install the crankshaft spacer on the balancer shaft and insert the balancer shaft key in the relevant slot before sliding the balancer shaft driven gear onto the actual balancer shaft.

Slide the balancer drive gear onto the left end of the crankshaft before sliding the crankshaft gear onto the left end of the crankshaft.

Line up the drive gear tooth featuring the index mark with the driven gear tooth featuring the index mark during assembly.

Fit the balancer drive gear lock nut washer and the flat washer on the crankshaft timing pinion gear and on the balancer shaft driven gear respectively.

Apply sealant to 3-4 threads on the balancer shaft M24×1 lock nut and the clutch M16×1 lock nut before sliding them onto the crankshaft and balancer shaft, and tighten them.

Torque setting: Balancer drive gear and driven gear nut: 80 to 90 Nm.

Torque setting: Driven gear nut: 80 to 90 Nm.

18.6.12 Install the generator rotor

Slide the magnet rotor onto the crankshaft on the left side and apply sealant to 3-4 threads on the magnet's nut before tightening the nut on the crankshaft.

Torque setting: Generator rotor nut: 85 to 90 Nm.

18.6.13 Install the generator stator

Secure the magnet stator assembly on the crankshaft on the left side by tightening the two M5×10 screws and M5×30 screws.

Torque setting: Generator stator screws: 7 to 9 Nm.

18.6.14 Install the crankcase cover on the left side

Remove the old gasket and replace it.
Fit the crankcase cover on the left side and secure with the M6×35 bolts.

Torque setting: Crankcase cover bolts on left side: 11 to 13 Nm.

18.7 CRANKCASE, CRANKSHAFT, GEARBOX AND BALANCER SHAFT

18.7.1 Removing the crankcase

Set the left crankcase down with its internal side facing up.
Remove the eight M6×65 bolts and five M6×45 bolts, separate the left crankcase from the right and remove the 2 dowel pins.

18.7.2 Remove the crankshaft, balancer shaft, mainshaft and countershaft

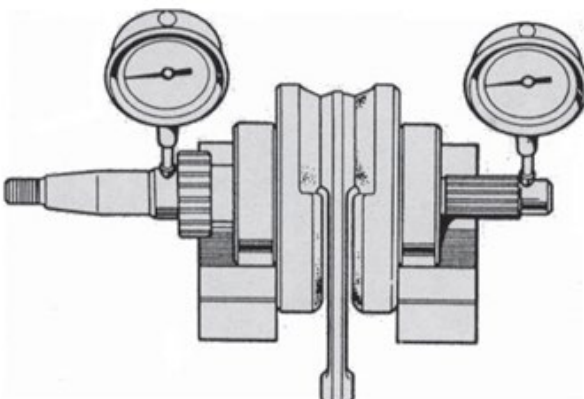
Remove the crankshaft assembly, balancer shaft, gearshift fork shaft, gearshift fork, shift drum, mainshaft assembly and countershaft assembly.

Make sure you do not miss any of the mainshaft assembly and countershaft assembly components.

18.7.3 Inspect the crankshaft

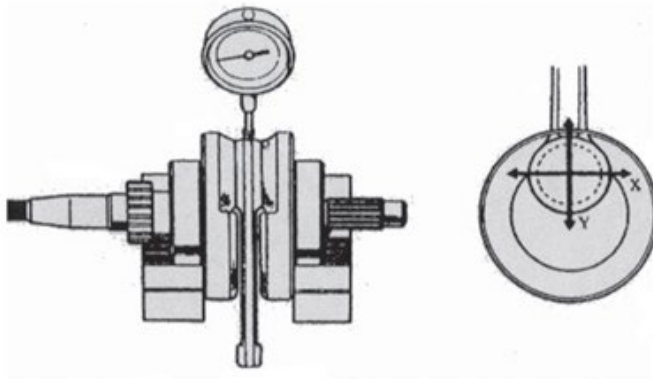
Set the crankshaft on a pair of V-blocks.
Using a dial gauge, measure the crankshaft's radial runout.
Actual radial runout must be 50% of the TIR value.

Service limit value: 0.1 mm



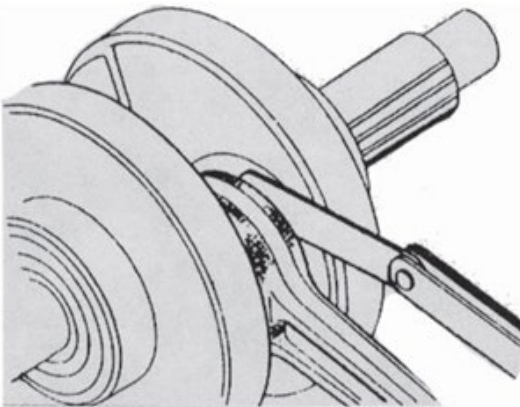
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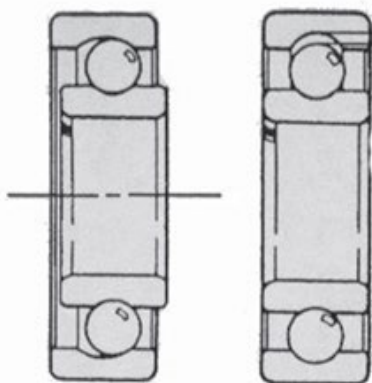
Measure the radial clearance of the connecting rod big end at two points in both the X- and Y-directions.

Service limit value: 0.02 mm



Use a feeler gauge to measure the connecting rod big end's side clearance.

Service limit value: 0.7 mm



18.7.4 Inspect the bearings on the crankcase left and right sides

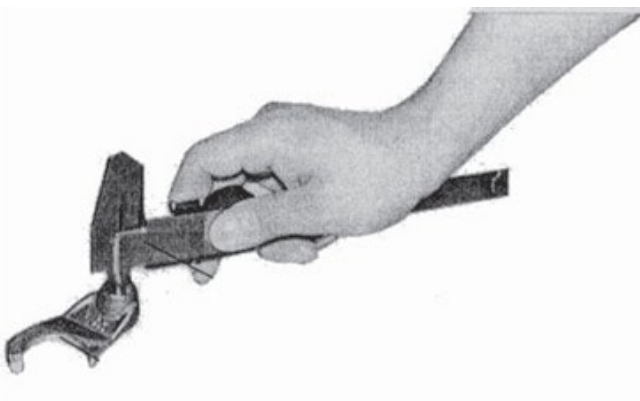
Check all bearings on the crankcase left and right sides for slow rotation and, if this is the case, install new bearings of the same type. Remove the bearings from the crankcase to check eccentricity and ensure they rotate smoothly. If they are noisy, eccentricity is excessive, or if they are not running smoothly, install new bearings.

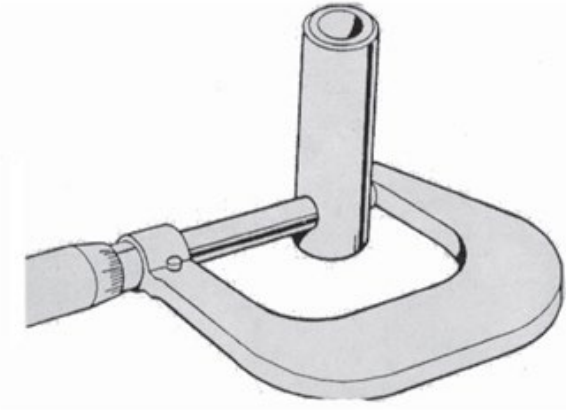
18.7.5 Inspect the shift fork, fork shaft and shift drum

Check the shift forks for wear, warp or other defects, and measure the inside diameter of the shift fork.

Shift fork service limit value:
φ 12.45 mm

Countershaft fork service limit value: φ 12.45 mm

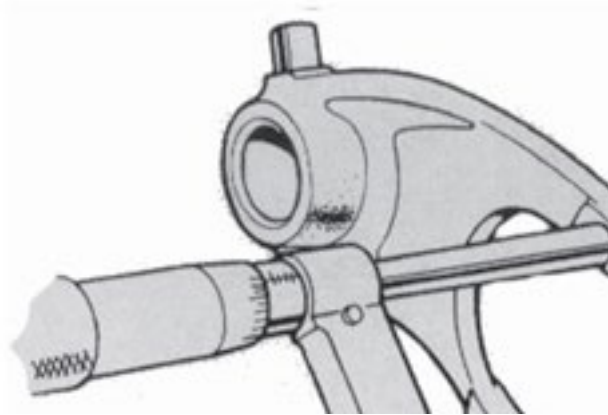




Check the mainshaft and countershaft forks for wear, damage or warp, and measure the outside diameter.

Mainshaft fork shaft service limit value: \varnothing 11.95 mm

Countershaft fork shaft service limit value: \varnothing 13.95 mm



Measure the thickness of the ends.

Service limit value: 4.7 mm



Check the shift drum surface and slots for wear or damage.



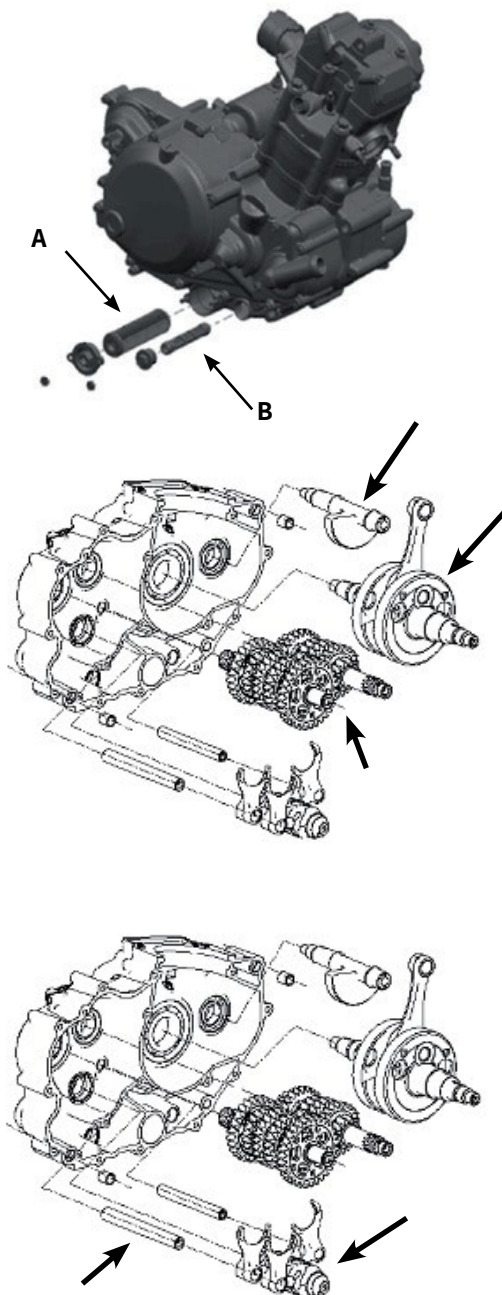
18.7.6 Inspect the mainshaft assembly and countershaft assembly

Check all mainshaft and countershaft gears for excessive or unusual wear.

Check that none of the circlips between the gears are misshapen or have popped out.

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18.7.7 Inspect the oil filters and their components

Check that oil filters and their components are clean: clean any fouled parts with clean petrol.

The fine filter "A" is a paper filter: do not use petrol to clean it.

The primary filter "B" is a metal filter.

Check the oil filters and their components for damage, and replace them if damaged.

18.7.8 Assemble the gearbox, crankshaft and balancer shaft

Insert the crankshaft and balancer shaft in the relevant openings in the crankcase left side.

Insert the mainshaft and countershaft components in the relevant openings in the crankcase left side, and fit the fork in its proper location.

Insert the fork marked R on the countershaft on the right side, the fork marked L on the countershaft on the left side, and the fork marked C on the mainshaft.

Fit the shift drum into the relevant openings in the crankcase left side, and the other end of the fork on the shift drum in the relevant slots before inserting the fork shaft in the relevant fork.

Slide the longest fork shaft through the forks marked R and L, and the shortest one through the fork marked C.

18.7.9 Assemble the left and right crankcase halves and the filter

Coat the right crankcase's mating surface with a layer of silicone sealant, insert the dowel pin in the relevant slot on the left crankcase, fit the right and left crankcases together, insert the five M6×45 bolts and eight M6×65 bolts in the relevant slots on the left crankcase and tighten them.

Torque setting: Left and right crankcase halves assembly bolts: 11 to 13 Nm

Insert the oil filter components in the relevant slots in the crankcase.



When installing the oil filter, keep the opening facing the crankcase's left side.

Install the filter cap on the pin and secure in place by tightening the two M5 nuts.

**Torque setting:
Engine oil filter cap nuts: 7 to 9 Nm.**

Insert the oil filter assembly in the relevant slots in the crankcase left and right sides before fastening the filter cap.

**Torque setting:
Oil filter assembly fasteners: 11 to 13 Nm.**

CHAPTER 19

**MAINTENANCE
CHART**



Unless you have all the specific tools, clothing and suitable protective equipment, and a suitable place to perform work safely, you are advised to refrain from performing maintenance. If you require technical advice or assistance from customer support, please contact an Authorized Fantic Motor Centre.



Fantic Motor disclaims all civil or criminal liability for damage to the vehicle or property, and/or injury to persons, as a result of maintenance work carried out by the user.



If users are not interested in carrying out certain routine maintenance procedures themselves, they are advised to contact an Authorized Fantic Motor Centre.



Perform maintenance work at shorter intervals if the vehicle is used in rainy or dusty areas, on uneven ground, or for racing.



Inspect and check the engine oil level every 1,000 km (600 mi).



The vehicle must go in for its first service within its first year of use, even if it has not completed the stated 1,000 km (600 mi).



The vehicle must go in for a further checkup within its second year of use, even if it has not completed the stated mileage.



The vehicle will not be covered under warranty unless it is serviced as prescribed (first service in the first year and second in the second year).



The vehicle must go in for regular annual checkups unless it reaches a stated service distance (in kilometres or miles) earlier.

19.1 INJECTION MAINTENANCE CHART

Position	Work	1,000 km (600 mi)	5,000 km (3,000 mi)	10,000 km (6,000 mi)	15,000 km (9,000 mi)	20,000 km (12,000 mi)
Fuel system	- Check petrol hoses for cracking or damage.		✓		✓	
Spark plug	Check condition. - Clean and restore electrode gap.	✓	✓	✓	✓	✓
	- Replace.			✓		
Valves	- Check valve clearance. - Adjust.	✓	✓	✓	✓	✓
Air filter	- Clean.	✓		✓		
	- Replace.		✓		✓	
Clutch	- Check operation. - Adjust.	✓	✓		✓	
Front brake	Check operation, fluid level, and inspect vehicle for leaks.	✓	✓		✓	
	Replace brake pads.	If worn down to limit value.				
Rear brake	- Check operation, fluid level, and inspect vehicle for leaks.	✓	✓		✓	
	- Replace brake pads.	If worn down to limit value.				

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Position	Work	1,000 km (600 mi)	5,000 km (3,000 mi)	10,000 km (6,000 mi)	15,000 km (9,000 mi)	20,000 km (12,000 mi)
Brake hoses	- Check for cracking or damage. - Check for correct routing and tightening.		✓		✓	
	- Replace.	Every 4 years.				
Brake fluid	- Replace.	Every 2 years.				
Wheels	- Check for runout or damage.		✓		✓	
Tyres	- Check tread depth and inspect for damage. - Replace where necessary. - Check air pressure. - Correct where necessary.		✓		✓	
Wheel bearings	- Check that bearings have not come loose or been damaged.		✓		✓	
Swingarm	- Check operation and inspect for excessive play.		✓		✓	
	- Lubricate with lithium soap grease.	Every 24,000 km (14,000 mi).				
Drive chain	- Check drive chain tension, alignment and condition. - Inspect and check the front and rear sprockets. - Adjust and lubricate the drive chain fully with a specific chain lubricant.	Every 500 km (300 mi). Following heavy use.				
	- Replace.	If chain elongation exceeds 2%.				
Steering bearings	- Check bearing play and steering stiffness.	✓	✓		✓	
	- Lubricate with lithium soap grease.	Every 24,000 km (14,000 mi).				
Frame and suspension fasteners	Make sure all nuts, bolts and screws are tightened correctly.	✓	✓	✓	✓	✓
Brake lever pivot bolt	- Lubricate with silicone grease.		✓		✓	
Brake pedal pivot bolt	- Lubricate with lithium soap grease.		✓		✓	
Clutch lever pivot bolt	- Lubricate with lithium soap grease.		✓		✓	
Kickstand	- Check operation. - Lubricate with lithium soap grease.		✓		✓	
Fork	- Check operation and inspect for oil leaks.		✓		✓	
	- Change the oil.			✓		
	- Replace oil seals			✓		✓
Rear shock absorber	- Check operation and inspect the shock absorber for oil leaks.		✓		✓	
Rear suspension pivot points	- Check operation of linkage.		✓		✓	

CHAPTER 19

**MAINTENANCE
CHART**

Position	Work	1,000 km (600 mi)	5,000 km (3,000 mi)	10,000 km (6,000 mi)	15,000 km (9,000 mi)	20,000 km (12,000 mi)
Engine oil	- Check the oil level and inspect the vehicle for oil leaks.	Every 1,000 km (600 mi).				
	- Change.	✓	✓	✓	✓	✓
Engine oil filter	- Replace.	✓	✓	✓	✓	✓
Cooling system	- Check the coolant level and inspect the vehicle for coolant leaks.		✓		✓	
	- Change the coolant.	Every 3 years.				
Front brake and rear brake switches	- Check operation.	✓	✓		✓	
Moving parts and cables		✓	✓	✓	✓	✓
Throttle	- Check operation. - Check throttle play and adjust where necessary. - Lubricate the throttle cable and assembly.		✓		✓	
Lights, indicators and switches	- Check operation. - Adjust headlight beam height.	✓	✓		✓	

**MAINTENANCE
CHART**

CHAPTER 19

19.2 CARBURETTOR MAINTENANCE CHART



NOTE: Perform maintenance work at shorter intervals if the vehicle is used in rainy or dusty areas or on uneven ground.

KEY

- 1** → Inspect and clean, adjust, lubricate, as necessary.
- 2** → clean;
- 3** → replace;
- 4** → adjust.

Parts	End of running-in 500 km (321 mi)	Every 2000 km (1250 mi) or 12 months	Every 5000 km (3125 mi) or 12 months
Spark plug	1	1	3
Clutch play	4	4	
Lighting system	1	1	
Engine idling	4	4	
Wheels/tyres and inflation pressure	once a month 1		
Chain tension and lubrication	every 500 km (321 mi) 1		
Front and rear brake pad wear	every 2000 km (1250 mi) 1		
Nut and bolt tightness	1	1	
Coolant	every 2000 km (1250 mi) 1		
Rear shock absorber			1
Carburettor	2	2	2
Clutch cables and controls	1	1	
Wheel alignment		1	
Steering head bearings and steering play	1	1	
Wheel bearings		1	
Brake discs	1	1	
Air filter	3	3	
General vehicle operation	1	1	

CHAPTER 19

**MAINTENANCE
CHART**

Parts	End of running-in 500 km (321 mi)	Every 2000 km (1250 mi) or 12 months	Every 5000 km (3125 mi) or 12 months
Braking systems	①	①	
Brake fluid	every 2 years ③		
Valve clearance	①	①	
Exhaust/silencer			
Engine oil and oil filter	③	③	
Fork oil and oil seal	every 12000 km (7500 mi) ③		
Nut and bolt tightness	①	①	
Final drive (chain, sprockets)		①	
Fuel line		①	every 4 years ③
Clutch wear	①	①	

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