SHERCO

MANUEL D 'ATELIER / WORKSHOP MANUAL / MANUAL DE TALLER

SHERCO

TABLE OF CONTENTS

This manual is primarily intended for qualified mechanics working in a properly equipped workshop.
The success of the various operations requires some mechanical skills and the SHERCO specific tools for the 125 / 250 / 300 ST engines.
This workshop manual complements the SHERCO 125 / 250 and 300 ST owner's manual.

Tool part number	Designation
10981	Crankshaft fitting tool
10982	Clutch lock tool
10983	Coolant connector fitting/ removal tool
10984	Flywheel puller
10985	Flywheel locking tool
10986	Primary drive locking tool
10987	Clutch spring centering tool
10988	Shifter spring locking tool
R455	Engine support
R481	Oil pan

ENGINE

	125	250	300
Type	Single cylinder, liquid cooled, two-stroke		
Displacement	123,70 cc	249,70 cc	294 cc
BoreXstroke	54X54 mm	72,8X60 mm	79X60 mm
Fuel	Premix with unleaded fuel (RON 98 minimum) and special injection 2 stroke oil, Premix ratio : 1,5%		
Cooling	Liquid, forced circulation		
Ignition system	Hidria Digital		
Spark plug	NGK BPMR6A		
Electrodes gap	0.7 mm		
Piston	Cast, graphite coated skirt		
Gearbox oil	450 ml , ATF type		
Primary drive	82 x 23	82 x 23	78 x 28
Gears	5 gears		
1st	13 : 41		
2nd	15 : 38		
3rd	17 : 37		
4th	21 : 30		
5th	30 : 24		
Secondary drive	9 X 42	10 x 42	9 X 44
Clutch	Hydraulic , diaphragm spring		
Starting	Geared, foldable kickstarter		

CHASSIS

Frame	Tubular, Chrome-Molybdenum steel
Fork	Tech 39mm Aluminium
Rear shock	2 way Reiger shock Aluminium swingarm
Front / rear stroke	165 / 175mm
Front brake	Disc Ø 185mm
Rear brakee	Disc Ø 145mm
Front tyre	2,75-21''
Rear tyre	4,00 - 18''
All terrain pressure FRONT/REAR	0.4/0.3 bar
Fuel tank capacity	2,2L / 0.58 US Gal (no reserve)
Wheelbase	1322 mm

FORK

Factory settings , TECH 39mm fork :

Spring preload	From fully closed, turn 5 ½ turns
Rebound	From fully closed , count 19 clicks
Stroke end setting	From fully closed , turn 2 ½ turns
Compression	From fully closed, open 1¾ turns
Left hand side leg oil level	140 mm
Righ hand side lego il level	85 mm

SHOCK ABSORBER

Factory settings, – REIGER shock :

Spring	70 N/mm
Spring preload	7.0mm +/- 0.8mm
Restrictor	1.55 mm
Rebound	From fully closed , count 33 clicks
Compression	From fully closed , count 9 clicks

CAUTION

Before every operation, make sure the bike is steady and won't fall.

Front end

1.1 Wheel bearings change

- Undo locking screw on the right fork foot
- Unlock wheel spindle and remove it.
- Remove the wheel
- Front wheel spindle tightening torque : **100Nm**.

- With a heat gun, heat the bearing housing on the hub.
- Extract bearings with a suitable tool and replace them by new ones.

CAUTION

Using a vernier caliper, check intern spacer's length and replace it if needed.

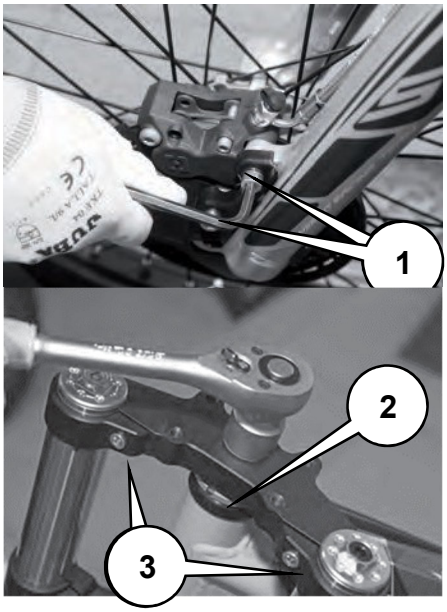
Minimum length : 67.5mm

1.2 Front brake disc change :

- As changing front brake disc, during assembling apply medium threadlocker (Loctite 243) on the screws and tighten them to a **12Nm** torque.
- Reassemble the wheel following the reverse procedure , applying a thin coat of grease on the front wheel spindle.

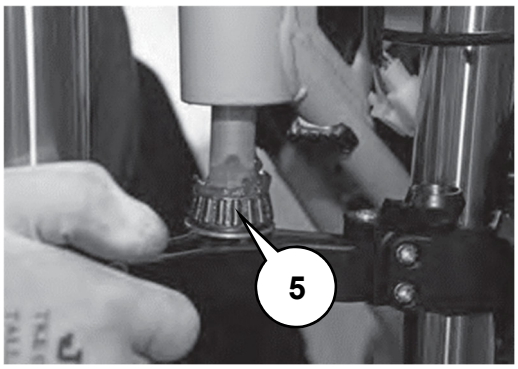
1.3 Fork disassembly and steering head bearings change

- Undo the two M8 screws ❶ and remove the caliper
- Check brake pads minimum thickness.
  Wear limit : 1mm



- Undo four M8 screws of the handlebar clamps and remove handlebar.
- Undo the steering column nut ❷, then the triple tree clamp M8 screws ❸ and remove it

- Undo the steering stem counternut, ❹ and its dust cover, then remove the fork from the frame.



- Replace both top and bottom bearings : the ones in the steering head and the steering stem ❺ by new ones (part number **C009)** , applying grease on it.
- During reassembly, tighten steering stem counternut so the front end can swing freely , without play and without hard point. Then place upper fork clamp and tighten its nut.

Tightening torques :

Steering stem counternut : **20 Nm**.

Caliper screw: 24 Nm

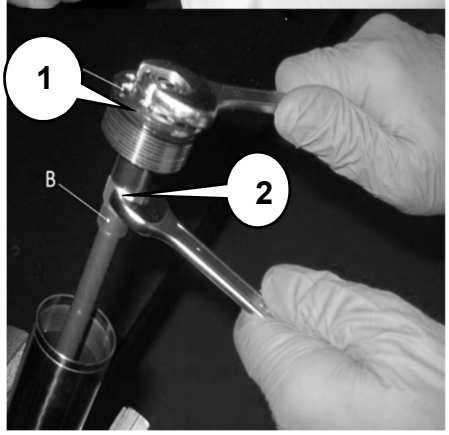
1.4 TECH fork servicing

CAUTION

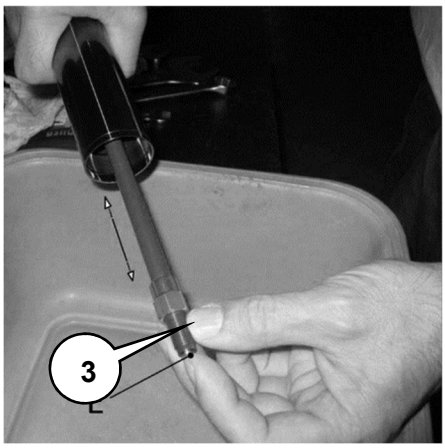
Service the fork every 20 hours of use or every 6 months

1.4.1 Right side oil change

- Place the fork tube in a vise with a suitable support so as not to damage it
- Using a 17mm wrench, undo the cap



- Remove the cap ❶ from the fork tube in order to reach the nut ❷.
- Hold the cap ❶ and unlock the nut ❷ using a 14mm wrench
- Remove the cap from the damping rod



- Hold the damping rod ❸ then drain oil in a container , doing a back and forth movement, as shown in the picture:

- Put fork leg vertically and pour **250cc** of new oil inside.

CAUTION

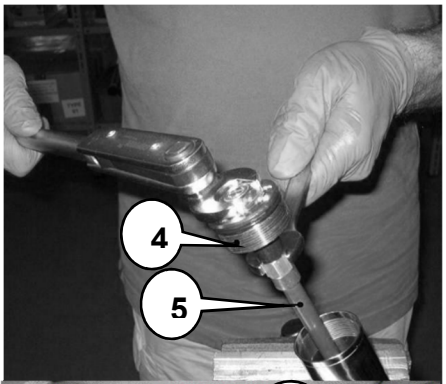
Use SAE 5 type oil.

- Do a back and forth movement as shown in the picture to prime the hydraulic system, until you feel resistance.

- Compress the fork tube and damping rod to the maximum.
- Measure oil level from the top of the tube, then fill until you reach the desired height.

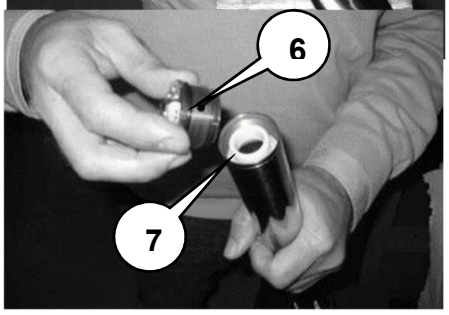
  Oil level : 85mm

- Undo totally the damping rod nut and place the cap
- Tighten the cap ❹ with the nut ❺ to a **12Nm** torque.
- Tighten the cap to the tube at a **12Nm** torque.

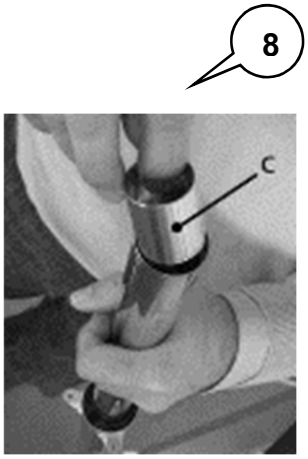


1.4.2 Left side oil change

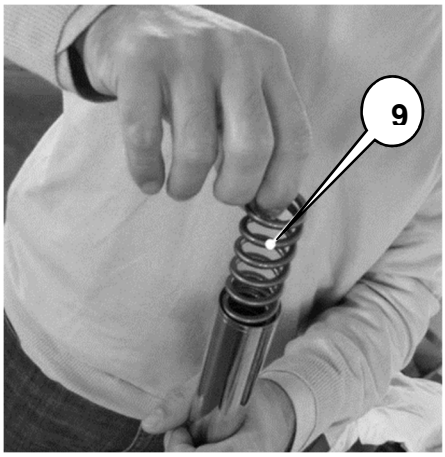
- Using a 17mm wrench, undo the cap ❻
- Remove conical spacer ❼.



- Remove spacer ❽ , as well as the washer placed between it and the spring.

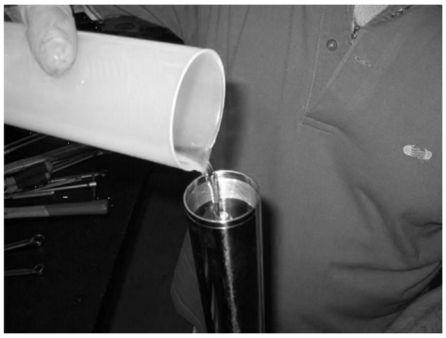


- Remove the spring ❾ and clean it with a cloth.
- Drain the oil.



- Put fork leg vertically and pour **250cc** of new oil inside.

  • Do a back and forth movement as shown in the picture to prime the hydraulic system, until you feel resistance.



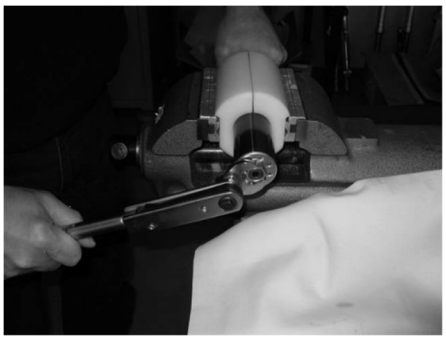
- Compress the fork tube and damping rod to the maximum.

- Measure oil level from the top of the tube, then fill until you reach the desired height.

  Oil level : 140mm

- Reassemble, in this order : the spring, the washer, the spacer, the conical spacer then the cap.

  • Place the fork tube in a vise with a suitable support so as not to damage it and tighten the cap to a **12Nm** torque.



❯| Rear end

2.1 Wheel bearings change

- Hold wheel spindle on the left side and undo the nut on the right side.
- Remove the spindle from the left.
- Remove the wheel and the wheel spacers.

Rear wheel spindle tightening torque : 100 Nm

- Using a heat gun, heat the hub at the bearing seat.
- Extract bearings using a suitable tool (ø 20)
- Replace bearings by new ones.
-

CAUTION

Using a vernier caliper, check intern spacer's length and replace it if needed.

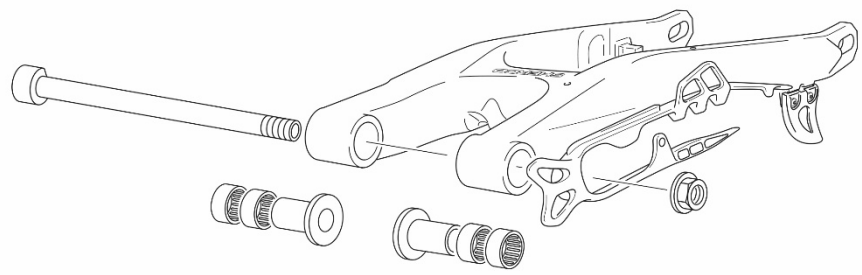
Minimum length : 118.5mm

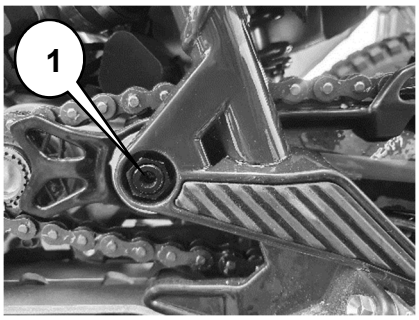
2.2 Brake disc change

- As changing front brake disc, during assembling apply medium threadlocker (Loctite 243) on the screws and tighten them to a **12Nm** torque..

Reassemble the wheel following the reverse procedure , applying a thin coat of grease on the wheel spindle.

2.3 Swingarm bearings check





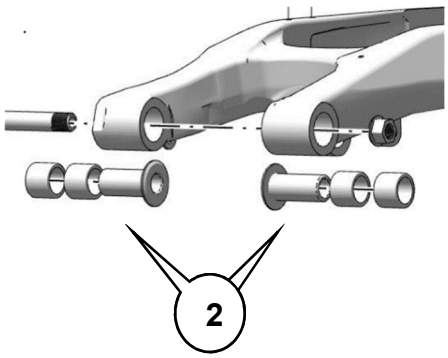
- Undo the nut on the bottom part of the swingarm and remove linkage shaft.
- Unlock swingarm spindle ❶ and remove it.

Linkage shaft tightening torque :

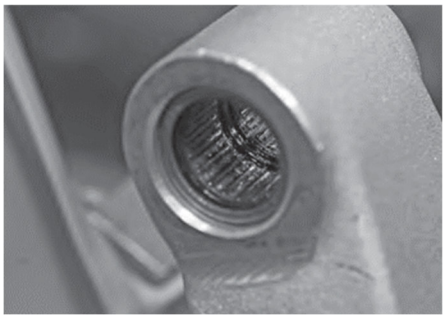
40 Nm

Swingarm spindle tightening torque : 50 Nm

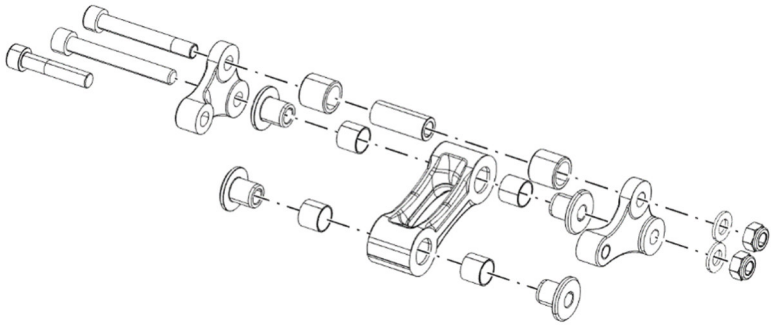
- Remove swingarm and take the two intern spacers ❷ out.



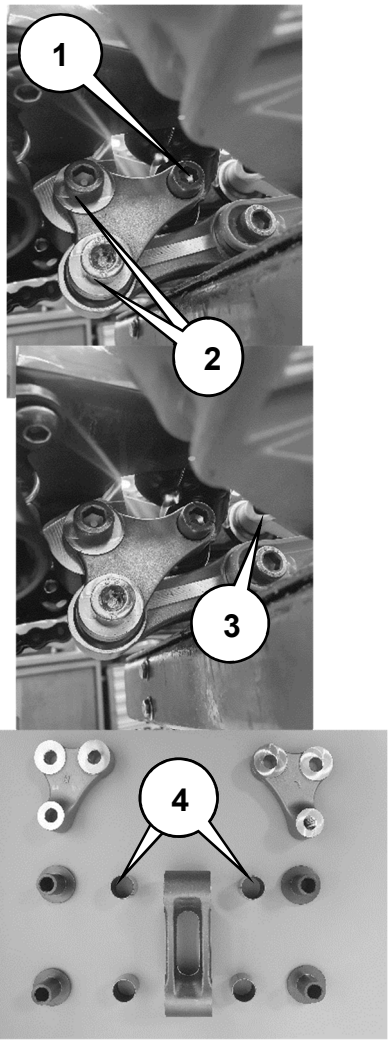
- Check the needle bearings of both sides.. In case of rust, replace them. Otherwise, apply grease before reassembling.
- Reassemble the set following the reverse procedure and applying grease on swingarm spindle and linkage shafts.



2.4 Suspension linkage check



- Loosen lower suspension shaft ❶ and linkage shafts❷.
  - Loosen the tie-rod screw ❸.



- Remove all the shafts and the linkages.

  Remove the linkage inner ring and check the bushings ❹. In case of wear sign, replace them by new ones.

  Reassemble the set following the reverse procedure , applying grease on the shafts and bushings.

- **Shock screw tightening torque : 40 Nm**
  - **Linkage shaft tightening torque : 40 Nm**

  Tie-rod screw tightening torque : 40 Nm

OPERATIONS REQUIRING THE REMOVAL OR NOT OF THE ENGINE

	OPERATIONS REQUIRING THE REMOVAL OF THE ENGINE	OPERATIONS NOT REQUIRING THE REMOVAL OF THE ENGINE
Crankshaft (also connecting rod)	•	
Shifting mechanism	•	
Whole gearbox	•	
Crankshaft bearings	•	
Gearbox bearings	•	
Piston		•
Cylinder		•
Cylinderhead		•
Ignition		•
Kickstarter gears		•
Whole clutch		•
Coolant pump		•

Engine removal

CAUTION

To withdraw the engine, you must remove the swingarm spindle, which allows pulling away the rear wheel/swingarm unit. In order to prevent bike from falling, make sure it is held by the frame.

- Drain coolant and gearbox (see user's manual)
- Remove airbox.
- Remove fuel tank.
- Disconnect the engine-connected part of the wiring harness. (Ignition, spark plug, CDI).
- Remove the exhaust header
- Remove the ignition coil
- Remove the throttle body
- Undo the quick-release clip of the transmission chain, and remove the chain.
- Remove clutch slave cylinder.
- Remove coolant hoses connected to the engine
- Loosen all the engine holding screws.
- Loosen the swingarm spindle.
- Remove the frame-cylinder head bracket.
- Remove the engine holding screws
- Remove the swingarm spindle
- Withdraw the engine.

CAUTION

When the clutch slave cylinder is removed, the piston is no held anymore. Make sure it remains stuck , using a zip tie, for example.

Fitting the engine in the frame

To fit the engine in the frame, follow the reverse procedure, observing the tightening torques :

Engine screw: 40Nm

Swingarm spindle nut: 50 Nm

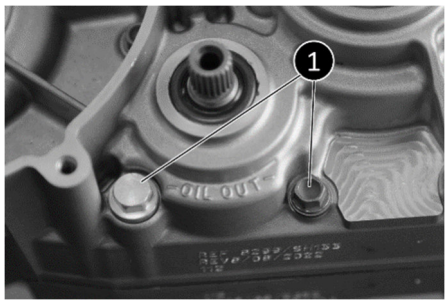
Clutch slave cylinder screw: 10 Nm

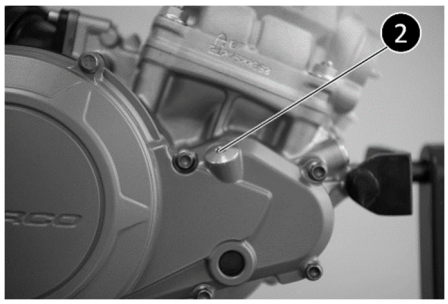
Cylinderhead-frame bracket: 23Nm

Exhaust nut: 10Nm

❱| Gearbox draining

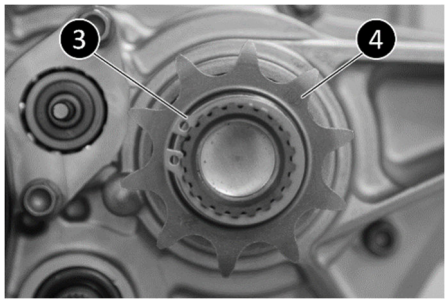
- Remove draining screws ❶ and the filler cap ❷, help the oil flow out by tilting the bike.





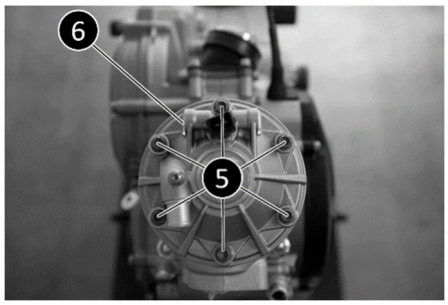
❱| Front sprocket removal

- Remove snap ring ❸.
- Remove front sprocket ❹.

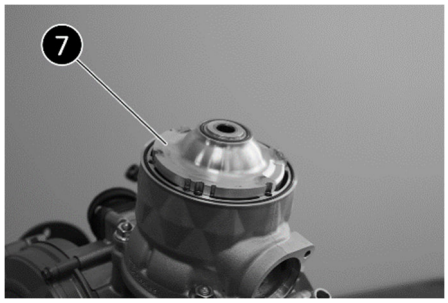


❱| Top-end removal

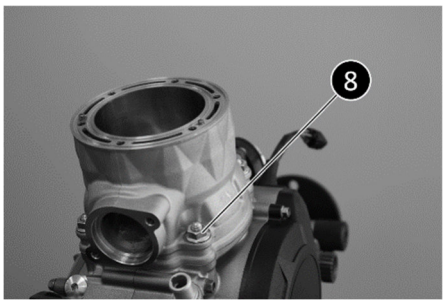
- Undo the screws ❺ and remove cylinderhead cover ❻.



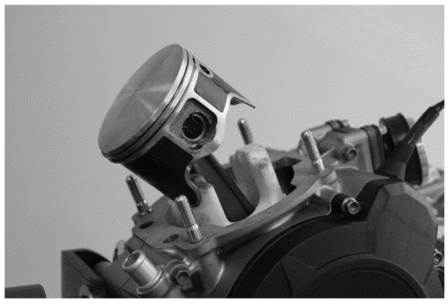
- remove the insert (combustion chamber) ❼ .



- Remove the four nuts ❽.

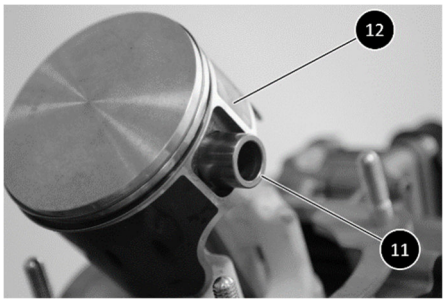


- Remove the cylinder
- Mask the opening in the crankcase.

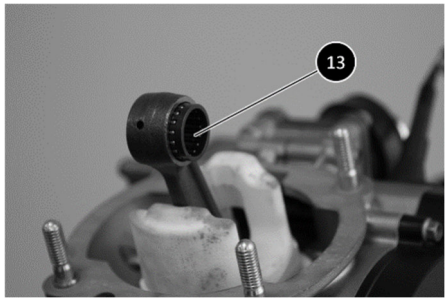


- remove the wrist pin snap ring ❿.

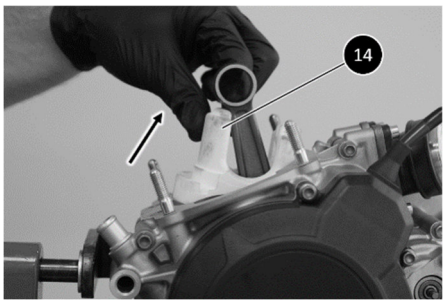
- Remove the wrist pin ⓫.
- Remove the piston ⓬.



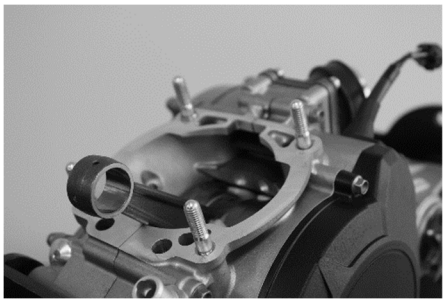
- Remove the needle cage⓭.



- tilt the inlay ⓮ to the rear and remove it to the top.

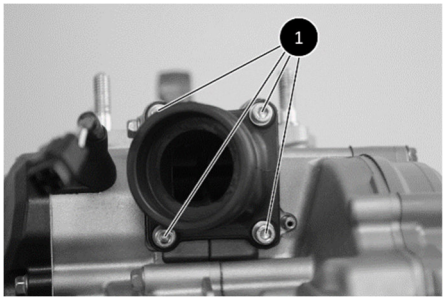


- remove base gasket



❱| Reeds valve removal

- Undo the 4 CHC screws ❶.

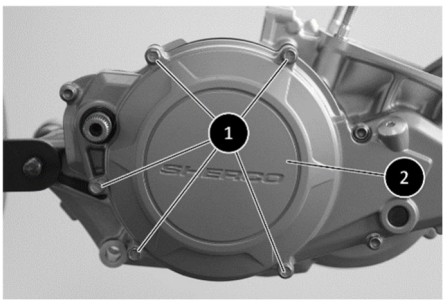


- Remove the reeds valve ❷ as well as the gasket ❸.

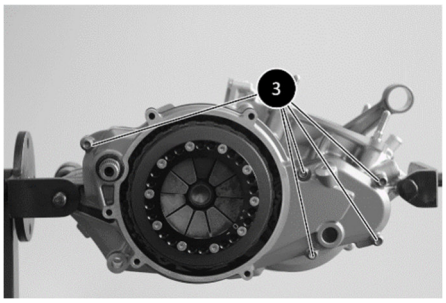
❱| Right side disassembling

❱| Clutch cover removal

- Undo the screws ❶.
- Remove the clutch cover ❷.

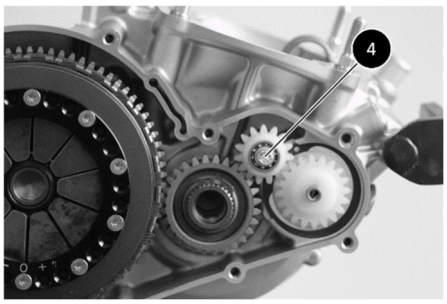


- Remove the screws ❸ as well as the clutch case.

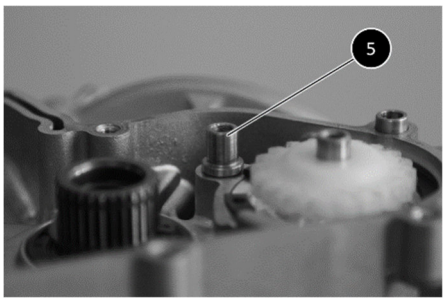


❱| Coolant pump disassembling

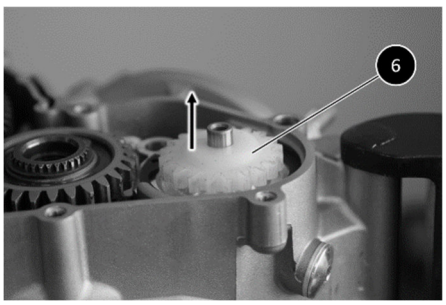
- Remove the CHC screw ❹ of the coolant pump idle gear, and its washer.



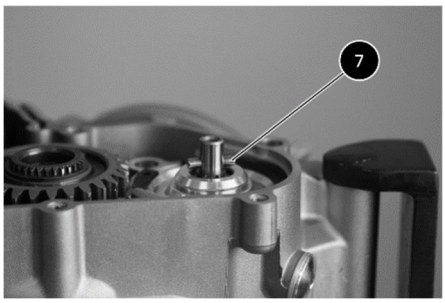
- Remove idle gear shaft ❺



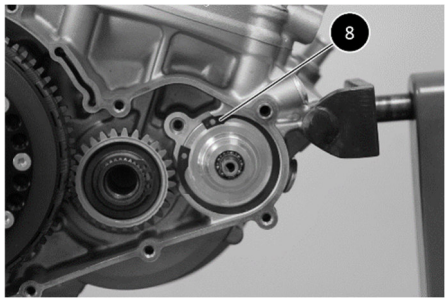
- Remove coolant pump gear ❻



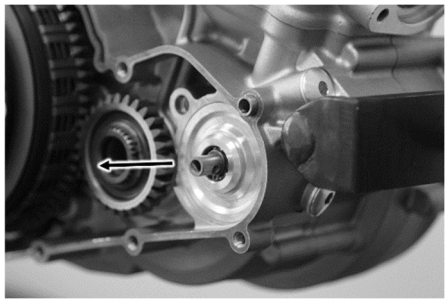
- Remove shaft ❼.

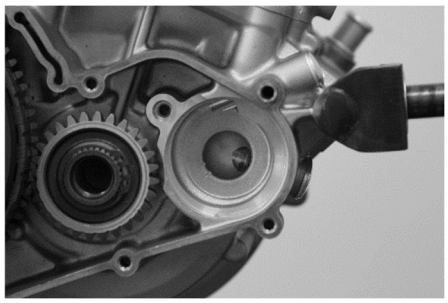


- Remove coolant pump snap ring ❽.



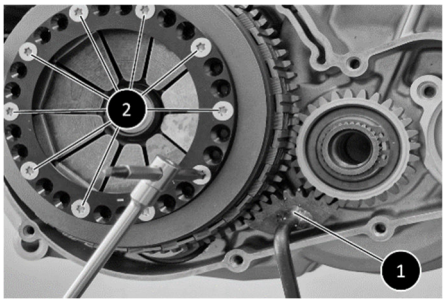
- With a pair of pliers, pull away the pump shaft in order to extract the pump body.



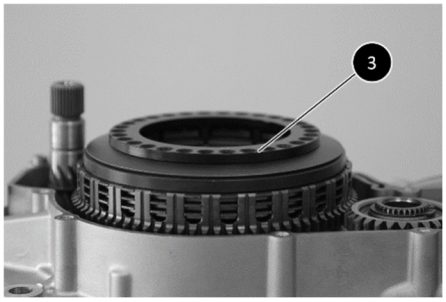


❯I Clutch and primary drive removal

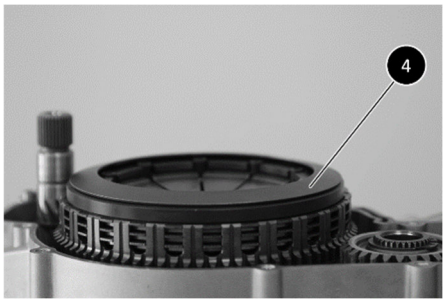
- Place the tool ❶ part number 10986 between the crankshaft gear and the clutch gear.
- Loosen clutch torx screws ❷ and remove them.



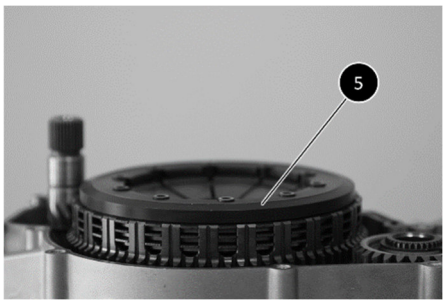
- Remove the preload plate ❸.



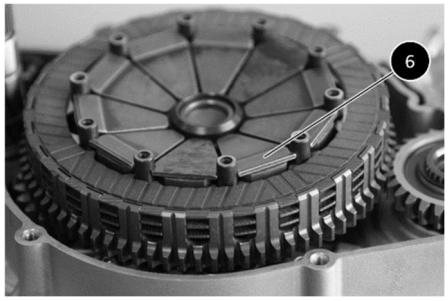
- Remove clutch spring ❹.



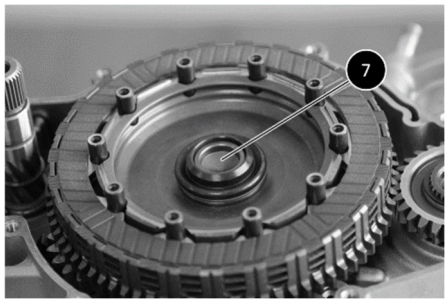
- Remove pressure plate ❺.



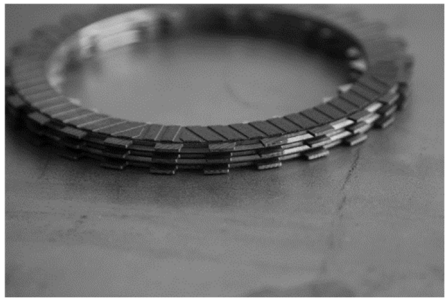
- Remove diaphragm pads ❻.



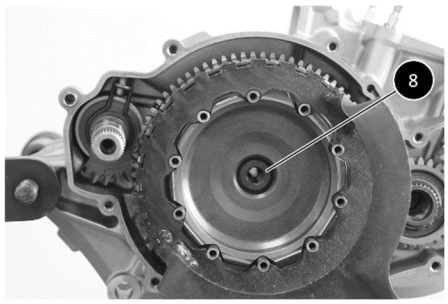
- Remove the clutch pusher ❼ , and the pushrod



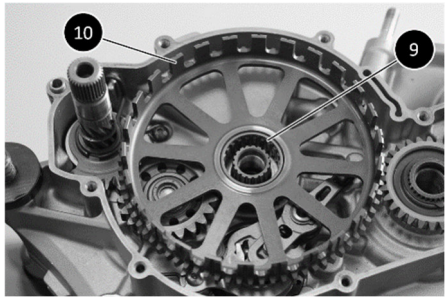
- Remove all the discs in one batch, taking care to keep them in the same position.



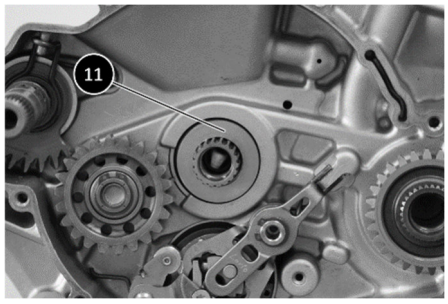
- Using the tool Reference 10982 hold the hub and the basket, to loosen the hub screw ❽.



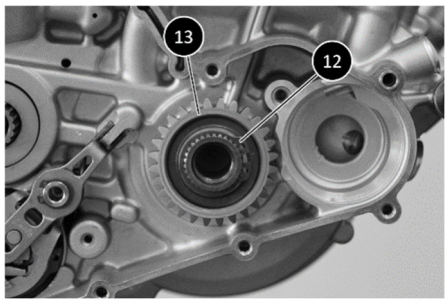
- Remove the needle cage ❾, and the clutch basket ❿.



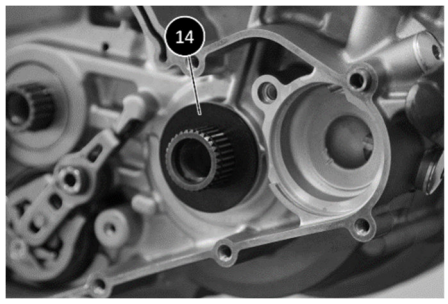
- Remove the washer ⓫.



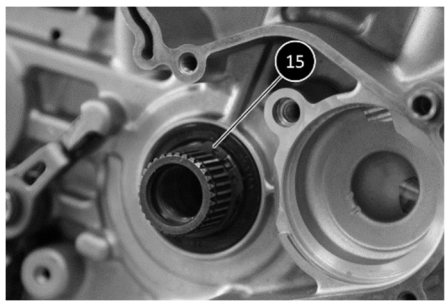
- Remove the snap ring ⓬ and the crankshaft gear ⓭.



- Remove the spring washer ⓮.

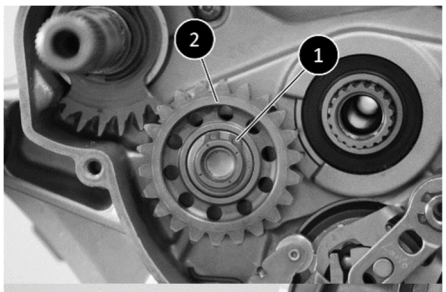


- Remove the snap ring ⓯ from the crankshaft

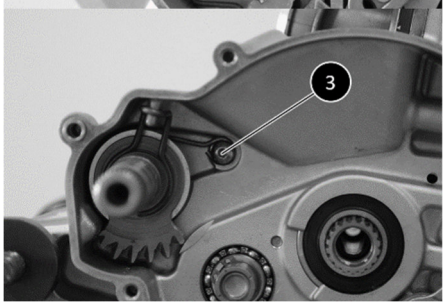


Kickstarter shaft removal

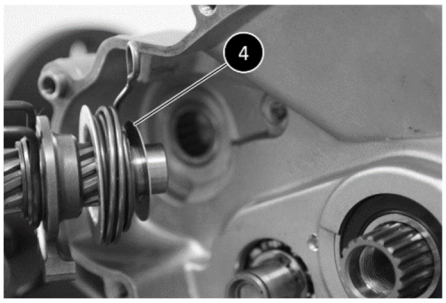
- Remove snap ring ❶ and idle gear ❷.



- Remove spring lock screw ❸.

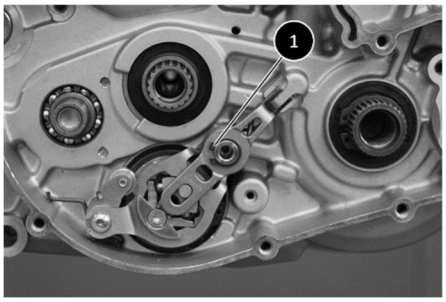


- Remove kickstarter shaft and the washer ❹.

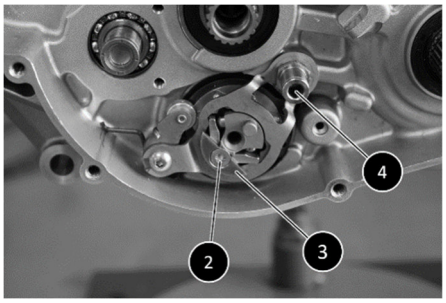


Shifting mechanism removal

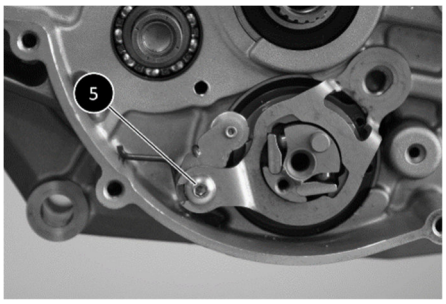
- Remove the snap ring ❶.
- Remove the return spring and the holding plate.



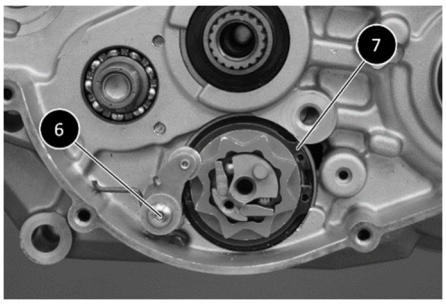
- Remove the torx screw ❷ and the shifting pawls's holding plate❸.
- Undo the shaft ❹.



- Slightly loosen the screw ❺ alowing the removal of the shifting mecanism.



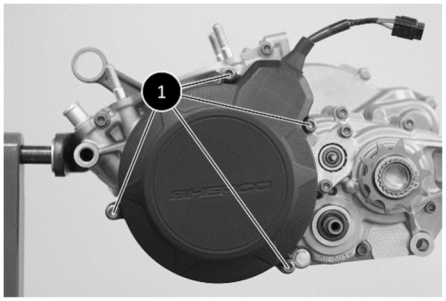
- Loosen the shifting locator screw ❻, remove it, as well as its spring.
- Remove the shifting drum snap gear ❼.



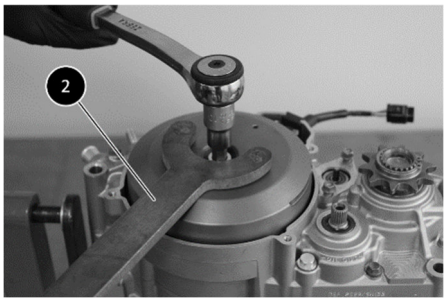
❱I Left side disassembling.

❱I Ignition removal.

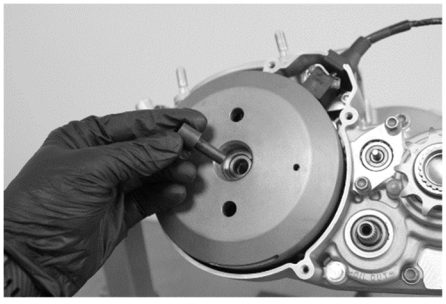
- Undo the four screws of the ignition cover ❶ and remove it , as well as its gasket.



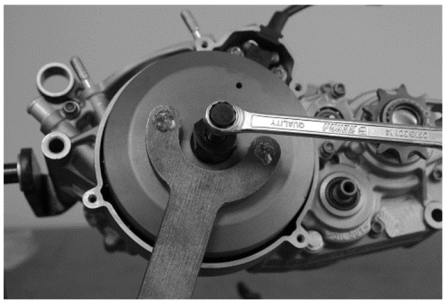
- Place the tool ❷ part number 10985 to hold the flywheel and unlock the screw.



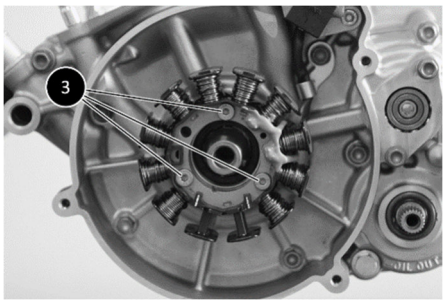
- Put the flywheel puller tool's extension part number10984.



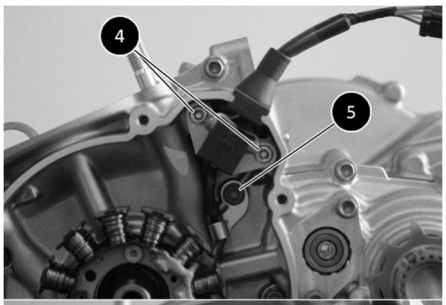
- Using the flywheel puller part number 10984 , remove the flywheel.



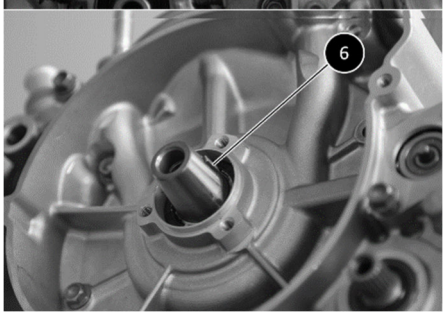
- Remove the 3 stator screws ❸



- Remove the pick-up holding screws ❹ and the wiring holding plate's screw ❺

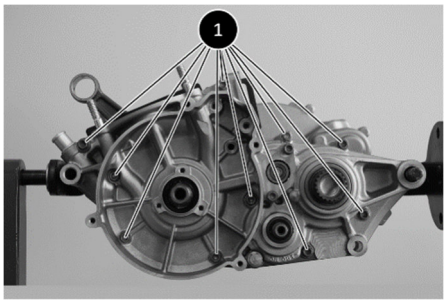


- Remove the flywheel woodruff key ❻.



Crankcase splitting

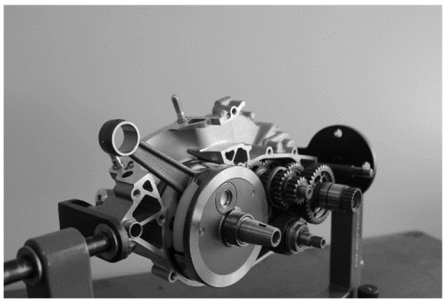
- After having removed the top-end, the intake, the right side and the left side,
- Turn the engine so you can see the ignition side.
- Remove the ten screws ❶.
- Lift the left crankcase , slightly hitting the output shaft and the crankshaft end with a rubber mallet.



CAUTION

Do not introduce a screwdriver or another tool between the cases to split them. You may damage the mating surfaces.

- Remove the central gasket.



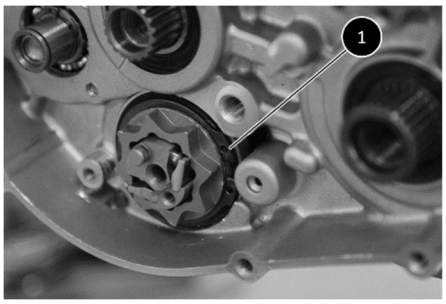
CAUTION

Take care about the gearbox shafts's trust shims. They may stick in the crankcase.

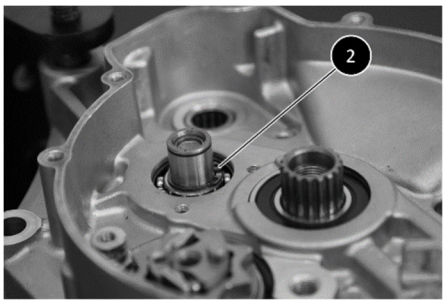
- Slightly hitting its end with a rubber mallet, remove the crankshaft.

Gearbox removal

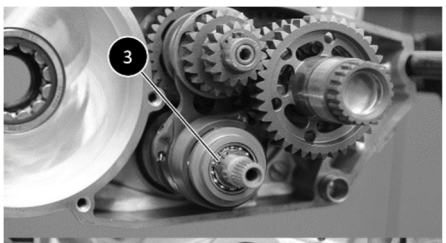
- Once you have done the previous steps, you may be able to remove the whole gearbox.
- Make sure the shift drum's snap ring ❶ is off.



- Remove the secondary shaft's snap ring ❷.

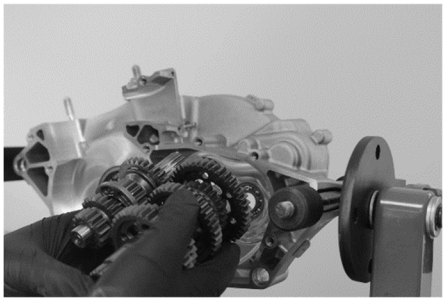


- Remove the gear selector shaft's snap ring ❸.



- Pinching the pawls, remove the gear selector shaft.

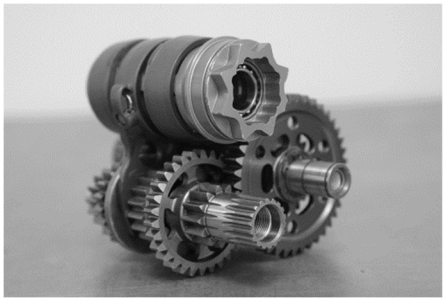
- To withdraw the gearbox, you must remove all the components (shifting drum, primary and secondary shafts) in one batch. If needed, slightly hit the shafts with a rubber mallet.



CAUTION

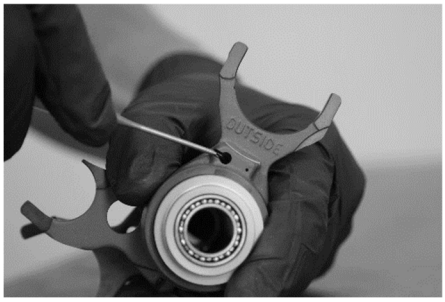
Take care about the gearbox shafts's trust shims. They may stick in the crankcase.

- Once the gearbox is removed you can separate the shifting drum from the shafts.

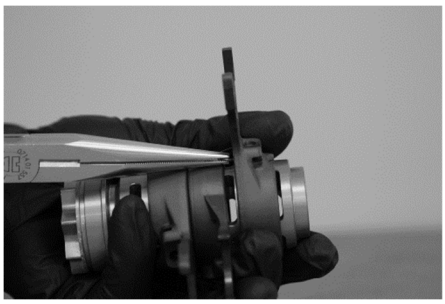


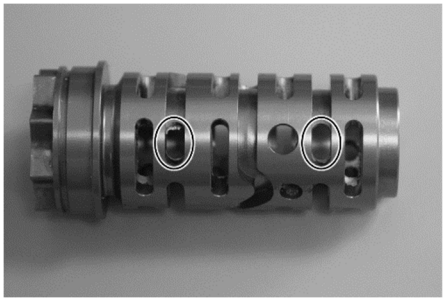
❯| Disassemble the selector fork- drum assembly

- Using a suitable tool, unlock the pin retaining clip ❶.



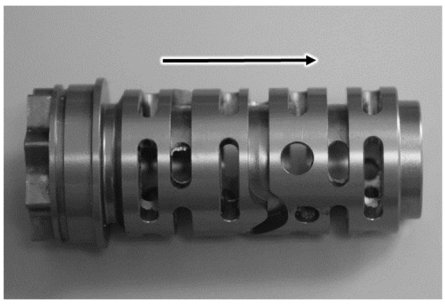
- Once the retaining clip is unlocked, remove it using a pair of pliers.





- Rotate the fork until you find the pins slots on the drum.

- Using a pin driver, push the pin to the inside of the drum.



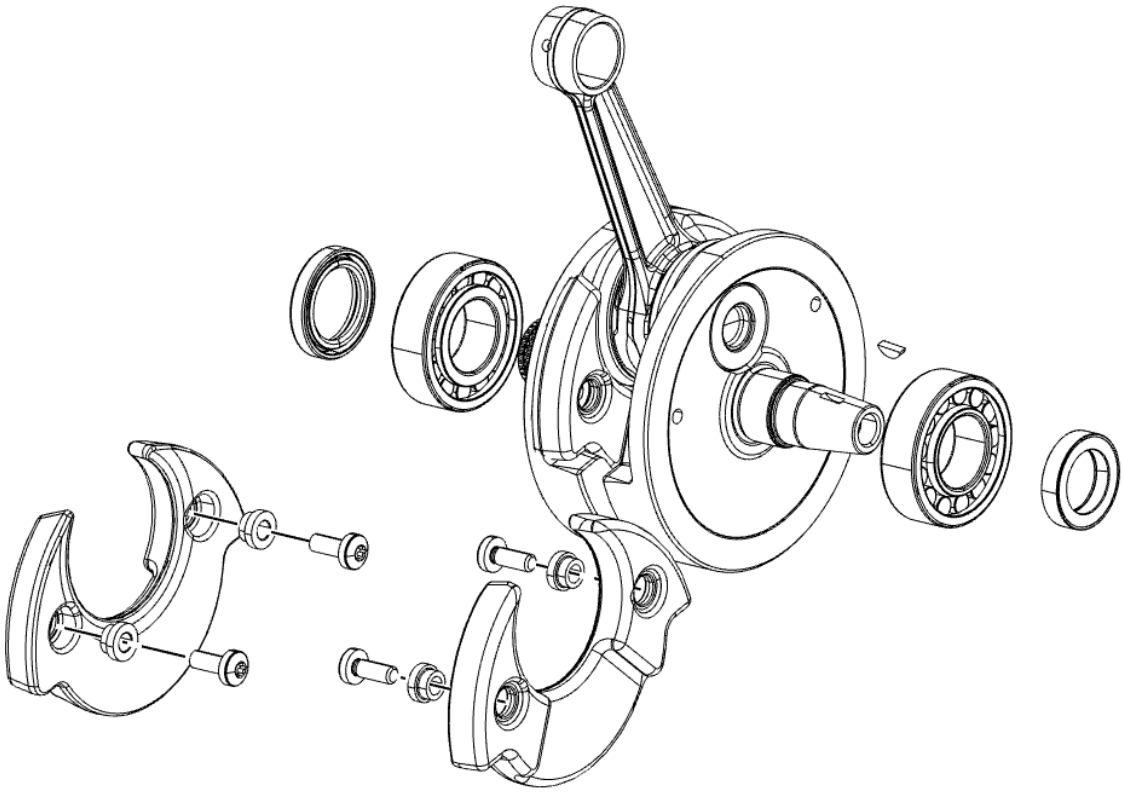
- Slide the forks the opposite way of the shifting star.

❱I Crankshaft removal

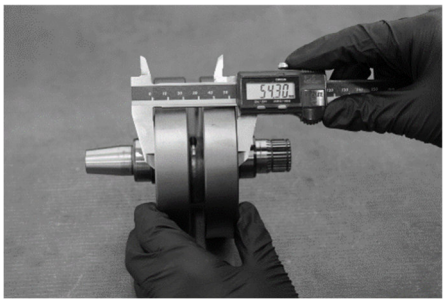
- Take the crankshaft out from its bearing (eventually hitting slightly its end with a rubber mallet)
- Clean all the parts and check for wear, replace them if needed.

CAUTION

When completely dismantling the motor, it's advised to replace all the gaskets, seals , O'rings as well as bearings.



❱| Crankshaft width measure



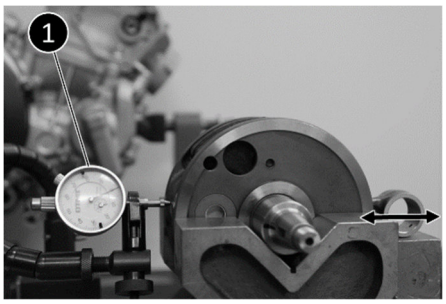
- Using a vernier caliper, measure the distance between both crank webs.

  Value :

  125cc → 56mm +0 / -0.2

  250cc / 300cc → 56mm +0 / -0.2

❱| Big-end radial play

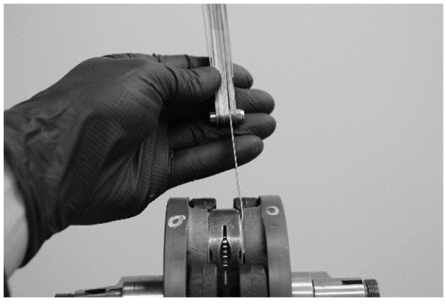


- Put the crankshaft on machinist V-blocks and place a dial gauge ❶ against conrod big end
- Push the conrod big end toward the gauge, then outwards. The difference between those two measures means the radial play
- Radial big end play :

Standard : 0.003 mm – 0.013 mm

If the radial play is beyond the maximum, the conrod kit must be replaced.

❱| Axial play of the big end



- Using thickness gauges, measure axial play of the big end.

Axial play of the big end:

Standard : 0.6 mm – 0.8 mm

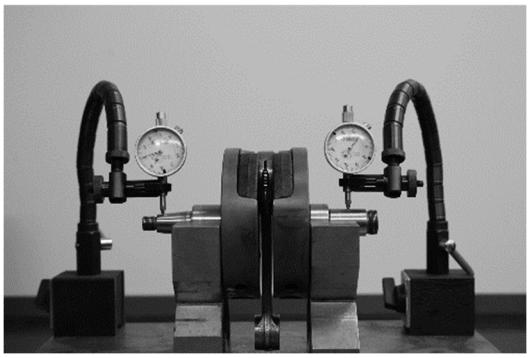
Maximum limit: 0.9 mm

If the conrod axial play is beyond the limit**, replace the conrod**

❱| Crankshaft runout check

- Put the crankshaft on an alignment device, or V-blocks, and place a dial gauge on the crankshaft axles, as shown :
-
-
-
- Then slowly rotate the crankshaft. The difference between measures means the runout.
- Runout:

Standard: 0.03 mm max.
Maximum runout: 0.05 mm



❱I Piston

- In case of fitting an used piston, check the following points:
- Skirt: Looking for seizure marks. Lights marks can be removed with a soft stone.
- Ring grooves: rings must be free in their grooves. In order to clean the grooves, you can use an old ring.
- The ring pins should not be worn or loose.
- Rings : check condition and end gap

❱I End gap

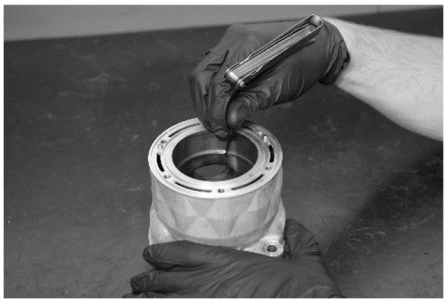
- Insert the ring in the cylinder, using the piston to make it square to the cylinder axis, to about 10mm of the cylinder deck.
- Measure end gap using a thickness gauge.

Ring end gap :

Standard :

125 : 0.35mm – 0.50mm

250 / 300 : 0.2mm – 0.4mm



CAUTION

If the end gap is greater than specified, you must check cylinder and piston condition. If they are within tolerance, only replace the rings.

t

❱I Wrist pin check

Wrist pin diameter ; 125cc:

Standard : 14,998 mm

Wear limit : 14,995 mm

Wrist pin diameter ; 250/300cc

Standard : 17,998 mm

Wear limit : 17,995mm

Wrist pin hole ; 125cc

Standard : 15,003mm

Wear limit : 15,007mm

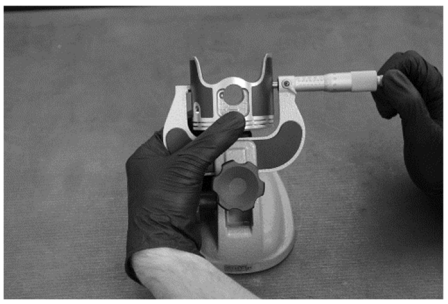
Wrist pin hole ; 250/300cc

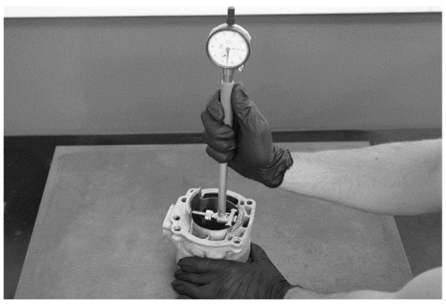
Standard : 18.002 mm

Wear limit : 18.006 mm

Cylinder – piston wear condition

- To determinate cylinder wear, measure cylinder bore with a dial bore gauge, about 10 mm from the cylinder deck. Make a cross-measurement in order to check ovalization.



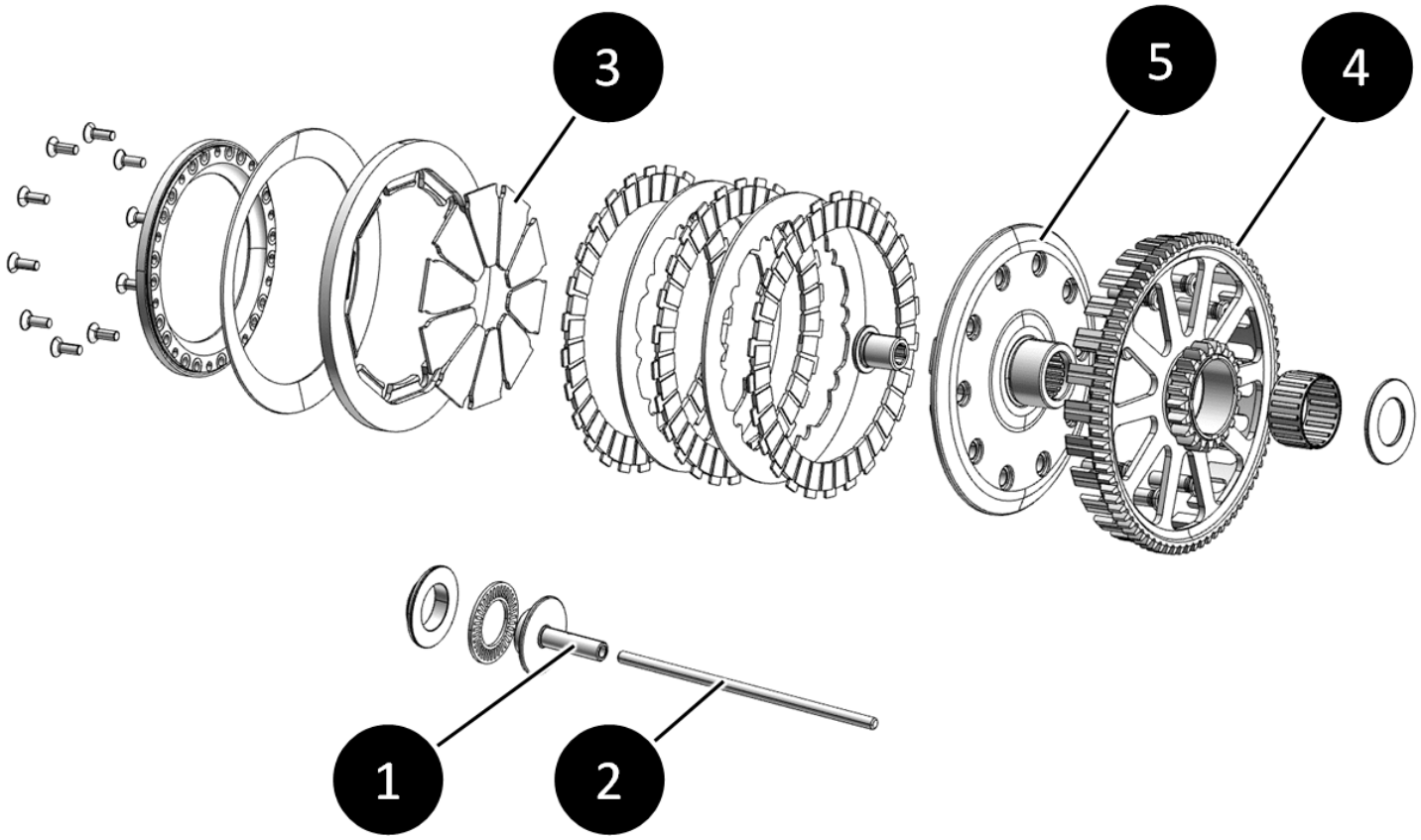


	125cc		250cc		300cc	
	A	B	A	B	A	B
Ø Piston	53,96	53,97	72,76	72,77	78,95	78,96
Ø Cylinder	53,975	53,985	72,79	72,816	79	79,016
Clearance	0,015	0,020	0,04	0,046	0,05	0,056

Reeds valve, intake boot

- Over time, the carbon reeds gradually lose their elasticity, which causes a loss of power.
- Replace used or frayed reeds, taking care of applying threadlocker on the stoppers screws.
- Check intake boot condition, especially looking for cracks.

Clutch



- Clutch pusher ❶ Check wear.
- Pushrod ❷ check wear, minimum length : **128.8 mm.**
- Pads ❸ check condition, looking for abnormal marks.
- Basket ❹ check for grooves, on the fingers.
- Hub ❺ check for marks on the discs seating surface.

Discs check

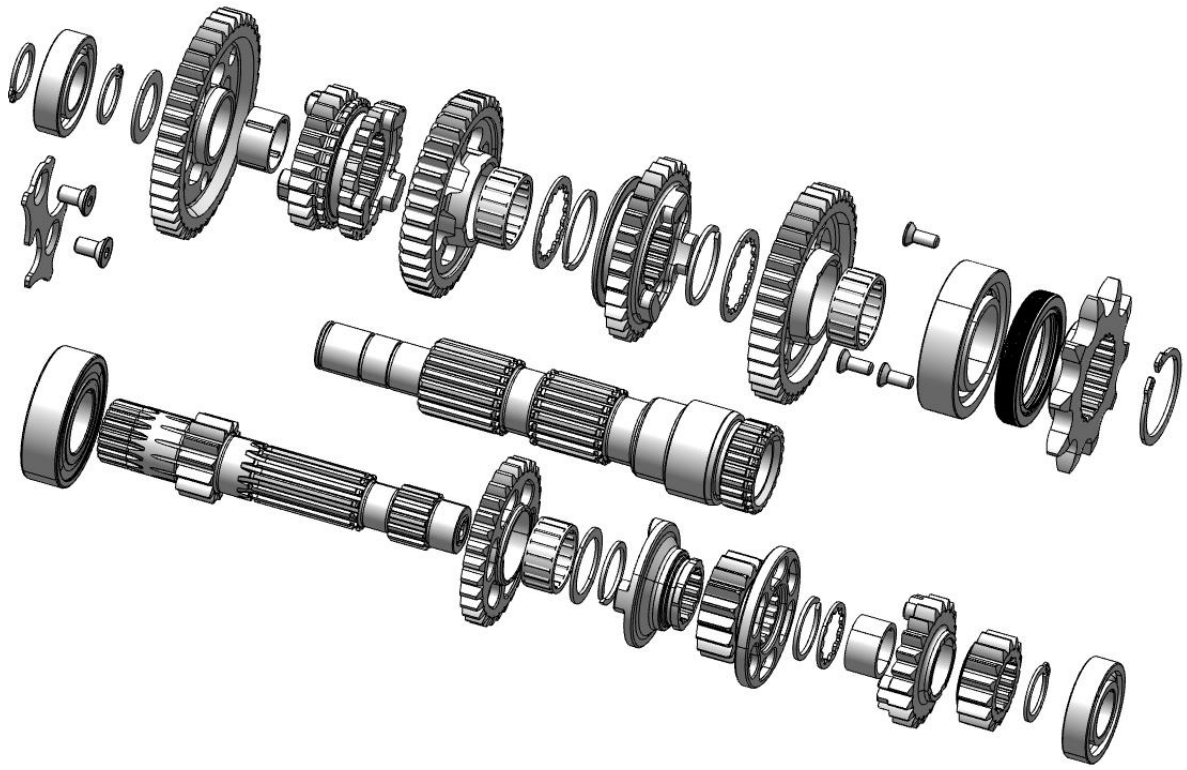
- On diaphragm clutch, discs thickness control is done with the whole batch (friction plates and smooth plates)

  Minimum thickness : **9,92 mm**

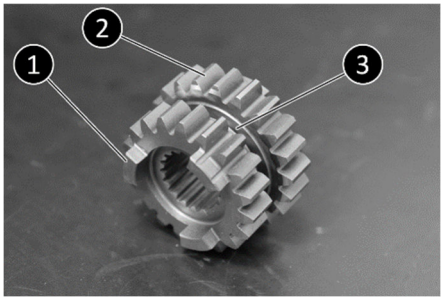
CAUTION

During discs disassembly, hold them together with a tie so as to keep their position and assembly order. Worn discs that are not reassembled in the same way can cause vibrations in the clutch.

❯| Gearbox shafts



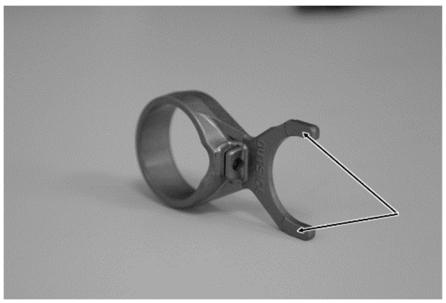
- Check all the gears :
- Check the coupling dogs ❶.
- Check pignon teeths ❷.
- Check the fork grooves ❸.



- Check the fork condition.

Minimum thickness : 3,97 mm

- Check the fork bore , looking for deep scratches.



- Check the shifting drum, looking for deformation or abnormal wear of the races.

  Replace the shifting drum if needed.

❱I Gearbox assembling.

- Prior to assembling, thoroughly oil all the parts with the correct oil.

  - Assembling order of the forks is stamped on each fork.:

  - The “Outside” mark matches the outside of the shifting drum.
  - The arrow points to the front forward direction.

- First, start the assembly with the fork on the selection star side..

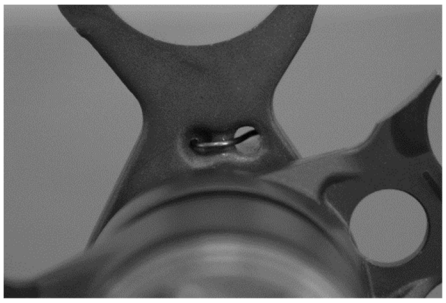
- Install it with the side stamped "outside" towards the outside of the cylinder.

- Put back in place the guide pin.

- - Place the clip so that the right hand side passes through the left hand hole to hold the guide pin and then lock the clip through the right hand hole.

CAUTION
Always replace the pin retaining clips after each removal

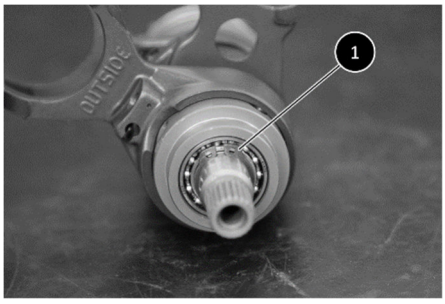
- Make sure the pin retaining clip in well positioned, as shown in the picture :



- Insert the gear selector shaft through the shifting drum.

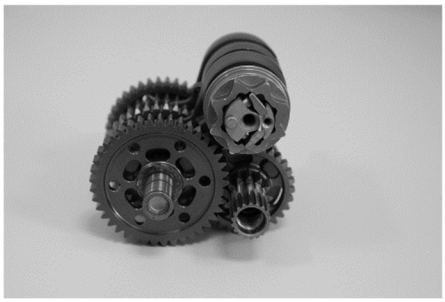
- Pinch the pawls, so that the gearbox is at neutral, as shown in the picture

- Install the selector shaft's snap ring ❶.

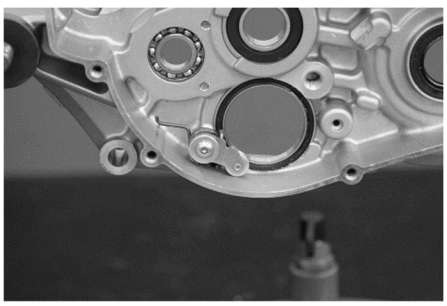


- Place the forks in this way :

- Place the two gear shafts, taking care on installing the forks in their grooves.

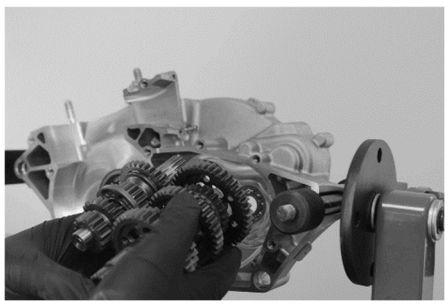


- Install the shifting locator, screw in the CHC screw without tightening it.

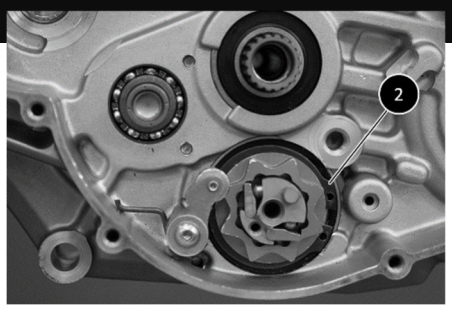


- Place the shifting locator locking tool Part number 10988 in order to hold it open.

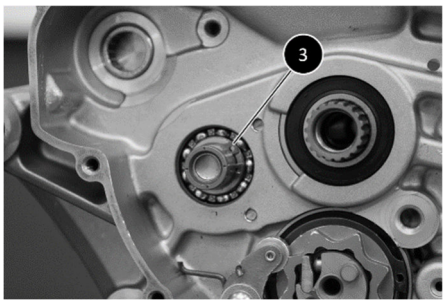
- Put back the gearbox-shifting assembly in the crankcase.



- Install the shifting drum's snap ring ❷ and remove the shifting locator locking tool.

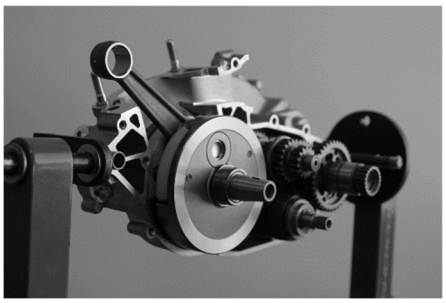


- Install the secondary shaft's snap ring ❸

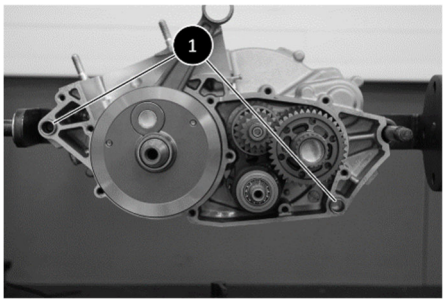


❱I Accoupling the crankcases

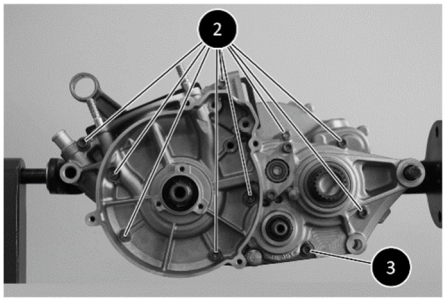
- Install the crankshaft in the crankcase.



- Make sure the two dowel pins ❶ are well positioned, and install the gasket.



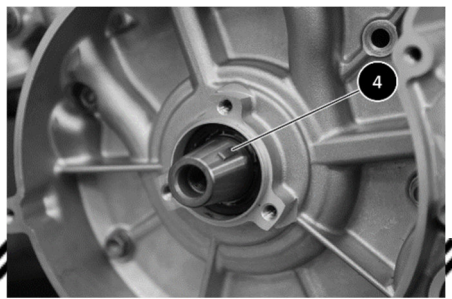
- Fit the nine screws ❷ , with a copper washer under the screw ❸ Tighten them to a **10Nm** torque.



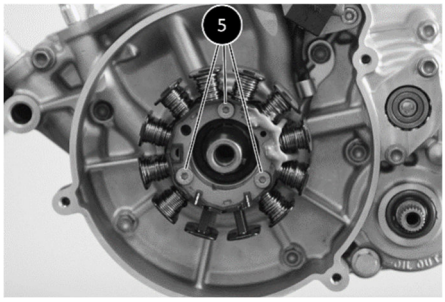
❱I Left hand side assembling

❱I Fitting the ignition

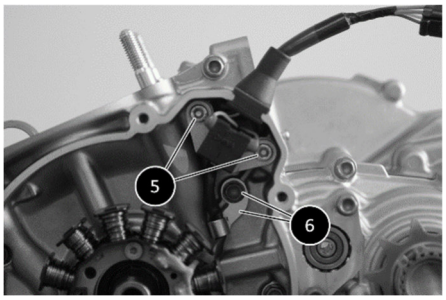
- Replace the woodruff key by a new one, and put it back in its slot. ❹



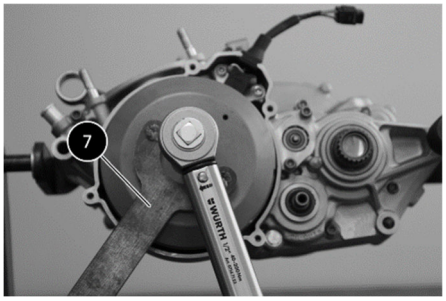
- Fit the stator and tighten its screw ❺ at a **7Nm** torque.



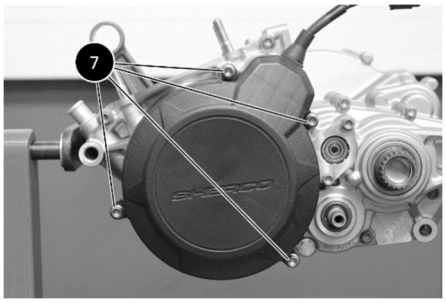
- Fit the CHC screws ❺ and the screw ❻ with the wiring holding plate.



- Fit the flywheel, and using the locking tool Part number 10985 ❼, tighten the CHC screw at a **80Nm** torque.



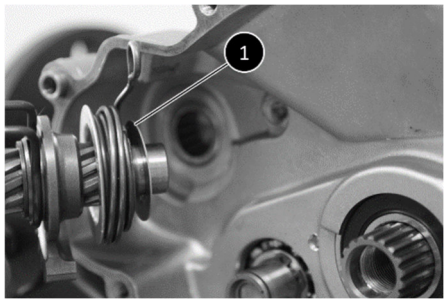
- Fit the ignition cover then tighten its four screws ❼ at a **8Nm** torque.



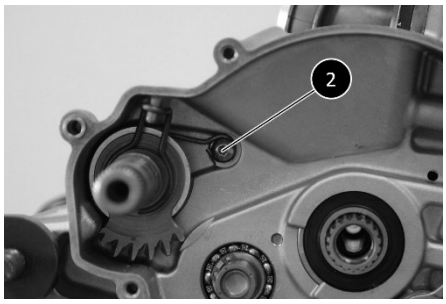
❯I Right-hand side assembling

❯IClutch assembling

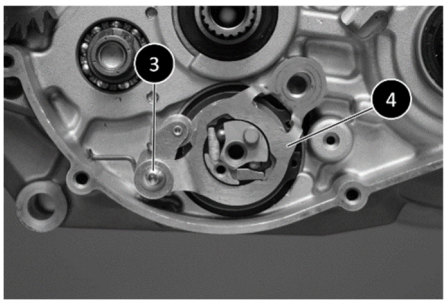
- Place the washer ❶ and the kickstarter shaft.



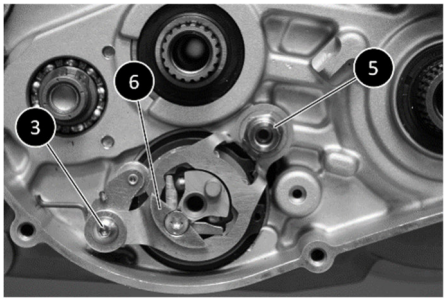
- Using medium threadlocker, fit the screw ❷, and tighten it to a **7Nm** torque.



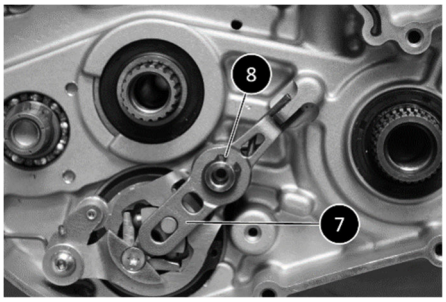
- Loosen the screw ❸ in order to place the retaining plate ❹.



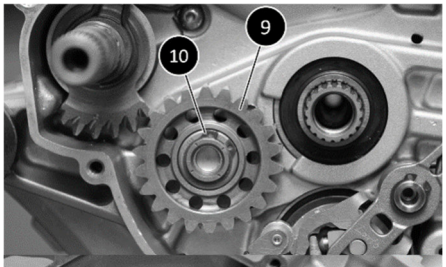
- Fit the screw ❺ and tighten it to a **20Nm** torque, tighten the screw ❸ to a **7Nm** torque, fit the holding plate and tighten the screw ❻ to a **5Nm** torque.



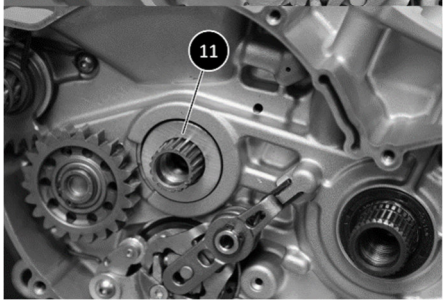
- Fit the shifing lever ❼ , and the snap ring ❽.



- Fit the kickstarter idle gear ❾ and its clips ❿.

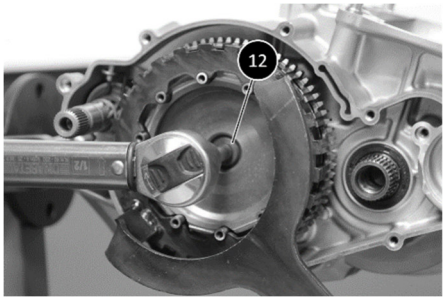


- Fit the primary shaft washer ⓫.

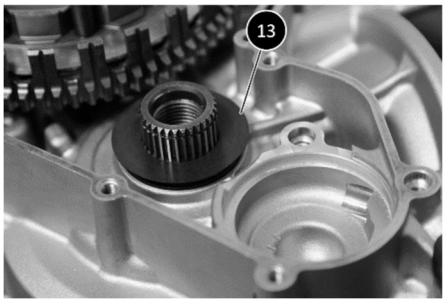


- Fit the clutch basket and the clutch hub.

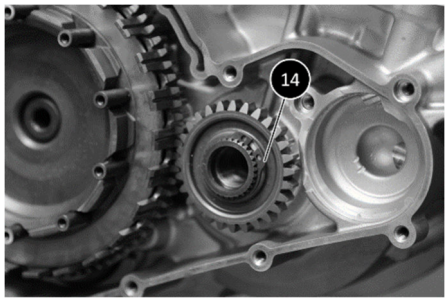
  Using the tool Part number 10982, hold the basket, fit the screw ⓬ and tighten it to a **60Nm** torque.



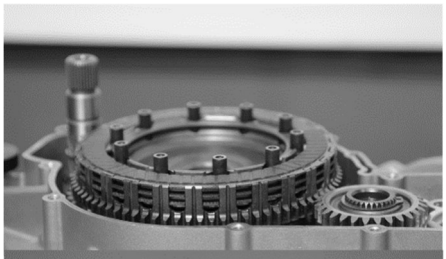
- Fit the first snap ring on the crankshaft, then the spring washer ⓭ its little diameter towards the snap ring, and its big diameter facing the primary drive gear. (the cone points the inside of the engine)



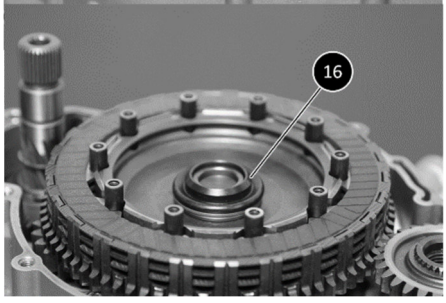
- Fit the primary drive gear and its snap ring ⓮. To make it easier to fit the snap ring, compress the spring washer by pushing the primary drive gear.



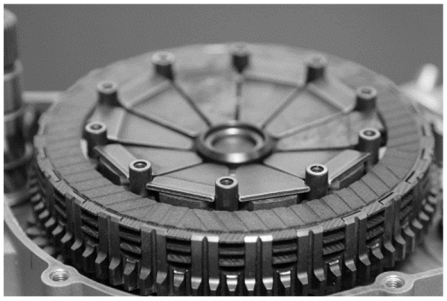
- Taking care of their position, fit the clutch discs.

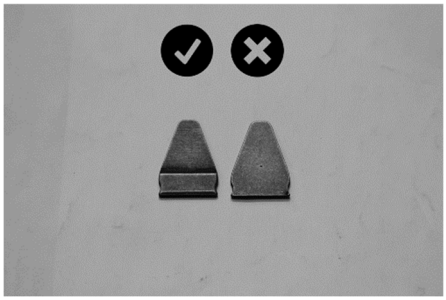


- Fit the clutch pushrod and the clutch pusher ⓰.

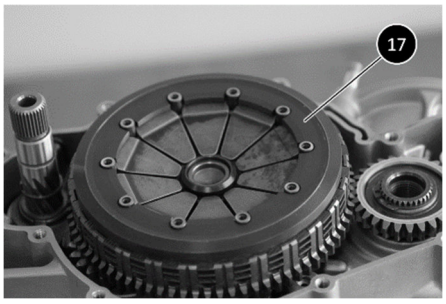


Fit the clutch spring pads so that their chamfered side is facing upward.

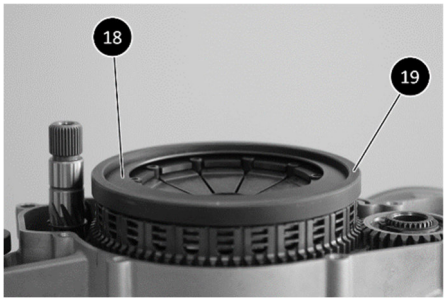




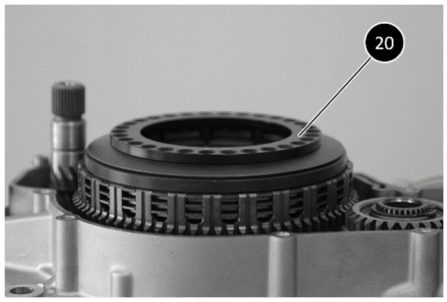
- Fit the pressure plate ⓱.



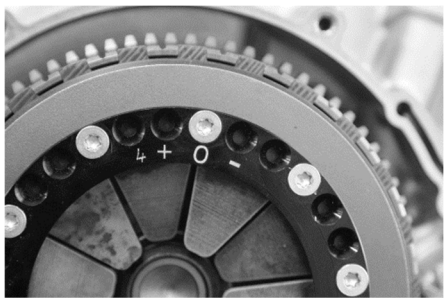
- Fit the diaphragm spring ⓲ and its centering tool ⓳ Part number 10987.



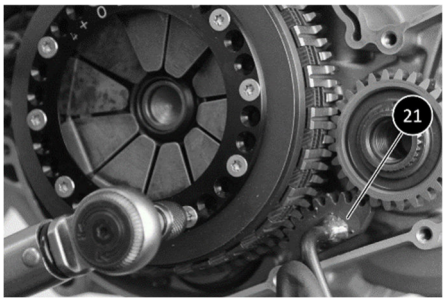
- Fit the pressure plate ⓴ and slightly tighten the screws.
- Remove the centering tool Part number 10987.



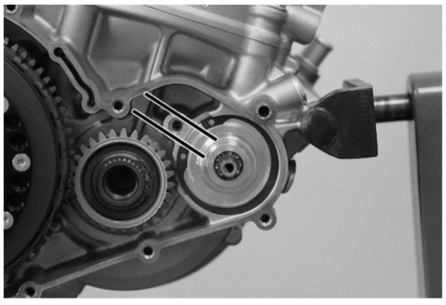
- The pressure plat features 3 hardness settings :
  - Screw in the middle hole = **standard setting.**
  - Screw in the left hole « + » = **harder setting**
  - (more preload)
  - Screw in the right hole « - » : = **softer setting** (less preload)



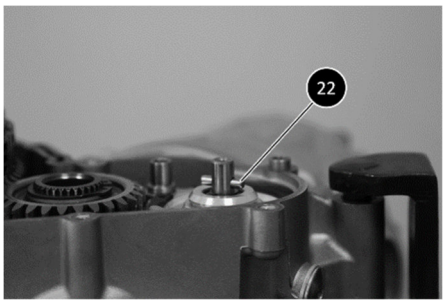
- Tighten all the screws at a 6 Nm torque, using the locking tool ㉑ Part number 10986.



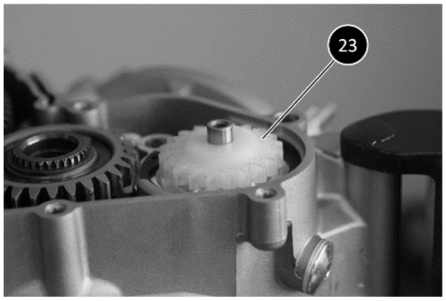
- Fit the water pump, then its snap ring. Make sure the ring end gap is lined up towards the pump gear's shaft hole.



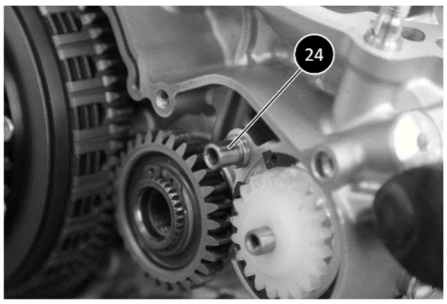
- Fit the drive pin ❷❷ in the water pump's shaft.



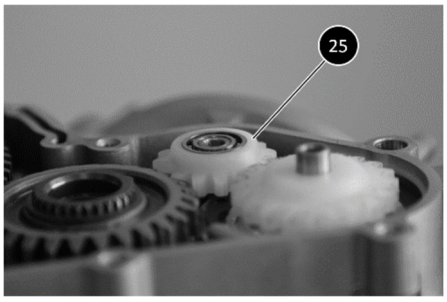
- Fit the water pump's drive gear ❷❸.



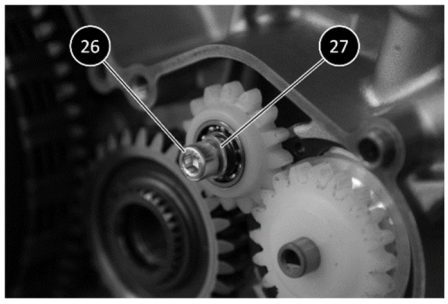
- Place the water pump idler shaft ❷❹.



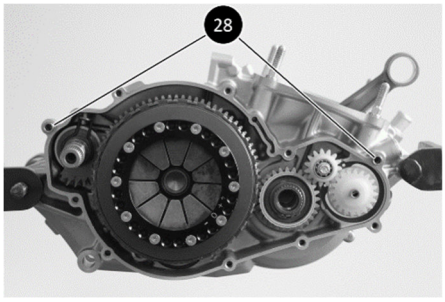
- Place the gear ❷❺ on its shaft.



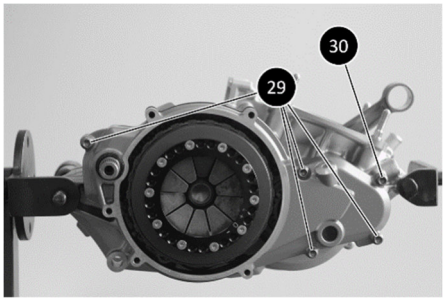
- Fit the screw ❷❻ as well as the washer ❷❼.
  - Tighten it to a **7Nm** torque.



- Place the two dowel pins ❷❽.

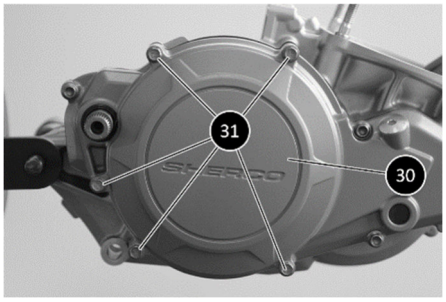


- Fit the clutch case and its screws



- Be sure to use a new copper washer when refitting the screw 30.

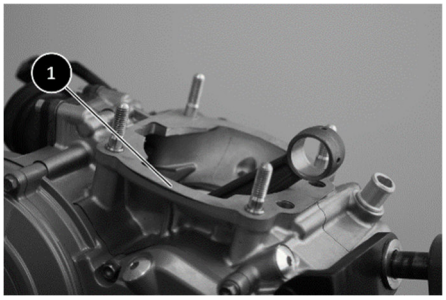
- Fit the clutch cover and its five screws 31.



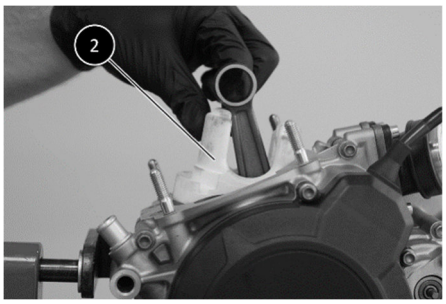
Top-end assembling

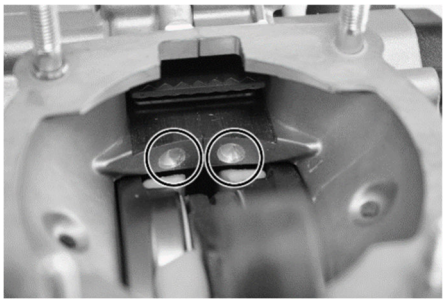
Piston fitting

- Place the base gasket 1.

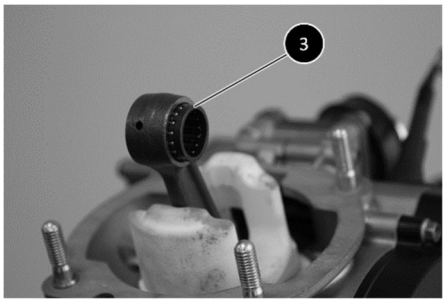


- Place the inlay 2 lined up with the conrod, intake side first, taking care to place it in the detents of the crankcase halves.

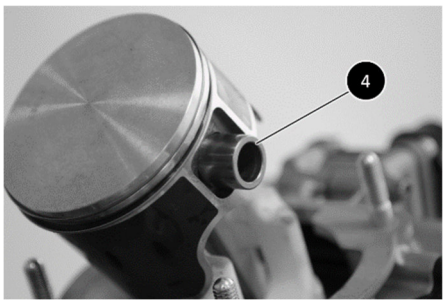




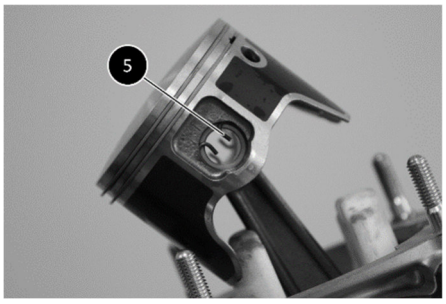
- Place the needle cage ❸.



- Fit the wrist pin ❹.



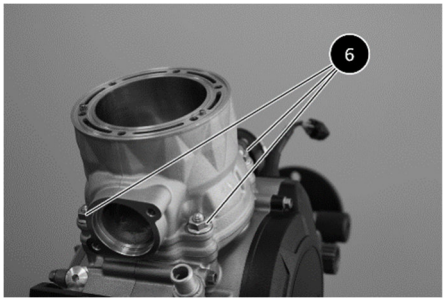
- Fit the clips on both sides of the piston ❺.



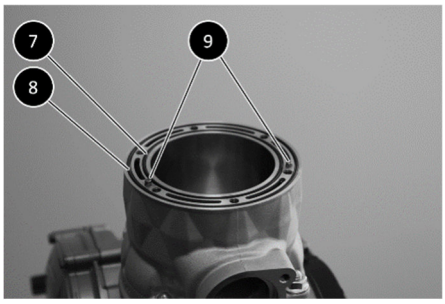
- Make sure the piston is in the right way : the arrow engraved on its crown must point towards the exhaust port.

  - Make sure the rings ends face the piston pins.

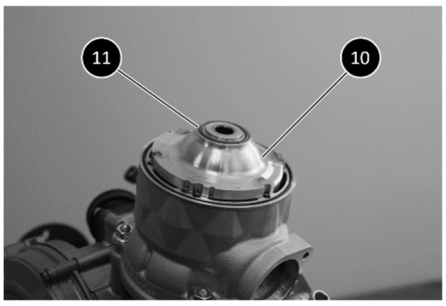
- Fit the cylinder.
- Tighten its four base nuts ❻ at a **20Nm** torque.



- Place inside ❼ and outside ❽ O-rings.
- Place the two dowel pins ❾



- Fit the combustion chamber ❿ and its O-ring ⓫.

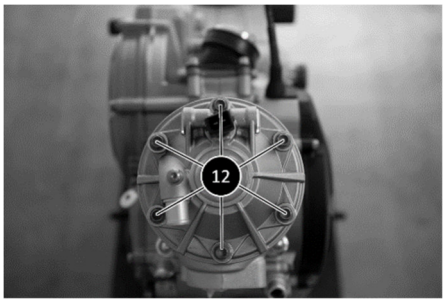


Squish check

- The squish check is carried out measuring the distance between the piston crown , at Top Dead Center, and the combustion chamber.
- **As a reference, fit a 0,5mm thick base gasket.**
- Place a bit of tin wire on the piston crown, parallel to the wrist pin.
- Fit the cylinder head, tighten the screws.
- Rotate the crankshaft to make sure the piston moves past Top Dead Centre
- Remove the combustion chamber, and measure the tin wire thickness.

	125cc	250cc	300cc
Min. Squish	0.9 mm	1.25 mm	1.25 mm
Max. Squish	1.00 mm	1.35 mm	1.35mm

- Fit the cylinder head cover and its 6 screws ⓬, with new copper washers, cross-tighten the screws at a **10Nm** torque.

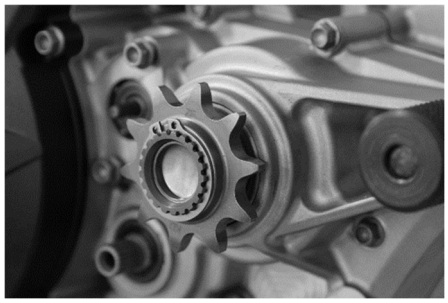


❱| Reed valve and intake boot

- Place a new reed valve gasket.
- Fit the reed valve.
- Place a new intake boot gasket.
- Fit the intake boot and tighten its four M5 screws at a **6Nm** torque.

❱| Gearbox output sprocket

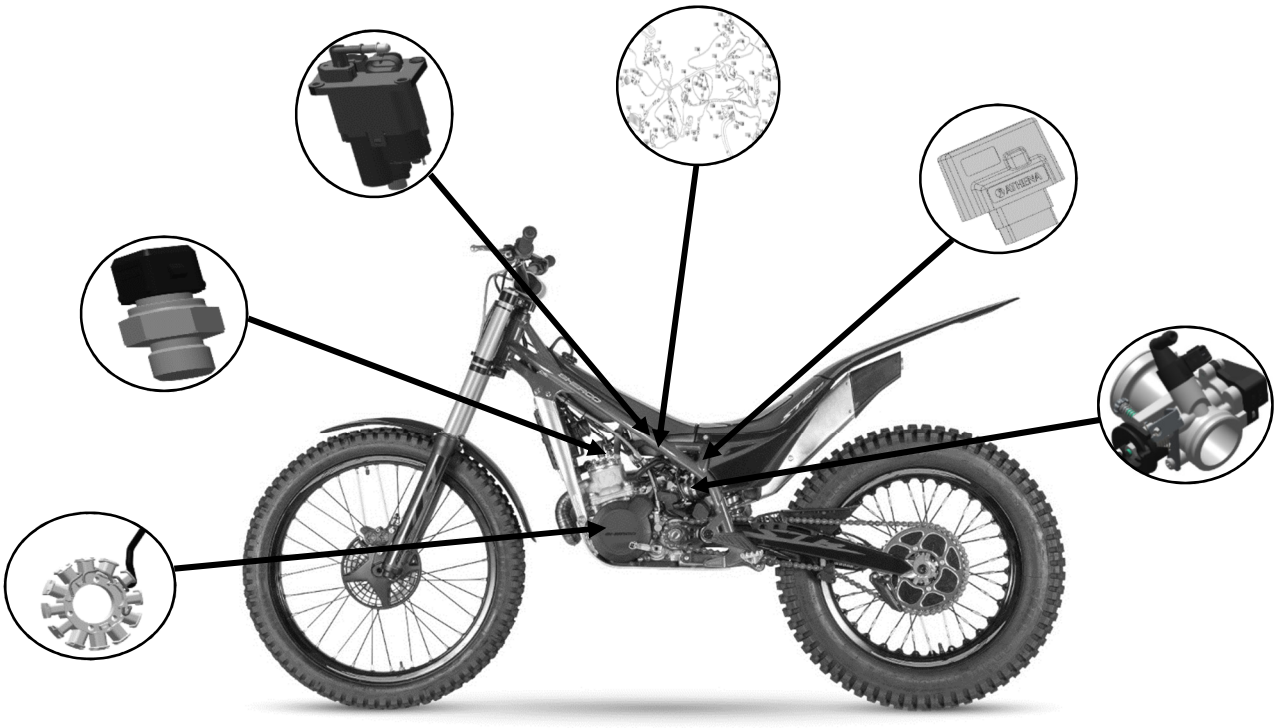
- Fit the engine-side snap ring.
- Place the sprocket, the number of teeth faced outwards .
- Fit the outside snap ring.



TIGHTENING TORQUES

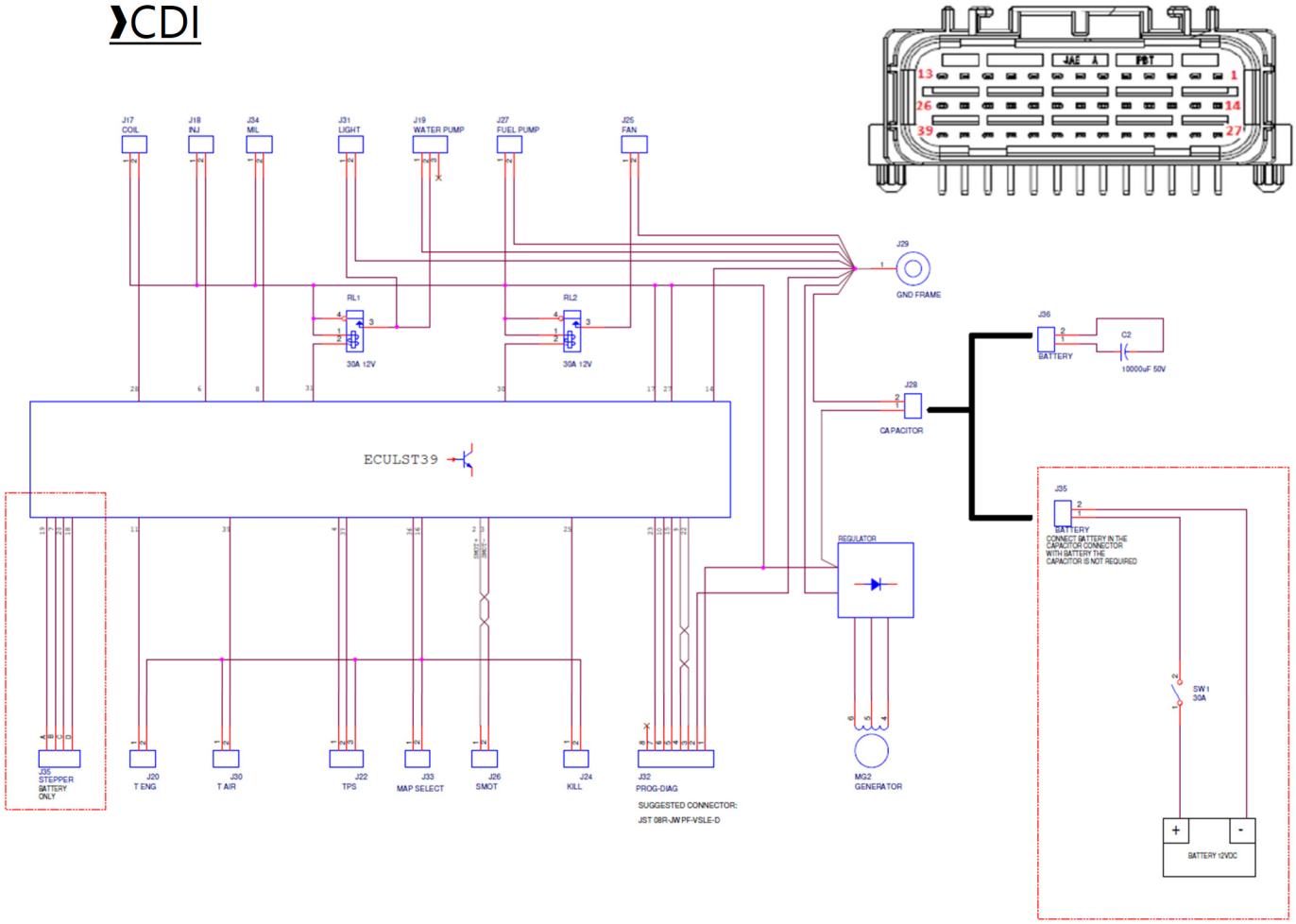
Cylinder head screws	10 N·m
Cylinder base nuts	22 N·m
Ignition cover screws	0,7 N·m
Stator screws	0,7 N·m
Flywheel screw	100 N·m
Pressure plate screws	0,7 N·m
Clutch nut	40 N·m (With medium threadlocker Loctite 243)
Intake boot screws	0,7 N·m
Crankcase halves screws	15 N·m
Primary drive gear nut	60 N·m
M5 screws	0,6 N·m
M6 screws	12 N·m
M8 screws	24 N·m
M10 screws	40 N·m
Rear wheel spindle nut	100 N·m
Front wheel spindle	100 N·m
Bottom steering head nut	20 N·m
Top steering head nut	20 N·m
Swingarm spindle	50 N·m

❯| Electric components



Position	Designation
1	Ignition
2	Temperature probe
3	Fuel pump
4	Wiring harness
5	Throttle body
6	CDI

CDI

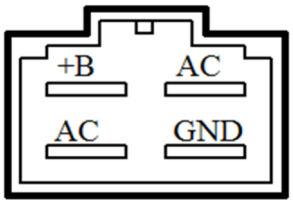


Regulator

- Tension regulator:
  On regulator output (20V continuous caliber)
  At 3500 Tr/min : 14.4V +/- 0.5V

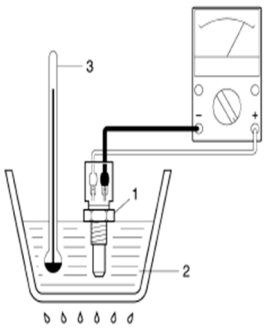
  Maximum output current : 15 A

  Max operating temperature : 110°C



Temperature sensor

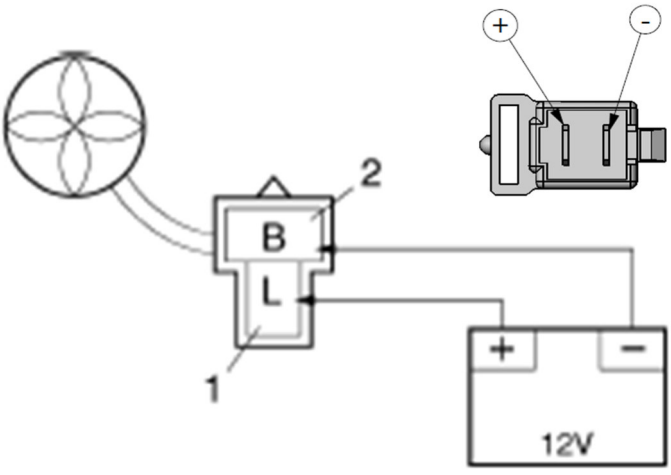
- Drain the coolant.
- Remove the temperature sensor from the cylinder head.
- Immerse the sensor **[1]** in a container filled with coolant **[2]** making sure to leave the terminals out of the liquid.
- Immerse a thermometer **[3]** in the liquid to check its temperature.
- Heat the liquid slowly and check the resistance of the sensor using a multimeter connected as shown in the diagram according to the temperature of the liquid by referring to the attached table.



Resistance Value			
Temp(℃)	Min(Ω)	Std(Ω)	Max(Ω)
−40	100950	98626	103274
−35	72777	71232	74322
−30	53100	52064	54136
−25	39111	38413	22201
−20	29121	28647	29595
−15	21879	21556	22201
−10	16599	16379	16819
−5	12695	12544	12845
0	9795	9697	9893
5	7616	7526	7706
10	5970	5892	6048
15	4712	4645	4780
20	3747	3689	3805
⚠ 25	3000	2950	3050
30	2417	2374	2460
35	1959	1923	1996
40	1598	1566	1630
45	1311	1283	1338
50	1081	1057	1104
55	895.9	875.5	916.2
60	746.4	728.7	764.1
65	624.9	609.6	640.2
70	525.6	512.3	538.9
75	444.4	432.8	456.1
80	377.4	367.2	387.6
⚠ 85	321.7	312.8	330.7

Ventilator

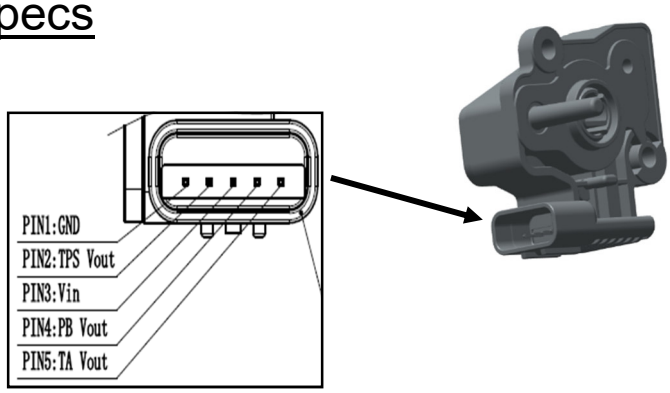
- Disconnect the fan from the harness.
- Connect a 12V battery directly to the fan as shown in the diagram.
- Check that the fan rotates correctly without hard points or abnormal noises.



Injector specs

Performance Parameters						
Dynamic flow rate: (Voltage 12±0.1V 100Hz 3000 pulse flow rage deviation±4%) unit: (g)						Static Flow Rate (g/min) Flow rate Deviation±4%
2ms	3ms	4ms	5ms	6ms	7ms	
11.2±6%	20	28.83	37.65	46.47	55.3	183.4
Test Liquid		Pressure (KPa)	Resistance (Ω)	Insulation Resistance (MΩ)	Leakage Rate (ml/min)	Static Minimum Operation Voltage (V)
TYH-4		300±1	12±0.6	〉10	≤0.3	≤7

MAP specs

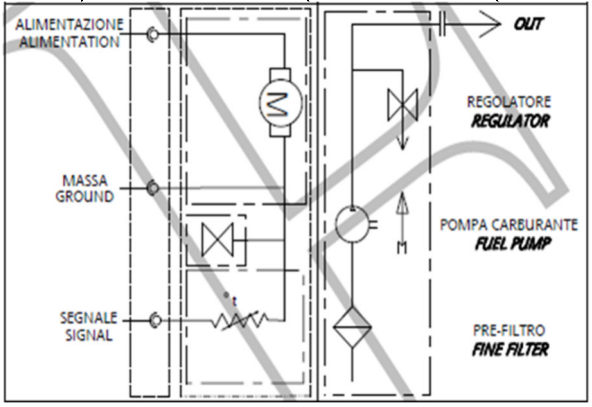


Fuel pump specification

- Disconnect the fuel pump line and place pressure gauge Part number **8691** as well as connector Part number **11207**.
- Make the pump build up pressure, connecting the shunt Part number **11212**.
- A steady pressure of **3,5 bars** must be maintained.

  In the case of inferior pressure, replace the fuel pump.

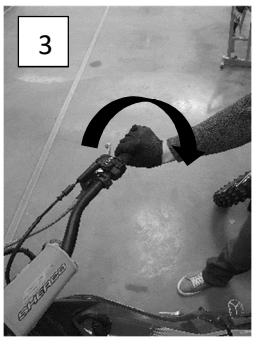
11207	8691
	



❯I Zeroing the TPS

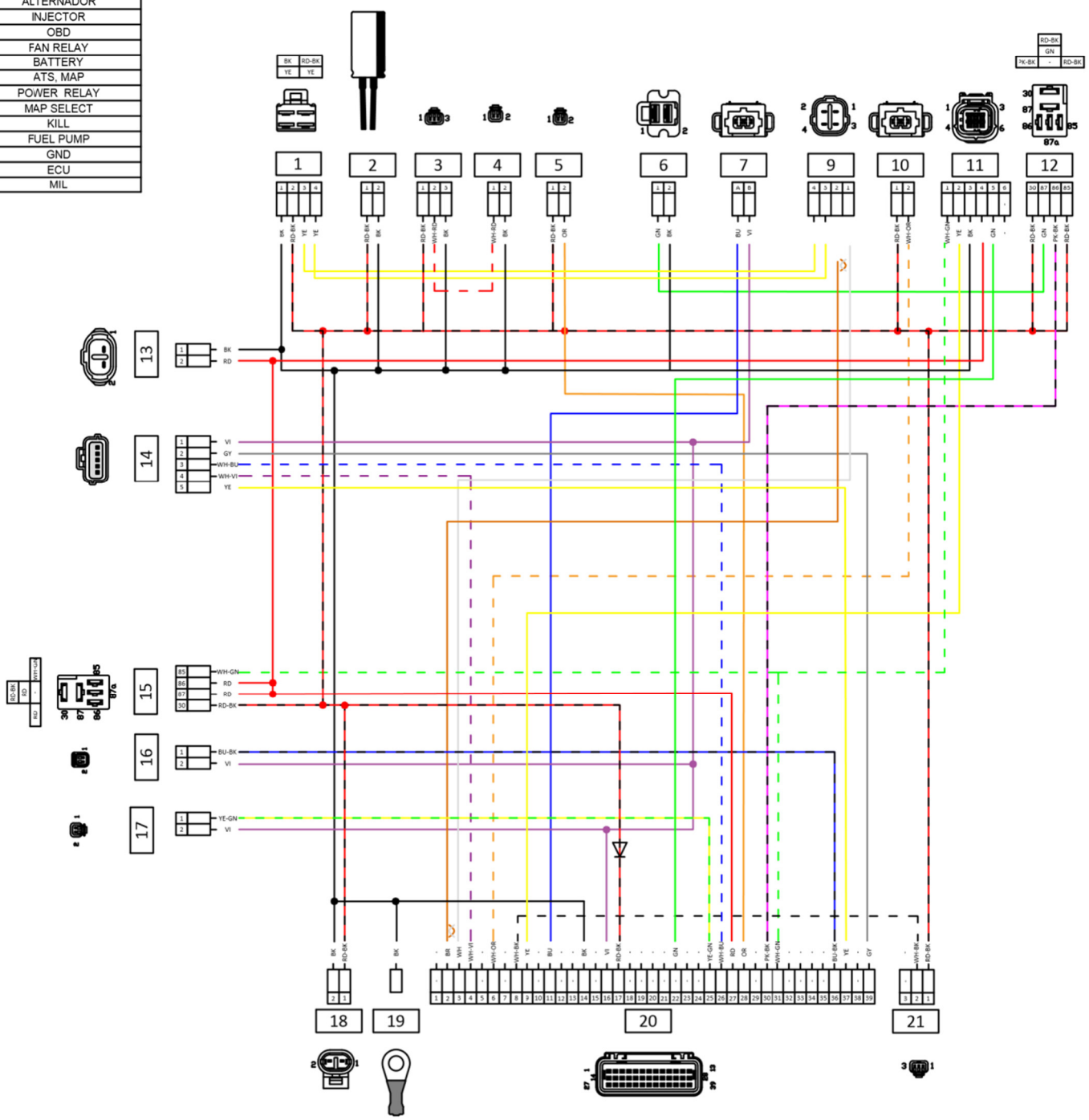
- In case of replacement of Throttle Position Sensor or the whole throttle body, it is necessary to proceed a zero TPS :
- First, connect the shunt Part number **11212** to the two-pins connector, on the left side of the bike [1].

- Remove the circuit breaker until the fuel pump starts working, then replace the circuit breaker [2].
  - Remove again the circuit breaker then twist the throttle grip to Wide Open Throttle. Once the fuel pump has ceased working release the throttle and place the circuit breaker [3].
  - Remove the shunt from the two-pin connector.



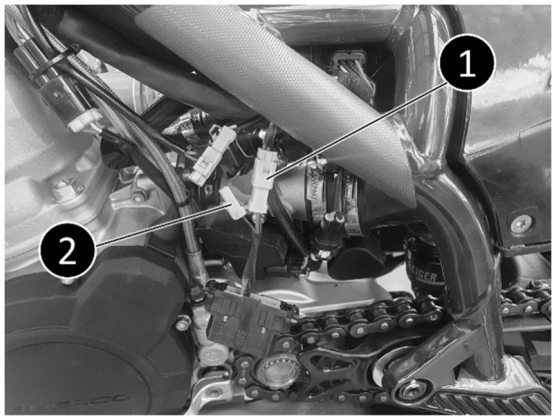
I Wiring diagram

FUNCTION	
1	REGULADOR
2	CONDENSADOR
3	FRONT LIGHT
4	REAR LIGT
5	COIL
6	FAN
7	T water
9	ALTERNADOR
10	INJECTOR
11	OBD
12	FAN RELAY
13	BATTERY
14	ATS, MAP
15	POWER RELAY
16	MAP SELECT
17	KILL
18	FUEL PUMP
19	GND
20	ECU
21	MIL

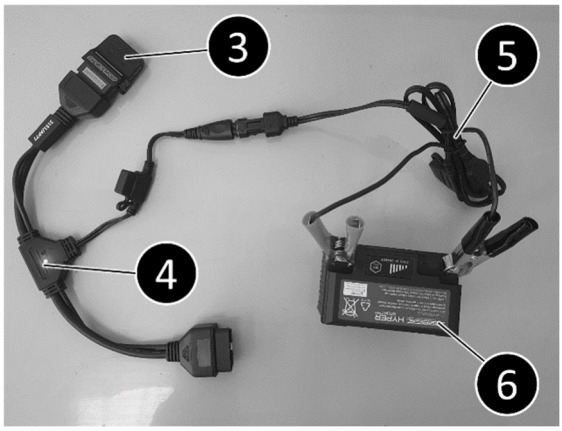


COLOR CODE	
YE	YELLOW
RD	RED
BK	BLACK
BU	BLUE
BR	BROWN
GN	GREEN
VI	VIOLET
WH	WHITE
GY	GREY
PK	PINK
OR	ORANGE

Setting up the tool



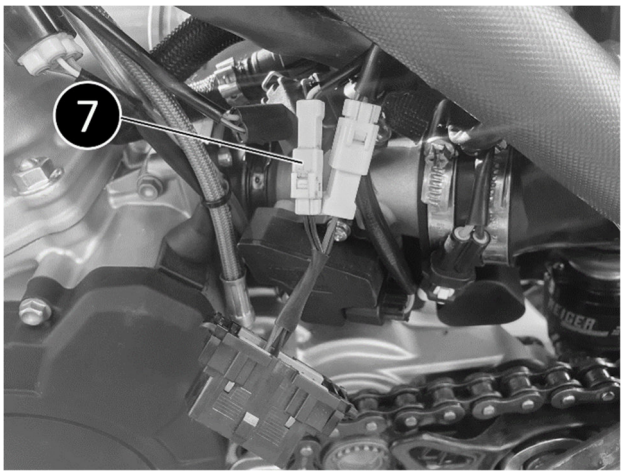
- Fit the OBD REF 11212 connector, taking care to connect only the 6-track connector [1] (leave the 2-track connector [2] disconnected for the moment).



- Then assemble the diagnostic tool [3], the OBD cable [4] and the external power cable [5] then connect everything to an external battery [6] as shown in the attached photo.
- Then connect everything to the bike

Launch of the program

- Connect the 2-way connector [7] of the OBD 11212 socket in order to switch on the ignition on the motorcycle.

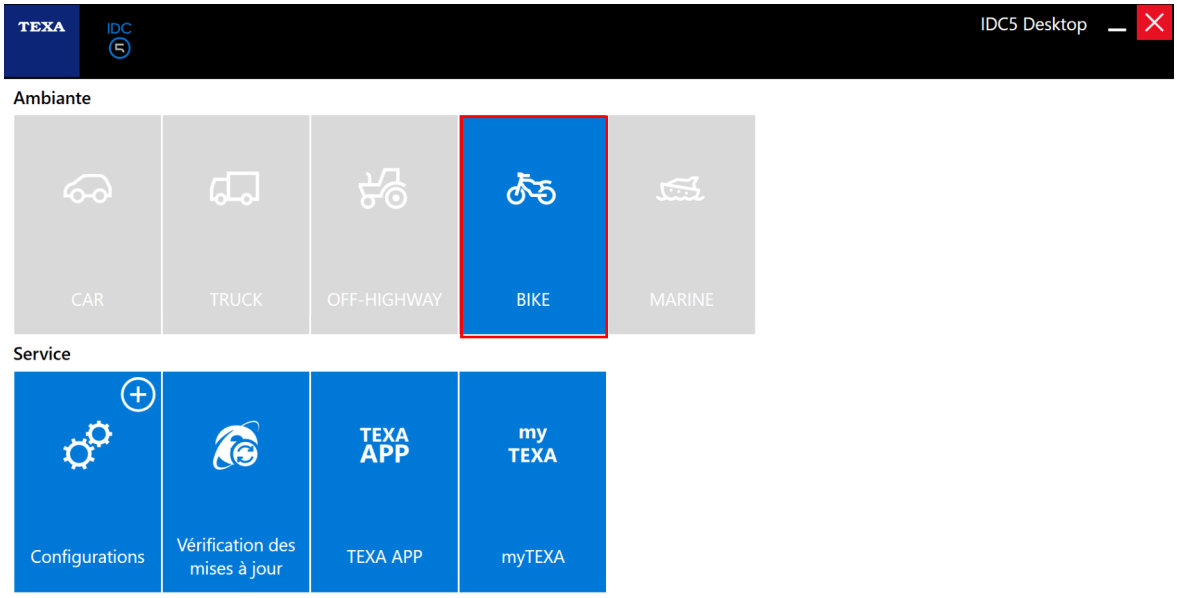


ATTENTION

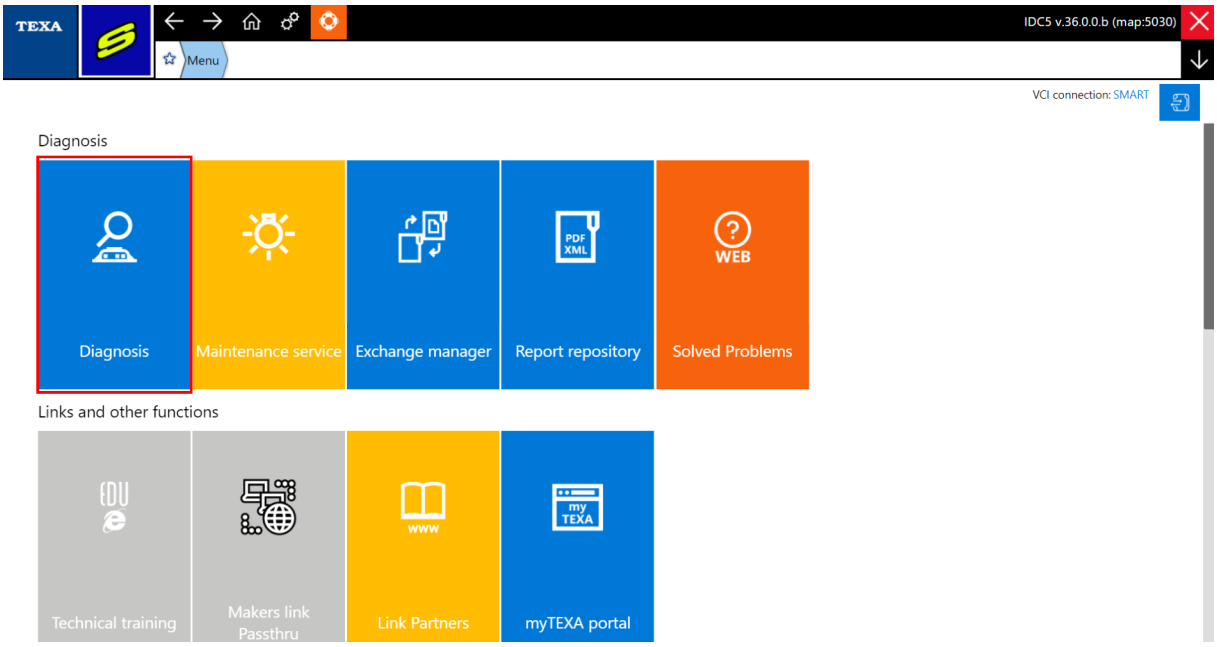
In order to preserve the battery, the connector must be removed each time the diagnostic tool is not used or in operation.

- To work, this program requires an internet connection. Make sure your computer is well connected to the internet and that the latest updates have been made 

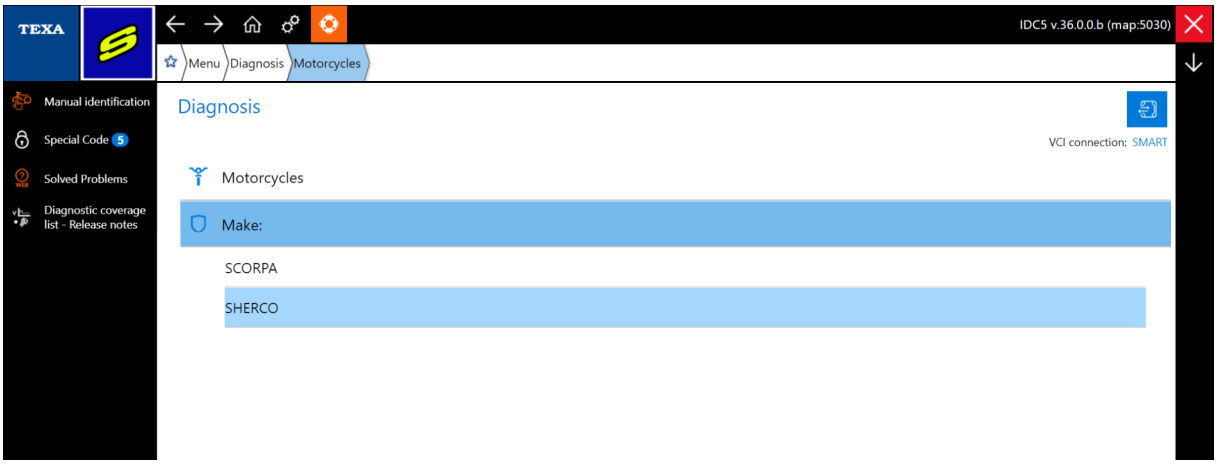
- Launch the program then select the “BIKE” menu



- Then select the "Diagnosis" mode

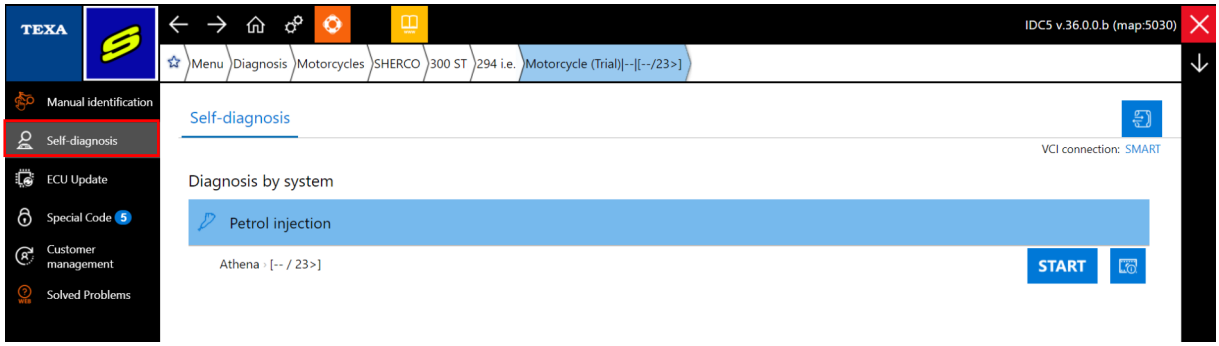


- Then select the Make and model of the vehicle

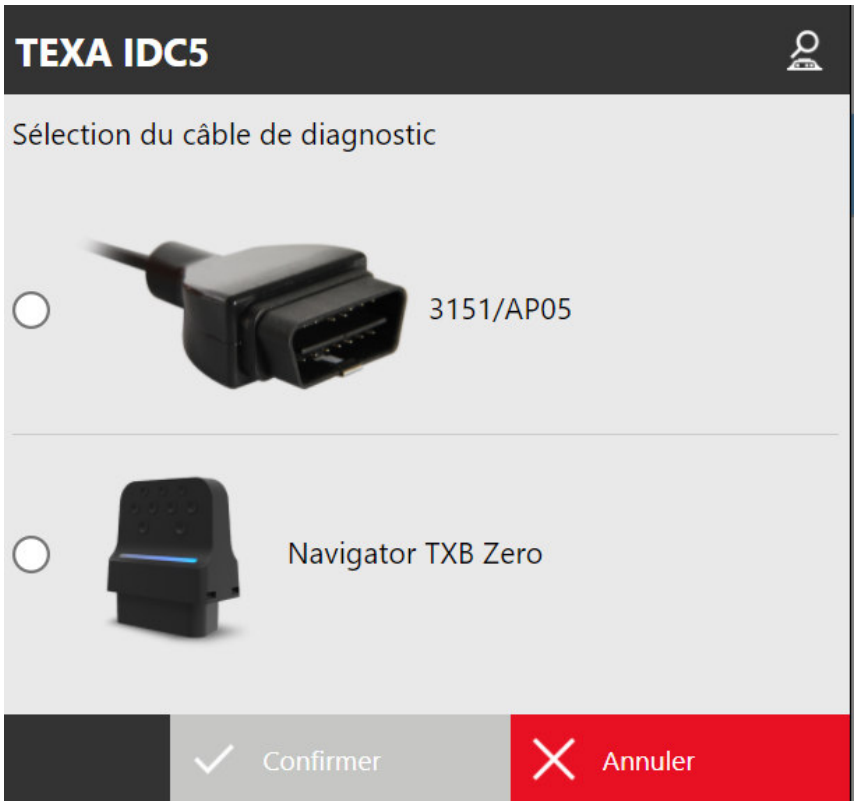


Using diagnostic mode

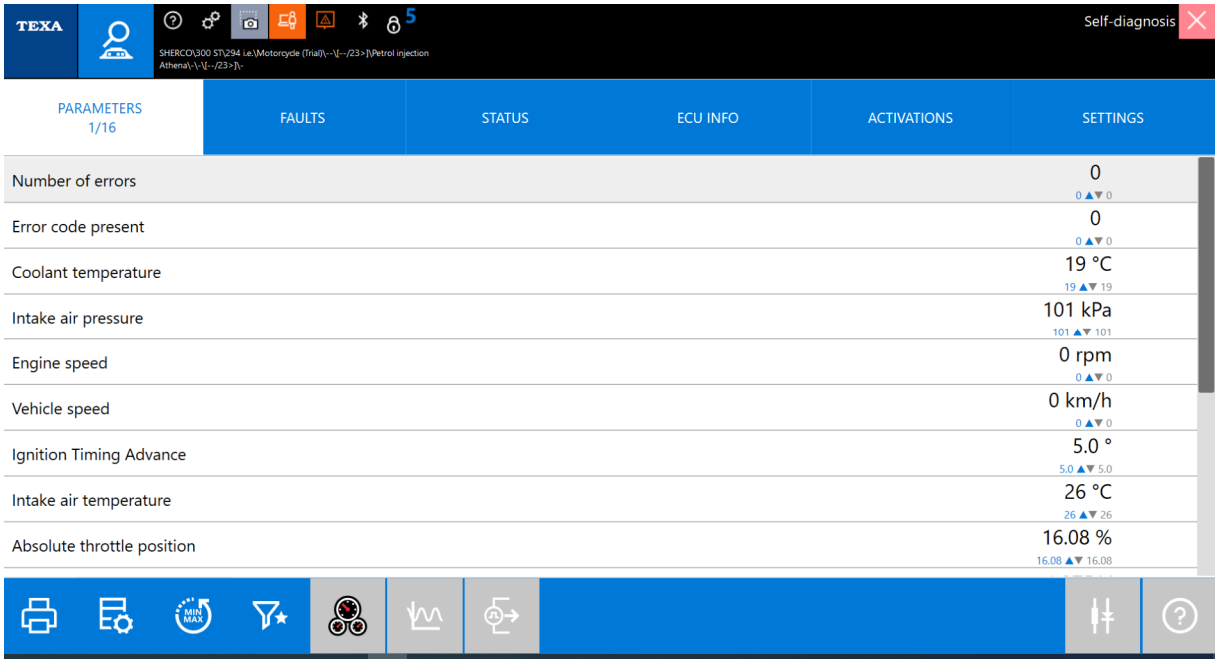
- Select the “Self-diagnosis” section



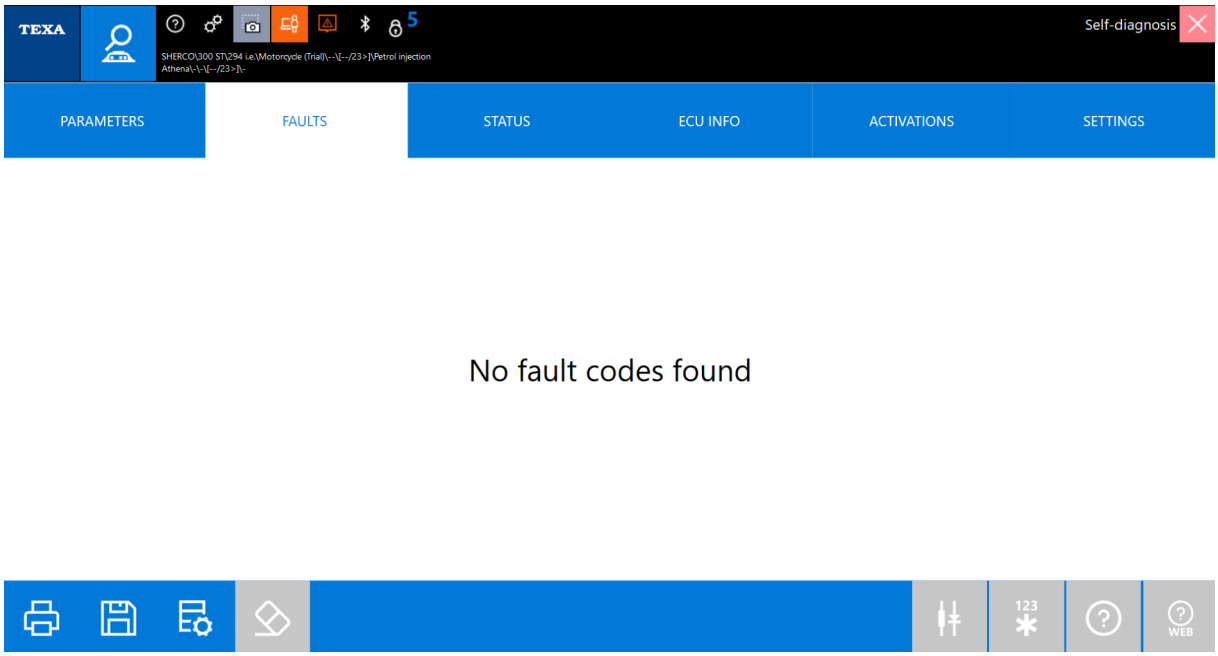
- Then select the type of connection cable used



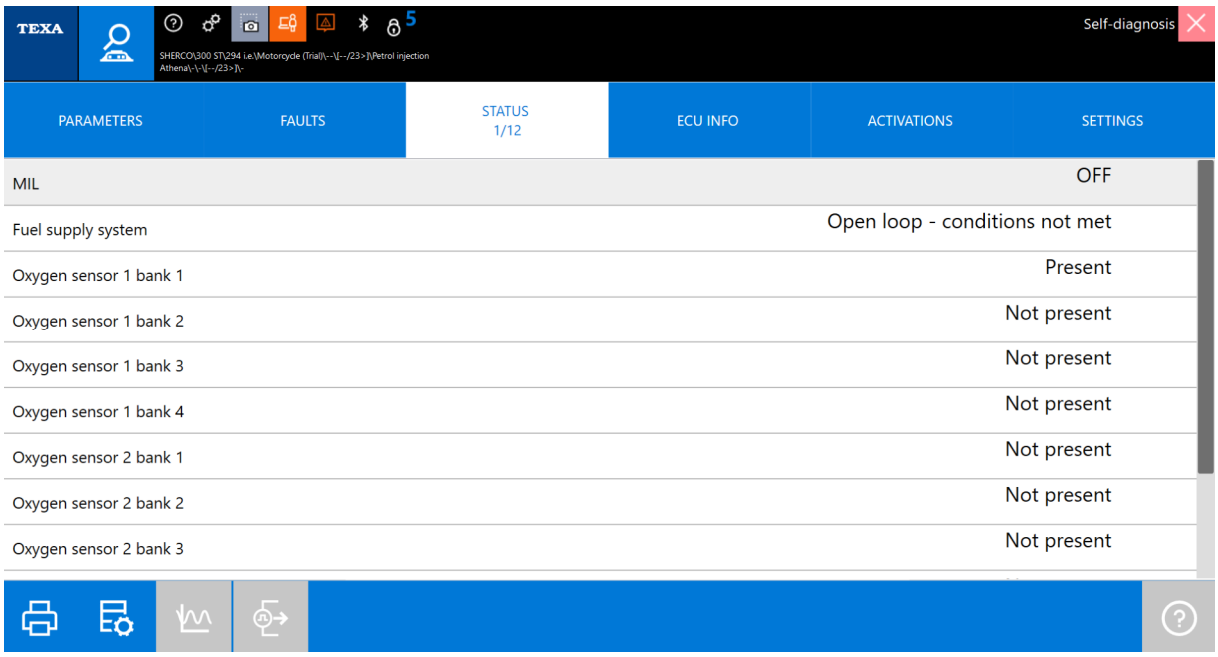
- The "PARAMETERS" tab allows you to view all engine data



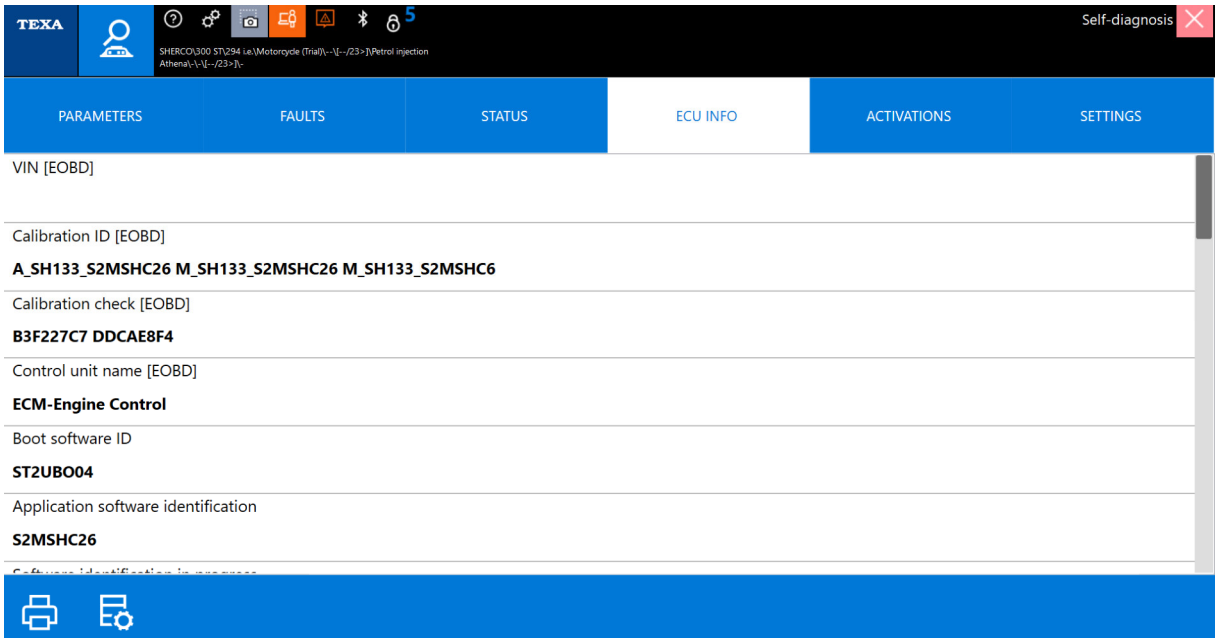
- The "FAULTS" tab allows you to read and erase fault codes



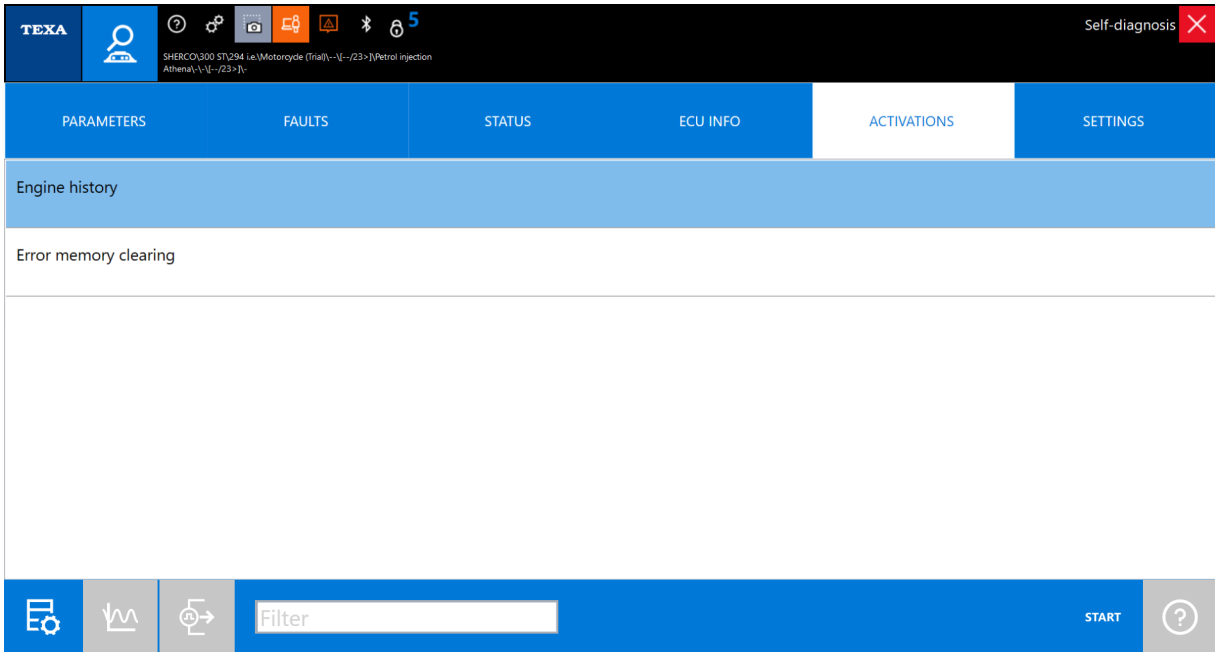
- The "STATUS" tab allows you to check the status of the various sensors



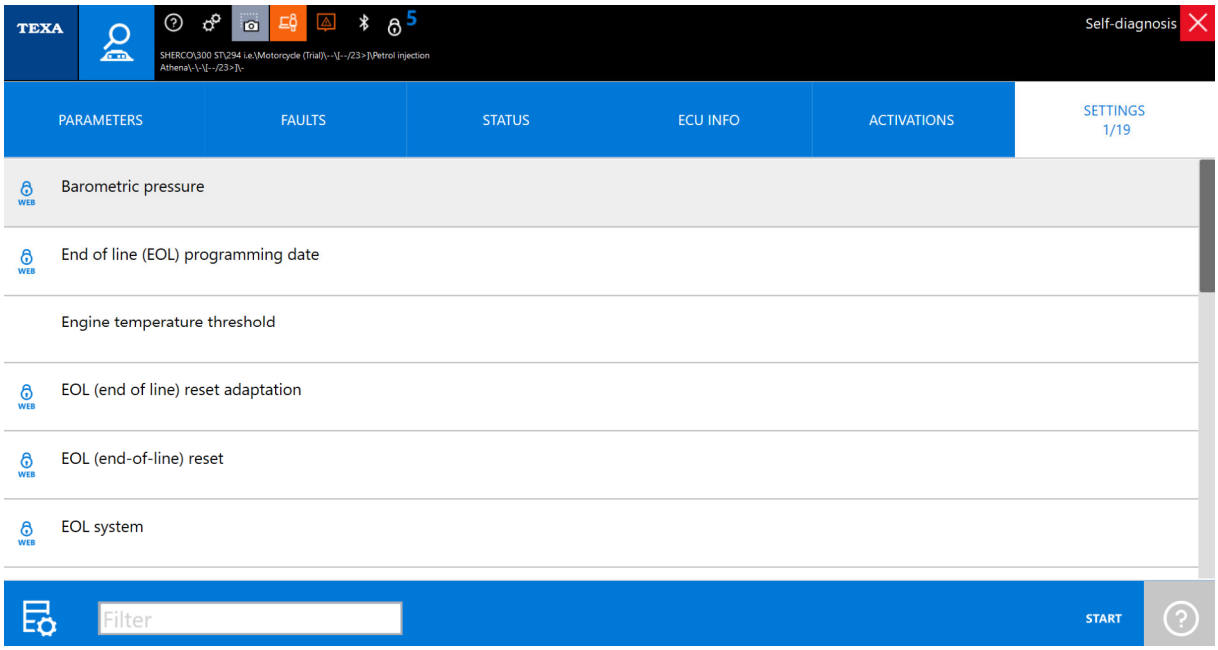
- The "ECU INFO" tab allows you to check the information stored in the computer (in particular the calibration present in the ECU)



- The "ACTIVATION" tab allows you to control the operation of the actuators

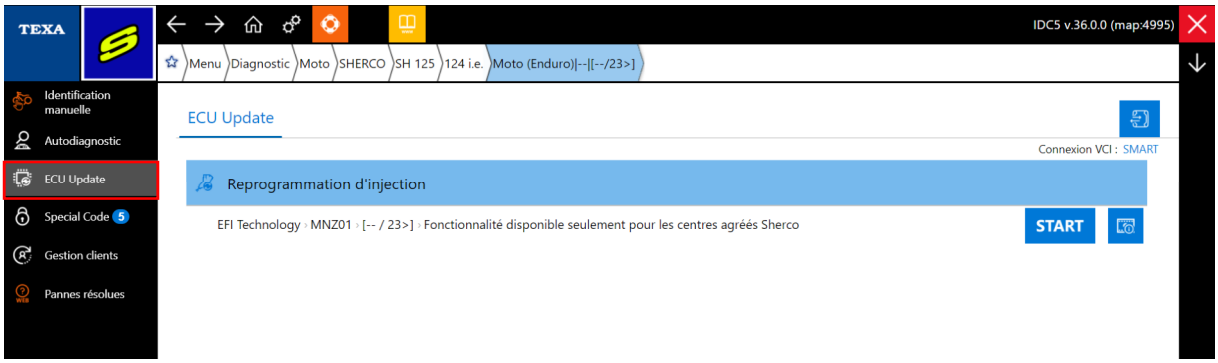


- The "SETTING" tab gives you access to certain setting functions

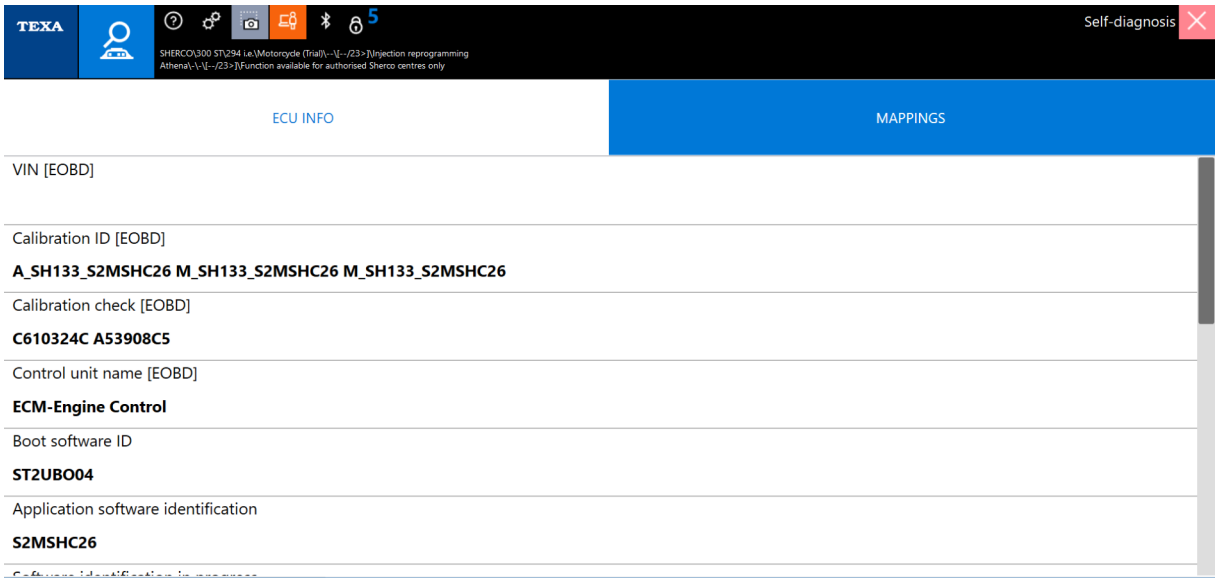


❯I Replacement of maps

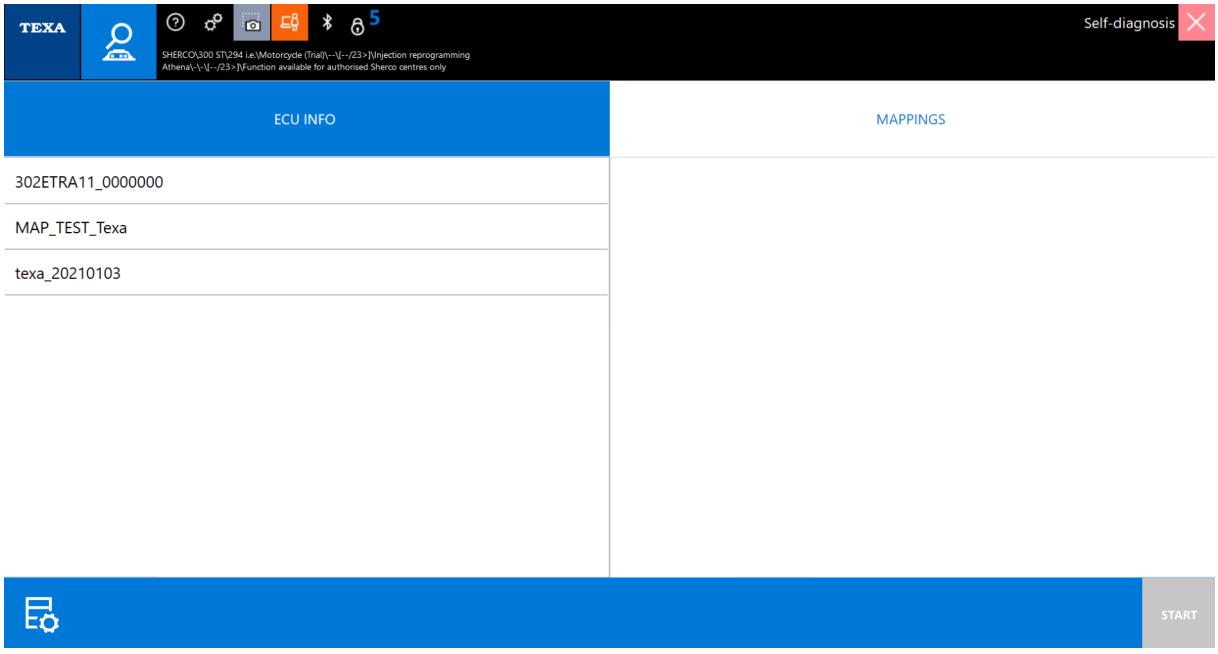
- Select the “ECU UPDATE” section



- The "ECU INFO" tab allows you to check the calibration present in the ECU



- The "MAPPINGS" tab allows you to update the maps. To do this, select the desired map then select “Start”



- Then follow the procedure indicated.

  Please note, on some models the TPS reset procedure will be necessary at the end of the operation.

SHERCO

WWW.SHERCO.COM